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Journal of Natural History

ISSN: 0022-2933 (Print) 1464-5262 (Online) Journal homepage: http://www.tandfonline.com/loi/tnah20

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To cite this article: M. A. Bologna & J. D. Pinto (2002) The Old World genera of Meloidae (Coleoptera): a key and synopsis, Journal of Natural History, 36:17, 2013-2102, DOI: 10.1080/00222930110062318

To link to this article: http://dx.doi.org/10.1080/00222930110062318

JOURNAL OF NATURAL HISTORY, 2002, **36**, 2013–2102

The Old World genera of Meloidae (Coleoptera): a key and synopsis

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(*Accepted 15 March 2001*)

This paper reviews the 77 Old World genera of blister beetles (Coleoptera: Meloidae). Included is a key to genera and a synopsis of each genus. The generic synopses incorporate synonyms, number of species, geographic distribution, and the most significant references on taxonomy, life history and certain other topics. Additional notes are appended to several of the generic treatments. Formal nomenclatural changes include two new generic synonymies, one new status, three new combinations and the transfer of one subgenus.

KEYWORDS: Coleoptera, Meloidae, Old World fauna, identification, catalogue.

Introduction

This is the second in a series of keys and synopses of the blister beetle genera of the World. An earlier paper addressed the 49 New World genera (Pinto and Bologna, 1999). Here we treat the 77 genera of the Old World. Only five are common to both areas. A third and final paper will cover the rather limited Australasian fauna. As defined here, the Old World includes the entire Eastern Hemisphere except Australasia and encompasses the Palaearctic, Afrotropical (= Ethiopian) and Oriental biogeographic regions (as figured in Brown and Gibson, 1983).

The Meloidae, a widespread family with about 120 genera and 2500 species, is primarily distributed in temperate steppic and arid regions, and in subtropical and tropical savannas or other open habitats. Blister beetles are of particular interest because of their importance to applied science (pharmacology, veterinary and agricultural problems) as well as their distinctive biology (hypermetamorphic development, parasitoid larval habits, defensive attributes and diverse courtship behaviour). An extensive review of meloid systematics, bionomics and biogeography was published by Bologna (1991a).

One of the most significant contributions to our knowledge of the Old World

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Journal of Natural History
ISSN 0022-2933 print/ISSN 1464-5262 online
http://www.tandf.co.uk/journals
DOI: 10.1080/00222930110062318

Meloidae is the splendid monograph by Beauregard (1890) with an exhaustive treatment of the pharmacological, anatomical and biological features of the family. Other important 19th-century additions include taxonomic studies of several Palaearctic genera by specialists such as Abeille de Perrin (1880), Escherich (1888–1904), Haag-Rutenberg (1879–1880), de Marseul (1867–1887), Prochazka (1892), Reiche (1847–1878), Reitter (1872–1916) and Semenov (1891–1937). Important 20th-century meloid studies include those of Pic (1894–1958), Cros (1910–1945), Soumacov (1907–1934), Maran (1940–1945), Kaszab (1937–1985), Pardo Alcaide (1948–1981), Kuzin (1927–1954) and Bologna (1973 to present). Of particular significance are the extensive studies of larval biology and morphology by Auguste Cros, the studies of the Hungarian specialist Zoltan Kazsab on the taxonomy of several Old World genera and the work of the Spanish entomologist Anselmo Pardo Alcaide who tried to deal with the enormous complexity of the mylabrine taxa which had never been studied extensively after Marseul's (1872) early monograph.

Comprehensive keys and synopses of the meloid genera of the Old World or of a single biogeographic region within do not exist. The most important studies are of limited taxonomic or/and geographic scope. Included is Escherich's study (1897a) of the Palaearctic Nemognathinae, Betrem's (1932) work on Horiini, treatment of the western Mediterranean taxa by Pardo Alcaide (1952), catalogues of *Cyaneolytta* and *Lydomorphus* by Selander (1986b, 1988a), several generic revisions by Kaszab (see References), and, most recently, Bologna's (1991a) monograph of the Italian fauna which includes keys and reviews of all European and Mediterranean genera. Noteworthy faunistic studies of the family are as follows: (1) Oriental—India and Sri Lanka (Mohamedsaid, 1979; Saha, 1979). (2) Afrotropical—S Africa (Péringuey, 1909; Moor, 1978), Namibia (Bologna, 2000b), Angola (Wellman, 1908), Madagascar (Kaszab, 1965), NE Africa (Bologna, 1978, 1980, 1990), Guinean Region (Pardo Alcaide, 1966, 1969b; Bologna, 1994b). (3) Palaearctic—N Africa (Gridelli, 1930; Normand, 1936; Kocher, 1956; Alfieri, 1976), Eastern Mediterranean and Iran (Kaszab, 1968b; Bologna, 1979, 1988b, 1994a; Özbek and Szaloki, 1998), Arabian Peninsula (Kaszab, 1983), Macaronesia (Bologna, 1994c), Iberian Peninsula (Gorriz y Muñoz, 1882; Valladares and Salgado, 1983; Valladares, 1984), Crimea (Levshinkaja, 1964), Armenia (Iablokoff-Khnzoryan, 1983), Tadzhkistan (Prispinova, 1987b), Tibet (Tan, 1981).

This study was prompted by the absence of comprehensive work on this important family in the Old World. We realize that in many cases (especially in the Nemognathinae) generic definitions remain unsettled. Indeed, most of the Old World genera have yet to be thoroughly revised. Also, the considerable diversity of the family precluded considering all species for our study. Yet we believe that judicious use of the key, supplemented by the synopsis and literature citations, will allow entomologists to satisfactorily identify most Old World Meloidae to genus without depending on specialists or extensive research collections. We also hope this work will help generate renewed interest in this fascinating group of beetles.

Classification. The most important classifications of the Meloidae in recent years include those by MacSwain (1956), Kaszab (1969a), Bologna (1991a), Selander (1991) and Bologna and Pinto (2001). For the most part, this paper follows the classification of Bologna and Pinto, which is similar to Bologna (1991a) except for the definition of the Meloini and certain tribal definitions in the Nemognathinae. We recognize four subfamilies—Eleticinae, Meloinae, Tetraonycinae and

Nemognathinae. The Tetraonycinae occur only in the New World; the Meloinae and Nemognathinae are widespread in both hemispheres, and the Eleticinae are restricted to South America, Africa, India and Indochina. The first-instar larvae of the Tetraonycinae and Nemognathinae are phoretic on species of Apoidea, with larval feeding and development occurring in their nests. In the Meloinae, larvae develop primarily in the nests of Apoidea or in the egg pods of Acridoidea. The first-instar larvae of only a minority of meloine genera are phoretic. Ontogeny in the Tetraonycinae, Nemognathinae and Meloinae is hypermetamorphic. Except for a few genera which do not feed, adults of all four subfamilies are phytophagous. The biology of the Eleticinae is virtually unknown. However, the first-instar larva of the palaeotropic genus *Eletica* (Pinto *et al.*, 1996), as well as that of the southern African genus *Iselma* (Bologna *et al.*, 2001), suggest the absence of hypermetamorphosis in this group. Bologna and Pinto (2001) noted that the tribe Lyttini of recent authors cannot be defended phylogenetically. Several genera traditionally placed there were thus considered *incertae sedis* in that study. Pending phylogenetic treatment of all genera involved, however, we continue herein to list these taxa as Lyttini. Further discussion of the subfamilies and included tribes can be found in Selander (1964, 1966, 1991), Bologna (1991a), Pinto *et al.* (1996), and Bologna and Pinto (2001).

Distribution. Of the 77 Old World genera, 53 occur in the Palaearctic, 40 in the Afrotropical and 22 in the Oriental regions. Fifteen genera are common to the Afrotropical and Oriental regions, 19 to the Afrotropical and Palaearctic regions, and 13 to the Oriental and Palaearctic regions. Ten genera occur in all three regions. Five Old World genera also occur in the New World (*Epicauta*, *Lytta*, *Meloe*, *Nemognatha*, *Zonitis*). Four, all phoretic, also are found in the Australasian region (*Horia*, *Synhoria*, *Zonitis*, *Zonitoschema*). The presence of common taxa among biogeographical regions can be explained by dispersal events, or late events of vicariance in the case of relationships associated with the Afrotropical plates (Arabia, Africa, Madagascar).

The Palaearctic Region has 30 endemic genera (56.6%). Perhaps the world's greatest diversity of meloid genera occurs in the Saharian–Mediterranean subregion of the Palaearctic. This zone, transitional to the Afrotropics, includes 39 of the 53 genera recorded from the Palaearctic. Seventeen of these are Saharian–Mediterranean endemics and comprise 32.1% of the region's diversity. A smaller pocket of endemicity in the Palaearctic is the Turanian depression. This area, characterized by desertic or subdesertic habitats, contains four endemic genera or 7.6% of the region's generic diversity. The Afrotropical region also is distinctive. Fifteen of its 40 genera (37.5%) are endemic, nine (22.5%) of which are restricted to southern Africa. The greatest level of Afrotropical endemicity is shown by the Eleticinae. Eight of the nine Old World genera of this subfamily are strictly Afrotropical. Only *Eletica* has an extralimital distribution in the Oriental region. Madagascar has a relatively depauperate meloid fauna. None of its seven genera are unique; all occur in the Oriental region and on the African mainland as well. The Oriental region has the least distinctive fauna. Three genera (*Denierella*, *Onyctenus*, *Pseudosybaris*) are endemic. However, these are taxonomically doubtful and possible synonyms of other widespread Afrotropical and Oriental genera (see synopsis). A more detailed account of the distribution of meloid genera is given by Bologna (1991a).

Key and synopsis. The generic key is artificial and designed for optimum identification, not for conveying phylogenetic information. Although it should be satisfactory for most species we are under no illusions that it will work for all. Problems may occur for certain species we were unable to examine, and for representatives of genera that remain poorly defined (see synopsis). Four genera, *Onyctenus*, *Oreomeloe*, *Pseudosybaris* and *Sitaromorpha*, could not be examined. However, only *Pseudosybaris* (see No. 28 in synopsis) is omitted from the key because of uncertain characters. Diagnostic features of the others are taken from the literature. All genera are treated in the synopsis.

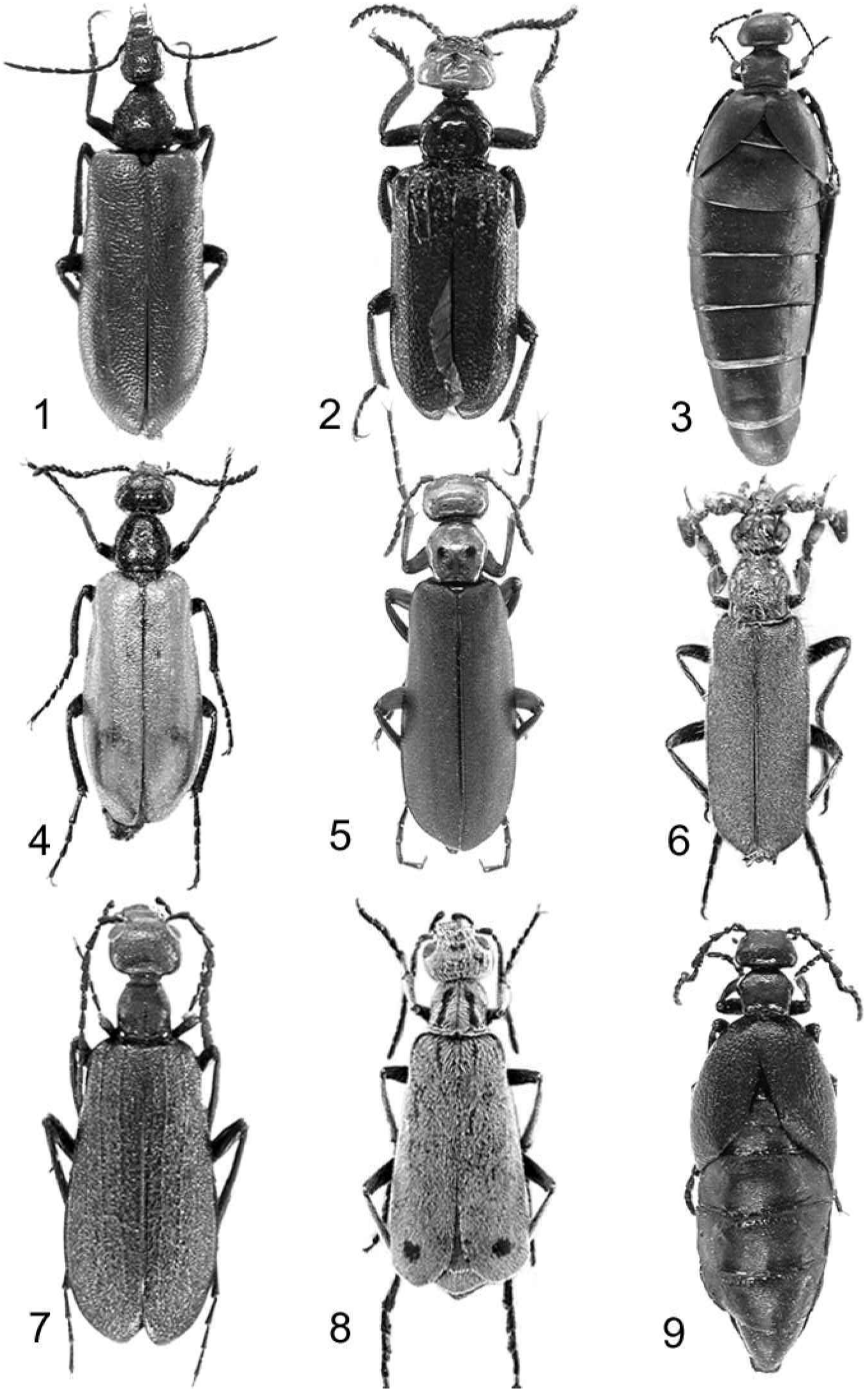
Anatomical terms largely follow those employed in recent taxonomic and anatomical studies of New World blister beetles (e.g. Selander, 1966, 1985, 1990; Gerber *et al.*, 1971b; Pinto, 1991; Pinto and Bologna, 1999). There are a few comments that need preface the key. Head length is taken from the occiput to the base of the clypeus (i.e. the length of the clypeus and labrum is not included unless indicated). Pronotum measurements always imply maximum dimensions. The length of antennal segments can vary somewhat depending on the degree of telescoping involved. To avoid ambiguity, except for segment I, the length of segments is taken from their apex to the point at their base where the segment suddenly tapers to a narrower stem. The degree to which the basal stem of a segment is exposed varies because of telescoping; consequently it should not be included when determining segment length. Numbers applied to abdominal sterna and terga refer to the visible segment number and not to the true anatomical number.

The anatomy of the mesosternum and mesepisterna, important for identification of Mylabrini, a strictly Old World group, is explained and illustrated in Pardo Alcaide (1952, 1954a, 1955, 1958a) and Bologna (1991a). These structures are extremely important for separating the genera and species of this tribe, the most speciose of the family. The anterior section of the mylabrine mesosternum is variously modified. At the very least its surface is smooth and impunctate relative to the posterior section. The demarcation between the two areas may be distinct (figures 64, 66–69) or not (figures 63, 65). In many taxa, the anterior section is slightly to distinctly elevated into what Pardo Alcaide termed a 'scutum', a structure varying considerably in shape and size (figures 64, 66, 68, 69). The critical character of the mesepisterna regards their structure anteriorly. In some genera such as *Hycleus* and *Ceroctis* there is a distinctly furrowed and relatively wide anterior border section which is delimited posteriorly by a carina and, in some taxa, by additional striae behind (figures 64, 66, 67). In others, for example *Mylabris* and *Croscherichia*, the mesepisterna are unmodified anteriorly (figures 63, 65, 68, 69).

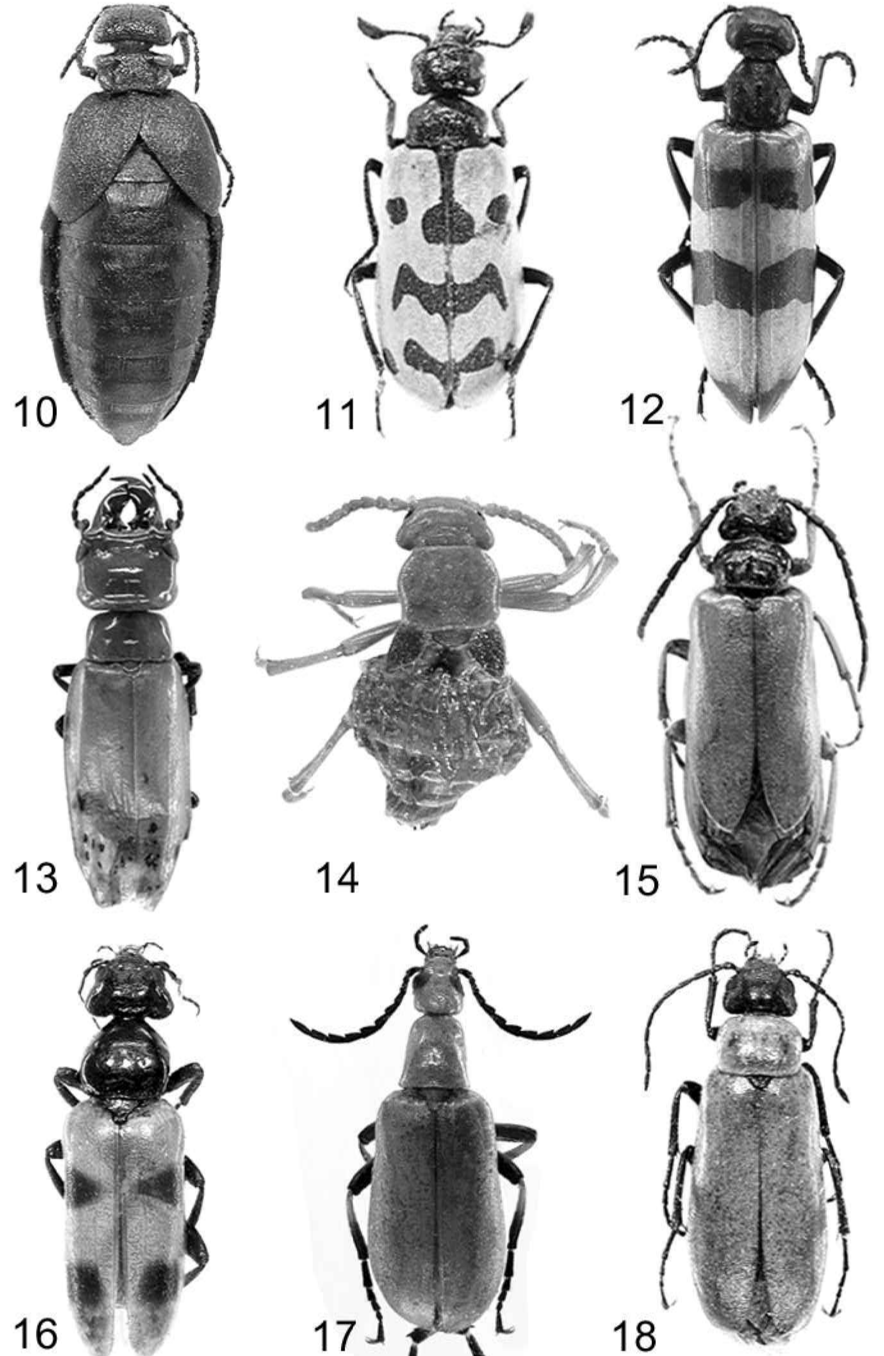
Another difficult character used in the key is the shape and size of the elytra in Nemognathinae previously referred to the tribe Sitarini (Bologna, 1991a). In these genera, the elytra narrow posteriorly and are dehiscent medially (see couplet 9). It needs to be noted, however, that the elytra of blister beetles frequently separate apically when they dry (e.g. figure 18). So as not to confuse this condition with that in the sitarines one must compare the width of each elytron along its entire length. In the latter group of genera the elytra actually narrow noticeably posteriorly (figures 15, 111, 112) and are not simply separated apically.

Figures 1–18, 111 and 112 are examples of several Old World genera. They are intended to convey the considerable morphological diversity in the family and are not necessarily typical of the genera illustrated.

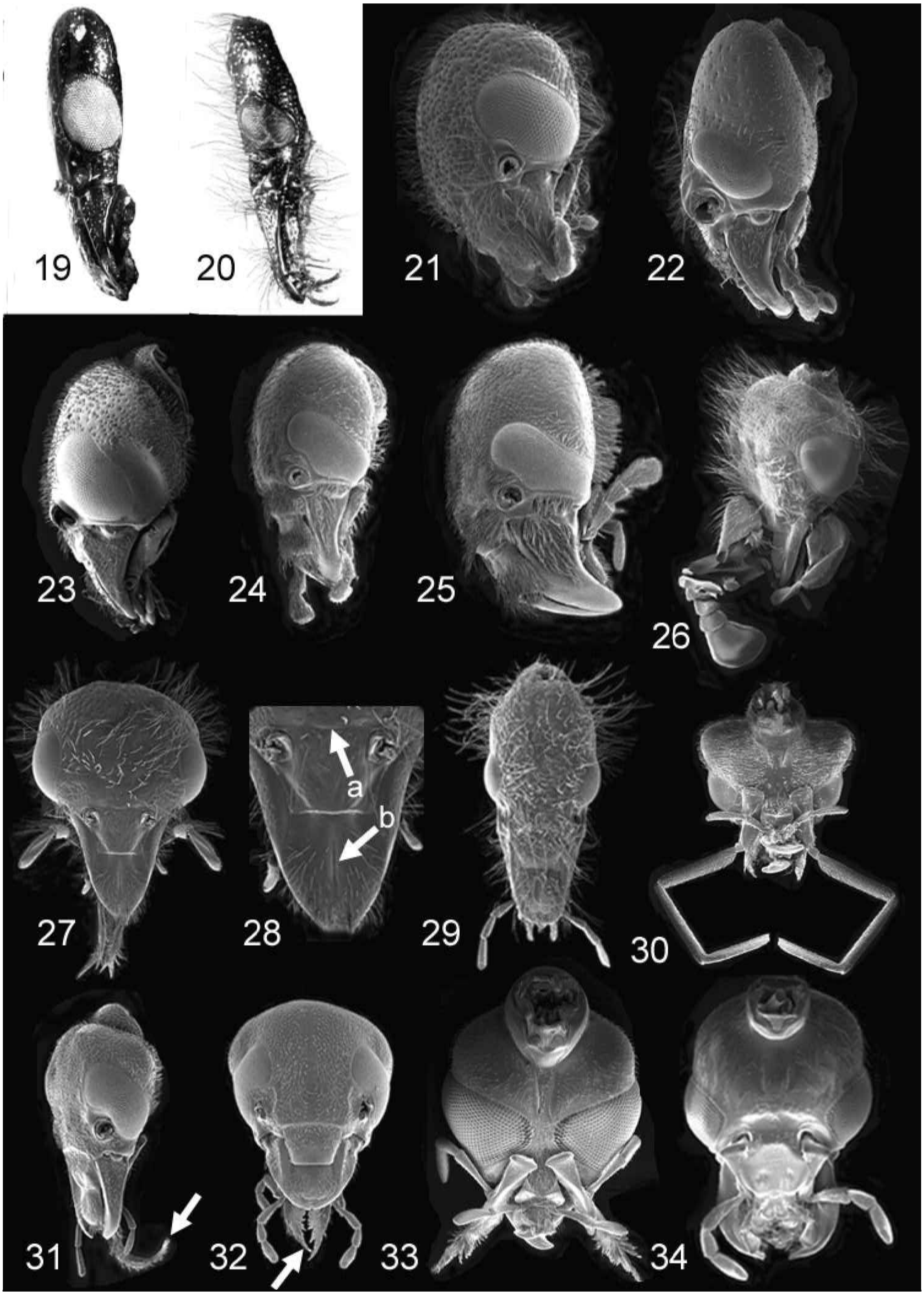
The synopsis lists genera alphabetically under the appropriate subfamily and tribe. To facilitate locating a genus in the synopsis, genera are numbered consecutively from 1 to 77, and this number, in parentheses, is inserted before the generic



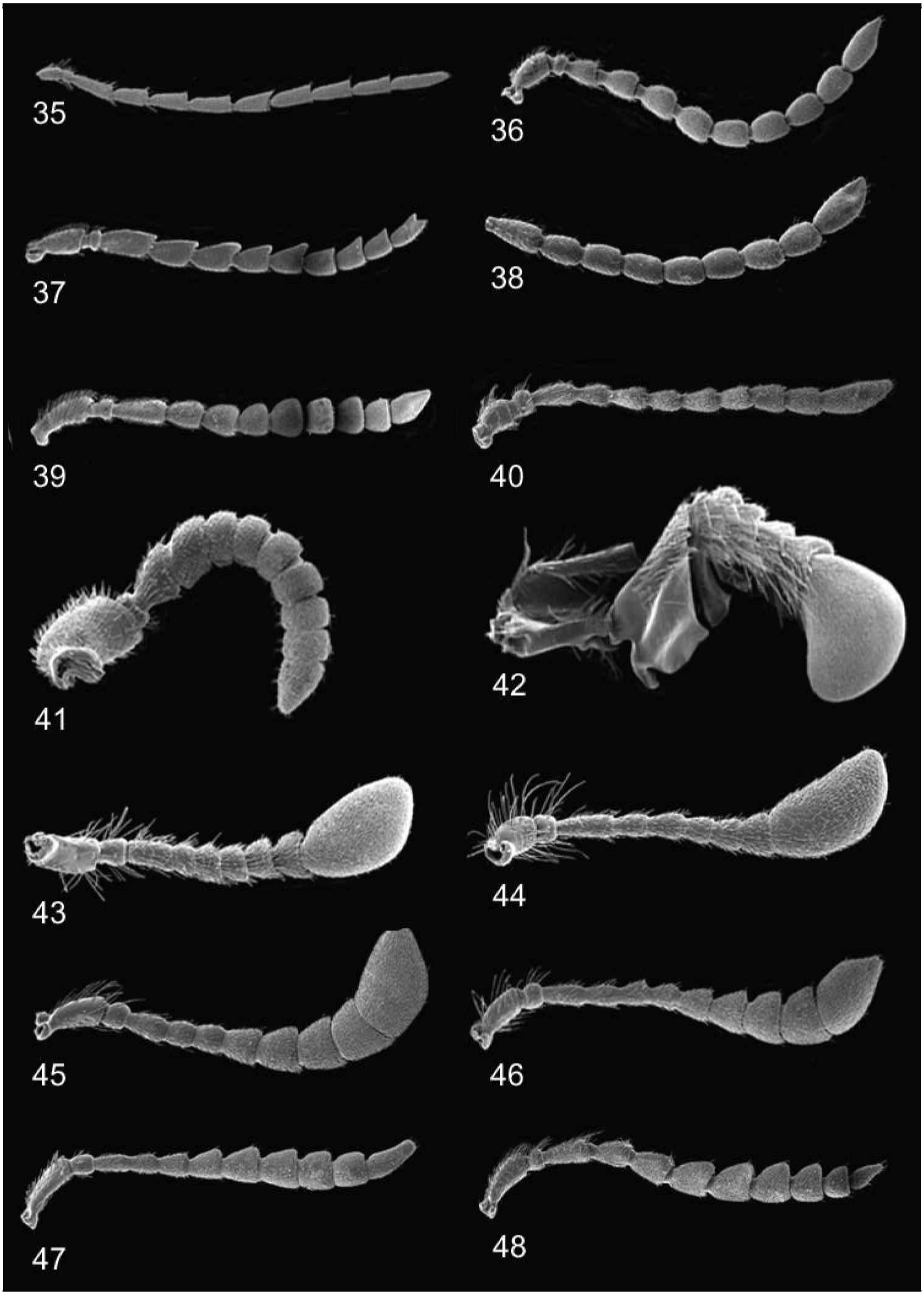
FIGS 1–9. (1) *Iselma brunneipes* Haag-R., 1879; (2) *Eletica infans* (Kolbe, 1894); (3) *Berberomeloe majalis*; (4) *Lydus trimaculatus* (Fab., 1775); (5) *Muzimes sterbai* (Maran, 1941); (6) *Cerocoma prevezaensis*; (7) *Cyaneolytta depressicornis* (Lap., 1840); (8) *Epicauta fasciceps* Walker, 1871; (9) *Meloe violaceus* Marsh., 1802.



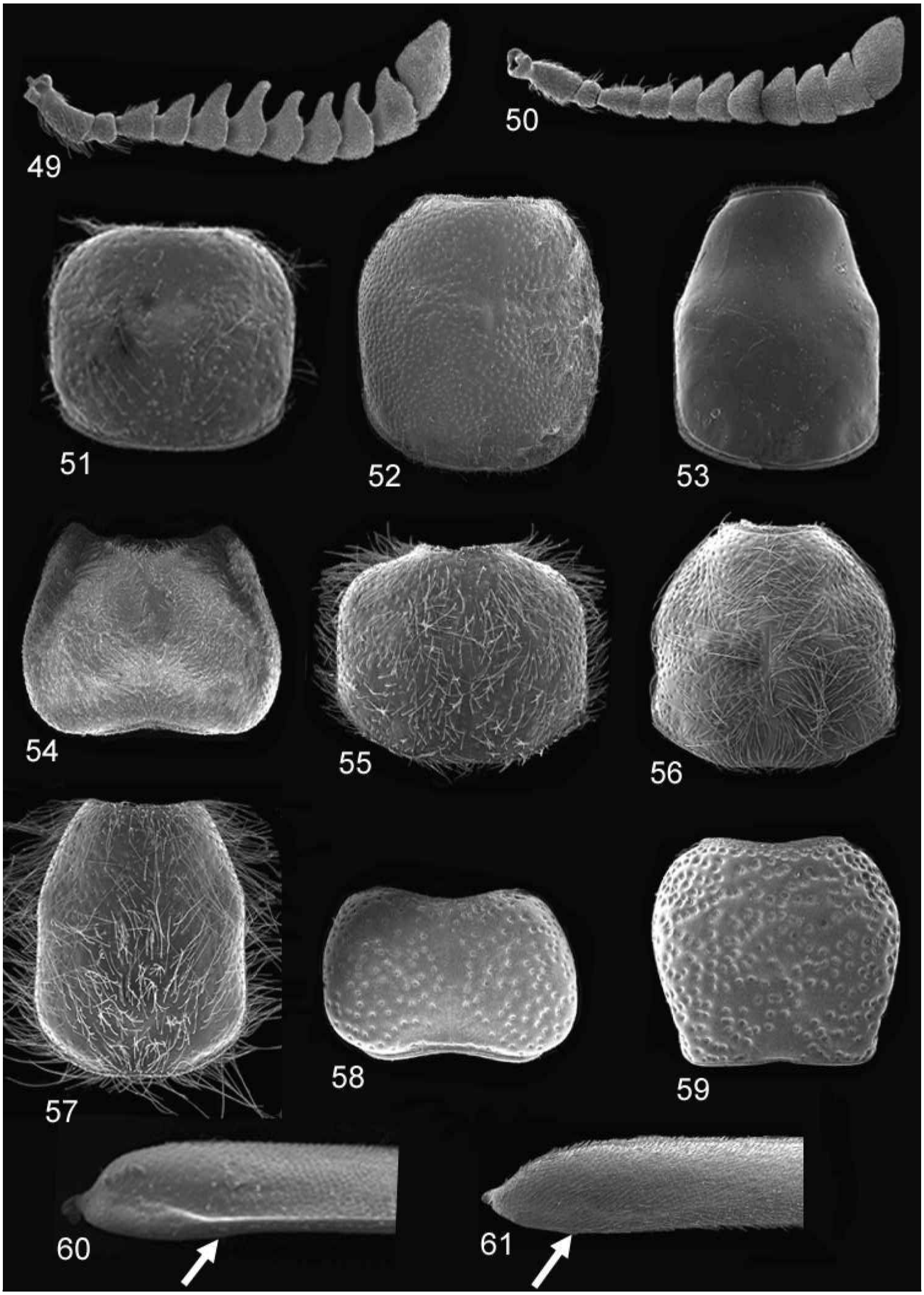
FIGS 10–18. (10) *Physomeloe corallifer*; (11) *Actenodia suturifera* (Pic, 1896); (12) *Mylabris cincta* Ol., 1795; (13) *Synhoria senegalensis* (Lap., 1840); (14) *Allendesalazaria nymphoides*; (15) *Apalus necydaleus* (Pallas, 1782); (16) *Megatrachelus politus*; (17) *Zonitomorpha transgressor* (Per., 1899); (18) *Zonitis nana* Ragusa, 1882.



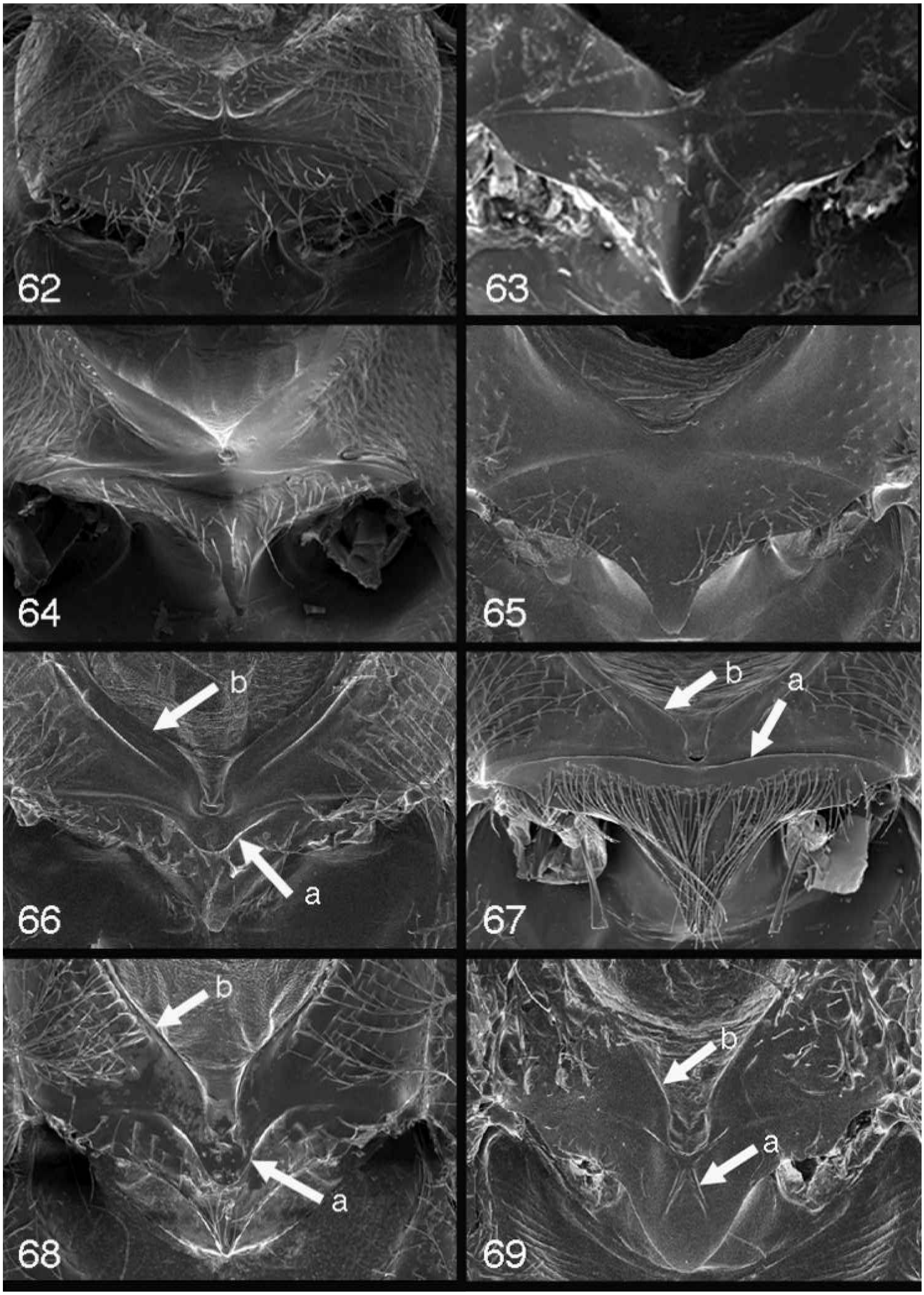
FIGS 19–34. Head capsule: (19) *Deridea curculionides*; (20) *Iselma brunneipes*; (21) *Cabalia segetum*; (22) *Lytta vesicatoria*; (23) *Oenas sericeus* (Ol., 1795); (24) *Epicauta* sp.; (25) *Psalydolytta sheffieldi* (Pic, 1909); (26) *Cerocoma schaefferi*; (27) *C. schaefferi*; (28) C. *schaefferi* (detail: a, frontal suture; b, lateral furrow); (29) *Iselma brunneipes*; (30) *Leptopalpus rostratus*; (31) *Nemognatha chrysomelina* (Fab., 1775); (32) *Zonitis flava* Fab., 1775; (33) *Zonitoschema gigantea* (Fairm., 1894); (34) *Lydomorphus dusaulti*.



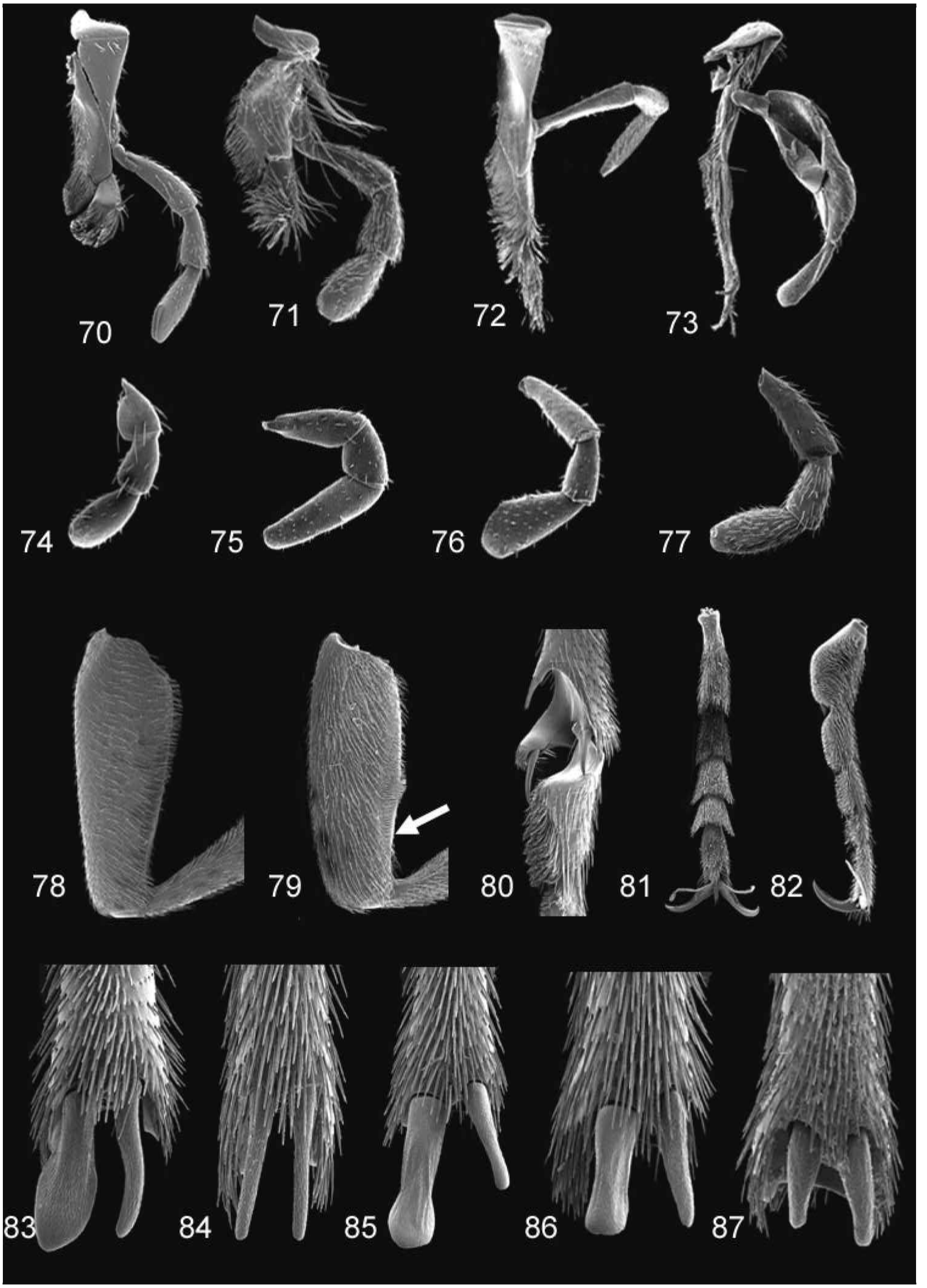
FIGS 35–48. Antenna: (35) *Iselma brunneipes*; (36) *Alosimus armeniacus* (Faldermann, 1837); (37) *Berberomeloe majalis*, male; (38) *Cabalia segetum* (segments I and II missing); (39) *Lydus marginatus* (Fab., 1792); (40) *Prolytta semilineata* (Haag-R., 1880); (41) *Oenas sericeus*; (42) *Cerocoma schaefferi*, male; (43) *C. schaefferi*, female; (44) *Actenodia distincta* (Chev., 1837); (45) *Hycleus lunatus* (Pallas, 1782); (46) *Hycleus tripunctatus* (Thunberg, 1791); (47) *Hycleus duedecimmaculatus* (Ol., 1811); (48) *Lydoceras stanleyanus*.



