New heteromerous beetles (Coleoptera) from the Baltic amber of eastern Prussia and gum copal of Zanzibar*

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With 2 Plates

Synopsis

Seven new species, of which six belong to five new genera of heteromerous beetles, are described from Baltic amber material in the British Museum (Natural History). One new species is described from gum copal material, also in the British Museum collection.

I. Introduction

The Heteromera form a very difficult group with which to work and have been classified in different ways by different coleopterists. I have followed the classification of Crowson (1955) in placing them in the cucujiform superfamily Cucujoidea. According to Crowson (*op. cit.*), the ancestral cucujoid type (and the ancestor of the related superfamilies Cleroidea, Lymexyloidea, Chrysomeloidea and Curculionoidea) probably differentiated in the middle or lower Jurassic, a common ancestral form of these and Dermestoidea and Bostrychoidea in the later Triassic, a common ancestor for all these and the Dascilliformia (Dascilloidea, Byrrhoidea, Dryopoidea, Buprestoidea, Elateroidea, and Cantharoidea) in the mid-Triassic, and a common ancestor for these and the Haplogastra (Staphylinoidea, Hydrophiloidea, Histeroidea, and possibly Scarabaeoidea), or the entire suborder Polyphaga, in the early Triassic. The primitive types of Cucujoidea are placed in the section Clavicornia, and the derivative types belong to the section Heteromera, which probably arose from a fairly primitive clavicorn type near Byturidae and Biphyllidae (Crowson, *op. cit.*).

Adult Heteromera are defined by Crowson (*op. cit.*) as having:

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Tarsal formula 5, 5, 4 in both sexes, or 4, 4, 4 (or in males 3, 4, 4, very rarely 3, 3, 3); front coxae often projecting or, if not, trochanters usually of heteromeroid type (femur extending dorsally round trochanter to meet coxa) and first 3 visible (morphologically 3–5) abdominal sternites connate; aedeagus never of typical cucujoid type, usually of characteristic heteromeroid type (ventral part of ring-piece of tegmen missing, parameres attached to a dorsal basal-piece, and median lobe ventral in orientation); wings never with more than 4 anal veins (in main group); metendosternite usually with narrow stalk and anterior tendons arising from arms; abdomen with 7 pairs of spiracles; maxillae 2-lobed.

Crowson (1960 : 127) suggested the transfer of the Cisidae from the Clavicornia to the Heteromera ; he considers the Prostomine subfamily of the Cucujidae to be a family of Heteromera (*personal communication*).

I do not consider the above-mentioned characters of heteromerous beetles as having evolved by convergence, as some characters may be secondarily changed in some families, and I do not care to follow the system used by Arnett (1960–62), who has split those from North America into several superfamilies, as did some earlier American students. Arnett (1960 : 18) writes "He [Crowson] has depended strongly on larval characters, frequently favoring them and at times strongly insisting that two groups otherwise seemingly closely related are not so because of big differences in the larvae. In this respect, I believe it remains to be proven that the evolutionary imprint is stronger in immature forms". Crowson (1955 : 91), however, had stated ". . . it is necessary to emphasise that there are many important Cucujoid types whose larvae still remain undescribed, and that, as throughout this study, somewhat greater weight is given to imaginal than to larval characters as indicators of relationships". In a modern systematic work the ideal is to take into consideration all the characteristics and attributes of individuals of a population throughout their life (the holomorph concept of Hennig, 1950). It is also a well-known fact that qualitative and quantitative evolutionary novelties appear at all stages in the ontogeny of living things and not solely in the adult. It seems to me probable that evidence for phylogenetic changes (kladogenesis) is more likely to be observed in ontogenetic and immature stages of most heteromerous beetles than in the comparatively short adult stage of their life history. A detailed account of the types of ontogenetic alteration arising in the course of phylogeny and other references to the subject can be found in the work of Rensch (1959) and he states (*op. cit.* : 264) "What we may safely say is that archallaxis and early deviation have been proved in numerous cases, but that late deviations and additions to the final stages of ontogeny are more frequent than the former two types".

Like Britton (1960 : 30), I have regarded it as a mistake to force a new taxon into the framework of existing taxa and thus artificially produce a polyphyletic assemblage but I have also briefly stated my reasons for arriving at a conclusion. This has been made possible by examination of representatives of recent genera and species in the British Museum collection and evaluation of their original descriptions (the latter, unfortunately, were not found useful in many instances). Revisionary work on the recent genera is, however, called for, and a subsequent examination of my specimens for further taxonomic consideration would then make possible some alterations in the subjective estimate of the ranks of the proposed taxa.

II. Baltic Amber Heteromera

The English "amber", French "ambre", Italian "ambra gialla" and Spanish "ambar" all seem to be derived from the Arabic word "anbar" (Williamson, 1932). The corresponding Latin term is "succinum" (succus=gum). Baltic amber is a fossil resin, known also as succinite, and is distinguishable from other fossil resins by its exceptionally high content of succinic acid. The resin is supposedly derived from an extinct coniferous tree, *Pinus* (or *Pinites*) *succinifera*. The greatest amount of it has been extracted from early Oligocene deposits of mixed sandy and clayey constitution

along the Baltic coast of the former East Prussia (now divided between Poland and Lithuania). As these deposits contain very few other remains of trees, it is supposed that the amber, the specific gravity of which is only slightly higher than that of sea-water, had drifted considerable distances from its source, which is generally supposed to have lain to the north, in the mass that is now Scandinavia. The pieces of amber from these deposits frequently appear considerably rolled and water-worn; some of them may well be distinctly older than the deposits in which they are now found, and are perhaps of Eocene age. The fauna and flora so far described from the Baltic amber show curious and contradictory features. Numerous species have been described, particularly among the insects, which appear to be almost identical with modern types from Central and Northern Europe, but there are also many definitely extinct types, and most of these have their closest living relatives in tropical and subtropical countries, scarcely any showing definite European affinities. One hypothesis that has been advanced is that the "Amber Forest" occupied a mountainous terrain and that some of the amber was washed down from considerable altitudes, whereas other pieces came from warm lowlands. It also seems possible that the ingenious technicians of the amber trade had secret methods for the introduction of insects and other matter into amber, and that some or all of the modern European types that have been described as amber fossils originated in this way. There is a large body of palaeontological evidence that early Tertiary Europe had a much warmer climate than we find today; thermophilic types disappeared from Europe in the great cold that occurred during the Pliocene period.

Lists of the currently known beetles from Baltic amber are given by Handlirsch (1906–08, 1925), Klebs (1910) and others. Wickham (1914) has described beetles from the Miocene of Florissant, Colorado[1] that include members of six heteromerous families (Anthicidae, Tenebrionidae, Alleculidae, Oedemeridae, Mordellidae, and Meloidae). Pongracz (1923 : 67) mentions three species of Meloidae from the lower Miocene of Hungary. Many of the specimens from Baltic amber examined by me come from Klebs, who listed the following heteromerous beetles in his collection, as identified by E. Reitter (Klebs, 1910 : 236–42): Alleculidae, 17; *Allecula*, 2; *Cteniopus*, 1; near *Gonodera*, 1; *Gonodera*, 4; near *Hymenalia*, 1; *Isomira*, 6; *Mycetochara*, 1; undetermined genus, 1. Anthicidae, 49: *Amblyderes*, 1; *Anthicus*, 12; near *Anthicus*, 6; near *Anthicus* and *Euglenes*, 3; *Macratria*, 9; *Ochthenomus*, 3; *Pedilus*, 1; *Steropes*, 3; *Tomoderus*, 2; new genus, 2; unfamiliar genus, 1; undetermined genus, 6. Colydiidae, 14: *Apistus*, 1; *Bothrideres*, 2; *Coxelus*, 1; *Diodesma*, 2; near *Endophloeus*, 1; near *Murmidius*, 1; *Synchita*, 2; *Xylolaemus*, 3; undetermined genus, 1. Euglenidae (=Aderidae), 53: *Euglenes*, 20; near *Euglenes*, 21; *Hylophilus*, 12. Lagriidae, 2: near *Statira*, 1; near *Lagria*, 1. Melandryidae, 44: *Abdera*, 5; near *Abdera*, 1; *Anisoxya*, 5; near *Carida* or *Orchesia*, 1; *Dircaea*, 5; near *Dircaea*, 1; *Eustrophus*, 3; near *Hallomenus*, 1; near *Hypulus*, 1; *Orchesia*, 9; near *Orchesia*, 3; *Phloeotrya*, 1; *Serropalpus*, 2; new genus, 3; unfamiliar genus, 3. Mordellidae, 115: *Anaspis*, 37; *Mordella*, 13; near *Mordella*, 1; *Mordellistena*, 11; *Scraptia*, 47; near *Scraptia*, 1; *Trotomma*, 1; new genus, 3; new genus (with characteristic head), 1. Mycetophagidae, 31: *Berginus*, 1; *Litargus*, 2; near *Litargus*, 1; *Mycetophagus*, 2; *Telmatophilus*, 1; *Triphyllus*, 1; *Typhaea*, 17; near *Typhaea*, 5; genus not Palaearctic, 1. Oedemeridae, 1: *Oedemera*, 1. Pythidae, 4: *Lissodema*, 1; *Salpingus*, 2; new genus, 1. Rhipiphoridae, 2: *Pelecotoma*, 2. Tenebrionidae, 12: near *Helops*, 4; *Laena*, 3; *Lichenum*, 1; *Palorus*, 2; *Tribolium*, 1; *Uloma*, 1. These identifications may not all be correct but they do at least give some idea of what probably was once in the Klebs collection.

