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Abstract

This paper is the first in a series on the classification, phylogeny and zoogeography of the supraspecific taxa of the subtribe Harpalina (Carabidae: Harpalini). The definition and composition of the Selenophori group have been sources of disagreement among authors who each dealt with taxa of only part of the world. Examination of selenophorines and of examples of most other genera of Harpalina permits diagnoses of the Selenophori group and of seven non-selenophorine groups.

The bulk of the paper is a revision at the supraspecific level of the 25 genera and subgenera of the Selenophori group. The paper also treats nine other genera and subgenera in an *Incertae Sedis* section: *Axinotoma*; *Lampetes*; *Harponixus*; *Liodaptus*; *Nothodaptus*; *Aztecarpalus*; *Trichotichnus*; *Bellogenus*; and *Harpaloxenus*. Examination of each of these taxa showed that they are members of Harpalina but can not be placed in Selenophori or other currently recognized groups. Keys permit identification of the genera and subgenera of selenophorines and of the nine supra-specific taxa placed in *Incertae Sedis*.

The treatment of each genus and subgenus includes: synonyms, if any; information about recognition of member species; description of the supraspecific taxon; when warranted, a discussion of synonymies and other taxonomic problems; data about papers useful in making species identifications; summaries of available data about geographical distribution of included forms and their way of life; and a list of included species.

Two new genera are described: the monobasic *Neodiachipteryx* (type species: *Selenophorus cariniger* Putzeys, 1878, known from the island of Hispaniola in the Caribbean); and *Neoaulacoryssus* (type species: *Selenophorus speciosus* Dejean, 1829, with two South American species.)

New synonymies are: *Ophonomimus* Schauberger, *Oesyperus* Andrewes, and *Paratheles* Basilewsky as junior synonyms of *Parophonus* Ganglbauer; *Harpaliscus* Bates, *Laparhetes* Jeannel, and *Hirpastolus* as junior synonyms of *Siopelus* Murray; *Pseudosiopelus* Alluaud as junior synonym of *Aulacoryssus* Alluaud; *Gynandropus* Dejean as junior synonym of *Selenophorus* Dejean; *Selenalius* Casey as junior synonym of *Discoderus* LeConte; *Oxycentropsis* Schauberger as junior synonym of *Oxycentrus* Chaudoir; *Coleolissus* Bates as junior synonym of *Hyphaereon* MacLeay; *Lyter* Darlington as a junior synonym of *Trichotichnus* Morawitz; and *Pseudotrichotichnus* Habu as junior synonym of *Bellogenus* Clarke.

The generic name *Pseudokareya* Schauberger is invalid because its author did not designate a type species.

Siopelus Murray, treated by Noonan (1976) as a subgenus of *Axinotoma* Dejean, is regarded as a distinct genus. *Lampetes* Andrewes is ranked as a subgenus of *Axinotoma* rather than as a separate genus. *Aulacoryssus* Alluaud is ranked as a subgenus of *Siopelus* Murray. *Harpaloxenus* Schauberger is ranked as a subgenus of *Trichotichnus* Morawitz.

New replacement names for species are: *Siopelus neomaynei*, for *Hirpastolus maynei* Basilewsky, 1947, a junior secondary homonym of *Siopelus maynei* Burgeon, 1936; *Selenophorus neobscuricornis*, for *Selenophorus obscuricornis* Putzeys, 1878, a junior secondary homonym of *Amblygnathus obscuricornis* Waterhouse, 1845; and *Trichotichnus gerni* for *Trichotichnus niger* Jedlička, 1962, a junior primary homonym of *Trichotichnus niger* Louwerens, 1951.

Key Terms

Carabidae, classification, Coleoptera, Harpalina, Harpalini, Insecta, Selenophori group, selenophorines, taxonomy

Introduction

The tribe Harpalini is a diverse group of beetles with approximately 238 genera and subgenera and 2,000 species. It occurs on all continents except Antarctica and is found on many islands. Harpalines are abundant in nature and are excellent organisms for testing hypotheses about evolution and zoogeography (Noonan, 1979). Studies of the systematics of these beetles contribute to the understanding of the classification of a major group of animals and are essential prerequisites for using data about harpalines to formulate and evaluate general hypotheses about the evolution and zoogeography of animals.

Most papers revising harpalines have been regional and have accorded separate status to supraspecific taxa which are actually congeneric. World wide treatments of categories above the species level are of heuristic interest in themselves. They also form the essential framework for organizing work at the specific and infraspecific level.

The only world wide analysis of the taxonomy, phylogeny and zoogeography of genera and subgenera is that done for the subtribe Anisodactylina (Noonan, 1973). The supraspecific taxa of the three other subtribes (Harpalina, Pelmatellina, and Stenolophina) still need such analysis (Noonan, 1976).

The largest of these three subtribes is Harpalina (Noonan, 1976), with about 137 supraspecific groups and approximately 1,200 species. Taxa are concentrated in the Palaearctic, Nearctic, and to a lesser degree the Neotropical and Ethiopian Regions, less numerous in the Oriental Region and few in the Australian.

This paper commences a series on the classification, phylogeny, and zoogeography of the supraspecific taxa of Harpalina. I shall publish on taxa of all groups but the Harpali. These papers together with current work by G. E. Ball on Harpali will in aggregate provide a world wide analysis of the supraspecific groups of the subtribe Harpalina. Subsequent series of papers by me will treat the genera, subgenera and selected species of the other subtribes.

This paper focuses on the taxonomy of the Selenophori group of Harpalina. A subsequent paper will treat the phylogeny and zoogeography of the group.

The present paper also treats nine genera and subgenera which are not selenophorines: *Axinotoma*; *Lampetes*; *Harponixus*; *Liodaptus*; *Nothodaptus*; *Aztecarpalus*; *Trichotichnus*; *Bellogenus*; and *Harpaloxenus*. Other authors had placed many of these in the Selenophori group. The examination showed that they are members of Harpalina but do not belong to selenophorines or any other groups of Harpalina as presently defined. Since there are no synapomorphies suggesting the nine supraspecific taxa form a single monophyletic group, it seems best to place them into an *Incertae Sedis* category, with the hope that further studies of Harpalina may clarify their phylogenetic relationships. These nine taxa are treated in this paper to facilitate study of them by other workers.

Materials

This study is based on examination of approximately 1,000 adult selenophorines borrowed from or studied in the museums listed in the acknowledgments section. For comparative purposes I examined several thousand other adults representing approximately 90 per cent of genera and subgenera regarded (Noonan, 1976) as members of other groups of the tribe Harpalini.

Methods

EXAMINATION OF SPECIMENS

Examination of specimens for most characters. For most characters specimens were studied under a Wild M5 microscope with illumination as in Noonan (1981).

Study of rows of setigerous punctures on elytral intervals 3, 5, and 7. These punctures occur in many selenophorines. (The punctures are borne on intervals 3, 5, and 7; in some adults they are also confluent with interneurs 2, 5 and 7.) For specimens with generally glabrous elytra the above examination techniques served for studying the punctures. Specimens with densely pubescent elytra were first examined for rows of setigerous punctures by turning the specimens sideways and looking for rows of setae notably longer (and/or thicker) than the general pubescence. This procedure worked for most such specimens. However with some pubescent specimens, especially those with abraded dorsa, rows of setigerous punctures could not be thus differentiated from the general pubescence. It was then necessary to remove an elytron for examination by both of two techniques. First, the elytron was placed in a white dish with strong illumination directed from above by two incandescent lamps placed at approximately 45 degree angles to the elytron. Second, the elytron was placed in a transparent dish and illuminated from below. One or both of these techniques would show the setigerous punctures as rows of punctures larger than the punctures bearing the general dorsal pubescence.

Other examination and dissecting techniques. Other techniques were as in Noonan (1973).

Criteria for Ranking Taxa

The classification herein proposed for selenophorines is based on a phylogeny of the genera and subgenera (to be published in a subsequent paper) reconstructed according to techniques of phylogenetic systematics as summarized in Wiley (1981). The classifications given for the nine genera and subgenera regarded as *incertae sedis* are based on phenetics. Species are grouped into units on the basis of shared characters. Further study of Harpalina will permit testing whether these shared characters are synapomorphies.

Where possible, genera of Selenophori are defined by synapomorphies, and subgenera are subunits within such genera as defined by more restrictive sets of synapomorphies. In some instances, groups of species (such as those in the genus *Selenophorus*) seem to represent assemblages of forms little differentiated from ancestral lineages and possessing no apparent synapomorphies. In these instances, I have grouped species into higher taxa by their apparent place in the reconstructed phylogeny, sharing of assemblages of symplesiomorphies, and chorology. Such grouping is preferable to disregarding often large assemblages of species or to dividing them into numerous units by characters which seem to vary at the subgeneric level or above.

Taxonomic Terms

Terms are as in Noonan (1973) except as noted below.

In the interest of deriving a common set of terms for research on Carabidae, I have adopted several terms recently used by other workers or suggested by G. E. Ball (*in litt.*).

Articulated parts of a structure. Such parts are identified by the suffix "mere" preceded by the name of the structure. For example, the second articulated part of the tarsi is "tarsomere 2" or "second tarsomere". For the legs, the words "front", "middle", and "hind" denote the first, second, and third such appendages respectively. The term "basitarsi" denotes the most proximal of the tarsomeres of each leg. "Scape" indicates the first antennomere.

Head. The "ligula" of Noonan (1973) is termed the "ligular sclerite" since most entomologists consider "ligula" to mean the glossae plus the paraglossae.

Thorax. "Apex of prosternal intercoxal process" replaces "apex of prosternal lobe".

Elytra. "Interneurs" replaces "striae" for the reasons given in Erwin (1974).

Ovipositor. In agreement with terms developed by Ball and Shpeley (1983) for this complex of structures, the most proximal articulated part of the styli is termed the "stylomere 1", and the distal is termed the "stylomere 2" rather than "basal" and "distal" "segments". However, the names for surfaces on structures are based on the retracted positions, as in my other papers on harpalines.

Format

The information provided about each supraspecific taxon includes: synonyms; a paragraph about recognition of member species; description of the supraspecific taxon; a discussion of synonymies and other taxonomic problems; information about species identification; summary of data about geographical distribution, and when available, information about the way of life of included forms; and a list of the included species. The latter section lists the current name of each included species, the author, and the date of original publication. The original descriptions of species are not listed in the "Literature Cited" section unless important for treatment of supraspecific taxa. An asterisk following the date of a species description indicates that I have not examined specimens of that species. An asterisk following a "m" or "f" indicates that I have not examined specimens of males or females respectively.

Definition and Composition of the Selenophori Group

Authors have frequently disagreed about the definition or composition of the group. Casey (1914) first recognized Selenophori as a tribe on the basis of rows of setigerous punctures associated with elytral interneurs 2, 5, and 7. He placed *Hartonymus* in it on this basis but put *Stenomorphus* in a separate tribe because of the elongate prothorax characteristic of its adults.

Jeannel (1942) treated selenophorines as a tribe, primarily due to its members having: the median lobe of the male genitalia with the ostium dorsal; and the head without clypeo-ocular prolongations or dentiform projections over the eyes; and labial palpi unmodified. He therefore placed *Trichotichnus* and *Trichopselaphus* in separate

tribes. In 1948 Jeannel stated that his earlier conclusions were based on study of Palaearctic forms and that detailed study of numerous African taxa demonstrated that the characters previously used by him were not as important as formerly believed; he combined his former tribes Selenophori, Trichotichni, and Harpalini into the tribe Harpalini.

Basilewsky (1950) dissented and stated that various African, Asiatic, European and American taxa belonged in a subtribe Selenophorina (tribe Harpalini) because their adults have hind basitarsi about as long or longer than tarsomeres two and three combined. However, he placed in subtribe Bradybaeina (tribe Harpalini) some genera with adults having such elongate basitarsi; rationale for recognizing Bradybaeina as a distinct group was the presence of numerous long setae on the abdominal sterna of adult members.

In his treatment of Neotropical Harpalini van Emden (1953) characterized his Selenophori group of the subtribe Harpalina as composed of adults with seriate punctures on the elytral interneurs 2, 5, and 7. However, he included in the group genus *Barysomus*, whose adults have few seriate punctures on these interneurs. Van Emden stated that the lack of ventral vestiture on the male front tarsi in adults of *Barysomus* might indicate affinities with either Anisodactylina or Harpalina. He also noted that its species are very similar to *Selenophorus pyritosus*, having elongate hind basitarsi, suggesting placement in Selenophori. Additionally, he placed *Trichoselaphus* and *Stenomorphus* in Selenophori.

Hatch (1953) reviewed the beetles of northwestern North America. He considered Selenophorina equal in rank to Harpalina in the tribe Harpalini based on adults of the former possessing series of punctures adherent to elytral interneurs 2, 5, and 7.

Ball (1960, 1963, 1968) accepted van Emden's (1953) system and did not discuss characters defining the Selenophori group. He included *Trichotichnus* in the group even though adults lack rows of punctures on the elytral interneurs; such inclusion was presumably based on the generally long hind basitarsi of most adults of North American *Trichotichnus*. Subsequently Ball (1976b) transferred *Hartonymus* from the Selenophori to the Harpali group.

In his revision of the Carabidae of Canada and Alaska, Lindroth (1968) noted that the genera he treated in the subtribe Harpali were divided by some workers into Selenophori and Harpali, the former characterized by adults having the median lobe with the ostium dorsal in position. This definition placed *Episcopellus* in the Harpali group.

Habu (1968) examined 17 Japanese species included in *Harpalus*, and in the three Japanese genera (*Oxycentrus*, *Platymetopus*, and *Trichotichnus*) belonging to Selenophorina *sensu* Basilewsky (1950). His study demonstrated that the length of the hind basitarsi relative to tarsomeres 2 plus 3 varies considerably and is not useful for separating Japanese species of *Harpalus* from those of the three genera of Selenophorina. Since Japanese species of these three genera also lack rows of punctures on elytral intervals 3, 5, and 7, Habu concluded that the *Selenophorus* genus group should not be taxonomically separate from the *Harpalus* genus group. In his 1973 monograph of the Harpalini of Japan he did not recognize separate Selenophorina and Harpali groups and treated *Episcopellus* as congeneric with *Trichotichnus*.

Why have authors been unable to agree on composition of the selenophorine group or even on whether it is a valid group? The answer is threefold. First, knowledge of

selenophorines has progressed by successive study and testing of previous concepts. New knowledge has often required reformulation of previous concepts. Second, the above authors each revised the selenophorines of only part of the world and thus presumably were not fully conversant with character states among the entire group. Thirdly, some authors included in the Selenophori group various of the nine genera and subgenera here regarded as *Incertae Sedis*. Such inclusions solved, on a regional basis, the problem of where to place one or more of these nine taxa. However, such inclusions made the selenophorines a paraphyletic group, impossible to define on a world wide basis.

My detailed study of all genera and subgenera here regarded as selenophorines and of most supra-specific taxa placed in other groups of Harpalina demonstrates that the Selenophori group as here treated is a monophyletic assemblage. Members of this group share the apomorphy of rows of setae on the third elytra interval and in some species also on intervals five and seven. (As will be discussed in the forthcoming paper on phylogeny and zoogeography, those few species lacking such rows have apparently secondarily lost them.)

Diagonsis to Separate Adult Selenophorines from Other Harpalini

Punctuation, Pubescence, and Setation. Paraglossae glabrous. Penultimate palpomeres of labial palpi with anterior margins plurisetose. Third elytral intervals each with dorsal row of setigerous punctures *OR* if such rows absent: apex of ligula with dorsal setae (some species of *Afromizonus* which have secondarily lost rows); *OR* elytral interneurs with prominent non-setigerous punctures along entire length (some species of *Xenodochus* which have secondarily lost rows); *OR* mentum with a median tooth (Fig. 8) and mandibles elongate, in repose both with apices projected beyond apex of labrum (some species of *Hyphaereon* which have secondarily lost rows); *OR* head (Fig. 1) with frontal fovea each an elongate deep pit near epistomal suture and with a complete deep sulcus (some species of *Oxycentrus* which have secondarily lost rows). Abdominal sterna lacking dense, long, moderately thick setae, at most with dense short, fine setae.

Head. Head not relatively large *OR* if relatively large, none of the following three character combinations present: (1) clypeal apex deeply emarginate *and* elytral scutellar interneurs each absent or appearing to arise from first interneur due to having captured distal portion of it and thus leaving base of first interneur to appear as the scutellar interneur; (2) mandibles prominently projected laterally from the sides *and* male front tarsi lacking ventral vestiture; and (3) dorsal or ventral tubercules present on head *AND/OR* labial palpi with penultimate palpomeres greatly elongate and densely setose on anterior margins *AND/OR* ligular sclerite thick and with apical sclerotized ventral plate *AND/OR* elytral basal borders absent or vestigial. Dentiform processes absent above antennal insertions. Mentum and submentum separated by a complete suture.

Legs. Male front tarsomeres 2 to 4 with ventral biseriate vestiture or (in burrowing forms) vestiture absent; lacking dense non-biseriate vestiture.

Notes on Other Groups of Harpalina

Since selenophorines have often been confused with other groups of Harpalina, I here characterize these groups.

The Harpali group includes those genera whose adults lack the synapomorphies of the groups discussed below but have pubescent paraglossae. *Hartonymus* and *Platymetopus* (placed in Selenophori by Noonan [1976]) belong in Harpali due to their probable evolutionary relationships to other Harpali, as suggested by their pubescent paraglossae.

Adults of the Bradybaeni group have dense setae on the abdominal sterna. While such setae are apomorphic, the group may be polyphyletic due to homoplasy. Revision of Bradybaeni and of Harpali may result in some taxa, especially those whose adults have pubescent paraglossae, being transferred to the latter.

The Acinopi group comprises genera whose adults have pubescent paraglossae and enlarged heads with preocular sulci for reception of the antennal scapes. Possibly this group evolved from an early member of the Harpali.