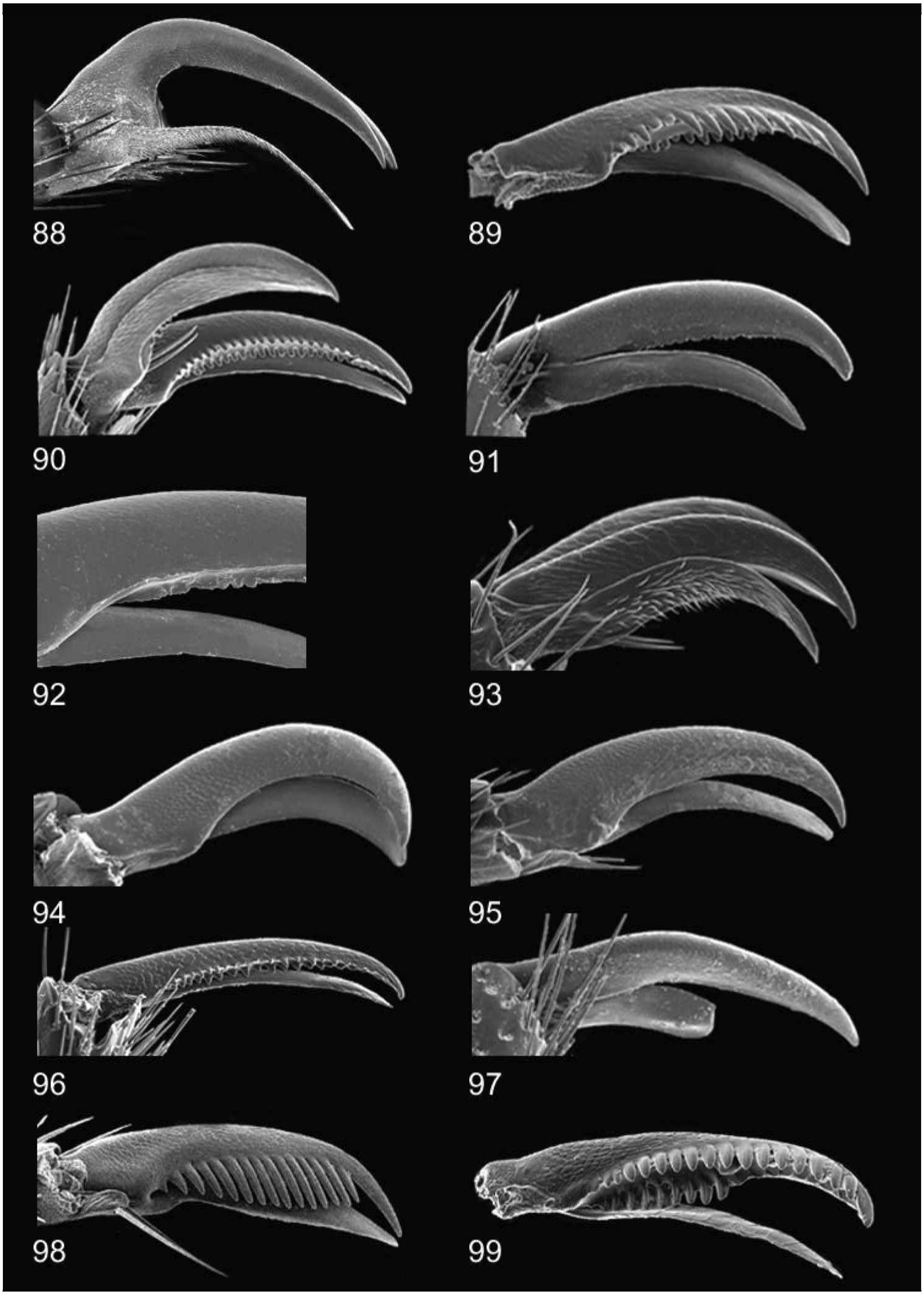
Figs 49–61. (49, 50) Antenna: (49) *Ceroctis exclamationis* (Mars., 1872), male; (50) C. *exclamationis*, female. (51–59) Pronotum: *Alosimus armeniacus*; (52) *Lydus marginatus*; (53) *Lydomorphus dusaulti*; (54) *Trichomeloe sericellus*; (55) *Actenodia distincta*; (56) *Hycleus lunatus*; (57) *Mylabris fabricii*; (58) *Meloe brevicollis*; (59) *Meloe proscarabaeus*. (60, 61) Elyron (base at left): (60) *Megatrachelus politus* (arrow to lateral border); (61) *Zonitis flava* (arrow to lateral edge lacking border).



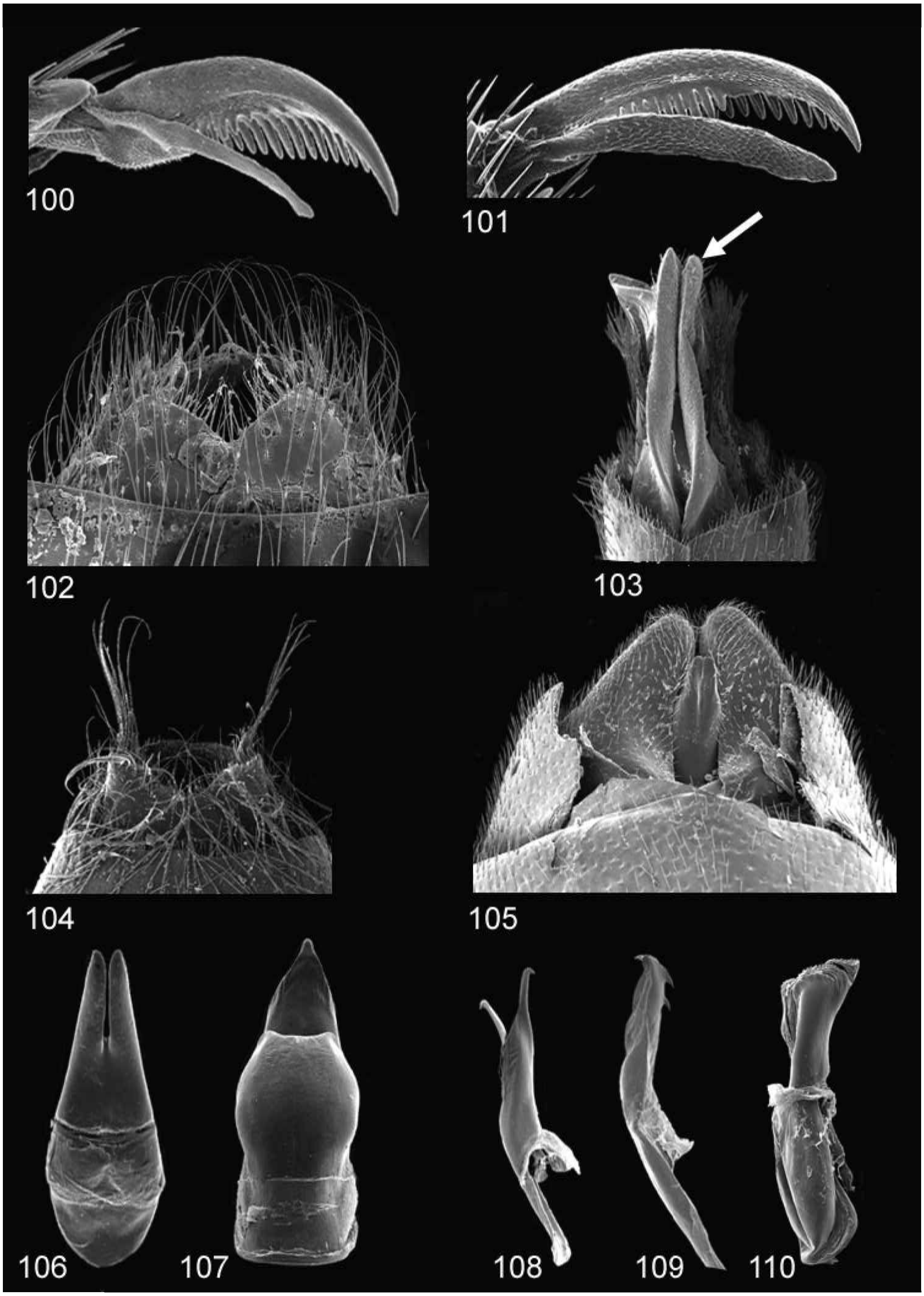
FIGS 62–69. Mesepisterna and mesosternum (ventral): (62) *Lytta vesicatoria*; (63) *Actenodia distincta*; (64) *Ceroctis exclamationis*; (65) *Croscherichia gilvipes* (Chev., 1838); (66) *Hycleus brevicollis*(Baud, 1878) (a, 'scutum', b, furrowed anterior border of mesepisternum); (67) *Hycleus lunatus* (a, differentiated anterior section of mesosternum but not modified as a 'scutum'; b, furrowed anterior border of mesepisternum); (68) *Mylabris fabricii* (a, 'scutum'; b, anterior edge of mesepisternum lacking furrowed border); (69) *Mylabris hieracii* Graells, 1849 (a, scutum; b, anterior edge of mesepisternum lacking furrowed border).



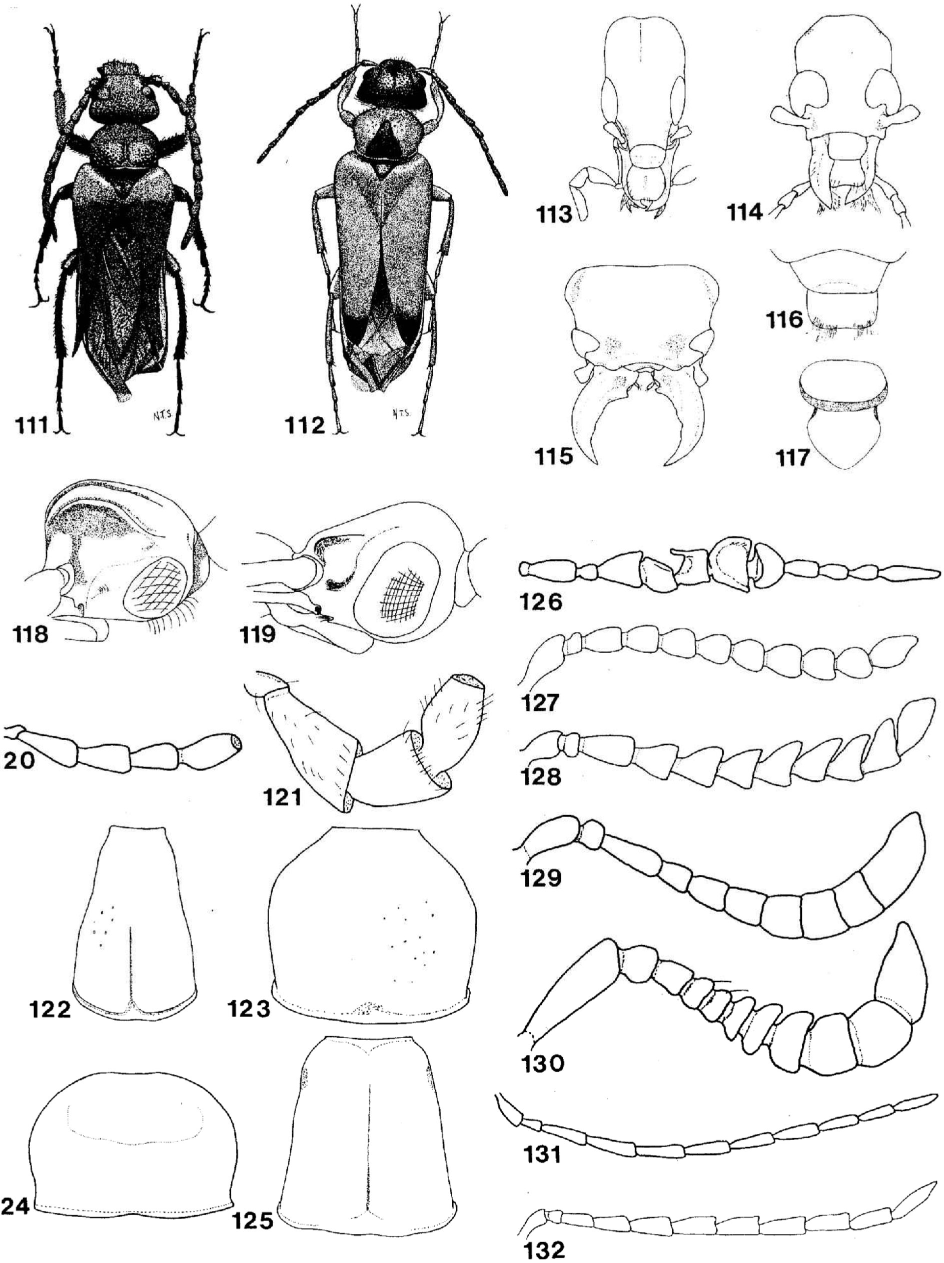
FIGS 70–87. (70–73) Maxilla: (70) *Lydomorphus dusaulti*; (71) *Apalus bipunctatus* Germar, 1817; (72) *Zonitoschema gigantea*; (73) *Cerocoma schaefferi*, male. (74–77) Maxillary palp: (74) *Alosimus armeniacus*; (75) *Oenas sericeus*; (76) *Stenodera puncticollis*; (77) *Zonitis flava*. (78, 79) Forefemur: (78) *Berberomeloe majalis*; (79) *Epicauta* sp. (arrow to modified area with transverse setae). (80) *Teratolytta dives*, male (modified apex of midtibia). (81, 82) Tarsus: (81) *Eletica* sp. (foreleg); (82) *Oenas sericeus*, male (midleg). (83–87) Hind tibia (right leg, ventral view showing apical spurs): (83) *Croscherichia gilvipes*; (84) *Mylabris fabricii*; (85) *Euzonitis fulvipennis* (Fab., 1792); (86) *Zonitis flava*; (87) *Zonitis immaculata* (Ol., 1789).



FIGS 88–99. Tarsal claw (ventral below): (88) *Eletica infans*; (89) *Alosimus armeniacus*; (90) *Oenas sericeus*; (91) *Eolydus conspicums* (Waterhouse, 1889); (92) *Eolydus conspicuus* (detail); (93) *Cabalia segetum*; (94) *Lytta vesicatoria*; (95) *Prolytta* sp.; (96) *Mylabris fabricii*; (97) *Mylabris allousei*; (98) *Stenodera puncticollis*; (99) *Zonitis flava.*



FIGS 100–110. (100–101) Tarsal claw (ventral below): (100) *Apalus bipunctatus*; (101) *Zonitis flava.* (102–105) Male last visible sternum: (102) *Sybaris* sp.; (103) *Lydomorphus dusaulti* (arrow to apex of twisted last sternum); (104) *Teratolytta dives*; (105) *Zonitis flava* (penultimate sternum removed to reveal completely divided last sternum). (106, 107) Male gonoforceps (ventral): (106) *Lytta nitidicollis* (LeC., 1851); (107) *Zonitis flava.* (108–110) Aedeagus (lateral, ventral on left): (108) *Epicauta puncticollis* (Mann., 1843); (109) *Meloe impressus* Kirby, 1837; (110) *Zonitis flava.*



FIGS 111–132. (111) *Sitaris muralis*; (112) *Stenoria apicalis* (111, 112 from Bologna, 1991a). (113–115) Head capsule: (113) *Deridea curculionides*; (114) *Zonitomorpha sellata*; (115) *Synhoria cephalotes*. (116, 117) Labrum: (116) *Sitaris muralis*; (117) *Syriolytta suturifera*. (118, 119) Head capsule (lateral, male): (118) *Rhampholyssa steveni*; (119) *Rhampholyssodes pitcheri*. (120, 121) Maxillary palp: (120) *Morphozonitis* sp.; (121) *Eletica colorata*. (122–125) Pronotum: (122) *Deridea curculionides*; (123) *Megatrachelis politus*; (124) *Zonitis bellieri* Reiche, 1860; (125) *Zonitomorpha sellata*. (126–132) Antenna: (126) *Ceriselma methneri* (male); (127) *Eolydus atripes*; (128) *Prionotolytta binotata*; (129) *Semenovilia fischeri*; (130) *Xanthabris baluchistana*; (131) *Zonitis* nr. *nigriventris* Mots., 1845; (132) *Zonitomorpha sellata*.

entry in the key. Each synopsis includes synonymies, the type species for all available nominal genera, the number of species (excluding fossils), general geographic distribution, the most important literature associated with each group, and, in several cases, notes pertaining to taxonomy and biology. The listing of genus group names includes, in addition to all synonyms, subgeneric names, including those of the New World fauna. The literature citations are not exhaustive. They include the most significant works on taxonomy and biology. Generic revisions, reviews, catalogues and keys to species are indicated. References are partitioned among various categories. The number of these listed of course varies with each genus. Only the *Taxonomy* category is included for all. References listed under *Bionomics* include papers on adult and larval behaviour, ontogeny and host relationships. Those listed under *Larvae* include works primarily restricted to larval morphology. Citations associated with *Anatomy* include works devoted to internal structure and embryology. The *Larvae* category is isolated from the latter because of the special importance of larval morphology in meloid taxonomy. Original generic descriptions are not referenced unless the publication also is considered an important source of general taxonomic information in which case the paper is listed in the *Taxonomy* category. References to this original literature are provided by Selander (1991).

The generic synopsis incorporates a greater number of 19th- and early 20th-century references than did our New World review. This is because, unlike a large proportion of those in the New World, very few Old World genera have been recently revised. This dependence on the older literature unavoidably presents problems for the non-specialist as the generic names and definitions found there will not always agree with current usage.

Two new, undescribed genera from South Africa are considered here also. One is a monotypic eleticine (see No. 9 in synopsis), and the second belongs to the Meloinae, tribe Lyttini (see No. 12 in synopsis).

Nomenclatural changes. The few formal nomenclatural modifications included in the synopsis are as follows: New synonymies—*Paroenas* Kolbe, 1894 (=*Cabalia* Mulsant and Rey, 1858); *Gnathonemula* Aksentjev, 1981 (=*Nemognatha* Illiger, 1807). New status—*Syriolytta* Kaszab, 1962. New combinations—*Actenodia perfuga* (Dvorak, 1993a); *Croscherichia sonyae* (Kaszab, 1983); *Lydomorphus fryi* (Borchmann, 1942). Also, the subgenus *Indiolytta* Selander, 1960a, is transferred from *Eolydus* and returned to *Lytta* where it originally was described. The questionable status of *Denierella*, *Nyadatus*, *Pseudosybaris* and *Zonitodema* is discussed, although formal synonymies are not proposed at this time.

Collections studied. We examined material from the following museums and collections (acronyms in parentheses for most follow Arnett *et al.*, 1993): The Natural History Museum, London (BMNH); California Academy of Sciences, San Francisco (CASC); Marco A. Bologna Collection, Università di Roma Tre, Roma (CB); Field Museum of Natural History (FMNH); Florida State Arthropod Collection, Gainesville (FSCA); Természettudomanyi Múzeum Allàttara, Budapest (HNHM); Los Angeles County Museum (LACM); Museo civico di Storia naturale 'G. Doria', Genova (MCSN); Museo Nacional de Ciencias Naturales, Madrid (MNMS); Museo regionale di Scienze naturali, Torino (MRSN); Museo civico di Storia Naturale, Verona (MSNV); Museo di Zoologia de 'La Specola', Università di Firenze (MZUF); Museo di Zoologia dell'Università di Roma La Sapienza (MZUL); Narodni Muzéum, Entomology, Kunratice-Praha (NMPC);

Naturhistorisches Museum, Wien (NMW); Muséum National d'Histoire naturelle, Paris (PMNH); Plant Protection Research Institute, Pretoria (PPRI); South African Museum, Department of Entomology, Cape Town (SAMC); Staatliches Museum für Naturkunde, Stuttgart (SMNS); State Museum of Namibia, Windhoek (SMWN); Transvaal Museum, Pretoria (TMSA); University of California, Riverside (UCRC); Insituut voor taxonomische Zoölogie, Zoölogisch Museum, Amsterdam (ZMAN); Museum für Naturkunde der Humboldt Universität, Berlin (ZMHB).

Key to the Genera of Old World Meloidae

1 Maxillary palpi five-segmented; segment I short, four segments easily visible (figure 120) 2

1° Maxillary palpi four-segmented; segment I short, three segments easily visible (figure 121) 5

2(1) Eyes large, bulged, extending on underside of head to lateral margin of maxilla. Temples short, rounded; top of eyes attaining level greater than half the distance from clypeus to occiput. Antennae slender, elongate, attaining base of elytra; segment IV subequal in length to III or longer. S Ethiopia, N Somalia. . (7) *Steniselma*

2° Eyes neither bulged nor extending to lateral margin of maxilla on underside of head. Temples elongate; top of eyes attaining level about half the distance from clypeus to occiput. Antennae shorter, attaining, at most, base of pronotum; segment IV usually shorter than III. 3

3(2°) Brachypterous. Hind femora greatly inflated. Elytra with lateral margin arcuate. Mandibles somewhat reclinate in lateral view. S Ethiopia (female unknown) . . . . (4) *Afrospasta*

3° Fully winged. Hind femora not inflated or only slightly so. Elytra with lateral margin relatively straight, not arcuate. Mandibles not reclinate 4

4(3°) Male antennal segments III–VII not enlarged and distorted. E and SE Africa. . . . . (6) *Morphozonitis*

4° Male antennal segments III–VII greatly enlarged and distorted (figure 126). Tanzania (female unknown). . . . . (5) *Ceriselma*

5(1°) Forefemora with apical half of ventral surface (that opposing tibia) slightly excavated, excavation with a patch of appressed, transversely directed silky pubescence (figure 79). 6

5° Forefemora without a ventroapical excavation and lacking a patch of transversely directed pubescence (figure 78). 8

6(5) Dorsal blade of tarsal claws with two rows of teeth along ventral margin (as in figure 89). India and Indochina. . . . . (39) *Denierella*

6° Dorsal blade of tarsal claws smooth along ventral margin (as in figures 94, 95) 7

7(6°) Mandibles elongate and pointed at apex, lateral margins appearing relatively straight in frontal view, apical half abruptly reclinate. Labrum short, leaving apical half of mandibles exposed. Figure 25. Subsaharan Africa and Oriental region. . . . . (41) *Psalydolytta*

7° Mandibles shorter, not pointed at apex, lateral margins appearing distinctly curved in frontal view, apical half not reclinate. Labrum longer, extending beyond basal half of mandibles. Figure 24. Generally distributed in Old World (except Madagascar). . . . . (40) *Epicauta*

8(5°) Dorsal blade of tarsal claws with one or two rows of teeth along ventral margin (only basally in one Mediterranean species). Claws always with a distinct ventral blade. Figures 89–92, 96, 98–101. 9

8° Dorsal blade of tarsal claws smooth (figures 88, 93–95), or at most, with a single large tooth-like projection, in which case a distinct ventral blade is absent (figure 97). 40

9(8) Elytra more or less reduced in apical width and often in length as well, dehiscent at least at apical third (i.e. with medial margins moderately to distinctly divergent at apex). Figures 15, 111, 112. Claws with ventral blade narrow, its greatest width less than half the basal width of dorsal blade (figure 100). Wings sometimes absent. Length <15 mm. Colour variable. 10

9° Elytra normal, not reduced in size or dehiscent apically. Claws usually with ventral blade wider, its greatest width greater than half basal width of dorsal blade (figure 101) but if narrower (Horiini) then large orange beetles exceeding 15 mm in length. Wings always present. 20

10(9) Maxillary palpi abnormally elongate, more than twice the length of labial palpi. Elytra greatly reduced and abruptly spathulate at apex. India or SE Asia? . . . . (69) (from literature) *Onyctenus*

10° Maxillary palpi of normal length, at most twice the length of labial palpi. Elytra variously shaped but never spathulate at apex. 11

11(10°) Antennae eight-segmented; segments V–VII subtriangular, VIII–X fused forming a single flattened, enlarged segment. Elytra dehiscent from base, lateral margins arcuate as in *Sitaris* (figure 111). Central Asia. . . . (72) (from literature) *Sitaromorpha*

11° Antennae 11-segmented; apical segments not enlarged. Elytral shape variable. . 12

12(11°) Antennae short in both sexes, never reaching middle of body, usually extending only to base of elytra. 13

12° Antennae elongate, especially in male, reaching middle of body (sometimes a little shorter in females). 14

13(12) Elytra completely covering abdomen and wings. Hind tarsal segment I shorter than combined length of segments II and III. Causasus to eastern Central Asia. . . . . (62) *Ctenopus*

13° Elytra short, not completely covering abdomen and wings. Hind tarsal segment I longer than combined length of segments II and III. W Sahara . . . . (73) (male unknown; from literature) *Stenoria* (*Gineremia*)

14(12°) Eyes, particularly in male, large and bulging, extending to maxilla on underside of head. Abdominal sterna II and III in male each with a deep, oval, transverse excavation set with long yellow setae. Central Asia. . . . . . (64) *Glasunovia*

14° Eyes smaller, not bulging, not extending to maxilla on ventral side of head, if rarely somewhat enlarged then not occurring in Central Asia. Abdominal sterna II and III not as above. 15

15(14°) Elytra short, shorter than half abdomen length. 16

15° Elytra longer, longer than half abdomen length. 17

16(15) Wingless. Elytra narrowest at apex, not dehiscent immediately at base; lateral margins not noticeably arcuate. E and S Mediterranean region, Canary Islands. . . . . (71) (female) *Sitarobrachys*

16° Winged. Elytra narrowest at middle, strongly dehiscent at base immediately beyond scutellum; lateral margins noticeably arcuate. E Mediterranean. . . . . (70) (minor part: females of one undescribed species from S Turkey) *Sitaris*

17(15°) Elytra (figure 111) very narrow, lyriform, usually not reaching apex of abdomen; strongly dehiscent from base; distance between elytra at middle at least 1.5–2.0 × width of each elytron at that point. Europe, Central Asia and India, Africa (except Guinean Gulf). . . . . (70) (major part) *Sitaris*

17° Elytra not as narrow, not lyriform in shape, usually attaining apex of abdomen; dehiscent posterior to base, often only at apical third; elytra contacting at middle, but if separate then distance between them less than 1.5 × width of each elytron at that point. 18

18(17°) External hind tibial spur very broad, considerably wider than inner spur (figure 141). Elytra not distinctly narrowed posteriorly (figure 15) with lateral margin only slightly arcuate at posterior two-thirds. Palaearctic region, E and S Africa. . (60) *Apalus*

18° Hind tibial spurs subequal in width (figure 142). Elytra variable in shape. . . 19

19(18°) Pronotum at least 0.7 as long as wide. Elytra greatly narrowed posteriorly (figure 112), with lateral margins usually strongly arcuate at posterior two-thirds. Palaearctic region, E and S Africa. . . . . (73) (in part) *Stenoria* (*Stenoria*)

19° Pronotum strongly transverse, less than 0.7 as long as wide. Elytra not as greatly narrowed, with lateral margin only moderately arcuate at posterior two-thirds. E and S Mediterranean region, Canary Islands. . . . . (71) (male) *Sitarobrachys*

20(9°) Labrum very short, not attaining middle of mandibles (figure 115). Claws with ventral blade narrow, its greatest width less than half the basal width of dorsal blade (as in figure 100). Colour uniformly orange or orange brown; surface often lacquered in appearance. Large beetles, exceeding 15 mm and usually attaining 30–50 mm in length. 21

20° Labrum longer, at least attaining middle of mandibles (figure 114). Claws with ventral blade wide, its greatest width more than half basal width of dorsal blade (figure 101). Colour variable. Smaller beetles, usually less than 20 mm, rarely attaining 30 mm in length. 22

21(20) Pronotum length usually greater than head length to apex of mandibles. Male hind femora inflated, noticeably broader than middle femora. Males with mandibles not extremely enlarged and with head narrower at temples than at eyes. (57) *Horia*

21° Pronotum length equal to or less than head length to apex of mandibles. Male hind femora not inflated, subequal in width to middle femora. Males with mandibles extremely enlarged and with head wider at temples than at eyes (figures 13, 115). . . . . (58) *Synhoria*

22(20°) Maxillary galeae unmodified, not elongate, with a tuft of dense relatively elongate medially directed setae (figure 70). Aedeagus with one or two dorsal hooks; endophallus well sclerotized and also hooked (figures 108, 109); gonoforceps fused only at basal third or half (figure 106). Male last sternum relatively shallowly V-emarginate (as in figure 102), if cleft to base (*Lydomorphus fryi*) then the divided sections elongate and twisted (figure 103). 23

22° Maxillary galeae modified, elongate, either penicillate with a tuft of dense elongate setae confined to apex and directed apically (figures 32, 33, 72) or produced into an elongate sucking tube (figure 31). Aedeagus without hooks, and endophallus only slightly sclerotized, never hooked (figure 110); gonoforceps usually completely fused (figure 107), rarely only at basal half (*Stenodera*, figure 151). Male last sternum deeply cleft to base but divided sections never elongate or twisted (figure 105), rarely shallowly V-emarginate (*Stenodera*). 31

23(22) Eyes large and bulging, extending at least to maxilla on underside of head (figure 34). 24

23° Eyes much smaller, not bulging, never extending to maxilla on underside of head (figure 22). 25

24(23) Male with last abdominal sternum moderately V-emarginate to near middle (figure 102). Male gonoforceps well sclerotized, usually not divergent at apex; phallobase distinctly shorter than gonoforceps (figure 148); aedeagus with a single, small apical dorsal hook. Pronotum subhexagonal. Subsaharan Africa, India and part of Indochina. . . . . (29) *Sybaris*

24° Male with last abdominal sternum deeply cleft to base with the divided sections elongate and twisted (as in figures 103, 144). Male gonoforceps lightly sclerotized, greatly divergent at apex; phallobase longer relative to gonoforceps (as in figure 149); aedeagus with a single, small distinctly subapical dorsal hook. Pronotum subcylindrical. Tanzania. . . . . (18) *Lydomorphus fryi*

25(23°) Colour pattern unique (figure 5): pronotum red with two parallel black spots; elytra metallic green or blue; head with vertex and occiput red, frons and underside primarily black; legs usually primarily red beyond trochanter. Middle tibiae with dorsal (outer) surface somewhat compressed, with dense black setae. E Europe to Iran. . . . . (24) *Muzimes*

25° Colour pattern never as above. Middle tibiae with dorsal (outer) surface not as above. 26

26(25°) Mesosternum anteriorly with a modified, smooth, sometimes elevated, glabrous area or 'scutum' (figure 68). Elytra orange-red with black spots or bands (as in figures 12, 135, 136) (rarely uniformly red in a variant of *Mylabris crocata*); body never metallic in colour. Palaearctic Region and W India. . . . (48) (in minor part) *Mylabris*

26° Mesosternum unmodified, its surface homogeneous (as in figure 62). Elytral colour variable, metallic or not. 27

27(26°) Ventral margin of dorsal blade of claws with a single row of minute, poorly defined, teeth or crenulae (figures 91, 92). 28

27° Ventral margin of dorsal blade of claws with two rows of distinctive teeth (figures 89, 90). 29

28(27) Pronotum with sides relatively straight or evenly arcuate, never angulate. Antennae submoniliform, with at least segments IX and X as wide as long, or slightly wider than long (figure 127). Male foretarsal segments unmodified. Iraq to Pakistan and Uzbekistan. . . . . (16) *Eolydus*

28° Pronotum more or less subhexagonal with sides angulate laterally. Antennae not submoniliform, with segments IX and X distinctly longer than wide. Male foretarsal segments enlarged (three spp.) or not (two spp.). Central Asia, Kashmir. . . . . (21) (minor part) *Lytta*

29(27°) Last segment of maxillary palpi distinctly narrowed apically (figure 75). Male head strongly impressed behind eye (figure 23). Antennal segments IV–X transverse and symmetrical (figure 41); antennae short, usually not attaining base of pronotum. Claws with relatively short teeth (figure 90). Middle tarsi with segment I always enlarged in male (figure 82). Colour never metallic. Mediterranean region. . . . . (25) *Oenas*

29° Last segment of maxillary palpi not distinctly narrowed apically (figure 74). Male head not impressed behind eye. Antennal segments IV–X more elongate or if transverse then at least slightly asymmetrical (figures 36, 39); antennae usually longer and attaining base of pronotum. Claws with relatively large teeth (figure 89). Middle tarsi with segment I enlarged in male or not. Colour metallic or not. 30

30(29°) Pronotum longer than wide or, less commonly, as wide as long (figure 52). Antennal segments VI–X as wide or wider than long with acentric sockets (segments appearing at least slightly asymmetrical); segment III usually noticeably longer than IV (figure 39). Colour never metallic. Mediterranean region to Iran. . (20) *Lydus*

30° Pronotum wider than long (figure 51). Antennal segments VI–X more elongate, V–VI (often V–X) usually longer than wide with sockets centrally placed (segments appearing symmetrical); segment III subequal in length to IV or only slightly longer (figure 36). Colour metallic or not. Mediterranean region, SE Europe, Causasus to Iran. . . . . (11) *Alosimus*

31(22°) Maxillary palpi with last segment widening to apex, subtriangular in shape (figure 76). Claws with a single row of teeth on ventral margin of dorsal blade. Male gonoforceps not fused at apical half (figure 151). E Mediterranean region, Iran, Central Asia, SE China. . . . . (56) *Stenodera*

31° Maxillary palpi with last segment not widening to apex (figure 77). Claws with two rows of teeth on ventral margin of dorsal blade (figure 99). Male gonoforceps completely fused (figure 107). 32

32(31°) Maxillary palpi extremely elongate (figure 30), almost as long as antennae. W Mediterranean region, Yemen, Eritrea. . . . . (65) *Leptopalpus*

32° Maxillary palpi of normal length (figure 32), much shorter than antennae. . . 33

33(32°) Eyes very large, at least attaining medial margin of maxillae on underside of head (almost in contact in several species, particularly in male) (figure 33). Saharo-Iranian Region, E Palaearctic, entire Afrotropical and Oriental regions. (77) *Zonitoschema*

33° Eyes smaller, at most attaining lateral margin of maxillae on underside of head (as in figure 34). 34

34(33°) Pronotum distinctly longer than wide (figure 125). 35

34° Pronotum wider than long or dimensions subequal (figures. 123, 124). . . . 36

35(34) Pronotum campaniform, widest at base (figures 17, 125). Head very elongate, temples parallel (figure 114). Antennae usually subserrate, particularly in male (figure 132). Afrotropical and Oriental regions. . . . . (76) *Zonitomorpha*

35° Pronotum not campaniform, widest anterior to base (as in figure 124). Head usually short, subtriangular in shape with temples divergent above eyes (figure 32). Antennae usually subfiliform (figure 131), rarely subserrate. Afrotropical and Oriental regions. . . . . (74) (minor part) *Zonitis*

36(34°) Maxillary galeae elongate, forming a sucking tube which usually is longer than the maxillary palpi (figure 31). . . . . (67, 75) *Nemognatha*, *Zonitodema*

36° Maxillary galeae only slightly elongate, not longer than maxillary palpi, not forming a sucking tube (figures 32, 33, 72). 37

37(36°) Pronotum smooth with extremely sparse and fine punctures, widest at middle and narrowed anteriorly (figure 123). Black with orange elytra. Elytra with (figure 16) or without black maculae, distinctly margined laterally (figure 60). NE Palaearctic region. . . . . (66) *Megatrachelus*

37° Pronotum distinctly punctate and variously shaped. Colour variable. Elytra usually not margined laterally (figure 61), but if so (*Cochliophorus*) then colour pattern not as above. 38

38(37°) Outer hind tibial spur much longer, more robust and wider apically than inner spur (figure 85). Mediterranean region, S Europe, Near East, Central Asia, Iran. . . . . (63) *Euzonitis*

38° Outer hind tibial spur about as long as inner spur, variable in width (figures 86, 87, 143). 39

39(38°) Colour orange-red with violet metallic elytra and black antennal segments III–X. Elytra distinctly margined laterally (as in figure 60); elytral ribbing (venation) not evident. Hind tibial spurs both widened (figure 143). Pronotum distinctly wider than long. Greece. . . . . (61) *Cochliophorus*

39° Colour not as above. Elytra not margined (figure 61), or if so then not Palaearctic; elytral ribbing evident or not. Hind tibial spurs and dimensions of pronotum variable. S Palaearctic, Afrotropical and Oriental regions. . . . (74) (major part) *Zonitis*

40(8°) Wingless with elytra abbreviated (figures 3, 9, 10, 14). 41

40° Winged with elytra well developed (elytra abbreviated but wings present in *Cyaneolytta violacea* Brandt and Ratzeburg from India). 47

41(40) Elytra extremely reduced, oval, widely separated immediately at base, barely extending to base of abdominal tergum II (figure 14). Claws with ventral blade absent or setiform. 42

41° Elytra not so reduced, not separated at very base, extending beyond base of abdominal tergum II (figures 3, 9, 10). Claws with ventral blade of normal shape (figures 94, 95). 43

42(41) Claws with ventral blade absent. Head with a distinct constriction between occiput and cervix. Metasternum with posterior margin not arcuate. NW Africa. . . . . (59) *Allendesalazaria*

42° Claws with ventral blade present but highly reduced, setiform. Head without a distinct constriction between occiput and cervix. Metasternum with posterior margin broadly arcuate. Tibet. . . . . (54) (from literature) *Oreomeloe*

43(41°) Antennal segments V-X subdentate and XI notched subapically (more evident in males) (figure 37). Abdominal terga black, commonly bordered posteriorly with red. Frontal suture distinctly arcuate. W Mediterranean. . . . . (13) *Berberomeloe*

43° Antennal segments V–X (at least VIII–X) not subdentate, XI never notched. Abdominal terga always entirely black. Frontal suture subangulate. 44

44(43°) Pronotum transverse, each side with two large shiny red lateral tubercles (figure 10). Iberian Peninsula. . . . . (55) *Physomeloe*

44° Pronotum not as above, usually uniformly dark in colour, sides rarely red (*Meloe vlasovi*), never laterally tuberculate. 45

45(44°) Head with a red frontal macula of varying size, or almost entirely red above eyes. Pronotum distinctly reniform (figure 54). Body with golden pubescence. Male with antennal segments III–VII (minimally only III or III–IV) with a smooth and glabrous ridge on dorsal surface. E Mediterranean, Mesopotamia (possibly also Central Asia). . . . . (32) *Trichomeloe*

45° Head completely dark in colour. Pronotum shape variable (figures 58, 59) but never reniform. Body rarely with golden pubescence. Male antennal segments without a glabrous ridge dorsally. 46

46(45°) Elytra overlapping at base (figure 9) and unicolorous, usually dark, rarely metallic green. Palaearctic Region and bordering Oriental countries, E and S Africa, Madagascar. . . . . (53) *Meloe*

46° Elytra not overlapping at base and bicolorous, yellow with black laterally. Nepal. . . . . (73) (female) *Stenoria thakkola*

47(40°) Labrum elongate and longitudinally furrowed or carinate (figures 27, 28). Antennal sockets distant from eyes, usually placed below or on frontal suture (figures 27, 28); antennae, foretibiae and often maxillae strongly and bizarrely modified in male (as in figures 26, 42, 73); antennae more or less claviform in female (figure 43). . 48

47° Labrum not longitudinally furrowed or carinate. Antennal sockets closer to eyes, placed above frontal suture (figure 21); male antennae, foretibiae and maxillae never similarly modified; antennae variable in female. 52

