# REVISION OF *POCADIUS* ERICHSON (COLEOPTERA: NITIDULIDAE).

A Dissertation

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by
Andrew R. Cline
B.S. University of Alabama - Huntsville, 1996
M.S. University of Missouri, 2000
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## DEDICATION

This dissertation is dedicated to my wife JoAnna. Through the many years we have spent together you have often been my balance and point of reason. Your patience and understanding were always a comfort and inspiration. The work produced herein would not have been possible without you.

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**ABSTRACT**

A revision of *Pocadius* Erichson (Coleoptera: Nitidulidae) was completed. A total of 46 species were (re)described, including 25 new species, a key to species constructed, and phylogenetic analysis performed. Taxonomic changes, including nomenclatural emendations, reinstatement of species, and description of new taxa, within this dissertation do not constitute formal changes as defined by the International Code of Zoological Nomenclature. Illustrations of the genitalia, key characters, and dorsal habitus of species are provided. The phylogeny demonstrates a monophyletic *Pocadius*. The phylogeny suggests a Palearctic origin of the genus with subsequent speciation into the Old World tropics and New World. Host specialization on gasteromycetes fungi by *Pocadius* species was shown not to be obligate but rather facultative. Some sympatric species were shown to have temporally disjunct occurrences that may provide reproductive isolation.

# CHAPTER 1. INTRODUCTION

"In all things of nature there is something of the marvelous."

Aristotle, On the Parts of Animals, circa 350B.C.

## GENERAL BACKGROUND

Nitidulidae, or sap beetles, are small to minute Clavicornia taxa (e.g. beetles having clubbed antennae) with a variety of body forms, ecologies, life history strategies, and evolutionary peculiarities. Characterization of the family is difficult, and the literature is replete with misplacements of members of other, sometimes unrelated families, into Nitidulidae. Until the 20th century, Nitidulidae contained several other families or parts of families (e.g. Cyclaxyridae, Smicripidae, Kateretidae, Protocucujidae, and Phloeostichidae). These small convex beetles with drab coloration have had historically unclear systematic affinities thereby making this family a quintessential "dumping ground" for small beetles with clubbed antenna.

Characterization of what a nitidulid is remains questionable as remarked upon by Murray (1864) prior to his monograph, "this I knew to be no easy task, no journey of the Sabbath day." Through comparative morphology, Lawrence et al. (1999a, 1999b) and Habeck (2002a, based on Parsons 1943 and Audisio 1993) provided the following that differentially define Nitidulidae: antennae 11 segmented with at least the three terminal antennomeres forming a well-defined club, labrum free and visible, maxilla with a single lobe, procoxae transverse, tarsal formula 5-5-5, larvae with a complex mandibular prostheca and pretarsal setae present. Of these, I find two most useful when identifying material, i.e. transverse procoxae and compact 3-segmented club. However, only the former character as well as a single-lobed maxilla and complex larval mandibular prostheca are synapomorphic, as evidenced by their absence in other beetle lineages.

To understand and appreciate the complexity of the taxonomic and subsequent systematic condition of Nitidulidae fully, it is best first to assess the superfamily in which it is contained and continue down the classification hierarchy (Table 1). The following sections deal with our current understanding of nitidulids and their closest allies. Taxonomic efforts focusing on nitidulids and their relatives, how nitidulids are subdivided, the lifestyles and evolutionary histories some nitidulids exhibit, and studies underlying comparative morphology and molecular biology in the family also are treated. Finally, an introduction to the focal taxa of this dissertation, i.e. the genus *Pocadius* Erichson and tribe Pocadiini Seidlitz, are given.

TABLE 1. Hierarchy demonstrating the placement of *Pocadius*, Pocadiini, and other taxa. Taxa in bold indicate some of the taxa considered in this study.

| | |
|---|---|
| KINGDOM | Animalia |
| PHYLUM | Arthropoda |
| CLASS | Insecta |
| ORDER | Coleoptera |
| SUBORDER | Archostemata, Myxophaga, Adephaga, **Polyphaga** |
| SERIES | Staphyliniformia, Scarabaeiformia, Elateriformia, Bostrichiformia, **Cucujiformia** |
| SUPERFAMILY | Lymexyloidea, Cleroidea, **Cucujoidea**, Tenebrionoidea, Chrysomeloidea |
| FAMILY | Sphindidae (cryptic slime mold beetles), Kateretidae (short winged flower beetles), **Nitidulidae** (sap beetles), Smicripidae (palmetto beetles), Coccinellidae (lady-bird beetles) |
| SUBFAMILY | Carpophilinae, Amphicrossinae, Cillaeinae, Maynipelinae, Calonecrinae, Meligethinae, Epuraeinae, **Nitidulinae**, Cryptarchinae, Cybocephalinae |
| TRIBE | Nitidulini, Cychramini, Cyllodini, Cychramptodini, Lawrencerosini, Amborotubini, **Pocadiini** |
| GENUS | *Atarphia*, *Hebasculinus*, *Hebascus*, *Hyleopocadius*, *Lordyrodes*, *Niliodes*, *Physoronia*, *Pocadioides*, ***Pocadius***, *Pocadites*, *Pseudoplatychora*, *Taraphia*, *Teichostethus* |
| SPECIES | ***Pocadius ferrugineus*** **(Fabricius)** |

## TAXONOMIC BACKGROUND. I. CUCUJOIDEA LATRIELLE 1802

Cucujoidea is one of six superfamilies (Lymexyloidea, Cleroidea, Cucujoidea, Tenebrionoidea, Chrysomeloidea, and Curculionoidea) in the series Cucujiformia Lameere (1938). The Cucujiformia is the most speciose series (~50% of all beetle species) containing hyperdiverse families such as Cerambycidae (long-horned beetles), Chrysomelidae (leaf beetles), and Curculionidae (weevils). Interestingly, the greatest species diversity occurs in the mainly phytophagous lineages, whereas the greatest familial diversity occurs in the mycophagous lineages. Characters delineating the cucujoid lineage include: cryptonephridic Malpighian tubules, ring-type or sheath-like aedeagus, hylecoetoid metendosternite, undivided mala in the larval maxilla, retention of larval spiracular closing apparatus in adults, and absence of spiracles on abdominal segment 8 in adults (see Crowson 1960 and Lawrence and Newton 1982). According to Pakaluk et al. (1995), the Cucujoidea contained 31 families, 78 subfamilies, ~1500 valid genera, and >20,000 species. However, numerous changes have occurred since this catalogue appeared, most importantly the transfer of Languriidae into a broadly defined Erotylidae (Leschen 2003) and erection of Cyclaxyridae. According to my tabulation (Table 2) Cucujoidea includes 31 families, 89 subfamilies, a little more than 1200 genera, and >20,000 species. Thus, some generic resolution has occurred over the last decade in some lineages and new subfamilies erected, but relatively few new species have been described (compare Pakaluk et al. 1995 to Table 2). This trend shows the relative push in insect systematics to produce higher level work while for the most part neglecting species level monographs.

The first formalization of the Cucujoidea was offered by Böving and Craighead (1931) and was based primarily on larval forms. This approach of using immature forms to recognize relationships is an important innovation, particularly with cucujoid beetles, as there is a long and erroneous history of classifications based on convergent adult morphological characters. Unfortunately, this seminal work was overlooked by many beetle systematists, and the superfamily did not begin to receive serious attention again until Crowson, the 20$^{th}$ century's most imminent coleopterist, began studies on members of the lineage in the 1950's (e.g. his "Classification of the Families of British Coleoptera" series, culminating with his 1955 text and

1960 phylogenetic assessment of the order). Böving and Craighead's concept of the Cucujoidea included the Tenebrionoidea (= Heteromera, so called for the 5-5-4 tarsal formula of adults), which was not formally divided from Cucujoidea "sensu lato" until Crowson (1954, 1960). Thus, by 1960 we began to see a well-developed concept of the Cucujoidea.

TABLE 2. Current classification summary of the Cucujoidea. Superscript numbers refer to published records, "?" values delineate undetermined affinities of the families.

| Family | Number of Subfamilies | Number of Genera | Number of Species | Defined Lineages | Undefined Lineages |
|---|---|---|---|---|---|
| Sphindidae[1] | 4 | 9 | 61 | Sphindid | |
| Protocucujidae[2] | 1 | 1 | 7 | Sphindid | |
| Nitidulidae[3] | 10 | >200 | >4000 | | Nitidulid |
| Kateretidae[4] | 1 | 12 | 100 | | Nitidulid |
| Smicripidae[5] | 1 | 1 | 6 | | Nitidulid |
| Cyclaxyridae* | 1 | 1 | 1 | | ? |
| Monotomidae[6] | 2 | 20 | 250 | | ? |
| Boganiidae[7] | 2 | 5 | 11 | | ? |
| Phloeostichidae[8] | 4 | 6 | 10 | | ? |
| Helotidae[9] | 1 | 5 | 108 | | ? |
| Cucujidae[10] | 1 | 4 | 40 | | Cucujid |
| Silvanidae[11] | 2 | 47 | 470 | | Cucujid |
| Passandridae[12] | 1 | 9 | 105 | | Cucujid |
| Laemophloeidae[13] | 1 | 37 | 400 | | Cucujid |
| Propalticidae[14] | 1 | 2 | 35 | | Cucujid |
| Phalacridae[15] | 2 | 55 | 600 | | ? |
| Hobartiidae[16] | 1 | 2 | 6 | | ? |
| Cavognathidae[17] | 1 | 4 | 5 | | ? |
| Cryptophagidae[18] | 3 | 48 | 600 | | Cryptophagid |
| Lamingtoniidae[19] | 1 | 1 | 1 | | Cryptophagid |
| Erotylidae[20] | 6 | 110 | >3500 | | Cryptophagid |
| Byturidae[21] | 2 | 7 | 16 | | ? |
| Biphyllidae[22] | 1 | 6 | 200 | | ? |
| Cerylonidae[23] | 5 | 52 | 300 | Cerylonid | |
| Bothrideridae[24] | 4 | 35 | 300 | Cerylonid | |
| Alexiidae[25] | 1 | 1 | 50 | Cerylonid | |
| Discolomatidae[26] | 5 | 18 | 400 | Cerylonid | |
| Endomychidae[27] | 12 | 120 | 1300 | Cerylonid | |
| Coccinellidae[28] | 6 | 360 | >6000 | Cerylonid | |
| Corylophidae[29] | 4 | 35 | 284 | Cerylonid | |
| Latridiidae[30] | 2 | 25 | 1050 | Cerylonid | |
| ∑ | 89 | 1238 | >20216 | 2 | 3 + ? |

[1] McHugh 2002; [2] Slipinski 1998; [3] Kirejtshuk 1986a, 1998a, 1998b; [4] Audisio 1993, Habeck 2002; [5] Price 2002; [6] Lawrence 1982, Bousquet 2002; [7] Crowson 1990, Endrödy-Younga 1991, Klimasweski and Watt 1997, [8] Lawrence 1982 and Lawrence 1995; [9] Kirejtshuk 2000; [10] Thomas 2002a; [11] Thomas 2002b; [12] Slipinski 1987, 1989, Burkhardt and Slipinski 1991, 1995; [13] Thomas 2002c; [14] Lawrence 1982; [15] Lawrence 1991, Steiner 2002; [16] Tomaszewska and Slipinski 1995; [17] Lawrence 1982, 1991; [18] Leschen 1996, Leschen and Skelley 2002; [19] SenGupta and Crowson 1969; [20] Leschen 2003; [21] Goodrich 2002a; [22] Lawrence 1991, Goodrich 2002b; [23] Slipinski 1990; [24] Phillips and Ivie (2002); [25] Lawrence 1982; [26] Lawrence 1982; [27] Tomaszewska 2000; [28] Vandenberg 2002; [29] Bowestead and Leschen 2002; [30] Lawrence 1991, Andrews 2002.

* Cyclaxyridae is incertae sedis, being monotypic and having no clear affinities for any cucujoid lineage.

The basal position of Cucujoidea with respect to other Cucujiformia appears well substantiated, in particular the Lymexyloidea and Cleroidea (Crowson 1960, 1964a, 1966, 1970, Lawrence 1991, Lawrence and Newton 1982). Cladistic efforts by Leschen, Lawrence, and Ślipiński (2005), however, suggested that Cucujoidea were paraphyletic with respect to the Cleroidea, which was peripherally remarked upon by Crowson in his Cleroidea work (1964a, 1966, 1970) and initially substantiated by preliminary efforts by Beutel and Ślipiński (2001). Multiple datasets of adults, larvae and molecules are needed to bring resolution to this confusion, and to provide a reconstruction of the phylogenetic position and composition of this superfamily.

The initial impetus on family and higher level phylogenetic work in the Cucujoidea and its constituent taxa by Crowson were continued by collaborative research with his student Sen Gupta. Work by these two individuals over three decades formalized many families and problematic taxa within them, including: Sphindidae (SenGupta and Crowson 1979), Rhizophagidae (= Monotomidae) (SenGupta 1988), Boganiidae (SenGupta and Crowson 1966, 1969a), Phloeostichidae (SenGupta and Crowson 1966, 1969a, Crowson 1973), Propalticidae (Crowson 1955, Crowson and Sen Gupta 1969, SenGupta and Crowson 1971), Hobartiidae (SenGupta and Crowson 1966, 1969a), Cavognathidae (Crowson 1964b, 1973, SenGupta and Crowson 1966, 1969a), Lamingtoniidae (SenGupta and Crowson 1969b), Languriidae (= Erotylidae) (SenGupta 1967, 1968a and 1968b, SenGupta and Crowson 1967, 1969b,1971), Erotylidae (SenGupta 1969), Sphaerosomatidae (= Alexiidae) (SenGupta and Crowson 1971), Cerylonidae (SenGupta and Crowson 1973), and Merophysiidae (= Endomychidae in part) (SenGupta 1979). The work by Crowson and Sen Gupta demonstrates the first two major modern contributions in cucujoid research (a total of three major contributions were proposed by Lawrence and Newton 1982, two of which include the erection and definition of endemic south temperate families, i.e. Boganiidae, Hobartiidae, Propalticidae, Cavognathidae, and

Lamingtoniidae; and clarification of the Erotylidae/Languriidae whereupon the Cryptophagid-lineage could be resolved).

The third contribution to cucujoid systematics as suggested by Lawrence and Newton (1982) was delimitation of the cerylonid-series. The “cerylonid-series” has been recognized as the most highly derived grouping of cucujoid beetles (Ślipiński and Pakaluk 1991). The group was originally defined by Crowson (1955). Ślipiński and Pakaluk (1991) included the following families in the lineage: Alexiidae, Bothrideridae, Cerylonidae, Coccinellidae, Corylophidae, Discolomidae (= Discolomatidae), Endomychidae, and Latridiidae. The group was characterized by: adults with tarsal formula 4-4-4 or 3-3-3 in both sexes, wing without a closed radial cell and reduced number of anal veins, aedeagi resting on side when retracted and with highly reduced tegmen, larvae with unisetose tarsungulus, annular spiracles, and sensory appendage of second antennal segment not as long as third segment. Current efforts by McHugh (University of Georgia) and his students are focused on resolving the status of the cerylonid-series with respect to other Cucujoidea, its constituent members, and phylogenetic progress within specific families. The families Sphindidae and Protocucujidae were thought to be sister taxa (Crowson 1954, 1955, and SenGupta and Crowson 1979), and at a basal position within Cucujoidea (Lawrence 1991, McHugh 1993, Chiao and McHugh 2000, Ślipiński 1998, Beutel and Ślipiński 2001). Crowson’s assessments of the relationship between these two families was based on adult morphological features; Ślipiński ’s, McHugh’s, and Chiao and McHugh’s research combined both adult and larval characters, and Lawrence’s and Beutel and Ślipiński ’s work further developed larval characters. Thus, the basal clade of Cucujoidea appears well corroborated with both larval and adult character systems. These works constitute what I propose as the fourth major contribution to cucujoid systematics, i.e. the establishment of a basal lineage (Sphindidae-

Protocucujidae) that can be used for evaluating character polarity and tree rooting in other cucujoid lineages.

With both basal and highly derived cucujoid lineages defined, the next contributions in cucujoid systematics must be focused on clarifying remaining familial clades, including: the nitidulid-lineage (Nitidulidae, Kateretidae, and Smicripidae); the cucujid-lineage (Cucujidae, Laemophloeidae, Silvanidae, Passandridae, Propalticidae); the cryptophagid-lineage (Cryptophagidae, Erotylidae, Byturidae, and Biphyllidae); and the remainder of the unplaced families (e.g. Monotomidae, Boganiidae, Cyclaxyridae, Phloeostichidae, Helotidae, Phalacridae, Hobartiidae, and Cavognathidae). Thomas (1984a, 1984b, 1984c) helped solidify relationships between some members of the cucujid-lineage, providing a basis for elevating the Laemophloeidae to a family and clarifying issues within Silvanidae. To provide a comprehensive phylogeny of the Cucujoidea, it will be necessary to do more than strip away basal and derived lineages leaving a polyphyletic assemblage of groups. Research on the remainder of the Cucujoidea as well as a complete treatment of the entire superfamily is in great need.

**TAXONOMIC BACKGROUND. II. NITIDULID-LINEAGE**

The Nitidulid-lineage includes three families: Nitidulidae, Kateretidae, and Smicripidae. The limits of these three families had been mired in controversy and until recently the two latter families were designated as subfamilies of Nitidulidae. These close affinities are illustrated in Figure 1. Price (2002) offered a modern generic review of the family Smicripidae, and Habeck (2002b) provided a similar review of Nearctic Kateretidae (= Habeck's Brachypteridae) with notes on global classification. However, neither of these reviews provided information on constituent species nor phylogenetic problems within the respective families.

The limits of Smicripidae were first assessed by Böving and Craighead (1931) and were based solely on larval characters. Prior to this work, LeConte (1878), Sharp (1900), Casey

(1916), Leng (1920), and Hetschko (1930) all placed this taxon into the Monotomidae (= Rhizophagidae) and Horn (1879) placed them within Nitidulidae. Parsons (1943) suggested a smicripid affinity to Cucujidae, and Arnett (1963) placed the group in Monotomidae. The following characters, when taken in combination, define Smicripidae: antennae 11 segmented with a loose 3-segmented club, pygidium and hypopygidium longer than preceding 4 segments combined, two abdominal tergites visible from above, frontoclypeal suture deeply impressed and curved, and maxilla with single lobe. No global treatment of the family exists; the last taxonomic work on the group was completed by Casey (1916).

The Kateretidae (sensu Audisio 1994, 1995), unlike Smicripidae, have had a much more linked history with Nitidulidae, remaining a nitidulid subfamily until recently (Kirejtshuk 1986c). However, the family was defined as having a maxillary lacina with two lobes instead of one, though this was traditionally thought to be a subfamilial attribute and numerous workers included them with nitidulids (Arnett 1963, Blackwelder 1945, Blatchley 1910, and Downie and Arnett 1996). Verhoeff (1923) elevated Kateretidae to a family based on larval characters. Audisio (1984) suggested a split of Kateretidae from Nitidulidae based on adults, which was further elaborated and formalized by Kirejtshuk (1986c) based on genitalia and a preliminary phylogeny. Audisio's (1993) work remains the most comprehensive treatment of Kateretidae. No global treatment of any genus exists at any hierarchical level, and only a few generic revisions are available, but which are regional in scope (Parsons 1943, Audisio 1979, 1989, Hisamatsu 1976, Jelínek 1976, 1979a, Kirejtshuk 1988b, 1989).

**TAXONOMIC BACKGROUND. III. NITIDULIDAE LATRIELLE 1802**

Nitidulidae, or sap beetles, are the second most diverse family of cucujoid beetles (after Coccinellidae containing >6,000 species) with more than 4,000 described species (Lawrence

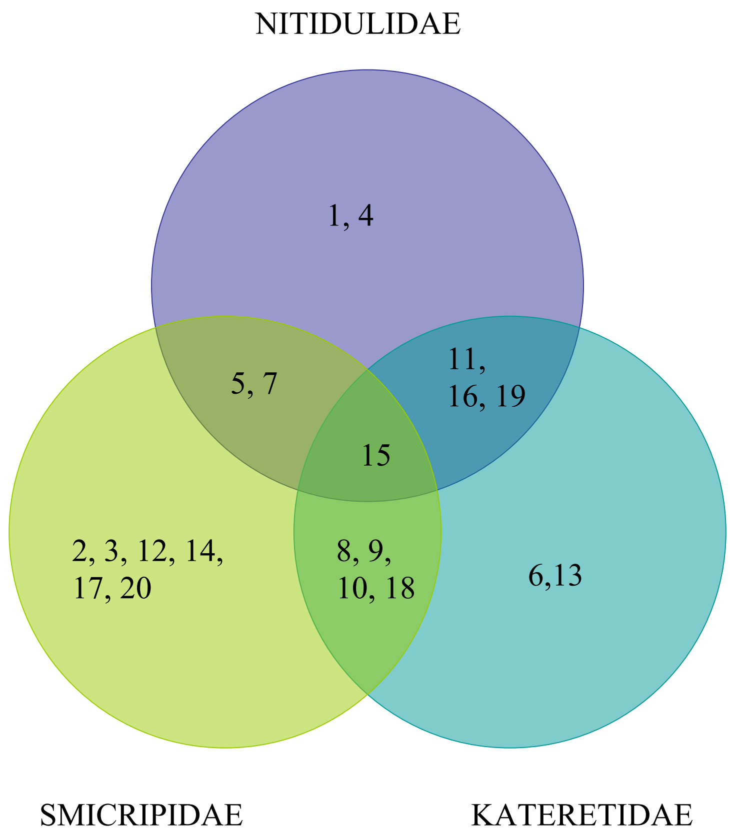


Figure 1. Venn diagram representing the similarities between the three Nitidulid-lineage families (Based on Lawrence 1999a, 1999b, and pers. obs.). 1) procoxae strongly transverse; 2) abdominal process truncate/indentate; 3) antennal club always loose; 4) prothoracic trochantin always exposed; 5) maxilla with lacinia only; 6) maxilla with galea and lacinia; 7) tarsal formula either 4-4-4 or 5-5-5; 8) procoxal cavities always open externally; 9) postcoxal lines on metaventrite always absent; 10) apical area of hindwing with branches RA and/or RP absent; 11) anal lobe of hindwing present; 12) metendosternal laminae reduced or absent (except in highly evolved inquilinous forms such as *Cychramptodes* and *Cylindroramus* from Australia); 13) tegminal paramera not fused to phallobase; 14) $5^{th}$ and $6^{th}$ abdominal spiracles lacking; 15) abdominal ventrite 1 not much longer than 2; 16) mesotarsomere 1 well-developed and visible; 17) posterior edge of hindwing with long fringe of hairs; 18) posterior edge of head capsule in larvae always distinctly emarginated; 19) frontal arms on larval head capsule lyriform; 20) frontal arms on larval head capsule u- or v-shaped

1982, updated in Table 2), although this number will likely increase several fold because there has been little to no modern (after 1950) comprehensive work in the Neotropics, Afrotropics, or SE Asia. Some historical studies (prior to 1950) were undertaken by Grouvelle in the Old and New World tropics (1896, 1897, 1898, 1899a, 1899b, 1899c, 1894, 1901, 1905a, 1905b, 1906, 1908a, 1908b, 1910, 1914a, 1914b, 1915, 1916, 1919); Erichson in the Old and New World tropics (1843); Sharp in the Neotropics (1890); Murray in the Old and New World tropics (1864, 1867, 1868); and Reitter in the Old and New World tropics (1873, 1874a, 1874b, 1875, 1876a, 1876b, 1876c, 1880, 1884). These authors described more than 75% of all known genera and more than 50% of all species. The works listed above are the more salient products of their efforts to document tropical Nitidulidae, in addition to numerous smaller publications.

Some regional treatments of the nitidulid fauna, both historic and modern, have been completed in well-defined areas such as: Japan (Reitter 1877, 1883 (adults) and Hayashi 1978 (larvae)), Korea and the Chejudo Islands (Chujo 1994 and 1992, respectively), North America (Parsons 1943, following Horn 1879), Europe (Audisio 1993, Jelínek 1965a, 1996, and Kirejtshuk 1997a), and part of the Russian Far East (Kirejtshuk 1992). Kirejtshuk initiated a modern treatment of the nitidulids of the Himalayas and northern Indochina from which the first volume was published (Kirejtshuk 1998a). Kirejtshuk also published numerous, isolated taxonomic papers on new taxa from Australia (Kirejtshuk 1986b, 1987, 1988a, 1990a, 1990b, 1992a, 1992b, and 1997a), although a thorough revision was never completed.

Modern research on nitidulids in the tropics has consisted of revisions or partial revisions of genera or genus groups in an area, for example the Axyroid-group from SE Asia (Audisio and Jelínek 1993), *Ithyra* and *Neothalycra* from Africa (Audisio and Kirejtshuk 1983), *Pocadius* in the Neotropics (Jelínek 1977a), *Hebascus* and *Teichostethus* in the Neotropics (Jelínek 1975), *Epuraea* in Africa (Jelínek 1977b), *Anister* from Africa and the Middle East (Jelínek 1981a), *Stelidota* in the Australasian region (Jelínek 1984), *Mystrops* from the Neotropics (Gillogly 1955, 1972 and Jelínek 1969), Cryptarchinae genera in the Afrotropics (Kirejtshuk 1981), *Neopallodes* from the Indo-Malayan region (Kirejtshuk 1994a), Mystropini from the Neotropics (Kirejtshuk and Jelínek 2000), *Phenolia* (*Lasiodites*) from Africa (Kirejtshuk and Kvamme 2002), *Cychramus* from Japan (Hisamatsu 1958), and *Meligethes* from South Africa (Spornraft and Kirejtshuk 1993). However, in the Neotropics hyperdiverse genera including *Colopterus*

(Larry Watrous completed dissertation work on this genus, however it was not published and remains available only as unpublished data), *Stelidota*, *Camptodes*, *Mystrops*, *Brachypeplus*, *Conotelus*, *Cyllodes*, *Pallodes*, and *Cryptarcha* have received little or no attention by taxonomists, and no comprehensive taxonomic works of any globally distributed genera including *Carpophilus*, *Epuraea*, *Cychramus*, *Cyllodes*, or *Soronia* were completed until the work reported here on *Pocadius*.

The modern literature contians isolated new species or genus descriptions from the tropics and subtropics including but not limited to: *Cnipsarcha* Jelínek (1982) from Chile, new species of *Vietterchnus* and *Ceramphosia* Kirejtshuk and Kirk-Spriggs (1996) from the Indo-Malayan region, *Cryptarchopria kabokowi* Kirejtshuk (1979) from Vietnam, new species of *Atarphia*, *Lordyrodes*, *Pocadites*, *Trimenus*, and other genera from the Indo-Malayan region (Kirejtshuk 1984a), new *Cyllodes* from Vietnam (Kirejtshuk 1985), new *Propetes* from Vietnam and the Philippines (Kirejtshuk 1997c), new *Lasiodactylus* from the Neotropics (Cline and Carlton 2004b), new *Epuraea* (*Orthopeplus*) from Mexico (Cline and Carlton 2004a), a new *Psilotus* from Peru (Cline 2004b), two new *Pocadius* from the Neotropics (Leschen and Carlton 1994), a new *Eusphaerius* from the Neotropics (Leschen and Carlton 1996), and a new *Pallodes* from the southern U.S. (Leschen 1988).

Several regional nitidulid checklists are available covering the Neotropics (Blackwelder 1945), the Nearctic (Poole and Gentili1996), Vietnam and Laos (Kirejtshuk 1997c), the Anatolian, Caucasian and Middle East regions (Audisio et al. 2000), Italy (Audisio 1993), the Philippine and Bismarck Islands (Gillogly 1969), Bhutan (Jelínek 1978), the Tokara Islands (Nakane 1959), Great Britain (Kirk-Spriggs 1996), Hungary (Audisio 1981, 1987, 1996), Namibia (Ferrer et al. 2000), Albania (Jelínek 1965a), Mongolia (Jelínek 1965b, 1966), Afghanistan (Jelínek 1964, 1967a), Turkey (Jelínek 1967b), Saudi Arabia (Jelínek 1979b, 1988), and Iran (Jelínek 1981b).

Keys for higher taxa in various regions include: global subfamilies of Nitidulidae (Kirejtshuk 1986a); global subfamilies and tribes of Nitidulidae (Kirejtshuk1998a); the world Nitidulinae genera (Gillogly 1965); the world Cyllodini (Leschen 1999); Meligethinae of Great Britain (Kirk-Spriggs 1996); the world *Physoronia*-group of genera (Jelínek 1999a); the world *Aethina*-complex of genera (Kirejtshuk and Lawrence 1999); the world *Thalycra*-complex of genera (Kirejtshuk and Leschen 1998); Neotropical Mystropini genera (Kirejtshuk and Jelínek 2000); Australian Cychramptodini and *Thalycrodes*-complex of genera (Kirejtshuk 1992a, 1992b); Oriental Cryptarchinae (Jelínek 1974); Afrotropical Cryptarchinae (Kirejtshuk 1981), and other more historical keys such as Grouvelle (1908a) for genera and species of nitidulids and kateretids from India, and Reitter (1873) for genera and species of nitidulids in South America.

Only one comprehensive global taxonomic catalogue has been produced, Pars 56 of the Coleopterum Catalogus (Grouvelle 1913). A recent endeavor by Jelínek and Audisio will seek to remedy this scarcity of nitidulid catalogues. These individuals are collaborating on a Catalog of the Palearctic Nitidulidae, of which there is already a preliminary publication addressing some nomenclatural issues (Jelínek and Audisio 2003). During the course of research for this generic revision, numerous advances have been made on New World Nitidulidae including generic reviews for *Epuraea* (*Orthopeplus*) (Cline and Carlton 2004a) and *Lasiodactylus* (Cline and Carlton 2004b), new distribution information for endemic western North American *Pocadius* (Cline 2003a) and *Thalycra* (Cline 2004a), new distribution records for some eastern North American *Lobiopa* (Shockley and Cline 2004), a new nitidulid to the U.S. from the Neotropics (Cline 2003b), a new *Psilotus* from Peru (Cline 2004b), and nitidulids associated with the fungus *Pleurotus ostreatus* Fries (Cline and Leschen 2005).

Very few complete monographs exist for nitidulid genera containing more than ten species. Kirejtshuk (1994a) revised *Neopallodes* Reitter, which included 20 species. *Neopallodes* are associated with the sporocarps and thalli of Basidiomycetes, and attain their highest diversity in the Eastern hemisphere, especially SE Asia. Cooper (1982) revised *Pria* Stephens, which includes 73 species. *Pria* is an Old World taxon with its highest diversity in Africa and surrounding areas. Members of the genus are associated with various flowers and vegetation. Cooper's monograph represents the largest comprehensive generic revision to date.

Few taxonomists work on nitidulids, perhaps because these beetles have small, generalized body forms and obscure habits. Nitidulids range in size from minute forms less than 1mm in length to moderate sized beetles ~15mm long. The three most abundant and speciose taxa, *Meligethes* Stephens, *Carpophilus* Stephens and *Epuraea* Erichson, are 1.5-6.0 mm in length and most require extraction of the male genitalia or DNA to confirm species identities. The habits of these genera include phytophagy and anthophily in *Meligethes* and *Epuraea*, frugivory in *Carpophilus*, and saprophagy and fungivory in both *Epuraea* and *Carpophilus*. The life history strategies of these taxa undoubtedly are correlated to their evolutionary success and global distribution (see biological/ecological considerations below).

**SYSTEMATICS AND CLASSIFICATION OF NITIDULIDAE**

Latrielle (1802, 1807) formally defined the family based on the type genus *Nitidula* (sensu Fabricius 1775), which was based on Linne's *Silpha rufipes* (1758). Although Latrielle did much for delimiting *Nitidula* from other unrelated Coleoptera, he did not adequately distinguish the family from related Coleoptera or provide insights into the taxa to be included within its limits. Erichson's (1843) treatment was the first work not only defining in detail characters uniting Nitidulidae, but also formally defining subfamilies, new genera (which included the removal of other described taxa from distantly related families), and numerous new species.  Erichson's work was the first true beginning of nitidulid systematics, and we begin to see comparative morphology used to formalize groupings, i.e. subfamilies, within Nitidulidae. Nitidulids are currently divided into ten subfamilies: Calonecrinae Kirejtshuk (1982), Carpophilinae Erichson (1843), Amphicrossinae Kirejtshuk (= Amphicrossini, 1986a), Meligethinae Thomson (1859), Epuraeinae Kirejtshuk (= Epuraeini, 1986c), Nitidulinae Latrielle (1802), Cillaeinae Kirejtshuk and Audisio (in Kirejtshuk 1986a), Maynipeplinae Kirejtshuk (1998b), Cryptarchinae Thomson (1859), and Cybocephalinae Jacquelin duVal (1858).

Systematics will from here on formalize the relationships between taxa of any lineage; this may or may not include rigorous quantitatively substantiated efforts utilizing modern cladistic or other tree-building protocols.  In point of fact, only a few such quantitative efforts exist for nitidulids, therefore this section will be subdivided into traditional/historical endeavors and more modern approaches using algorithm based methods.  Although it should be pointed out that these two sections are not mutually exclusive and I do not suggest that the efforts of one are not bound by the precepts and inferences gained by the other.

Traditional/Historical Endeavors.  The status and monophyly of nitidulid subfamilies has never been rigorously tested and it is very likely that the Nitidulinae will be paraphyletic as currently delimited, the Cybocephalinae will be separated as a distinct family (see Lawrence et al. 1999a, 1999b for a list of larval and adult apomorphies), and the Maynipeplinae will be a basal member of the Cillaeinae.  The only systematic views of subfamilial relationships have been reported by Kirejtshuk (1982 and 1995), and were represented by hand-drawn diagrams based on a rudimentary table containing 19 characters including adult morphology, the fossil record, some biological information and his intuition about the distribution of these 'characters' for a few exemplar taxa from some but not all of the subfamilies .  The 1982 dendrogram represents six subfamilies, one of which is Kateretinae (= Kateretidae).  The same dendrogram showed the Kateretinae as the most basal subfamily, Calonecrinae and Carpophilinae as ancestral with respect to the other nitidulid subfamilies, and the Meligethinae, Nitidulinae and Cryptarchinae as a derived polytomy. From his 1995 dendrogram, Kirejtshuk suggested two major groups: the carpophilin- and nitidulin-lineages. His carpophilin-lineage corresponded to the subfamilies Epuraeinae, Carpophilinae, Amphicrossinae, and Calonecrinae with the nitidulin-lineage containing the Meligethinae, Nitidulinae, Cillaeinae, Cryptarchinae, and Cybocephalinae. The split of Nitidulidae into two lineages was further elaborated in Kirejtshuk's (1998a) treatise on Epuraeinae. Interestingly, Kirejtshuk does not address Maynipeplinae in this latest treatment, which was published the same year. From the 1995 dendrogram, the Epuraeinae, within the basal carpophilin- lineage, were depicted as ancestral with a Carpophilinae, Amphicrossinae, and Calonecrinae polytomy. Within the derived Nitidulin-lineage, the Cybocephalinae were most basal, with Cillaeinae and Cryptarchinae forming a more derived grouping, and Meligethinae and Nitidulinae appearing as a derived polytomy. Kirejtshuk's resistance to quantitative endeavors, i.e. phenetics and cladistics, is a philosophical one based on his view that such methods are examples of extreme reductionism (see Kirejtshuk 1995, pg. 13).

Alhough Kirejtshuk's contribution to modern nitidulid systematics via rigorous analytical methods is minimal, his traditional work on classifying nitidulid taxa has been influential. Some of his seminal works on members of the Australian (Kirejtshuk 1986b, 1987, 1988a, 1990a, 1990b, 1992a, 1992b, and 1997a), African (Kirejtshuk 1980, 1981, 1990d, 1993, 1994b, 1996, 1998b, 2001, Kirejtshuk and Audisio 1995, Kirejtshuk and Kvamme 2002), and Asian nitidulid faunas (Kirejtshuk 1979, 1982, 1984a, 1985, 1986d, 1987, 1990c, 1994a, 1997c, Kirejtshuk and Kirk-Spriggs 1996) cannot be overstated. Without these works progress toward a natural classification of the family would not be possible. Four works authored by Kirejtshuk stand out among modern systematic treatments and deserve special mention below.

The first paper dealt with a predaceous nitidulid form that feeds on scale insects from Australia and the beetle's body is modified supposedly due to pressure by ants that tend the scales they are eating (Kirejtshuk and Lawrence 1992a). The tribe, Cychramptodini, was described and its affinities to another derived tribe, i.e. the Lawrencerosini, were suggested. This latter tribe was described by Kirejtshuk (1990b) and includes highly modified body forms with long legs and heavily sculptured surfaces thought to be associated with ants (or some other social insect). The Cychramptodini paper suggested one purported synapomorphy between the two tribes, i.e. the elevation of the metasternum. This character is not known in any other recognized ant associated nitidulid genus, including a remarkably similar form from Bolivia that is also thought to be associated with social insects (Leschen and Carlton 2004). Perhaps these two Australian tribes should be united into a more broadly defined Lawrencerosini with the elevated metasternum as a synapomorphy.

A second paper by Kirejtshuk and Leschen (1998), made an informal attempt to define the *Thalycra*-complex of genera. They suggested that the *Thalycra*-complex contains 12 genera with broad distribution except the Oriental region. The complex was defined using numerous pleisiomorphies, with no clear synapomorphies uniting the genera or delimiting them from the purportedly closely related *Pocadius*-complex as stated by them; rather the authors assumed monophyly and a sister-group relationship between these two complexes. A potential behavioral synapomorphy linking the two complexes (in this case feeding on fungi without a hymenium) was used to establish monophyly. This trait also was used by Leschen (1999) in a subsequent nitidulid paper, which quantitatively tested the limits of the tribe Cyllodini (detailed below).

A third paper dealt with the *Aethina*-complex of genera (Kirejtshuk and Lawrence 1999). They defined and delimited the complex, presented a key to genera, and also reviewed the subgenera *Idaethina* Gemminger et Harold and *Cleidorura* Kirejtshuk and Lawrence. In their definition of the group they mentioned the modification of the basal portion of the pygidium as occurring in all but two south temperate genera, i.e. *Brounithina* Kirejtshuk from New Zealand and *Lordyra* Gemminger et Harold from Argentina. In all other genera and subgenera arc-like impressions on the pygidium of some type and number can be found.

The fourth and final paper was a preliminary review of the tribe Mystropini (Kirejtshuk and Jelínek 2000). In this work they made a first-attempt to formalize the tribe, disentangle the taxonomic confusion surrounding some genera (some errors extending back to Erichson 1843), and provided keys to genera of Mystropini and species of the genera *Anthocorcina* Kirejtshuk and *Nitidulora* Reitter. They suggested that the synapomorphy uniting members of the tribe was a lack of antennal grooves on the ventral surface of the epicranium. This synapomorphy seems at best tenuous, as the absence of a character is not suggestive of shared ancestry.

Modern/Algorithmic-Based Endeavors. The first true cladistic phylogeny of a nitidulid lineage was Endrödy-Younga's (1978) revision of some Meligethinae genera from the Ethiopian region of Africa. He sought to explain the rift between the *Meligethes*- and *Pria*- generic complexes by analyzing some of the smaller, lesser known genera from tropical Africa and Madagascar. Although not robust in scope, the paper explained the methods of Hennig, applied them to a small group of genera, and produced a cladogram that could be tested by others. Unfortunately, a robust ingroup and outgroup selection of taxa was lacking. Endrödy-Younga recognized this lack of taxon sampling but also knew that the work was a preliminary assessment of the Meligethinae and not a comprehensive approach to understanding the relationships of all taxa within the subfamily. The paper included a discussion of characters used and their character state transformations from plesiomorphic to apomorphic condition. An insightful discussion of polymorphic and plesiomorphic characters and their utility, although limited, in assessing relationships between taxa was also included.

The second attempt at a modern systematic view of a nitidulid group was performed by Audisio and Jelínek (1993) on what they defined as the axyroid-group of genera. This groundbreaking paper defined character states used in the analysis, polarized characters based on out-group analysis, and produced a cladogram based on synapomorphic characters. The authors used five ingroup taxa and one outgroup taxon, 16 characters, and a most parsimonious cladogram. Their axyroid-group was supported by a single synapomorphy, the presence of a pronotosternal mycangium. Their discussion of choice of characters and character distribution in other taxa demonstrated the authors' willingness to have their hypothesis of common ancestry and relatedness of the group tested. These authors and their collaborators began the modern age of nitidulid systematics. Audisio and DeBiase (1996) revised the genus *Dapsa* Latrielle in the cucujoid family Endomychidae using similar methods. Audisio and DeBiase also initiated the molecular taxonomy movement in Nitidulidae (see below). Jelínek (1999a) contributed greatly to the clarification of the Nitidulinae in his treatment of the *Physoronia*-complex of genera. Although mainly taxonomic in nature, Jelínek also hypothesized relationships by pointing out that this generic complex was related to certain other genera but differed from them "by the presumably synapomorphic presence of lateral grooves on postmentum."

The most comprehensive cladistic revision of any nitidulid lineage was completed by Leschen (1999) on Cyllodini Everts. Leschen attempted to solidify the traditional grouping of glabrous convex nitidulids (conventionally referred to as Strongylinae, Strongyllini, etc. by European workers) as a formal tribe, and with the new phylogeny in hand discussed the evolution of convexity and phallalophagy ("stinkhorn feeding"). Leschen used 19 ingroup and 8 outgroup taxa, and 63 characters (including adult and larval morphology and fungal host use) in his analysis. Leschen modified his trees via ACCTRAN, DELTRAN, and other weighting measures (e.g. successive approximations and others) to produce a monophyletic Cyllodini, which was still not unambiguously defined. Leschen's derived character states supporting the monophyly of Cyllodini, e.g. procoxal rests on the mesosternum and visible tibial lines, were ambiguous. These two characters occur in other groups including other nitidulines as well as other subfamilies of Nitidulidae, and they are polymorphic within some Cyllodini genera and absent in others (i.e. *Camptodes*). Leschen attempted to strengthen his argumentation for a monophyletic Cyllodini with additional tree-building and weighting techniques following the exclusion of problematic taxa or taxa for which he did not have specimens, including larvae for additional characters. The inclusion of larval characters was problematic as there are no comprehensive descriptions for some genera. Thus taxon sampling became an even greater issue, because the genera *Ceramphosia*, *Cyllodesus* and *Camptomorphus* were not included in the original dataset as well as likely sister-taxa in the Lawrencerosini and other members of the Cychramptodini. The resulting trees, therefore, offered a murky interpretation of the tribe. Although there were problems with Leschen's analysis, his efforts provided the first rigorous cladistic treatment of any nitidulid lineage.

**BIOLOGICAL / ECOLOGICAL CONSIDERATIONS**

As their common name suggests, nitidulids can often be encountered at fresh tree wounds and sap flows (Crowson 1981), especially members of the Cryptarchinae (e.g. *Cryptarcha* and *Glischrochilus*), Cillaeinae (Ewing, pers. comm.), and some Nitidulinae (e.g. *Phenolia*, *Lobiopa*, *Soronia* and *Prometopia*) (Parsons 1943, Lawrence 1991). I have used a blend of molasses, beer, yeast, and other ingredients to mimic sap flows in bait traps, and the following genera often have been collected: *Amphicorssus*, *Colopterus*, *Carpophilus*, *Lobiopa*, *Stelidota*, *Epuraea*, *Prometopia*, *Glischrochilus*, *Cryptarcha*, *Psilotus*, and *Brachypeplus*. The greatest diversity of nitidulid genera, however, do not feed on sap but rather feed primarily on the fruiting bodies of Basidiomycota (with some exceptions occurring with Ascomycota and Myxomycota). Besides sap and fungal feeding, other notable feeding behaviors and life history strategies include: frugivory, saprophagy, anthophily, phytophagy, predation, necrophagy, and inquilinism with social Hymenoptera.

Nitidulid mycophagy has interested many authors, and nitidulid fungus feeding involves most major fungal lineages (see Lawrence 1991 for a review). Within Pocadiini (sensu Kirejtshuk and Leschen 1998) two genera display peculiar habits of being epigeous gasteromycetes specialists (i.e. *Pocadius* and *Physoronia*). Gasteromycetes specialists are uncommon in Coleoptera, only occurring again in Endomychidae (*Lycoperdina*) and Anobiidae (*Caenocara*). The gasteromycetes fungi, however, are not monophyletic (see Hibbett et al. 1997 and Binder and Bresinsky 2002), and specialization on them does not connote specialization on a monophyletic fungal group. Most Nitidulidae, in particular Nitidulinae, feed on mushrooms and their relatives in the Agaricales. These beetles include *Apsectochilus*, *Carinocyllodes*, *Cycolcaccus*, *Cyllodes*, *Eusphaerius*, *Hebascus*, *Neopallodes*, *Niliodes*, *Oxycnemus*, *Pallodes*, *Somatoxus*, *Teichostethus*, *Tricanus*, and others. Aphyllophorales, shelf/bracket fungi and their relatives, represent another common host for nitidulids, in particular *Lobiopa*, *Soronia*, *Platychora*, *Parametopia*, some *Ipidia*, *Atarphia*, *Pocadites*, *Hebasculinus*, and others. Some nitidulines feed on hypogeous fungi in the Hymenogastrales, e.g. *Rhizopogon* and their relatives (Howden 1961, Kirejtshuk and Leschen 1998). Two interesting new records for Nitidulidae include *Oxycnemus fulvus* Erichson feeding on the slime-coating of a Clavicipitaceae (Ascomycota) fungus (Cline and Bischoff, unpublished data), and *Phenolia grossa* (F.) feeding and reproducing on the fruiting body of *Laetiporus cinnamoides* (Basidiomycota) (Cline, unpublished data). The clavicipitaceous record for *O. fulvus* is the first of a host outside of Phallales (see Navarette-Heredia 2003). The record for *P. grossa* may represent the first beetle reported for this fungus species, but the fungus has not often been correctly identified (M.

Blackwell, pers. comm.). Larvae obtained during acquisition of *P. grossa* represented the first known larva/adult/host association for the species. Fungivorous habits of other nitidulids are evidenced in the transmittal of plant fungal pathogens (Dorsey and Leach 1956, Juzwik 1986, Bruck and Lewis 2002).

Frugivory in Nitidulidae is most commonly associated with members *Carpophilus*. *Carpophilus* are known from hosts including citrus, pineapple, stone fruit, figs, strawberries, corn, almond, cherries, grapes, quince, plum, peaches, apples, and more (see Connell 1956 and 1981 for historical aspects and argumentation for a revision due to its agricultural importance). These ubiquitous beetles occur in orchards and fields, as well as canneries, granaries, and other places where stored products are processed and housed. Other *Carpophilus* spp., however, are frugivorous on non-agricultural plants including *Yucca* (Huth and Pellmyr 1997, Bronstein and Ziv 1997). Other frugivorous taxa occur in Cillaeinae, in particular *Colopterus* and *Brachypeplus,* both of which have been collected by me in large numbers on decaying banana.

Saprophagy in detritus, subcortical cavities, or soil, is common among some taxa, especially *Epuraea*, *Carpophilus*, some Cillaeinae, and nitidulines such as *Stelidota*. Associations with nitidulids and soil ecology are undoubtedly important, in particular within *Stelidota*. This genus is abundant in soil litter, often being the predominant macrocoleopteran within a sample. The genus is widely distributed except Europe, where *S. geminata*, a fruit pest, has only recently been introduced. The genus has its highest diversity in SE Asia and the Neotropics, where it is abundant year-round with montane endemics scattered across its range (Cline unpublished data). Fungal hyphae have been retrieved from the gut of both *Stelidota octomaculata* (Say) and *S. ferruginea* Reitter from the Nearctic, and specimens are available to determine gut contents from species in Costa Rica, Panama and Bolivia. Revision of this genus will help shed light on its biology and classification, as well as the potential efficacy for which species can be used in biodiversity studies (see Anderson and Ashe 2000 for commentary on using soil beetles in conservation practices and Didham et al. 1998 on soil-inhabiting beetles in addressing biodiversity responses with respect to forest fragmentation).

Anthophily and phytophagy are combined to include feeding on the reproductive and vegetative structures of plants. These habits are prevalent in many nitidulids (Crowson 1981). The most studied genus of Nitidulidae, i.e. *Meligethes*, is a known plant associate (see Kirk-Spriggs 1996 for a comprehensive treatment of the British fauna). The Meligethinae are known anthophiles and herbivores, as well as most Epuraeinae, most Cillaeinae, and some Nitidulinae including *Aethina*, *Camptodes*, *Xenostrongylus*, *Anister*, and others. Interestingly, species of *Macrostola* have begun to receive attention from tropical ecologists due to their importance as a pollinator of palms. Recently, I identified adults and larvae of *Macrostola costulata* Reitter from Colombia as part of a study on the pollination biology of the palm *Xanthosoma daguense* (Garcia-Robledo et al. 2004). Mystropini is one of the most important anthophilous lineages. These beetles are numerous in the Neotropics, and have undoubtedly been misidentified in studies as they are readily mistaken for *Epuraea* (see Listabarth 1996, who unfortunately even misspelled *Epuraea*), and have more restricted ranges than previously thought (Scariot and Lleras 1991). Until recently, not only were species identifications extremely suspect, but also generic confirmations (Kirejtshuk and Jelínek 2000). These instances of misidentification are important because the proliferation of such literature produces an erroneous account of the biology and subsequent ecological niches these beetles occupy, and could have profound affects on the perceived importance of some groups over others. For example, Naskrecki and Colwell (1995) noted the occurrence of phoretic mites on species of *Mystrops* that feed on the pollen of palms. Female *Mystrops*, which do not exhibit marked sexual dimorphism, are not easily distinguished from other genera of Mystropini and could be easily misidentified. The need for reliable taxonomic identifications of beetles in ecological, evolutionary and other studies is imperative for our understanding of nature. Lachance et al. (2001) suggested that perhaps anthophily and saprophagy on yeasts might be more intimately associated than once thought. Their results showed that anthophilous/phytophagous nitidulids often transfer specific yeasts that could be potential feeding substrata for their larvae. These and other studies focused on specific trophic interactions require great taxonomic attention to the entities of the study system.

Cybocephalinae, a group delimited from others in the family by both adult and larval characters, are predators. These beetles are also peculiar for their ability to roll themselves into a ball, i.e. conglobation, which is also seen in *Eusphaerius*. *Cybocephalus* is a diverse genus (see Kirejtshuk 1984b, Endrödy-Younga 1968, 1982, 1984, Blumberg 1973, and Blumberg and Swirski 1982 for treatments of the Palearctic fauna, and Yu and Tian 1995 and Tian and Pang 1994 for Chinese and Taiwanese taxa respectively) that will likely increase in species diversity by more than ten-fold with further efforts on the Neotropical fauna. These beetles are predaceous on scale insects, particularly Diaspididae and Coccidae, and have, therefore, been of importance in biocontrol studies (Drea and Carlson 1988, Lima 2002, Matadha et al. 2003, Kirejtshuk et al. 1997). Another predator of scale insects is *Cychramptodes murrayi* Reitter, from Australia. Other nitidulid taxa are likely facultatively predaceous on Scolytinae larvae (i.e. some *Epuraea*, *Pityophagus*, and *Glischrochilus*), however more research will be needed to substantiate their predaceous habits (Currie et al. 1996).

Necrophagy is known in three nitidulid genera, *Omosita*, *Nitidula*, and *Epuraea*, with *Epuraea* being the only facultative necrophagous taxon. Both *Nitidula* and *Omosita* species occur on carrion in the latter stages of decay, feeding on the dried remains of the corpse. Their importance in the succession of carrion decomposition is well known (Payne 1965, Payne and

King 1970, and Shubeck et al. 1981). The evolution of necrophagy has not been thoroughly discussed, but likely represents a unique shift from ancestral mycophagy/saprophagy.

Inquilinism, the intimate association with social insects, is a peculiar occurrence in nitidulids and a phenomenon that deserves more attention. At least four (three associated with ants or termites and one with honeybees) independent originations of inquilinism within the subfamily Nitidulinae have occurred. One event occurred in *Amphotis* Erichson, which is found in association with various ant genera including *Pheidole* (Parsons 1943) and *Lasius* (Hölldobler and Wilson 1990) from which it solicits food through simple antennation behaviors. This genus does not have an elevated metasternum or the flattened legs as seen in the two Australasian inquilinous tribes. The Australasian tribes Cychramptodini and Lawrencerosini include some of the most bizarre forms in the entire Nitidulidae (see Kirejtshuk and Lawrence 1992a, and Kirejtshuk 1990b, respectively). Only the biology of *Cychramptodes murrayi* is known, and it is a predator of the wattle tick scale (Homoptera: Coccidae), and thus does not directly obtain nutrients from social Hymenoptera, but is in intimate association with them as ants are typically found guarding this scale insect. A recently described genus, *Amborotubus* (Leschen and Carlton 2004), from Bolivia resembles the *Cylindroramus* species from Australia with flattened leg segments and shielded appearance with retracted head. *Amborotubus*, however, was not mentioned as having an elevated metasternum in the description, a condition indicating that it is not likely to be a close relative of either of the Australasian tribes. Its association with social insects has only been postulated on the basis of morphology since all known examples were collected at lights. *Aethina tumida* Murray, the small hive beetle, is associated with honeybees and the adults derive nutrients from adult bees, whereas larvae occupy combs within the hive.

There appear to be four body morphologies evolved to deal with the rigors of inquilinism: 1) *Amphotis*-type that is denoted by a broad flat body, such that when attacked by ants the beetle lies close to the ground with legs retracted, being firmly attached to the substrate via specialized setae on the legs, and the ants are unable to flip the beetle over to expose its venter; 2) the Cychramptodini/*Amborotubus*-type that is shield-like in appearance being extremely convex dorsally and flattened ventrally with the sides of the elytra and pronotum extending ventrally to help protect the legs, so that when attacked the beetle lies flat on the ground with legs retracted and the attacker is unable to grasp the highly convex surface; 3) the Lawrencerosini-type indicated by a longer-legged beetle with heavily sculptured pronotum perhaps affording the beetles speed and chemical camoflauge (via sequestration of frass and/or other chemicals in the pronotal fovea) against ant attack, and 4) the *Aethina tumida*-type that has little or no external modifications, but relies heavily on chemical means to confuse and distract its honeybee hosts. The small hive beetle, *Aethina tumida* Murray, has become a pest of apiaries in the eastern U.S. (see Hood 2000 for a review). Most members of *Aethina* (s.str.) are associated with flowering plants. The shift to inquilinism in *A. tumida* is not surprising. A native *Aethina* from Central America has recently been discovered as an associate in honeybee colonies, and morphological comparisons of this species to the small hive beetle are currently underway by me.

**MORPHOLOGICAL / MOLECULAR CONSIDERATIONS**

The majority of revisionary taxonomic work has been accomplished using larval and adult morphology. Species-level studies traditionally have relied on the form of male and female genitalia (see Fig. 5), antennal segments, body vestiture, body punctation, sexually dimorphic characters of the antennae and legs, mouthpart sensory regions, pronotal shape, elytral shape, development of the prosternal process, pygidial shape, scutellum shape, development and shape of coxal lines, color patterns, and overall body shape (see Fig. 2 for a dorsal view of *Pocadius*). Higher level revisions have also emphasized some of these characters, but typically with a somewhat different more broadly defined resolution. Most higher-level taxonomic works

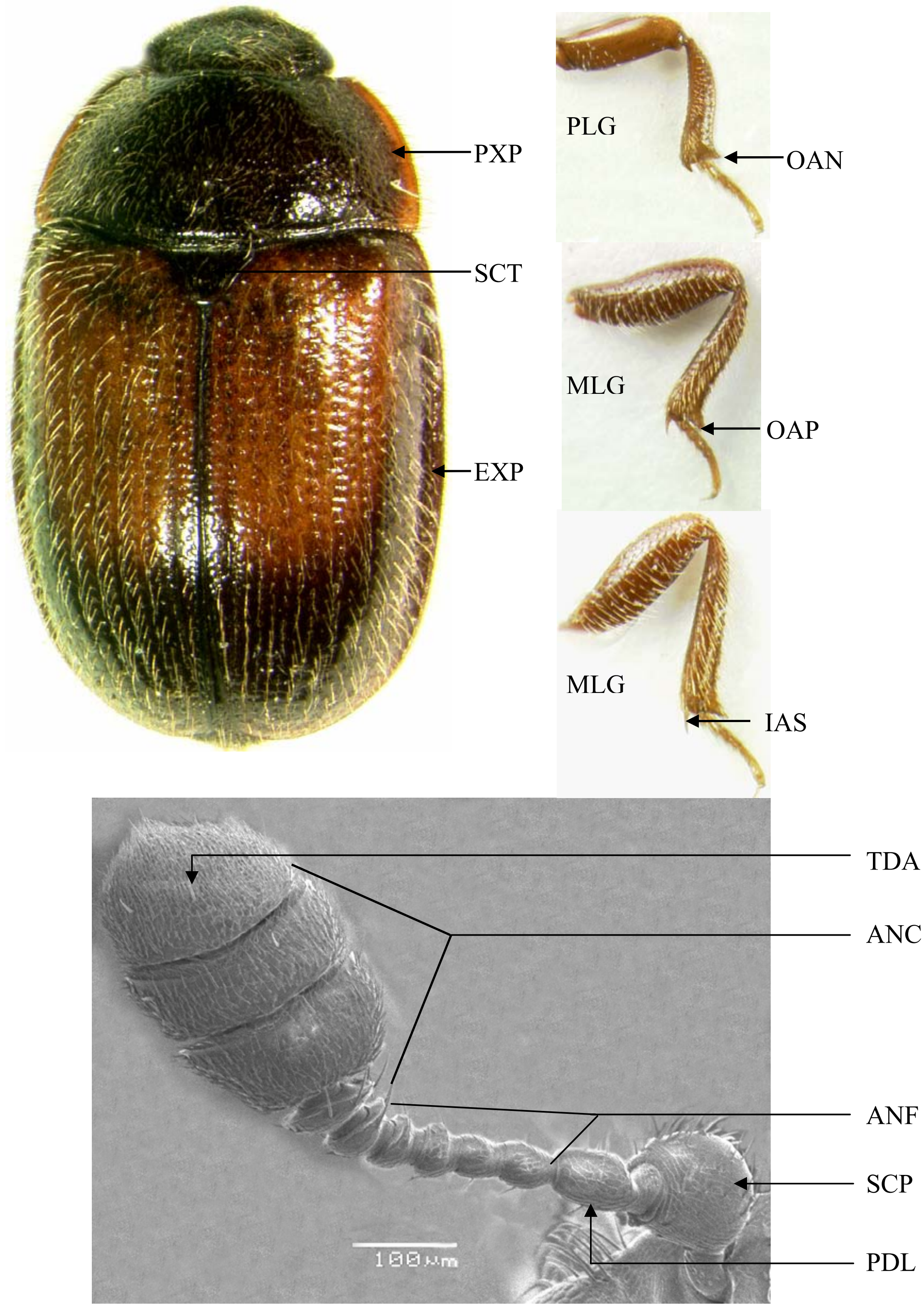


Figure 2. Dorsal habitus of *Pocadius fulvipennis* Erichson, with pro-, meso-, and meta- legs disarticulated and close-up of antenna. Antennal funicle (ANF), antennal club (ANC), terminal depressed area (TDA), scape (SCP), pedicel (PDL), proleg (PLG), mesoleg (MLG), metaleg (MTG), inner apical spine (IAS), outer apical process (OAP), outer apical notch (OAN), pronotal explanation (PXP), elytral explanation (EXP), scutellum (SCT).

have also included descriptions of the mentum, mandibles, maxilla, labrum, clypeus (see Fig. 4), meso- and metasterna, shape and size of the leg segments, and abdominal segments (see Fig. 3 for ventral view of *Pocadius*). Distinctive larval features of Nitidulidae were described by Böving and Rozen (1962) and those of *Pocadius* were discussed by Hayashi (1978) and Lawrence (1991). A treatment of larval *Pocadius* was not undertaken as part of this research.

Only recently have proteins and DNA been used to acquire characters for the reconstruction of nitidulid relationships. Audisio et al. (2000) used allozyme and RAPD analyses to clarify the relationships among members of the *Meligethes viridescens* species complex. With more than 600 species in the genus *Meligethes*, most of them occurring in the Palearctic in sympatry, there is difficulty in establishing specific limits of the more cosmopolitan species such as *M. viridescens*. A total of 12 enzymes were used in the isozyme analysis and eight different oligonucleotides were used as amplification primers in the RAPD analysis. The resulting dendrograms were produced (1978) by calculating pairwise genetic distances (Nei 1978); these provided evidence for discriminating the purported five species in the complex using *M. aeneus* as an outgroup. This study was a follow up to an electrophoresis study that discerned the identity of *M. exilis* (Audisio et al. 1984), and laid the foundation for the continued study of problematic species groups in *Meligethes*, including Audisio et al.'s (2001) paper on the *Meligethes caracinus* complex, Audisio et al.'s paper (2002) and DeBiase et al.'s paper (2003) on other sympatric *Meligethes* species.

**POCADIINI / *POCADIUS* BACKGROUND**

Pocadiini are members of Nitidulinae, the most diverse subfamily of Nitidulidae with regard to the number of constituent taxa, as well as the diversity of niches occupied (Crowson 1954, Hayashi 1978, Lawrence1991). As defined by Kirejtshuk and Leschen (1998), the tribe Pocadiini Seidlitz (or as they state, the "*Pocadius*-complex") contains: *Atarphia* Reitter,

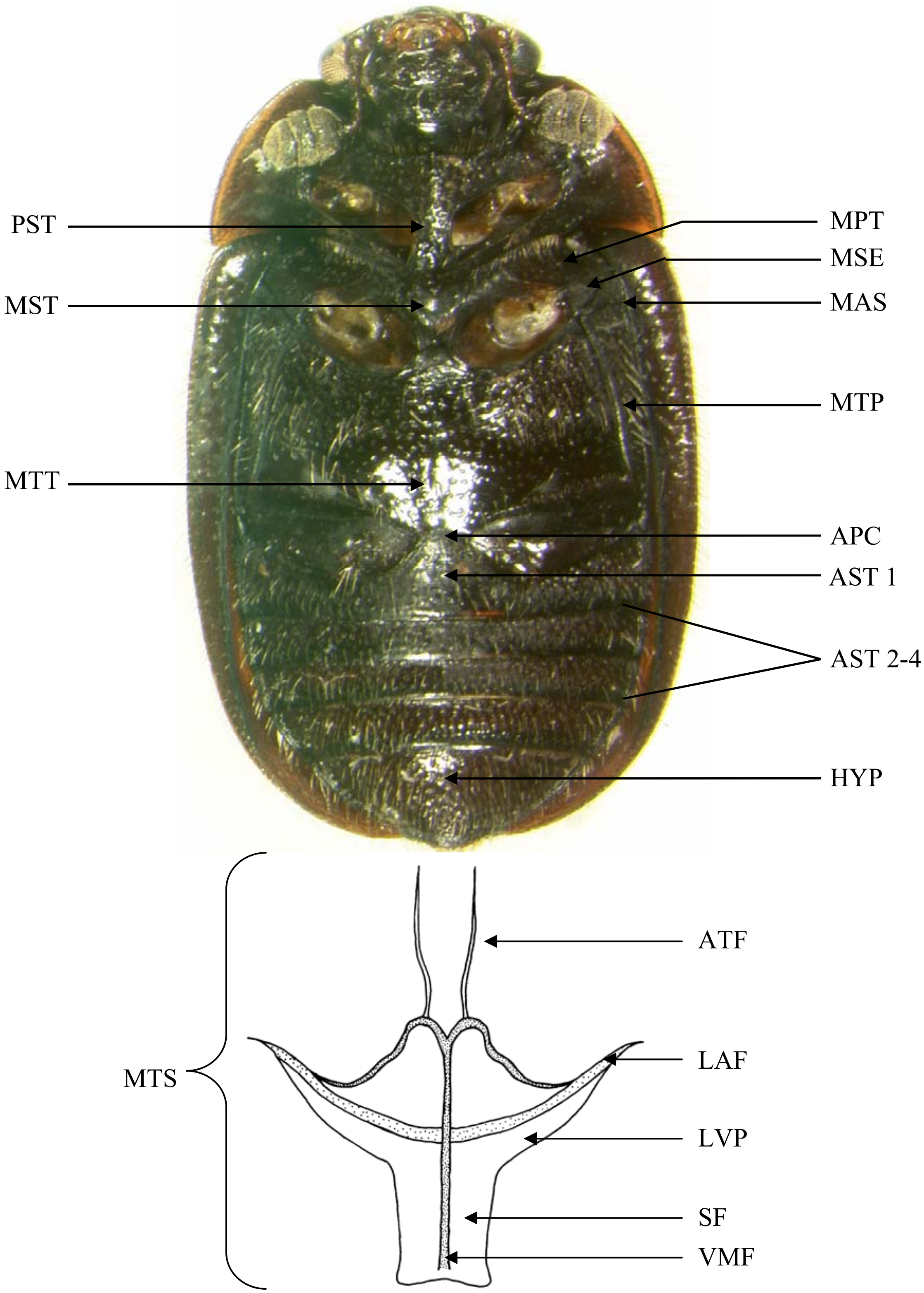


Figure 3. Ventral habitus of *Pocadius fulvipennis* Erichson, with metendosternite (MTS) inset. Anterior tendons of furca (ATF), lateral portion of ventral process (LVP), lateral arms of furca (LAF), stalk of furca (SF), ventral median flange of furca (VMF), abdominal sternite (AST), prosternum (PST), mesosternum (MST), metasternum (MTT), abdominal process (APC), hypopygidium (HYP), metepisternal axillary space (MAS), metepisternum (MTP), mesepimeron (MSE), mesepisternum (MPT).

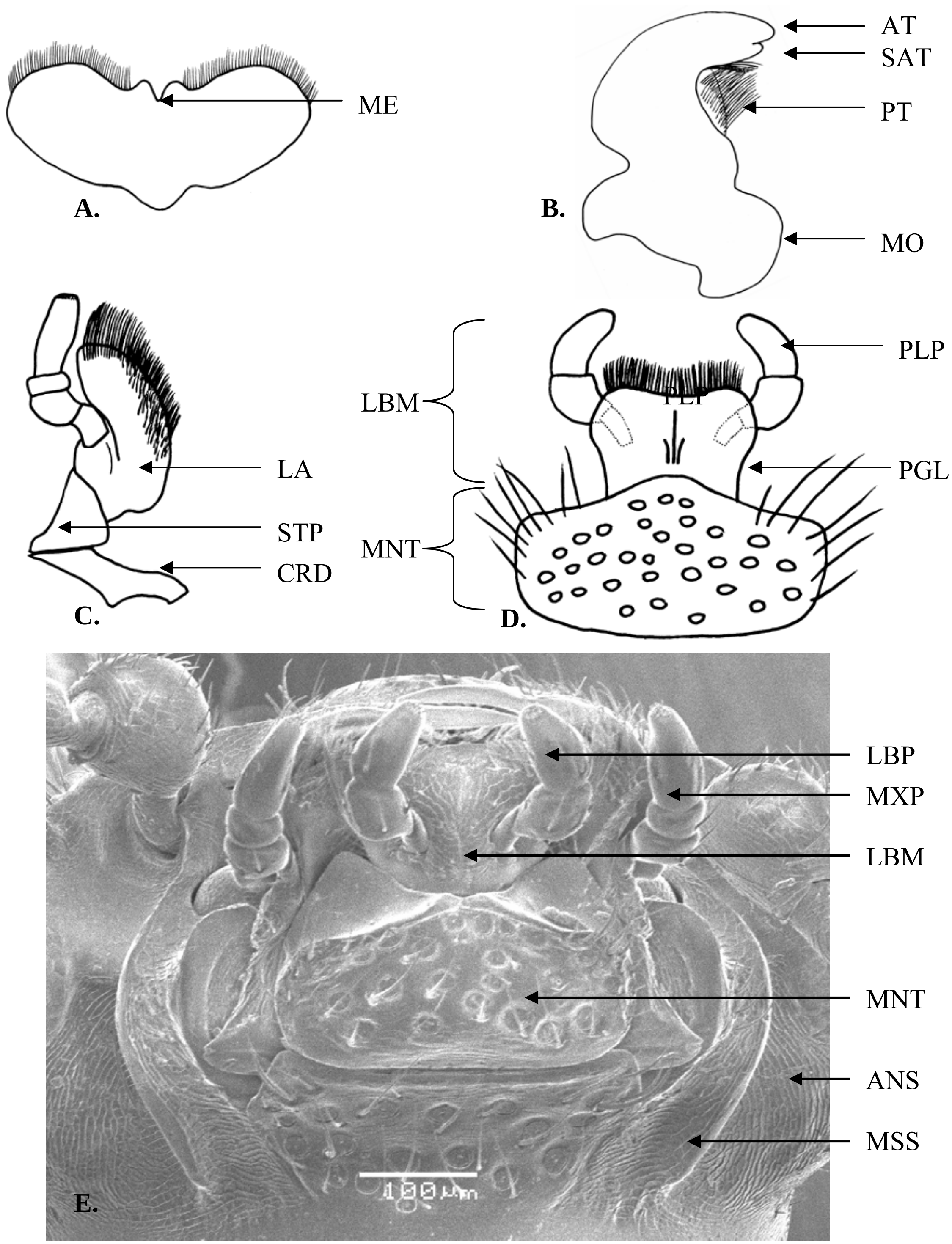


Figure 4. Mouthparts of *Pocadius fulvipennis* Erichson. **A.** dorsal aspect of labrum, with median excision (ME); **B.** dorsal aspect of left mandible, with apical tooth (AT), subapical tooth (SAT), prostheca (PT), and mola (MO); **C.** ventral aspect of right maxilla, with palpomere (PLP), lacinia (LA), cardo (CRD), and stipes (STP); **D.** ventral aspect of combined mentum (MNT) and labium (LBM), with palpomere (PLP) and paraglossae (PGL), only elevated portion of mentum drawn; **E.** scanning electron micrograph of ventral aspect of head, with mouthparts articulated, labial palpomere (LBP), maxillary paplomere (MXP), mental/submental sulcus (MSS), antennal sulcus (ANS).

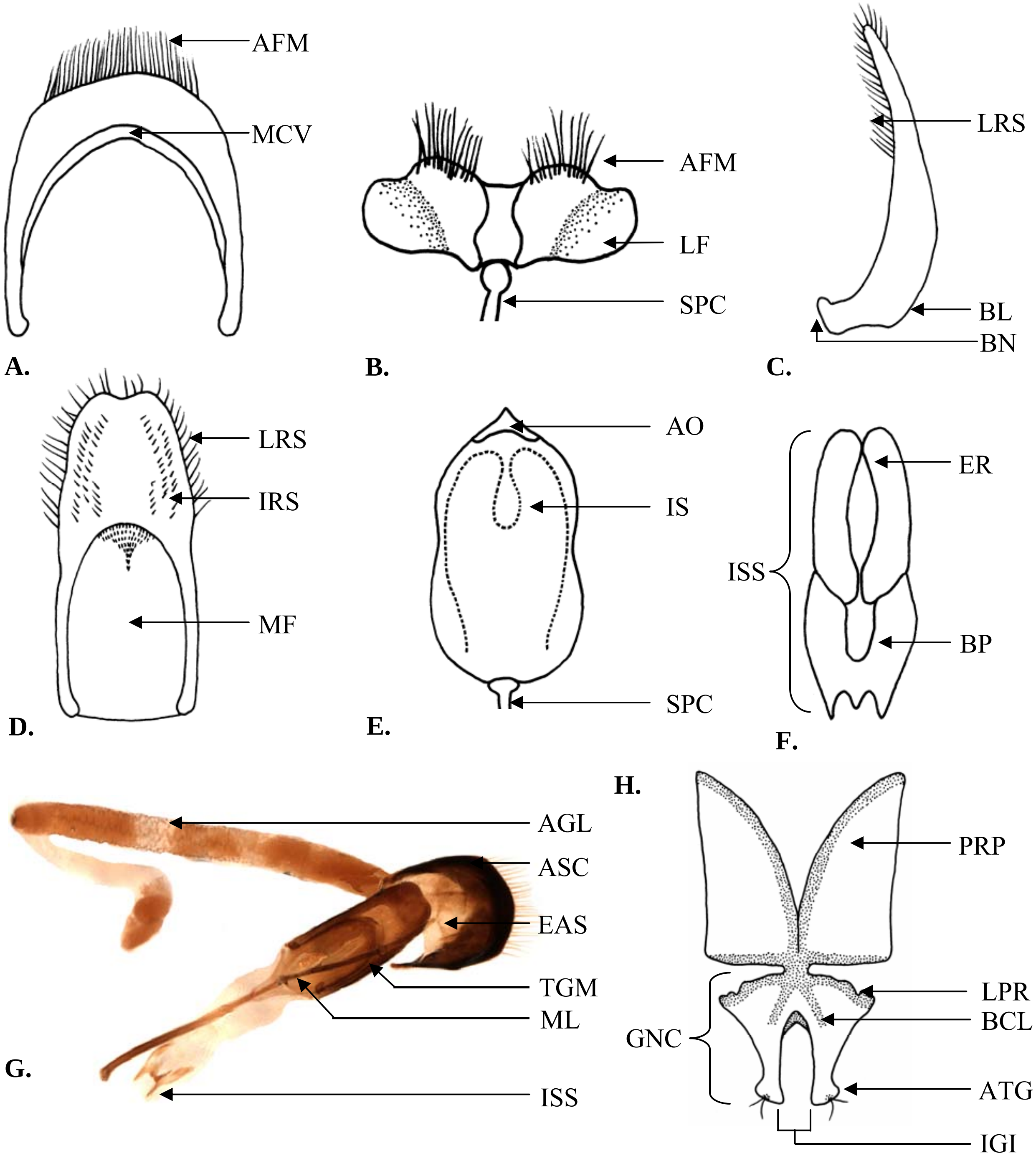


Figure 5. Male and female genitalia of *Pocadius fulvipennis* Erichson. **A.** ventral aspect of the male anal sclerite (ASC), with medial concavity (MCV) and apical fimbriae (AFM); **B.** ventral aspect of eighth abdominal sternite (EAS), with apical fimbriae (AFM), lateral flange (LF), and spiculum (SPC); **C.** lateral aspect of tegmen (TGM), with lateral row of setae (LRS), basal notch (BN), and basal lobe (BL); **D.** ventral aspect of tegmen (TGM), with lateral row of setae (LRS), inner row of setae (IRS), and median fossa (MF); **E.** ventral aspect of median lobe (ML), with apical opening (AO), internal structure (IS), and spiculum (SPC); **F.** ventral aspect of primary internal sac sclerite (ISS), with ejaculatory rods (ER) and basal piece (BP); **G.** ventral aspect of articulated male intermittent organ with accessory gland (ACG) present; **H.** female ovipositor (OVP), with paraprocts (PRP), gonocoxite (GNC), apical tooth of gonocoxites (ATG), lateral prominence (LPR), baculi (BCL), and intragonocoxal invagination (IGI).

*Hebasculinus* Kirejtshuk, *Hebascus* Erichson, *Hyleopocadius* Jelínek, *Lordyrodes* Reitter, *Niliodes* Murray, *Physoronia* Reitter, *Pocadioides* Ganglbauer, *Pocadius* Erichson, *Pocadites* Reitter, *Axyra* Erichson, *Taraphia* Audisio and Jelínek, and *Teichostethus* Sharp. Confusion has surrounded the relationships among the members of Pocadiini and those of the *Thalycra* complex (which included the *Thalycrodes* group of genera), the Axyroid group (sensu Audisio and Jelínek 1993), and the *Physoronia* complex (sensu Jelínek 1999a). Members of the *Physoronia* complex were included in Pocadiini by Kirejtshuk and Leschen (1998). Kirejtshuk and Lawrence (1992b) included three genera in the *Thalycrodes* complex: *Australycra* Kirejtshuk and Lawrence, *Rixerodes* Kirejtshuk and Lawrence, and *Thalycrodes* Blackburn. Several genera have been included in the *Pocadius*-, *Thalycra*-, *Thalycrodes*-, Axyroid-, and *Physoronia*-genus complexes (Table 3), and there are internal inconsistencies as to what genera constitute the *Pocadius*, *Physoronia*, and Axyroid groups. This situation is confounded further in Kirejtshuk (1997a), which synonymized *Lordyrodes* and *Pocadioides* as subgenera of *Physoronia*, but which were retained as separate genera in later (Kirejtshuk and Leschen 1998), and which Jelínek (1999a) subsequently conserved as subgenera.

Of the Pocadiini genera, only *Pocadius* is globally distributed, i.e. found on all continents except Antarctica. *Pocadius* is also the most speciose of these genera, currently with more than three times as many species as any other, including the related *Physoronia*, *Thalycra*, and Axyroid genera. *Pocadius* beetles have their highest diversity in the tropics and subtropics, particularly the Australasian and Neotropical regions. These beetles are prevalent in most forest types and grasslands from lowland rain forests to nearly xeric conditions in higher montane elevations, wherever conditions amenable to fungal hosts occur. *Pocadius* species are all obligate fungivores, feeding and reproducing primarily in members of the gasteromycetes (Eumycota, Basidiomycota), most commonly in puffballs, especially *Lycoperdon*, *Calvatia*, and

TABLE 3. Historical classification of genera related to *Pocadius*.

| Genus | *Thalycrodes* Complex[1] | Axyroid Lineage[2] | *Thalycra* Complex[3] | *Pocadius* Complex[3] | *Physoronia* Complex[4] |
|---|---|---|---|---|---|
| *Atarphia* Reitter | | | | X | X |
| *Hebasculinus* Kirejtshuk | | | | X | |
| *Hebascus* Erichson | | | | X | |
| *Hyleopocadius* Jelinek | | | | X | X |
| *Lordyrodes* Reitter | | | | X | X |
| *Niliodes* Murray | | | | X | |
| *Physoronia* Reitter | | | | X | X |
| *Pocadioides* Ganglbauer | | | | X | X |
| *Pocadius* Erichson | | | | X | |
| *Pocadites* Reitter | | | | X | |
| *Pseudoplatychora* Grouv. | | X | | X | |
| *Taraphia* Aud. & Jel. | | X | | X | |
| *Teichostethus* Sharp | | | | X | |
| *Thalycra* Erichson | | | X | | |
| *Pseudothalycra* Howden | | | X | | |
| *Quadrifrons* Blatchley | | | X | | |
| *Thalycrodes* Blackburn | X | | X | | |
| *Rixerodes* Kir.& Lawr. | X | | X | | |
| *Australycra* Kir. & Lawr. | X | | X | | |
| *Neothalycra* Aud. & Kir. | | | X | | |
| *Thalycrinella* Kirejtshuk | | | X | | |
| *Pleuroneces* Olliff | | | X | | |
| *Pocadionta* Lucas | | | X | | |
| *Pocadiolycra* Kir. & Les. | | | X | | |
| *Tagmalycra* Kir. & Les. | | | X | | |
| *Ussuriphia* Kir. | | | | | X |
| *Megauchenia* MacLeay | | X | | | |
| *Axyra* Erichson | | X | | | |
| *Megauchenoides* Aud. & Jel. | | X | | | |

[1]Kirejtshuk and Lawrence 1992b, [2]Audisio and Jelinek 1993, [3]Kirejtshuk and Leschen 1998, [4]Jelinek 1999a

less frequently *Scleroderma* (Boletales) (Donisthorpe 1935, Jelínek 1977a, 1999b, Lawrence 1991, Leschen and Carlton 1994, and Kirejtshuk 1998a). This genus, like so many other groups of small brown non-descript cucujoids has been a quintessential "dumping ground" for other small setose forms. More than 10 species from six genera were once classified as *Pocadius*, and numerous synonymies for *Pocadius* species have been erected (in for *P. ferrugineus* and *P. audstus*). This genus and tribe were long overdue for critical revisionary work.

The objectives of this thesis include: 1) an assessment and argumentation for outgroups to be used in cladistic analysis of *Pocadius*; 2) a complete monograph world *Pocadius* species that includes an identification key, (re)description of all species, redescription of the genus, notes on the biology, seasonality, distribution, phenotypic variation, and host data for each species, 3) phylogenetic analysis using adult and larval characters, and 4) a discussion of how the monograph and systematic revision will lay the foundation for future work and that of other nitidulid taxonomists/systematists.

# CHAPTER 2.  MATERIALS AND METHODS

"..I confess I often feel wearied with the work, and cannot help sometimes asking myself what is the good of spending a week or a fortnight in ascertaining that certain just perceptible differences blend together and constitute varieties and not species...."

Charles Darwin

## TAXONOMIC MATERIALS / METHODS

From a total of >250,000 Coleoptera obtained on loan, >2500 *Pocadius* specimens and >600 non-*Pocadius* members of Pocadiini were examined.  This material formed the basis of this revision in conjunction with analysis of type material.  All primary type specimens from previously described *Pocadius* species, with the exception of *P. monticolis* Lechanteur, *P. brevis* Grouvelle, and *P. ferrugineus* (Fabricius) were examined.  These types were not located, however, determined specimens that matched species descriptions and/or were identified by nitidulid specialists were available. Primary type species of most Pocadiini genera were also studied, as well as type material from other species from other nitidulid genera.

Males and females (when both were available) were studied, photographed, and dissected.  Genitalia, mouthparts, internal sclerites (e.g. the metendosternite and genitalic structures), and appendages were extracted and disarticulated with minuten pin tools. These tools were comprised of minuten pins attached to wooden dowels (an angled probe, recurved hook, and straight probe were all constructed for micro-dissection). Genitalia and mouthparts were either cleaned manually with the minuten pin tools or with a 5-10% KOH solution, depending on the condition of the organs; heavily sclerotized and/or organs with excessive tissue were treated with KOH, whereas less sclerotized and/or structures with debridement already partially to mostly completed were cleaned with minuten tools. The cleaned organs were then placed on glycerin slide mounts for microscopic examination. The descriptors for the external adult features illustrated follow the terminology used in Audisio's (1993) detailed tome on the Italian Nitidulidae, and the terminology used for the metendosternite follows that of Crowson (1954). New terms have been added to provide better clarity for diagnostic characters and to consolidate multiple terms for specific anatomical features.

All drawings were prepared using a camera lucida. Genitalia drawings were made with an Olympus® BX50 compound microscope and all other anatomical features with a WILD® Heerbrugg dissecting microscope. Measurements were made with a calibrated ocular micrometer. Total length is defined as the distance from the labral tips to the pygidial apex, width is defined as the distance across the elytra base, and depth the distance from the humeri to the mesosternum when viewed laterally. Metasternal width to length ratio is calculated as the distance between the metepisterna and the distance between the border of the metacoxae with the first abdominal sternite and the mesosternum. Head width is defined as the distance between the orbits, and head length the distance from the labral tips to the occiput. Pronotal length is defined as the distance from the middle of the anterior margin to the middle of the posterior margin, and width the greatest distance across the structure. Tegmen length is defined as the distance along the longitudinal midline from the apex to the base of the structure, and the width the greatest width across the structure. Median lobe length is defined as the distance along the longitudinal midline from the apex to base of the structure. Unless otherwise stated, body length, width and depth are defined as discrete values for taxa in which only one specimen was observed or an average of 10 randomly selected individuals from the total number of specimens observed (including males and females).

Photographs were prepared using a JVC® digital camera (JVC KY-F75U) attached to a Leica® dissecting scope (Leica Z16 AP0) with z-stepper system. Images were captured via Auto Montage Pro® (Syncroscopy®, Inc.) on an IBM® PC. Any modification of images was performed in Adobe Photoshop®. Scanning electron micrographs were prepared at the Florida State Collection of Arthropods in Gainesville, FL using a JEOL system (model# JSM-5510LV).

Label information from all specimens was recorded into an Excel® file. Label data was divided into the following categories: collection locality, collector, date collected, collecting method, loaning institution, and notes. The notes section contained information regarding variation in the phenotype of a particular specimen, any damage or missing parts to the specimen (in the case of type specimens), and if the specimen belonged to the type series for a particular species. Type labels were recorded in the exact format they were on the specimen in the (re)descriptions, but not in the Excel file. For type information, line breaks are here denoted by a ";" and for specimens with more than one label the label breaks are delineated by a "/". Holotype labels of newly described species, as well as lectotype labels, were printed on all red paper, whereas paratype labels were printed on all yellow paper. Labels that connoted new locality records were provided in detail. All other label information was recorded in the Excel database, summarized, and reported as broad geographical ranges in the distribution section, month ranges for the seasonality/habitat section, and fungal host or other biological peculiarity in the notes section.

The following acronyms were used to denote the museums and institutions that loaned specimens or type depositories for new or described species. These abbreviations can be found at the Bishop Museum's website, which maintains an up to date list of all museums worldwide (www.bishopmuseum.org/research/natsci/ento/codens-inst.html). Those entries marked with an "*" are not included in the website.

*ACM - American Coleoptera Museum, Bulverde, TX, Jim Wappes collection

AMNH – American Museum of Natural History, New York, New York USA

ANIC – Australian National Insect Collection, CSIRO, Canberra, Australia

*ACC – Andrew Cline Collection, currently housed at the California State Collection of Arthropods, Sacramento, CA, USA.

ASUT – Frank M. Hasbrouk Insect Collection, Arizona State University, Tempe, Arizona USA

BMNH – The Natural History Museum (formerly the British Museum of Natural History), London, United Kingdom

CAS – California Academy of Sciences, San Francisco, California USA

CMNC – Canadian Museum of Nature Collection, Ottawa, Canada

CMNH – The Carnegie Museum of Natural History, Pittsburgh, Pennsylvania, USA

CNC – Canadian National Collection of Inscets, Ottawa, Canada

CSCA – California State Collection of Arthropods, Sacramento, California, USA

CUIC – Cornell University Insect Collection, Ithaca, New York USA

DEI – Deutsches Entomologisches Institut, Eberswalde-Finow, Germany

EAPZ – Escuela Agrcicola Panamerica, Tegucigalpa, Honduras

EDNC – North Carolina Department of Agriculture, North Carolina State University, Raleigh, North Carolina USA

EMEC – Essig Museum of Entomology, Berkeley, California USA

FMNH – Field Museum of Natural History, Chicago, Illinois USA

FSCA – Florida State Collection of Arthropods, Gainesville, Florida USA

GSNP – Great Smoky Mountains National Park, Gatlinburg, Tennessee USA

HNHM - Hungarian Natural History Museum, Budapest, Hungary

INBC – Instituto Nacional de Biodiversidad (INBio), Santo Domingo de Heredia, Costa Rica

LACM – Los Angeles County Museum of Natural History, Los Angeles, California USA

LSAM – Louisiana State Arthropod Museum, Baton Rouge, Louisiana USA

MCZ – Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts USA

MEMU – Mississippi Entomological Museum, Starkville, Mississippi USA

MNGC – Museo Nacional de Historia Natural, Guatemala City, Guatemala

MNHN - Muséum National d'Histoire Naturelle, Paris, France

MTEC – Montana Entomology Collection, Bozeman, Montana USA

NMPC – National Museum (Natural History), Prague, Czech Republic

NMPI – Division of Plant Industry, New Mexico State University, Las Cruces, New Mexico USA

OSAC – Oregon State Arthropod Collection, Corvallis, Oregon USA

OSUC – Ohio State University Collection, Columbus, Ohio USA

RLC - Richard Leschen Collection, Auckland, New Zealand

RMC - Roy Morris Collection, Lakeland, Florida, USA

RMNH - Nationaal Naturhistorische Museum ("Naturalis"), Leiden, Netherlands

RTC – Robert Turnbow Collection, Fort Rucker, Alabama, USA

SDMC – San Diego Natural History Museum, San Diego, California USA

SEMC – Snow Entomological Museum, University of Kansas, Lawrence, Kansas USA

TAMU – Texas A&M University, College Station, Texas USA

TMSA – Transvaal Museum, Pretoria, Gauteng, South Africa

UAIC – University of Arizona Insect Collection, Tucson, Arizona USA

UASC - Museo de Historia Natural "Noel Kempff Mercado", Santa Cruz, Bolivia

UCMC – University of Colorado Museum, Boulder, Colorado USA

UCRC – University of California-Riverside Collection, Riverside, California USA

UDCC – University of Delaware Collection, Newark, Delaware USA

UGCA – University of Georgia Collection of Arthropods, Athens, Georgia USA

UGZM –Universidade de Guadalajara Zapopan Mexico, Centro de Estudios en Zoología Jalisco a Universidad de Guadalajara, Jalisco, Mexico

UMRM – Enns Entomology Museum, University of Missouri, Columbia, Missouri USA

UMSP – University of Minnesota, St. Paul, Minnesota USA

UNSM – University of Nebraska State Museum, Lincoln, Nebraska USA

USNM – National Museum of Natural History, Smithsonian Institute, Washington, D.C.