The Bleusi group includes only genus *Bleusea* whose two species have adults with relatively large heads, mandibles projected laterally from the sides, short moniliform antennae, and unmodified front and middle male tarsi.

Adults of the Dapti group have relatively large heads, a dentiform process above each antennal insertion, and preocular sulci for reception of antennal scapes.

The Amblystomi group includes genera whose adults have: relatively large heads with deeply emarginate clypeal apex; and elytral scutellar interneurs each absent or appearing to arise from the first interneur due to having captured the distal portion of it, thus leaving the base of the first interneur to appear as the scutellar interneur.

Adults of the Ditomi group have: heads transversely shaped, relatively large in many taxa, with tubercules dorsally or ventrally in some taxa; paraglossae pubescent in some taxa; penultimate labial palpomeres greatly elongate and densely setose in some taxa; ligular sclerite thick and in most taxa with an apical ventral plate; male front tarsi unmodified except in some species of *Carterus* which bear irregular to somewhat biseriate, sparse ventral vestiture; elytral basal borders each absent or incomplete in most taxa; sixth abdominal sternum of female of many taxa with distal margin medially enlarged and plate-like; and median lobe of male genitalia relatively small.

Description of Adult Selenophorines

Body varied from average in general habitus to stout or cylindrical and from about 5 to 20 mm in length; form average (not excessively narrow or wide) for Harpalini unless otherwise noted.

Color. Various.

Dorsal Luster. Varied from dull to iridescent.

Dorsal Microsculpture. Varied on frons, pronotum and elytra from granulate isodiametric mesh to mesh of fine transverse micro-lines, or absent.

Punctuation, Pubescence, and Setation. Mentum with median pair of setae unless otherwise noted. Submentum with 1 long inner seta at each side; some species also with 1 shorter seta laterad to the long one at each side. Ligular sclerite with 2

moderately elongate distal ventral setae. Paraglossae glabrous. Pronotum with 1 seta at each side near mid point except in *Pseudohyparpalus*. Apex of prosternal intercoxal process with several moderately long setae in most species. Posterior margins of hind femora with various numbers of long setae depending on taxon. Elytral intervals 3 each with 1 row of dorsal setigerous punctures in most species; intervals 5, and 7 each with or without row of setigerous punctures; rows of punctures near or confluent with interneurs, 2, 5, and 7 in most taxa of the New World and some of the Old World. Abdominal sterna 3 to 6 each with 1 median pair of ambulatory setae; sternum 6, unless otherwise noted, also with lateromedial pair of ambulatory setae. Ovipositor, stylomeres 1 each ventrally with or without setae; stylomeres 2 each with 2 long distal mesal setae situated adjacent to each other.

Head. Unless otherwise noted, labral and clypeal apices straight to moderately emarginate medially and not with labral base exposed in clypeal emargination. Eyes varied from small to large. Frontal foveae varied in prominence and shape. Mentum with or without median tooth. Mentum and submentum separated by a complete transverse suture. Ligular sclerite narrow and with apex not laterally expanded unless otherwise noted.

Thorax. Pronotum with anterior and posterior beads present laterally but not medially unless otherwise noted; lateral beads complete unless otherwise noted.

Legs. Front and middle tarsi of males with apices or all of tarsomeres 1 and all of 2 to 4 laterally expanded and biseriate beneath unless otherwise noted. Hind tarsi slender and elongate to short and stout; length of basitarsi varied from approximately 0.6 to 1.2 length of tarsomeres 2 plus 3.

Elytra. Humeri lacking teeth unless otherwise noted. Scutellar interneurs varied from absent to present and elongate, average for Harpalini unless otherwise noted. Intervals 10 in number; unless otherwise noted, average for Harpalini and flat to slightly convex. Interneurs 9 in number. Subapical sinuations varied in prominence.

Hind wings. Fully developed unless otherwise noted.

Abdomen. Tergum 8 of females obtusely rounded at apex.

Male genitalia. Median lobe arcuate and symmetrical unless otherwise noted; apex lacking apical disc unless otherwise noted; dorsal membranous area varied in length; ostium dorsal unless otherwise noted, in a few taxa deflected slightly or strongly to left or situated on venter.

Ovipositor. Valvifers and styli average (for Harpalina) in size and shape unless otherwise noted.

Keys to Genera and Subgenera of the Selenophori Group and to Nine Genera and Subgenera Placed in *Incertae Sedis* Within the Subtribe Harpalina

Notes on use of the keys. The taxa treated in the keys are not easy to identify to genus or subgenus due to many species of different genera having similar appearances and/or exhibiting considerable variation in character states. Therefore, one must closely read all sections of each couplet and examine specimens in detail. Reliable identification of all species of some genera and subgenera may require dissection of specimens. For many species of these groups the reader may avoid dissection of specimens by noting the included information about geographical distributions.

Many of the genera and subgenera which are difficult to distinguish in keys are endemic to the Old World. For the convenience of readers with taxa from only the Americas, there is a separate key to the genera and subgenera of the New World. This shorter key is followed by a longer one to the genera and subgenera of the world.

Key to Genera and Subgenera of the New World

1 Posterior part of seventh and eight elytral intervals raised into longitudinal ridge extended from interval 8 to suture and formed by dorsum of disc sloped over prominent concave inflexion of distal portion of elytron (Figs. 24) range Haiti and Dominican Republic in Caribbean ..... *Neodiachipteryx* new genus, p. 42

Posterior part of seventh and eight elytral intervals not raised into longitudinal ridge; range various 2

2 (1) All of elytra densely pubescent ..... genus *Athrostictus* Bates, p. 35

At least a portion of elytral disc lacking pubescence 3

3 (2) Mentum without median tooth (Fig. 9); third elytral interval with row of 3 or more setigerous punctures 5

Mentum with median tooth (Fig. 8); third elytral interval at most with 1 or 2 setigerous punctures in approximately posterior 1/3 to 1/5 4

4 (3) Frontal fovea with clypeo-ocular prolongation complete to eye and moderate (Fig. 2); prosternum medially with pubescence; range eastern Canada and eastern United States ..... subgenus*Trichotichnus* Morawitz (genus *Trichotichnus*), p. 67

Frontal fovea with clypeo-ocular prolongation absent or weak (Fig. 4), not reaching eye in most specimens; prosternum glabrous medially; range Mexico and Texas ..... genus *Aztecarpalus* Ball, p. 63

5 (3) Elytral intervals 1 to 8 with prominent elongate punctures; some areas between these punctures joined into irregular elevated chains (Fig. 27); mental setae each located at sides of median emargination (Fig. 10); range South America ..... genus *Neoaulacoryssus* new genus, p. 37

Eytral intervals not so modified; mental setae located more medially in most specimens (Fig. 9) 6

6 (5) Front tibia (Fig. 35) expanded (more so in males than in females), with outer distal margin crenulate; front tarsus (Fig. 35) at most slightly laterally expanded; range Neotropical Region ..... genus *Anisocnemus* Chaudoir, p. 49

Front tibia not so modified (expanded in some specimens but not with outer distal margins crenulate) 7

7 (6) Body elongate, narrow, cylindrical *AND* pronotum narrow, elongate (distance from anterior margin of prosternum to anterior rim of front coxal cavity twice or more distance from latter point to tip of prosternal intercoxal process); *AND* pronotal anterior and posterior beads complete and broad medially; front tarsus of females with basitarsus moderately laterally expanded (Fig. 36); stylomere 2 of ovipositor doubled distally (Fig. 37); range southwestern United States south into northern South America ..... genus *Stenomorphus* Dejean, p. 46

Body not elongate, narrow and cylindrical, *OR* if so shaped, pronotum not as above; stylomere not doubled distally 8

8 (7) Clypeus with apex deeply, broadly emarginate and labral base visible in emargination (Fig. 5) ..... genus *Amblygnathus* Dejean, p. 44

Clypeus with apex not deeply broadly emarginate (Fig. 4) 9

9 (8) Mentum with or without setae; apex of ligular sclerite with setae on dorsum; body form sub-terete; range Neotropical Region ..... genus *Trichopselaphus* Chaudoir, p. 45

Mentum with 2 moderately long setae (medially located in most specimens) (Fig. 9); apex of ligular sclerite without setae on dorsum; body form various 10

10 (9) Front tibia with 6 or more stout spines on outer margin near apex; pronotum with posterior angle broadly rounded and disc more or less markedly convex (Fig. 13); middle tibia of male bowed or not; abdominal sternum 6 of females with apex bearing median thickened or plate-like (Fig. 31) area; range southwestern United States, Mexico and Jamaica ..... (in part) genus *Discoderus* LeConte, p. 47

Front tibia with 5 or fewer stout spines on outer margin near apex; pronotum various; middle tibia of males not bowed; abdominal sternum 6 of females with (Fig. 31) or without (Fig. 32) apex thickened or plate-like medially; range Nearctic and/or Neotropical Regions 11

11 (10) Pronotum cordate shaped and with posterior angle broadly rounded (Fig. 14) *AND* elytral scutellar interneurs absent *AND* some of setigerous punctures on elytral intervals 3, 5, and 7 not situated in or confluent with interneurs 2, 5, and 7 respectively; abdominal sternum 6 of females with apex bearing median thickened or plate-like area (Fig. 31); range southwestern United States and Mexico ..... *D. cordicollis* of genus *Discoderus* LeConte, p. 47

Pronotal shape not as above *OR* elytral scutellar interneurs present *OR* elytral setigerous punctures not as above; abdominal sternum 6 of females with apex not thickened or plate-like medially (Fig. 32); range Nearctic and/or Neotropical Regions 12

12 (11) Apex of prosternal intercoxal process with or without slight to prominent lateral margin along at least sides (if such margin lacking, median lobe of male genitalia with apical disc and with large spine extended distally from near proximal end of ostium); pronotum not cordate shaped; fine short setae present on elytral intervals 9; all elytral interneurs present ..... subgenus *Celiamorphus* Casey (genus *Selenophorus*), p. 41

Apex of prosternal intercoxal process lacking lateral margins; median lobe of male genitalia lacking large spine extended distally from near proximal end of ostium; pronotal shape various; elytral intervals 9 with or without setae; all elytral interneurs present or not; body length approximately 4.5 to 11 mm ... subgenus *Selenophorus* Dejean, (genus *Selenophorus*), p. 38

Key to Genera and Subgenera of the World

1 Posterior part of seventh and eighth elytral intervals raised into longitudinal ridge extended from interval 8 to suture and formed by dorsum of disc sloped over prominent concave inflexion of distal portion of elytron (Figs. 24, 25) . 2

Elytron not so modified 3

2 (1) Dorsum densely pubescent; range Ethiopian portion of Africa ..... genus *Pseudodiachipteryx* Burgeon, p. 23

Dorsum glabrous except for usual fixed setae; range Haiti and Dominican Republic in Caribbean ..... *Neodiachipteryx* new genus, p. 42

3 (1) All of elytra densely pubescent ..... Key A, p. 11

At least a portion of elytral disc lacking pubescence 4

4 (3) Third elytral interval with row of 3 or more setigerous punctures 5

Third elytral interval at most with 1 or 2 setigerous punctures in approximately posterior 1/3 to 1/5 ..... Key D, p. 17

5 (4) Mentum with median tooth (Fig. 8) (doubtful specimens treated in both couplets) . ..... Key B, p. 12

Mentum lacking median tooth (Fig. 9) (doubtful specimens treated in both couplets) ..... Key C, p. 14

Key A

All of elytra with dense pubescence

1 Antenna with antennomeres 4 to 11 greatly enlarged, their maximum widths each greater than maximum width of front tibial apex; range country of Ethiopia ..... genus *Harpathaumas* Basilewsky, p. 29

Antenna not enlarged, maximum width of antennomeres 4 to 11 much less than maximum width of front tibial apex 2

2 (1) Pronotum with 1 to 4 mid-length setae (shorter than long seta at midpoint of side and longer than short fine setae of pronotal general pubescence) at anterior angle and 1 such seta at posterior angle . genus *Pseudohyparpalus* Basilewsky, p. 22

Pronotum lacking such mid-length setae at angles 3

3 (2) Mentum lacking median tooth (Fig. 9) (doubtful specimens treated in both couplets) 4

Mentum with median tooth (Fig. 8) (doubtful specimens treated in both couplets) 8

4 (3) Clypeus with apex deeply, broadly emarginate and labral base visible in emargination (Figs. 6, 7) 5

Clypeal apex unmodified (Figs, 2-4) 6

5 (4) Pubescence on median portions of elytral intervals 1 to 7 composed of setae much shorter than those of intervals 8 to 10 and difficult to discern at magnifications below approximately 24X; range Neotropical and Oriental Regions .... (in part) genus *Dioryche* MacLeay, p. 34

Pubescence on median portions of elytral intervals 1 to 7 composed of setae as long and prominent as those on intervals 8 to 10 and readily discernible at 12 X or lower magnification; range mainland portions of Oriental Region .... *K. erebia* Bates of genus *Kareya* Andrewes, p. 33

6 (4) Range, tropics and subtropics of Neotropical Region; pronotal anterior angles prominent (Fig. 20); stylomere 2 of ovipositor lacking any extra setae .... genus *Athrostictus* Bates, p. 35

Range, tropical to warm temperate portions of Old World; pronotal anterior angle various; stylomere 2 of ovipositor with 1 or more extra setae 7

7 (6) Ligular sclerite with approximately 4 distal setae on dorsum; range Burma, India and Indochina ..... (in part) genus *Ophoniscus* Bates, p. 31

Ligular sclerite lacking setae on dorsum; range Ethiopian, Oriental and southern part of Palaearctic Region ..... (in part) genus *Parophonus* Ganglbauer, p. 19

8 (3) Ligular sclerite with approximately 4 distal setae on dorsum; clypeus with apex not deeply broadly emarginate; range Oriental Region .... (in part) genus *Ophoniscus* Bates, p. 31

Ligular sclerite lacking setae on dorsum; clypeal apex various; range various . 9

9 (8) Clypeus with apex deeply, broadly emarginate; in many specimens labral base visible in emargination (Fig. 6); range mainland portions of Oriental Region. . ..... *K. erebia* Bates of genus *Kareya* Andrewes, p. 33

Clypeus with apex not deeply, broadly emarginate (Figs. 2-4) 10

10 (9) Elytral interval 3 lacking any discernible rows of setigerous punctures; range Ethiopian Region ..... genus *Harponixus* Basilewsky, p. 61

Elytral interval 3 with row of 8 or more setigerous punctures; range Ethiopian, Oriental and southern part of Palaearctic Regions .... (in part) genus *Parophonus* Ganglbauer, p. 19

Key B

At least inner elytral intervals (approximately 1 to 7) lacking pubescence; third elytral interval with row of 3 or more setigerous punctures; mentum with median tooth.

1 Clypeus with apex deeply emarginate medially and labral base exposed (Fig. 6); elytral intervals 8 to 10 and apices of other intervals with dense setae, at approximately 24X appearance of yellowish to whitish pubescence; all portions of all elytral intervals with dense setigerous or non-setigerous punctures; range Burma and India ..... (in part) genus *Kareya* Andrewes, p. 33

Clypeus with apex not deeply emarginate and labral base not exposed; elytral intervals 8 to 10 with or without setae 2

2 (1) Frontal fovea an elongate deep pit near epistomal suture and with complete deep sulcus prolonged or not onto clypeus and with clypeo-ocular prolongation extended to eye and deep groove extended from junction of eye to base of mandible (Fig. 1); *AND* body subcylindrical in form; *AND* pronotal anterior

bead flattened but complete medially; range Palaearctic and Oriental Regions . . . . . (in part) genus *Oxycentrus* Chaudoir, p. 56

Combination of character states not as above 3

3 (2) Elytral intervals (Fig. 26) each with approximately 2 to 4 prominent regular to irregular shaped non-setigerous punctures per interval width and with surfaces between punctures raised into longitudinal ridges and in many specimens with sides of approximately intervals 1 to 8 each with ridge alongside interneurs; range Ethiopian Region and Cape Verde Islands of Palaearctic Region . . . . . subgenus *Aulacoryssus* Alluaud (genus *Siopelus*), p. 28

Elytral intervals and interneurs not as above 4

4 (3) Elytral intervals 1 to 7 covered with moderately dense to very dense non-setigerous punctures 7

Elytral intervals 1 to 7 lacking punctures other than rows of setigerous punctures found on intervals 3, and in some specimens also on intervals 5 and 7 5

5 (4) Mandibles moderately elongate and both in repose with apices projected beyond apex of labrum; *AND* microsculpture medially on elytral intervals 1 to 7 very fine and transverse; range Oriental Region, New Guinea, extreme northern Australia, Ryukyu Islands . . . . . (in part) genus *Hyphaereon* MacLeay, p. 53

Combination of characters not as above; range Africa 6

6 (5) Frontal fovea punctiform, with clypeo-ocular prolongation complete to eye . . . . . (in part) subgenus *Siopelus* Murray (genus *Siopelus*), p. 27

Frontal fovea lacking clypeo-ocular prolongations . . . . . (in part) genus *Phyrometus* Basilewsky, p. 50

7 (4) Mandibles moderately elongate and in repose both with apices projected beyond apex of labrum; microsculpture medially on elytral intervals 1 to 7 very fine and transverse; frontal fovea with clypeo-ocular prolongation (such prolongation shallow in many specimens); range Oriental Region, New Guinea, extreme northern Australia, Ryukyu Islands . . . . . (in part) genus *Hyphaereon* MacLeay, p. 53

Mandibles shorter, at most left one in repose with apex projected beyond apex of labrum; range Ethiopian and Oriental Regions 8

8 (7) Sex male (front tarsus with tarsomeres 2 to 4 laterally expanded and with biseriate vestiture beneath) 9

Sex female (front tarsus with tarsomeres 2 to 4 not laterally expanded and not with biseriate vestiture beneath) . . . . . (in part) subgenus *Siopelus* Murray (genus *Siopelus*), p. 27

9 (8) Elytral intervals 8 and 9 and apices and bases of intervals 1 to 7 with dense short setae, at 24X the appearance of dense whitish vestiture; pronotum with anterior angle moderate to prominent (Figs. 15, 16) . . . . . some males of genus *Parophonus* Ganglbauer, p. 19

Elytral intervals 8 and 9 and apices and bases of intervals 1 to 7 with or

without setae; setae when present finer and shorter, not with appearance at 24X of whitish vestiture; *OR* pronotum with anterior angle obsolete (Fig. 17) . . . . . some males of subgenus *Siopelus* Murray (genus *Siopelus*), p. 27

Key C

At least inner elytral intervals (approximately 1 to 7) lacking pubescence; third elytral interval with row of 3 or more setigerous punctures; mentum lacking median tooth.