48(47) Elytra yellowish with or without black maculae, never metallic. Protibiae with one apical spur. Male foretarsi not modified. Antennae eight to nine-segmented. . 49

48° Elytra completely or partially metallic. Protibiae usually with two apical spurs (rarely one or both spurs absent). Male foretarsi usually strongly modified. Antennae 9–11-segmented. 50

49(48) Antennae eight-segmented. Male frons with a high longitudinal crest which is profoundly concave laterally; head in lateral view with top of eyes much less than half the distance to top of crest (figure 118). Elytra uniformly yellow, at most only slightly darkened at apex. Central Asia. . . . . (36) *Rhampholyssa*

49° Antennae nine-segmented. Male frons with a weak longitudinal crest which is only weakly concave laterally; head in lateral view with top of eyes greater than half the distance to top of crest (figure 119). Elytra with a black macula at middle and a black apex. Arabia. . . . . (37) *Rhampholyssodes*

50(48°) Antennae nine-segmented. From Spain and Morocco to Central Asia. . . . . (34) *Cerocoma*

50° Antennae 11-segmented. 51

51(50°) Head (at least in part), pronotum and abdomen yellow-orange. Mesopotamia, S Iran, Arabia, N Somalia. . . . . (33) *Anisarthrocera*

51° Head, pronotum and abdomen either black or metallic, never yellow-orange. Sahara from Morocco to Arabia and Palestine. . . . . . . (35) *Diaphorocera*

52(47°) Head very elongate, flat, length from clypeus to top of head *ca.* 1.5 × greatest width (figure 113), with long axis of eye subparallel to long axis of head (figure 19). Pronotum also very elongate, more than 1.5 × as long as wide, considerably wider at base than at middle (figure 122). Elytra with dorsal surface flattened, apical margin broadly arcuate to transverse. Central, E and S Africa, W Arabia. . (1) *Deridea*

52° Head not so elongate, but if moderately so (*Iselma*) (figure 29) then long axis of eye not subparallel to long axis of head (figure 20). Pronotum not as elongate, widest at middle or at least no wider at base than at middle. Elytra relatively convex throughout, apical margin distinctly arcuate or subangulate. 53

53(52°) Colour metallic blue, green or black, except metasternum with an orange or red stripe or blotch (head and pronotum orange in the Malagasy species, and red metasternal stripe much reduced in a brachyelytrous Indian species). Antennal segments usually noticeably flattened. Africa south of N Sahara, Cabo Verde islands, S Arabia, Pakistan, India. . . . . (38) *Cyaneolytta*

53° Colour variable but metasternum never dark with orange or red metasternal markings as above. Antennal segments variable. 54

54(53°) Claws with ventral blade fringed with micropubescence, at least at basal half (figures 88, 93). 55

54° Claws with ventral blade not fringed with micropubescence (figures 94, 95). . 61

55(54) Genae and mouthparts with elongate golden setae, these setae distinctly longer than those on other surfaces of head. Hind tibial spurs similar, spiniform. Saharo-Arabian region. (23) *Lyttonyx*

55° Genae and mouthparts with variable setation but if elongate then setae similar to those on other surfaces of head. Hind tibial spurs variable but both never spiniform. 56

56(55°) Tarsi with two or more segments bilobed (figure 81). Elytra with ribbing (venation) obvious at least at basal third (figure 2). Frons swollen between eyes resulting in base of clypeus at a lower level. Male gonoforceps robust, short, not narrowing in apical half, recurved dorsally. Sub-Saharan Africa, India, Indochina. . . (8) *Eletica*

56° Tarsal segments not bilobed. Elytral ribbing not evident. Frons not swollen between eyes, at same level as clypeus. Male gonoforceps elongate and relatively slender, narrowing in apical half, not recurved. 57

57(56°) Head and pronotum almost always with elongate, shaggy setae (figure 29). Head narrow and distinctly longer than wide in most species (figures 1, 29). Pronotum longer than wide or not. Antennal segments elongate (e.g. subterminal segments *ca.* twice as long as wide), subfiliform (rarely subserrate); segment I shorter or subequal in length to IV (figure 35). Maxillary galeae penicillate. Male abdominal tergum VIII largely membranous, sclerotization, at most, restricted to posterior margin. Aedeagus usually without hooks, or if with two very small dorsal hooks, these set in a groove and not obvious. S Africa (Namibia, Cape Province). . . . . . (2) *Iselma*

57° Head and pronotum without elongate shaggy setae. Head and pronotum wider than long. Antennal segments shorter (e.g. subterminal segments no more than 1.5 × as long as wide), variable in shape but never subfiliform; segment I variable in length (but longer than IV in genera with non-serrate antennae). Maxillary galeae not penicillate. Male abdominal tergum VIII not as above (unknown in *Iselmeletica*, however). Aedeagus with one or two dorsal hooks but these never set in a groove. 58

58(57°) Male antennal segments III–X distinctly serrate. Male gonoforceps slender, slightly decurved ventrally; aedeagus with two short, blunt dorsal hooks distant from apex. Base of first abdominal sternum modified, excavated for reception of hind coxae. Female presumably as in other Eleticinae, with ovipositor elongate and membranous, telescoped within abdomen (figure 147). N South Africa (N Transvaal). . . . . (3) (female unknown) *Iselmeletica*

58° Male antennal segments either not serrate or with only IV(V)-X so modified. Male gonoforceps not decurved ventrally; aedeagus with one or two distinct dorsal hooks (figures 108, 109). Base of first abdominal sternum not modified for reception of hind coxae. Ovipositor short, compact, not tubiform (figure 146). 59

59(58°) Antennal segments IV(V)–X distinctly asymmetrical in male, serrate to subpectinate, subserrate in female (figure 128). S Africa. . . . . . (26) *Prionotolytta*

59° Antennal segments symmetrical (figure 38). 60

60(59°) Eyes entire anteriorly. Hind tibia with apex fringed laterally with dense elongate setae, fringe setae distinctly longer and denser than those on other surfaces (figure 140); dorsoapical margin deeply incised; hind tibia distinctly widened to apex with apical width about twice that near base. Male gonostyli short, not setose at apex; aedeagus with two dorsal hooks. S Africa (Namibia, Namaqualand, Zimbabwe). . . . . (10) *Afrolytta*

60° Eyes distinctly notched anteriorly (figure 21). Hind tibia with apex fringed laterally with setae which are no longer or denser than on other surfaces; dorsoapical margin arcuate but not deeply incised; hind tibia less distinctly widened to apex with apical width only *ca*. 1.75 that near base. Male gonostyli elongate, distinctly setose at apex; aedeagus with one apical dorsal hook. S Mediterranean region, W Arabia, tropical Africa from Nigeria to Somalia and Tanzania. . . . . . . (14) *Cabalia*

61(54°) Claws with ventral blade fused to, and not attaining apex of, dorsal blade (claws appearing toothed) (figure 97). 62

61° Claws with ventral blade separate from dorsal blade, both of similar length (ventral blade rarely shorter, claws not appearing toothed) (figures 94, 95). 63

62(61) Mesosternum without a modified anterior area or ‘scutum’ (as in figure 62). Claws with ventral blade (tooth) diverging at middle of dorsal blade. Elytral and pronotal setae very short and recumbent. Male gonoforceps with long setae apically; aedeagus with one dorsal hook. . . . . (15) *Calydus*

62° Mesosternum with a distinct anterior ‘scutum’ (as in figure 68). Claws with ventral blade (tooth) diverging at basal fourth of dorsal blade (figure 97). Elytral and pronotal setae more elongate and suberect. Male gonoforceps without setae apically; aedeagus with two dorsal hooks. . . . . (48) *Mylabris* (*Calydabris*)

63(61°) Claws with ventral blade narrow, its greatest width less than half the basal width of dorsal blade (figure 100). Maxillary galeae fringed with elongate, shaggy setae (figure 71). Male gonoforceps completely fused (figure 107); aedeagus and endophallus without hooks (figure 110). 64

63° Claws with ventral blade wider, its greatest width distinctly more than half basal width of dorsal blade (figure 101). Maxillary galeae not fringed with elongate, shaggy setae (figure 70). Antennal segments variable but not flattened. Male gonoforceps separate at apical half to quarter (figure 106); aedeagus and endophallus hooked (figures 108, 109). 66

64(63°) Elytra very narrow, not attaining apex of abdomen, lyriform, strongly dehiscent from base; distance between elytra at middle, 1.5–2.0 × or more the width of each elytron at that point. Figure 111. Mediterranean. . . . . . (70) (minor part) *Sitaris*

64° Elytra not as narrow, not lyriform in shape, almost attaining apex of elytra, not dehiscent from base; distance between elytra at middle less than 1.5 × width of each elytron at that point. 65

65(64°) Elytra only dehiscent apically, lateral margin weakly arcuate. Central Asia. . . . . (68) *Nyadatus*

65° Elytra dehiscent from near middle, lateral margin distinctly arcuate. Figure 112. Caucasus, Mongolia, Nepal. . . . . (73) (minor part) *Stenoria* (*Stenoria*)

66(63°) Antennae 6–11-segmented, with segments either slightly to distinctly widened to apex (figures 44–46, 49, 50, 129, 130), or, less commonly, with apical one or two segments abruptly narrowed (figures 47, 48). Mesosternum with a distinctly modified anterior ‘scutum’ of varying size (figures 64, 66, 68, 69, 139) or at least with a smooth, glabrous anterior area whose surface is distinct from that of the remaining area (figures 63, 65, 67). Elytra yellow to orange-red with black or metallic maculae or transverse fasciae (e.g. figures 11, 12, 135, 136), rarely unicolorous. 67

66° Antennae 11 segmented, neither with segments widened to apex nor with apical one or two segments abruptly narrowed (figures 40, 127); if antennae do widen slightly to apex then elytra lack dark-coloured maculae or transverse fasciae. Mesosternum uniform, without a differentiated anterior area (figures 62, 137, 138). Elytra variable but rarely patterned as above. 79

67(66) Mesosternum with a longitudinal, furrowed carina which is continuous anteriorly with the mesepisterna (figure 139). Pronotum subhexagonal with angulate sides. Male gonoforceps with elongate setae apically. Himalayan area, Tibet. (50) *Pseudabris*

67° Mesosternum without such a carina. Pronotum shape variable but never subhexagonal with angulate sides. Male gonoforceps usually without elongate setae apically (a few *Mylabris* spp. are exceptions). 68

68(67°) Antennal segments IV–VIII strongly transverse and symmetrical, X–XI slightly narrowed (figure 130). Colour reddish yellow to yellow except partially black below and elytra with three black fasciae. Dorsal surface subglabrous. Pakistan. . . . . (52) (male unknown) *Xanthabris*

68° Antennae variable but not as above, if certain segments transverse then they also are strongly asymmetrical (as in figures 49, 50). Colour variable but only rarely with head reddish. Dorsal surface distinctly setose (subglabrous only in one S African *Paractenodia*). 69

69(68°) Antennae 11-segmented, segments IV–X asymmetrical, subpectinate in male (figure 49), subserrate in female (figure 50). Mesosternum with a 'scutum' (figure 64). Saharo-Arabian region, S Palestine, Afrotropical region (except Madagascar). . . . . (43) *Ceroctis*

69° Antennae 7–11-segmented, segments IV–X not as above. Mesosternum with or without a 'scutum'. 70

70(69°) Antennae 11-segmented, progressively widened only to segment VIII, X–XI (often IX as well) distinctly narrower than preceding segments (figures 47, 48). . . 71

70° Antennae 7–11-segmented, progressively widened from segment VI to apex (figures 44–46). 72

71(70°) Antennal segment III subequal in length to I (figure 48); segments IV–VII subtriangular and with elongate setae apicoventrally. Mesepisterna without a furrowed anterior border (as in figure 63). Relatively large in size (20–40 mm). E and central Africa, Arabia. . . . . (46) *Lydoceras*

71° Antennal segment III shorter than I (figure 47); segments IV–VII not all subtriangular and without elongate setae apicoventrally. Mesepisterna with a relatively wide and distinctly furrowed anterior border (figures 66, 67). Moderate in size (*ca.* 12–22 mm). Near East, N Arabia, Guinean Gulf. . . . . . (45) (minor part) *Hycleus*

72(70) Elytra planate with apical margin transverse (figure 135). Antennae 11-segmented (eight apparent segments in one species), with terminal four or five segments gradually widening to apex. Pronotum distinctly transverse, *ca.* 0.8 as long as wide. Aedeagus with one dorsal hook distant from apex. SW Africa (S Namibia, Namaqualand, Karoo). . . . . (47) *Mimesthes*

72° Elytra convex with apical margin rounded (figure 136). Antennae 7–11-segmented. Pronotum as long as wide or longer than wide, if distinctly wider than long (*Actenodia*) then terminal antennal segment much wider than all preceding segments (figure 44). Aedeagus with two dorsal hooks, rarely with a single hook but if so then hook apical. 73

73(72°) Antennae 10-segmented (X–XI fused) (figure 129), IX and X subcircular in cross-section. Mesosternum without a 'scutum'. Central Asia. . . . (51) *Semenovilia*

73° Antennae 7–11-segmented, variously shaped but never cylindrical apically. Mesosternal 'scutum' present or absent. 74

74(73°) Hind tibial spurs dissimilar, outer spur spathulate, about twice the width of sticklike inner spur (figure 83). Mesosternum without a distinct 'scutum'; anterior mesosternal suture obsolescent (figure 65). Saharo-Sindian and N Sahel regions. . . . . (44) *Croscherichia*

74° Hind tibial spurs similar, both more or less stick-like or spiniform (figure 84), if rarely dissimilar as above then mesosternum with a 'scutum'. Mesosternum with anterior suture distinct. 75

75(74°) Antennae six- to nine-segmented, abruptly clubbed (figure 44). Usually small beetles, 4–10 mm, rarely larger. 76
75° Antennae 10–11-segmented, segments gradually enlarged to apex (figures 45, 46). Size variable, varying from 10 to 35 mm. 78

76(75) Pronotum distinctly wider than long (0.8–0.9 as long as wide), more or less rectangular (figure 55). Aedeagus with two dorsal hooks, both distant from apex. Mesepisterna without a furrowed anterior border (figure 63). Mediterranean region, Africa, Arabia and Sind. . . . . (42) *Actenodia*
76° Pronotum length subequal to width, or distinctly longer than wide (figures 56, 57). Aedeagus with two dorsal hooks, the distal hook apical in position and dissimilar to proximal hook. Mesepisterna almost always with a furrowed anterior border (figures 66, 67). 77

77(76°) Antennae six- to seven-segmented. Mesepisterna with a poorly developed, obsolescently furrowed anterior border. SW Africa (Namibia, Namaqualand, Kalahari). . . . . (49) *Paractenodia*
77° Antennae eight - to nine-segmented. Mesepisterna with a relatively wide and distinctly furrowed anterior border area (figures 66, 67). Africa S of Sahara. . . . . (45) (minor part) *Hycleus*

78(75°) Mesepisterna with a relatively wide and distinctly furrowed anterior border area (figures 66, 67). Pronotum with a very fine median line and depression at centre of disk (figure 56). Antennae 10–11-segmented (figures 45, 46). Aedeagus with distal dorsal hook apical in position and dissimilar to proximal hook (figure 150). Palaearctic, Oriental and Afrotropical regions. . . . (45) (major part) *Hycleus*
78° Mesepisterna without a wide and furrowed anterior border area (figures 68, 69) although their anterior edge is sometimes narrowly grooved. Pronotum without a fine median line at centre of disk (figure 57) (a simple depression may occur in some species). Antennae usually 11-segmented (10-segmented in three species from Near East and Central Asia). Aedeagus with dorsal hooks variable in shape and position. Palaearctic region and W India. . . . . . . (48) (major part) *Mylabris*

79(66°) Body covered by short, dense cinereous setae with glabrous spots of varying dimensions on elytra. Head black with two large lateral orange spots (almost completely red in one species). Hind tibial spurs both enlarged apically. S Africa (S Angola, Namibia, South Africa). . . . . . . (12) '*Lytta*' of the Spilotella Group
79° Body setation variable but elytra never covered by dense cinereous setae with glabrous spots. Hind tibial spurs both relatively narrow, or only the outer spur enlarged apically. 80

80(79°) Labrum subacuminate apically, distinctly widest at middle (figure 117). Mandibles relatively straight, not noticeably curved to apex. Occiput distinctly furrowed longitudinally. S Turkey, Syria, Iraq. . . . . (30) *Syriolytta*
80° Labrum normal, not narrowing apically (figure 116). Mandibles distinctly curved at least at apical half. Occiput without a distinct longitudinal furrow (obsolescently impressed in two *Prolytta* from South Africa). 81

81(80°) Last five antennal segments obsolescently separated, appearing almost fused. . . . . (19) *Lydulus*
81° All antennal segments distinctly separated from one another. 82
82(81°) Black except pronotum orange, with four lateral and one medial black maculae; elytra brown; femora primarily orange brown. Male foretarsal segments II–IV bilobed. S Africa (Namibia, W South Africa). . . . . (9) '*Lytta*' *elegantula*
82° Coloration variable but not as above. Male foretarsi not bilobed. 83

83(82°) Elytral disk with extremely short, sparse setae, appearing subglabrous even at relatively high magnifications. Colour except elytra black or metallic, elytra distinctly lighter, uniformly coloured or vittate. Hind wing with vein 2A$_2$ present (figure 134). Male gonoforceps fused to the apical quarter; female gonostyli absent. S Africa (Namibia, South Africa). . . . . (27) *Prolytta*

83° Elytral disk rarely with such sparse and short setae, if so then colour not as above or not occurring in S Africa. Hind wing with vein 2A$_2$ absent (figure 133). Male gonoforceps, at most, fused to apical third; female gonostyli present (figure 146). 84

84(83°) Males uniquely modified: Lateral lobes of last abdominal sternum with a long tuft of black modified setae which are as long or longer than the pentultimate sternum (figure 104). Hind trochanters excavated or with a distinct protuberance. Middle tibiae strongly modified apically in most species (as in figure 80). Metasternum usually with two pubescent tubercles. Both sexes usually with long shaggy pubescence. Balkans to central Asia. . . . . (31) *Teratolytta*

84° Males without above modifications. Both sexes with pubescense of varying length. 85

85(84°) Pronotum elongate, at least 1.1 as long as wide, disk usually smooth, shiny, micropunctate (figure 53). Male with last abdominal sternum in most species lightly sclerotized, deeply cleft to near base with the divided sections elongate and usually twisted to bring their ventral surface to face laterally (figure 103). Eyes large, bulged, extending to maxillae on underside of head (figure 34), if not so large (e.g. *melanocephalus* group) then interocular distance usually half head width at eyes or less. Male genitalia with gonoforceps usually poorly sclerotized. Africa, Madagascar, from Arabia and Near East to Indochina. . . . . (18) *Lydomorphus*

85° Pronotum as wide as long, or if slightly longer than wide (*Lyttolydulus*, *Eolydus*), then less than 1.1 as long as wide. Male with last abdominal sternum V-emarginate, emargination confined to apical half of segment (as in figure 102). Eyes variable but rarely bulged; interocular distance greater than half head width at eyes. Male genitalia with gonoforceps well sclerotized. 86

86(85°) Antennae subclavate, segments VI–X each about as wide as long; antennae only attaining very base of elytra, not sexually dimorphic. Eyes somewhat bulged, almost extending to maxilla on underside of head. Saharo-Arabian region. . . . . (22) *Lyttolydulus*

86° Antennae not subclavate, segments VI–X variable but commonly longer than wide; antennae extending beyond very base of elytra, sexually dimorphic or not. Eyes smaller, not bulging, separated from maxilla on underside of head by a distance equal to at least two thirds the basolateral width of mandible (as in figure 22) (the Indian *L. melanura* Hope has relatively large eyes but differs from *Lyttolydulus* in having the last tergum of males elongate and acuminate). 87

87(86°) Mesepisterna meeting narrowly at midline; mesosternum angulate anteriorly (figure 138). Colour entirely metallic. Iberian Peninsula, NW Mediterranean Africa. . . . . (17) *Lagorina*

87° Mesepisterna usually meeting broadly at midline; mesosternum usually not angulate anteriorly (figures 62, 137). Colour variable, metallic or not. 88

88(87°) Ventral margin of dorsal blade of claws smooth (figure 94). Antennal segments variable in shape but only rarely submoniliform (*melanura* Hope), segments VI–X usually longer than wide. Antennae and foretarsi sexually dimorphic or not. Last abdominal tergum in male never incised. N and central Palaearctic, Oriental region (except Indochina and Indonesia). . . . . (21) (major part) *Lytta*

88° Ventral margin of dorsal blade of claws subcrenulate (figures 91, 92). Antennal segments distinctly submoniliform, segments IX–X about as wide as long (figure 127). Antennae and foretarsi never sexually dimorphic. Last abdominal tergum of male incised (*conspicuus*, *afghanicus*), or if entire (*atripes*) then large black species with blue elytra. Iraq to Pakistan and Uzbekistan. . . . . (16) *Eolydus*

Synopsis of the Old World genera of Meloidae

Subfamily ELETICINAE

The definition of this subfamily follows Selander (1966, 1991) except for the tentative assignment of *Deridea*. An undescribed genus based on '*Lytta*' *elegantula* may also belong here (see No. 9).

Tribe DERIDEINI (*sensu* Bologna, 1995)

1. ***Deridea*** Westwood, 1875

Type species. *Deridea curculionides* Westwood, 1875, by monotypy. 3 spp.
Geographic distribution. Angola, Congo, Namibia, E South Africa (Natal-Kwa Zulu); SE Arabian Peninsula.

References
Taxonomy. Kaszab (1966, key and catalogue).
Anatomy. Gupta (1971, 1978).

Notes
The Arabian *Deridea notata* Thomas, 1897, is considered polytypic (Kaszab, 1966) but the subspecies *minor* Kaszab, 1960, is based only on coloration, an unreliable character in this species.

2. ***Iselma*** Haag-Rutenberg, 1879

(figure 1)

Type species. *Meloe ursus* Thunberg, 1791, by subsequent designation (Wellman, 1910). 24 spp.
Geographic distribution. Namibia, South Africa (Cape Province).

References
Taxonomy. Haag-Rutenberg (1879); Péringuey (1909); Kaszab (1953b, 1954a, 1966 key and catalogue, 1981); Selander (1966); Bologna *et al*. (2001 review and catalogue).

Notes
The primitive first-instar larva, sexual behaviour and host plants of adults are known (Bologna *et al.*, 1997, 2001).
One undescribed species from Namibia is housed in the HNHM collection.

3. ***Iselmeletica*** Kaszab, 1966

Type species. *Iselmeletica flabellicornis* Kaszab, 1966, by monotypy. 1 sp.

Geographic distribution. South Africa (N Transvaal).

References

Taxonomy. Kaszab (1966).

Notes

The genus is known only from the unique male holotype of the type species (HNHM).

Tribe MORPHOZONITINI (*sensu* Bologna, 1995)

4. ***Afrospasta*** Bologna, 1995

Type species. *Afrospasta borana* Bologna, 1995, by original designation. 1 sp.

Geographic distribution. SW Ethiopia.

References

Taxonomy. Bologna (1995).

Notes

Afrospasta is related to *Morphozonitis* but differs considerably in the shape of the wings, elytra and legs. The genus is known only from the unique male holotype (PMNH) of the type species.

5. ***Ceriselma*** Borchmann, 1942

Type species. *Ceriselma methneri* Borchmann, 1942, by original designation. 2 spp.

Geographic distribution. Tanzania.

References

Taxonomy. Borchmann (1942); Kaszab (1954a, 1966 key and catalogue); Selander (1966).

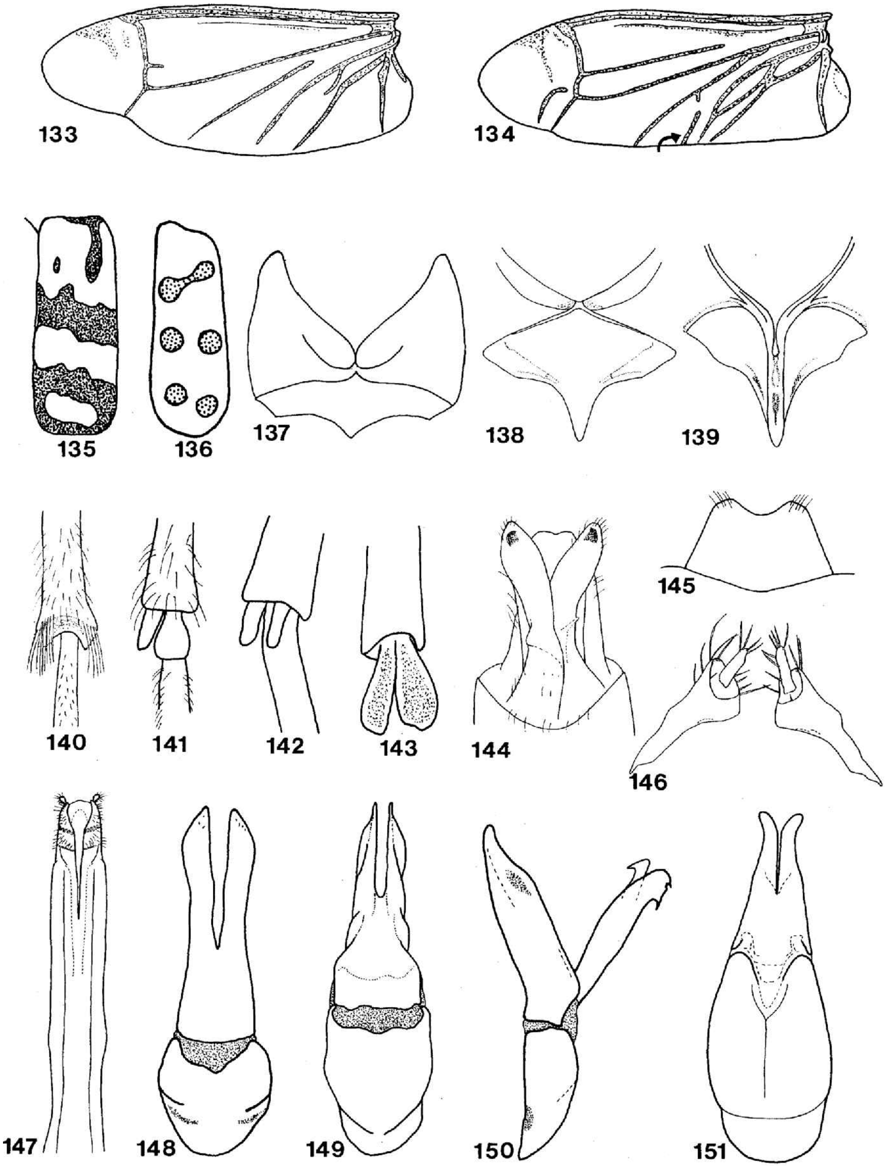
6. ***Morphozonitis*** Pic, 1922

Ertlia Borchmann, 1942 [nec *Ertlia* Aurivillius, 1907 (Coleoptera, Cerambycidae); replaced by *Ertliana* Selander, 1964].

Ertliana Selander, 1964 (pars). *Type species*: *Ertlia fasciata* Borchmann, by monotypy, as type species of *Ertlia* Borchmann; new name for *Ertlia* Borchmann.

Type species. *Morphozonitis atripennis* Pic, 1922, by monotypy. 9 spp.

Geographic distribution. South Africa (Transvaal), Zimbabwe, Zambia, Malawi, Congo, Tanzania, Kenya.



FIGS 133–151. (133, 134) Hind wing: (133) *Lytta vesicatoria*; (134) *Prolytta pallidipennis* (arrow to 2A2 vein). (135, 136) Elytron: (135) *Mimesthes karooensis* Bologna, 2000; (136) *Mylabris crocata* (Pallas, 1781). (137–139) Mesepisternum and mesosternum (ventral): (137) *Lytta vesicatoria*; (138) *Lagorina sericea*; (139) *Pseudabris hingstoni.* (140) *Afrolytta amoena* (Per., 1892) (hind tibia apex with fringe). (141–143) Hind tibia (ventral, showing apical spurs): (141) *Apalus bimaculatus*; (142) *Stenoria analis*; (143) *Cochliophorus reitteri.* (144, 145) Last visible sternum, male (ventral): (144) *Lydomorphus rufopectus*; (145) *Lydomorphus cinnamomeus.* (146, 147) Female genitalia (ventral): (146) *Meloe apenninicus* Bologna, 1988 (compact genitalia typical of Meloinae and Nemognathinae); (147) *Eletica colorata* (elongate ovipositor tube, typical of Eleticinae). (148–151) Male gonoforceps: (148) *Sybaris ictericus* (Gyll., 1817); (149) *Lydomorphus melanocephalus* (ventral); (150) *Hycleus polymorphus* (Pallas, 1771) (lateral, with aedeagus at right); (151) *Stenodera oculifera* (Abeille de Perrin, 1880) (ventral).

References

Taxonomy. Kaszab (1954a, 1966 key and catalogue); Selander (1966).

Anatomy. Gupta (1971, 1978).

7. ***Steniselma*** Borchmann, 1942

Type species. Steniselma brunnea Borchmann, 1942, by monotypy. 2 spp.

Geographic distribution. SE Ethiopia (Ogaden) and NE Somalia.

References

Taxonomy. Borchmann (1942); Kaszab (1954a, 1966); Selander (1966); Bologna (1990).

Notes

Steniselma is closely related to *Morphozonitis*, and perhaps should be treated as a subgenus. It was considered a junior synonym of *Morphozonitis* by Selander (1991).

Tribe ELETICINI

8. ***Eletica*** Dejean, 1834 (1833–1837)

(figure 2)

Iletica Gemminger and Harold, 1870 (unjustified emendation).

Sibuteletica Pic, 1913 (as subgenus; currently valid). *Type species*: *Eletica lemoulti* Pic, 1913, by monotypy.

Meteletica Kaszab, 1955 (as subgenus; currently valid). *Type species*: *Cantharis testacea* Olivier, 1795, by original designation.

Proeletica Kaszab, 1955 (as subgenus; currently valid). *Type species*: *Eletica colorata* Harold, 1878, by original designation.

Type species. Lytta rufa Fabricius, 1801(=*Lytta bipustulata* Fabricius, 1801), by monotypy (see Selander, 1991). 34 spp.

Geographic distribution. Africa south of the Sahara, India, SE Asia.

References

Taxonomy. Kaszab (1955a key and catalogue); Saha (1972).

Anatomy. Gupta (1971, 1978).

Bionomics. Wellman (1908); Pinto *et al.* (1996).

Larvae. Pinto *et al.* (1996).

Notes

Eletica is divided into four subgenera (Kaszab, 1955a). The taxonomy of the African species is complex because of extreme intraspecific variation. The two Indian species described by Saha (1972) need confirmation and may be synonyms of other Oriental species.

The first-instar larva of two species, and the sexual and oviposition behaviours of one S African species were described by Pinto *et al.* (1996). The primitive behaviour and larval morphology suggest predaceous rather than parasitoid habits.

9. ‘*Lytta*’ *elegantula* Péringuey, 1909

Geographic distribution. Namibia, South Africa (W Cape Province).

References

Taxonomy. Péringuey (1909); Kaszab (1953b).

Notes

This species was included in the *spilotella* group of *Lytta* (Kaszab, 1953b). The entire assemblage is inappropriately placed in *Lytta* and its species are not congeneric. We believe ‘*Lytta*’ *elegantula* represents an undescribed genus with eletecine affinity. The remaining species of the group comprise a distinct lyttine genus (see No. 12).

Subfamily MELOINAE

Tribe LYTTINI

10. ***Afrolytta*** Kaszab, 1959

Type species. *Lytta carneola* Péringuey, 1892, by original designation. 3 spp.
Geographic distribution. Namibia, South Africa (W Cape Province), Zimbabwe.

References

Taxonomy. Péringuey (1909); Kaszab (1959).

11. ***Alosimus*** Mulsant, 1857

Halosimus Gemminger and Harold, 1870 (unjustified emendation).

Type species. *Meloe syriacus* Linnaeus, 1858, by monotypy. 27 spp.
Geographic distribution. North Africa, central and E Europe from Anatolia and Palestine to Afghanistan; a single species in Somalia.

References

Taxonomy. Escherich (1896a); Maran (1941a, 1942c); Kaszab (1951a key and catalogue); Bologna (1979, 1989b, 1991a).
Bionomics. Cros (1911); Bologna (1991a).
Larvae. Cros (1928c).
Anatomy. Beauregard (1890); Gupta (1971, 1978).

Notes

Alosimus was treated as a subgenus of *Lydus* in the early literature (e.g. Escherich, 1896a; Maran, 1942c); its current status dates from Kaszab (1951a).

At least two species from the Maghreb probably are synonyms, and the status of a few Near East taxa of the *armeniacus* complex remain unresolved. An Italian and a Somali endemic species are known only from the original records.

The first-instar larva of a NW African and an E Mediterranean species are known (Cros, 1928c; CB). One species was reared with honey of an *Andrena* bee (Andrenidae).

12. ‘***Lytta***’ spp. (=*spilotella* group sensu Kaszab, 1953b, major part)

Geographic distribution. SW Angola, Namibia, South Africa, S Mozambique, S Zimbabwe.

References

Taxonomy. Kaszab (1953b).

Bionomics and larvae. Gess and Gess (1976, 1983).

Notes

The six species of this group had been assigned to the Holarctic genus *Lytta* but are now believed to represent a distinct genus based on several adult, larval and biological features (Bologna, unpublished). The biology of one species has been studied. Unlike other Lyttini it is a parasitoid of Eumenidae wasps, feeding on their eggs and provisioned paralysed caterpillars.

13. ***Berberomeloe*** Bologna, 1989

(figure 3)

Type species. *Meloe majalis* Linnaeus, 1758, by original designation. 2 spp.

Geographic distribution. SW France, Iberian Peninsula, from Morocco to W Tunisia.

References

Taxonomy. Bologna (1989a); Garcia-París (1998 key and catalogue).

Bionomics. Beauregard (1890); Cros (1912b); Valladares (1984); Bologna (1989a, 1991a).

Larvae. Cros (1912b); Bologna (1989a).

Anatomy. Beauregard (1890).

Pharmacology. Beauregard (1890).

Notes

Garcia-París (1998) recently resurrected a second species, *B. insignis* Charpentier, 1818, endemic to southern Spain. It had been considered a variety of *majalis* and its species status requires further study.

Berberomeloe is a parasitoid of Anthophoridae (*Anthophora, Eucera*) and Andrenidae (*Andreana*) bees, and perhaps also of Megachilidae (*Osmia*).

14. ***Cabalia*** Mulsant and Rey, 1858

Paroenas Kolbe, 1894. *Type species*: *Paroenas limbata* Kolbe, by monotypy. **New synonymy**.

Type species. *Lytta segetum* Fabricius, 1792, by subsequent designation (Wellman, 1910). 9 spp.

Geographic distribution. From Morocco to Sinai and S Arabia, Sicily, E Africa, Rwanda, Nigeria.

References

Taxonomy. Kaszab (1948 key and catalogue, 1981, 1983); Bologna (1980, 1990, 1991a)

Bionomics. Beauregard (1890); Bologna (1991a).
Larvae. Cros (1928b).
Anatomy. Beauregard (1890); Gupta (1971, 1978).
Pharmacology. Beauregard (1890).

Notes

Females of *Cabalia* are characterized by their extremely long gonostyli. A single species, *C. longicollis* Kaszab, 1948, differs from congeners by the narrow and elongate pronotum. The holotype of this species (HNHM) is an intersex.

The monotypic genus *Paroenas* is herein synonymized with *Cabalia.* In both, the female gonostyli are very long, a derived condition, the claws are micropubescent, and the aedeagus has a single hook. The minor generic differences cited by Bologna (1980) show intermediate states in the E African species [*abyssinica* Kaszab, 1948; *aethiopica* Kaszab, 1981; *ruspolii* (Pic, 1914)].

The first-instar larva of *C. rufiventris* (Walker, 1871) was described by Cros (1928b); that of *C. segetum* also is known (CB, UCRC). Larval hosts are unknown.

15. **Calydus** Reitter, 1896

Caloenas Reitter, 1889 [(nec *Caloenas* Gray, 1840 (Aves)].

Type species: Caloenas pulcher Reitter, 1889, by monotypy as type species of its objective synonym *Caloenas* Reitter. 6 spp.

Geographic distribution. E and S Turkey, Caucasus, Syria, Iraq, Iran.

References

Taxonomy. Reitter (1889); Escherich (1896b); Kaszab (1960a key and catalogue); Bologna (1991a).

Notes

Calydus originally was assigned to the Mylabrini and later to the Nearctic tribe Eupomphini (Kaszab, 1959, 1960a, 1969a). The latter placement was prompted primarily by the presence of toothed claws in *Calydus*, a defining trait of the Eupomphini. However, Pinto (1984a) considered this feature convergent and excluded the genus from the tribe. Selander (1991) again placed *Calydus* in the Mylabrini. Bologna (1991a), however, considered only the subgenus *Calydabris* Kaszab as mylabrine (see No. 48, below), and moved the nominate subgenus to the Lyttini, where it is treated here. The placement of *Calydus* as a lyttine genus (Bologna, 1991a) is based on male genitalia and mesosternal structure, but its position within the tribe is not clear.

16. **Eolydus** Denier, 1913

Type species. Eolydus atrocoeruleus Denier, 1913 (=*Alosimus atripes* Pic, 1905), by monotypy. 7 spp.

Geographic distribution. From Iraq to Afghanistan.

References

Taxonomy. Kaszab (1958b, 1962a pars, key and catalogue).

Notes

We do not recognize Kaszab's (1962b) transfer of the subgenus *Indiolytta* Selander from *Lytta* to *Eolydus*. This action was not accompanied by justification or additional characterization (see No. 21).

17. ***Lagorina*** Mulsant and Rey, 1858

Type species. *Lytta sericea* Waltl, 1835, by subsequent designation (Wellman, 1910) (see Selander, 1991). 2 spp.

Geographic distribution. Maghreb, Iberian Peninsula.

References

Taxonomy. Mulsant and Rey (1858); Escherich (1894); Bologna (1991a).

Bionomics. Cros (1934b).

Larvae. Cros (1934b).

Anatomy. Beauregard (1890); Gupta (1971, 1978).

Pharmacology. Beauregard (1890).

Notes

The first-instar larva of *L. sericea* has been described; its host is unknown.

18. ***Lydomorphus*** Fairmaire, 1882

Sagitta Escherich, 1894 [nec *Sagitta* Quaoy and Gaimard, 1827 (Chaetognatha)]; replaced by *Cylindrothorax* Escherich.

Cylindrothorax Escherich, 1896. *Type species*: *Lytta angusticollis* Haag-Rutenberg, 1880, by subsequent designation (Wellman, 1910) as type species of *Sagitta* Escherich; new name for *Sagitta* Escherich.

Mimovesperus Pic, 1923. *Type species*: *Mimovesperus pilosus* Pic, 1923 (=*Lytta verrucicollis* Karsch, 1881), by monotypy.

Pardolydus Bologna, 1992 (as subgenus; currently valid). *Type species*: *Lytta dusaulti* Dufour, 1821, by original designation.

Somalolydus Bologna, 1992 (as subgenus; currently valid). *Type species*: *Cantharis bifoveiceps* Fairmaire, 1897, by original designation.

Type species. *Lydomorphus cinnamomeus* Fairmaire, 1882 (not *cinammomeus* as indicated by Bologna and Aloisi, 1992), by original designation (see Bologna and Aloisi, 1992). 74 spp.

Geographic distribution. Africa, Madagascar, from Arabia and the Syro-Palestinian region east to Thailand.

References

Taxonomy. Peyerimhoff (1934); Kaszab (1955b key and catalogue, 1962a, 1965, 1978 partial key, 1983); Saha (1979, key to Indian spp.); Selander (1988a, annotated catalogue); Bologna (1990); Bologna and Alosi (1992).

Bionomics. Paoli (1931–1933); Zethner and Laurense (1988); Selander (1988a, 1991).

Larvae. Bologna and Aloisi (1992).

Pharmacology. Théodoridès (1950, 1954); Giglioli (1965).

Anatomy. Gupta (1971, 1978); Yadav (1973).