WSUC – Maurice T. James Entomological Collection, Pullman, Washington USA

ZISP – Zoological Institute in St. Petersburg, Russian Academy of Sciences, St. Petersburg, Russia

ZMHB - Museum für Naturkunde der Humboldt-Universitat, Berlin, Germany

ZMUC – Zoological Museum, University of Copenhagen, Denmark

**SYSTEMATIC METHODS. I. INGROUP/OUTGROUP CONSIDERATIONS**

The use of outgroup taxa in assessing character polarity was implied by Hennig (see Hennig 1965, 1966); however, the outgroup comparison method for determining character polarity was not broadly defined until Watrous and Wheeler (1981) depicted it in the following manner: for a particular character with two or more states, the state observed in related groups is assumed to be plesiomorphic. Nixon and Carpenter (1993) further elaborated on Watrous and Wheeler's concept, and provided a more concise outgroup comparison method that was recently summarized by Schuh (2000) and followed five steps: 1) define ingroup taxa on the basis of presumed synapomorphies; 2) select outgroups based on synapomorphies at a more inclusive level and on a higher-level cladistic analysis; 3) perform unrooted parsimony analysis; 4) root cladogram between outgroup and ingroup; and 5) read character polarities from cladogram. Nixon and Carpenter (1993) suggested that outgroup taxa need not comprise a monophyletic group. Schuh (2000) not only summarized Nixon and Carpenter's work, but also further suggested that phylogenetic analyses are likely best conducted using multiple outgroups. Outgroup comparison is not a perfect methodological system and Farris (1982), Maddison et al. (1984) and Nixon and Carpenter (1996) found this to be an oversimplification that would obtained locally parsimonious explanations (also see Kitching et al. 2000 for a discussion of the problems associated with outgroup comparison methods). However, with the poor state of systematic knowledge of Nitidulidae and reliance on a morphological dataset for this analysis, the outgroup comparative method was the only viable alternative for ascertaining character polarity. Due to the inherent problems with nitidulids and use of morphological data, the selection of potential outgroup taxa was critical to the successful analysis of *Pocadius*. A total of nine outgroup taxa representing species from nine genera and three subfamilies were used. The following justification is provided the outgroup taxa in this revision.

Due to the purported basal position of *Pocadius* (Kirejtshuk pers. comm., global distribution of genus, and large numbers of symplesiomorphic characters compared to other related genera) in the subfamily Nitidulinae, inclusion of not only members of closely allied genera in the Nitidulinae but also genera in more ancestral subfamilies (e.g. Carpophilinae and Epuraeinae) was necessary. Genera used as outgroups for the *Pocadius* analysis include: *Thalycra* Erichson, *Pocadionta* Lucas, *Lasiodactylus* Perty, *Hebascus* Erichson, *Teichostethus* Sharp, *Hyleopocadius* Jelínek, *Epuraea* (*Orthopeplus*) Erichson, and *Carpophilus* Stephens. These genera represented each of the complexes in Table 2 as well as a member of the basal *Aethina*-complex and two ancestral nitidulid subfamilies. All *Pocadius* species were included as terminal ingroup taxa.

Members of *Thalycra* and associated genera in the *Thalycra*-complex (including *Pocadionta*), have been thought to be sister taxa to Pocadiini (Kirejtshuk and Leschen 1998, following Reitter 1873 and Ganglbauer 1899). Two species of *Thalycra*, *T. acuta* Howden and *T. carolina* (Wickham), were used as exemplars of the genus for this analysis. I have spent much time researching the New World members of *Thalycra*, visiting the Canadian Museum of Nature to study type specimens of Howden, and also identifying several hundreds of specimens during the course of this study as evidenced by a short publication on new distribution records for some *Thalycra* (Cline 2004a). The monotypy of *Pocadionta* precluded the use of anything but *P. dentipes* Grouvelle as an exemplar. The endemism of *Pocadionta* to the Andes Mountains in Chile and Argentina has been reported (Blackwelder 1945, Cline unpublished Neotropical catalogue). These two genera sufficiently represented the *Thalycra* genus complex in the expression of both plesiomorphic and apomorphic characters.

*Lasiodactylus* Perty constituted a member of the *Aethina*-complex (sensu Kirejtshuk and Lawrence 1999). To thoroughly understand the distribution and nature of characters used to define *Lasiodactylus* and the generic complex, I undertook a complete review of the genus and described three new species (Cline and Carlton 2004b). Two new synapomorphies were defined to establish the monophyly of this taxon, and to provide a basis for its inclusion in this study and future analysis of the *Aethina*-complex. To assess the informative nature of the two synapomorphies exhibited by *Lasiodactylus* species, it was necessary to perform a study of other genera of the complex. Thus, a preliminary review of the *Aethina*-complex was completed and I determined not only the distribution of apomorphic characters within the group, but also the validity of some characters and character systems for higher-level taxa within the Nitidulinae. One species, *L. brunneus* Perty, was included in this revision.

*Hebascus* and *Teichostethus* are endemic Neotropical genera that were included in the *Pocadius*-complex (Kirejtshuk and Leschen 1998, following Kirejtshuk 1997 and Kirejtshuk and Lawrence 1990, 1992). Both genera were reviewed by Jelínek (1975), wherein they were redescribed, types designated for each, an identification key for species of both genera given, and remarks on the taxonomy and biology of some species provided. Jelínek's revision enabled me to describe 8 new species of *Hebascus* and 7 new species of *Teichostethus* (Cline unpublished data). Jelínek's review also provided some of the original ideas for character transformation in Pocadiini through his detailed descriptions. In particular, his drawings and remarks on specific mouthparts including the basal segment of the lacinia (i.e. cardo), the carinate nature of the ligula, the extent and shape of the mandibular mola, and development of the medial excision of the labrum can all be traced to this work by Jelínek. Also, Jelínek's drawings of the egg-laying apparatus (i.e. ovipositor), in particular the shape of the extremity of the gonocoxal sclerites, were instrumental in developing my thoughts on the evolution of the ovipositor in mycophagous Nitidulinae. The following species were used as exemplars in the *Pocadius* analysis: *H. discoideus* Reitter, *H. erinaceous* Sharp, *H. traili* Sharp, *T. analis* (F.), *T. testaceous* (Erichson), and *T. villosus* Sharp.

Jelínek's efforts on *Hyleopocadius* (Jelínek 1977) provided insights into the comparative morphology of a likely transitional form between the *Physoronia*-complex and Pocadiini. *Hyleopocadius carbonarius* (Erichson) was originally placed in the genus *Pocadius* in Erichson's 1843 tome, however Jelínek provided convincing evidence to transfer this species into a new genus, and remarked that the newly erected genus is likely more related to the Old World members of *Pocadites* and other Pocadiini and *Physoronia*-complex members by virtue of the prosternal process with low obsolete apical wall, shape of anterior tibia, short terminal tibial spurs, elytral punctation and pubescence, and the entirely dorsad position of the mesosternum. Due to the monotypy of the genus, only *H. carbonarius* was included in this analysis.

The placement of *Pocadius* within the Nitidulinae has not been unequivocally established. The mycophagous habits, generalized body form, setose surface, and distinctly separated coxae suggested a likely ancestral position in the subfamily. Thus, to thoroughly root the *Pocadius* revision exemplars from the ancestral Carpophilin-lineage, i.e. Carpophilinae and Epuraeinae were used. *Epuraea* (*Orthopeplus*) is an endemic New World subgenus. As with the previous study on *Lasiodactylus*, a review of this subgenus was conducted to develop a familiarity with the characters and character state distributions, however, this particular taxon is a distant relative of *Pocadius*. The monophyly of the subgenus was discerned from the synapomorphy of fused gonocoxal sclerites of the ovipositor (Cline and Carlton 2004a). Two new species were described in the manuscript, a key to the species of the subgenus provided, and a diagnosis of the subgenus given. During the course of the study of *Epuraea* (*Orthopeplus*), I was able to identify numerous new *Epuraea s*pecies from other subgenera (Cline unpub. data) including: seven of *Epuraea* (*Epuraea*) from the Nearctic, three of *Epuraea* (*Haptoncus*) from the Neotropics, and four of *Epuraea* (*Amedanyraea*) from Central America (see Kirejtshuk and Pakaluk 1996 for a discussion of New World *Epuraea* subgenera). One species, *Epuraea* (*Orthopeplus*) *quadricollis* (Horn) was included in this revision. The justification of *Carpophilus* in this revision was similar to that of *Epuraea* (*Orthopeplus*), i.e. to provide a clearly ancestral outgroup. One cosmopolitan species, *C. humeralis* (F.), was included in this revision.

**SYSTEMATIC METHODS. II. CHARACTER DISCUSSION**

Characters 1-15. Modifications of the cuticle surface (including punctures, lines, depressions, pores, and sculpturing) have been used extensively for species descriptions and diagnoses (see Audisio 1993, Kirejtshuk 1998a, and Jelínek 1975 for general use and Jelínek 1977a for use in *Pocadius*). Punctures tend to be circular to elliptical shaped depressions on the cuticular surface that may or may not have an associated seta projecting from it. Lines are elongate structures on the exoskeleton that often demarcate the juncture of sclerites, areas of cuticular thickening or thinning, and moderate invaginations. Depressions are concave regions on the external body surface, i.e. in *Pocadius* the depressed frontoclypeal region (#18 below). Pores tend to be deep, typically circular, openings of the cuticle often associated with a gland or sensory structure. Sculpturing deals with surface markings, which vary from smooth (i.e. little to no sculpturing) to micreticulate/rugose (i.e. minute ridges or roughened areas).

1. Punctation of metasternal disc: (0) absent; (1) faint/scattered; (2) deep/aggregated. When present on the metasternal disc, punctures that are scattered are always faintly impressed and when aggregated they are always deeply impressed.
2. Punctation of scutellum: (0) evenly dispersed; (1) aggregated anteriorly. In character state 1 some punctures may appear evenly dispersed in the posterior third of the structure, but most punctures are located in the anterior two-thirds.
3. Punctation of pygidium: (0) dense, <1 diameter apart; (1) dispersed, >1 diameter apart.
4. Punctation of mental-submental sulcus: (0) smooth; (1) punctate.
5. Punctation of gula: (0) present; (1) absent.
6. Punctation of submentum: (0) present; (1) absent.
7. Punctation of head vertex: (0) punctures all similar in size; (1) punctures of two distinct types, large and small interspersed.
8. Punctation on abdominal sternites 2-4: (0) >2 serial rows; (1) 2 rows; (2) 1 row; (3) absent.
9. Punctation of anterior metacoxal space: (0) impunctate; (1) punctate. The anterior metacoxal space is the area between the anterior border of the coxae and the anterior metacoxal line. The anterior metacoxal line is always well-defined and evenly curved laterally from the medial border of the metacoxae
10. Punctation of anterior metepisternum axillary space: (0) impunctate; (1) punctate.
11. Number of small puncture rows between larger puncture rows on elytra: (0) no distinctly larger punctures present, punctures interspersed; (1) 1; (2) >1.

12. Development of metasternal line: (0) complete; (1) incomplete. A complete metasternal line extends from the posterior margin of the metasternum anteriorly to the border between the meta- and mesosterna.

13. Development of medial vertexal depression: (0) not extending completely between orbits; (1) extending completely between orbits.

14. Sculpturing of mental-submental ridge: (0) granulate; (1) microreticulate; 2) punctate/reticulate.

15. Development of mental/submental lateral sulcus: (0) absent; (1) present.

Characters 16-23. Extensions of the cuticle, as with the above cuticular surface modifications, have been heavily used in lower-level taxonomic studies. Most cuticular extensions include setosity, in particular: the location of particular setae in specific localities, the type and degree of pubescence exhibited, as well as development and placement of spines. Presence/absence of setae on the dorsal surface was demonstrated by Leschen (1999) to be important for reconstructing the phylogeny of the Cyllodini. At the species level, pubescence has been used repeatedly to differentiate between related taxa. Setosity was used by Erichson (1843) in his original diagnoses of *Pocadius* species, and was the key external feature used by Audisio (1993) to differentiate between the two closely related Palearctic *Pocadius* species. The number of tibial spines are diagnostic for many species of *Meligethes* (see Kirk-Spriggs 1996 for an overview), as well as in several nitiduline genera, most notably *Thalycra* (Howden 1961).

16. Pubescence of metasternum: (0) setae short, < length of scape; (1) setae elongate, > length of scape; (2) disc glabrous.

17. Pubescence of antennal scape: (0) moderate, <15 setae; (1) setose, >15 setae.

18. Pubescence of lateral margin of elytra: (0) sparsely fimbriate, setae more than 2 diameters apart; (1) densely fimbriate, setae not more than 2 diameters apart.
19. Pubescence on elytra: (0) decumbent only; (1) erect/semi-erect only; (2) both decumbent and erect/semi-erect.
20. Pubescence on elytra (0) uniform length: (1) two different lengths.
21. Pubescence on pronotal lateral margin: (0) asetose, (1) fimbriate.
22. Development of elytral setosity: (0) diffusedly setose, (1) serially setose at 1:1, (2) serially setose at 1:2.
23. Number of spines on lateral margin of metatibia: (0) <10 spines present; (1) > 10 spines present.

Characters 24-35. Mouthparts were used to some degree in Leschen's (1999) reconstruction of Cyllodini, and have been of some importance in diagnosing genera (see Gillogly's 1965 Nitidulinae key); however, species level use of mouthpart characters tends to be limited except in instances of sexual dimorphism (see Cline 2004b for mandibular characters of *Psilotus*).

24. Shape of mental-submental sulcus: (0) narrow, ≤ diameter of pedicel, (1) produced laterally, >diameter of pedicel.
25. Shape of anterior border of submentum: (0) truncate; (1) indentate.
26. Shape of mentum in lateral aspect: (0) flattened; (1) bulbous, convex medially.
27. Shape of raised portion of anterior mental border in ventral aspect: (0) broadly rounded; (1) angulate. In character state 1, the anterior borders are oblique and join together in a distinct apex, whereas in state 2 there is no distinct apex.
28. Shape of anterior margin of labrum: (0) deeply cleft; (1) indentate.

29. Shape of raised portion of mentum: (0) hemispherical; (1) pentagonal; (2) triangular (3) quadrate with apical emargination (4) quadrate with apical biconcavity. If raised portion absent, the entire shape of the mentum was assessed.

30. Development of mandibular apex: (0) simple, (1) bifid; (2) oblique.

31. Length of terminal maxillary palpus: (0) ≤length of basal 2 segments; (1) >length of basal 2 segments. In some specimens this character may be difficult to visualize without dissection of the entire palpus.

32. Length of mental-submental sulcus: (0) absent; (1) elongate, extending past submentum to gula; (2) shortened, not extending past submentum.

33. Diameter of basal segment of labial palpi: (0) slender, <diameter of pedicel; (1) robust, >diameter of pedicel. In some specimens this character may be difficult to visualize without dissection of the entire palpus.

34. Development of mentum: (0) flattened or partially elevated in posterior 0.33; (1) distinctly elevated in posterior 0.66.

35. Shape of terminal maxillary palpus: (0) conical; (1) barrel; (2) globular.

Characters 36-48. The shape of the ventral sclerites (including, the prosternum, mesosternum, metasternum, metepisternum, and all abdominal sternites) had been overlooked in species level studies, except with respect to modification of the cuticular surface. Parsons (1943) demonstrated the importance of the metepisternal axillary space in differentiating species groups and as a diagnostic character for species. He also noted the importance of mesosternum and metasternum characters for delimiting genera (1972).

36. Shape of abdominal process: (0) broadly rounded without acuminate apex; (1) narrowed with acuminate apex.

37. Shape of lateral aspect of prosternal process: (0) not produced; (1) produced posteriorly; (2) produced posteriorly and anteriorly.
38. Shape of posterior face of prosternal process in lateral aspect: (0) absent (1) straight; (2) oblique; (3) oblique with concavity.
39. Shape of posterior margin of mesosternum: (0) truncate, (1) broadly concave, (2) indentate.
40. Development of metepisternum: (0) medial margin angulate or with slight concavity; (1) medial margin with distinct concavity.
41. Development of carina on prosternal process: (0) no carina visible; (1) short obsolete carina in anterior 0.25.
42. Development of carina on mesosternum: (0) obsoletely carinate; (1) moderately carinate; (2) distinctly carinate.
43. Development of anterior portion of metepisternum: (0) absent; (1) only anterior 0.125 cut-off from rest of structure; (2) at least anterior 0.20 cut-off from rest of structure by raised line forming small axillary space.
44. Development of the antennal grooves on head: (0) convergent; (1) parallel; (2) absent.
45. Development of the prosternal process between procoxae: (0) broad, > length of pedicel, (1) narrow, < length of pedicel.
46. Development of the mesosternum: (0) not carinate, (1) feebly carinate, (2) carinate. If the carina is only present in the anterior portion of the structure then it is coded as (1), if the carina is present along the entire structure it is coded as (2).
47. Development of the procoxal cavities: (0) open, (1) closed.
48. Development of metepisternal axillary space: (0) absent; (1) present.

Characters 49-56. The primary sclerites of the dorsum (including the pronotum, scutellum, elytra, and pygidium) have been used in varying degrees at higher and lower taxonomic levels. Leschen (1999) attempted to use overall body convexity, in particular the dorsal convexity, for higher level systematic analysis.

49. Shape of epiplurae: (0) narrow, ≤ width of mesotibia in female; (1) broad, > width of mesotibia in female. The female mesotibia is used due to the sexually dimorphic condition of the mesotibia in some males that can often be observed as a thickening of the leg segment.
50. Shape of anterior margin of pronotum: (0) truncate; (1) evenly rounded; (2) trapezoidal.
51. Shape of posterior pronotal margin: (0) truncate; (1) bisinuate; (2) undulate.
52. Shape of scutellum: (0) broadly rounded; (1) triangular with angulate sides.
53. Shape of male pygidial apex: (0) indentate; (1) truncate; (2) broadly rounded.
54. Shape of posterior pronotal angles: (0) distinct, (2) obsolete.
55. Development of dorsal convexity: (0) flattened, (1) moderately convex, (2) greatly convex.
56. Exposure of pygidium: (0) fully exposed; (1) partially exposed; (2) concealed.

Characters 57-62. The antennae, whether in total or segments thereof, have been used mostly for lower-level taxonomic work, specifically the shape of the antennal club with particular reference to the terminal antennomere. *Pocadius* followed this general rule, and the shape of the terminal antennomere and placement of sensillar regions on its surface are important for systematic and taxonomic research.

57. Shape of terminal antennomeres: (0) symmetrical; (1) asymmetrical.
58. Shape of antennal club (0) ovate; (1) obovate; (2) elongate.

59. Length of terminal antennomeres: (0) =length of basal 2 club antennomeres combined; (1) >length of basal 2 club antennomeres combined.

60. Length of antennal segment 4: (0) <length of 5; (1) >length of 5.

61. Development of antennal funicle: (0) antennomeres 7-8 not flattened, disc-like; (1) antennomeres 7-8 flattened, disc-like.

62. Development of antennal club: (0) not compact, some space evident between club segments; (1) compact, no space evident between club segments.

Characters 63-68. The legs, in particular the shape of the individual segments and armature of tibia are important taxonomic characters. Kirejtshuk (2003) and Kirejtshuk and Leschen (1998) used protibial characters (i.e. lateral crenulation, presence/absence of outer apical processes) to help define generic complexes. *Meligethes* treatments have included protibial morphology, in particular dentition pattern, for species-level studies. Likewise, Howden (1961) used protibial dentition to delimit *Thalycra* species.

63. Development of anterior-lateral region of protibia: (0) not produced, (1) broadly produced or expanded, (2) produced into sharp prominence.

64. Development of protibial lateral margin: (0) smooth, (1) crenulate.

65. Development of tibial anterior-medial spines: (0) absent, (1) single spine present, (2) two equal spines, (3) two unequal spines.

66. Development of apico-lateral protibial notch: (0) absent; (1) shallow, <length of first tarsomere; (2) deep, >length of first tarsomere.

67. Location of protibial apico-lateral tooth: (0)absent; (1) at same level as tarsomere junction; (2) distinctly subapical.

68. Development of tarsomeres: (0) thin, length > width; (1) thickened, width > length.

Characters 69-91. The aedeagus, or male intermittent organ, has had a long history in species level taxonomic work. Surprisingly, most descriptions of nitidulid taxa do not outwardly discuss specific structures of the aedeagus. *Pocadius* aedeagi, in particular the tegmen and median lobe, are structurally similar in most species; however, the setosity of the tegmen and development of the internal sac sclerites are quite useful.

69. Shape of apex of male spiculum gastrale (= 8$^{th}$ abdominal sternite): (0) truncate; (1) indentate; (2) bisinuate; (3) crenulate; (4) ridged.
70. Shape of ventral surface of male anal sclerite shape: (0) shallowly concave; (1) deeply concave.
71. Shape of tegminal apex: (0) truncate; (1) evenly rounded; (2) indentate.
72. Shape of apex of tegminal central fossa (i.e. fossa that houses median lobe): (0) evenly rounded; (1) sharply incised; (2) with broad protuberance
73. Shape of ventral protuberance on phallobase: (0) produced anteriorly; (1) produced ventrally.
74. Shape of apical sclerite of ejaculatory rods (i.e. principal sclerites of the internal sac): (0) straight; (1) laterally curved; (2) elbowed.
75. Shape of medial margin of basal sclerite of ejaculatory rods: (0) straight; (1) concave; (2) bisinuate.
76. Setosity of male speculum gastrale: (0) ≤10 setae; (1) >10 setae.
77. Setosity of tegminal lateral margin: (0) present from apex of central fossa to apex; (1) only in apical 1/3 of tegmen
78. Setosity of inner tegminal row: (0) aciliate; (1) not attaining apex; (2) reaching apex in U-shaped row.

79. Development of subapical furrow on tegmen: (0) absent; (1) small; (2) two small furrows; (3) elongate furrow.

80. Development of aedeagal parameres: (0) not fused to each other, (1) fused basally, (2) completely fused throughout; (3) fused with apical division.

81. Degree of fusion of apical to basal sclerites of ejaculatory rods (0) fused; (1) separate.

82. Degree of phallobase/paramere fusion: (0) loosely fused, (1) completely fused.

83. Location of the anal sclerite: (0) ventral, (1) posterior, (2) withdrawn into abdomen.

84. Development of tegmen: (0) without well-developed median furrow; (1) with well-developed median furrow.

85. Setosity of spiculum gastrale: (0) >1 row of apical setae; (1) 1 row of apical setae.

86. Point of attachment of spiculum gastrale strut: (0) dorsally; (1) posteriorly.

87. Degree of fusion of ejaculatory rods to each other: (0) separate; (1) separate.

88. Number of segments comprising ejaculatory rods: (0) 1; (1) 2; (2) >2.

89. Development of tegminal lateral setae: (0) attaining apex; (1) not attaining apex.

90. Development of tegminal inner row of tegminal setae: (0) multiple rows present; (1) single row present; (2) aciliate.

91. Development of male anal sclerite: (0) produced apically; (1) evenly rounded.

Characters 92-111. The ovipositor, or egg-laying apparatus, is a simple structure compared to the male aedeagus. However, modifications of the gonocoxite, i.e. the primary ovipositor sclerite, can be dramatic and host specific for oviposition. Despite these modifications, female genitalia have been used in relatively few species-level works (see Howden 1961 and Kirk-Spriggs 1996 for the most comprehensive use in species-level taxonomic work). Audisio et al (2001) used the setal pattern of the gonostylus, an apical prolongation of the gonocoxite, as one of several characters to validate a new species of *Meligethes*. Leschen (1999) used 3 ovipositor characters in his higher-level analysis of the Cyllodini; one of these (#115) is repeated in this study.

92. Shape of lateral margin of gonostyloid: (0) angulate; (1) sinuate.

93. Shape of the medial region of the basal gonocoxal margin: (0) broadly rounded; (1) indentate; (2) truncate.

94. Shape of apical border of paraproct: (0) evenly rounded; (1) acute.

95. Shape of lateral margin of paraproct: (0) evenly tapering from apex to base; (1) broadly flanged; (2) concave.

96. Shape of inner margin of gonostylus: (0) straight; (1) curved; (2) bisinuate.

97. Degree of separation of ovipositor gonocoxites:(0) ≤1 gonostyloid width; (1) >1 gonostyloid width.

98. Degree of sclerotization of medial region of gonocoxites between gonostyloids: (0) absent; (1) present.

99. Degree of fusion of paraprocts to gonocoxite base: (0) loosely fused medially; (1) extensively fused medially and laterally.

100. Degree of sclerotization of paraprocts: (0) medial border sclerotized; (1) medial border and apical portion of lateral border sclerotized.

101. Development of apical gonostyloid sete-bearing region: (0) no modification; (1) apical pit; (2) apical groove.

102. Development of sclerotized ridge along basal margin of gonocoxite: (0) approximating lateral prominence; (1) extending to lateral prominence.

103. Development of oblique baculi on gonocoxite base: (0) absent; (1) ≤1/2 length of gonostylus; (2) >1/2 length of gonostylus.

104. Development of apico-lateral region of ovipositor gonostylus: (0) evenly rounded; (1) produced laterally into "tooth"; (2) with 2 "teeth".

105. Development of gonostyloid terminal appendage: (0) large, (1) reduced, (2) absent.

106. Setosity of gonostyloid terminus: (0) ≤4 setae; (2) >4 setae. These numbers indicate the presence of primary setae, not microscopic secondary setae.

107. Degree of fusion of gonocoxites: (0) separate; (1) basal fusion only in 0.5 of structure; (2) extensive fusion.

108. Number of lateral protuberances on ovipositor gonocoxite base: (0) 1; (1) 2.

109. Cross-section of gonostyloid: (0) rounded, (1) elliptical, (2) flattened.

110. Development of intragonocoxal invagination: (0) deep, extending > 0.50 length of gonocoxal extension; (1) shallow; not extending past 0.50 of gonocoxal extension.

111. Degree of tegmen curvature: (0) no marked declivity in lateral aspect; (1) marked declivity in lateral aspect.

Characters 112-114. Larval characters were used in Leschen's (1999) analysis of Cyllodini. He used three characters, however, none of these were repeated here.

112. Development of the larval epicranial stem: (0) present, (1) absent.

113. Shape of body curvature: (0) flattened, (1) recurved.

114. Degree of separation of frontal arms (i.e. frontal sutures): (0) distant at base; (1) adjacent at base.

## SYSTEMATIC METHODS. III. PHYLOGENETIC RECONSTRUCTION

Tree Building. All characters were coded as unordered and unweighted, and multistate characters were treated as non-additive. Phylogenetic analyses were performed in PAUP* 4.0b10 for Macintosh (Swofford 2001, Sinauer Assoc., Inc.); all PAUP calculations were executed on a Power Macintosh 7100/80AV with a MacOS operating system. A simultaneous analysis of outgroup and ingroup taxa was performed to polarize characters (see Farris 1972 and Nixon and Carpenter 1993). The TBR swapping algorithm was used for all tree construction. One-hundred replicates were performed for each tree construction. A successively weighted tree was constructed using the strict consensus tree of *Pocadius* and the outgroups *Carpophilus* and *Epuraea*; a total of 4 iterations were used in the successive weighting protocol.

Tree Statistics/Analysis. Following phylogenetic reconstruction, statistical analyses were performed to quantitatively assess the level of support of the chosen characters based on the phylogenies produced. Bremer methods were undertaken in lieu of Bootstrap or Jacknife methods due to likely violation of the independence of characters criterion. Bremer, or decay, analysis was performed using the Macintosh software program TreeRot© (Copyright 1999, Michael D. Sorenson, Department of Biology, Boston University, Boston, MA 02215) to determine the number of characters needed to support a particular branch. TreeRot© aided in the determination of decay, or Bremer support, indices (Bremer 1988) by generating a command file for PAUP or PAUP* (Swofford 1993, 2002). The command file included 1) a constraint statement for each node in a given shortest or strict consensus tree and 2) commands to search for trees inconsistent with each of these constraint statements in turn (see website for details and free download: http://people.bu.edu/msoren/TreeRot.html). The default number of replicates executed in TreeRot© was 20. Other basic statistics computed by PAUP that were reported include: tree length (TL), consistency index (CI), retention index (RI), rescaled consistency index (RC), and homoplasy index (HI). Character distributions and alternative tree topologies were analyzed using MacClade 4.0PPC (Maddison and

Maddison 2000). The monophyly of Pocadius was evaluated in the context of the entire set of taxa.

# CHAPTER 3. SYSTEMATIC TREATMENT

"Progress in natural history starts from a basis of species, and until these are accurately described so that others can arrive at a knowledge of them, no great advance is possible."

George H. Horn

## GENERIC REDESCRIPTION

### *Pocadius* Erichson 1843

*Pocadius* Erichson 1843: 318 (original description); Reitter 1873: 94, 1884: 267 (new species LSAMounts); Horn 1879: 310 (new species accounts); Parsons 1936: 114, 1943: 235 (review of North American fauna); Jelínek 1977: 29 (review of South American fauna); Hayashi 1978: 22 (larval descriptions); Kirejtshuk 1984: 182, 1992: 191 (new species accounts); Lawrence 1991: 456 (larval description), Audisio 1993: 171 (review of Palearctic fauna); Leschen and Carlton 1994: 209 (new species accounts).

**Type Species.** *Nitidula ferruginea* Fabricius 1775 (= *Strongylus ferrugineus* Stephens 1839, *Cychramus ferrugineus* Heer 1841, and *Pocadius ferrugineus* Erichson 1843) subsequent designation by Parsons 1943.

**Diagnosis.** Distinct ridge and sulcus laterad to mentum and submentum, scape asymmetrical with convexity anteriorly, protibia with crenulate outer margin, unequal tibial spurs, pronotum with large and small punctures interspersed, elytral pubescence and elytral punctation serial alternating from rows of smaller simple to rows of larger umbilicate punctures, lateral margins of elytra and pronotum fimbriate, outer apical angle of protibia produced into sharp flat tooth, metatarsi simple without thick setal pads, head transverse with medial depression between orbits, meso- and metatibiae finely spinulose laterally, distance between mesocoxae subequal to distance between metacoxae (i.e. metacoxae not widely separated), elytra separately rounded exposing at least part of pygidium, mesosternum situated more dorsad than metasternum sometimes, with blunt rounded medial carina, metasternal axillary space small with narrow elaboration posteriorly, metepisternum always with anterior 0.10-0.25 cut-off by oblique ridge and forming a metepisternal axillary space, lateral margins of pronotum and elytra narrowly explanate, male anal sclerite (= tergite VIII) always visible from above, tegmen compact and always ciliate, gonocoxites always fused basally, gonocoxal apices in ovipositor divergent and lacking styli (*P. femoralis* n. sp. is unique amongst *Pocadius* in having short abrupt gonocoxal apices that are scarcely separated).

**Description of Adult.** Size: 3-6mm in length. Broadly oval to somewhat elongate oval, convex, body varying from moderately to densely pubescent. Dorsum visibly punctate, elytra with serial rows of punctures and setae (Fig. 2). Head wider than long, prognathous, medial depression visible in anterior region of head prior to clypeal region. Clypeus somewhat distinct and moderately projecting forward. Labrum visible, strongly transverse, feebly bilobed with anterior medial emargination or incision (Fig 4a). Mandibles large and simple, often blunt apically, with additional smaller tooth subapically on median edge; prostheca often densely setose; basal molar region often enlarged (Fig. 4b). Maxilla with cardo elongate and in most species biconcave laterally, stipes triangular, lacinia broadly hemispherical with dense setal brush along medial margin, palpi elongate with second segment typically broader than others and terminal palpomere usually longer than preceding three combined (Fig. 4c). Mentum transverse; labium extending anteriorly from above mentum, typically with dense setose brush along anterior margin, labial palpi 3-segmented with basal segment short and narrow, second segment large and asymmetrical, and terminal palpomere subequal to preceding two combined (Fig. 4d). Eyes always finely faceted. No prominence above antennal insertions. Antennae 11-segmented and a little longer than length of head. Scape large, convex anteriorly, asymmetrical, bearing setae on outer edge of anterior margin. Pedicel mostly conical in shape. Segments 3-5 variable, but becoming more transverse towards club. Segments 6-8 often flattened, transverse, disc-like, shorter than any of the previous segments. Antennal club compact, always three-segmented, shape variable, though the terminal antennomere is always the largest of the club segments. Pronotum convex, not wider than elytra, lateral edges with variable (with regards to length, number and color) fringe of setae. Elytra a little longer than wide, separately rounded to expose majority of pygidium. Hindwing with simple venation and fine minute ciliate posterior margin. Epiplurae moderately wide, usually flat or with slight lateral proclivity, not reaching elytral apices. Pygidium always more densely punctate than other dorsal sclerites. Venter punctation mostly similar or less dense than dorsum. Prosternal process extending posteriorly past procoxal cavities, typically convex medially. Procoxal cavities completely closed. Mesosternum situated more dorsad than either the prosternum or mesosternum with no or not well-developed median longitudinal carina. Meso- and metacoxal lines not diverging from coxal cavities. Metepisternum narrowed medially, with small axillary space delimited by transverse raised ridge. Metasternum with hemispherical glabrous region anterior to metacoxal cavity, for reception of meta-femur. Metendosternite of the common cucujoid hylecoetoid type as defined by Crowson (1954) but with anterior tendons arising medially on furca, sclerotized lateral arm of furca well-developed with acute apex, stalk of furca moderately long with heavily sclerotized ventral median flange (see Fig. 3). First abdominal sternite with process extending between metacoxae. Sternites 2-4 similar in size to each other. Hypopygidium always more densely punctate than any other sternite, no sexual dimorphism visible. Anal sclerite of male visible from above, with setose posterior margin. Male pygidium typically truncate, emarginate or more broadly rounded than that of the female. Male genitalia with tegmen consisting of a fused phallobase and parameres; median lobe with long basal strut; internal sac with two sets of sclerotized “parts” including an apical set of ejaculatory rods and a basal ejaculatory rod base, the former of which may be a single or set of two rods, and the latter of which may or may not be fused to the former; and an eighth abdominal sternite having two lateral sclerites associated with one another via a membranous connection and with a long basal strut that may be as long or longer than the median lobe strut. The anal sclerite in combination with the eighth abdominal sternite form a “tube” through which the tegmen and median lobe pass into the bursa copulatrix of the female with a subsequent eversion of the internal sac and associated ejaculatory rods. The female genitalia have a membranous valvifer and paraproct that may be either loosely or extensively fused to the well-sclerotized gonocoxites, which have two apical prolongations that are divergent, lack terminal styli, and have pits or other apical modifications bearing setae and some species have a recurved apical “tooth” on each prolongation; oblique baculi are often present medially on the gonocoxal bases.

**Etymology.** Derivation of the Greek “poca” meaning hair or wool, apparently owing to the vestiture of setae on the habitus.

**Notes.** The above description is based on the works of Audisio (1993), Jelínek (1977), and Kirejtshuk (1992) with additional elaborations of the genitalia, mouthparts, and other salient features such as the metendosternite. Jelínek’s (1977) revision of Neotropical *Pocadius*, asserted that *Pocadius* was closely related to the New World genus *Hyleopocadius* Jelínek and Old World genera *Physoronia* Reitter (= *Lordyrodes* Reitter) and *Pocadiodes* Ganglbauer based on fused, apically divergent ovipositor gonocoxites, however, this appears to be a homeoplastic character developed for oviposition on members of the Gasteromycetes (eluded to by Jelínek 1999a). Synapomorphies linking all *Pocadius* include the flattened shape of antennomeres 6-8 (though 6 is usually less flattened than 7 and 8, the latter two being disc-like), an elevated mentum in posterior 0.66 of structure that forms various geometric shapes, a short epicranial stem visible dorsally on the larval head, and recurved body of mature larvae (2nd instars and further in development).

**Distribution.** *Pocadius* are found on all continents except Antarctica, and most major islands and archipelagos with the exception of Greenland, Iceland, New Zealand, Madagascar, Hawaii, and most of Polynesia. Species are also notably lacking from high latitudes.

### KEY TO SPECIES

**1a)** Species occurring in the Old World……………………………………………..……………**2**

**1b)** Species occurring in the New World……………………………………………………..**17**

**2a)** All tarsomeres greatly thickened, 1-4 wider than long and swollen; species occurring in SE Asia and Australia…………………………………………………..……….….……**3**

**2b)** All tarsomeres thin, 1-4 longer than wide and not swollen; species occurring in SE Asia and throughout the Old world except Australia………………………………..……………**6**

**3a)** Elytral pubescence moderately long, ≥ length of scape; prosternal process with posterior face oblique. Median lobe as in Fig 152. (Australia)………..***P. kirejtshuki*** **n.sp.**

**3b)** Elytral pubescence short, < length of scape; prosternal process with posterior face straight…………………………………………………..…………………………**4**

**4a)** Large, >5mm in length; terminal antennomere with clearly defined depressed region extending across entire apex with circular areas laterally. Internal sac sclerites as in Fig 193. (Thailand)…………………...………………………….……***P. majusculus*** **Kirejtshuk**

**4b)** Smaller, <5mm in length; terminal antennomere with depressed region not well-defined or extending across entire apex………………………………………….………..………....**5**

**5a)** Posterior two-thirds of elytra and pronotal disc much darker than rest of body; male pygidium truncate at apex. Internal sac sclerites as in Fig 187. (Sulawesi)……….. ……………………………………………………………………...….***P. fusiformis* n. sp.**

**5b)** Pronotal disc not darker than rest of body and only posterior on-fourth to one-eighth of elytra darker than rest of body; male pygidium slightly emarginate at apex. Internal sac sclerites as in Fig 171. (Sulawesi)…………………...……………...……***P. barclayi* n. sp.**

**6a)** Terminal antennomere distinctly asymmetrical, longer than preceding two segments combined……………………………………………………………….……………**7**

**6b)** Terminal antennomere symmetrical, equal to or shorter than preceding two segments combined…………………………………………………………………...……….**12**

**7a)** Scutellum broadly hemispherical without distinct apical angle……………………………...**8**

**7b)** Scutellum triangular with distinct apical angle………………………………………………**9**

**8a)** Scutellum, sides of elytra, and basal half of pronotum black; all femora and tibia testaceous; elytral surface between punctures mostly smooth and shining. Median lobe as in Fig. 138. (Vietnam)……...……………………….……………………***P. decoratus* Kirejtshuk**

**8b)** Scutellum, sides of elytra, and basal half of pronotum testaceous; all femora and tibia black; elytral surface between punctures granular and dull. Ovipositor as in Fig. 219. (Vietnam)………...………………………………………………..….***P. femoralis* n. sp.**

**9a)** Protibia with indistinct outer apical notch (as in Fig. 2), depth < length of tarsomere 1; elytra with markings lighter than rest of body……………………………...………………..**10**

**9b)** Protibia with distinct outer apical notch, depth ≥ length of tarsomere 1; elytra concolorous with rest of body………………………………………...……………**11**

**10a)** Terminal antennomere with distinctly depressed circular sensillar region (as in Fig. 2, i.e. TDA) midway to apex near medial margin; pronotum unicolorous. Internal sac sclerites as in Fig 198. (Okinawa)……………...........................................***P. okinawaensis* n. sp.**

**10b)** Terminal antennomere without distinct circular sensillar region; pronotum with lateral margins lighter than disc. Ovipositor as in Fig. 232. (Zaire)…..***P. monticolis Lechanteur***

**11a)** Terminal antennomere with distinct elliptical depressed sensillar region near medial margin midway between base and apex; metasternum with small faint punctation and interspaces smooth. Internal sac sclerites as in Fig 203. (India)…***P. testaceous* Grouvelle**

**11b)** Terminal antennomere without distinct depressed sensillar region; metasternum with faint moderate punctation and interspaces alutaceous. Ovipositor as in Fig. 231. (Philippines)……………………………………………………..***P. martini* Kirejtshuk**

**12a)** Male anal sclerite with produced apex (Figs. 7, 10); outer protibial notch greatly reduced or absent (Africa)……………………………………………………………….…..**13**

**12b)** Male anal sclerite with evenly rounded apex, not acute; outer protibial notch visible, not reduced or absent (Palearctic).………………………..…………………………...…..**14**

**13a)** Smaller species, ≤3mm in length; prosternal process with apical border perpendicular when viewed laterally; elytra with decumbent and semi-erect rows of setae. Internal sac sclerites as in Fig. 168. (West Africa)………………………………..***P. africanus* Kraatz**

**13b)** Larger species, ≥3.5mm in length; prosternal process with apical border oblique when viewed laterally; elytra with semi-decumbent and adpressed rows of setae. Internal sac sclerites as in Fig. 181. (Southern Africa)………….…..…***P. endroedyi* n. sp.**

**14a)** Anterior margin of pronotum trapezoidal; elytra unicolorous……………………………..**15**

**14b)** Anterior margin of pronotum broadly concave; elytra with pale humeri…………………..**16**

**15a)** Pronotal and elytral fimbriae elongate, longer than length of antennal scape; male pygidium truncate apically. Internal sac sclerites as in Fig. 167. (Western Palearctic)……..…………………………………………………….***P. adustus* Reitter**

**15b)** Pronotal and elytral fimbriae not elongate, subequal to length of antennal scape; male pygidium concave apically. Internal sac sclerites as in Fig. 184. (Western Palearctic)……….……………………………………………***P. ferrugineus* (Fabricius)**

**16a)** Elytra with rows of decumbent setae only; pronotum with dark longitudinal line medially; basal half to two-thirds of elytral lighter in color. Internal sac sclerites as in Fig. 197. (Japan)……………..………………………………………..***P. nobilis* Reitter**

**16b)** Elytra with rows of semi-erect setae; pronotum uniformly dark with only extreme lateral margin lighter; basal one-fourth to one-third lighter in color. Ovipositor as in Fig. 242. (China)……………………...……………………...…………..***P. yunnanensis* Grouvelle**

**17a)** Terminal antennomere enlarged, longer than preceding two segments combined……….**18**

**17b)** Terminal antennomere not enlarged, equal to or shorter than preceding two segments combined…………………………………………………………………………....**36**

**18a)** Pronotum widest in posterior third or near posterior angles……………………..……….**19**

**18b)** Pronotum widest near middle, not in posterior third or near posterior angles…………....**26**

**19a)** Metasternal disc with few minute punctures or impunctate……………………………....**20**

**19b)** Metasternal disc densely punctate……………………………………………..………..**22**

**20a)** Male pygidium emarginate at posterior margin; apical protibial notch shallow, equal to 0.5 length of tarsomere 1; terminal antennomere not greatly enlarged, <0.25 larger than preceding two segments combined. Internal sac sclerites as in Fig. 199. (Venezuela)….. ……………………………………………………………….……….***P. pecki* n. sp.**

**20b)** Male pygidium truncate at posterior margin; apical protibial notch deep, greater than 0.5 length of tarsomere 1; terminal antennomere greatly enlarged, >o.25 larger than preceding two segments combined....…………………………….…………………**21**

**21a)** Body dark reddish brown in color; pronotum and elytra with short fimbriae, subequal or equal to the length of the antennal scape; epimeron without distinct rows of large punctures. Internal sac sclerites as in Fig. 169. (Brazil)………....***P. antennuliferus*** **n. sp.**

**21b)** Body light gold-brown in color; pronotum and elytra with elongate fimbriae, much greater than the length of the antennal scape; epimeron with two distinct rows of large punctures. Internal sac sclerites as in Fig. 178. (Guyana)…………..…………..…….***P. crypsis*** **n. sp.**

**22a)** Elytra with alternating rows of erect and decumbent/adpressed setae……………….......**23**

**22b)** Elytra with alternating rows of erect and semi-erect setae……………………………...…**24**

**23a)** Body surface shining with smooth to finely alutaceous sculpturing; elytra with apices and part of lateral margin much darker than rest of body; metasternum W:L < 3. Internal sac sclerites as in Fig. 186. (SE Brazil and Argentina)…………………..…***P. fumatus*** **Jelínek**

**23b)** Body surface not or only slightly shining with mostly granular to microreticulate sculpturing; elytra concolorous with rest of body; metasternum W:L > 3. Internal sac sclerites as in Fig. 176. (Bolivia)…………………..………..……..***P. cochabambus*** **n. sp.**

**24a)** Elevated portion of mentum triangular in shape; metasternum W:L ≤ 3; metasternal disc with deeply impressed large punctures. Internal sac sclerites as in Fig. 174. (Nicaragua).. ……………………………………......................…………..………***P. carltoni*** **n. sp**.

**24b)** Elevated portion of mentum pentagonal in shape (as in Fig. 4); metasternum W:L > 3; metasternal disc with faintly impressed small to moderate sized punctures. Internal sac sclerites not as above…………………………………………………………......…**25**

**25a)** Procoxae much lighter than rest of body and other coxae; outer protibial notch absent; head only slightly longer than wide (W:L = 1.35:1); body dark brown to black in color. Internal sac sclerites as in Fig. 177. (Brazil)……..……………………..….***P. coxus*** **n. sp.**

**25b)** Procoxae concolorous with rest of coxae and body; outer protibial notch present; head much wider than long (W:L = 1.75:1); body light golden brown to reddish brown in color sometimes with elytral apices and lateral margin dark brown. Internal sac sclerites as in Fig. 200. (Peru)……………………………………………...………***P. peruensis*** **n. sp.**

**26a)** Elevated portion of mentum pentagonal, lateral margins present and perpendicular.....…**27**

**26b)** Elevated portion of mentum triangular or hemispherical, not pentagonal, without distinct lateral margins.………….………………………..……………………...…………**31**

**27a)** Body bicolored with the pronotum different in color than the rest of the body. Ovipositor as in Fig. 210. (Brazil)………………………...………………...……...…***P. bicolor*** **n. sp.**

**27b)** Body not bicolored, pronotum concolorous with rest of body…………………………….**28**

**28a)** Abdominal process narrow with acuminate apex; elytra with alternating rows of semi-erect setae; terminal antennomere lacking well-defined sensillar region; dorsal surface almost completely granular in sculpture. Internal sac sclerites as in Fig. 204. (Bolivia)………… ……………………….…………………………………..…….***P. wappesi*** **n. sp.**

**28b)** Abdominal process broad with widely rounded or truncate apex; elytra with alternating rows of setae that are not both semi-erect; terminal antennomere with a well-defined sensillar region; dorsal surface variously sculptured but not completely granular……...**29**

**29a)** Terminal antennomere with two elliptical sensillar regions; male pygidium with distinctly concave posterior margin; posterior prosternal wall perpendicular; anterior pronotal margin nearly truncate. Internal sac sclerites as in Fig. 183. (Paraguay)…..***P. falini*** **n. sp.**

**29b)** Terminal antennomere with a single sensillar region; male pygidium with a truncate posterior margin; posterior prosternal wall oblique; anterior pronotal margin concave or trapezoidal…………………………………………………………...………………...…**30**

**30a)** Body smaller in size, <3.5mm in length; brown in color; prosternal process with distinct medial concavity in lateral aspect; axillary space on metepisternum small 0.10 length of structure; pronotum with W:L > 2:1; metasternum W:L <3:1. Internal sac sclerites as in Fig. 191. (Costa Rica, Nicaragua)……..………………..***P. jelineki*** **Leschen and Carlton**

**30b)** Body larger in size >3.5mm in length; black in color; prosternal process with slight medial concavity in lateral aspect; axillary space on metepisternum moderate 0.15 length of structure; pronotum with W:L < 2:1; metasternum W:L > 3:1. Internal sac sclerites as in Fig. 194. (Ecuador)….……………………..***P. maquipucunensis*** **Leschen and Carlton**

**31a)** Protibia with outer apical notch absent…………………………………………………**32**

**31b)** Protibia with outer apical notch present…………………………………………….....**33**

**32a)** Erect and semi-erect rows of elytral setae; antennomeres 4-6 trapezoidal and subequal in length; densely deeply punctate scutellum, metasternum L:W > 1:2; antennal club ~.85 length of segments 1-8 combined; body uniformly reddish brown. Internal sac sclerites as in Fig. 170. (Andean Bolivia)………………….……………..………..***P. ashei*** **n. sp.**

**32b)** Erect and decumbent rows of elytral setae; antennomeres 5-6 trapezoidal and antennomere 4 cuboid to barrel-shaped and longer than 5 or 6; scutellum obsoletely punctate; metasternum L:W < 1:2; antennal club ~0.75 length of segments 1-8 combined; body dark brown with elytral apices and lateral margin darker. Internal sac sclerites as in Fig. 179. (Argentina)……………………………………………...…***P. dimidiatus*** **Jelínek**

**33a)** Abdominal process broad between metacoxae with widely rounded to truncate apex; large puncture rows on elytra separated by >1.75 large puncture diameters; protibial outer apical notch depth shallow, ≤ 0.5 length of tarsomere 1; male pygidium with posterior margin distinctly concave……………………………………..……………..…**34**

**33b)** Abdominal process narrow between metacoxae with acuminate apex; large puncture rows on elytra separated by <1.75 large puncture diameters; protibial outer apical notch depth shallow, > 0.5 length of tarsomere 1; male pygidium with posterior margin straight…...**35**

**34a)** Elytra with alternating erect and semi-erect rows of setae; terminal antennomere with circular to elliptical shaped sensillar region; punctures on mentum large, equal to large punctures on vertex of head; prosternal process with posterior wall concave; metasternal disc with faint minute punctures; head L:W < 1:1.75. Internal sac sclerites as in Fig. 196. (Paraguay)…………………………………………………..…..…***P. nigerrimus*** **n. sp.**

**34b)** Elytra with alternating erect and decumbent rows of setae; terminal antennomere with V-shaped sensillar region; punctures on mentum small, equal to small punctures on vertex of head; prosternal process with posterior wall oblique; metasternal disc with deep large punctures; head L:W > 1:1.75. Internal sac sclerites as in Fig. 202. (Mexico)…………..…… ……………………………………..…………..……………....…***P. tepicensis*** **n. sp.**

**35a)** Body orange brown with apical 0.5-0.66 of elytra black; elytra with alternating rows of semi-erect and decumbent setae; punctures on mentum large, equal to large punctures on vertex of head; prosternal process with posterior wall perpendicular; antennal club 0.6 length of segments 1-8 combined; male hypopygidium with small central asetose region. Internal sac sclerites as in Fig. 180. (Hispaniola)...…..……..………...***P. dominicus*** **n. sp.**

**35b)** Body uniformly light brown; elytra with alternating rows of erect and semi-erect setae; punctures on mentum small, equal to small punctures on vertex of head; prosternal process with posterior wall oblique; antennal club 0.95 length of segments 1-8 combined male hypopygidium uniformly setose. Internal sac sclerites as in Fig. 182. (Costa Rica). ………………………………………...…………….***P. ephite* Leschen and Carlton**

**36a)** Pronotum widest in posterior third or near posterior angles…………………...……….**37**

**36b)** Pronotum widest in middle, not in posterior third or near posterior angles……………..…**42**

**37a)** Antennal scape <1.8X length of antennal pedicel; elytra with alternating rows of semi-erect setae only……………………..…………………………………..…………………**38**

**37b)** Antennal scape >1.8X length of antennal pedicel; elytra with varying orientations of setal rows, but both not semi-erect………………………………………………………..……**40**

**38a)** Pronotum with posterior angles indistinct and broadly rounded; prosternal process with posterior wall concave; protibial outer apical notch absent; metasternal W:L $\geq$ 3:1; mentum triangular. Internal sac sclerites as in Fig. 201. (South America)………………… ………...…………………………………………………………***P. rubidus* Erichson**

**38b)** Pronotum with posterior angles distinct, not broadly rounded; prosternal process with posterior wall oblique; protibial outer apical notch present; metasternal W:L < 3:1; mentum not triangular……………………………...…………………………………….**39**

**39a)** Pronotum with anterior margin distinctly trapezoidal; metasternal disc with large moderately impressed punctures; abdominal process narrow between metacoxae; body uniformly dark reddish brown. Internal sac sclerites as in Fig. 188. (Honduras)………… …………………………………………………….……….…….……***P. globularis* n. sp.**

**39b)** Pronotum with anterior margin shallowly concave; metasternal disc with small faintly impressed punctures; abdominal process broad between metacoxae; body uniformly light golden brown. Internal sac sclerites as in Fig. 190. (Trinidad)…………***P. insularis* n. sp.**

**40a)** Abdominal process narrow between metacoxae (as in Fig. 3); prosternal process with posterior wall concave; metasternal W:L > 2.9:1; metepisternal axillary space $\geq$ 0.175;

elytra with at least one of the alternating rows bearing erect setae. Internal sac sclerites as in Fig. 189. (E North America through Central Mexico)……….….***P. helvolus*** **Erichson**

**40b)** Abdominal process broad between metacoxae; prosternal process with posterior wall not concave; metasternal W:L < 2.9:1; metepisternal axillary space < 0.175; elytra with no rows bearing erect setae………………………………..…………………………….**41**

**41a)** Body uniformly dark brown to blackish in color; elytra with alternating rows of decumbent setae; mentum with small shallow punctures. Internal sac sclerites as in Fig. 175. (Mexico, Guatemala, and Honduras)……………………………......***P. centralis*** **n. sp.**

**41b)** Body with pronotum and head always darker in color than elytra, with elytral apices sometimes darker as well; elytra with alternating rows of semi-erect and decumbent setae; mentum with large moderately impressed punctures. Internal sac sclerites as in Fig. 185. (W North America and NW Mexico)……………..………..***P. fulvipennis*** **Erichson**

**42a)** Head slightly transverse, not much wider than long (W:L < 1.3:1); pronotal anterior margin deeply concave; metepisternal axillary space small, < 0.13 length of metepisternum. Median lobe as in Fig. 165. (Argentina)……………………………..…..***P. torresi*** **Jelínek**

**42b)** Head transverse, wider than long (W:L > 1.3:1); pronotal anterior margin trapezoidal or shallowly concave; metepisternal axillary space moderate to large, > 0.15 length of metepisternum……………………………………………………………………..…**43**

**43a)** Elevated portion of mentum pentagonal; pronotal punctation dense, separated by <1 puncture diameter…………………………………………………………………….**44**

**43b)** Elevated portion of mentum not pentagonal; pronotal punctation dispersed, punctures separated by >1 puncture diameter….……………………………...………………....**45**

**44a)** Elytra with lighter colored maculi on humeri; antennal scape elongate, >1.9X length of pedicel; protibia with outer apical notch deep, equal to length of tarsomere 1 and part of 2 combined; abdominal process narrow between metacoxae. Internal sac sclerites as in Fig. 195. (SW United States)………..…………………………………***P. niger* Parsons**

**44b)** Elytra concolorous with rest of body; antennal scape not elongate, <1.9X length of pedicel; protibia with outer apical notch absent; abdominal process broad between metacoxae. Internal sac sclerites as in Fig. 173. (Cuba)………………***P. brevis* Grouvelle**

**45a)** Head and pronotum concolorous, dark piceous to black with elytral humeri sometimes lighter than rest of body; posterior prosternal wall oblique; metasternum and mentum with large punctures, equal to or larger than larger ones on vertex; elytra with alternating rows of semi-erect setae. Internal sac sclerites as in Fig. 172. (SW United States)……….. ……………………………………………………...…...…….***P. basalis* Schaeffer**

**45b)** Midline of pronotum and elytra apices and suture darker than rest of body; posterior prosternal wall concave; metasternum and mentum with small punctures, equal to smaller ones on vertex; elytra with alternating rows of setae variable; protibial notch deep and distinct. Internal sac sclerites as in Fig. 192. (Nayarit State, Mexico)…………..................... ...…………………………………………………………..............***P. luisalfredoi* n. sp.**

## SPECIES ACCOUNTS

### *Pocadius adustus* Reitter

(Figs. 6, 46, 85, 126, 167, 205)

**Type Material Examined.** HOLOTYPE (HNHM): Caucus. Occ.; Circassien; Leder Reitter / Holotypus 1888; Pocadius ferrugin.; v. adustus; Reitter / coll. Reitter.

**Non-Type Material Examined.** >350 specimens from throughout the Palearctic, ranging from the Iberian peninsula north through the British Isles and eastward through northern Italy and eastern Europe into parts of Turkey and with eastern examples from Sweden, Belarus, western parts of Russia, and the Ukraine.  Kirejtshuk (1992) includes *P. adustus* in his treatment of the Russian Far East, stating their presence in Siberia, the Caucuses, and Malaysia.  The latter of these countries should be confirmed to provide the most detailed distribution of this widespread species.

**Diagnosis.** Most closely allied to *P. ferrugineus*, with which it is sympatric throughout most of its known range.  *Pocadius adustus* can be distinguished from this species by the broadly concave apex of the male pygidium, more elongate hairs on the meso- and metatibia, the overall longer body pubescence, more pronounced apico-lateral spine on meso-metatibia of males, the prosternal process in lateral aspect with its highest convexity more posterior, and body punctation more widely spaced throughout habitus.  Differs from *P. africanus* by having much longer body vestiture, particularly the elytral and pronotal fimbriae which are ~2-3 times longer, terminal antennomere more symmetrical, interspaces between dorsal habitus punctures more rugulose and serial elytral punctures more closely spaced.  Ejaculatory rods of male distinctive, in particular the basal piece which is more robust and resembles recurved spines.

**Redescription.** Length 4.2mm, Width 2.8mm, Depth 1.7mm.  Body convex, somewhat shining, light to dark reddish brown, pubescence long pale grey to golden, pronotal and elytral fimbriae distinctly elongate (> length of scape).  Pygidium and hypopygidium densely pubescent.

Head surface densely irregularly punctate, puncture surface deeply rugulose, interspaces smooth to alutaceous, ~0.25 puncture width.  Punctures not decidedly larger near orbits or occiput.  Labrum either with minute punctures and rugulose interspaces or completely rugulose. Pronotal surface with large and small punctures interspersed throughout.  Large punctures ~1.33X width of head punctures, smaller punctures ~0.33-0.5 width of head punctures; interspaces 0.5 to 1 large puncture diameters apart, smooth to alutaceous.  Each puncture bearing an elongate semierect seta.  Scutellar surface densely to moderately punctuate, punctures similar in size to smaller ones on pronotum; interspaces alutaceous to rugose and separated by 0.25-0.5 puncture diameter. Eytral surface with large punctures ~2X diameter of punctures on head, each giving rise to a decumbent seta. Small punctures ~0.25 diameter of large punctures, each giving rise to an elongate semi-erect seta; interspaces alutaceous to rugose, larger punctures separated from each other by 0.5-0.75 diameter, smaller punctures separated from each other by 2 small puncture diameters. Large and small puncture rows separated from each other by ~2 small puncture diameters. Pygidium densely irregularly punctate, punctures equal in size to small punctures on elytra; interspaces alutaceous to rugose with some microreticulation, punctures separated by 0.5-1 puncture diameter. Each puncture giving rise to a shorter decumbent to erect seta, setae ~0.5 length of those on elytra.

Venter with somewhat shorter pubescence (~0.75 length of dorsal vestiture) than dorsum with the exception of that on the head and prosternal process. Mentum with scattered punctures similar in size to the small punctures on the pronotum, interspaces alutaceous with microreticulation, punctures 1 diameter apart. Each puncture giving rise to a moderately elongate seta. Submentum and gula with similar sized punctures as mentum, each giving rise to a short seta, interspaces alutaceous to rugose. Prosternum and epimeron faintly to moderately impressed with large punctures, punctures ~2 times larger than those on mentum, interspaces alutaceous to rugose with microreticulation present, ~1-1 0.5 diameters apart. Mesosternum with punctures only near posterior margin with metasternum, interspaces and anterior portion of mesosternum rugulose. Metasternal disc faintly punctate with moderate sized punctures equal to those on mentum. Metasternum becoming more densely punctate laterally. Interspaces alutaceous to faintly rugose. Abdominal sternite 1 with faint punctures, equal in size to those on metasternum, interspaces rugose, separated by ~1-2 puncture diameters, abdominal process mostly impunctate and alutaceous. Abdominal segments 2-4 with punctures scattered throughout with some punctures aligned in an irregular lateral row near the posterior border. Serial punctures ~0.75 diameter of scattered punctures, interspaces smooth to alutaceous, serial punctures closely spaced, ~0.25 diameter apart. Hypopygidium densely shallowly punctate, punctures equal to those on metasternum, interspaces alutaceous with faint microreticulation, punctures separated by 0.25-0.5 diameter of puncture.

Head wider than long (W:L = 1.5:1), fronotclypeal region well pronounced. Vertex with deep broad concavity extending between each orbit from the posterior region of the frons to the clypeal region. Labrum transverse with small medial incision on anterior margin. Antennal club compact, large, obovate, asymmetrical with the last antennomere subequal to previous two segments combined, entire club equal in length to 1.3X's the antennal stem. Antennomeres 6-8 flattened, segment 6 less flattened than 7 and 8, their combined length slightly longer than length of antennomere 9. Antennal scape asymmetrical, broadly hemispherical, 2 times as long as pedicel, ≤12 setae originating from it. Pedicel more or less barrel-shaped. Antennal segment 3 equal in length to pedicel, narrowed proximally. Segments 4 and 5 globular, 0.75 the length of segment 3. Antennal grooves deep and somewhat curved posteriomedially. Prosternal process narrowed slightly between coxae, evenly rounded with an acute apex. Mesosternum extending to midway between mesocoxae with a concave apex. Metasternum wider than long (W:L = 2.4:1). Metepisternum not concave medially, anterior third strongly produced anteriomedially and impunctate with surface granular with microreticulation. First abdominal sternite with broadly rounded process with a small point between metacoxae, ~2.3X's longer than second sternite. Sternites 2-4 subequal in length. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth as long as tarsomeres 1 and half of 2 combined. Outer apical notch with no distinct angle or notch but oriented in oblique manner. Longer inner apical spine subequal in length to first and second tarsomere combined. Apical border of protibia smooth, no armature present. Mesotibia armored with a row slender spines along entire lateral edge, spines ~0.5 length of lateral setae on mesotibia. Apical border armored with 2-3 short spines, 0.33-0.5 length of lateral spines. Outer apical process elongate and robust, subequal in length to inner apical spine. Inner apical spine equal in length to tarsomeres 1-2 combined. Metatibia more heavily armored than mesotibia, lateral slender spines more elongate and numerous. Spines of varying lengths, but mostly longer than those on the mesotibia. Apical border armored with a few short spines, as in mesotibia, but more apparent. Outer apical process elongate and robust, slightly longer than inner apical spine. Inner apical spine equal in length to tarsomeres 1-2 combined.

Male genitalia well sclerotized. Anal sclerite with large broadly curved membranous region anteriodorsally (Fig. 6), apex densely fimbriate with elongate setae; ventrally with a deep medial concavity approaching apex. Spiculum gastrale more lightly sclerotized than anal sclerite and tegmen (Fig. 46), lateral region somewhat rounded and moderately explanate, apical border undulate with >10 setae, spiculum attached posterio-medially to sclerites. Tegmen evenly broadly rounded apically (Fig. 85), longer than wide (w:l ~ 2.6:1), lateral row of setae visible anterior to the median fossa around the apex, inner row of setae absent, basal notch slightly projecting forward, basal margin slightly concave. Median lobe large and robust, 0.66 the length of the tegmen, apical opening well-developed extending posteriorly to ~ 0.5 the length of the median lobe (Fig. 126). Ejaculatory rods not fused to each other, evenly concave, basal piece with recurved apices and with proximally projecting medial region (Fig. 167).

Ovipositor moderately sclerotized. Gonocoxites with sclerotized basal border with one lateral prominence, basal border giving rise to two medial oblique sclerotized baculi extending apicolaterally, ridges long ~0.33 length of basal border. Gonocoxal apices moderately separated with intragonocoxal invagination evenly rounded at base, gonocoxal tips rounded at apex, each apex with a small lateral recurved "tooth" giving rise to 5-7 short seta (Fig. 205). Valvifers membranous with some sclerotization along medial border, evenly tapering to lateral apex.

**Variation.** Color varies from light red brown to dark red brown with some individuals having dark brown elytral sutures, lateral elytral margins, and sometimes a dark scutellum. The number of terminal setae on the gonocoxal apices varies from 5-7.

**Seasonality/Habitat.** Specimens studied were collected from March - October.

**Distribution.** Found throughout Europe eastward into Turkey and the Western Caucasus in Russia (Audisio et al. 2000, Kirejtshuk 1992).

**Notes.** *Pocadius adustus* has been collected from the following fungal genera: *Lycoperdon*, *Bovista*, *Calvatia*, and *Langermannia*. This species was recently redescribed by Audisio (1993) in his treatise on Italian Nitidulidae.

## ***Pocadius africanus*** **Kraatz**

(Figs. 7, 47, 86, 127, 168, 206)

**Type Material Examined.** HOLOTYPE (DEI): Togo / ♂ / Pocadius; africanus; Kraatz 95 / Coll. Kraatz; Grouvelle det. / Holotypus 1895-1968; Pocadius; africanus Kr.; Dr. Endrödy-Younga / Coll. DEI; Eberswalde

**Non-Type Material Examined.** 24 specimens with the following label data: (LSAM) GHANA: Bobiri Forest Reserve; Near FIT #1; 23-VII-2001; V. Moseley & C. Carlton collr.; in earthstar fungi. (LSAM) GHANA: Ashanti Province; Bobiri Forest Preserve; 6˚42'N 1˚20'W; 23-31-July-2001, FIT# 3; V. Moseley and C. Carlton collr. GHANA: Ahanti Reg.; Bobiri Forest Reserve; 6˚42'N 1˚20'W; 15-22-III-2002; E. Opuni-Frimpong collr. FIT. GHANA: Ahanti Reg.; Bobiri Forest Reserve; 6˚42'N 1˚20'W; III-V-2002; E. Opuni-Frimpong collr. FIT.

**Diagnosis.** Differs from the Palearctic and other African fauna by its diminutive size, lack of recurved gonocoxal apices, acute pointed apex of anal sclerite in males, and the single fused ventrally curved ejaculatory rod in males.

**Redescription.** Length 2.9mm, Width 1.1mm, Depth 0.9mm. Body convex, moderately shining, uniformly light to reddish brown, long golden pubescence throughout dorsum, setae on head longer than that on rest of body. Pronotum and elytra narrowly explanate with margins fimbriate. Pygidium and hypopygidium densely pubescent with posterior margins densely fimbriate.

Head surface deeply distinctly irregularly punctate, punctures larger near orbits and occiput becoming smaller near clypeal region with some small punctures interspersed with larger ones on vertex. Smaller punctures ~5 times larger than eye facets, larger punctures between 2-3 times diameter of smaller punctures. Each puncture giving rise to a single elongate apically curved seta. Interspaces narrow between lateral punctures, about 0.25 puncture diameter, becoming wider between medial punctures about 1 puncture diameter apart; alutaceous to smooth in texture. Labrum bearing no punctures, completely alutaceous. Pronotal surface with large and small punctures interspersed throughout. Large and small punctures similar in size to respective large and small punctures on head. Interspaces 0.5 to 1 puncture diameter apart, smooth to alutaceous. Each puncture bearing a straight semidecumbent seta. Scutellar surface densely punctate anteriorly with large punctures similar in size to the large punctures on the head, impunctate at apex, interspaces alutaceous and 0.25 diameter of puncture in basal half. Eytral surface with serial rows of alternating large and small shallow punctures. Large punctures 3-4 times diameter of the large punctures on head, each giving rise to a decumbent seta. Small punctures 0.20 diameter of large punctures, each giving rise to a semi-erect seta. Interspaces alutaceous to smooth between all punctures, larger punctures separated from each other by 0.5

puncture diameter, smaller punctures separated from each other by 1-2 puncture diameters. Large and small puncture rows separated from each other by ~1 small puncture diameter. Pygidium densely finely punctate, punctures equal in size to small punctures on elytra, interspaces alutaceous with some minute microreticulation, punctures separated by 0.20 puncture diameter. Each puncture giving rise to a short fine seta, setae ~0.5 length of those on elytra.

Venter with less dense pubescence than dorsum. Mentum with scattered punctures similar in size to the small punctures on the vertex, interspaces smooth and shining, punctures 0.5 diameter apart. Submentum and gula with several large punctures equal in size to the large punctures on the vertex, interspaces smooth and shining. Prosternum and epimeron irregularly punctate, punctures 3 times larger than those on mentum, interspaces alutaceous, prosternal punctures separated by 0.75 diameter, those on the epimeron by 0.25 to 0.5 diameter. Prosternal punctures very faint. Meso- and metasternum irregularly punctate, with large faint punctures similar in size to those on prosternum and epimeron, interspaces alutaceous becoming smooth on metasternal disc, punctures separated by ~1 diameter. Mesosternal punctures aggregated toward posterior margin. Abdominal sternite 1 with faint, almost obsolete, punctures occurring in all but the anterior 0.33 of the structure which is completely alutaceous. Interspaces alutaceous, punctures separated by 1 diameter. Abdominal segments 2-4 with punctures aligned in irregular lateral rows. Punctures equal in size to those on abdominal sternite 1. Interspaces alutaceous, punctures separated by 0.5 diameter. Hypopygidium densely shallowly punctate, punctures equal to those on other abdominal sternites, interspaces alutaceous with faint microreticulation, punctures separated by 0.25 diameter of puncture.

Head somewhat wider than long, broadly triangular, with fronotclypeal region projecting slightly anteriorly. Vertex with deep broad concavity. Antennal club compact, broadly oval, asymmetrical with the last antennomere longer than previous two combined. Antennomeres 6-8 strongly flattened into disc-like structures, their combined length equal to the length of antennomere 9. Antennal scape asymmetrical, broadly hemispherical, 2 times as long as pedicel. Pedicel very similar in shape to scape only smaller. Antennal segment 3 subequal in length to pedicel. Segments 4 and 5 subquadrate, 0.5 the length of segment 3. Segments 6-8 flattened, disc-like in shape. Antennal club large, equal in length to 2X's the pedicel, slightly asymmetrical, terminal segment equal to preceding two segments. Prosternal process narrowed slightly between coxae, evenly rounded at apex. Mesosternum extending to midway between mesocoxae with a concave apex. Metasternum much wider than long (W:L = 3:1). Metepisternum only slightly concave medially, anterior third strongly produced anteriolaterally and separated from rest of metepisternum by a slightly raised carina. First abdominal sternite with broad almost truncate process ending in a small point between metacoxae, ~2X's longer than second sternite. Sternites 2-4 subequal in length. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth as long as second tarsomere. Outer apical notch with almost 90° angle, notch depth shallow, equal to length of first tarsomere. Inner apical spine subequal in length to first tarsomere. Apical border of tibia smooth, no armature present. Mesotibia heavily armored with two rows of slender spines, one row along entire lateral edge and another row laterally oriented on ventral surface. Apical border armored with short spines, 0.33-0.25 length of lateral spines. Outer apical process elongate and robust, 0.75 length of inner apical spine. Inner apical spine equal in length to tarsomeres 1-2. Metatibia heavily armored with four rows of slender elongate spines, one dorsal row, one ventral row, and two lateral rows. Spines of varying lengths, but most longer than those on the mesotibia. Apical border armored with short spines, as in mesotibia, but more numerous. Outer apical process elongate and robust, 0.75

length of inner apical spine. Inner apical spine equal in length to tarsomeres 1-2 and half of tarsomere 3.

Male genitalia moderately sclerotized. Anal sclerite with large broadly curved membranous region anteriodorsally (Fig. 7), and a more heavily sclerotized well-demarcated posteriodorsal region, apex densely fimbriate, ventrally with a deep medial concavity approaching apex. Spiculum gastrale more lightly sclerotized than other genitalic structures (Fig. 47), lateral region broadly rounded and widely explanate, medial region elevated and extended beyond basal margin posteriorly, apical border finely crenulate with ≤10 setae, apico-lateral margins deeply concave, spiculum attached posteriorly to sclerites. Tegmen evenly rounded apically (Fig. 86), much longer than wide (w:l ~ 1.5:6), lateral row of setae visible from the median fossa around the apex, inner row of hair incomplete apically extending from apex of median fossa to just prior to apex, basal notch projecting forward, basal margin slightly concave, entire apex of median fossa border densely ciliate. Median lobe large and robust, slightly greater than 0.5 the length of the tegmen, apical opening not well-developed extending posteriorly to ~ 0.25 the length of the median lobe (Fig. 127). Ejaculatory rods small, less than half the length of median lobe. Basal piece not fused to apical rod. Apical rods fused into single stout rod with ventrally curved apex (Fig. 168).

Female genitalia lightly sclerotized. Gonocoxites with sclerotized basal border with two lateral prominences, basal border giving rise to two medial oblique sclerotized ridges extending apicolaterally, ridges long ~0.33 length of basal border. Gonocoxal apices widely separated with intragonocoxal invagination evenly rounded at base, gonocoxal tips evenly rounded at apex, each apex with a small lateral depression that gives rise to 5-6 short seta (Fig. 206). Valvifers membranous with some sclerotization along medial border, evenly tapering to lateral apex.

**Variation.** Females are slightly larger than males, can be up to 3.2mm long and somewhat more robust. Some individuals examined had deeper punctation on the ventral surface than others, however, the patterns and interspaces are alike. Males typically have a slightly more produced outer apical process on the protibia. Gonocoxites of ovipositor with between 5-7 terminal setae.

**Seasonality/Habitat.** The Ghana material was collected from flight intercept traps and fungi from mid-March through July. These specimens were all within the Bobiri Forest Reserve, which is composed primarily of upper Guinean wet forest. The specimens reported from Angola, Zaire and Sudan are from areas dominated by lower Guinean rain forest.

**Distribution.** Specimens were studied from western Africa, however Kirejtshuk reported its distribution east and southward to Angola, Zaire, and Sudan (pers. comm.)

**Notes.** Label data from the Ghana specimens indicated individuals collected from "earthstar fungi". This record indicates the occurrence of the species in the fungal family Geasteraceae. This is the first and only known host record for this species.

## ***Pocadius antennuliferus* Cline new species**

(Figs. 8, 48, 87, 128, 169)

**Type Material Examined.** HOLOTYPE ♂ (CMN): BRAZIL: Pará; Carajas, Serra; Norte, III-1985; 6 15'S 50 75'W; N. Degallier; FIT, carrion, dung.

**Diagnosis.** This species is easily distinguished from all other Neotropical *Pocadius* by the following suite of characters: head surface deeply punctate and shining with interspaces completely smooth, clypeus distinctly indentate medially, protibial outer apical notch deep and distinct; prosternal process when viewed laterally with drastic posterior declivity and short posterior face, terminal antennomere greatly enlarged and asymmetrical with two lateral depressed regions, metasternal disc with faint minute punctation; tegmen with incomplete rows of inner and lateral setae, median lobe with apex narrowly rounded, and ejaculatory rods comprised of three distinct pieces.

**Description.** Length 3.1mm, Width 2.4mm, Depth 1.3mm. Body moderately convex, surface shining, dark reddish-brown in color, with legs and antennae lighter. Pronotum and elytra margins with moderate fimbriae, setae subequal to width of antennal scape. Dorsal and ventral pubescence moderate, fine and inconspicuous.

Head surface deeply, irregularly punctate, punctures larger on vertex, becoming somewhat smaller towards orbits and fronotclypeal region. Larger punctures 3-4 X diameter of eye facet, smaller punctures 2 X diameter. Interspaces smooth and shining. Each smaller puncture gives rise to short fine golden seta. Pronotal surface with large punctures equal in size to large punctures on vertex of head, interspersed with relatively few smaller punctures, equal to smaller ones on vertex. Interspaces alutaceous to finely microreticulate, larger punctures ~0.5 diameters apart. Each puncture gives rise to a moderate golden seta. Scutellar surface with very few vague shallowly impressed small punctures equal in size to smaller ones on vertex, interspaces are alutaceous to granular. Elytral surface with serial rows of alternating large and small deep punctures. Smaller punctures are 1.5 X diameter of smaller ones on pronotum, larger punctures are ~1.5-2 X diameter of smaller ones. Smaller punctures giving rise to an straight erect fine seta, larger punctures giving rise to a decumbent fine seta. Interspaces narrow between punctures of a given row and between different rows. Within a row, small punctures are separated by ~0.75 puncture width, and large punctures by 0.5 puncture width. Large rows are separated by 1.0-1.5 large puncture diameters. Interspaces moderately shining, alutaceous to finely microreticulate in sculpture. Pygidium densely punctate, punctures equal in size to those on pronotum, each puncture giving rise to a short fine golden seta. Interspaces narrow, 0.5-0.75 diameter, with alutaceous to granular sculpture.

Venter with similar short fine dispersed pubescence as dorsum. Mentum with small very shallow scattered punctures, equal in size to smaller ones vertex. Interspaces smooth to finely alutaceous. Submentum and gula similar in punctation to mentum but with punctures more widely dispersed. Prosternum and epimeron deeply irregularly punctate, punctures 2X larger than larger ones on vertex, interspaces granular with microreticulate areas with apex of prosternal process becoming smooth, prosternal punctures separated by ~0.5 diameter, those on the epimeron by 0.5-0.75 diameter. Mesosternum with shallow punctures, about 0.5 diameter of those on prosternum, interspaces alutaceous to granular, separated by about 0.5 to 1 diameter and mostly aggregated near metasternum. Metasternum irregularly punctate, with faint small punctures on disc similar in size to smaller ones on vertex and larger punctures equal to those on prosternum, interspaces faintly alutaceous on disc becoming granular with microreticulate areas laterally, disc punctures separated by ~2-4 diameters and lateral punctures by ~1 diameter. Abdominal sternite 1 with small faint, almost obsolete punctures, punctures equal to smaller ones on vertex, interspaces alutaceous, separated by ~1-2 diameters. Abdominal sternites 2-4 with two irregular indistinct rows of punctures, one row near anterior margin and the other near posterior margin, punctures similar in size to those on abdominal sternite 1, rows separated by ~2 puncture diameters, punctures within rows separated by ~1 puncture width. Hypopygidium with more deep punctures than other sternites, diameter similar in size to those on sternites 2-4, interspaces mostly alutaceous to granular, punctures separated by ~1-2 puncture diameters.

Head slightly wider than long (W:L = 1.5:1), fronotclypeal region projecting anteriorly with clypeus distinctly indentate. Vertex with concavity between orbits near fronotclypeal region. Labrum with deep incision at anterior margin. Antennal club compact, swollen apically, distinctly asymmetrical with the last antennomere larger than the previous two combined. Antennomeres 4-8 more or less compact, with 6-8 characteristically disc-like. Antennal scape asymmetrical, somewhat hemispherical, subequal in length to pedicel. Pedicel cylindrical in shape. Antennal segment 3 subequal in length to pedicel. Antennal club large, ~0.85 length of segments 1-8 combined. Antennal grooves very deep and excavate, converging posteriorly. Lateral mental-submental sulcus prominent, at lower level than submentum, medially the sulcus is punctate with microreticulations and laterally with oblique to longitudinal microreticulations. Mentum with anterior angles distinct, anterior margin broadly with medial acuminate apex, pentagonal, entire structure flattened.

Pronotum widest in posterior third (L:W = 1:2.1), anterior margin broadly concave, posterior margin slightly convex almost truncate, lateral margins somewhat arcuate anteriorly, posterior angles nearly indistinct. Scutellum large, triangular, apex acuminate. Prosternal process somewhat narrowed between procoxae, apex acuminate, in lateral aspect the posterior third has a well-defined declivity, medially convex, and anteriorly with well-developed carina, posterior apical wall reduced. Mesosternum small, extending to midway between mesocoxae, evenly concave for reception of metasternum. Metasternum much wider than long (W:L ~ 3:1). Metepisternum with slight medial constriction, oblique line dividing anterior 0.125 of structure. First abdominal sternite with narrowed acuminate process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-4 subequal in length. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth prominent, slightly longer than tarsomeres 1. Outer apical notch with ~110° angle, notch depth moderate, equal to length of tarsomere 1. Inner apical spine short, 0.75 length to tarsomeres 1. Protibia not heavily armored but with characteristic dense patch of stiff setae along the inner apical region. Mesotibia more heavily armored than protibia with more dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process not well-developed, subequal to protibial process. Inner apical spine equal in length to tarsomeres 1-2 combined. Metatibia with armature similar to that of mesotibia, but outer apical process well-developed, subequal to tarsomeres 1-2 combined.

Male genitalia well-sclerotized. Anal sclerite with large broadly curved region anteriodorsally (Fig. 8); apex somewhat fimbriate; ventrally with a broad medial concavity approaching apex in a broadly convex manner. Spiculum gastrale with wide narrowly curved lateral flanges, medial margins slightly concave, long stiff setae originating from apex (Fig. 48). Tegmen evenly rounded apically (Fig. 87), longer than wide (w:l = 1.0:2.31), lateral row of setae visible from the median fossa to prior to the apex, large shallow concavity in apical third, basal notch perpendicular, basal margin nearly straight. Median lobe robust, ~0.4 the length of the tegmen, apex narrowly rounded, apical opening well-developed with inner structure complex (Fig. 128). Ejaculatory rods not fused to basal piece or each other, overall elongate and comprised of three distinct segments. Basal piece of internal sac sclerites with rounded with apico-medial projection (Fig. 169).

Female genitalia not observed.

**Variation.** Known only from the holotype.

**Seasonality/Habitat.** Holotype collected in March.

**Distribution.** Known only from the type locality.

**Notes.** No fungal host is known for this species.

**Etymology.** Specific epithet denotes the greatly enlarged terminal antennomere with distinct sensillar regions.

## *Pocadius ashei* Cline new species

(Figs. 9, 88, 129, 170, 207)

**Type Material Examined.** HOLOTYPE ♀ (SNEC): BOLIVIA: LaPaz; 6km W Yanacachi, 2150m; 16°25.95'S 67°47.07'W, 23-24-I-2001; J.S. Ashe, R.S. Hanley, ex. flight; intercept trap, BOL1AH01 048 / SM0553606; KUNHM-ENT [barcode label]; HOLOTYPE; Pocadius; ashei; A.R. Cline des. 2004. 3 PARATYPE ♀ (SNEC): same data label as holotype but with paratype labels and the following barcode numbers: SM0553601, SM0553600, SM0553614. 1 PARATYPE ♂ (SNEC): BOLIVIA: LaPaz; 9.4km E Chulumani, Apa Apa Ecol.; Reserve, 2110m, 16°20.98'S; 67°30.28'W, 17-19-I-2001, J.S. Ashe; R.S. Hanley, ex. flight intercept trap; BOL1AH01 022 / SM0553649; KUNHM-ENT / PARATYPE; Pocadius; ashei; A.R. Cline des. 2004.

**Diagnosis.** This species is readily distinguished from other Neotropical *Pocadius* by the reddish brown elongate pubescence covering the habitus, elongate pronotal and elytral fimbriae, dorsal surface densely punctate with shining interspaces throughout, inner protibial patch of short setae extending to more than midway proximad on the tibia, lateral setae on all tibia elongate, erect and semi-erect rows of elytral setae, antennomeres 4-6 trapezoidal and subequal in length, densely punctate scutellum, the extremely high W:L ratio of the pronotum, aedeagus with tegmen having complete rows of inner and lateral elongate setae; ejaculatory rods fused to each other in the apical 025; basal piece of internal sac sclerites consisting of paired sharply curved pieces; ovipositor with deep intragonocoxal invagination, numerous terminal primary setae, short baculi at gonocoxal base, and gonocoxae with lateral convexity.

**Description.** Length 4.2mm, Width 2.55mm, Depth 1.5mm. Body robust and convex, surface shining, reddish brown to dark reddish brown in color, venter somewhat lighter in color than dorsum. Pronotum and elytra margins with long fimbriae, setae longer than length of antennal scape. Dorsal and ventral pubescence quite long and conspicuous on the appendages, all pubescence reddish brown.

Head surface deeply, densely, irregularly punctate, large and small punctures interspersed on vertex, interspaces for all punctures <0.25 large puncture diameter. Larger punctures 4 X diameter of eye facet, smaller punctures ~2 X diameters, interspaces smooth and shining. Most punctures give rise to a long seta, with those near the orbits longer. Pronotal surface with large and small interspersed punctures, equal in size to large and small punctures on vertex; interspaces smooth and shining, about 0.5-1.0 diameter apart. Each puncture gives rise to a long seta, most seta are slightly curved. Scutellar surface with numerous moderately impressed small punctures, punctures equal to smaller ones on pronotum, some punctures giving rise to setae, interspaces smooth and shining. Elytral surface with serial rows of alternating large and small deep punctures. Smaller punctures are equal in size to smaller ones on pronotum, larger punctures are ~2 times diameter of smaller ones. Smaller punctures giving rise to an erect, long seta, larger punctures giving rise to a semi-erect long seta. Interspaces narrow between punctures of a given row and wide between different rows. Within a row, small punctures are separated by ~0.5-1 puncture width, and large punctures by ~0.25 puncture width. Larger rows are separated by ~2.0 large puncture diameters. Interspaces mostly smooth shining. Pygidium densely punctate, punctures subequal in size to larger ones on pronotum, each puncture giving rise to a short seta. Interspaces narrow, ~0.25 diameter, with smooth to somewhat alutaceous sculpture and shining.

Venter with similar long pubescence as dorsum. Mentum with several shallowly impressed punctures, equal in size to smaller ones on vertex, each giving rise to a seta; interspaces smooth to alutaceous. Submentum and gula with less developed punctation as mentum but with interspaces similar in sculpture. Prosternum and epimeron with moderately impressed irregular punctures, punctures slightly larger in size to those on mentum, interspaces alutaceous with microreticulate areas, prosternal punctures separated by 0.5 diameter, and those on the epimeron by 0.5-1 diameter. Mesosternum with shallow punctures, subequal to those on prosternum, interspaces smooth to alutaceous, separated by ~0.5 diameter, with most punctures aggregated near metasternal border. Metasternum irregularly punctate with moderately impressed punctures on disc similar in size to those on mesosternum, interspaces smooth and shining on metasternal disc becoming more alutaceous laterally, punctures separated by ~1-2 diameters, lateral punctures much larger than those on disc ~2-3X's diameter of those on metasternal disc and more closely spaced. Abdominal sternite 1 with moderately impressed punctures, punctures equal to those on metasternal disc, interspaces smooth to alutaceous and shining, separated by ~1-2 diameters. Abdominal sternites 2-4 with two irregular rows of punctures, one row near anterior margin and the other near posterior margin, punctures similar in size to those on metasternal disc, rows separated by ~2 puncture diameters, punctures within rows separated by ~0.5 punctures width, interspaces smooth to granular and shining. Punctures between rows are irregularly organized and do not form definite rows. Hypopygidium with moderately deep punctures, similar in size to those on sternites 2-4, interspaces mostly smooth to alutaceous and shining, punctures separated by ~0.25 puncture diameters.

Head transverse, wider than long (W:L = 1.5:1), fronotclypeal region moderately projecting anteriorly. Vertex with broad distinct concavity between orbits near fronotclypeal region. Antennal club compact, somewhat circular to oblong, asymmetrical, with the last antennomere twice as long as the previous two combined. Antennomeres 4-6 trapezoidal and subequal in length, and 7-8 characteristically disc-like. Antennal scape asymmetrical, hemispherical, 1.5 times as long as pedicel. Pedicel cylindrical in shape. Antennal segment 3 subequal in length to pedicel, and tapering proximally. Antennal club large, ~0.85 length of segments 1-8 combined. Antennal grooves very deep and narrowly excavate, strongly converging posteriorly. Lateral mental/submental sulcus and ridge prominent, at level of submentum, ridge is sculptured with lateral areas of longitudinal microreticulation and the sulcus is finely granulate. Mentum with anterior angles obsolete, anterior margin broadly hemispherical with short central acute point, entire structure somewhat convex when viewed laterally.

Pronotum widest near middle (L:W = 1:2.07), anterior margin broadly deeply concave, posterior margin moderately broadly convex, lateral margins less arcuate posteriorly. Scutellum large, broadly triangular, apex broadly rounded. Prosternal process somewhat narrowed between procoxae, apex acuminate, in lateral aspect there is only a moderate convexity over the procoxae. Posterior apical wall prominent and slightly oblique. Mesosternum extending to midway between mesocoxae, broadly shallowly concave for reception of the metasternum. Metasternum width to length ratio is ~2.47:1.0. Metepisternum with medial constriction, oblique line dividing anterior 0.16 of structure into metepisternal axillary space. Elytral humeri moderately produced, lateral margin very narrow. First abdominal sternite with narrow process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-4 subequal in length. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth moderately prominent, subequal in length to tarsomere 1. Outer apical notch absent. Inner apical spine subequal in length to tarsomeres 1 and part of 2 combined. Protibia moderately armored with characteristic dense patch of stiff setae along the inner apical region reaching midway to femoral articulation. Mesotibia more heavily armored than protibia with more dense stiff setae and two rows of numerous slender spines along entire lateral edge. Outer apical process moderately prominent, slightly longer and more robust than protibial process. Inner apical spine equal in length to tarsomeres 1-2 combined. Metatibia with armature similar to that of mesotibia, but apical spine more robust.