1 Elytral intervals 1 to 8 with prominent elongate punctures; some areas between these punctures joined into irregular elevated chains (Fig. 27); mental setae each located at sides of median emargination (Fig. 10); range South America . . . . . genus *Neoaulacoryssus* new genus, p. 37

Elytral intervals not so modified; mental setae located more medially in most specimens (Fig. 9) 2

2 (1) Front tibia (Fig. 35) expanded (more so in males than in females), with outer distal margin crenulate; front tarsus (Fig. 35) at most slightly laterally expanded; range Neotropical Region . . . . . genus *Anisocnemus* Chaudoir, p. 49

Front tibia not so modified (expanded in some specimens but not with outer distal margins crenulate) 3

3 (2) Body elongate, narrow, cylindrical *AND* pronotum narrow, elongate (distance from anterior margin of prosternum to anterior rim of front coxal cavity twice or more distance from latter point to tip of prosternal intercoxal process); *AND* pronotal anterior and posterior beads complete and broad medially; front tarsus of females with basitarsus moderately laterally expanded (Fig. 36); stylomere 2 of ovipositor doubled distally (Fig. 37); range southwestern United States south into northern South America . . . . . genus *Stenomorphus* Dejean, p. 46

Body not elongate, narrow and cylindrical, *OR* if so shaped, pronotum not as above; stylomere not doubled distally 4

4 (3) Ligular sclerite with 2 long and 2 short distal ventral setae; range Burma . . . . . genus *Prakasha* Andrewes, p. 52

Ligular sclerite with only 2 (both long) distal ventral setae 5

5 (4) Clypeus with apex deeply, broadly emarginate and labral base visible in emargination (Figs. 5-7) 6

Clypeus with apex not deeply emarginate as above 8

6 (5) Range New World; stylomere 2 of ovipositor lacking extra setae . . . . . genus *Amblygnathus* Dejean, p. 44

Range Old World; stylomere 2 of ovipositor with or without extra setae . . 7

7 (6) Frontal fovea small, continued to or nearly to eye by clypeo-ocular prolongation (Fig. 6); elytral intervals 8 to 10 and apices of other intervals with dense setae, at approximately 24X appearance of yellowish to whitish pubescence; all portions of all elytral intervals with dense setigerous or non-setigerous punctures; body length approximately 9 to 13 mm; pronotal posterior angle little evident, broadly rounded (Fig. 18); range Burma and India . . . . . (in part) genus *Kareya* Andrewes, p. 33

Frontal fovea small, lacking clypeo-ocular prolongation (Fig. 7); elytral intervals 8 to 10 and apices of other intervals with setae shorter and less dense, at approximately 24X not with appearance of yellowish or whitish pubescence; body length approximately 7 to 10 mm; pronotal posterior angle evident, acute to obtuse (Fig. 19); range Oriental and Neotropical Regions ..... (in part) genus *Dioryche* MacLeay, p. 34

8 (5) Mentum with 2 moderately long setae (medially located in most specimens) (Fig. 9); apex of ligular sclerite with or without setae on dorsum; body form various 9

Mentum with or without setae; apex of ligular sclerite with setae on dorsum; body form sub-terete; range Neotropical Region ..... genus *Trichopselaphus* Chaudoir, p. 45

9 (8) Fifth elytral interval with row of 2 or more setigerous punctures on disc (in some species punctures on fifth interneur) 13

Fifth elytral interval lacking 2 or more setigerous punctures on disc 10

10 (9) Apex of ligular sclerite with approximately 6 dorsal setae; frontal fovea punctiform and with clypeo-ocular prolongation; range Ethiopian portions of Africa ..... (in part) genus *Afromizonus* Basilewsky, p. 32

Apex of ligular sclerite lacking dorsal setae; frontal fovea various 11

11 (10) Elytral interneurs with prominent non-setigerous punctures along entire length; pronotal anterior bead complete medially in many species; elytral intervals moderately convex in apical 1/3; range Ethiopian Region ..... (in part) genus *Xenodochus* Andrewes, p. 51

Elytral interneurs lacking prominent non-setigerous punctures; pronotal anterior bead not complete medially; elytral intervals convex or not .. 12

12 (11) Range South West Africa; third elytral interval with approximately 8 moderately large setigerous punctures on disc; mentum (on careful examination) with slight median tooth; microsculpture of elytra prominent and isodiametric ..... genus *Phyrometus* Basilewsky, p. 50

Range Neotropical and Nearctic Regions; setigerous punctures of third elytral interval various; microsculpture of elytra various ..... (in part) subgenus *Selenophorus* Dejean, genus *Selenophorus*, p. 38

13 (9) Apex of ligular sclerite with approximately 6 dorsal setae; frontal fovea punctiform and with clypeo-ocular prolongation; range Ethiopian portions of Africa ..... (in part) genus *Afromizonus* Basilewsky, p. 32

Apex of ligular sclerite lacking dorsal setae; frontal fovea various 14

14 (13) Elytral interneurs with prominent non-setigerous punctures along entire length *AND* range Ethiopian and Oriental Regions ..... (in part) genus *Xenodochus* Andrewes, p. 51

Elytral interneurs lacking prominent non-setigerous punctures *OR* range Nearctic and Neotropical Regions 15

15 (14) Frontal fovea with clypeo-ocular prolongation (Fig. 11); range Ethiopian Region ..... (in part) subgenus *Siopelus* Murray (genus *Siopelus*), p. 27

Frontal fovea lacking clypeo-ocular prolongation (Fig. 4); range Ethiopian, Nearctic or Neotropical Region 16

16 (15) Range Ethiopian Region; most females with proximal peg-like seta ventrally on stylomere 2 of ovipositor (Fig. 34) .... (in part) subgenus *Siopelus* Murray (genus *Siopelus*), p. 27

Range Nearctic and/or Neotropical Regions; stylomere 2 of ovipositor lacking such a proximal peg-like ventral setae 17

17 (16) Front tibia with 6 or more stout spines on outer margin near apex; pronotum with posterior angle broadly rounded and disc more or less markedly convex (Fig. 13); middle tibia of male bowed or not; abdominal sternum 6 of females with apex bearing median thickened or plate-like (Fig. 31) area; range southwestern United States, Mexico and Jamaica .... (in part) genus *Discoderus* LeConte, p. 47

Front tibia with 5 or fewer stout spines on outer margin near apex; pronotum various; middle tibia of males not bowed; abdominal sternum 6 of females with (Fig 31) or without (Fig. 32) apex thickened or plate-like medially; range Nearctic and/or Neotropical Regions 18

18 (17) Pronotum cordate shaped and with posterior angle broadly rounded (Fig. 14) *AND* elytral scutellar interneurs absent *AND* some of setigerous punctures on elytral intervals 3, 5, and 7 not situated in or confluent with interneurs 2, 5, and 7 respectively; abdominal sternum 6 of females with apex bearing median thickened or plate-like area (Fig. 31); range southwestern United States and Mexico .... *D. cordicollis* of genus *Discoderus* LeConte, p. 47

Pronotal shape not as above *OR* elytral scutellar interneurs present *OR* elytral setigerous punctures not as above; abdominal sternum 6 of females with apex not thickened or plate-like medially (Fig. 32); range Nearctic and/or Neotropical Regions 19

19 (18) Apex of prosternal intercoxal process with or without slight to prominent lateral margin along at least sides (if such margin lacking, median lobe of male genitalia with apical disc and with large spine extended distally from near proximal end of ostium); pronotum not cordate shaped; fine short setae present on elytral intervals 9; all elytral interneurs present .... subgenus *Celiamorphus* Casey (genus *Selenophorus*), p. 41

Apex of prosternal intercoxal process lacking lateral margins; median lobe of male genitalia lacking large spine extended distally from near proximal end of ostium; pronotal shape various; elytral intervals 9 with or without setae; all elytral interneurs present or not; body length approximately 4.5 to 11 mm ... subgenus *Selenophorus* Dejean, (genus *Selenophorus*), p. 38

Key D

At least inner elytral intervals (approximately 1 to 7) lacking pubescence; third elytral interval at most with 1 or 2 setigerous punctures in approximately posterior 1/3 to 1/5.

1 Frontal fovea an elongate deep pit near epistomal suture and with a complete deep sulcus prolonged or not onto clypeus and with clypeo-ocular prolongation extended to eye and deep groove extended from junction of eye to base of mandible (Fig. 1); *AND* prosternum glabrous medially; *AND* body cylindrical in form; *AND* pronotal anterior bead flattened but complete medially; range Palaearctic and Oriental Regions ..... (in part) genus *Oxycentrus* Chaudoir, p. 56

Combination of characters not as above 2

2 (1) Clypeo-ocular prolongation deep, continued as deep furrow around mesal edge of eye (Fig. 3); *AND* abdominal sterna 4 to 6 glabrous except for ambulatory setae; *AND* mentum with moderate to prominent median tooth; range Australian, Oriental and Palaearctic Regions, and country of Ethiopia ..... subgenus *Bellogenus* Clarke (genus *Trichotichnus*), p. 69

Combination of characters not as above 3

3 (2) Elytral interneurs with prominent non-setigerous punctures along entire length; *AND* at least median portion of elytral intervals 1 to 7 lacking dense non-setigerous punctures; *AND* range Ethiopian and Oriental Regions ..... (in part) genus *Xenodochus* Andrewes, p. 51

Elytral interneurs lacking dense non-setigerous punctures; *OR* median portions of elytral intervals 1 to 7 with dense non-setigerous punctures; *OR* range in New World 4

4 (3) Mentum with median tooth (Fig. 8) 7

Mentum lacking median tooth (Fig. 9) 5

5 (4) Elytral intervals with dense non-setigerous punctures; range Ethiopian Region ..... (in part) subgenus *Axinotoma* Dejean (genus *Axinotoma*), p. 59

Elytral intervals lacking dense non-setigerous punctures 6

6 (5) Elytra bicolored with outer intervals and in many specimens bases and apices of all intervals yellowish to yellowish brown in color and inner intervals medially a darker reddish brown color; frontal fovea deep, prominent, crescent shaped and continued as clypeo-ocular prolongation to eye; range Oriental Region ..... genus *Liodaptus* Bates, p. 61

Elytra unicolorous reddish brown; frontal fovea punctiform and with shallow, short clypeo-ocular prolongation; range South Africa ..... genus *Nothodaptus* Maindron, p. 62

7 (4) Elytral intervals 1 to 7 with dense non-setigerous punctures; range Ethiopian or Oriental Regions or Japan 8

Elytral intervals 1 to 7 lacking dense non-setigerous punctures 10

8 (7) Frontal fovea with moderately prominent clypeo-ocular prolongation (Fig. 2) ; *AND* abdominal sterna with pubescence (other than ambulatory setae) re-

stricted to median portions of sterna 2, 3, and in some species 4; *AND* range Japan

. . . . (in part) subgenus *Trichotichnus* Morawitz (genus *Trichotichnus*), p. 67

Frontal fovea with or without clypeo-ocular prolongation (Figs 2, 4); abdominal sterna with pubescence as above or more extensive; range other than Japan . 9

9 (8) Pronotum large relative to elytra and transverse in shape and with posterior angle various in shape (Fig. 39); mentum with or without median tooth; range Ethiopian Region . . . . . (in part) subgenus *Axinotoma* Dejean (genus *Axinotoma*), p. 59

Pronotum small relative to elytra and cordate in shape and with posterior angle prominent, nearly acute (Fig. 38); range Oriental Region . . . . . (in part) subgenus *Lampetes* Andrewes (genus *Axinotoma*), p. 60

10 (7) Prosternum glabrous medially 11

Prosternum pubescent medially 12

11 (10) Frontal fovea with clypeo-ocular prolongation complete to eye and moderate (Fig. 2); body length approximately 5 to 14 mm; range New Guinea, Oriental or Palaearctic Regions . . . . . (in part) subgenus *Trichotichnus* Morawitz (genus *Trichotichnus*), p. 67

Frontal fovea with clypeo-ocular prolongation absent or weak (Fig. 4), not reaching eye in most specimens; body length approximately 7 to 12 mm; range Mexico and extreme southeastern Texas . . . . . genus *Aztecarpalus* Ball, p. 63

12 (10) Abdominal sterna 4 to 6 completely covered with fine short setae (setae may be extremely fine and short, best discerned by rotating specimen under fixed light source at magnification of 12X or more) 13

Abdominal sterna 4 to 6 glabrous except for ambulatory setae . . . . . (in part) subgenus *Trichotichnus* Morawitz (genus *Trichotichnus*), p. 67

13 (12) Venter mottled in color (most evident on abdominal sterna) and with strongly contrasting yellowish and darker areas; apex of front tibia enlarged and with maximum width approximately 0.22 to 0.33 (or more) length of front tibia; range Philippines and Indo-Australian Archipelago . . . . . subgenus *Harpaloxenus* Schauberger (genus *Trichotichnus*), p. 66

Venter not mottled in color (some specimens with lateral edges of abdominal sterna lighter in color, but prominently lighter colored areas absent elsewhere); apex of front tibia not enlarged, maximum width less than approximately 0.2 length of front tibia; range Oriental Region . . . . . (in part) subgenus *Lampetes* Andrewes (genus *Axinotoma*), p. 60

Descriptions of Genera and Subgenera

genus *Parophonus* Ganglbauer
(Figs. 15, 16, 33, 34)

Parophonus Ganglbauer, 1892: 340, 345. Type species: *Carabus maculicornis* Duftschmid, 1812, designated by Jeannel, 1942: 625.

Hypolithus Dejean, November, 1829: 5, 166. Type species: *Carabus saponarius* Oliver, 1795, designated by Hope, 1838: 84. (*Hypolithus* Dejean, November, 1829 is a junior homonym of *Hypolithus* Eschscholtz, January, 1829. Workers have incorrectly used *Hypolithus* as the generic component of species names of taxa now in *Parophonus*).

Tachyophonus Tschitschérine, 1901: 235, 236. Type species: *Harpalus planicollis* Dejean, 1829, designated by Jeannel, 1942: 625.

Ophonomimus Schauberger, 1923: 72. Type species: *Harpalus hirsutulus* Dejean, 1829, by monotypy. NEW SYNONYMY.

Oesyperus Andrewes, 1923: 444. Type species: *Oesyperus unctulus* Andrewes, designated by Andrewes, 1939: 136. NEW SYNONYMY.

Hyparpalus Alluaud, 1930: 162. Type species: *Hypolithus tomentosus* Dejean, 1829, by original designation.

Pseudokareya Schauberger, 1933b: 77-78. (Invalid name, see discussion).

Heterohyparpalus Basilewsky, 1946: 252, 257. Type species: *Hypolithus integer* Péringuey, 1896, by original designation.

Paratheles Basilewsky, 1950: 115. Type species: *Ophonus tibialis* LaFerté-Sénectère, 1853, by original designation. NEW SYNONYMY.

Orphanixus Clarke, 1971b: 366. Type species: *Orphanixus gibbiensis* Clarke, 1971, by original designation.

Recognition. Adults of species other than *P. caffer*, *P. holosericeus*, *P. integer*, *P. lugubris*, *P. moestus* and *P. nossibianus* have dense pubescence on the elytral disc in both sexes. Males of these six species have lost the setae from the dense punctures on all or part of the elytral disc and are best identified by use of the key. Members of *Parophonus* differ from other pubescent bodied Old World taxa by having unmodified: clypeus; ligular sclerite; antennae; pronotal setation; eighth elytral intervals; and rows of elytral setigerous punctures on intervals 3, 5, and 7. They can be distinguished from the New World *Athrostictus* by their Old World geographical range.

Description. Body length 7 to 20 mm.

Color. Body yellowish brown to reddish brown or black and with darker reddish, reddish brown, brown, reddish black or black areas.

Dorsal Luster. Dull to iridescent.

Dorsal Microsculpture. Mesh obsolete to isodiametric on frons of head; obsolete irregular to regular and fine, slightly or completely transverse on pronotum and elytra.

Punctuation, Pubescence, and Setation. Frons of head and pronotum with dense, fine, short setae in many species. Elytra in males of *P. caffer*, *P. holosericeus*, *P. integer*, *P. lugubris*, *P. moestus* and *P. nossibianus* with dense, fine short setae on all of intervals 8 to 10 and on bases and apices of intervals 1 to 7, with or without

setae on median portions of intervals 1 to 7; all intervals in females of these species and specimens of both sexes of other species with dense, fine, short setae. Venter with dense, fine, short setae on prosternum and abdomen in all species and on other sclerites in many species. Dorsa of tarsi pubescent or not. Submentum in some species with 1 short seta laterad to long seta at each side. Elytral intervals 3 each with row of approximately 8 to 15 setigerous punctures from apex to near base, all or part of such punctures confluent with interneurs 2 in many species; intervals 5 each with row of approximately 8 to 15 setigerous punctures from apex to near base, most of such punctures not confluent with interneurs; intervals 7 each with row of approximately 4 to 12 setigerous punctures from apex to near base or to near midpoint of interval,most of such punctures not confluent with interneurs. Ovipositor, valvifers each with 1 or 2 distal lateral setae on venter; stylomeres 1 with or without setae; stylomeres 2 each with proximal short peg-like seta on venter (Fig. 34) in all species but *P. errensis*, in *P. gibbiensis* and *P. imitativus* with 1 or 2 proximal seta on dorsum, with 1 seta in scrobe of *P. saponarius* and 2 in scrobe of *P. biseriatus*, *P. edentatus*, *P. hirsutulus*, and *P. mendax*.