Notes

Kaszab (1955b, 1983) divided this genus into several species groups. These also were utilized by Selander (1988a). Bologna (in Bologna and Aloisi, 1992) described two distinct subgenera based on sexually dimorphic features in the male. Included is *Somalolydus*, with 18 species, characterized by the modified third antennal segment and last sternum, and the monotypic *Pardolydus*, delimited by the modified middle antennal segments. *Lydomorphus* requires complete revision. The monophyly of the genus and several of the species groups are questionable, and certain additional groups require recognition (Bologna, 1990; Bologna and Aloisi, 1992; also see below).

There is no single feature that characterizes all *Lydomorphus*, and the genus may eventually prove to be polyphyletic. The following synapomorphic characters are shared by *Somalolydus*, *Pardolydus* and numerous species of the nominate subgenus (including the type species): male last sternum almost completely divided and prolonged into twisted apical lobes (figures 103, 144); eyes, particularly in males, extending on the ventral surface of the head to the lateral margin of the maxilla or beyond (figure 34); aedeagus and gonoforceps (laterally) poorly sclerotized; gonoforceps straight, not decurved apically; pronotum elongate, narrowed anteriorly and transversely depressed at anterior third of disk (figure 53); antennae very elongate; mesepisterna usually broadly meeting at midline and divided by a distinct carina. The species of the *melanocephalus* group [*melanocephalus* (Fabricius, 1801), *kulzeri* (Kaszab, 1955), *pilitarsis* (Kaszab, 1955)], characterized by the modified male foretarsi, differ from most congeners in that their eyes are not as greatly bulged and do not quite extend to the base of the maxilla.

At least 12 species lack these derived features but are tentatively retained in *Lydomorphus*. All have the male last sternum normally emarginate and without apical lobes (figure 145), and the male gonoforceps are normally sclerotized and decurved apically. These include the following: (1) five species herein referred to as the *sudanicus* group [*pici* (Kaszab, 1955), *rufopectus* (Kaszab, 1955), *sudanicus* (Pic, 1930), *casalei* (Pic, 1914), *discolor* (Haag-Rutenberg, 1880)] which had been placed in Kaszab's (1955b) heterogeneous *discolor* group. (2) The species of the monotypic *leonensis*, *braeti*, *optatus* and *mesembryanthemi* groups. (3) At least three species of Kaszab's *angusticollis* group [*saharanus* (Kaszab, 1962), *palaestinus* (Kirsch, 1870), *femoralis* (Kocher, 1955)] which we herein refer to as the *saharanus* group. Although certain of these 12 species have rather distinctive traits [e.g. extremely short antennae in *L. mesembryanthemi* (Péringuey, 1888), modified male antennae in *leonensis* (Pic, 1913) and *optatus* (Péringuey, 1892), narrowly contacting mesepisterna in *leonensis*], their common features are almost certainly plesiotypic and do not suggest relationship.

Sybaris may be related to *Lydomorphus*. It also has enlarged eyes and a somewhat similar pronotal structure. Unlike *Lydomorphus*, however, it differs by having serrate claws, distinct male genitalia (well sclerotized with a short and wide phallobase and very elongate gonoforceps; aedeagus only with an apical hook), and an unmodified last sternum in males. Species of the *sudanicus* group of *Lydomorphus* closely resemble

Sybaris, particularly in the shape of the pronotum. Their claws and male genitalia, however, are typical of *Lydomorphus*.

One species, *fryi* Borchmann, 1942, placed in *Sybaris* is herein transferred to *Lydomorphus*, its serrate claws notwithstanding (**new combination**). Borchmann (1942) placed the species in *Sybaris* solely due to claw structure. However, it possesses all of the derived features of *Lydomorphus* and, although its claws are serrate, we note that the teeth are finer than is typical for *Sybaris*, and that the single aedeagal hook retained is the distal not the proximal hook as is typical for *Sybaris*. The species clearly has been misplaced.

Selander (1991) placed this genus in the Meloini, presumably because he assumed larval phoresy due to the presence of the genus in Madagascar. The first instar larva of *L. dusaulti* (Dufour, 1821), however, demonstrates lyttine affinity (Bologna and Aloisi, 1992), and this is now corroborated by the larva of *L. bisignatus* (Mäklin, 1875) (Bologna, unpublished). Hosts are unknown. There is no support for Escherich's (1894) assumption that the group is associated with Orthoptera.

The species of this genus were treated as *Cylindrothorax* by most authors prior to Bologna and Aloisi (1992).

19. ***Lydulus*** Semenov, 1893

Lydoenas Reitter, 1894. *Type species*: *Lydus pygmaeus* Dokthouroff, 1890, by original designation.

Type species. *Lydulus albopilosus* Semenov, 1893, by subsequent designation (Wellman, 1910) (see Selander, 1991). 5 spp.

Geographic distribution. Central Asia (from the Caspian Sea to E Turkestan).

References

Taxonomy. Semenov (1893b); Reitter (1894); Kaszab (1963a key and catalogue, 1981); Dvorak (1983).

Bionomics. Prispinova (1987b).

Notes

A similarity in antennal structure to *Syriolytta* Kaszab, probably is convergent; the two genera are distinguished by several characters of the head, mouthparts and genitalia.

The synonymy of *L. uzbekistanus* Kaszab, 1981, with *semipurpureus* Reitter, 1902, suggested by Dvorak (1983), is not accepted.

20. ***Lydus*** Dejean, 1821
(figure 4)

Type species. *Meloe algiricus* Linnaeus, 1758, by subsequent designation (Blanchard, 1836–1849) (see Selander, 1991). 15 spp.

Geographic distribution. Maghreb, E Mediterranean and Near East (from Italy to N Arabia and Iran).

References

Taxonomy. Abeille de Perrin (1880); Escherich (1896a); Kaszab (1952a key and catalogue).

Bionomics. Beauregard (1890); Cros (1912a, 1928c); Jannone (1935); Bologna (1991a).

Larvae. Cros (1912a, 1922b, 1928c); MacSwain (1956).

Anatomy. Beauregard (1890); Gupta (1971, 1978).

Pharmacology. Beauregard (1890); Théodoridès (1950).

Notes

The taxonomy and distribution of the species of the *algiricus* group proposed by Kaszab (1952a) are not clear; certain nominal species are likely to prove synonymous.

The first instar larvae of two North African species were described by Cros (1912a, 1928c); that of another N Mediterranean species is known (CB). Larvae of a Maghrebian species were reared on honey of a *Ceratina* bee (Cros, 1912a, 1928c); however Jannone (1935) assumed parasitism on Orthoptera by *L. trimaculatus* (Fabricius, 1775) in Italy.

21. ***Lytta*** Fabricius, 1775

Cantharis Geoffroy, 1762 (misapplication of *Cantharis* Linné, 1758).

Pomphopoea LeConte, 1862. *Type species*: *Lytta aenea* Say, 1824, by subsequent designation (Dillon, 1952); currently as subgenus (Selander, 1960a; Kaszab, 1962b).

Poreospasta Horn, 1868. *Type species*: *Poreospasta polita* Horn, 1868 =*Nomaspis sublaevis* Horn, 1868, by monotypy; currently as subgenus (Selander, 1960a; Kaszab, 1962b).

Adicolytta Selander, 1960 (as subgenus; currently valid). *Type species*: *Cantharis mutilata* Horn, 1875, by original designation.

Indiolytta Selander, 1960 (as subgenus; currently valid). *Type species*: *Lytta apicalis* Haag-Rutenberg, 1880 (=*Lydus melanurus* Hope, 1831), by monotypy.

Paralytta Selander, 1960 (as subgenus; currently valid). *Type species*: *Lytta magister* Horn, 1870, by original designation.

Pseudolytta Selander, 1960 (as subgenus; currently valid). *Type species*: *Lytta aeneiventris* Haag-Rutenberg, 1880, by original designation.

Mesolytta Kaszab, 1962 (as subgenus; currently valid). *Type species*: *Oenas coccineus* Ménétriés, 1848, by original designation.

Asiolytta Kaszab, 1962 (as subgenus; currently valid). *Type species*: *Lytta badakschanica* Kaszab, 1958, by original designation.

Type species. Meloe vesicatorius Linné, 1758, by subsequent designation (Wellman, 1910). 109 spp. (*ca.* 40 spp. Old World).

Geographic distribution. Holarctic. In the Palaearctic region *Lytta* is distributed in Europe (north to S Scandinavia), W and central Asia (south to Turkey, N Iran, Afghanistan), and E Asia to Japan; in the Oriental region it is distributed in S China, Taiwan and N India. In North America it occurs from central Canada to Panama. One species from Brazil is tentatively assigned here (see Pinto and Bologna, 1999).

References

Taxonomy. Haag-Rutenberg (1880); Escherich (1894); Maran (1941b revision spp. of subgenus *Pseudolytta*); Selander (1960a revision including key to North American spp., 1960b); Kaszab (1958b, 1962a, 1962b subgeneric review, 1981); Saha (1979 key to the Indian spp.); Pinto (1985); Bologna (1983b, 1991a).

Bionomics. Beauregard (1890); Chobaut (1897); Görnitz (1937); Ronchetti (1953); MacSwain (1956); Selander (1960a); Selander and Downey (1963); Levshinskaja (1964); Werner *et al.* (1966); Church (1967); Matthes (1972); Gerber and Church (1973, 1976); Erickson and Werner (1974); Erickson *et al.* (1976);

Church and Gerber (1977); Pinto and Mayor (1979, 1986); Snead and Alcock (1985); Prispinova (1987b); Brown (1990); Bologna (1991a); Cooley (1995).

Larvae. Beauregard (1890); MacSwain (1956).

Anatomy. Beauregard (1890); Gupta (1971, 1978); Gerber *et al.* (1971a, 1971b, 1971c); Heming (1996).

Physiology. Beauregard (1890); Cohen and Pinto (1977).

Pharmacology. Beauregard (1890); Meyer *et al.* (1968); Schlatter *et al.* (1968); Inagaki *et al.* (1983).

Fossils. Werner (1970).

Notes

Lytta currently includes nine subgenera (Selander, 1960a; Kaszab, 1962b; Bologna, 1991a). Included is the subgenus *Indiolytta*, which we return here from *Eolydus* where it was transferred by Kaszab (1962b). The latter contains at least four Indian species (Saha, 1979). Although its original definition by Selander (1960a) included solely plesiomorphic traits (e.g. an unmodified pronotum), an argument for placement in *Eolydus* was never made by Kaszab.

As discussed by Pinto and Bologna (1999), generic limits of *Lytta* have yet to be satisfactorily resolved. The genus historically has served as a depository for generalized meloine species and many of those originally assigned have now been transferred to other genera in various tribes. Virtually all of the species in the Southern Hemisphere formerly placed in *Lytta* are now placed in other genera of Lyttini and Pyrotini; in South America only *Lytta neivai* Denier, 1940, tentatively remains (Selander, 1987c; Pinto and Bologna, 1999). The S African '*spilotella*' group remains assigned to *Lytta* (see Kaszab, 1953b), but it is not congeneric (see Nos 9 and 12).

Most of the Old World species of *Lytta* are characterized by the laterally angulate pronotum. The only exceptions are the subgenera *Indiolytta* and *Mesolytta*. As discussed below, *Syriolytta* Kaszab, described as a subgenus of *Lytta*, is considered here as a distinct genus.

Five Palaearctic species in different subgenera have microserrate claws: *flavoangulata* Fairmaire, 1891; *kabakovi* Kaszab, 1981; *laeta* Waterhouse, 1889; *luteovittata* Kraatz, 1882; *grumi* Semenov, 1893 (herein considered distinct and not a synonym of *luteovittata*). This character has not previously been noted in the literature for *Lytta*. Although it is a characteristic of most Nemognathinae, it is a relatively uncommon meloine feature. Other lyttine taxa with microserrate claws include *Alosimus*, *Lydus*, *Muzimes*, *Oenas*, *Sybaris*, *Eolydus* and one species of *Lydomorphus*. Within the subfamily such claws also are known in certain Epicautini and Pyrotini. This convergent feature presumably is related to the host plants these beetles climb on when feeding.

The larvae of *Lytta* are parasitoids of Apoidea, particularly of the families Anthophoridae, Megachilidae, Halictidae and Colletidae. First instar larvae of a large number of North American species were described primarily by MacSwain (1956); others are available but remain undescribed (CB, UCRC).

22. ***Lyttolydulus*** Reitter, 1913

Lyttalydulus Reitter, 1913. Original spelling; emended to *Lyttolydulus* by Reitter (1915). See *Notes*.

Lydopsis Martinez de la Escalera, 1914. *Type species*: *Lydus susicus* Martinez de la Escalera, 1914.

Type species. *Lytta suturalis* Reitter, 1913 (=*simplicicornis* Pic, 1899), by monotypy. 10 spp.

Geographic distribution. Sahara and Near East (from W Sahara to Egypt, Palestine and Saudi Arabia).

References

Taxonomy. Reitter (1913); Martinez de la Escalera (1914); Peyerimhoff (1934, 1935); Pardo Alcaide (1950); Kaszab (1952d key and catalogue, 1983).

Bionomics. Peyerimhoff (1931).

Notes

This genus was cited in the original description as *Lyttalydulus*. The name was later changed to *Lyttolydulus* by Reitter (1915). Because the unjustified emendation crediting the original date has been in prevailing use (e.g. Kaszab, 1969a; Bologna, 1991a; Selander, 1991) it must be maintained as the correct spelling (ICZN, Article 33).

This genus is heterogeneous for some morphological characters: a single species (*susicus*) has the pronotum about as wide as long rather than elongate; also, some species have the antennae subclavate and not submoniliform.

23. ***Lyttonyx*** Marseul, 1876

Type species. *Cantharis bilateralis* Marseul, 1876 (=*bicolor* Walker, 1871), by monotypy. 1 sp.

Geographic distribution. Sahara (from Morocco to Egypt), Arabian Peninsula (south to Yemen and east to Oman), Near East (from Palestine to Iran).

References

Taxonomy. Marseul (1876); Pardo Alcaide (1952); Kaszab (1983).

Notes

The single species of *Lyttonyx* is variable in colour and was described under four different names. The genus was erroneously cited from Angola by Wellman (1908) and other authors [as *Lytta myrmido* (Fairmaire, 1876) =*bicolor*]. This probably stemmed from an erroneous identification of another S African lyttine.

24. ***Muzimes*** Aksentjev, 1988

(figure 5)

Micromerus Mulsant and Rey, 1858 [nec *Micromerus* Rambur, 1842 (Neuroptera), and *Micromerus* Guillebeau, 1892 (Coleoptera) (see Dvorak, 1993b)].

Type species. *Litta* (*sic*!) *collaris* Fabricius, 1787, by monotypy as type species of its objective synonym *Micromerus* Mulsant and Rey. 17 spp.

Geographic distribution. From the Balkans and S Russia to Anatolia, Caucasus, Syria, Iraq and Iran.

References

Taxonomy. Escherich (1896a); Maran (1940, 1941a); Kaszab (1958a key and catalogue, 1963b, 1968a); Bologna (1979); Dvorak (1983, 1993b).

Bionomics. Ozbek (1979).

Anatomy. Gupta (1971, 1978).

Pharmacology. Théodoridès (1956).

Notes

Muzimes is morphologically homogeneous. Most of the species can only be clearly distinguished by male genitalia. In several cases it appears that sister species are allopatric to one another.

Özbek (1979) recorded Anthophoridae and Andrenidae bees as hosts in Turkey.

25. **Oenas** Latreille, 1802

Type species. *Lytta atrata* Fabricius, 1775 (misidentification) = *Meloe afer* Linnaeus, 1767, by monotypy (see Selander, 1991). 12 spp.

Geographic distribution. Mediterranean (from Morocco and Spain, east to Caucasus, Palestine and Iran).

References

Taxonomy. Abeille de Perrin (1880); Kaszab (1951c key and catalogue); Bologna (1991a, 1991b).

Bionomics. Gorriz y Muñoz (1882); Beauregard (1890); Bedel (1892); Cros (1922b); Valladares and Salgado (1983); Valladares (1984); Bologna (1991a, 1994a).

Larvae. Cros (1922b); MacSwain (1956).

Anatomy. Beauregard (1890); Gupta (1971, 1978).

Pharmacology. Beauregard (1890).

Notes

The W Mediterranean species of the *afer* group are in particular need of revisionary study (see Bologna, 1991a).

26. **Prionotolytta** Péringuey, 1909

Type species. *Lytta binotata* Péringuey, 1888, by monotypy. 11 spp.

Geographic distribution. Angola, Namibia, South Africa, Botswana, Zimbabwe.

References

Taxonomy. Kaszab (1955c key and catalogue, 1981).

Notes

The first-instar larva of *P. binotata* is known but undescribed (CB). The genus was erroneously attributed to Kaszab by Bologna (1991a: 86).

27. ***Prolytta*** Kaszab, 1959

Type species. Lytta lucida Haag-Rutenberg, 1880, fixed by original designation. 13 spp.

Geographic distribution. Namibia, South Africa.

References

Taxonomy. Péringuey (1909); Kaszab (1959, 1967 partial key and catalogue, 1981).

Anatomy. Gupta (1971, 1978).

Notes

Prolytta is characterized by very distinctive features. Included are the presence of wing vein $2A_2$ (figure 134), the more extensive fusion of the male gonoforceps, the partially invaginated sternite VIII and the absence of gonostyli in females. On the basis of these traits Selander (1964, 1966, 1991) divorced the genus from other lyttines and treated it as the most primitive tribe of Meloinae (Prolyttini). While recognizing its primitive position, Kaszab (1969a) and Bologna (1991a) retained membership in the Lyttini. Recent phylogenetic analysis (Bologna and Pinto, 2001) also does not support its recognition as a distinct tribe.

Two groups of species are easily distinguishable. The *lucida* group is characterized by its metallic coloration; the *pallidipennis* group is never metallic. The latter was revised by Kaszab (1967). The recently described *P. opacoides* Kaszab, 1981, may be a synonym of its sympatriate, *P. semilineata* (Haag-Rutenberg, 1880) of the *lucida* group. Several specimens from the type locality examined have intermediate characters between these forms. An on-going review of the genus (Bologna, in preparation) should resolve this question.

The first-instar larvae of four species representing both species groups [(*semilineata*, *lucida*, *lucidicollis* Kaszab, 1967; *pallidipennis* (Haag-Rutenberg, 1880)] are known (CB) but undescribed.

28. ***Pseudosybaris*** Saha, 1982

Type species. Pseudosybaris kempi Saha, 1982, by original designation. 1 sp.

Geographic distribution. India.

References

Taxonomy. Saha (1982).

Notes

This genus is unknown to us. It is not inserted in the key because we cannot distinguish it from several other lyttine genera. On the basis of the description it appears very close to *Sybaris*, particularly with respect to the male genitalia. However, it differs by its smooth rather than serrate claws. Intrageneric variation in this feature is known in other meloines and generic status for *Pseudosybaris* requires additional character support.

29. ***Sybaris*** Stephens, 1832

Prionotus Redetenbacher, 1842. *Type species*: *Prionotus praestus* Redtenbacher, 1842, by subsequent designation (Wellman, 1910) (see Selander, 1991).

Type species. *Sybaris immunis* Stephens, 1832, by monotypy. 30 spp.

Geographic distribution. Africa south of the Sahara (except S Africa and Madagascar), India, Pakistan, Sri Lanka, east to Burma.

References

Taxonomy. Pic (1913); Mohamedsaid (1979); Saha (1979 key to Indian spp.).

Anatomy. Gupta (1971, 1978); Yadav *et al.* (1977).

Notes

Kaszab (1969a) considered this genus close to those Mediterranean lyttine genera which also have serrate claws (i.e. *Lydus*, *Alosimus*, *Muzimes*, *Oenas*, *Eolydus*). This feature may prove to be independently derived in *Sybaris* as it is not obviously related to any other genus. While very similar to *Lydomorphus* in the shape of the head, eyes and pronotum, it differs considerably in male genitalic structure (aedeagus with a single hook, gonoforceps very elongate, phallobase wide in dorsal view), and, of course, in claw structure as well. As indicated above, it is possible that *Pseudosybaris* is a *Sybaris* with unmodified claws.

The generic assignment of the African species originally described as *Zonitis validiceps* Pic, 1916, remains uncertain. Kaszab (1963a) referred it to *Sybaris*, citing presence of serrate claws as justification. However, we examined two specimens identified by Kaszab (HNHM) as *Sybaris validiceps*, and both have smooth claws. In our opinion these specimens represent *Lydomorphus pici*, which, as previously discussed, differ from typical *Lydomorphus* and do resemble *Sybaris*.

As indicated above, *fryi* is herein transferred from *Sybaris* to *Lydomorphus*.

30. ***Syriolytta*** Kaszab, 1962 **new status**

Lytta (Syriolytta) Kaszab, 1962.

Type species. *Lydus vulneratus* Fairmaire, 1892 (=*Lytta fairmairei* Borchmann, 1917; =*Lytta suturifera* Pic, 1899) (erroneously given as *Lytta vulnerata* Fairmaireby Kaszab, see *Notes*), by original designation. 1 sp.

Geographic distribution. SE Turkey, Syria, N Iraq.

References

Taxonomy. Kaszab (1962b); Bologna (1991a).

Notes

Bologna (1991a) previously suggested that this taxon was distinct from *Lytta.* The elevation of *Syriolytta* to genus is justified by several traits. Unlike *Lytta*, in *Syriolytta* the mesepisterna do not broadly contact each other medially, the mandibles are acuminate apically, the labrum is distinctly narrowed apically, the frons is depressed and the occiput is furrowed medially. Kaszab (1962b) also placed *Lydus impressicollis* Fairmaire, 1892, in *Syriolytta*. However, an examination of its type (PMHN) suggests that it belongs in *Lydus*.

The transfer of the type species *Lydus vulneratus* Fairmaire, 1892, to *Lytta* by Borchmann (1917) resulted in its replacement name, *Lytta fairmairei* Borchmann, 1917, because of preoccupation by *Lytta vulnerata* Le Conte, 1851. Borchmann (1917) considered this species a synonym of *Lytta suturifera*, which Kaszab (1962b) also considered to be the valid name. We follow these authors here although we have not confirmed this synonymy.

31. ***Teratolytta*** Semenov, 1894

Type species. *Cantharis dives* Brullé, 1832, by subsequent designation (Wellman, 1910) (see Selander, 1991). 13 spp.

Geographic distribution. From the Balkans to the Near East (south to Palestine) and east to Afghanistan.

References

Taxonomy. Semenov (1894); Kaszab (1958b key and catalogue); Kryzhanovskij (1959); Dvorak (1983, 1996b key); Bologna (1991a, 1994a).

Bionomics. Prispinova (1987b); Bologna (1994a).

Anatomy. Gupta (1971, 1978).

Notes

Description of the first-instar larva of *T. gentilis* (Frivaldszky, 1877), as well as notes on sexual behaviour, and a taxonomic review of the genus with the addition of new species is in preparation (Bologna, in preparation).

32. ***Trichomeloe*** Reitter, 1911

Type species. *Meloe chrysocomus* Miller, 1861, by subsequent designation (MacSwain, 1956). 6 spp.

Geographic distribution. Turkey, Cyprus, Iraq, Syria, Lebanon, Palestine, Israel. Prispinova (1987a) recently recorded a species from Tadzhikistan. *T. sericellus* (Reiche, 1857) has been recorded also from Crimea and Sicily. A single old specimen labelled as from Sicily has been examined (see also Kaszab, 1962a; Bologna, 1991a). Both records require corroboration.

References

Taxonomy. Escherich (1890 partial key); Reitter (1895 partial key); Cros (1940a); MacSwain (1956); Kaszab (1958b); Prispinova (1987a); Bologna (1989a, 1991a).

Bionomics. Bologna (1991a).

Larvae. Cros (1934a); MacSwain (1956); Bologna (1989a).

Notes

Trichomeloe was separated from *Meloe* by MacSwain (1956) on the basis of Cros' observations (1940a). Both authors also included *Meloe majalis* Linné, which was later separated by Bologna (1989a) as the type species of the new genus *Berberomeloe*.

Prispinova (1987a) described a new species from Tadzhikistan as *Meloe (Trichomeloe) ovatus*. This extends the range of the genus considerably. The species is unknown to us but, based on the figures provided, it seems to be a true *Trichomeloe*.

A revision of *Trichomeloe* currently under way (Bologna, in preparation) will include the description of a new species from Iraq.

The first-instar larvae of two species are known (*T. chrysocomus*: Cros, 1934a; *T. deflexus* (Reitter, 1889) (CB). Adults were historically confused with *Meloe*. Unlike those of *Meloe*, however, the larvae of *Trichomeloe* are not phoretic. Larval biology is undescribed but probably is similar to that of other lyttine parasitoids of bees.

Tribe CEROCOMINI

33. ***Anisarthrocera*** Semenov, 1895

Type species. *Rhampholyssa batesi* Marseul, 1871, by monotypy (see Selander, 1991). 2 spp.

Geographic distribution. Iraq, S Iran, Saudi Arabia, N Somalia.

References

Taxonomy. Semenov (1895b); Kaszab (1951b catalogue; 1968b); Bologna (1990, 1991a).

Bionomics. Bologna (1990); Dvorak (1996a).

Notes

The separation of *Anisarthrocera* from *Diaphorocera*, a Saharan genus, needs confirmation (see Bologna, 1990). The two species of *Anisarthrocera* are quite different from one another. *A. batesi*, a polytypic species, is distinctive and characterized by the shape of male foretibiae which bears a basal digitiform appendage. *A. semirufa* (Fairmaire, 1882) from N Somalia has unmodified tibiae and is difficult to distinguish from *Diaphorocera*. Contrary to Kaszab (1951b), frontal calli are found in both *Anisarthrocera* and *Diaphorocera* and cannot be used to separate them.

34. ***Cerocoma*** Geoffroy, 1762

(figure 6)

Meloides Piller and Mitterpacher, 1783. *Type species*: *Meloides adamovichiana* Piller and Mitterpacher, 1783, by monotypy.

Metacerocoma Kaszab, 1951 (as subgenus; currently valid). *Type species*: *Cerocoma schreberi* Fabricius, 1781, by original designation.

Mesocerocoma Kaszab, 1951 (as subgenus; currently valid). *Type species*: *Cerocoma scovitzii* Faldermann, 1837, by original designation.

Cerocomina Kaszab, 1951 (as subgenus; currently valid). *Type species*: *Cerocoma vahli* Fabricius, 1783, by original designation.

Type species. *Meloe schaefferi* Linné, 1758, by subsequent monotypy (Fabricius, 1775). 26 spp. See *Notes*.

Geographic distribution. Central and S Europe, Maghreb, Egypt, Near East; central Asia east to Mongolia and W China.

References

Taxonomy. Kraatz (1863); Baudi di Selve (1878); Abeille de Perrin (1880); Reitter (1885); Maran (1944 partial key); Kaszab (1951b key and catalogue); Muche (1963); Pardo Alcaide (1977); Bologna (1979, 1994a); Dvorak (1990 partial key, 1993a, 1996a).

Bionomics. Beauregard (1884, 1890); Fabre (1886); Bedel (1892); Cros (1919b, 1924b); Molitor (1931); Matthes (1969, 1970); Bologna (1983a, 1991a, 1994a); Prispinova (1987b).

Larvae. Beauregard (1884, 1890); Fabre (1886); Cros (1919b, 1924b).

Anatomy. Beauregard (1890); Matthes (1970); Gupta (1971, 1978).

Pharmacology. Gorriz y Muñoz (1882); Beauregard (1890).

Notes

Fabricius (1775) was considered the author of *Cerocoma* by Selander (1991); however this was prior to publication of the International Commission on Zoological Nomenclature's Opinion 1754 (ICZN, 1994) which conserves *Cerocoma* Geoffroy as an available name.

The number of species probably will increase once the genus is thoroughly revised. *Meloides*, considered a subgenus by Dvorak (1993a), does not appear to differ distinctively from the nominate subgenus (Bologna, 1994a).

The first-instar larvae of *C. vahli* and *C. schreberi* are known; that of another Balkan species (*prevezaensis* Dvorak) is undescribed (CB). Larvae are parasitoids of Colletidae and Megachilidae bees. One species is a parasitoid of sphecid wasps (*Tachysphex*) feeding on provisioned paralysed mantids.

35. ***Diaphorocera*** Heyden, 1863

Type species. *Diaphorocera hemprichi* Heyden, 1863, by monotypy. 8 spp.

Geographic distribution. From the W Sahara to Egypt, S Israel, S Iraq, Saudi Arabia and S Iran.

References

Taxonomy. Heyden (1863); Bedel (1895); Chobaut (1921); Kaszab (1951b key and catalogue; 1983); Kocher (1954, 1956); Bologna (1991a).

Bionomics. Peyerimhoff (1931); Pardo Alcaide (1961).

Anatomy. Gupta (1971, 1978).

36. ***Rhampholyssa*** Kraatz, 1863

Type species. *Cerocoma steveni* Fischer von Waldheim, 1824, by monotypy. 2 spp.

Geographic distribution. Central Asia (from SE Russia to E Turkestan and N Iran).

References

Taxonomy. Kraatz (1863); Semenov (1895b); Reitter (1906); Kaszab (1951b key and catalogue); Bologna (1991a).

Bionomics. Prispinova (1987b).

Anatomy. Gupta (1971, 1978).

37. ***Rhampholyssodes*** Kaszab, 1983

Type species. Rhampholyssodes pitcheri Kaszab, 1983, by original designation. 1 sp.

Geographic distribution. Saudi Arabia.

References

Taxonomy. Kaszab (1983); Bologna (1991a).

Notes

This genus has nine antennal segments and not 10 as indicated by Kaszab (1983). It is close to *Rhampholyssa* which has eight-segmented antennae. The presence of the longitudinal head crest is a synapomorphic character common to both genera (figures 118, 119).

Tribe EPICAUTINI

38. ***Cyaneolytta*** Péringuey, 1909

(figure 7)

Type species. Lytta signifrons Fahraeus, 1870, by subsequent designation (Selander, 1986b) (see Selander, 1991). 31 spp.

Geographic distribution. Afrotropical region (except extreme south-west), S Sahara, SW Arabia, India east to Sikkim.

References

Taxonomy. Mäklin (1875); Haag-Rutenberg (1880 partial key); Péringuey (1909); Kaszab (1953a key and catalogue, 1960b); Bologna (1978); Anand (1979); Saha (1979 key to Indian spp.); Selander (1986a, 1986b annotated catalogue).

Bionomics. Selander (1986b, 1987a); Bouseman (1988); Bologna *et al.* (1990).

Larvae. Selander (1987a); Bologna *et al.* (1990).

Physiology. Gäde (1995).

Pharmacology. Cornalia (1865); Théodoridès (1950).

Notes

Pic (1952, 1953) described and cited two species (*crambeli* and *lepineyi*) from the Sahel unknown to us. The former was not recognized by Kaszab (1953a) or Selander (1986b); the latter was treated as *incertae sedis* and not assigned to species group.

Selander (1987a) described the first instar of a W African species and considered it phoretic and a parasitoid of bees. Bologna *et al.* (1990) showed considerable polymorphy in the first-instar larvae of this genus (three types) and noted phoretic behaviour of at least four African species on Carabidae of genera belonging to the tribes Anthiini and Panagaeini. Larvae of several other undetermined Afrotropical and Indian *Cyaneolytta*, referable to these morphological types, have now been found on additional taxa of ground beetles (Bologna, unpublished).

The phoretic larvae of *Cyaneolytta* prompted Selander (1987a) to place the genus in the Meloini. Recent phylogenetic analysis (Bologna and Pinto, 2001) finds no support for this and instead tentatively allies the genus with Epicautini.

39. ***Denierella*** Kaszab, 1952

Type species. Cantharis incompleta Fairmaire, 1896, by original designation. 9 spp.

Geographic distribution. India, Burma, Thailand, S China.

References

Taxonomy. Kaszab (1952c key and catalogue); Saha (1979 key to Indian spp.).

Notes

Denierella is a probable synonym of *Epicauta.* It can be distinguished only by its serrate claws, a character state that also occurs in two New World species of *Epicauta* (Pinto, 1991). Similar intrageneric variation in claw structure occurs in other large meloine genera (*Lytta*, *Lydomorphus*, *Mylabris*, etc.).

40. ***Epicauta*** Dejean, 1834

(figure 8)

Causima Dejean, 1834. *Type species*: *Lytta vidua* Klug, 1825, by monotypy.

Henous Haldeman, 1852. *Type species*: *Henous techanus* Haldeman (= *Meloe conferta* Say, 1824), by monotypy.

Isopentra Mulsant and Ray, 1858. *Type species*: *Lytta megalocephala* Gebler, 1817, by subsequent designation (Werner, 1945).

Apterospasta LeConte, 1862. *Type species*: *Lytta segmenta* Say, 1823, by subsequent designation (Wellman, 1910).

Macrobasis LeConte, 1862. *Type species*: *Lytta albida* Say, 1824, by subsequent designation (Wellman, 1910); currently as subgenus (Pinto, 1991).

Pleuropompha LeConte, 1862. *Type species*: *Lytta costata* LeConte, 1854, by monotypy.

Nomaspis LeConte, 1866. *Type species*: *Meloe parvus* Haldeman, 1852 (= *Meloe parvulus* Haldeman, 1854), by monotypy.

Gnathospasta Horn, 1875. *Type species*: *Gnathospasta mimetica* Horn, by monotypy.

Anomalonyx Denier, 1935. *Type species*: *Lytta fumosa* Germar, 1824, by original designation. [nec *Anomalonyx* Weise (1903) (Chrysomelidae)]; replaced by *Anomalonychus* Saylor.

Anomalonychus Saylor, 1940. New name for *Anomalonyx* Denier, 1935.

Maculicauta Dillon, 1952. *Type species*: *Epicauta stuarti* LeConte, 1868, by original designation.

Type species. Meloe erythrocephalus Pallas, 1776, by subsequent designation (Werner, 1945). *Ca* 381 spp. (*ca* 110 in the Old World).

Geographic distribution. Occurring on all of the major land masses except Australia, New Zealand and Madagascar. Widespread throughout the Old World except at extreme N latitudes.

References

Taxonomy. Haag-Rutenberg (1880 partial key); Reitter (1905); Péringuey (1909 key to South African spp.); Denier (1935a, 1935b); Werner (1945 key to US and Canadian spp., 1954); Kaszab (1952b key to the Palaearctic and Oriental species, 1953c key to the Afrotropical species, 1960b, 1978); Tan (1958); Anand (1977); Saha (1979); Selander and Mathieu (1969 partial catalogue of American spp.); Adams and Selander (1979 partial catalogue of American spp.); Pinto (1980, 1984b, 1991 revision North American species including key to spp.); Bologna (1991a); Dvorak (1996c).

Bionomics. Beauregard (1890); Roepke (1917); Verbeek (1932); Jannone (1935); Cros (1937); Görnitz (1937); Horsfall (1941, 1942, 1943); Church (1967); Nagatomi (1967); Selander and Mathieu (1969); Selander and Weddle (1969, 1972); El Rayah (1973); Adams and Selander (1979); Selander (1981, 1982); Pinto (1973, 1991); Gahukar *et al.* (1989); Bologna (1991a, 1994b).

Larvae. Beauregard (1890); Bréthes (1901, 1917); Cros (1937); Horsfall (1941); MacSwain (1956); Berríos-Ortiz and Selander (1972); Pinto (1972a, 1991); Selander and Agafitei (1982).

Anatomy. Beauregard (1890); Gupta (1971, 1978); Ferreira and Mesa (1977); Berríos-Ortiz and Selander (1979); Dey *et al.* (1985); Berríos-Ortiz (1986).

Physiology. Cohen and Pinto (1977).

Pharmacology. Cornalia (1865); Beauregard (1890); Théodoridès (1950); Hammouda and Salama (1974); Inagaki *et al.* (1983).

Fossils. Werner (1970).

Notes

Epicauta includes two subgenera. The geographic distribution of the nominate subgenus coincides with that of the genus itself. *Macrobasis* (*ca* 70 species) is restricted primarily to North America (Pinto, 1991). Among the synonyms listed above, *Gnathospasta* and *Apterospasta* are junior synonyms of *Macrobasis* at the subgeneric level. Keys by Kaszab (1952b, 1953c, 1960b, 1978) are available for the Old World species although they are incomplete and difficult to use especially for females. A modern revision is available only for the North American species (Pinto, 1991).

Epicauta are parasitoids of grasshopper eggs, primarily of the family Acrididae. Selander (1981, 1982) provides evidence that certain species feed on the eggs of other *Epicauta*.

41. ***Psalydolytta*** Péringuey, 1909

Gnathospastoides Fletcher, 1914. *Type species*: *Lytta rouxii* Castelnau, 1840, by monotypy.

Type species. Lytta lorigera Gerstaecker, 1854, by subsequent designation (Imperial Institute of Entomology, 1935) (see Selander, 1991). 52 spp.

Geographic distribution. Most of Africa south of the Sahara (except Madagascar, Somalia and extreme S Africa), India and the S Himalayan region.

References

Taxonomy. Mäklin (1875); Péringuey (1909); Kaszab (1954b key and catalogue); Anand (1977, 1989); Bologna (1978, 1994b); Saha (1979 key to the Indian spp.); Selander (1988c annotated catalogue).

Bionomics. Giglioli (1965); Anand (1978); Selander and Laurense (1987); Selander (1988c); Zethner and Laurense (1988); Gahukar (1989); Gahukar *et al.* (1989).

Larvae. Selander and Laurense (1987).

Pharmacology. Giglioli (1965).

Notes

The number of species belonging to *Psalydolytta* is questionable. Some recently described Indian species need re-evaluation. Also, an additional Indian species, *P. fasciculata* (Pic, 1920), was not examined in Kaszab's revision, but is considered as distinct by Anand (1980).

The first-instar larva of a single species has been described. It is very similar to those of *Epicauta*, as is the little that is known of its larval biology (Selander and Laurense, 1987).

Tribe MYLABRINI

42. *Actenodia* Laporte de Castelnau, 1840

(figure 11)

Rusadiria Pardo Alcaide, 1954 (as a subgenus of *Mylabris*). *Type species*: *Mylabris billbergi* Gyllenhal, 1817, by original designation. Pardo Alcaide originally introduced this name in 1952 but failed to designate a type species.

Type species. *Actenodia guttata* Laporte de Castelnau, 1840, by monotypy (see *Notes*). 20 spp.

Geographic distribution. Mediterranean Basin, Arabia and Africa (except Madagascar). Records from Pakistan and Afghanistan are questionable.

References

Taxonomy. Reiche (1865); Marseul (1870, 1872 keys and catalogues); Baudi di Selve (1878), Wellman (1908 pars); Péringuey (1909); Soumacov (1915); Pardo Alcaide (1952, 1954a, 1959, 1963); Kuzin (1954); Kaszab (1958b); Bologna (1978, 1990, 1991a); Dvorak (1993a).

Bionomics. Gorriz y Muñoz (1882); Beauregard (1890); Bedel (1892); Cros (1930); Valladares and Salgado (1983); Bologna (1991a).

Larvae. Cros (1917a, 1930); Bologna (1991a).

Anatomy. Beauregard (1890); Gupta (1971, 1978).

Pharmacology. Beauregard (1890).

Notes

Selander (1991) indicated, erroneously, that the type species, *A. guttata*, is a synonym of *Meloe decemguttata* Thunberg, 1791. Pardo Alcaide (1958b) examined the type and showed that *decemguttata* is a distinct species of *Hycleus* [cited as *Mylabris* (*Gorrizia*)]. It also is the type species of *Arithmema* and consequently the latter name is a junior synonym of *Hycleus* (see below) and not a senior synonym of *Actenodia* as listed by Selander (1991).

As discussed by Bologna (1978, 1991a, 2000a), the number of antennal segments is variable in mylabrine genera. For example, in *Actenodia* the number varies from six to nine (most commonly eight or nine). This variation has caused considerable confusion in generic assignments. For this reason, the number of described species assignable to *Actenodia* is unclear. Bologna (1991a: 46) noted 31 species (indicated erroneously as *ca* 50 on p. 275), but it now appears that certain SW African species with eight antennal segments (*amoenus* Marseul,1872; *deserticolus* Wellman, 1908 (=*annulipes* Pic, 1910); *bushmanicus* Kaszab, 1952; *devylderi* Borchmann, 1928; *kochi* Kaszab, 1952; *politus* Kaszab, 1955; *vansoni* Kaszab, 1952) should be placed in *Hycleus* (Bologna, unpublished). The placement in *Actenodia* of other African and Asian species (*mirabilis* Kaszab, 1952; *waziristanica* Kaszab, 1958) that we have not examined, also remains questionable.