Male genitalia well-sclerotized. Anal sclerite with elongate apical fimbriae; ventrally with a narrow medial concavity approaching apex in a truncate manner (Fig. 9). Spiculum gastrale not observed. Tegmen broadly rounded apically (Fig. 88), longer than wide (w:l = 1.0:2.4), lateral row of setae visible from the median fossa to around the apex, elongate somewhat rectangular concavity in apical third, basal notch perpendicular, basal margin obsoletely concave, inner row of setae complete. Median lobe elongate, 0.7 length of tegmen, apex narrowly rounded, apical opening well-developed with double bilobed internal structure (Fig. 129). Ejaculatory rods not fused to basal piece but fused to each other in apical 0.33, basal portion perpendicular and apical portion curved outward. Basal piece distinctive with paired crescent shaped portions laterally and medially with a bilobed globular portion that is less sclerotized than the lateral crescent shaped portions (Fig. 170).

Female genitalia moderately sclerotized. Paraprocts large and broadly flanged with sclerotization only along median line and not extending to baso-lateral angles. Gonocoxite with one basal lateral prominence, basal ridge well-sclerotized with two short and sub-parallel baculi, and lateral margin curved. Intragonocoxal invagination 0.5 length of total gonocoxite length. Gonocoxal apices with recurved “tooth” absent. Three to four primary setae originate from small depressions at the gonocoxal apices (Fig. 207).

**Variation.** None observed.

**Seasonality/Habitat.** All specimens were collected from mid to late January from montane forests in Andean Bolivia.

**Distribution.** Known from the type locality near LaPaz, Bolivia.

**Notes.** No host data is available for this species.

**Etymology.** Specific epithet honors Steve Ashe, director of the Snow Entomological Museum, for his generosity and understanding during the course of this study.

## *Pocadius barclayi* Cline new species

(Figs. 10, 49, 89, 130, 171, 208)

**Type Material Examined.** HOLOTYPE ♂ (BMNH): INDONESIA:; SULAWESI UTARA,; Dumoga-Bone N.P.; 25 February 1985. / Flight; interception; trap 1 / Plot A, ca 200m; Lowland forest / [upside down] R.Ent.Soc.Lond.; PROJECT WALLACE; B.M. 1985-10 / HOLOTYPE; Pocadius; barclayi; A.R. Cline des. 2004. 1 PARATYPE (BMNH): same data labels as holotype but 24 February 1985, and also having a pink colored label with number 80.5. 1 PARATYPE (BMNH): same data labels as holotype but 26 February 1985. 1 PARATYPE (BMNH): same data labels as holotype but April 1985. 1 PARATYPE (BMNH): INDONESIA:; SULAWESI UTARA,; Dumoga-Bone N.P.; 9-16 May 1985 / Lowland forest; edge ca 200m / malaise; trap / [upside down] R.Ent.Soc.Lond.; PROJECT WALLACE; B.M. 1985-10. 2 PARATYPES (BMNH): INDONESIA; SULAWESI UTARA; Gng. Ambang F.R.; nr. Kotamobagu; Jan. 1985 / Lower montane; forest; 1200-1400m / in mature puffballs / [upside down] R.Ent.Soc.Lond.; PROJECT WALLACE; B.M. 1985-10.

**Diagnosis.** This species is most similar to *P. martini* from the Philippines but differs from it and the other Old World species by the following suite of characters: surface with mostly granular sculpture; metasternum with small densely distributed punctures on disc becoming greatly enlarged and more widely spaced laterally; terminal antennomere more than twice as long as previous two segments combined; mesosternum distinctly carinate along midline; mentum hemispherical; pronotum with anterior margin broadly slightly concave; scutellum comparatively large; tarsomeres greatly thickened with relatively few setae; tegmen elongate with inner median row of setae angulate to apex; median lobe elongate with complex apical opening; internal sac with ejaculatory rods adjacent and large basal piece with small lunate lateral LSAMessory pieces; and ovipositor with sharp medial gonocoxal incision and numerous apical setae on gonocoxae.

**Description.** Length 3.4mm, Width 2.0mm, Depth 1.4mm. Body moderately convex, surface somewhat shining, light brown to brown in color, with elytral apices darker or body uniformly dark brown with legs lighter. Pronotum and elytra margins with short fimbriae, setae subequal to length of antennal scape. Dorsal and ventral pubescence quite short and inconspicuous.

Head surface shallowly, irregularly punctate, large and small punctures interspersed on vertex. Larger punctures 3-4 X diameter of eye facet, smaller punctures ~2 X diameters, interspaces alutaceous to granular. Each smaller puncture gives rise to a short decumbent golden seta. Pronotal surface with large and small interspersed punctures, equal in size to large and small punctures on vertex. Interspaces alutaceous to granular, about 0.5-1.0 diameter apart. Each puncture gives rise to a short decumbent golden seta, most seta are slightly curved. Scutellar surface with very few vague shallowly impressed punctures, some punctures giving rise to setae, and the interspaces are granular. Elytral surface with serial rows of alternating large and small deep punctures. Smaller punctures are equal in size to larger ones on pronotum, larger punctures are ~1.5 times diameter of smaller ones. Smaller punctures giving rise to a semi-erect, oblique short golden seta, larger punctures giving rise to a decumbent short golden seta. Interspaces narrow between punctures of a given row and between different rows. Within a row, small punctures are separated by ~0.5 puncture width, and large punctures by ~0.25 puncture width. Larger rows are separated by ~1.0 large puncture diameters. Interspaces moderately shining being mostly granular in sculpture. Pygidium densely punctate, punctures equal in size to larger ones on pronotum, each puncture giving rise to a short stiff golden seta. Interspaces narrow, ~0.5 diameter, with alutaceous to mostly granular sculpture.

Venter with similar short sparse golden pubescence as dorsum. Mentum with several moderately impressed punctures, equal in size to larger ones on vertex, each giving rise to a short seta. Interspaces alutaceous to granular with some microreticulate areas. Submentum and gula with less developed punctation as mentum but with interspaces similar in sculpture. Prosternum and epimeron with moderately impressed irregular punctures, punctures slightly equal in size to those on mentum, interspaces granular with microreticulate areas, prosternal punctures separated by 0.25-0.5 diameter, and those on the epimeron by 0.25 to 0.5 diameter. Mesosternum with shallow punctures, subequal to those on prosternum, interspaces alutaceous to granular, separated by about 1 diameter, with most punctures aggregated near metasternal border. Metasternum irregularly punctate, with moderately impressed punctures on disc similar in size to those on mesosternum, interspaces granular on metasternal disc and laterally, punctures separated by ~1 diameters, lateral punctures 3-3.5 X's diameter of those on metasternal disc and more widely separated. Abdominal sternite 1 with faint, almost obsolete punctures, punctures equal to those on metasternal disc, interspaces alutaceous to granular, separated by ~1-2 diameters. Abdominal sternites 2-4 with two irregular rows of punctures, one row near anterior margin and the other near posterior margin, punctures similar in size to those on metasternal disc, rows separated by ~2-3 puncture diameters, punctures within rows separated by ~0.25-0.5 punctures width. Punctures between the rows are irregularly organized and not forming definite rows. Hypopygidium with moderately deep punctures, similar in size to those on sternites 2-4, interspaces mostly granular, punctures separated by ~1 puncture diameters.

Head transverse, wider than long (W:L = 1.5:1), fronotclypeal region moderately projecting anteriorly. Vertex with broad distinct concavity between orbits near fronotclypeal region. Eyes large and protruding. Antennal club compact, somewhat circular to oblong, asymmetrical, with the last antennomere twice as long as the previous two combined.

Antennomeres 4-8 more or less compact, with 4-5 somewhat trapezoidal, and 6-8 characteristically disc-like. Antennal scape asymmetrical, greatly hemispherical, 1.8 times as long as pedicel. Pedicel cylindrical in shape. Antennal segment 3 equal in length to pedicel. Antennal club large, ~0.65 length of segments 1-8 combined. Each club segment with dense short setae, and only relatively few protruding setae. Antennal grooves very deep and narrowly excavate, strongly converging posteriorly. Lateral mental ridge prominent, at level of submentum, ridge is sculptured with small closely packed minute punctures and some lateral areas of microreticulation. Mentum with anterior angles obsolete, anterior margin broadly hemispherical, entire structure somewhat convex when viewed laterally.

Pronotum widest near middle (L:W = 1:1.83), anterior margin broadly shallowly concave, posterior margin moderately broadly convex, lateral margins less arcuate posteriorly. Scutellum large, oblong and broadly hemispherical, apex broadly rounded. Prosternal process somewhat narrowed between procoxae, apex acuminate, in lateral aspect the anterior half slopes steeply dorsad, and the posterior half flattens into a short shelf, moderate convexity over procoxae. Posterior apical wall prominent and straight to slightly oblique. Mesosternum extending to midway between mesocoxae, deeply evenly concave for reception of the metasternum, a distinct longitudinal median carina is present along entire length. Metasternum width to length ratio is ~2.25:1.0. Metepisternum with medial constriction, oblique line dividing anterior 0.20 of structure. Elytral humeri moderately produced, lateral margin very narrow. First abdominal sternite with broad process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-4 subequal in length. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth prominent, slightly longer than tarsomere 1. Outer apical notch with ~100° angle, notch depth shallow, equal to length of tarsomere 1. Inner apical spine subequal in length to tarsomeres 1-2 combined. Protibia moderately armored with characteristic dense patch of stiff setae along the inner apical region. Mesotibia more heavily armored than protibia with more dense stiff setae and two rows of numerous slender spines along entire lateral edge. Outer apical process not prominent, subequal to protibial process. Inner apical spine equal in length to tarsomeres 1-2 and part of 3 combined. Metatibia with armature similar to that of mesotibia, but apical spine more elongate and robust.

Male genitalia well-sclerotized. Anal sclerite with apex forming a distinct pointed lobe; apex fimbriate; ventrally with a narrow medial concavity approaching apex (Fig. 10). Spiculum gastrale with broad lateral flanges, medial margins parallel, elongate setae originating from apex (Fig. 49). Tegmen narrowly rounded apically (Fig. 89), much longer than wide (w:l = 1.0:3.85), lateral row of setae visible from the median fossa to prior to the apex, elongate oval concavity in apical third, basal notch perpendicular, basal margin concave, median fossa elongate. Median lobe elongate, equal in length to the tegmen, apex acuminate, apical opening well-developed with distinct proximal concavity (Fig. 130). Ejaculatory rods not fused to basal piece, adjacent with distal region slightly curved outward. Basal piece distinctive with small lateral projections and basal lateral LSAMessory pieces that are lunate in shape (Fig. 171).

Female genitalia moderately sclerotized. Paraprocts large with sclerotization only along median line and not extending to baso-lateral angles. Gonocoxite with one basal lateral prominence, basal ridge well-sclerotized with two elongate oblique baculi. Gonocoxal apices with recurved “tooth” absent. Four to five setae originate from small depressions on the gonocoxal apices (Fig. 208).

**Variation.** The specimen collected in March is much smaller than the other specimens. The two specimens collected from Ambang F.R. are completely dark brown and do not exhibit the darker elytral apices as in the other specimens.

**Seasonality/Habitat.** Specimens were collected in lowland wet forests from January to mid-May.

**Distribution.** Known from the Utara (northern) region of Sulawesi (a.k.a. Celebes).

**Notes.** The genitalia of the holotype are contained in a glycerin vial beneath the specimen, which is card-mounted. Host data is listed as "mature puffballs" for the Ambang F.R. specimens.

**Etymology.** Specific epithet honors Maxwell Barclay, curator at the Natural History Museum London, for his efforts and generosity during the course of this study.

## *Pocadius basalis* Schaeffer

(Figs. 11, 50, 90, 131, 172, 209)

**Type Material Examined.** HOLOTYPE (USNM) ♂: Huach Mts.; VIII-29, Ariz. / Brooklyn; Museum; Coll. 1929 / Type No.; 42564; U.S.N.M. / *Pocadius*; *basalis*; Type, Schffr. Specimen in average condition but lacking both antennal clubs, and right metatarsi. PARATYPES (USNM) ♀, 3 specimens with same label data as Holotype. PARATYPES (USNM), 2 specimens with the following labels: Douglas, Ariz.; 20-VIII-1960; J. H. Russell / ex. puffball; 61-24953 / Pocadius; basalis; Schaeffer.

**Non-Type Material Examined.** >200 specimens total: (5) from LSAM: Hck. Hwy. Mi.24, Sta.; Catalina Mts., ARIZ.; VIII-8-1959, F.G. Werner; in hole in puffball / ♀. (5) from LSAM: ARIZONA Pajarito; Mts. Pena Blanca; Cyn. 15 Aug 1970; K. Stephan coll. (1) from LSAM: ARIZONA: Pajarito; Mts. Pena Blanca Cyn.; Aug. 15 1971; K. Stephan leg. (4) from LSAM: U.S.A. ARIZ; Santa Cruz Co.; Pena Blanca; Pajarito Mts. / Lot No. 521; July. 28, 1961; R.H. Arnett Jr.; E. VanTassell. (4) Tex. Jeff Davis Co.; Davis Mts. Resort; 25 June 2000; R. Turnbow. (2) AZ: Cochise Co., Rustler Park Camp; 20-21 Aug 1981; J. Liebherr; El. 8000'. (8)

from UAC: AZ: Fajarito Mts.; Sycamore Cn. At Tank Springs; 6 Aug. 1978; F.G. Nerner; in puffball. (8) from UAC: Peña Blanca, 10mi. W. Nogales, ARIZ.; Aug.1, 1961; Werner, Nutting. (3) from UAC: Ruby, Ariz.; Aug.17, 1959; M.W. Larson. (1) from UAC: 4mi. N of Sonita, Ariz.; VIII-12-1947; in puffball; L.R. Gillogly collr. (28) from UAC: Casa Blanca Cn.; 7mi. NE Patagonia, Ariz.; 5 Aug. 1978; F. Werner. (128) from CAS: Huachuca Mts., Carr Cn., Ariz.; VIII (22-24) 1961; fungi; L.R. Gillogly collr. (5) from CAS: Sta. Catalina Mts., Bear Wallow, Ariz.; VIII-20-1961. (7) from CAS: Skeleton Cyn., Hidalgo Co., New Mexico; VIII-13-1965; G. Forister.

**Diagnosis.** This species is most similar to *P. niger* known from New Mexico and the Pinal and Sierra Ancha Mts. in Arizona. These species are putative sister taxa and the variation in color in *P. basalis* approaches that of *P. niger*, but the head and pronotum are never black. *Pocadius basalis* has a well-developed apical notch on the inner margin of the profemora that *P. niger* does not. Clear differences can be seen in both the male and female genitalia, specifically the median lobe of *P. basalis* has an acuminate tip and shallow apical opening, the tegmen contains setae that extend around the apex and also on the lateral margins of the medial fossa, whereas *P. niger* does not. Females possess 3 terminal gonocoxal setae in a small shallow depression, whereas in *P. niger* there are 2 terminal setae in an oblique groove.

**Redescription.** Length 4.1mm, Width 2.7mm, Depth 2.1mm. Body moderately convex, surface shining, reddish-brown to dark brown in color, sometimes with elytral humeri lighter. Pronotum and elytra margins with elongate fimbriae, setae longer than width of antennal scape. Dorsal and ventral pubescence quite long.

Head surface deeply, irregularly punctate, punctures larger on vertex, becoming somewhat smaller towards orbits and fronotclypeal region. Larger punctures 6-7 X diameter of eye facet, smaller punctures 3-4 X diameter. Interspaces smooth to finely alutaceous, shining.

Each puncture gives rise to an elongate curved golden seta. Labrum distinctly granular on entire dorsal surface. Pronotal surface with large punctures equal in size to large punctures on vertex of head, interspersed with relatively few smaller punctures, ~0.75 size of larger ones. Interspaces alutaceous to finely microreticulate, about 1-1.5 diameters apart. Each puncture gives rise to a long golden seta, most seta are curved but some are rather straight. Scutellar surface with very few vague shallowly impressed punctures, some punctures giving rise to setae, and the interspaces are granular. Elytral surface with serial rows of alternating large and small deep punctures. Smaller punctures are equal in size to those on pronotum, larger punctures are ~1.5 times diameter of smaller ones. Smaller punctures giving rise to a semi-erect long golden seta, larger punctures giving rise to a semi-erect long golden seta. Interspaces narrow between punctures of a given row and between different rows. Within a row, small punctures are separated by ~1 puncture width, and large punctures by 0.3-0.8 puncture width. Rows are separated by 0.5-1.0 puncture diameters. Interspaces always shining but variable from smooth to finely microreticulate in sculpture. Pygidium densely punctate, punctures equal in size to those on pronotum, each puncture giving rise to a moderately long golden seta. Interspaces narrow, 0.7-1.2 diameters, with granular sculpture.

Venter with similar long golden pubescence as dorsum. Mentum with large very shallow punctures, equal in size to those on vertex, each giving rise to an elongate seta. Interspaces granular to finely microreticulate. Submentum and gula similar in punctation to mentum but with interspaces completely granular. Prosternum and epimeron deeply irregularly punctate, punctures slightly larger than those on mentum, interspaces alutaceous with microreticulate areas, prosternal punctures separated by 0.5 diameter, those on the epimeron by 0.25 to 0.5 diameter. Mesosternum with shallow punctures, about 0.75 diameter of those on prosternum, interspaces alutaceous to smooth, separated by about 0.5 to 1 diameter. Metasternum irregularly punctate, with moderate faint punctures on disc similar in size to those on mesosternum, interspaces smooth on metasternal disc becoming microreticulate to granular laterally, punctures separated by ~1-2 diameters. Abdominal sternite 1 with large faint, almost obsolete punctures, punctures equal to large punctures on elytra, interspaces smooth to alutaceous, separated by ~1 diameter. Abdominal sternites 2-4 with two irregular rows of punctures, one row near anterior margin and the other near posterior margin, punctures similar in size to those on metasternum, rows separated by 1.5-2 puncture diameters, punctures within rows separated by ~0.5 punctures width. Rows on abdominal sternite 4 becoming less organized. Hypopygidium with moderately deep punctures, similar in size to those on sternites 2-4, interspaces alutaceous to granular, punctures separated by 1-2 puncture diameters.

Head wider than long (W:L = 1.55:1), fronotclypeal region moderately projecting anteriorly. Vertex with shallow concavity between orbits near fronotclypeal region. Labrum with shallow concavity at anterior margin. Antennal club compact, oval, only slightly asymmetrical with the last antennomere subequal to the previous two combined. Antennomeres 5-8 more or less compact, with 6-8 characteristically disc-like. Antennal scape asymmetrical, somewhat hemispherical, 1.7 times as long as pedicel. Pedicel subcylindrical in shape. Antennal segment 3 subequal in length to pedicel. Antennal club large, ~0.75 length of segments 1-8 combined. Antennal grooves very deep and widely excavate, slightly converging posteriorly. Lateral mental/submental ridge prominent, at level of submentum, ridge is divided longitudinally by rounded crest, medially the ridge is transversely sculptured with microreticulations and laterally with oblique to longitudinal microreticulations. Mentum with anterior angles obsolete, anterior margin angulate, triangular, entire structure somewhat convex.

Pronotum widest near middle (L:W = 1:1.9), anterior margin broadly trapezoidal, posterior margin moderately convex, lateral margins less arcuate posteriorly. Scutellum large, obtusely triangular, apex rounded. Prosternal process somewhat narrowed between procoxae, apex somewhat acuminate, in lateral aspect the anterior and posterior ends are prominent and convex medially. Posterior apical wall prominent and only slightly oblique. Mesosternum extending to midway between mesocoxae, evenly concave for reception of the metasternum. Metasternum width to length ratio is ~2.6:1.0. Metepisternum with slight medial constriction, oblique line dividing anterior 0.2 of structure. Elytral humeri moderately produced, lateral margin very narrow. First abdominal sternite with acuminate process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-3 subequal in length, the fourth slightly larger than the preceding two. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth very prominent, slightly longer than tarsomeres 1-2 combined. Outer apical notch with ~105° angle, notch depth moderate, equal to length of tarsomere 1. Inner apical spine subequal in length to tarsomeres 1-2 combined. Protibia heavily armored with characteristic dense patch of stiff setae along the inner apical region. Mesotibia more heavily armored than protibia with more dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process elongate and robust, larger than protibia process, and bifid apically. Inner apical spine equal in length to tarsomeres 1-2 combined. Metatibia with armature similar to that of mesotibia.

Male genitalia well-sclerotized. Anal sclerite with large broadly curved region anteriodorsally (Fig. 11); apex somewhat fimbriate; ventrally with a broad medial concavity approaching apex. Spiculum gastrale with wide lateral flanges, medial margins concave proximally, short stiff setae originating from apex (Fig. 50). Tegmen evenly rounded apically (Fig. 90), much longer than wide (w:l = 1.0:2.55), lateral row of setae visible from the median fossa to prior to the apex, small shallow concavity in apical third, basal notch perpendicular, basal margin nearly straight, apex of median fossa border with small patch of fine setae. Median lobe large and robust, ~0.66 the length of the tegmen, apex acuminate, apical opening well-developed with proximal concavity (Fig. 131). Ejaculatory rods not fused to basal piece, curved inward and expanded outward at basal piece. Basal piece of rods with deep medial concavity extending almost half length of structure, proximally with four sharp projections (Fig. 172).

Female genitalia moderately sclerotized. Paraprocts large with sclerotization only along median line to baso-lateral angles. Gonocoxite with two basal lateral prominences, basal ridge well-sclerotized. Gonocoxal apices with recurved "tooth" present. Three setae originate from small depressions on the gonocoxal apices (Fig. 209).

**Variation.** Color varies considerably among members of this species. Most individuals are brown to dark reddish brown, some individuals have slightly lighter humeri. Some variation exists in the armature of the mesotibial, some individuals exhibit 1-2 fewer lateral spines than others, but overall armature is still quite impressive. Some variation in the length and degree of setation on the male anal sclerite was observed, with a few males having more longer setae than illustrated.

**Seasonality/Habitat.** Adults are known to occur from June to August, with the only known host record as "puffballs". This species can be considered an alpine taxon with individuals collected up to 8000' in elevation.

**Distribution.** Known from southern Arizona, New Mexico, and western Texas (see Cline 2003a).

**Notes.** This species likely occurs in northern Mexico and future collecting will undoubtedly reveal records for its occurrence there. *Pocadius basalis* exhibits a peculiar sympatry with both *P. helvolus* and *P. niger* both of which occur within its known range.

## *Pocadius bicolor* Cline n. sp.

(Fig. 210)

**Type Material Examined.** HOLOTYPE ♀ (CMN): BRAZIL: Para; Carajas, Serra; Norte, III-1985; 6 15'S 50 25'W; N. Degallier; FIT, carrion, dung.

**Diagnosis.** The bicolored appearance of this species is unlike any other in the genus, with the pronotum distinctly lighter than the rest of the body.

**Redescription.** Length 2.7mm, Width 2.1mm, Depth 1.35mm. Body moderately convex, surface shining, pronotum and legs lighter than rest of body, pubescence light colored mostly golden, pronotal and elytral fimbriae not exceptionally elongate (~0.5 as long as scutellum) and sparsely distributed along margins. Pygidium and hypopygidium densely deeply punctate.

Head surface densely irregularly punctate with small and large punctures, some larger punctures with their surface rugose, interspaces smooth to granular and ~0.5 diameter apart on disc. Larger punctures equal to ~4 eye facet diameters, smaller punctures scattered on vertexal disc and ~0.5 diameter of large puncture. Pronotal surface with large and small punctures interspersed throughout. Large and small punctures similar in size to corresponding large and small punctures on head. Interspaces 1-2 puncture diameters apart, alutaceous to granular. Each smaller puncture bearing a semierect seta. Scutellar surface faintly punctate, most punctures similar in size to the smaller punctures on the pronotum, interspaces granular to finely microreticulate and separated by ~1-1.5 diameter of puncture width. Eytral surface with serial rows of alternating large and small shallow punctures. Large punctures ~1.5X diameter of larger punctures on head, each giving rise to a decumbent seta. Small punctures ~0.5 diameter of large punctures, each giving rise to an erect seta. Interspaces alutaceous to finely microreticulate between all punctures, larger punctures separated from each other by 1 puncture diameter, smaller punctures separated from each other by 1-2 puncture diameters. Large and small puncture rows separated from each other by ~1 small puncture diameters. Pygidium densely irregularly punctate, subequal in size to small punctures on elytra, interspaces rugose with some microreticulation, punctures separated by ~0.25-0.5 puncture diameters. Each puncture giving rise to a short straight seta.

Venter more scarcely pubescent than dorsum with the exception of that on the abdominal segments, which is similar to that of the dorsum. Mentum with only a few faintly impressed minute punctures, punctures subequal in size to the small punctures on the vertex, interspaces smooth to faintly alutaceous, punctures ~1 diameter apart. Submentum and gula with similar sized punctures as mentum, each giving rise to a short seta, interspaces 1-2 diameters apart with surface alutaceous and having transverse microreticulations. Mental/submental sulcus with oblique microreticulations present. Prosternum and epimeron deeply impressed with large punctures, punctures similar in size to larger ones on pronotum, interspaces alutaceous with slight microreticulation present, ~0.25-0.5 diameter apart. Mesosternum with punctures dispersed throughout, ~0.5-.75 those of prosternum, interspaces alutaceous to rugose. Metasternal disc faintly punctate with smaller punctures 0.5 diameter to those on prosternum, interspaces smooth to alutaceous, becoming more rugose laterally. Abdominal sternite 1 with moderately impressed punctures, 1.5-2 diameters of those on metasternal disc, interspaces alutaceous to rugose, separated by ~1 puncture diameter, abdominal process with more reticulation present. Abdominal segments 2-4 with punctures scattered in an irregular transverse row near the anterior border, similar in size to those on abdominal sternite 1, interspaces mostly alutaceous to rugose, 0.5 - 1 diameter apart. Hypopygidium more densely deeply punctate than rest of abdominal sternites, punctures equal in size to those on metasternal disc, interspaces rugose with faint microreticulation, punctures separated by ~0.5 diameter.

Head wider than long (W:L = 1.5:1), fronotclypeal region moderately pronounced. Vertex with deep broad concavity extending between each orbit from the posterior region of the frons to the clypeal region. Eyes very large, bulbous and convex, finely faceted. Labrum transverse with sharp medial incision on anterior margin. Mentum pentagonal in shape and somewhat convex. Antennal club compact, large, ovate, asymmetrical with the last antennomere longer than previous two segments combined, entire club subequal in length to antennal stem. Terminal antennomere with distinct sensillar region extending across entire apex on ventral surface in a U-shaped manner. Antennomeres 10 more narrow than 9. Antennomeres 6-8 flattened, segment 6 less flattened than 7 and 8, their combined length slightly longer than length of antennomere 9. Antennal scape asymmetrical, broadly hemispherical, 1.2X's longer than pedicel, >12 setae originating from it. Pedicel more cylindrical in shape than scape and thinner. Antennal segment 3 subequal in length and similar in shape to pedicel, narrowed proximally. Segment 4 cuboidal and 5 more or less trapezoidal. Antennal grooves deep and somewhat curved posteriomedially. Prosternal process narrowed slightly between coxae, evenly rounded over procoxae with flattened declivity posterior to procoxae, apical border oblique when viewed laterally. Mesosternum extending to anterior 0.33 of mesocoxae with a broadly concave apex, with no visible carina present. Mesepisternum slightly wider than mesosternum, ~2 times wider than mesepimeron. Metasternum width to length ratio 3.33:1. Metepisternum rather broad and well-developed, moderately concave medially, axillary space impunctate ~0.05 length of entire structure. First abdominal sternite with narrowly rounded process ending in a small point between metacoxae, ~2X's longer than second sternite. Sternites 2-4 subequal in length. Hypopygidium subequal in length to first abdominal sternite.

Protibia finely crenulate along entire lateral edge. Apical tooth as long as tarsomere 1-2 combined. Outer apical notch with 85° angle. Longer inner apical spine subequal in length to tarsomeres 1-2 combined.  Apical border of tibia smooth, no armature present.  Mesotibia armored with a row slender spines along entire lateral edge, spines ~0.75 length of lateral setae on mesotibia; apical border armored with 2-3 short spines, ~0.5 length of lateral spine; outer apical process robust, subequal length of inner apical spine; inner apical spine equal in length to tarsomeres 1-2.5 combined.  Metatibia more heavily armored than mesotibia, lateral slender spines more elongate and numerous.  Spines of varying lengths, but most longer than those on the mesotibia.  Apical border armored with a few short spines, as in mesotibia, but more apparent.  Outer apical process similar in length and robustness as that on mesotibia, but shorter in length to inner apical spine.  Inner apical spine equal in length to tarsomeres 1-2 combined. All tarsomeres thin and elongate.

Male genitalia not observed.

Female genitalia overall moderately sclerotized.  Gonocoxite with well sclerotized basal border with two lateral prominences.  Gonocoxal apices narrowly separated with intragonocoxal invagination narrowly acute basally, gonocoxal tips broadly rounded at apex, each apex without a small lateral recurved "tooth", apical pits giving rise to 2 primary seta (Fig. 210).  Valvifers membranous, relatively long compared to gonocoxite, with sclerotization along medial border, evenly tapering to lateral apex.

**Variation.**  Known only from the holotype.

**Seasonality/Habitat.**  Holotype collected in March in equatorial Brazil.

**Distribution.**  Known only from the type locality in north central Brazil.

**Notes.**  No fungal host data is available for this species.

**Etymology.**  Specific epithet denotes the distinctive bicolored habitus.

### ***Pocadius brevis*** **Reitter**

(Figs. 12, 51, 91, 132, 173, 211)

**Non-Type Material Examined.** 27 specimens with the following label data: Baños de Ciego, Montero, Santa Clara, Cuba, 14-IV-1918 / beetles collected from inside puffball (20 specimens USNM, 7 specimens LSAM). Cayamas, Cuba (USNM). CUBA: Pinar del Rio, Sierra del Rosario, ca. 15km S. Cinco Pesos Range 1, 29 June 1990, 420m, M.A. Ivie colr. (MTEC).

**Diagnosis.** This species appears related to the Eastern North American species *P. helvolus*. *Pocadius brevis*, unlike *P. helvolus*, is always light brown to light brown-red with antennal segments 3-11 darker. The mentum is much wider than long, with no prominent anterio-lateral angles. Clear differences are also visible in the male genitalia, i.e. the median lobe is markedly narrowed apically, the tegmen has an incomplete inner line of setae, the ejaculatory rods are more slender and nearly approximate basally, the spiculum gastrale is greatly expanded laterally with numerous projecting setae apically.

**Redescription.** Length 3.9mm, Width 2.2mm, Depth 1.5mm. Body modestly convex, surface shining, light brownish red with antennal segments 3-9 darker, pubescence light colored mostly golden, pronotal and elytral fimbriae not exceptionally elongate and sparsely distributed along margins.

Head surface densely irregularly punctate with small and large punctures, some larger punctures with their surface microreticulate, interspaces smooth to alutaceous and ~0.25-0.5 diameter apart. Larger punctures equal to ~4-5 eye facet diameters, smaller punctures scattered on vertex and ~0.5 diameter of large puncture. Pronotal surface with large and small punctures interspersed throughout. Large and small punctures similar in size to corresponding large and small punctures on head. Interspaces 0.25-0.5 puncture diameter apart, smooth to alutaceous. Each puncture bearing an erect or semierect seta. Scutellar surface faintly punctate, punctures similar in size to the smaller punctures on the pronotum, interspaces rugose and separated by ~0.5 diameter of puncture width. Eytral surface with serial rows of alternating large and small shallow punctures. Large punctures ~1.5X diameter of larger punctures on head, each giving rise to a decumbent seta. Small punctures ~0.25-0.33 diameter of large punctures, each giving rise to a semierect seta. Interspaces smooth to alutaceous between all punctures, larger punctures separated from each other by 0.5 puncture diameter, smaller punctures separated from each other by 1-2 puncture diameters. Large rows separated from each other by ~2-2.5 large puncture diameters. Pygidium densely irregularly punctate, punctures equal in size to small punctures on elytra, interspaces rugose with some microreticulation, punctures separated by ~0.5 puncture diameters. Each puncture giving rise to a short straight seta, setae similar in length of those on elytra.

Venter with more scarce somewhat shorter pubescence (~0.5 - 0.75 length of dorsal vestiture) than dorsum with the exception of that on the abdominal segment which is subequal to that of the dorsum. Mentum with only a few punctures near anterior margin, punctures similar in size to the small punctures on the pronotum, interspaces smooth to alutaceous, punctures 0.5 - 1 diameter apart. Submentum and gula with similar sized punctures as mentum, each giving rise to a short seta, interspaces 1-2 diameters apart and surface alutaceous. Prosternum and epimeron faintly impressed with moderate sized punctures, punctures ~2 times larger than those on mentum, interspaces alutaceous with slight microreticulation present, ~1 diameter apart. Mesosternum with punctures mostly dispersed but with distinct aggregation near posterior margin with metasternum, interspaces and anterior portion of mesosternum alutaceous to rugulose. Metasternal disc moderately punctate with moderate sized punctures equal to those on prosternum, interspaces alutaceous to rugose. Abdominal sternite 1 with faint punctures, equal in size to those on metasternum, interspaces alutaceous to rugose, separated by ~1-2 puncture diameters, most punctures located in anterior 0.5 of sternite. Abdominal segments 2-4 with punctures scattered in an irregular lateral row near the anterior border, similar in size to those on abdominal sternite 1, interspaces mostly rugose, 0.5 - 1 diameter apart. Hypopygidium more densely deeply punctate than rest of abdominal sternites, punctures equal in size to those on metasternum, interspaces rugose with faint microreticulation, punctures separated by 0.25-0.5 diameter.

Head wider than long (W:L = 1.5:1), fronotclypeal region well pronounced. Vertex with deep broad concavity extending between each orbit from the posterior region of the frons to the clypeal region. Labrum transverse with medial incision on anterior margin. Mentum hemispherical in shape and slightly convex. Antennal club compact, large, ovate, slightly asymmetrical with the last antennomere subequal to previous two segments combined, entire club equal in length to 0.85 length of antennal stem. Terminal antennomere with distinct hemispherical sensillar region midway to apex on ventral surface. Antennomeres 9-10 similar in shape. Antennomeres 6-8 flattened, segment 6 more trapezoidal than 7 and 8, their combined length slightly longer than length of antennomere 9. Antennal scape asymmetrical, broadly hemispherical, only slightly longer than pedicel, >12 setae originating from it. Pedicel more or less similar in shape as scape but thinner. Antennal segment 3 ~0.75 length of pedicel, narrowed proximally. Segments 4 and 5 more or less globular, together ~0.75 the length of segment 3. Antennal grooves deep and somewhat curved posteriomedially.

Pronotum widest near middle (L:W = 1:1.9). Anterior margin deeply trapezoidal, posterior margin moderately convex, lateral margin more arcuate anteriorly than posteriorly. Prosternal process narrowed slightly between coxae, evenly rounded with a moderately acute apex. Posterior margin well-developed and perpendicular. Mesosternum extending to anterior 0.33 of mesocoxae with an indentate apex, with no visible carina present. Mesepisternum equal slightly wider than mesosternum, ~2.4 times wider than mesepimeron. Metasternum width to length ratio 2.5:1. Metepisternum rather broad and well-developed, width to length 1:3, moderately concave medially, anterior third strongly produced anteriomedially with axillary space (0.2 of metepisternum) impunctate with surface granular with microreticulation. Metasternal axillary space minute, extending medially closely to the mesocoxal border. Metacoxal lines not deviating much from metacoxal border. Median metasternal line incomplete, extending only 0.75 length of structure, rounded abdominal sternite line encircling junction between metasternum and first abdominal sternite. First abdominal sternite with broadly rounded process ending in a small point between metacoxae, ~2.5X's longer than second sternite. Sternites 2-4 subequal in length. Hypopygidium subequal in length to first abdominal sternite. Mentum with

Protibia finely crenulate along lateral edge. Apical tooth as long as tarsomere 1 and half of tarsomere two. Outer apical notch with no distinct angle or notch but oriented in a lateral manner. Longer inner apical spine subequal in length to first tarsomere. Apical border of tibia smooth, no armature present. Mesotibia armored with a row slender spines along entire lateral edge, spines ~0.5 length of lateral setae on mesotibia. Apical border armored with 2-3 short spines, ~0.5 length of lateral spines. Outer apical process not robust, ~0.5 length of inner apical spine. Inner apical spine equal in length to tarsomeres 1-1.5 combined. Metatibia more heavily armored than mesotibia, lateral slender spines more elongate and numerous. Spines of varying lengths, but most longer than those on the mesotibia. Apical border armored with a few short spines, as in mesotibia, but more apparent. Outer apical process more elongate and robust than on mesotibia, subequal in length to inner apical spine. Inner apical spine equal in length to tarsomeres 1-2 combined. All tarsomeres elongate, protarsomeres combined greater than 0.5 length of protibia.

Male genitalia well sclerotized. Anal sclerite with fossa anteriodorsally for reception of the tegmen with apical border nearly truncate (Fig. 12), apex of sclerite moderately fimbriate with elongate setae. Spiculum gastrale with well-pronounced medial regions (Fig. 51), lateral region hemispherical and moderately explanate, apical border rounded with >10 setae, spiculum attached posterio-medially to sclerites. Tegmen evenly broadly rounded apically (Fig. 91), longer than wide (w:l ~ 1:2.2), lateral row of setae visible anterior to the median fossa but not attaining apex, inner row of hair present but not connecting apically, basal notch of phallobase absent, basal margin angulate. Median lobe moderately large, ~0.5 the length of the tegmen, entire structure becoming narrowed apically, apical opening not well-developed (Fig. 132). Ejaculatory rods not fused, proximal pair more or less straight, apical pair with distinct medial concavity (Fig. 173).

Female genitalia overall moderately sclerotized. Gonocoxites with sclerotized basal border with two lateral prominences. Gonocoxal apices moderately separated with intragonocoxal invagination narrowly rounded at base, gonocoxal tips rounded at apex, each apex without a small lateral recurved “tooth”, apical pits giving rise to 2short seta (Fig. 211). Valvifers membranous, relatively small compared to gonocoxites, with some sclerotization along medial border, evenly tapering to lateral apex.

**Variation.** No demonstrable differences between geographic regions or between males and females.

**Seasonality/Habitat.** Specimens studied were collected between April and June.

**Distribution.** Found throughout most of Cuba.

**Notes.** The only known host for this species comes from the generic data label “inside puffball”.

## *Pocadius carltoni* Cline new species

(Figs. 13, 52, 92, 133, 174, 212)

**Type Material Examined.** HOLOTYPE ♂ (SNEC): NICARAGUA : Rio San Juan Dept.; 60km SE San Carlos, Refugio; Bartola 100m, 10°58.40'N 84°20.30'W; 25-V-2002, R. Brooks, Z. Falin; S. Chatzimanolis, ex. pyrethrum; fogging fungusy logs, NIC1BFC02 065 / SM0531370; KUNHM-ENT [barcode label]. 5 PARATYPES (3 SNEC, 2 LSAM): same data labels as holotype except barcode numbers are SM0531374, SM0531376, SM0531375, and SM0531368 . 4 PARATYPES (SNEC) NICARAGUA : Rio San Juan Dept.; 60km SE San Carlos, Refugio; Bartola 100m, 10°58.40'N 84°20.30'W; 29-V-2002, R. Brooks, Z. Falin; S. Chatzimanolis, ex. puffball fungus; NIC1BFC02 126 / SM0557674 [other barcode numbers include SM0557682, SM0557675, SM0557684, and SM0557688; KUNHM-ENT.

**Diagnosis.** This species is similar to *P. jelineki* that is known from Costa Rica and parts of Nicaragua, however, it differs from this and other Neotropical members of the genus by the following attributes: large densely spaced punctures on the metasternal disc, more globular shaped terminal antennomere and corresponding sensillar region, erect and semi-erect rows of alternating setae on the elytra, strongly oblique apical wall of prosternal process when viewed laterally, and the basal piece of the aedeagal ejaculatory rods are not elbowed, but have sharply produced lateral flanges.

**Description.** Length 2.85mm, Width 2.1mm, Depth 1.3mm. Body moderately convex, surface shining, unicolorous light brown, legs and venter only slightly lighter. Pronotum and elytra margins with moderate fimbriae, setae subequal to length of antennal scape. Dorsal and ventral pubescence fine, moderately short and sparsely distributed.

Head surface deeply, irregularly punctate, interspersed large and small punctures on vertex, becoming somewhat more dense towards orbits and fronotclypeal region. Larger punctures 4-5 X diameter of eye facet, smaller punctures ~3 X diameter. Interspaces smooth to finely alutaceous and shining, becoming slightly granular near orbits. Most punctures give rise to a moderate length straight golden seta. Pronotal surface with large punctures equal in size to large punctures on vertex of head, interspersed with relatively few smaller punctures, similar in size to those on vertex. Interspaces smooth to finely alutaceous and shining, about 1-1.5 diameters apart. Each puncture gives rise to a moderate length golden seta, most seta are straight. Scutellar surface with deeply to moderately impressed smaller punctures similar to smaller ones on pronotum and vertex, some punctures giving rise to short seta, interspaces smooth to alutaceous. Elytral surface with serial rows of alternating large and small deep punctures. Smaller punctures are equal in size to those on pronotum, larger punctures are ~2-2.5 times diameter of smaller ones. Smaller punctures giving rise to an erect golden seta, larger punctures giving rise to a semi-erect golden seta that is slightly longer than the erect seta. Interspaces broad between punctures of a given row and between different rows. Within a row, small punctures are separated by ~1.5 puncture diameters, and large punctures by ~1 puncture width. Rows are separated by 1.0-1.5 small puncture diameters. Interspaces always shining but variable from smooth to finely alutaceous in sculpture. Pygidium deeply densely punctate, punctures equal in size to larger ones on pronotum, each puncture giving rise to a short stiff golden seta. Interspaces narrow, 0.25-0.5 diameter, with granular sculpture.

Venter with similar sparse golden pubescence as dorsum. Mentum with large shallow punctures, equal in size to large ones on vertex, each giving rise to a short seta, interspaces alutaceous to finely granular. Submentum and gula similar in punctation to mentum but with interspaces completely granular. Prosternum and epimeron moderately impressed with irregular punctures, punctures slightly larger than those on mentum, interspaces alutaceous with granular and microreticulate areas, prosternal punctures separated by 0.5-1 diameter, those on the epimeron by 0.25 to 0.5 diameter. Mesosternum with shallow punctures, subequal in diameter of those on prosternum, interspaces alutaceous to granular, separated by ~0.5-1 diameter. Metasternum irregularly punctate, with deeply impressed large punctures on disc similar in size to large ones on pronotum, interspaces smooth to alutaceous on metasternal disc becoming mostly alutaceous to granular laterally, punctures separated by ~1 diameter on disc. Abdominal sternite 1 with faint, almost obsolete punctures, punctures 0.75 diameter of those on metasternum, interspaces alutaceous to granular, separated by ~0.5-1 diameter. Abdominal sternites 2-4 with two or three irregular rows of punctures, one row near anterior margin and the other two near posterior margin, punctures similar in size to those on sternite 1, rows separated by 0.5 puncture diameter, punctures within rows separated by ~0.25-0.5 diameter. Rows on abdominal sternite 4 becoming less organized. Hypopygidium with moderately deep punctures, similar in size to those on sternites 2-4, interspaces alutaceous to granular, punctures separated by 0.5-1 diameter.

Head slightly wider than long (W:L = 1.3:1), fronotclypeal region moderately projecting anteriorly. Vertex with moderate concavity between orbits near fronotclypeal region. Labrum with shallow incision at anterior margin. Antennal club compact, obovate, asymmetrical with the last antennomere longer than the previous two combined. Antennomeres 6-8 disc-like, 4-5 cuboidal to slightly trapezoidal. Antennal scape asymmetrical, hemispherical, 1.2 times as long as pedicel. Pedicel subcylindrical in shape. Antennal segment 3 subequal in length to pedicel, and similarly shaped. Antennal club large, ~0.90 length of segments 1-8 combined. Antennal grooves very deep and widely excavate, slightly converging posteriorly. Mental submental ridge slightly produced, at level of submentum, the ridge is laterally sculptured with oblique to longitudinal microreticulations. Mentum with single medial anterior angle, entire structure triangular and somewhat convex.

Pronotum widest in posterior third (L:W = 1:1.8), anterior margin broadly trapezoidal, posterior margin broadly convex, lateral margins less arcuate posteriorly. Scutellum large, obtusely triangular, apex rounded. Prosternal process somewhat narrowed between procoxae, apex somewhat acuminate, in lateral aspect the anterior and posterior ends are prominent and slightly convex medially. Posterior apical wall prominent and sharply oblique. Mesosternum extending to midway between mesocoxae, evenly concave for reception of the metasternum. Metasternum wider than long (W:L = 2.6:1.0). Metepisternum with slight medial constriction, oblique line dividing anterior 0.20 of structure. First abdominal sternite with moderately broad process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-3 subequal in length, the fourth slightly larger than the preceding two. Hypopygidium subequal in length to first abdominal sternite.

Protibia distinctly crenulate along lateral edge. Apical tooth very prominent, slightly longer than tarsomeres 1 and part of 2 combined. Outer apical notch with ~95° angle, notch depth shallow, subequal to length of tarsomere 1. Inner apical spine short, equal in length to tarsomere 1. Protibia not heavily armored, but with characteristic dense patch of stiff setae along the inner apical region. Mesotibia more heavily armored than protibia with more dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process elongate and robust, larger than protibia process. Inner apical spine equal in length to tarsomeres 1-2 combined. Metatibia with armature similar to that of mesotibia, but outer apical spine much longer.

Male genitalia well-sclerotized. Anal sclerite with large broadly curved region anteriodorsally; apex moderately fimbriate; ventrally with a broad medial concavity approaching apex (Fig. 13). Spiculum gastrale with wide rounded lateral flanges, medial margins concave proximally, sclerotized region more or less hourglass-shaped, short stiff setae originating from apex (Fig. 52). Tegmen evenly rounded apically (Fig. 92), much longer than wide (w:l = 1.0:2.83), lateral row of setae visible from the median fossa to prior to around the apex, large shallow concavity in apical third with inner row of setae attaining apex of concavity, basal notch perpendicular, basal margin nearly straight. Median lobe large and robust, ~0.85 the length of the tegmen, apex rounded, apical opening well-developed with proximal concavity, base tapering to acute point (Fig. 133). Ejaculatory rods not fused to basal piece, straight and slightly outward at basal piece (Fig. 174). Basal piece of rods with sharply produced lateral flanges and a slightly curved central region.

Female genitalia moderately sclerotized. Paraprocts moderately large with sclerotization only along median line to apico-lateral angles. Gonocoxite with two basal lateral prominences, basal ridge well-sclerotized. Gonocoxal apices with recurved "tooth" absent. Three primary setae originate from small depressions on the gonocoxal apices. Intragonocoxal invagination deep, ~0.66 the length of the gonocoxite (Fig. 212).

**Variation.** No demonstrable variation within the type series.

**Seasonality/Habitat.** All specimens were collected in late May in southern Nicaragua near the Costa Rican border in a lowland tropical forest.

**Distribution.** Known only from the type locality in southern Nicaragua.

**Notes.** Specimens were collected from both puffballs and fungusy logs. The latter suggests that this species may be residing in members of bracket and/or shelf fungi that dominate most old decaying wood.

**Etymology.** Specific epithet honors Christopher Carlton, director of the Louisiana State Arthropod Museum, for his guidance and support during the course of this study.

### ***Pocadius centralis* Cline new species**

(Figs. 14, 53, 93, 134, 175, 213)

**Type Material Examined.** HOLOTYPE ♂ (CMN): HONDURAS: Cortés; 25km N Cofradia, P.N.; Cosuco, 15.IX.-7.X.1994;S.&J. Peck, cloud forest; flight inter. Trap, 94-62 / HOLOTYPE; Pocadius; centralis; A.R. Cline des. 2004. 1 ♂ PARATYPE (CMN): MEX.: SLP, 1700m; 40km W. Xilitla; 12.VI-6.VIII.83; S&J Peck, FIT; pine-oak forest / PARATYPE; Pocadius; centralis; A.R. Cline des. 2004. 1 ♀ PARATYPE (CMN): GUAT.: Zacapa; 3.5km SE LaUnion; 1500m, 25-27.VI.1993; J. Ashe & R. Brooks; cloud forest, FIT / PARATYPE; Pocadius; centralis; A.R. Cline des. 2004. 1 ♀ PARATYPE (SNEC): HONDURAS: Ocotepeque ; 24km E Ocotepeque ; El Güisayote, 14-16.VI.1994 ; 2170m, 14°25'N, 89°04'W ; J. Ashe, R. Brooks #117; ex. flight intercept traps/ PARATYPE; Pocadius; centralis; A.R. Cline des. 2004.

**Diagnosis.** This species is similar in coloration to *P. maquipucunensis* in its dark brown/black surface, however, it differs from it and the other Neotropical species by the following suite of characters: antennal club symmetrical with terminal antennomeres not greatly enlarged; terminal antennomeres with circular depressed region medially near base; metasternum deeply densely punctate throughout with greatly enlarged punctures; pronotum densely deeply punctate; protibia with distinct outer apical tooth but rather shallow apical notch; pubescence very fine and light colored; abdominal process broad; males with pygidial apex distinctly concave medially; tegmen with inner row of setae complete and laterally with elongate setae; median lobe elongate oval with large bilobed internal structure; internal sac sclerites with one basal piece having long curved lateral arms; and ovipositor with extremely deep intragonocoxal invagination, ~0.75 length of gonocoxite.

**Description.** Length 3.45mm, Width 2.25mm, Depth 1.2mm. Body moderately convex, surface shining, dark brown/black in color, legs and antennal club somewhat lighter. Pronotum and elytra margins with moderately long fimbriae with that of the elytra being distinctly longer than that of the pronotum. Dorsal and ventral pubescence fine and light colored.

Head surface deeply, irregularly punctate, punctures mostly larger on vertex, becoming somewhat smaller towards orbits, occiput and fronotclypeal region. Larger punctures 4X diameter of eye facet, smaller punctures 2X diameter; interspaces smooth and shining. Most vertexal punctures give rise to a moderately long curved seta. Pronotal surface with large punctures equal in size to large punctures on vertex of head, interspersed with relatively few smaller punctures, similar in size to smaller ones on vertex; interspaces smooth and shining, large punctures ~0.75-1 diameter apart. Most punctures give rise to an elongate seta, most seta are decumbent. Scutellar surface with very few vague shallowly impressed punctures, ~0.5 diameter of small vertexal puncture, some punctures giving rise to minute setae, interspaces smooth to finely alutaceous. Elytral surface with serial rows of alternating large and small deep punctures. Smaller punctures are equal in size to smaller ones on pronotum, larger punctures are ~1.25-1.5X diameter of smaller ones. Both smaller and larger punctures giving rise to an elongate decumbent golden seta. Interspaces moderately broad between punctures of a given row and between different rows. Within a row, small punctures are separated by ~1.5 puncture diameter, and large punctures by 1 puncture diameter. Rows are separated by ~1.0 puncture diameter; interspaces always shining but variable from smooth to finely alutaceous in sculpture. Pygidium densely punctate, punctures equal in size to larger ones on pronotum, each puncture giving rise to a moderately long golden seta; interspaces narrow, 0.33-0.5 diameters, with smooth to finely alutaceous sculpture.

Venter with similar pubescence as dorsum. Mentum with few shallow punctures, equal in size to smaller ones on vertex; interspaces smooth to finely microreticulate. Submentum and gula similar in punctation to mentum but somewhat larger with interspaces more alutaceous.

Prosternum and epimeron deeply irregularly punctate, punctures subequal to larger ones on pronotum; interspaces alutaceous with microreticulate areas, prosternal punctures separated by 0.5 diameter, those on the epimeron 0.33-0.5 diameter. Mesosternum with moderately impressed punctures, subequal to those on prosternum, interspaces alutaceous to finely microreticulate, separated by about 0.5 diameter. Metasternum deeply densely irregularly punctate, with punctures on disc similar in size to larger ones on pronotum, interspaces smooth to finely alutaceous on metasternal disc becoming more alutaceous and microreticulate laterally, disc punctures separated by ~0.5-1 diameter. Abdominal sternite 1 with punctures equal to large punctures on elytra, interspaces mostly alutaceous, separated by ~1 diameter with only few punctures present on abdominal process. Abdominal sternites 2-4 with two irregular rows of punctures, one row near anterior margin and the other near posterior margin, punctures subequal to those on metasternum, rows separated by 1.5-2 puncture diameters, punctures within rows separated by ~0.5 puncture diameter. Rows on abdominal sternite 4 becoming less organized. Hypopygidium with deep punctures, similar in size to those on sternites 2-4, interspaces alutaceous to granular, punctures separated by ~0.5 puncture diameter.

Head slightly wider than long (W:L = 1.3:1), fronotclypeal region moderately projecting anteriorly. Vertex with shallow extensive concavity between orbits near fronotclypeal region. Antennal club compact, oval, symmetrical with the last antennomere subequal in length to the previous two combined. Antennomeres 4-8 more or less compact, with 7-8 characteristically disc-like and 4-6 trapezoidal. Antennal scape asymmetrical, somewhat hemispherical, ~2X as long as pedicel. Pedicel subcylindrical in shape. Antennal segment 3 equal in length to pedicel. Antennal club large, ~0.70 length of segments 1-8 combined. Antennal grooves very deep and widely excavate, slightly converging posteriorly. Lateral mental/submental ridge prominent, at level of submentum, ridge with longitudinal microreticulations laterally and densely punctate medially. Mentum with anterior angles faint but present, anterior margin obsoletely angulate, entire structure somewhat pentagonal, convex when viewed laterally.

Pronotum transverse, widest in posterior third (L:W = 1:2.0), anterior margin broadly deeply trapezoidal, posterior margin moderately convex, lateral margins less arcuate posteriorly. Scutellum large, obtusely triangular, apex rounded. Prosternal process somewhat narrowed between procoxae, apex acuminate, in lateral aspect the anterior and posterior ends are prominent with a modest convexity medially; the posterior end being somewhat prolonged. Posterior apical wall short and slightly oblique. Mesosternum extending to midway between mesocoxae, evenly concave for reception of the metasternum. Metasternum width to length ratio is ~2.8:1.0. Metepisternum with slight medial constriction, oblique line dividing anterior 0.15 of structure. Elytral humeri moderately produced, lateral margin very narrow. First abdominal sternite with broad process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-3 subequal in length, the fourth slightly larger than the preceding two. Hypopygidium subequal in length to first abdominal sternite.

Protibia distinctly crenulate along lateral edge. Apical tooth moderately prominent, slightly longer than tarsomeres 1. Outer apical notch with ~100° angle, notch depth shallow, subequal to length of tarsomere 1. Inner apical spine subequal in length to tarsomeres 1. Protibia not heavily armored but with characteristic dense patch of stiff setae along the inner apical region. Mesotibia more heavily armored than protibia with more dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process moderately robust, only slightly larger than protibia process. Inner apical spine equal in length to tarsomere 1 and part of 2 combined. Metatibia with armature similar to that of mesotibia.

Male genitalia well-sclerotized. Anal sclerite with large broadly curved region anteriodorsally (Fig. 14); apex with elongate moderately dense fimbria; ventrally with a broad medial concavity approaching apex in a narrowly concave manner. Spiculum gastrale with wide lateral flanges apically oriented, medial margins concave , elongate stiff setae originating from apex (Fig. 53). Tegmen narrowly rounded apically (Fig. 93), much longer than wide (w:l = 1:3), lateral row of setae visible from the median fossa to prior to the apex, inner row of setae complete, elongate oval concavity in apical third, basal notch perpendicular, basal margin concave. Median lobe large and oval, ~0.75 the length of the tegmen, apex acuminate, apical opening well-developed with bilobed internal structure (Fig. 134). Ejaculatory rods not fused to basal piece or each other, distinctly curved outward apically. Basal piece of rods with as one fused piece with long basally projecting lateral arms and centrally with a short medio-basal bilobed projection (Fig. 175).

Female genitalia moderately sclerotized. Paraprocts large with sclerotization only along median line to apico-lateral angles. Gonocoxite with one broad lateral prominence, basal ridge well-sclerotized. Gonocoxal apices with recurved "tooth" present. Two primary setae originate from small depressions on the gonocoxal apices. Intragonocoxal invagination extremely deep, ~0.75 length of gonocoxite (Fig. 213).

**Variation.** None observed.

**Seasonality/Habitat.** Specimens are known to occur from June to October in mid to high elevation forests.

**Distribution.** Known range is from southern Mexico to Honduras.

**Notes.** No fungal records exist for this species. It appears to favor montane environments.

**Etymology.** Specific epithet is a derivative of the region from which the species is known, i.e. Central America.

***Pocadius cochabambus* Cline new species**

(Figs. 15, 54, 135, 176)

**Type Material Examined.** HOLOTYPE ♂(CMN): BOLIVIA: Cochabamba; Cochabamba, 67.5km NE Est. Biol.; Valle del Sajita, Univ. De San Simon; 300m, 17°6'33"S 64°47'52"W; 7-9-II-1999, R. Hanley, ex. flight; intercept trap, BOL1H99 057 / HOLOTYPE; Pocadius; cochabambus; A.R. Cline des. 2004.

**Diagnosis.** This species is most similar to *P. ashei*, but differs from it and the other Neotropical fauna by the following suite of characters: antennal club greatly widened with large oblong sensillar region; habitus not shining with surface almost entirely alutaceous to granular in texture; all tibial spines elongate; elytral fimbria elongate; densely punctured pronotum; serial row of small punctures on elytra often with multiple punctures not just a single row; the extreme W:L ratio of the metasternum of 3.2:1.0; aedeagus with tegmen having incomplete row of inner setae; basal piece of internal sac sclerites U-shaped curved structure and a median section with an elongate blunt process.

**Description.** Length 3.45mm, Width 2.25mm, Depth 1.05mm. Body moderately convex, surface dull, uniformly light brown in color. Pronotum and elytra margins with elongate fimbriae, setae longer than width of antennal scape. Dorsal and ventral pubescence quite long.

Head surface deeply, densely, irregularly punctate with large and small punctures, punctures mostly larger on vertex, becoming somewhat smaller towards orbits, occiput and fronotclypeal region. Larger punctures 4-5X diameter of eye facet, smaller punctures 1-2X diameter; interspaces alutaceous to granulate and dull. Each puncture gives rise to an elongate somewhat curved golden seta. Pronotal surface with large punctures equal in size to large punctures on vertex of head, interspersed with numerous smaller punctures, ~0.5 size of larger ones; interspaces alutaceous and dull, all punctures ~0.25-0.5 large diameter apart. Each puncture gives rise to a long golden seta, most seta are decumbent. Scutellar surface with several shallowly impressed punctures equal to smaller ones on pronotum, some punctures giving rise to setae; interspaces are granular. Elytral surface with serial rows of alternating large and small deep punctures. Smaller punctures are equal in size to smaller ones on pronotum, larger punctures are ~2-2.5X diameter of smaller ones. Smaller punctures giving rise to an elongate erect long golden seta, larger punctures giving rise to a decumbent to adpressed moderately long golden seta that is much shorter than those derived from the smaller punctures. Interspaces broad between punctures of a given row and between different rows. Within a row, small punctures are separated by ~2 puncture diameters, and large punctures by 1 puncture diameter. Larger rows are separated by 2 large puncture diameters. Interspaces always dull with alutaceous to granular sculpture. Pygidium densely punctate, punctures equal in size to smaller ones on pronotum, each puncture giving rise to a moderately long golden seta' interspaces narrow, ~0.5 diameter, with mostly granular sculpture.

Venter with similar long golden pubescence as dorsum. Mentum with obsolete shallow punctures, equal in size to smaller ones on vertex, each giving rise to a moderately elongate seta; interspaces granular. Submentum and gula similar in punctation and surface sculpture as mentum. Prosternum and epimeron moderately impressed with irregular punctures, punctures 2X larger than those on mentum with epimeron punctures slightly larger than those on prosternum, interspaces granular with microreticulate areas, prosternal punctures separated by 0.5 diameter, those on the epimeron by 0.25 to 0.5 diameter. Mesosternum with shallow punctures, subequal in diameter to those on prosternum, interspaces alutaceous to granular, separated by 0.5 diameter. Metasternum irregularly punctate, with moderately impressed punctures on disc similar in size to those on mesosternum, interspaces granular on metasternal disc becoming granular and microreticulate laterally, punctures separated by ~1-2 diameters.

Metepisternum deeply punctate with large irregular punctures, 2X larger than those on metasternal disc. Abdominal sternite 1 with faint punctures, punctures equal to those on metasternal disc, interspaces alutaceous to granular, separated by ~1 diameter. Abdominal sternites 2-4 with two irregular rows of punctures, one row near anterior margin and the other near posterior margin, punctures similar in size to those on metasternal disc, rows separated by 1.5-2 puncture diameters, punctures within rows separated by ~0.5 punctures width. Rows on abdominal sternites 3-4 becoming less organized. Hypopygidium with moderately deep punctures, similar in size to those on sternites 2-4, interspaces granular with microreticulations, punctures separated by 0.5 puncture diameter.

Head slightly wider than long (W:L = 1.26:1), fronotclypeal region moderately projecting anteriorly. Vertex with shallow concavity between orbits near fronotclypeal region. Antennal club compact, greatly widened apically, greatly asymmetrical with the last antennomere longer than the previous two combined. Antennomeres 4-8 more or less compact, with 6-8 characteristically disc-like, 4-5 cuboidal to slightly trapezoidal. Antennal scape asymmetrical, somewhat hemispherical, 1.8 times as long as pedicel. Pedicel subcylindrical in shape. Antennal segment 3 ~.85 length to pedicel. Antennal club large, ~0.75 length of segments 1-8 combined. Antennal grooves very deep and widely excavate, slightly converging posteriorly. Lateral mental/submental ridge prominent and elongate, at level of submentum, ridge sculptured laterally with longitudinal microreticulations and the mental/submental sulcus if granulate in sculpture. Mentum with anterior angles visible, anterior margin angulate, entire structure pentagonal, when viewed laterally slightly convex.

Pronotum widest near posterior angles (L:W = 1:2.0), anterior margin broadly concave, posterior margin moderately convex, lateral margins not distinctly arcuate. Scutellum large, obtusely triangular, apex rounded. Prosternal process narrowed between procoxae, apex acuminate, in lateral aspect there is an even convexity over the procoxae. Posterior apical wall prominent and slightly oblique. Mesosternum extending to midway between mesocoxae, evenly concave for reception of the metasternum. Metasternum much wider than long W:L = 3.2:1.0. Metepisternum with slight medial constriction, oblique line dividing anterior 0.18 of structure. First abdominal sternite with broad process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-3 subequal in length, the fourth slightly larger than the preceding two. Hypopygidium subequal in length to first abdominal sternite.

Protibia distinctly crenulate along lateral edge. Apical tooth prominent, slightly longer than tarsomeres 1. Outer apical notch with ~135° angle, notch depth shallow, equal to length of one-third of tarsomere 1. Inner apical spine subequal in length to tarsomeres 1-2 combined. Protibia heavily armored with characteristic dense patch of stiff setae along the inner apical region. Mesotibia more heavily armored than protibia with more dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process robust, equal in length to that of the protibia. Inner apical spine equal in length to tarsomeres 1-2 and part of 3 combined. Metatibia with armature similar to that of mesotibia, but apical spine not as long, only equal in length to tarsomeres 1-2 combined.

Male genitalia well-sclerotized. Anal sclerite with large broadly curved region anteriodorsally (Fig. 15); apex with elongate dense fimbriae; ventrally with a broad medial concavity approaching apex in a convex manner. Spiculum gastrale with wide lateral flanges, medial margins perpendicular, moderately long stiff setae originating from apex (Fig. 54). Tegmen broadly rounded apically (Fig. 94), much longer than wide (w:l = 1:3), lateral row of setae visible from the median fossa to prior to the apex, inner row of setae incomplete, small shallow concavity barely visible in apical third, basal notch perpendicular, basal margin concave. Median lobe large and robust, ~0.66 the length of the tegmen, rounded, apical opening well-developed with bilobed internal structure (Fig. 135). Ejaculatory rods not fused to basal piece or each other, curved inward and expanded outward at proximally and distally. Basal piece of rods with U-shaped curved structure and a central elongate blunt section (Fig. 176).

Female genitalia not observed.

**Variation.** Known only from the holotype.

**Seasonality/Habitat.** Collected in early February from a lowland forest.

**Distribution.** Known only from the type locality in western Bolivia.

**Notes.** No host data is available for this species.

**Etymology.** Specific epithet is a derivative of the type locality, i.e. Cochabamba, Bolivia.

## *Pocadius coxus* Cline new species

(Figs. 16, 55, 95, 136, 177)

**Type Material Examined.** HOLOTYPE ♂ (SNEC): BRAZIL: Rondonia; 9km NE Cacaulandia; XII-1996 to I-1997; K. Vulinec & D. Mellow / HOLOTYPE; Pocadius; coxus; A.R. Cline des. 2004.

**Diagnosis.** This species is most similar to *P. maquipucunensis* in overall shape and dorsal coloration, but differs from it and other Neotropical species by the following combination of characters: procoxae light tan in color, terminal antennomere with medial and lateral elliptical sensillar regions, antennomere 3 ~0.5 the length of pedicel, dorsal habitus with primarily granular surface sculpture but shining, sharply oblique apical wall of prosternal process when viewed laterally, ejaculatory rods distinctly elongate with medial swellings that almost abut, and basal piece of internal sac sclerites with two lateral arms and a medial “t-shaped” arm.

**Description.** Length 3.6mm, Width 2.1mm, Depth 1.35mm. Body moderately convex, surface shining, dark brown to black in color, with venter and legs somewhat lighter, and procoxae light tan in color. Pronotum and elytra margins with moderately long fimbriae, setae slightly longer than width of antennal scape. Dorsal and ventral pubescence golden and moderately long.

Head surface deeply, densely, irregularly punctate, punctures larger on vertex with interspersed smaller punctures, becoming predominantly smaller towards orbits and fronotclypeal region. Larger punctures 4-5 X diameter of eye facet, smaller punctures ~2X diameter. Interspaces alutaceous to granular and moderately shining. Each puncture gives rise to a moderately long curved golden seta. Pronotal surface with large punctures equal in size to large punctures on vertex of head, interspersed with relatively few smaller punctures, ~0.5-0.75 size of larger ones. Interspaces alutaceous to granular, about 0.5-1 diameter apart. Each puncture gives rise to a moderately long golden seta, most seta are curved. Scutellar surface with very shallowly impressed punctures that are mostly aggregated in anterior one-third of structure, some punctures giving rise to short setae, and the interspaces are mostly granular. Elytral surface with serial rows of alternating large and small deep punctures. Smaller punctures are equal in size to those on pronotum, larger punctures are ~2 times diameter of smaller ones. Smaller punctures giving rise to an erect moderately long golden seta, larger punctures giving rise to a semi-erect shorter golden seta. Interspaces wide between punctures of a given row and between different rows. Within a row, small punctures are separated by ~2 puncture width, and large punctures by 0.5-0.75 puncture diameter. Large rows are separated by 1 large puncture diameter. Interspaces shining but variable from alutaceous to finely microreticulate in sculpture. Pygidium densely punctate, punctures equal in size to smaller ones on pronotum, each puncture giving rise to a moderately long golden seta. Interspaces narrow, 0.25-0.5 diameter, with mostly granular sculpture.

Venter with similar golden pubescence as dorsum. Mentum with large very shallow punctures, equal in size to larger ones on vertex, each giving rise to a short seta; interspaces granular to finely microreticulate. Submentum and gula similar in punctation to mentum but with interspaces more microreticulate. Prosternum and epimeron deeply irregularly punctate, punctures 1.5X larger than those on mentum, interspaces alutaceous to granular with microreticulate areas, prosternal punctures separated by 0.5-1 diameter, those on the epimeron by 0.25 to 0.5 diameter. Mesosternum with shallow punctures, subequal to those on prosternum, interspaces alutaceous to granular, separated by about 0.5 to 1 diameter and aggregated near metasternal border. Metasternum irregularly punctate, with moderate faint punctures on disc similar in size to those on mesosternum, interspaces granular with microreticulations on metasternal disc, appearing rugulose, and becoming more microreticulate laterally, punctures separated by ~1-2 diameters. Abdominal sternite 1 with faint, almost obsolete punctures, punctures equal to those on mesosternum, interspaces alutaceous to granular, separated by ~1-2 diameters. Abdominal sternites 2-4 with two irregular, disorganized rows of punctures, one row near anterior margin and the other near posterior margin, punctures similar in size to those on metasternum, rows separated by ~2 puncture diameter, punctures within rows separated by ~0.5-1 punctures diameter. Rows on abdominal sternite 4 becoming less organized. Hypopygidium with deeper punctures than the other abdominal sternites, similar in size to those on sternites 2-4, interspaces mostly granular with microreticulate regions, punctures separated by 0.25-0.5 puncture diameter.

Head slightly wider than long (W:L = 1.35:1.0), fronotclypeal region moderately projecting anteriorly. Vertex with shallow concavity between orbits near fronotclypeal region.

Labrum with medial incision at anterior margin. Antennal club compact, oval, only slightly asymmetrical with the last antennomere slightly longer than the previous two combined. Antennomeres 4-8 more or less compact, with 6-8 characteristically disc-like and 4-5 more or less trapezoidal. Antennal scape asymmetrical, somewhat hemispherical, 1.2 times as long as pedicel. Pedicel subcylindrical in shape. Antennal segment 3 ~0.5 length of pedicel. Antennal club large, subequal in length to segments 1-8 combined. Each club segment with dense short setae, and only relatively few protruding setae (2-4 in number). Antennal grooves very deep and widely excavate, slightly converging posteriorly. Lateral mental/submental ridge prominent, at level of submentum, the ridge is heavily sculptured with numerous longitudinal microreticulations and the sulcus is almost entirely granular in sculpture. Mentum with anterior angles faint, anterior margin broadly angulate, appearing pentagonal ventrally and slightly convex laterally.

Pronotum widest near posterior angles (L:W = 1:1.8), anterior margin broadly trapezoidal, posterior margin moderately convex, lateral margins arcuate anteriorly. Scutellum large, triangular, apex narrowly rounded. Prosternal process narrowed between procoxae, apex acuminate, in lateral aspect there is a steep convexity over the procoxae with a sharp declivity and then flattened region posterior to the coxae. Posterior apical wall prominent and greatly oblique. Mesosternum extending to midway between mesocoxae, evenly concave for reception of the metasternum. Metasternum much wider than long (W:L = 3:1). Metepisternum with distinct medial constriction, oblique line dividing anterior 0.125 of structure. First abdominal sternite with broad process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-3 subequal in length, the fourth slightly larger than the preceding two. Hypopygidium subequal in length to first abdominal sternite.

Protibia distinctly crenulate along lateral edge. Apical tooth prominent, subequal in length to tarsomere 1 and part of 2 combined. Outer apical notch absent. Inner apical spine subequal in length to tarsomeres 1 and part of 2 combined. Protibia not heavily armored but with characteristic dense patch of stiff setae along the inner apical region. Mesotibia more heavily armored than protibia with more dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process elongate and robust, larger than protibia process. Inner apical spine equal in length to tarsomeres 1-2 combined. Metatibia with armature similar to that of mesotibia, with inner apical spine slightly longer.

Male genitalia well-sclerotized. Anal sclerite with apex coming to a more or less acute point and somewhat fimbriate, ventrally with a broad medial concavity approaching apex (Fig. 16). Spiculum gastrale with wide lateral flanges, medial margins concave straight, long stiff setae originating from apex (Fig. 55). Tegmen evenly rounded apically (Fig. 95), much longer than wide (w:l = 1.0:2.9), lateral row of setae visible from the median fossa to around the apex, oblong shallow concavity in apical third with short setae around lateral border, basal notch perpendicular, basal margin concave. Median lobe large and robust, ~0.75 the length of the tegmen, apex narrowly rounded, apical opening well-developed with simple internal structure (Fig. 136). Ejaculatory rods not fused to basal piece, elongate and straight with medial swelling. Basal piece of internal sac sclerites with two lateral arms and a medial arm that is “t-shaped” (Fig. 177).

Female genitalia not observed.

**Variation.** Known only from the holotype.

**Seasonality/Habitat.** Specimen collected during December/January in lowland tropical forest.

**Distribution.** Known from the type locality in western Brazil.

**Notes.** No host data is available for this species.

**Etymology.** Specific epithet denotes the distinctive light colored procoxae.

***Pocadius crypsis* Cline new species**

(Figs. 17, 56, 96, 137, 178, 214)

**Type Material Examined.** HOLOTYPE ♂(SNEC): GUYANA: Region 8; Iwokrama Forest, Turtle Mt. Base; camp, 4°43’5”N 58°43’5”W, 50m; 1 JUN 2001, R. Brooks, Z. Falin; GUY1BF01 104, ex. in puffballs / SM0226858; KUNHM-ENT [barcode label] / HOLOTYPE; Pocadius; crypsis; A.R. Cline des. 2004. 51 PARATYPES (SNEC) with the same data label as the holotype but with PARATYPE designation labels and the following barcode numbers: SM0226877, SM0226898, SM0226847, SM0386268, SM0386267, SM0226864, SM0226855, SM0226856, SM0386265, SM0226857, SM0226853, SM0226852, SM0226851, SM0226850, SM0226849, SM0226848, SM0226861, SM0226862, SM0226863, SM0226864, SM0226865, SM0226867, SM0226866, SM0226869, SM0226897, SM0226878, SM0226876, SM0226875, SM0226896, SM0226895, SM022688, SM0226884, SM0226886, SM0226882, SM0226881, SM0226879, SM0226891, SM0226892, SM0226893, SM0226860, SM0226870, SM0226871, SM0226872, SM0226873, SM0226874, SM0226868, SM0226889, SM0226894, SM0226890, SM0226887, SM0226859. 1 PARATYPE (SNEC): GUYANA: Region 8; Iwokrama Forest, 1km W Kurupukari; Iwokrama Field Stn., 60m; 4°40’19”N 58°41’4”W, 28-29 MAY 2001; R. Brooks, Z. Falin, GUY1BF01 064; ex. flight intercept trap / SM0565301; KUNHM-ENT [barcode label] / PARATYPE; Pocadius; crypsis; A.R. Cline des. 2004. 1 PARATYPE (SNEC): GUYANA: Region 8; Iwokrama Forest, 1km W Kurupukari; Iwokrama Field Stn., 60m; 4°40’19”N 58°41’4”W, 21 MAY 2001; R. Brooks, Z. Falin, GUY1BF01 005; ex. *Acromyrmex hystrix* refuse pile / SM0568734; KUNHM-ENT [barcode label] / PARATYPE; Pocadius;

crypsis; A.R. Cline des. 2004. 1 PARATYPE (SNEC): GUYANA: Region 8; Iwokrama Forest, Pakatau Hills; 70m, 4°44’54”N 59°1’36”W; 25-29 MAY 2001, R. Brooks; Z. Falin, GUY1BF01 061; ex. flight intercept trap / SM0569499; KUNHM-ENT [barcode label] / PARATYPE; Pocadius; crypsis; A.R. Cline des. 2004.

**Diagnosis.** This species is most similar to *P. coxus*, but can be distinguished from them by the following suite of characters: deep distinct protibial notch and heavily armored tibiae, mentum transversely hemispherical, alternating rows of erect and semi-erect setae on elytra, metasternal disc with minute faintly impressed punctures appearing nearly glabrous, body uniformly light tan in color, terminal antennomere enlarged with small circular sensillar region, elytral fimbriae distinctly elongate, epimeron with two distinct rows of large punctures, mentum with numerous large punctures, habitus shining with mostly smooth surface sculpture, each ejaculatory rod split into two adjacent rods, basal piece of internal sac sclerites with two short lateral arms and a simple medial arm, anal sclerite with elongate fimbria, median lobe short and robust with widely diverging internal structure, and tegmen with inner row of setae minute and extending around apex of apical tegminal fossa.

**Description.** Length 3.75mm, Width 2.25mm, Depth 1.35mm. Body moderately convex, surface shining, uniformly light brown in color. Pronotum and elytra margins with elongate fimbriae that of the elytra being longer than the pronotum, all setae longer than width of antennal scape. Dorsal and ventral pubescence long.

Head surface deeply, densely, irregularly punctate, punctures larger on vertex, becoming somewhat smaller towards orbits and fronotclypeal region. Larger punctures 4-5 X diameter of eye facet, smaller punctures ~2X diameter; interspaces smooth with some microreticulation and shining. Each puncture gives rise to an elongate straight red-brown seta. Pronotal surface with large punctures equal in size to large punctures on vertex of head, interspersed with relatively few smaller punctures, ~0.5 size of larger ones; interspaces smooth with some fine microreticulations, about 0.5-1 diameter apart. Each puncture gives rise to a long brown-red seta, most seta are rather straight. Scutellar surface with shallowly impressed small punctures, equal to small ones on pronotum some punctures giving rise to short straight setae, interspaces smooth to finely alutaceous. Elytral surface with serial rows of alternating large and small deep punctures. Smaller punctures are equal in size to those on pronotum, larger punctures are ~2-2.5X diameter of smaller ones. Smaller punctures giving rise to an erect long red-brown seta, larger punctures giving rise to a semi-erect long red-brown seta. Interspaces broad between punctures of a given row and between different rows. Within a row, small punctures are separated by ~2-2.5 puncture diameters, and large punctures by 0.75-1 puncture diameter. Large rows are separated by 1-1.5 large puncture diameters. Interspaces always shining but variable from smooth to finely alutaceous in sculpture. Pygidium densely punctate, punctures equal in size to larger ones on pronotum, each puncture giving rise to a moderately long red-brown seta; interspaces narrow, 0.25-0.5 diameter, with smooth to finely alutaceous sculpture and some faint areas of microreticulation.

Venter with similar long red-brown pubescence as dorsum. Mentum with numerous large deeply impressed punctures, equal in size to larger ones on vertex, each giving rise to a moderately long seta, interspaces smooth with finely microreticulate areas. Submentum and gula with little to no punctation punctation; interspaces alutaceous to faintly granular. Prosternum and epimeron deeply irregularly punctate, punctures on epimeron slightly larger than those on mentum and those on prosternum slightly smaller than mental punctures, interspaces alutaceous with microreticulate areas, prosternal punctures separated by 0.5-1 diameter, those on the epimeron by 0.25 to 0.5 diameter and organized into two distinct rows. Mesosternum with shallow punctures, equal in size to those on mentum, interspaces smooth to alutaceous, separated by about 0.5 to 1 diameter and aggregated near metasternum. Metasternum irregularly punctate, faint minute punctures on disc similar in size to small ones on vertex those laterally on metasternum 2-3X diameter of those on disc, interspaces smooth to alutaceous on metasternal disc becoming more granular laterally, punctures separated by ~2-3 diameters on disc. Abdominal sternite 1 with large moderately impressed punctures, punctures equal to large punctures on vertex, interspaces smooth to alutaceous, separated by ~1-2 diameter. Abdominal sternites 2-4 with two irregular rows of punctures, one row near anterior margin and the other near posterior margin, punctures similar in size to those on abdominal sternite 1, rows separated by 0.5-1 puncture diameter, punctures within rows separated by ~0.25-0.5 punctures width. Rows on abdominal sternites 3-4 becoming less organized. Hypopygidium with moderately deep punctures, similar in size to those on sternites 2-4, interspaces smooth to alutaceous, punctures separated by 1-2 puncture diameters.

Head wider than long (W:L = 1.44:1), fronotclypeal region moderately projecting anteriorly. Labrum with broad concavity at anterior margin. Antennal club compact, ovoid, asymmetrical with the last antennomere longer than the previous two combined. Antennomeres 4-8 more or less compact, with 6-8 characteristically disc-like and 4-5 mostly cuboidal. Antennal scape asymmetrical, somewhat hemispherical, 1.6 times as long as pedicel. Pedicel subcylindrical in shape. Antennal segment 3 subequal in length to pedicel. Antennal club large, ~0.85 length of segments 1-8 combined. Lateral mental/submental ridge moderately prominent, at level of submentum, ridge is longitudinally sculptured with microreticulations and the sulcus with alutaceous to finely granular surface sculpturing. Mentum with anterior angles obsolete, anterior margin hemispherical, entire structure transversely hemispherical when viewed ventrally and somewhat convex laterally.

Pronotum widest in posterior third (L:W = 1:1.9), anterior margin shallowly trapezoidal, posterior margin moderately convex, lateral margins less arcuate posteriorly. Scutellum large, triangular, apex acute. Prosternal process narrowed between procoxae, apex acuminate, in lateral aspect there is a slight even convexity over the procoxae. Posterior apical wall prominent and oblique. Mesosternum extending to midway between mesocoxae, evenly concave for reception of the metasternum. Metasternum much wider than long, W:L = 3.3:1.0. Metepisternum with slight medial constriction, oblique line dividing anterior 0.18 of structure. First abdominal sternite with acuminate process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-3 subequal in length, the fourth slightly larger than the preceding two. Hypopygidium subequal in length to first abdominal sternite.

Protibia distinctly crenulate along lateral edge. Apical tooth very prominent, slightly longer than tarsomeres 1 and part of 2 combined. Outer apical notch with ~95° angle, notch depth deep, equal to length of tarsomere 1 and part of 2 combined. Inner apical spine subequal in length to tarsomere 1. Protibia heavily armored with characteristic dense patch of stiff setae along the inner apical region and other elongate stiff setae. Mesotibia more heavily armored than protibia with more dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process elongate and robust, larger than protibia process. Inner apical spine equal in length to tarsomeres 1-2 combined. Metatibia with heavier armature than that of mesotibia with more setae and spines and the inner apical spine equal to tarsomeres 1-2 and part of 3 combined.

Male genitalia well-sclerotized. Anal sclerite with large narrowly curved region ventrally and apical fimbria elongate (Fig. 17). Spiculum gastrale with wide lateral flanges, medial margins concave, inner raised area extending past posterior margin, and numerous short stiff setae originating from apex (Fig. 56). Tegmen evenly rounded apically (Fig. 96), longer than wide (w:l = 1.0:2.4), lateral row of setae visible from the median fossa to around the apex, shallow concavity in apical third with minute setae laterally and around apex, basal notch perpendicular, basal margin broadly concave. Median lobe short and robust, ~0.5 the length of the tegmen, apex coming to an acuminate point, apical opening well-developed with internal structure broadly separated (Fig. 137). Ejaculatory rods not fused to basal piece and split into two adjacent pieces, the distal pieces abutting apically. Basal piece of rods with two lateral and one medial arm (Fig. 178).

Female genitalia moderately sclerotized. Paraprocts large with sclerotization only along median line to apico-lateral angles. Gonocoxite with two basal lateral prominences, basal ridge well-sclerotized. Gonocoxal apices with recurved "tooth" absent. Two primary setae originate from small depressions on the gonocoxal apices. Intragonocoxal invagination moderately deep, ~0.5 length of gonocoxite (Fig. 214).

**Variation.** Some male specimens were less than 3mm in length.

**Seasonality/Habitat.** Specimens were collected from May and June in lowland tropical forests.

**Distribution.** Known from localities in central Guyana.

**Notes.** Host data is indicated by the generic term "puffball" on some data labels. One specimen was collected from an *Acromyrmex hystrix* refuse pile, which could be LSAMidental or indicate that the refuse was sufficiently decayed to potentially have fungal mycelia intermixed within it, thereby providing the individual a fungus meal.

**Etymology.** Specific epithet denotes the cryptic, uniform coloration of the habitus, which is undoubtedly excellent camouflage in the field.

## *Pocadius decoratus* Kirejtshuk

(Figs. 97, 138)

**Type Material Examined.** (1) HOLOTYPE ♂ (ZISP): [N] Vietnam, mountains, 50km; NE Thai-Nguen, 300m; 9/1/1964, O. Kabokav / Holotypus Pocadius; decoratus; det. Kirejtshuk 1983.

**Non-Type Material Examined.** None.

**Diagnosis.** Differs from the other *Pocadius* fauna by its distinctive color pattern of orange and black on the pronotum and elytra, and also in genitalic features.

**Redescription.** Length 4.1mm, Width 2.1mm, Depth 2.0mm. Body moderately convex, surface very shining, orange in color with distinct black markings on the pronotum and elytra, setae short and fine. Pronotum and elytra with margins scarcely fimbriate. Pygidium and hypopygidium scarcely setate, but posterior margins fimbriate.

Head surface deeply punctate, punctures becoming dense near orbits, punctures becoming smaller near fronto-clypeal region. Only relatively few punctures giving rise to small fine pale setae. Interspaces smooth to slightly alutaceous. Smaller punctures about 0.75 the size of larger ones, large punctures about 7-8 times the size of facets. Eyes with small fine facets. Pronotal surface with large and small punctures interspersed throughout. Large and small punctures similar in size to respective large and smaller punctures on head. Interspaces 1-2 puncture diameters apart, smooth to alutaceous. Each puncture bearing a short fine pale seta. Scutellar surface scarcely punctate with small punctures similar in size to the smaller punctures on the head, granular near apex, interspaces alutaceous. Eytral surface with serial rows of alternating large and small shallow punctures. Large punctures 2-3 times diameter of the large punctures on head, each giving rise to a single short fine seta. Small punctures 0.20 diameter of large punctures, each giving rise to a short fine seta. Interspaces mostly smooth between all punctures, larger punctures separated from each other by < 0.5 puncture diameter, smaller punctures separated from each other by 2 puncture diameters. Large and small puncture rows separated from each other by ~1 large puncture diameter. Pygidium moderately punctate, punctures equal in size to small punctures on elytra, interspaces alutaceous with some minute microreticulation, punctures separated by ~1 puncture diameter. Each puncture giving rise to a short stiff seta, setae ~0.5 length of those on elytra.

Venter similar in pubescence to dorsum. Mentum alutaceous with no distinct punctation. Submentum and gula with scattered small punctures equal in size to the smaller punctures on the vertex, interspaces alutaceous with some microreticulation. Prosternum and epimeron irregularly punctate, punctures approximately equal in size to larger punctures on vertex, interspaces mostly smooth with faint alutaceous areas, prosternal punctures separated by 0.5 diameter, those on the epimeron by 0.25 to 0.5 diameter. Prosternal punctures quite deep. Mesosternum with very faint small punctures. Metasternum irregularly punctate, with small faint punctures on disc similar in size to those on vertex, interspaces smooth on metasternal disc, punctures separated by ~3 diameters. Large punctures, equal large punctures on elytra, on lateral region of metasternum, interspaces smooth and ~1-2 diameters apart. Abdominal sternite 1 with faint large punctures occurring in all but the anterior 0.33 of the structure which is completely alutaceous. Interspaces alutaceous, punctures separated by 1 diameter. Abdominal segments 2-4 with punctures aligned in irregular lateral rows. Punctures equal in size to those on abdominal sternite 1. Interspaces alutaceous, punctures separated by 0.25 – 0.5 diameter. Hypopygidium densely deeply punctate, punctures equal to those on other abdominal sternites, interspaces smooth to alutaceous with faint microreticulation, punctures separated by 0.25- 0.5 diameter of puncture.

Head much wider than long, broadly triangular, with fronotclypeal region projecting slightly anteriorly. Vertex with shallow concavity in the fronto-clypeal region. Eyes large with small fine facets. Labrum transverse with minute medial incision on anterior margin. Antennal club compact, oblong oval, asymmetrical with the last antennomere longer than previous two combined. Antennomeres 6-8 strongly flattened into disc-like structures, their combined length equal to the length of antennomere 9. Antennal scape asymmetrical, globular, somewhat hemispherical, 3 times as long as pedicel. Pedicel subcylindrical in shape, ~0.75 length of scape. Antennal segment 3 subequal in length to pedicel. Segment 4 subquadrate, 0.5 the length of segment 3. Antennal club large, ~0.75 length of segments 1-8 combined, asymmetrical, terminal segment equal to preceding two segments. Antennal grooves moderately deep.