Head. Frontal foveae obsolete to punctiform, each with or without clypeo-ocular prolongation. Mentum with or without median tooth. Ligular sclerite in some species slightly expanded laterally at apex.

Thorax. Pronotum with anterior and posterior beads present medially in some specimens; anterior angles prominent or not.

Legs. Hind basitarsi each slightly shorter to slightly longer than 2 + 3.

Male genitalia. Median lobe with dorsal membranous area extended to basal bulb in all species but *P. lividus* and *P. vitalisi*; serrate latero-ventral carinae present in many species; ostium in many species covered with virga. Internal sac with varied armature, according to species, of large spines, hairs, scales, or enlarged microtrichia.

Discussion. The generic names *Heterohyparpalus*, *Hyparpalus*, *Ophonomimus*, *Orphanixus*, *Paratheles*, *Parophonus*, *Tachyophonus* and *Oesyperus* were proposed by workers who each studied harpalines of only part of the world. Jeannel (1942, 1948) and Antoine (1959) treated *Tachyophonus* as congeneric with *Parophonus sensu stricto* and regarded *Ophonomimus* as the name of a subgenus with three species characterized by lacking a mental tooth. De Miré (1976) treated *Orphanixus* as congeneric with *Parophonus sensu stricto*. I accept these treatments except that I rank *Ophonomimus* as congeneric with *Parophonus* since presence or absence of a mental tooth is too variable a feature for defining subgenera; among four specimens of *Tachyophonus planicollis* examined by me the mentum varies from edentate to possessing a moderate sized median tooth.

Hyparpalus is congeneric with *Parophonus* due to: females and most males of the former having dense fine short setae on all elytral intervals; and all of its species but *H. imitativus* having a proximal short seta on the venter of each stylomere 2 of the female ovipositor.

Heterohyparpalus was previously (Basilewsky, 1946, 1950) ranked as a genus because its two species have a short but distinct clypeo-ocular prolongation on each frontal fovea of the head, and its males have elytral pubescence limited to the outer two intervals. Antoine (1959) noted that clypeo-ocular prolongations vary interspecifically from absent to present in forms previously placed in *Parophonus sensu stricto*, *Tachyophonus*, and *Ophonomimus*. At least one Ethiopian Region species (*P. colmanti*) and at least nine from other faunal regions have slight to prominent

clypeo-ocular prolongations depending on the species; in some, prominence of the prolongations varies intraspecifically. Presence or absence of clypeo-ocular prolongations is not a stable character for defining former generic level taxa now treated as congeneric with *Parophonus*. The five males I saw of *Heterohyparpalus integer* have dense pubescence on elytral intervals 8 to 10 and on the bases and apices of intervals 1 to 7. They also have medially on intervals 1 to 7 very fine short setae, each originating from a puncture. The nine males I examined of *Heterohyparpalus caffer* have dense pubescence on intervals 8 to 10 and on the bases and apices of intervals 1 to 7, but lack pubescence medially on these first seven intervals. Females of both species have all intervals densely pubescent. Males probably secondarily lost part of the normal elytral vestiture, similar to loss of setae which probably occurred in male *P. holosericeus*, *P. lugubris*, *P. moestus* and *P. nossibianus*.

Specimens of the former *Laparhetes* (*Paratheles*) *tibialis* have all elytral intervals densely pubescent in both sexes. Among a series of 14 specimens at the Museum National d'Histoire, Paris, clypeo-ocular prolongations vary from absent to moderately deep and do not warrant separate generic status for this species. *Paratheles* is congeneric with *Parophonus* since its type species is *Ophonus tibialis*.

The single female I have seen (paraglossae lacking) of *Oesyperus unctulus* has a densely pubescent dorsum, a peg-like seta on the second stylomere of the ovipositor and lacks apomorphies suggesting that *Oesyperus* warrants generic status.

Schauberger (1933b) proposed the subgeneric name *Pseudokareya* for two species of *Ophonomimus*. Since he did not designate a type species, the name *Pseudokareya* is invalid according to Article 13b, page 15 of the International Code of Zoological Nomenclature.

Species Identification. Basilewsky (1950) provided keys to the Ethiopian species under their former generic names. A revision that includes all species is needed.

Geographical Distribution and Notes about Way of Life. The geographical distribution centers around the tropics of the Ethiopian Region and to lesser degrees around the Oriental tropics, and warm temperate areas of the Ethiopian and Palaearctic Regions. The 58 species occur in three faunal regions: 28 in the Ethiopian; 16 in the Oriental; and 14 in the Palaearctic. Except for being most abundant in tropical climates, the Ethiopian Region species do not show any common geographical patterns of restriction and extend in aggregate across much of Ethiopian Africa with: *P. holosericeus* present in Africa, Madagascar and the Comoro and Sechelles Islands; and *P. nossibianus*, *P. madecassus* and *P. pierroni* endemic to Madagascar. Many of the species in Africa have wide ranging geographical distributions. Most Palaearctic species are restricted to warm temperate areas adjacent to the Mediterranean Basin. Of the Oriental species, *P. javanus*, extends into the Indo-Australian Archipelago from Ceylon and India; *P. cyanellus* and *P. cyaneotinctus* extend from the mainland into the Indo-Australian Archipelago; *P. compositus* and *P. lividus* occur in India and Ceylon; and *P. formosanus* occurs in Formosa and the Ryukyu Islands. The other 10 Oriental species are restricted to mainland regions (Burma, India, Indochina, Malasia). There is little published information about habitat preferences. Basilewsky (1950: 94) stated that some Ethiopian species are restricted to xeric areas while others are not. Antoine (1959: 434) stated that adults of the four species found in Morocco occur in habitats with damp clay soil, appear with the first rains of October and, at least in the plains, disappear in summer.

Included Species (58): *P. antoinei* Schauberger, 1932 *; *P. attenuatus* Erichson, 1842 *; *P. axinotomoides* Basilewsky, 1968 *; *P. biseriatus* Lesne, 1896: *P. caffer* Boheman, 1848; *P. capensis* Dejean, 1831 *; *P. collaris* Putzeys, 1876 *; *P. colmanti* Burgeon, 1936 f*; *P. compositus* Walker, 1858; *P. conviva* Kolbe, 1897; *P. cyanellus* Bates, 1889; *P. cyaneotinctus* Bates, 1889 *; *P. dejeani* Csiki, 1932 f *; *P. deplanatus* Basilewsky, 1946 *; *P. dia* Reitter, 1900; *P. edentatus* Bates, 1892; *P. errerensis* Clarke, 1972 *; *P. escheri* Dejean, 1831; *P. formosanus* Jedlička, 1940 *; *P. gibbiensis* Clarke, 1971; *P. gojebensis* Clarke, 1971 *; *P. gracilis* Andrewes, 1931 f*; *P. hauseri* Schauberger, 1933 *; *P. hirsutulus* Dejean, 1829; *P. hispanus* Rambur, 1838 m *; *P. holosericeus* Dejean, 1829; *P. imitativus* Péringuey, 1908; *P. indicus* Andrewes, 1931; *P. integer* Péringuey, 1896; *P. interstitialis* Reitter, 1900 m *; *P. iridicolor* Landin, 1955 *; *P. javanus* Gory, 1833; *P. juvencus* Dejean, 1829; *P. laeviceps* Ménétriés, 1832 *; *P. lividus* Andrewes, 1923; *P. lugubris* Harold, 1880; *P. maculicornis* Duftschmid, 1812; *P. madecassus* Jeannel, 1948; *P. mendax* Rossi, 1790; *P. moestus* Putzeys, 1878; *P. nigripes* Burgeon, 1933; *P. nossibianus* Brancsik, 1893; *P. optivus* Péringuey, 1908 m *; *P. ovalipennis* Schauberger, 1932 *; *P. pierroni* Jeannel, 1948; *P. planicollis* Dejean, 1829; *P. planus* Andrewes, 1923 *; *P. pygmaeus* Andrewes, 1923 *; *P. saponarius* Olivier, 1795; *P. subtilis* Bates, 1892; *P. suturalis* Chaudoir, 1846; *P. tibialis* LaFerté-Sénectère, 1853; *P. tomentosus* Dejean, 1829; *P. ugandanus* Basilewsky, 1946; *P. unctulus* Andrewes, 1923 m *; *P. velutinus* Dejean, 1829; *P. vigil* Tschitschérine, 1901 f *; and *P. vitalisi* Andrewes, 1922.

genus *Pseudohyparpalus* Basilewsky

Pseudohyparpalus Basilewsky, 1946: 252, 257. Type species: *Ophonus angustipennis* Putzeys, 1876, by original designation.

Recognition. Adults are distinguished by the combination of: pronotum with 1 or more mid length setae at each angle; and elytra densely pubescent.

Description. Body with average general habitus; length approximately 5 to 11 mm.

Color. Body yellowish brown, reddish yellow, brown, reddish brown, reddish black to black; dorsum with or without color patterns, metallic coloration or metallic tinges.

Dorsal Luster. Dull to iridescent.

Dorsal Microsculpture. Mesh obsolete to isodiametric on frons of head; fine and transverse on pronotum; very fine and transverse on elytra.

Punctuation, Pubescence, and Setation. Frons of head and pronotum of most species with dense moderate sized punctures, each with short fine seta; such punctures less dense or absent in a few species; elytra of all species with dense moderate sized punctures, each with short fine seta. Venter with dense short fine setae, each situated in a small puncture. Submentum with 1 short seta laterad to the long seta at each side. Pronotum with 1 to 4 mid length setae (shorter than long setae at midpoint of each side and longer than short fine setae of pronotal general pubescence) at each anterior angle and 1 such seta at each posterior angle; such setae not each situated in prominent socket characteristic of long seta at mid point of each side of pronotum. Dorsa of tarsi with moderately dense short setae. Elytral intervals 3, 5, and 7 each with row of 7 to 15 setigerous punctures; many punctures confluent with interneurs 2 on each third interval but not confluent with interneurs on other intervals. Ovipositor, valvifers each with 1 to 5 distal setae on venter; styli, stylomeres 1 each

with 2 or 3 distal mesal setae on venter, stylomeres 2 each with 1 proximal short peg-like seta on venter and 1 proximal seta on dorsum.

Head. Frontal foveae punctiform to nearly absent, each with or without clypeo-ocular prolongation of varied length and depth. Mentum with moderate to prominent median tooth. Ligular sclerite expanded laterally at apex.

Thorax. Pronotum with posterior bead present medially in some specimens.

Legs. Hind basitarsi approximately 0.8 to 1.1 length of tarsomeres 2 + 3.

Male genitalia. Median lobe in many species with tip of apex expanded dorso-ventrally; dorsal membranous area very short to long and extended to basal bulb. Internal sac in most species with armature of enlarged microtrichia, spines, or scales.

Discussion. Species are characterized by dense elytral pubescence, mid length setae at anterior and posterior pronotal angles, and a short peg-like seta on the venter of each stylomere 2 of the female ovipositor.

Species Identification. Basilewsky (1950) provided a key to all species then known and (1956b) described *P. mossoensis.*

Geographical Distribution. The species are restricted to the Ethiopian Region; *P. elongatus* and *P. hova* are endemic to Madagascar; and *P. audens* occurs in Ethiopian Africa and the Comoro Islands. The remainder have an aggregate range embracing most or all of the Ethiopian portions of Africa. Several African species have large distributions.

Included Species (14): *P. angustipennis* Putzeys, 1876; *P. audens* Péringuey, 1878; *P. casperi* Kuntzen, 1919 *; *P. diasticus* Alluaud, 1926; *P. elongatus* Jeannel, 1948; *P. hova* Alluaud, 1917; *P. kolbei* Kuntzen, 1919 f *; *P. lamottei* Basilewsky, 1950 *; *P. luluensis* Burgeon, 1936 m *; *P. metalobus* Alluaud, 1926; *P. mossoensis* Basilewsky, 1956 *; *P. nindae* Burgeon, 1937; *P. parcepunctatus* Basilewsky, 1949 *; *P. puncticollis* Boheman, 1848.

genus *Pseudodiachipteryx* Burgeon
(Fig. 25)

Pseudodiachipteryx Burgeon, 1936: 277-278. Type species: *Pseudodiachipteryx expansipennis* Burgeon, 1936, by monotypy.

Recognition. The combination of dense pubescence on the elytral disc; modified distal portions of the elytra (Fig. 25); and the Old World geographical range distinguish the sole included species.

Description. Body length 9 to 10 mm.

Color. Body reddish black to black.

Dorsal Luster. Iridescent.

Dorsal Microsculpture. Mesh obsolete on frons of head and on pronotum; fine and transverse on elytra.

Punctuation, Pubescence, and Setation. Body with dense, fine short setae (somewhat longer on elytral margins), each originating in moderate sized puncture. Dorsum of tarsi with moderately dense short setae. Elytral intervals 3 each with row of 4 to 7 setigerous punctures from apex to near base, many punctures associated with interneurs 2; intervals 5 and in some specimens intervals 7 each with row of

4 to 7 setigerous punctures not associated with interneurs. Ovipositor, valvifers each with 2 distal setae on venter; stylomeres 1 each with 1 distal mesal seta on venter; stylomeres 2 each with 1 proximal short peg-like seta on venter and 1 proximal seta on dorsum.

Head. Frontal foveae punctiform, each with or without clypeo-ocular prolongation of varied length and depth. Antennae short; antennomeres sub-moniliform. Mentum with moderate median tooth. Ligular sclerite narrow; apex very slightly expanded laterally in some species.

Thorax. Pronotum with posterior bead present medially in some specimens.

Legs. Hind basitarsi approximately 0.8 to 0.9 length of tarsomeres 2 + 3.

Elytra. Distal portion modified (Fig. 25); posterior part of each elytron with intervals 7 and 8 fused into a single raised longitudinal ridge extended to suture and formed by dorsum of each disc sloped over prominent concave inflexion of distal portion of elytron; only interneurs 8 and 9 continued distally beyond transverse ridge and onto concave inflexion. Scutellar interneurs average. Intervals flat to convex.

Male genitalia. Median lobe with dorsal membranous area extended to basal bulb; distal half of venter with slight lateral carina at each side; basal bulb and parameres membranous but complete. Internal sac with armature.

Ovipositor. Valvifers moderately sclerotized.

Species Identification. Basilewsky (1950) redescribed the single species.

Geographical Distribution. The single included species has a wide distribution within Africa of the Ethiopian Region and occurs throughout tropical portions of the continent south into northern areas of South Africa.

Included Species (1): *P. expansipennis* Burgeon, 1936.

genus *Siopelus* Murray NEW STATUS
(Figs. 11, 17, 26)

Description. Body length 6.5 to 14 mm.

Color. Body reddish, reddish brown to reddish black or black, with yellowish areas in some specimens.

Dorsal Luster. Dull to iridescent.

Dorsal Microsculpture. Mesh obsolete, isodiametric, slightly transverse, or transverse.

Punctuation, Pubescence, and Setation. Dorsum with head in some species, pronotal base in all species, other pronotal areas in some species, and elytral intervals in most species with dense non-setigerous punctures. Moderately dense small punctures, each with short fine seta, on elytral intervals 8 or 9 to 10 and on most of venter. Submentum in most species with 1 short seta laterad to long seta at each side. Dorsum of tarsi with scattered to dense short fine setae. Elytral intervals 3 each with row of setigerous punctures; intervals 5 and 7 each with or without such punctures. Ovipositor, valvifers with or without distal setae on venter; stylomeres 1 each in most species with 1 to 3 setae on distal lateral margin of venter; stylomeres 2 each in most species of subgenus *Aulacoryssus* and most Ethiopian ones of subgenus *Siopelus* with a stout proximal peg-like seta on venter near margin of scrobe (Fig. 34); stylomeres 2 of Oriental species of subgenus *Siopelus* each with 1 seta in scrobe

near mid point by ventral edge; stylomeres 2 also in most Ethiopian species of both subgenera with 1 or 2 proximal setae on dorsum.

Head. Frontal foveae obsolete, punctiform, to large and basin like, each with or without clypeo-ocular prolongation of varied length and depth. Mentum with or without median tooth. Ligular sclerite slightly to moderately laterally expanded at apex in Oriental species.

Thorax. Pronotum with posterior bead present medially in some specimens.

Legs. Middle tarsi of some males not expanded laterally and not with ventral biseriate vestiture. Hind tarsi elongate in appearance; basitarsi approximately 0.8 to 1.1 length of tarsomeres 2 + 3.

Elytra. Scutellar interneurs short to average in length.

Male genitalia. Median lobe with dorsal membranous area various, extended to basal bulb in most species; ostium clearly deflected to left in *S. congoanus* and *S. pierri*, slightly deflected to left in *S. micans* and *S. venustulus*; ostium dorsal but shaft twisted to right in *S. fuscus*; ostium ventral in some species of subgenus *Aulacoryssus*. Internal sac with or without armature.

Ovipositor. Styli, in *S. harpaloides*, dorso-ventrally flattened and latero-medially expanded; unmodified in other species.

Discussion. Csiki (1932: 1217) treated *Harpaliscus* as a subgenus of *Trichotichnus*. However species of *Harpaliscus* differ by having a row of setigerous punctures on each third elytral interval. Their elytral intervals have moderately spaced to dense small non-setigerous punctures, as in many species of *Siopelus*, and *Harpaliscus* is congeneric with the subgenus *Siopelus*.