Dvorak (1993a) recently described *Paractenodia perfuga* from Syria. This very distinct species has unique coloration (a red frontal spot and red pronotum), only seven antennal segments (abruptly clubbed at apex) and elongate setae on the genae, similar to those in the lyttine genus *Lyttonyx*. It differs from the SW African *Paractenodia* (see below), which also has seven antennal segments, by the shape (subequal length and width dimensions) and position of the aedeagal hooks (distant from apex), the unmodified mesosternum and the absence of a distinct mesepisternal carina. After examining a paratype of this species, we are transferring it to *Actenodia* (**new combination**). This is primarily based on the structure of the antennae, male genitalia and mesosternum. Unlike most *Actenodia*, however, the pronotum is not strongly transverse and the mesepisterna are slightly furrowed although less so than in *Paractenodia.*

Eight S Mediterranean and Saharan species of this genus having nine antennal segments were historically assigned to *Coryna*, a synonym of *Hycleus* (see Bologna, 1991a: 275).

The first-instar larvae of two S Mediterranean species have been described.

43. *Ceroctis* Marseul, 1870

Type species. *Mylabris trizonata* Reiche, 1865, by subsequent designation (Pardo Alcaide, 1954a). See Selander (1991). 59 spp.

Geographic distribution. Africa (except western regions, Madagascar and the inner Sahara), W Arabia, Sinai, Palestine.

References

Taxonomy. Marseul (1870, 1872 partial keys and catalogues); Péringuey (1909); Wellman (1908); Borchmann (1940); Pic (1948); Kaszab (1951d, 1958c, 1983); Kuzin (1954); Pardo Alcaide (1958b); Bologna (1980, 1990).

Bionomics. Cros (1919a, 1927a); Peyerimhoff (1931); MacSwain (1956); Gess and Gess (1980, 1983).

Larvae. Cros (1919a, 1927a).

Anatomy. Gupta (1971, 1978).

Notes

The genus can be divided into several distinct species groups on the basis of elytral pattern and antennal shape. The status of about 10 species of *Ceroctis* insufficiently characterized by Pic (see particularly Pic, 1948) remains questionable.

The larval biology of the only two species of *Ceroctis* adequately studied deviates from that in other mylabrines and most meloines. *Ceroctis groendali* (Billberg, 1813) is a parasitoid of Masaridae wasps (Gess and Gess, 1980), and *C. capensis* (Linné, 1767) has been associated with the nest of a sphecid wasp (specimens associated with wasps in SAMC; also Whitehead, in verbis, 1994). The Mylabrini generally are parasitoids of Acridoidea, or, less commonly, megachilid bees.

The first-instar larva of a single Saharan species was described; those of four additional S African species remain undescribed (CB).

44. *Croscherichia* Pardo Alcaide, 1950

Lybicisca Kuzin, 1954. *Type species*: *Mylabris sanguinolenta* Olivier, 1811, by original designation.

Type species. *Mylabris circumflexa* Chevrolat, 1837 (=*Mylabris paykulli* Billberg, 1813), by monotypy. 18 spp.

Geographic distribution. From North Africa (Mediterranean, Saharan, W and E Sahelian regions) to the Middle East and Arabian Peninsula, and east to SW India. There are doubtful records from Turkestan, S Spain and the Baleares Islands.

References

Taxonomy. Escherich (1899); Soumacov (1915); Pardo Alcaide (1950, 1954a); Kuzin (1954); Biondi *et al.* (1988); Bologna and Coco (1991 revision and key to species).

Bionomics. Cros (1927b, 1940b); Bologna and Coco (1991).

Larvae. Cros (1917a, 1927b, 1940b); MacSwain (1956); Bologna and Coco (1991).

Pharmacology. Beauregard (1890).

Notes

The limits of *Croscherichia* were discussed by Bologna and Coco (1990); their study removed certain species and reassigned them to *Hycleus* and *Mylabris.* After an examination of types (HNHM), we herein transfer to *Croscherichia*, *Mylabris* (*Gorrizia*) *sonyae* Kaszab, 1983, from Arabia (**new combination**). This species differs from *Hycleus* (of which *Gorrizia* is a synonym) by the structure of the mesosternum and male genitalia. It is markedly differentiated from other *Croscherichia* by the modified antennae (segments V–III and XI) and the first foretarsal segment in males, and by the erect setae on the dorsal surface of the middle tibiae in females.

The first-instar larvae of three North African species have been described. Although larval biology remains unknown, one species was reared artificially on eggs of *Osmia* (Megachildae). The specialized first-instar larvae have certain traits characteristic of phoretic genera of Meloidae (Bologna and Pinto, 2001).

45. ***Hycleus*** Latreille, 1817

Coryna Billberg, 1813. *Type species*: *Mylabris argentata* Fabricius, 1792, by monotypy [nec *Coryna* Bosc, 1802 (Hydrozoa) and *Coryna* Wolff, 1811 (Hemiptera)].

Dices Dejean, 1821. *Type species*: *Cerocoma ocellata* Olivier, 1791, by monotypy (see Selander, 1991).

Arithmema Chevrolat, in Guérin de Méneville, 1829–1844 (131, legend for plate 35, fig. 2). *Type species*: *Meloe decemguttata* Thunberg, 1791, by monotypy (see *Actenodia* for the correct status of this species); also see Selander (1991).

Decatoma Dejean, 1821 [nec *Decatoma* Spinola, 1811 (Hymenoptera); replaced by *Decapotoma* Voigts].

Decapotoma Voigts, 1902. *Type species*: *Meloe lunata* Pallas, 1782, by monotypy as type species of *Decatoma* Dejean; new name for *Decatoma* Dejean. (Pars).

Euzonabris Kuzin, 1954. *Type species*: *Meloe cichorii* Linnaeus, 1758, by original designation (as subgenus of *Mylabris* Fabricius, 1775).

Sphenabris Kuzin, 1954. *Type species*: *Meloe balteata* Pallas, 1782, by original designation (as subgenus of *Mylabris* Fabricius, 1775); name originally proposed by Kuzin (1953) without designation of a type species.

Tigrabris Kuzin, 1954. *Type species*: *Meloe atrata* Pallas, 1773, by original designation (as subgenus of *Mylabris* Fabricius, 1775); name originally proposed by Kuzin (1953) without designation of a type species.

Gorrizia Pardo Alcaide, 1954. *Type species*: *Mylabris duodecimpunctata* Olivier, 1811, by original designation (as subgenus of *Mylabris* Fabricius, 1775); name originally proposed by Pardo Alcaide (1950) without designation of a type species.

Mesogorbata Pardo Alcaide, 1954. *Type species: Mylabris apicipennis* Reiche, 1865, by original designation [as section of *Mylabris* (*Gorrizia*) Pardo Alcaide, 1954; = *Sphenabris* Kuzin, 1954).

Mesoscutata Pardo Alcaide, 1954. *Type species*: *Mylabris duodecimpunctata* Olivier, 1811, by original designation (as section of *Mylabris* (*Gorrizia*) Pardo Alcaide, 1954).

Androfoveata Pardo Alcaide, 1954. *Type species*: *Mylabris duodecimpunctata* Olivier, 1811, by original designation [as subsection of *Mylabris* (*Gorrizia*) section *Mesoscutata* Pardo Alcaide, 1954]; name originally proposed by Pardo Alcaide (1950) without designation of a type species.

Mesotaeniata Pardo Alcaide, 1955. *Type species*: *Meloe lunata* Pallas, 1782, by original designation [as section of *Mylabris* (*Gorrizia*) Pardo Alcaide, 1954].

Type species. *Mylabris argentata* Fabricius, 1792, by subsequent designation (Blanchard, 1836–1849). *Ca* 430 spp.

Geographic distribution. Widespread in the Palaearctic, Oriental (to Timor) and Afrotropical regions (Also see *Notes*).

References

Taxonomy. Marseul (1870, 1872 partial keys and catalogues); Escherich (1899); Wellman (1908); Péringuey (1909 partial key to South African spp.); Soumacov (1915, 1930 catalogue of Palaearctic spp.); Borchmann (1940); Gridelli (1940); Pardo Alcaide (1950, 1954a, 1955, 1958a, 1958b, 1963, 1968); Kuzin (1954); Kaszab (1957a, 1983); Saha (1979 partial key to Indian spp.); Bologna (1978, 1990, 1991a).

Bionomics. Beauregard (1890); Portchinsky (1914); Cros (1927a); Zachvatkin (1931); Verbeek (1932); Greathead (1963); Hall (1984); Gahukar *et al.* (1989); Bologna (1991a review).

Larvae. Beauregard (1890); Cros (1927a, 1929b, 1931b); MacSwain (1956); Juchnevitsh (1955); Prjamikova and Juchnevitsh (1958); Bologna (1991a review, 1991c).

Anatomy. Beauregard (1890); Deobhakta (1957); Gupta (1971, 1978); Yadav (1973); Yadav *et al.* (1977); Sidhra *et al.* (1983, 1984).

Physiology. Chockalingam and Manoharan (1980); Thakare *et al.* (1980); Sidhu *et al.* (1982); Dhillon *et al.* (1983a, 1983b); Gäde (1995).

Pharmacology. Beauregard (1890); Theodoridès (1950); Tagwireyi *et al.* (2000).

Notes

With over 400 described species, *Hycleus* is the largest genus of Meloidae. The group has been confused with *Mylabris* and other Mylabrini taxa by several authors. The very complex synonymies and generic definitions involved are explained by Bologna (1978, 1991a). This speciose genus is badly in need of revision. Pardo Alcaide (1952, 1954a, 1955) described three distinct sections characterized by the shape of mesosternal structures; the same author (Pardo Alcaide, 1955, 1958a, 1958b, 1963, 1968) and Bologna (1978, 1979, 1980, 1990, 1991a, 1994a, 1994b) defined various Afrotropical and Palaearctic groups of species.

Three distribution records of *Hycleus* require corroboration. Previously unrecorded from Madagascar, we have examined a single specimen (LACM) of an undetermined species [with 11 antennal segments belonging to the '*Mesotaeniata*' type (see Pardo Alcaide, 1954a; Bologna, 1991a) collected from the Berenty Lemur Reserve (July 1982)]. Another record from the malagasy region is cited by Marseul (1872) who described '*Mylabris*' *mauritia* from Mauritius, a possible synonym of the east African *kersteni* Gestaecker. A doubtful record from the Canary Islands also was recently noted by Bologna (1994c).

The first-instar larvae of *ca* 20 species have been described, and larvae of about

10 additional species are known but undescribed (CB, UCRC). Larvae appear to be most commonly associated with the eggs of various Acrididae; however, two species are recorded as parasitoids of *Osmia* bees (Megachilidae).

46. ***Lydoceras*** Marseul, 1870

Denierus Pic, 1913. *Type species*: *Zonabris* (*Mylabris*) *stanleyana* Duvivier, 1890, by monotypy. Subsequently misspelled as *Deniorus* by Pic (1914).

Type species. *Mylabris fasciata* Fabricius, 1775, by monotypy. 4 spp.

Geographic distribution. Central (Angola, Congo) and E Africa, W Arabia. *L. fasciata* is recorded in the early literature also from Egypt (one specimen in HNHM, examined). This may be in error for the Arabian coast. Old records from India are erroneous.

References

Taxonomy. Marseul (1870, 1872); Soumacov (1915); Kuzin (1954); Bologna (1978, 1990).

Bionomics. Paoli (1931–1933).

Notes

The four species of *Lydoceras* can be divided into two species groups; *L. stanleyana* is quite distinct from congeners (Bologna, 1990; unpublished).

47. ***Mimesthes*** Marseul, 1872

Type species. *Mimesthes maculicollis* Marseul, 1872, by monotypy. 4 spp.

Geographic distribution. SW Namibia and W South Africa.

References

Taxonomy. Marseul (1870); Péringuey (1909); Kaszab (1952e, 1955c, 1981); Kuzin (1954); Bologna (2000a revision and key to spp.).

Bionomics. Bologna (2000a).

48. ***Mylabris*** Fabricius, 1775

(figure 12)

Zonabris Harold, 1879. *Type species*: *Meloe cichorii* Linné, 1758, according to Selander (1991), by fixation as type species of *Mylabris* Fabricius. Invalid replacement name for *Mylabris* Fabricius.

Megabris Des Gozis, 1881. *Type species*: *Meloe cichorii* Linneaus, 1758, according to Selander (1991), by fixation as type species of *Mylabris* Fabricius. Invalid replacement name for *Mylabris* Fabricius.

Androplicata Pardo Alcaide, 1948, without type species designation (as section, not an available name; =*Mylabris* (*Micrabris)* Kuzin, 1954).

Mesosulcata Pardo Alcaide, 1950 (as section; currently valid subgenus). *Type species*: *Mylabris hieracii* Gräells, 1849, by monotypy (see Selander, 1991 for invalid designation).

Lachnabris Kuzin, 1953 (as subgenus; currently valid). *Type species*: *Mylabris mannerheimi* Gebler, 1845, by monotypy.

Monabris Kuzin, 1953 (as subgenus; currently valid). *Type species*: *Mylabris undecimpunctata* Fischer von Waldheim, 1842, by monotypy.

Ammabris Kuzin, 1954 (as subgenus; currently valid). *Type species*: *Mylabris elegans* Olivier, 1811, by original designation.

Argabris Kuzin, 1954 (as subgenus; currently valid). *Type species*: *Meloe ocellata* Pallas, 1773, by original designation.

Chalcabris Kuzin, 1954 (as subgenus; currently valid). *Type species*: *Meloe festiva* Pallas, 1773, by original designation.

Chrysabris Kuzin, 1954 (as subgenus; currently valid). *Type species*: *Meloe trifascis* Pallas, 1773, by original designation.

Eumylabris Kuzin, 1954 (as subgenus; currently valid). *Type species*: *Mylabris decempunctata* Fabricius, 1792 (= *Mylabris fabricii* Soumacov, 1924), by original designation.

Glaucabris Kuzin, 1954 (as subgenus; = *Mylabris (Mesosulcata)* Pardo Alcaide, 1950). *Type species*: *Mylabris hieracii* Gräells, 1849, by original designation.

Micrabris Kuzin, 1954 (as subgenus; currently valid). *Type species*: *Mylabris geminata* Fabricius, 1798, by original designation.

Mesolaevigata Pardo Alcaide, 1954 (as section; = *Mylabris (Micrabris)* Kuzin, 1954). *Type species*: *Mylabris geminata* Fabricius, 1798, by original designation; name originally proposed by Pardo Alcaide (1950) without designation of a type species.

Mesopunctata Pardo Alcaide, 1954 (as section of *Mylabris*; = *Mylabris (Mylabris)* Fabricius, 1775). *Type species*: *Meloe quadripunctata* Linnaeus, 1767, by original designation; name originally proposed by Pardo Alcaide (1950) without designation of a type species.

Mesorbata Pardo Alcaide, 1954 (as section; = *Mylabris (Ammabris*) Kuzin, 1954). *Type species*: *Mylabris elegans* Olivier, 1811, by original designation. Synonymized in error with *Mylabris (Argabris)* by Bologna, 1991a.

Neabris Kaszab, 1958 (as subgenus; = *Mylabris (Eumylabris)* Kuzin, 1954). *Type species*: *Mylabris klapperichi* Kaszab, 1958, by original designation.

Calydabris Kaszab, 1960 (herein as subgenus). *Type species*: *Calydus allousei* Kaszab, 1960, by original designation.

Mauritabris Pardo Alcaide, 1969 (as subgenus; currently valid). *Type species*: *Mylabris tenebrosa* Laporte de Castelnau, 1840, by original designation.

Zitunabris Pardo Alcaide, 1969 (as subgenus; currently valid). *Type species*: *Mylabris oleae* Chevrolat, 1837 (not Laporte de Castelnau, 1840, as erroneously indicated by Selander, 1991), by original designation.

Type species. *Meloe cichorii* Linné, 1758, by subsequent designation (Latreille, 1810), according to Selander (1991) and other authors (but see *Notes*).

Geographic distribution. Central and S Palaearctic region, and areas transitional to the Oriental region (W India, Himalayas, W China).

References

Taxonomy. Billberg (1813); Marseul (1870, 1872 keys and catalogues); Escherich (1899); Soumacov (1915, 1930 catalogue); Pardo Alcaide (1948, 1950, 1954a, 1969a); Kuzin (1953, 1954); Kaszab (1958b), Bologna (1978, 1979, 1991a, 1994a); Aksentjev (1988).

Bionomics. Beauregard (1890); Chobaut (1890); Buysson (1902); Portchinsky (1914); Cros (1929b); Zachvatkin (1931); Paoli (1932, 1937); Paoli and Boselli (1947); Greathead (1963); Bologna (1991a review).

Larvae. Gorriz y Muñoz (1882); Beauregard (1890); Chobaut (1890); Cros (1926, 1928a, 1929b); Paoli (1932, 1937); MacSwain (1956); Juchnevitsh (1955); Prjamikova and Juchnevitsh (1958); Bologna (1991a review).

Anatomy. Beauregard (1890); Gupta (1971, 1978).

Pharmacology. Beauregard (1890); Wang (1989).

Notes

The fact that *Meloe cichorii* is the type species of *Mylabris* is problematic. Ignoring the designation of this species as type by Latreille (1810), Kuzin (1954) transferred it to *Hycleus* [as *Mylabris* (*Euzonabris*), a synonym of *Hycleus*] and its placement there has been adopted by other workers (e.g. Bologna, 1991a: 207). Following Kuzin's definition of *cichorii* will result in extensive nomenclatural disruption in two of the most speciose genera of Meloidae. However, a recent examination of the type series of *M. cichorii* (BMNH) shows that it is mixed and includes not only *Hycleus cichorii* as defined by recent authors, but also *Mylabris variabilis* (Pallas). Consequently there are two options available that will preserve current generic definitions: (1) Designation of the representative of *M. variabilis* as lectotype of *Mylabris cichorii*; or (2) petition the International Commision of Zoological Nomenclature to set aside the designation of *Meloe cichorii* as type species and accept the designation of *Meloe quadripunctata* Linné. The latter was inappropriately designated the type species by Pardo Alcaide (1954a) but is in accordance with the modern definition of *Mylabris* (Kuzin, 1954; Bologna, 1991a).

Bologna (1991a) recognized 12 subgenera of *Mylabris*. As proposed by Bologna (1991a: 207) and as indicated above, we treat *Calydabris* Kaszab as a subgenus of *Mylabris*. It previously was considered a subgenus of the lyttine genus *Calydus* Reitter, but recently treated as a distinct mylabrine genus by Selander (1991). *Calydabris* includes two Iranian species (*C. allousei* Kaszab and *C. mirzayani* Kaszab) and three additional undescribed species from Iran and Turkey (Bologna, 1991a: 207, in preparation). Several species of *Mylabris* remain undescribed.

Bologna and Coco (1990) transferred the Iraqi species, *maceki* Dvorak, from *Croscherichia* to *Mylabris*.

The first-instar larvae of several species have been described; those of several others are available but undescribed (CB). Larvae develop on the eggs of several genera of Acrididae; one species of the subgenus *Eumylabris* is a parasitoid of bees.

49. ***Paractenodia*** Péringuey, 1904

Type species. *Paractenodia parva* Pèringuey, 1904, fixed by monotypy. 4 spp.
Geographic distribution. Namibia and W South Africa.

References

Taxonomy. Péringuey (1904, 1909); Kaszab (1952e, 1955c, 1969b key and catalogue); Bologna (1991a).

Notes

Although treated as distinct by Kaszab (1969a) and Dvorak (1993a), the validity of *Paractenodia* has been questioned by other authors. Pardo Alcaide (1952) considered it a probable synonym of *Actenodia* (as *Rusadiria*), and Selander (1991) listed it as a junior synonym of that genus (as *Arithmema*). While treating it as distinct, Bologna (1991a) also questioned its separation from *Actenodia*. The recent discovery of the first instar of *P. parva*, the type species (Bologna, unpublished), now convinces us that *Paractenodia* is a valid genus close to *Hycleus*. The larvae of the other three species assigned here are unknown and, although adults are phenetically very similar to *P. parva*, their placement here is tentative. The seven-segmented antennae can be used to separate adults of these species from *Hycleus* where antennal segment number varies from 8 to 11.

The genus is endemic to the western part of S Africa. As indicated above, we are transferring the Syrian species described as a *Paractenodia* by Dvorak (1993a) to *Actenodia*.

The first-instar larva of *P. parva* is known but undescribed (CB); larval biology is unknown.

50. ***Pseudabris*** Fairmaire, 1894

Type species. *Pseudabris tigriodera* Fairmaire, 1894, by monotypy [listed as a synonym of *Zonabris przewalskyi* Dokhtouroff, 1887, by Selander (1991); this requires confirmation]. 4 spp.

Geographic distribution. Tibet and the Himalayas.

References

Taxonomy. Fairmaire (1894); Blair (1927); Kuzin (1954); Tan (1981 partial key).

Anatomy. Gupta (1971, 1978).

Notes

This genus is defined by numerous autapomorphic traits including enlarged temples, a very flat frons, a medially sulcate carina on the mesoscutum (figure 139), unique elytral sculpturing and highly setose gonoforceps.

51. ***Semenovilia*** Kuzin, 1954

Type species. *Mylabris fischeri* Gebler, 1847, by monotypy. 1 sp.

Geographic distribution. Central and SW Asia (Kazhakstan, Turkmenistan, Iran, Afghanistan).

References

Taxonomy. Marseul (1870, 1872); Soumacov (1915); Kuzin (1954).

52. ***Xanthabris*** Kaszab, 1956

Type species. *Xanthabris baluchistana* Kaszab, 1956, by original designation. 1 sp.

Geographic distribution. Pakistan.

References

Taxonomy. Kaszab (1956).

Tribe MELOINI

53. ***Meloe*** Linné, 1758

(figure 9)

Proscarabaeus Schrank, 1781. *Type species*: *Meloe proscarabaeus* Linnaeus, 1758, by absolute tautonymy.

Melittophagus Kirby, 1818. *Type species*: *Pediculus melittae* Kirby, 1802 (=*Meloe violaceus* Marsham, 1802), by original designation.

Triungulinus Dufour, 1828. *Type species*: *Triungulinus andrenatarum* Dufour, 1828, by monotypy.

Cnestocera Thomson, 1859. *Type species*: *Meloe proscarabaeus* Linnaeus, 1758, by original designation.

Treiodous Dugès, 1869. *Type species*: *Treiodous barranci* Dugès, 1869 (=*Meloe laevis* Leach, 1815), by monotypy. Currently considered as subgenus (Pinto and Selander, 1970; Bologna, 1991a).

Lampromeloe Reitter, 1911 (as subgenus; currently valid). *Type species*: *Meloe variegatus* Donovan, by subsequent designation (Aksentjev, 1988).

Lasiomeloe Reitter, 1911 (as subgenus; currently valid). *Type species*: *Meloe olivieri* Chevrolat, 1833, by monotypy.

Meloegonius Reitter, 1911 (as subgenus; currently valid). *Type species*: *Meloe cicatricosus* Leach, 1815, by subsequent designation (Aksentjev, 1988).

Coeloemeloe Reitter, 1911 (as subgenus; currently valid). *Type species*: *Meloe tuccius* Rossi, 1792, by monotypy.

Taphromeloe Reitter, 1911 (as subgenus; currently valid). *Type species*: *Meloe erythrocnemus* Pallas, by monotypy.

Chiromeloe Reitter, 1911 (as subgenus; currently valid). *Type species*: *Meloe nigropilosellus* Reitter, 1900, by monotypy.

Listromeloe Reitter, 1911 (as subgenus; currently valid). *Type species*: *Meloe hungarus* Schrank, 1776, by monotypy.

Micromeloe Reitter, 1911 (as subgenus; currently valid). *Type species*: *Meloe uralensis* Pallas, 1773, by subsequent designation (Aksentjev, 1988).

Meloenellus Reitter, 1911 (as subgenus; currently valid). *Type species*: *Meloe nigropuberulus* Reitter, 1890, by subsequent designation (Aksentjev, 1988).

Eurymeloe Reitter, 1911 (as subgenus; currently valid). *Type species*: *Meloe brevicollis* Panzer, 1793, by subsequent designation (Pinto and Selander, 1970).

Mesomeloe Reitter, 1911 (as subgenus; currently valid). *Type species*: *Meloe sulcicollis* Kraatz, 1882 (=*Meloe xanthomelas* Solsky, 1881), by subsequent designation (Aksentjev, 1988).

Afromeloe Schmidt, 1913 (as subgenus; currently valid). *Type species*: *Meloe angulatus* Leach, 1815, by subsequent designation (Aksentjev, 1988).

Trapezimeloe Pliginskij, 1935 [as subgenus; =*Meloe* (*Micromeloe*) Reitter, 1911]. *Type species*: *Meloe conradti* Heyden, 1888, by monotypy.

Desertimeloe Kaszab, 1964 (as subgenus; currently valid). *Type species*: *Meloe centripubens* Reitter, 1897, by original designation.

Anchomeloe Iablokoff-Khnzorian, 1983 [as section of the nominate subgenus, =*Meloe* (*Treiodous*) Dugès, 1869]. *Type species*: *Meloe autumnalis* Olivier, 1795, by monotypy.

Alveomeloe Prispinova, 1987 (as subgenus; currently valid). *Type species*: *Meloe tadzhikistanicus* Prispinova, 1987, by original designation.

Type species. *Meloe proscarabaeus* Linnaeus, 1758, by subsequent designation (Latreille, 1810) (see Bologna, 1989a, Selander, 1991). *Ca* 155 spp. (*ca* 130 in Old World).

Geographic distribution. Primarily Holarctic but widespread also in E and S Africa and Madagascar. Also occurring in areas transitional to the Oriental region (N India, S China, Taiwan).

References

Taxonomy. Brandt and Erichson (1832); Escherich (1890 partial key); Reitter (1895 partial key; 1911 key to Palaearctic subgenera); Schmidt (1913 key to Afrotropical species); Maran (1942b partial key); Pinto and Selander (1970 revision of New World spp. including key); Kaszab (1964, 1981); Selander (1985, 1988b); Prispinova (1987a); Bologna (1988a partial key and catalogue, 1991a); Bologna and Pinto (1992, 1995, 1998 review Afrotropical spp. including key); Pinto and Bologna (1993).

Bionomics. Beauregard (1890); Cros (1914a, 1918, 1927d, 1931a, 1935, 1941, 1943); Pinto and Selander (1970); Pinto (1972b); Erickson *et al.* (1976); Bologna and Havelka (1985); Bologna and Marangoni (1986); Bologna (1988a, 1991a review); Bologna and Pinto (1998); Hafernik and Saul-Gershenz (2000).

Larvae. Beauregard (1890); Cros (1918, 1922a, 1927d, 1929a, 1931a, 1941, 1943); Blair (1943); Emden (1943); MacSwain (1956); Pinto and Selander (1970); Kifune *et al.* (1973); Selander (1985, 1988b, 1989); Bologna *et al.* (1989); Bologna (1991a); Bologna and Pinto (1992, 1995, 1998); Pinto and Bologna (1993).

Anatomy. Beauregard (1890); Gupta (1971, 1978).
Pharmacology. Beauregard (1890).
Physiology. Cohen and Pinto (1977).

Notes

Meloe includes 16 subgenera (Bologna, 1991a; Bologna and Pinto, 1998). All are represented in the Old World, the region harbouring the vast majority of species. In the New World only the nominate subgenus, *Treiodous* and, marginally, on the Aleutian Islands, *Eurymeloe*, occurs.

Selander (1985, 1991) treated *Eurymeloe* and *Afromeloe* as distinct genera. As demonstrated by Bologna (1988a), Bologna *et al.* (1989) and Bologna and Pinto (1992, 1995) for *Eurymeloe*, and by Bologna and Pinto (1998) for *Afromeloe*, both are simply subgenera of *Meloe*. Selander (1985, 1991) considered *Coelomeloe* as a synonym of *Eurymeloe*. This synonymy is supported by larval morphology and probably is correct (see Bologna and Pinto, 1998).

Submeloegonius, described by Pliginskij (1935) without a type species, is an unavailable name. The group included *Meloe adisabebae* Pliginskij, and thus was referred to *Afromeloe* by Bologna and Pinto (1998).

Meloe vlasovi Semenov-Tian Shansky and Arnoldi, 1937, from Turkmenistan and Afghanistan, is characterized by a pronotum bordered with red. This is the only remaining *Meloe* with red coloration on the pronotum and its generic placement is questionable. Other species originally placed here with red coloration on the head or pronotum have been transferred to the Lyttini based on first-instar larval anatomy (e.g. see Bologna, 1991a). The first-instar larva of *M. vlasovi* is unknown.

Some undescribed species are known to us from the Near East (Turkey) and the Himalayas.

The phoretic first-instar larvae of *Meloe* develop in the nests of several families of Apoidea, particularly the Anthophoridae, Megachilidae, Colletidae and Andrenidae. The first-instar larvae of 11 of the 16 subgenera are described (see Bologna and Pinto, 1998 for a review).

54. ***Oreomeloe*** Tan, 1981

Type species. *Oreomeloe spinulus* Tan, 1981, by original designation. 1 sp.
Geographic distribution. Tibet.

References

Taxonomy. Tan (1981).

Notes

We did not examine specimens of this very distinct genus. On the basis of the original description it is possible that it represents another beetle family.

55. ***Physomeloe*** Reitter, 1911

(figure 10)

Type species. *Meloe corallifer* Germar, 1818, by monotypy. 1 sp.
Geographic distribution. Iberian Peninsula.

References

Taxonomy. Baudi di Selve (1878); Reitter (1895, 1911); Bologna and Aloisi (1994).

Bionomics. Bedel (1892); Traizet (1896); Pic (1897); Görnitz (1937); Valladares and Salgado (1983); Valladares (1984); Bologna and Aloisi (1994).

Larvae. Bologna and Aloisi (1994).

Pharmacology. Cornalia (1865); Gorriz y Muñoz (1882).

Notes

Unlike *Meloe*, to which *P. corallifer* was previously assigned, the first-instar larvae of *Physomeloe* are not phoretic; they probably are parasitoids of bees.

The placement of *Physomeloe* in the Meloini is suggested by recent phylogenetic analysis (Bologna and Pinto, 2001). Its position here requires corroboration, however.

Subfamily NEMOGNATHINAE

Tribe STENODERINI

56. ***Stenodera*** Eschscholtz, 1818

Zonitides Abeille de Perrin, 1880. *Type species*: *Zonitides oculifer* Abeille de Perrin, 1880, by monotypy (see Selander, 1991).

Stenoderina Aksentjev, 1988 (as subgenus; currently valid). *Type species*: *Zonitis puncticollis* Chevrolat, 1829–1844, by original designation; name originally proposed by Maran (1942a) without designation of a type species.

Type species. *Stenodera sexpunctata* Eschscholtz, 1818 (=*Meloe caucasica* Pallas, 1782), by monotypy. 8 spp.

Geographic distribution. From the Balkans to the Near East and central Asia, and into China including the southern tropical regions (Kiangsi; Fukien).

References

Taxonomy. Abeille de Perrin (1880); Escherich (1897a, 1897b); Fairmaire (1897); Maran (1942a revision and key); Aksentjev (1978); Bologna (1979, 1988b, 1991a).

Bionomics. Bologna (1994a).

Anatomy. Gupta (1971, 1978).

Notes

Based on adult morphology, Selander (1964) separated this genus as the most primitive tribe of Nemognathinae. Although not initially accepted by Bologna (1991a), the recent discovery of the first-instar larva of *S. puncticollis* Chevrolat (CB) and subsequent phylogenetic analysis support Selander's placement (Bologna and Pinto, 2001).

As the most primitive genus of Nemognathinae several plesiotypic characters are found in adults (e.g. gonoforceps incompletely fused; galeae unmodified) and larvae (non-phoretic). The presence of modified tarsal segments in males of two species (*djakonovi* Aksentjev, 1978 and *anatolica* Frivaldsky, 1884) presumably is associated with complex courtship behaviour and may be phylogenetically significant. Strong sexual dimorphism is common in the Meloinae (Selander, 1964) but is infrequent in the Nemognathinae, occurring only in *Stenodera* and two Australian genera (*Palaestra* LaPorte de Castelnau and an undescribed genus). Interestingly, all three genera are primitive nemognathines and somewhat intermediate phenetically to the two subfamilies.

The species *foveicollis* (Fairmaire, 1897) was included in this genus by Maran (1942a) without examining specimens. Its placement here is confirmed based on our study of material from S China (CASC).

The first-instar larva of S. Puncticollis is currently being described. Larval biology has not been studied but first-instar anatomy indicates the absence of phoresy. This is the only known example of non-phoresy in the Nemognathinae.

Tribe HORIINI

57. ***Horia*** Fabricius, 1787

Hoplozonitis Blackburn, 1892. *Type species*: *Hoplozonitis mira* Blackburn, 1892, by monotypy.

Type species. *Lymexylon testaceum* Fabricius, 1871 (= *Horia fabriciana* Betrem, 1929). 8 spp.

Geographic distribution. Africa south of the central Sahara (except Madagascar and the extreme southwestern areas), from the Nile Valley to the Mediterranean coast, S Arabian Peninsula, Oriental and Australasian regions (New Guinea; Australia [Cape York in N Queensland]).

References

Taxonomy. Blackburn (1892); Gahan (1908, 1909); Cros (1924a, 1927c); Betrem (1929, 1932 revision and key).

Bionomics. Bugnion (1910); Schroo (1920); Blair (1924); Cros (1938b); Mohamedsaid (1979); Bologna and Laurenzi (1994 for a synthesis).

Larvae. Bugnion (1910); Cros (1924a, 1929c, 1938a, 1938b); Bologna and Laurenzi (1994).

Notes

The first-instar larvae of three species are described; they are phoretic and parasitoids of Anthophoridae bees.

58. ***Synhoria*** Kolbe, 1897
(figure 13)

Type species. *Horia cephalotes* Olivier, 1792, by subsequent designation (Cros, 1924a) (see Selander, 1991). 5 spp.

Geographic distribution. Afrotropical (including Madagascar and Comore Islands), Oriental (Japan and Taiwan) and Australasian regions (New Guinea; Queensland, Australia).

References

Taxonomy. Gahan (1908); Cros (1924a, 1938a, 1938b); Betrem (1929, 1932 revision and key); Kono (1936); Paulian (1956); Bologna (1978, 1994b).

Bionomics. Cros (1924a, 1938a, 1938b); Ishida (1982); Taketsuka (1984, 1986, 1989a, 1989b); Gess (1981); Bologna and Laurenzi (1994 review).

Larvae. Cros (1924a, 1938a, 1938b); Bologna and Laurenzi (1994 review).

Anatomy. Beauregard (1890); Gupta (1971, 1978).

Notes

The validity of the four Afrotropical species needs confirmation due to extreme intraspecific variability.

The first and other larval instars have been described. The genus is phoretic; larvae are parasitoids of Anthophoridae.

Tribe NEMOGNATHINI

59. ***Allendesalazaria*** Martinez de la Escalera, 1910

(figure 14)

Type species. *Allendesalazaria nymphoides* Martinez de la Escalera, 1910, by monotypy. 1 sp.

Geographic distribution. Morocco, Algeria.

References

Taxonomy. Martinez de la Escalera (1910); Cros (1913b); Pardo Alcaide (1950).

Bionomics. Cros (1910); Linsley (1942).

Larvae. Cros (1910, 1913b); Linsley (1942); MacSwain (1956).

Ethology. Cros (1913b).

Anatomy. Gupta (1971, 1978).

Notes

The first-instar larva is phoretic; larvae are parasitoids of Anthophoridae. The life history of this genus is very similar to that of the North American *Hornia*. Adults of both are aphagous and lead a completely subterranean existence.

60. ***Apalus*** Fabricius, 1775

(figure 15)

Hapalus Illiger, 1801. Unjustified emendation of *Apalus* Fabricius, 1775.
Criolis Mulsant, 1858. *Type species*: *Criolis guerini* Mulsant, 1858, by monotypy.
? *Coriologiton* Marseul, 1879. *Type species*: *Criolis hilaris* Marseul, 1879, by monotypy.
Deratus Motschulsky, 1848. *Type species*: *Meloe necydalea* Pallas, 1773, by monotypy (see Selander, 1991).

Type species. *Meloe bimaculatus* Linnaeus, 1761, by monotypy. 21 spp.

Geographic distribution. Palaearctic Region, E and S Africa (Eritrea, Kenya, Tanzania, Zambia, Angola).

References

Taxonomy. Mulsant (1858); Marseul (1879); Prochazka (1892 key and catalogue); Escherich (1897a key and catalogue); Borchmann (1942); Kaszab (1981); Bologna (1991a, 1994a).

Bionomics. Gené (1831); Strauch (1863); De Stefani Perez (1885); Beauregard (1890); Bedel (1892); Cros (1917b, 1928a); Bologna (1991a review).

Larvae. Cros (1917b, 1928a); Bologna (1991a).
Ethology. Strauch (1863).
Anatomy. Beauregard (1890); Gupta (1971, 1978).

Notes

The limits of *Apalus* are not clearly defined, and some species seem to be almost intermediate to *Stenoria*, herein regarded as a distinct genus (see below).

Aksentjev (1988) treated the African *Coriologiton* as a genus. Although we follow Kaszab (1969a) and Selander (1991) by treating it as a junior synonym this may prove to be in error. *Coriologiton* was based on a species from Angola which we have not examined. It was originally compared to *Criolis* by Marseul (1879), a certain junior synonym of *Apalus*. However, *Coriologiton* was described as having flabellate antennae, a transverse pronotum and three distinct elytral costae. These features suggest that the genus is valid. The five Afrotropical species are represented by single specimens in collections and require further examination to confirm generic assignment (see Bologna, 1991a). It is possible that one or more of these, as well a new undescribed species from Zambia (CASC), belong to *Coriologiton.* We have confirmed clear assignment to *Apalus* only for *tanganyikanus* Kaszab, 1981, from Tanzania (holotype examined, HNHM).

We do not follow Kaszab (1969a) and Selander (1991) who both erroneously associated *Deratus* with *Stenoria* rather than *Apalus*. Also, Selander (1991) treated *Sitaropsis* Iablokoff-Khnzoryan as a subgenus of *Apalus.* Based on the original description, and in agreement with Aksentjev (1988), we refer it to *Stenoria*.

The first-instar larvae are phoretic. The genus is known to include parasitoids of bees of several families, particularly Colletidae (*Colletes*) and Anthophoridae (*Anthophora*).

61. **Cochliophorus** Escherich, 1891

Type species. *Cochliophorus reitteri* Escherich, 1891, by monotypy. 1 sp.
Geographic distribution. Greece.

References

Taxonomy. Escherich (1891a, 1897a); Bologna (1994a).

Notes

This genus was based on a single (?) specimen labelled ‘Greichenland’ and has never been collected again. Bologna (1994a) recently commented on the type (PMHN) and cast doubt on the terra typica. The general shape of this species differs greatly from other Palaearctic Nemognathini and is rather similar to certain Afrotropical and Australian *Zonitis*. Yet, no known African *Zonitis* has the combination of characters of *Cochliophorus*: pronotum distinctly wider than long; elytra not costate, completely bordered; metatibial spurs similarly shaped, enlarged. Clarification of the status of this taxon must await a complete revision of *Zonitis* latu senso.

62. **Ctenopus** Fischer von Waldheim, 1824

Type species. *Ctenopus melanogaster* Fischer von Waldheim, 1824, by monotypy. 18 spp.

Geographic distribution. From Turkey and Caucasus to Iran and central Asia, east to Afghanistan and W China.

References

Taxonomy. Reitter (1889, 1896); Semenov (1893a, 1900); Escherich (1897a key and catalogue); Reichardt (1934).

Bionomics. Prispinova (1987a).

Notes

This genus is poorly known and its limits remain questionable. Certain species currently residing in other nemognathine genera (e.g. *Euzonitis*, *Nemognatha*) may belong here. According to Reitter (1896) and Reichardt (1934) four of the central Asian species should be considered synonyms of *C. sinuatipennis* (Fairmaire, 1892). Two undescribed species of *Ctenopus* are cited from central Turkey by Bodemeyer (1906).

63. ***Euzonitis*** Semenov, 1893

Type species. *Apalus sexmaculatus* Olivier, 1789, by original designation (see Selander, 1991). 18 spp.

Geographic distribution. S Palaearctic region, from Macaronesia (Madeira and Canary Islands), Maghreb and Iberian Peninsula, to Central Asia (Turkestan).

References

Taxonomy. Escherich (1891b, 1897a key and catalogue); Semenov (1893b, 1900, 1910); Iablokoff-Khnzoryan (1983); Bologna (1991a).