Wasmann (1929 and 1933) has described several new genera and species of Paussidae from the Baltic amber. Darlington (1950 : 84), however, doubts "almost everything that Wasmann says about relationships of genera" and the systematic

[1] *The Florissant deposits are now considered to be of Oligocene age.*

position of some of them, and suggests a careful revision. Recently, Schedl (1947) has studied Scolytidae and Platypodidae from Baltic amber. Spiders from the Baltic amber have been studied by Petrunkevitch (1942). Mr. R. A. Crowson, of the University of Glasgow, has informed me (*in litt.*) of a Russian coleopterist, Iablokoff-Khnzorian, who has described a new genus, *Circaeus* from the Baltic amber and placed it in a new family, Circaeidae, related to Colydiidae and Mycetophagidae (see: 1960, *Dokl. Akad. Nauk SSR* **136** (1) : 209–10). He also informed me that from the figures it appears to be an aderid type (Phytobaenini). It is to be noted that fossil records of Alleculidae and Tenebrionidae are found in the Eocene, and those of other Heteromera not before the Oligocene. The Baltic amber forms are from Lower Oligocene, some 40 million years old.

Mr. A. Ponomarenko, Palaeontological Institute, Academy of Sciences, Moscow, U.S.S.R., has informed me (*in litt.*) of some Russian work on fossil Heteromera by A. V. Martynov (Oedemeridae : *Necromera baeckmanni*) and by Scegoleva-Barovskaja (Praemordellidae: *Praemordella martynovi*) from the Jurassic deposits of Karatau, southern Kazhakstan and Turkestan. The correct family associations, however, need to be confirmed.

(1) Anthicidae (Pedilinae, Macratriini)

(*a*) ***Protomacratria*** gen. n.

The following are the distinguishing characters seen in the material here described that place it in the family Anthicidae, excluding it from the Aderidae, Cephaloidae, Meloidae, Pythidae, Pyrochroidae, Nilionidae, Lagriidae, Tenebrionidae, Alleculidae and Pterogeniidae by all five visible abdominal sternites being free, the tarsus having the penultimate segment lobed below and the maxillary palp being subcultriform; from the Oedemeridae by the head being strongly deflexed and sharply and deeply constricted at the neck, the eyes entire and elytra without vein-like ribbing; from the Rhipiphoridae by the antenna being filiform and the base of the prothorax narrower than the elytra at the shoulders; from the Scraptiidae, Mordellidae, Melandryidae and Tetratomidae[2] by the tibial spurs not being pubescent and the side borders of the prothorax obsolete; from the Trictenotomidae, Monommidae and Zopheridae by the projecting front coxa; from the Inopeplidae, Salpingidae, Cononotidae, Mycteridae, Hemipeplidae and Elacatidae by the middle coxal cavity not being closed outwardly by the sterna; from the Boridae by the antenna not being inserted under the sides of the frons; and from the Merycidae, Mycetophagidae and Colydiidae by a tarsal formula of 5, 5, 4.

In general form and shape of maxillary palp the two specimens described below remind me of *Macratria* Newman but they lack pubescence on the tibial spurs and have unusual punctures on the vertex. When the revision of the world species of *Macratria* on which I am now engaged is complete, the position of the two specimens from amber can be considered. *Lithomacratria* Wickham from the Miocene of Florissant, Colorado, differs from *Protomacratria* in having a short, transverse, pronotum and the apical three segments of the antenna together longer than the remaining segments combined. The presence of a narrow neck, large, entire and coarsely-faceted eyes, and of an apically constricted prothorax distinguish *Protomacratria* from members of the tribes Pedilini and Eurygeniini. Finally, I have examined all the genera of Anthicidae in the British Museum collection and the two specimens cannot be satisfactorily placed in them.

Other characters of the genus are:

Tempora reduced; clypeolabral sulcus distinct; frontoclypeal sulcus indistinct; frontal ridge obsolete; maxillary palp 4-segmented, nearly as long as head; eyes lateral, convex, dorsally separated by a distance slightly greater than their individual width; width of head here nearly equal to that

[2] *The tibial spurs are not pubescent in Tetratomidae.*

of pronotum at base; antenna filiform, 11-segmented, segments 9 and 10 and to a lesser extent 11 subserrate or thickened apically, last segment slightly longer than penultimate, apically tapering beyond middle. Pronotum longer than broad; hind coxae not contiguous, but not widely separated; tibial spurs short; tarsal claw simple or appendiculate; epipleural fold of elytra indistinct; elytra striate, punctate. Abdomen with 5 visible sternites.

Type species: *Protomacratria appendiculata*

Key to Species

Tarsal claw appendiculate; apical segment of maxillary palp subcultriform; second segment of maxillary palp slightly longer than third segment . . . . . ***appendiculata*** sp. n.

Tarsal claw simple; apical segment of maxillary palp cultriform; second segment of maxillary palp slightly smaller than third segment ***tripunctata*** sp. n.

Protomacratria appendiculata sp. n. (Pl. I, figs. 1–3)

Holotype

Shape: elongate, cylindrical.

Colour: black; eyes lighter in colour.

Vestiture: short, sparse, decumbent, a few erect hairs on elytra towards lateral margins.

Head: shining, triangular, nearly as long as wide across eyes; sparsely, finely punctate; 3 unusual large punctures or pits present on vertex, 1 on the right not visible on account of an obstruction in the specimen; labrum rounded and entire at apex, more than twice as wide as long, maxilla with galea well developed, second and third segments of maxillary palp subtriangular, fourth segment subcultriform and twice as long as third segment (other mouthparts not clearly visible); eleventh antennal segment less than twice as long as tenth segment.

Thorax: pronotum shining; sparsely, finely punctate; prosternum not prolonged between coxae; trochantin absent; middle coxae not contiguous; femur swollen distally; tibia and tarsus slender, former narrowed basally, first hind tarsal segment less than twice as long as remaining segments combined, tarsal claws appendiculate (*i.e.* each with medium size teeth); scutellum small; elytron with apex rounded and slightly pointed, sparsely, finely punctate (punctures appear to be arranged in longitudinal rows). Cost-apical and dorso-apical areas of right wing pulled out from beneath the elytron during imbedding in amber.

Abdomen: first visible sternite less than twice as long as second; fifth visible sternite entire, rounded at apex, latter strongly bent downwards.

Measurements (in mm.).—Total length, 2·90. Antenna: total length, 1·23 (segments I–XI: 0·15, 0·09, 0·09, 0·09, 0·09, 0·09, 0·09, 0·09, 0·12, 0·12 and 0·21 respectively). Maxillary palp: total length, 0·44 (segments I–IV: 0·04, 0·12, 0·09 and 0·19 respectively). Pronotum: length, 0·72; width at apex, 0·18. Elytron: length, 1·80; maximum width, 0·60. Front tarsus: not distinct. Middle tarsus: total length, 0·52 (segments I–V: 0·18, 0·09, 0·08, 0·08 and 0·09 respectively). Hind tarsus: total length, 0·53 (segments I–IV: 0·30, 0·06, 0·08 and 0·09 respectively). Hind tibial spur, 0·08.

The holotype is deposited in the Department of Palaeontology, British Museum (Natural History), B.M. number In. 18788, collector's number XIII B 702; ex coll. Klebs, Baltic amber.

Protomacratria tripunctata sp. n. (Pl. I, fig. 4)

Holotype

Shape: elongate, cylindrical.

Colour: brown; maxillary palpi, antennae (segments 1–8) and legs, light; last 3 antennal segments and rest of body mostly dark.

Vestiture: not visible in the specimen, except that vertex appears to have a few somewhat suberect hairs.

Head: shining, broadly triangular; second and third segments of maxillary palp triangular, fourth segment cultriform and nearly as long as preceding 2 segments combined; facets of eyes on the whole coarse but appearing to be slightly finer than in *appendiculata*; eleventh antennal segment less than twice as long as penultimate segment.

Thorax: femur swollen at base, those of middle and hind legs arcuate; tibia and tarsus slender, former narrowed towards base; tarsal claws simple; elytron rounded at apex, sparsely, finely punctate,

punctures appearing to have been arranged in longitudinal rows (at least this is distinct towards mid-lateral border of right elytron, where it is also finely pubescent).

Abdomen: sternites so obscured by air bubbles that they are not easy to count but first 2 visible ones definitely free.

Measurements (in mm.).—Total length, 2·94. Antenna: total length? (segments I–XI: ?, ?, ?, ?, 0·09, 0·09, 0·09, 0·09, 0·12, 0·12 and 0·15 respectively). Maxillary palp: total length? (segments I–IV: ?, 0·08, 0·12 and 0·19 respectively). Pronotum: length, 0·60; width, hard to measure. Elytron: length, 1·98. Front tarsus: total length, 0·54 (segments I–V: 0·16, 0·09, 0·08, 0·09 and 0·12 respectively). Middle tarsus: total length, 0·62 (segments I–V: 0·16, 0·09, 0·08, 0·07 and 0·12 respectively). Hind tarsus: total length, 0·60 (segments I–IV: 0·36, 0·09, 0·06 and 0·09 respectively). Hind tibial spur, 0·09.

The holotype is deposited in the Department of Palaeontology, British Museum (Natural History), B.M. number In. 17723, Samland, Baltic amber.

Parts of the specimen cannot be clearly seen. When the head is examined in an anterodorsal position, a median spot is visible on the vertex, which resembles a similar spot or puncture in *appendiculata*. The two posterior punctures are not visible but I think they will be found to be present.

(*b*) *Some General Considerations*

In the classification of Arnett (1962 : 744) the genus *Protomacratria* will belong to Pedilidae. He states "Crowson (1955) treats this family (=Pedilidae) as a part of the Anthicidae on the basis of the primitive larvae of the two groups, but without further evidence; he also seems to indicate some doubt in his own mind that these two families should be kept united". There is an error both of fact and of interpretation in this statement. The two groups not only have similar larvae but share the following characters in the adult stages as well.