Liosepus was proposed (Basilewsky, 1950) as a subgenus of *Siopelus*, with *S. diatypoides*, characterized by deep, explanate pronotal lateral depressions and twisted median lobe of male genitalia. The pronotal lateral depressions are prominent but not to the degree asserted. Two male paratypes I examined did not have twisted median lobes. Possibly the description of the twisted median lobe was based on a non-type teneral male, at the Museum National d'Histoire Naturelle, Paris, with a dissected median lobe, collapsed and apically twisted, presumably artifacts due to the specimen being so teneral.

Noonan (1976) discussed nomenclatorial problems concerning *Parasiopelus* and showed that: *Parasiopelus* is the generic name of two species not belonging to the selenophorines; and the five species formerly placed (Basilewsky, 1950, 1951) in it are members of the subgenus *Siopelus*.

Neosiopelus was treated (Basilewsky, 1946, 1950, in generic keys) as separate from *Siopelus* because species of the former were well characterized by: (1) absence of clypeo-ocular prolongations on frontal fovea of head; (2) flat versus somewhat convex elytral intervals; (3) wider elytral interneurs; (4) more prominent setigerous punctures on elytral intervals 3 and 5; (5) dorsa of hind tarsi with less prominent pubescence than in front tarsi; and (6) mental tooth present or absent (versus absent or very weak in species of *Siopelus*). The last five characters actually vary inter- and to a lesser degree intraspecifically in both *Siopelus sensu stricto* and *Neosiopelus*. Clypeo-ocular prolongations vary interspecifically in *Parasiopelus* (*sensu* Basilewsky, 1950) and inter- and intraspecifically in other groups of Selenophori, from absent to present but short and shallow to present and long and deep. Absence of clypeo-ocular prolongations in species of the former *Neosiopelus* does not warrant separate generic status.

Parasiopelus sensu Basilewsky (1950) and *Africobatus* were formerly distinguished (generic keys in Basilewsky, 1950) from *Siopelus* and *Neosiopelus* by species of the former two groups lacking setigerous punctures on the fifth elytral intervals and having the tarsal dorsa glabrous. Species included in *Parasiopelus sensu* Basilewsky (1950) have fine short fine setae on the tarsal dorsa; these setae are merely less discernible than those of species in *Siopelus* and *Neosiopelus*. The two species of *Africobatus* have glabrous tarsal dorsa; tarsal dorsal pubescence varies interspecifically in other groups of selenophorines and is not a stable character for delimitation of genera and subgenera. The fifth elytral interval of species of *Parasiopelus sensu* Basilewsky (1950) and *Africobatus* lacks the row of setigerous punctures reported by Basilewsky for species of the other two groups. However, setigerous punctures of the fifth elytral interval of many species of *Siopelus sensu stricto* and *Neosiopelus* are reduced, possibly as a transition towards complete loss. A paratype I examined of *S. diatypoides* lacks setigerous punctures on the fifth interval. The row of setigerous punctures on the seventh elytral interval also varies. *Neosiopelus* was characterized (Basilewsky, 1950) by all species having a row of setigerous punctures on the seventh interval, but such a row was reported (Basilewsky, 1950) absent in *N. babaulti*, *N. jeanneli*, and *N. tschibindensis*. The paratype I examined of *N. jeanneli* has one setigerous puncture on the seventh interval of the left elytron and one on the right. Descriptions (Basilewsky,1950) of several species of *Neosiopelus* mention rows of setigerous punctures on the third and fifth intervals but not on the seventh. (Since other descriptions mention such punctures on the seventh interval, it is not clear if these species have them.)

Absence of rows of setigerous punctures from the fifth elytral interval of species of *Parasiopelus sensu* Basilewsky (1950) and *Africobatus* does not warrant separation of these species from those of *Siopelus sensu stricto* and *Neosiopelus*.

Hirpastolus was treated (Basilewsky, 1950 in generic keys) as separate from *Siopelus sensu stricto* and *Neosiopelus* on the basis of its specimens having the tarsal dorsa glabrous and the elytral intervals lacking dense non-setigerous punctures. These characters vary between other former genera here treated as congeneric with *Siopelus sensu lato*. The single female I saw of the sole included species of *Hirpastolus* lacks a proximal peg-like seta from the venter of the stylomere 2 of the ovipositor. Such a seta is characteristic of most other — but not all — species of *Siopelus sensu lato* and was probably lost in the former *Hirpastolus maynei* Basilewsky. This latter species agrees with my concept of the subgenus *Siopelus*. The name *Hirpastolus maynei* Basilewsky, 1947 is a junior secondary homonym of *Siopelus maynei* Burgeon, 1936 and is replaced by *S. neomaynei*, replacement name.

Previous (Basilewsky, 1950) distinction of *Orinophonus* from the above taxa on the basis of its two species having pubescent outer elytral intervals is not warranted. At least nine species of the other taxa have such intervals pubescent.

The former *Laparhetes alluaudi* and *L. gracilis* have pubescence limited to the outer elytral intervals and have a fine short seta on the stylomere 2 of the ovipositor in the position where most species of *Siopelus* have a stouter peg-like seta. I regard *Laparhetes sensu stricto* as consubgeneric with the subgenus *Siopelus*. The former subgenus *Paratheles* of *Laparhetes* is congeneric with *Parophonus* as discussed under that taxon.

Aulacoryssus was formerly treated as separate from the above taxa on the basis of its species having (Basilewsky, 1950) the elytral interval surfaces between the

non-setigerous punctures raised into longitudinal ridges in many species and also in many species having a low ridge on each side of the first approximately eight intervals. These characters vary considerably between species of the former *Aulacoryssus*. I here rank *Aulacoryssus* as a subgenus of *Siopelus* but note that a phylogenetic revision of all species of *Siopelus sensu lato* might show *Aulacoryssus* to be paraphyletic and thus not warranting subgeneric rank. Basilewsky (1975) treated *Pseudosiopelus* as congeneric with *Aulacoryssus*.

subgenus *Siopelus* Murray
(Figs. 11, 17,)

Siopelus Murray, 1859: 27. Type species: *Siopelus calabaricus* Murray, 1859, by monotypy.

Harpalidium Kolbe, 1883: 17. Type species: *Harpalidium punctiger* Kolbe, 1833, by monotypy.

Harpaliscus Bates, 1892: 340. Type species: *Harpaliscus birmanicus* Bates, by monotypy. NEW SYNONYMY.

Orinophonus Alluaud, 1917: 92. Type species: *Orinophonus kilimanus* Alluaud, 1917, designated by Basilewsky, 1946.

Laparhetes Jeannel, 1946: 159, 160. Type species: *Laparhetes alluaudi* Jeannel, 1948, by original designation and monotypy. NEW SYNONYMY.

Africobatus Basilewsky, 1946: 253, 257. Type species: *Hypolithus harpaloides* Guérin-Méneville, 1847, by original designation and monotypy.

Neosiopelus Basilewsky,1946: 253, 257. Type species: *Ophonus punctatellus* Reiche, 1847, by original designation and monotypy.

Hirpastolus Basilewsky, 1947: 202. Type species: *Hirpastolus maynei* Basilewsky, 1947, by original designation and monotypy. NEW SYNONYMY.

Haplocoleus Jeannel, 1948: 652, 654. Type species: *Harpalus micans* Klug, 1833, by original designation, and monotypy.

Liosepus Basilewsky, 1950: 174-177. Type species: *Siopelus diatypoides* Basilewsky, 1946, by original designation and monotypy.

Recognition. Members are best identified by use of the keys. Some males of *Parophonus* lack the dense elytral discal pubescence characteristic of *Parophonus* and may be difficult to distinguish from those of *Siopelus sensu stricto*. In doubtful cases it is helpful to read Basilewsky's (1950) descriptions of the six species noted in this paper under that genus as having males lacking such pubescence.

Description. Body length approximately 6.5 to 14 mm.

Punctuation, Pubescence, and Setation. Elytral intervals 3 each with row of dorsal setigerous punctures; intervals 5 and 7 with or without such punctures.

Species Identification. Basilewsky (1950) provided a key to Ethiopian Region species described before 1950. He treated some as *Siopelus* and others under generic names listed above in synonymy. See Basilewsky (1962, 1967, 1976) and Clarke (1973) for Ethiopian Region species described since 1950. Schauberger (1934) pro-

vided a key (under the generic name of *Harpaliscus*) to the Oriental species then known.

Geographical Distribution and Notes on Way of Life. This genus includes five Oriental species with an aggregate range from northern India and the Himalaya to southern China and 56 species endemic to the Ethiopian Region. Three of the Ethiopian species are endemic to Madagascar, and three occur on Madagascar and the Comoro Islands; the remainder occur in Africa. Many African species have large ranges and at least one, *P. melancholicus*, also occurs on the Arabian Peninsula (Basilewsky, 1950). Label data (Basilewsky 1950) for Ethiopian species indicate that: the aggregate range of the species is throughout most or all of the African portions of the Ethiopian Region; and most species occur at elevations below approximately 500 to 1000 meters, but a few species are restricted to mountains.

Included Species (61): *S. aethiopicus* Clarke, 1973 *; *S. alluaudi* Jeannel, 1948; *S. alticolus* Basilewsky, 1950 *; *S. amaroides* Basilewsky, 1967 *; *S. andrewesianus* Schauberger, 1934 m*; *S. angustatus* Dejean, 1829; *S. babaulti* Basilewsky, 1946; *S. basilewsky* Noonan, 1976 * (new name for *S. kilimanus*, Basilewsky 1962); *S. birmanicus* Bates, 1892; *S. brittoni* Basilewsky, 1946 *; *S. bunduki* Basilewsky, 1962 *; *S. calabaricus* Murray, 1859; *S. calathoides* Dejean, 1829 f*; *S. camerunensis* Basilewsky, 1948; *S.castaneus* Barker, 1922 m*; *S. charicus* basilewsky, 1947; *S.collarti* Basilewsky 1948 *; *S. congoanus* Burgeon, 1936; *S. connexus* Péringuey, 1896 *; *S. consobrinus* Dejean, 1829; *S. crassicornis* Burgeon, 1936; *S. cratericola* Basilewsky, 1962 *; *S. decorsei* Jeannel, 1948; *S. diatypoides* Basilewsky, 1946; *S. fletifer* Dejean, 1829; *S. fuscus* Dejean, 1829; *S. glabripennis* LaFerté-Sénectère, 1853; *S. gracilis* Harold, 1879; *S. hargreavesi* Basilewsky, 1948 *; *S. harpaloides* Guérin-Méneville, 1847; *S. hypsinomus* Alluaud, 1917; *S. iris* Alluaud, 1918; *S. jeanneli* Basilewsky, 1948; *S. kikuyu* Basilewsky, 1948; *S. kilimanus* Alluaud, 1917; *S. kivuensis* Basilewsky, 1948; *S. leleupi* Basilewsky, 1976 *; *S. lucens* Putzeys, 1878; *S. matsumari* Jedlička, 1948 *; *S. maynei* Burgeon, 1936; *S. melancholicus* Boheman, 1848; *S. micans* Klug, 1833; *S. micros* Jeannel, 1948 m*; *S. neomaynei* (replacement name for *Hirpastolus maynei* Basilewsky, 1947); *S. nimbanus* Basilewsky, 1950 *; *S. nyassicus* Basilewsky, 1948; *S. oldeanicus* Basilewsky, 1962 *; *S. patruelis* Péringuey, 1898 *; *S. pediobius* Alluaud, 1926; *S. punctatellus* Reiche, 1847; *S. punctulatus* Lutshnik, 1922 *; *S. punctiger* Kolbe, 1883; *S. quadraticollis* Putzeys, 1878; *S. radama* Alluaud, 1932 m*; *S. resplendens* Putzeys, 1876; *S. rubrosuturatus* Kuntzen, 1919 *; *S. stevensi* Schauberger, 1934; *S. tabularis* Basilewsky, 1948 m*; *S. tenuestriatus* Basilewsky, 1948; *S. tschibindensis* Burgeon, 1936 *; and *S. usambaranus* Basilewsky, 1948 *.

subgenus *Aulacoryssus* Alluaud NEW STATUS
(Fig. 26)

Aulacoryssus Alluaud, 1916: 63, 65-69. Type species: *Hypolithus aciculatus* Dejean, 1829, by original designation.

Pseudosiopelus Alluaud, 1916: 66, 68. Type species: *Hypolithus pulchellus* Dejean, 1829, designated by Jeannel, 1948: 652. NEW SYNONYMY.

Recognition. Members are distinguished by the modified elytral intervals and interneurs and the Old World range of the subgenus.

Description. Body length approximately 5 to 11 mm.

Head. Mentum with moderate median tooth.

Thorax. Pronotal posterior angles rounded or dentate.

Elytra with 2 to 4 prominent regular to irregular shaped non-setigerous punctures per interval width; interval surfaces between punctures raised in many species into longitudinal ridges (Fig. 26); in many species sides of approximately intervals 1 to 8 each with ridge and interneurs deep and prominent.

Ovipositor. Valvifers membranous to moderately sclerotized.

Discussion. The ventral position of the ostium in *S. pulchellus*, and *S. simplex* is an interesting feature reported only for these two species and for some lebiines (G.E. Ball, pers. comm.). The median lobe is not twisted in *S. pulchellus* or *S. simplex*, and the ostium's ventral position appears due to simple ventral migration. Such postulated migration is supported by presence in *S. natalicus* of a distal membranous area on the venter of the median lobe.

Species Identification. Basilewsky (1950) keyed out, as members of the former genus *Aulacoryssus*, the species known by then and (1956a, 1968b) described two additional species, and (1975) raised *S. pavonius* to species level status with *S. vermiculatus* Putzeys as a synonymn, and provided a key to distinguish between *S. pavonius*, *S. aciculatus*, and *S. persculptus*.

Geographical Distribution and Notes about Way of life. Eleven of the 12 species are endemic to the Ethiopian Region. One African species (see below) also occurs in the Cape Verde Islands of the Palaearctic Region. Label data in Basilewsky (1950) suggest that species occur throughout most of the Ethiopian portions of Africa but are most diverse in the tropics and at elevations below approximately 1500 m. Four species occur in Africa and on islands: *S. aciculatus* in the Cape Verde Islands and western Africa; *S. pavonius* in eastern Africa, Madagascar and the islands of Aldabra, Agalega, Amirantes, Coetivy, Comoros, Farquhar, Mautirius, Reunion, Rodrique, and Seychelles; *S. pulchellus*, widely distributed in Africa and present on Madagascar, and the islands of Aldabra, Cosmoledo, and Farquhar; and *S. simplex* present across central Africa and on Madagascar and Farquhar Island. The presence of four species on Africa and on islands suggests that adults fly readily. Two species, *S. exaratus* and *S. imerinae* are endemic to Madagascar, and six are known only from mainland Africa.

Included Species (12): *S. aciculatus* Dejean, 1829; *S. exaratus* Klug, 1833; *S. freyi* Basilewsky, 1956 *; *S. imerinae* Alluaud, 1916; *S. luteoapicalis* Burgeon, 1935; *S. natalicus* Péringuey, 1896; *S. pallidior* Burgeon, 1936; *S. pavonius* Gerstaecker, 1867 *; *S. persculptus* Basilewsky, 1968 *; *S. pulchellus* Dejean, 1829; *S. simplex* Putzeys, 1878; and *S. venustulus* Boheman, 1848.

genus *Harpathaumas* Basilewsky

Harpathaumas Basilewsky, 1947: 200. Type species: *Harpathaumas priscus* Basilewsky, 1947, by original designation and monotypy.

Recognition. The large antennae distinguish the sole included species.

Description. Body length approximately 15 mm.

Color. Body black. Legs black except: dark reddish brown in coxae of all legs and proximal approximately 1/2 of front and middle femora; and yellow in approximately distal 1/2 of front and middle femora and approximately distal 1/3 of hind femora. Palpi dark reddish brown except penultimate palpomeres yellowish at apices. Antennae with scapes yellowish in approximately basal 3/4 and reddish brown in distal 1/4; antennomeres 2 to 11 black.

Dorsal Luster. Slightly shiny.

Dorsal Microsculpture. Mesh obsolete on frons of head; on pronotum generally obsolete on disc and slight and irregular elsewhere; on elytra, weak, irregular and transverse to isodiametric.

Punctuation, Pubescence, and Setation. Dorsum with moderately dense and moderately large punctures, each with moderately thick and long seta. Prosternum with sparse setae of moderate size and length. Anterior margin of proepisterna with sparse setae of moderate length and thickness. Remainder of proepisterna and all of proepimera glabrous and impunctate. Mesosternum and mesepisterna with very sparse setae of moderate size. Metasternum with moderately dense setae of moderate size. Metepisterna with scattered setae of moderate size. Metepimera glabrous and impunctate. Antennomeres 4 to 11 entirely covered with fine short setae, lacking median longitudinal glabrous areas. Submentum with 1 short seta laterad to long seta at each side. Posterior margins of hind femora each with 2 long setae. Dorsa of tarsi with dense moderate sized and moderately long setae. Elytral intervals 3, 5, and 7 respectively each with approximately 12, 10, and 11 setigerous punctures (differentiated from general pubescence by larger setae) scattered across widths. Ovipositor, valvifers each with 3 distal setae on venter; stylomeres 1 each with 1 distal lateral setae on venter; stylomeres 2 each with 1 proximal seta on dorsum.

Head. Frontal foveae small, punctiform, each with clypeo-ocular prolongation complete to eye. Antennomeres 4 to 11 greatly enlarged and with maximum widths greater than maximum widths of apices of front tibiae (on right side of female holotype of *H. priscus*, maximum length and width of antennomere 4 = 0.81 mm and 0.49 mm respectively; maximum width of front tibial apex = 0.43 mm); antennomeres 1 and 2 normal in size; antennomeres 3 enlarged in approximately distal 2/3; antennae moderate in length (0.9 mm long on right side of female holotype of *H. priscus*) and extended past posterior margin of pronotum to approximately anterior 1/10 of elytra.