Bionomics. Lindberg (1963); Prispinova (1987b); Bologna (1991a, 1994a).

Pharmacology. Beauregard (1890).

Notes

This genus needs complete revision based on characters other than coloration. The genus does not occur in sub-saharan Africa. Although Borchmann (1942) treated the Namibian *maculicollis* Borchmann as a *Euzonitis*, Kaszab (1954c) considered it a *Zonitis*.

E. jacobsoni Semenov from Central Asia differs somewhat from congeners in that the galeae are only slightly modified at the apex and the external metatibial spur is very wide.

The undescribed larva of a species from Turkey, *E. rubida* Ménétriès, 1832 (obtained from eggs and adult *Anthophora*), has characters very similar to those of *Zonitis* (Bologna, unpublished). A second species was recorded as a parasitoid on Anthophoridae (*Anthophora*) (Lindberg, 1963).

64. ***Glasunovia*** Semenov, 1895

Type species. *Glasunovia caspica* Semenov, 1895, by subsequent designation (Wellman, 1910). 4 spp.

Geographic distribution. Central Asia, from Transcaspia to W China and Karakorum.

References

Taxonomy. Semenov (1895a, 1900); Escherich (1897a key and catalogue); Borchmann (1935); Pic (1938).

Notes

Semenov (1895a) and Aksentjev (1981) erroneously described the claws as smooth in this genus. We have examined two species, the type, *G. caspica* Semenov and *G. sillemi* Borchmann. Both have serrate claws as do most other nemognathines.

The significance of the male sternal structure (see couplet 14 in key) has never been studied, but almost certainly is related to mating. Less specialized abdominal modifications are present in males of several North American *Nemognatha* and in *Stenoria* of the *analis* group (see Enns, 1956; Bologna, 1991a).

65. ***Leptopalpus*** Guérin de Méneville, 1829–1844

Type species. *Leptopalpus chevrolatii* Guérin de Méneville, 1829-1844, by monotypy (=*Zonitis rostrata* Fabricius, 1792). 2 spp.

Geographic distribution. Western Mediterranean Basin, Eritrea and S Yemen.

References

Taxonomy. Escherich (1897a); Pardo Alcaide (1952); Bologna (1991a).

Bionomics. Bedel (1892); Cros (1923); Pardo Alcaide (1981); Bologna (1991a).

Larvae. Cros (1913a, 1923); MacSwain (1956); Pardo Alcaide (1981); Bologna (1991a).

Anatomy. Beauregard (1890).

Notes

The first-instar larvae are phoretic; larvae are parasitoids of *Anthophora* (Anthophoridae).

66. ***Megatrachelus*** Motschulsky, 1845

(figure 16)

Schroetteria Reitter, 1911. *Type species*: *Zonitis polita* Gebler, 1832, by subsequent designation (Aksentjev, 1988).

Type species. *Zonitis polita* Gebler, 1832, by subsequent designation (Aksentjev, 1988). 3 spp.

Geographic distribution. Siberia, Mongolia, China, Korea, Japan.

References

Taxonomy. Abeille de Perrin (1880); Escherich (1897a); Reitter (1911 partial key); Kono (1940).

Anatomy. Gupta (1971, 1978).

Notes

The number of species of *Megatrachelus* indicated above is tentative. We are aware of a probable new species from S China (Kwangtung) in the CASC. Also, the validity of *M. pallidipennis* Motschulsky, 1845, from Dauria, cited by Maran (1942a), should be confirmed as should the synonymy of the Japanese *megacephalus* Kono, 1936, with *politus* (Kono, 1940). Also *Zonitis quadricollis* Fairmaire, 1892, never cited after the original description, may be assignable to *Megatrachelus.*

67. ***Nemognatha*** Illiger, 1807

Nematognatha Gemminger and Harold, 1870. Unjustified emendation for *Nemognatha* Illiger, 1807.

Meganemognatha Enns, 1956 (as subgenus; currently valid). *Type species*: *Nemognatha lurida* LeConte, 1853, by original designation.

Pauronemognatha Enns, 1956 (as subgenus; currently valid). *Type species*: *Nemognatha nigripennis* LeConte, 1853, by original designation.

Pronemognatha Enns, 1956 (as subgenus; currently valid). *Type species*: *Nemognatha sparsa* LeConte, 1868, by original designation.

Gnathonemula Aksentjev, 1981. *Type species*: *Gnathonemula gracilis* Aksentjev, 1981, by monotypy; **new synonymy**.

Type species. *Zonitis vittata* Fabricius, 1801 (=*Zonitis piazata* Fabricius, 1798), by monotypy (see Selander, 1991). 77 spp. (*ca* 28 spp. in Old World).

Geographic distribution. Worldwide in distribution (except Australia and Oceania). Occurring throughout the Old World but avoiding mesic and cold regions of Europe and Asia.

References

Taxonomy. Escherich (1897a revision of Palaearctic fauna and key to spp.); Péringuey (1909 key to South African spp.); Pic (1948); Denier (1935a); Enns (1956 revision and key to North American spp.); Bologna (1991a).

Bionomics. Beauregard (1890); Martin (1891); Cros (1912d, 1919c, 1928a); Linsley and MacSwain (1952); Dillon (1952); Enns (1956); Erickson et al. (1976); Erickson and Werner (1974); Packer (1987); Blochtein and Wittman (1988); Bologna (1991a review); Brown and Stanford (1992).

Larvae. Cros (1919c, 1928a); MacSwain (1956); Selander (1957); Packer (1987).

Anatomy. Beauregard (1890); Gupta (1971, 1978).

Pharmacology. Beauregard (1890).

Notes

The monophyly of *Nemognatha* remains unresolved. Enns (1956) recognized four subgenera based primarily on the US species, but the Old World fauna has never been revised and the limits of the genus and subgenera are not clear. For example, some African species are very distinct from those of the Palaearctic and Nearctic. On the other hand, the African genus *Zonitodema* may belong here (see below). Separation from *Zonitis* also remains problematic. In the Old World, separation has been based solely on the structure of the maxillary galea (elongate in *Nemognatha*, short in *Zonitis*), whereas in North American they are separated by structure of the aedeagus (see Enns, 1956). The latter character has yet to be adequately tested against the fauna of South America and the Old World.

In this paper we consider *Gnathonemula* a synonyn of *Nemognatha*. Aksentjev (1981) distinguished *Gnathonemula* by its elongate temples, anteriorly narrowed pronotum and smaller size. *Nemognatha* with similar characters and intermediate to those of *Gnathonemula* occur in the Nearctic (Enns, 1956) as well as in the Afrotropical and Oriental regions. We note that *Nemognatha trascaspica* Kaszab, 1981 is a probable synonym of *gracilis* Aksentjev, 1981, the type species of *Gnathonemula*.

Pinto and Bologna (1999) continued to treat the South American genus

Zonitolytta as distinct rather than as a subgenus of *Nemognatha* as proposed by Selander (1991).

The African species of *Nemognatha* are very poorly known; we are aware of several undescribed species (in HMHM).

Larval development is known to occur in the nests of solitary bees of several families (primarily Megachilidae and Anthophoridae, but also Halictidae, Melittidae and Andrenidae); the first-instar larvae are phoretic.

68. ***Nyadatus*** Aksentjev, 1981

Type species. *Nyadatus telejus* Aksentjev, 1981, by original designation. 2 spp.
Geographic distribution. Kazhakstan and Tadzikistan (and perhaps Kashmir).

References
Taxonomy. Aksentjev (1981).
Bionomics. Prispinova (1987b).

Notes

The status of this genus requires confirmation. As discussed below, it may be a synonym of *Stenoria* or *Apalus* (see *Stenoria*).

An undescribed species of nemognathine from Kashmir has the claws and elytral characters of *Nyadatus* (Bologna, unpubl.; also see *Stenoria*).

69. ***Onyctenus*** Le Peletier and Audinet de Serville, 1828

Onychoctenus Gemminger and Harold, 1870. Unjustified emendation of *Onyctenus* LePeletier and Audinet-Serville, 1828.

Type species. *Onyctenus sonnerati* LePeletier and Audinet-Serville, 1828, by monotypy. 1 sp.

Geographic distribution. India? (type locality given as 'Indes Orientales').

References
Taxonomy. Laporte de Castelnau (1840); Beauregard (1890).

Notes

The identity of *Onyctenus* is unknown. As far as we know the type of *O. sonnerati* has not been examined since the original description and may be lost. A search for the type (in PMNH, NMW) was unsuccessful. Judging from the original description and Beauregard (1890), this genus is somewhat similar to an undescribed *Sitaris* from S Turkey (perhaps referable to a new subgenus; see below). However, the similarity is only in elytral shape. *Onyctenus* clearly differs by the length of the maxillary palpi originally stated to be twice as long as the labial palpi.

70. ***Sitaris*** Latreille, 1802
(figure 111)

Filalia Martinez de la Escalera, 1906. *Type species*: *Filalia cerambycina* Martinez de la Escalera, 1906, by monotypy. Currently considered as subgenus (Bologna, 1991a).

Type species. *Necydalis humeralis* Fabricius, 1775 (= *Necydalea muralis* Forster, 1771), by monotypy. *Ca* 25 spp.

Geographic distribution. Palaearctic region (from Canary and Cabo Verde Islands and Iberian Peninsula, east to Turkestan and perhaps Tibet), with scattered records from the Afrotropical and Oriental (one Indian sp.) regions.

References

Taxonomy. Escherich (1897a key and catalogue to Palaearctic spp.); Martinez de la Escalera (1906); Péringuey (1909 partial key to South African spp.); Peyerimhoff (1931); Kaszab (1951d, 1953b); Pardo Alcaide (1958c); Bologna (1991a, 1994a).

Bionomics. Fabre (1857); Beauregard (1890); Cros (1910, 1913c); Martinez de la Escalera (1914); Fagniez (1936); Kaszab (1951d); Bologna (1991a review).

Larvae. Fabre (1857); Beauregard (1890); Cros (1910, 1913c, 1914b, 1928a, 1929d); MacSwain (1956); Bologna (1991a).

Anatomy. Beauregard (1890); Lienhart and Remy (1930).

Physiology. Beauregard (1886, 1890).

Pharmacology. Beauregard (1890).

Notes

The systematics of *Sitaris* remains confused as the current generic definition does not seem to apply easily to various undescribed species that we have examined. Thus, in S Turkey (Lycian Taurus) a new undescribed species occurs that differs strongly from typical *Sitaris* by its extremely short elytra which only occupies the basal half of the abdomen. It may represent a distinct subgenus (see Bologna, 1991a: 412). Among certain African species the elytral shape of one is intermediate to *Stenoria*, making generic assignment difficult; two South African species differ strongly in elytral and antennal structure from typical *Sitaris* and may represent a distinct genus (Bologna, unpublished). We also are aware of additional undescribed species from the Near East, Congo and South Africa which conform to the current definition of the genus.

Some authors (Kaszab, 1969a; Aksentjev, 1988) considered *Filalia* Martinez de la Escalera [1906: described as *Filalia* (*Sitaris*) from a single specimen from Morocco] as a distinct genus. Following Bologna (1991a) we retain *Filalia* as a subgenus of *Sitaris.* It is characterized by the subserrate male antennal segments. We recently examined a second specimen of *Filalia* from Tripoli, Lybia (HNHM).

As occurs in a few other Nemognathinae genera, serrate claws are not a constancy in *Sitaris.* In *S. muralis*, the claws are serrate only at the basal half; in some individuals they are entirely smooth. Two undescribed species from W Turkey and Palestine also have entirely smooth claws.

The phoretic first-instar larvae of three species have been described. Development occurs in the nests of various species of Anthophoridae, Megachilidae and Halictidae.

71. ***Sitarobrachys* Reitter**, 1883

Type species. *Sitarobrachys brevipennis* Reitter, 1883, by monotypy (= *Stenoria thoracica* Kraatz, 1863). 1 sp.

Geographic distribution. E and S Mediterranean Basin, E Canary Islands.

References

Taxonomy. Reitter (1883, 1895); Martinez de la Escalera (1909, 1914); Cros (1928a); Pardo Alcaide (1952); Bologna (1994a, 1994c revision).

Bionomics. Stahlberg (1909); Andrès (1910); Cros (1912c, 1924c, 1928a); Kaszab (1957b); Bologna (1994a, 1994c).

Larvae. Cros (1924c, 1928a, 1928d).

Notes

The shape of the elytra and metatibial spurs are very similar to *Stenoria*; the most significant differences are the more transverse pronotum, and the greater degree of sexual dimorphism (see below *Stenoria*). Differences from *Apalus* were discussed by Bologna (1994a).

The first-instar larvae are phoretic; development occurs in the nests of Megachilidae and Andrenidae.

72. ***Sitaromorpha*** Dokhtouroff, 1890

Type species. *Sitaromorpha wilkinsi* Dokhtouroff, 1890, by monotypy. 1 sp.

Geographic distribution. Turkestan (specific localities unknown).

References

Taxonomy. Dokhtouroff (1890); Semenov (1895a); Escherich (1897a).

Notes

This genus is unknown to us. It was based on a single specimen with ankylosed terminal antennal segments, a character not known in any other Nemognathinae. *S. wilkinsi* has never been recollected and it may simply represent a teratological individual of *Sitaris*.

73. ***Stenoria*** Mulsant, 1857

(figure 112)

Sitaropsis Iablokhoff-Khnzoryan, 1958. *Type species*: *Apalus (Sitaropsis) erevanensis* Iablokhoff-Khnzoryan, 1958, by original designation (described as subgenus of *Apalus* Fabricius).

Gineremia Pardo Alcaide, 1961. *Type species*: *Stenoria saharica* Pardo Alcaide, 1961, by original designation.

Type species. *Sitaris apicalis* Latreille, 1804, by monotypy. *Ca* 30 spp.

Geographic distribution. Palaearctic Region (excluding NE areas) from the Canary Islands east to Afghanistan, Tibet and N China; also E and S Africa.

References

Taxonomy. Prochazka (1892 partial key and catalogue); Semenov (1893b, 1900); Escherich (1897a, key and catalogue of Palaearctic spp.); Iablokoff-Khnzoryan (1958); Pardo Alcaide (1961); Kaszab (1983); Bologna (1991a, 1994a); Schawaller (1996).

Bionomics. Mayet (1875); Lichtenstein (1878); Beauregard (1884, 1890); Bedel (1892); Kaszab (1953b); Bologna (1991a review); Schawaller (1996).

Larvae. Mayet (1875); Beauregard (1884, 1890); Cros (1919a, 1922a, 1928a); MacSwain (1956).

Anatomy. Beauregard (1890); Gupta (1971, 1978).
Physiology. Beauregard (1886).
Pharmacology. Beauregard (1890).

Notes

The status of *Stenoria* is questionable. We retain it as a distinct genus but separation from *Apalus*, *Sitaris*, *Nyadatus*, and *Sitarobrachys* is not straightforward (also see Bologna, 1991a; Schawaller, 1996). To some extent these taxa appear to represent a continuum for several of the characters supposedly separating them. For example, distinguishing *Stenoria* from the first two genera is based largely on the level of elytral reduction and metatibial spur shape, characters which vary to some extent in all three taxa (see above). We already mentioned the doubtful status of *Nyadatus.* Although this genus was characterized by its non-serrate claws, similarly unmodified claws occur in at least three *Stenoria* [*S. thakkola* Shawaller, 1996, from Nepal, *S. laterimaculata* (Reitter, 1898) from Mongolia and Tadzhikistan, and an undescribed species close to *S. analis* Schaum, 1859, from the Caucasus]. Finally, the strong sexual dimorphism in elytra and wing development distinguishing *Sitarobrachys* is bridged by the recent discovery of *Stenoria thakkola* by Schawaller (1996). Larval features seem to be similarly problematic. Although the first instar larvae of two Palaearctic species (*analis* and *apicalis*) are quite distinctive, those of an undescribed South African species with adult characters intermediate to *Stenoria* and *Sitaris* are not easily placed in either genus. This entire group of related genera requires careful study and redefinition.

The phoretic first-instar larvae of two Palaearctic species have been described. Larvae develop as parasitoids of Colletidae (*Colletes*) and, less commonly, of Andrenidae (*Andrena*). The South African species *S. hessei*, which probably is not a true *Stenoria*, was recorded as a parasitoid of Megachilidae (*Osmia*) (Kaszab, 1953b).

74. ***Zonitis*** Fabricius, 1775
(figure 18)

Neozonitis Enns, 1956 (as subgenus; currently valid). *Type species*: *Zonitis bilineata* Say, 1817, by original designation. Aksentjev (1988, as genus).

Parazonitis Enns, 1956 (as subgenus; currently valid). *Type species*: *Nemognatha vittigera* LeConte, 1853, by original designation.

Type species. *Zonitis flava* Fabricius, 1775, fixed by subsequent designation (Selander, 1987b) (see Selander, 1991). 163 spp. (*ca* 130 spp. in Old World) (see *Notes*).

Geographic distribution. Cosmopolitan genus based on current definition (see *Notes*).

References

Taxonomy. Fairmaire (1880 revision of Australian fauna and key to spp.); Escherich (1891b, 1897a revision of Palaearctic fauna and key to spp.); Blackburn (1899); Semenov (1900); Pic (1911, 1948); Lea (1914, 1916); Kaszab (1954c revision of Afrotropical fauna and key to spp., 1965); Pardo Alcaide (1954b); Enns (1956 revision of North American fauna and key to spp.); Selander (1987b); Bologna (1991a review, 1994b).

Bionomics. Beauregard (1890); Bedel (1892); Cros (1928a); Saz (1945); Selander and Bohart (1954); Enns (1956); MacSwain (1956); Erickson *et al.* (1976); Bologna (1991a review).

Ethology. Beauregard (1890); Saz (1945); Bologna (1991a).

Larvae. Beauregard (1890); Cros (1922a, 1928a, 1928e); MacSwain (1956); Selander (1959); Bologna (1991a).

Anatomy. Beauregard (1890); Gupta (1971, 1978).

Physiology. Beauregard (1886).

Pharmacology. Beauregard (1890).

Notes

As discussed by Pinto and Bologna (1999), the generic limits of *Zonitis* remain questionable. The species of the Northern Hemisphere were divided by Enns (1956) into three subgenera. *Neozonitis* and *Parazonitis* are New World. The Palaearctic species were assigned to the nominate subgenus. Although *Neozonitis* was recently elevated to genus by Aksentjev (1988), this change has not been adopted (Pinto and Bologna, 1999). Pinto and Bologna (1999) noted that certain Neotropical species appear to be assignable to *Pseudozonitis* Dillon. A parallel situation exists in the Old World with *Zonitis* and *Zonitoschema* particularly with respect to species occurring in the Oriental and Australasian regions. The relationship of the Old World species to those in the New World and Australasia is in need of study. Within the Old World itself, the Afrotropical and Oriental *Zonitis* differ from most of those in the Palaearctic. Several have laterally bordered elytra, a feature not typical of *Zonitis*. Others have a very elongate head and/or an elongate and anteriorly narrowed pronotum. A few African species also have costate elytra; others have the maxillary galeae only slightly penicillate. *Z. marani*, 1965, from Madagascar has thickened foretibiae and tarsi as do certain South American species (Pinto and Bologna, 1999) and may represent a new genus.

Species of *Zonitis* are primarily known as parasitoids of bees in the family Megachilidae. They have also been associated with Halictidae, Anthophoridae, Colletidae and Andrenidae.

We examined several undescribed species from Africa and South-East Asia in the HNHM and CASC collections.

75. **Zonitodema** Péringuey, 1909

Type species. *Zonitis viridipennis* Fabricius, 1798, by original designation. 15 spp.

Geographic distribution. Afrotropical region (except Madagascar).

References

Taxonomy. Péringuey (1909 partial key); Kaszab (1954d key and catalogue); Bologna (1978).

Anatomy. Gupta (1971, 1978).

Notes

This genus is tentatively treated as distinct but we are unable to separate it satisfactorily from *Nemognatha*. Most of the species have a characteristic metallic green elytra, a triangular-shaped elongate head and relatively elongate maxillary galeae. Exceptions include a species from Angola and Namibia (*posoka* Wellman, 1908) with short galeae, and two species without metallic green elytra (*hayekae* Kaszab, 1954, and *rufipennis* Pic, 1939).

76. ***Zonitomorpha*** Péringuey, 1909
(figure 17)

Type species. Zonitis sellata Fahraeus, 1870, fixed by subsequent designation (Aksentjev, 1988) (see Selander, 1991). 20 spp.

Geographic distribution. Afrotropical and Oriental (E India, Laos, Vietnam, China) regions

References

Taxonomy. Péringuey (1909); Pic (1909 partial key and catalogue, 1910 partial key and catalogue, 1932); Kaszab (1981).

Notes

Bologna (2000b) recently transferred the Namibian *notaticollis* Kaszab, 1951, to *Zonitis*. This species differs from *Zonitomorpha* in both antennal and pronotum shape. Its antennae are subfiliform rather than subserrate, and the pronotum, although elongate, is not campaniform. These traits are characteristic of *Zonitis.* Subserrate antennae and the distinctively campaniform pronotum (figure 17) characterize all *Zonitomorpha.* The placement of *notaticollis* in *Zonitomorpha* apparently was prompted by its elongate, narrow head, a trait relatively uncommon in *Zonitis.*

At least three Oriental species examined [*cribripennis* (Fairmaire, 1895) from E India, *davidis* (Fairmaire, 1886) from China, *dollei* (Fairmaire, 1888) from Vietnam] differ from others by their shorter temples and antennae; they appear to represent a distinct group of species.

77. ***Zonitoschema*** Péringuey, 1909

Zonitoides Fairmaire, 1883 [nec *Zonitoides* Lehman, 1862 (Gastropoda)]; replaced by *Zonitopsis* Wellman.

Zonitopsis Wellman, 1910. *Type species*: *Zonitoides megalops* Fairmaire, 1883, by monotypy as type species of *Zonitoides* Fairmaire; new name for *Zonitoides* Fairmaire.

Stenoderistella Reitter, 1911. *Type species*: *Stenodera pallidissima* Reitter, 1908, by monotypy.

Type species. Lytta coccinea Fabricius, 1801, by subsequent designation (Aksentjev, 1988). *Ca* 58 spp.

Geographic distribution. Afrotropical and Oriental regions, part of the Palaearctic (Sahara, Palestine, Arabia, Iran, China, Japan, Taiwan, Korea) and Australasian regions (New Guinea, some Melanesian and Micronesian islands, Tonga Island, E Australia).

References

Taxonomy. Péringuey (1909 partial key to South African spp.); Pic (1911); Kaszab (1960c, 1962a, 1983); Pardo Alcaide (1966); Mohamedsaid (1981); Bologna (1990).

Bionomics. Peyerimhoff (1931); Iwata (1933); Kifune (1961); Maeta (1978); Gess (1981).

Larvae. Iwata (1933); Kifune (1961).

Anatomy. Gupta (1971, 1978).

Notes

As discussed above some species of *Zonitis* may belong to *Zonitoschema.* Pinto and Bologna (1999) noted the possible relationships of this genus to the New World

Pseudozonitis Dillon. In addition to the enlarged eyes, the males of both genera also have apically recurved gonoforceps.

Numerous undescribed species of this genus exist in collections. We are aware of at least 20 in the HNHM, CB and other collections.

The first-instar larva is phoretic. The larva is known for a single Japanese species; it develops as a parasitoid of Megachilidae.

Acknowledgements

This work was supported by grants from the National Science Foundation (DEB-9508735; to J.D.P.), the Ministero per l'Università e la Ricerca Scientifica e Tecnologica ('Variazione geografica e diversità a livello di specie, faune e zoocenosi: cause storiche ed ecologiche', to M.A.B.) and the Consiglio nazionale delle Ricerche (to M.A.B.). A grant to both authors was received from the Center for Systematic Entomology in Gainesville to study the L. F. and R. B. Selander Collection (now part of the Florida State Collection of Arthropods (FSCA) in Gainesville, Florida) in December 1995. We thank the following curators for loan of specimens and/or for making their collections available for study: Museums: Luca Bartolozzi (MZUF), Jane Beard (BMNH), Ben Brugge (ZMAN), Brian Brown (LACM), Achille Casale and Pier Mauro Giachino (MRSN), M. A. Cochrane and Vin Whitehead (SAMC), Stanislav Dvorak (NMPC), the late Sebastian Endrödy-Younga (TMSA), Claude Girard (PMNH), Franz Hieke (ZMHB), Isabel Izquierdo (MNMS), Manfred Jäch (NMW), Josef Jelinek (NMPC), Otto Merkl and the late Zoltan Kaszab (HNHM), Alfred Newton, Jr. and Margaret Thayer (FMNH), Norman Penny (CASC), Eugene Marais (SMWN), Rolf G. Oberprieler (PPRI), B. Giuseppe Osella (previously at MSNV), Roberto Poggi (MCSN), Paul E. Skelley, Michael C. Thomas and Robert E. Woodruff (FSCA), Wolfang Schawaller (SMNS), Augusto Vigna Taglianti (MZUL) and several other entomologists and curators for loan of specimens. Finally, we wish to acknowledge the invaluable assistance of Gary Platner (UCRC) for assistance in preparing the photographs and plates, and additional help in other phases of this study.

References

Abeille de Perrin, E., 1880, Contribution à la faune coléoptèrologique de la Méditerranée, *Bulletin de la Société d'Histoire naturelle de Toulouse*, **14**, 233–262.

Adams, C. L. and Selander, R. B., 1979, The biology of blister beetles of the Vittata group of the genus Epicauta (Coleoptera, Meloidae), *Bulletin of the American Museum of Natural History*, **162**, 139–266.

Aksentjev, S. I., 1978, A new species of meloid beetles of the genus *Stenodera* Eschol. (Coleoptera, Meloidae) from Primorye Territory, *Entomologicheskoye Obozreniye*, **57**, 124–125 [in Russian].

Aksentjev, S. I., 1981, New genera and species of blister beetles (Coleoptera, Meloidae) from Middle Asia, *Entomologicheskoye Obozreniye*, **60**, 860–864 [in Russian].

Aksentjev, S. I.,1988, A catalogue of the genus group taxa of the beetle family Meloidae (Coeleoptera), *Entomologicheskoye Obozreniye*, **67**, 569–582 [in Russian].

Alfieri, A., 1976, The Coleoptera of Egypt, *Mémoires de la Société d'Egypt*, **5**, i–xvi, 1–362.

Anand, R. K., 1977, Description of a new species of the genus *Psaldolytta* (sic) Peringuey (Coleoptera: Meloidae) from Bombay (India) with a key to the Indian species, *Journal of Entomological Research*, **1**, 36–39.

Anand, R. K., 1978, Blister beetles as pests on agricultural crops, *Indian Journal of Entomology*, **40**, 472, 1 pl.

Anand, R. K., 1979, A new species of *Cyaneolytta* Peringuey (Col., Meloidae) from India, *The Entomologist's Monthly Magazine*, **115**, 227–228.

Anand, R. K., 1980, Distributional patterns of Meloidae (Coleoptera), *Oriental Insects*, **14**, 11–15.

Anand, R. K., 1989, Indian Meloidae (Coleoptera): a taxonomic review, *Bulletin of Entomology*, **30**, 24–34.

Andrès, A., 1910, Note biologique sur *Sitarobrachys brevipennis* Reitter. Coléopt., *Bulletin de la Société Entomologique d'Egypte*, 1909, 177–179.

Arnett, R. H., Samuelson, G. A. and Nishida, M., 1993, *The Insect and Spider Collections of the World*, 2nd edn (Gainesville, FL: Sandhill Crane Press), 310 pp.

Baudi di Selve, F., 1878, Coleotteri Eteromeri esistenti nelle collezioni del R. museo zoologico di Torino ed in altre italiane, *Atti della reale Accademia delle Scienze di Torino*, **13**, 765–866, 1027–1183.

Beauregard, H., 1884, Sur le développement des *Cerocoma Schreberi* et *Stenoria apicalis*, *Le Naturaliste*, **6**, 546.

Beauregard, H., 1886, Recherches sur les insectes vésicants, *Journal d'Anatomie et Physiologie*, **21**, 483–524, 4 pls; **22**, 83–108, 242–284, 3 pls.

Beauregard, H., 1890, *Les insectes vésicants* (Paris: Félix Alcan), XVI + 544 pp., 34 pls.

Bedel, L., 1892, Reinsegnements sur les moeurs et le développement des Meloidae, *L'Abeille*, **27**, 235–250, 304.

Bedel, L., 1895, Synopsis du genre *Diaphorocera* Heyd. (1863), *L'Abeille*, **28**, 180.

Berrìos-Ortiz, A., 1986, Musculature of adult *Epicauta segmenta* (Say) (Coleoptera: Meloidae). Part I, Head, *Journal of the Kansas Entomological Society*, **59**, 7–19.

Berrìos-Ortiz, A. and Selander, R. B., 1972, Sexing immature blister beetles, *Journal of the Kansas Entomological Society*, **45**, 376–380.

Berrìos-Ortiz, A. and Selander, R. B., 1979, Skeletal musculature in larval phases of the beetle *Epicauta segmenta* (Coleoptera, Meloidae), *Series Entomologica*, **16**, 1–112.

Betrem, G., 1929, Systematiek der Horiini, *Tijdschrift voor Entomologie*, **72**, xxvi-xxix [in Dutch].

Betrem, G., 1932, Beiträge zur Kenntnis des Tribus Horiini der familie der Meloidae (Col.). 1. Die Systematik der Horiini, *Treubia*, **14**, 85–101, 1 pl.

Billberg, G. J., 1813, *Monographia Mylabridum* (Holmiae), 74 pp., 6 pp. [not numbered], 7 pls.

Biondi, M., Bologna, M. A. and Coco, E., 1988, Metodi di classificazione a confronto: il genere *Croscherichia* Pardo Alcaide, 1950 (Coleoptera, Meloidae), *Atti del XV Congresso nazionale italiano di Entomologia, L'Aquila, 1988*, 673–680.

Blackburn, T., 1892, Further notes on Australian Coleoptera with description of new genera and species XI, *Transactions and Proceedings of the Royal Society of South Australia*, **15**, 207–268.

Blackburn, T., 1899, Further notes on Australian Coleoptera with description of new genera and species XXV, *Transactions and Proceedings of the Royal Society of South Australia*, **23**, 22–101.

Blair, K. G., 1924, Coleopterous larvae from the burrows of *Xylocopa aestuans*, *Transactions of the Entomological Society of London*, **1924**, 149–150.

Blair, K. G., 1927, Heteromera of the third Mt. Everest expedition, 1924, *The Annals and Magazine of Natural History*, **19**, 241–255.

Blair, K. G., 1943, The first-stage larva of *Meloe violaceus* Marsh. (Col. Meloidae), *The Entomologist's Monthly Magazine*, **78** (1942–1943), 112–116.

Blanchard, E., 1836–1849, in Audouin, J.V., Blanchard, E., Doyère, L. and Milne Edwards, H. *Les Insectes. Myriapodes, thysanoures, parasites, suceurs et coléoptères*, Vol. 1 Atlas, in Cuvier, G. *Le règne animal distributé* ... (Paris: Fortin, Masson et Cie), 75 pls.

Blochtein, B. and Wittmann, D., 1988, Mating site specificity, reproduction and vector selection in *Nemognatha nigrotarsata* (Col., Meloidae), a nest parasite of leaf-cutter bees and other pollinators of crops in Rio Grande do Sul, *Journal Applicata Entomologica*, **105**, 414–419.

Bodemeyer, E. von, 1906, Beiträge zur Käferfauna von Kleinasien, *Deutsche Entomologische Zeitschrift*, **1906**, 417–434.

Bologna, M. A., 1978, Alcuni Meloidi dell'Africa orientale e meridionale e descrizione di una specie nuova (Coleoptera, Meloidae), *Zoological researches in Ethiopia, Part I. Quaderni dell'Accademia Nazionale dei Lincei, Roma*, **243**(1), 137–189.

Bologna, M. A., 1979, Meloidae di Turchia. I Contributo, *Fragmenta Entomologica*, **15**, 143–199.

Bologna, M. A., 1980, Recherches en Afrique de l' Institut de Zoologie de L'Aquila (Italie). V. Coleoptera Meloidae du Kenya et de Tanzanie, *Revue de Zoologie africaine*, **94**, 921–935.

Bologna, M. A., 1983a, Utilizzazione dei dati biologici nella sistematica dei Meloidae (Coleoptera), *Atti del XII Congresso nazionale italiano di Entomologia, Roma 1980*, **2**, 21–36.

Bologna, M. A., 1983b, Una nuova specie di *Lytta* del Kashmir, *Fragmenta Entomologica*, **17**, 125–138.

Bologna, M. A., 1988a, Note su *Eurymeloe* e revisione delle specie euromediterrenæ del gr. *rugosus* (Coleoptera, Meloidae), *Fragmenta Entomologica*, **20**, 233–301.

Bologna, M. A., 1988b, Il popolamento delle aree di transizione zoogeografica: I Meloidae (Coleoptera) della regione siro-palestinese, *Biogeographia (N.S.)*, **12**, 27–47.

Bologna, M. A., 1989a, *Berberomeloe,* a new west Mediterranean genus of Lyttini for *Meloe majalis* Linné (Coleoptera, Meloidae). Systematics and bionomics, *Bollettino di Zoologia*, **55** (1988), 359–366.

Bologna, M. A., 1989b, Un nuovo *Alosimus* del litorale tirrenico e note tassonomiche su altre specie congeneriche nord africane (Coleoptera, Meloidae), *Fragmenta Entomologica*, **21**, 191–204.

Bologna, M. A., 1990, Faunistica e zoogeografia dei Meloidae (Coleoptera) della Somalia, *Biogeographia (N.S.)*, **14**, 293–401.

Bologna, M. A., 1991a, Coleoptera Meloidae, *Fauna d'Italia.* XXVIII. (Bologna: Calderini), XIV + 541 pp.

Bologna, M. A., 1991b, Un nouvel *Oenas* de Grèce et note synonymique sur une autre espèce du Proche-Orient (Coleoptera, Meloidae), *Revue française d'Entomologie (N. S.)*, **13**, 175–179.

Bologna, M. A., 1991c, Note sul comportamento sessuale nella Tribù Mylabrini e descrizione di un nuovo modello di corteggiamento (Coleopetera, Meloidae), *Bollettino dell'Associazione Romana di Entomologia*, **45** (1990), 51–56.

Bologna, M. A., 1994a, I Meloidae della Grecia (Coleoptera), *Fragmenta Entomologica*, **25** (suppl.), 1–119.

Bologna, M. A., 1994b, The Coleoptera Meloidae of Sierra Leone, *Quaderni dell'Accademia nazionale dei Lincei*, '*Ricerche Biologiche in Sierra Leone (Parte IV)*', **247**, 357–379.

Bologna, M. A., 1994c, Meloidae from Canary and other Macaronesian islands (Coleoptera), *Miscellània Zoològica*, **16** (1992), 73–80.

Bologna, M. A., 1995, A new Eleticinae genus from Ethiopia and remarks on the tribe Morphozonitini (Coleoptera: Meloidae), *Annales de la Scoieté Entomologique de France (N. S.)*, **31**, 185–193.

Bologna, M. A., 2000a, Revision of the genus *Mimesthes* (Coleoptera: Meloidae: Mylabrini), *European Journal of Entomology*, **97**, 75–84.

Bologna, M. A., 2000b, Meloidae (Coleoptera: Tenebrionoidea), in A. H. Kirk-Spriggs (ed.) *Biodiversity of the Brandberg Massif, Namibia*, Cimbebasia Memoir 9, **20**, 201–208.

Bologna, M. A. and Aloisi, G., 1992, Systematics of *Lydomorphus* Fairmaire 1882, with description of the first instar larva of *L. dusalti* (Dufour, 1821) (Coleoptera Meloidae), *Tropical Zoology*, **5**, 55–71.

Bologna, M. A. and Aloisi, G., 1994, Systematics and bionomics of *Physomeloe* Reitter, 1911, with description of the first instar larva (Coleoptera, Meloidae), *Eos, Revista Española de Entomologia*, **69** (1993), 45–56.

Bologna, M. A. and Coco, E., 1991, Revisione del genere *Croscherichia* Pardo Alcaide, 1950 (Coleoptera, Meloidae), *Memorie della Società entomologica italiana*, **69** (1990), 97–180.

Bologna, M. A. and Havelka, P., 1985, Nuove segnalazioni di attrazione della cantaridina dei Meloidae su Coleotteri e Ditteri, *Bollettino dell'Associazione Romana di Entomologia*, **39** (1984), 77–82.

Bologna, M. A. and Laurenzi, M., 1994, Descriptions of the triungulins of *Synhoria testacea* (Fabricius) and another undetermined African species (Coleoptera: Meloidae), with data on Horiini larvae, *African Entomology*, **2**, 155–162.

Bologna, M. A. and Marangoni, C., 1986, Sexual behaviour in some Palaearctic species of

Meloe (Coleoptera, Meloidae), *Bollettino della Società Entomologica Italiana*, **118**, 65–82.

BOLOGNA, M. A. and PINTO, J. D., 1992, A review of *Meloe (Taphromeloe)*, including a description of the first instar larva of *M. (T.) erythrocnemus* and comments on the classification of the tribe Meloini (Coleoptera: Meloidae), *Proceedings of the Entomological Society of Washington*, **94**, 299–308.

BOLOGNA, M. A. and PINTO, J. D., 1995, The triungulin of two Palaearctic *Meloe* subgenera: *Lasiomeloe* Reitter and *Micromeloe* Reitter (Coleoptera, Meloidae), with bionomic and taxonomic notes, *Bollettino di Zoologia*, **62**, 383–393.

BOLOGNA, M. A. and PINTO, J. D., 1998, A review of the Afrotropical species of *Meloe* Linnaeus, 1758 (Coleoptera Meloidae) with descriptions of first instar larvae, a key to species and an annotated catalogue, *Tropical Zoology*, **11**, 19–59.

BOLOGNA, M. A. and PINTO, J. D., 2001, Phylogenetic studies of Meloidae (Coleoptera) with emphasis on the evolution of phoresy, *Systematic Entomology*, **26**, 33–72.

BOLOGNA, M. A., ALOISI, G. and MARANGONI, C., 1989, Nuove osservazioni su *Eurymeloe* Reitter e descrizione di larve di I stadio (Coleoptera, Meloidae), *Bulletin et Annales de la Société Royale Belge d'Entomologie*, **125**, 67–75.

BOLOGNA, M. A., ALOISI, G. and VIGNA TAGLIANTI, A., 1990, Phoretic association of some African *Cyaneolytta* Péringuey 1909 with carabids, and morphology of first instar larvae in Meloini (Coleoptera Meloidae), *Tropical Zoology*, **3**, 159–180.

BOLOGNA, M. A., PINTO, J. D., VIGNA TAGLIANTI, A. and ZETTO BRANDMAYR, T., 1997, Aspetti della morfologia imaginale e preimaginale nella ricostruzione filogenetica di gruppi critici di Insetti olometaboli, *58° Congresso dell'Unione Zoologica Italiana, Cattolica 24–28 settembre 1997, Riassunti*, 7.

BOLOGNA, M. A., FATTORINI, S. and PINTO, J. D., 2001, Review of the primitive blister beetle genus *Iselma* with description of the first instar larva (Coleoptera, Tenebrionoidea), *African Entomology* (in press).

BORCHMANN, F., 1917, Pars 69: Meloidae, Cephaloidae. In W. Junk and S. Schenkling *Coleopterorum catalogus* (Berlin), pp. 1–208.

BORCHMANN, F., 1935, Meloidae (Col.): In: C. Visser and J. Visser-Hooft (eds) *Wissenschaftliche Ergebnisse der Niederländischen Expeditionen in den Karakorum und die angrenzenden Gebiete in den Jahren 1922, 1925 und 1929/1930* (Leipzig: Brockhaus), pp. 308–309.

BORCHMANN, F., 1940, Neue Meloiden-Arten (Col.), *Mitteilungen der Münchener Entomologischen Gesellschaft*, **30**, 592–621.

BORCHMANN, F., 1942, Neue Meloiden-Arten (Col.) II, *Mitteilungen der Münchener Entomologischen Gesellschaft*, **32**, 682–712.

BOUSEMAN, J., 1988, Records of blister beetles of the genus *Cyaneolytta* (Coleoptera: Meloidae) from Zambia, *Entomological News*, **99**, 237–238.