> All visible abdominal sternites free; mesepisterna usually meeting in front of mesosternum; tarsi with penultimate segments more or less lobed below, antepenultimate simple (or not appreciably lobed); internal keel of hind coxa usually reduced to a narrow-based apophysis; and metendosternite not of byturid type (ventral process not convex anteriorly). (Crowson, 1955 : 121.)

Contrary to the views expressed by Arnett and Werner *in* Arnett, 1962 : 747–8, the two groups cannot be satisfactorily distinguished on the basis of entire or emarginate eyes, or separate and contiguous hind coxae.

It is doubtful if the large punctures or pits on the vertex of *Protomacratria* are dorsal ocelli. Dorsal ocelli are found in the adults of some Staphylinoidea and Dermestoidea (Crowson, 1959), but the structures on the vertex of *Protomacratria* are unlike any that have been described as ocelli in Coleoptera. A slight parallel does, however, occur in Hemiptera: I have examined a paratype of *Agriopocornis porcellus* Miller (Coreidae, Agriopocorinae) in the British Museum (Natural History), in which the ocelli are missing but there are two pits corresponding to the distinct ocelli that are described by Miller (1954) on the vertex of *A. froggatti* and *A. chadwicki*. I must add, however, that the pits in *Agriopocornis* are more suggestive of ocelli than are those in *Protomacratria*.

From the studies of Crowson (1959) it is obvious that the Dermestoidea provide likely ancestors for Cucujiformia (Cleroidea, Lymexyloidea, Cucujoidea, Chrysomeloidea, Curculionoidea and probably Stylopoidea) and Staphyliniformia, but a direct relationship between Staphylinoidea and Cucujoidea remains to be proven.

(2) Mycetophagidae

(*a*) ***Crowsonium*** gen. n.

The genus is named in honour of Mr. Crowson, who identified the family for me. I have been able to separate this genus from other genera of Mycetophagidae in the British Museum collection by a combination of the following characters, all of which are present in *Crowsonium* but of which certain are not found in the other genera:

(1) Antennal club: *a*, loose; *b*, three-segmented; *c*, last segment tapering apically beyond middle. (2) Eyes entire. (3) Pronotum less than twice as wide as long at widest part in middle, narrowed towards apex (more) and towards base (less). (4) Lateral margins of pronotum and elytra bordered by spine-like decumbent hairs. (5) Elytral punctures arranged in ten or more longitudinal rows. These characters were absent in the other genera, as indicated by the numbers in parenthesis after each genus, as follows: *Mycetophagus* Hellw. (2, 3, 4); *Triphyllus* Latr. (1*a*, 4, 5); *Triphyllina* Reitt. (1*a* and *c*, 4, 5); *Pseudotriphyllus* Reitt. (1*a* and *c*, 4, 5); *Litargus* Erichson (1*a* and *c*, 4, 5); *Catopius* Sharp (1*c*, 2, 3, 4, 5); *Atritomus* Reitt. (1*c*, 4); *Typhaea* Steph. (1*a* and *c*, 4); *Typhaeola* Ganglb. (1*c*, 4, 5); *Berginus* Er. (1, 3, 4); *Esarcus* Reiche (1, 3); *Pseudesarcus* Champion (1, 2, 4); *Tilargus* Casey (1*a* and *c*, 3, 4, 5); and *Pseudochrodes*, as represented by *P. suturalis* Reitter (1*c*, 3).

Comparisons of *Crowsonium* with the published descriptions of the remaining genera of Mycetophagidae shows that in the former the basal angles of pronotum are well developed, unlike those of *Thrimolus* Casey; the first visible abdominal sternite is not short, as it is in *Lendomus* Casey; *Litargops* Reitter differs, according to Miyatake (1957 : 34), in having elytra with series of large punctures, vanishing posteriorly, and fore tibia with one bipectinate spur and one rather simple short spur at apex, and *Triphyllioides* Miyatake (1959) differs in having only the basal halves of the elytra punctate-striate, male prosternum with a median round pit, and tenth antennal segment about as long as eleventh.

The characters in which the following genera differ from *Crowsonium* are:— *Triphyllia* Reitter (1898 : 359): length 4·3 mm., last segment of maxillary palpi truncate; *Litargosomus* Motschulsky (1858): apex of tibiae with three characteristic spines, and first tarsal segment nearly as long as three following segments; *Rhipidonyx* Reitter (1876 : 304): length 5·0 mm., antennae filiform, apical segment of maxillary palpi truncate-excavate, eyes subemarginate; *Eulagius* Motschulsky (1845 : 92): surface lustrous, rugose; colour brown-testaceous.

Crowsonium was found to be quite distinct from the following New Zealand Mycetophagids in the Broun Collection at the British Museum, all of which have an antennal club with more than three segments: *Triphyllus fuliginosus* Broun, *T. substriatus* Broun, *T. aciculatus* Broun, *T. serratus* Broun, *T. punctulatus* Broun, *T. adspersus* Broun, *T. hispidellus* Broun, *T. integratus* Broun, *T. constans* Broun, *T. pubescens* Broun, and *Typhaea curvipes* Broun and *T. hirta* Broun.

Other characters of *Crowsonium* are:

Lateral margins of pronotum and elytra bordered by spine-like decumbent hairs (clearly visible in the ventral view); head short, triangular; clypeolabral sulcus distinct; frontoclypeal sulcus may not be visible, because this region is slightly depressed; tempora indistinct; apical (=fourth) segment of maxillary palp cylindrical, rounded at apex and not appreciably tapering; eyes lateral, entire; antenna clavate, last 3 segments forming a loose club; last segment tapering beyond middle, scape inserted under small frontal ridge; pronotum trapezoidal, lateral edges convex and rounded; procoxa large, rounded (but prominent), somewhat protuberant, procoxal cavity open behind; metacoxae transverse, contiguous; tibial spur simple; elytra striate-punctate (I can count 10 longitudinal rows of fine punctures on the right elytron; possibly there is 1 more row towards the extreme lateral border but it is hard to see in the specimen); epipleural fold broad basally, narrowed beyond third visible abdominal sternite, flat throughout; abdomen with 5 free, visible sternites, first less than twice as long as the next.

Type species: *Crowsonium succinium.*

Crowsonium succinium sp. n. (Pl. I, figs. 5–8)

Holotype

Shape: oblong, oval.

Colour: brown, eyes reddish-brown.

Vestiture: short, sparse.

Head: finely punctate, widest across eyes, nearly as wide as pronotum at apex; labrum appears to be feebly emarginate at apex; mandible bifid apically; maxilla with galea distinct, lacinia not

clearly visible, cardo cuneate; maxillary palp 4-segmented, slightly shorter in length than head, first segment rounded, second segment triangular, third segment slightly lobed, fourth segment as long as preceding 2 segments combined; labium with ligula sclerotised, glossa and paraglossa not differentiated, sulcus between mentum and submentum not visible (if the position of the posterior tentorial pit is regarded as defining the boundary between the gula and the submentum then the gula is wide and short in length, nearly twice as wide as long); eyes convex.

Thorax: pronotum finely punctate, less than twice as wide as long; prosternum triangular, its 3 sides narrow and prolonged, with broad, elevated keel in front of coxae; ventral surface of meso- and metathorax finely punctate: tarsal formula 3, 4, 4 (so that the specimen is a male); anterior trochantins present (?—not quite clear); femur broad, tibia and tarsus slender, tibial spur short, tarsal claw simple; scutellum short, entire and rounded at apex, nearly twice as wide as long; elytron with apex rounded, base slightly curved, scutellary margin forming obtuse angle with base; sutural margins of the 2 elytra approximated basally but slightly separated apically, lateral margin arcuate from base to middle, then only slightly curvate to humeral margin.

Measurements (in mm.).—Total length, 1·98. Antenna: total length, 0·68 (segments I–XI: 0·06, 0·04, 0·06, 0·06, 0·06, 0·06, 0·06, 0·06, 0·06, 0·06, and 0·10 respectively). Maxillary palp: total length, 0·23 (segments I–IV: 0·02, 0·05, 0·05 and 0·11 respectively). Pronotum: length, 0·42; width at apex, 0·42, in middle, 0·72, at base, 0·66. Elytron: length, 1·32; maximum width, 0·48. Front tarsus: total length, 0·22 (segments I–III: 0·10, 0·02 and 0·10 respectively). Middle tarsus: total length, 0·28; segments I–IV: 0·10, 0·03, 0·03 and 0·12 respectively. Hind tarsus: total length, 0·31; segments I–IV: 0·09, 0·06, 0·04 and 0·12 respectively.

The holotype is a male and is deposited at the Department of Palaeontology, British Museum (Natural History), B.M. number In. 18777; ex coll. Klebs, Baltic amber.

A second specimen (?allotype) (In. 18778) differs from the holotype as follows:

Less clearly visible in general. Colour piceous, last antennal segment comparatively less tapering beyond middle; tarsi not completely visible, first tarsal segment slender and not broad (assuming that this is a female specimen, this may well represent a sexually dimorphic character, but if this specimen is a male, then the difference may be indicative of a distinct species); sutural margins of the two elytra separated from each other from apex up to base and what should be the region of scutellum. I think that the tarsal formula is 4, 4, 4 and that the specimen is a female. Measurements (in mm.).—Total length, 2·04. Antenna: total length, ? (segments I–XI: ?, ?, ?, 0·06, 0·06, ?, ?, ?, 0·06, 0·06 and 0·09 respectively). Maxillary palp: total length, ? (segments I–IV: ?, ?, 0·06 and 0·09 respectively). Pronotum: length, 0·42; width at apex, 0·42, in middle, 0·72, at base, 0·66. Elytron: length, 1·32: maximum width, 0·48. Front and middle tarsi not distinct. Hind tarsus: total length, 0·32 (segments I–IV: 0·10, 0·06, 0·04 and 0·12 respectively).