Pronotum widest near posterior angles (L:W = 1:2.97 ), anterior margin truncate, posterior margin broadly convex with distinct "lobe" over scutellum. Scutellum large and broadly hemispherical. Prosternal process somewhat narrowed between coxae, evenly rounded at apex, in lateral aspect the apex is slightly depressed behind the procoxae. Mesosternum extending to midway between mesocoxae. Mesepisternum larger than mesosternum. Metasternum width to length ratio is ~3:1. Metepisternum narrow, only slightly concave medially, anterior third moderately produced anteriolaterally. Elytral humeri moderately produced, lateral margin very narrow. First abdominal sternite with broadly truncate process between metacoxae, first sternite ~2X's longer than second sternite. Sternites 2-4 subequal in length. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth prominent, slightly longer than tarsomeres 1-2 combined. Outer apical notch with 90° angle, notch depth equal to tarsomere 1-2 combined. Inner apical spine subequal in length to first tarsomere. Protibia with very little armature overall. Mesotibia more heavily armored than protibia with a row of slender spines along entire lateral edge and other spines scattered on ventral surface. Outer apical process elongate and robust, larger than protibia process. Inner apical spine equal in length to tarsomeres 1 and 0.5 of 2. Metatibia heavily armored with four rows of slender elongate spines, one dorsal row, one ventral row, and two lateral rows. Spines of varying lengths, but most longer than those on the mesotibia. Outer apical process elongate and robust, equal in length to inner apical spine, projecting more posteriorly than pro- or mesotibial processes. Inner apical spine subequal in length to tarsomeres 1-2 combined.

Male genitalia moderately well-sclerotized. Anal sclerite large broadly curved apically (not figured); apex moderately fimbriate; ventrally with a broad medial concavity approaching apex. Spiculum gastrale not observed. Tegmen evenly broadly rounded apically (Fig. 97), much longer than wide (w:l ~ 1:3), lateral row of setae visible from the median fossa around the apex, inner row of hair absent, basal notch of phallobase only slightly concave. Median lobe large and robust, ~0.5 the length of the tegmen, apical opening well-developed extending posteriorly (Fig. 138). Ejaculatory rods not observed.

**Variation.** None documented, only known from male Holotype.

**Seasonality/Habitat.** The holotype, and only existing specimen of the species, was collected in September in a wet tropical forest.

**Distribution.** Known only from the type locality.

**Notes.** No host records are available for this species. Due to the attachment of the genitalia directly to the specimen card mount with a water insoluble adhesive, some characters of the “aedeagus” were not readily visible. No attempts were made to remove the genitalia from the card mount due to the fragility of the organ and the extensive amount of adhesive present.

### ***Pocadius dimidiatus* Jelínek**

(Figs. 18, 57, 98, 139, 179, 215)

**Type Material Examined.** PARATYPE ♂ (NMP): ARGENTINA: prov. Entre Rios; Conocordia; Hayward lgt.

**Non-Type Material Examined.** >20 specimens with the following data labels: ARGENTINA: Salta Prov.; 45km W Salta, 1950m; 1-29-XII-1987, El Alisal; S&J Peck, moist ravine thicket, malaise FIT (CMN). ARGENTINA: Salta Prov.; El Rey Nat. Park, 900m; 11-15-XII-1987, S&J Peck; Aguas Negras Trail, *Prosopis* forest, malaise-FIT (CMN). ARGENTINA: Salta Prov.; 17km N La Caldera, Alto de la Sierra; 1550m, 2-30-XII-1987; S&J Peck, malaise-FIT; subtropical humid forest (CMN). ARGENTINA: Salta Prov.; El Rey Nat. Park, 900m; Rio La Sala, S&J Peck; 5-15-XII-1987, malaise-FIT; humid mossy Chaco forest.

**Diagnosis.** Jelínek (1977) noted that specimens of this species were in the museum at LaPlata under the name *P. helvolus*, the eastern North American species, which was likely the basis of Blackwelder's (1945) LSAMount of *P. helvolus* in Argentina. The species is easily distinguished from any North American species by the greatly enlarged terminal antennomere as noted by Jelínek . However, due to the presence of the enlarged terminal antennomere in other Neotropical species, there is a necessity for a more detailed diagnosis using both external and genitalic characters. *Pocadius dimidiatus* has the following characters delimiting the species: proportionately elongate pronotal and elytral fimbriae and overall long dorsal pubescence, pronotum with trapezoidal anterior margin and simple almost truncate posterior margin, prosternal process with prolonged apex, proportionately elongate tegmen to body size of adult, large robust median lobe, ejaculatory rods fused medially, and both the lateral and inner rows of setae on the tegmen are incomplete.

**Redescription.** Length 3.2 mm, Width 1.8mm, Depth 1.4mm. Body moderately convex, surface shining, reddish-brown to dark brown in color, most specimens with elytral apices and lateral regions dark brown. Pronotum and elytra margins with elongate fimbriae, setae much longer than width of antennal scape. Dorsal and ventral pubescence golden and quite long.

Head surface deeply, irregularly, densely punctate, punctures larger on vertex, becoming somewhat smaller towards fronotclypeal region. Larger punctures 4-5 X's diameter of eye facet, smaller punctures 3-4 X's diameter of facet. Interspaces smooth to finely alutaceous, shining. Each smaller puncture gives rise to an elongate curved golden seta. Eyes finely faceted. Pronotal surface with large punctures equal to slightly larger in size to large punctures on vertex of head, interspersed with relatively few smaller punctures, ~0.75 size of larger ones. Interspaces smooth to alutaceous, about 0.5-1 diameters apart. Each puncture gives rise to an elongate golden seta, most seta are slightly curved. Pronotal fimbria elongate, longer than length of scape. Scutellar surface with shallowly impressed smaller punctures, somewhat smaller than small punctures on pronotum, interspaces smooth, no punctures in apical 0.25. Elytral surface with serial rows of alternating large and small deep punctures. Smaller punctures are equal in size to smaller punctures on pronotum, larger punctures are ~2 times diameter of smaller ones. Smaller punctures giving rise to an erect elongate curved golden seta, larger punctures giving rise to a shorter decumbent golden seta. Interspaces more narrow between punctures of a given row than those of different rows. Within a row, small punctures are separated by ~1 puncture width, and large punctures by ~1 puncture width. Rows are separated by 1.0 large puncture width. Interspaces always shining but variable from alutaceous to finely microreticulate in sculpture. Elytral fimbria elongate, setae about 1.25X length of pronotal fimbria. Pygidium densely punctate, punctures equal in size to smaller punctures on pronotum, each puncture giving rise to a short stiff golden seta. Interspaces narrow, 0.7-1.2 diameters, with alutaceous to granular sculpture.

Venter less densely setose surface as dorsum, however, setae still elongate like those on dorsum. Mentum with large very faint punctures, equal in size to large punctures on vertex, some but not all of punctures giving rise to moderately long golden seta, interspaces smooth to alutaceous. Submentum and gula much less densely punctate than mentum with interspaces smooth to granular and more than 3 puncture diameters apart. Prosternum and epimeron faintly irregularly punctate, punctures slightly larger than those on mentum, interspaces alutaceous to rugulose, prosternal punctures separated by 0.5 - 1 diameter, those on the epimeron by >1 diameter. Punctures on prosternal process giving rise to elongate golden setae. Mesosternum with shallow punctures, about 1.25 diameter of those on prosternum, interspaces alutaceous to granular, separated by about 0.25-0.5diameter. Metasternum irregularly punctate, with large punctures laterally, becoming slightly smaller and more faintly impressed on disc, lateral punctures similar in size to those on mesosternum, interspaces smooth on metasternal disc becoming microreticulate to granular laterally, punctures separated by ~1 diameter. Abdominal sternite 1 with large faint, almost obsolete punctures, punctures equal to smaller punctures on metasternal disc, interspaces alutaceous, separated by ~1-1.5 diameter. Abdominal sternites 2-4 with two irregular rows of punctures, one row near anterior margin and the other near posterior margin, punctures similar in size to larger punctures on metasternum, rows separated by 0.5 puncture diameter, punctures within rows separated by ~0.5 punctures width. Hypopygidium with moderately deep punctures, similar in size to those on sternites 2-4, interspaces alutaceous to granular, punctures separated by 0.5 puncture diameter.

Head much wider than long (L:W = 1:1.5), fronotclypeal region moderately projecting anteriorly. Vertex with shallow concavity between orbits near fronotclypeal region. Labrum with deep medial incision at anterior margin. Antennal club compact, obovate, asymmetrical with the last antennomere greater in length to the previous two combined. Antennomeres 6-8 characteristically disc-like. Antennal scape asymmetrical, slightly hemispherical, 1.9 times as long as pedicel. Pedicel subcylindrical in shape. Antennal segment 3 slightly longer in length than pedicel. Antennal club large, ~0.75 length of segments 1-8 combined. Each club segment with dense short setae, and a small dense sensillar region near the anterior border of the ventral surface of antennomeres 11. Antennal grooves very deep and widely excavate, slightly converging posteriorly. Lateral mental channel prominent and widely excavated, at level of submentum, densely punctate with small punctures each giving rise to curved golden setae. Mentum with anterior angles almost obsolete, anterior margin angulate, entire structure somewhat pentagonal and convex ventrally.

Pronotum widest near middle (L:W = 1:2), anterior margin trapezoidal, posterior margin simple, lateral margins less arcuate posteriorly, anterior and posterior angles present. Scutellum large, elongate triangular, apex narrowly rounded. Prosternal process somewhat narrowed between procoxae, apex acuminate, in lateral aspect the anterior and posterior ends are prominent and slightly convex medially. Posterior apical wall prominent and only slightly oblique. Mesosternum extending to midway between mesocoxae, sharply concave for reception of the metasternum. Metasternum width to length ratio is ~1.6:1. Metepisternum with slight medial concavity, oblique line dividing anterior 1/8 of structure. Elytral humeri moderately produced, lateral margin very narrow. First abdominal sternite with acuminate process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-3 subequal in length, the fourth slightly larger than the preceding two. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth not prominent, slightly longer than tarsomere 1. Inner apical spine subequal in length to tarsomeres 1 and half of 2 combined. Outer apical notch absent. Protibia heavily armored with characteristic dense patch of stiff setae along the inner apical region. Mesotibia more heavily armored than protibia with more dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process somewhat developed, larger than protibia process. Inner apical spine equal in length to tarsomeres 1-2 combined.

Metatibia with more developed armature than that of mesotibia, outer apical process well-developed.

Male genitalia well-sclerotized. Anal sclerite with large broadly curved region anteriodorsally (Fig. 18); apex sparsely fimbriate; ventrally with a broad medial concavity approaching apex. Spiculum gastrale with wide lateral flanges, medial margins concave proximally, short stiff setae originating from angulate apical margin (Fig. 57). Tegmen evenly rounded apically (Fig. 98), much longer than wide (w:l = 1.0:2.1), lateral row of setae visible from the median fossa to around the apex, small shallow concavities in apical third, basal notch perpendicular, basal margin concave. Median lobe elongate, ~0.75 the length of the tegmen, apex acuminate, apical opening well-developed (Fig. 139). Ejaculatory rods not fused to basal piece, but fused to each other in apical third, concave medially. Basal piece of rods in three pieces, two lateral asymmetrical tear-drop pieces, and a medial bilobed globular section (Fig. 179).

Female genitalia well sclerotized. Paraprocts large with sclerotization only along median line to baso-lateral angles. Gonocoxite with two basal lateral prominences, basal ridge well-sclerotized with two short medial baculi. Gonocoxal apices with recurved "tooth" absent. Three setae originate from small depressions on the lateral region of the gonocoxal apices (Fig. 215).

**Variation.** Some variability exists in the amount of dark coloration on the lateral and apical regions of the elytra.

**Seasonality/Habitat.** The type and non-type specimens were all collected during December. The species is found in both lowland and mid- to high elevation wet forests.

**Distribution.** The type series is from eastern Argentina and the non-type material from northwestern Argentina. Leschen and Carlton (1994) mistakenly identified specimens of the new species *P. peruensis* as members of this species, indicating these individuals denoted a range extension for *P. dimidiatus*. This is not surprising as like other New World *Pocadius* this species has the elytral apices darker in color than the rest of the body. However, following dissection of the Peruvian material, the specimens were determined as undescribed. Thus, this species does appear to be restricted to north and central Argentina.

**Notes.** No host records exist for this species.

## ***Pocadius dominicus* Cline new species**

(Figs. 19, 58, 99, 140, 180, 216)

**Type Material.** HOLOTYPE ♂ (MTEC): DOM. REP.: PR. Hato Mayor; Par. Nac. Los Haitises; 02 JULY 1992 – 16 JULY 1993; D. Sikes & R. Rosenfield; flight intercept trap / HOLOTYPE; Pocadius; dominicus; A.R. Cline des. 2004. Holotype with genitalia dissected and contained under specimen in genitalia vial. PARATYPE (MTEC): DOMINICAN REPUBLIC: Prov. Hato Mayor; Par. Nac. Los Hatises; 22-31 JULY 1993, FIT; D. Sikes & R. Rosenfield. PARATYPE (MTEC): DOMINIC. REP.: Prov Hato; Mayor, P.N. Los Hatises; JULY 1992 - 16 JULY 1993; flight intercept trap; D.S. Sikes colr. PARATYPE (LSAM): DOM. REP.: Prov Hato Mayor; Par. Nac. Los Hatises; 16-APR-01-JULY-1992; FIT #1, bosque humido; M. Ivie, D. Sikes, Lanier. PARATYPE (CMN): DOM. REP.: LaVega Prov.; 10km NE Jaraboca; Raquet Club, 550m, FIT; 20-VII-4-VIII-1995, mixed; for., S&J Peck, 95-37. PARATYPE (CMN) 3 specimens: DOM. REP.: LaVega Prov.; PN. A. Bermudez Cienaga; 19-VII-2-VIII-1995, 1100m; trop. evgrn. for., FIT; S&J Peck, 95-36. PARATYPE (LSAM) 2 specimens: DOM. REP.: LaVega Prov.; PN. A. Bermudez Cienaga; 19-VII-2-VIII-1995, 1100m; trop.evgrn.for., FIT; S&J Peck, 95-36. PARATYPE (ARC) 1 specimen: DOMINICAN REPUBLIC: La; Vega, Cordillera Central; 4.1km SW El Convento; 18-50-37N 70-42-48W; 1730m, 31 May 2003 / J. Rawlins, R. Davidson; C. Young, C. Nunez, P.; Acevedo, dense secondary; evergreen forest with; pine, hand collected; Sample 22242 / Carnegie Museum; Specimen Number; CMNH-347,548. PARATYPE (LSAM) 1 specimen: label data same as above but specimen number is CMNH-347,284. 12 PARATYPES (CMNH): same as above but specimen numbers as follows: CMNH-347,410, CMNH-347,617, CMNH-347,448, CMNH-347,520, CMNH-347,842, CMNH-347,354, CMNH-347,247, CMNH-347,280, CMNH-347,843, CMNH-347,881, CMNH-347,891, and CMNH-347,238.

**Diagnosis.** This species is easily distinguished from any other Neotropical *Pocadius* by the following characters: body coloration dull orange-yellow with well-demarcated apical 0.66 of elytra black, nearly triangular mentum, male hypopygidium with central asetose region, terminal antennomere with distinct circular sensillar region, densely setose tegmen with inner setal row attaining apex in convergent manner, and lateral pores on gonocoxites.

**Description.** Length 4.0 mm, Width 1.9mm, Depth 0.9mm. Body slightly convex, surface shining, orange-yellow in color with antennal club somewhat darker and apical 0.66 well-demarcated black. Pronotal and elytral margins with dense moderately elongate fimbriae. Dorsal and ventral pubescence moderately elongate. Head, pronotum and elytra densely punctate with surface rugulose.

Head surface densely irregularly punctate, with both large and small punctures evenly dispersed across vertex. Larger punctures 3-4 X diameter of eye facet, smaller punctures ~1.5 X diameter. Interspaces granular, moderately shining. Each smaller puncture gives rise to an elongate curved golden seta. Pronotal surface with large punctures equal in size to large punctures on vertex of head, interspersed with relatively few smaller punctures, approximately 2X diameter small punctures on vertex. Interspaces finely granular, about 0.25-0.5 diameter apart. Each puncture gives rise to a moderately long golden seta, seta curved and decumbent. Scutellar surface with more shallowly impressed small punctures, similar in size to small punctures on pronotum, some punctures giving rise to setae, interspaces granular. Elytral surface with serial rows of alternating large and small moderately impressed punctures. Smaller punctures equal in size to smaller punctures on pronotum, larger punctures are ~4 times diameter of smaller ones. Smaller punctures giving rise to a semi-erect moderately long golden seta, larger punctures giving rise to a short decumbent golden seta. Interspaces narrow between punctures of a given row and between different rows. Within a row, small punctures are separated by ~1 puncture diameter, and large punctures by 0.25-0.5 puncture diameter. Larger rows are separated by 0.5-1 large puncture diameter. Interspaces somewhat shining but granular in surface sculpture. Pygidium somewhat densely punctate, punctures equal in size to larger punctures on pronotum, each puncture giving rise to a rather short stiff golden seta. Interspaces narrow, 0.75 diameter, with granular surface sculpture.

Venter with less dense shorter golden pubescence than dorsum. Mentum with faintly impressed punctures, equal in size to larger punctures on vertex, each giving rise to a short straight seta, interspaces mostly alutaceous. Submentum and gula with similar punctation as mentum but with interspaces more granular. Prosternum and epimeron more regularly punctate, punctures equal to large punctures on vertex, interspaces granular with microreticulate areas, prosternal punctures separated by 0.5-1.0 diameter, those on the epimeron by 0.5 diameter. Mesosternum with moderately impressed punctures, congregated along posterior margin only, interspaces granular, separated by approximately 1 diameter. Metasternum irregularly punctate, with a few smaller more faint punctures on disc similar in size to those on mesosternum, lateral punctures larger, interspaces granular, punctures separated by ~1 diameter laterally. Abdominal sternite 1 with somewhat faintly impressed punctures, punctures equal to those on lateral region of metasternum, interspaces granular, separated by ~1 diameter. Abdominal sternites 2-4 with irregular rows of punctures, one distinct row near posterior margin, punctures similar in size to those on metasternum, punctures separated by ~0.75-1 puncture diameter. Hypopygidium with deep punctures, similar in size to those on sternites 2-4, interspaces granular, punctures separated by 0.25-0.5 puncture diameter, central region of hypopygidium with only a few setal bearing punctures present.

Head wider than long (W:L = 1.33:1), fronotclypeal region moderately projecting anteriorly. Vertex with deep indistinct concavity between orbits near fronotclypeal region. Labrum with deep medial incision at anterior margin. Antennal club compact, obovate, asymmetrical with the last antennomere greater in length than the previous two combined. Antennomeres 6-8 flattened. Antennal scape asymmetrical, distinctly hemispherical, 1.66 times as long as pedicel. Pedicel subcylindrical in shape, somewhat swollen anteriorly. Antennal segment 3 shorter in length than pedicel. Antennal club moderately large, ~0.6 length of segments 1-8 combined. Each club segment with dense short setae, and several protruding elongate setae. Antennal grooves deeply excavate, slightly converging posteriorly. Lateral mental ridge prominent and elongate, at level of submentum, ridge with longitudinal microreticulations laterally and medially granular surface. Mentum with anterior angles absent, anterior margins angulate and coming together in acuminate apex, overall triangular in appearance, entire structure with slight convexity.

Pronotum widest at middle (L:W = 1:2), anterior margin distinctly trapezoidal, posterior margin highly convex, lateral margins less arcuate posteriorly, anterior and posterior angles distinct. Scutellum large, hemispherical, apex broadly rounded. Prosternal process greatly narrowed between procoxae, apex acuminate, in lateral aspect the anterior and posterior ends are not prominent with moderate convexity medially over procoxae. Posterior apical wall prominent and perpendicular. Mesosternum extending to approximately midway between mesocoxae, broadly concave for reception of the metasternum. Metasternum much wider than long (W:L = 3:1). Metepisternum with broad medial concavity, oblique line dividing anterior 0.16 of structure into axillary space. First abdominal sternite with acuminate process between metacoxae. First sternite ~1.8 X's longer than second sternite. Sternites 2-3 subequal in length, the fourth slightly larger than the preceding two. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth moderately prominent, approximately equal to length of first tarsomere Outer apical notch with ~100° angle, notch depth moderately deep, equal to length of tarsomere 1 and part of 2. Inner apical spine subequal in length to tarsomere 1 and part of 2. Protibia moderately armored with elongate stiff setae on the lateral margin and with characteristic dense patch of stiff setae along the inner apical region. Mesotibia more heavily armored than protibia with more dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process distinct, larger than protibia process. Inner apical spine equal in length to tarsomeres 1. Metatibia more heavily armored than mesotibia with longer more densely distributed stiff setae, and more distinct outer apical tooth and inner apical spine, the latter of these is subequal in length to tarsomeres 1 and 2 combined.

Male genitalia well-sclerotized. Anal sclerite with broadly curved region anteriodorsally (Fig. 19); apex with elongate fimbria; ventrally with a more broad medial concavity approaching apex. Spiculum gastrale with broad rounded lateral flanges, medial margin approximate, numerous short stiff setae originating from apex (Fig. 58). Tegmen evenly rounded apically (Fig. 99), much longer than wide (w:l = 1.0:2.2), lateral row of setae visible from the median fossa around the apex, no concavity in apical third, basal notch oriented perpendicular, inner row of setae attaining apex in triangular fashion. Median lobe becoming narrow apically, ~0.4 the length of the tegmen, apex acuminate, apical opening moderately well-developed (Fig. 140). Ejaculatory rods not fused to basal piece or to each other, more or less straight without medial concavity. Basal piece of rods fused basally with elongate paired apical projections (Fig. 180).

Female genitalia well sclerotized. Paraprocts with sclerotization along median border only. Gonocoxite with two basal lateral prominences, basal ridge well-sclerotized. Gonocoxal apices with recurved "tooth" not well-developed. Several elongate setae originate from small depressions on lateral margin of the gonocoxal apices. Numerous pores present laterally along gonocoxites (Fig. 216).

**Variation.** No demonstrable variation exists except for the denuded asetose central region visible only on the male hypopygidium.

**Seasonality/Habitat.** Though some FIT's were serviced year-round, specimens appear most likely to be collected from mid-April through August as evidenced by other less long-term FIT sampling protocols.

**Distribution.** Known only from the Dominican Republic on the island of Hispaniola.

**Notes.** No host data available for this species.

**Etymology.** Specific epithet is a derivative of the type locality, i.e. the Dominican Republic.

### ***Pocadius endroedyi*** **Cline new species**

(Figs. 20, 59, 100, 141, 181, 217)

**Type Material.** HOLOTYPE ♂ (TMSA): S. Afr., Transvaal; Pretoria, Waterkloof; 25.43S – 28.11E / 11-3-1993, E-Y: 2879; ex puffballs; leg. Endrödy-Younga. 27 PARATYPE (TMSA): same data label as holotype. 1 PARATYPE (BMNH): same data label as holotype. 5 PARATYPE (LSAM): same data label as holotype. ! PARATYPE (LSAM): TANGANYIKA

Terr.; Ukerewe Island; leg. Father Conrad. 1 PARATYPE (LSAM): Sartruggens; Marico; Dr. Brauns / Transvaal; 15-I-1921.

**Diagnosis.** This species is well distinguished from *P. africanus* by the following attributes: more robust overall body size, more elongate antennal club with different sensillar region on terminal antennomere, much smaller axillary space on metepisternum, anterior pronotal margin broadly evenly concave, head and pronotum much more densely punctate with smooth interspaces, prosternal process with posterior apical wall in lateral aspect with distinct concavity, ejaculatory rods not fused basally, more narrowed elongate median lobe of aedeagus, inner row of setae on tegmen not complete apically, lateral row of setae on tegmen with elongate central tuft, eighth abdominal sternite with apical margin with crenulations, and numerous setae originating from each gonocoxal apex.

**Redescription.** Length 3.9 mm, Width 1.8mm, Depth 1.3mm. Body moderately convex, surface shining, reddish-brown to brown in color. Pronotal and elytral margins with sparse moderately elongate fimbriae. Dorsal and ventral pubescence not elongate. Head, pronotum and elytra densely deeply punctate.

Head surface deeply, irregularly punctate, with both large and small punctures evenly dispersed across vertex. Larger punctures 3-4 X diameter of eye facet, smaller punctures 1-2 X diameter. Interspaces smooth to finely alutaceous, shining. Each smaller puncture gives rise to an elongate curved golden seta. Pronotal surface with large punctures equal in size to large punctures on vertex of head, interspersed with relatively few smaller punctures, similar in size to small punctures on vertex. Interspaces finely microreticulate to granular, about 0.5-1 diameter apart. Each puncture gives rise to a moderately long golden seta, most seta curved and decumbent. Scutellar surface with few vague shallowly impressed punctures, some punctures giving rise to setae, interspaces alutaceous to granular. Elytral surface with serial rows of alternating large and small deep punctures. Smaller punctures are equal in size to smaller punctures on pronotum, larger punctures are ~3-4 times diameter of smaller ones. Smaller punctures giving rise to a semi-decumbent moderately long golden seta, larger punctures giving rise to a short almost adpressed golden seta. Interspaces narrow between punctures of a given row and between different rows. Within a row, small punctures are separated by ~1-1.5 puncture diameters, and large punctures by 0.33-0.5 puncture diameter. Rows are separated by 0.5 large puncture diameter. Interspaces somewhat shining but granular in surface sculpture. Pygidium densely punctate, punctures equal in size to larger punctures on pronotum, each puncture giving rise to a rather short golden seta. Interspaces narrow, 0.5-1 diameter, with alutaceous to granular surface sculpture.

Venter with similar moderately long golden pubescence as dorsum. Mentum with small faintly impressed punctures, equal in size to smaller punctures on vertex, each giving rise to a short straight seta, interspaces alutaceous to somewhat granular. Submentum and gula with similar punctation as mentum but with interspaces more granular. Prosternum and epimeron deeply regularly punctate, punctures equal to large punctures on vertex, interspaces granular with microreticulate areas, prosternal punctures separated by 0.25-0.5 diameter, those on the epimeron by 0.25 diameter. Mesosternum with moderately impressed punctures, congregated along posterior margin, interspaces alutaceous to granular, separated by about 0.5-1 diameter. Metasternum deeply irregularly punctate, with smaller more faint punctures on disc similar in size to those on mesosternum with lateral punctures slightly larger, interspaces alutaceous on metasternal disc becoming granular laterally, punctures separated by ~1-2 diameters. Abdominal sternite 1 with large somewhat faintly impressed punctures, punctures equal to those on metasternum, interspaces alutaceous to granular, separated by ~1-2 diameters. Abdominal sternites 2-4 with irregular rows of punctures, one distinct row near posterior margin, punctures similar in size to those on metasternum, punctures separated by ~0.5-0.75 puncture diameter. Hypopygidium with deep punctures, similar in size to those on sternites 2-4, interspaces granular, punctures separated by 0.25-0.5 puncture diameter.

Head wider than long (W:L = 1.4:1), fronotclypeal region moderately projecting anteriorly. Vertex with small but indistinct concavity between orbits near fronotclypeal region. Eyes large, moderately protruding. No prominence over antennal insertion. Labrum with small shallow concavity at anterior margin. Antennal club compact, elongate oval, more or less symmetrical with the last antennomere subequal to the previous two combined. Antennomeres 6-8 more or less compact, with 7-8 characteristically disc-like. Antennal scape asymmetrical, distinctly hemispherical, 1.5 times as long as pedicel. Pedicel subcylindrical in shape. Antennal segment 3 shorter in length to pedicel. Antennal club large, ~0.75 length of segments 1-8 combined. Each club segment with dense short setae, and only relatively few protruding elongate setae (2-4 in number). Antennal grooves very deep and moderately excavate, slightly converging posteriorly. Lateral mental ridge prominent, at level of submentum, ridge with longitudinal microreticulations laterally and medially is granular. Mentum with anterior angles obsolete, anterior margin broadly hemispherical, entire structure flattened with no convexity.

Pronotum widest in posterior 0.33 (L:W = 1:1.8), anterior margin broadly evenly concave, posterior margin convex, lateral margins less arcuate posteriorly, anterior and posterior angles distinct. Scutellum moderately large, triangular, apex acutely rounded. Prosternal process narrowed between procoxae, apex somewhat acuminate, in lateral aspect the anterior and posterior ends are prominent with little convexity medially over procoxae. Posterior apical wall prominent with distinct concavity. Mesosternum extending to approximately midway between mesocoxae, deeply incised for reception of the metasternum. Metasternum much wider than long (W:L = 2.9:1.0). Metepisternum with slight medial concavity, curved oblique line dividing anterior 1/7 of structure. Elytral humeri moderately produced, lateral margin very narrow. First abdominal sternite with broad truncate process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-3 subequal in length, the fourth slightly larger than the preceding two. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth not prominent, approximately 0.5 length of first tarsomere Outer apical notch with ~90° angle, notch depth moderate, equal to 0.75 length of tarsomere 1. Inner apical spine subequal in length to tarsomeres 1. Protibia not heavily armored but with characteristic dense patch of stiff setae along the inner apical region. Mesotibia more heavily armored than protibia with more dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process only faintly distinct, only slightly larger than protibia process. Inner apical spine equal in length to tarsomeres 1. Metatibia with armature similar to that of mesotibia, but with longer more distinct outer apical tooth and inner apical spine.

Male genitalia well-sclerotized. Anal sclerite with narrowly curved region anteriodorsally (Fig. 20); apex densely fimbriate; ventrally with a more narrow medial concavity approaching apex; posterior apex with well-defined acuminate apex. Spiculum gastrale with angulate lateral flanges, medial margin biconcave, numerous short stiff setae originating from apex, apical margin with crenulations near edge (Fig. 59). Tegmen evenly rounded apically (Fig. 100), much longer than wide (w:l = 1.0:3.0), lateral row of setae visible from the median fossa around the apex, narrow elongate shallow concavity in apical third, basal notch oriented somewhat posteriorly, inner row of setae not attaining apex and expanded basally. Median lobe narrow, ~0.5 the length of the tegmen, apex acuminate, apical opening not well-developed (Fig. 141). Ejaculatory rods not fused to basal piece or to each other. Basal piece of rods with deep medial projection extending almost half length of ejaculatory rods, proximally with swollen base (Fig. 181).

Female genitalia moderately sclerotized. Paraprocts relatively small compared to gonocoxites, with sclerotization along median line to midway to baso-lateral angles. Gonocoxite with two basal lateral prominences, basal ridge well-sclerotized. Gonocoxal apices with recurved "tooth" absent. Several setae originate from small depressions on lateral margin of the gonocoxal apices (Fig. 217).

**Variation.** The single specimen from Tanzania is slightly lighter in color than those from Zimbabwe and South Africa.

**Seasonality/Habitat.** Specimens were collected from December through March

**Distribution.** The species range extends south from the Tanzanian island of Ukerewe which lies in the southern reaches of Lake Victoria through Salisbury, Zimbabwe to the northeastern region of South Africa.

**Notes.** Specimens from South Africa and Zimbabwe were collected from puffballs.

**Etymology.** Specific epithet honors Sebastian Endrödy-Younga, former nitidulid specialist, for his work on the fauna of Africa.

### ***Pocadius ephite*** **Leschen and Carlton**

(Figs. 21, 60, 101, 142, 182)

**Type Material Examined.** HOLOTYPE ♂ (SNEC): COSTA RICA: Alajuela; Peñas Blancas 875m; 19 May 1989, J. Ashe,; R. Brooks, R. Leschen; ex., flight intercept / Snow Entomol. Mus.; Costa Rica Exped. #267 / HOLOTYPE; *Pocadius ephite*; R. Leschen & C. Carlton.

**Non-Type Material Examined.** None.

**Diagnosis.** The original description of this species (Leschen and Carlton 1994) suggested similarities with *P. fumatus* from South America, with deviations in elytral vestiture and protibial armature. The authors also briefly diagnosed *P. ephite* from the two other species described in the paper, i.e. *P. jelineki* and *P. maquipucunensis*, by "the structure of the rods in the ejaculatory duct of the aedeagus, protibial morphology, and vestiture without curved ends." This diagnosis must be modified as other *Pocadius* are known to have vestiture without curved ends and details of the structure/morphology of the protibia and ejaculatory rods were not fully discussed. *Pocadius ephite* is one of the more oval shaped members, with an extremely low L:W ratio, making initial identification moderately successful. Also, the large robust very asymmetrical antennal club, in particular the terminal antennomere, the evenly rounded anterior margin of the pronotum, the rounded apex of the abdominal process, as well as the large umbilicate punctures with smooth shining interspaces on the metasternal disc help to externally define this species. These characters, in combination with the apical fossa of the tegmen attaining the tegminal apex, readily identify *P. ephite* from the other Neotropical members of the genus.

**Redescription.** Length 2.9mm, Width 2.1mm, Depth 1.2mm. Body moderately convex, surface shining, light brown to reddish brown. Pronotum and elytra with moderately long fimbriae, setae ~1.5 width of antennal scape. Dorsal and ventral pubescence moderate in length, fine and relatively sparsely distributed.

Head surface irregularly punctate, punctures larger on vertex, becoming somewhat smaller laterally and posteriorly, and minute punctures on clypeal-labral region. Large punctures equal to ~4 eye facet diameters, smaller punctures ~3 diameters, and minute punctures ~1 diameter. Interspaces smooth to alutaceous, shining except on clypeal-labral region where the interspaces are alutaceous to granular. Each vertexal puncture gives rise to a single fine short seta. Eyes finely faceted. Pronotal surface with large punctures about 1.3X's diameter of large punctures on vertex of head, interspersed with smaller punctures, equal to size of large vertex punctures. Interspaces smooth to finely alutaceous, shining, about 0.25-0.5 diameter apart. Each puncture gives rise to a fine golden seta that is either semi-erect or erect. Scutellar surface with very few vague shallowly impressed large punctures, some punctures giving rise to setae, and the interspaces are alutaceous, impunctate in apical third. Elytral surface with serial rows of alternating large and small deep punctures. Punctures equal in size to corresponding large and small punctures on pronotum. Smaller punctures giving rise to an erect golden seta, larger punctures giving rise to a semi-erect golden seta. Interspaces widely spaced between punctures of a given row and between different rows. Within a row, small punctures are separated by ~1-1.5 puncture width, and large punctures by 0.75-1 puncture width. Rows are separated by ~1 large puncture width. Interspaces shining but variable from smooth to finely alutaceous. Pygidium densely punctate, punctures equal in size to larger ones on pronotum, each puncture giving rise to a short stiff golden seta. Interspaces narrow, 0.25-0.5 diameters apart.

Venter with shorter more sparsely distributed pubescence than dorsum. Mentum with shallow small punctures faintly visible, equal in size to small punctures on vertex. Interspaces granular to alutaceous. Submentum similar in punctation to mentum but with interspaces completely granular. Gula impunctate with alutaceous surface. Prosternum and epimeron deeply irregularly punctate, punctures slightly larger than those on mentum, interspaces alutaceous prosternal punctures separated by 0.5 diameter, those on the epimeron by 0.5-1 diameter. Mesosternum with large shallow punctures, about 2-3 diameter of those on prosternum, interspaces alutaceous, separated by ~1 diameter. Metasternum irregularly punctate, with large punctures on disc similar in size to those on mesosternum, interspaces alutaceous to granular. Abdominal sternite 1 with faint punctures, punctures 0.5-0.75 diameter of metasternal punctures, interspaces alutaceous, separated by ~1 diameter. Abdominal sternites 2-4 with 2-3 irregular rows of punctures, two rows near anterior margin and the other near posterior margin, rows separated by 1 puncture width, punctures within rows separated by ~0.25 punctures width. Hypopygidium with moderately deep punctures, similar in size to those on sternites 2-4, interspaces alutaceous, punctures separated by 1-2 puncture diameters, each puncture giving rise to a moderately long golden seta.

Head much wider than long (W:L = 2:1), fronotclypeal region only slightly projecting anteriorly. Vertex with concavity between orbits broad and deep. Labrum with moderately broad concavity medially at anterior margin. Antennal club compact, globular, greatly asymmetrical with the last antennomere much larger than the previous two segments combined. Antennomeres 4-6 more or less compact and somewhat cuboidal, with 7-8 characteristically flattened and disc-like. Antennal scape moderately asymmetrical, somewhat hemispherical, 2 times as long as pedicel. Pedicel subcylindrical in shape. Antennal segment 3 equal in length to pedicel. Antennal club large, ~0.95 length of segments 1-8 combined. Antennal grooves moderately deep and widely excavate, slightly converging posteriorly. Lateral mental ridge prominent, at level of submentum, medially the ridge has granular sculpture with some faint microreticulations. Mentum with anterior angles obsolete, anterior margin broadly hemispherical with well defined medial apical tip, entire structure slightly convex.

Pronotum widest near middle (L:W = 1:1.8), anterior margin broadly shallowly trapezoidal, posterior margin moderately convex, lateral margins less arcuate posteriorly. Scutellum large, obtusely triangular, apex broadly rounded. Prosternal process somewhat narrowed between procoxae, apex acuminate, in lateral aspect the anterior and posterior ends are moderately prominent and only slightly convex medially. Posterior apical wall prominent and slightly oblique. Mesosternum extending to midway between mesocoxae, evenly and somewhat deeply concave for reception of the metasternum. Metasternum width to length ratio is ~2.5:1.0. Metepisternum with medial margin angulate, oblique line dividing anterior 0.125 of structure.

Elytral humeri moderately produced, lateral margin very narrow. First abdominal sternite with moderately narrow acuminate process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-3 subequal in length, the fourth slightly larger than the preceding two. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth very prominent, equal in length to first tarsomere and half of second combined. Outer apical notch with ~90° angle, notch depth deep, equal to length of tarsomere 1 and part of two combined. Inner apical spine subequal in length to first tarsomere and half of second combined. Protibia only somewhat armored but with characteristic patch of stiff setae along the inner apical region. Mesotibia somewhat more heavily armored than protibia with more dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process elongate and robust, slightly larger than protibia process. Inner apical spine equal in length to first tarsomere and half of second combined. Metatibia with armature similar to that of mesotibia, but outer apical process and spines slightly longer.

Male genitalia well-sclerotized. Anal sclerite with broadly curved region anteriodorsally (Fig. 21); apex somewhat fimbriate; ventrally with a broad elongate medial concavity approaching apex. Spiculum gastrale with wide elongate lateral flanges, medial margins concave, numerous short stiff setae originating from apex (Fig.60). Tegmen evenly rounded apically (Fig. 101), longer than wide (w:l = 1.0:2.75), lateral row of setae visible from the apex of the median fossa around the tegminal apex, large broad shallow concavity in apical half, basal notch perpendicular, basal margin angulate with basal concavity. Median lobe elongate oval, ~0.45 the length of the tegmen, apex broadly rounded, apical opening well-developed with trilobed concavity (Fig. 142). Ejaculatory rods not fused to basal piece, nearly straight with medially projecting apical prominence. Basal piece of rods fused with shallow medial concavity extending one fourth length of structure, evenly rounded proximally (Fig. 182).

Female genitalia not observed.

**Variation.** Known only from holotype male.

**Seasonality/Habitat.** Type collected from mid-May in a wet forest in the Alajuela Province of Costa Rica.

**Distribution.** Known only from type locality.

**Notes.** Holotype has abdomen completely dissected from body, also protarsi and mesotarsi on left side missing. Two vials are under specimen, first contains abdomen, second contains male genitalia except for anal sclerite and spiculum gastrale which are contained in the first vial. No specimens outside of the type locality around Monteverde have been collected, suggesting this species is a cloud forest endemic. This is common in Central and South American Nitidulidae, as other genera (i.e. *Stelidota*, *Epuraea*, *Psilotus* (Cline 2004b)) also have endemic species in mid- to high elevation cloud forests.

## *Pocadius falini* Cline new species

(Figs. 22, 61, 102, 143, 183, 218)

**Type Material Examined.** HOLOTYPE ♂ (SNEC): PARAGUAY: Itapua; Yatai, prop. Hostettler family ; San Rafael Reserve, 100m ; 26°38'17"S 55°39'50"W ;21-25 NOV 2000, Z.H. Falin; PAR1F00 040; ex. flight intercept trap / SM0258682; KUNHM-ENT [barcode label] / HOLOTYPE; Pocadius; falini; A.R. Cline des. 2004. 3 PARATYPES (SNEC): same data label as holotype but with barcode # SM0258640, SM0564420, SM0564350and PARATYPE designation labels.

**Diagnosis.** This species is similar to *P. crypsis* and *P. coxus* but can be differentiated from them and the other Neotropical fauna by the following characters: male pygidium with distinctly concave apical margin, uniformly dark reddish brown coloration with antennal club darker, posterior prosternal wall perpendicular, anterior pronotal margin nearly truncate, elongate elytral fimbriae, alternating erect and semi-erect rows of setae on elytra, mentum distinctly pentagonal, pronotum with trapezoidal anterior margin, protibia with deep outer apical notch, terminal antennomere with two elliptical sensillar regions, abdominal sternites 2-4 with three organized rows of punctures, ejaculatory rods elongate and not split, basal piece of internal sac sclerites with lateral arms wrapping around middle ovoid section, tegmen with two apical depressions, and median lobe large and robust with acute apex and complex internal structure.

**Description.** Length 4.35mm, Width 2.7mm, Depth 2.0mm. Body large and robust, convex, surface moderately shining, dark chestnut brown in color with venter somewhat lighter. Pronotum and elytra margins with elongate fimbriae, setae longer than width of antennal scape. Dorsal and ventral pubescence quite long.

Head surface densely, deeply, irregularly punctate, punctures larger on vertex, becoming somewhat smaller towards orbits and fronotclypeal region. Larger punctures ~5X diameter of eye facet, smaller punctures ~2X diameter; interspaces smooth to finely alutaceous, shining. Each puncture gives rise to an elongate curved golden seta. Pronotal surface with large punctures ~1.5 diameter of large punctures on vertex of head, interspersed with relatively few smaller punctures, ~0.5 size of larger ones; interspaces alutaceous to finely microreticulate, about 0.75-1 diameter apart. Each puncture gives rise to a long, curved, golden seta. Scutellar surface with very few vague shallowly impressed punctures, some punctures giving rise to setae, and the interspaces are alutaceous and 3-4 diameters apart. Elytral surface with serial rows of alternating large and small deep punctures, rows not clearly organized, rows of smaller punctures sometimes with multiple smaller punctures instead of the typical single row. Smaller punctures minute, 0.5-0.75 diameter of smaller ones on pronotum, larger punctures are ~2X diameter of smaller ones. Smaller punctures giving rise to an erect long golden seta, larger punctures giving rise to a semi-erect long golden seta; interspaces narrow between punctures of a given row and broad between different rows. Within a row, small punctures are separated by ~1 puncture width, and large punctures by 0.5-0.75 puncture diameter. Larger rows are separated by1-2 large puncture diameters. Interspaces moderately shining but variable from alutaceous to finely granulate with some microreticulations in sculpture. Pygidium densely punctate, punctures equal in size to larger ones on pronotum, each puncture giving rise to a moderately long golden seta; interspaces narrow, 0.25-0.5 diameter, with alutaceous to granular sculpture.

Venter with similar long golden pubescence as dorsum. Mentum with minute very shallow punctures, equal in size to smaller ones on vertex, each giving rise to a golden seta. Interspaces granular to finely microreticulate. Submentum and gula similar in punctation to mentum but with interspaces more granular. Prosternum and epimeron deeply irregularly punctate, punctures on epimeron equal to large ones on vertex those on prosternum slightly smaller, interspaces alutaceous to granular with microreticulate areas, prosternal punctures separated by 0.5-1 diameter, those on the epimeron by 0.25 to 0.5 diameter. Mesosternum with shallow punctures, equal in size to large ones on vertex, interspaces alutaceous to granular, separated by about 0.5 to 1 diameter, and aggregated near the metasternum. Metasternum irregularly punctate, with moderately faint large punctures on disc 1.5 diameter of those on mesosternum, interspaces alutaceous to granular on metasternal disc and similarly sculptured laterally, punctures separated by ~0.5-1 diameter on disc. Abdominal sternite 1 with large moderately faint punctures, punctures equal to those on metasternum, interspaces alutaceous to granular, separated by ~1 diameter. Abdominal sternites 2-4 with three irregular rows of punctures, one row near anterior margin another near posterior margin and midway between the anterior and posterior margins, punctures similar in size to those on metasternum, rows separated by 1 puncture diameter, punctures within rows separated by ~0.5 punctures width.

Hypopygidium with moderately deep punctures, similar in size to those on sternites 2-4, interspaces granular, punctures separated by 0.5-1 puncture diameter.

Head slightly wider than long (W:L = 1.66:1), fronotclypeal region moderately projecting anteriorly. Labrum with broad concavity at anterior margin. Antennal club compact, ovoid, asymmetrical with the last antennomere longer than the previous two combined. Antennomeres 7-8 characteristically disc-like, 6 is trapezoidal, and 4-5 are somewhat cuboidal. Antennal scape asymmetrical, somewhat hemispherical, 1.8 times as long as pedicel. Pedicel subcylindrical in shape. Antennal segment 3 subequal in length to pedicel. Antennal club large, ~0.75 length of segments 1-8 combined. Antennal grooves very deep and widely excavate, slightly converging posteriorly. Lateral mental/submental ridge prominent, at level of submentum, ridge with oblique and longitudinal microreticulations and sulcus with minute punctures and granulate sculpturing. Mentum with anterior angles narrowly rounded, anterior margin angulate, entire structure pentagonal when viewed ventrally and somewhat convex laterally.

Pronotum widest near middle (L:W = 1:1.77), anterior margin distinctly trapezoidal, posterior margin moderately convex. Scutellum large, triangular, apex acute. Prosternal process narrowed between procoxae, apex acuminate, in lateral aspect the posterior portion is 0.5 length of anterior portion and there is a moderate convexity over the procoxae. Posterior apical wall prominent and perpendicular. Mesosternum extending to midway between mesocoxae, evenly concave for reception of the metasternum. Metasternum much wider than long (W:L = 3:1). Metepisternum with slight medial constriction, oblique line dividing anterior 0.20 of structure. First abdominal sternite with broad process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-3 subequal in length, the fourth slightly larger than the preceding two. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth very prominent, slightly longer than tarsomere 1and part of 2 combined. Outer apical notch with ~90° angle, notch depth deep, equal to length of tarsomere 1 and part of 2 combined. Inner apical spine subequal in length to tarsomeres 1. Protibia not heavily armored but with characteristic dense patch of stiff setae along the inner apical region. Mesotibia more heavily armored than protibia with more dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process moderately robust, somewhat larger than protibia process. Inner apical spine equal in length to tarsomeres 1-2 and part of 3 combined. Metatibia more heavily armored than either protibia or mesotibia with longer and more numerous setae and spines, inner apical spine slightly shorter than mesotibial spine.

Male genitalia well sclerotized. Anal sclerite with broadly curved region ventrally (Fig. 22); apex moderately fimbriate; apex with an acute apex. Spiculum gastrale with wide lateral flanges, medial margins concave, numerous long stiff setae originating from apex (Fig. 61). Tegmen evenly narrowly rounded apically (Fig. 102), much longer than wide (w:l = 1.0:3.1), lateral row of setae visible from the apex of the median fossa around the tegminal apex, two shallow concavities in apical half with numerous short stiff setae laterally but not extending around apex, basal notch perpendicular, basal margin with slight concavity. Median lobe elongate with slight medial constriction, ~0.5 the length of the tegmen, apex with acute point, apical opening well-developed with inverted bilobed structure (Fig. 143). Ejaculatory rods greatly elongate and not fused to basal piece, nearly straight with somewhat enlarged apex. Basal piece of internal sac sclerites globular with lateral arms partially wrapping around central region (Fig. 183).

Female genitalia moderately sclerotized. Paraprocts large with sclerotization only along median line to apico-lateral angles. Gonocoxite with two basal lateral prominences, basal ridge well-sclerotized. Gonocoxal apices with recurved “tooth” absent. Two primary setae originate from small depressions on the gonocoxal apices. Intragonocoxal invagination extremely deep, ~0.75 length of gonocoxite (Fig. 218).

**Variation.** Some specimens are slightly lighter in color than the holotype.

**Seasonality/Habitat.** Specimens were collected in late November in a lowland tropical forest.

**Distribution.** Known from the type locality in southern Paraguay.

**Notes.** No host information is available for this species.

**Etymology.** Specific epithet honors Zack Falin, collection manager of the Snow Entomological Collection, for the collection of the specimens and his generosity during the course of this study.

### *Pocadius femoralis* Cline new species

(Figs. 219)

**Type Material Examined.** HOLOTYPE ♀ (SNEC): VIETNAM: Dong Nai; Cat Tien National Park, near Park Hqtrs.; 11°25'23"N, 107°25'41"E, 120m; 27-31 MAY 1999, B. Hubley, N. Tatmic; VIET1H95-99 039, ex. malaise trap / SM0189129; KUNHM-ENT [this is a bar code label] / HOLOTYPE; Pocadius; femoralis; A.R. Cline des. 2004.

**Diagnosis.** This species is somewhat similar to *P. decoratus* and *P. martini*, which are also known from SE Asia. This species can be easily delimited from all other Old World species by the following suite of characters: small body size, unique color pattern including all femora and tibia darkly colored, integument sparsely shining, scutellum not triangular, broad abdominal process, metasternal disc with few minute punctures, outer protibial notch extremely deep, prosternal process enlarged laterally posterior to procoxae, and ovipositor with greatly reduced gonocoxal extensions that are present only as short extensions.

**Description.** Length 3.0mm, Width 2.0mm, Depth 1.2mm. Body moderately convex; surface sparsely shining; head, prosternum, sides of pronotum, elytral apices and legs dark brown with rest of body light red-brown. Pronotum and elytra margins with rather short fimbriae, setae subequal in length to that of antennal scape. Dorsal and ventral pubescence moderately long and fine.

Head surface densely, deeply, irregularly punctate, punctures larger on vertex, becoming somewhat smaller towards orbits and fronotclypeal region, very few smaller punctures present and not at all on vertex. Larger punctures 4-5X diameter of eye facet, smaller punctures 2X diameter. Interspaces smooth to finely alutaceous, shining. Each puncture gives rise to a moderately long curved golden seta. Pronotal surface with large punctures equal in size to large punctures on vertex of head, interspersed with relatively few smaller punctures, ~0.33 size of larger ones, smaller punctures closely adjacent to the anterior margin of the larger ones; interspaces alutaceous, ~1-1.5 diameters apart. Most punctures give rise to a moderately long curved golden seta. Scutellar surface with very few vague shallowly impressed small punctures, equal to small ones on pronotum, some punctures giving rise to setae, interspaces alutaceous to granular. Elytral surface with serial rows of alternating large and small deep punctures. Smaller punctures are equal in size to smaller ones on pronotum, larger punctures are ~2.5 times diameter of smaller ones. Smaller punctures giving rise to an erect long golden seta, larger punctures giving rise to a shorter decumbent golden seta. Interspaces narrow between punctures of a given row and between different rows. Within a row, small punctures are separated by ~1 puncture diameter, and large punctures by 0.25 puncture diameter. Large rows are separated by 0.75-1.0 puncture diameter. Interspaces sparsely shining but variable from alutaceous to granular with finely microreticulate regions. Pygidium densely punctate, punctures equal in size to large ones on pronotum, each puncture giving rise to a moderately long golden seta; interspaces narrow, 0.25 diameters, with granular sculpture.

Venter with similar golden pubescence as dorsum. Mentum with minute shallow punctures, equal in size to smaller ones on vertex, each giving rise to a seta; interspaces granular. Submentum and gula with punctures 2X diameter of those on mentum and with interspaces completely granular. Prosternum and epimeron deeply irregularly punctate, punctures equal to larger ones on vertex on epimeron and slightly smaller on prosternum, interspaces alutaceous to granular with some microreticulate areas, prosternal punctures separated by 0.5-1 diameter, those on the epimeron by 0.25 diameter. Mesosternum with shallow punctures, equal to larger ones on vertex, interspaces alutaceous to granular separated by about 0.5diameter and aggregated near metasternum. Metasternum irregularly punctate, with moderate faint punctures on disc similar in size to smaller ones on lateral region of head, interspaces smooth on metasternal disc becoming microreticulate and granular laterally, punctures separated by ~1-2 diameters on disc and more densely aggregated laterally. Abdominal sternite 1 with large faint, almost obsolete punctures, punctures equal to large ones on vertex, interspaces alutaceous with numerous microreticulate regions, separated by ~1 diameter. Abdominal sternites 2-4 with two irregular rows of large punctures, one row near anterior margin and the other near posterior margin, punctures similar in size to those on mesosternum, rows separated by 0.5 puncture diameter, punctures within rows separated by ~0.25-0.5 punctures diameter. Rows on abdominal sternite 4 becoming less organized. Hypopygidium with moderately deep punctures, similar in size to those on sternites 2-4, interspaces mostly granular, punctures separated by 0.25-0.5 puncture diameter.

Head wider than long (W:L = 1.5:1), fronotclypeal region moderately projecting anteriorly. Labrum with narrow medial incision at anterior margin. Antennal club compact, oval, slightly asymmetrical with the last antennomere slightly longer than the previous two combined. Antennomeres 4-8 more or less compact, with 7-8 characteristically disc-like, and 4-6 appearing trapezoidal. Antennal scape asymmetrical, distinctly hemispherical, 1.5 times as long as pedicel. Pedicel barrel-like in shape. Antennal segment 3 equal in length to pedicel. Antennal club large, ~0.90 length of segments 1-8 combined. Antennal grooves very deep and widely excavate, slightly converging posteriorly. Lateral mental/submental ridge prominent, at level of submentum, ridge with all oblique microreticulations and corresponding sulcus with minute punctures and microreticulations. Mentum with anterior angles obsolete, anterior margin broadly hemispherical, entire structure transversely hemispherical ventrally and laterally somewhat convex.

Pronotum widest near posterior angles (L:W = 1:2), anterior margin broadly shallowly concave, posterior margin moderately convex, lateral margins slightly arcuate to anterior angles. Scutellum large, obtusely hemispherical, apical angle obsolete. Prosternal process somewhat narrowed between procoxae, apex widely expanded posterior to procoxal cavities and somewhat acuminate, in lateral aspect the structure is mostly flattened with a slight convexity over the coxae. Posterior apical wall moderately prominent and perpendicular. Mesosternum extending to midway between mesocoxae, evenly convexly shaped for reception of the metasternum. Metasternum much wider than long (W:L = 3.2:1.0). Metepisternum with slight medial constriction, oblique line dividing anterior 0.10 of structure. First abdominal sternite with broad process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-3 subequal in length, the fourth slightly larger than the preceding two. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth prominent, slightly longer than tarsomeres 1 and part of 2 combined. Outer apical notch with ~85° angle, notch depth deep, equal to length of tarsomere 1-2 combined. Inner apical spine short, subequal in length to tarsomere 1. Protibia not heavily armored but with characteristic dense patch of stiff setae along the inner apical region. Mesotibia more heavily armored than protibia with more dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process moderately elongate and robust, slightly larger than protibia process. Inner apical spine equal in length to tarsomeres 1-2 combined. Metatibia with armature similar to that of mesotibia, but outer apical process and inner apical spine longer and more robust.

Male genitalia not observed.

Female genitalia moderately sclerotized (Fig. 218). Paraprocts elongate with sclerotization only along median line and not extending to baso-lateral angles. Gonocoxite with one basal lateral prominences, basal ridge well-sclerotized with two short oblique baculi extending apically. Gonocoxal apices extremely reduced, present only as short extensions, narrowly separated by short concavity. Two primary setae originate from small depressions near the gonocoxal apices.

**Variation.** Known only from the single holotype female.

**Seasonality/Habitat.** Specimen collected from late May in the forested region of Dong Nai.

**Distribution.** Known only from the type locality in southern Vietnam.

**Notes.** No fungal hosts are known for this species.

**Etymology.** Specific epithet denotes the distinctive darkened femora.

## ***Pocadius ferrugineus*** **(Fabricius)**

(Figs. 23, 62, 103, 144, 184, 220)

**Non-Type Material Examined.** >250 specimens from throughout the Palearctic including material from Austria, Belgium, Czech Republic, Denmark, England, France, Germany, Hungary, Italy, Lithuania, Poland, Russia, Spain, Sweden, Switzerland, and Ukraine.

**Diagnosis.** This species can be distinguished from the sympatric Palearctic *P. adustus* by the following characters: distinctly shorter pronotal and elytral fimbria, protibial notch deeper, antennal pedicel shorter, terminal antennomere with different sensillar region, anal sclerite more broadly convex, apico-lateral angles of eighth abdominal sternite less developed, tegmen with more diffused/scattered inner rows of setae, median lobe more rectangular with almost perpendicular sides, basal piece of ejaculatory rods more elongate, gonocoxites of ovipositor with fewer elongate setae.

**Redescription.** Length 3.8 mm, Width 2.1mm, Depth 1.8mm. Body moderately convex, surface somewhat shining, reddish-brown to dark reddish brown in color, sometimes with head, pronotum and antennal club slightly darker. Pronotum and elytra margins with moderately long fimbria, setae only slightly longer than width of antennal scape. Dorsal and ventral pubescence moderate in length.

Head surface deeply, irregularly punctate, punctures larger on vertex with a few interspersed smaller ones, becoming predominantly smaller towards orbits and fronotclypeal region. Larger punctures 5 X diameter of eye facet, smaller punctures ~3 X diameter. Interspaces smooth to alutaceous becoming somewhat granular in fronotclypeal depression, moderately shining. Each smaller puncture gives rise to an elongate curved golden seta. Eyes finely faceted. Pronotal surface with large punctures equal in size to large punctures on vertex of head, interspersed with relatively few smaller punctures, equal in size to smaller punctures on head. Interspaces smooth to alutaceous, large punctures about 0.25-0.5 diameters apart. Each smaller puncture gives rise to a moderately long somewhat curved golden seta. Scutellar surface with few moderately impressed punctures ~0.75 diameter of large punctures on pronotum, some but not all punctures giving rise to setae, interspaces smooth with some microreticulation present.  Elytral surface with serial rows of alternating large and small deep punctures.  Smaller punctures are equal in size to smaller ones on pronotum, larger punctures are ~2.5-3 times diameter of smaller ones.  Smaller punctures giving rise to a semi-decumbent moderately long golden seta, larger punctures giving rise to a shorter completely decumbent golden seta.  Interspaces not narrow between punctures of a given row and between different rows.  Within a row, small punctures are separated by ~2 puncture diameters, and large punctures by 0.5-0.75 puncture width.  Rows are separated by 1.0-1.5 large puncture diameters.  Interspaces moderately shining but variable from smooth to somewhat granular in sculpture.  Pygidium densely punctate, punctures equal in size to smaller ones on pronotum, each puncture giving rise to a short stiff golden seta.  Interspaces narrow, 0.33-0.5 diameter, with alutaceous to granular sculpture.

Venter with similar moderate golden pubescence as dorsum.  Mentum with large very shallowly impressed punctures, equal in size to larger ones on vertex, each giving rise to a short golden seta.  Interspaces alutaceous to finely granular.  Submentum and gula similar in punctation to mentum but with interspaces becoming more granular.  Prosternum and epimeron irregularly punctate, punctures equal to those on mentum, interspaces alutaceous to granular, prosternal punctures separated by 0.5 diameter, those on the epimeron by 0.5-0.75 diameter.  Mesosternum with smaller somewhat deeper punctures than prosternum, about 0.75 diameter of those on prosternum, interspaces alutaceous to granular, separated by about ~1 diameter.  Metasternum irregularly punctate, with moderate faint punctures on disc similar in size to those on mesosternum, interspaces smooth to slightly alutaceous on metasternal disc becoming microreticulate to granular laterally, punctures separated by ~1-3 diameters on disc.  Abdominal sternite 1 with moderately impressed punctures, punctures equal to those on metasternum, interspaces alutaceous to granular, separated by ~0.5-1 diameter. Abdominal sternites 2-4 with a faintly defined irregular row of punctures along posterior margin, the rest of the sternite has moderately impressed punctures, interspaces 0.25-0.66 diameters apart and mostly granular surface sculpture. Hypopygidium with moderately deep punctures, similar in size to those on sternites 2-4, interspaces granular, punctures separated by 0.25-0.33 puncture diameter.

Head wider than long (L:W = 1:1.8), fronotclypeal region moderately projecting anteriorly. Vertex with distinct deep concavity between orbits near fronotclypeal region. Eyes large, moderately protruding. No prominence over antennal insertion. Labrum with small shallow concavity at anterior margin. Antennal club compact, oval, mostly symmetrical with the last antennomere subequal to the previous two combined. Antennomeres 6-8 more or less compact, with 7-8 characteristically disc-like. Antennal scape broadly asymmetrical, somewhat hemispherical, 2.1 times as long as pedicel. Pedicel subcylindrical, somewhat barrel-shaped. Antennal segment 3 subequal in length to pedicel, becoming narrowed proximally. Antennal club somewhat large, ~0.55 length of segments 1-8 combined. Each club segment with dense short setae, and only relatively few protruding setae. Antennal grooves deep and widely excavate, slightly converging posteriorly. Lateral mental ridge prominent, at level of submentum, medially the ridge is longitudinally sculptured with microreticulations and laterally with oblique to longitudinal microreticulations. Mentum with anterior angles obsolete, anterior margin broadly hemispherical, lateral margins nearly perpendicular, entire structure flattened.

Pronotum widest near posterior angles (L:W = 1:2.0), anterior margin broadly trapezoidal to moderately concave, posterior margin moderately convex with concavity near posterior corners, lateral margins more or less evenly arcuate to posterior angles. Scutellum large, obtusely triangular, apex rounded. Prosternal process somewhat narrowed between procoxae, apex somewhat acuminate, in lateral aspect the structure is convex posterior-medially. Posterior apical wall prominent and only slightly oblique. Mesosternum extending to 0.75 length of mesocoxae, evenly and broadly concave for reception of the metasternum. Metasternum width to length ratio is ~2.25:1.0. Metepisternum with only slight medial constriction, oblique line dividing anterior 0.18 of structure. Elytral humeri moderately produced, lateral margin very narrow. First abdominal sternite with broadly rounded process between metacoxae. First sternite ~1.8X's longer than second sternite. Sternites 2-3 subequal in length, the fourth slightly larger than the preceding two. Hypopygidium 0.88 length to first abdominal sternite.

Protibia with apical tooth slightly prominent, subequal in length to 0.5 tarsomere 1. Outer apical notch with ~130° angle, notch depth moderately deep, equal to length of tarsomere 1 and part of 2 combined. Inner apical spine subequal in length to tarsomeres 1 and small part of 2 combined. Protibia not heavily armored but with characteristic dense patch of stiff setae along the inner apical region. Mesotibia more heavily armored than protibia with more dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process moderately elongate, larger than protibia process, and apical margin with row of flat teeth. Inner apical spine equal in length to tarsomeres 1-2 combined. Metatibia with armature similar to that of mesotibia, including row of flat teeth on apical margin.

Male genitalia well-sclerotized. Anal sclerite with large broadly curved region anteriodorsally (Fig. 23); apex fimbriate; ventrally with a broad medial concavity approaching apex. Spiculum gastrale with wide broadly convex lateral flanges, medial margins narrowly concave, short stiff setae originating from apex and also anteapically (Fig. 62). Tegmen evenly rounded apically (Fig. 103), much longer than wide (w:l = 1.0:2.25), lateral row of setae visible from the median fossa around the apex, small shallow concavity in apical third, basal notch perpendicular, basal margin angulate. Median lobe large and robust, ~0.5 the length of the tegmen, apex acuminate, lateral margins nearly perpendicular, apical opening well-developed (Fig. 144). Ejaculatory rods not fused to basal piece or each other, straight with slight outward expansion apically. Basal piece of rods separated, with two lunate shaped pieces coming to sharp apical point (Fig. 184).

Female genitalia moderately sclerotized. Paraprocts large with sclerotization only along median line. Gonocoxite with two basal lateral prominences, basal ridge well-sclerotized. Baculi extending medially from gonocoxites base, length equal to ~0.5 gonocoxal invagination. Gonocoxal apices with recurved "tooth" present. No primary elongate setae originate from small grooves along the side of the gonocoxal tooth apices (Fig. 220).

**Variation.** Overall length of specimens can vary greatly, but typically females are somewhat larger than males.

**Seasonality/Habitat.** Specimens that were available for this study indicate that most collections of this species occurred from May through October in forested regions of the Palearctic.

**Distribution.** This species has the most extenisve distribution of any known *Pocadius*. *Pocadius ferrugineus* is known from Scandinavia south through the Iberian peninsula, west through Turkey parts of the Middle East and Central Asia, and as far west and north as the Kamchatka peninsula in northwestern Russia. Kirejtshuk (1992) also proposes the species is known from Malaysia, however, this record seems suspect and should be confirmed.

**Notes.** This species has the most catholic diet of Lycoperdaceae genera known amongst the *Pocadius* having been reported from species of *Lycoperdon*, *Calvatia*, *Bovista*, *Langermannia*, and *Scleroderma*, as well as non-Gasteromycetes taxa (Audisio 1993).

## ***Pocadius fulvipennis* Erichson**

(Figs. 24, 63, 104, 145, 185, 221)

**Type Material Examined.** HOLOTYPE ♀ (Humboldt, Berlin): 8641 / HOLOTYPUS; Pocadius; fulvipennis; Erichson, 1843 / fulvipennis; Er.; Mexico, Ehrenb.

**Non-Type Material Examined.** >400 specimens from western and southwestern North America. Most specimens were collected from Mendocino, Marin, Santa Cruz, Trinity, Sonoma, San Matco, and Alameda Counties in California. Other specimens were identified from Arizona, Oregon and Washington in the U.S. and British Columbia, Canada. The following are new distribution records for the species: IDAHO: Valley Co.; Round Valley, David M. Ward Jr. collr.; ex. puffball; 25-JUN-1995. IDAHO: Bonner Co.; Sandpoint, N.M. Downie; VII-8-1971 (FMNH).

**Diagnosis.** Easily distinguished from the other Nearctic species by the following characters: pronotum and head always darker in color than elytra, though elytral apices may sometimes be as dark as the head and pronotum; terminal antennomeres with distinct sensillar region, prominent tibial armature, granular mental-submental sulcus, relatively broad abdominal process, very slender concavity for reception of the tegmen on the anal sclerite, eighth abdominal sternite with dense elongate brush of setae apically, apex of tegmen characteristically indentate, median lobe with well-developed acuminate apex and concave lateral margins, ejaculatory rods thick and robust and abutting each other and basal piece, and gonocoxites with two elongate primary setae.

**Redescription.** Length 3.8 mm, Width 2.0mm, Depth 1.1mm. Body moderately convex, surface shining, dark reddish-brown to dark brown in color, elytra always lighter in color, varying from light brown to light red-brown. Pronotum and elytra margins with extremely elongate fimbriae, setae more than 2X's longer than width of antennal scape. Dorsal and ventral pubescence overall quite elongate and light golden in color.

Head surface deeply, irregularly punctate, punctures larger on vertex, becoming somewhat smaller towards orbits and with only small punctures on fronotclypeal region. Larger punctures 4-5 X's diameter of eye facet, smaller punctures ~3 X's diameter. Interspaces smooth to alutaceous, shining, 0.5-0.75 diameter of large puncture apart. Each smaller puncture gives rise to an elongate moderately curved golden seta. Eyes finely faceted. Pronotal surface densely punctate with large punctures equal in size to large punctures on vertex of head, interspersed with relatively few smaller punctures, ~0.75 size of larger ones. Interspaces smooth to alutaceous, about 0.25-0.75 large puncture diameters apart. Each puncture gives rise to a long curved golden seta. Scutellar surface with large impressed punctures mostly in basal 0.5 of structure, some punctures giving rise to setae, with interspaces alutaceous to granular. Elytral surface with serial rows of alternating large and small deep punctures. Smaller punctures are equal in size to large ones on pronotum, larger punctures are ~2.5 times diameter of smaller ones. Smaller punctures giving rise to a semi-erect long golden seta, larger punctures giving rise to a decumbent shorter golden seta. Interspaces moderately well separated between punctures of a given row and between different rows. Within a row, small punctures are separated by 1-2 puncture diameters, and large punctures by 0.75-1.0 puncture width. Large puncture rows are separated by 1.0-1.5 puncture diameters. Interspaces shining but variable from finely alutaceous to granular in sculpture. Pygidium densely punctate, punctures equal in size to larger ones on pronotum, each puncture giving rise to a moderately long straight golden seta. Interspaces narrow, 0.5-0.75 diameters, with micro-reticulate to granular surface sculpture.

Venter with somewhat shorter golden pubescence as dorsum. Mentum with large moderately impressed punctures, equal in size to larger ones on vertex, each giving rise to a moderately long seta. Interspaces smooth to finely alutaceous. Submentum and gula similar in punctation to mentum but with interspaces alutaceous to microreticulate. Prosternum and epimeron deeply irregularly punctate, punctures slightly larger than those on mentum, ~1.5X diameter, interspaces microreticulate with some granular areas, prosternal punctures separated by 0.25-0.5 diameter, those on the epimeron by ~0.5 diameter. Mesosternum with deeply impressed punctures, about 1.25-1.5 diameter of those on prosternum, interspaces alutaceous to granular, separated by about 0.5 diameter. Metasternum irregularly punctate, with moderately deep punctures on disc similar in size to those on mentum, interspaces smooth to alutaceous on metasternal disc becoming alutaceous to granular laterally, punctures separated by ~1-2 diameters on disc. Abdominal sternite 1 with large moderately impressed punctures, punctures equal to those on metasternum, interspaces alutaceous with some microreticulation present, separated by ~1-1.5 diameter. Abdominal sternites 2-4 with one irregular disorganized rows of punctures near the posterior margin, punctures similar in size to those on metasternum, punctures separated by 0.5-1 diameters. Hypopygidium with moderately deep punctures, similar in size to those on sternites 2-4, interspaces alutaceous to granular with some microreticulation present, punctures separated by 0.25-0.5 puncture diameters.

Head slightly wider than long (W:L = 1:1.3), fronotclypeal region moderately projecting anteriorly. Vertex with shallow and broad concavity between orbits near fronotclypeal region. Labrum with narrow incision at anterior margin. Antennal club compact, oval, symmetrical with the last antennomere subequal in length to the previous two combined. Antennomeres 6-8 more or less compact, with 7-8 characteristically disc-like. Antennal scape asymmetrical, distinctly hemispherical, ~2 times as long as pedicel. Pedicel subcylindrical, approximately barrel-shaped. Antennal segment three ~0.8 length of pedicel. Antennal segments four and five cuboid and equal in length. Antennal club large, ~0.8 length of segments 1-8 combined. Each club segment with several dense short setae protruding. Antennal grooves very deep and widely excavate, converging posteriorly. Lateral mental ridge prominent and elongate, at level of submentum, medially the ridge is granular with few transversely sculptured microreticulations. Mentum broadly pentagonal with anterior angles broad but distinct, lateral sides short but perpendicular, anterior margin coming to acute medial apex, entire structure flattened.

Pronotum widest near posterior angles (L:W = 1:2.2), anterior deeply distinctly trapezoidal, posterior margin broadly convex, lateral margins arcuate from posterior to anterior angles. Scutellum large, broadly triangular, apex broadly rounded. Prosternal process broadly narrowed between procoxae, apex broadly rounded, in lateral aspect the anterior and posterior ends are not prominent and convex in posterior 0.33 and angulate in anterior 0.66. Posterior apical wall not prominent, short, and perpendicular. Mesosternum extending to midway between mesocoxae, evenly broadly concave for reception of the metasternum. Metasternum width to length ratio is ~2.38:1.0. Metepisternum with slight medial constriction, oblique line dividing anterior 0.125 of structure. Elytral humeri moderately produced, lateral margin very narrow. First abdominal sternite with broadly rounded process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-4 subequal in length. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth prominent, slightly longer than tarsomeres one and part of two combined. Outer apical notch with ~105° angle, notch depth moderate, subequal to length of tarsomere 1. Inner apical spine subequal in length to tarsomere one and part of two combined. Protibia heavily armored with characteristic dense patch of stiff setae along the inner apical region. Mesotibia more heavily armored than protibia with more dense stiff setae and an additional row of numerous slender spines along entire lateral edge. Outer apical process elongate and robust, larger than protibia process, equal to tarsomere one and two combined. Inner apical spine equal in length to tarsomeres 1-2 combined. Metatibia with armature similar to that of mesotibia, but setae longer and apical spine and process slightly more robust and longer.

Male genitalia well-sclerotized. Anal sclerite with large broadly curved region anteriodorsally (Fig. 24); apex somewhat fimbriate; ventrally with a narrow medial concavity approaching apex. Spiculum gastrale with broad wide lateral flanges, medial margins concave proximally, elongate stiff setae originating from apex (Fig. 63. Tegmen broadly emarginate apically (Fig. 104), much longer than wide (w:l = 1.0:3.2), lateral row of setae visible from the median fossa to around the apex, basal notch perpendicular, basal margin of phallobase broadly concave, three inner rows of setae present. Median lobe large and robust with lateral margins concave and apex sharply acuminate, ~0.66 the length of the tegmen, apical opening not well-developed (Fig. 145). Ejaculatory rods not fused to basal piece but directly adjacent to it, and adjacent to each other apically and basally, slightly curved outwardly. Basal piece of rods with deep medial concavity extending almost 0.75 length of structure, proximally with three sharp projections, fused basally but not apically (Fig. 185).

Female genitalia moderately sclerotized. Paraprocts large with sclerotization along median line to baso-lateral angles. Gonocoxite with two basal lateral prominences, basal ridge well-sclerotized. Two elongate baculi extending down median region of gonocoxites, ~0.5 length of gonocoxal extension. Gonocoxal apices with recurved "tooth" present. Two primary setae originate from small depressions on the sides of the gonocoxal teeth (Fig. 221).

**Variation.** Some specimens have elytral lateral and apical margins darker than rest of elytra, some specimens may also have a lighter pronotal lateral margin. Some specimens from Idaho are more slender in overall body shape, but have all other features similar to holotype. Females are slightly larger than males, and the male pygidial apex broadly shallowly concave.

**Seasonality/Habitat.** Most specimens have been collected from lowland deciduous/mixed deciduous forests from March through October.

**Distribution.** This species occurs from British Columbia, Canada in the north southward through the western U.S. and into parts of Mexico. Other than the holotype, the author has encountered relatively few specimens from Mexico (e.g. six specimens). Clearly more collection efforts in NW Mexico and Baja California are needed to verify the southern limits of the range of this species.

**Notes.** Larval specimens of this species were successfully reared from *Lycoperdon* puffball spores mixed 0.5:0.5 with rust spores by Lorin Gillogly. Gillogly noted on labels that the process of maturation from larvae to adult took approximately 1-2 months on this medium. However, no definitive information was provided regarding the stage of larval development from which this rearing process was initiated. Specimens reared on this diet were smaller than others of the species. Other host records include *Calvatia giganteum*.

### *Pocadius fumatus* Jelínek

(Figs. 25, 64, 105, 146, 186, 222)

**Type Material Examined.** 1 PARATYPE (Czech Republic): Brazil, Sao Paulo; J. Mráz lgt.

**Non-Type Material Examined.** 12 specimens (CMN): ARG: Salta Prov.; 45km W Salta, 1950m; 1-29-XII-87, El Alisal; S&J Peck, moist ravine; thicket, malaise-FIT.

**Diagnosis.** As suggested by Jelínek (1977) *P. fumatus* is closely related to *P. dimidiatus*, but can be readily distinguished from it by the following suite of characters: surface of head smooth and shining with no rugose or microreticulate regions, overall large body size, terminal antennomere less broadly hemispherical and with distinct depressed area, protibial outer apical tooth only somewhat anteapical with very short small outer apical notch, serial row of large punctures on elytra widely separated, tegmen robust with complete inner row of setae and elongate apical furrow, median lobe with shallow bilobed opening, spiculum gastrale broadly flanged with elongate apical fimbria, ejaculatory rods fused basally, basal piece separated into two large sickle-shaped pieces, ovipositor with short baculi on gonocoxae and two primary and two secondary apical gonocoxal setae.

**Redescription.** Length 4.7 mm, Width 2.8mm, Depth 1.2mm. Body somewhat convex, surface shining, tan-brown to dark brown in color with posterior 0.66-0.75 of elytral dark brown, and sometimes with pronotal disc somewhat darker. Pronotum and elytra margins with moderately long fimbriae, setae subequal to slightly longer than width of antennal scape. Dorsal and ventral pubescence moderately long.

Head surface deeply, densely, irregularly punctate, punctures larger on vertex, becoming somewhat smaller towards orbits and fronotclypeal region, some smaller punctures interspersed with large ones on vertex. Larger punctures 5-6 X diameter of eye facet, smaller punctures 2-3 X diameter. Interspaces smooth and shining, ~0.5 diameter apart. Each smaller puncture gives rise to a moderately elongate golden seta. Eyes finely faceted. Pronotal surface with large punctures ~1.5 diameter to large punctures on vertex of head, interspersed with relatively few smaller punctures, which are subequal to size of larger ones on vertex. Interspaces smooth to finely alutaceous, about 0.25-0.5 diameters apart. Each smaller puncture gives rise to a thin golden seta, most seta are curved and not elongate. Scutellar surface evenly punctate with very moderately impressed punctures equal to large punctures on pronotum, some punctures giving rise to short thin golden setae, interspaces smooth to alutaceous. Elytral surface with serial rows of alternating large and small moderately impressed punctures. Smaller punctures are equal in size to smaller ones on pronotum, larger punctures are slightly larger than larger punctures on pronotum. Smaller punctures giving rise to a semi-erect to erect moderately long golden seta, larger punctures giving rise to a shorter decumbent golden seta. Interspaces narrow between punctures of a given row and wide between different rows. Within a row, small punctures are separated by ~1 puncture width, and large punctures by 0.33 puncture width. Larger puncture rows are separated by ~2 large puncture diameters. Interspaces always shining but variable from mostly smooth to finely alutaceous in sculpture. Pygidium densely punctate, punctures equal in size smaller ones on elytra, each puncture giving rise to a short semi-erect golden seta. Interspaces narrow, 0.33-0.5 diameters, with smooth to finely microreticulate sculpture.

Venter with similar moderately long golden pubescence as dorsum. Mentum with few very shallow punctures, equal in size to smaller ones on vertex, each giving rise to a short seta. Interspaces smooth to finely microreticulate. Submentum and gula similar in punctation to mentum but with interspaces completely having more distinct microreticulation present. Prosternum and epimeron shallowly irregularly punctate, punctures larger than those on mentum, interspaces smooth to alutaceous with some microreticulate areas, prosternal punctures separated by 0.25-0.5 diameter, those on the epimeron by 0.5-0.75 diameter. Mesosternum with shallow punctures aggregated along meso- metasternal border, equal in diameter to those on prosternum, interspaces mostly alutaceous, separated by about 0.5 diameter. Metasternum irregularly punctate, with moderately deep punctures on disc similar in size to those on mesosternum, interspaces smooth on metasternal disc becoming microreticulate to granular laterally, punctures separated by ~1 diameter. Abdominal sternite 1 with large faint, almost obsolete punctures, punctures subequal to those on metasternum, interspaces mostly alutaceous with abdominal process rugose, separated by ~0.5-1 diameter. Abdominal sternites 2-4 with an irregular row of punctures near posterior margin, punctures ~0.66 in size to those on metasternum, punctures within row separated by ~0.5 punctures width. Hypopygidium with moderately deep punctures, similar in size to those on sternites 2-4, interspaces smooth to alutaceous with some microreticulate areas, punctures separated by 0.5-1 puncture diameter.

Head wider than long (W:L = 1.43:1), fronotclypeal region moderately projecting anteriorly. Vertex with broad shallow concavity between orbits near fronotclypeal region. Labrum with deep distinct incision at anterior margin. Antennal club compact, oval, broadly asymmetrical with the last antennomere longer than the previous two combined. Antennomeres 6-8 more or less compact, with 7-8 characteristically disc-like. Antennal scape somewhat asymmetrical, broadly hemispherical, 1.33 times as long as pedicel. Pedicel subcylindrical in shape and elongate. Antennal segment 3 equal in length to pedicel. Antennal club large, ~0.68 length of segments 1-8 combined. Each club segment with dense short setae, and several longer protruding setae. Antennal grooves very deep and widely excavate, slightly converging posteriorly. Lateral mental ridge prominent, at level of submentum, medially the ridge is granularly sculptured with few microreticulations and laterally with oblique to longitudinal microreticulations. Mentum with anterior angles somewhat distinct and obtuse, anterior margin more or less angled to a central point, having an overall broadly pentagonal appearance, entire structure with little to no central convexity.

Pronotum widest in posterior third (L:W = 1:2), anterior margin broadly shallowly concave, posterior margin moderately convex, lateral margins less arcuate posteriorly. Scutellum large, triangular, apex narrowly rounded. Prosternal process somewhat narrowed between procoxae, apex somewhat acuminate, in lateral aspect the anterior and posterior ends are prominent with a distinct medial convexity. Posterior apical wall prominent and oblique (though in some Argentinean specimens not as dramatic as illustrated in Jelínek 1977). Mesosternum extending to midway between mesocoxae, evenly broadly concave for reception of the metasternum. Metasternum width to length ratio is ~2.6:1.0. Metepisternum with slight medial constriction, oblique line dividing anterior 0.15 of structure. Elytral humeri moderately produced, lateral margin very narrow. First abdominal sternite with acuminate process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-4 subequal in length. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth prominent, subequal in length to tarsomeres 1-2 combined. Outer apical notch absent. Inner apical spine subequal in length to tarsomeres 1 and most of 2 combined. Protibia not heavily armored but with characteristic dense patch of stiff setae along the inner apical region. Mesotibia more heavily armored than protibia with more dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process elongate and robust, larger than protibial process. Inner apical spine equal in length to tarsomeres 1-2 combined. Metatibia with armature similar to that of mesotibia, but with setae and spines slightly longer.

Male genitalia well-sclerotized. Anal sclerite transverse (Fig. 25); apex somewhat fimbriate; ventrally with a broad shallow medial concavity approaching apex. Spiculum gastrale with wide lateral flanges, medial margins straight, moderately long stiff setae originating from apex (Fig. 64). Tegmen evenly rounded apically (Fig. 105), much longer than wide (w:l = 1.0:2.56), lateral row of setae visible from the median fossa to prior to around the apex, elongate shallow concavity in apical third, basal notch obsolete, basal margin nearly straight, inner row of tegminal setae distinct and reaching apex. Median lobe large and robust, ~0.66 the length of the tegmen, apex narrowly rounded, apical opening well-developed with proximal and lateral concavity (Fig. 146). Ejaculatory rods not fused to basal piece but fused to each other in distal third, enlarged and expanded outward distally. Basal piece of rods with two separate sclerites, each more or less sickle shaped with distal swollen region (Fig. 186).

Female genitalia moderately sclerotized. Paraprocts large with sclerotization only along median line to baso-lateral angles. Gonocoxite with two basal lateral prominences, basal ridge well-sclerotized. Gonocoxal apices without recurved "tooth" present. Two primary and three secondary setae originate from small depressions on the gonocoxal apices (Fig. 222).

**Variation.** Some specimens with dark area on elytra more clearly delimited than others, two specimens with lighter area extending posteriorly on elytra near suture.

**Seasonality/Habitat.** This species is known from moist-wet forested areas. No seasonality information was recorded from the type series (Jelínek 1977), however, the Argentinean specimens suggest the species is active throughout December.

**Distribution.** Previously this species was known only from Brazil, the Argentina locality above denotes a new country record and range extension for the species.

**Notes.** No host fungal information is available for this species. The Argentinean specimens are evidence that this species is sympatric with the closely related *P. dimidiatus*, which is known from Argentina. Specimens of both species were collected at the same locality 45km W of Salta.

## *Pocadius fusiformis* Cline new species

(Figs. 26, 65, 106, 147, 187, 223)

**Type Material Examined.** HOLOTYPE ♂ (BMNH): INDONESIA; SULAWESI UTARA; Danau Mooat 1200m.; nr. Kotamobagu; 16 Feb. 1985 / Lower montane; forest; 1200-1400m / puffballs / HOLOTYPE; Pocadius; fusiformis; A. Cline des. 2004. 1 PARATYPE ♂ (BMNH): same data as holotype. 3 PARATYPES ♀ (BMNH): INDONESIA; SULAWESI UTARA; Gng. Ambang F.R.; nr. Kotamobagu; Jan. 1985 / Lower montane; forest; 1200-1400m / in mature puffballs. All specimens have a label turned upside down under the rest of the data labels, but prior to a type label with the following information: R. Ent. Soc. Lond.; PROJECT WALLACE; B.M. 1985-10. One of the female paratypes collected in January also has an additional label with the following information: 2 examples in; Mus. Bogoriense.

**Diagnosis.** This species is easily distinguished from the other Old World species by the following suite of characters: the characteristic color pattern consisting of a dark brown-black scutellum, pronotal disc, and elytra except for the anterior-medial fourth with the rest of the body light tan-brown; very short elytral pubescence that is decumbent in both the large and small serially punctate rows; greatly enlarged terminal antennomere; swollen/thickened tarsomeres; anal sclerite ending in acute apical point; elongate narrow tegmen and median lobe; ejaculatory rods with convex distal region; and ovipositor gonocoxites without recurved apical tooth and broadly rounded baso-lateral angles.

**Description.** Length 4.1mm, Width 2.3mm, Depth 1.5mm. Body moderately convex, surface shining, dark brown/black in color with elytral humeri, lateral pronotal margins, anterior half of head, venter, and appendages lighter. Pronotal and elytral margins with short fimbriae, setae shorter than length of antennal scape. Dorsal and ventral pubescence quite short and fine, light yellow in color.

Head surface moderately deeply, irregularly punctate, punctures larger on vertex with some interspersed smaller punctures, becoming somewhat smaller towards orbits and fronotclypeal region. Larger punctures 3-4X diameter of eye facet, smaller punctures ~2X diameter; interspaces smooth with some microreticulation present and distinctly shining. Each smaller puncture gives rise to a short seta. Pronotal surface with large punctures equal in size to large punctures on vertex of head, interspersed with relatively few smaller punctures, equal in size to smaller ones on head; interspaces smooth with areas of fine microreticulation, about 1-2 diameters apart. Each puncture gives rise to a short decumbent seta. Scutellar surface with few vague, shallowly impressed small punctures, equal to smaller ones on vertex, some punctures giving rise to short setae; interspaces smooth with fine microreticulate areas. Elytral surface with serial rows of alternating large and small deep punctures. Smaller punctures are equal in size to smaller ones on pronotum, larger punctures are ~3 times diameter of smaller ones. Smaller punctures giving rise to a decumbent short seta, larger punctures giving rise to a short decumbent seta. Interspaces broad between punctures of a given row and between different rows. Within a row, small punctures are separated by ~2-3 puncture diameters, and large punctures by ~1 puncture diameter. Larger rows are separated by ~2 large puncture diameters. Interspaces always shining but variable from smooth to finely microreticulate in sculpture. Pygidium densely punctate, punctures equal in size to larger ones on pronotum, each puncture giving rise to a short straight seta. Interspaces narrow, 0.25-0.5 diameter, shining with heavily microreticulate sculpture.

Venter with similar short pubescence as dorsum. Mentum with few moderately large shallow punctures, equal in size to larger ones on vertex, each giving rise to a short seta; interspaces smooth to alutaceous and finely microreticulate. Submentum and gula with smaller punctation, punctures ~0.5-0.75 diameter of those on mentum, and with interspaces more granular. Prosternum and epimeron irregularly punctate, punctures moderately impressed, those on epimeron equal to large punctures on elytra and those of prosternum to smaller elytral punctures, interspaces alutaceous with microreticulate areas, prosternal punctures separated by 0.5 diameter, those on the epimeron by 0.25 diameter. Mesosternum with shallow punctures, about 0.75 diameter of those on epimeron, interspaces alutaceous to somewhat granular, separated by about 0.5 to 1 diameter, and aggregated near metasternum. Metasternum densely irregularly punctate, with faint punctures on disc similar in size to those on mesosternum, interspaces granular on metasternal disc becoming microreticulate laterally, punctures separated by ~0.5-1 diameter. Abdominal sternite 1 with large faint, almost obsolete punctures, punctures equal to those on metasternal disc, interspaces granular with microreticulations, separated by ~0.5-1 diameter. Abdominal sternites 2-4 with irregular rows of punctures, punctures similar in size to those on metasternum, rows separated by 1-2 puncture diameters, punctures within rows separated by ~0.5 puncture diameter. Rows on abdominal sternite 4 becoming less organized. Hypopygidium with moderately deep punctures, similar in size to those on sternites 2-4, interspaces granular, punctures separated by 0.25-0.5 puncture diameter.