BRANDT, J. F. and ERICHSON, W. F., 1832, Monographia generis Meloes, *Nova Acta Academiae Caesarae Leopoldino-Carolinae Germanicae Naturae Curiosorum*, **16**, 101–142, 1 pl.

BRÈTHES, J., 1901, El Bicho moro. Estudio biologico sobre la *Epicauta adpersa* Klug y medios de destruirla, *Boletin de Agricultura y Ganaderia*, **1** (14), 20–31.

BRÈTHES, J., 1917, El bicho moro (*Epicauta adpersa, Epicauta atomaria*). El pequeño escarabajo negro (*Dycninetus gagates* (Burm.), *Anales de la Sociedad Rural Argentina*, **51**, 591–600.

BROWN, J. H. and GIBSON, A. C., 1983, *Biogeography* (London: C. V. Mosby Co.), xi + 643 pp.

BROWN, W. D., 1990, Size-assortative mating in the blister beetle *Lytta magister* (Coleoptera: Meloidae), *Ethology*, **86**, 146–160.

BROWN, W. D. and STANFORD, R., 1992, Male mating tactics in a blister beetle (Coleoptera: Meloidae) vary with female quality, *Canadian Journal of Zoology*, **70**, 1652–1655.

BUGNION, E., 1910, Le *Cissites testaceus* Fab. des Indes et de Ceylan. Métamorphoses. Appareil génital, *Bulletin de la Société entomologique d'Egypte*, **1910** (4), 182–200, 3 pls.

BUYSSON, R. DU, 1902, Sur la ponte du *Mylabris variabilis* Pall. (Col.), *Bulletin de la Société entomologique de France*, **1902**, 284–286.

CHOBAUT, A., 1890, Sur les moeurs des Mylabres, avec la description et la figure des larves primaires de *Mylabris Schreibersi* Reiche et de *Mylabris variabilis* var. *tricincta* Chevrolat, *Le Coléoptériste*, **1**, 6–9, 19–23, 1 pl.

CHOBAUT, A., 1897, Nouvelles observations sur les relations biologiques des Anthicides avec les Vésicants, *Bulletin de la Société Entomologique de France*, **1897**, 74–78.

Chobaut, A., 1921, Description d'un nouveau *Diaphorocera* (Col., Meloidae) de l'Algérie méridionale, *Bulletin de la Société Entomologique de France*, **1921**, 298–299.

Chockalingam, S. and Manoharan, T., 1980, Studies on the damage to the flower of *Hibiscus rosasinensis* by the beetle, *Mylabris indica* and utilization of the food by the insect, *The Indian Zoologist*, **3**, 83–87.

Church, N. S., 1967, The egg-laying behavior of 11 species of Lyttinae (Coleoptera: Meloidae), *The Canadian Entomologist*, **99**, 752–760.

Church, N. S. and Gerber, G. H., 1977, Observations on the ontogeny and habits of *Lytta nuttali*, *L. viridana*, and *L. cyanipennis* (Coleoptera: Meloidae): the adults and eggs, *The Canadian Entomologist*, **109**, 565–573.

Cohen, A. C. and Pinto, J. D., 1977, An evaluation of xeric adaptiveness of several species of blister beetles (Meloidae), *Annals of the Entomological Society of America*, **70**, 741–749.

Cooley, J. R., 1995, Mating bahavior of *Lytta nuttalli* Say (Coleoptera: Meloidae), *Coleopterists Bulletin*, **49**, 132.

Cornalia, E., 1865, Sopra i caratteri microscopici offerti dalle cantaridi e da altri Coleotteri facili a confondersi con esse. Studi di Zoologia legale fatti nell'occasione del processo Galavresi, *Memorie della Società italiana di Scienze naturali*, **1**, 1–39, 4 pls.

Cros, A., 1910, Notes sur le *Sitaris muralis* Foerst, *Bulletin de la Société d'Histoire naturelle de l'Afrique du Nord*, **2**, 164–171, 176-186.

Cros, A., 1911, *Lydus (Alosimus) viridissimus* Lucas. Ses moeurs—sa larve primaire, *La Feueille des jeunes Naturalistes*, **41**, 191–199.

Cros, A., 1912a, *Lydus algiricus* L. Ses moeurs—sa larve primaire, *La Feuille des jeunes Naturalistes*, **42**, 78–86.

Cros, A., 1912b, Moeurs et évolution du *Meloe majalis* L, *Bulletin de la Societé d'Histoire naturelle de l'Afrique du Nord*, **4**, 45–48, 70–72, 93–96, 154–161, 181–190, 209–215.

Cros, A., 1912c, Contribution à la biologie des Méloïdes algériens (Note préliminaire), *La Feuille des jeunes Naturalistes*, **42**, 131–132.

Cros, A, 1912d, Entomologie algérienne. *Nemognatha chrysomelina* F. Ses variétés—son evolution, *Zeitschrift für wissenschaftliche Insektenbiologie*, **8**, 137–141.

Cros, A., 1913a, *Leptopalpus rostratus* Fabr., *Bulletin de la Societé d'Histoire naturelle de l'Afrique du Nord*, **4**, 175.

Cros, A., 1913b, *Hornia nymphoides* Escal. *Allendesalazaria nymphoïdes* Escal.—Col. Meloidae. Moeurs.-Evolution, *Bulletin de la Société d'Histoire naturelle de l'Afrique du Nord*, **4**, 42–52, 65–72, 101–122.

Cros, A., 1913c, Le *Sitaris rufipes* Gory, ses moeurs, son évolution, *La Feuille des jeunes Naturalistes*, (5) **43**, 173–177, 187–193.

Cros, A., 1914a, Le *Meloe autumnalis* Ol. Var. *cribripennis* Dej. (=*punctipennis* Heyd.). Moeurs—Evolution, *Bulletin de la Société d'Histoire naturelle de l'Afrique du Nord*, **5**, 45–52, 102–112, 155–160, 202–205.

Cros, A., 1914b, Le *Sitaris solieri* Pecchioli, *La Feuille des jeunes Naturalistes*, (5) **44**, 38–40.

Cros, A., 1917a, Forme des ongles des larves primaires des Meloidae et valeur du terme 'triungulin', *Annales de la Société Entomologique de France*, **86**, 159–164.

Cros, A., 1917b, *Apalus bimaculatus* L. var. *Comptei* Pic, *Bulletin de la Société d'Histoire naturelle de l'Afrique du Nord*, **8**, 125–132.

Cros, A., 1918, Le *Meloe foveolatus* Guérin, *Bulletin de la Société d'Histoire naturelle de l'Afrique du Nord*, **9**, 38–50, 70–80, 87–96, 98–104, 1 pl.

Cros, A., 1919a, Notes sur les larves primaires des meloidae avec indication de larves nouvelles, *Annales de la Société Entomologique de France*, **88**, 261–279.

Cros, A., 1919b, Biologie des *Cerocoma*, *Bulletin de la Société Entomologique de France*, 1919, 248–252.

Cros, A., 1919c, *Nemognatha chrysomelina* F. La larve primaire, *Bulletin de la Société d'Histoire naturelle de l'Afrique du Nord*, **11**, 55–61.

Cros, A., 1922a, Notes sur les larves primaires des Meloidae avec indication de larves nouvelles (2e série), *Annales de la Société Entomologique de France*, **97**, 27–58.

Cros, A., 1922b, *Oenas afra* L. Ses moeurs, sa larve primaire, *Bulletin de la Société d'Histoire naturelle de l'Afrique du Nord*, **13**, 226–236.

Cros, A., 1923, Le *Leptopalpus rostratus* Fabr. Ses moeurs, sa larve primaire, *Bulletin de la Société d'Histoire naturelle de l'Afrique du Nord*, **14**, 327–337, 1 pl.

Cros, A., 1924a, Révision des espèces africaines et orientales des genres *Horia* Fabr. et *Cissites* Latr., avec description de larves inédites, *Bulletin de la Royale entomologique d'Egypte*, **1924**, 24–80.

Cros, A., 1924b, *Cerocoma Vahli* Fabricius. Moeurs—Évolution, *Bulletin de la Société d'Histoire naturelle de l'Afrique du Nord*, **15**, 262–292.

Cros, A., 1924c, Contribution à l'étude des espèces du genre *Sitarobrachys* Reitter et plus spécialement du *Sitarobrachys Buigasi* Escal, *Bulletin de la Société des Sciences naturelles du Maroc*, **4**, 22–39.

Cros, A., 1926, *Zonabris impressa* Chevrolat, *Bulletin de la Société de Sciences naturelles du Maroc*, **6**, 42–55, 3 pls.

Cros, A., 1927a, *Zonabris Wagneri* Chevrolat. Moeus—Evolution, *Bulletin de la Société d'Histoire naturelle de l'Afrique du Nord*, **18**, 103–117, 1 pl.

Cros, A., 1927b, *Zonabris circumflexa* Chevrolat. Moeurs. Evolution, *Bulletin de la Société de Sciences naturelles et physiques du Maroc*, **7**, 177–197.

Cros, A., 1927c, Révision des genres *Horia* Fabr. et *Cissites* Latr. (note rectificative et complementaire), *Bulletin de la Société Royale Entomologique d'Egypte (n. s.)*, **11**, 103–115.

Cros, A., 1927d, Le *Meloe cavensis* Petagna. Etude biologique, *Annales de Sciences naturelles, Zoologie*, (10) **10**, 347–391.

Cros, A., 1928a, Essai sur la forme contractée (hypnothèque ou pseudonymphe) des larves des Meloidae, *Annales de la entomologique de France*, **17**, 27–58.

Cros, A., 1928b, *Cabalia rufiventris* Walker. Etude biologique, *Encyclopédie entomologique, Coleoptera, (B)* **3**, 39–48.

Cros, A., 1928c, Etudes biologiques sur diverses espèces algériennes du genre *Lydus* Latr., *Encyclopédie entomologique, Coleoptera, (B)* **3**, 49–92, 5 pls.

Cros, A., 1928d, A propos du Genre *Sitarobrachys* Reitter (Colèopt.), *Bulletin de la Société Royale Entomologique d'Egypte*, 1928, 100–102.

Cros, A., 1928e, Etudes biologiques sur les *Zonitis* (Meloidae), *Encyclopédie Entomologique, Coleoptera, (B)* **3**, 7–34, 1 pl.

Cros, A., 1929a, Observations nouvelles sur le Meloés, *Annales de Sciences naturelles, Zoologie*, (10) **12**, 137–191.

Cros, A., 1929b, Notes sur les larves primaires des Meloidae (3e Série), *Annales de la Entomologique de France*, **98**, 193–222.

Cros, A., 1929c, *Horia testacea* Fabr. (=*Horia africana* Auriv.), sa larve primaire, *Bulletin de la Société Royale Entomologique d'Egypte*, **29**, 1–7.

Cros, A., 1929d, Le *Sitaris solieri* opecchioli. Sa larve primaire—etude biologique, *Bulletin de la Société de Sciences naturelles du Maroc*, **9**, 77–84.

Cros, A., 1930, Notes biologiques sur les espèces algériennes du gen. *Coryna*, *Bulletin de la Société de Sciences naturelles du Maroc*, **10**, 156–174, 3 pls.

Cros, A., 1931a, Biologie des Méloés, *Annales de la Société de Sciences naturelles, Zoologie*, **12** (10), 137–191.

Cros, A., 1931b, *Zonabris Silbermanni* Chevrolat. La larve primaire, *Bulletin de la Société d'Histoire naturelle de l'Afrique du Nord*, **22**, 80–88.

Cros, A., 1934a, Le *Meloe chrysocomus* Miller; sa larve primaire, *Bulletin de la Royale Entomologique d'Egypte*, **1934**, 427–435.

Cros, A., 1934b, *Lagorina sericea* Waltl. Sa larve primaire, *Bulletin de la Société des Sciences naturelles du Maroc*, **14**, 35–44, 4 pls.

Cros, A., 1935, Le *Meloe erythrocnemus* Pallas, sa biologie, *Bulletin de la Société d'Histoire naturelle de l'Afrique du Nord*, **26**, 18–22.

Cros, A., 1937, Considérations générales sur le Genre *Epicauta* Redtenbacher. Étude biologique sur *Epicauta albovittata* Gestro, *Memorie della Società entomologica italiana*, **16**, 129–144.

Cros, A., 1938a, *Cissites maculata* Swederus (Col. Meoidae). Sa larve primaire, *Anales de la Sociedad Cientifica Argentina*, **126**, 285–300.

Cros, A., 1938b, Description de la larve primaire d'une espèce indéterminée de la tribu des Horiini (Col. Meloidae), *Bulletin du Musée Royale d'Histoire Naturelle de Belgique*, **14** (47), 1–13.

Cros, A., 1940a, Essai de classification des Meloides algériens, *VI Congreso Internacional de Entomologia*, Madrid, **1935**, 312–338.

CROS, A., 1940b, Etudes biologiques sur un groupe de Mylabres dont les larves primaires ont une conformation spéciale (*Mylabris gilvipes* Chevrol., *M. wartmanni* Pic), *Bulletin de la Société de Sciences naturelles et physiques du Maroc*, **19**, 88–106.

CROS, A., 1941, Le *Meloe variegatus* Donovan. Sa presence dans le Nord de l'Afrique. Sa biologie, *EOS, Revista Española de Entomologia*, **17**, 313–334.

CROS, A., 1943, Considérations générales sur les espèces de *Meloe* du groupe *rugosus* Marsh. Observations biologiques sur le *M. ganglbaueri* Apfelbeck et le *M. mediterraneus* Müller, *Annales de la Société de Sciences naturelles, Zoologie*, (11) **5**, 61–77.

DENIER, P., 1935a, Estudios sobre Meloidos americanos. Apuntes criticos de sistematica y de nomenclatura, *Revista Argentina de Entomologia*, **1**, 15–28.

DENIER, P., 1935b, Coleopterorum americanorum familiae Meloidarum enumeratio synonymica, *Revista de la Sociedad Entomólogica Argentina*, **7**, 139–176.

DEOBHAKTA, S. R., 1957, Embryonic development of *Mylabris pustulata* (Thunberg), *Agra University Journal of Research (Science)*, **6**, 139–176.

DE STEFANI PEREZ, T., 1885, Raccolte imenotterologichwe sui Monti di Renda e loro adiacenze, *Naturalista Siciliano*, **5**, 41–43.

DEY, S. K., DEY, K. and HENZY, W., 1985, The cytology of Indian Coleoptera. I. A study of chromosomal behaviour during meiosis in five species of Coleoptera from the eastern Himalayas, *Entomon*, **10**, 329–334.

DHILLON, S. S., KAUR, S. P. and SIDHU, D. S., 1983a, Lipid distribution in the tissues of *Mylabris pustulata* Thunb. (Insecta), *Bulletin of Pure and Applied Sciences*, **2A**, 17–24.

DHILLON, S. S., SIDHU, D. S., KAUR, S. P. and KUMAR, N., 1983b, Neutral lipids of certain tissues of *Mylabris pustulata* Thunb., and *Periplaneta americana* L. (Insecta), *Comparative Physiology and Ecology*, **8**, 375–378.

DILLON, L. S., 1952, The Meloidae (Coleoptera) of Texas, *The American Midland Naturalist*, **48**, 330–420.

DOKHTOUROFF, W., 1890, Faune coléoptèrologique aralo-caspienne. XIII partie, Méloides—Cantharides, *Horae Societatis Entomologicae Rossicae*, **24**, 121–192, 1 pl.

DVORAK, M., 1983, Drei neue Arten und bemerkungen zur Familie Meloidae (Coleoptera), *Acta Entomologica Bohemoslovaca*, **80**, 441–450.

DVORAK, M., 1990, Taxonomische bemerkungen zur Gattung *Cerocoma* Geoffroy (Coleoptera, Meloidae, Cerocomini), *Annotationes Zoologicae et Botanicae*, **199**, 1–12.

DVORAK, M., 1993a, Einige neue paläarktische Meloiden-Arten (Coleoptera), *Annotationes Zoologicae et Botanicae*, **212**, 1–10.

DVORAK, M., 1993b, Revision der Gattung *Micromerus* Mulsant et Rey, 1858 (Coleoptera, Meloidae), *Annotationes Zoologicae et Botanicae*, **214**, 1–9.

DVORAK, M., 1996a, Ergänzung zum Bestimmungschüssel der Tribus Cerocomini (Coleoptera: Meloidae), *Klapalekiana*, **32**, 159–162 [in Czech].

DVORAk, M., 1996b, Der Schlüssel zur Bestimmung der Meloiden-Gattung *Teratolytta* (Coleoptera: Meloidae), *Klapalekiana*, **32**, 163–165 [in Czech].

DVORAK, M., 1996c, Neue asiatische *Epicauta*-Arten (Coleoptera: Meloidae), *Folia Heyrovskiana*, **4**, 35–42.

EL RAYAH, E., 1973, On the gravity reactions, and sexual behaviour of *Epicauta aethiops* (Col. Meloidae), *Revue de Zoologie et de Botanique africaines*, **87**, 402–412.

EMDEN, F. I. VAN, 1943, Larvae of British beetles. Various small families, *Entomologist's Monthly Magazine*, **78–79** (1942–1943), 209–223.

ENNS, W. R., 1956, A revision of the genera *Nemognatha, Zonitis* and *Pseudozonitis* (Coleoptera, Meloidae) in America North of Mexico, with a proposed new genus, *University of Kansas Sciences Bulletin*, **37**, 685–909.

ERICKSON, E. H. and WERNER, F. G., 1974, Bionomics of Nearctic bee-associated Meloidae (Coleoptera); life histories and nutrition of certain Meloinae, *Annals of the Entomological Society of America*, **67**, 394–400.

ERICKSON, E. H., ENNS, W. R. and WERNER, F. G., 1976, Bionomics of the bee-associated Meloidae (Coleoptera); bee and plant hosts of some Nearctic Meloid beetles. A synopsis, *Annals of the Entomological Society of America*, **69**, 959–970.

ESCHERICH, K., 1890, Revision der behaarten *Meloe*-arten der alten Welt, *Wiener Entomologische Zeitung*, **9**, 87–96.

ESCHERICH, K., 1891a, *Cochliophorus* nov. gen. Meloidarum, *Deutsche Entomologische Zeischrift*, 1891,16.

Escherich, K., 1891b, Die Palaärktischen vertrerter der Coleopteren-Gattung *Zonitis* Fab.Versuch einer Monographie. I, *Deutsche entomologische Zeitschrift*, **1891**, 225–250, 1 pl.

Escherich, K., 1894, Beiträge zur Naturgeschichte der Meloidengattung *Lytta* Fab., *Verhandlungen der zoologische-botanischen Gesellschaft in Wien*, **44**, 251–298, 4 pls.

Escherich, K., 1896a, Revision der Meloiden-Gattung *Lydus* Latr., *Deutsche Entomologische Zeitschrift*, **1896**, 193–235.

Escherich, K., 1896b, Zur Kenntnis der gattung *Caloenas* Reitt., *Wiener Entomologische Zeitung*, **15**, 121–123.

Escherich, K., 1897a, Revision der palaearktischen Zonitiden, einer Unterfamilie der Meloiden, *Verhandlungen des Naturforschenden Vereines in Brünn*, **35**, 96–132.

Escherich, K., 1897b, Zoologische Ergebnisse einer von Dr. K. Escherich und L. Kathariner nach Central-Kleinasien unternommen Reise. IV. Theil. Coleopteren, *Entomologische Zeitung herausgegeben von dem entomologische Vereine zu Stettin*, **58**, 1–69.

Escherich, K., 1899, Zur kenntniss der Coleopteren-Gattung *Zonabris* Harold, *Wiener Entomologische Zeitung*, **18**, 84–109.

Fabre, M., 1857, Mémoire sur l'hypérmétamorphose et les moeurs des Méloides, *Annales de Sciences naturelles, Zoologie*, (4) **7**, 299–365, 1 pl.

Fabre, M., 1886, Souvenirs entomologiques (Troisième série), *Etudes sur l'instinct et les moeurs des Insectes* (Paris: Delagrave), 433 pp.

Fabricius, J. C., 1775, *Systema entomologiae, sistens Insectorum classes, ordines, genera, species, adjectis synonymis, locis, descriptionibus, observationibus* (Kortius: Flensburgi et Lipsiae), xxx + 832 pp.

Fagniez, Ch., 1936, Contribution à l'étude biologique du *Sitaris Solieri* Pecchioli (Col. Meloidae), *Bulletin de la Société entomologique de France*, **1936**, 181–185.

Fairmaire, L., 1880, Révision des *Zonitis* d'Australie, *Entomologische Zeitung, Herausgegeben von dem Entomologischen Vereine zu Stettin*, **41**, 261–282.

Fairmaire, L., 1894, Quelques Coléoptères du Thibet, *Annales de la Société entomologique du Belgique*, **38**, 216–225.

Fairmare, L., 1897, Description de Coléoptères nouveaux de la Malaise, de l'Inde et de la Chine, *Notes from the Leyden Museum*, **19**, 209–233.

Ferreira, A. and Mesa, A. 1977, Estudios citólogicos em três espécies brasileiras de coleópteros (Chrysomelidae, Cerambycidae e Meloidae), *Revista Brasileira de Biologia*, **37**, 61–64.

Gäde, G., 1995, Isolation and identification of AKH/RPCH family peptides in blister beetles (Meloidae), *Physiological Entomology*, **20**, 45–51.

Gahan, M. A., 1908, Notes on the coleopterous genera *Horia*, Fab., and *Cissites*, Latr., and a list of the described species, *The Annals and Magazine of Natural History*, (8) **2**, 199–204.

Gahan, M. A., 1909, Coleoptera, Part III. *In,* Zoological results of the Ruwenzori Expedition, 1905–1906, *Transactions of the Zoological Society of London*, **19**, 202–226, 2 pls.

Gahukar, R. T., 1989, Insects pests of millets and their management: a review, *Tropical Pest Management*, **35**, 382–391.

Gahukar, R. T., Doumbia, Y. O., Bal, A. B. and Bhatnagar, V. S., 1989, Distribution géographique, planthes-hôtes et fluctuation saisonnière des Méloides au Mali et au Sénégal, *Insect Science and its Application*, **10**, 99–106.

Garcia-Parìs, M., 1998, Revisión sistemática del género *Berberomeloe* Bologna, 1988 (Coleoptera, Meloidae) y diagnosis de un endemismo ibérico olvidado, *Graellsia*, **54**, 97–109.

Genè, G., 1831, Mémoire pour servir à l'histoire naturelle de l'*Apalus bimaculatus* et des Cantharidiens en général, *Annales des Sciences naturelles*, **23**, 138–144.

Gerber, G. H. and Church, N. S., 1973, Courtship and copulation in *Lytta nuttalli* (Coleoptera: Meloidae), *The Canadian Entomologist*, **105**, 719–724.

Gerber, G. H. and Church, N. S., 1976, The reproductive cycles of male and female *Lytta nuttalli* (Coleoptera: Meloidae), *The Canadian Entomologist*, **108**, 1125–1136.

Gerber, G. H., Church, N. S. and Rempel, J. G., 1971a, The anatomy, histology, and physiology of the reproductive systems of *Lytta nuttalli* Say (Coleoptera: Meloidae). I. The internal genitalia, *Canadian Journal of Zoology*, **49**, 523–533.

Gerber, G. H., Church, N. S. and Rempel, J. G., 1971b, The anatomy, histology, and physiology of the reproductive systems of *Lytta nuttalli* Say (Coleoptera: Meloidae). II. The abdomen and external genitalia, *Canadian Journal of Zoology*, **50**, 649–660.

Gerber, G. H., Church, N. S. and Rempel, J. G., 1971c, The structure, formation, histochemistry, fate, and functions of the spermatophore of *Lytta nuttalli* Say (Coleoptera: Meloidae), *Canadian Journal of Zoology*, **49**, 1595–1610.

Gess, F. W., 1981, Some aspects of an ethological study of the aculeate wasps and the bees of a karroid area in the vicinity of Grahamstown, South Africa, *Annals of the Cape Provincial Museums (natural History)*, **14**, 1–80.

Gess, F. W. and Gess, S. K., 1976, An ethological study of *Parachilus insignis* (Saussure) (Hymenoptera: Eumenidae) in the Eastern Cape Province of South Africa, *Annals of the Cape Provincial Museums (natural History)*, **11**, 83–102.

Gess, F. W. and Gess, S. K., 1980, Ethological studies of *Jugurtia confusa* Richards, *Ceramius capicola* Brauns, *C. linearis* Klug and *C. lichtensteini* (Klug) (Hymenoptera: Masaridae) in the Eastern Cape Province of South Africa, *Annals of the Cape Provincial Museums (natural History)*, **13**, 63–83.

Gess, F. W. and Gess, S. K., 1983, The private lives of meloid beetles, *The Naturalist*, **27**, 5–7.

Giglioli, M. E. C., 1965, Some observations on blister beetles, family Meloidae, in Gambia, West Africa, *Transactions of the Royal Society of Tropical Medicine and Hygiene*, **59**, 657–663.

Görnitz, K., 1937, Cantharidin als Gift und Anlockungsmittel für Insekten, *Arbeiten über physiologische und angewandte Entomologie aus Berlin-Dahlem*, **4**, 116–157.

Gorriz y Muñoz, R. J., 1882, *Ensayo para la Monografía de los Coléopteros Melóidos indigenas con Aplicación a las Ciencias médicas* (Zaragoza: Sanz y Navarro), 201 pp., 2 pls.

Greathead, D. J., 1963, A review of the insect enemies of Acridoidea (Orthoptera), *Transactions of the Royal Entomological Society of London*, **114**, 437–517.

Gridelli, E., 1930, Risultati zoologici della missione inviata dalla R. Società Geografica Italiana per l'esplorazione dell'Oasi di Giarabub (1926–1927). Coloetteri, *Annali del Museo civico di Storia naturale 'G. Doria' di Genova*, **54**, 1–485.

Gridelli, E., 1940, Coleoptera Staphylinidae. Diversicornia, Heteromera, Lamellicornia, Chrysomelidae (partim). In *Missione biologica nel paese dei Borana*, Vol. 2, *Raccolte Zoologiche*, parte I (Roma: Reale Accademiad'Italia, Centro Studi per l'Africa orientale), pp. 331–695.

Gupta, A. P., 1971, External genitalia of Meloidae (Coleoptera). II. The genitalia and their taxonomic significance, *Miscellaneous Publications of the Entomological Society of America*, **8** (1), 1–29.

Gupta, A. P., 1978, External genitalia of Meloidae (Coleoptera). III. Significance of some genitalic components in the higher classification of the family, *Deutsche Entomologische Zeitschrift,* (N.F.) **25**, 131–157.

Haag-Rutenberg, G. J., 1879, Ueber *Meloe ursus* Thnb. Und Verwandte, *Deutsche Entomologische Zeitschrift*, **23**, 401–407.

Haag-Rutenberg, G. J., 1880, Beiträge zur Kenntniss der Canthariden, *Deutsche Entomologische Zeitschrift*, **24**, 17–90.

Hafernik, J. and Saul-Gershenz, L., 2000, Beetle larvae cooperate to mimic bees, *Nature*, **405**, 35–36.

Hall, M. J. R., 1984, Trap-oriented behaviour of red-banded blister beetles, *Mylabris designata* var. *hacolyssa* Rochebrune (Coleoptera: Meloidae), in the Sudan, *Bulletin of the Entomological Researches*, **74**, 103–112.

Hammouda, Y. and Salama, R. B., 1974, Isolation of cantharidin from *Epicauta tomentosa*, *Pharmazie*, **29**, 147.

Heming, B. S., 1996, Structure and development of larval antennae in embryos of *Lytta viridana* LeConte (Coleoptera: Meloidae), *Canadian Journal of Zoology*, **74**, 1008–1034.

Heyden, L. von, 1863, Zwei neue Coleopteren-Gattungen aus dem Mittelmeergebiet, *Berliner Entomologische Zeitschrift*, **7**, 126–130.

Horsfall, W. R., 1941, Biology of the black blister beetle (Coleoptera: Meloidae), *Annals of the Entomological Society of America*, **34**, 114–126.

Horsfall, W. R., 1942, Biology of the squash blister beetle, *Journal of the Kansas Entomological Society*, **15**, 93–99.

Horsfall, W. R., 1943, Biology and control of common blister beetles in Arkansas, *University of Arkansas Agriculture Experiment Station Bulletin*, No. 436, 55 pp.

Iablokoff-Khnzoryan, S. M., 1958, Deux nouveaux Coléoptères Hétéromères de l'Arménie sovietique, *Zoologiske Zhournal Akademia Nauk SSSR*, **37**, 1896–1898 [in Russian and French abstract].

Iablokoff-Khnzoryan, S. M., 1983, Fauna Armenia SSR. Meloidae and Alleculidae, *Akademia Nauk Armeniskoye SSR, Institut Zoologii*, **5**, 1–155 [in Russian].

ICZN, 1994, Opinion 1754, *Histoire abrégée des insectes qui se trouvent aux environs de Paris* (Geoffroy, 1762): some generic names conserved (Crustacea, Insecta), *Bulletin of Zoological Nomenclature*, **51**, 58–70.

Imperial Institute of Entomology, 1935, [*Psalydolytta*], *Zoological Record*, **71** (11), Insecta, 238.

Inagaki, K., Nunome S. and Namba, T., 1983, Pharmacological studies on the chinese crude drugs derived from insects (II). On 'Banmao', *Shoyakugaku Zasshi*, **37**, 255-261.

Ishida, A., 1982, Behavior of *Horia tosana* Kono (Meloidae, Coleoptera), *Gensei*, **42**, 1-11.

Iwata, K., 1933, Studies on the nesting habits and parasites of *Megachile sculpturalis* Smith (Hym., Megachilidae), *Mushi*, **6**, 4–24.

Jannone, G., 1935, Osservazioni ecologiche e biologiche sul *Dociostaurus maroccanus* Thunb., *Calliptamus italicus* L. e loro parassiti in Prov. di Napoli (Primo contributo), *Bollettino del Laboratorio di Zoologia di Portici*, **28**, 75–151.

Juchnevitsh, L. A., 1955, Observations on the biology of the meloid genus *Mylabris* F. in Kazakhistan, *Trudy Institut Zoologii Akademia Nauk Kazhakistan S.S.R.*, **4**, 173–198 [in Russian].

Kaszab, Z., 1948, Die arten der Gattung *Cabalia* Muls. (Col., Meloidae), *Folia Entomologica Hungarica*, (s.n.) **3**, 12–14.

Kaszab, Z., 1951a, Neue Revision der Gattung *Alosimus* Muls. (Col., Meloidae), *Annales Historico-Naturales Musei nationalis Hungarici*, **1**, 138–150.

Kaszab, Z., 1951b, Revision der Cerocominen, *Acta biologica Academiae Scientiarum Hungaricae*, **2**, 255–274.

Kaszab, Z., 1951c, Über die Arten der Gattung *Oenas*, *Acta biologica Academiae Scientiarum Hungaricae*, **2**, 275–279.

Kaszab, Z., 1951d, Neue Meloiden (Coleoptera) aus Südafrika, *Annals of the Transvaal Museum*, **21**, 429–437.

Kaszab, Z., 1952a, Eine neue *Lydus*-Art aus Kleinasien, nebst einer Bestimmungstabelle der bisher bekannten Arten der Gattung *Lydus sensu stricto* (Col., Meloidae), *Annales Historico-Naturales Musei nationalis Hungarici*, (s.n.) **2**, 95–99.

Kaszab, Z., 1952b, Die paläarktischen und orientalischen Arten der Meloiden-Gattung *Epicauta* Redtb., *Acta biologica Academiae Scientiarum Hungaricae*, **3**, 573–599.

Kaszab, Z., 1952c, Neue Epicautinen (Col. Meloidae) aus der orientalischen region, *Entomologische Arbeiten aus dem Museum G. Frey*, **3**, 79–89.

Kaszab, Z., 1952d, Über *Lydus susicus* Esc. Und die neuen Arten der Gattung *Lyttolydulus* Reit. (Col. Meloidae), *Entomologische Arbeiten aus dem Museum G. Frey*, **3**, 89–95.

Kaszab, Z., 1952e, Über neue und wenig bekannte Meloiden aus Südafrika, *Annals of the Transvaal Museum*, **22**, 47–57.

Kaszab, Z., 1953a, Revision der Meloiden-Gattung *Cyaneolytta* Pér. (Col.), *Annales Historico-Naturales Musei nationalis Hungarici*, (s.n.) **4**, 81–93.

Kaszab, Z., 1953b, Studien über südafrikanischen Meloiden (Coleoptera), *Annals of the South African Museum*, **40**, 61–79.

Kaszab, Z., 1953c, Revision der aethiopischen Arten der Meloiden-Gattung *Epicauta* Redtb., *Acta biologica Academiae Scientiarum Hungaricae*, **4**, 481–513.

Kaszab, Z., 1954a, Über die Arten der Meloiden-Gattung *Iselma* Haag-R., *Annales du Musée Royal du Congo Belge Tervuren (Belgique)* (in 8°), *Sciences Zoologiques*, **1**, 423–430.

Kaszab, Z., 1954b, Die Arten der Meloiden Gattung *Psalydolytta* Pér., *Acta Zoologica Academiae Scientiarum Hungaricae*, **1**, 69–103.

Kaszab, Z., 1954c, Die aethiopischen Arten der Gattung *Zonitis* Fabr. (Coleoptera Meloidae), *Revue de Zoologie et Botanique africaine*, **50**, 17–28.

Kaszab, Z., 1954d, Über die Arten der Meloiden-Gattung *Zonitodema* Péringuey (Coleoptera), *Proceedings of the Royal Entomological Society of London*, (B) **1954**, 191–196.

Kaszab, Z., 1955a, Revision der meloiden-Gattung *Eletica* Lac. (Coleoptera-Heteromera), *Annales du Musée Royal du Congo Belge Tervuren (Belgique)* (in 8°), *Sciences Zoologiques*, **41**, 1–121, 11 pls.

Kaszab, Z., 1955b, Die Arten der Meloiden-Gattung *Cylindrothorax* Escher. (Coleoptera), *Annales Historico-Naturales Musei nationalis Hungarici*, (s.n.) **6**, 225–258.

Kaszab, Z., 1955c, Neue südafrikanische Meloiden (Coleoptera) aus dem Transvaal Museum in Pretoria, *Annals of the Transvaal Museum*, **2**, 401–413.

Kaszab, Z., 1956, Neue Meloiden aus der Sammlung des British Museum (Coleoptera), *Annals and Magazine of Natural History,* (12) **9**, 631–640.

Kaszab, Z., 1957a, Meloidae (Coleoptera-Heteromera), *Exploration du Parc National de l'Upemba, Mission G. F. De Witte*, **47**, 1–45.

Kaszab, Z., 1957b, New Meloidae (Coleoptera) from Israel, *Bulletin of the Research Council of Israel, Section Biology and Geology*, **6b**, 229–232.

Kaszab, Z., 1958a, Die Arten der Meloiden-Gattung *Micromerus* Muls. and Rey (Coleoptera), *Acta entomologica Musei nationalis Pragae*, **32** (488), 5–18.

Kaszab, Z., 1958b, Die Meloiden Afghanistans (Coleoptera), *Acta zoologica Academiae scientiarum Hungaricae*, **3**, 245–312.

Kaszab, Z., 1958c, Neue *Ceroctis*-Formen aus Afrika, *Revue de Zoologie et Botanique africaine*, **57**, 282–308.

Kaszab, Z., 1959, Phylogenetische Beziehungen des Flügelgeäders Meloiden (Coleoptera), nebst Beschreibung neuer Gattungen und Arten, *Acta zoologica Academiae scientiarum Hungaricae*, **5**, 67–114.

Kaszab, Z., 1960a, Die Arten und systematische Stellung der Meloiden-Gattung *Calydus* Reitter (Coleoptera), *Acta zoologica Academiae scientiarum Hungaricae*, **6**, 125–134.

Kaszab, Z., 1960b, Einige neue Meloiden (Coleoptera) des Museums G. Frey, *Entomologische Arbeiten aus dem Museums G. Frey*, **11**, 283–290.

Kaszab, Z., 1960c, Mission zoologique de l'I.R.S.A.C. en Afrique orientale (P. Basilewsky et N. Leleup, 1957). XLV. Coleoptera Meloidae, *Annales du Musée Royal du Congo Belge Tervuren, (Belgique)* (in 8°), *Sciences Zoologiques*, **88**, 269–286.

Kaszab, Z., 1962a, Neue Meloiden (Coleoptera) aus dem Museum A. Koenig in Bonn, *Bönner zoologische Beitrage*, 1961–1962, **12**, 343–353.

Kaszab, Z., 1962b, Über das System der Asiatischen *Lytta*-Arten, nebst Beschreibung drei neuer Arten (Coleoptera, Meloidae), *Annales Historico-Naturales Musei nationalis Hungarici, Pars Zoologica*, **54**, 289–298.

Kaszab, Z., 1963a, Studien über Meloiden (Coleoptera), *Annales Historio-naturales Musei nationalis Hungarici, Pars Zoologica*, **55**, 335–346.

Kaszab, Z., 1963b, A Meloidák földrajzi elterjedésének filogenetikai vonatkozásai, *Különlenyomat az Allattani közlemények*, **50**, 69–74 [in Hungarian].

Kaszab, Z., 1964, Ergebnisse der Mongolisch-Deutschen biologischen Expedition 1962. Nr. 3. Meloidae (Coleoptera), *Folia Entomologica Hungarica*, **17**, 317–324.

Kaszab, Z., 1965, Die Meloiden Madagaskars (Coleoptera), *Acta Entomologica Musei nationalis Pragae*, **36**, 393–402.

Kaszab, Z., 1966, Revision der Triben Ertliini und Derideini (Coleoptera, Meloidae), *Annales Historico-Naturales Musei nationalis Hungarici, Pars Zoologia*, **58**, 343–360.

Kaszab, Z., 1967, Über *Prolytta pallidipennis* (Haag-R.) und seine verwandten (Coleoptera, Meloidae), *Annales Historico-Naturales Musei Nationalis Hungarici, Pars Zoologica*, **59**, 284–289.

Kaszab, Z., 1968a, Ergebnisse zoologischer Sammlreisen in der Türkey. Coleoptera: Meloidae, *Annalen des Naturhistorischen Museums in Wien*, **72**, 443–450.

Kaszab, Z., 1968b, Contribution à la faune de l'Iran, 8. Coléoptères Meloidae, *Annales de la Société Entomologique de France* (N. S.), **4**, 749–776.

Kaszab, Z., 1969a, The system of the Meloidae (Coleoptera), *Memorie della Società entomologica italiana*, **48**, 241–248.

Kaszab, Z., 1969b, Eine neue *Paractenodia*-art (Col. Meloidae) aus der wüste Namib, *Scientific Papers of the Namib Desert Research Station*, **50**, 119–121.

Kaszab, Z., 1978, Neue Meloiden aus Asien, Afrika uns Südamerika (Coleoptera), *Acta zoologica Academiae scientiarum hungaricae*, **24**, 331–342.

Kaszab, Z., 1981, Faunistische und taxonomische studien über Meloiden (Coleoptera), *Annales Historico-Naturales Musei nationalis Hungarici*, **73**, 159–181.

Kaszab, Z., 1983, Insects of Saudi Arabia. Coleoptera: Fam. Meloidae. A synopsis of the Arabian Meloidae, *Fauna of Saudi Arabia*, **5**, 144–204.

Kifune, T., 1961, Biological notes on two Japanese species of the genus *Zonitis* Fabricius (Coleoptera, Meloidae) (Studies on Meloidae—I), *Mushi*, **35**, 51–61.

Kifune, T., Maeta Y. and Sato, T., 1973, Biological notes on some Japanese species of the genus *Meloe* with description of their first instar larvae (Coleoptera: Meloidae) (Studies on Meloidae. II), *Mushi*, **47**, 47–65.

Kocher, L., 1954, Prospection entomologique (Coléoptères) de la Moyenne Moulouya, *Bulletin de la Société de Sciences naturelles et physiques du Maroc*, **34**, 262–286.

Kocher, L., 1956, Catalogue commenté des Coléoptères du Maroc. V. Hétéromères (Ténebrionides exceptés), *Travaux de l'Institut scientifique Chérifien, Zoologie*, **10**, 1–107.

Kono, H., 1936, Neue und wenig bekannte Käfer Japans. I, *Insecta Matsumurana*, **10**, 87–98.

Kono, H., 1940, Die Meloiden von Mandschukuo, *Insecta Matsumurana*, **15**, 57–62.

Kraatz, G., 1863, Revision der Cerocomiden-gruppe, *Berliner Entomologische Zeitschrift*, **1863**, 109–115.