(*b*) *Some General Considerations*

The morphological differences between Mycetophagidae and Tetratomidae are slight indeed in the adult (*see* Crowson, 1955 and Miyatake, 1960). Arnett (1962: 848) states "The inclusion of *Triphyllus* (in Mycetophagidae) is seriously questioned" but this is not the impression one gets from Miyatake's work. The inclusion of *Myrmechixenus* Chevrolat in Mycetophagidae by Arnett is, however, to be seriously questioned. According to his own definition, Mycetophagids have elongate procoxae, open front coxal cavities, contiguous hind coxae and moderate scutellum. *Myrmechixenus* differs in all these important characters.

(3) Mycteridae (Lacconotinae, Lacconotini)

(*a*) ***Neopolypria*** gen. n.

The following distinguishing characters of the family are visible in the material here described: tarsus with only penultimate segment distinctly and markedly lobed below, claw appendiculate; front coxa distinctly projecting; last segment of maxillary palp securiform; it differs from the Hemipeplidae, Salpingidae, Cononotidae, Monommidae and Zopheridae in having the first two visible sternites of the abdomen connate; from the Inopeplidae in having the elytra not truncate; from the Boridae in having the antenna not inserted under the sides of the frons; from the Elacatidae, Nilionidae, Lagriidae, Tenebrionidae and Alleculidae in having the front

coxal cavity not externally (=visibly) closed behind; and from the Merycidae, Mycetophagidae and Colydiidae in having tarsal claws 5, 5, 4.

Although it is not possible to observe whether the middle coxal cavities are closed or open, I think that the middle coxal cavities are closed outwardly by sterna and not open as in the Pterogeniidae, Trictenotomidae, Pythidae, Pyrochroidae, Tetratomidae, Melandryidae, Scraptiidae, Mordellidae, Rhipiphoridae, Cephaloidae, Meloidae, Oedemeridae, Anthicidae, and Aderidae. However, if the middle coxal cavities are not closed outwardly by sterna, then the specimen would have to be assigned to the Anthicidae (Pedilinae), into which it does not fit in respect of two important characters: (1) abdomen with first two visible sternites connate; (2) bordered prothorax; the last, however, is probably not so important a character when we consider *Phytilea* Broun (New Zealand) and *Anthicodes* Woll. (St. Helena).

It is interesting to note that most of the recent genera of Lacconotini are distributed in the Neotropical and Australian regions. In the warmer Tertiary times primitive members of the tribe existed in the Baltic region when the amber was formed.

A combination of the following characters distinguishes this genus from *Polypria* Chevr., *Eurypus* Kirby, *Physcius* Champion, *Cleodaeus* Champion, *Conomorphus* Champion, *Conomorphinus* Champion, *Omineus* Lewis, *Stilponotus* Gray, *Loboglossa* Solier, *Grammatodera* Champion, *Lacconotus* LeConte, *Eurypinus* Champion, *Stictodrya* Champion, *Thisias* Champion, *Batobius* Fairm. and Germ., *Lagrioida* Fairm. and Germ., *Mycterus* Clairv., and *Mycteromimus* Champion:

Antenna subserrate (nearly filiform); beak absent, eyes large, convex, hairy, feebly emarginate apically near antennal insertion, coarsely-faceted, separated by nearly their own individual width above and below; pronotum slightly wider than long; coarsely, densely punctate towards both sides, punctures fine and sparse in centre; first 2 visible abdominal sternites connate.

Of these genera, all of which were examined by me, the one that was most similar to the new genus was *Polypria*, which is native to Brazil. I have examined three out of four known species of *Polypria* (*P. cruxrufa* Chevr., *P. brevipennis* Pic, and *P. lateralis* Pic). The fourth, *P. brunnescens* Pic is not represented in the B.M. collection. I have also compared the new genus with genera of the tribes Batobiini and Thysiini of the subfamily Lacconotinae and with *Mycterus* Clairv. and *Mycteromimus* Champion of the subfamily Mycterinae. Three genera of Lacconotini not represented in the B.M. collection and not examined by me are: *Hybogaster* Seidlitz (Australian and Neotropical), *Physiomorphus* Pic (French Guinea), and *Microconomorphus* Pic (Indonesia).

Other characters of the genus are:

Head nearly as long as wide, slightly wider across eyes than pronotum, constricted behind eyes; clypeolabral sulcus distinct; frontoclypeal sulcus absent, head depressed in this region; maxillary palp shorter than head, 4-segmented, last segment nearly as long as all remaining segments combined; labium with ligula bilobed; labial palp 3-segmented, apical segment securiform, slightly longer than and much broader than preceding 2 segments combined; last antennal segment slightly longer than penultimate segment; pronotum subquadrate, slightly bordered, apically narrowed and slightly emarginate, narrower than elytra at shoulders; tibial spur short; penultimate tarsal segments distinctly lobed below, others not lobed so appreciably; hind coxae not contiguous; scutellum basally emarginate towards sides, narrowly rounded at apex; elytron with apex pointed, base notched towards scutellary margin, latter forming an obtuse angle with base; abdomen with 5 visible sternites.

Type species: *Neopolypria nigra*.

Neopolypria nigra sp. n. (Pl. I, figs. 9–10)

Holotype

Shape: elongate.

Colour: black; apices of clypeus, labrum, and apical maxillary segment slightly rufous.

Vestiture: dimorphic; short, sparse pubescence throughout; long and thick hairs present along margins of pronotum, posterior to labium, and similar long but thin hairs present along lateral borders of elytra.

Head: hind portion of vertex and (reduced) tempora densely, coarsely punctate, punctures becoming gradually sparser and finer towards frontoclypeal and postgenal regions; clypeus laterally produced into short setose lobes arcuate dorsally to mandibles, continued over antennae up to eyes but in anterodorsal view not covering antennal insertions; labrum nearly rectangular, less than twice as wide as long; mandible well-developed, apically bifid, curved, nearly twice as long as wide at base; maxilla with galea densely pubescent at apex, lacinia not visible (if hidden underneath, probably smaller than galea), basistipes and mediostipes distinct, former conico-acuminate, latter elliptical; labium with mentum slightly wider than long, submentum beset with a few long hairs; eleventh (=last) antennal segment tapering at both ends.

Thorax: femur stout, tibia and tarsus slender; scutellum slightly depressed in middle, elytron with lateral margin arcuate from apex to middle, then becoming straight; sutural margins of elytra much separated apically, distance between them becoming gradually smaller towards base, where margin is sinuate, irregularly punctate, punctures coarser than those on pronotum but finer than those on vertex, surface with 2 kinds of hairs, one posteriorly-directed, shorter, finer and denser, the other longer and thicker, erect or suberect, sparsely distributed.

Abdomen: intercoxal process of first visible sternite triangular, long and pointed; second visible sternite wider throughout than posterior sternites (considered individually), wider than preceding sternite only between intercoxal process and lateral margins.

Measurements (in mm.).—Total length, 4·70. Antenna: total length 1·66 (segments I–XI: 0·24, 0·06, 0·15, 0·15, 0·14, 0·14, 0·14, 0·14, 0·14, 0·15 and 0·21 respectively). Maxillary palp: total length, 0·31 (segments I–IV: 0·03, 0·07, 0·06 and 0·15 respectively). Pronotum: length, 0·70; width at apex, 0·60, in middle, 1·02, at base, 0·99. Elytron: length, 3·5; maximum width, 0·96. Front tarsus: total length, 0·55 (segments I–V: 0·21, 0·09, 0·07, 0·06 and 0·12 respectively). Middle tarsus: total length, 0·63 (segments I–V: 0·30, 0·08, 0·07, 0·06 and 0·12 respectively). Hind tarsus: total length, 0·69 (segments I–IV: 0·36, 0·09, 0·06 and 0·18 respectively).

The holotype is deposited in the Department of Palaeontology, British Museum (Natural History), B.M. number In. 18786, collector's number XIII B 674; ex coll. Klebs, Baltic amber.

(*b*) *Some General Considerations*

The genus *Neopolypria* would belong to Salpingidae, according to the definition of Arnett (1962), which includes the Mycteridae, Cononotidae and Pythidae. If this is a natural classification, one would expect that the following differences between the groups would not have phylogenetic significance at the family level: antenna clubbed in the Salpingidae, filiform in the Cononotidae, subserrate, filiform or clubbed in the Mycteridae and Pythidae; apical segment of maxillary palp securiform in the Cononotidae and Mycteridae and not securiform in the Salpingidae; the middle coxal cavity not closed outwardly by the sterna in the Pythidae but closed in Salpingidae, Cononotidae and Mycteridae; antepenultimate segment of tarsus not lobed in the Salpingidae, Cononotidae and Pythidae, lobed in Mycteridae; abdomen with all visible sternites free in the Salpingidae and Pythidae, but first two or three connate in the Cononotidae and Mycteridae; aedeagus of normal heteromeran type in the Salpingidae and Pythidae, and of inverted heteromeran type in Cononotidae; in the Pythidae the anterior tendons arise on the anterolateral arms of the met-endosternite as they do in *Tribolium* but not in most Tenebrionidae (a primitive character), whereas in the Mycteridae they arise from the anterior margin of the body of the met-endosternite, as in the Oedemeridae (an advanced character).