Head wider than long (L:W = 1:1.5), fronotclypeal region moderately projecting anteriorly. Vertex with deep transverse concavity between orbits near fronotclypeal region. Labrum with shallow concavity at anterior margin. Antennal club compact, somewhat globular, asymmetrical with the last antennomere greater in length than the previous two combined. Antennomeres 4-8 more or less compact, with 7-8 characteristically disc-like and 4-6 trapezoidal. Antennal scape asymmetrical, somewhat hemispherical, 1.4 times as long as pedicel. Pedicel subcylindrical in shape. Antennal segment 3 subequal in length to pedicel. Antennal club large, ~0.65 length of segments 1-8 combined. Antennal grooves very deep and widely excavate, slightly converging posteriorly. Lateral mental/submental ridge moderately prominent, at level of submentum, ridge with longitudinal microreticulations and the corresponding sulcus with minute punctures and granular sculpture. Mentum with anterior angles present, anterior margin angulate coming to an acute apex, entire structure transversely pentagonal ventrally and somewhat convex laterally.

Pronotum widest near middle (L:W = 1:2), anterior margin broadly trapezoidal to evenly concave, posterior margin moderately convex, lateral margins slightly arcuate to anterior and posterior angles. Scutellum large, obtusely triangular, apex broadly rounded. Prosternal process somewhat narrowed between procoxae, apex acuminate, in lateral aspect the posterior end is prominent and slightly upturned and steeply convex medially over the procoxae. Posterior apical wall prominent and perpendicular. Mesosternum extending to midway between mesocoxae, evenly concave for reception of the metasternum. Metasternum wider than long (L:W = 1:2.9). Metepisternum with slight medial constriction, oblique line dividing anterior 0.13 of structure. First abdominal sternite with broad process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-3 subequal in length, the fourth slightly larger than the preceding two. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth prominent, slightly longer than tarsomeres 1 and part of 2 combined. Outer apical notch with ~115° angle, notch depth shallow, equal to length of half of tarsomere 1. Inner apical spine subequal in length to tarsomeres 1-2 combined. Protibia not heavily armored but with characteristic dense patch of stiff setae along the inner apical region. Mesotibia more heavily armored than protibia with more dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process moderate, subequal in length to that of protibia process. Inner apical spine equal in length to tarsomeres 1-2 combined. Metatibia with armature similar to that of mesotibia, but with inner apical spine equal to tarsomeres 1-2 and part of 3 combined.

Male genitalia well-sclerotized. Anal sclerite with elongate narrowly curved region anteriodorsally (Fig. 26); apex sparsely fimbriate; ventrally with a medial concavity approaching apex in a broadly concave manner. Spiculum gastrale with narrow lateral flanges curved apically, medial margins biconcave, moderately long stiff setae originating from apex (Fig. 65). Tegmen evenly rounded apically (Fig. 106), much longer than wide (w:l = 1:3.7), lateral row of setae visible from the median fossa to prior to the apex, small shallow concavity in apical third, inner row of setae incomplete not attaining apex, basal notch perpendicular, basal margin deeply concave. Median lobe elongate, ~0.85 the length of the tegmen, apex rounded, apical opening well-developed with short bilobed internal structure (Fig. 147). Ejaculatory rods not fused to basal piece or each other but adjacent to one another almost the entire length, both rods swollen apically. Basal piece of rods with two elongate apico-lateral extensions (Fig. 187).

Female genitalia moderately sclerotized. Paraprocts large with sclerotization only along median line to apico-lateral angles. Gonocoxite with no basal lateral prominences, basal ridge well-sclerotized. Gonocoxal apices with recurved "tooth" absent. Four primary setae originate from small depressions on the gonocoxal apices. Intragonocoxal invagination shallow, <0.25 length of gonocoxite (Fig. 223).

**Variation.** Some specimens have more of the elytra and pronotal margin lighter in color. Females tend to be slightly larger.

**Seasonality/Habitat.** Specimens were collected during January and February from montane forests.

**Distribution.** Known from the type locality on the northern peninsula of Sulawesi, Indonesia.

**Notes.** Host information exists only as collected in "puffballs."

**Etymology.** Specific epithet denotes the overall fusiform body shape.

## ***Pocadius globularis*** **Cline n. sp.**

(Figs. 27, 66, 107, 148, 188, 224)

**Type Material Examined.** HOLOTYPE ♂ (CDFA): HONDURAS: Fca. Morazan; San Anotnio de Oriente; El Zamorano; 5 MAY 1993; rcol. R. Cave / Bovistos / HOLOTYPE; Pocadius; globularis; A.R. Cline des. 2004. 9 PARATYPES (3 FSCA, 2 CAS, 2 LSAM, 2 USNM): same data labels as holotype but with PARATYPE designation labels.

**Diagnosis.** Similar to *P. helvolus*, but can be distinguished by the following characters: body overall globular in shape with low L:W ratio, uniformly dark reddish brown color, pronotum with trapezoidal anterior margin and widest point near posterior angles, terminal antennomere with central circular sensillar region, metasternal disc smooth and shining but heavily punctate with large punctures, scutellum heavily punctate, elytra with both large and small rows of serial punctures bearing semi-erect setae, apical wall of prosternal process oblique when viewed laterally, median lobe large and robust with acute apex, tegmen with elliptical apical fossa and elongate curved inner row of setae not attaining apex, basal piece of internal sac sclerites with two distinct pieces the more distal of which has two medial sharp projections.

**Redescription.** Length 3.45 mm, Width 2.25mm, Depth 1.2mm. Body moderately convex, surface shining, reddish-brown to dark reddish brown in color. Pronotum and elytra margins with moderately long fimbriae, setae equal in length to antennal scape. Dorsal and ventral pubescence moderately long.

Head surface deeply, densely, irregularly punctate, punctures larger on vertex, interspersed with somewhat smaller punctures that become more abundant towards orbits and fronotclypeal region. Larger punctures 3-4 X diameter of eye facet, smaller punctures 1-2 X diameter. Interspaces alutaceous to granular, ~0.5-1 diameter apart, and somewhat shining. Each smaller puncture gives rise to a short golden seta. Pronotal surface with large punctures 1.5 diameter to large punctures on vertex of head, interspersed with numerous smaller punctures, ~0.5-0.75 size of larger ones. Interspaces alutaceous to finely granular, about 0.5-1.5 diameters apart. Each puncture gives rise to a short straight golden seta. Scutellar surface with numerous shallowly impressed punctures equal to smaller punctures on pronotum, some punctures giving rise to setae, with the interspaces smooth to alutaceous. Elytral surface with serial rows of alternating large and small deep punctures. Smaller punctures are equal in size to smaller ones on pronotum, larger punctures are ~2 times diameter of smaller ones. Smaller punctures giving rise to a semi-erect somewhat decumbent moderately long golden seta, larger punctures giving rise to an adpressed moderately long golden seta. Interspaces broad between punctures of a given row and between different rows. Within a row, small punctures are separated by ~1-2 puncture diameters, and large punctures by ~1 puncture diameter. Large puncture rows are separated by ~2 large puncture diameters. Interspaces only shining and mostly alutaceous with some microreticulation in sculpture. Smaller puncture rows may contain more than a single row of punctures, in particular near suture. Pygidium densely punctate, punctures equal in size to larger ones on pronotum, each puncture giving rise to a short straight golden seta, interspaces narrow, 0.25-0.5 diameter, with smooth sculpture.

Venter with similar moderately long golden pubescence as dorsum. Mentum with small shallow punctures, equal in size to smaller ones on vertex, each giving rise to a moderately long seta, interspaces smooth to alutaceous. Submentum and gula similar in sparse punctation to mentum but with interspaces becoming granular. Prosternum and epimeron with moderately deep irregular punctation, punctures on epimeron equal to large ones on pronotum and those on prosternum equal to smaller ones on pronotum, interspaces almost completely granular, prosternal punctures separated by 0.5-2 diameters, those on the epimeron by ~0.5-1 diameter. Mesosternum with shallow punctures, similar in size as those on prosternum, interspaces alutaceous to finely granular, separated by about 0.5 to 1 diameter, and aggregated along posterior border next to metasternum. Metasternum irregularly punctate, with moderately impressed punctures on disc similar in size to larger ones on pronotum, interspaces smooth on metasternal disc becoming more finely alutaceous laterally, punctures separated by ~1 diameter. Abdominal sternite 1 with small faint, almost obsolete punctures, punctures equal to those on mentum, interspaces smooth with microreticulate areas, separated by ~1-2 diameters.

Abdominal sternites 2-4 with indistinct irregular rows of punctures, punctures separated by ~0.5-1 puncture diameter. Hypopygidium with moderately deep punctures, similar in size to those on sternites 2-4, interspaces smooth with microreticulate regions, punctures separated by 0.25-0.5 puncture diameters.

Head wider than long (L:W = 1:1.41), fronotclypeal region moderately projecting anteriorly. Vertex with broad deep concavity between orbits near fronotclypeal region. Labrum with moderately deep medial incision at anterior margin. Antennal club compact, oval, symmetrical with the last antennomere subequal to the previous two combined. Antennomeres 4-5 more or less cuboid, 6 trapezoidal and 7-8 characteristically disc-like. Antennal scape moderately asymmetrical, slightly hemispherical, 0.9 times as long as pedicel. Pedicel subcylindrical in shape. Antennal segment 3 equal in length to pedicel and tapering proximally. Antennal club large, ~0.80 length of segments 1-8 combined. Antennal grooves very deep and widely excavate, slightly converging posteriorly. Lateral mental/submental ridge prominent, at level of submentum, with both oblique and longitudinal microreticulations, corresponding sulcus widely excavate. Mentum with anterior angles distinct, anterior margin angulate with well defined apical angle, entire structure broadly pentagonal when viewed ventrally and flattened when viewed laterally.

Pronotum widest near posterior angles (L:W = 1:1.9), anterior margin broadly deeply trapezoidal, posterior margin moderately convex, lateral margins evenly arcuate to anterior angles. Scutellum large, obtusely triangular, apex rounded. Prosternal process narrowed between procoxae, apex acuminate, in lateral aspect the posterior end is somewhat recurved and there is a modest convexity medially over the coxae. Posterior apical wall prominent and oblique. Mesosternum extending to midway between mesocoxae, evenly broadly concave for reception of the metasternum. Metasternum wider than long (W:L = 2.77:1.0). Metepisternum with slight medial constriction, oblique line dividing anterior 0.2 of structure. First abdominal sternite with acuminate process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-3 subequal in length, the fourth slightly larger than the preceding two. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth prominent, slightly longer than tarsomere 1. Outer apical notch with ~100° angle, notch depth moderate, equal to length of tarsomere 1. Inner apical spine equal in length to tarsomeres 1. Protibia not heavily armored but with characteristic dense patch of stiff setae along the inner apical region. Mesotibia more heavily armored than protibia with more dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process similar in length to protibia, and bifid apically. Inner apical spine equal in length to tarsomeres 1 and part of 2 combined. Metatibia with armature similar to that of mesotibia, but outer apical process slightly longer, and inner apical spine equal to tarsomeres 1-2 combined.

Male genitalia well-sclerotized. Anal sclerite with large broadly curved region anteriodorsally that is truncate apically (Fig. 27); apex densely fimbriate and broadly rounded. Spiculum gastrale with wide posteriorly directed lateral flanges, medial margins only deeply concave, sparse long setae originating from apex (Fig. 66). Tegmen evenly rounded apically (Fig. 107), longer than wide (w:l = 1.0:2.6), lateral row of setae visible from the median fossa to around the apex, elongate shallow concavity in apical third with sinuate arranged row of small setae not attaining the apex of the fossa, basal margin concave. Median lobe large and robust, ~0.75 the length of the tegmen, apex broadly rounded with acuminate tip, apical opening well-developed (Fig. 148), with broadly diverging internal structure. Ejaculatory rods not fused to basal piece, and nearly straight with slight outward orientation apically. Basal piece in two parts, apical piece with deep medial concavity and multiple sharp projections, proximal piece separated into two inwardly curved structures each having a medial sharp projection (Fig. 188).

Female genitalia moderately sclerotized. Paraprocts large with sclerotization only along median line to apico-lateral angles. Gonocoxite with two basal lateral prominences, basal ridge well-sclerotized. Gonocoxal apices with recurved "tooth" present. Three primary setae originate from small depressions on the sides of the gonocoxal teeth. Introgonocoxal invagination extremely deep, ~0.75 length of gonocoxite (Fig. 224).

**Variation.** None observed.

**Seasonality/Habitat.** Specimens collected in early may in mid-elevation forest.

**Distribution.** Known only from the type locality in central Honduras.

**Notes.** Host data include all specimens collected from a "bovista" type of Gasteromycetes.

**Etymology.** Specific epithet denotes the overall globular body shape.

### ***Pocadius helvolus*** **Erichson**

(Figs. 28, 67, 108, 149, 189, 225)

**Type Material Examined.** LECTOTYPE ♂ (Humboldt, Berlin): 8642 / LECTOYPUS; Pocadius; helvolus; Erichson 1843; Jelínek det. 1971. / helvolus; Er.; Am. Sept. Auf. Kn. [The bottom (3$^{rd}$) label is hand-written and only partially legible]. The translation of the last line "Am. Sept. Mus. Kn." likely is "America Septrionalis Museum Knoch'schen" as revealed in part by Erichson's (1843: 320) original description and the typed label data of the paralectotype below.] . PARALECTOTYPE ♀ (Humboldt, Berlin): Hist. Coll. (Coleoptera); Nr. 8642; Pocadius helvolus Erichs.; Americ. Sept. Mus. Knoch; Zool. Mus. Berlin / PARALECTOTYPUS; Pocadius; helvolus; Erichson 1843; Jelínek det. 1971.

**Non-Type Material Examined.** ~1500 specimens from throughout North America.

**Diagnosis.** Though somewhat variable in color pattern and overall body pubescence, the following characters clearly define *P. helvolus* from all other species: the almost complete alutaceous to granular surface sculpturing of the pronotum and elytra, distinct antennal sensillar region on ventral surface of terminal antennomere, terminal antennomeres broadly evenly rounded or truncate apically, eyes comparatively small (width ~.10 width of head), posterior face of prosternal process when viewed laterally with slight concavity, tegmen with 1 inner row of setae meeting near apex, median lobe with simple deeply incised apical opening, ejaculatory rods straight with basal piece having two separate distinct curved parts adjacent to the baso-lateral margin, and ovipositor with single baso-lateral prominence on gonocoxites and three elongate primary setae.

**Redescription.** Length 3.9 mm, Width 2.1mm, Depth 1.5mm. Body moderately convex, surface only slightly shining, reddish-brown to dark reddish brown in color, sometimes with elytral apices and lateral area much darker brown to black. Pronotum and elytra margins with moderately elongate fimbriae, setae longer than width of antennal scape. Dorsal and ventral pubescence quite long.

Head surface moderately, irregularly punctate, punctures larger on vertex, becoming somewhat smaller towards orbits and fronotclypeal region. Larger punctures 4 X diameter of eye facet, smaller punctures 2 X diameter. Interspaces smooth to finely alutaceous, ~0.5-0.75 diameters apart, and shining becoming completely granular near occiput. Each smaller puncture gives rise to an elongate curved golden seta, very few smaller punctures on vertex. Pronotal surface with large punctures equal in size to large punctures on vertex of head, interspersed with numerous smaller punctures, ~0.5-0.75 size of larger ones. Interspaces alutaceous to granular, about 0.5-1 diameters apart. Each puncture gives rise to a long straight golden seta. Scutellar surface with numerous shallowly impressed punctures equal to smaller punctures on pronotum, some punctures giving rise to setae, with the interspaces are granular. Elytral surface with serial rows of alternating large and small deep punctures. Smaller punctures are equal in size to smaller ones on pronotum, larger punctures are ~2 times diameter of smaller ones. Smaller punctures giving rise to an erect long golden seta, larger punctures giving rise to a semi-erect long golden seta. Interspaces narrow between punctures of a given row and between different rows. Within a row, small punctures are separated by ~1-1.5 puncture width, and large punctures by 0.5-0.75 puncture width. Large puncture rows are separated by 1.50-2 large puncture diameters. Interspaces only slightly shining and mostly granular in sculpture. Pygidium densely punctate, punctures equal in size to larger ones on pronotum, each puncture giving rise to a moderately long straight golden seta, interspaces narrow, 0.25-0.5 diameters, with granular sculpture.

Venter with similar long golden pubescence as dorsum. Mentum with few smaller shallow punctures, equal in size to smaller ones on vertex, each giving rise to a moderately long seta, interspaces smooth to alutaceous. Submentum and gula similar in sparse punctation to mentum but with interspaces becoming granular. Prosternum and epimeron with moderately deep irregular punctation, punctures equal to large ones on vertex, interspaces almost completely granular, prosternal punctures separated by 0.25-0.5 diameter, those on the epimeron by ~0.5-1 diameter. Mesosternum with shallow punctures, similar in size as those on prosternum, interspaces alutaceous to granular, separated by about 0.5 to 1 diameter, and aggregated along posterior border next to metasternum. Metasternum irregularly punctate, with moderately impressed punctures on disc similar in size to those on mesosternum, interspaces alutaceous to granular on metasternal disc becoming completely granular laterally, punctures separated by ~1 diameter. Abdominal sternite 1 with large faint, almost obsolete punctures, punctures equal to those on metasternum, interspaces granular, separated by ~0.5 diameter. Abdominal sternites 2-

4 with two distinct irregular rows of punctures, punctures similar in size to those on metasternum, punctures in row separated by 1 puncture diameter, other punctures on sternite diffusedly dispersed and separated by ~0.5 punctures width. Hypopygidium with moderately deep punctures, similar in size to those on sternites 2-4, interspaces granular, punctures separated by 0.25-0.5 puncture diameters.

Head slightly wider than long (L:W = 1:1.34), fronotclypeal region moderately projecting anteriorly. Vertex with broad moderately deep concavity between orbits near fronotclypeal region. Eyes comparatively small, moderately protruding. Labrum with relatively deep medial incision at anterior margin. Antennal club compact, oval, symmetrical with the last antennomere subequal to the previous two combined. Antennomeres 4-5 more or less cuboid, 6 only moderately flattened with 7-8 characteristically disc-like. Antennal scape moderately asymmetrical, slightly hemispherical, 2 times as long as pedicel. Pedicel subcylindrical in shape. Antennal segment 3 subequal in length to pedicel. Antennal club large, ~0.75 length of segments 1-8 combined. Each club segment with dense short setae, and several protruding setae. Antennal grooves very deep and widely excavate, slightly converging posteriorly. Lateral mental ridge prominent, at level of submentum, medially the ridge is granular in sculpture with microreticulations laterally. Mentum with anterior angles broadly rounded, anterior margin broadly hemispherical with somewhat defined apex, lateral sides short and somewhat convergent, entire structure pentagonal and flattened.

Pronotum widest near posterior angles (L:W = 1:2), anterior margin broadly trapezoidal, posterior margin moderately convex, lateral margins evenly arcuate to anterior angles. Scutellum large, obtusely triangular, apex rounded. Prosternal process narrowed between procoxae, apex acuminate, in lateral aspect the anterior and posterior ends are prominent and convex medially. Posterior apical wall prominent and only slightly concave.

Mesosternum extending to midway between mesocoxae, evenly broadly concave for reception of the metasternum. Metasternum width to length ratio is ~3:1.0. Metepisternum with slight medial constriction, oblique line dividing anterior 0.2 of structure. First abdominal sternite with acuminate process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-3 subequal in length, the fourth slightly larger than the preceding two. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth very prominent, slightly longer than tarsomeres 1 and part of 2 combined. Outer apical notch with ~100° angle, notch depth moderate, subequal to length of tarsomere 1. Inner apical spine subequal in length to tarsomeres 1 and part of 2 combined. Protibia not heavily armored but with characteristic dense patch of stiff setae along the inner apical region. Mesotibia more heavily armored than protibia with more dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process elongate and robust, larger than protibia process, and bifid apically. Inner apical spine equal in length to tarsomeres 1-2 combined. Metatibia with armature similar to that of mesotibia, but outer apical process slightly longer.

Male genitalia well-sclerotized. Anal sclerite with large broadly curved region anteriodorsally (Fig. 28); apex fimbriate and acuminate; ventrally with a broad medial concavity approaching apex in truncate fashion. Spiculum gastrale with wide lateral flanges, medial margins only slightly concave proximally, sparse long setae originating from apex (Fig. 67). Tegmen evenly rounded apically (Fig. 108), somewhat longer than wide (w:l = 1.0:1.6), lateral row of setae visible from the median fossa to around the apex, small shallow concavity in apical third, basal margin angulate, inner row of setae complete and meeting near apex. Median lobe large and robust, ~0.50 the length of the tegmen, apex broadly rounded, apical opening with well-developed medial opening (Fig. 149). Ejaculatory rods not fused to basal piece, and nearly straight. Basal piece with deep medial concavity extending almost two-thirds length of structure, proximally with broad basal convexity and two separate lateral pieces that are inwardly curved (Fig. 189).

Female genitalia moderately sclerotized. Paraprocts large with sclerotization only along median line. Gonocoxite with one basal lateral prominence, basal ridge well-sclerotized. Gonocoxal apices with recurved "tooth" present. Three primary setae originate from small depressions on the sides of the gonocoxal teeth (Fig. 225).

**Variation.** Specimens from Colorado, Manitoba, and the Northwest Territory have the ejaculatory rods more slender and slightly inwardly curved, however, other genitalic features are similar.

**Seasonality/Habitat.** Specimens can be collected nearly year-round depending on the collecting locality. Specimens from the southern U.S. and Mexico have been collected in all months except January and February, with most specimens collected from April through October.

**Distribution.** Known range extends from the Northwest Territories, Saskatchewan, Manitoba and Quebec, Canada south through the eastern U.S. to central Florida in the east and central Mexico in the west. This range includes all states on or east of the 100$^{th}$ parallel in the U.S.A, as well as the following western states that may lie west of that line: Nebraska, Montana, Wyoming, and Arizona. Mexico records were indicated by Parsons (1943) as Puente de Ixtla, Durango and Guanajuata. New records from Mexico include the following: **(78)** from CAS: Cocula; Jalisco, Mex.; VII-2-60; in puffball; L.R. Gillogly collr. **(41)** from CAS: Cocula; Jalisco, Mex.; VII-22-60; in puffball; L.R. Gillogly collr. **(29)** from CAS: Guadalajara; Jalisco, Mex.; 9 July 1960; in puffball; Gilloglys collrs. **(3)** from CAS: Delgollado, Jalisco; Mexico, VII-2-1963; in puffball; L.R. Gillogly collr. **(8)** from CAS: LaVenotsa, Oaxaca; Mexico, VII-

19-1963; ex. shaggy-mane; L.R. Gillogly collr. **(3)** from CAS: Tapalpa; Jalisco; Mexico; VII-4-1960; ex. fungi; L.R. Gillogly collr. **(1)** from University of Guadalajara: MEXICO: Jalisco, Zapopan; Nextipac, Las Agujas, CUCBA; 1600m, 14-VII-1994; ex. Lycoperdon, D. Pérez col. **(17)** from Montana St. University: MEX.: Jalisco, 20mi.; SW Encarnacion de Diaz; 09 JUL 1982, 2000m; M.A. Ivie colr.

**Notes.** Specimens have been collected from numerous Lycoperdaceae as well as from "gilled fungi" and fungus covered logs.

### *Pocadius insularis* Cline new species

(Figs. 29, 68, 109, 150, 190)

**Type Material Examined.** HOLOTYPE ♂ (CMN): Simla, 5 mi. N.; Arima, Trinidad; W.I. Aug.20, 1969; H. & A. Howden / HOLOTYPE; Pocadius; insularis; A.R. cline des. 2004.

**Diagnosis.** This species is most similar to *P. dimidiatus* but can be differentiated from it and the rest of the Neotropical fauna by the following suite of characters: nearly circular antennal club without enlarged terminal antennomere; pronotum widest near posterior angles with anterior margin broadly shallowly concave; mentum transversely hemispherical; prosternal process in lateral view highly convex over procoxal cavities and with strongly oblique apical wall; overall minute body size; and aedeagus with tegmen having a complete inner row of setae, nearly perpendicular basal margin; basal piece of internal sac sclerites with three distinct parts.

Description. Length 3.3mm, Width 1.9mm, Depth 1.2mm. Body moderately convex, surface slightly shining, uniformly light reddish-brown in color. Pronotum and elytra margins with moderately long sparse fimbriae, setae subequal to length of antennal scape. Dorsal and ventral pubescence short to moderately long, dorsal surface with heavily granulate and microreticulate sculpturing.

Head surface deeply, irregularly punctate, punctures larger on vertex, becoming somewhat smaller towards orbits and fronotclypeal region. Larger punctures 3-4X diameter of eye facet, smaller punctures 1-2X diameter. Interspaces granular with microreticulations, sparsely shining. Each puncture gives rise to a moderately long curved golden seta. Pronotal surface with large punctures equal in size to large punctures on vertex of head, interspersed with relatively few smaller punctures, ~0.5 size of larger ones. Interspaces granular with microreticulations, about 0.5-1 diameter apart. Each puncture gives rise to a moderately long curved golden seta. Scutellar surface with few shallowly impressed punctures, some punctures giving rise to setae, and the interspaces are granular. Elytra with serial rows of alternating large and small deep punctures. Smaller punctures are equal in size to smaller ones on pronotum, larger punctures are ~2.5 times diameter of smaller ones. Smaller punctures giving rise to a semi-erect long golden seta, larger punctures giving rise to a short to minute semi-erect golden seta. Interspaces narrow between punctures of a given row and between different rows. Within a row, small punctures are separated by ~1 puncture width, and large punctures by 0.5 puncture width. Larger rows are separated by 0.5-1.0 large puncture diameters. Interspaces sparsely shining with granular to microreticulate sculpture. Pygidium densely punctate, punctures equal in size to larger ones on pronotum, each puncture giving rise to a moderately long golden seta. Interspaces narrow, 0.25-0.5 diameter, with granular sculpture.

Venter with similar moderately long pubescence as dorsum. Mentum with large shallow punctures, equal in size to larger ones on vertex, each giving rise to a moderately long seta. Interspaces granular to finely microreticulate. Submentum and gula punctures somewhat smaller than mentum but with interspaces similar. Prosternum and epimeron faintly irregularly punctate, punctures subequal to those on mentum, interspaces granular with microreticulate areas, prosternal punctures separated by 0.5-2 diameters, those on the epimeron by ~0.5-1 diameter.

Mesosternum with shallow punctures, subequal to those on prosternum, interspaces alutaceous to granular, separated by about 0.5 to 1 diameter, and aggregated near metasternal border. Metasternum irregularly punctate, with moderate faint punctures on disc similar in size to smaller ones on vertex, interspaces dull on metasternal disc becoming more microreticulate to granular laterally, punctures separated by ~1-3 diameters on disc. Abdominal sternite 1 with small faint, almost obsolete punctures, punctures equal to those on metasternum, interspaces mostly granular, separated by ~1-2 diameters. Abdominal sternites 2-4 with irregular rows of punctures, punctures similar in size to those on metasternum, rows separated by 1.5-2 puncture diameters, punctures within rows separated by ~0.5 punctures width. Hypopygidium with moderately deep punctures, similar in size to those on sternites 2-4, interspaces granular with microreticulations, punctures separated by 0.5-1 diameter.

Head slightly wider than long (W:L = 1.27:1), fronotclypeal region moderately projecting anteriorly. Vertex with deep concavity between orbits near fronotclypeal region. Labrum with shallow concavity at anterior margin. Antennal club compact, circular, symmetrical with the last antennomere subequal to the previous two combined. Antennomeres 4-8 more or less compact, with 7-8 characteristically disc-like, 4-5 cuboidal, and 6 trapezoidal. Antennal scape asymmetrical, hemispherical, 1.75 times as long as pedicel. Pedicel similar in shape to scape but not as hemispherical. Antennal segment 3 longer in length to pedicel. Antennal club relatively small, ~0.65 length of segments 1-8 combined. Antennal grooves very deep and widely excavate, slightly converging posteriorly. Lateral mental/submental ridge prominent, at level of submentum, ridge and corresponding sulcus with longitudinal microreticulations. Mentum with anterior angles obsolete, entire structure broadly hemispherical when viewed ventrally and flattened in lateral aspect.

Pronotum widest near posterior angles (L:W = 1:1.7), anterior margin broadly shallowly concave, posterior margin moderately convex, lateral margins slightly arcuate anteriorly. Scutellum moderately large, obtusely triangular, apex rounded. Prosternal process narrowed between procoxae, apex acuminate, in lateral aspect the anterior and posterior ends are prominent and there is a steep convexity medially. Posterior apical wall prominent and slightly oblique. Mesosternum extending to midway between mesocoxae, evenly concave for reception of the metasternum. Metasternum wider than long (W:L = 2.6:1.0). Metepisternum with slight medial constriction, oblique line dividing anterior 0.17 of structure. First abdominal sternite with broad process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-3 subequal in length, the fourth slightly larger than the preceding two. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth not prominent, subequal to tarsomere 1. Outer apical notch with ~95° angle, notch depth moderate, subequal to length of tarsomere 1. Inner apical spine subequal in length to tarsomeres 1 and part of 2 combined. Protibia not heavily armored but with characteristic dense patch of stiff setae along the inner apical region. Mesotibia more heavily armored than protibia with more dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process robust, larger than protibia process, subequal to tarsomeres 1-2 combined. Inner apical spine equal in length to tarsomeres 1-2 combined. Metatibia with armature similar to that of mesotibia.

Male genitalia well-sclerotized. Anal sclerite with large broadly curved region anteriodorsally (Fig. 29); apex densely fimbriate; ventrally with a broad medial concavity approaching apex in a truncate manner. Spiculum gastrale with wide lateral flanges, medial margins deeply concave, moderately long stiff setae originating from apex (Fig. 68). Tegmen evenly rounded apically (Fig. 109), much longer than wide (w:l = 1:2.6), lateral row of setae visible from the median fossa to around the apex, inner row of setae complete, small shallow concavity in apical third, basal notch perpendicular, basal margin nearly perpendicular. Median lobe large and robust, ~0.66 the length of the tegmen, apex narrowly rounded, apical opening well-developed with deeply cleft bilobed internal structure (Fig. 150). Ejaculatory rods not fused to basal piece or each other, curved inward and expanded outward basally and apically. Basal piece of internal sac sclerites with two short paired basal lateral sections each having a medial projection, and a central section that is concave apically and has a basally projecting extension (Fig. 190).

Female genitalia not observed.

**Variation.** Known only from the holotype male.

**Seasonality/Habitat.** Known from late August in a lowland tropical forest.

**Distribution.** Known from the type locality on the island of Trinidad.

**Notes.** No host information is available for this species.

**Etymology.** Specific epithet is a derivative of the Latin "insula" meaning "living on an island", alluding to the type locality of the island of Trinidad.

### ***Pocadius jelineki*** **Leschen and Carlton**

(Figs. 30, 69, 110, 151, 191, 226)

**Type Material Examined.** HOLOTYPE ♂ (SNEC): COSTA RICA: Puntarenas; Monte Verde, 1580m; 13 May 1989, J. Ashe; R. Brooks, R. Leschen; ex. *Lycoperdon* sp. / Snow Entomol. Mus.; Costa Rica Exped. #159 / HOLOTYPE; Pocadius jelineki; R. Leschen & C. Carlton. 6 PARATYPES (SNEC): same data labels as holotype. 2 PARATYPES (SNEC): COSTA RICA:; Puntarenas, Monte Verde; 1400m, 14-16-July-1989; ex. flight intercept trap; Robert E. Beer. 1 PARATYPE (SNEC): COSTA RICA: Puntarenas; Monte Verde, 1550m; 22

May 1989, J. Ashe; R. Brooks, R. Leschen; ex. *Lycoperdon* / Snow Entomol. Mus.; Costa Rica Exped. #375. 1 PARATYPE (SNEC): COSTA RICA: Puntarenas; Reserva Biologica de; Monteverde, 1550m; nr. Quelorada cuecha / on Sendero rio; 13 May 1989, J. Ashe; R. Brooks, R. Leschen; ex. *Lycoperdon* / Snow Entomol. Mus.; Costa Rica Exped. #160.

**Non-Type Material Examined.** >100 specimens: 16 specimens (CMN) Costa Rica: Punt., Monteverde, 1400m, 21-24-VIII, H. & A. Howden, FIT. Costa Rica: Monteverde, flight intercept, 1520m, 18-25-VI-1983, D.H. Lindeman. Costa Rica: Punt., Monteverde, 1400m, 18-20-VIII-1987, H. & A. Howden, FIT. Costa Rica: Monteverde, unbaited pit traps, 3-VII-1983, D.H. Lindeman. Costa Rica: 1520m, Monteverde, FIT, 9-13-VII-1983, D.H. Lindeman. Costa Rica: 1520m, Monteverde, FIT, 2-9-VII-1983, D.H. Lindeman. Costa Rica: Punt., Monteverde, 1400m, 15-17-VIII-1987, H. & A. Howden. Costa Rica: Monteverde, flight intercept, 1520m, 11-18-VI-1983, D.H. Lindeman. 8 specimens (SNEC): COSTA RICA: Guanacaste; Cacao Biological Station, 1050m; 10°55’38”N, 85°27’7”W; 10 JUL 2000; J. Ashe, R. Brooks, Z. Falin; CR1ABF00 089; ex: in giant puffball mushroom. 5 specimens (SNEC): NICARAGUA: Granada Dept.; Res. Nat. Volcan Mombacho, 1150m, 11°50.05’N 85°58.83’W; 3-VI-2002, R. Brooks, Z. Falin, S. Chatzimanolis, ex. puffball fungus; NIC1BFC02 171.

**Diagnosis.** In the original diagnosis two characters were given to distinguish this species: the curved apices of the setae and the elbowed posterior ejaculatory rods. The first of these characters is seen in numerous other *Pocadius* and therefore is of little diagnostic value and the latter is only useful for discerning males of the species. Other characters that more thoroughly define the species include: metepisternal axillary space very narrow (~.10 length of structure), antennal segment 2-3 elongate, terminal antennomere with characteristic sensillar region, eyes comparatively large and protruding, pronotum widest near middle, metatibial spurs elongate, eighth abdominal sternite with elongate narrow lateral flanges projecting anteriorly, median lobe with complex apical opening, and ovipositor with narrowed paraprocts, gonocoxal base with one lateral prominence, inner gonocoxal margin angulate, gonocoxal apices lacking "tooth", and 4-5 primary elongate setae projecting from the gonocoxites apices.

**Redescription.** Length 3.1 mm, Width 1.7mm, Depth 1.1mm. Body moderately convex, surface shining, brown to dark brown in color, venter distinctly lighter. Pronotum and elytra margins with elongate fimbriae, setae longer than width of antennal scape. Dorsal and ventral pubescence quite long.

Head surface deeply, irregularly punctate, both small and large punctures on vertex, becoming proportionately smaller towards orbits and fronotclypeal region. Larger punctures 4 X diameter of eye facet, smaller punctures 3 X diameter. Interspaces smooth to finely alutaceous, shining. Each smaller puncture gives rise to an moderately long curved golden seta. Eyes finely faceted. Pronotal surface with large punctures equal in size to large punctures on vertex of head, interspersed with relatively few smaller punctures, ~0.75 size of larger ones. Interspaces smooth to alutaceous, about 0.5-0.75 diameters apart. Each puncture gives rise to a moderately long golden seta, most seta are curved but some are rather straight. Scutellar surface with very few moderately impressed punctures equal to smaller ones on pronotum, some punctures giving rise to short golden decumbent setae, interspaces smooth to alutaceous. Elytral surface with serial rows of alternating large and small deep punctures. Smaller punctures are equal in size to smaller ones on pronotum, larger punctures are ~1.75 times diameter of smaller ones. Smaller punctures giving rise to semi-erect longer curved golden seta, larger punctures giving rise to a decumbent long curved golden seta. Interspaces narrow between punctures of a given row and between different rows. Within a row, small punctures are separated by ~1 puncture width, and large punctures by 0.25-0.5 puncture diameters. Larger puncture rows are separated by 1 larger puncture diameter. Interspaces always shining but variable from smooth to finely alutaceous in sculpture. Pygidium densely punctate, punctures equal in size to smaller ones on vertex, each puncture giving rise to a short straight golden seta. Interspaces narrow, 0.75-1.0 diameters, with smooth to alutaceous sculpture.

Venter with short more sparsely distributed pubescence as dorsum. Mentum with small shallowly impressed punctures, equal in size to smaller ones on vertex, each giving rise to a short straight seta, interspaces alutaceous. Submentum and gula similar in punctation to mentum but with interspaces alutaceous to microreticulate. Prosternum and epimeron deeply irregularly punctate, punctures 1.5-1.75X larger than those on mentum, interspaces alutaceous with microreticulate areas, prosternal punctures separated by 0.5 diameter, those on the epimeron by 0.33 to 0.66 diameter. Mesosternum with shallow punctures, about 0.75 diameter of those on prosternum, interspaces alutaceous to microreticulate, separated by about 0.5 to 1 diameter, aggregated near posterior margin. Metasternum irregularly punctate, with moderate faint punctures on disc similar in size to those on prosternum, interspaces smooth to alutaceous on metasternal disc becoming more microreticulate laterally, punctures separated by ~1-2 diameters. Abdominal sternite 1 with large faint, almost obsolete punctures, punctures equal to those on mesosternum, interspaces smooth to alutaceous, separated by ~1 diameter. Abdominal sternites 2-4 with two irregular rows of punctures, one row near posterior margin, punctures similar in size to those on abdominal sternite 1, rows separated by ~1-1.5 puncture diameters, punctures within rows separated by ~0.33 punctures diameters. Hypopygidium with moderately deep punctures, similar in size to those on sternites 2-4, interspaces alutaceous, punctures separated by 0.25 puncture diameter.

Head slightly wider than long (L:W = 1:1.6), fronotclypeal region moderately projecting anteriorly. Vertex with broad shallow concavity between orbits near fronotclypeal region. Labrum with deep median incision at anterior margin. Antennal club compact, obovate, distinctly asymmetrical with the last antennomere much greater in length than the previous two antennomeres combined.  Antennomeres 6-8 more or less compact, with 7-8 characteristically disc-like.  Antennomeres 4-5 more or less cuboid, slightly narrowed proximally  Antennal scape asymmetrical, somewhat hemispherical, 1.4 times as long as pedicel.  Pedicel elongate cylindrical in shape.  Antennal segment 3 subequal in length to pedicel. Antennal club large, ~0.95 length of segments 1-8 combined.  Each club segment with dense short setae, terminal antennomeres with deep circular sensillar region.  Antennal grooves very deep and widely excavate, slightly converging posteriorly.  Lateral mental ridge prominent, at level of submentum, medially ridge has setal bearing small punctures and alutaceous to granular interspaces and laterally with longitudinal to oblique microreticulations.  Mentum with anterior angles apparent, anterior margin broadly hemispherical with acuminate apex, lateral margins short and perpendicular, entire structure pentagonal and somewhat convex.

Pronotum widest near middle (L:W = 1:2.1), anterior margin broadly shallowly trapezoidal, posterior margin moderately convex, lateral margins less arcuate posteriorly. Scutellum large, triangular, apex narrowly rounded.  Prosternal process somewhat narrowed between procoxae, apex somewhat acuminate, in lateral aspect the anterior and posterior ends are prominent and convex medially.  Posterior apical wall short but prominent and only slightly oblique.  Mesosternum extending to midway between mesocoxae, evenly broadly concave for reception of the metasternum.  Metasternum width to length ratio is ~2.67:1.0.  Metepisternum rather broad with two medial constrictions, oblique line dividing anterior 0.10 of structure. Elytral humeri moderately produced, lateral margin very narrow.  First abdominal sternite with broadly rounded process between metacoxae.  First sternite ~2X's longer than second sternite. Sternites 2-4 subequal in length.  Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth very prominent, slightly longer than tarsomeres 1 and part of 2 combined. Outer apical notch with ~100° angle, notch depth shallow, equal to length of tarsomere 1. Inner apical spine subequal in length to tarsomeres 1-2 combined. Protibia heavily armored with characteristic dense patch of stiff setae along the inner apical region. Mesotibia more heavily armored than protibia with more dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process elongate and robust, larger than protibia process. Inner apical spine equal in length to tarsomeres 1-2 combined. Metatibia with more armature than that of mesotibia, including more and longer spines, and apical spur equal to tarsomeres equal in length to one two and part third tarsomere combined.

Male genitalia well-sclerotized. Anal sclerite with large broadly curved region anteriodorsally (Fig. 30); apex fimbriate; ventrally with a broad medial concavity approaching apex. Spiculum gastrale with narrow anteriorly projecting lateral flanges, medial margins concave proximally, numerous short stiff setae originating from apex (Fig. 69). Tegmen evenly rounded apically (Fig. 110), much longer than wide (w:l = 1.0:2.55), lateral row of setae visible from the median fossa around the apex, small shallow concavity in apical third, basal notch perpendicular, basal margin slightly concave, inner row of setae complete coming together near apex. Median lobe moderately large, ~0.50 the length of the tegmen, apex acuminate, apical opening well-developed (Fig. 151). Ejaculatory rods not fused to basal piece or each other, mostly straight and perpendicular. Basal piece of rods visible as two distinct elbowed parts (Fig. 191).

Female genitalia moderately sclerotized. Paraprocts narrow with concave lateral margins, sclerotization only along median line to gonocoxal base. Gonocoxite with one basal lateral prominence, basal ridge well-sclerotized. Gonocoxal apices without recurved “tooth”.

Four or five primary setae originate from small depressions laterally on the gonocoxal apices (Fig. 226).

**Variation.** Some variability in size of specimens, though not directly correlated to gender.

**Seasonality/Habitat.** The species is known from the mid-elevation tropical wet forests from mid-May through late July.

**Distribution.** Known from Costa Rica and southern Nicaragua.

**Notes.** Specimens are known from *Lycoperdon* puffballs.

### ***Pocadius kirejtshuki*** **Cline new species**

(Figs. 31, 70, 111, 152, 227)

**Type Material Examined.** HOLOTYPE ♀ (BMNH): AUSTRALIA; C.E. Clarke; Collection; B.M. 1957-24 / Katanda; 24-6-38; C.E.C. / Katanda / HOLOTYPE; Pocadius; kirejtshuki; A.R. Cline des. 2004. 2 PARATYPES (BMNH): AUSTRALIA; C.E. Clarke; Collection; B.M. 1957-24 / Katanda / PARATYPE; Pocadius; kirejtshuki; A.R. Cline des. 2004. 1 PARATYPE (BMNH): Moreton Bay / Pocadius; sp.; det. Jelínek , 1970 / PARATYPE; Pocadius; kirejtshuki; A.R. Cline des. 2004.

**Diagnosis.** Distinct from the other Old World fauna by the following suite of characters: thickened tarsomeres; sides and apex of elytra darker than rest of body; terminal antennomere enlarged, greater than previous two combined, and with sharply pointed apex; apical wall of prosternal process oblique; aedeagus with tegmen having an elliptical apical fossa with few elongate thick associated setae; median lobe with prolonged acuminate apex and complex internal structure; spiculum with numerous ridges along the apical border; and ovipositor with gonocoxal apices abutting distally with numerous primary setae originating apico-laterally..

**Description.** Length 4.2mm, Width 2.25mm, Depth 1.35mm. Body slightly convex, surface moderately shining to dull, reddish-brown to dark brown in color, with elytral sides and apex darker. Pronotum and elytra margins with moderately long fimbriae, setae subequal to length of antennal scape. Dorsal and ventral pubescence moderately long.

Head surface with moderately impressed irregular punctures, punctures larger on vertex, becoming somewhat smaller towards orbits and fronotclypeal region. Larger punctures 3-4X diameter of eye facet, smaller punctures 1-2X diameter. Interspaces granular with some microreticulation, slightly shining. Each puncture gives rise to a moderately long curved golden seta. Pronotal surface with large punctures equal in size to large punctures on vertex of head, interspersed with relatively few smaller punctures, ~0.5 size of larger ones. Interspaces granular to finely microreticulate, about 0.5-1 diameter apart. Each puncture gives rise to a moderately long golden seta, most seta curved. Scutellar surface with few vague shallowly impressed punctures, some punctures giving rise to setae, and the interspaces nearly completely microreticulate. Elytral surface with serial rows of alternating large and small deep punctures. Smaller punctures are equal in size to those on pronotum, larger punctures are ~2-3 times diameter of smaller ones. Smaller punctures giving rise to a semi-erect to decumbent moderately long golden seta, larger punctures giving rise to a semi-erect to decumbent long golden seta. Interspaces narrow between punctures of a given row and between different rows. Within a row, small punctures are separated by ~1-2 puncture diameter, and large punctures by 0.5-1 puncture diameter. Larger rows are separated by ~1.0 large puncture diameter. Interspaces slightly shining but variable from granular to finely microreticulate in sculpture. Pygidium densely punctate, punctures equal in size to larger ones on pronotum, each puncture giving rise to a short golden seta. Interspaces narrow, 0.5-0.75 diameter, with granular to microreticulate sculpture.

Venter with similar pubescence as dorsum. Mentum with minute shallow punctures, equal in size to smaller ones on vertex, each giving rise to a short seta. Interspaces granular to finely microreticulate in areas. Submentum and gula similar in punctation to mentum but with interspaces more microreticulate. Prosternum and epimeron shallowly irregularly punctate, punctures slightly larger than those on mentum, interspaces granular with microreticulate areas, prosternal punctures separated by 1-3 diameters, those on the epimeron by 2-4 diameters. Mesosternum with faint shallow punctures, equal in diameter to those on prosternum, interspaces granular, separated by about ~1 diameter, and aggregated near metasternum. Metasternum faintly irregularly punctate with minute punctures on disc similar in size to those on mentum, interspaces granular on metasternal disc becoming granular with microreticulations laterally, punctures separated by ~2-3 diameters. Abdominal sternite 1 with large faint punctures, equal to large punctures on elytra, interspaces granular to microreticulate, separated by ~1-2 diameters. Abdominal sternites 2-4 with irregular rows of punctures, one defined row near anterior margin, punctures similar in size to those on abdominal sternite 1. Hypopygidium with moderately deep punctures, similar in size to those on sternites 2-4, interspaces granular to microreticulate, punctures separated by 0.5-1 diameter.

Head wider than long (W:L = 1.65:1), fronotclypeal region moderately projecting anteriorly. Vertex with shallow concavity between orbits near fronotclypeal region. Labrum with shallow concavity at anterior margin. Antennal club compact, obovate with acute apical point, somewhat asymmetrical with the last antennomere longer than the previous two combined. Antennomeres 5-8 more or less compact, with 7-8 characteristically disc-like, 5-6 trapezoidal, and 4 cuboidal. Antennal scape asymmetrical, somewhat hemispherical, 1.9 times as long as pedicel. Pedicel barrel-shaped. Antennal segment 3 longer in length than pedicel. Antennal club large, ~0.80 length of segments 1-8 combined. Antennal grooves very deep and widely excavate, distinctly converging posteriorly. Lateral mental/submental ridge prominent, at level of submentum, ridge with few longitudinal microreticulations and the corresponding sulcus with none. Mentum with anterior angles present, anterior margin with acute apex, entire structure somewhat compactly pentagonal when viewed ventrally and flattened when viewed laterally.

Pronotum widest near middle (L:W = 1:1.9), anterior margin broadly concave with the central region slightly convex, posterior margin moderately convex, lateral margins somewhat more arcuate anteriorly. Scutellum large, hemispherical, apex broadly rounded. Prosternal process somewhat narrowed between procoxae, apex somewhat acuminate, in lateral aspect the posterior end is prominent with a slight convexity medially. Posterior apical wall prominent and only slightly oblique. Mesosternum extending to midway between mesocoxae, evenly concave for reception of the metasternum. Metasternum width to length ratio is ~2.6:1.0. Metepisternum with slight medial constriction, oblique line dividing anterior 0.10 of structure. First abdominal sternite with moderately narrow process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-3 subequal in length, the fourth slightly larger than the preceding two. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth moderately prominent, slightly longer than tarsomeres 1. Outer apical notch absent. Inner apical spine subequal in length to tarsomeres 1 and part of 2 combined. Protibia not heavily armored but with characteristic dense patch of stiff setae along the inner apical region. Mesotibia more heavily armored than protibia with more dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process robust, larger than protibia process. Inner apical spine equal in length to tarsomeres 1-2 and part of 3 combined. Metatibia with armature similar to that of mesotibia.

Male genitalia well-sclerotized. Anal sclerite with large broadly curved region anteriodorsally (Fig. 31) and recurved convexity apically; apex densely fimbriate. Spiculum gastrale with wide posterior projecting lateral flanges, medial margins convex, short stiff setae originating from finely ridged apex (Fig. 70). Tegmen narrowly rounded apically (Fig. 111), much longer than wide (w:l = 1.0:3.1), sparse lateral row of setae visible from the median fossa to prior to the apex, elliptical shallow concavity in apical third with few thick associated setae, basal notch perpendicular, basal margin deeply concave. Median lobe large and robust but not elongate, ~0.45 the length of the tegmen, apex acuminate and slightly prolonged, apical opening well-developed with large complex internal structure (Fig. 152). Ejaculatory rods not observed.

Female genitalia moderately sclerotized. Paraprocts large with sclerotization only along median line. Gonocoxite with two basal lateral prominences, basal ridge well-sclerotized. Gonocoxal apices with recurved "tooth" absent. Several primary setae originate from small depressions on the gonocoxal apices. Gonocoxal apices abutting in distal third of structure (Fig. 227).

**Variation.** Some specimens are uniformly brown without darkened elytral apices.

**Seasonality/Habitat.** Collected in June in wet forests.

**Distribution.** Known from the type localities in Australia.

**Notes.** No host information is available for this species.

**Etymology.** Specific epithet honors Alexander Kirejtshuk, research scientist at the Zoological Institute in St. Petersburg, a world authority on Nitidulidae.

## ***Pocadius luisalfredoi*** **Cline new species**

(Figs. 32, 71, 112, 153, 192, 228)

**Type Material Examined.** HOLOTYPE ♂ (Univ. of Guadelajara): MEXICO: México, Atlanta; Sn. J. Tepecoculco; 29-IX-1991; Col. J.L. Navarrete #1108; ex. L. aff. compactum / HOLOTYPE; Pocadius; luisalfredoi; A. Cline des. 2004. 4 PARATYPES (2 Univ. of

Guadelajara; 2 LSAM): MEXICO: México; Atlanta, San Juan; Tepecoculco; 5-X-1991 / ex. Lycoperdon; aff. compactum; #1110 / PARATYPE; Pocadius; luisalfredoi; A. Cline des. 2004. 1 PARATYPE (Univ. of Guadelajara): MEXICO: Guerrera; km. 10 carr. Teti; pac, “El Peral”; 23-VIII-1986 / Bosque Mesopilo; 2180 msnm; ex. Lycoperdon; #72 / PARATYPE; Pocadius; luisalfredoi; A. Cline des. 2004. 2 PARATYPES (CAS): Cerro de Garnica; Mich., Mex., VII-25-1963 / puffball / G.M. Gillogly collector / L.R. Gillogly Collection / Lorin R. Gillogly; Collection; Donated To The; Calif. Academy Of Sciences; May 1990 / PARATYPE; Pocadius; luisalfredoi; A. Cline des. 2004. 2 PARATYPES (CAS): same as previous but J.J. Gillogly collector. 5 PARATYPES (CAS): Summit bet.; Mexico and Puebla / VIII-14-1965; in puffball / L.R. Gillogly Collector / L.R. Gillogly Collection / Lorin R. Gillogly; Collection; Donated To The; Calif. Academy Of Sciences; May 1990 / PARATYPE; Pocadius; luisalfredoi; A. Cline des. 2004. 15 PARATYPES (CAS): 15mi. E. of; Zitauaro, Mex.; VIII-12-1965 / gill; fungus / L.R. Gillogly Collector / L.R. Gillogly Collection / Lorin R. Gillogly; Collection; Donated To The; Calif. Academy Of Sciences; May 1990 / PARATYPE; Pocadius; luisalfredoi; A. Cline des. 2004. 6 PARATYPES (CAS): Paracutin / July 15, 1960 / puffball / A.R. Gillogly Collector / L.R. Gillogly Collection / Lorin R. Gillogly; Collection; Donated To The; Calif. Academy Of Sciences; May 1990 / PARATYPE; Pocadius; luisalfredoi; A. Cline des. 2004. 2 PARATYPES (CAS): Paracho; Mich., Mex.; July 15, 1960 / Boletus / A.R. Gillogly Collector / L.R. Gillogly Collection / Lorin R. Gillogly; Collection; Donated To The; Calif. Academy Of Sciences; May 1990 / PARATYPE; Pocadius; luisalfredoi; A. Cline des. 2004. 31 PARATYPES (CAS): 27mi. N.; Guadalajara; Mex. VIII-65 / puffball / L.R. Gillogly Collector / L.R. Gillogly Collection / Lorin R. Gillogly; Collection; Donated To The; Calif. Academy Of Sciences; May 1990 / PARATYPE; Pocadius; luisalfredoi; A. Cline des. 2004. 8 PARATYPES (Univ. Guadalajara): MEXICO: Jalapa; Zapopan, Bosque la; Primavera; Rancho Tres Rios; 20°41’1.4”N, 103°36’32.8”W; 28 August 1999 / collected by: R. Leschen & J.L. Navarette-Heredia; on *Lycoperdon*; *pyriforme* / PARATYPE; Pocadius; luisalfredoi; A. Cline des. 2004.

**Diagnosis.** This species is more similar to others from the Nearctic fauna, including *P. niger*, *P. basalis*, and *P. fulvipennis* than it is to those of the Neotropical fauna. However, it differs from the other Nearctic members by the following suite of characters: characteristic color pattern with dark pronotal stripe and large light colored region on elytra; densely deeply punctate head and pronotum with smooth surface sculpturing; elongate pronotal and elytral fimbriae; disproportionately long and slender tibiae; hemispherical mentum; elytral pubescence with alternating rows of elongate decumbent apically curved golden setae; male pygidium indentate along posterior margin; tegmen with complete row of inner setae attaining apex; median lobe robust and globular with correspondingly large apical opening and simple internal structure; ejaculatory rods oriented in a converging manner and with internal sac basal piece “U-shaped”; and ovipositor with deep widely divergent gonocoxal appendages bearing two primary setae in depressions next to apical tooth.

**Description.** Length 3.6mm, Width 1.8mm, Depth 1.2mm. Body moderately convex, surface shining, dark brown-black with the following areas much lighter in color: legs, lateral third of pronotal margins, middle area of elytra, and transverse portions of each abdominal sternite. Pronotum and elytra margins with extremely elongate fimbriae, setae longer than 2X length of antennal scape. Dorsal and ventral pubescence sparse but quite long.

Head surface deeply, irregularly punctate, punctures mostly larger on vertex, becoming somewhat smaller towards orbits and fronotclypeal region. Larger punctures 5-6 X diameter of eye facet, smaller punctures ~3X diameter. Interspaces smooth to finely alutaceous, shining. Each puncture gives rise to an elongate curved golden seta. Pronotal surface with large punctures equal in size to large punctures on vertex of head, interspersed with numerous smaller punctures, equal to smaller ones on head. Interspaces smooth to finely alutaceous, about 1-2 diameters apart. Each puncture gives rise to an elongate curved golden seta. Scutellar surface with numerous moderately impressed punctures, most punctures giving rise to elongate setae, interspaces smooth. Elytral surface with serial rows of alternating large and small deep punctures. Smaller punctures are equal in size to smaller ones on pronotum, larger punctures are ~2-3X diameter of smaller ones. Smaller punctures giving rise to a semi-erect elongate curved golden seta, larger punctures giving rise to a semi-erect elongate curved golden seta. Interspaces broad between punctures of a given row and between different rows. Within a row, small punctures are separated by 3-4 puncture diameters, and large punctures by ~1 puncture diameter. Larger rows are separated by 2-3 puncture diameters. Interspaces always shining but variable from smooth to finely alutaceous in sculpture. Pygidium densely punctate, punctures equal in size to larger ones on pronotum, each puncture giving rise to a moderately long golden seta; interspaces narrow, 0.25-0.5 diameter, with smooth to microreticulate sculpture.

Venter with much shorter more sparsely distributed golden pubescence than dorsum. Mentum with few small very shallow punctures, equal in size to smaller ones on vertex; interspaces alutaceous with finely microreticulate areas. Submentum and gula similar in punctation to mentum but with interspaces more granular than alutaceous. Prosternum and epimeron shallowly irregularly punctate, punctures slightly larger than those on mentum, interspaces alutaceous to granular with microreticulate areas, prosternal punctures separated by 2-4 diameters, those on the epimeron by 1-2 diameters. Mesosternum with shallow punctures, about 1.5 diameter of those on prosternum, interspaces alutaceous to granular, separated by ~1 diameter. Metasternum irregularly punctate, with faint small punctures on disc similar in size to those on mentum, interspaces alutaceous to finely granular on metasternal disc becoming somewhat more granular laterally, punctures separated by ~2-4 diameters. Abdominal sternite 1 with large faint punctures, punctures equal to large punctures on pronotum, interspaces alutaceous to finely microreticulate, separated by 1-2 diameter. Abdominal sternites 2-4 with two irregular rows of punctures, one row near anterior margin and the other midway to the posterior margin, punctures similar in size to those on abdominal sternite 1, rows separated by 0.5-1 diameter, punctures within rows separated by ~0.5 punctures width. Rows on abdominal sternite 4 becoming less organized. Hypopygidium with deeply impressed punctures, similar in size to those on sternites 2-4, interspaces smooth to granular, punctures separated by 0.25-0.5 diameter.

Head wider than long (W:L = 1.6:1), fronotclypeal region moderately projecting anteriorly. Vertex with deep concavity between orbits near fronotclypeal region. Labrum with deep incision at anterior margin. Antennal club compact, oval, symmetrical with the last antennomere subequal to the previous two combined. Antennomeres 4-8 more or less compact, with 7-8 characteristically disc-like, 5-6 trapezoidal, and 4 cuboidal. Antennal scape asymmetrical, somewhat hemispherical, 1.5 times as long as pedicel. Pedicel barrel-shaped. Antennal segment 3 subequal in length to pedicel. Antennal club large, ~0.70 length of segments 1-8 combined. Antennal grooves very deep and widely excavate, slightly converging posteriorly. Lateral mental/submental ridge moderately prominent, at level of submentum, ridge with few longitudinal microreticulations and the corresponding sulcus with granular sculpturing. Mentum with anterior angles obsolete, anterior margin broadly somewhat angulate, entire structure obtusely triangular when viewed ventrally and somewhat convex laterally.

Pronotum widest near middle (L:W = 1:1.9), anterior margin broadly trapezoidal, posterior margin moderately convex, lateral margins less arcuate posteriorly. Scutellum large, obtusely triangular, apex rounded. Prosternal process somewhat narrowed between procoxae, apex somewhat acuminate, in lateral aspect the anterior and posterior ends are prominent with a slight convexity medially. Posterior apical wall not prominent and concave. Mesosternum extending to midway between mesocoxae, evenly concave for reception of the metasternum. Metasternum wider than long (W:L = 2.6:1.0). Metepisternum with slight medial constriction, oblique line dividing anterior 0.20 of structure. First abdominal sternite with acuminate process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-3 subequal in length, the fourth slightly larger than the preceding two. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth prominent, equal in length to tarsomeres 1 and part of 2 combined. Outer apical notch with ~100° angle, notch depth deep, equal to length of tarsomere 1 and part of 2 combined. Inner apical spine subequal in length to tarsomeres 1 and part of 2 combined. Protibia not heavily armored but with characteristic dense patch of stiff setae along the inner apical region. Mesotibia more heavily armored than protibia with more dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process robust, larger than protibia process. Inner apical spine equal in length to tarsomeres 1-2 combined. Metatibia with armature similar to that of mesotibia.

Male genitalia well-sclerotized. Anal sclerite with large broadly curved region anteriodorsally (Fig. 32); apex densely fimbriate. Spiculum gastrale with wide curved lateral flanges, medial margins concave, numerous short stiff setae originating from apex (Fig. 71). Tegmen evenly rounded apically (Fig. 112), longer than wide (w:l = 1.0:2.1), lateral row of setae visible from the median fossa to prior to the apex, large shallow concavity in apical third with inner row of setae attaining apex, basal notch perpendicular, basal margin deeply concave. Median lobe large and robust, ~0.66 the length of the tegmen, apex rounded, apical opening well-developed with simple internal structure (Fig. 153). Ejaculatory rods not fused to basal piece or each other, oriented at angles to each other. Basal piece U-shaped with inner margin of arms sinuate (Fig. 192).

Female genitalia moderately sclerotized. Paraprocts moderately large with sclerotization along median line and approximating baso-lateral angles. Gonocoxite with one basal lateral prominence, basal ridge well-sclerotized. Gonocoxal apices with recurved “tooth” present. Two primary setae originate from small depressions on the gonocoxal apices (Fig. 228).

**Variation.** This species is quite variable in size, with males typically smaller than females. Color varies with some individuals being darker than others, and some without a darkened pronotal disc.

**Seasonality/Habitat.** Specimens are known to occur from mid-July through October, mostly in low to mid-elevation forests.

**Distribution.** Known from the type localities in southern Mexico from

**Notes.** This species is known from the fungal hosts, *Lycoperdon compactum* and *L. pyriforme*.

**Etymology.** Specific epithet honors Luis Alfredo, the son of Jose Luis Navarette Heredia.

### *Pocadius majusculus* Kirejtshuk

(Figs. 33, 72, 113, 154, 193, 229)

**Type Material Examined.** (1) Holotype ♂: North Thailand; Doi Sutep; 19-6-1958, 1100m; B. Degerbøl leg.; Pr. 5/0 (1-7-59) / Holotypus *Pocadius*; *majusculus*; det. Kirejtshuk 1982. (1) Paratype ♀: Zoologisk Museum, Kobenhaven; Loc. Doi Sutep, N. Thailand; 1100m; Dat.: 19-6-1968; Leg.: B. Degerbøl; Pr. 510, Journ. 1/759 / *Pocadites*; sp.; ♀ / Paratypus *Pocadius*; *majusculus*; det. Kirejtshuk 1982.

**Diagnosis.** The large size, sparse pubescence, and relatively small head outwardly delineate this species from other members of the genus in the Old World. Other characters delimiting the species include: large umbilicate elytral punctures widely spaced, pronotum markedly narrowing from base to apex with a shallow anterior emargination, tegmen truncate apically with setae of similar size extending from margins, pygidial punctation complex with large irregular punctures bearing no setae and smaller circular punctures bearing short stiff setae anteriorly to each large puncture, and the gonocoxites with large blunt apices and no recurrent lateral "teeth".

**Redescription.** Length 5.4mm, Width 3.7mm, Depth 1.7mm. Body uniformly brownish-orange, appendages only slightly lighter, surface somewhat shining, pubescence short and scattered. Pronotum and elytra with margins fimbriate. Pygidium and hypopygidium sparingly setate, but posterior margins distinctly fimbriate.

Head surface deeply densely punctate, punctures large becoming smaller and more densely packed towards orbits, and minute and dense in fronotclypeal region. Only relatively few punctures giving rise to small fine pale setae. Interspaces alutaceous with some microreticulation. Smaller punctures about 0.75 the size of larger ones, large punctures about 7-8 times the size of facets, minute punctures about 0.20 the size of larger punctures. Pronotal surface with large and small punctures interspersed throughout, all punctures deep. Larger punctures ~1.5 times diameter of large punctures on vertex, smaller punctures ~0.33 the size of larger punctures. Interspaces 0.25 - 0.5 diameter apart, smooth to alutaceous with some microreticulation. Each puncture bearing a short fine pale seta. Scutellar surface scarcely punctate with small punctures similar in size to the smaller punctures on the pronotum, microreticulate near apex, interspaces alutaceous. Eytral surface with serial rows of alternating large and small shallow punctures. Large punctures similar in size to large pronotal punctures, each giving rise to a single short fine semierect seta. Small punctures 0.20 diameter of large punctures, each giving rise to a short fine seta. Small punctures in either single or irregular double rows. Interspaces mostly alutaceous between all punctures, larger punctures separated from each other by 0.25 puncture diameter, smaller punctures separated from each other by 1-2 puncture diameters. Large and small puncture rows separated from each other by ~0.5 large puncture diameter. Pygidium densely punctate, punctures equal in size to small punctures on elytra, interspaces alutaceous with some minute microreticulation, punctures separated by ~0.5 puncture diameter. Each puncture giving rise to a short stiff seta, setae equal to length of those on elytra.

Venter with less pubescence than dorsum. Mentum with sparse minute punctation, punctures similar in size to small punctures on elytra. Submentum and gula with scattered small punctures equal in size to those on mentum, interspaces alutaceous with some microreticulation. Prosternum and epimeron irregularly faintly punctate, punctures approximately equal in size to larger punctures on vertex, interspaces alutaceous, prosternal punctures separated by 0.25 - 0.5 diameter, those on the epimeron similarly separated. Mesosternum with very faint large punctures laterally, interspaces alutaceous. Metasternum irregularly punctate, with small faint punctures on disc similar in size to large punctures on vertex, interspaces smooth to alutaceous on metasternal disc, punctures separated by ~2-3 diameters. Abdominal sternite 1 with faint large punctures, only tip of abdominal process lacking punctation. Interspaces alutaceous, punctures separated by 0.5 - 1 diameter. Abdominal segments 2-4 with punctures aligned in irregular lateral rows. Punctures equal in size to those on abdominal sternite 1. Interspaces alutaceous, punctures separated by 0.25 diameter. Hypopygidium densely deeply punctate, punctures equal to those on other abdominal sternites, interspaces alutaceous with microreticulation, punctures separated by 0.25 diameter of puncture.

Head only slightly wider than long, somewhat triangular, with fronotclypeal region projecting anteriorly. Vertex with moderate concavity in the frontoclypeal region. Labrum transverse with indented medial region on anterior margin. Antennal club compact, oblong oval, densely setose, asymmetrical with the last antennomere longer than previous two combined. Antennomeres 6-8 strongly flattened into disc-like structures, their combined length less than the length of antennomere 9. Antennal scape asymmetrical, broadly hemispherical, 2 times as long as pedicel. Pedicel cylindrical in shape, ~0.5 length of scape. Antennal segment 3 subcylindrical, subequal in length to pedicel. Segments 4-5 subquadrate, narrowing basally, each 0.5 the length of segment 3. Antennal club large, ~0.75 length of segments 1-8 combined, asymmetrical, terminal segment larger than preceding two segments. Antennal grooves moderately deep, antennal ledge extending from gula laterally along mentum and transversely microreticulate. Mentum with apex acutely pointed anteriorly.

Pronotum widest near base (W:L = 1.875:1), anterior margin broadly shallowly concave, posterior margin convex and somewhat undulate with faint "lobe" over scutellum. Prosternal process somewhat narrowed between coxae, evenly rounded at apex, in lateral aspect the apex is somewhat depressed behind coxae. Scutellum large, elongate, with rounded apex. Mesosternum extending to midway between mesocoxae, posterior border truncate. Mesepisternum larger than mesosternum. Metasternum width to length ratio is ~2.8:1. Metepisternum somewhat narrow, only slightly concave medially, anterior third produced anteriolaterally. First abdominal sternite with broadly rounded almost truncate process between metacoxae with medial acute tip, first sternite ~2X's longer than second sternite. Sternites 2-4 subequal in length. Hypopygidium subequal in length to first abdominal sternite. Humeri moderately produced. Elytral margin narrow.

Protibia distinctly curved laterally, and faintly crenulate along posterior 0.75 of lateral edge. Apical tooth prominent, subequal to tarsomere 2. Outer apical notch with >90° angle, notch depth equal to tarsomere 1 and 0.5 of 2 combined. Inner apical spine subequal in length to first tarsomere. Protibia with very little armature overall. Mesotibia more heavily armored than protibia with a row of slender spines along entire lateral edge and another row medially to lateral spines on ventral surface. Outer apical process elongate and robust, larger than protibia process, projecting more posteriorly than protibial process. Inner apical spine equal in length to tarsomeres 1 and 0.5 of 2. Metatibia heavily armored with numerous rows of slender elongate spines. Spines of varying lengths, but mostly longer than those on the mesotibia. Outer apical process elongate and robust, equal in length to inner apical spine, projecting more posteriorly than mesotibial processes. Inner apical spine subequal in length to tarsomeres 1-2 combined.

Male genitalia well sclerotized. Anal sclerite with large broadly curved medial concavity approaching apex (Fig. 33). Spiculum gastrale with moderately wide lateral flanges, medial margins deeply concave, short stiff setae originating from apex (Fig. 72. Tegmen truncate apically (Fig. 113), much longer than wide (w:l = 1.0:2.5), lateral row of setae visible from the median fossa to prior to around apex, large concavity in apical third, basal notch perpendicular, basal margin nearly straight, apex of median fossa border with extended patch of fine setae. Median lobe large and robust, ~0.6 the length of the tegmen, apex acuminate, apical opening well-developed with proximal invagination well-developed (Fig. 154). Ejaculatory rods fused basally, but not fused to basal piece, straight and elongate, basal piece not observed (Fig. 193).

Female genitalia well-sclerotized. Gonocoxites with large blunt apices and no recurrent lateral “teeth”. Inner gonocoxal cavity parallel-sided, not acute basally. Gonocoxite base with ridge of sclerotization, and two medial sclerotized ridges. Paraprocts moderately sclerotized with inner margin heavily sclerotized to apex (Fig. 229).

**Variation.** None documented, only one Paratype studied.

**Seasonality/Habitat.** Known from mid-June.

**Distribution.** Known from the type locality in northern Thailand.

**Notes.** *Pocadius majusculus* is the largest species in the genus. No host records have been recorded for this species.

### *Pocadius maquipucunensis* Leschen and Carlton

(Figs. 34, 73, 114, 155, 194, 230)

**Type Material Examined.** HOLOTYPE ♂ (SNEC): ECUADOR: Pichiincha; Maquipucuna For. Res.; 50km NW Quito, 1600m; 21 Dec. 1991, C. Carlton; R. Leschen #34; ex. *Lycoperdon* / HOLOTYPE; Pocadius; maquipucunensis; R. Leschen & C. Carlton. 13 PARATYPES: same data label as holotype. 1 PARATYPE: ECUADOR: Pichincha; Maquipucuna For. Res.; 50km NW Quito, 1720m; 23 Dec.1991, C. Carlton; R. Leschen #64, ex. FIT.

**Non-Type Material Examined.** 2 specimens with the following label data. (CMN): ECU: Pich., 16km E Sanot Domingo, Tinalandia, 4-V-25-VII-1985, S&J Peck, 680m, malaise-FIT, rainforest.

**Diagnosis.** The original description of this species suggested that the black coloration was sufficient to distinguish it from other species of the genus. The author's stated that the somewhat similarly colored *P. niger* is mostly black with red maculae on the elytra. The present study demonstrates that *P. niger* has individuals completely black and lack red elytral maculae. Also, new species described here from the Neotropics have individuals that are completely black in color. The following characters provide a more reliable diagnosis of the species: metacoxae broadly separated by rounded almost truncate abdominal process, terminal antennomere much longer than previous two segments combined and with characteristic sensillar region, prosternal process in lateral view with very slight convexity over procoxal cavity and with short slightly oblique posterior face, scutellum broader than long with large punctures aggregated in basal half and smaller punctures in apical half, elytra with extremely narrowly spaced rows of large and small punctures both within and between rows, metasternal disc with central glabrous apunctate region, tegmen much longer than wide and with two anterior shallow fossae, median lobe evenly rounded at apex with complex apical opening, ejaculatory rods with basal piece thickened and adjacent basally, and ovipositor with broad gonocoxites having more or less converging apical processes, and three primary setae extending from apical pit (not asetose as remarked upon in the original description).

**Redescription.** Length 3.8 mm, Width 2.6mm, Depth 1.4mm. Body moderately convex, surface shining, dark pitchy brown-black to black in color, venter and appendages lighter. Pronotum and elytra margins with elongate fimbriae, setae longer than width of antennal scape. Dorsal and ventral pubescence quite long, but ventral setae somewhat shorter and more sparsely distributed than dorsal ones.

Head surface deeply, irregularly punctate, punctures larger on vertex, becoming somewhat smaller and more densely aggregated towards orbits and fronotclypeal region. Larger punctures 5-6 X diameter of eye facet, smaller punctures 3-4 X diameter. Interspaces smooth to finely alutaceous, shining. Each puncture gives rise to an elongate curved golden seta. Pronotal surface with large punctures equal in size to large punctures on vertex of head, interspersed with relatively few smaller punctures, ~0.85 size of larger ones. Interspaces alutaceous to granular, about 0.5-1 diameters apart. Each puncture gives rise to a long golden seta, most seta are curved but some are rather straight. Scutellar surface with shallowly impressed punctures, larger punctures aggregated in basal half becoming smaller posteriorly, some punctures giving rise to setae, interspaces alutaceous to granular. Elytral surface with serial rows of alternating large and small deep punctures. Smaller punctures are equal in size to smaller ones on pronotum, larger punctures are ~1.5 times diameter of smaller ones. Smaller punctures giving rise to a semi-erect long golden seta, larger punctures giving rise to a semi-erect long golden seta. Interspaces extremely narrow between punctures of a given row and between different rows. Within a row, small punctures are separated by ~0.75 puncture width, and large punctures by 0.25-0.5 puncture diameter. Large puncture rows are separated by 1.0 large puncture diameter. Interspaces shining but variable from alutaceous to granular in sculpture. Pygidium densely punctate, punctures equal in size to larger ones on pronotum, each puncture giving rise to a long straight golden seta. Interspaces narrow, 0.25-0.5 diameter, with smooth to alutaceous sculpture.

Venter with shorter more sparsely distributed golden pubescence as dorsum. Mentum with small very shallow punctures, equal in size to smaller ones on vertex, each giving rise to a moderately long seta. Interspaces alutaceous to granular. Submentum and gula with similar vaguely impressed small punctation as mentum but with interspaces completely granular. Prosternum and epimeron deeply irregularly punctate, punctures 1.5-1.75X larger than those on mentum, interspaces granular, prosternal and epimeron punctures separated by 0.5 diameter. Mesosternum with shallow punctures, similar in diameter to those on prosternum, interspaces granular, separated by about 0.5 to 1 diameter and mostly aggregated along posterior border. Metasternum irregularly punctate, with central glabrous apunctate region on disc, those on rest of metasternum similar in size to those on mesosternum, interspaces alutaceous to granular becoming more granular laterally, punctures separated by ~1-1.5 diameters. Abdominal sternite 1 with large faint punctures, punctures equal to those on metasternum, interspaces alutaceous to granular with some microreticulation anteriorly, separated by ~1-2 diameter. Abdominal sternites 2-4 with an irregular row of punctures near posterior margin as well as other dispersed punctures, punctures somewhat smaller in size to those on metasternum, dispersed punctures separated by 0.75-1 puncture diameter, punctures within rows separated by ~0.5 punctures diameter. Hypopygidium with moderately deep punctures, similar in size to those on abdominal sternite 1, interspaces alutaceous to granular, punctures separated by 0.75-1 puncture diameter.

Head slightly wider than long (W:L = 1.56:1), fronotclypeal region moderately projecting anteriorly. Vertex with shallow broad wide concavity between orbits near fronotclypeal region. Labrum with shallow medial incision at anterior margin. Antennal club compact, broadly obovate, strongly asymmetrical with the last antennomere much greater in length than the previous two combined. Antennomeres 6-8 more or less compact, and characteristically disc-like. Antennal scape asymmetrical, somewhat hemispherical, 1.75 times as long as pedicel. Pedicel subcylindrical in shape. Antennal segment 3 shorter in length than pedicel. Antennal club large, ~0.73 length of segments 1-8 combined. Each club segment with dense short setae, and only relatively few protruding setae. Antennal grooves very deep and widely excavate, slightly converging posteriorly. Lateral and medial mental ridges prominent with very broadly excavate furrow, at level of submentum, medially the ridge is granularly sculptured with several setal bearing punctures, and laterally with oblique to longitudinal microreticulations. Mentum with anterior angles reduced, anterior margin angulate and coming to a distinct medial acuminate apex, lateral margins very short almost obsolete , basal margin straight, entire structure pentagonal and moderately convex.

Pronotum widest near middle (L:W = 1:1.83), anterior margin broadly concave and only slightly trapezoidal, posterior margin moderately convex, lateral margins less arcuate posteriorly. Scutellum large, obtusely broadly triangular, much wider than long, apex broadly rounded. Prosternal process somewhat narrowed between procoxae, apex acuminate, in lateral aspect the anterior and posterior ends are not prominent and there is only a slight medial convexity over the procoxae. Posterior apical wall prominent, but short, and only slightly oblique. Mesosternum extending to just before midway between mesocoxae, evenly deeply concave for reception of the metasternum. Metasternum width to length ratio is ~3.2:1.0. Metepisternum broad with slight medial concavity, oblique line dividing anterior 0.15 of structure. Elytral humeri moderately produced, lateral margin very narrow. First abdominal sternite with broadly convex to truncate process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-3 subequal in length, the fourth slightly larger than the preceding two. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth very prominent, subequal to tarsomeres 1 and half of 2 combined. Outer apical notch with ~95-100° angle, notch depth deep, equal to length of tarsomere 1 and part of 2. Inner apical spine subequal in length to tarsomeres 1-2 combined. Protibia not heavily armored but with characteristic dense patch of stiff setae along the inner apical region. Mesotibia more heavily armored than protibia with more dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process elongate but not robust, larger than protibia process. Inner apical spine equal in length to tarsomeres 1-2 combined. Metatibia with armature similar to that of mesotibia, but with apical tooth and spines longer.

Male genitalia well-sclerotized. Anal sclerite with large broadly curved region anteriodorsally (Fig. 34); apex with elongate fimbria; ventrally with a broad medial concavity approaching apex. Spiculum gastrale with moderately wide lateral flanges, medial margins broadly concave proximally, numerous moderately long stiff setae originating from apex (fig. 73). Tegmen more acutely rounded apically (Fig. 114), much longer than wide (w:l = 1.0:2.9), lateral row of setae visible from the median fossa to prior to around the apex, two small shallow concavities in apical third, inner row of setae incomplete, not attaining apex, basal margin of phallobase angulate. Median lobe large and robust, ~0.66 the length of tegmen, apex broadly rounded, apical opening well-developed (Fig. 155). Ejaculatory rods not fused to basal piece or each other, apical rods curved inward medially and expanded outward at basal piece. Basal piece of rods as two distinct elongate parts, thicker than apical ejaculatory rods and abutting basally (Fig. 194).

Female genitalia moderately sclerotized. Paraprocts large with sclerotization only along median line to gonocoxite. Gonocoxite with one basal lateral prominence, basal ridge well-sclerotized. Gonocoxal apices with recurved "tooth" absent. Usually three but in a few specimens four primary setae originate from small depressions at the gonocoxal apices (Fig. 230).

**Variation.** Some specimens are more dark brown than black. Male pygidium with apical margin truncate.

**Seasonality/Habitat.** The species is known from mid-elevation tropical rainforests from May through July and again in December.

**Distribution.** Known only from Amazonian Ecuador in the Pichincha Province.

**Notes.** Specimens have been collected from *Lycoperdon* sp.

## ***Pocadius martini* Kirejtshuk**

(Fig. 231)

**Type Material Examined.** (1) Holotype ♀ (ZMUC): PHILIPPINES, Palawan; Mantalingajan; Pinigisan, 630 meter; 4 Sept. 1961; Noona Dan Exp., 61-62 / caught in malaise trap / Holotypus *Pocadius martini* det. Kirejtshuk 1982.

**Non-Type Material Examined.** None.

**Diagnosis.** Easily distinguished from any other *Pocadius* due to the extremely short antennal stem (i.e. antennomeres 1-8), which is subequal in length to the antennal club (i.e. antennomeres 9-11); and the antennal club is distinctly asymmetrical. *Pocadius martini* is also one of the smaller members of the genus at ~3.1mm in length.

**Redescription.** Length 3.1mm, Width 1.6mm, Depth 0.7mm. Body slightly convex, surface shining, light tan to reddish brown in color, setae pale, short and fine. Pronotum and elytra with margins scarcely fimbriate. Pygidium and hypopygidium scarcely setate, but posterior margins finely fimbriate.

Head surface shallowly, diffusely punctate with only relatively few punctures giving rise to small fine pale setae. Interspaces granular to alutaceous. Smaller punctures about 0.75-0.5 the size of larger ones, large punctures about 6-7 times the size of facets. Eyes with small fine facets. Pronotal surface with large and small punctures interspersed throughout. Large punctures similar in size to respective large punctures on head, smaller punctures about 0.75 size of large ones. Interspaces ~1 puncture diameter apart, granular with some microreticulation present on disc. Each puncture bearing a short fine pale seta. Scutellar surface scarcely punctate with small punctures similar in size to the smaller punctures on the pronotum, interspaces alutaceous. Eytral surface with serial rows of alternating large and small shallow punctures. Large punctures ~3 times diameter of the large punctures on head, each giving rise to a single short fine decumbent seta. Small punctures 0.25 diameter of large punctures, each giving rise to a short fine decumbent seta. Interspaces faintly granular to smooth between all punctures, larger punctures separated from each other by <0.5 puncture diameter, smaller punctures separated from each other by 1.5-2 puncture diameters. Large and small puncture rows separated from each other by ~0.33 large puncture diameter. Pygidium densely punctate, punctures equal in size to small punctures on elytra, interspaces granular with some minute microreticulation, punctures separated by ~0.5-0.25 puncture diameter. Each puncture giving rise to a short stiff semi-decumbent seta, setae ~0.33 length of those on elytra.

Venter similar in pubescence to dorsum, with femora having longest setae. Mentum with small fine punctures, equal in size to small punctures on head, interspaces distant with granular to alutaceous texture. Submentum and gula also with scattered small punctures equal in size to the small punctures on mentum, interspaces granular to alutaceous. Prosternum and epimeron more deeply and irregularly punctate, punctures approximately 0.75 size larger punctures on vertex, interspaces mostly alutaceous with some microreticulation, prosternal punctures separated by 0.25 diameter, those on the epimeron by 0.25 to 0.5 diameter. Mesosternum with very faint small punctures in a linear series, punctures equal to large punctures on head, interspaces smooth to alutaceous. Metasternum deeply irregularly punctate, with large punctures similar in size to those on elytra, disc less densely punctate than lateral regions, interspaces smooth to alutaceous, punctures separated by ~1-2 diameters. Abdominal sternite 1 with faint large punctures occurring in all but the anterior 0.33 of the structure which has faint transverse microreticulate sculpturing. Interspaces alutaceous, punctures separated by 1-2 diameters. Abdominal segments 2-4 with punctures aligned in irregular transverse rows, punctures equal in size to those on abdominal sternite 1. Interspaces alutaceous to granular, punctures separated by ~1 diameter. Hypopygidium densely deeply punctate, punctures slightly larger than those on other abdominal sternites, interspaces smooth to alutaceous with faint microreticulation, punctures separated by ~0.5 diameter of puncture.

Head much wider than long (W:L = 1.4:1), broadly triangular, with fronotclypeal region projecting slightly anteriorly. Vertex with broad deep concavity in the fronto-clypeal region. Eyes large with small fine facets. Labrum transverse with minute medial incision on anterior margin. Mentum with ventral convexity, giving somewhat convex appearance, structure broadly pentagonal with acute apex. Lateral mental ridge not prominent, at level of submentum, ridge with longitudinal microreticulation on surface. Antennal club compact, oblong oval, asymmetrical with the last antennomere much longer than previous two combined, subequal in length to segments 1-8 combined. Antennal scape asymmetrical, somewhat hemispherical, 2 times as long as pedicel. Pedicel subcylindrical in shape. Antennomere three elongate, longer than either the pedicel or segment 4. Antennomeres 4-5 subquadrate, subequal to one another. Antennomeres 6-8 flattened into disc-like structures, their combined length equal to the length of antennomere 9. Antennal grooves moderately shallow.

Pronotum transverse, widest near posterior angles (L:W = 1:2.8 ), anterior margin broadly shallowly emarginate, posterior margin mostly truncate with faint "lobe" over scutellum, lateral margins slightly tapering anteriorly. Scutellum large and broadly triangular. Prosternal process somewhat narrowed between coxae, acute apex, in lateral aspect the apical 0.33 is straight and more dorsad behind the procoxae (Fig. ?). Mesosternum extending to 0.66 between mesocoxae. Mesepisternum wider than mesosternum. Metasternum transverse, W:L ~3.5:1. Metepisternum moderate, only slightly concave medially, anterior third moderately produced anteriolaterally. Anterior 0.20 cut-off to form axillary space which lacks punctures. Elytral humeri slightly produced, lateral margin narrow. First abdominal sternite with broadly rounded process between metacoxae, first sternite ~2X's longer than second sternite. Sternites 2-4 subequal in length. Hypopygidium subequal in length to first abdominal sternite. All femora elongate, widest at middle to distal 0.66.

Protibia with apical tooth prominent, slightly longer than tarsomere 1. Outer apical notch with ~90° angle, notch depth equal to tarsomere 1 and part of 2 combined. Inner apical spine subequal in length to tarsomeres 1 and part of 2. Protibia with very little armature overall. Mesotibia more heavily armored than protibia with a row of slender spines along entire lateral edge and other spines scattered on ventral surface. Outer apical process elongate and robust, larger than protibia process. Inner apical spine equal in length to tarsomeres 1 and 0.5 of 2. Metatibia heavily armored with several rows of slender elongate spines. Spines of varying lengths, but mostly longer than those on the mesotibia. Outer apical process elongate and robust, equal in length to inner apical spine, projecting more posteriorly than pro- or mesotibial processes. Inner apical spine subequal in length to tarsomeres 1-2 combined.

Female genitalia overall moderately sclerotized. Gonocoxites with sclerotized basal border with two lateral prominences, basal border giving rise to two medial oblique sclerotized ridges extending apicolaterally, ridges short ~1/8 length of basal border. Gonocoxal apices moderately separated with intragonocoxal invagination evenly rounded at base, gonocoxal tips evenly rounded basally, each apex with a small lateral depression that gives rise to 4 short seta. Valvifers membranous with some sclerotization along medial border, evenly tapering to lateral apex (Fig. 231).

Male genitalia not observed

**Variation.** None documented, only Holotype studied.

**Seasonality/Habitat.** Holotype collected in early September.

**Distribution.** Known from the type locality on the southwest island of Palawan.

**Notes.** This species does not superficially resemble any of the new species from the Malaysian archipelago and likely represents an island endemic. More collecting from the other Philippine islands is needed to further define this fauna, which will likely include other island endemics as observed in the Greater Antille island chain. No host records are known for this species.

### *Pocadius monticolis* Lechanteur

(Fig. 232)

**Type Material Examined.** (1) Paratype ♀ (Prague, Czech Rep.): Blukwa; Mont Wago; 7900m; 7-5-56 / Ituri, Zaire / Paratype / F. Lechanteur det., 1958; Pocadius; monticola; n. sp. / Mus. Nat. Prague; 65627; Inv.

**Non-Type Material Examined.** None.

**Diagnosis.** Differs from other *Pocadius* by unique dark medial line on the pronotum in combination with orange-brown humeri, a dark antennal club, the protibial outer apical spur without a prominent notch, heavy armature on all tibia, the elongate sub-cylindrical shape of the antennal pedicel, and genitalic features such as .

**Redescription.** Length 4.9mm, Width 2.4mm, Depth 1.6mm. Body dark brown/black with the following areas orange/brown: lateral 0.33 of pronotum, anterior 0.33 of elytra from humeri to near suture, venter and appendages except antennal club which is dark. Pronotum and elytra with margins fimbriate. Pygidium and hypopygidium moderately setate, with posterior margins densely fimbriate.