Thorax. Pronotum with sides almost evenly rounded from anterior to posterior angles except slightly straightened in approximately posterior 1/3; posterior bead flattened medially but complete; anterior angles acute and very prominent; posterior angles obtuse but prominent; lateral depressions prominent and wide even anteriorly, posteriorly much wider and extended mesally to posterior lateral impressions, such impressions elliptical continuations of lateral depressions; lateral margins, especially in posterior approximately 1/3, reflexed or raised upward.

Legs. Hind tarsi elongate (on female holotype of *H. priscus*, hind tarsi 3.03 mm long versus 3.8 mm length of hind tibia); basitarsi longer than tarsomeres 2 + 3 (on right side of female holotype of *H. priscus*, basitarsus = 1.1 mm, tarsomere 2 = 0.55 mm, tarsomere 3 = 0.40 mm).

Elytra. Humeral angles very broadly rounded and each with tooth. Scutellar inter-

neurs short. Subapical sinuations obsolete.

Male genitalia (from Basilewsky, 1950). Median lobe membranous at base. Parameres membranous.

Species Identification. Basilewsky (1950) keyed out this monobasic genus.

Geographical Distribution. This genus is known by the female holotype and a male allotype from Ethiopia.

Included Species (1): *H. priscus* Basilewsky, 1947 m*.

genus *Ophoniscus* Bates

Ophoniscus Bates, 1892: 337. Type species: *Ophoniscus iridulus* Bates, 1892, designated by Andrewes, 1939: 136.

Recognition. The dense elytral discal pubescence and the distal dorsal setae on the ligular sclerite distinguish members of this genus.

Description. Body length approximately 8 to 10 mm.

Color. Body reddish black to black.

Dorsal Luster. Dull.

Dorsal Microsculpture. Mesh obsolete to isodiametric on frons of head; obsolete, irregular to regular and transverse or slightly transverse on pronotum and elytra.

Punctuation, Pubescence, and Setation. Frons (of head) and pronotum with dense, fine, short setae in many species. Elytra and venter with dense, fine short setae. Dorsa of tarsi with dense setae in most species. Submentum in some species with 1 short outer seta at each side. Ligular sclerite with 4 distal dorsal setae. Intervals 3 each with row of 8 to 14 setigerous punctures from apex to near base, all or part of punctures confluent with interneur 2 in many species; intervals 5 each with row of 8 to 15 setigerous punctures from apex to near base, most not confluent with interneurs; intervals 7 each with row of 4 to 12 setigerous punctures from apex to near base or to near midpoint of intervals, most not confluent with interneurs. Ovipositor, valvifers each with 1 to 5 distal ventral setae; stylomeres 1 each with 1 or 2 distal lateral setae on venter; stylomeres 2 each with 1 proximal seta on dorsum.

Head. Frontal foveae punctiform, shallow, with or without clypeal-ocular prolongations. Mentum with small medial tooth.

Legs. Hind basitarsi approximately 0.8 length of tarsomeres 2 + 3.

Male genitalia. Median lobe with dorsal membranous area narrowed but extended to basal bulb; ostium deflected to left in *O. iridulus*. Internal sac lacking armature.

Ovipositor. Valvifers moderately sclerotized, with membranous distal, lateral and mesal margins.

Discussion. I now regard as incorrect my former (1976) placement of *Ophoniscus* as a subgenus of *Parophonus*. While species of both have pubescent dorsa, those of *Ophoniscus* are distinguished by lack in females of a short seta on the ventral side of stylomere 2 of the ovipositor and by having 4 distal dorsal setae on the ligular sclerite.

Species Identification. Indentification is only possible by use of original descriptions and comparisons with types.

Geographical Distribution. The three species have an aggregate range of Burma, India, and Indochina.

Included Species (3): *O. cribifrons* Bates, 1892 *; *O. iridulus* Bates, 1892; and *O. hypolithoides* Bates, 1892 *.

genus *Afromizonus* Basilewsky

Afromizonus Basilewsky, 1947: 204. Type species: *Afromizonus tecospilus* Basilewsky, 1947, by original designation.

Recognition. Members can be recognized by the combination of: elytral disc lacking pubescence; elytral intervals 3 each with row of 3 or more setigerous punctures; ligular sclerite with dorsal setae; and geographical distribution in the Ethiopian Region.

Description. Body length approximately 5 to 8 mm.

Color. Body yellowish to brown or reddish brown.

Dorsal Luster. Dull to slightly shiny.

Dorsal Microsculpture. Mesh obsolete on frons of head; transverse on pronotum and elytra.

Punctuation, Pubescence, and Setation. Frons of head impunctate. Small moderately dense punctures, each with fine short seta, present on pronotal base and lateral margins, elytra intervals 8 to 10, bases and apices of elytral intervals 1 to 7, and venter of body. Dorsa of tarsi with or without scattered setae. Ligular sclerite with 6 distal dorsal setae. Elytral intervals 3 each with row of 2 to 6 small setigerous punctures, many adjacent to interneur 2; intervals 5 to 7 each with row of 2 to 6 small setigerous punctures. Ovipositor, valvifers each with 3 distal setae on venter; stylomeres 1 each with 3 distal lateral setae on venter; stylomeres 2 each with 2 or 3 setae in scrobe.

Head. Frontal foveae punctiform, each with short clypeo-ocular prolongation. Mentum lacking tooth. Ligular sclerite in some species laterally expanded at apex.

Thorax. Pronotum with posterior bead complete but flattened medially.

Legs. Hind basitarsi approximately 0.8 length of tarsomeres 2 + 3.

Elytra. Humeri each with prominent outward projected tooth. Scutellar interneurs elongate, joined distally to interneurs 1. Intervals flat.

Male genitalia. Median lobe with dorsal membranous area narrowed proximally but extended to basal bulb.

Species Indentification. Basilewsky (1950) provided a key to species.

Geographical Distribution. The three species are restricted to tropical and warm temperate portions of Africa in the Ethiopian Region.

Included Species (3): *A. ruber* Basilewsky, 1950 *; *A. tecospilus* Basilewsky, 1947; and *A. voltae* Basilewsky, 1946.

genus *Kareya* Andrewes

(Figs. 6, 18)

Kareya Andrewes, 1919: 473. Type species: *Platymetopus erebia* Bates, 1892, by original designation.

Recognition. *Kareya*, *Dioryche* and *Amblygnathus* are the only genera whose species have the clypeus with apex deeply, broadly emarginate and labral base visible in the emargination (Figs. 5, 6, 7). *Amblygnathus* species occur in the New World while those of the other two genera occur in the Old. Species of *Kareya* are distinguished from those of *Dioryche* by the combination of: frontal foveae small, each continued to or nearly to eye by clypeo-ocular prolongation (Fig. 6); dense setae on elytral intervals 8 to 10 and apices of other intervals (or on all of elytra) giving appearance at approximately 24X of yellowish to whitish pubescence; and pronotal posterior angles little evident, broadly rounded.

Description. Body length approximately 9 to 13 mm.

Color. Body reddish black to black. Appendages same or lighter in color.

Dorsal Luster. Dull to slightly shiny.

Dorsal Microsculpture. Mesh isodiametric to transverse on frons of head and on pronotum; transverse on elytra.

Punctuation, Pubescence, and Setation. Dorsum of head impunctate. Pronotum with punctures of varied sizes posteriorly and in narrow band adjacent to each lateral bead, many of such punctures each with short fine seta. Elytra, in *K. erebia* all intervals with dense prominent punctures, each with 1 seta; in other species all intervals with such dense prominent punctures but many or all of punctures on median portions of intervals 1 to 8 without setae. Small punctures, each with fine short setae on prosternum (except medially), prosternal intercoxal process and anterior margin of proepisterna. Moderate sized punctures, each with fine short seta, on mesosternum, mesepisterna, mesepimera, metasternum laterally, metepisterna, abdominal sterna 2 to 3 medially, and abdominal sterna 3 to 5 or 3 to 6. Dorsa of tarsi with short setae. Submentum with 1 short seta laterad to long seta at each side. Posterior margins of hind femora each with 2 long setae. Elytral intervals 3 each with row of 8 to 12 setigerous punctures, mostly confluent with interneur 2; intervals 5 and 7 each with row of 8 to 15 setigerous punctures scattered across width. Ovipositor, valvifers each with 2 to 3 distal ventral setae; stylomeres 1 each with 2 distal lateral ventral setae; stylomeres 2 lacking extra setae.

Head. (dorsum, Fig. 6) Labrum with apex deeply, broadly emarginate medially. Clypeus with apex deeply, broadly emarginate and labral base visible in emargination. Frontal foveae small, each continued to or nearly to eye by clypeo-ocular prolongation. Genae moderately wide. Mentum lacking tooth in *K. erebia*; specimens of other species with or without slight to moderate median tooth.

Thorax. Pronotum (Fig. 18) with posterior angles obtusely or broadly rounded.

Legs. Hind basitarsi approximately 0.9 length of tarsomeres 2 + 3.

Elytra. Scutellar interneurs moderately long.

Male genitalia. Median lobe lacking apical disc; dorsal membranous area rapidly narrowed proximally but extended to basal bulb. Internal sac lacking armature.

Discussion. Csiki (1932: 1210) treated *Kareya* as a subgenus of *Trichotichnus*. However species of *Kareya* differ by their prominent clypeal emarginations, rows of

setigerous punctures on elytral intervals 3, 5,and 7 and extensive elytral punctuation and pubescence.

Species Identification. Identification is only possible by use of original descriptions and comparisons with types.

Geographical Distribution The four species occur in Burma and India, with *K. erebia* also recorded from Hong Kong.

Included Species (4): *K. erebia* Bates, 1892; *K. grandiceps* Bates, 1892 *; *K. major* Bates, 1891; and *K. sublaevis* Bates, 1891.

genus *Dioryche* W.S. MacLeay

(Figs. 7, 19)

Dioryche W.S. MacLeay, 1825: 21-22. Type species: *Harpalus (Dioryche) torta* MacLeay, 1825, by monotypy.

Hypodioryche Schauberger, 1935: 93. Type species: *Platymetopus cavernosa* Putzeys, 1875, by original designation.

Recognition. See notes under genus *Kareya*

Description. Body length approximately 7 to 10 mm.

Color. Body reddish brown, reddish black, black. Appendages partly or completely lighter in color than body.

Dorsal Luster. With or without slight metallic tinges.

Dorsal Microsculpture. Mesh isodiametric and prominent to obsolete on frons of head; isodiametric and prominent to average, slightly or completely transverse or obsolete on pronotum; slightly transverse, average to prominent on elytra.

Punctuation. Pubescence, and Setation. Punctures, each with short fine seta, distributed as follows: moderate sized, nearly confluent on pronotum posteriorly; small to moderate sized and moderately dense on pronotal and elytral lateral margins; small, sparse to moderately dense on pronotal disc; very small, moderately dense on venter. Elytral intervals 1 to 7 or 8 with very fine to moderate sized punctures, sparse to moderately dense, each with or without short and very fine to short seta. Dorsa of tarsi with moderately dense fine short setae. Elytral intervals 3, 5, and 7 each with row of 9 to 15 setigerous punctures, mostly adjacent to interneurs 2, 5, and 7 respectively and small to large and prominent according to species. Ovipositor, valvifers each with 2 to 3 distal ventral setae; stylomeres 1 each with 2 or 3 distal lateral setae on venter; stylomeres 2 each with 1 or 2 proximal dorsal setae.

Head. (dorsum, Fig. 7) Clypeal apex deeply emarginate. Frontal foveae very small, punctiform, lacking clypeo-ocular prolongations. Mentum lacking tooth. Thorax. Pronotum (Fig. 19) with posterior angles acute to obtuse.

Legs. Hind basitarsi approximately 0.7 to 1.0 length of tarsomeres 2 + 3.

Elytra. Scutellar interneurs absent to moderately long. Intervals 3, 5, and 7 apically varied from not much wider to much wider than 2, 4, and 8; when much wider, all intervals apically flat to slightly convex and intervals 5 each sloped towards interneur 5 due to lateral longitudinal depression; if not to slightly wider, then all intervals apically slightly to moderately convex. Subapical sinuations moderately prominent.

Male genitalia. Median lobe in some species with knob like apical disc; dorsal

membranous area rapidly narrowed proximally or not, extended to basal bulb. Internal sac with 2 to 9 enlarged spines.

Discussion. Schauberger (1935) proposed *Hypodioryche* as a subgenus for seven species characterized by three features of the elytral apices: intervals 3, 5, and 7 much wider than 2, 4, and 8; intervals 5 each sloped towards interneur 5 due to lateral longitudinal depression; and all intervals flat. These features vary among the seven species Schauberger placed in *Hypodioryche*, and specimens of some of these seven species have intervals 3, 5, and 7 slightly to moderately wider than 2, 4, and 8 at the apex. Therefore, I regard *Hypodioryche* as consubgeneric with the type species of *Dioryche*.

Species Identification. Andrewes (1933) provided a key to the 11 forms found in India and Burma. A revision of all 13 forms is needed.

Geographical Distribution. The 13 species are restricted to the Oriental Region and primarily centered in Burma, India and Indochina. Five species (*D. chinnada*, *D. colombensis*, *D. nagpurensis*, *D. sericea*, *D. torta*) occur on the mainland and in Ceylon, and two species (*D. cavernosa* and *D. torta*) extend from the mainland into the Indo-Australian Archipelago; the other species are restricted to the mainland.

Included Species (13): *D. cavernosa* Putzeys, 1875; *D. chinnada* Andrewes, 1921; *D. clara* Andrewes, 1922; *D. colombensis* Nietner, 1857; *D. convexa* Andrewes, 1924 *; *D. indochinensis* Bates, 1889; *D. liparops* Andrewes, 1933 *; *D. longula* Bates, 1892 *; *D. melanauges* Andrewes, 1922; *D. nagpurensis* Bates, 1891; *D. sericea* Andrewes, 1922 *; *D. solida* Andrewes, 1933 *; and *D. torta* W.S. MacLeay, 1825.

genus *Athrostictus* Bates
(Fig. 20)

Athrostictus Bates, 1878: 592. Type species: *Athrostictus sericatus* Bates, 1878, designated by Noonan, 1976: 41.

Arthrostictus Rye, 1880: 33 (typographical error).

Recognition. Athrostictus and *Neoaulacoryssus* are the only New World genera whose species have the elytral disc pubescent. Members of *Athrostictus* lack the elongate deep, dense punctures and intervening irregular raised chains found on the elytral intervals of *Neoaulacoryssus*. Males of *A. dispar* have all elytral intervals densely punctate but lack setae in the punctures of approximately intervals 2 to 5. These males may key to subgenus *Selenophorus* and can be reliably identified to genus only by association with females.

Description. Body length approximately 6 to 15 mm.

Color. Varied from reddish brown to reddish black to black.

Dorsal Luster. Frons and glabrous portions of pronotum dull to shiny. Elytra (except approximately median portions of intervals 2 to 5 in male *A. dispar*) dull due to dense pubescence.

Dorsal Microsculpture. Mesh varied from isodiametric to fine transverse microlines, or irregular in form.

Punctuation, Pubescence, and Setation. Dense moderately sized setae on: sides and approximately posterior 1/4 of pronotum; all of pronotum in some species; all of

elytra in all species but *A. dispar* (in this species setae fine and short, present in females over all elytra; males with all intervals densely punctuate but punctures on median portions of approximately intervals 2 to 5 lacking setae). Moderately dense and moderately sized to fine and short setae (depending on species) present on: prosternum; anterior margin of proepisterna; metasternum; metepisterna; and abdominal sterna. Mesepisterna with or without setae. Dorsa of tarsi with moderately dense and moderate sized setae. Posterior margins of hind femora each with 2 long setae in most species. Elytral intervals 3, 5, and 7 each with row of setigerous punctures, all or part of such punctures in contact with interneurs 2, 5, and 7 respectively or not. Abdominal sternum 6 of some males lacking latero-medial pair of ambulatory setae. Ovipositor, valvifers each with 0 to 3 distal ventral setae; stylomeres 1 each with 0 to 3 distal lateral setae on venter.

Head. Frontal foveae punctiform, lacking clypeo-ocular prolongations. Eyes moderate in size and protrusion from head. Mentum lacking median tooth.

Thorax. Pronotum (Fig. 20) with sides evenly arcuate; posterior bead present medially in some species; anterior angles prominent in most species; posterior angles obtusely to broadly rounded.

Legs. Hind tarsi elongate in appearance; basitarsi in most species equal to or slightly longer than tarsomeres 2 + 3, in a few species approximately 0.98 length of tarsomeres 2 + 3.

Elytra. Scutellar interneurs absent to present.

Male genitalia. Median lobe with dorsal membranous area extended approximately 1/3 distance to basal bulb. Internal sac with varied armature.

Discussion. Van Emden (1953) stated that species of *Athrostictus* tend to grade into those of *Selenophorus*. However, I believe that *Athrostictus* should retain separate status unless a cladistic analysis of all species of both groups suggests otherwise. Specimens of *Athrostictus* are characterized by: all of elytra (except in *A. dispar*) with dense moderate sized setae; pronotum with sides arcuate, anterior angles prominent in most species, and posterior angles obtusely to broadly rounded.

Species Identification. Species can be identified only by recourse to original descriptions and types.