Arnett (1962 : 715) writes, "Crowson (1955) is concerned with the separation of this family from the Cucujidae, so that the relationships become obscure". There is little, if any, justification either for this statement or for the inclusion of Inopeplidae and Hemipeplidae in Cucujidae (Arnett, 1962 : 775–81). Even the cucujid subfamily Prostominae should be placed in Heteromera somewhere near Inopeplidae and Hemipeplidae, as suggested by Crowson (1955 : 104); the characters of the wing-venation and aedeagus of the adult (*see* Wilson, 1930), and the blunt maxillary mala and mandible without a prostheca of the larva significantly point in this direction, and the tarsal formula (4, 4, 4) shows apparent similarities to that in Merycidae, Mycetophagidae and Colydiidae; the reduction from 5, 5, 4 to 4, 4, 4 appears to have been secondarily acquired in the group. When the Cucujidae are defined so as to exclude

the groups mentioned above, the family comes closer to a natural (phylogenetic) classification and the differences between the Salpingidae and Cucujidae (including the Silvanids) become obvious rather than "obscure". According to Crowson (1955: 129) the Salpingids differ from both the Cucujids and Silvanids in the possession of trochanters and tarsi of the heteromerous type, distinctly projecting front coxae, and in the character of the aedeagus (metendosternite?) and from the Silvanids alone in the visibly open but internally closed front coxal cavities, the simple antepenultimate tarsal segments, and the closed middle coxal cavities.

(4) Scraptiidae

(*a*) ***Palaeoscraptia*** gen. n. (Scraptiinae)

The following are the distinguishing characters presented by the material here described that place it in the family Scraptiidae: tarsal claw simple, penultimate tarsal segment distinctly lobed below, last abdominal tergite not produced posteriorly into a spine, outer face of hind tibia without (Mordellid-like) oblique or transverse rows of spinules (excluding it from the Pterogeniidae and Mordellidae); tibial spurs pubescent, prothorax with distinct side borders and base not much narrower than elytra at shoulders, antenna filiform (excluding it from the Elacatidae, Rhipiphoridae, Cephaloidae, Meloidae, Oedemeridae, Anthicidae, and Aderidae); head sharply constricted to a narrow neck (excluding it from the Melandryidae); maxillary palp strongly securiform (excluding it from the Tetratomidae); front coxal cavity open behind and prothorax with side borders (excluding it from the Pythidae and Pyrochroidae); front coxa strongly projecting (excluding it from the Trictenotomidae); middle coxal cavity not closed outwardly by the sterna (excluding it from the Inopeplidae, Salpingidae, Cononotidae, Mycteridae, and Hemipeplidae); antenna not inserted under sides of frons (excluding it from the Boridae); prosternal process narrow (excluding it from the Monommidae and Zopheridae); abdomen with all visible sternites freely articulated (excluding it from the Nilionidae, Lagriidae, Tenebrionidae, and Alleculidae); tarsal formula 5, 5, 4 (excluding it from the Merycidae, Mycetophagidae, and Colydiidae).

Palaeoscraptia belongs to the Scraptiinae rather than to the Anaspinae on account of the short tibial spurs and the lobed penultimate tarsal segments. It was compared with the following genera in the British Museum collection and found to be different: *Scraptia* Latr., *Scraptogetus* Broun, *Evalces* Champion, *Biophida* Pascoe, *Biophidina* Champion, *Trotomma* Kiesw., and *Tolmetes* Champion, and important differences were noticed from the descriptions of *Allopoda* LeConte, *Canifa* LeConte and *Neoscraptia* Fender. There are superficial resemblances to *Scraptia*, but the pronotum of the specimen is more transverse and the eyes lack setae. The distinguishing features of *Palaeoscraptia* are:

Eyes emarginate near antennal insertions (emargination less than width of eye at that point), coarsely-faceted, separated by a little more than their individual width above; antenna filiform, segments 8–10 slightly thickened; pronotum half as long as wide in middle; vestiture prominent along lateral borders; longitudinal sulcus present on posterior half of metasternum; trochantin visible on all coxae; penultimate tarsal segments lobed.

Three other genera of Scraptiinae differ from *Palaeoscraptia* in the following characters (mentioned in the original descriptions): *Egidyella* Reitter (1899 : 284) is 3·1 mm. long and the last antennal segment is twice as long as the penultimate segment; *Pseudoscraptia* Wollaston (1867 : 214) has a carinate mesosternum and simple penultimate hind tarsal segments; in *Trotommidea* Reitter (1883 : 307) eyes are subglobose (=not emarginate ?) and maxillary palpi are cultriform.

Other characters of the genus *Palaeoscraptia* are:

Head less than twice as wide as long; clypeolabral and frontoclypeal sulci distinct; tempora reduced; maxilla with galea bigger than lacinia; maxillary palp nearly as long as head, 4-segmented;

labium with ligula not or only slightly bilobed; antenna 11-segmented, last segment slightly longer than penultimate segment, insertion not or only slightly concealed by frontal ridge above; pronotum constricted at apex, widest in middle, only slightly narrowed towards base, slightly narrower at base than elytra at shoulders; mesepisterna appear to meet in front of mesosternum, but this is not completely clear; front and middle coxae contiguous, hind coxae nearly but not quite contiguous; first tarsal segment of front leg smaller than remaining segments combined; scutellum prominent, rounded at apex; elytron with apex round and broadly tapering, sutural margin notched at base, scutellary margin forming obtuse angle with base; epipleural fold narrow, not covering any abdominal sternite; abdomen with usual 5 sternites visible; ovipositor extrudes at apex, thus exposing 2 more sternites, morphologically the eighth and ninth; external genitalia of elongate type with coxite and valvifer baculi apparent; styli borne at end of a 2-segmented coxite.

Type species: *Palaeoscraptia elongata.*

Palaeoscraptia elongata sp. n. (Pl. I, fig. 11; Pl. II, fig. 1)

Holotype

Shape: elongate, slender.

Colour: rufous; eyes reddish-brown.

Vestiture: sparse, short.

Head: not much deflexed, surface sparsely, finely punctate; frontal ridge weakly developed; clypeus nearly rectangular; labrum nearly twice as wide as long, rounded and entire at apex; apical segment of maxillary palp longer than rest combined; labium with submentum trapezoidal, less than half as wide at apex as at base, nearly as long as wide at apex; mentum narrower and less prominent than submentum; eyes lateral, convex, large.

Thorax: pronotum sparsely, finely punctate; femur swollen, tibia and tarsus slender; elytra with sutural margins becoming increasingly separated towards apex, sparsely, finely punctate.

Measurements (in mm.).—Total length, 2. Antenna: total length, 0·98 (segments I–XI: 0·10, 0·06, 0·08, 0·09, 0·09, 0·09, 0·09, 0·09, 0·09, 0·09 and 0·11 respectively). Maxillary palp: total length, 0·33 (segments I–IV: 0·03, 0·06, 0·06 and 0·18 respectively). Labial palp: total length, 0·26 (segments I–III: 0·03, 0·06 and 0·17 respectively). Pronotum: length, 0·27; width at apex, 0·15, in middle, 0·57, at base, 0·54. Elytron: length, 0·75; maximum width, 0·39. Front tarsus: total length, 0·21 (segments I–V: 0·08, 0·03, 0·03, 0·03 and 0·04 respectively). Middle tarsus: total length, 0·28 (segments I–V: 0·15, 0·03, 0·03, 0·03 and 0·04 respectively). Hind tarsus: total length, 0·37 (segments I–IV: 0·24, 0·06, 0·03 and 0·04 respectively). Hind tibial spur, 0·05.

The holotype is deposited in the Department of Palaeontology, British Museum (Natural History), B.M. number In. 18776, collector's number XIII B 735; ex coll. Klebs, Baltic amber.

(*b*) ***Archescraptia*** gen. n. (Scraptiinae)

The following are the distinguishing characters presented by the material here described that place it in the family Scraptiidae: tarsal claw simple, antepenultimate tarsal segment more or less lobed below in all legs, penultimate tarsal segment lobed in front and middle leg, seventh abdominal tergite not prolonged posteriorly into a spine (excluding it from the Mordellidae, Pterogeniidae, Tetratomidae, and Inopeplidae); tibial spurs pubescent; prothorax with distinct side borders and base not much narrower than elytra at shoulders, antenna filiform (excluding it from the Elacatidae, Rhipiphoridae, Cephaloidae, Meloidae, Oedemeridae, Anthicidae, and Aderidae); head sharply constricted to a narrow neck (excluding it from the Melandryidae); front coxal cavity open behind, prothorax with side borders (excluding it from the Pythidae and Pyrochroidae); front coxa strongly projecting (excluding it from the Trictenotomidae and Hemipeplidae); maxillary palp securiform, abdomen with all visible sternites free (excluding it from the Mycteridae, Cononotidae, Salpingidae, Nilionidae, Lagriidae, Tenebrionidae, and Alleculidae); antenna not inserted under sides of frons (excluding it from the Boridae); prosternal process narrow (excluding it from the Monommidae and Zopheridae); tarsal formula 5, 5, 4 (excluding it from the Merycidae, Mycetophagidae, and Colydiidae).

The short tibial spurs and lobed penultimate hind tarsal segments indicate that it should be placed in the Scraptiinae. Comparison was made with *Palaeoscraptia*

and with other genera mentioned in the comparison of that genus. *Archescraptia* could be easily distinguished from *Palaeoscraptia* by its coarsely punctate tempora, its pronotum (which is only slightly wider than long) and its comparatively much larger size. Other diagnostic characters are:

Apical segment of labial palp securiform; eyes distinctly emarginate near antennal insertion, coarsely faceted, hairy; antenna filiform, segments 7–10 subserrate; pronotum slightly wider than long, margined laterally; longitudinal sulcus of metasternum prominent basally; penultimate tarsal segment distinctly lobed below.

An evolutionary study of Scraptiinae at the generic level is needed.