Head surface deeply densely punctate, large and small punctures interspersed throughout vertex. Large punctures ~4-5 times the diameter of an eye facet, smaller punctures about 0.5 size of larger punctures, interspaces alutaceous and granular, ~ 1 diameter apart. Smaller punctures giving rise to elongate pale brown setae. Fronotclypeal region with broad shallow concavity on vertex. Pronotal surface with large and small punctures interspersed throughout, with the pronotal disc having more abundance of smaller punctures than lateral regions. Elongate pale brown setae derived from each small puncture. Larger punctures ~1.5 times diameter of large punctures on vertex, smaller punctures ~0.33 the size of larger punctures. Interspaces 0.5-1 diameter apart, mostly granular texture. Scutellar surface faintly punctate with punctures similar in size to the larger punctures on the vertex, most punctures aggregated in anterior 0.5, interspaces granular, a few long setae derived from some of the punctures. Eytral surface with serial rows of alternating large and small shallow punctures. Large punctures somewhat transverse, ~1.5 times the size of the large pronotal punctures, each giving rise to a single short stiff semidecumbent seta, ~0.5 the length of the setae derived from the smaller punctures. Small punctures 0.25 diameter of large punctures, each giving rise to an elongate pale brown seta, similar in length to those on head and pronotum. Large and small punctures in single rows. Interspaces mostly alutaceous to granular between all punctures, larger punctures separated from each other by 0.25 puncture diameter, smaller punctures separated from each other by 1-2 puncture diameters. Large and small puncture rows separated from each other by ~0.75-1 large puncture diameter. Pygidium densely irregularly punctate, punctures equal in size to small punctures on elytra, interspaces alutaceous, punctures separated by ~0.25 puncture diameter. Some but not all punctures giving rise to a short stiff seta, setae equal to length of those from large punctures on elytra.

Venter with shorter finer pubescence than dorsum. Mentum with faint large punctation, punctures similar in size to ~0.75 the size of the large vertex punctures, some of the punctures giving rise to moderately long setae, interspaces granular. Submentum and gula with scattered small punctures equal to 0.5 size of those on mentum, interspaces alutaceous to granular, with moderately long setae derived from them. Prosternum and epimeron irregularly faintly punctate, punctures approximately equal in size to mentum punctures, interspaces alutaceous, prosternal punctures separated by 0.25 - 0.5 diameter, those on the epimeron similarly separated. Prosternal punctures giving rise to elongate setae the are slightly curved apically. Mesosternum with very faint large punctures along posterior margin, interspaces alutaceous. Metasternum irregularly punctate, with small faint punctures on disc similar in size to small elytral punctures, interspaces smooth to alutaceous on metasternal disc, punctures separated by ~2-3 diameters, each punctures giving rise to a straight moderately long seta. Abdominal sternite 1 with faint medium sized punctures on the abdominal process that are about 1.5 times larger than those on metasternum, interspaces wide, ~3 diameters apart, mostly alutaceous with transverse microreticulation visible; large pictures posteriorly and laterally on sternite 1, equal in size to those on elytra. Abdominal segments 2-4 with large punctures aligned in irregular lateral rows. Punctures similar in size to larger punctures on abdominal sternite 1. Interspaces alutaceous, punctures separated by 0.25 diameter. Hypopygidium densely deeply punctate, punctures equal to those on abdominal sternites 2-4, interspaces alutaceous with some microreticulation, punctures separated by 0.25-0.5 diameter of puncture. Head only slightly wider than long, somewhat triangular, with fronotclypeal region projecting anteriorly. No prominence over antennal insertion. Labrum transverse with broad indented medial region on anterior margin. Antennal club compact, elongate oval, densely setose, asymmetrical, with the last antennomere longer than previous two combined. Antennomeres 6-8 strongly flattened into disc-like structures, their combined length less than the length of antennomere 9. Antennal scape somewhat asymmetrical, subcylindrical, 2 times as long as pedicel, numerous elongate setae arising from anterior margin of scape. Pedicel cylindrical in shape, ~0.5 length and width of scape, widest near middle. Antennal segment 3 subcylindrical, about 0.75 length of pedicel. Segments 4-5 subquadrate, narrowing basally, each ~0.5 the length of segment 3. Antennal club large, subequal in length of segments 1-8 combined, asymmetrical, terminal segment larger than preceding two segments. Antennal grooves moderately deep and somewhat medially curved posteriorly, antennal ledge extending from submentum laterally along mentum with alutaceous and microreticulate surface. Mentum with apex evenly rounded anteriorly, hemispherical, somewhat convex.

Pronotum transverse, widest near posterior angles (W:L = ~2:1), anterior margin broadly deeply concave, posterior margin broadly convex. Prosternal process somewhat narrowed between coxae, acute apex, in lateral aspect the anterior portion is depressed before coxal cavities, with a perpendicular apical wall. Scutellum large, broadly triangular with rounded apex. Mesosternum not extending to midway between mesocoxae, posterior border deeply concave. Mesepisternum equal in width to mesosternum. Mesepimeron ~0.5 the width of mesepisternum. Metasternum width to length ratio is ~2.3:1. Metepisternum somewhat broad, only slightly concave medially, anterior third produced anteriomedially, anterior 1/6 cut-off from rest of metepisternum by faint oblique incomplete carina. First abdominal sternite with broadly triangular process between metacoxae with medial acute tip, first sternite ~1.75's longer than second sternite. Sternites 2-4 subequal in length. Hypopygidium ~1.2 times the length of first abdominal sternite. Humeri slightly produced with faint to obsolete narrow elytral margin.

Protibia with slight lateral curvature, faintly crenulate along lateral edge. Apical tooth somewhat prominent, subequal to tarsomere 2. Outer apical notch indistinct, notch depth equal to 0.5 length of tarsomere 1. Inner apical spine subequal in length to first tarsomere and 0.5 of second. Protibia with moderate armature overall, a row of short stiff spines along inner edge. Mesotibia more heavily armored than protibia with several rows of slender spines along lateral edge and medial and ventral surfaces. Outer apical process somewhat robust, subequal to protibial process, projecting slightly more posteriorly than protibial process. Inner apical spine equal in length to tarsomere 1. Metatibia heavily armored with numerous rows of slender elongate spines. Spines of varying lengths, but mostly longer than those on the mesotibia. Outer apical process robust, projecting more posteriorly than mesotibial processes. Inner apical spine subequal in length to tarsomeres 1 and 0.5 of the second combined.

Male genitalia not observed.

Female genitalia moderately sclerotized (Fig. 232). Paraprocts large with sclerotization along median margin. Gonocoxite with one basal lateral prominence, basal ridge moderately well-sclerotized. Gonocoxal apices with recurved "tooth" present. Two primary setae originate from small depressions on the gonocoxal apices (Fig. ?). Intragonocoxal invagination deep and narrow.

**Variation.** None documented, only 1 Paratype studied.

**Seasonality/Habitat.** Known to the author only from the single paratype female that was collected in May.

**Distribution.** Known only from the type locality.

**Notes.** No host information is known for this species.

## ***Pocadius niger*** **Parsons**

(Figs. 35, 74, 115, 156, 195, 233)

**Type Material Examined.** HOLOTYPE (USNM): Las Vegas HS; 5-8, N.M. / Barber &; Schwarz Coll. / Holotype No; 54656. 4 PARATYPES (USNM): same data labels as holotype, except last label reads "Paratype No; 54656".

**Non-Type Material Examined.** 22 specimens (CAS, LSAM, ACC) with the following label data: Peterson Ranch; [illegible handwriting]; Sierra Ancha Mts. / Gila Co., AZ; VIII-20-1947 / puffball / L.R. Gillogly collector. ARIZ. Rustler Park; Chiricahua Mts., Cochise Co., Aug. 11, 1970, 8500ft.

**Diagnosis.** This species can be distinguished from the other New World fauna by the following characters: body coloration black often with orange brown humeri; prosternal process evenly rounded over procoxae with posterior face straight to slightly concave; terminal antennomere shorter than segments 9-10 combined and evenly rounded apically, apico-lateral protibial notch deep and distinct; eyes smaller and not greatly protruding; elytral fimbriae markedly elongate and sparsely distributed; median lobe of aedeagus oval in shape with evenly rounded apex; basal structure of ejaculatory rods with medial convexity along basal margin; ovipositor gonocoxites with one lateral prominence and with a W:L ~1:1.

**Redescription.** Length 3.6 mm, Width 1.9mm, Depth 1.3mm. Body moderately convex, surface somewhat shining, dark brown/black in color often with elytral humeri and basal portion of elytra lighter. Pronotum and elytra margins with elongate sparsely distributed fimbriae, setae much longer than width of antennal scape. Dorsal and ventral pubescence quite long.

Head surface deeply, irregularly punctate, large and smaller punctures evenly distributed across vertex. Larger punctures ~5 X diameter of eye facet, smaller punctures 4 X diameter, interspaces finely alutaceous and somewhat shining. Each smaller puncture gives rise to an elongate curved golden seta. Pronotal surface with large punctures equal in size to large punctures on vertex of head, interspersed with numerous smaller punctures, ~0.75 size of larger ones, interspaces alutaceous with some microreticulation, about 0.5 diameters apart. Each puncture gives rise to a long golden seta. Scutellar surface with few vague shallowly impressed punctures similar in size to smaller ones on pronotum, some punctures giving rise to setae, and the interspaces are alutaceous to somewhat granular. Elytral surface with serial rows of alternating large and small moderately deep punctures. Smaller punctures are equal in size to smaller ones on pronotum, larger punctures are ~1.5-2 times diameter of smaller ones. Smaller punctures giving rise to an erect long golden seta, larger punctures giving rise to a semi-erect long golden seta. Interspaces narrow between punctures of a given row and between different rows. Within a row, small punctures are separated by ~1 puncture width, and large punctures by 0.3-0.5 puncture width. Large puncture rows are separated by 2 large puncture diameters.

Interspaces moderately shining but variable from smooth to somewhat rugose in sculpture. Pygidium densely punctate, punctures equal in size to smaller ones on pronotum, each puncture giving rise to a moderately long golden seta. Interspaces narrow, 0.25-0.5 diameters, with alutaceous to granular sculpture.

Venter with similarly long golden pubescence as dorsum. Mentum with few small very shallow punctures, equal in size to smaller ones on vertex, each giving rise to an short stiff seta. Interspaces alutaceous to finely microreticulate. Submentum and gula similar in punctation to mentum but with interspaces having more microreticulation present. Prosternum and epimeron deeply irregularly punctate, punctures similar in size to larger ones on vertex, interspaces granular with conspicuous microreticulate areas, prosternal punctures separated by 0.25-0.5 diameter, those on the epimeron similarly spaced. Mesosternum with shallow punctures, similar in size to those on prosternum, interspaces alutaceous to rugose, separated by about 0.5 to 1 diameter, and mostly aggregated near metasternal border. Metasternum deeply irregularly punctate, with punctures on disc slightly larger in size to those on mesosternum, interspaces alutaceous to rugose on metasternal disc becoming microreticulate to granular laterally, punctures separated by ~0.75-1 diameter. Abdominal sternite 1 with some large and smaller punctures intermixed, larger punctures equal to those on metasternum and smaller punctures equal to those on mentum, interspaces alutaceous to granular, separated by ~1 diameter. Abdominal sternites 2-4 with two irregular rows of punctures near the anterior and posterior margin and other dispersed punctures, punctures similar in size to smaller ones on abdominal sternite 1, punctures within a row separated by ~1 puncture width, other punctures more widely spaced. Hypopygidium with moderately deep punctures, similar in size to those on sternites 2-4, interspaces alutaceous to granular, punctures separated by 0.5-1 puncture width.

Head slightly wider than long (W:L = 1.5:1), fronotclypeal region moderately projecting anteriorly. Vertex with broad deep concavity between orbits near fronotclypeal region. Labrum with shallow but broad incision at anterior margin. Antennal club compact, elongate to oval, symmetrical with the last antennomere shorter than the previous two segments combined. Antennomeres 6-8 more or less compact, with 7-8 characteristically disc-like. Antennal scape asymmetrical, faintly hemispherical, 2 times as long as pedicel. Pedicel short, subcylindrical in shape. Antennal segment 3 equal in length to pedicel. Antennal club moderately large, ~0.68 length of segments 1-8 combined. Antennal grooves very deep and widely excavate, slightly converging posteriorly. Lateral mental/submental ridge prominent, at level of submentum, ridge sculptured with small minute punctures medially and laterally with oblique to longitudinal microreticulations. Mentum with anterior angles distinct, anterior margin angular coming to more or less distinct apex, entire structure pentagonal and flattened when viewed laterally.

Pronotum widest near middle (L:W = 1:1.73), anterior margin broadly trapezoidal, posterior margin moderately convex, lateral margins less arcuate posteriorly, anterior and posterior angles distinct. Scutellum large, elongate triangular, apex narrowly rounded. Prosternal process somewhat narrowed between procoxae, apex somewhat acuminate, in lateral aspect the anterior and posterior ends are prominent and evenly convex medially. Posterior apical wall prominent and perpendicular with a slight concavity. Mesosternum extending to midway between mesocoxae, evenly concave for reception of the metasternum. Metasternum width to length ratio is ~2.51:1.0. Metepisternum with slight medial constriction, oblique line dividing anterior 0.20 of structure. Elytral humeri moderately produced, lateral margin very narrow. First abdominal sternite with narrow acuminate process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-3 subequal in length. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth very prominent, slightly longer than tarsomeres 1-2 combined. Outer apical notch with ~95° angle, notch depth deep, equal to length to tarsomere 1 and part of 2 combined. Inner apical spine subequal in length to tarsomere 1 and part of 2 combined. Protibia heavily armored with characteristic dense patch of stiff setae along the inner apical region and numerous elongate setae along lateral margin. Mesotibia more heavily armored than protibia with more rows of dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process elongate and robust, larger than protibia process. Inner apical spine equal in length to tarsomeres 1-2 combined. Metatibia with more than that of mesotibia, numerous spines adorning the lateral and medial borders, but with outer apical process similar to that of mesotibia.

Male genitalia well-sclerotized. Anal sclerite with large broadly curved region anteriodorsally (Fig. 35); apex somewhat fimbriate; ventrally with a broad medial concavity approaching apex in a truncate manner. Spiculum gastrale with wide lateral flanges having small concavity near apical-lateral region, medial margins concave, extremely short stiff setae originating from apex (Fig. 74). Tegmen evenly rounded apically (Fig. 115), longer than wide (w:l = 1.0:1.77) becoming somewhat narrowed basally, lateral row of setae visible from apex of the median fossa to prior to the tegmen apex, circular/oval shallow concavity in apical third, basal notch perpendicular, basal margin slightly concave, inner row of setae not attaining apex. Median lobe oval and robust, ~0.50 the length of the tegmen, apex evenly rounded, apical opening well-developed with deep proximal concavity (Fig. 156). Ejaculatory rods not fused to basal piece, slightly curved inward medially and expanded outward at basal piece. Basal piece of rods with biconcavity along apical margin, proximally with two sharp projections and two rounded projections (Fig. 195).

Female genitalia moderately sclerotized. Paraprocts large and widely flared with sclerotization along median and basal margins. Gonocoxite with one basal lateral prominence, basal ridge moderately well-sclerotized. Gonocoxal apices with recurved "tooth" present. Two primary setae originate from small depressions on the gonocoxal apices (Fig. 233).

**Variation.** Some specimens have the reddish areas on the elytral humeri lacking, giving rise to an all dark brown/black color pattern.

**Seasonality/Habitat.** Specimens have only been collected in the month of August in all localities in Arizona and New Mexico. This species occurs at some of the highest altitudes in the genus, with specimens collected from above 8000'.

**Distribution.** This species is known from southern New Mexico through parts of southern and south-central Arizona.

**Notes.** Host records for this species only include the generic term "puffball" in the label data.

## ***Pocadius nigerrimus* Cline new species**

(Figs. 36, 75, 116, 157, 196)

**Type Material Examined.** HOLOTYPE ♂ (SNEC): PARAGUAY: Itapúa; Yataí, prop. Hostettler family,; San Rafael Reserve, 100m; 26°38'17"S, 55°38'50"W; 21-25 NOV 2000, Z.H. Falin; PAR1F00 040; ex. flight intercept trap / SM0257887; KUNHM-ENT ["bar-code" label] / HOLOTYPE; Pocadius; nigerrimus; A.R. Cline des. 2004.

**Diagnosis.** This species can be delimited from the other Neotropical fauna by the following suite of characters: uniformly dark reddish brown/black coloration; thickened tarsomeres; elongate pronotal and elytral fimbriae; elytral punctures with little dissimilarity in the diameter of the large and small serial rows of punctures; elytral setae erect and semi-erect;

widely globular antennal club with transversely expanded terminal antennomere; male pygidium deeply indentate along apical border; tegmen with incomplete sinuately organized inner row of setae; median lobe globular but with narrowed apex; ejaculatory rods elongate with expanded proximal and distal regions; basal piece of internal sac sclerites with two separate lateral pieces and a central elongate piece that overlaps the two lateral arms.

**Description.** Length 4.5mm, Width 2.7mm, Depth 1.8mm. Body moderately convex, surface shining, uniformly dark reddish-brown/black. Pronotum and elytra margins with elongate fimbriae, setae longer than width of antennal scape. Dorsal and ventral pubescence somewhat sparsely distributed but quite long.

Head surface deeply, irregularly punctate, punctures larger on vertex, becoming somewhat smaller towards orbits and fronotclypeal region. Larger punctures 5-6X diameter of eye facet, smaller punctures 1-2X diameter. Interspaces smooth to finely granular, shining. Each puncture gives rise to an elongate curved golden seta. Pronotal surface with large punctures subequal in size to large punctures on vertex of head, interspersed with relatively few smaller punctures, ~0.5 size of larger ones. Interspaces alutaceous to finely microreticulate, about 0.5-1 diameter apart. Each puncture gives rise to a long curved golden seta. Scutellar surface with many shallowly impressed punctures, some punctures giving rise to setae, and the interspaces are alutaceous to finely microreticulate. Elytral surface with serial rows of alternating large and small deep punctures. Smaller punctures are equal in size to those on pronotum, larger punctures are ~2-3 times diameter of smaller ones. Smaller punctures giving rise to an erect long golden seta, larger punctures giving rise to a semi-erect somewhat shorter golden seta. Interspaces broad between punctures of a given row and between different rows. Within a row, small punctures are separated by ~2-3 puncture diameters, and large punctures by 1 puncture diameter. Larger rows are separated by ~2 large puncture diameters. Interspaces always shining but variable from smooth to finely microreticulate in sculpture. Pygidium densely punctate, punctures equal in size to larger ones on pronotum, each puncture giving rise to a moderately long golden seta. Interspaces narrow, 0.25-0.75 diameter, with granular to microreticulate sculpture.

Venter with somewhat shorter and sparser golden pubescence as dorsum. Mentum with large small shallow punctures, equal in size to smaller ones on vertex, each giving rise to a short seta. Interspaces smooth with areas of fine microreticulations. Submentum and gula similar in punctation to mentum. Prosternum and epimeron shallowly irregularly punctate, epimeron punctures equal to large punctures on vertex and those on prosternum equal to smaller punctures on vertex, interspaces alutaceous with microreticulate areas, prosternal punctures separated by ~1-2 diameter, those on the epimeron by 0.25 to 0.5 diameter. Mesosternum with shallow punctures, equal in diameter of those on epimeron, interspaces alutaceous to granular, separated by about 0.5 to 1 diameter, and aggregated near metasternum. Metasternum irregularly punctate, with minute faint punctures on disc similar in size to smaller ones on vertex, interspaces finely alutaceous to granular on metasternal disc becoming somewhat smoother laterally, disc punctures separated by ~1-2 diameters. Abdominal sternite 1 with large faint punctures, punctures equal to large punctures on pronotum, interspaces alutaceous with microreticulations present, separated by ~1-2 diameters. Abdominal sternites 2-4 with two irregular rows of punctures, one row near anterior margin and the other near posterior margin, punctures similar in size to those on abdominal sternite 1, rows separated by ~2-3 puncture diameters, punctures within rows separated by ~1-2 puncture diameter. Rows on abdominal sternite 4 becoming less organized. Hypopygidium with moderately deep punctures, similar in size to those on sternites 2-4, interspaces alutaceous to granular, punctures separated by 0.5-1 diameter.

Head wider than long (W:L = 1.5:1), fronotclypeal region moderately projecting anteriorly. Vertex with shallow concavity between orbits near fronotclypeal region. Labrum with deep broad medial incision at anterior margin. Antennal club compact, globular, asymmetrical with the last antennomere longer than the previous two combined. Antennomeres 4-8 more or less compact, with 6-8 characteristically disc-like, and 4-5 cuboidal. Antennal scape asymmetrical, somewhat hemispherical, 1.6 times as long as pedicel. Pedicel subcylindrical in shape. Antennal segment 3 longer in length to pedicel. Antennal club moderately large, ~0.65 length of segments 1-8 combined. Antennal grooves very deep and widely excavate, slightly converging posteriorly. Lateral mental/submental ridge prominent, at level of submentum, ridge with well-developed longitudinal microreticulations throughout and the corresponding sulcus completely granular. Mentum with anterior angles obsolete, anterior margin broadly hemispherical, entire structure widely hemispherical when viewed ventrally and somewhat convex when viewed laterally.

Pronotum widest near middle (L:W = 1:1.7), anterior margin deeply broadly trapezoidal, posterior margin moderately convex, lateral margins less arcuate posteriorly. Scutellum large, obtusely triangular, apex rounded. Prosternal process somewhat narrowed between procoxae, apex somewhat acuminate, in lateral aspect the anterior and posterior ends are prominent with a slight convexity medially. Posterior apical wall not prominent and with a medial concavity. Mesosternum extending to midway between mesocoxae, evenly concave for reception of the metasternum. Metasternum width to length ratio is ~3.0:1.0. Metepisternum with slight medial constriction, oblique line dividing anterior 0.15 of structure. First abdominal sternite with broad truncate process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-3 subequal in length, the fourth slightly larger than the preceding two. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth not prominent, subequal to tarsomere 1. Outer apical notch with ~115° angle, notch depth shallow, equal to length of tarsomere 1. Inner apical spine subequal in length to tarsomeres 1 and part of 2 combined. Protibia moderately heavily armored with characteristic dense patch of stiff setae along the inner apical region and numerous elongate setae along the lateral margin. Mesotibia more heavily armored than protibia with more dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process elongate and robust, larger than protibia process. Inner apical spine equal in length to tarsomeres 1-2 combined. Metatibia with heavier armature than that of mesotibia, and inner apical spine equal to tarsomeres 1-2 and part of 3 combined.

Male genitalia well-sclerotized. Anal sclerite with large broadly curved region anteriodorsally (Fig. 36); apex somewhat fimbriate; ventrally with a broad medial concavity approaching apex in a truncate manner. Spiculum gastrale with wide lateral flanges, medial margins convex proximally, numerous short stiff setae originating from apex (Fig. 75). Tegmen evenly rounded apically (Fig. 116), much longer than wide (w:l = 1.0:2.55), lateral row of setae visible from the median fossa to prior to the apex, large elliptical concavity in apical third, basal notch perpendicular, basal margin nearly straight. Median lobe large and robust, ~0.75 the length of the tegmen, apex narrowing, apical opening well-developed with large internal structure (Fig. 157). Ejaculatory rods not fused to basal piece or each other, straight, and expanded outward basally and apically. Basal piece of internal sac sclerites with two separate lateral pieces and a large elongate central piece that overlaps the two lateral ones (Fig. 196).

Female genitalia not observed.

**Variation.** Known from the holotype male.

**Seasonality/Habitat.** The holotype was collected in late November in a lowland tropical forest.

**Distribution.** Known from the type locality in southeastern Paraguay.

**Notes.** No host information is available for this species.

**Etymology.** Specific epithet is derived from the Latin “niger” meaning “black” or “dark”, and “imus” meaning “ a likeness”, denoting the dark almost black habitus.

## *Pocadius nobilis* Reitter

(Figs. 37, 76, 117, 158, 197, 234)

**Type Material Examined.** HOLOTYPE (BMNH), two female specimens on same paper card with the following data labels: Type; H.T. [circular label with red trim] / Japan.; G. Lewis.; 1910-320 / *Pocadius*; *nobilis* m. HOLOTYPE (RNH) ♂: Japan; leg. Lewis; Coll. Reitter / nobilis; Japan, Rtts. [upside down yellow label] / Holotypus 1873; Pocadius; nobilis; Reitter [rectangular label with red trim] /P. nobilis; m.; Japan [upside down label].

**Non-Type Material Examined.** 10 specimens (BMNH): 3 with same data labels as holotype but without type labels, 1 with same data label as holotype but with additional label of “Higo.”, 1 with same data label as holotype but with additional label of “Hitoyoshi.; 3.V. – 8.V.81.”, 1 with the following labels: Japan, (BMNH) 1 specimen: in puffball / JAPAN:; J.E.A. Lewis.; B.M. 1933-490, 1 with the following labels: JAPAN; Kobe; Shinohara; 30-IX-’30; J.E.A. Lewis / JAPAN:; J.E.A. Lewis.; B.M. 1933-490. 1 specimen (RMNH ) with the following labels: KOREA, No. 693; Kangwon Prov.; Mts. Kumgang-san; singled, 16-IX-1980; leg. Topál and Forró. 4 specimens (ZMHB): no specimens with specific label data, only ID labels.

**Diagnosis.** The peculiar color pattern, particularly the dark medial longitudinal “stripe” on the pronotum serves to distinguish *P. nobilis* from the other Oriental and Old World *Pocadius*. The deep punctation of the pygidium and non-trapezoidal anterior pronotal margin serves to differentiate this species from the Palearctic species *P. adustus* and *P. ferrugineus*. These features in conjunction with densely setose tegmen, sub-parallel sided median lobe with angular apical margins, and basally fused ejaculatory rods and deeply cleft and separated basal piece of ejaculatory rods clearly delimit this species.

**Redescription.** Length 3.6mm, Width 2.0mm, Depth 0.9 mm. Body convex, shining, light reddish brown with the following regions being much darker brown to almost black: antennal club, temples of head, pronotal disc from apex to base, scutellum, lateral region of elytra from humeri to apices as well as apical 0.5 of elytra from suture to lateral explanation leaving only the medial basal region lighter in color. Pubescence of modest length, golden, sparsely covering dorsum. Pronotum more broadly explanate than elytra, sides fimbriate.

Head approximately equal in length and width, broadly triangular, with clypeolabral region projecting anteriorly. Head surface irregularly punctate, both large and small punctures interspersed throughout vertex, becoming somewhat more densely packed near orbits, becoming more obsolete near clypeus, interspaces smooth to alutaceous. Smaller punctures ~3 times larger than eye facets, larger punctures between 3-5 times diameter of smaller punctures. Large punctures microreticulate. Each puncture giving rise to a single apically curved seta. Labrum impunctate, smooth to alutaceous in texture. Labrum transverse with small medial incision on anterior margin. Vertex with deep somewhat narrow concavity extending between antennal insertions from the medial region of the frons to the clypeal region. Clypeal region convex, distinctly bulging dorsally. Antennal club compact, broadly oval, asymmetrical with the last antennomere subequal to previous two combined. Antennomere 8 strongly flattened into disc-like structure, 6 and 7 also flattened and disc-like but not to the extent of 8, their combined length subequal to the length of antennomere 9. Antennal scape asymmetrical, broadly convex dorsally, 2 times as long as pedicel. Pedicel subcylindrical in shape. Antennal segment 3 subequal in length to pedicel, gradually expanded apically. Segments 4 and 5 subquadrate, 0.5 the length of segment 3. Antennal grooves deep and somewhat curved posteriomedially. Mentum with anterior margin broadly evenly convex, convex medially, surface with minute faint punctures sparsely distributes, interspaces smooth with some microreticulation laterally. Submentum and gula, elongate, parallel-sided, surface with faint punctation, punctures equal in size to the large punctures on the vertex, interspaces alutaceous with microreticulation. Lateral mental-gular ledge well-developed, evenly rounded along outer edge,0.5 as wide as gula, widest anterior to middle, surface with distinct oblique microreticulation.

Pronotum widest near middle, evenly rounded laterally, anterior and posterior apices somewhat rounded, anterior margin broadly shallowly concave, posterior margin with deep concavity near posterior apices becoming broadly convex near middle. Pronotal surface with large and small punctures interspersed throughout. Large and small punctures similar in size to respective large and small punctures on head. Interspaces 1 to 2 puncture diameters apart, smooth to alutaceous. Prosternum and epimeron irregularly punctate, punctures equal in size to large punctures on head, interspaces alutaceous. Prosternal process somewhat narrowed between coxae, acutely rounded at apex, basal 0.33 elevated but not carinate. Prosternal process surface with indistinct punctation, surface completely alutaceous and granular, with apical margin finely granular. Scutellum large, broadly rounded at apex. Scutellar surface sparsely punctate with minute punctures ~0.5 the diameter of the small punctures on the head, interspaces mostly smooth. Elytra L:W = 1.1:1, narrowly margined, humeri moderately produced, apices separately rounded with a complete subapical line present. Eytral surface with serial rows of alternating large and small shallow punctures. Large punctures ~2 times diameter of the large punctures on head, each giving rise to a decumbent seta. Small punctures 0.20 diameter of large punctures, each giving rise to a decumbent seta. Interspaces mostly alutaceous between all punctures, larger punctures separated from each other within a row by 0.5 puncture diameter, smaller punctures separated from each other by 2-3 puncture diameters. Large and small puncture rows separated from each other by ~2 small puncture diameters. Mesosternum extending to midway between mesocoxae with a faint medial carina, deeply concave apical margin, lateral margin broadly shallowly concave. Mesosternal punctures aggregated toward posterior margin. Anterior surface completely granular with faint microreticulation. Mesepisternum only slightly larger than mesepimeron. Metasternum width to length ratio is 2.5:1. Metasternal punctures faint, equal in size to large punctures on head, interspaces on disc smooth to alutaceous, becoming completely alutaceous laterally. Metepisternum rather broad, width to length 1:3.8, surface with faint large punctation similar in size to those on metasternum, interspaces alutaceous with some microreticulation. First abdominal sternite with broad almost truncate process ending in a small point between metacoxae, ~2.5X's longer than second sternite. Sternites 2-4 subequal in length. Abdominal sternite 1 with faint umbilicate punctures occurring in all but the anterior 0.33 of the structure which is alutaceous. Abdominal segments 2-4 with punctures aligned in irregular lateral rows. Punctures equal in size to those on abdominal sternite 1, but not umbilicate. Interspaces alutaceous, punctures separated by 0.5 diameter. Pygidium broadly triangular with sparsely fimbriate margins. Pygidial surface densely punctate, punctures equal in size to large punctures on elytra, interspaces microreticulate, punctures separated by 0.25-0.20 puncture diameter. Each puncture giving rise to a short seta, ~0.25 length of those on elytra. Hypopygidium smaller in length than first abdominal sternite. Hypopygidium densely punctate, punctures equal to those on other abdominal sternites, interspaces almost rugulose, punctures separated by 0.25 diameter of puncture.

Protibia with apical tooth approximately 1.5 times length of second tarsomere. Outer apical notch indistinct. Inner apical spine subequal in length to 1.5 length of first tarsomere.

Apical border of tibia with one large tooth.  Mesotibia modestly armored with one row of slender spines along entire lateral edge and other rows of stiff hairs on the ventral and dorsal surfaces. Apical border armored with short spines, 0.33 length of lateral spines.  Outer apical tooth short and robust, 0.5 length of inner apical spine.  Inner apical spine equal in length to tarsomeres 1-2. Metatibia similarly armored as mesotibia.  Apical border armored with short spines, as in mesotibia, but more numerous.  Outer apical process robust, 0.5 length of inner apical spine. Inner apical spine equal in length to tarsomeres 1-2.

Male genitalia moderately sclerotized.  Anal sclerite with large broadly curved region anteriodorsally (Fig. 37), apex moderately fimbriate; ventrally with a deep medial concavity approaching apex in a truncate manner.  Spiculum gastrale with (Fig. 76) lateral region broadly rounded and widely explanate, medial border evenly concave, apical border with numerous elongate setae.  Tegmen broadly rounded to truncate apically (Fig. 117), longer than wide (w:l ~ 1.3.1), lateral row of setae visible from the median fossa to prior to the apex, inner row of setae incomplete apically extending from apex of median fossa to just prior to apex, basal notch perpendicular when viewed laterally, basal margin slightly concave.  Median lobe large and robust, sides subparallel laterally becoming angulate apically, slightly greater than 0.6 the length of the tegmen, apical opening well-developed (Fig. 158).  Ejaculatory rods fused to each other basally but not fused to basal piece, basal piece deeply cleft apically and becoming narrowed proximally (Fig. 197).

Female genitalia overall moderately sclerotized.  Gonocoxites with well sclerotized basal border and two lateral prominences, basal border giving rise to two medial oblique sclerotized baculi extending apicolaterally, ridges long ~0.33 length of basal border. Gonocoxal apices narrowly separated with intragonocoxal invagination evenly rounded at base, gonocoxal tips evenly rounded at apex, each apex with a small lateral depression that gives rise to 4-5 primary seta (Fig. 234). Paraprocts membranous with some sclerotization along medial border, evenly tapering to lateral apex.

**Variation.** Male specimens tend to have a broader apico-lateral notch on the protibia.

**Seasonality/Habitat.** Specimens are known to occur from May through September.

**Distribution.** This species may be found on the major islands of Japan. The Korean specimen is a new distribution record for the species and extends the range into mainland Asia.

**Notes.** The only host information given is that of "puffball."

## *Pocadius okinawaensis* Cline new species

(Figs. 38, 77, 118, 198, 235)

**Type Material Examined.** HOLOTYPE ♂ (FMNH): Ryukyu Is.: OKINAWA; Katsudake, IX-28-1945; leg. E. Ray / eating hole; in Lycoperdon; fungus / Pocadius; nobilis Rtt; Kirejtshuk det. 1994 / HOLOTYPE; Pocadius; okinawaensis; A.R. Cline des. 2004. 12 PARATYPES (FMNH): same data labels as holotype, but with PARATYPE designation labels.

**Diagnosis.** This species is most similar to *P. nobilis* known from Japan, but can be differentiated from it and the other Palearctic fauna by the following suite of characters: terminal antennomere slightly longer than preceding two combined, irregularly shaped, and with distinct centrally located sensillar region; elytra with dark markings laterally and apically; head and pronotum with surface smooth and shining; metasternal disc with minute dispersed punctures and smooth shining surface; elytra with alternating rows of semi-erect and decumbent setae; outer apical notch of protibia indistinct; tegmen with a double row of inner setae not attaining the apex; median lobe with elongate deeply cleft internal structure; ejaculatory rods diverging apically and parallel basally; basal piece of internal sac sclerite complex with two deeply cleft lateral arms; ovipositor with short intragonocoxal invagination and 3-4 primary setae.

**Description.** Length 3.75mm, Width 2.55mm, Depth 1.5mm. Body moderately convex, surface shining, reddish-brown to dark reddish brown in color, with lateral and apical portion of elytra darker. Pronotum and elytra margins with moderately long fimbriae, setae longer equal to length of antennal scape. Dorsal and ventral pubescence moderately long.

Head surface irregularly punctate with moderately impressed small and large punctures, most larger ones on vertex, becoming somewhat smaller towards orbits and fronotclypeal region. Larger punctures 3-4X diameter of eye facet, smaller punctures 1-2X diameter. Interspaces smooth, shining. Each puncture gives rise to a curved golden seta. Pronotal surface with large punctures equal in size to large punctures on vertex of head, interspersed with relatively few smaller punctures, ~0.5 size of larger ones. Interspaces smooth and shining, about 1-2 diameters apart. Each puncture gives rise to a curved golden seta. Scutellar surface with very few vague shallowly impressed small punctures, some punctures giving rise to setae, interspaces smooth to finely alutaceous. Elytral surface with serial rows of alternating large and small deep punctures. Smaller punctures are equal in size to smaller ones on pronotum, larger punctures are ~2-3 times diameter of smaller ones. Smaller punctures giving rise to a semi-erect long golden seta, larger punctures giving rise to a decumbent long golden seta. Interspaces broad between punctures of a given row and between different rows. Within a row, small punctures are separated by ~2-3 puncture diameter, and large punctures by 0.5-1 puncture diameter. Larger rows are separated by 2-3 puncture diameters. Interspaces always shining but variable from smooth to finely alutaceous in sculpture. Pygidium densely punctate, punctures equal in size to larger ones on pronotum, each puncture giving rise to a short golden seta; interspaces narrow, 0.25-0.5 diameter, with smooth to finely alutaceous sculpture.

Venter with shorter sparser pubescence as dorsum. Mentum with large very shallow punctures, equal in size to larger ones on vertex, each giving rise to a short seta; interspaces alutaceous with finely microreticulate areas. Submentum and gula similar in punctation to mentum but with interspaces more granular. Prosternum and epimeron shallowly irregularly punctate, punctures on epimeron slightly larger than those on mentum and those on prosternum equal to smaller punctures on vertex, interspaces alutaceous to granular with microreticulate areas, prosternal punctures separated by 1-2 diameter, those on the epimeron by 0.5-1 diameter. Mesosternum with moderately impressed punctures, equal to those on epimeron, interspaces alutaceous to granular, separated by about ~1 diameter and aggregated near metasternal border. Metasternum irregularly punctate, mostly impunctate on disc but with some moderately faint large and small punctures on disc similar in size to those on vertex, interspaces smooth on metasternal disc becoming alutaceous to finely granular laterally, punctures separated by ~1-3 diameters. Abdominal sternite 1 with large faint punctures, punctures equal to large punctures on elytra, interspaces smooth to alutaceous, separated by ~0.5-1 diameter. Abdominal sternites 2-4 with irregular rows of punctures, punctures similar in size to those on sternite 1. Hypopygidium with moderately deep punctures, similar in size to those on sternites 2-4, interspaces alutaceous to granular, punctures separated by ~0.5 diameter.

Head wider than long (W:L = 1.5:1), fronotclypeal region moderately projecting anteriorly. Vertex with shallow concavity between orbits near fronotclypeal region. Labrum with shallow concavity at anterior margin. Antennal club compact, obovate, slightly asymmetrical with the last antennomere slightly longer than the previous two combined. Antennomeres 4-8 more or less compact, with 6-8 characteristically disc-like, and 4-5 trapezoidal. Antennal scape asymmetrical, somewhat hemispherical, 2X as long as pedicel. Pedicel subcylindrical in shape. Antennal segment 3 subequal in length to pedicel. Antennal club moderately large, ~0.65 length of segments 1-8 combined. Antennal grooves very deep and widely excavate, slightly converging posteriorly. Lateral mental/submental ridge prominent with a corresponding widely excavate sulcus, ridge at level of submentum, ridge with faint longitudinal microreticulations and sulcus with alutaceous to granular sculpture. Mentum with anterior angles obsolete, anterior margin broadly convex, entire structure hemispherical in ventral view and somewhat convex laterally.

Pronotum widest near posterior angles (L:W = 1:1.9), anterior margin shallowly concave, posterior margin moderately convex, lateral margins slightly arcuate anteriorly. Scutellum large, obtusely triangular, apex rounded. Prosternal process somewhat narrowed between procoxae, apex somewhat acuminate, in lateral aspect the anterior and posterior ends are not prominent and there is a slight convexity medially, appearing almost flat. Posterior apical wall moderately prominent and oblique. Mesosternum extending to midway between mesocoxae, evenly concave for reception of the metasternum. Metasternum wider than long (W:L = 2.9:1.0). Metepisternum with slight medial constriction, oblique line dividing anterior 0.20 of structure. First abdominal sternite with acuminate process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-3 subequal in length, the fourth slightly larger than the preceding two. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth not prominent, equal to 0.5 length of tarsomere 1. Outer apical notch absent. Inner apical spine subequal in length to tarsomeres 1 and part of 2 combined. Protibia not heavily armored but with characteristic dense patch of stiff setae along the inner apical region. Mesotibia somewhat more heavily armored than protibia with some dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process not robust, subequal to protibia process. Inner apical spine equal in length to tarsomere 1 and part of 2 combined. Metatibia with armature similar to that of mesotibia.

Male genitalia well-sclerotized. Anal sclerite with large broadly curved region anteriodorsally (Fig. 38); apex fimbriate; ventrally with a broad medial concavity approaching apex in a truncate manner. Spiculum gastrale with wide lateral flanges, medial margins deeply concave proximally, few short stiff setae originating from apex (Fig. 77). Tegmen evenly rounded apically (Fig. 118), much longer than wide (w:l = 1.0:2.67), lateral row of setae visible from the median fossa to prior to the apex, large elliptical shallow concavity in apical third with double row of inner setae not attaining apex, basal notch perpendicular, basal margin slightly concave. Median lobe large and robust, ~0.66 the length of the tegmen, apex narrowed, apical opening well-developed with deeply cleft bilobed internal structure (Fig. 159). Ejaculatory rods not fused to basal piece or each other, parallel basally and divergent from one another apically. Basal piece of internal sac sclerite with two lateral deeply cleft extensions (Fig. 198).

Female genitalia moderately sclerotized. Paraprocts large with sclerotization only along median line. Gonocoxite with two basal lateral prominences, basal ridge well-sclerotized. Gonocoxal apices with reduced recurved “tooth” present. Three to four primary setae originate from terminal pits on the gonocoxal apices. Intragonocoxal invagination shallow (Fig. 235).

**Variation.** None observed.

**Seasonality/Habitat.** All specimens were collected in late September.

**Distribution.** Known only from the type locality.

**Notes.** Specimens were collected from a Lycoperdon puffball.

**Etymology.** Specific epithet is a derivative of the type locality, i.e. Okinawa.

## *Pocadius pecki* Cline new species

Figs. (39, 78, 119, 160, 199)

**Type Material Examined.** HOLOTYPE ♂ (CMN): VEN: Miranda: 400m; 35km N Altagracia; Guatopo NP, Aqua Blanca; 31-V-7-VI87-2; S&J Peck, ravine FIT / HOLOTYPE: Pocadius; pecki; A.R. Cline des. 2004. PARATYPE (CMN): VENEZUELA: Tachira;

Pregonera, Presa Las; Cuevas, 650m, 9-31-VII-; 1989, S&J Peck, rain-; forest, ex: FIT, 89-255 / PARATYPE: Pocadius; pecki; A.R. Cline des. 2004.

**Diagnosis.** This species can be delimited from the rest of the Neotropical fauna by the following suite of characters: mentum obtusely triangular with curved lateral margins; pronotum widest near middle with anterior margin feebly concave; prosternal process with apical wall concave in lateral aspect; elytra with alternating rows of erect and semi-erect setae; metasternum faintly punctate with minute punctures, nearly glabrous; terminal antennomere only slightly large than preceding two segments combined, not drastically asymmetrical, and with large sensillar region; male pygidium with indentate posterior margin; aedeagus with tegmen having a complete outer row and incomplete inner row of setae, ejaculatory rods with sharply excised distal regions, basal piece of internal sac sclerites with paired lateral arms each having two sharp projections.

**Description.** Length 3.50mm, Width 2.27mm, Depth 1.5mm. Body moderately convex, surface shining, uniformly light golden brown in color. Pronotum and elytra margins with elongate fimbriae, setae longer than width of antennal scape. Dorsal and ventral pubescence moderately long.

Head surface irregularly punctate with moderately impressed small and large punctures, most larger ones on vertex, becoming somewhat smaller towards orbits and fronotclypeal region. Larger punctures 3-4X diameter of eye facet, smaller punctures 1-2X diameter; interspaces smooth to finely alutaceous, shining. Each puncture gives rise to a curved golden seta. Pronotal surface with large punctures equal in size to large punctures on vertex of head, interspersed with numerous smaller punctures, equal to smaller punctures on vertex; interspaces smooth to finely alutaceous and shining, ~0.5-1 diameter apart. Each puncture gives rise to a curved golden seta. Scutellar surface with numerous shallowly impressed small punctures, some punctures giving rise to setae, interspaces smooth to finely microreticulate apically. Elytral surface with serial rows of alternating large and small deep punctures, the first few rows of smaller punctures are confusedly arranged and may appear to have more than a single row of punctures. Smaller punctures are equal in size to smaller ones on pronotum, larger punctures are ~3 times diameter of smaller ones. Smaller punctures giving rise to an erect long golden seta, larger punctures giving rise to a semi-erect moderately long golden seta. Interspaces broad between punctures of a given row and between different rows. Within a row, small punctures are separated by ~2-3 puncture diameters, and large punctures by 1 puncture diameter. Larger rows are separated by 2-3 puncture diameters. Interspaces always shining but variable from smooth to finely alutaceous in sculpture. Pygidium densely punctate, punctures equal in size to larger ones on pronotum, each puncture giving rise to a moderately long golden seta; interspaces narrow, 0.25-0.5 diameter, with alutaceous to finely microreticulate sculpture.

Venter with somewhat shorter sparser pubescence as dorsum. Mentum with minute shallowly impressed punctures, equal in size to smaller ones on vertex, each giving rise to a short seta; interspaces alutaceous with finely microreticulate areas. Submentum and gula similar in punctation to mentum but with interspaces more granular. Prosternum and epimeron irregularly punctate, punctures on epimeron equal to larger ones on pronotum and those on prosternum equal to smaller ones on pronotum, interspaces alutaceous to microreticulate, prosternal punctures separated by 1-2 diameter, those on the epimeron by 0.5 diameter. Mesosternum with shallowly impressed punctures, equal to those on epimeron, interspaces alutaceous to granular, separated by about ~1 diameter and aggregated near metasternal border. Metasternum irregularly punctate, mostly impunctate on disc but with some moderately faint minute broadly dispersed punctures on disc similar in size to smaller ones on vertex, interspaces alutaceous on metasternal disc becoming more granular laterally, punctures separated by ~3-5 diameters on disc. Abdominal sternite 1 with moderate sized faint punctures, punctures equal to large ones on vertex, interspaces alutaceous, separated by ~1-2 diameters. Abdominal sternites 2-4 with 2 irregular rows of punctures, one near anterior margin and the other near the posterior margin with some intervening punctures, punctures similar in size to those on sternite 1. Hypopygidium with moderately deep punctures, 1.5 diameter of those on sternites 2-4, interspaces alutaceous to granular, punctures separated by ~0.5-1 diameter.

Head slightly wider than long (W:L = 1.4:1), fronotclypeal region moderately projecting anteriorly. Vertex with shallow concavity between orbits near fronotclypeal region. Labrum with minute medial incision at anterior margin. Antennal club compact, obovate, slightly asymmetrical with the last antennomere slightly longer than the previous two combined. Antennomeres 4-8 more or less compact, with 6-8 characteristically disc-like, 5 trapezoidal, and 4 cuboidal. Antennal scape asymmetrical, somewhat hemispherical, 2X as long as pedicel. Pedicel subcylindrical in shape. Antennal segment 3 equal in length to pedicel. Antennal club not large, ~0.5 length of segments 1-8 combined. Antennal grooves very deep and widely excavate, slightly converging posteriorly. Lateral mental/submental ridge prominent with a corresponding widely and deeply excavate sulcus, ridge at level of submentum, ridge with numerous distinct longitudinal microreticulations and sulcus with alutaceous to granular sculpture and some longitudinal microreticulations. Mentum with anterior angles obsolete, anterior margin broadly curved with acute apex, entire structure obtusely triangular in ventral view and somewhat convex laterally.

Pronotum widest in posterior third (L:W = 1:1.9), anterior margin concave, posterior margin moderately convex, lateral margins more arcuate anteriorly. Scutellum large, obtusely triangular, apex rounded. Prosternal process somewhat narrowed between procoxae, apex somewhat acuminate, in lateral aspect the anterior and posterior ends are prominent and there is a distinct convexity medially. Posterior apical wall moderately prominent and concave.

Mesosternum extending to midway between mesocoxae, evenly concave for reception of the metasternum. Metasternum much wider than long (W:L = 3.1:1.0). Metepisternum with slight medial constriction, oblique line dividing anterior 0.18 of structure. First abdominal sternite with acuminate process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-3 subequal in length, the fourth slightly larger than the preceding two. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth prominent, equal to length of tarsomere 1. Outer apical notch reduced, equal to 0.5 length of tarsomere 1. Inner apical spine subequal in length to tarsomere 1. Protibia not heavily armored but with characteristic dense patch of stiff setae along the inner apical region. Mesotibia much more heavily armored than protibia with numerous dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process robust, larger than protibial process. Inner apical spine equal in length to tarsomere 1-2 and part of 3 combined. Metatibia with armature similar to that of mesotibia.

Male genitalia well-sclerotized. Anal sclerite with large broadly curved region anteriodorsally (Fig. 39); apex fimbriate; ventrally with a broad medial concavity approaching apex in a convex manner. Spiculum gastrale with wide lateral flanges, medial margins concave, relatively few long stiff setae originating from apex (Fig. 78). Tegmen narrowly rounded apically (Fig. 119), longer than wide (w:l = 1:2.6), lateral row of setae visible from the median fossa to prior to the apex, large elliptical shallow concavity in apical third with single row of inner setae not attaining apex, basal notch perpendicular, basal margin convex. Median lobe large and robust, ~0.66 the length of the tegmen, apex narrowed, apical opening well-developed with shallowly cleft bilobed internal structure (Fig. 160). Ejaculatory rods not fused to basal piece or each other, slightly curved outward apically and basally with the apical ends sharply excised. Basal piece of internal sac sclerite with paired curved structures having two lateral sharp projections (Fig. 199).

Female genitalia not observed.

**Variation.** No demonstrable variation.

**Seasonality/Habitat.** Specimens known from May to July in lowland rainforest.

**Distribution.** Known from the type localities in Venezuela.

**Notes.** No host information available for this species.

**Etymology.** Specific epithet honors Stewart Peck, Professor of Biology at Carleton University, whose devotion to beetle collecting is unsurpassed.

### *Pocadius peruensis* Cline new species

(Figs. 40, 79, 120, 161, 200, 236)

**Type Material Examined.** HOLOTYPE ♂ (SNEC) PERU: Tambopata Prov.; Madre de Dios Dpto.; 15km NE Puerto Maldonaldo Reserva; Cuzco Amazonica / 12° 33'S 69° 03'W; 220m, Plot# Z1U16; 22 June 1989, J.S. Ashe, R.A. Leschen #207; ex. flight intercept trap. 1 PARATYPE (SNEC): PERU: Tambopata Prov.; 15km NE Pto. Maldonaldo; 22 June 1989, 200m; J. Ashe, R. Leschen, #210; ex: *Geastrum*. 2 PARATYPES (SNEC): PERU: Tambopata Prov.; 15km NE Pto. Maldonaldo; 17 June 1989, 200m; J. Ashe, R. Leschen, #210; ex: *Lycoperdonales*. 1 PARATYPE (SNEC): PERU: Tambopata Prov.; Madre de Dios Dpto.; 15km NE Puerto / Maldonaldo Reserva; Cuzco Amazonica; 12°33'S 69°03'W; 200m, Plot# Z2E15 / 15 June 1989; R.A. Leschen #061; ex. Flight intercept trap. 1 PARATYPE (FSCA): PERU: Loreto Pr., nr.; jct. Rio Maranon &; Ocayali, 73.5°W 4.8°S; 6-20-VIII-1994; P. Skelley, day catch.

**Diagnosis.** This species can be delimited from the rest of the Neotropical fauna by the following suite of characters: ;anal sclerite with broad flanges pointed apically; tegmen with small depression apically, inner row of setae not attaining apex, and a distinctly concave posterior margin when viewed laterally; median lobe with medial constriction; basal piece of internal sac sclerites U-shaped with small piece separating the two arms of the U; ovipositor with paraprocts acute apically, and gonocoxal extensions abutting midway down the intragonocoxal invagination.

**Description.** Length 4.1mm, Width 2.7mm, Depth 2.1mm. Body moderately convex, surface shining, light golden to reddish-brown, sometimes with elytral apices and lateral margin darker. Pronotum and elytra margins with elongate fimbriae, setae longer than length of antennal scape. Dorsal and ventral pubescence quite long.

Head surface irregularly punctate with deeply impressed small and large punctures, most larger ones on vertex, becoming somewhat smaller towards orbits and fronotclypeal region. Larger punctures ~4X diameter of eye facet, smaller punctures 1-2X diameter. Interspaces alutaceous to finely granular, moderately shining. Each puncture gives rise to a curved golden seta. Pronotal surface with large punctures equal in size to large punctures on vertex of head, interspersed with numerous smaller punctures, ~0.5 size of larger ones; interspaces alutaceous to finely granular and moderately shining, ~0.25-0.5 diameter apart. Each puncture gives rise to a curved golden seta. Scutellar surface with numerous vague shallowly impressed minute punctures equal to smaller ones on vertex, some punctures giving rise to setae, interspaces alutaceous with some microreticulation apically. Elytral surface with serial rows of alternating large and small deep punctures. Smaller punctures are equal in size to smaller ones on pronotum, larger punctures are ~2 times diameter of smaller ones. Smaller punctures giving rise to an erect long golden seta, larger punctures giving rise to a semi-erect long golden seta.

Interspaces narrow between punctures of a given row and between different rows. Within a row, small punctures are separated by ~1-2 puncture diameter, and large punctures by 0.25-0.5 puncture diameter. Larger rows are separated by 1-1.5 larger puncture diameters. Interspaces somewhat shining but variable from alutaceous to finely granular in sculpture. Pygidium densely punctate, punctures equal in size to larger ones on pronotum, each puncture giving rise to a short golden seta; interspaces narrow, ~0.5-1 diameter, with finely granular sculpture.

Venter with shorter sparser pubescence as dorsum. Mentum with minute shallow punctures, equal in size smaller ones on vertex, each giving rise to a short seta; interspaces finely granular. Submentum and gula similar in punctation to mentum but with interspaces more granular with some microreticulation present. Prosternum and epimeron irregularly punctate with moderately impressed punctures, punctures on epimeron equal to larger ones on pronotum and those on prosternum equal 0.75 diameter of those on epimeron, interspaces granular, prosternal punctures separated by 1 diameter, those on the epimeron by ~0.5 diameter. Mesosternum with few moderately impressed punctures, equal to those on epimeron, interspaces granular, separated by about ~1 diameter and aggregated near metasternal border. Metasternum irregularly punctate, disc punctures similar in size to smaller ones on vertex, interspaces alutaceous to finely granular on metasternal disc becoming more granular laterally, punctures separated by ~1-2 diameters. Abdominal sternite 1 with large faint punctures, punctures equal to large punctures on pronotum, interspaces granular, separated by ~1-2 diameters. Abdominal sternites 2-4 with two irregular but distinct rows of punctures, one near anterior margin and the other near the posterior margin, punctures similar in size to those on sternite 1. Hypopygidium with moderately deep punctures, similar in size to those on sternites 2-4, interspaces granular, punctures separated by ~0.25 diameter.

Head wider than long (W:L = 1.75:1), fronotclypeal region moderately projecting anteriorly. Vertex with shallow concavity between orbits near fronotclypeal region. Labrum with deep medial incision at anterior margin. Antennal club compact, obovate, slightly asymmetrical with the last antennomere longer than the previous two combined. Antennomeres 4-8 more or less compact, with 6-8 characteristically disc-like, and 4-5 trapezoidal. Antennal scape asymmetrical, somewhat hemispherical, 1.8X as long as pedicel. Pedicel subcylindrical in shape. Antennal segment 3 subequal in length to pedicel. Antennal club moderately large, ~0.65 length of segments 1-8 combined. Antennal grooves very deep and widely excavate, slightly converging posteriorly. Lateral mental/submental ridge prominent with a corresponding widely excavate sulcus, ridge at level of submentum, ridge with distinct oblique and longitudinal microreticulations and sulcus with transverse to oblique microreticulations. Mentum with anterior angles distinct, anterior margin angulate, entire structure pentagonal in ventral view and somewhat convex laterally.

Pronotum widest near indistinct posterior angles (L:W = 1:1.9), anterior margin shallowly concave, posterior margin moderately convex, lateral margins slightly arcuate anteriorly. Scutellum large, obtusely triangular, apex rounded. Prosternal process somewhat narrowed between procoxae, apex somewhat acuminate, in lateral aspect the anterior end is more prominent than the posterior end and there is a moderate convexity medially. Posterior apical wall prominent and slightly oblique. Mesosternum extending to midway between mesocoxae, deeply concave for reception of the metasternum. Metasternum much wider than long (W:L = 3.2:1.0). Metepisternum with slight medial constriction, oblique line dividing anterior 0.13 of structure. First abdominal sternite with acuminate process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-3 subequal in length, the fourth slightly larger than the preceding two. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth prominent, equal to length of tarsomere 1. Outer apical notch present, depth equal to length of tarsomere 1, notch angle ~75°. Inner apical spine subequal in length to tarsomeres 1 and part of 2 combined. Protibia not heavily armored but with characteristic dense patch of stiff setae along the inner apical region. Mesotibia somewhat more heavily armored than protibia with dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process robust, larger than protibial process. Inner apical spine equal in length to tarsomere 1-2 and part of 3 combined. Metatibia with armature similar to that of mesotibia, but with more numerous slender spines.

Male genitalia well-sclerotized. Anal sclerite with large broadly curved region anteriodorsally (Fig. 40); apex densely fimbriate; ventrally with a narrow medial concavity approaching apex in a curved manner. Spiculum gastrale with wide lateral flanges that are pointed apically, medial margins perpendicular, 5-7 stiff setae originating from apex (Fig. 79). Tegmen narrowly rounded apically (Fig. 120), much longer than wide (w:l = 1.0:3.1), lateral row of setae visible from the median fossa to around the apex, small circular shallow concavity in apical third with single row of inner setae not attaining apex, basal notch perpendicular, basal margin distinctly concave. Median lobe large and robust with medial constriction, ~0.66 the length of the tegmen, apex narrowly rounded, apical opening well-developed with simple internal structure (Fig. 161). Ejaculatory rods not fused to basal piece or each other, slightly converging basally and divergent from one another apically. Basal piece of internal sac sclerite U-shaped with small piece present between arms of U (Fig. 200).

Female genitalia moderately sclerotized. Paraprocts somewhat narrowed, acute apically, with sclerotization only along median line to base. Gonocoxite with one basal lateral prominence, basal ridge well-sclerotized. Gonocoxal apices without recurved "tooth". Two or three primary setae originate from small depressions on the gonocoxal apices. Gonocoxal extensions approximate midway down the intragonocoxal invagination (Fig. 236).

**Variation.** Three of the paratypes have the elytral sides more markedly darker than the holotype specimen.

**Seasonality/Habitat**. Known from lowland tropical forests in June and August.

**Distribution.** Known from the type localities in Peru.

**Notes.** This species is known from the fungi *Lycoperdonales* and *Geastrum*.

**Etymology.** Specific epithet is a derivative of the type locality, i.e. Peru.

### *Pocadius rubidus* Erichson

(Figs. 41, 80, 121, 162, 201, 237)

**Type Material Examined.** HOLOTYPE ♂ (Humboldt): 8643 / Holotype; Pocadius; rubidus; ERICHSON, 1843 / rubidus; Er.; [illegible handwriting on last line].

**Non-Type Material Examined.** 12 specimens (USNM): 2 with the following label data: ROSAS - F.C. SUD; Provincia de Buenos Aires; Juan B. Daguerre / ARGNETINA; 1968 colln.; J. Daguerre. 3 with the following label data: BsAsTanolil; P. Köelerls / ARGNETINA; 1968 colln.; J. Daguerre. 5 with the following label data: BsAs; Zelolya [sp?]; X-45, J. Daguerre / ARGNETINA; 1968 colln.; J. Daguerre. 3 with the following label data: Cordoba; Alta Gracia; III-45, J. Daguerre / ARGNETINA; 1968 colln.; J. Daguerre.

**Diagnosis.** One of the larger South American species, *P. rubidus* can be distinguished from the other New World *Pocadius* by the following suite of characters: elytral surface distinctly rugose to microreticulate and densely punctate; pronotum with posterior angles indistinct and broadly rounded; antennal club with terminal antennomeres not asymmetrical or longer than previous two segments combined; body large and robust; dorsum densely pubescent with elongate golden setae; metasternal disc glabrous with few widely distributed minute punctures; outer protibial tooth large and robust; anal sclerite with characteristically curved setae along apical border;

**Redescription.** Length 4.0 mm, Width 2.4mm, Depth 1.9mm. Body convex, surface shining, reddish-brown to dark brown in color, sometimes with apical third of elytra dark brown to piceous. Pronotum and elytra margins with elongate fimbriae, setae much longer than length of antennal scape. Dorsal and ventral pubescence quite long and conspicuous.

Head surface deeply, irregularly punctate, large and smaller punctures densely aggregated throughout head. Larger punctures 4-5 X diameter of eye facet, smaller punctures 3 X diameter. Interspaces smooth to finely alutaceous, shining. Most smaller punctures gives rise to an elongate curved golden seta. Eyes finely faceted. Pronotal surface with large punctures equal in size to large punctures on vertex of head, interspersed with numerous smaller punctures, ~0.33-0.50 size of larger ones. Interspaces smooth to alutaceous, about 0.33-0.5 diameters apart. Each smaller puncture gives rise to a long golden seta, most seta are moderately curved. Scutellar surface with very numerous shallowly impressed punctures, somewhat larger than smaller punctures on pronotum, most punctures giving rise to setae, with the interspaces are alutaceous to granular. Elytral surface with serial rows of alternating large and small deep punctures, rows of smaller punctures confusedly dispersed such that in some places there appears to be 2 rows of smaller punctures between the larger ones. Smaller punctures are equal in size to smaller ones on pronotum, larger punctures are ~2 times diameter of smaller ones. Smaller punctures giving rise to an erect long golden seta, larger punctures giving rise to a semi-erect long golden seta. Interspaces narrow between punctures of a given row and between different rows. Within a row, small punctures are separated by ~0.75-1 puncture width, and large punctures by 0.1-0.25 puncture diameters. Larger rows are separated by 1.0 large puncture width. Interspaces moderately shining but variable from rugose/granular to microreticulate in sculpture, the sculpturing is characteristically deep and distinct. Pygidium densely punctate, punctures equal in size to smaller ones on elytra, each puncture giving rise to a shorter golden seta. Interspaces narrow, 0.25-0.33 diameter, with granular sculpture.

Venter with similar long golden pubescence as dorsum. Mentum with moderately large shallow punctures, equal in size to larger ones on vertex, each giving rise to an elongate seta. Interspaces alutaceous to granular. Submentum and gula similar in punctation to mentum but with interspaces completely granular with some microreticulation present. Prosternum and epimeron more deeply irregularly punctate than mentum, punctures slightly larger than those on mentum, interspaces granular with microreticulate areas, prosternal punctures separated by ~0.5 diameter, those on the epimeron by 0.25 to 0.5 diameter. Mesosternum with more deeply impressed punctures, slightly larger than those on prosternum, interspaces completely granular, separated by about 0.5 diameter and mostly aggregated along metasternal border. Metasternum irregularly punctate, with minute faint punctures on disc similar in size to smaller ones on venter, interspaces alutaceous to granular on metasternal disc becoming granular to microreticulate laterally, punctures separated by >2 diameters around disc and becoming more dense laterally. Abdominal sternite 1 with large faint, almost obsolete punctures, punctures equal to those on prosternum, interspaces alutaceous to granular, separated by ~0.75 - 1.5 diameter. Abdominal sternites 2-43 with three irregular rows of punctures, one row near anterior margin, one midway between anterior and posterior border, and the other near posterior margin, punctures similar in size to those on abdominal segment 1, rows separated by 1-1.5 puncture diameters, punctures within rows separated by ~0.25-0.5 punctures width. Rows on abdominal sternite 4 becoming much less organized, in particular the middle row. Hypopygidium with moderately deep punctures, similar in size to those on sternites 2-4, interspaces mostly granular, punctures separated by 0.5 puncture diameters.

Head wider than long (L:W = 1:1.45), fronotclypeal region moderately projecting anteriorly. Vertex with shallow broad indistinct concavity between orbits near fronotclypeal region. Eyes large, moderately protruding. Antennal club compact, elongate oval, mostly symmetrical with the last antennomere subequal in length to the previous two combined. Antennomeres 4-5 more or less compact, with 6-8 characteristically disc-like. Antennal scape asymmetrical, shortened and somewhat hemispherical, 1.3 times as long as pedicel. Pedicel subcylindrical in shape. Antennal segment 3 shorter in length to pedicel. Antennal club moderately large, ~0.55 length of segments 1-8 combined. Each club segment with dense short setae, and only relatively few protruding setae. Antennal grooves very deep and widely excavate, slightly converging posteriorly. Lateral mental ridge prominent, at level of submentum, medially the ridge is rugose sculptured with a few small punctures and laterally with oblique to longitudinal microreticulations. Mentum with anterior angles obsolete, anterior margin angulate, overall shape is transversely triangular, entire structure when viewed laterally is flattened.

Pronotum widest near in posterior 0.33, transverse (L:W = 1:2), anterior margin broadly concave, posterior margin moderately convex, lateral margins somewhat arcuate anteriorly, anterior angles distinct, posterior angles indistinct and broadly rounded. Scutellum large, obtusely triangular, apex rounded. Prosternal process somewhat narrowed between procoxae, apex somewhat acuminate, in lateral aspect the anterior and posterior ends are not prominent, convex medially with a steeper declivity in anterior 0.66. Posterior apical wall not prominent, oblique with little concavity. Mesosternum extending to midway between mesocoxae, evenly concave for reception of the metasternum. Metasternum width to length ratio is ~3.1:1.0.

Metepisternum with slight medial constriction, oblique line dividing anterior 0.20 of structure. Elytral humeri moderately produced, lateral margin very narrow. First abdominal sternite with acuminate process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-4 subequal in length. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth somewhat prominent, slightly longer than tarsomeres 1. Outer apical notch indistinct. Inner apical spine subequal in length to tarsomeres 1 and part of 2 combined. Protibia not heavily armored but with characteristic dense patch of stiff setae along the inner apical region. Mesotibia somewhat more heavily armored than protibia with a few more dense stiff setae and a row of numerous short slender spines along entire lateral edge. Outer apical process elongate and robust, larger than protibia process. Inner apical spine equal in length to tarsomeres 1 and part of 2 combined. Metatibia with heavy armature, lateral row of spines 2-2.5 X longer than those on mesotibia.

Male genitalia well-sclerotized. Anal sclerite with large broadly curved region anteriodorsally (Fig. 41); apex fimbriate with characteristically curved setae; ventrally with a broad medial concavity approaching apex in a convex manner. Spiculum gastrale with wide tapering lateral flanges, medial margin evenly concave, long stiff setae originating from apex (Fig. 80). Tegmen evenly rounded apically (Fig. 121), much longer than wide (w:l = 1.0:2.44), lateral row of setae visible from the median fossa to prior to the apex, small shallow elliptical concavity in apical third, basal notch perpendicular, basal margin concave, inner row of setae almost attaining apex. Median lobe large and robust, ~0.66 the length of the tegmen, apex broadly rounded, lateral sides with slight constriction basally, apical opening well-developed with proximal concavity (Fig. 162). Ejaculatory rods not fused to each other or to basal piece, curved inward and expanded outward basally and apically. Basal piece of rods with lateral inward projecting arms (Fig. 201).

Female genitalia moderately sclerotized. Paraprocts large with sclerotization only along median line to baso-lateral angles. Gonocoxite with two basal lateral prominences, basal ridge well-sclerotized with two short widely diverging baculi. Gonocoxal apices with distinct recurved “tooth” present. Two primary and at least two secondary setae originate from small depressions on the gonocoxal apices (Fig. 237).

**Variation.** The specimens from Cordoba have a different color pattern than the other Argentinean material. In these individuals the basal half of the elytra are lighter brown than the rest of the body. A similar pattern is seen in P. helvolus, a Nearctic member of the genus, where individuals in the same region have some specimens with darker bodies and lighter elytral bases.

**Seasonality/Habitat.** Specimens have been collected in March and October.

**Distribution.** Known from northern and central Argentina.

**Notes.** No host records are available for this species.

### *Pocadius tepicensis* Cline new species

(Figs. 42, 81, 122, 163, 202, 238)

**Type Material Examined.** HOLOTYPE ♂ (CAS): 20mi. E. Tepic, Nay.; Mex. VIII-3-65 / L.R. Gillogly Collector / gill; fungus / L.R. Gillogly Collection / Lorin R. Gillogly; Collection; Donated To The; Calif. Academy Of Sciences; May 1990 / HOLOTYPE; Pocadius; tepicensis; A. Cline des. 2004. 12 PARATYPES (CAS): same data labels as holotype.

**Diagnosis.** This species can be delimited from the rest of the Neotropical fauna by the following suite of characters: terminal antennomere longer than preceding two and with V-shaped sensillar region; mentum hemispherical with an obsoletely acute apex; metasternal disc deeply densely punctate with large punctures; prosternal process in lateral aspect with sharp declivity posterior to coxal cavities to a flattened posterior third, posterior wall strongly oblique;

protibia lacking an outer apical notch; indentate male pygidium; and basal piece of ejaculatory rods L-shaped lateral arms and scoop-shaped central region.

**Description.** Length 3.75mm, Width 2.15mm, Depth 1.35mm. Body slightly convex, surface shining, uniformly reddish-brown to dark brown in color. Pronotum and elytra margins with moderately elongate fimbriae, setae slightly longer than length of antennal scape. Dorsal and ventral pubescence moderately long.

Head surface irregularly punctate with deeply impressed small and large punctures, most larger ones on vertex, becoming somewhat smaller towards orbits and fronotclypeal region. Larger punctures 4-5X diameter of eye facet, smaller punctures ~2X diameter; interspaces smooth to finely alutaceous, shining. Each puncture gives rise to a curved golden seta. Pronotal surface with large punctures equal in size to large punctures on vertex of head, interspersed with relatively few smaller punctures, ~0.5 size of larger ones; interspaces smooth to finely alutaceous and shining, ~0.5 diameter apart. Each puncture gives rise to a curved golden seta. Scutellar surface with vague shallowly impressed small punctures, some punctures giving rise to setae, interspaces smooth to finely alutaceous. Elytral surface with serial rows of alternating large and small deep punctures. Smaller punctures are 0.75 diameter to smaller ones on pronotum, larger punctures are ~3-4X diameter of smaller ones. Smaller punctures giving rise to an erect curved golden seta, larger punctures giving rise to an erect curved golden seta. Interspaces narrow between punctures of a given row and broad between different rows. Within a row, small punctures are separated by ~2 puncture diameters, and large punctures by 0.25-0.5 puncture diameter. Larger rows are separated by ~3 larger puncture diameters. Interspaces always shining but variable from smooth to finely alutaceous in sculpture. Pygidium densely punctate, punctures equal in size to larger ones on pronotum, each puncture giving rise to a short golden seta; interspaces narrow, ~0.5 diameter, shining, with alutaceous to finely granular sculpture.

Venter with shorter sparser pubescence as dorsum. Mentum with minute very shallow punctures, equal in size to smaller ones on vertex, each giving rise to a seta; interspaces alutaceous to granular. Submentum and gula similar in punctation to mentum but with interspaces more granular. Prosternum with moderately impressed punctures and epimeron deeply irregularly punctate, punctures on epimeron equal to larger ones on pronotum and those on prosternum 0.75 diameter of those on epimeron, interspaces alutaceous to granular, prosternal punctures separated by ~1 diameter, those on the epimeron by 0.25-0.5 diameter. Mesosternum with moderately impressed punctures, equal to those on epimeron, interspaces alutaceous to granular, separated by ~0.5-1 diameter and aggregated near metasternal border. Metasternum irregularly punctate, heavily punctate on disc with moderately to deeply impressed large punctures similar in size to those on mesosternum, interspaces alutaceous to granular on metasternal disc becoming more granular laterally, punctures separated by ~0.5-1 diameter. Abdominal sternite 1 with few large faint punctures, punctures equal to those on metasternal disc, interspaces alutaceous, separated by ~1-2 diameters. Abdominal sternites 2-4 with 3 irregular rows of punctures, one row near anterior margin, one near the posterior margin, and a confusedly organized row medially, punctures similar in size to those on sternite 1. Hypopygidium with moderately deep punctures, similar in size to those on sternites 2-4, interspaces alutaceous to granular, punctures separated by ~0.5 diameter.

Head much wider than long (W:L = 1.9:1), fronotclypeal region somewhat projecting anteriorly. Vertex with deep concavity between orbits near fronotclypeal region. Labrum with deep medial incision at anterior margin. Antennal club compact, ovate, slightly asymmetrical with the last antennomere slightly longer than the previous two combined. Antennomeres 4-8 more or less compact, with 6-8 characteristically disc-like, and 4-5 cuboidal. Antennal scape asymmetrical, somewhat hemispherical, 1.75X as long as pedicel. Pedicel subcylindrical in shape. Antennal segment 3 ~0.75 length of pedicel. Antennal club moderately large, ~0.65 length of segments 1-8 combined. Antennal grooves very deep and widely excavate, slightly converging posteriorly. Lateral mental/submental ridge prominent with a corresponding widely excavate sulcus, ridge at level of submentum, ridge with distinct longitudinal and oblique microreticulations and sulcus with transverse and oblique microreticulations and granular sculpture. Mentum with anterior angles obsolete, anterior margin broadly convex with an acute apex, entire structure obtusely triangular in ventral view and somewhat convex laterally.

Pronotum widest near middle (L:W = 1:1.75), anterior margin shallowly concave, posterior margin moderately convex, lateral margins slightly arcuate anteriorly and less so posteriorly. Scutellum large, obtusely triangular, apex rounded. Prosternal process somewhat narrowed between procoxae, apex somewhat acuminate, in lateral aspect the anterior and posterior ends are prominent and there is a distinct convexity medially that abruptly declines to a flattened posterior third. Posterior apical wall moderately prominent and sharply oblique. Mesosternum extending to midway between mesocoxae, broadly concave to almost truncate for reception of the metasternum. Metasternum wider than long (W:L = 2.6:1.0). Metepisternum with slight medial constriction, oblique line dividing anterior 0.20 of structure. First abdominal sternite with broad process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-3 subequal in length, the fourth slightly larger than the preceding two. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth not prominent, equal to 0.5 length of tarsomere 1. Outer apical notch shallow, equal to 0.25 length of tarsomere 1 with an ~100°. Inner apical spine subequal in length to tarsomeres 1. Protibia not heavily armored but with characteristic dense patch of stiff setae along the inner apical region. Mesotibia somewhat more heavily armored than protibia with some dense stiff setae and a row of numerous slender spines along entire lateral edge.

Outer apical process not robust, subequal to protibia process. Inner apical spine equal in length to tarsomere 1 and part of 2 combined. Metatibia with armature similar to that of mesotibia, but with inner apical spine equal to tarsomeres 1-2 combined.

Male genitalia well-sclerotized. Anal sclerite with large broadly curved region anteriodorsally (Fig. 42); apex moderately fimbriate; ventrally with a broad medial concavity approaching apex in a truncate manner. Spiculum gastrale with wide lateral indentate flanges, medial margins deeply concave apically, few short stiff setae originating from apex (Fig. 81). Tegmen evenly broadly rounded apically (Fig. 122), longer than wide (w:l = 1.0:2.7), lateral row of setae visible from the median fossa to prior to the apex, large elliptical shallow concavity in apical third with single row of inner setae not attaining apex, basal notch perpendicular, basal margin perpendicular to slightly oblique. Median lobe large and robust, ~0.7 the length of the tegmen, apex evenly broadly narrowed, apical opening well-developed with deeply cleft bilobed internal structure (Fig. 163). Ejaculatory rods not fused to basal piece or each other, oriented parallel to each other. Basal piece of internal sac sclerite with lateral arms L-shaped and central region evenly depressed or scoop-like (Fig. 202).

Female genitalia moderately sclerotized. Paraprocts large with sclerotization only along median line to apico-lateral angles. Gonocoxite with two basal lateral prominences, basal ridge well-sclerotized. Gonocoxal apices with recurved "tooth" absent. Four primary setae originate from small depressions on the gonocoxal apices. Intragonocoxal invagination extremely deep, ~0.8 length of gonocoxite (Fig. 238).

**Variation.** None observed.

**Seasonality/Habitat.** All specimens were collected in early August.

**Distribution.** Known from the type locality only.

**Notes.** The fungal host data available suggests that this species was not collected in a Gasteromycetes, but rather a mushroom or some other Agaricales. This is the only species known to occur solely from a non-Gasteromycetes host.

**Etymology.** Specific epithet is a derivative of the type locality, i.e. Tepic, Mexico.

## *Pocadius testaceous* Grouvelle

(Figs. 43, 82, 123, 164, 203, 239)

**Type Material Examined.** HOLOTYPE ♀ (MNHN) : Mandar; Bengale / Type / Museum Paris; 1917; Coll. Grouvelle / 76 / Pocadius; testaceus; ty. Grouv / Holotypus Pocadius; testaceus Grouvelle; det. Kirejtshuk 1994.

**Non-Type Material Examined.** 1 ♂ and 1 ♀ (BMNH): CEYLON, C. Prov.; Knucles, 1600m; 28-VI-1983; Ole Mehl Leg. 1 ♂ (RNH, Leiden): India or. Biró, 1902 / Matheran; 800m.

**Diagnosis.** This species can be distinguished from all other *Pocadius* by the following suite of characters: body uniformly testaceous in color; terminal antennomere enlarged, asymmetrical and longer than previous two segments combined; prosternal process in lateral aspect with posterior face long and with slight concavity ventrally, posterior region of prosternal process with marked declivity behind procoxae; metasternal disc glabrous with few widely spaced minute punctures; mesosternum convex medially; abdominal process broad between metacoxae; anal sclerite with an acute apical point; inner margin of spiculum gastrale convex; apex of tegmen truncate to broadly rounded; basal piece of ejaculatory rods with deeply cleft apices; ovipositor with narrow not broadly flanged paraprocts, gonocoxites with elongate baculi and prolongations narrowly separated and abutting, intragonocoxal invagination shallow.

**Redescription.** Length 3.3 mm, Width 1.9mm, Depth 1.0mm. Body moderately convex, surface shining, uniformly testaceous in color. Pronotum and elytra margins with short fimbriae, setae subequal to length of antennal scape. Dorsal and ventral pubescence short.

Head surface moderately deeply, irregularly punctate, punctures more widely dispersed on vertex, becoming somewhat more congregated towards orbits and fronotclypeal region. Larger punctures 4-5 X diameter of eye facet, smaller punctures 3 X diameter. Interspaces smooth to finely alutaceous, shining. Some punctures give rise to a short somewhat curved golden seta. Eyes finely faceted. Pronotal surface with large punctures equal in size to large punctures on vertex of head, interspersed with relatively few smaller punctures, ~0.50 - 0.75 size of larger ones. Interspaces alutaceous to finely microreticulate, about 1-1.5 diameters apart on disc. Some punctures gives rise to a short somewhat curved golden seta. Scutellar surface with very few vague shallowly impressed punctures, punctures similar in size to smaller ones on pronotum, some punctures giving rise to setae, and the interspaces are alutaceous. Elytral surface with serial rows of alternating large and small deep punctures. Smaller punctures are equal in size to larger ones on pronotum, larger punctures are ~1.5 times diameter of smaller ones. Smaller punctures giving rise to a semi-erect to erect golden seta, larger punctures giving rise to a decumbent golden seta. Interspaces narrow between punctures of a given row and between different rows. Within a row, small punctures are separated by ~1 puncture width, and large punctures by 0.5-0.75 puncture width. Larger rows are separated by 1.5 large puncture diameters. Interspaces always shining but mostly alutaceous in sculpture. Pygidium densely punctate more so in the apical 0.33, punctures equal in size to smaller ones on pronotum, each puncture giving rise to a short stiff golden seta. Interspaces narrow, 0.25-0.5 diameters, with granular sculpture.

Venter with similar short golden pubescence as dorsum. Mentum with shallow minute punctures, equal in size to smaller ones on vertex, interspaces alutaceous to finely microreticulate. Submentum and gula similar in punctation to mentum but with interspaces more granular with some microreticulation present. Prosternum and epimeron shallowly irregularly punctate, punctures 1.5X larger than those on mentum, interspaces alutaceous to granular, prosternal punctures separated by 0.5 diameter, those on the epimeron by 0.5 diameter. Mesosternum with shallow punctures, about 0.75 diameter of those on prosternum, interspaces alutaceous to granular, separated by about 0.5 to 1 diameter, with most punctures congregated near the metasternal border. Metasternum irregularly punctate, with faint minute punctures on disc similar in size to smaller ones on venter, interspaces alutaceous on metasternal disc becoming more microreticulate to granular laterally, punctures separated by >2-3 diameters around disc. Abdominal sternite 1 with faint small, almost obsolete punctures, punctures equal to larger ones on vertex, interspaces alutaceous, separated by ~1-2 diameters. Abdominal sternites 2-4 with one distinct irregular rows of punctures near anterior margin, punctures in the row separated by 1 puncture diameters, other non-row punctures more diffusely distributed. Hypopygidium with more deeply impressed punctures, similar in size to those on sternites 2-4, interspaces alutaceous to granular, punctures separated by 0.5-1 puncture width.

Head slightly wider than long (W:L = 1.28:1), fronotclypeal region distinctly projecting anteriorly. Vertex with shallow broad indistinct concavity between orbits near fronotclypeal region. Eyes large and protruding. Antennal club compact, somewhat oval, slightly asymmetrical with the last antennomere longer than the previous two combined. Antennomeres 6-8 more or less compact, with 7-8 characteristically disc-like. Antennal scape asymmetrical, distinctly hemispherical, 1.3 times as long as pedicel. Pedicel subcylindrical in shape. Antennal segment 3 slightly shorter in length to pedicel. Antennal club large, ~0.95 length of segments 1-8 combined. Each club segment with dense short setae, and only relatively few protruding setae. Antennal grooves very deep and widely excavate, slightly converging posteriorly. Lateral mental ridge prominent, at level of submentum, medially the ridge is granular in sculpture with some microreticulation and laterally with longitudinal microreticulations. Mentum with anterior angles distinct, anterior margin angular coming to a distinct medial point, lateral sides subparallel, overall pentagonal in shape, when viewed laterally the entire structure is flattened.

Pronotum widest near posterior angles (L:W = 1:2.1), anterior margin broadly shallowly concave, posterior margin moderately convex, lateral margins slightly arcuate anteriorly, anterior and posterior angle distinct. Scutellum large, obtusely triangular, apex broadly rounded. Prosternal process somewhat narrowed between procoxae, apex somewhat acuminate, in lateral aspect the anterior and posterior ends are prominent and convex medially over procoxae with distinct declivity behind coxal cavities. Posterior apical wall prominent, mostly straight with a slight concavity ventrally. Mesosternum extending to midway between mesocoxae, evenly concave for reception of the metasternum, somewhat convex ventrally but not carinate. Metasternum width to length ratio is ~2.57:1.0. Metepisternum with slight medial constriction, oblique line dividing anterior 0.10 of structure. Elytral humeri moderately produced, lateral margin very narrow. First abdominal sternite with broadly convex process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-4 subequal in length. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth distinct, slightly longer than tarsomere 1. Outer apical notch with ~100° angle, notch depth shallow, equal to length of tarsomere 1. Inner apical spine subequal in length to tarsomere 1 and part of 2 combined. Protibia not heavily armored but with characteristic dense patch of stiff setae along the inner apical region. Mesotibia more heavily armored than protibia with more dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process elongate and robust, larger than protibia process. Inner apical spine equal in length to tarsomeres 1-2 combined. Metatibia with armature similar to that of mesotibia, but lateral setae somewhat longer.

Male genitalia well-sclerotized. Anal sclerite with large broadly curved region anteriodorsally (Fig. 43) ending in a distinct apical point; apex somewhat fimbriate; ventrally with a broad medial concavity approaching apex in more or less truncate manner. Spiculum gastrale with wide narrowly rounded lateral flanges, medial margins convex, short stiff setae originating from apex (Fig. 82). Tegmen broadly rounded to truncate apically (Fig. 123), much longer than wide (w:l = 1.0:2.56), lateral row of setae visible from the median fossa to prior to the apex, broad shallow concavity in apical third, basal notch perpendicular, basal margin concave, inner row of setae not attaining apex. Median lobe large and elongate, ~0.75 the length of the tegmen, apex acuminate, apical opening well-developed with proximal concavity (Fig. 164), lateral margins slightly angulate becoming wider posteriorly. Ejaculatory rods not fused to each other or to basal piece, straight and subparallel. Basal piece of rods not fused to each other, deeply cleft in apical 0.66 (Fig. 203).

Female genitalia moderately sclerotized. Paraprocts not broadly flanged with sclerotization only along median line to baso-lateral angles. Gonocoxite with two basal lateral prominences, basal ridge well-sclerotized. Gonocoxal apices without recurved “tooth”, and intragonocoxal invagination shallow and narrow. Four primary setae originate from small depressions on the gonocoxal apices (Fig. 239).

**Variation.** Specimens from Ceylon have slightly longer dorsal pubescence than the specimen from India/Biró, however all other characters are consistent.

**Seasonality/Habitat.** Specimens from Ceylon were collected in June, and the species is likely known from the more tropical regions of India.

**Distribution.** Known from India and Ceylon.

**Notes.** No fungal hosts are available for this species.

### *Pocadius torresi* Jelínek

(Figs. 44, 84, 124, 165, 240)

**Type Material Examined.** (5) PARATYPES 3 ♀, 2 ♂: two females and one male with the following data label: Argent. prov.; Buenos Aires; J. Basq coll.; one female and one male with the following data label: Argentina; LA PLATA; ex. coll. Mus. La Plata. All specimens with the following labels: Paratypus; Pocadius; torresi; sp. n.; Jelínek det. 1976. / Mus. Nat. Prague; Inv. #'s 65614 – 65618 respectively.

**Non-Type Material Examined.** One with the following label data (CMN): ARG: Salta Prov.; El Rey Nat. Park, 900m; 7-XII-1987, S&J Peck; Hasteria, Chaco Forest; leaf and wood litter.

**Diagnosis.** Differs from other *Pocadius* by the absence of setae in the apico-medial regions of the inner row and median lobe fossa, the almost symmetrical antennal club with rather short terminal antennomere, and lack of a well-developed protibial apical-lateral notch.

**Redescription.** Length 4.2mm, Width 2.8mm, 1.8Depth mm. Body uniformly brown-orange, head and pronotum somewhat darker and less shining than elytra. Pronotum and elytra with margins with dense and elongate fimbria. Pygidium and hypopygidium densely setate, with posterior margins moderately fimbriate.

Head surface moderately punctate, large and small punctures interspersed throughout vertex, becoming more densely packed near orbits and posterior margin. Large punctures ~5 times the diameter of an eye facet, smaller punctures about 0.33 size of larger punctures, interspaces mostly alutaceous, ~ 1-2 diameters apart. Smaller punctures giving rise to very elongate pale golden setae, setae longer than length of eye, overall head very densely pubescent. Fronotclypeal region with broad shallow concavity between the orbits. Pronotal surface with large and small punctures interspersed throughout, with the punctures similar in size to respective large and small punctures on vertex. Elongate golden setae derived from each small puncture. Interspaces 2-3 diameters apart becoming somewhat more dense laterally, mostly granular to alutaceous texture. Scutellar surface with faint large punctures similar in size to the larger punctures on the vertex aggregated along anterior margin, other punctures aggregated in anterior 0.75 are smaller, similar in size to smaller punctures on vertex , interspaces granular, a few elongate setae derived from some of the smaller punctures. Eytral surface with serial rows of alternating large and small shallow punctures. Large punctures irregularly rounded, ~1.5 times the size of the large pronotal punctures, each giving rise to a single erect elongate curved seta. Small punctures 0.25 diameter of large punctures, each giving rise to a smaller semi-erect to decumbent seta, setal length about 0.75 length of setae derived from larger punctures. Large and small punctures in single rows. Interspaces mostly alutaceous between all punctures, larger punctures separated from each other by 0.5 puncture diameter, smaller punctures separated from each other by 1-2 puncture diameters. Large and small puncture rows separated from each other by ~1-1.5 large puncture diameter. Pygidium densely irregularly punctate, punctures equal in size to large punctures on pronotum, interspaces alutaceous with clear transverse microreticulation present, punctures separated by ~0.25 puncture diameter. Some but not all punctures giving rise to a moderately long setae, setae equal to length of those from small punctures on elytra, becoming longer laterally.