Geographical Distribution and Notes about Way of Life. Species occur in the tropics and subtropics of the Neotropical Region. One species, *A. iridescens*, occurs on the Caribbean island of Guadeloupe; the remainder are on the mainland. Field work on Carabidae in the Andes of Ecuador and Peru (19 October, 1977 through 7 April, 1978) indicated that members of genera *Athrostictus* and *Selenophorus* are absent from or uncommon in the higher and cooler regions. Adults of *Athrostictus* were not taken above 1880 m; those of *Selenophorus* occurred at elevations up to 2430 m but seem uncommon, relative to other Carabidae, above approximately 2000 m. Habitats with adults of the two genera ranged from mesic pastures and fields with mostly green grass and dry to moist soil to xeric areas with mesquite, scattered dry grass and dry soil. Adults were taken during the day beneath debris on the ground such as rocks and large boulders. In xeric areas adults were found only beneath large boulders and aggregated beneath some of these shelters. Ball (1977) noted that species of *Athrostictus* inhabit lowlands, are found in drier, open forests in Mexico, and some are "domestic." Adults of both genera have been taken at lights during the night by numerous collectors and appear to fly readily.

Included Species (16): *A. chlaenioides* Dejean, 1829; *A. gilvipes* van Emden, 1935; *A. iridescens* Chaudoir, 1843 m*; *A. luctuosus* Reiche, 1843 m*; *A. luridus* Reiche, 1843 *; *A. magus* Boheman, 1858 *; *A. metallicus* Reiche, 1843 *; *A. nobilis* Brullé, 1838 *; *A. opalescens* Bates, 1878 *; *A. paganus* Dejean, 1831; *A. puberulus* Dejean, 1829 m*; *A. pubipennis* Boheman, 1858 *; *A rufilabris* Dejean, 1829; *A. sericatus* Bates, 1878 *; *A. sulcatulus* Dejean, 1829 *; and *A. vicinus* Gory, 1833 *.

genus *Neoaulacoryssus* NEW GENUS
(Fig. 27)

Type species: *Selenophorus speciosus* Dejean, 1829: 117-118, here designated.

Diagnostic Features. The elongate deep, dense punctures and intervening irregular raised chains (Fig. 27) on the elytral intervals (chains most prominent on intervals 7 and 8) distinguish species of this genus from those of other New World genera. The lack of a mental tooth distinguishes species from those of subgenus *Aulacoryssus*, genus *Siopelus* of the Old World. Species of *Neoaulacoryssus* also differ from New World species other than some *Athrostictus*, *Discoderus*, and possibly *Selenophorus fatuus* (not seen by me; Casey, 1914, described many of its elytral setigerous punctures as not in contact with interneurs) by having most or all of the setigerous punctures on elytral intervals, 3, 5, and 7 not in contact with interneurs 2, 5, and 7 respectively.

Description. Body length approximately 12 to 18 mm.

Color. Dorsum unicolorous bronze, blackish bronze, or bicolored with head and pronotum coppery or dark green, and elytra green to dark green, bronze, or dark coppery. Venter and legs dark reddish brown to blackish brown. Palpi yellowish to dark brownish. Antennae, scapes yellowish; remainder predominately reddish brown.

Dorsal Luster. Dull when viewed by eye, slightly shiny when viewed by microscope.

Dorsal Microsculpture. Obsolete on middle of frons and pronotum; weak to irregular isodiametric mesh on edges of frons and pronotum; transverse mesh on elytra (not producing iridescence).

Punctuation, Pubescence, and Setation. Elytral intervals 1 to 8 or 9 with prominent elongate punctures; some areas between these punctures joined into irregular elevated chains (Fig. 27). Clypeus, frons, pronotum, and elytra with dense prominent punctures, each (except for those with longer setae on approximately anterior and posterior 1/4 of intervals 9 and 10) with an extremely fine, short seta. Short fine setae on: genae; prosternum; anterior margin of proepisterna; mesepisterna (irregularly scattered); metasternum; metepisterna; dorsa of tarsi; approximately anterior and posterior 1/4 of elytral intervals 9 and 10. Mentum with 1 seta at each side of emargination (Fig. 10). Posterior margins of hind femora each with 2 long setae. Elytral intervals 3, 5, and 7 each with row of setigerous punctures, most not contacting interneurs 2, 5, and 7 respectively. Abdominal sternum 6 of males lacking latero-medial pair of ambulatory setae. Ovipositor, valvifers each with 2 to 3 distal ventral setae.

Head. Frontal foveae punctiform, lacking clypeo-ocular prolongations. Mentum lacking tooth.

Thorax. Pronotum with sides convergent posteriorly and slightly to moderately but briefly sinuate anterior to posterior angles; anterior angles very prominent; posterior angles acute and dentate to slightly obtuse.

Elytra. Scutellar interneurs elongate, joined distally to interneurs 1 in many specimens. Regular interneurs and scutellar interneurs prominent, wide, deep. Subapical sinuations moderate.

Male genitalia. Median lobe with apex elongate; dorsal membranous area short, extended approximately 1/4 distance to basal bulb. Everted internal sac with proximal field of spine like macrotrichia and distal smaller field of spine like macrotrichia.

Discussion. This genus has two South American forms: *N. cupripennis* Gory, 1833 and *N. speciosus* Dejean, 1829. They may be conspecific.

genus *Selenophorus* Dejean

Description. Body length approximately 4 to 11 mm.

Color. Varied.

Dorsal Luster. Graded from dull in species with microsculpture of prominent isodiametric mesh to iridescent in those with microsculpture of fine transverse micro-lines.

Microsculpture. Mesh graded from granulate and isodiametric to fine transverse micro-lines.

Punctuation, Pubescence, and Setation. Elytral intervals of some species of subgenus *Selenophorus* with non-setigerous punctures, varied from dense and prominent to scattered and small. Very fine and short setae on: genae and metepisterna; and in most species, anterior margin of proepisterna. Fine short setae present in most species on: margins and approximately posterior 1/4 of pronotum; elytral intervals 9 to 10 and apices of all intervals; on all but median portion of most elytral intervals in one species (not identified) seen from Brazil. Short setae on: prosternum; metasternum; and abdominal sterna. Posterior margins of hind femora each with 2 long setae in most species. Elytral intervals 3, 5, and 7 each with row of setigerous punctures on interneurs 2, 5, and 7 respectively except part or all of such punctures vestigial or absent in some species of subgenus *Selenophorus* and many such punctures not associated with interneurs in *S. fatuus*. Abdominal sternum 6 of many males lacking latero-medial pair of ambulatory setae. Ovipositor, valvifers each with 0 to 3 distal ventral setae; stylomeres 1 each with 0 to 3 distal lateral setae on venter.

Head. Frontal foveae punctiform, lacking clypeo-ocular prolongations. Mentum lacking median tooth.

Legs. Hind tarsi elongate in appearance; basitarsi in most species longer than or equal to tarsomeres 2 + 3, in a few species as short as approximately 0.9 length tarsomeres 2 + 3.

Elytra. Scutellar interneurs graded from absent to present and moderately long. Interneurs in a few species of nominate subgenus shallow and with coarse punctures.

Male genitalia. Median lobe with apical disc in some species; dorsal membranous area varied in length, not extended to basal bulb in most species; ostium deflected to right in few species of nominate subgenus. Internal sac with varied armature or not.

subgenus *Selenophorus* Dejean

Selenophorus Dejean, 1829: 4, 80. Type species: *Carabus palliatus* Fabricius, 1798, designated by Hope, 1838: 84.

Gynandropus Dejean, 1831: 810, 817. Type species: *Gynandropus americanus* Dejean, 1831 (= *G. hylacis* Say, 1823), by monotypy. NEW SYNONYMY.

Hemisopalus Casey, 1914: 134, 135. Type species: *Selenophorus opalinus* LeConte, 1863, by original designation.

Recognition. Members are best identified by use of the keys. Note the comments under genus *Discoderus* and also those for male *A. dispar* under genus *Athrostictus*.

Description. Body length approximately 4 to 11 mm.

Color. Varied.

Dorsal Luster. Graded from dull in species with prominent isodiametric mesh to iridescent in those with microsculpture of fine transverse micro-lines.

Thorax. Pronotal shape various.

Legs. Front and middle tarsi (or just front tarsi) of females of some species with tarsomeres 1 laterally expanded and with ventral vestiture of thick setae, partially so modified in some other species, not so modified in most species.

Elytra. Scutellar interneurs graded from absent to present and moderate in length.

Male genitalia. Median lobe with apical disc present in some species. Internal sac lacking armature.

Discussion. Gynandropus has previously been a separate genus on the basis of (Ball, 1960, 1963, 1968): pronotum cordate; elytron lacking scutellar interneur; and females with front basitarsi broadened laterally and bearing dense ventral vestiture of thick setae. George E. Ball (pers. comm.) has stated that Mexican members might also be characterized by an iridescent dorsum due to a microsculpture of fine micro-lines. However, Ball (1977) expressed doubts that *Gynandropus* is generically different from *Selenophorus* because the key character of the expanded front basitarsi of females is not constant. Examination of undescribed Mexican and South American forms shows that: pronota grade from cordate to non-cordate; scutellar interneurs grade from absent to present and moderate in length; female front (and middle in some specimens) basitarsi grade from unmodified to modified; and the luster of the elytra grades from iridescent to only slightly shiny in conjunction with gradation of microsculpture from transverse micro-lines to isodiametric mesh. For example, I have seen specimens from Peru of an apparently undescribed species in which: females have modified front tarsi, and both sexes have non-cordate pronota, prominent scutellar interneurs, and an isodiametric mesh on the elytron. Some Mexican species, on close inspection, have a weak iridescence and a weak isodiametric mesh on the elytra. *Gynandropus* is not definable by morphological features other than perhaps small body size. It seems best placed in subgenus *Selenophorus*, similar to placement by Noonan (1973) in subgenus *Gynandrotarsus* (genus *Anisodactylus*) of species whose females have unmodified, partially modified, or completely modified front basitarsi.

Hemisopalus has had varied treatment: as a genus by Casey (1914); as a subgenus by Lindroth (1968); and as congeneric with *Selenophorus* by Noonan (1976). Lindroth (1968) noted the possibly distinguishing features of: pronotum broad, with quite rounded posterior angles; dorsum lacking metallic luster but elytra iridescent from microsculpture of dense micro-lines; median lobe lacking apical disc; and internal sac lacking armature. All of these features intergrade in a complex manner, independently in some subgroups and partially correlated in others. *Hemisopalus* is best regarded as congeneric with subgenus *Selenophorus* unless and until a revision and

reconstructed phylogeny for all species suggests other treatment.

The diversity and complex patterns of intergradation of morphological features of included species suggest that species are the result of a burst of radiation. *Selenophorus obscuricornis* Putzeys, 1878 is a junior secondary homonym of *Amblygnathus obscuricornis* Waterhouse, 1845 (also a member of subgenus *Selenophorus*) , and I propose the replacement name of *Selenophorus neobscuricornis* for Putzeys's species.

Species Identification. Darlington (1934) provided a key to species of the West Indies. Lindroth (1968) provided a key to 11 of the species found in the Nearctic Region. Reichardt (1976) included a key to the two species known from the Galapagos Islands. Identification of most other species is possible only by recourse to original descriptions and types; G. E. Ball is revising the species of Canada, the United States and Middle America.

Geographical Distribution and Notes about Way of Life. The subgeneric distribution is centered in the tropics and subtropics of the Neotropical Region, where 134 species occur; approximately 31 species occur in the Nearctic Region, and four of these reach southern Canada. Species are restricted to continents except for: 22 species endemic to islands in the Caribbean; *S. striatopunctatus* known from Middle America and islands of the Caribbean; *S. galapagoensis* and *S. obscuricornis* from the Galapagos Islands; *S. subaeneus* known from Panama, South America and the Caribbean Island of Guadeloupe; *S. pubifer* and *S. alternans* known from islands of the Caribbean and South America; and *S. pyritosus* known from Middle America and islands in the Caribbean. See under genus *Athrostictus* for notes on Andean *Selenophorus*. Ball (1977) noted that: species inhabit a wide variety of habitats, including forests from sea level to approximately 2500 m, and open habitats such as grassland and deserts; a few synanthropic species occur in tropical gardens, yards and under sidewalks; and species formerly considered *Gynandropus* occur in mesic lowland forests.

Included Species. (164): *S. abaxoides* Reiche, 1843 *; *S. actangulus* Putzeys, 1878 *; *S. aenopiceus* Casey, 1884; *S. aequinoctalis* Dejean, 1829; *S. affinis* Dejean, 1831 *; *S. agilis* Putzeys, 1878 *; *S. agonoides* Putzeys, 1878 *; *S. alternans* Dejean, 1829 *; *S. anceps* Dejean, 1831 *; *S. angulatus* Chaudoir, 1843 *; *S. antarcticus* Steinheil, 1869 *; *S. apicalis* Putzeys, 1878 *; *S. assimilis* Putzeys, 1878 *; *S. aureocupreus* Bates, 1891 *; *S. aurichalceus* Dejean, 1831 *; *S. barysomoides* Putzeys, 1878 m*; *S. batesi* Putzeys, 1878 f*; *S. beauvoisi* Dejean, 1829; *S. blanchardi* Manee, 1915 *; *S. blandus* Dejean, 1829; *S. bradycelloides* Bates, 1891 *; *S. brasiliensis* Chaudoir, 1837 *; *S. brevis* Putzeys, 1878 *; *S. callistichus* Bates, 1878 *; *S. cardinotus* Putzeys, 1878 *; *S. cayennensis* Fauvel, 1861 *; *S. chalceus* Putzeys, 1878 *; *S. chalcosomus* Reiche, 1843 m*; *S. chalybaeus* Dejean, 1829; *S. chiriquinus* Bates, 1882 *; *S. chryses* Bates, 1884 *; *S. cinctus* Putzeys, 1878 *; *S. circumfusus* Putzeys, 1878 *; *S. concinnus* Schaeffer, 1910; *S. confinis* Sahlberg, 1844 *; *S. coracinus* Dejean, 1831 *; *S. cordatus* Putzeys, 1878 *; *S. cupreolus* Casey, 1914 *; *S. cyaneopacus* Darlington, 1934 m*; *S. cyaneus* Putzeys, 1878 *; *S. cyclogonus* Putzeys, 1878 *; *S. depressulus* Casey, 1914 *; *S. dichromatus* Casey, 1914 *; *S. dilutipes* Putzeys, 1878; *S. discoderoides* Schaeffer, 1910 *; *S. dispar* Bates, 1891 *; *S. distinctus* Putzeys, 1878; *S. dives* Bates, 1884 *; *S. dorsalis* Kirsch, 1873 *; *S. dubis* Putzeys, 1878 *; *S. elongatus* LeConte, 1848 *; *S. emarginatus* Putzeys, 1878 *; *S. emdeni* Reichardt, 1976 *; *S. exilis* Dejean, 1831; *S. faldermani* Putzeys, 1878; *S. famulus* LeConte, 1814 *; *S. fatuus* LeConte,

1863; *S. flavilabris* Dejean, 1829; *S. flavipes* Putzeys, 1878 *; *S. foveatus* Putzeys, 1878 *; *S. foveolatus* Chaudoir, 1843 *; *S. fulvicornis* Putzeys, 1878 *; *S. gagatinus* Dejean, 1829; *S. galapagoensis* Waterhouse, 1845 *; *S. genuinus* Putzeys, 1878 *; *S. glabripennis* Putzeys, 1878 *; *S. guadeloupensis* Fleutiaux and Salle, 1889 *; *S. haitianus* Darlington,1934 *; *S. hepburni* Bates, 1884 *; *S. houstoni* Casey, 1914 *; *S. hylacis* Say, 1823; *S. implicans* Casey, 1914 *; *S. illustris* Putzeys, 1878 *; *S. intermedius* Putzeys, 1878 *; *S. irideus* Reiche, 1843 *; *S. irinus* Reiche, 1843; *S. lacordairei* Dejean, 1831 *; *S. laesus* LeConte, 1858 *; *S. laevicollis* Bates, 1884 *; *S. latior* Darlington, 1934 *; *S. limbolaris* Perty, 1830 *; *S. liodiscus* Putzeys, 1878 *; *S. lubricipes* Dejean, 1831 *; *S. lucidulus* Dejean, 1829 *; *S. lugubris* Putzeys, 1878 *; *S. macleayi* Kirby, 1837 *; *S. marginepilosus* Steinheil, 1869 m*; *S. maritimus* Casey, 1914 *; *S. mendicus* Putzeys, 1878 *; *S. mexicanus* Putzeys, 1878 *; *S. misellus* Putzeys, 1878 *; *S. modestus* Putzeys, 1878; *S. multiporus* Bates, 1884 *; *S. multipunctatus* Dejean, 1829 *; *S. mundus* Putzeys, 1878 *; *S. myrmidon* Dejean, 1831 *; *S. neobscuricornis* (replacement name for *S. obscuricornis* Putzeys, 1878, a junior secondary homonym of *Amblygnathus obscuricornis* Waterhouse, 1845); *S. nonseriatus* Darlington, 1934 *; *S. obscuricornis* Waterhouse, 1845 *; *S. obscurus* Putzeys, 1878 *; *S. obtusus* Dejean, 1829 *; *S. opacus* Putzeys, 1878 *; *S. opalinus* LeConte, 1863 *; *S. otiosus* Casey, 1914 *; *S. palliatus* Fabricius, 1798 *; *S. pampicola* Steinheil, 1869 *; *S. parilus* Casey, 1914 *; *S. parumpunctatus* Dejean, 1829 *; *S. parvus* Darlington, 1934 *; *S. pedicularis* Dejean, 1829 *; *S. perpolitus* Casey, 1884 *; *S. placidus* Putzeys, 1878 *; *S. planipennis* LeConte, 1848; *S. pleuriticus* Putzeys, 1878 m*; *S. poeciloides* Putzeys, 1878 m*; *S. promptus* Dejean, 1829 *; *S. propinguus* Putzeys, 1874 m*; *S. pubifer* Putzeys, 1878 *; *S. puertoricensis* Motschulsky, 1834 *; *S. pullus* Dejean, 1829 *; *S. puncticollis* Putzeys, 1878 *; *S. punctulatus* Putzeys,1878 *; *S. putzeysi* Csiki, 1932 *; *S. pyritosus* Dejean, 1829 *; *S. ramosi* Darlington, 1939 *; *S. riparius* Casey, 1914; *S. rodriguezi* Putzeys, 1878; *S. rufescens* Putzeys, 1878 *; *S. rugulosus* Putzeys, 1878; *S. sallei* Putzeys, 1878 *; *S. satyrus* Putzeys, 1878 *; *S. schaeferi* Csiki, 1829 *; *S. scolopaceus* Casey, 1914; *S. semirufus* Bates, 1882; *S. seriatoporus* Putzeys, 1878; *S. sinuaticollis* Notman, 1922 *; *S. sinatus* Gyllenhall, 1806 *; *S. solitarius* Darlington, 1934 *; *S. splendidus* Putzeys, 1878 *; *S. steinheili* Blackwelder, 1944 *; *S. striatopunctatus* Putzeys, 1878 f*; *S. suavis* Bates, 1884; *S. subaeneus* Reiche, 1843 *; *S. subcordatus* Putzeys, 1878 *; *S. subpunctatus* Reiche, 1843 *; *S. sulcatelus* Dejean, 1829; *S. subsinuatus* Putzeys, 1878 *; *S. tarsalis* Putzeys, 1878 *; *S. tesselatus* Putzeys, 1878 *; *S. thoracicus* Putzeys, 1878 *; *S. tibialis* Putzeys, 1878; *S. trepidus* Casey, 1924 *; *S. tubericaudus* Bates, 1884 *; *S. valgus* Bates, 1882 *; *S. variabilis* Curtis, 1839 m*; *S. variegatus* Dejean, 1831 *; *S. velutinus* Putzeys, 1878 *; *S. ventralis* Putzeys, 1878 *; *S. vicinus* Dejean, 1829 *; *S. vigilans* Casey, 1914 f*; *S. vilis* Putzeys, 1878 *. *S. xantholomus* Putzeys, 1878 *; and *S. yucatanus* Putzeys, 1878 *.

subgenus *Celiamorphus* Casey

Celiamorphus Casey, 1914: 134, 141. Type species: *Selenophorus ellipticus,* Dejean, 1829, designated by Lindroth, 1968: 828.