Other characters of *Archescraptia* are:

Head strongly deflexed, somewhat oval; tempora short; clypeolabral sulcus distinct; frontoclypeal sulcus indistinct, this region depressed; frontal ridge short; maxillary palp 4-segmented, apical segment longer than previous 2 segments combined; apical (=third) segment of labial palp much longer than second segment; last (=eleventh) antennal segment as long as tenth segment; pronotum narrow at apex, width increasing towards base; coxae contiguous; first tarsal segment of front leg slightly shorter than remaining tarsal segments combined; those of middle and hind legs longer; elytron with apex acutely pointed, scutellary margin forming obtuse angle with base; epipleural fold narrow; abdomen with usual 5 sternites visible; but 2 additional sternites, the morphological eighth and ninth, associated with ovipositor, also exposed through extrusion of external female genitalia; ovipositor of elongate type, with coxite and valvifer baculi, coxite 2-segmented, stylus very small.

Type species: *Archescraptia emarginata.*

Archescraptia emarginata sp. n. (Pl. II, figs. 2–3)

Holotype

Shape: elongate, convex, slender.
Colour: brown.
Vestiture: sparse, short, uniform.
Head: coarsely punctate; labrum nearly twice as wide as long, rounded and entire at apex; mandible apically bifid; eyes lateral, convex; eleventh antennal segment apically tapering beyond middle.
Thorax: pronotum finely punctate; femur broad; tibia and tarsus slender; scutellum not clearly visible; elytra irregularly punctate, punctures coarser than on pronotum; sutural margins of elytra apparently confluent except near apex.
Measurements (in mm.).—Total length, 4·34. Antenna: total length, 1·92 (segments I–XI: 0·18, 0·12, 0·18, 0·18, 0·18, 0·18, 0·18, 0·18, 0·18, 0·18 and 0·18 respectively). Maxillary palp: total length, ? (segments I–IV: ?, 0·10, 0·04 and 0·21 respectively). Labial palp: third segment, 0·09. Pronotum: length, 0·60; width at apex, 0·36, in middle, 0·84, at base, 0·96. Elytron: length, 3·5; maximum width, 0·90. Front tarsus: total length, 0·51 (segments I–V: 0·21, 0·06, 0·06, 0·06 and 0·12 respectively). Middle tarsus: total length, 0·79 (segments I–V: 0·40, 0·12, 0·09, 0·06 and 0·12 respectively). Hind tarsus: total length, 0·81 (segments I–IV: 0·54, 0·12, 0·06 and 0·09 respectively.) Hind tibial spur, 0·12.

The holotype (female) is deposited in the Department of Palaeontology, British Museum (Natural History), B.M. number In. 18787, collector's number XIII B 736.

(*c*) *Anaspis* Geoffroy (Anaspinae)

Anaspis (Silaria) parva sp. n. (Pl. II, figs. 4–5)

The following are the distinguishing characters visible in the specimen that place it in the family Scraptiidae: tarsal claw simple, seventh abdominal tergite not prolonged posteriorly into a style (excluding it from the Mycteridae and Mordellidae); tibial spurs pubescent, prothorax with distinct side borders and nearly as wide basally as elytra at shoulders, antenna filiform, segments eight to ten slightly thickened (excluding it from the Pythidae, Pyrochroidae, Rhipiphoridae, Cephaloidae, Meloidae, Oedemeridae, Anthicidae, and Aderidae); head sharply constricted to a narrow neck (excluding it from the Melandryidae); maxillary palpi securiform

(excluding it from the Tetratomidae and Salpingidae); front coxa projecting (excluding it from the Trictenotomidae, Inopeplidae, Hemipeplidae, Monommidae, and Zopheridae); abdominal sternites all free (excluding it from the Cononotidae, Nilionidae, Lagriidae, Tenebrionidae, Alleculidae, and Pterogeniidae); antenna not inserted under sides of frons (excluding it from the Boridae); front coxal cavity open behind (excluding it from the Elacatidae; tarsal formula 5, 5, 4 (excluding it from the Merycidae, Mycetophagidae, and Colydiidae).

The tibial spurs are long, and the penultimate hind tarsal segments are not lobed below. For these reasons the species belongs to the Anaspinae and not to the Scraptiinae. It is very similar to *Anaspis* Geoffroy and I am tentatively placing it in that genus, but this specimen should be reconsidered when an evolutionary study of Anaspinae and particularly of *Anaspis* is undertaken. I have examined *Anaspella* Schilsky, *Diclidia* LeConte, *Cyrtanaspis* Emery, *Naucles* Champion, *Pentaria* Muls. and *Ectasiocnemis* Franciscolo in the B.M. collection. This specimen appears to be generically distinct from them; it keys out to the genus *Anaspis* in the key given by Franciscolo (1954), although some characters are difficult to see.

Further examination of the salient features visible in the specimen leads us to place it in the subgenus *Silaria* Muls. This conclusion is based on the following observations: (1) epipleural fold appears to extend to not more than the first visible abdominal sternite, thus differing from that of subgenera *Anaspis* Geoffr. and *Nassipa* Em.; (2) hind tibia much longer than the hind tarsal segments, thus differing from that of *Larisia* Em.

Comparison was made with the following species of *Silaria* in the B.M. collection and the specimen was found to be specifically distinct: *everestina* Blair (Himalayas), *alticola* Champion (N. India), *tenebrica* Champion (N. India), *tenebrica* var. *dilutipennis* Champion (N. India and W. Pakistan), *binotata* Champion (N. India), *binotata* var. *nigrojuncta* Champion (W. Pakistan), var. *obliterata* Champion (N. India and W. Pakistan), *almorana* Champion (N. India), and *minutula* Champion (N. India).

Other taxonomic characters of *parva* are:

Holotype

Shape elongate, convex, somewhat broadened; colour brown; vestiture short, sparse (but the surface is not clearly visible); head strongly deflexed, tempora reduced; mandible bifid at apex; maxillary palp large, with apical (=fourth) segment tapering at apex; eyes lateral, not protuberant, emarginate near antennal insertion; last (=eleventh) antennal segment nearly as long as preceding 2 together; pronotum nearly as long as wide, as wide at apex as head across eyes, arcuate laterally, apex and base nearly equal in width, width greatest in middle; coxae contiguous; femur broad; tibia slender towards base, broader towards apex; antepenultimate tarsal segment of front and middle legs slightly lobed, penultimate segment smallest; apex of elytron slightly pointed, base broad; elytra separated along sutural margins at apex; abdomen with 4 sternites clearly visible, but most probably there is a fifth also, which cannot be clearly seen in this specimen.

Measurements (in mm.).—Total length, 2·30. Antenna, total length, 0·93 (segments I–XI: 0·09, 0·05, 0·08, 0·08, 0·08, 0·08, 0·08, 0·08, 0·08, 0·08 and 0·15 respectively). Maxillary palp: segments III and IV: 0·04 and 0·15, respectively. Pronotum: length, 0·48. Elytron: length, 1·70; maximum width, 0·42. Front tarsus: total length, 0·34 (segments I–V: 0·12, 0·06, 0·06, 0·02 and 0·08 respectively). Middle tarsus: total length, 0·59 (segments I–V: 0·30, 0·12, 0·06, 0·02 and 0·09 respectively). Hind tarsus: total length, 0·70 (segments I–IV: 0·30, 0·18, 0·12 and 0·10 respectively). Hind tibial spur, 0·10.

The holotype is deposited in the Department of Palaeontology, British Museum (Natural History), B.M. number In. 17741, Samland, Baltic amber.

After this paper was submitted for publication Mr. Crowson kindly drew my attention to a paper by Ermisch (1941) containing descriptions of some new Mordellidae and Scraptiidae from Baltic amber. Judging from the photographs *Anaspis parallela* Ermisch appears to belong to *Archescraptia* rather than *Anaspis* but nothing useful can be said without examining the specimen, which as described differs from my

emarginata in having the antennal segments four to ten as long as the second segment, and the eleventh segment twice as long as the tenth segment (Ermisch, 1941 : 182). *Anaspis longispina* Ermisch has much longer tibial spurs (Ermisch, 1941 : fig. 1) than *A. parva* Abdullah. *Scraptia pseudofuscula* Ermisch differs from both *Archescraptia emarginata* and *Palaeoscraptia elongata* in having the antennal segments four to ten as long as the segments two and three combined (Ermisch, 1941 : 183). It is possible that *Scraptia inclusa* Ermisch belongs to *Palaeoscraptia*, as suggested by the photographs, but it is wider than *P. elongata* and also differs in having the fourth antennal segment nearly as long as the preceding two segments combined (Ermisch, 1941: 184).

III. Gum Copal Heteromera

The gum copal of Zanzibar, locally called "Sandarusi Inti", is a semi-fossil gum, found imbedded in the earth and generally collected during the rainy season. Copal is mostly derived from trees of the family Leguminosae and is now found in places where no tree is visible (Williamson, 1932 : 190–1). The Zanzibar Copal tree is *Trachylobium verrucosum* Oliv. According to Hagedorn (1907 : 109), the copal is between 2000–3000 years old.

(1) Lagriidae (Statirinae)

(*a*) *Sora* Walker

Sora (Sora) zanzibarensis sp. n. (Pl. II, fig. 6)

The two specimens are clearly visible and run out to the family in the key of Crowson (1955) and to the subfamily and genus in the key of Borchmann (1936). The species belongs to the subgenus *Sora* for the following reasons: the apical segment of the maxillary palp is not enlarged, unlike that of *Sora* (*Nemostiropsis*) *purpureipennis* Borchman or *S.* (*N.*) *semiviridis* (Pic), and the pronotum is not longer than broad, a character that excludes *S.* (*Hirsutosora*) *fortithorax* (Pic) and its variety *latior* Pic.