Venter with shorter pubescence than dorsum, setae about 0.5 to 0.75 length of pronotal setae. Mentum with faint large punctation, punctures similar in size to ~0.75 the size of the large vertex punctures, some of the punctures giving rise to moderately long setae, interspaces granular with some microreticulation present. Submentum and gula with very faint scattered small punctures equal to 0.5 size of those on mentum, interspaces very granular, with no setae derived from them. Prosternum and epimeron with very faintly impressed punctures approximately 1.25 size of mentum punctures, interspaces alutaceous, prosternal punctures separated by 0.5 diameter, those on the epimeron similarly separated. Prosternal punctures giving rise to moderately long setae the are curved apically. Mesosternum with very faint large punctures along posterior margin, interspaces alutaceous. Metasternum irregularly punctate, with punctures on disc similar in size to small mentum punctures, interspaces smooth to alutaceous on metasternal disc becoming more granular laterally, punctures separated by ~3 diameters becoming somewhat more dense laterally, no disc punctures giving rise to setae, but lateral punctures giving rise to long setae. Metepisternum with dense elongate setae, setae longer than anywhere else on venter. Abdominal sternite 1 with very faint medium sized punctures that are slightly larger than those on the metasternum, interspaces ~2 diameters apart, mostly alutaceous. Abdominal segments 2-4 with similar faint punctures as on sternite 1, however they are aligned in irregular lateral rows, interspaces alutaceous to granular, punctures separated by 0.25-0.5 diameter, each puncture giving rise to a long seta. Hypopygidium more densely deeply punctate than other sternites, punctures ~0.75 the size of those on abdominal sternites 2-4, interspaces alutaceous to granular, punctures separated by ~0.5-1 diameter of puncture.

Head wider than long (W:L = 1.25:1), somewhat triangular, with fronotclypeal region projecting anteriorly. Labrum transverse with sharp triangular medial incision on anterior margin. Antennal club compact, oval, densely setose, almost symmetrical, with the last antennomere subequal to the previous two combined. Antennomeres 6-8 flattened into disc-like structures, their combined length equal to the length of antennomere 9. Antennal scape asymmetrical, hemispherical, 1.75 times as long as pedicel, numerous elongate setae arising from anterior margin of scape. Pedicel subcylindrical in shape tapering proximally, widest near middle. Antennal segment 3 subcylindrical, about 0.75 length of pedicel, tapering proximally as in the pedicel. Segments 4-5 similar in shape to segment 3, each ~0.5 the length of segment 3. Antennal club large, subequal in length to ~0.60 the length of segments 1-8 combined. Antennal grooves quite deep and medially curved posteriorly, antennal ledge extending from submentum laterally along mentum with a longitudinal and oblique microreticulate surface. Mentum with apex evenly narrowly rounded anteriorly with short medial angle, lateral angles faint but present, overall pentagonal and somewhat convex.

Pronotum broadly convex, widest near middle (W:L = ~1.9:1), anterior margin broadly deeply concave to trapezoidal, posterior margin broadly convex with slight undulation near humeri. Prosternal process narrowed between coxae, somewhat acute apex, in lateral aspect the process is almost evenly convex, with greatest height achieved at midline of procoxae. Posterior wall well-developed and slightly oblique. Scutellum large, elongate triangular with rounded apex. Mesosternum extending to midway between mesocoxae, posterior border truncate. Mesepisternum wider than mesosternum. Mesepimeron ~0.33 the width of mesepisternum. Metasternum width to length ratio is ~2.1:1. Metepisternum broad, not concave medially, anterior third produced anteriomedially, anterior 0.13 cut-off from rest of metepisternum by faint incomplete carina. First abdominal sternite with triangular process between metacoxae with produced medial acute tip, first sternite ~2 X's longer than second sternite. Sternites 2-4 subequal in length. Hypopygidium equal to the length of the first abdominal sternite.

Protibia with slight lateral curvature, crenulate along lateral edge. Apical tooth prominent, subequal to tarsomeres 1 and 2 combined. Outer apical notch indistinct, notch depth equal to 0.25 length of tarsomere 1. Inner apical spine subequal in length to first tarsomere and 0.5 of second. Protibia with well-developed armature overall, several rows of short stiff spines visible. Mesotibia more heavily armored than protibia with several rows of slender spines along lateral edge and medial and ventral surfaces. Outer apical process more robust, somewhat larger than protibial process, projecting more posteriorly than protibial process. Inner apical spine equal in length to tarsomere 1 and 2 combined.

Metatibia heavily armored with numerous rows of slender more elongate spines. Spines of varying lengths, but most longer than those on the mesotibia. Outer apical process robust, projecting more posteriorly than mesotibial process. Inner apical spine subequal in length to tarsomeres 1, 2 and 0.5 of the third combined.

Male genitalia moderately sclerotized. Anal sclerite with very broad tegminal fossa, apex and lateral borders well-sclerotized, ~35 elongate setae on apical border (Fig. 44). Spiculum gastrale with ~20 setae extending from the apical margin, lateral flange widely rounded and not well-developed, lateral flange on same plane as rest of sclerite, spiculum attached posterio-medially (Fig. 83). Tegmen not elongate (W:L = ), large median lobe fossa that is longer than 0.5 the length of the tegmen, cilia along apico-lateral regions of medina lobe fossa but not apico-medially, vaguely defined apical fossa with no cilia around it, tegmen apex truncate, lateral edge of tegmen with long setae derived from small pits, inner row of setae originating apico-laterally but also absent apico-medially, posterior prominence projecting forward, posterior margin shallowly concave (Fig. 124). Median lobe quite large, greater than half the length of the tegmen, with bilobed apical opening (Fig. 165). Internal sac sclerites not observed.

Female genitalia moderately to well sclerotized. Gonocoxites elongate, well-developed, intragonocoxal invagination wide, greater than width of gonocoxite process, invagination with acute excavate base, gonocoxite apices with faintly developed recurrent “tooth” present, three primary setae extending from apical pit of gonocoxal apices, basal gonocoxal ridge well-sclerotized, oblique sclerotized baculi short, basal sclerotized ridge with only one basal prominence (Fig. 240).

**Variation.** No noticeable variation between the five specimens studied.

**Seasonality/Habitat.** Known from early December from non-type material.

**Distribution.** Known from the type series in the Buenos Aries province of Argentina and La Salta Province.

**Notes.** No host information is available for this species.

### ***Pocadius wappesi*** **Cline n. sp.**

(Figs. 45, 84, 125, 166, 204, 241)

**Type Material Examined.** HOLOTYPE ♂ (UASC): BOLIVIA: Santa Cruz; 4-6k SSE Buena Vista; F&F Hotel, 2-12 Feb.; 2000, JE Wappes / transition tropical; forest, 420-450m / HOLOTYPE; Pocadius; wappesi; A.R. Cline des. 2004. 1 PARATYPE (CDFA): same data label as holotype but with PARATYPE designation label. 2 PARATYPES (SNEC): BOLIVIA: Santa Cruz Dept.; 3.7km SSE Buena Vista; Hotel Flora-Fauna, 400-440m; 17°29.949’S 63°33.152’W; R. Leschen, 9-Nov. 2002; Ex. Lycoperdon fungus, #054 / PARATYPE; Pocadius; wappesi; A.R. Cline des. 2004. 5 PARATYPES (CMN): BOLIVIA: Sta. Cruz, 5km; SSE Buena Vista, Hotel; Flora y Fauna, 17°29.925’S; 63°39.128’W, 440m forest,; FIT, 15-24 December 2003; S&J Peck 03-131 / PARATYPE; Pocadius; wappesi; A.R. Cline des. 2004.

**Diagnosis.** This species can be delimited from the rest of the Neotropical fauna by the following suite of characters: mentum robustly pentagonal; terminal antennomere without well-defined sensillar region; prosternal process in lateral view with pronounced declivity posteriorly past coxal cavities to flattened posterior third, posterior wall prominent and oblique; all tibia well-armored; elytra with alternating rows of semi-erect setae; dorsal surface almost completely granular in surface sculpture and only moderately shining; abdominal process acute; metasternal disc distinctly punctate; aedeagus with tegmen having a complete inner row of setae; ejaculatory rods partially fused to each other in apical 0.33, and curving inward basally; basal piece of internal sac sclerites with paired short curved structures and a globular central piece that is concave basally and distally; ovipositor with short intragonocoxal invagination, ~0.33 length of gonocoxite, three elongate primary setae, and two short oblique baculi.

**Redescription.** Length 3.8 mm, Width 2.25mm, Depth 1.55mm. Body moderately convex, surface not to only moderately shining, brown to dark brown in color, with the elytral apices darker in some specimens. Pronotum and elytra margins fimbriate, setae equal to slightly longer than length of antennal scape. Dorsal and ventral pubescence moderately long.

Head surface irregularly punctate with moderately impressed small and large punctures, most larger ones on vertex, becoming somewhat smaller towards orbits and fronotclypeal region. Larger punctures ~4X diameter of eye facet, smaller punctures 1-2X diameter; interspaces alutaceous to granular, somewhat shining. Each puncture gives rise to a curved golden seta. Pronotal surface with large punctures equal in size to large punctures on vertex of head, interspersed with relatively few smaller punctures, ~0.5 size of larger ones; interspaces granular and somewhat shining, ~0.25-0.75 diameter apart. Each puncture gives rise to a curved golden seta. Scutellar surface with few vague shallowly impressed small punctures, equal to smaller ones on pronotum, some punctures giving rise to setae, interspaces granular with some microreticulation present. Elytral surface with serial rows of alternating large and small deep punctures. Smaller punctures are equal in size to smaller ones on pronotum, larger punctures are ~3 times diameter of smaller ones. Smaller punctures giving rise to a semi-erect long golden seta, larger punctures giving rise to a semi-erect long golden seta. Interspaces narrow between punctures of a given row and between different rows. Within a row, small punctures are separated by ~1-2 puncture diameters, and large punctures by ~0.5 puncture diameter. Larger rows are separated by 1-2 larger puncture diameters. Interspaces scarcely shining and granular in sculpture. Pygidium densely punctate, punctures equal in size to smaller ones on pronotum, each puncture giving rise to a short golden seta; interspaces narrow, 0.25-0.5 diameter, with granular sculpture.

Venter with shorter pubescence than dorsum. Mentum with minute very shallow almost obsolete punctures, equal in size to smaller ones on vertex, each giving rise to a short seta; interspaces alutaceous to finely granular. Submentum and gula similar in punctation to mentum but with interspaces more granular. Prosternum and epimeron shallowly irregularly punctate, punctures on epimeron equal to larger ones on pronotum and those on prosternum 0.50 diameter of those on epimeron, interspaces granular with microreticulate areas, prosternal punctures separated by 0.5-1 diameter, those on the epimeron by 0.25-0.5 diameter. Mesosternum with faintly impressed punctures, equal to those on epimeron, interspaces granular, separated by about ~1 diameter and most but not all aggregated near metasternal border. Metasternum irregularly punctate, large punctures on disc similar in size to those on mesosternum; interspaces alutaceous to granular on metasternal disc becoming more granular laterally, punctures separated by ~1-2 diameters on disc. Abdominal sternite 1 with large faint punctures, punctures equal to those on metasternum, interspaces granular, separated by ~1-2 diameter. Abdominal sternites 2-4 with irregular rows of punctures, punctures similar in size to those on sternite 1. Hypopygidium with moderately deep punctures, similar in size to those on sternites 2-4, interspaces granular, punctures separated by ~0.5 diameter.

Head much wider than long (W:L = 1.7:1), fronotclypeal region moderately projecting anteriorly. Vertex with shallow concavity between orbits near fronotclypeal region. Labrum with deep medial incision at anterior margin. Antennal club compact, obovate, slightly asymmetrical with the last antennomere slightly longer than the previous two combined. Antennomeres 4-8 more or less compact, with 6-8 characteristically disc-like, and 4-5 trapezoidal. Antennal scape asymmetrical, somewhat hemispherical, 1.8X as long as pedicel. Pedicel subcylindrical in shape. Antennal segment 3 subequal in length to pedicel. Antennal club moderately large, ~0.60 length of segments 1-8 combined. Antennal grooves moderately deep and excavate, slightly converging posteriorly. Lateral mental/submental ridge prominent with a corresponding excavate sulcus, ridge at level of submentum, ridge with longitudinal microreticulations and sulcus with alutaceous to granular sculpture and faint oblique microreticulations. Mentum with anterior angles present, anterior margin angulate, entire structure pentagonal in ventral view and somewhat convex laterally.

Pronotum widest near middle (L:W = 1:2.2), anterior margin shallowly concave almost truncate, posterior margin moderately convex, lateral margins more arcuate anteriorly. Scutellum large, obtusely triangular, apex rounded. Prosternal process somewhat narrowed between procoxae, apex somewhat acuminate, in lateral aspect the posterior end is prominent and there is a slight convexity medially, posterior to coxal cavities there is a sharp declivity to a flattened posterior thirds of the structure. Posterior apical wall prominent and strongly oblique. Mesosternum extending to midway between mesocoxae, evenly concave for reception of the metasternum. Metasternum wider than long (W:L = 3.2:1.0). Metepisternum with slight medial constriction, oblique line dividing anterior 0.14 of structure. First abdominal sternite with acuminate process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-3 subequal in length, the fourth slightly larger than the preceding two. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth moderately prominent, subequal to length of tarsomere 1. Outer apical notch absent. Inner apical spine subequal in length to tarsomere 1. Protibia heavily armored with numerous setae and with characteristic dense patch of stiff setae along the inner apical region. Mesotibia more heavily armored than protibia with numerous dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process robust, larger than protibial process. Inner apical spine equal in length to tarsomere 1 and part of 2 combined. Metatibia with heavier armature than that of mesotibia, and inner apical spine equal to length of tarsomeres 1-2 combined.

Male genitalia well-sclerotized. Anal sclerite with large broadly curved region anteriodorsally (Fig. 45); apex fimbriate; ventrally with a broad medial concavity approaching apex in a broadly convex to truncate manner. Spiculum gastrale with wide lateral flanges, medial margins concave, many elongate stiff setae originating from apex (Fig. 84). Tegmen evenly rounded apically (Fig. 125), longer than wide (w:l = 1:2.3), lateral row of setae visible from the median fossa to prior to the apex, large elliptical shallow concavity in apical third with single row of inner setae completely attaining apex, basal notch perpendicular, basal margin slightly concave. Median lobe large and robust, ~0.66 the length of the tegmen, apex moderately narrowed, apical opening well-developed with widely bilobed internal structure (Fig. 166). Ejaculatory rods not fused to basal piece but to each other in apical 0.33, slightly divergent from one another basally where they are inwardly curved. Basal piece of internal sac sclerite with paired short curved structures laterally and a medial globular structure with concavities apically and basally (Fig. 204).

Female genitalia moderately sclerotized (Fig. ?). Paraprocts moderately large with sclerotization only along median line to apico-lateral angles. Gonocoxite with two basal lateral prominences, basal ridge well-sclerotized. Gonocoxal apices without recurved “tooth”. Three primary setae originate from small depressions on the gonocoxal apices. Intragonocoxal invagination shallow, not greater than 0.33 entire length of gonocoxite (Fig. 241).

**Variation.** No demonstrable variation.

**Seasonality/Habitat.** All specimens were collected in a lowland tropical transition forest from November through February.

**Distribution.** Known only from the type locality.

**Notes.** Specimens were collected from *Lycoperdon* fungi.

**Etymology.** Specific epithet honors Jim Wappes for introducing me to fieldwork in Bolivia and his generosity during the course of this research.

### *Pocadius yunnanensis* Grouvelle 'nomen reinstated'

(Fig. 242)

**Type Material Examined.** HOLOTYPE (MNHN) 2 specimens on same card mount: Yunnan / MUSEUM PARIS; Yunnan; H. Donckier 1907 / Pocadius; yunnanis; Gr. ex. type [specific epithet published as yunnanensis in 1910 and again in 1913 catalog by author]. CO-TYPE (BMNH) ♀: Yunnan; Mission / Yunnan; 1908-55 / [circular label] Co-type / Pocadius; yunnanensis; ty. Grouv.

**Diagnosis.** The following suite of characters clearly delimit *P. yunnanensis* from all other Old World species: circular antennal club, obsoletely carinate mesosternum, broad abdominal process extending between metacoxae, smaller less protuberant eyes, pronotum densely punctate, protibia with outer apical notch indistinct, and gonocoxae with shallow incision between extensions, gonocoxal apices with 3 primary setae, and sclerotized baculi at base of gonocoxite reduced.

**Redescription.** Length 3.2 mm, Width 1.3mm, Depth 0.9mm. Body moderately convex, surface shining, brown to dark brown in color, with the extreme lateral pronotal margins and basal 0.25 of elytra excluding the humeri orange-brown. Pronotum and elytra margins fimbriate, setae equal to length of antennal scape. Dorsal and ventral pubescence moderately long.

Head surface deeply, irregularly punctate, large and small punctures evenly dispersed on vertex, becoming more densely aggregated towards orbits and fronotclypeal region. Larger punctures 4 X diameter of eye facet, smaller punctures 3 X diameter. Interspaces alutaceous and shining. Each smaller puncture gives rise to a golden seta. Pronotal surface with large punctures slightly larger in size to large punctures on vertex of head, interspersed with smaller punctures, roughly equal in size to larger ones on vertex. Interspaces smooth to alutaceous, about 0.25-0.5 diameters apart. Each puncture gives rise to a golden seta, most seta are slightly curved but some are rather straight. Scutellar surface with vague shallowly impressed punctures similar in size to smaller ones on pronotum, some punctures giving rise to setae, and the interspaces are alutaceous to granular. Elytral surface with serial rows of alternating large and small deep punctures. Smaller punctures are equal in size to smaller ones on pronotum, larger punctures are ~2 times diameter of smaller ones. Smaller punctures giving rise to a semi-erect moderately long golden seta, larger punctures giving rise to a semi-erect shorter golden seta, all setae have curved apices. Interspaces narrow between punctures of a given row and between different rows. Within a row, small punctures are separated by ~1 puncture width, and large punctures by 0.5 puncture width. Rows are separated by 0.5-0.75 large puncture diameters. Interspaces always shining but variable from smooth to alutaceous in sculpture. Pygidium densely punctate, punctures equal in size to smaller ones on pronotum, each puncture giving rise to a short stiff golden seta. Interspaces narrow, 0.33 diameters, with granular sculpture.

Venter with similar moderately long golden pubescence as dorsum. Mentum with several somewhat deeply impressed punctures, equal in size to larger ones on vertex, each giving rise to a golden seta. Interspaces granular to finely microreticulate. Submentum and gula with more shallowly impressed punctation to mentum but with interspaces completely granular. Prosternum and epimeron deeply irregularly punctate, punctures slightly larger than those on mentum, interspaces alutaceous to granular, prosternal punctures separated by 0.25 diameter, those on the epimeron by 0.25 diameter. Mesosternum with shallow punctures, similar in diameter to those on prosternum, interspaces alutaceous to granular, separated by about 0.5 diameter, all punctures aggregated along metasternal border. Metasternum irregularly punctate, with moderately faint punctures on disc similar in size to those on mesosternum, interspaces granular throughout, punctures separated by ~0.5-1 diameters. Abdominal sternite 1 with large faint, almost obsolete punctures, punctures equal to those on metasternum, interspaces granular, separated by ~1 diameter. Abdominal sternites 2-4 with two irregular rows of punctures, one row near anterior margin and the other near posterior margin, punctures similar in size to those on metasternum, rows separated by 2-3 puncture diameters, punctures within rows separated by ~0.33 punctures width, punctures not in rows diffusedly dispersed. Hypopygidium with moderately deep punctures, similar in size to those on sternites 2-4, interspaces granular, punctures separated by 0.5 puncture diameters.

Head slightly wider than long (W:L = 1.65:1), fronotclypeal region moderately projecting anteriorly. Vertex with broad shallow obsoletely defined concavity between orbits near fronotclypeal region. Eyes large, moderately protruding. Labrum with shallow obsolete indentation at anterior margin. Antennal club compact, nearly circular, not asymmetrical, with the last antennomere subequal to the previous two combined. Antennomeres 6-8 more or less compact and characteristically disc-like. Antennal scape asymmetrical, somewhat hemispherical, 1.9 times as long as pedicel. Pedicel subcylindrical in shape. Antennal segment 3 subequal in length to pedicel. Antennal club moderately large, ~0.55 length of segments 1-8 combined. Each club segment with dense short setae, and only relatively few protruding setae.

Antennal grooves very deep and widely excavate, slightly converging posteriorly. Lateral mental ridge prominent and elongate, at level of submentum, ridge extends completely to apex of gula, all microsculpturing of ridge surface is longitudinal. Mentum with anterior angles visible, anterior margin angular to narrowly rounded apex, overall pentagonal in shape, entire structure flattened when viewed laterally.

Pronotum widest near posterior angles (L:W = 1:1.9), anterior margin broadly concave somewhat truncate, posterior margin moderately convex, lateral slightly arcuate anteriorly. Scutellum large, obtusely triangular, apex broadly rounded. Prosternal process somewhat narrowed between procoxae, apex somewhat acuminate, in lateral aspect the anterior and posterior ends are prominent and convex medially. Posterior apical wall short and slightly oblique. Mesosternum extending to midway between mesocoxae, evenly concave for reception of the metasternum, with faintly produced medial carina. Metasternum width to length ratio is ~2.66:1.0. Metepisternum with slight medial constriction, oblique line dividing anterior 0.125 of structure. Elytral humeri moderately produced, lateral margin very narrow. First abdominal sternite with broadly rounded process between metacoxae. First sternite ~2X's longer than second sternite. Sternites 2-4 subequal in length. Hypopygidium subequal in length to first abdominal sternite.

Protibia with apical tooth prominent, slightly longer than tarsomeres 1. Outer apical notch indistinct. Inner apical spine subequal in length to tarsomeres 1 and part of 2 combined. Protibia not heavily armored but with characteristic dense patch of stiff setae along the inner apical region. Mesotibia more heavily armored than protibia with more dense stiff setae and a row of numerous slender spines along entire lateral edge. Outer apical process elongate and robust, larger than protibia process. Inner apical spine equal in length to tarsomeres 1-2 combined. Metatibia with more armature than that of mesotibia, spines longer and more robust.

Male genitalia not observed.

Female genitalia moderately sclerotized. Paraprocts moderately large with sclerotization only along median line to lateral angles. Gonocoxite with two basal lateral prominences and one medial prominence, basal ridge well-sclerotized. Gonocoxal apices without recurved "tooth". Three primary setae originate from small depressions on the gonocoxal apices. Intragonocoxal invagination shallow, not greater than 0.33 entire length of gonocoxite (Fig. 242).

**Variation.** No demonstrable variation between the three specimens observed.

**Seasonality/Habitat.** No seasonality information or specific habitat information is known for this species.

**Distribution.** Known only from the type locality of Yunnan, China.

**Notes.** Kirejtshuk (1984) synonomized this species with *P. nobilis* Reitter without giving detailed morphological explanations for this change, however distinct differences are available that preclude the inclusion of *P. yunnanensis* with *P. nobilis*. Kirejtshuk stated that his taxonomic change was "based on a study of many specimens of *P. nobilis*, and the type series of *P. yunnanensis* from (RNH)…". Specimens of *P. yunnanensis* from RNH possessing label data Kirejtshuk mentioned were not located during the course of this study. However, one Co-type specimen with the exact label data provided by Kirejtshuk was borrowed from the BMNH. This specimen and the two specimens from Paris are the basis for the reinstatement of *P. yunnanensis* as a valid species. No host data are available for this species.

## *POCADIUS* PHYLOGENY

Following the phylogenetic analyses a total of 1131 equally parsimonious trees were constructed, which included all 46 in-group species and 9 out-group taxa. Figure 243 represents the strict consensus tree from this analysis.

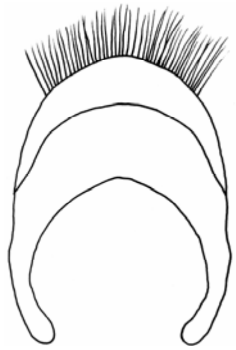

Fig. 6. Anal sclerite,
*P. adustus*.

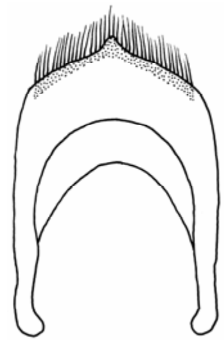

Fig. 7. Anal sclerite,
*P. africanus*.

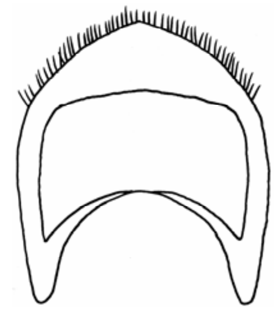

Fig. 8. Anal sclerite,
*P. antennuliferus.*

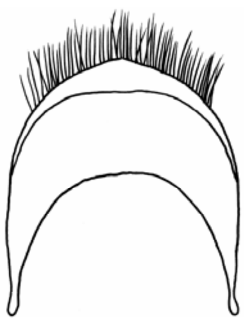

Fig. 9. Anal sclerite,
*P. ashei*.

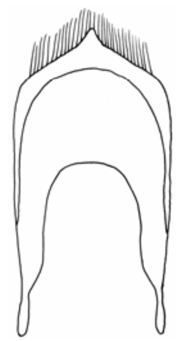

Fig. 10. Anal sclerite,
*P. barclayi*.

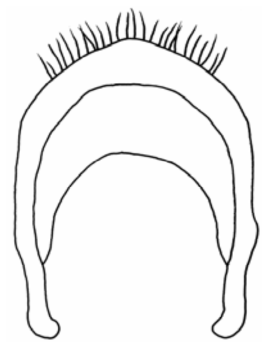

Fig. 11. Anal sclerite,
*P. basalis*.

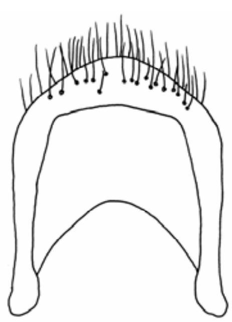

Fig. 12. Anal sclerite,
*P. brevis*.

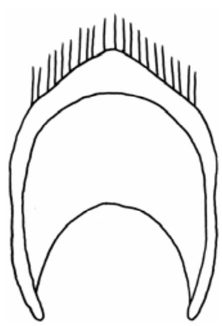

Fig. 13. Anal sclerite,
*P. carltoni*.

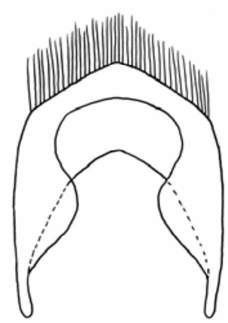

Fig. 14. Anal sclerite,
*P. centralis*.

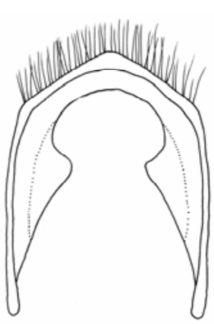

Fig. 15. Anal sclerite,
*P. cochabambus*.

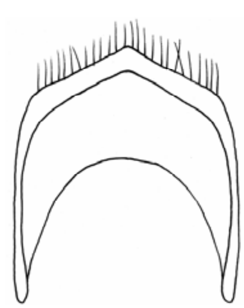

Fig. 16. Anal sclerite,
*P. coxus*.

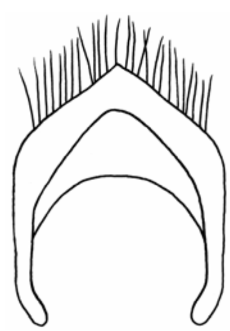

Fig. 17. Anal sclerite,
*P. crypsis*.

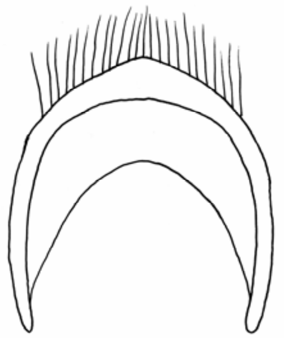

Fig. 18. Anal sclerite,
*P. dimidiatus*.

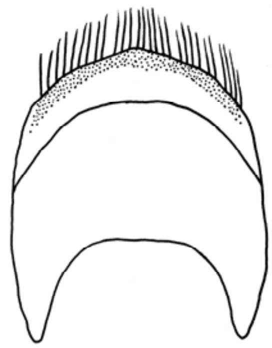

Fig. 19. Anal sclerite,
*P. dominicus*.

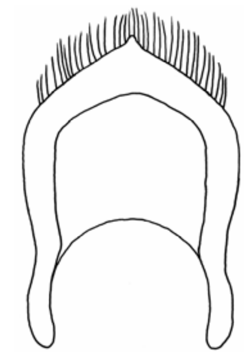

Fig. 20. Anal sclerite,
*P. endroedvi*.

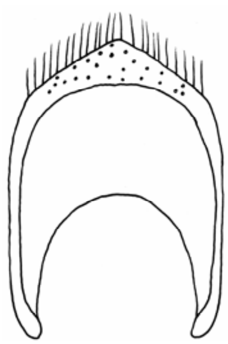

Fig. 21. Anal sclerite,
*P. ephite*.

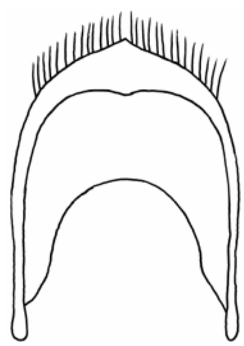

Fig. 22. Anal sclerite,
*P. falini*.

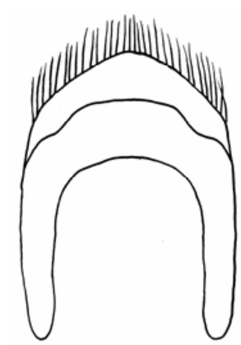

Fig. 23. Anal sclerite,
*P. ferrugineus*.

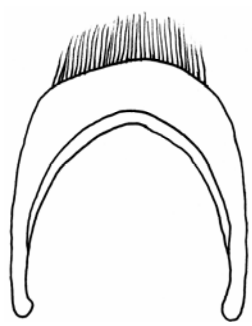

Fig. 24. Anal sclerite,
*P. fulvipennis*.

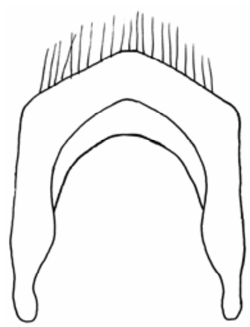

Fig. 25. Anal sclerite,
*P. fumatus*.

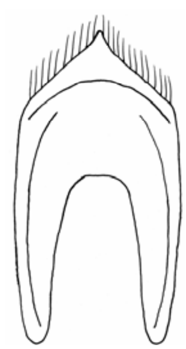

Fig. 26. Anal sclerite,
*P. fusiformis*.

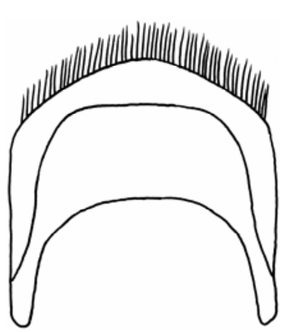

Fig. 27. Anal sclerite,
*P. globularis*.

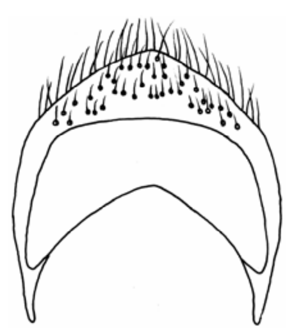

Fig. 28. Anal sclerite,
*P. helvolus*.

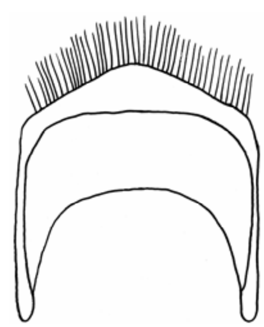

Fig. 29. Anal sclerite,
*P. insularis*.

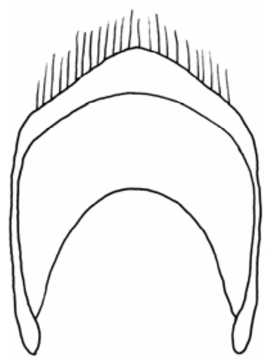

Fig. 30. Anal sclerite, *P. jelineki*.

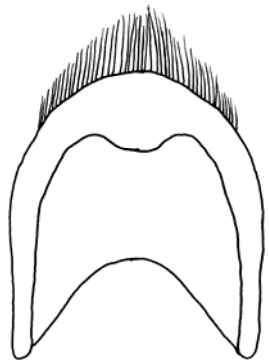

Fig. 31. Anal sclerite, *P. kirejtshuki*.

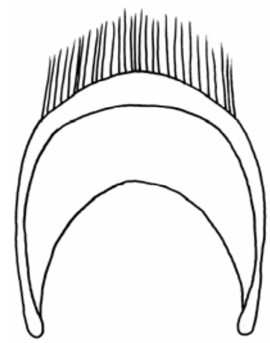

Fig. 32. Anal sclerite, *P. luisalfredoi*.

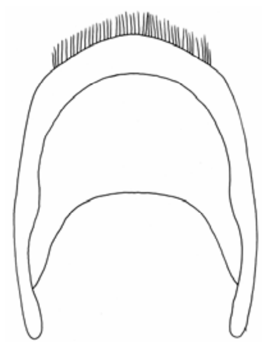

Fig. 33. Anal sclerite, *P. majusculus*.

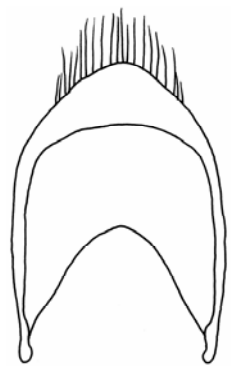

Fig. 34. Anal sclerite, *P. maquipucunensis*.

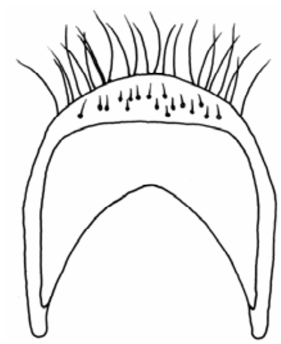

Fig. 35. Anal sclerite, *P. niger*.

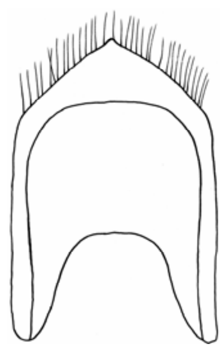

Fig. 36. Anal sclerite, *P. nigerrimus*.

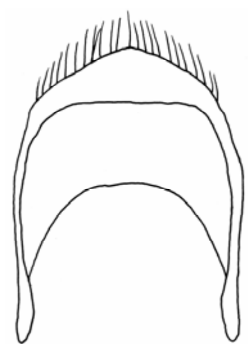

Fig. 37. Anal sclerite, *P. nobilis*.

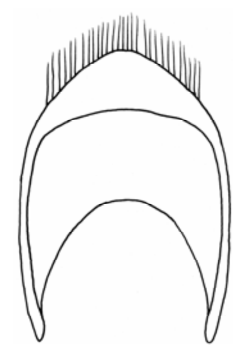

Fig. 38. Anal sclerite, *P. okinawaensis*.

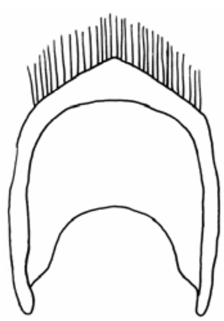

Fig. 39. Anal sclerite, *P. pecki*.

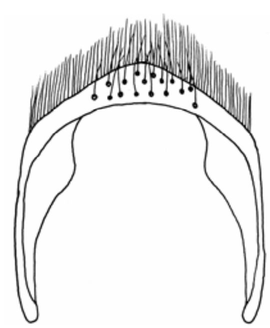

Fig. 40. Anal sclerite, *P. peruensis*.

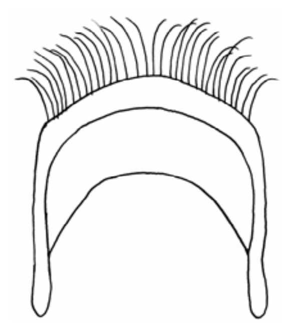

Fig. 41. Anal sclerite, *P. rubidus*.

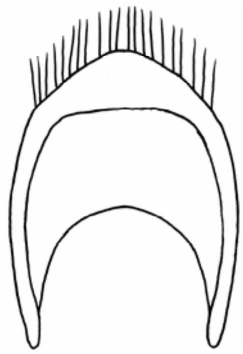

Fig. 42. Anal sclerite, *P. tepicensis*.

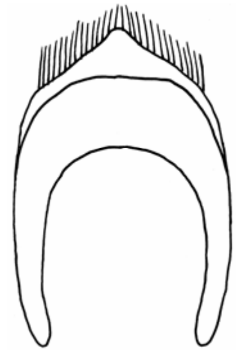

Fig. 43. Anal sclerite, *P. testaceous*.

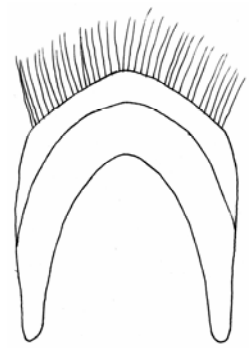

Fig. 44. Anal sclerite, *P. torresi*.

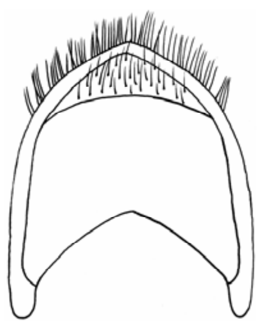

Fig. 45. Anal sclerite, *P. wappesi*.

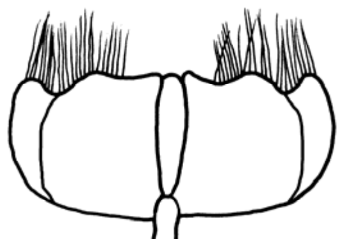

Fig. 46. Spiculum gastrale, *P. adustus*.

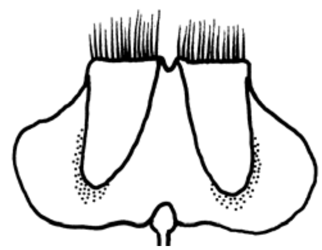

Fig. 47. Spiculum gastrale, *P. africanus*.

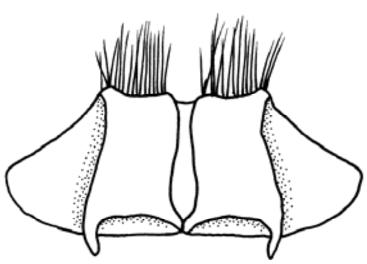

Fig. 48. Spiculum gastrale, *P. antennuliferus*.

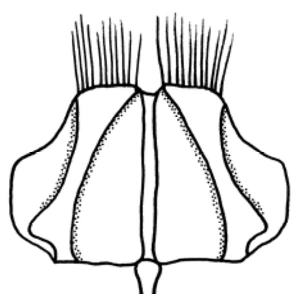

Fig. 49. Spiculum gastrale, *P. barclayi*.

Fig. 50. Spiculum gastrale, *P. basalis*.

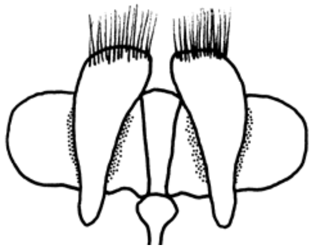

Fig. 51. Spiculum gastrale, *P. brevis*.

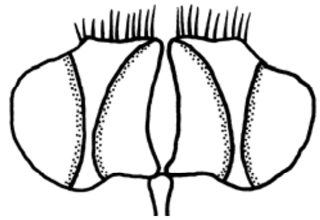

Fig. 52. Spiculum gastrale, *P. carltoni*.

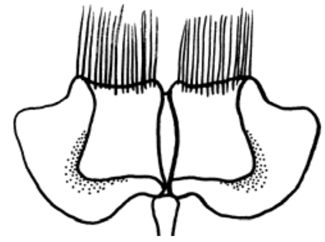

Fig. 53. Spiculum gastrale, *P. centralis*.

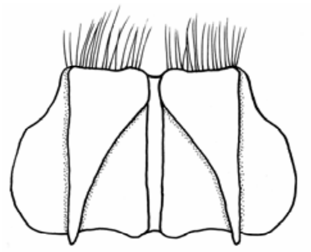

Fig. 54. Spiculum gastrale, *P. cochabambus*.

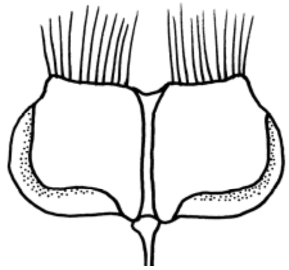

Fig. 55. Spiculum gastrale, *P. coxus*.

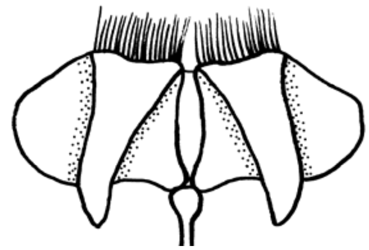

Fig. 56. Spiculum gastrale, *P. crypsis*.

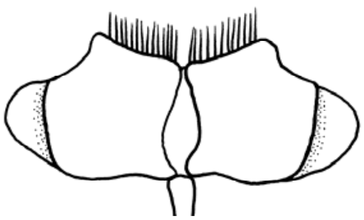

Fig. 57. Spiculum gastrale, *P. dimidiatus*.

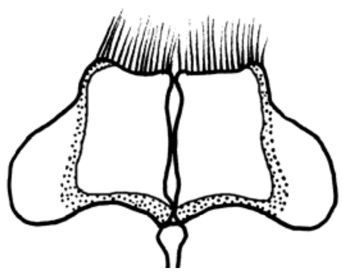

Fig. 58. Spiculum gastrale, *P. dominicus*.

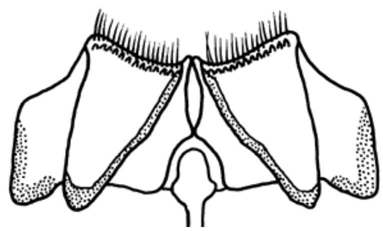

Fig. 59. Spiculum gastrale, *P. endroedyi*.

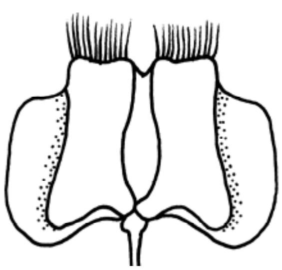

Fig. 60. Spiculum gastrale, *P. ephite*.

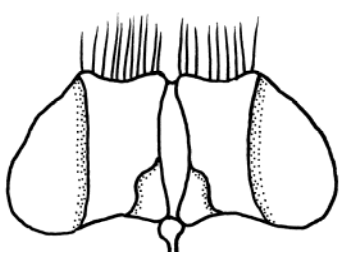

Fig. 61. Spiculum gastrale, *P. falini*.

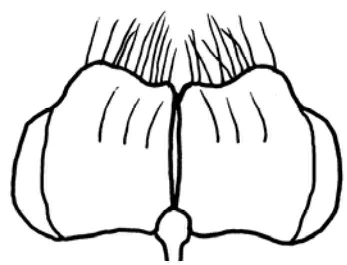

Fig. 62. Spiculum gastrale, *P. ferrugineus*.

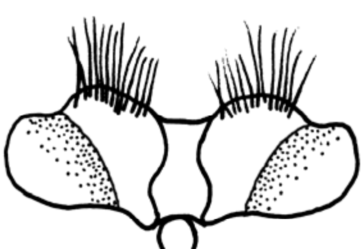

Fig. 63. Spiculum gastrale, *P. fulvipennis*.

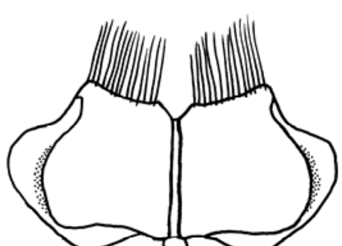

Fig. 64. Spiculum gastrale, *P. fumatus*.

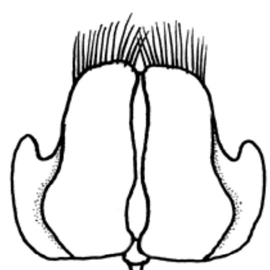

Fig. 65. Spiculum gastrale, *P. fusiformis*.

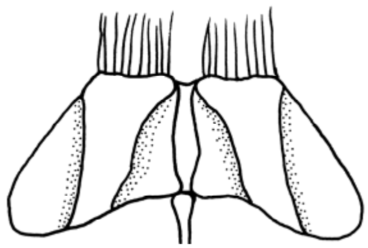

Fig. 66. Spiculum gastrale,
*P. globularis*.

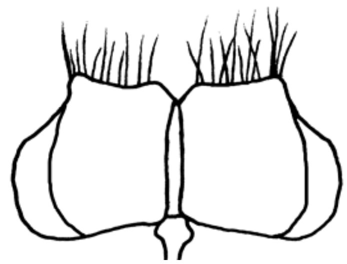

Fig. 67. Spiculum gastrale,
*P. helvolus*.

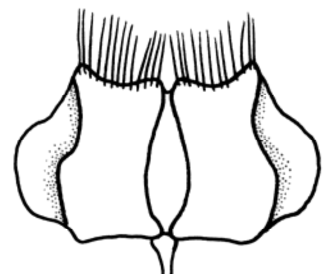

Fig. 68. Spiculum gastrale,
*P. insularis*.

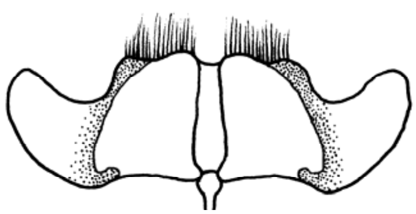

Fig. 69. Spiculum gastrale,
*P. jelineki*.

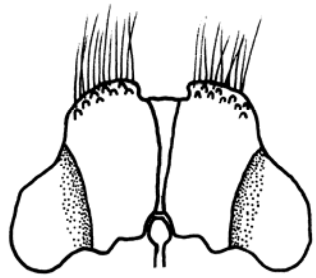

Fig. 70. Spiculum gastrale,
*P. kirejtshuki*.

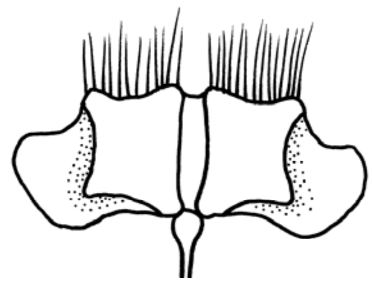

Fig. 71. Spiculum gastrale,
*P. luisalfredoi*.

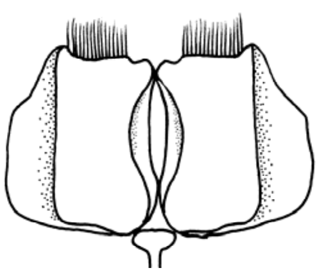

Fig. 72. Spiculum gastrale,
*P. majusculus*.

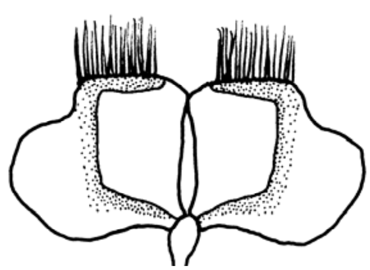

Fig. 73. Spiculum gastrale,
*P. maquipucunensis*.

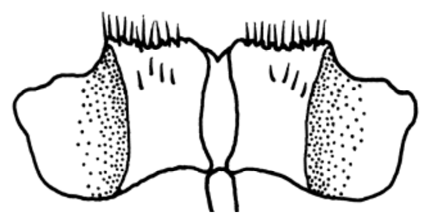

Fig. 74. Spiculum gastrale,
*P. niger*.

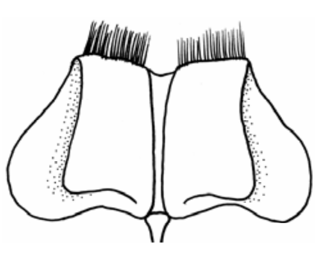

Fig. 75. Spiculum gastrale,
*P. nigerrimus*.

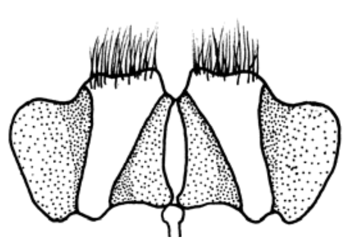

Fig. 76. Spiculum gastrale,
*P. nobilis*.

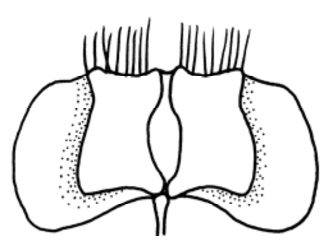

Fig. 77. Spiculum gastrale,
*P. okinawaensis*.

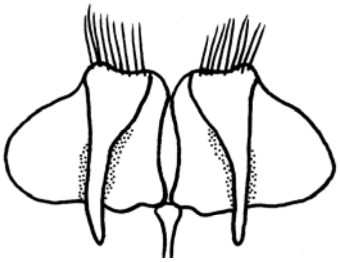

Fig. 78. Spiculum gastrale,
*P. pecki*.

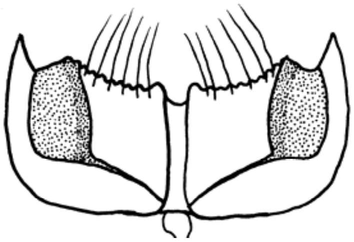

Fig. 79. Spiculum gastrale,
*P. peruensis*.

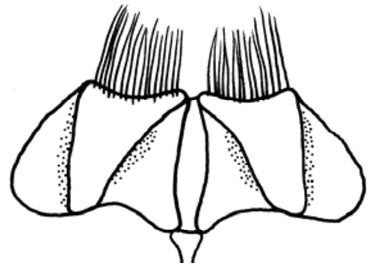

Fig. 80. Spiculum gastrale,
*P. rubidus*.

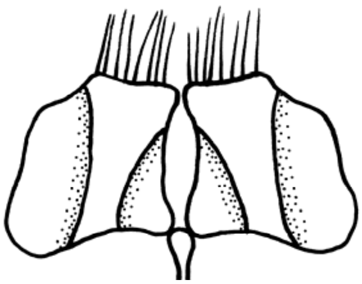

Fig. 81. Spiculum gastrale,
*P. tepicensis*.

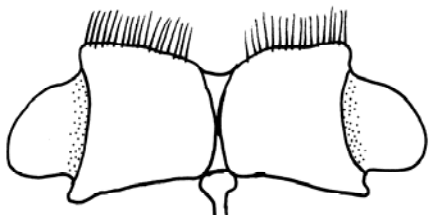

Fig. 82. Spiculum gastrale,
*P. testaceous*.

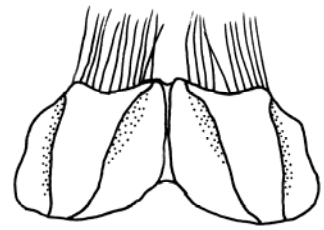

Fig. 83. Spiculum gastrale,
*P. torresi*.

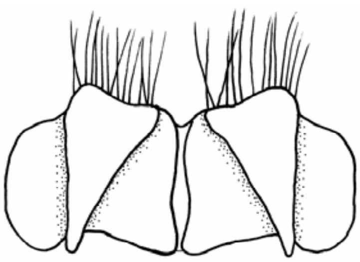

Fig. 84. Spiculum gastrale,
*P. wappesi*.

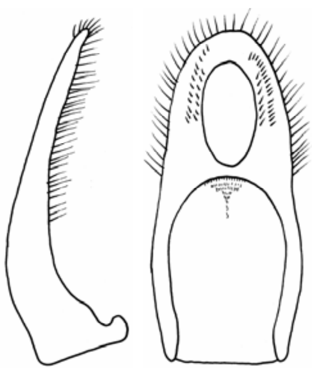

Fig. 85. Tegmen,
*P. adjustus*.

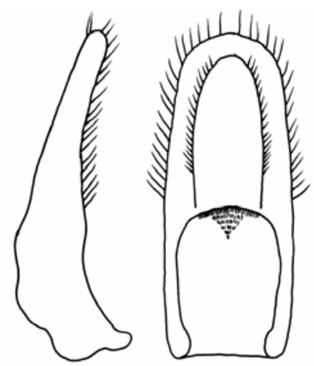

Fig. 86. Tegmen,
*P. africanus.*

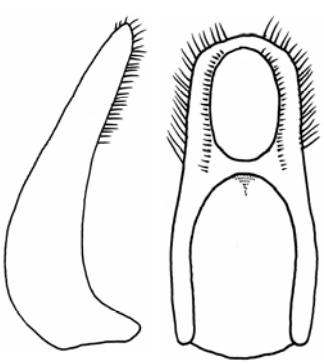

Fig. 87. Tegmen,
*P. antennuliferus.*

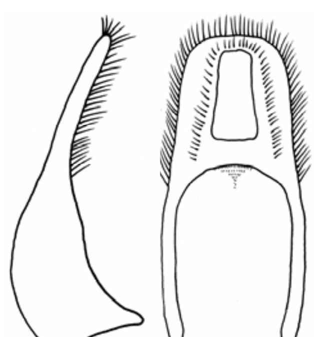

Fig. 88. Tegmen,
*P. ashei*.

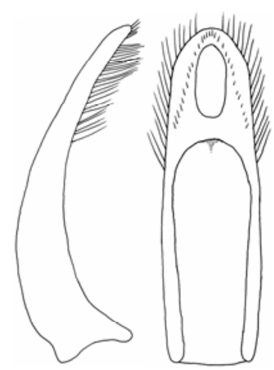

Fig. 89. Tegmen,
*P. barclayi*.

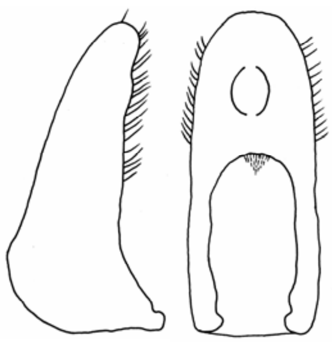

Fig. 90. Tegmen,
*P. basalis*.

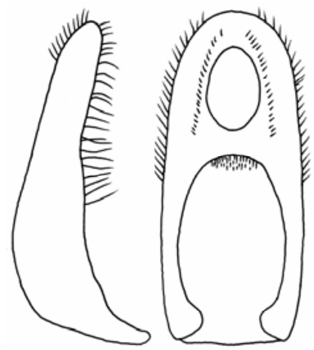

Fig. 91. Tegmen,
*P. brevis*.

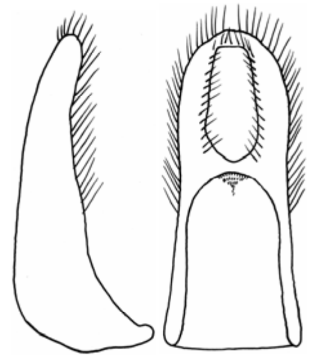

Fig. 92. Tegmen,
*P. carltoni*.

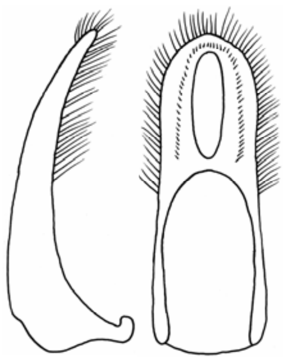

Fig. 93. Tegmen,
*P. centralis*.

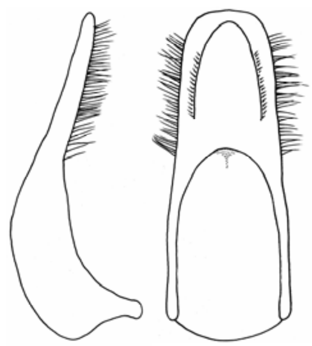

Fig. 94. Tegmen,
*P. cochabambus*.

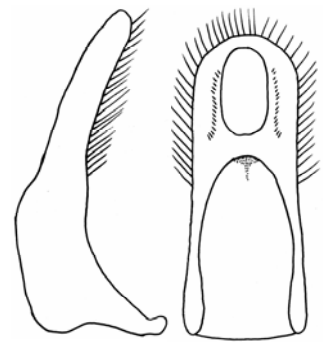

Fig. 95. Tegmen,
*P. coxus*.

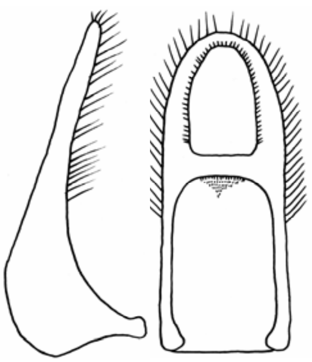

Fig. 96. Tegmen,
*P. crypsis*.

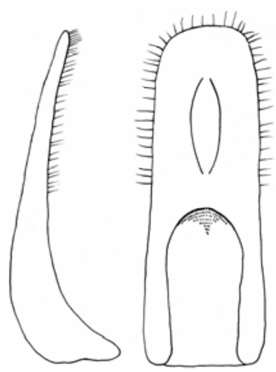

Fig. 97. Tegmen,
*P. decoratus*.

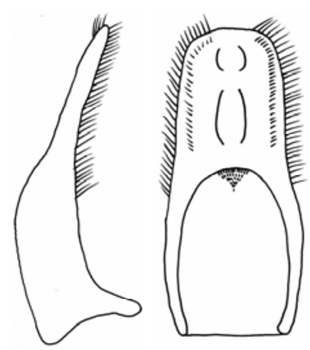

Fig. 98. Tegmen,
*P. dimidiatus*.

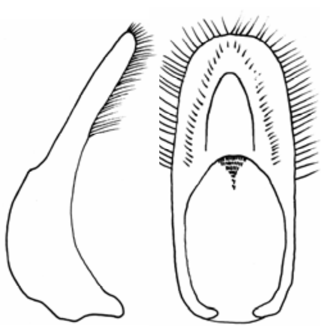

Fig. 99. Tegmen,
*P. dominicus*.

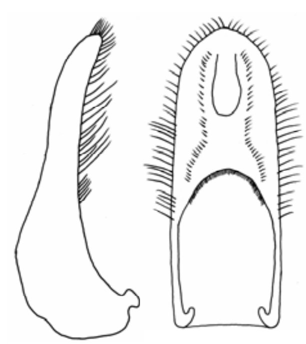

Fig. 100. Tegmen,
*P. endroedyi*.

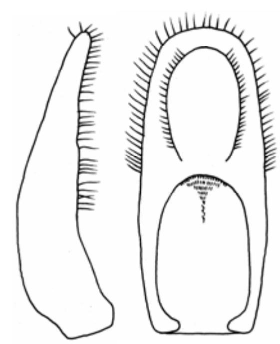

Fig. 101. Tegmen,
*P. ephite*.

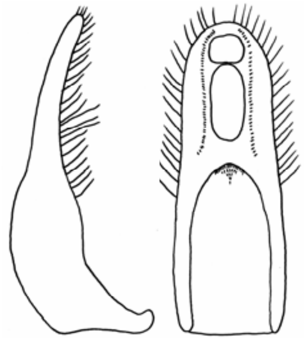

Fig. 102. Tegmen,
*P. falini*.

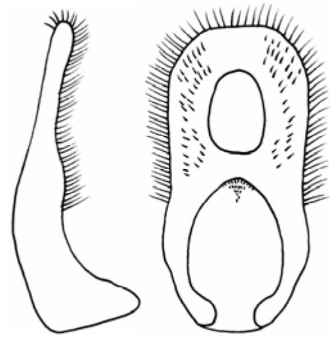

Fig. 103. Tegmen,
*P. ferrugineus*.

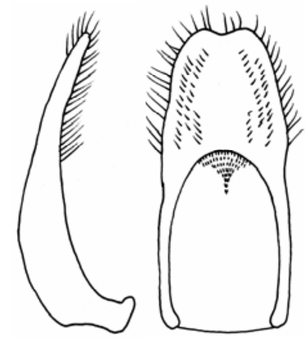

Fig. 104. Tegmen,
*P. fulvipennis*.

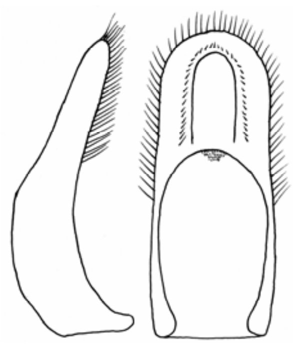

Fig. 105. Tegmen,
*P. fumatus*.

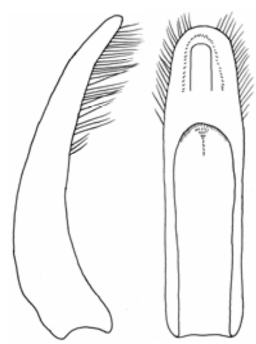

Fig. 106. Tegmen,
*P. fusiformis*.

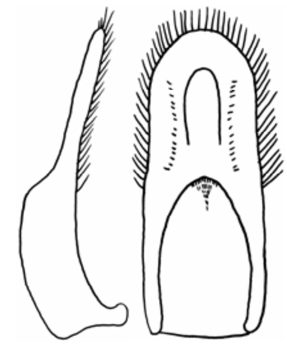

Fig. 107. Tegmen,
*P. globularis*.

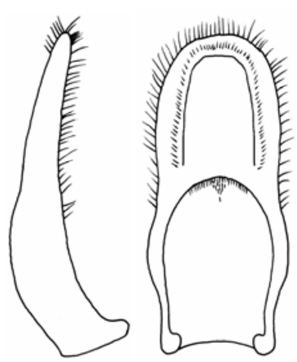

Fig. 108. Tegmen,
*P. helvolus*.

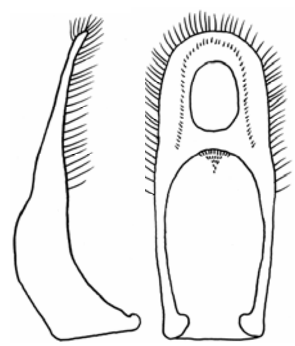

Fig. 109. Tegmen,
*P. insularis*.

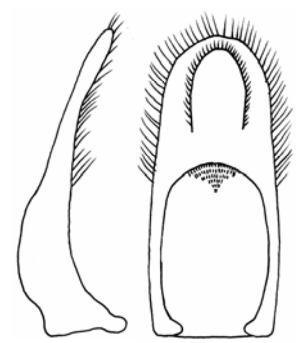

Fig. 110. Tegmen,
*P. jelineki*.

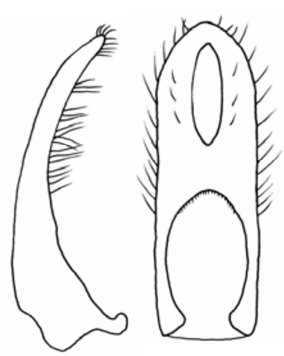

Fig. 111. Tegmen,
*P. kirejtshuki*.

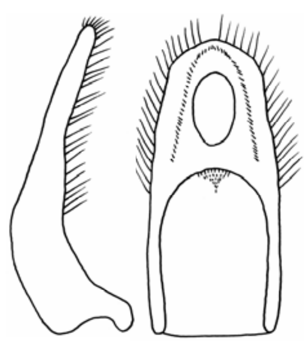

Fig. 112. Tegmen,
*P. luisalfredoi*.

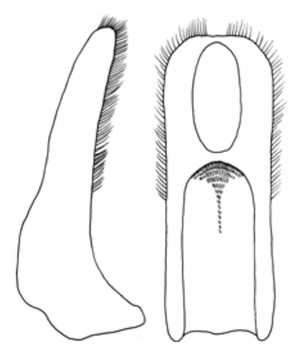

Fig. 113. Tegmen,
*P. majusculus*.

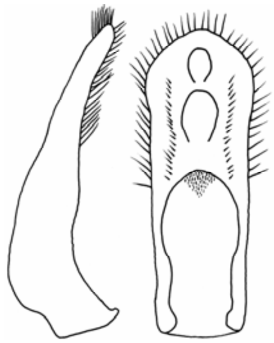
Fig. 114. Tegmen, *P. maquipucunensis*.

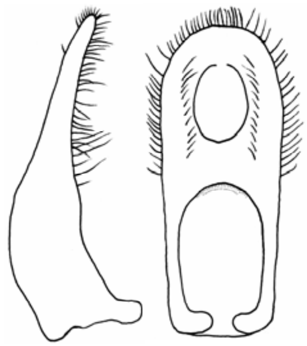
Fig. 115. Tegmen, *P. niger*.

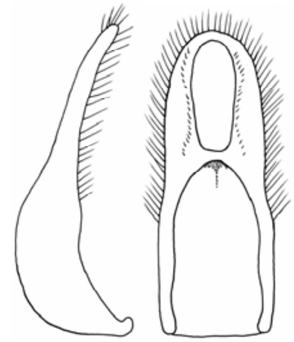
Fig. 116. Tegmen, *P. nigerrimus*.

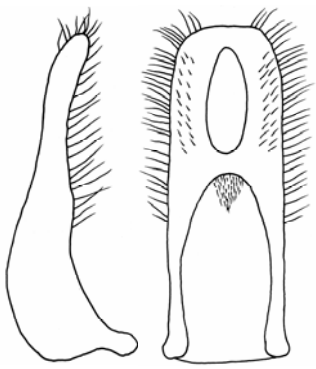
Fig. 117. Tegmen, *P. nobilis*.

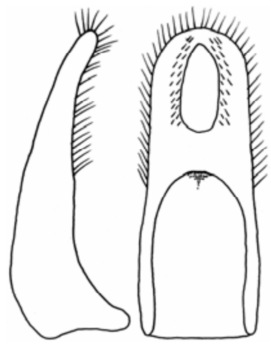
Fig. 118. Tegmen, *P. okinawaensis*.

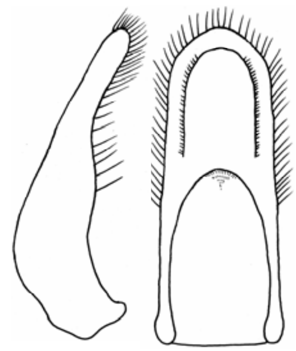
Fig. 119. Tegmen, *P. pecki*.

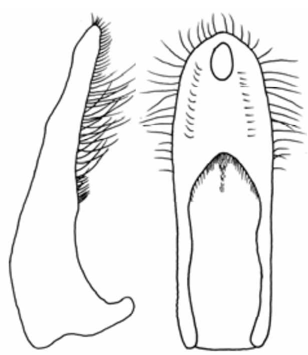
Fig. 120. Tegmen, *P. peruensis*.

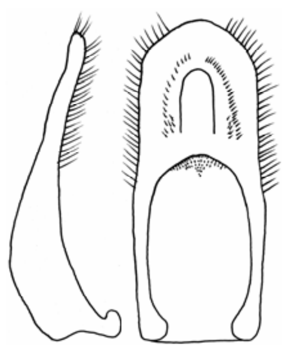
Fig. 121. Tegmen, *P. rubidus*.

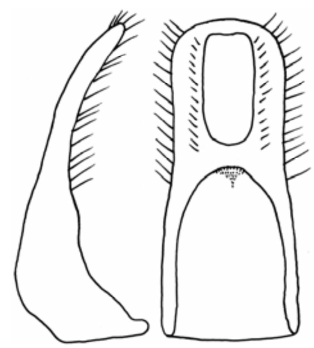
Fig. 122. Tegmen, *P. tepicensis*.

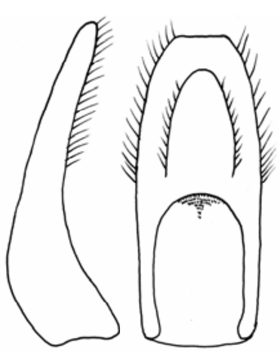
Fig. 123. Tegmen, *P. testaceous*.

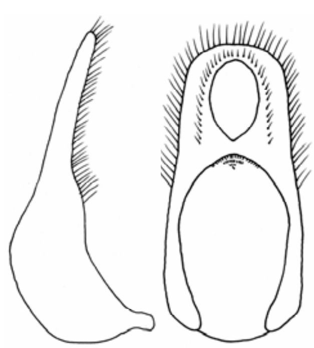
Fig. 124. Tegmen, *P. torresi*.

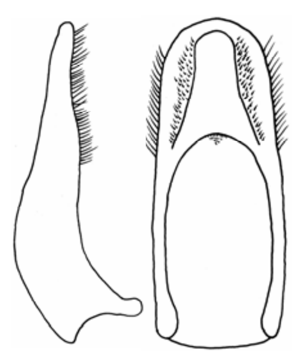
Fig. 125. Tegmen, *P. wappesi*.

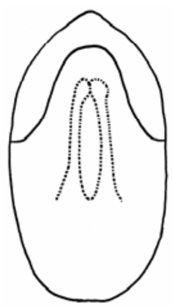

Fig. 126. Median Lobe, *P. adjustus*.

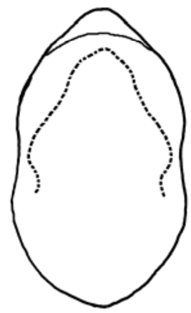

Fig. 127. Median Lobe, *P. africanus*.

Fig. 128. Median Lobe, *P. antennuliferus*.

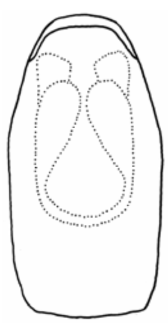

Fig. 129. Median Lobe, *P. ashei*.

Fig. 130. Median Lobe, *P. barclayi*.

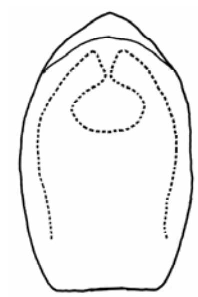

Fig. 131. Median Lobe, *P. basalis*.

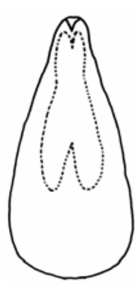

Fig. 132. Median Lobe, *P. brevis*.

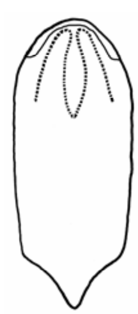

Fig. 133. Median Lobe, *P. carltoni*.

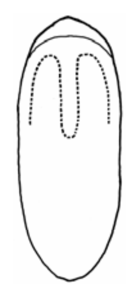

Fig. 134. Median Lobe, *P. centralis*.

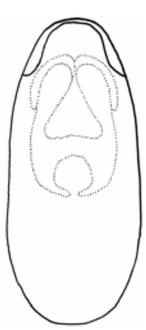

Fig. 135. Median Lobe, *P. cochabambus*.

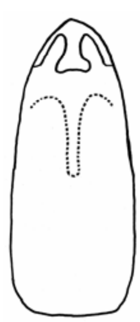

Fig. 136. Median Lobe, *P. coxus*.

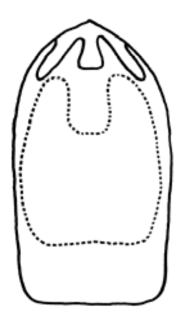

Fig. 137. Median Lobe, *P. crypsis*.

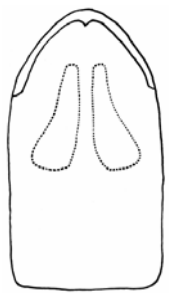

Fig. 138. Median Lobe,
*P. decoratus*.

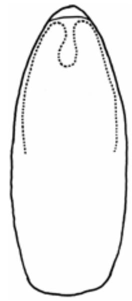

Fig. 139. Median Lobe,
*P. dimidiatus*.

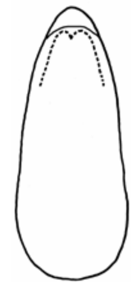

Fig. 140. Median Lobe,
*P. dominicus*.

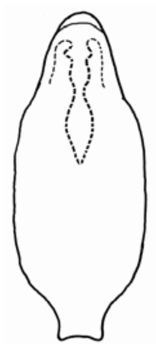

Fig. 141. Median Lobe,
*P. endroedyi*.

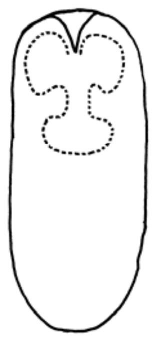

Fig. 142. Median Lobe,
*P. ephite*.

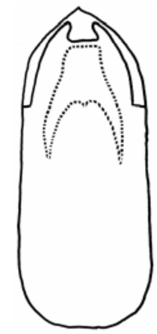

Fig. 143. Median Lobe,
*P. falini*.

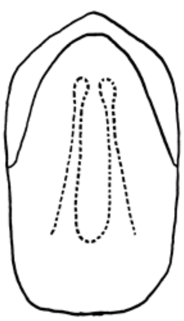

Fig. 144. Median Lobe,
*P. ferrugineus*.

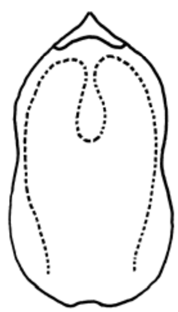

Fig. 145. Median Lobe,
*P. fulvipennis*.

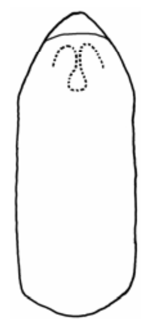

Fig. 146. Median Lobe,
*P. fumatus*.

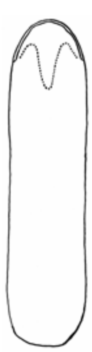

Fig. 147. Median Lobe,
*P. fusiformis*.

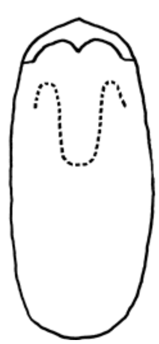

Fig. 148. Median Lobe,
*P. globularis*.

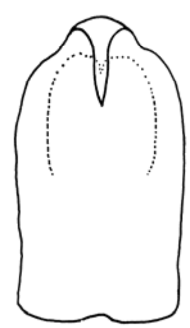

Fig. 149. Median Lobe,
*P. helvolus*.

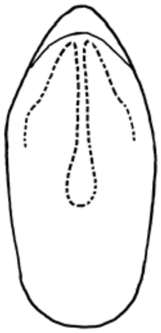

Fig. 150. Median Lobe,
*P. insularis*.

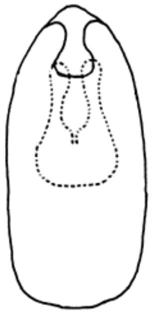

Fig. 151. Median Lobe,
*P. jelineki*.

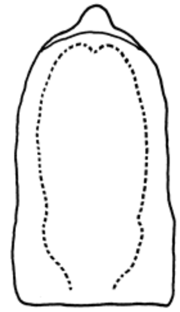

Fig. 152. Median Lobe,
*P. kirejtshuki*.

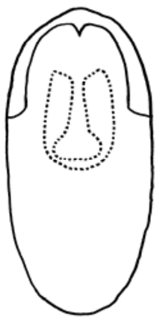

Fig. 153. Median Lobe,
*P. luisalfredoi*.

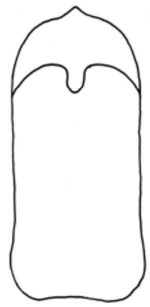

Fig. 154. Median Lobe,
*P. majusculus*.

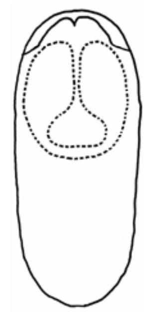

Fig. 155. Median Lobe,
*P. maquipucunensis*.

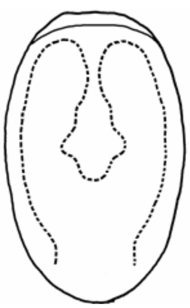

Fig. 156. Median Lobe,
*P. niger*.

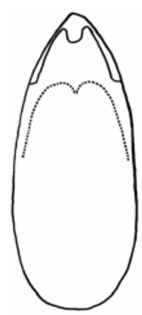

Fig. 157. Median Lobe,
*P. nigerrimus*.

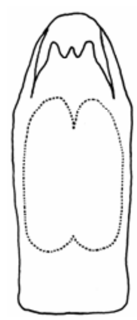

Fig. 158. Median Lobe,
*P. nobilis*.

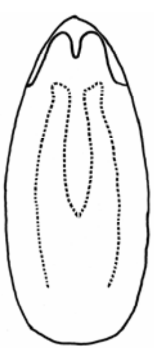

Fig. 159. Median Lobe,
*P. okinawaensis.*

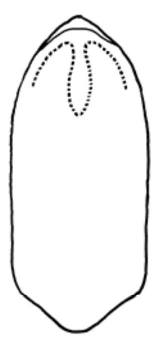

Fig. 160. Median Lobe,
*P. pecki*.

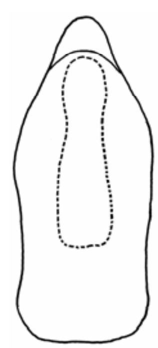

Fig. 161. Median Lobe,
*P. peruensis*.

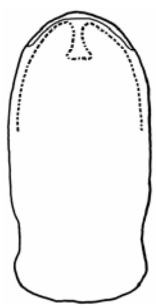

Fig. 162. Median Lobe, *P. rubidus*.

Fig. 163. Median Lobe, *P. tepicensis*.

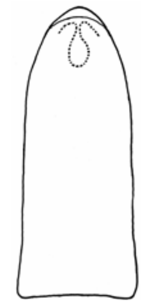

Fig. 164. Median Lobe, *P. testaceous*.

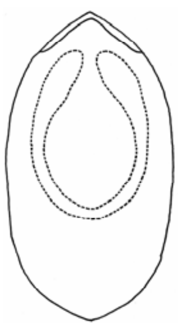

Fig. 165. Median Lobe, *P. torresi*.

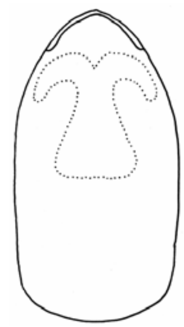

Fig. 166. Median Lobe, *P. wappesi*.

Fig. 167. Internal Sac Sclerites, *P. adjustus*.

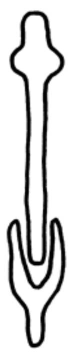

Fig. 168. Internal Sac Sclerites, *P. africanus*.

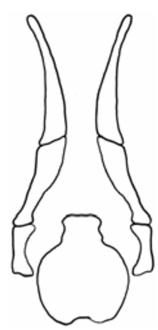

Fig. 169. Internal Sac Sclerites, *P. antennuliferus*.

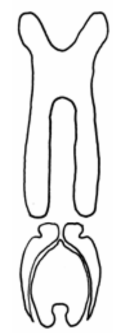

Fig. 170. Internal Sac Sclerites, *P. ashei*.

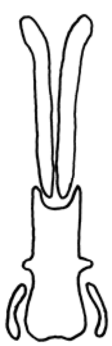

Fig. 171. Internal Sac Sclerites, *P. barclayi*.

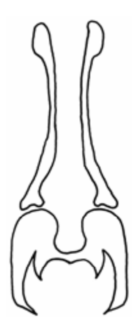

Fig. 172. Internal Sac Sclerites, *P. basalis*.

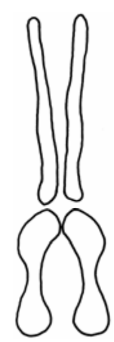

Fig. 173. Internal Sac Sclerites, *P. brevis*.

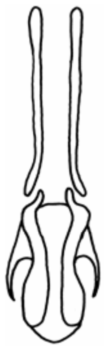

Fig. 174. Internal Sac Sclerites, *P. carltoni*.

Fig. 175. Internal Sac Sclerites, *P. centralis*.

Fig. 176. Internal Sac Sclerites, *P. cochabambus*.

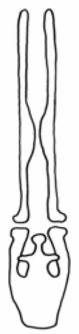

Fig. 177. Internal Sac Sclerites, *P. coxus*.

Fig. 178. Internal Sac Sclerites, *P. crypsis*.

Fig. 179. Internal Sac Sclerites, *P. dimidiatus*.

Fig. 180. Internal Sac Sclerites, *P. dominicus*.

Fig. 181. Internal Sac Sclerites, *P. endrodi*.

Fig. 182. Internal Sac Sclerites, *P. ephite*.

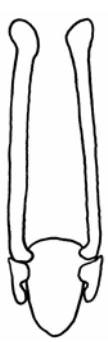

Fig. 183. Internal Sac Sclerites, *P. falini*.

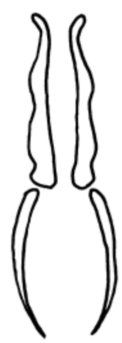

Fig. 184. Internal Sac Sclerites, *P. ferrugineus*.

Fig. 185. Internal Sac Sclerites, *P. fulvipennis*.

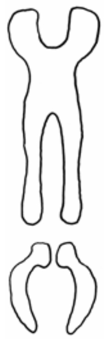

Fig. 186. Internal Sac Sclerites, *P. fumatus*.

Fig. 187. Internal Sac Sclerites, *P. fusiformis*.

Fig. 188. Internal Sac Sclerites, *P. globularis*.

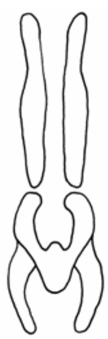

Fig. 189. Internal Sac Sclerites, *P. helvolus*.

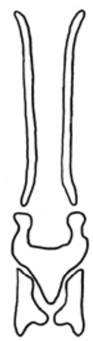

Fig. 190. Internal Sac Sclerites, *P. insularis*.

Fig. 191. Internal Sac Sclerites, *P. jelineki*.

Fig. 192. Internal Sac Sclerites, *P. luisalfredoi*.

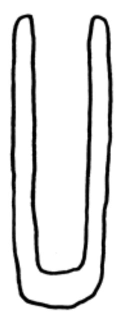

Fig. 193. Internal Sac Sclerites (basal piece not observed), *P. majusculus*.

Fig. 194. Internal Sac Sclerites, *P. maquipucunensis*.

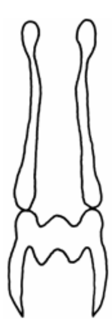

Fig. 195. Internal Sac Sclerites, *P. niger*.

Fig. 196. Internal Sac Sclerites, *P. nigerrimus*.

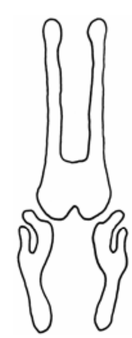

Fig. 197. Internal Sac Sclerites, *P. nobilis*.

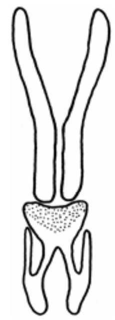

Fig. 198. Internal Sac Sclerites, *P. okinawaensis.*

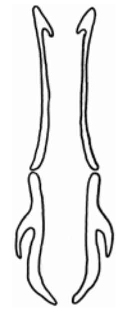

Fig. 199. Internal Sac Sclerites, *P. pecki*.

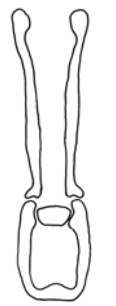

Fig. 200. Internal Sac Sclerites, *P. peruensis*.

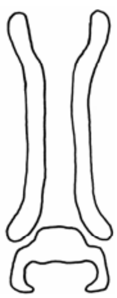

Fig. 201. Internal Sac Sclerites, *P. rubidus*.

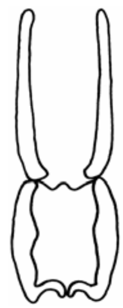

Fig. 202. Internal Sac Sclerites, *P. tepicensis*.

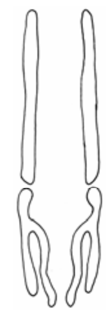

Fig. 203. Internal Sac Sclerites, *P. testaceous*.

Fig. 204. Internal Sac Sclerites, *P. wappesi*.

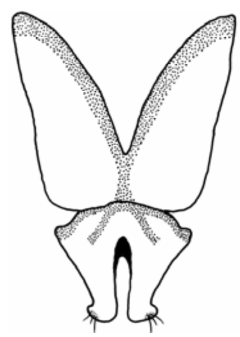

Fig. 205. Ovipositor, *P. adustus*.

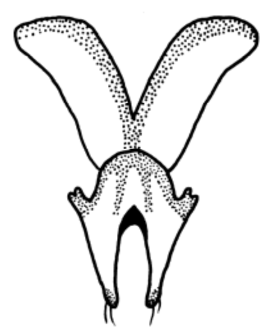

Fig. 206. Ovipositor, *P. africanus*.

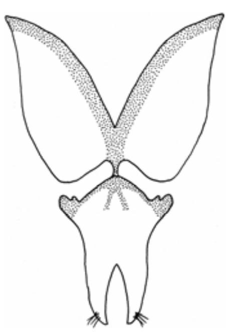

Fig. 207. Ovipositor, *P. ashei*.

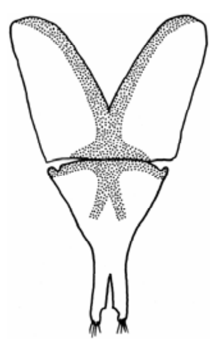

Fig. 208. Ovipositor, *P. barclayi*.

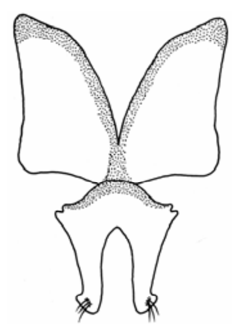

Fig. 209. Ovipositor, *P. basalis*.

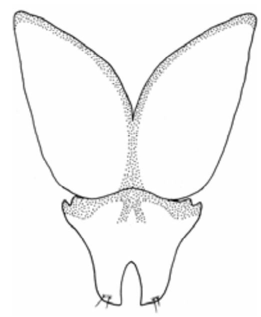

Fig. 210. Ovipositor, *P. bicolor*.

Fig. 211. Ovipositor, *P. brevis*.

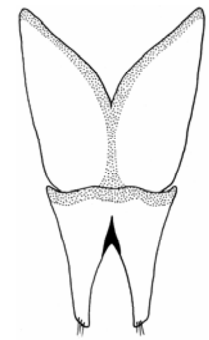

Fig. 212. Ovipositor, *P. carltoni*.

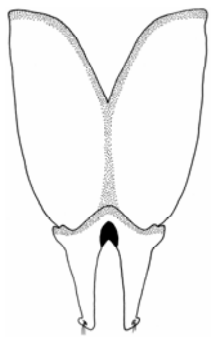

Fig. 213. Ovipositor, *P. centralis*.

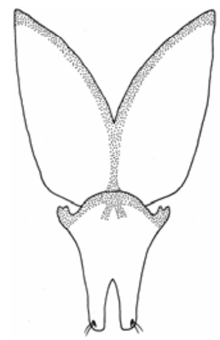

Fig. 214. Ovipositor, *P. crypsis*.

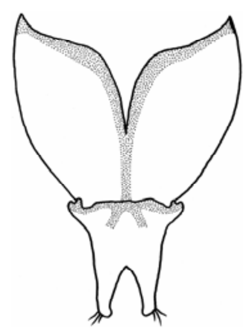

Fig. 215. Ovipositor, *P. dimidiatus*.

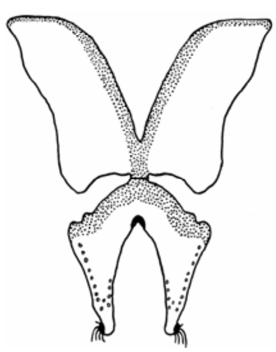

Fig. 216. Ovipositor, *P. dominicus*.

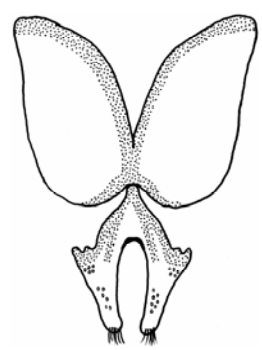

Fig. 217. Ovipositor, *P. endroedyi*.

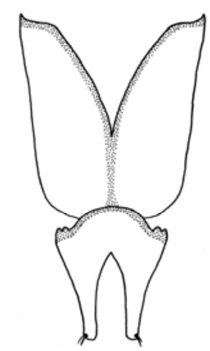

Fig. 218. Ovipositor, *P. falini*.

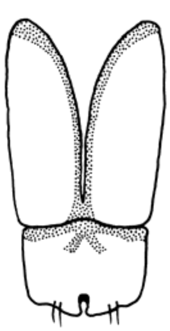

Fig. 219. Ovipositor, *P. femoralis*.