Kryzhanovskij, O. L., 1959, The key of the species *Teratolytta* (Coleoptera, Meloidae), inhabiting the U.S.S.R., with the description of two new forms from Tadjikistan, *Entomologicheskoye Obozreniye*, **38**, 855–859 [in Russian, with English Summary].

Kuzin, V. S., 1953, The blister beetles of Kazakhstan, *Trudy Respublikanskoy Stantsii Zashchity Rasteniy Kazakhstanskiy Filial Vaskhnil (Alma-Ata)*, **1**, 72–154 [in Russian].

Kuzin, V. S., 1954, K posnanyju systemy narybnikov (Coleoptera, Meloidae, Mylabrini), *Trudly Usesojnogo Entomologizesko Obzestva*, **44**, 336–379 [in Russian].

Laporte de Castelnau, F. L., 1840, *Histoire naturelle des insectes. Coléoptères*, Vol. 2. (Paris: P. Duménil), 563 pp., 38 pls.

Latreille, P. A., 1810, *Considérations générales sur l'ordre naturel des animaux composant les classes des Crustacés, des Arachnides et des Insectes avec un tableau méthodique de leurs genres disposés en familles* (Paris: Schoell), 444 pp.

Lea, A. M., 1914, Notes on some miscellaneous Coleoptera with descriptions of new species, *Transactions and Proceedings of the Royal Society of South Australia*, **38**, 249–344.

Lea, A. M., 1916, Descriptions of new species of Australian Coleoptera. Part XI, *Proceedings of the Linnean Society of New South Wales*, **40**, 490–499.

Levshinskaja, G. M., 1964, Blister beetles (Coleoptera, Meloidae) of the Crimea, *Entomologicheskoye Obozreniye*, **43**, 587–591 [in Russian].

Lichtenstein, J., 1878, *Colletes fodiens* garni de petites larves du genre *Sitaris*, *L'Abeille, Nouveautes et faits*, **17**, 2 (21), 84.

Lienhart, R. and Remy, P., 1930, Les derniers stigmates abdominaux des larves primaires des *Sitaris* (Coléoptères Meloidae), *Comptes rendus des séances de la Société de Biologie, Société de Biologie de Nancy*, **103**, 606–608.

Lindberg, H., 1963, A contribution to the study of beetles in the Madeira islands. Results of the expeditions in 1957 and 1959. XI. Cisidae, Bostrychidae, Ptinidae, Oedemeridae, Aderidae, Meloidae, *Commentationes biologicae Societas Scientiarum Fennica*, **25**, 103–104.

Linsley, E. G., 1942, Systematics of the meloid genera *Hornia* and *Allendesalazaria* (Coleoptera), *University of California Publications in Entomology*, **7**, 189–206.

Linsley, E. G. and MacSwain, J. W., 1952, Notes on the biology and host relationships of some species of *Nemognatha*, *The Wasmann Journal of Biology*, **10**, 205–224.

MacSwain, J. W., 1956, A classification of the first instar larvae of the Meloidae (Coleoptera), *University of California Publications in Entomology*, **12**, i–iv, 1–182.

Maeta, Y., 1978, A preliminary study on the physical control of *Melittobia acasta* (Walker) by cold treatment (Hymenoptera: Eulophidae), *Bulletin of the Thoku National Agricultural Experimental Station*, **58**, 211–229.

Mäklin, F. W., 1875, Neue Canthariden, *Acta Societatis Scientificae Fennicae*, **10**, 597–632.

Maran, J., 1940, Conspectus specierum generis *Lydus* Latr. (subg. *Alosimus* Muls.) ex affinitate speciei *Lydus collaris* Fabr., *Vestnik Ceskoslovenské zoologické spolecnosti v Praze*, **8**, 73–90 [in Czech and Latin].

Maran, J., 1941a, Duae novae species *Lydus* Latr. (subg. *Alosimus*) ex affinitate speciei *Lydus collaris* Fabr., *Sbornik entomologickeho oddelini Zemského Musea v Praze*, **19**(202), 60–63 [in Czech and Latin].

Maran, J., 1941b, De novis parumque cognitis chinensibus generis *Lytta* F. speciebus ex affinitate *L. aeneiventris* Haag. Coleopteram Meloidae, *Sbornik entomologickeho oddelini Zemského Musea v Praze*, **19** (223), 180–185 [in Czech and Latin].

Maran, J., 1942a, Generis *Stenodera* Eschschz. revisio. Coleoptera. Meloidae, *Sbornik entomologickeho oddelini Zemského Museav Praze*, **20**(228), 14–29 [in Czech and Latin].

Maran, J., 1942b, Subgeneris *Taphromeloë* Rttr. revisio. Coleoptera Meloidae. Gen, *Meloë* L., *Sbornik entomologickeho oddelini Zemského Musea v Praze*, **20**(239), 50–58 [in Czech and Latin].

Maran, J., 1942c, Specierum generis *Lydus* (Subg. *Alosimus* Muls.) ex affinitate speciei *Lydus syriacus* L. revisio. Coleoptera Meloidae, *Sbornik entomologickeho oddelini Zemského Musea v Praze*, **20**(234), 78–98 [in Czech and Latin].

Maran, J., 1944, Vorarbeiten für eine monographische Bearbeitung der Gattung *Cerocoma* Geoffr., *Vestnik Ceskoslovenské zoologické spolecnosti v Praze*, **9** (1941–1944), 78–101.

Marseul, S. A. de, 1870, Monographie des Mylabrides d'Europe, et des contrées limitrophes en Afrique et en Asie, *L'Abeille*, **7**, 1–204.

Marseul, S. A. de, 1872, Monographie des Mylabrides, *Mémoires de la Société royale des Sciences de Liège*, 363–662, 9 pls.

Marseul, S.A. de, 1876, Mélanges, *L'Abeille*, **16**(1878), 35–36.

Marseul, S. A. de, 1879, Etudes sur les Insectes d'Angola qui se trouvent au Muséum National de Lisbonne, *Journal de Sciences mathématiques, physiques et naturelles*, **25**, 43–67.

Martin, H. C., 1891, Observation sur les moeurs de *Nemognatha*, *Bulletin de la Société entomologique de France*, 1891, liv.

Martinez de la Escalera, M., 1906, Especies nuevas de Coleópteros de Marruecos, *Boletín de la Sociedad española de Historia natural*, **6**, 161–162.

Martinez de la Escalera, M., 1909, Especies nuevas de Meloidos del SW. de Marruecos, *Boletín de la real Sociedad Española de Historia Natural*, **9**, 240–244.

Martinez de la Escalera, M., 1910, Coleópteros nuevos de Marruecos, *Boletín de la real Sociedad Española de Historia Natural*, **10**, 379–382.

Martinez de la Escalera, M., 1914, Los Coleópteros de Marueccos, *Trabajos del Museo Nacional de Ciencias Naturales, Zoologica*, **11**, 1–553.

Matthes, D., 1969, Die fächelbalz von *Cerocoma schäfferi* (L.) (Coleopt., Meloidae), *Verhandlungen der Zoologischen Gesellschaft, Supplementband*, **33**, 316–322.

Matthes, D., 1970, Der Meloide *Cerocoma schäfferi* (L.), *Entomologische Blätter und Biologische Systematik Käfer*, **66**, 33–40.

Matthes, D., 1972, Die Balz der Spanischen Fliege (*Lytta vesicatoria* L.), *Zoologischer Anzeiger*, **188**, 441–447.

Mayet, V., 1875, Mémoire sur les moeurs et les métamorphoses d'une nouvelle espèce de Coléoptère de la famille des Vésicants le *Sitaris colletis*, *Annales de la Société entomologique de France*, **5**, 65–92, 2 pls.

Meyer, D., Schlatter, C., Schlatter-Lanz, I., Schmid, H. and Bovey, P., 1968, Die Zucht von *Lytta vesicatoria* in Laboratorium und Nachweis der Cantharidinsynthese in Larven, *Experientia*, **25**, 995–998.

Mohamedsaid, M. S., 1979, The blister beetles (Meloidae) of Sri Lanka, *Ceylon Journal of Sciences* (*Biological Sciences*), **13**, 203–251.

Mohamedsaid, M. S., 1981, The blister beetles of Melanesia with descriptions of three new species (Coleoptera: Meloidae), *Sians Malaysiana*, **10**, 81–91.

Molitor, A., 1931, Über Lebensweise und Fang von Käfern, die zu Wespen und Bienearten in Beziehung stehen, *Koleopterologische Rundschau*, **17**, 173–184.

Moor, F. C. de, 1978, Botswana Meloidae (Coleoptera), *Occasional Papers of the National Museums and Monuments of Rhodesia (B, Natural Sciences)*, **6**, 80–127.

Muche, W. H., 1963, Beitrag zur kenntnis der Genus *Cerocoma* Geoffr. (Coleoptera, Meloidae, Cerocomini), *Reichenbachia*, **2**, 11–15.

Mulsant, E., 1858, Description d'un Coléoptère nouveau de la tribu des Vésicants, *Annales de la Société Linnéenne de Lyon*, (2) **8**, 239–242.

Mulsant, E. and Rey, C., 1858, Coup d'oeil sur les Insectes de la famille des Cantharidiens accompagné de la description de diverses espèces nouvelles ou peu connues, *Mémoires de l'Académie des Sciences de Lyon*, (2) **8**, 122–220, 3 pls.

Nagatomi, A., 1967, Temperature and induction of diapause in *Epicauta gorhami* Marseul (Coleoptera: Meloidae), *Japan Journal of Applied Entomology and Zoology*, **11**, 62–65.

NORMAND, H., 1936, Contribution au catalogue des Coléoptères de la Tunisie (9e fascicule), *Bulletin de la Société d'Histoire naturelle de l'Afrique du Nord*, **27**, 144–164.

ÖZBEK, H., 1979, *Micromerus erivanicus* Maran (Coleoptera: Meloidae), Erzurum ve yöresi için yeni bir korunga zararlisi, *Türkiye Bitki Koruma Dergisi*, **3**, 189–193 [in Turkish with English summary].

ÖZBEK, H. and SZALOKI, D., 1998, A contribution to the knowledge of the Meloidae (Coleoptera) fauna of Turkey along with new records, *Turkish Journal of Zoology*, **22**, 23–40.

PACKER, L., 1987, The triungulin larva of *Nemognatha* (*Pauronemognatha*) *punctulata* LeConte (Coleoptera: Meloidae) with a description of the nest of its host—*Megachile brevis pseudobrevis* Say (Hymenoptera: Megachilidae), *Journal of the Kansas Entomological Society*, **60**, 280–287.

PAOLI, G., 1932, Osservazioni sulla biologia del *Dociostaurus maroccanus* Thnb. in Italia nelle fasi gregarie e solitarie e sull'azione di alcuni Insetti parassiti, *Nuovi Annali di Agricoltura*, **12**, 627–639.

PAOLI, G., 1931–1933, *Prodromo di entomologia agraria della Somalia italiana* (Firenze: Istituto Agricolo Coloniale), 428 pp.

PAOLI, G., 1937, Studi sulle cavallette di Foggia (*Dociostaurus maroccanus* Thnb.) e sui loro oofagi (Ditteri-Bombiliidi e Coleotteri Meloidi) ed acari ectofagi (Eritreidi e Trombidiidi), *Redia*, **23**, 27–202, 3 pls.

PAOLI, G. and BOSELLI, F., 1947, Introduzione di oofagi del *Dociostaurus maroccanus* Thnb. dalla penisola italiana in Sardegna, *Memorie della Società entomologica italiana*, **26** (suppl.), 21–40.

PARDO ALCAIDE, A., 1948, Estudios sobre Meloidae. I. Acerca de la validez especifica de *Mylabris maculoso-punctata* Grll., *rosinae* Escher. y *pauper* Escher, *EOS*, *Revista Española de Entomologia*, **24**, 493–502.

PARDO ALCAIDE, A., 1950, Estudios sobre Meloidae. II. Los Mylabrini de la peninsula Iberica, *Boletin de Patóologia vegetal y de Entomologia Agricola*, **17**, 61–82.

PARDO ALCAIDE, A., 1952, Los generos de Meloidae de la fauna hespérica, *Graellsia*, **8** (1950), 39–79.

PARDO ALCAIDE, A., 1954a, Études sur les Meloidae. V. Les Mylabrini du Maroc et du Sahara occidental espagnol (Col. Meloidae), *Bulletin de la Société de Sciences naturelles et physiques du Maroc*, **34**, 55–88.

PARDO ALCAIDE, A., 1954b, Nota sobre algunos Coleopteros euroafricanos, *EOS*, *Revista Española de Entomologia*, **30**, 81–87.

PARDO ALCAIDE, A., 1955, Estudios sobre Meloidae Vi. Sobre algunos *Mylabris* (s. lat.) de la región etiópica, *Bulletin de l'Institut royal de Sciences naturelles du Belgique*, **31**(49), 1–32.

PARDO ALCAIDE, A., 1958a, Études sur les Meloidae (Col.). IX. Observations sur quelques *Mylabris* (s.l.) des régions éthiopienne et orientale, *Bulletin de l'Institut royal des Sciences naturelles de Belgique*, **35**(13), 1–39.

PARDO ALCAIDE, A., 1958b, Études sur Meloidae (Col.) X. Quelques *Mylabris* nouveaux ou intéressants de la faune ethiopienne, *Bollettino del Museo civico di Storia naturale di Trieste*, **21**, 63–76.

PARDO ALCAIDE, A., 1958c, Analectas entomologicas. VII. Los Sitarini de la Peninsula Iberica (Col. Meloidae), *Graellsia*, **16**, 13–22.

PARDO ALCAIDE, A., 1959, Études sur les Meloidae (Col.) XI. Sur quelques Mylabrini éthiopiens mal connus du genre *Rusadiria* Pardo, *Miscelania Zoologica*, **1**, 57–68.

PARDO ALCAIDE, A., 1961, Estudios sobre 'Meloidae'. XIII. Meloideos del Sahara occidental español y de la región du Draa (Marueccos) (Coleoptera), *EOS, Revista española de Entomologia*, **37**, 91–111.

PARDO ALCAIDE, A., 1963, Coléoptères Méloïdes récoltés par M. J. Mateu dans l'Ennedi et au Tchad. Etudes sur les Meloidae, XII, *Bulletin de l'Institut fondamental de l'Afrique Noire*, (A) **25**, 572–588.

PARDO ALCAIDE, A., 1966, Contribution à la faune du Congo (Brazzaville). Mission A. Villiers et A. Descarpentries. XXX. Coléoptères Meloïdae, *Bulletin de l'Institut fondamental de l'Afrique Noire*, (A) **38**, 1196–1207.

PARDO ALCAIDE, A., 1968, Étude sur les Meloidae (Coleoptera). XX. Sur le genre *Gorrizia* Pardo et une nouvelle espèce soudanaise du groupe du *brunnipes* (Klug), *EOS*, *Revista Española de Entomologia*, **43**, 623–629.

Pardo Alcaide, A., 1969a, Études sur les Meloidae. XXI. Matériaux pour une révision des Mylabrini de l'Afrique du Nord et du Moyen Orient (2ème partie) (Coleoptera), *EOS, Revista Española de Entomologia*, **44**, 367–376.

Pardo Alcaide, A., 1969b, XI. Coleoptera Meloidae, *Mémoires de l'Institut fondamental de l'Afrique noire. Le Parc national du Niokolo-Koba*, **3**, 237–245.

Pardo Alcaide, A., 1977, Études sur les Meloidae (Col.). XXIII. Trois nouvelles taxa de *Cerocoma* Geoffroy d'Iran et Turquie d'Asie, *Nouvelle Revue d'Entomologie*, **7**, 59–66.

Pardo Alcaide, A., 1981, Études sur les Meloidae (Col.). XXV. Sur les états pré-imaginaux du *Leptopalpus rostratus* (Fabricius), *Bulletį de la Institució Catalana d' Història Natural*, **45** (Zool. 3) (1980), 61–63.

Paulian, R., 1956, Les Meloidae Malgaches (Coleoptera), *Le Naturaliste Malgache*, **8**, 203–207.

Pèringuey, L., 1904, Sixth contribution to the South African coleopterous fauna. Descriptions of new species of Coleoptera in the collection of the South African Museum, *Annals of the South African Museum*, **3**, 167–300, 1 pl.

Pèringuey, L., 1909, Descriptive catalogue of the Coleoptera of South Africa. Family Meloidae, *Transactions of the Royal Society of South Africa*, **1**, 165–297, 4 pls.

Peyerimhoff, P. de, 1931, Mission scientifique du Hoggar envoyée de Fevrier à Mai 1928. Coléoptères, *Mémoires de la Société d'Histoire naturelle de l'Afrique du Nord*, **2**, 1–172, 3 pls, 2 maps.

Peyerimhoff, P. de, 1934, Observations sur les differences sexuelles et les caracteristiques géneriques de *Cylindrothorax* Esch. 1896 (*Sagitta* Esch. 1894, *Mimovesperus* Pic 1923) (Coleoptera: Meloidae), *Bulletin de la Société Entomologique d'Egypte*, **18**, 202–208.

Peyerimhoff, P. de, 1935, Qu-est-œ que le *Lydus (Lydopsis) susicus* Escal.? (Coleoptera-Meloidae), *Bulletin de la Société Entomologique d'Egypte*, **19**, 156–159.

Pic, M., 1897, Moeurs des *Anthicus* (Col.), note rectificative et observations, *Bulletin de la Société Entomologique de France*, **1897**, 124.

Pic, M., 1909, Sur le genere *Zonitomorpha* Péring. (Col. Heteromera), *Bulletin de la Société Entomologique de France*, **1909**, 261–263.

Pic, M., 1910, Nouvelle contribution à l'étude du genre *Zonitomorpha* Péring. (Col. Hétéromères), *Annales de la Société Entomologique de France*, **89**, 391–325.

Pic, M., 1911, Sur divers 'Zonitini' de la Nouvelle Guinée et régions avoisinantes, *L'Echange*, **27**, 147.

Pic, M., 1913, Coléoptères exotiques en partie nouveaux (suite), *Echange*, **29**, 125–126, 133–135, 147–150, 163–166, 175–176, 191–192.

Pic, M., 1914, Nouveaux Coléoptères du Congo er d'Afrique orientale au Musée de Tervuren, *Revue de Zoologie Africaine*, (3) **3**, 483-489.

Pic, M., 1932, Nouveautés diverses, *Mélanges exotiques entomologiques*, **59**, 10–36.

Pic, M., 1938, Mutations et Coléoptères nouveaux, *L'Echange*, **54**, 14–16.

Pic, M., 1948, Opuscola Martialis VI, *L'Echange*, (numero spécial) (1941), 1–9.

Pic, M., 1952, *Diversités Entomologiques XI* (Moulis: Les Impriméries réunies), pp. 4–16.

Pic, M., 1953, Contribution à l'étude de la zone d'inondation du Niger (Mission G. Remaudier, 1950), Coléoptères Malacodermoidea, *Bulletin de l'Institut Française de l'Afrique Noire*, **15**, 1529–1534.

Pinto, J. D., 1972a, Notes on the Caviceps Group of the Genus *Epicauta* with descriptions of first instar larvae, *The Pan-Pacific Entomologist*, **48**, 253–260.

Pinto, J. D., 1972b, The sexual behavior of *Meloe (Meloe) strigulosus* Mannerheim, *Journal of the Kansas Entomological Society*, **45**, 396–412.

Pinto, J. D., 1973, Sexual behavior in the genus *Pleuropompha* LeConte: a new mating display in blister beetles (Coleoptera: Meloidae), *The Canadian Entomologist*, **195**, 957–969.

Pinto, J. D., 1980, Behavior and taxonomy of the *Epicauta maculata* Group (Coleoptera: Meloidae), *University of California Publications in Entomology*, **89**, 1–111.

Pinto, J. D., 1984a, Cladistic and phenetic estimates of relationships among genera of eupomphine blister beetles (Coleoptera: Meloidae), *Systematic Entomology*, **9**, 165–182.

Pinto, J. D., 1984b, New generic synonymies in the Epicautina (Coleoptera: Meloidae; Meloinae), *Proceedings of the Entomological Society of Washington*, **86**, 378–382.

Pinto, J. D., 1985, A new species of *Lytta* (Coleoptera: Meloidae) from Baja California with notes on relationships in the subgenus *Paralytta*, *The Coleopterists Bulletin*, **39**, 335–339.

Pinto, J. D., 1991, The taxonomy of North American *Epicauta* (Coleoptera: Meloidae), with a revision of the nominate subgenus and a survey of courtship behavior, *University of California Publications in Entomology*, **110**, i–ix, 1–372, 40 pls.

PINTO, J. D. and BOLOGNA, M. A., 1993, The first instar larvae of *Meloe afer* and *M. occultus*, with a clarification of antennal structure in larval *Meloe* (Coleoptera: Meloidae), *Coleopterists Bulletin*, **47**, 340–348.

PINTO, J. D. and BOLOGNA, M. A., 1999, The new world genera of Meloidae (Coleoptera): a key and synopsis, *Journal of Natural History*, **33**, 569–619.

PINTO, J. D. and MAYOR, A. J., 1979, Sexual behavior of three species of *Lytta* (Coleoptera: Meloidae), *The Wasmann Journal of Biology*, **36** (1978), 106–115.

PINTO, J. D. and MAYOR, A. J., 1986, Size, mating success, and courtship pattern in the Meloidae (Coleoptera), *Annals of the Entomological Society of America*, **79**, 597–604.

PINTO, J. D. and SELANDER, R. B., 1970, The bionomics of blister beetles of the genus *Meloe* and a classification of the New World species, *Illinois Biological Monographs*, **42**, 1–222.

PINTO, J. D., BOLOGNA, M. A. and BOUSEMAN, J. K., 1996, First-instar larvae, courtship and oviposition in *Eletica*: amending the definition of the Meloidae (Coleoptera: Tenebrionidae), *Systematic Entomology*, **21**, 63–74.

PLIGINSKIJ, V. G., 1935, Notizen über Meloiden (Coleoptera, Meloidae), III, *Revue d'Entomologie de l'URSS*, **25**, 320–323 [partially in Russian].

PORTCHINSKY, I. A., 1914, Les Insectes parasites des criquets nuisibles en Russie. Première partie. Les parasites Coléoptères, *Trudy Byuro Entomologii St. Petersburg*, **11**(1), 1–68, 2 pls [in Russian].

PRISPINOVA, M. G., 1987a, New subgenus and species of the genus *Meloe* L. (Coleoptera, Meloidae) from the Tadzhik S.S.R., *Izvestia Akademia nauk. Tadzhkskoj SSR, Otdelenia Biologiskie Nauk*, No. 3 (104), 41–45 [in Russian].

PRISPINOVA, M. G., 1987b, Fauna and ecology of the meloid beetles (Coleoptera, Meloidae) of Tazhik SSR, *Entomologicheskoye Obozreniye*, **66**, 555–571 [in Russian].

PRJAMIKOVA, M. G. and JUCHNEVITSH, L. A., 1958, Key to the triungulin of blister beetles (Coleoptera, Meloidae) of the tribe Mylabrini, of the fauna of the USSR, *Entomologicheskoye Obozreniye*, **27**, 176–182 [in Russian].

PROCHAZKA, J., 1892, Revision der Arten der Coleopteren-Gattung *Hapalus* Fabr. aus der palaärctischen Fauna, *Wiener Entomologische Zeitung*, **11**, 263–270.

REICHARDT, A. N., 1934, Keys and list of blister beetles from Turkmenia (in Russian), *Akademia nauk SSR. Seriia Turkmenskaia*, **6**, 205–239.

REICHE, L., 1865, Etude sur les epèces de Mylabrides de la collection de L. Reiche, suivie d'une note sur le genre *Trigonurus* Mulsant et description d'une espèce nouvelle, *Annales de la Société Entomologique de France*, (4) **5**, 627–642.

REITTER, E., 1883, [*Sitarobrachys*]. *Wiener Entomologische Zeitung*, **2**, 309, 1 pl.

REITTER, E., 1885, Uebersicht der arten der Gattung *Cerocoma* Geoffr., *Deutsche Entomologische Zeitschrift*, **1885**, 1–14.

REITTER, E., 1889, Neue Coleopteren aus Europa, dem angrenzenden Ländern und Sibirien mit Bemerkungen über bekante Arten, *Wiener Entomologische Zeitung*, **33**, 17–44.

REITTER, E., 1894, Coleopterologische Notizen, *Wiener Entomologische Zeitung*, **13**, 115–117.

REITTER, E., 1895, *Bestimmungs-tabelle der europäischen Coeleopteren Meloidae. 1. Theil: Meloini. 32* (Paskau: Verfassers), 13 pp.

REITTER, E., 1896, Coleopterologische Notizen, *Wiener Entomologische Zeitung*, **15**, 283.

REITTER, E., 1905, Übersicht der mir bekannten arten der Coleopteren-Gattung *Epicauta* Redtb. Aus palaearktischen fauna, *Wiener Entomologische Zeitung*, **24**, 194–196.

REITTER, E., 1906, Neue Coleopteren aus der paläarktischen Fauna, Wiener Entomologische Zeitung, **25**, 31–37.

REITTER, E., 1911, *Fauna Germanica. Die Käfer des Deutschen Reiches*, Vol. 3 (Stuttgart: Lutz), 436 pp., 48 pls.

REITTER, E., 1913, Eine Serie neuer Coleopteren aus der paläarktischen Fauna, *Deutsche Entomologische Zeitschrift*, **1913**, 649–669.

REITTER, E., 1915, Coleopterologische Notizen, *Wiener Entomologische Zeitung*, **34**, 124.

ROEPKE, W., 1917, Eenige opmerkingen over twee Javaansche Canthariden: *Mylabris pstulata* Thnb. En *Epicauta ruficeps* Ill., *Tijdschrift voor Entomologie*, **60**, 252–267, 2 pls.

RONCHETTI, G., 1953, Ricerche sperimentali sulla igroreazione di Artropodi. I contributo alla conoscenza della igroreazione di Insetti, *Bolletino della Società entomologica italiana*, **83**, 114–125.

Saha, G. N., 1972, Studies on blister beetles (Coleoptera: Meloidae) from India. I. Two new species of the genus *Eletica* Lac., *Zoologischer Anzeiger*, **189**, 98–101.

Saha, G. N., 1979, Revision of Indian blister beetles (Coleoptera: Meloidae: Meloinae), *Records of the Zoological Survey of India*, **74**, 1–146.

Saha, G. N., 1982, A new genus of Meloidae (Coleoptera) from India, *Oriental Insects*, **15**, 277–280.

Saz, E., 1945, La puenta de huevos de *Zonitis immaculata* Ol., *Graellsia*, **3**, 119–123.

Schawaller, W., 1996, *Stenoria thakkola* sp. n., the first species of the tribe Sitarini from the Himalayas (Coleoptera: Meloidae), *Elytron*, **10**, 147–152.

Schlatter, Ch., Waldner, E. E. and Schmid, H., 1968, Zur Biosynthese des Cantharidins. I, *Experientia*, **24**, 994–995.

Schmidt, K., 1913, Zur Kenntnis der äthiopisch-afrikanischen Meloeformen (Coleopt.), *Entomologische Zeitung herausgegeben von dem Entomologische Vereines zu Stettin*, **74**, 327–339.

Schroo, H., 1920, Houtbijen (*Xylocopa*), *De Tropische Natuur*, **9**, 33–39.

Selander, R. B., 1957, A new *Nemognatha* from southern Mexico (Meloidae), *The Coleopterists Bulletin*, **11**, 25–28.

Selander, R. B., 1959, The first instar larvae of some North American species of Meloidae (Coleoptera), *Proceedings of the Entomological Society of Washington*, **61**, 205–213.

Selander, R. B., 1960a, Bionomics, systematics, and phylogeny of *Lytta*, a genus of blister beetles (Coleoptera, Meloidae), *Illinois Biological Monographs*, **28**, i–vi, 1–295.

Selander, R. B., 1960b, Restriction of the genus *Lytta* (Meloidae), *Coleopterists Bulletin*, **14**, 80–86.

Selander, R. B., 1964, Sexual behavior in blister beetles (Coleoptera: Meloidae). I. The genus *Pyrota*, *The Canadian Entomologist*, **96**, 1037–1082.

Selander, R. B., 1966, A classification of the genera and higher taxa of the meloid subfamily Eleticinae (Coleoptera), *The Canadian Entomologist*, **98**, 449–481.

Selander, R. B., 1981, Evidence of a third type of larval prey in blister beetles (Coleoptera: Meloidae), *Journal of the Kansas Entomological Society*, **54**, 757–783.

Selander, R. B., 1982, Further stusies of predation on meloid egg by meloid larvae (Coleoptera), *Journal of the Kansas Entomological Society*, **55**, 427–441.

Selander, R. B., 1985, *Spastomeloe*, a new genus of Meloini from Peru (Coleoptera: Meloidae), *Journal of the Kansas Entomological Society*, **58**, 668–685.

Selander, R. B., 1986a, The identity of *Lytta coeruleata* Pfaff, 1824 (Coleoptera, Meloidae), *Journal of the Kansas Entomological Society*, **59**, 557–559.

Selander, R. B., 1986b, An annotated catalog and summary of bionomics of blister beetles of the genus *Cyaneolytta* (Coleoptera, Meloidae), *Transactions of the American Entomological Society*, **112**, 95–128.

Selander, R. B., 1987a, Behavioral observations in *Cyaneolytta* and a description of the triungulin larva of *C. fryi* (Coleoptera: Meloidae), *Journal of the Kansas Entomological Society*, **60**, 288–304.

Selander, R. B., 1987b, The type-species of *Zonitis* Fabricius and the synonymies of *Z. flava* Fabricius and *Z. ruficollis* Frivaldszky (Col., Meloidae), *Deutsche Entomologische Zeitschrift*, (N. F.) **34**, 341–350.

Selander, R. B., 1987c, Restriction of the South American genus *Acrolytta* (Coleoptera: Meloidae), *Entomological News*, **98**, 208–210.

Selander, R. B., 1988a, An annotated catalog and summary of bionomics of blister beetles of the genus *Cylindrothorax* (Coleoptera, Meloidae), *Transactions of the American Entomological Society*, **114**, 15–70.

Selander, R. B., 1988b, Blister beetles of the genus *Lyttomeloe* (Coleoptera: Meloidae), *Journal of the Kansas Entomological Society*, **61**, 80–101.

Selander, R.B., 1988c, An annotated catalog and a summary of bionomics of blister beetles of the genus *Psalydolytta* (Coleoptera: Meloidae), *Insecta Mundi*, **2**, 1–15.

Selander, R. B., 1989, The triungulin of *Meloe cicatricosus* Leach (Col., Meloidae), *Deutsche Entomologische Zeitschrift*, (N.F.) **36**, 401–407.

Selander, R. B., 1990, Blister beetles of the genus *Pseudopyrota* (Coleoptera: Meloidae), *Journal of the Kansas Entomological Society*, **63**, 46–79.

Selander, R. B., 1991, On the nomenclature and classification of the Meloidae (Coleoptera), *Insecta Mundi*, **5**, 65–94.

SELANDER, R. B. and AGAFITEI, N. J., 1982, First-instar larvae of the Uniforma Group of the genus *Epicauta* (Coleoptera, Meloidae), *Proceedings of the Entomological Society of Washington*, **84**, 138–148.

SELANDER, R. B. and BOHART, G. E., 1954, The biology of *Zonitis atripennis flavida* (Coleoptera: Meloidae), *The Wasmann Journal of Biology*, **12**, 227–243.

SELANDER, R. B. and DOWNEY, J. C., 1963, Distributional and food plant records in the Cyanipennis subgroup of the genus *Lytta* (Coleoptera: Meloidae), *The Pan-Pacific Entomologist*, **39**, 124–129.

SELANDER, R. B. and LAURENSE, A. A., 1987, On the imature stages of *Psalydolytta fusca* (Coleoptera, Meloidae), *Proceedings of the Entomological Society of Washington*, **89**, 489–499.

SELANDER, R. B. and MATHIEU, J. M., 1969, Ecology, behavior and adult anatomy of the Albida group of the genus *Epicauta* (Coleoptera, Meloidae), *University of Illinois Biological Monographs*, **41**, 1–168.

SELANDER, R. B. and WEDDLE, R. C., 1969, The ontogeny of blister beetles (Coleoptera, Meloidae). II. The effects of age of triungulin larvae at feeding and temperature on development in *Epicauta segmenta*, *Annals of the Entomological Society of America*, **62**, 27–39.

SELANDER, R. B. and WEDDLE, R. C., 1972, The ontogeny of blister beetles (Coleoptera, Meloidae). III. Diapause termination in coarctate larvae of *Epicauta segmenta*, *Annals of the Entomological Society of America*, **65**, 1–17.

SEMENOV, A., 1893a, Revisio synoptica Meloidarum generis *Ctenopus* Fisch., *Bulletin de l'Académie de St. Petersburg*, **13**, 367-376.

SEMENOV, A., 1893b, Meloidarum species novae, *Horae Societatis Entomologicae Rossicae*, **27**, 265–281.

SEMENOV, A., 1894, Coleoptera asiatica nova, *Horae Societatis Entomologicae Rossicae*, **28**, 526–547.

SEMENOV, A., 1895a, Coleoptera asiatica nova. VI, *Horae Societatis Entomologicae Rossicae*, **29**, 336–362.

SEMENOV, A, 1895b, De genere *Rhampholyssa* Krtz., *Horae Societatis Entomologicae Rossicae*, **29**, 515–519.

SEMENOV, A., 1900, Commentarii des Meloidis, *Horae Societatis Entomologicae Rossicae*, **34**, 479–497.

SEMENOV, A., 1910, Analecta coleopterologica. XVI, *Revue russe d'Entomologie*, **4**, 433–435.

SIDHU, D. S., KAUR, S. P., DHILLON, S. S. and KUMAR, N., 1982, Phospholypids of *Mylabris pustulata* Thnb. (Col. Mylabridae) and *Periplaneta americana* L. (Dictyoptera, Blattidae), *Acta Entomologica Jugoslavica*, **18**, 73–79.

SIDHRA, D. V., THAKARE, U. K. and TEMBHARE, D. B., 1983, The cephalic neuroendocrine system of the beetle, *Mylabris pustulata* (Thunb.) (Meloidae: Coleoptera), *Journal of Hirnforschung*, **24**, 71–78.

SIDHRA, D. V., THAKARE, U. K. and TEMBHARE, D. B., 1984, The histological studies on the ovary in relation to vitello-genesis in the Meloid beetle, *Mylabris pustulata* (Thnb.) (Meloidae: Coleoptera), *Journal of Animal Morphology and Physiology*, **31**, 89–102.

SNEAD, J. S. and ALCOCK, J., 1985, Aggregation formation and assortative mating in two meloid beetles, *Evolution*, **39**, 1123–1131.

SOUMACOV, G. G., 1915, Les espèces paléarctiques du genre *Mylabris* Fabr. (Coloptera, Meloidae), *Horae Societatis Entomologicae Rossicae*, **42**, 1–71.

SOUMACOV, G. G., 1930, Catalogue des espèces paléarctiques de tribu Mylabrina (Coleoptera, Meloidae), *Acta Instituti et Musei Zoologici Universitatis Tartuensis*, **37**, 1–114.

STAHLBERG, P., 1909, Notiz über *Sitarobrachys brevipennis* Reitt. (Col.), *Wiener Entomologische Zeitung*, **28**, 318.

STRAUCH, A., 1863, Note sur l'*Apalus bimaculatus*, *Annales de la Société Entomologieque de France*, (4) **3**, 481–482.

TAGWIREYI, D., BALL, D. E., LOGA, P. J. and MOYO, S., 2000, Cantharidin poisoning due to 'blister beetle' ingestion, *Toxicon*, **38**, 1865–1869.

TAKESTUKA, T., 1984, New information on the life history of *Horia tosana* Kono (Meloidae, Coleoptera), *Gensei*, **45**, 9–13 [in Japanese with English summary].

TAKESTUKA, T., 1986, A review on the observations on imagos of *Cissites cephalotes* Olivier

(Meloid beetle formerly called as *Horia tosana*), *Gensei*, **48**, 11–22 [in Japanese with English summary].

TAKESTUKA, T., 1989a, Notes on biology of *Cissites cephalotes*, *Gensei*, **52**, 26 [in Japanese].

TAKESTUKA, T., 1989b, Notes on biology of *Cissites cephalotes*, *Gensei*, **53**, 2 [in Japanese].

TAN JUAN-JIE, 1958, On the genus *Epicauta* Redtb. of China (Meloidae, Coleoptera), *Acta Entomologica Sinica*, **8**, 152–167 [in Chinese with English summary].

TAN JUAN-JIE, 1981, *Coleoptera Meloidae*. In: AA. VV. *The Series of the Comprehensive Scientific Expedition to the Qhinghai-Xizang Plateau. Insects of Xizang*, Vol. 1 (Peking: Sciences Press), XI + 600 pp. [in Chinese with English summary].

THAKARE, V. K., PATIL, H. N. and RAINA, S. K., 1980, In vivo studies on glucose conversion/utilization rate in the haemolymph of *Periplaneta americana* and *Mylabris pustulata*, *Journal of Animal Morphology and Physiology*, **27**, 190–193.

THÈODORIDÈS, J., 1950, Parasitological, medical and veterinary importance of Coleoptera, *Acta Tropica*, **7**, 48–60.

THÈODORIDÈS, J., 1954, Notes sur des Coléoptères d'importance médicale (Deuxième série), *Medecine Tropicale*, **14**, 318–323.

THÈODORIDÈS, J., 1956, Notes sur des Coléoptères d'importance médicale (Troisième série), *Medecine Tropicale*, **16**, 101–105.

TRAIZET, E., 1896, Observations biologiques sur le *Notoxus monoceros* (Col.), *Bulletin de la Société Entomologique de France*, 1896, 104.

VALLADARES, L. F., 1984, *Estudio de los Coleópteros Vesicantes de la provincia de León (Coleoptera, Meloidae),* (León: Celarayn), 156 pp.

VALLADARES, L. F. and SALGADO, J. M., 1983, Contribución al conocimiento de los Meloidae (Col.) en la provincia de León, *Boletin de la Asociación española de Entomologia*, **7**, 79–100.

VERBEEK, f. a. Th., 1932, De ontwikkelings-stadia van *Mylabris* en *Epicauta* in de tropen, *Tijdschrift voor Entomologie*, **75** (suppl.), 163–169.

WANG, G.-S., 1989, Medical uses of *Mylabris* in ancient China and recent studies, *Journal of Ethnopharmacology*, **26**, 147–162.

WELLMAN, F. C., 1908, On the Meloidae of Angola, *Proceedings of the Academy of Natural Sciences of Philadelphia*, **60**, 600–624.

WELLMAN, F. C., 1910, The generic and subgeneric types of the Lyttidae (Meloidae s. Cantharidae auctt.), (Col.), *The Canadian Entomologist*, **41**, 389–396.

WERNER, F. G., 1945, Revision of the genus *Epicauta* in America north of Mexico, *Bulletin of the Museum of Comparative Zoology at Harvard College*, **95**, 421–517, 7 pls.

WERNER, F. G., 1954, A review of the subgenus *Gnathospasta* of the genus *Epicauta* (Meloidae), *Coleopterists Bulletin*, **8**, 25–27.

WERNER, F. G., ENNS, W. R. and PARKER, F. H., 1966, The Meloidae of Arizona, *The University of Arizona Agricultural Experiment Station Technical Bulletin*, **75**, 1–96.

WERNER, F. G., 1970, Terrestrial insects of the Rita Blanca Lake deposits, *University of Arizona Agricultural Experimental Station Journal*, (1108) 123–130, 8 pls.

YADAV, J. S., 1973, Chromosome number and sex-determining mechanism in fourteen species of Coleoptera, *Current Sciences*, **42**, 514.

YADAV, J. S., PILLAI, R. K. and BHARANDWAJ, S. C., 1977, Chromosome studies on two species of the family Meloidae (Coleoptera), *Researches Bulletin (Sciences) of the Punjab University*, **28**, 35–38.

ZACHVATKIN, A. A., 1931, Parasites and hyperparasites of the egg-ponds of injurious locusts (Acridoidea) of Turkestan, *Bulletin of the Entomological Researches*, **22**, 385–391.

ZETHNER, O. and LAURENSE, A. A., 1988, The economic importance and control of the adult blister beetle *Psalydolytta fusca* Olivier (Coleoptera: Meloidae), *Tropical Pest Management*, **34**, 407–412.