A differential diagnosis at the species level is now attempted. The two specimens do not key out to any of the species of the subgenus *Sora* treated by Borchmann from Madagascar or Africa. I have been able to separate *zanzibarensis* from the species in the B.M. collection listed below by means of the following characters: (1) last antennal segment nearly as long as preceding two segments combined; (2) pronotum nearly as long as wide, or only slightly wider than long; (3) eyes nearly touching each other dorsally; (4) elytra entirely brown; (5) metasternum and metepimera coarsely punctate laterally. These characters were absent in the other species as indicated by the numbers in parenthesis after each species as follows: *Sora marginata* Walker (Ceylon) (1, 2, 3); *hirta* Borchmann (Assam, India) (1, 2, 3, 4); *suturalis* Borchmann (Celebes) (1, 3, 4); *geniculata* Fairmaire (Mindoro) (1, 2); *amicta* Borchmann (Los Banos) (1, 2, 3); *nitidissima* Pic (W. Celebes) (1, 2, 3, 4); *servillei* Cast. (Madagascar) (1, 2, 5); and *coquereli* Fairmaire (Madagascar) (2, 4, 5).

A number of species of *Sora* Walker (=*Nemostira* Fairmaire) were described from Madagascar and Africa after the catalogue of Borchmann (1910) of the family Lagriidae was published. These species are listed below and the characters in which they differ from *zanzibarensis* are mentioned The characters are taken from their original descriptions A revision of *Sora* is needed and it is possible that there are fewer species than species names. All the species that I have to deal with were described by Pic, whose descriptions are very poor and lacked illustrations and who gave no keys (Pic, 1911–24). *Sora distincticornis* (Congo): length, 7·0 mm., antennal segments V–X black; *S. batangana* (Cameroon (Batanga)): length, 13·0 mm., elytral punctation partly irregular; *S. pouilloni* (Madagascar): length, 9·0 mm., last antennal

segment as long as preceding five segments; *S. longiceps* (Madagascar): length 13·0 mm., head very long, last antennal segment as long as preceding three segments combined; *S. ?distinctipes* (Congo): length, 8·0 mm., prothorax much longer than wide; *S. semirufescens* (Madagascar): length, 11·0 mm., last antennal segment slightly longer than preceding two combined, prothorax much longer than wide; *S. cinctipennis* (Madagascar): length, 9·0 mm., prothorax much longer than wide; *S. benitensis* (Congo): length, 9·0 mm., elytron attenuated at apex; *S. striatipennis* (Madagascar): length, 15·0 mm., prothorax much longer than wide; *S. rufipes* (Madagascar): length, 11·0 mm., prothorax long, subsinuate laterally; *S. pallidimembris* (Sierra Leone): length, 10·0 mm., last antennal segment slightly longer than penultimate segment, pronotum slightly longer than wide; *S. madecassa* (Madagascar): length, 12·0 mm., pronotum coarsely punctate; *S. obscuritarsis* (Congo): length, 9·0 mm., pronotum longer than wide, brilliantly coloured; *S. favareli* (Congo): length, 10·0 mm., colour black; *S. crampeli* (Congo): length, 7·0 mm., pronotum black, *S. atrosuturalis* (Madagascar): length, 10·0 mm., elytral sutures black; *S. tananarivana* (Madagascar): length, 9·0 mm., scutellum and last antennal segment black; *S. rufa* var. *abdominalis* (Congo): legs black-piceous; *S. mocquerysi* (Gabon): antennae black, pronotum short and wide; *S. gabonica* (Gabon): length, 9·0 mm., testaceous, pronotum short and wide; *S. benitensis* (Gabon): length, 10·0 mm., apical parts of legs and abdomen piceous; *S. particularis* (Ivory Coast): length, 10·0 mm., apices of antennae black; *S. apicalis* (Congo): length, 7·0 mm., antennae black; *S. microceps* (Madagascar): length, 10·0 mm., apices of head and femora piceous, pronotum subalutaceous; *S. carnoti* (Madagascar): length, 10·0 mm., elytra metallic-shining, head and pronotum nigro-piceous; *S. cyanipennis* (Madagascar): length, 3·0 mm., black; *S. striatipennis* var. *reductelineata* (Madagascar): length, 10·0 mm., colour nigro-piceous.

Other characters of *zanzibarensis* are:

Holotype

Shape: elongate.

Colour: brown; eyes red; femora black at apex, pale elsewhere.

Vestiture: sparse, long suberect hairs present on head, elytra and legs.

Head: prominent; finely, sparsely punctate, constricted behind eyes; tempora reduced, frons reduced, depressed at apex; labrum prominent, entire at apex; maxillary palp with apical (=fourth) segment enlarged; apical (=third) segment of labial palp long, cylindrical; eyes lateral, large, convex, slightly emarginate, coarsely-faceted, nearly touching each other dorsally; head here nearly as wide as pronotum at base; antenna filiform, last (=eleventh) segment as long as preceding 2 segments combined.

Thorax: prothorax subcylindrical, nearly as long as broad, narrower than elytra at base, borders unmargined, smooth, sparsely finely punctate; front coxa globose, somewhat projecting; coxal cavity closed behind, prosternal process narrow, projecting beyond the coxa; metasternum and metepimeron coarsely punctate laterally, longitudinal sulcus of metasternum distinct; coxae not contiguous; femur moderately broad; tibia and tarsus slender, tibial spurs absent; penultimate tarsal segment lobed below, tarsal claw simple; scutellum prominent, broadly triangular, emarginate at base, somewhat pointed apically; elytron striate, coarsely punctate, punctures arranged in 10 longitudinal rows; before row 1 and between longitudinal rows 2 and 3, 4 and 5, 6 and 7, 8 and 9 (counting from sutural margin) there are long, suberect, black hairs, longitudinally arranged and sparsely distributed; apex of elytron pointed, base slightly curvate, scutellary margin long and forming obtuse angle with base, sutural margins of the 2 elytra notched at base and becoming increasingly separated from each other towards apex; apex of wing visible between elytra, anal cell appearing to be closed; elytral epipleura very narrow.

Abdomen: with 5 visible sternite; apex of deeply emarginate sixth visible (eighth morphological) sternite also visible; first 3 sternites connate, sutures between them distinct; sparsely hairy; apical end of abdomen slightly bent downwards; eighth morphological tergite entire, rounded apically, apparently nearly as long as wide; apex of aedeagus visible in specimen, of the tenebrionid, modified trilobe type; lateral lobes (parameres) fused apically, gradually tapering and pointed.

Measurements (in mm.).—Total length, 10·0. Antenna: total length, 7·10 (segments I–XI: 0·45, 0·25, 0·30, 0·64, 0·75, 0·75, 0·75, 0·72, 0·69, 0·55 and 1·25 respectively). Pronotum: length, 1·54; width in middle, 1·60, at base, 1·50. Elytron: length, 7·5; maximum width, 1·55. Front tarsus:

total length, 2·2 (segments I–V: 0·6, 0·4, 0·4, 0·3 and 0·5 respectively). Middle tarsus: total length: 2·2 (segments I–V: 0·6, 0·4, 0·4, 0·3 and 0·5 respectively). Hind tarsus: total length, 2·3 (segments I–IV: 0·8, 0·6, 0·3 and 0·6 respectively).

The holotype (a male) is deposited in the Department of Palaeontology, British Museum (Natural History), B.M. number I. 5281.

The Gum Copal inclusa also has another specimen (?allotype), which appears to be a female and which differs from the holotype as follows:

Pronotum slightly wider than long; hind tibiae each with a short, thick spur on lateral side towards insect body, near base; posterior end of abdomen (not clearly visible on account of air bubbles) appears to lack the paramere-like projection.

The measurements (in mm.) are:—Total length, 9·5 (? apices of elytra are concealed by air bubbles). Antenna: total length, 6·55 (segments I–XI: 0·48, 0·15, 0·22, 0·50, 0·60, 0·67, 0·67, 0·67, 0·64, 0·55 and 1·40 respectively). Pronotum: length, 1·10; width at apex, 0·65, in middle, 1·55, at base, 1·60. Elytron: length, 7 (? apex not clearly visible); maximum width, 1·6. Front tarsus: total length, 2·1 (segments I–V: 0·5, 0·4, 0·4, 0·3 and 0·5 respectively). Middle tarsus: total length, ? (segments I–V: ? (concealed by air bubbles), 0·4, 0·4, 0·3, and 0·5 respectively). Hind tarsus: total length, ?2·3 (segments I–IV: 0·8 (?), 0·6, 0·4 and 0·5 respectively).

I think that this is a female and that the differences are those of sexual dimorphism; however, if the two specimens are of the same sex, then they may represent two distinct species.

I am grateful to Mr. R. A. Crowson for suggesting the problem, for his assistance and guidance during the progress of the work and for his useful comments on the manuscript. These facts are responsible for any worth that the paper may possess. I also wish to record my thanks to Mr. Ralph Baker, Department of Palaeontology, British Museum (Natural History) for providing space and material for research, to Dr. E. I. White and Mr. J. P. Doncaster, Keepers of Palaeontology and Entomology at the British Museum, respectively, for permission to study in their Departments, to Mr. J. Balfour-Browne, Department of Entomology, B.M. (N.H.) for offering useful comments on the manuscript, to Dr. M. S. K. Ghauri, Commonwealth Institute of Entomology, for the interesting specimens of *Agriopocornis* Miller (Hemiptera). The photographs were taken by Mr. Peter Green of the B.M. (N.H.) Photographic Staff. The University of Reading Research Board defrayed part of the cost of including the plates.