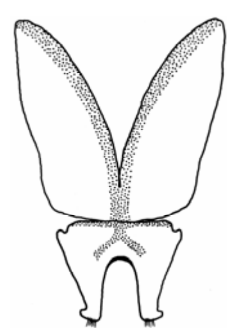

Fig. 220. Ovipositor, *P. ferrugineus*.

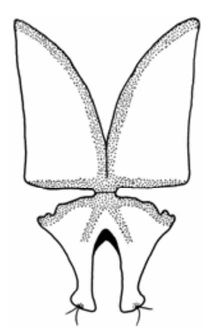

Fig. 221. Ovipositor, *P. fulvipennis*.

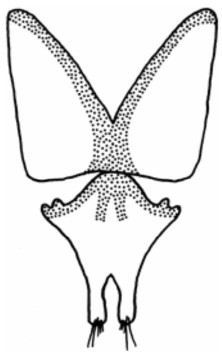

Fig. 222. Ovipositor,
*P. fumatus*.

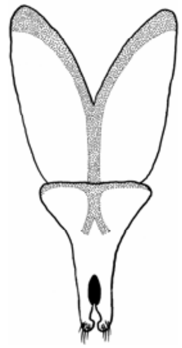

Fig. 223. Ovipositor,
*P. fusiformis*.

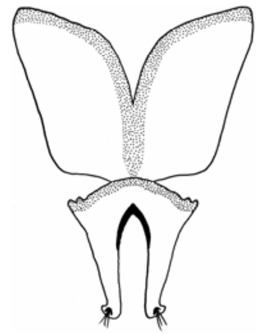

Fig. 224. Ovipositor,
*P. globularis*.

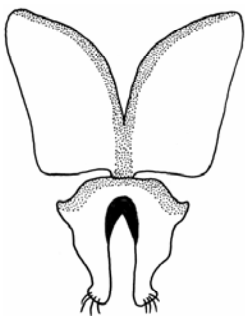

Fig. 225. Ovipositor,
*P. helvolus*.

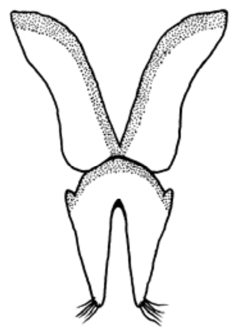

Fig. 226. Ovipositor,
*P. jelineki*.

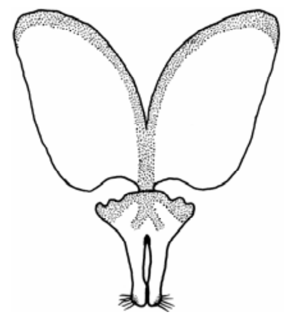

Fig. 227. Ovipositor,
*P. kirejtshuki*.

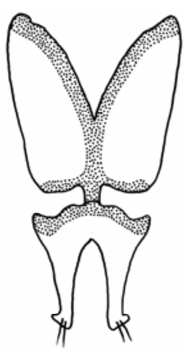

Fig. 228. Ovipositor,
*P. luisalfredoi*.

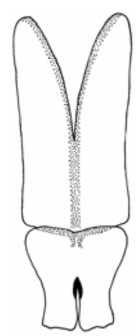

Fig. 229. Ovipositor,
*P. majusculus*.

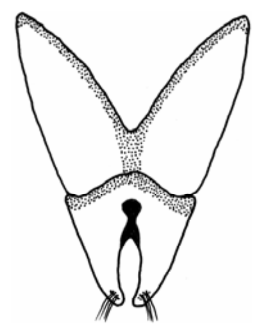

Fig. 230. Ovipositor,
*P. maquipucunensis*.

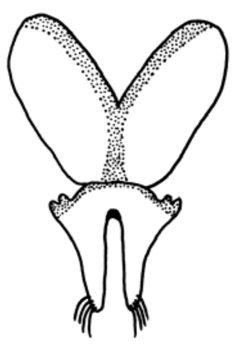

Fig. 231. Ovipositor,
*P. martini*.

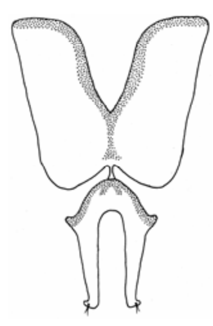

Fig. 232. Ovipositor,
*P. monticolis*.

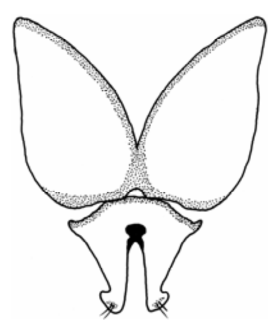

Fig. 233. Ovipositor,
*P. niger*.

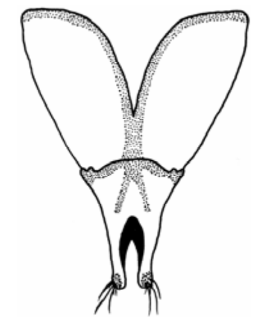

Fig. 234. Ovipositor,
*P. nobilis*.

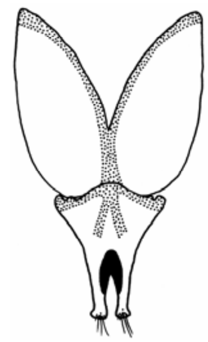

Fig. 235. Ovipositor,
*P. okinawaensis.*

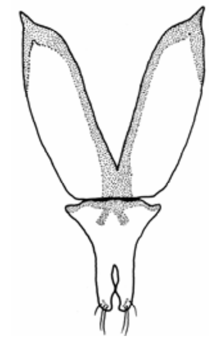

Fig. 236. Ovipositor,
*P. peruensis*.

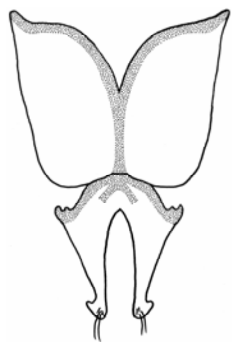

Fig. 237. Ovipositor,
*P. rubidus*.

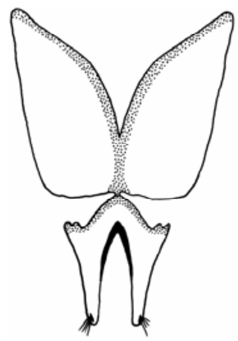

Fig. 238. Ovipositor,
*P. tepicensis*.

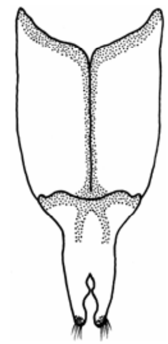

Fig. 239. Ovipositor,
*P. testaceous.*

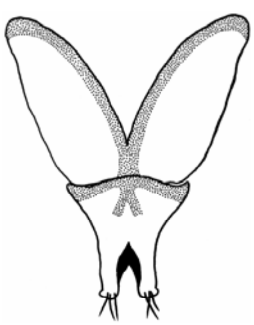

Fig. 240. Ovipositor,
*P. torresi*.

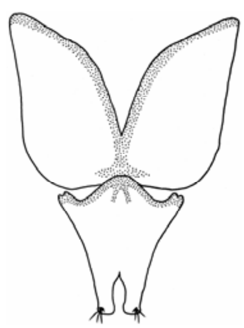

Fig. 241. Ovipositor,
*P. wappesi*.

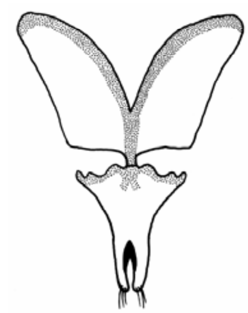

Fig. 242. Ovipositor,
*P. yunnanensis*.

The tree length was reported to be 674, CI = 0.24, RI = 0.57, RC = 0.14, and HI = 0.76. There is an unresolved polytomy basally that contains *P. adustus*, *P. africanus*, *P. endroedyi*, *P. ferrugineus*, *P. monticolis*, *P. nobilis*, *P. okinawaensis*, *P. rubidus*, *P. yunnanensis*, and *P. rubidus*. This unresolved grouping contains two Palearctic members from Europe and Asia (*P. adustus* and *P. ferrugineus*), two Palearctic members from the Orient (*P. nobilis*, and *P. okinawaensis*), three members from Africa (*P. africanus*, *P. endroedyi*, and *P. monticolis*), and one member from the Neotropics (*P. rubidus*). Two clades are supported excluding the basal polytomy: one clade including the remainder of the Old World species (i.e. those from the Orient, SE Asia, and Australia), and the other containing all of the New World species (except *P. rubidus*). Within the Old World clade, the oriental species *P. yunnanensis* is most basal with the Australian *P. kirejtshuki* in a more derived but basal position. The clade *P. testaceous* + *P. barclayi* + *P. fusiformis* are known from India and Sulawesi respectively. The clade *P. decoratus* + *P. femoralis* + *P. majusculus* + *P. martini* are from mainland SE Asia and the Philippines. The New World clade has a basal rooting with *P. fulvipennis* from western North America, and *P. globularis* from Honduras. Following these two basal taxa is a clade containing *P. niger*, *P. luisalfredoi*, *P. basalis*, *P. brevis*, and *P. dominicus*, which occur in Central America and the Caribbean. The final large clade of taxa from the New World is rooted with *P. helvolus*, *P. centralis*, and *P. carltoni* from the Nearctic and Central America, and a large polytomy of exclusively South American species. The most derived grouping includes *P. ashei*, *P. fumatus*, and *P. wappesi*, which are from Bolivia and Brazil.

The sup-optimal resolution of the tree shown in Fig. 243 prompted a more in-depth look at the out-group taxa chosen. The genera *Teichostethus*, *Hebascus*, and *Hyleopocadius* are all Neotropical taxa that are highly derived and most likely derivatives of *Pocadius*. Thus, the original matrix was reconfigured with those genera excluded from a subsequent analysis. The

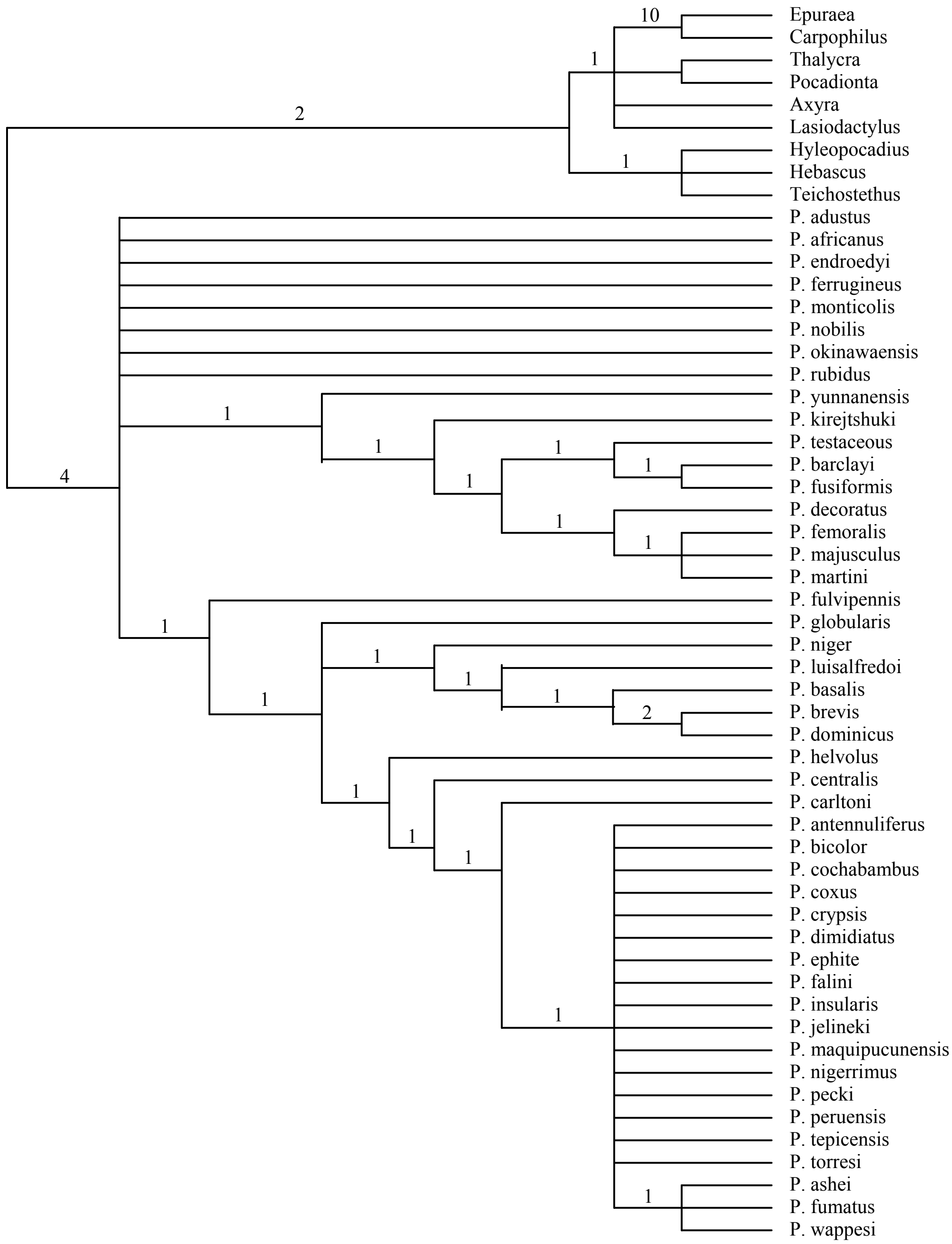


Figure 243. Strict consensus tree of 46 *Pocadius* species and nine outgroup taxa (TL = 674, CI = 0.24, RI = 0.57, RC = 0.14, HI = 0.76). Bremer support is indicated above branches with values ≥1.

strict consensus tree of the resulting analysis is shown in Fig. 244. The tree length was reported to be 623, CI = 0.25, RI = 0.57, RC = 0.14, and HI = 0.75. The resulting topology was significantly different at several nodes. First, the basal polytomy was more clearly defined, leaving only *P. ferrugineus* and two African species (*P. endroedyi* and *P. africanus*) as basally unresolved. However, *P. endroedyi* and *P. africanus* did group together in a single clade. Also, there was more basal clarity within the Palearctic and Oriental fauna conferring a more logical evolutionary progression as discussed below. Most importantly, *P. rubidus*, moved from a basal position with the Palearctic fauna to the basal member of the New World clade. The Oriental, SE Asian, and Australian clade of *P. yunnanensis* + *P. kirejtshuki* + *P. testaceous* + *P. barclayi* + *P. fusiformis* + *P. decoratus* + *P. femoralis* + *P. majusculus* + *P. martini* remained consistent in both analyses with no change in the overall topology. Likewise, the two imbedded New World clades of *P. niger* + *P. luisalfredoi* + *P. basalis* + *P. brevis* + *P. dominicus* and the derived *P. helvolus* clade with the South American polytomy did not change. Thus the removal of these three derived out-group genera most notably changed the basal nodes within the overall *Pocadius* lineage and two important tree statistics changed as well, namely the dramatic decrease in tree length (623 in this analysis instead of 674 in the previous analysis) as well as the total number of most parsimonious trees produced (534 total trees in this analysis compared to 1131 total trees in the previous analysis). Though these two tree values were found to be different, the other tree statistics remained constant.

As Fig. 244 illustrates, there are still some unresolved nodes in both basal and derived regions of the tree. To help further resolve these polytomies, all outgroups except *Epuraea* and *Carpophilus* were excluded. These two genera are known to be basal within the Nitidulidae as evidenced by both morphological (Kirejtshuk 1986c) evidence and molecular data (Cline, unpublished data). The morphological evidence is primarily concerned with features of the male

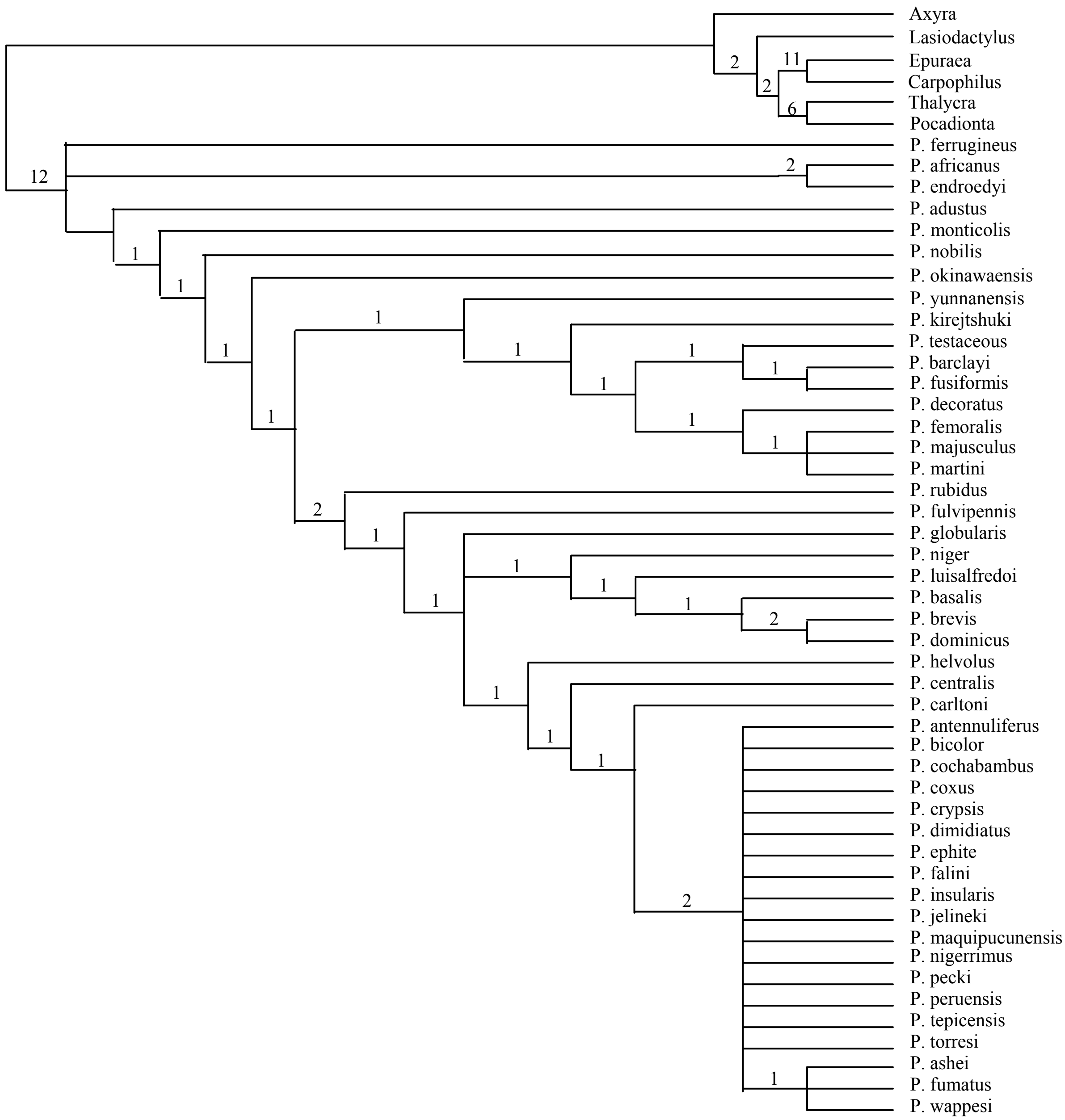


Figure 244. Strict consensus tree of 46 *Pocadius* species and six out-group taxa (TL = 623, CI = 0.25, RI = 0.57, RC = 0.14, HI = 0.75). Bremer support is indicated above branches with values ≥1.

genitalia and the molecular evidence is based on 6 genes representing 7kb. *Axyra*, *Lasiodactylus*, *Pocadionta*, and *Thalycra* are all within the same subfamily as *Pocadius*, e.g. Nitidulinae, whereas the other two genera are in the Epuraeinae and Carpophilinae. The strict consensus tree of the resulting analysis is shown in Fig. 245. The tree length was reported to be 568, CI = 0.25, RI = 0.54, RC = 0.14, and HI = 0.75. The resulting topology was significantly different at some of the basal nodes. First, and foremost, the basal polytomy was resolved with the two Palearctic species, i.e. *P. adustus* and *P. ferrugineus*, being most basal with the three African species, i.e. *P. africanus*, *P. endroedyi*, and *P. monticolis*, subsequently more derived. The Oriental taxa, i.e. *P. nobilis*, *P. okinawaensis*, and *P. yunnanensis*, follow with the latter of these species giving rise to the SE Asian and Australian fauna, i.e. *P. kirejtshuki* + *P. testaceous* + *P. barclayi* + *P. fusiformis* + *P. decoratus* + *P. femoralis* + *P. majusculus* + *P. martini*. This SE Asian and Australian fauana remained consistent in both analyses with no change in the overall topology.. The rest of the tree topology remained constant as well with a derived polytomy of the South American fauna as the most derived grouping. The trees represented in Figs. 244 and 245 not only differ in tree topology, but also in tree lenth (Fig. 244 = 623 and Fig. 245 = 568) and the number of trees generated in the analaysis (Fig. 244 = 534 and Fig. 245 = 238). Though these two tree values were found to be different, the other tree statistics remained constant.

As with the previous analyses, the reduction in outgroups did not resolve the polytomy in the derived South American clade of *P. antennuliferus* + *P. bicolor* + *P. cochabambus* + *P. coxus* + *P. crypsis* + *P. dimidiatus* + *P. ephite* + *P. falini* + *P. insularis* + *P. jelineki* + *P. maquipucunensis* + *P. nigerrimus* + *P. pecki* + *P. peruensis* + *P. tepicensis* + *P. torresi* + *P. ashei* + *P. fumatus* + *P. wappesi*. To help resolve this issue the dataset containing the 46

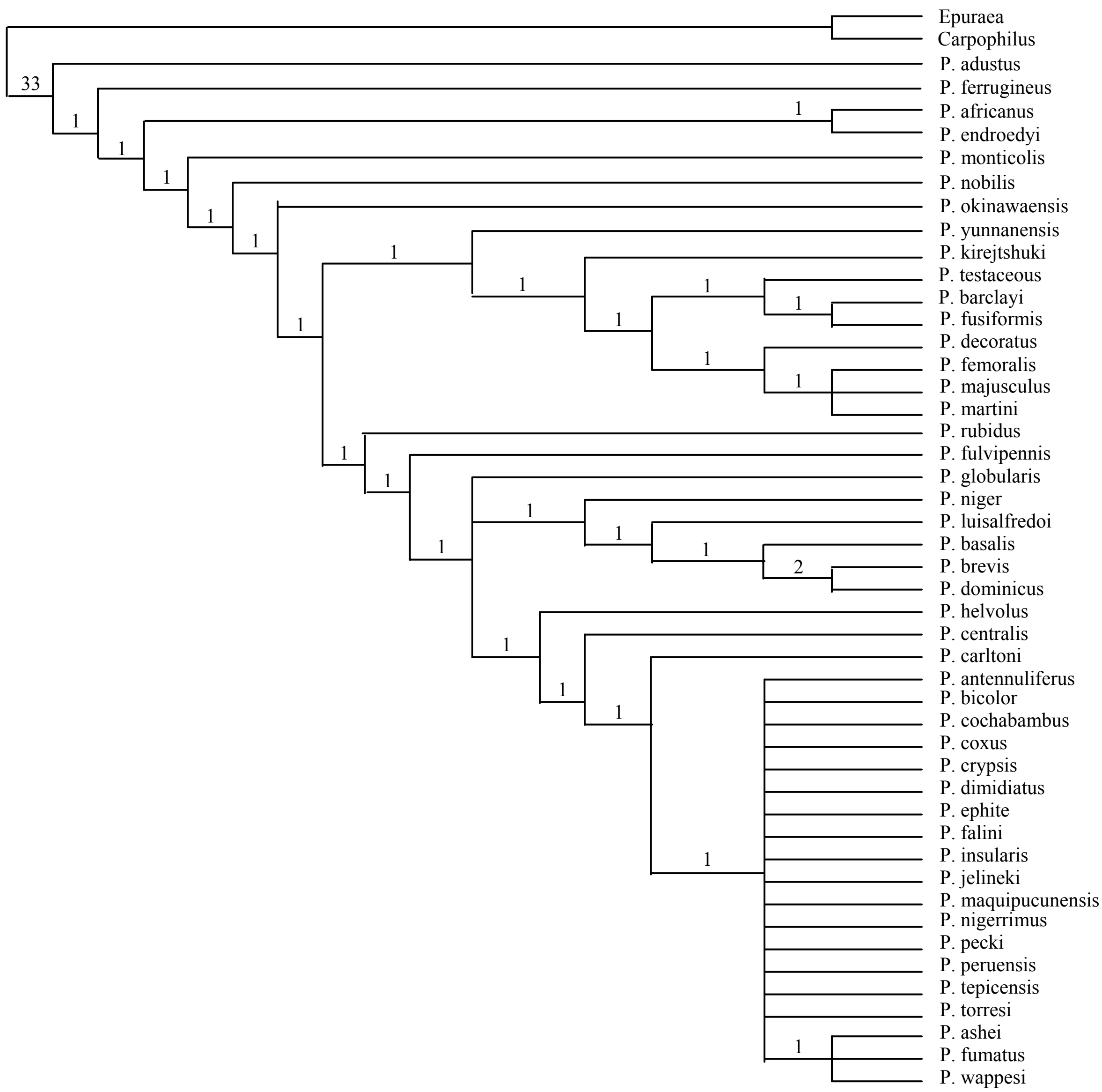


Figure 245. Strict consensus tree of 46 *Pocadius* species and two out-group taxa (TL = 568, CI = 0.25, RI = 0.54, RC = 0.14, HI = 0.75). Bremer support is indicated above branches with values ≥1.

*Pocadius* and two outgroups (*Epuraea* and *Carpophilus*) was successively weighted through four iterations (Fig. 246). Following these iterations, the South American polytomy was spilt into several more basal taxa and two derived clades. From the previous polytomy, *P. pecki* grouped with *P. carltoni* to form the basal lineage (*P. carltoni* originating from Central American and *P. pecki* from Venezuela in northern South America). *Pocadius ephite* follows this basal lineage as well as the clade *P. maquipucunensis* + *P. jelineki* + *P. tepicensis*. *Pocadius falini* and *P. bicolor* follow the *maquipucunensis* clade, leaving two clades: 1) the clade of *P. crypsis + P. antennulifus + P. torresi + P. peruensis + P. cochabambus + P. dimidiatus* and 2) the clade of *P. insularis + P. nigerrimus + P. coxus + P. ashei + P. fumatus + P. wappesi*. The unresolved highly derived polytomy of *P. ashei + P. fumatus + P. wappesi* from the previous analyses also became resolved in the successive weighting protocol, indicating a basal *P. ashei* and more derived sister grouping of *P. wappesi* and *P. fumatus*.

A final phylogenetic analysis was performed using only external characters to help decipher the relative value of both external and internal (i.e. genitalia) features. Figure 247 illustrates the strict consensus tree of this analysis. For this analysis all outgroups except *Hebascus*, *Hyleopocadius* and *Teichostethus* were used. This was deemed appropriate and a compromise from the above three analyses. From a total of 65 trees, the tree length was reported to be 407, CI = 0.25, RI = 0.62, RC = 0.15, and HI = 0.75. The resulting topology was most similar to the prior analyses regarding the Old World taxa, and demonstrated numerous changes in the New World taxa. Most notable in the Old World analysis was the placement of *P. yunnanensis* near *P. adustus* at the base of the *Pocadius* group and the placement of *P. ferrugineus* near where *P. yunnanensis* was near the more derived SE Asian/Australian clade. The SE Asia/Australia clade remained intact with some rearrangements within the clade. The

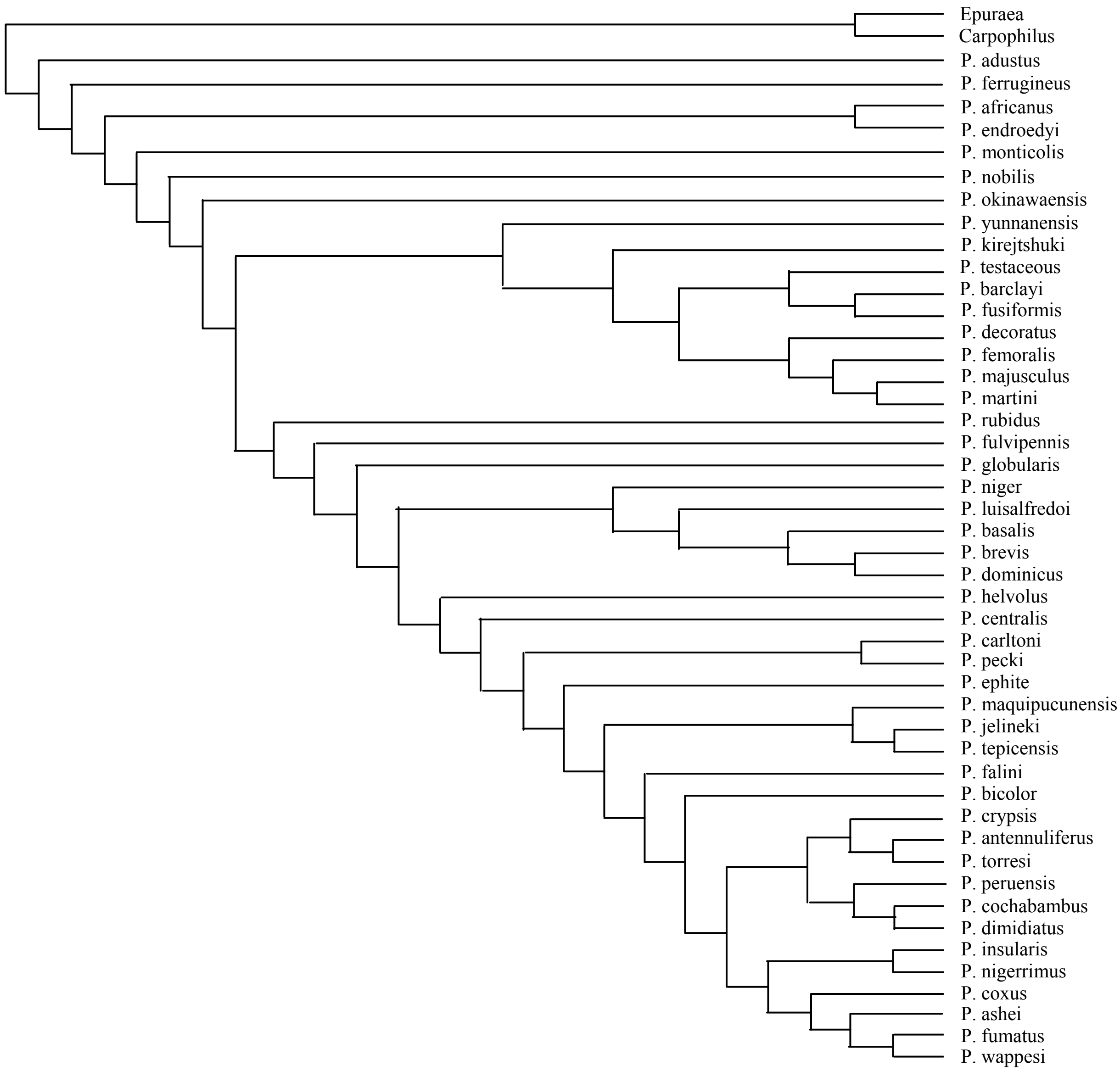


Figure 246. Succesive weighting (4 iterations) of the strict consensus tree of 46 *Pocadius* species and two out-group taxa (TL = 568, CI = 0.25, RI = 0.54, RC = 0.14, HI = 0.75).

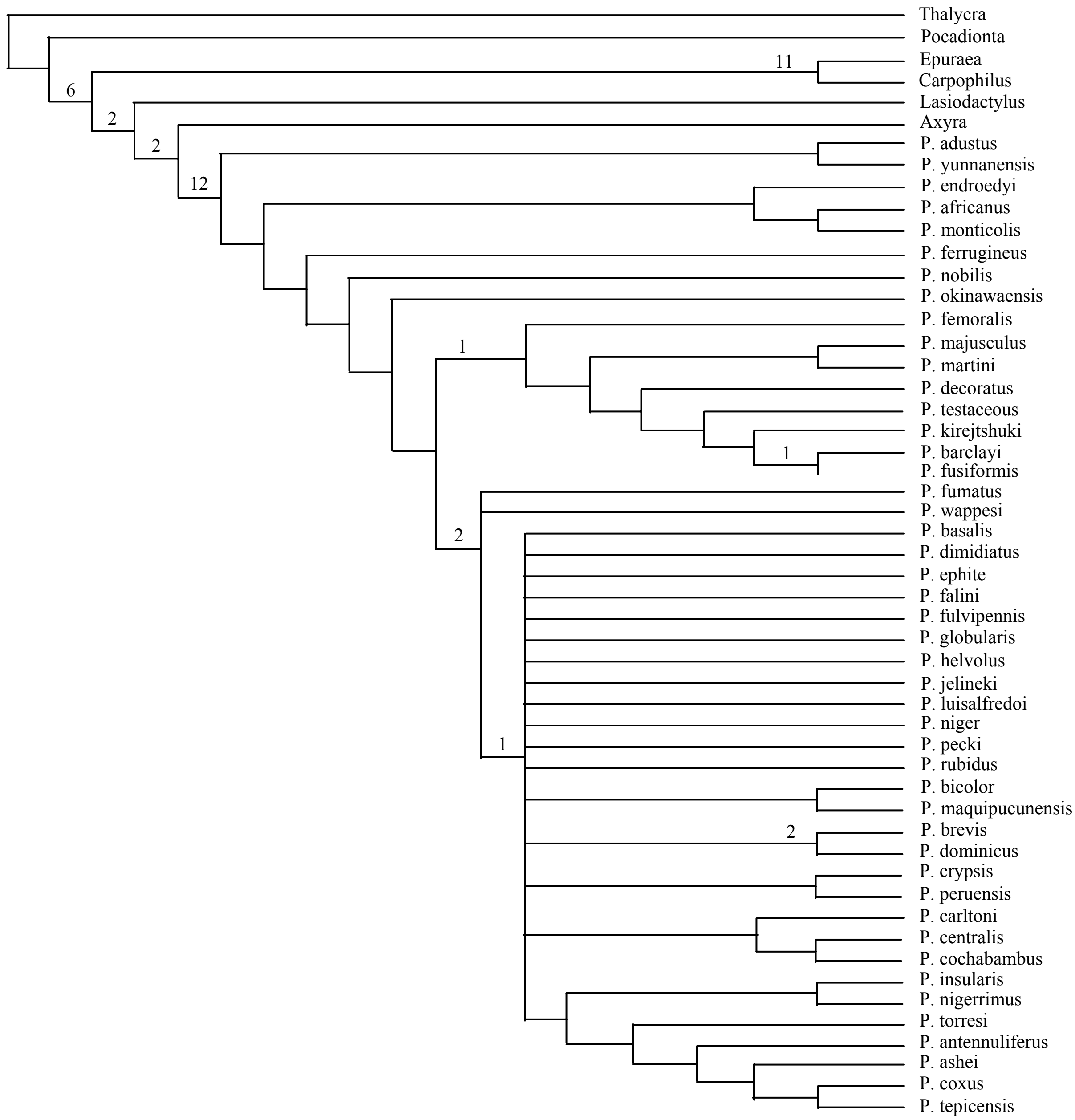


Figure 247. Strict consensus tree of external charcters only for the 46 *Pocadius* species and six out-group taxa (TL = 407, CI = 0.25, RI = 0.62, RC = 0.15, HI = 0.75). Bremer support is indicated above branches with values ≥1.

New World taxa, however, notably changed based on external characters alone. *Pocadius fumatus* and *P. wappesi* rooted the New World clade with a large polytomy following. However, interesting sister groupings became evident that were not clear with the combined analysis. The following sister relationships were deduced, *P. maquipucunensis* and *P. bicolor*, and *P. brevis* and *P. dominicus*, *P. crypsis* and *P. peruensis*, *P. centralis* and *P. cochabambus*, *P. insularis* and *P. nigerrimus*, and *P. coxus* and *P. tepicensis*. A terminal clade of *P. torresi* + *P. antennuliferus* + *P. ashei* + *P. coxus* + *P. tepicensis* also is well resolved. The influence of external versus internal characters on the phylogenetic reconstruction of *Pocadius* and the ramifications of the resulting external character only tree will be further discussed in the following section.

## CHECKLIST OF *POCADIUS* ERICHSON

*Pocadius adustus* Reitter. (Distribution: Europe, northern Africa)

*Pocadius africanus* Kraatz (Distribution: western Africa)

*Pocadius antennuliferus* Cline **n. sp.** (Distribution: Brazil)

*Pocadius ashei* Cline **n. sp.** (Distribution: Andean Bolivia)

*Pocadius barclayi* Cline **n. sp.** (Distribution: Sulawesi region of Indonesia)

*Pocadius basalis* Schaeffer (Distribution: SW United States of America)

*Pocadius bicolor* Cline **n. sp.** (Distribution: Brazil)

*Pocadius brevis* Grouvelle (Distribution: Cuba)

*Pocadius carltoni* Cline **n. sp.** (Distribution: Nicaragua)

*Pocadius centralis* Cline **n. sp.** (Distribution: southern Mexico, Honduras, Guatemala)

*Pocadius cochabambus* Cline **n. sp.** (Distribution: western Bolivia)

*Pocadius coxus* Cline **n. sp.** (Distribution: Brazil)

*Pocadius crypsis* Cline **n. sp.** (Distribution: Guyana)

*Pocadius decoratus* Kirejtshuk (Distribution: Vietnam)

*Pocadius dimidiatus* Jelínek (Distribution: Argentina)

*Pocadius dominicus* Cline **n. sp.** (Distribution: Dominican Republic)

*Pocadius endroedyi* Cline **n. sp.** (Distribution: Tanzania, Zimbabwe, South Africa)

*Pocadius ephit*e Leschen and Carlton (Distribution: Costa Rica)

*Pocadius falini* Cline **n. sp.** (Distribution: Paraguay)

*Pocadius femoralis* Cline **n. sp.** (Distribution: Vietnam)

*Pocadius ferrugineus* (Fabricius) (Distribution: Europe to the Russian Far East, northern Africa)

*Pocadius fulvipennis* Erichson (Distribution: western North America, northern Mexico)

*Pocadius fumatus* Jelínek (Distribution: Brazil, Argentina)

*Pocadius fusiformis* Cline **n. sp.** (Distribution: Sulawesi region of Indonesia)

*Pocadius globularis* Cline **n. sp.** (Distribution: Honduras)

*Pocadius helvolus* Erichson (Distribution: eastern North America, central and northern Mexico)

*Pocadius insularis* Cline **n. sp.** (Distribution: Trinidad)

*Pocadius jelineki* Leschen and Carlton (Distribution: Costa Rica, Nicaragua)

*Pocadius kirejtshuki* Cline **n. sp.** (Distribution: Australia)

*Pocadius luisalfredoi* Cline **n. sp.** (Distribution: southern Mexico)

*Pocadius majusculus* Kirejtshuk (Distribution: Thailand)

*Pocadius maquipucunensis* Leschen and Carlton (Distribution: Ecuador)

*Pocadius martini* Kirejtshuk (Distribution: Philippines)

*Pocadius monticolis* Lechanteur (Distribution: Central Africa)

*Pocadius niger* Parsons (Distribution: SW United States of America)

*Pocadius nigerrimus* Cline **n. sp.** (Distribution: Paraguay)

*Pocadius nobilis* Reitter (Distribution: Japan)

*Pocadius okinawaensis* Cline **n. sp.** (Distribution: Okinawa)

*Pocadius pecki* Cline **n. sp.** (Distribution: Venezuela)

*Pocadius peruensis* Cline **n. sp.** (Distribution: Peru)

*Pocadius rubidus* Erichson (Distribution: Argentina)

*Pocadius tepicensis* Cline **n. sp.** (Distribution: southern Mexico)

*Pocadius testaceous* Grouvelle (Distribution: India, Ceylon)

*Pocadius torresi* Jelínek (Distribution: Argentina)

*Pocadius wappesi* Cline **n. sp.** (Distribution: central Bolivia)

*Pocadius yunnanensis* Grouvelle (Distribution: China)

# CHAPTER 4. DISCUSSION

"The number of minute and obscurely-colored beetles is exceedingly great. It is sufficient to disturb the composure of an entomologist's mind, to look forward to the future dimensions of a complete catalogue."

Charles Darwin, The Voyage of the Beagle

The treatment herein of *Pocadius* represents the first-ever complete revision of a globally distributed nitidulid genus, including taxonomic descriptions, keys, biological notes, geographic ranges, host fungal associations, cladistic phylogenies, phenological data, and remarks on the evolution of both the genus and tribe. *Pocadius* species diversity more than doubled following this revision (46 total species, 25 of which are new, and one reinstated species). Most new species were discovered from Neotropical and SE Asian material. The availability of large amounts of small beetle material to study is due in part to new techniques involved with collecting beetles from the upper canopy (e.g. chemical fogging, cranes, and inflatable rafts), and other methods for mass collecting beetles passively (i.e. flight intercept traps, malaise traps, Townes traps, etc.). These new collecting methodologies in combination with biodiversity initiatives have generated interest in obscure but diverse groups of beetles such as Nitidulidae.

## MONOPHYLY OF *POCADIUS* AND ITS PLACEMENT IN NITIDULINAE

In all cladistic reconstructions *Pocadius* was found to be monophyletic. Synapomorphies uniting all *Pocadius* species include: a row of punctures along the anterior metacoxal line, flattened shape of antennomeres 6-8 (though 6 is usually less flattened than 7 and 8, the latter two being disc-like), an elevated mentum in posterior

0.66 of structure that forms various geometric shapes, abdominal segments 2-4 with a row of closely spaced punctures near the posterior margin, a short epicranial stem visible dorsally on the larval head, and recurved body of mature larvae (2$^{nd}$ instars and further in development). Thus, the morphological characters chosen for this revision appear to provide substantial evidence supporting a unified *Pocadius*. More characters are likely to come to light once males and females of all species are collected and studied. The present phylogeny relies heavily on genitalic characters (37% of characters are genitalic, 60% external features, and 3% larval), and with 9 species (~20% of the total number of known *Pocadius*) represented by only males or females there is little doubt that the lack of one sex or the other has affected the tree topology due to the coding of these characters as "?'" in the matrix.

The delimitation of appropriate outgroups for the phylogenetic analyses proved more difficult than originally thought, and is likely the cause of the basal polytomy in *Pocadius* seen in the reconstruction in Figure 243. These problems are due to the basal position of *Pocadius* within the Nitidulinae and Pocadiini (it is not uncommon for a widely distributed genus to be ancestral in a particular clade). The Pocadiini outgroups chosen were *Hebascus*, *Hyleopocadius*, and *Teichostethus*. These Pocadiini members are likely derived from a *Pocadius* ancestor as they exhibit many derived characters not seen in *Pocadius*, including: a more highly modified ovipositor (*Hebascus* and *Teichostethus*), a more loosely joined antennal club (all three genera), pronotal pits and setal tufts (*Hyleopocadius*), widely separated metacoxae (*Hyleopocadius*), elongate antennal funicle (all three genera), tegmen with apical split (*Teichostethus*), variously enlarged maxillary palpi (all three genera), more convex body form (all three genera), an association with members of the Agaricales, and are restricted to the New World tropics.

Other Pocadiini taxa also exhibit some of the above characters but were unavailable for study due to their rarity in collections and the lack of both males and females in museum holdings. Further work with other Pocadiini members may resolve some of these issues as more specimens become available.

The Nitidulinae outgroups (*Axyra*, *Lasiodactylus*, *Pocadionta*, and *Thalycra*) are also somewhat problematic (see Fig. 244), but less so than the Pocadiini outgroups as more resolution is obtained basally within *Pocadius* with the exclusion of the non-*Pocadius* Pocadiini taxa, and little further resolution is obtained with the exclusion of the Nitidulinae outgroups (compare Figs 244 and 245). However, the exclusion of the Nitidulinae taxa (Fig. 245) does place the two Palearctic species in closer relation (i.e. *P. ferrugineus* and *P. adustus*), as well as placing two of the African species together (i.e. *P. africanus* and *P. endroedyi*) with the other African taxa derived from them (i.e. *P. monticolis*); clearly, a more logical configuration. The relationship of the African taxa would likely be more highly supported, however no males of *P. monticolis* were available for study.

The placement of *Pocadius* within the Nitidulinae was not resolved by this analysis; however, it was not the major objective of the dataset that was constructed. Some interesting finds within the Nitidulinae, however, were made based on the dataset at hand. The *Thalycra*-complex of genera, which was thought to be sister to Pocadiini (Kirejtshuk and Leschen 1998), is represented by *Thalycra* and *Pocadionta* and is supported by high Bremer values. However, there is no clear sister relationship to *Pocadius* or the other Pocadiini taxa as demonstrated in any of the present reconstructions. A molecular analysis (in prep.), which is focused more on higher-level relationships within the Nitidulidae, likewise does not support a close relationship between members of Pocadiini and the *Thalycra* complex. Thus, both morphological and preliminary molecular evidence does not support a close relationship between these purported sister tribes. A logical presumption may be an early split of the *Thalycra* complex from a common Pocadiini ancestor with subsequent isolation and evolutionary divergence. This hypothesis, though not tested here, is somewhat supported by Kirejtshuk's (1995) conjecture on the mode of life evolution within Nitidulidae.

**ORIGIN AND DISTRIBUTION OF *POCADIUS***

This revision suggests several interesting species distribution patterns and the subsequent adaptive radiation of the genus. *Pocadius*, according to the phylogenetic reconstruction (excluding the reconstruction in Fig. 243 which includes outgroups *Hebascus*, *Hyleopocadius*, and *Teichostethus*), appears to have originated in the Palearctic somewhere in Europe and/or northern Africa. The consistent placement of *P. adustus* (European/North Africa), *P. ferrugineus* (European/Asian/North Africa), *P. africanus* (western Africa), *P. endroedyi* (southern Africa), and *P. monticolis* (central Africa) clearly denote the western Palearctic or African origin of the genus. From this region, *Pocadius* radiated into the rest of the Old World, including all of Asia and extending into the Malaysian archipelago and Australia. No relationships between the African and/or Palearctic fauna with the South American fauna, suggests that *Pocadius* originated after the break-up of Laurasia and Gondwanaland and the separation of the current continents. The species from SE Asia, including *P. testaceous* (India), *P. barclayi* (Sulawesi), *P. fusiformis* (Sulawesi), *P. decoratus* (Vietnam), *P. femoralis* (Vietnam), *P. majusculus* (Thailand), and *P. martini* (Philippines) all form a monophyletic grouping that is most derived within the Old World taxa, thus suggesting that these species represent the most recent adaptive radiation in the Old World, that of penetration into the Old World tropics via radiation from the Palearctic. No sister relationship between *P. endroedyi* (South Africa) and *P. kirejtshuki* (Australia) again suggests that *Pocadius* evolved sometime after the current continents separated in the Mesozoic.

A significant find was a new species from Australia, i.e. *P. kirejtshuki*, which extended the known range of the genus into a continent previously known to contain an undescribed *Pocadius* (Lawrence 1991). This species is known from the more tropical eastern and northern areas of Australia and is absent from the more arid western region. *Pocadius kirejtshuki* is most closely allied to the SE Asian *Pocadius* fauna suggesting a migration from mainland Asia into Australia with subsequent reproductive isolation, rather than a ancient vicariant event associated with the break-up of Gondwanaland. This does not necessarily suggest that a *Pocadius* species could not have evolved in such a manner and subsequently become extinct, but the present species does not appear to have arisen in this fashion. Also, a lack of *Pocadius* in the New World south temperate (Chile and parts of Argentina) regions suggests that this genus was not present during the breakup of Gondwanaland. However, there is one shared character between *P. endroedyi* and *P. kirejtshuki*, that of the male anal sclerite with an apical produced tip. The SE Asian and Australian clade are derived from the Oriental species *P. nobilis*, *P. okinawaensis*, and *P. yunnanensis* in all phylogenetic reconstructions. This evolutionary track, or pathway, is not surprising due to the high mountains and arid environments in Central Asia that do not typically support the preferred fungal hosts for this genus. Thus, the Old World taxa appear to have evolved from western Palearctic or African ancestors with expansion into the Orient and subsequent radiation into tropical SE Asia and Australia.

The evolution of *Pocadius* in the New World is a bit more perplexing, and, according to the phylogeny, likely occurred relatively recently in a geological context. This recent origin and radiation of species is further substantiated by a lack of *Pocadius* (and Pocadiini) in Dominican amber deposits (Cline pers. observation), as well as the derived polytomy of the Neotropical fauna that suggests not enough time has occurred for characters to evolve which delineate natural groups. *Pocadius rubidus* is the only Neotropical taxon without clear affinities to the rest of the New World fauna based on the complete dataset with all outgroups included (see Fig. 243.). However, with subsequent exclusion of the Pocadiini and Nitidulinae outgroup taxa this species becomes established as the basal taxon of the New World clade (see. Figs. 244, 245, and 246). The position of *P. rubidus* is not readily indicative of a Palearctic to Nearctic to Neotropical evolution as indicated by the rest of the taxa. Removing genitalic characters from the dataset (Fig. 247) subsequently removes *P. rubidus* from this basal position and places it within a more derived polytomy. Thus, I suggest that *P. rubidus* may have reverted to more plesiomorphic genitalic forms, which in turn placed this species basally in the New World clade. Character reversion is evident in *P. rubidus* in the following genitalic features: development of apico-lateral region of ovipositor gonostylus; degree of fusion of gonocoxites; number of lateral protuberances on ovipositor gonocoxite base; development of intragonocoxal invagination; development of oblique baculi on gonocoxite base; development of tegminal lateral setae; development of subapical furrow on tegmen; and the number of components of the basal portion of the ejaculatory rods. Further analysis of males and females of all New World taxa are needed to fully resolve this issue. Also, one cannot completely abandon the hypothesis that *P. rubidus* may indeed be of more ancient Gondwanaland origin with long-term extreme isolation from the rest of the Old World fauna and thus retention of some characters more associated with the Old World fauna.

Other than *P. rubidus*, the New World fauna follows a pattern of North American to Central American to South American (as shown in Fig. 246) speciation. There are exceptions to this general pattern such as the fauna of the Greater Antilles (i.e. *P. brevis* and *P. dominicus*), which is discussed further below. *Pocadius fulvipennis*, like *P. rubidus*, has a basal position in the New World clade; however this species has a more logical connection to the Old world fauna via a Beringian land bridge link. Following the arrival of *P. fulvipennis*, two separate groups originated, one from the Southwestern U.S., Mexico, and the Greater Antilles, and another from Eastern North America and the rest of the Neotropics. The first of these groupings is interesting as it is corroborated by a peculiar geologic event, i.e. the passing of the Caribbean plate between North and South America prior to the formation of the Isthmus of Panama. *Pocadius luisalfredoi* is known from southern Mexico and, in combination with the two southwestern U.S. species (*P. niger* and *P. basalis*) is sister to the Greater Antilles group (*P. brevis* from Cuba and *P. dominicus* from Hispaniola). The migration of the Caribbean plate between North and South America was nearing completion approximately 30-40 million years ago (see Rosen 1985 and Donnelly 1988 for discussion of this geological event and its pertinence to biogeography). I suggest this event is a good geological marker for understanding not only the origin of the Greater Antilles *Pocadius* group, but also for establishing a conservative estimate for the invasion of South America and thus the time needed for specialist fungivores to spread and colonize tropical environments. The placement of *P. globularis* (Honduras) between *P. fulvipennis* and the SW U.S. / Greater Antilles group suggests that there was early colonization of the southernmost reaches of the Tertiary Mexican peninsula sometime prior to the completion of the Panamanian Isthmus. Other insect groups, including various beetle lineages, have exhibited this Central American and Greater Antillean connection (Liebherr 1988, Browne, Peck and Ivie 1993, Gaimari and Erwin 2000, Morrone and Marquez 2001, and Davis, Scholtz and Philips 2002).

The multiplicity of *Pocadius* species within South America shows only a vaguely clear biogeographic pattern of radiation. The successively weighted phylogeny (Fig. 246) does illustrate some trends, but these cannot be quantitatively substantiated. First, this phylogeny suggests an origin of the South American Neotropical fauna from the Eastern North American species *P. helvolus*, and subsequently the widespread Central American species *P. centralis*. The southward radiation is continued through southern Nicaragua (*P. carltoni*) and eventually into northern South America (*P. pecki*). Interestingly, no specimens of *Pocadius* are known from Panama, despite observations and identifications of thousands of Panamanian Nitidulidae via loans from many regions of Panama and personal collecting on Barro Colorado Island.

Upon entering South America via the Panamanian Isthmus, *Pocadius* underwent a significant series of speciation events (16 of 46 species, e.g. ~35% of known *Pocadius*, occur in South America). According to the phylogeny (Fig. 246), South America was invaded from species most closely related to *P. helvolus* (Eastern North America and Northern Mexico), *P. centralis* (widespread in Central America), and *P. carltoni* (Nicaragua). Three Central American species are embedded within the South American grouping (i.e. *P. ephite*, Costa Rica; *P. jelineki*, Costa Rica and Nicaragua; and *P. tepicensis*, Southern Mexico), and may represent speciation in Central America concurrent or following the invasion of South America. Due to a lack of specimens/species known from Panama, Colombia, and Chile, no clear patterns are readily apparent in the South American fauna and may in part be due to the relatively recent radiation of the genus into the continent.

**HOST FUNGAL EVOLUTION**

Prior to this work, most coleopterists (Lawrence 1991), including notable nitidulid researchers (Parsons 1943, Audisio 1980, Kirejtshuk 1992), suggested that *Pocadius* was a specialist solely on members of gasteromycetes fungi in the Lycoperdaceae, in particular on members of *Lycoperdon* and *Calvatia*. This suggestion seemed well-founded as most collection records at the time consisted of no host data or host data that only included gasteromycetes genera (Parsons 1936, Leschen and Carlton 1994, and Kubisz 1995). Only Audisio (1993) suggested that this may not be a clear trend as the two European species have also been collected from Basidiomycetes, in particular on the fruiting bodies of Agaricales. However, Kirejtshuk and Leschen (1998) did not consider Audisio's recent finding and concurred that members of the *Pocadius* complex specialize on fungi with a concealed hymenium. This statement can only be concluded to mean that members of *Pocadius* of Pocadiini feed exclusively on gasteromycetes. Members of *Pocadius,* for which host information is available, demonstrate that host fungal preferences do not exclusively include gasteromycetes fungi; these taxa include *P. carltoni*, *P. crypsis* (found in ant refuse pile), *P. ferrugineus, P. helvolus, P. tepicensis,* and *P. torresi*. Ashe and his colleagues utilize a field collecting technique in which "fungusy logs" are sprayed with a pyrethroid insecticide and the resulting beetles collected. This technique has produced abundant *Pocadius* specimens and indicates that some species may be utilizing polypores (i.e. bracket fungi) and other Basidiomycetes as a secondary food source and refugia. Thus, the data presented herein suggests that

*Pocadius* adults are, at best, facultative specialists on gasteromycetes and that only the larval stage appears to be obligately associated with fungi that have a concealed hymenium. Larvae have only been collected from Lycoperdales. *Pocadius* adults may utilize other fungal substrates for food and refuge and then switch to the more ephemeral Lycoperdales for oviposition and larval development. Field observations suggest that only puffballs near or at full maturity contain larval *Pocadius*.

Members of gasteromycetes are globally distributed, in particular *Lycoperdon*, *Calvatia*, *Scleroderma*, and *Geastrum*, which have been recorded in a separate database as the favored adult and larval fungal host (i.e. ~90% of all *Pocadius* recorded with host fungal data). These gasteromycetes appear to be able to resist desiccation and elevational atmospheric conditions, and are found in most environments except xeric conditions. This ubiquity and resistance to desiccation is likely the cause for the success of *Pocadius* worldwide. Schubert (1988) suggested that northern South America and the Antilles were much more arid during the Tertiary period than present day conditions suggest. The spread of *Pocadius* into these regions coincides with this dry time and their association with desiccation resistant fungi, such as those in the gasteromycetes, suggests that *Pocadius* was able to survive this period through the utilization of these fungal taxa. *Pocadius africanus* and *P. peruensis*, as reported here, are the first records of the genus on members of Geasteraceae.

*Pocadius* larvae are known to survive in lab culture for approximately 6-8 weeks (Gillogly unpub. data), but typically takes less than 3 weeks to finish their development. The larvae leave the host fungus through an exit hole where they pupate in the surrounding leaf litter or soil. Pupation time is unknown; however, I predict this to be a plastic time interval that is influenced strongly by external environmental factors, especially rainfall because this will trigger the development of fungal hosts. Larvae of *P. jelineki* were studied in the field and an interesting developmental pattern was exhibited by the different larval stages in a species of *Lycoperdon*. As the larvae matured, the older more advanced stages migrated away from the hymenium towards the inside of the fungus near the developing spores while the younger less developed stages were more embedded within the hymenium and absent from the internal cavity where spore development was taking place. This may represent a division of the fungal resource such that competition between early larval instars is lessened. Larvae of *P. helvolus* from Louisiana also exhibited this peculiar life history trait in *Lycoperdon pyriforme*.

Hibbett et al. (1997) performed a phylogenetic analysis to understand the evolutionary relationships of gilled mushrooms and puffballs. Their analysis suggested a polyphyletic gasteromycetes with puffballs and other forms with an enclosed spore-bearing structure independently evolving at least four times. The genera *Lycoperdon* and *Calvatia* group together and are sister to *Scleorderma*, a boletoid member according to Binder and Bresinsky (2002). *Geastrum*, the newly recorded host fungus from this study, was shown not to be closely related to any of the three genera listed above (see Hibbett et al. 1997). Thus, fungal host use in *Pocadius* does not appear to have any phylogenetic significance and the use of varied fungal genera may be do in part to their convergence on body forms with an enclosed spore-bearing structure that is likely a safe refugia for larval development.

**PHENOLOGICAL CONSIDERATIONS**

Species in sympatry may be temporally distributed such that there is no seasonal overlap of adults and thus reproductive isolation can be maintained. Most species of *Pocadius* that are sympatric do not exhibit temporal displacement. However, some exceptions to this can be found, though caution must be considered as few specimens from some regions are known and temporal data may be due to collecting bias (supported by the fact that widespread common species have broad temporal occurrences, whereas more endemic and/or isolated species have a shorter temporal occurrence). The European species, *P. adustus* and *P. ferrugineus*, overlap in all months except early in the season when only *P. adustus* is known from March and April with *P. ferrugineus* not occurring until May. In Vietnam, *P. decoratus* occurs in September whereas *P. femoralis* occurs four months earlier in May. In the Southwestern United States, *P. basalis* and *P. niger* overlap in all months except *P. basalis* occurs in the months of June and July prior to the occurrence of *P. basalis* in August. The Brazilian fauna appears to have two pairs of species that coexist at two different time periods; *P. antennuliferus* and *P. bicolor* both occur in March, whereas *P. coxus* and *P. fumatus* occur earlier in December and January. As more specimens are collected the temporal reproductive boundaries will undoubtedly become more defined.

**FUTURE/CONTINUING RESEARCH**

The research described herein, as well as published works (Cline 2003b, 2004b, Cline and Carlton 2004a, 2004b, Ewing and Cline 2004 and Ewing and Cline 2005), unpublished works (Nitidulidae and Kateretidae of Nova Scotia and Prince Edward Island, Majka and Cline 2005 submitted; Phalacridae and Corylophidae of Nova Scotia and Prince Edward Island, Majka and Cline in prep.; review of North American Kateretidae Cline in prep.; and revision of Smicripidae, Cline in prep.), and study at numerous museums and institutes will help make advancements in Cucujoidea taxonomy and systematics possible. A catalogue of Nearctic Nitidulidae and Kateretidae is currently underway, in collaboration with C. Ewing. Several new genera and numerous new species of Nitidulinae have been identified from the New and Old World tropics and will be described in the near future. Also, faunistic and ecological studies in the Neotropics through the IBISCA (Investigations in the BIodiversity of Soil and Canopy Arthropods) working group will help study large scale phenomena via nitidulid beetle diversity patterns. A future revision of the genus *Stelidota* will help shed light on its biology and classification, as well as the efficacy for which nitidulid species can be used in biodiversity and conservation studies (see Anderson and Ashe 2000 for a commentary on using soil beetles in conservation practices and Didham et al. 1998 on the use of soil-inhabiting beetles in addressing biodiversity responses with respect to forest fragmentation).

An ongoing project with Michael Whiting is underway to test the status and monophyly of nitidulid subfamilies, which has never been rigorously tested and will likely indicate that the Nitidulinae is paraphyletic, the Cybocephalinae will be separated as a distinct family (especially in light of the numerous larval and adult apomorphies now evident, see Lawrence et al. 1999a and 1999b for a more or less comprehensive list), and the Maynipeplinae will likely be a basal member of the Cillaeinae.

Larval studies in Cucujoidea were also initiated during this research and will be continued for *Pocadius* and expanded into other Nitidulinae. A previously unknown larval form of *Macrostola* was identified in collaboration with a Neotropical pollination study (see Garcia-Robledo 2004). This is the first-ever known larva of the genus *Macrostola*, and one of only a very few larvae known for Neotropical Cillaeinae taxa (Cline and Carlton unpublished data). The larval nitidulid holdings at the California State Collection of Arthropods, where Cline currently is employed, are among the best in the nation due to the efforts of Iris Savage whose illustrations and specimens have been given to Cline to further develop and publish. Larval characters remain enigmatic for many beetle taxa, but which provide a wealth of new character systems that are valuable for understanding phylogenetic relationships.

Undoubtedly a solid foundation of Coleoptera taxonomy and systematics was established during the course of this dissertation and will provide a lifetime of opportunities to pursue research on little known groups of beetles. With fewer and fewer traditional beetle taxonomists being educated and trained, the role of a morphological taxonomist and systematist will be continually sought for biodiversity, ecological, systematic, and conservation efforts. Thus, the research undertaken herein is not considered a single self-contained study, but rather an ongoing program that will sustain innumerable future endeavors.

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# APPENDIX. DATA MATRIX

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **adustus** | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| **africanus** | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 |
| **antennuliferus** | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 |
| **ashei** | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 |
| **barclayi** | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| **basalis** | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| **bicolor** | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 2 | 1 | 0 | 1 | 1 | 1 | 2 | 0 | 1 | 1 |
| **brevis** | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 |
| **carltoni** | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 1 | 0 |
| **centralis** | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 0 |
| **cochabambus** | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 0 |
| **coxus** | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 2 | 0 | 1 | 0 |
| **crypsis** | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 2 | 0 | 1 | 1 |
| **decoratus** | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| **dimidiatus** | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| **dominicus** | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 1 |
| **endrodi** | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 2 | 0 | 0 | 0 |
| **ephite** | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 2 | 0 | 1 | 1 |
| **falini** | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 |
| **femoralis** | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 |
| **ferrugineus** | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 |
| **fulvipennis** | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| **fumatus** | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 2 | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 1 | 1 |
| **fusifromis** | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| **globularis** | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 1 | 0 |
| **helvolus** | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 1 | 1 |
| **insularis** | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 2 | 0 | 1 | 1 |
| **jelineki** | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 1 |
| **kirejtshuki** | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| **luisalfredoi** | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 1 |
| **majusculus** | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 1 |
| **maquipucunensis** | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 0 | 1 | 1 | 1 | 2 | 0 | 1 | 1 |
| **martini** | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 |
| **monticolis** | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 |
| **niger** | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 2 | 1 | 1 | 1 |
| **nigerrimus** | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 1 | 1 |
| **nobilis** | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 2 | 0 | 0 | 0 |
| **okinawaensis** | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 |
| **pecki** | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 2 | 0 | 1 | 1 |
| **peruensis** | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| **rubidus** | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 2 | 0 | 1 | 1 |
| **tepicensis** | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 2 | 0 | 0 | 1 |
| **testaceous** | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 0 | 0 |
| **torresi** | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 1 |
| **wappesi** | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 1 | 1 |
| **yunnanensis** | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| **Thalycra** | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | - | 1 | 1 | 1 |
| **Pocadionta** | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 1 |
| **Lasiodactylus** | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | - | 0 | 1 | 1 |
| **Hebascus** | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 2 | 0 | 1 | 1 |
| **Teichostethus** | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 1 | 0 |
| **Hyleopocadius** | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 2 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| **Axyra** | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| **Epuraea** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 |
| **Carpophilus** | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 |

| | | | | | | | | | | 3 | | | | | | | | | | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |
| **adustus** | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| **africanus** | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 2 | 1 | 1 |
| **antennuliferus** | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 2 | 2 | 1 | 1 |
| **ashei** | 2 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 0 | 2 | 0 | 1 | 2 | 2 | 1 | 1 |
| **barclayi** | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 2 | 1 | 1 |
| **basalis** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 0 | 1 | 2 | 2 | 1 | 1 |
| **bicolor** | 2 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 2 | 3 | 1 | 1 |
| **brevis** | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| **carltoni** | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 0 | 1 | 2 | 2 | 1 | 1 |
| **centralis** | 0 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 2 | 2 | 1 | 1 |
| **cochabambus** | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 2 | 1 | 1 |
| **coxus** | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 2 | 1 | 1 |
| **crypsis** | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 0 | 1 | 1 | 2 | 0 | 0 | 1 | 2 | 1 | 1 |
| **decoratus** | 2 | 0 | 1 | 1 | 1 | 2 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 2 | 1 | 1 |
| **dimidiatus** | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 2 | 2 | 1 | 1 |
| **dominicus** | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 0 | 1 | 1 | 1 | 1 | 1 |
| **endrodi** | 0 | 0 | 1 | 1 | 1 | 2 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 2 | 3 | 1 | 1 |
| **ephite** | 2 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 0 | 1 | 2 | 2 | 1 | 1 |
| **falini** | 2 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 2 | 1 | 1 | 1 |
| **femoralis** | 2 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 0 | 2 | 0 | 0 | 1 | 1 | 1 | 1 |
| **ferrugineus** | 1 | 0 | 1 | 1 | 1 | 2 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 1 | 1 | 1 |
| **fulvipennis** | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 2 | 1 | 1 |
| **fumatus** | 2 | 0 | 1 | 1 | 1 | 2 | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 2 | 2 | 1 | 1 |
| **fusifromis** | 0 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 0 | 2 | 0 | 0 | 1 | 1 | 1 | 1 |
| **globularis** | 2 | 0 | 1 | 1 | 1 | 2 | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 2 | 1 | 1 |
| **helvolus** | 2 | 0 | 1 | 1 | 1 | 2 | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 3 | 1 | 1 |
| **insularis** | 1 | 0 | 1 | 1 | 1 | 2 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 2 | 0 | 1 | 2 | 2 | 1 | 1 |
| **jelineki** | 2 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 2 | 2 | 1 | 1 |
| **kirejtshuki** | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 2 | 1 | 1 |
| **luisalfredoi** | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 2 | 3 | 1 | 1 |
| **majusculus** | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 |
| **maquipucunensis** | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 2 | 1 | 1 |
| **martini** | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 2 | 1 | 1 |
| **monticolis** | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| **niger** | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 2 | 3 | 1 | 1 |
| **nigerrimus** | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 2 | 0 | 1 | 2 | 3 | 1 | 1 |
| **nobilis** | 0 | 0 | 1 | 1 | 1 | 2 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 1 | 2 | 1 | 1 |
| **okinawaensis** | 2 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 2 | 1 | 1 |
| **pecki** | 2 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 0 | 1 | 2 | 3 | 1 | 1 |
| **peruensis** | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 2 | 1 | 1 |
| **rubidus** | 2 | 0 | 1 | 1 | 1 | 2 | 1 | 0 | 2 | 1 | 2 | 1 | 1 | 2 | 0 | 0 | 2 | 3 | 1 | 1 |
| **tepicensis** | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 2 | 2 | 1 | 1 |
| **testaceous** | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 |
| **torresi** | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 0 | 1 | 1 | 2 | 1 | 1 |
| **wappesi** | 1 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 2 | 1 | 1 |
| **yunnanensis** | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 2 | 2 | 1 | 1 |
| **Thalycra** | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 |
| **Pocadionta** | 0 | 0 | 1 | 0 | 1 | 2 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 2 | 1 | 0 | 2 | 2 | 1 | 0 |
| **Lasiodactylus** | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 2 | 1 | 2 | 0 |
| **Hebascus** | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 0 | 0 | 0 | 3 | 1 | 1 | 2 | 0 | 0 | 2 | 3 | 1 | 0 |
| **Teichostethus** | 2 | 0 | 1 | 1 | 1 | 2 | 1 | 0 | 0 | 2 | 3 | 1 | 0 | 2 | 1 | 0 | 2 | 3 | 1 | 0 |
| **Hyleopocadius** | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 0 | 1 | 3 | 2 | 1 | 1 | 1 | 0 | 2 | 3 | 1 | 1 |
| **Axyra** | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Epuraea** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| **Carpophilus** | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 50 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 60 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **adustus** | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| **africanus** | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 1 |
| **antennuliferus** | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **ashei** | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 2 | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| **barclayi** | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 |
| **basalis** | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 2 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| **bicolor** | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | ? | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **brevis** | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 2 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| **carltoni** | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| **centralis** | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| **cochabambus** | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 |
| **coxus** | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| **crypsis** | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **decoratus** | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 |
| **dimidiatus** | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| **dominicus** | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 2 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| **endrodi** | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| **ephite** | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| **falini** | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| **femoralis** | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 2 | 2 | 1 | ? | 0 | 1 | 1 | 1 | 1 | 0 | 1 |
| **ferrugineus** | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| **fulvipennis** | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 2 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| **fumatus** | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| **fusifromis** | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 |
| **globularis** | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| **helvolus** | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 2 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| **insularis** | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 |
| **jelineki** | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| **kirejtshuki** | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| **luisalfredoi** | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| **majusculus** | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| **maquipucunensis** | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| **martini** | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | ? | 0 | 1 | 1 | 1 | 1 | 0 | 1 |
| **monticolis** | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 2 | 0 | ? | 0 | 1 | 1 | 0 | 1 | 0 | 1 |
| **niger** | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 2 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| **nigerrimus** | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| **nobilis** | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| **okinawaensis** | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 |
| **pecki** | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| **peruensis** | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| **rubidus** | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 2 | 2 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 |
| **tepicensis** | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| **testaceous** | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 |
| **torresi** | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 |
| **wappesi** | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| **yunnanensis** | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 2 | 0 | ? | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| **Thalycra** | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 2 | 2 | 0 | 2 | 0 | 1 | 0 | 2 | 0 | 1 | 0 |
| **Pocadionta** | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 2 | 0 | 0 | 2 | 0 | 1 | 0 | 2 | 0 | 1 | 0 |
| **Lasiodactylus** | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 2 | 1 | 1 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| **Hebascus** | 1 | 2 | 1 | 0 | 1 | 2 | 1 | 1 | 1 | 2 | 2 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| **Teichostethus** | 1 | 2 | 1 | 0 | 1 | 2 | 1 | 1 | 1 | 2 | 2 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| **Hyleopocadius** | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 2 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| **Axyra** | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 2 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| **Epuraea** | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Carpophilus** | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | 7 | | | | | | | | | | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |
| **adustus** | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 2 | 2 | 1 | 1 | 1 |
| **africanus** | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 1 | 1 |
| **antennuliferus** | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 2 | 1 | 1 | 1 |
| **ashei** | 1 | 1 | 0 | 0 | ? | 0 | 0 | 0 | 0 | 1 | 1 | 2 | ? | 0 | 1 | 2 | 2 | 1 | 1 | 1 |
| **barclayi** | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 1 | 2 | 2 | 1 | 1 | 1 |
| **basalis** | 1 | 1 | 2 | 2 | 4 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 2 | 0 | 2 | 1 | 1 | 1 |
| **bicolor** | 1 | 1 | 2 | 2 | ? | ? | 0 | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? |
| **brevis** | 1 | 1 | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 2 | 2 | 1 | 1 | 1 |
| **carltoni** | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 1 | 0 | 1 | 2 | 2 | 1 | 1 | 1 |
| **centralis** | 1 | 1 | 1 | 1 | 2 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 2 | 2 | 1 | 1 | 1 |
| **cochabambus** | 1 | 1 | 1 | 1 | 2 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 2 | 2 | 1 | 1 | 1 |
| **coxus** | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 2 | 2 | 1 | 1 | 1 |
| **crypsis** | 1 | 1 | 1 | 2 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 2 | 2 | 1 | 1 | 1 |
| **decoratus** | 1 | 1 | 2 | 2 | ? | ? | 0 | 1 | 0 | 1 | ? | ? | ? | 0 | 2 | 0 | 2 | ? | 1 | 1 |
| **dimidiatus** | 1 | 1 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 1 | 2 | 1 | 1 | 1 |
| **dominicus** | 1 | 1 | 2 | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 2 | 2 | 1 | 1 | 1 |
| **endrodi** | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 1 |
| **ephite** | 1 | 1 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 2 | 1 | 1 | 1 |
| **falini** | 1 | 1 | 2 | 2 | 2 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 1 | 0 | 0 | 1 | 2 | 1 | 1 | 1 |
| **femoralis** | 1 | 1 | 2 | 2 | 2 | ? | 0 | ? | ? | ? | ? | ? | 0 | ? | ? | ? | ? | ? | ? | ? |
| **ferrugineus** | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 1 |
| **fulvipennis** | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 2 | 1 | 1 | 1 |
| **fumatus** | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 2 | 2 | 1 | 1 | 1 |
| **fusifromis** | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 2 | 2 | 1 | 1 | 1 |
| **globularis** | 1 | 1 | 1 | 2 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 1 | 0 | 0 | 2 | 2 | 1 | 1 | 1 |
| **helvolus** | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 2 | 2 | 1 | 1 | 1 |
| **insularis** | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 1 | 2 | 2 | 1 | 1 | 1 |
| **jelineki** | 1 | 1 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 0 | 1 | 2 | 2 | 1 | 1 | 1 |
| **kirejtshuki** | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | ? | ? | 0 | 0 | 0 | 2 | 2 | ? | 1 | 1 |
| **luisalfredoi** | 1 | 1 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 2 | 2 | 1 | 1 | 1 |
| **majusculus** | 1 | 1 | 2 | 2 | 2 | 0 | 0 | 1 | 0 | 1 | ? | ? | 0 | 0 | 2 | 2 | 2 | 1 | 1 | 1 |
| **maquipucunensis** | 1 | 1 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 1 | 1 |
| **martini** | 1 | 1 | 2 | 2 | ? | ? | 0 | ? | ? | ? | ? | 0 | ? | ? | ? | ? | ? | 1 | 1 | 1 |
| **monticolis** | 1 | 1 | 1 | 1 | ? | ? | 0 | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | 1 | 1 | 1 |
| **niger** | 1 | 1 | 2 | 2 | 4 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 2 | 2 | 1 | 1 | 1 |
| **nigerrimus** | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 2 | 2 | 1 | 1 | 1 |
| **nobilis** | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 2 | 2 | 1 | 1 | 1 |
| **okinawaensis** | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 2 | 2 | 1 | 1 | 1 |
| **pecki** | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 2 | 1 | 1 | 1 |
| **peruensis** | 1 | 1 | 1 | 1 | 3 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 2 | 2 | 1 | 1 | 1 |
| **rubidus** | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 2 | 1 | 1 | 1 |
| **tepicensis** | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 1 | 0 | 0 | 2 | 2 | 1 | 1 | 1 |
| **testaceous** | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 2 | 2 | 1 | 1 | 1 |
| **torresi** | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 1 | ? | ? | 0 | 0 | 0 | 2 | 2 | ? | 1 | 1 |
| **wappesi** | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 1 | 0 | 2 | 2 | 1 | 1 | 1 |
| **yunnanensis** | 1 | 1 | 0 | 0 | ? | ? | 0 | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? |
| **Thalycra** | 2 | 1 | 0 | 0 | 1 | - | 2 | 0 | 0 | 1 | - | - | 0 | 0 | - | 0 | 2 | - | 1 | 1 |
| **Pocadionta** | 2 | 1 | 0 | 0 | 1 | - | 1 | 0 | 0 | 1 | - | - | 0 | 0 | - | 0 | 2 | - | 1 | 1 |
| **Lasiodactylus** | 1 | 1 | 0 | 0 | 1 | - | 0 | 0 | 0 | 1 | - | - | 0 | 0 | - | 0 | 2 | - | 1 | 2 |
| **Hebascus** | 1 | 1 | 0 | 0 | 1 | - | 0 | 0 | 0 | 1 | - | - | 0 | 0 | - | 0 | 3 | - | 1 | 1 |
| **Teichostethus** | 1 | 1 | 0 | 1 | 1 | - | 0 | 0 | 0 | 1 | - | - | 0 | 0 | - | 0 | 2 | - | 1 | 1 |
| **Hyleopocadius** | 1 | 1 | 2 | 2 | 1 | - | 0 | 0 | 0 | 1 | - | - | 0 | 0 | - | 0 | 2 | - | 1 | 1 |
| **Axyra** | 1 | 1 | 0 | 1 | 1 | - | 0 | 0 | 0 | 1 | - | - | 0 | 0 | - | 0 | 2 | - | 1 | 1 |
| **Epuraea** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | - | 0 | 1 | - | 1 | 1 |
| **Carpophilus** | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | - | 0 | 0 | - | 0 | 0 |

| | | | | | | | | | | 9 | | | | | | | | | | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |
| **adustus** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 2 | 1 | 2 | 0 | 2 | 1 | 1 |
| **africanus** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 | 0 | 2 | 1 | 2 | 1 | 1 |
| **antennuliferus** | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | 2 | ? | ? | 1 | 1 |
| **ashei** | 1 | 1 | 1 | 2 | 1 | 0 | 1 | 0 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 1 |
| **barclayi** | 1 | 1 | 0 | 0 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 1 | 2 | 0 | 2 | 1 | 1 |
| **basalis** | 1 | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 1 | 2 | 0 | 2 | 0 | 2 | 1 | 2 | 1 | 2 | 1 | 1 |
| **bicolor** | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 0 | 2 | 1 | 2 | 1 | 1 |
| **brevis** | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 1 | 2 | 0 | 2 | 1 | 2 | 1 | 1 |
| **carltoni** | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 0 | 2 | 0 | 2 | 1 | 1 |
| **centralis** | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 1 | 1 |
| **cochabambus** | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | 2 | ? | ? | 1 | 1 |
| **coxus** | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | 2 | ? | ? | 1 | 1 |
| **crypsis** | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 2 | 1 | 1 | 1 | 2 | 0 | 2 | 1 | 2 | 1 | 1 |
| **decoratus** | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | 2 | ? | ? | 1 | 1 |
| **dimidiatus** | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 1 |
| **dominicus** | 1 | 0 | 0 | 2 | 1 | 1 | 0 | 0 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 1 |
| **endrodi** | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 1 |
| **ephite** | ? | 0 | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | 2 | ? | ? | 1 | 1 |
| **falini** | 1 | ? | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | ? | ? | 0 | 2 | 1 | 2 | 1 | 1 |
| **femoralis** | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 2 | 0 | 2 | 0 | 2 | 1 | 1 |
| **ferrugineus** | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 2 | 0 | 2 | 1 | 1 |
| **fulvipennis** | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 2 | 0 | 2 | 1 | 2 | 1 | 1 |
| **fumatus** | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 2 | 1 | 2 | 1 | 1 |
| **fusifromis** | 1 | 1 | 0 | 1 | 2 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 0 | 2 | 1 | 1 |
| **globularis** | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 2 | 1 | 2 | 0 | 2 | 0 | 2 | 1 | 2 | 1 | 1 |
| **helvolus** | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 1 | 2 | 0 | 2 | 1 | 2 | 0 | 2 | 1 | 1 |
| **insularis** | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | 2 | ? | ? | 1 | 1 |
| **jelineki** | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 0 | 2 | 1 | 1 |
| **kirejtshuki** | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 2 | 1 | 1 | ? | 2 | 1 | 2 | 1 | 2 | 1 | 1 |
| **luisalfredoi** | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 1 | 1 |
| **majusculus** | 1 | 2 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 2 | 0 | 2 | 1 | 1 |
| **maquipucunensis** | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 0 | 2 | 1 | 1 |
| **martini** | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 1 |
| **monticolis** | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 2 | 0 | 2 | 0 | 2 | 1 | 1 |
| **niger** | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 2 | 1 | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 1 | 1 |
| **nigerrimus** | ? | 0 | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | 2 | ? | ? | 1 | 1 |
| **nobilis** | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 1 |
| **okinawaensis** | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 0 | 2 | 1 | 2 | 1 | 1 |
| **pecki** | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | ? | 2 | ? | ? | 1 | 1 |
| **peruensis** | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 0 | 2 | 0 | 2 | 1 | 1 |
| **rubidus** | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 2 | 0 | 2 | 1 | 2 | 1 | 1 |
| **tepicensis** | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 1 |
| **testaceous** | 1 | 1 | 0 | 0 | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 2 | 0 | 2 | 1 | 1 |
| **torresi** | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 2 | 0 | 2 | 0 | 2 | 1 | 1 |
| **wappesi** | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 2 | 1 | 1 | 1 | 2 | 0 | 2 | 1 | 2 | 1 | 1 |
| **yunnanensis** | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 2 | 1 | 2 | 1 | 1 |
| **Thalycra** | 0 | - | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| **Pocadionta** | 0 | - | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | 0 | 0 | 0 | 1 | 0 | 1 | ? | ? |
| **Lasiodactylus** | 0 | - | 1 | 0 | - | 0 | 0 | 0 | 1 | 0 | - | - | 0 | 0 | 0 | 0 | 0 | 1 | ? | ? |
| **Hebascus** | 0 | - | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | 2 | 2 | 0 | 2 | 0 | 2 | ? | ? |
| **Teichostethus** | 0 | - | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | - | - | 1 | 2 | 0 | 2 | 0 | 2 | ? | ? |
| **Hyleopocadius** | 1 | - | 0 | 0 | - | 1 | 0 | 1 | 0 | 0 | - | - | 0 | 1 | 0 | 1 | 0 | 2 | ? | ? |
| **Axyra** | 0 | - | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | 0 | 0 | 0 | 1 | ? | ? |
| **Epuraea** | 0 | - | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| **Carpophilus** | 0 | - | 0 | 0 | - | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | 11 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 |
| **adustus** | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 |
| **africanus** | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 |
| **antennuliferus** | 1 | 1 | 1 | 0 | 2 | 1 | 0 | 1 | 1 | ? | 1 | 0 | 1 | 1 |
| **ashei** | 1 | 1 | ? | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **barclayi** | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 |
| **basalis** | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 2 | 1 | 0 | 1 | 0 | 1 | 1 |
| **bicolor** | 1 | ? | ? | ? | ? | ? | 0 | ? | ? | 1 | 1 | ? | 1 | 1 |
| **brevis** | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 1 |
| **carltoni** | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 1 |
| **centralis** | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 1 |
| **cochabambus** | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | ? | 1 | 1 | 1 | 1 |
| **coxus** | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | ? | 1 | 1 | 1 | 1 |
| **crypsis** | 1 | 1 | 1 | 0 | 2 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 |
| **decoratus** | 1 | 1 | ? | ? | ? | 0 | 0 | 2 | 1 | ? | 1 | 1 | 1 | 1 |
| **dimidiatus** | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **dominicus** | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |
| **endrodi** | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 |
| **ephite** | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | ? | 1 | 0 | 1 | 1 |
| **falini** | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |
| **femoralis** | 1 | ? | 1 | 0 | 1 | ? | 0 | ? | ? | 1 | 1 | ? | 1 | 1 |
| **ferrugineus** | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 |
| **fulvipennis** | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 |
| **fumatus** | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **fusifromis** | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 |
| **globularis** | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |
| **helvolus** | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 1 |
| **insularis** | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | ? | 1 | 1 | 1 | 1 |
| **jelineki** | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |
| **kirejtshuki** | 1 | 1 | 0 | ? | ? | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 |
| **luisalfredoi** | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |
| **majusculus** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| **maquipucunensis** | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |
| **martini** | ? | ? | ? | ? | ? | ? | 0 | ? | ? | 0 | 1 | ? | 1 | 1 |
| **monticolis** | ? | ? | ? | ? | ? | ? | 0 | ? | ? | 0 | 1 | ? | 1 | 1 |
| **niger** | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |
| **nigerrimus** | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | ? | 1 | 1 | 1 | 1 |
| **nobilis** | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 |
| **okinawaensis** | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 |
| **pecki** | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | ? | 1 | 0 | 1 | 1 |
| **peruensis** | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 |
| **rubidus** | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 |
| **tepicensis** | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 1 |
| **testaceous** | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 |
| **torresi** | 1 | 1 | 1 | ? | ? | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **wappesi** | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| **yunnanensis** | ? | ? | ? | ? | ? | ? | 0 | ? | ? | 1 | 1 | ? | 1 | 1 |
| **Thalycra** | 0 | 1 | 0 | - | - | - | 0 | - | 1 | - | 0 | - | 0 | 1 |
| **Pocadionta** | ? | 1 | 0 | - | - | - | 0 | - | 1 | - | ? | - | 1 | 2 |
| **Lasiodactylus** | ? | 1 | 0 | - | - | - | 0 | - | 1 | - | ? | - | 0 | 1 |
| **Hebascus** | ? | 1 | 1 | - | - | - | 0 | - | 1 | - | ? | - | 1 | 1 |
| **Teichostethus** | ? | 1 | 1 | - | - | - | 0 | - | 1 | - | ? | - | 1 | 1 |
| **Hyleopocadius** | ? | 1 | 1 | - | - | - | 0 | - | 1 | - | ? | - | 1 | 2 |
| **Axyra** | ? | 1 | 0 | - | - | - | 0 | - | 1 | - | 0 | - | 1 | 1 |
| **Epuraea** | 0 | 0 | 0 | - | - | - | 0 | - | 0 | - | 0 | - | 0 | 0 |
| **Carpophilus** | 0 | 0 | 0 | - | - | - | 0 | - | 0 | - | 0 | - | 0 | 0 |

## VITA

Andrew R. Cline was born in Springfield, Illinois, in March of 1974, and spent the first ten years of his life in the "Land of Lincoln." The Cline family then moved to northern Alabama, following an employment opportunity for Roger Cline, Andrew's father. In the Decatur area, Andrew and his two brothers spent much time enjoying outdoor activities and gaining an appreciation for the natural beauty of the southern states. In May of 1995 Andrew married JoAnna Caudle. Andrew and JoAnna were blessed with their first child, Joshua David, in July of 2002.

Andrew received his Bachelor of Science degree in biology/ecology at the University of Alabama – Huntsville in 1996, and following graduation joined the department as a part-time instructor. In 1998, he began graduate studies at the University of Missouri, and in 2000 was awarded a Master of Science degree in entomology with a specialization in insect behavior, and also was awarded the Stone Award for Outstanding Master of Science student in the Department of Entomology.

Andrew joined the Entomology Department at LSU in the fall of 2000, pursuing doctoral work under the direction of Dr. Chris Carlton. During doctoral research he engaged in biodiversity, ecological, taxonomic and systematic research on nitidulids and other beetles. Andy took part in three international biodiversity studies including: the INBio initiative in Costa Rica, the IBISCA working group in Panama, and a project to document the fauna of Nova Scotia and Prince Edward Island. In a pedagogical context, Andy taught numerous biology and entomology courses at his undergraduate and graduate institutions, and attended a National Science Foundation teaching workshop in

June of 2004, which was devoted to the advancement of undergraduate instruction in science.

Funding for Andrew's doctoral research came from a number of sources including: a National Science Foundation Doctoral Dissertation Improvement Grant, an Ernst Mayr Grant from the Museum of Comparative Zoology at Harvard University, visiting systematist grants from the Canadian Museum of Nature and Field Museum, an Organization for Tropical Studies and Smithsonian Tropical Research Institute A.W. Mellon Grant, a Sigma Xi Grant in Aid of Research, Florida Entomological Society Grants, LSU Entomology Department Funds, and the Louisiana State University Agricultural Center and Graduate School.

The dissertation presented herein is not the culmination of an academic career but rather the beginning of another phase of scientific investigation. Much has changed since Andrew began his journey in higher education and this work is dedicated to those who have provided inspiration and encouragement throughout those many years.

Andrew is currently an Associate Insect Biosystematist at the Plant Pest Diagnostics Branch of the California Department of Food and Agriculture. At his new post he is able to not only aid in the detection of potential beetle pests of California, but also has an active research program involving the taxonomy and systematics of little known groups of beetles.