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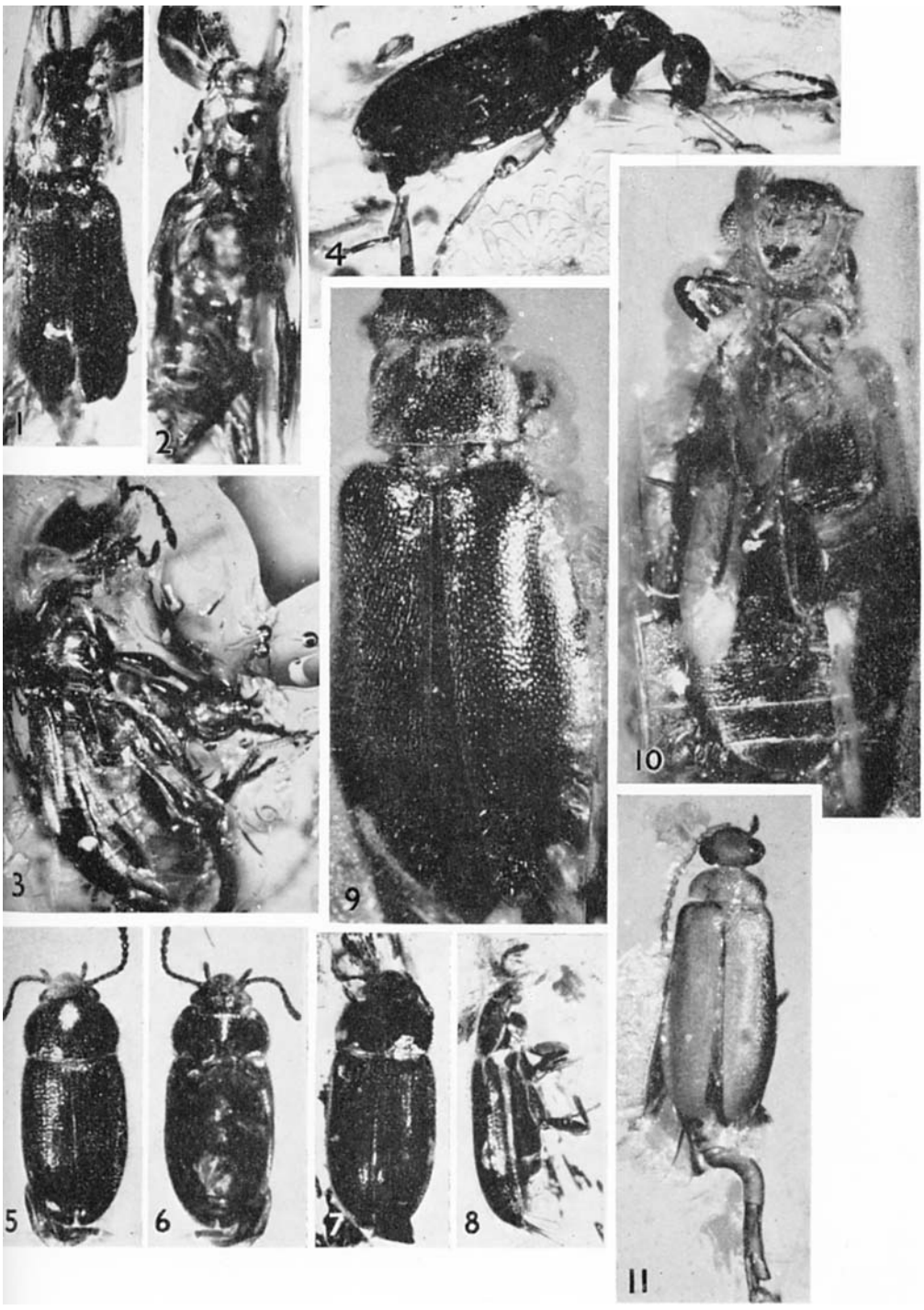
(Manuscript received 27th September, 1963)

PLATE I

FIG. 1.—*Protomacratria appendiculata* gen. et sp. n. Dorsal. Holotype, In. 18788 (Baltic amber).
FIG. 2.—*P. appendiculata* gen. et sp. n. Ventral. Holotype, In. 18788 (Baltic amber).
FIG. 3.—*P. appendiculata* gen. et sp. n. Lateral. Holotype, In. 18788 (Baltic amber).
FIG. 4.—*P. tripunctata* gen. et sp. n. Dorsolateral. Holotype, In. 17723 (Baltic amber).
FIG. 5.—*Crowsonium succinium* gen. et sp. n. Dorsal. Holotype, In. 18777 (Baltic amber).
FIG. 6.—*C. succinium* gen. et sp. n. Ventral. Holotype, In. 18777 (Baltic amber).
FIG. 7.—*C. succinium* gen. et sp. n. Dorsal. ?Allotype, In. 18778 (Baltic amber).
FIG. 8.—*C. succinium* gen. et sp. n. Lateral. ?Allotype, In. 18778 (Baltic amber).
FIG. 9.—*Neopolypria nigra* gen. et sp. n. Dorsal. Holotype, In. 18786 (Baltic amber).
FIG. 10.—*N. nigra* gen. et sp. n. Ventral. Holotype, In. 18786 (Baltic amber).
FIG. 11.—*Palaeoscraptia elongata* gen. et sp. n. Dorsal. Holotype, In. 18776 (Baltic amber).



Heteromerous beetles from Baltic amber

M. Abdullah

PLATE II

FIG. 1.—*Palaeoscraptia elongata* gen. et sp. n. Ventral. Holotype, In. 18776 (Baltic amber).

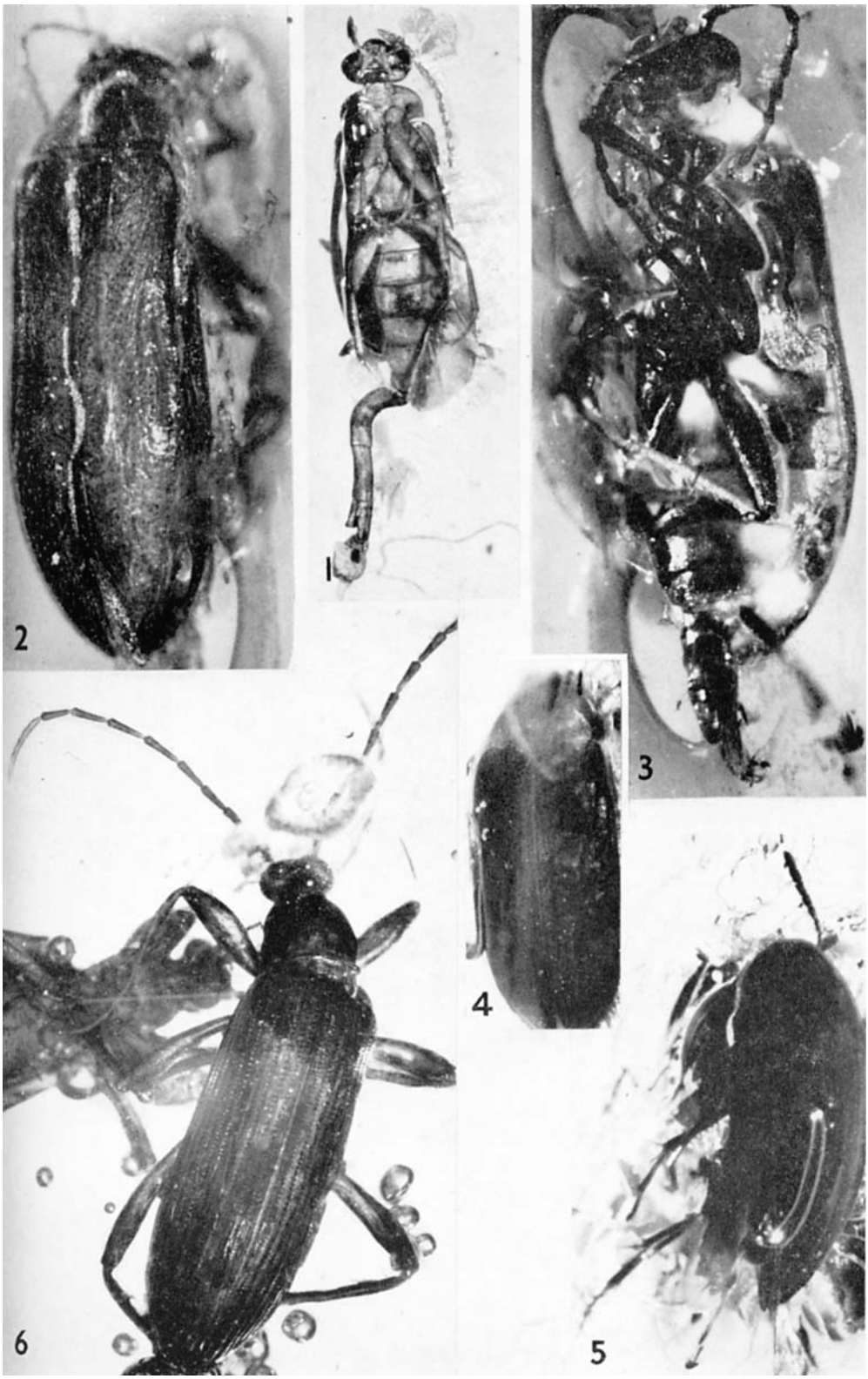
FIG. 2.—*Archescraptia emarginata* gen. et sp. n. Dorsal. Holotype, In. 18787 (Baltic amber).

FIG. 3.—*Archescraptia emarginata* gen. et sp. n. Ventrolateral. Holotype, In. 18787 (Baltic amber).

FIG. 4.—*Anaspis* (*Silaria*) *parva* sp. n. Dorsal. Holotype, In. 17741 (Baltic amber).

FIG. 5.—*A.* (*S.*) *parva* sp. n. Dorsolateral. Holotype, In. 17741 (Baltic amber).

FIG. 6.—*Sora* (*Sora*) *zanzibarensis* sp. n. Holotype (dorsal), ?allotype (ventral), I. 15821 (gum copal).



Heteromerous beetles from Baltic amber and gum copal

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