Recognition. Members are best identified by use of keys.

Description. Body stout; small in most species; length approximately 4 to 7 mm, except approximately 9 mm in *S. amaroides.*

Color. Dorsum reddish brown to black.

Dorsal Luster. Iridescent in *S. pusio, S. rufulus,* and an undescribed species; dull in other species examined.

Dorsal Microsculpture. Obsolete or a very fine transverse mesh in some species; in others isodiametric mesh, moderate to prominent or granulate.

Punctuation, Pubescence, and Setation. Fine short setae present on elytral intervals 9 and in some species also intervals 10, also present in most species along pronotal base. Dorsa of tarsi of most species glabrous or with 3 to 5 small setae per tarsomere (moderately dense setae present in *S. discopunctatus*). Ovipositor, valvifers each with 1 distal ventral seta; stylomeres 1 each with 1 distal lateral seta on venter.

Thorax. Pronotum not cordate. Apex of prosternal intercoxal process with slight to prominent margin along at least sides in all species except *S. ovalis,* and one undescribed species.

Male genitalia. Median lobe with apical disc in all species except *S. pusillus*; large spine extended distally from near proximal end of ostium, in some species completely or partly projected from ostium, except spine vestigial in *S. rufulus.*

Species Identification. Lindroth (1968) provided a key to two species found in the Nearctic Region. Darlington (1934) included *S. discopunctatus* in a key to *Selenophorus* of the West Indies. Identification of most other species is possible only by recourse to original descriptions and types; G. E. Ball is revising the species of Canada, the United States and Middle America.

Geographical Distribution and Notes about Way of Life. The geographical range of this subgenus centers around subtropical North America (Mexico and southern United States) and tropical South America, with *S. ellipticus* and *S. granarius* extending northward from Texas to southern Canada and Massachusetts respectively. Nine species occur in southern Canada, the United States or northern Mexico and seem primarily or totally Nearctic in distribution. Five Neotropical species occur in South America. *S. discopunctatus* occurs in Florida, Central and South America and on islands in the Caribbean. Species are not known from Central America but may well occur there.

Included Species (15): *S. amaroides* Dejean, 1829 f*; *S. adjunctus* Casey 1914 *; *S. contractus* Casey, 1914 *; *S. discopunctatus* Dejean, 1829; *S. ellipticus* Dejean, 1829; *S. fossulatus* Dejean, 1829 *; *S. granarius* Dejean, 1829 *; *S. municeps* Casey, 1924 *; *S. nanulus* Casey, 1914 *; *S. ovalis* Dejean, 1829; *S. pusillus* Putzeys, 1878; *S. pusio* Putzeys, 1878; *S. rufulus* Putzeys, 1878; *S. scitulus* Dejean, 1829; and *S. subtropicus* Casey, 1924 *. I have seen an additional three undescribed Mexican species from the Strickland Museum, University of Alberta.

genus *Neodiachipteryx* NEW GENUS

(Fig. 24)

Type species: *Selenophorus cariniger* Putzeys, 1878: 44, here designated.

Diagnostic Features. The single included species resembles the sole one of *Pseudodiachipteryx* by having the posterior portion of the seventh and eighth elytral

intervals joined into a raised longitudinal ridge extended from interval 8 to the suture and formed by the dorsum of the disc sloped over a prominent concave inflexion of the distal portion of the elytron (Fig. 24). It differs by: having the dorsum glabrous except for the usual fixed setae; lacking a mental tooth; having elytral interneurs 2 to 6 nearly obsolete; having the posterior portion of the elytra less concave laterally; and lacking extra setae on stylomere 2 of the ovipositor.

Description. Body length approximately 9 to 9.6 mm.

Color. Body reddish brown, with slight greenish tinge on pronotum and elytra. Appendages reddish yellow to reddish brown.

Dorsal Luster. Shiny.

Dorsal Microsculpture. Obsolete.

Punctuation, Pubescence, and Setation. Short fine setae on: genae; prosternum; anterior margin of proepisterna; metasternum; abdomen; and dorsa of tarsi. Mentum with 1 seta at each side of emargination. Submentum with 1 shorter seta mediad to the longer one at each side. Posterior margins of hind femora each with 2 long setae. Elytral intervals 3, 5, and 7 each with row of approximately 5 small setigerous punctures confluent with interneurs 2, 5, and 7 respectively. Abdominal sternum 6 of males lacking latero-medial pair of ambulatory setae. Ovipositor, valvifers each with 1 or 2 to 3 distal ventral setae; stylomeres 2 lacking extra setae.

Head. Eyes moderate in size. Frontal foveae punctiform, small, lacking clypeo-ocular prolongations. Mentum lacking tooth.

Thorax. Pronotum with sides arcuate; anterior angles moderate; posterior angles broadly rounded.

Legs. Hind tarsi slender and elongate in appearance; length of basitarsi approximately equal to length of tarsomeres 1 + 2.

Elytra. Distal portion modified (Fig. 24); posterior part of intervals 7 and 8 fused into a single raised longitudinal ridge extended to suture and formed by dorsum of each disc sloped over concave inflexion of distal portion of each elytron; only interneurs 8 and 9 continued distally beyond transverse ridge and onto concave inflexion. Scutellar interneurs average. Intervals 1 to 6 flat. Subapical sinuations moderate.

Male genitalia. Median lobe with apex asymmetrical; dorsal membranous area extended approximately 1/3 distance to basal bulb.

Discussion. Except for the modified elytra *N. cariniger* resembles a species of *Selenophorus*. The modified elytra clearly form a suite of apomorphic character states representing change in a feature (shape of outer portion of elytra) normally stable among members of the tribe Harpalini. The question is whether the species should be regarded as merely a *Selenophorus* with highly modified elytra or as the sole member of a separate genus.

Recognition by authors of genera, whether with one or with several species, is due to recognition of significant change in structures normally stable among species. Ranking of *N. cariniger* in a separate genus agrees with treatment of other monobasic genera of selenophorines. Adults of the species *Pseudodiachipteryx expansipennis* has elytra somewhat similar to those of *N. cariniger*, and workers have therefore traditionally accorded it generic rank. In this paper it receives such rank because of the change in a normally stable feature. Similarly, I have accepted previous recognition of genus *Harpathaumas* containing *H. priscus* with antennae greatly thickened, a striking change in the normally stable feature of relative antennal thickness. If change in a normally stable feature is ignored and *N. cariniger* left in

Selenophorus, then logic would require ignoring changes in features defining other genera and combining taxa of selenophorines into a single genus. That genus could then be combined with those of other carabids.

I have seen a male and female (both from the Museum of Comparative Zoology, Harvard University) of the single included species, *N. cariniger*, recorded (Csiki, 1932) from the island of Hispaniola. The species may be restricted to montane habitats. One specimen is labeled as taken at an elevation of 5,000 to 7,000 feet at or near La Visite in the La Selle Range. The other specimen is labeled as from Furcy, a montane locality above 1,000m in elevation (R. Henderson, pers. comm.). The two specimens had hind wings with reflexed apices; specimens seen by G. E. Ball were brachypterous (pers. comm.).

genus *Amblygnathus* Dejean
(Fig. 5)

Amblygnathus Dejean, 1829: 4, 62. Type species: *Amblygnathus cephalotes* Dejean, 1829, designated by Brullé, 1835: 10.

Recognition. This is the only selenophorine genus in the New World with clypeal apex deeply emarginate and exposing the labral base.

Description. Body length approximately 7 to 10 mm.

Color. Body and appendages black to yellowish brown.

Dorsal Luster. Shiny in most specimens; elytra iridescent.

Dorsal Microsculpture. Mesh varied, in most specimens obsolete or composed of fine microlines on elytra.

Punctuation, Pubescence, and Setation. Fine punctures, each with short fine seta, distributed as follows: approximately posterior 1/3 of pronotum with or without moderately dense punctures, most evident in posterior lateral impressions; sparsely present on anterior edges of proepisterna; moderately dense on prosternum, mesosternum, metasternum, metepisterna, and abdominal sterna; moderately dense on all or most of elytral intervals 8 to 10. Dorsa of tarsi with moderately dense fine short setae. Elytral intervals 3, 5, and 7 each with row of 9 to 15 setigerous punctures, mostly situated on interneurs 2, 5, and 7 respectively. Mentum with 1 seta at each side rather than in median. Posterior margins of hind femora each with 2 to 3 long setae. Ovipositor, valvifers each with 1 to 3 disal ventral setae; stylomeres 1 each with 1 or 2 distal lateral setae on venter; stylomeres 2 lacking extra setae.

Head. (dorsum, Fig. 5) Clypeus with apex broadly emarginate and labral base exposed in emargination. Frontal foveae varied from obsolete to moderately large and basin like. Mentum lacking tooth.

Legs. Hind basitarsi slightly shorter to slightly longer than tarsomeres 2 + 3.

Elytra. Scutellar interneurs short to long.

Male genitalia. Median lobe in some species with apical disc; dorsal membranous area short.

Species Identification. Recourse to types and original descriptions is necessary; G. E. Ball is revising the species.

Geographical Distribution and Notes about Way of Life. The species are centered in the Neotropical Region, but four occur in the Nearctic Region: *A. angulatus* in

Texas; and *A. delumbis*, *A. iripennis* and *A. subtinctus* in Florida. Species are restricted to the mainland except for *A. puncticollis*, *A. subquadratus* and *A. vitraci* known from Caribbean islands. Ball (1977) noted that Mexican species inhabit environs of *Sagittaria* and *Typha* marshes.

Included Species (15): *A. angulatus* Casey, 1914 *; *A. cephalotes*, Dejean, 1829; *A. corvinus* Dejean, 1829 *; *A. delumbis* Casey, 1914 *; *A. iripennis* Say, 1823 *; *A. janthinus* Dejean, 1829 *; *A. lucidus* Dejean, 1829 *; *A. mexicanus* Bates, 1882 *; *A. nigripennis* Bates, 1884 *; *A. puncticollis* Putzeys, 1878 *; *A. ruficollis* Putzeys, 1878 *; *A. subquadratus* Putzeys, 1878 *; *A. subtinctus* LeConte, 1866; *A. suturalis* Putzeys, 1846 *; *A. vitraci* Fleutiaux and Sallé, 1889.

genus *Trichopselaphus* Chaudoir

Trichopselaphus Chaudoir, 1843: 399. Type species: *Trichopselaphus subiridescens* Chaudoir, 1843, by monotypy.

Recognition. Members are characterized by pterostichoid, sub-cylindrical shaped bodies and by characters given in the keys.

Description. Body pterostichoid, sub-cylindrical in form; length approximately 7 to 13 mm.

Color. Dorsum black, bright metallic green, coppery, or purplish. Venter infuscated to black. Appendages reddish brown to black.

Dorsal Luster. Shiny or metallic in most specimens; pronotum and elytra slightly iridescent.

Dorsal microsculpture. Mesh on frons fine, isodiametric in females, slightly transverse in males; on elytra narrow, formed by transverse lines, generally finer in males than in females.

Punctuation, Pubescence, and Setation. Dorsum generally impunctate, glabrous except for usual fixed setae. Sparse setae on prosternum, metasternum and abdominal sterna. Mentum lacking medial setae in some species. Ligular sclerite setose dorsally at apex. Elytral intervals 3 each with 5 or more setigerous punctures confluent with interneur 2; intervals 5 and 7 each with or without setigerous punctures, when present such punctures confluent with interneurs 5 and 7 respectively. Ovipositor, valvifers each with 1 to several distal setae on venter; stylomeres 2 each with or without additional setae along length.

Head. Eyes small to large. Frontal foveae punctiform to basin like, lacking clypeo-ocular prolongations. Mentum lacking tooth. Ligular sclerite moderately to strongly expanded laterally at apex.

Thorax. Pronotum generally cordate; anterior angles slightly obtuse; posterior angles sub-rectangular.

Legs. Hind femora and tibiae normal or in males of *T. minor* and *T. subiridescens* femora each expanded with ventral projection and tibiae bowed slightly or markedly. Front tibiae thickened, with or without prolongation at outer apical angle. Middle tibiae unmodified or in *T. gloriosus* thickened, slightly bowed and more setose than usual. Middle tarsi of males not expanded laterally and not with ventral biseriate vestiture. Hind tarsi not elongate; basitarsi shorter than tarsomeres 2 + 3.

Elytra. Humeri prominent and toothed in some species. Scutellar interneurs short

to moderate in length. In some species interneurs deep and intervals markedly convex.

Hind wings. Reduced in *T. gloriosus*.

Male genitalia. Median lobe with apex short to long, with apical disc; dorsal membranous area extended to or near to basal bulb. Internal sac with armature various.

Ovipositor. Valvifers in some species short and broad apically and basally. In some species stylomeres 1 reduced but blade-like or palpiform.

Species Identification. Ball (1978) provided a key to the species and an excellent treatment of their zoogeography and probable evolutionary history. The above generic description is largely drawn from his paper.

Geographical Distribution and Notes about Way of Life. The six species have an aggregate range in the Neotropical Region from Uruguay northward to the edge of the tropics in eastern Mexico. Ecological data on *T. erwinorum* and *T. meyeri* suggest they occur in tropical forests (maximum elevations with specimens approximately 1700 and 850 m respectively), and the allotype of *T. meyeri* flew to light (Ball, 1978). There are no published observations of adults' mode of life, but Ball (1978) discussed morphological adaptations suggesting a burrowing mode of life.

Included Species. (6): *T. erwinorum* Ball, 1978 *; *T. gloriosus* Ball, 1978 *; *T. magnificus* Ball, 1978 *; *T. meyeri* Ball, 1978 *; *T. minor* Bates, 1882 *; and *T. subiridescens* Chaudoir, 1843.

genus *Stenomorphus* Dejean
(Figs. 36, 37)

Stenomorphus Dejean, 1831: 692, 696. Type species: *Stenomorphus angustatus* Dejean, 1831, by monotypy.

Agaosoma Ménétriés, 1843: 63. Type species: *Agaosoma californicum* Ménétriés, 1843, by monotypy.

Recognition. The cylindrical shaped body, elongate pronotum, absence of clypeo-ocular prolongations, complete pronotal anterior and posterior beads and lack of dense pubescence on the elytral disc identify members of this genus. Females of this genus are unique in having stylomeres 2 of the female ovipositor each doubled distally (Fig. 37).

Description. Body elongate, narrow, cylindrical; length approximately 9 to 18 mm.

Color. Body and appendages red, reddish brown, reddish black, or black.

Dorsal Luster. Dull.

Dorsal Microsculpture. Mesh on frons isodiametric laterally, isodiametric or transversely stretched medially; transverse on pronotum; weak and isodiametric on elytra.

Punctuation, Pubescence, and Setation. Fine short setae present: sparsely along pronotal margins; along elytral intervals 8 to 10 and bases and apices of other intervals. Moderate sized punctures, each with fine short seta, present on: prosternum; prosternal intercoxal process; proepisterna, except posteriorly; proepimera; mesosternum; mesepisterna; mesepimera; metasternum; metepisterna; and abdominal sterna 1 to 6. Dorsa of tarsi with moderate sized setae. Submentum with 1 short

seta laterad to long seta at each side. Ligular sclerite with several distal dorsal setae. Posterior margins of hind femora each with 2 long setae. Elytral intervals 3 and 5 each with row of 8 to 10 setigerous punctures, most or all of such punctures adjacent to or confluent with interneurs 2 and 5 respectively; intervals 7 each with or without 0 to 4 punctures, when present most or all of such punctures adjacent to or confluent with interneurs 7. Ovipositor, valvifers each with several setae of various sizes on venter; stylomeres 1 each with 4 distal lateral setae on venter; stylomeres 2 each with many setae of various sizes.

Head. Frontal foveae moderate in size and depth, lacking clypeo-ocular prolongations. Mandibles striate dorsally. Eyes small. Genae each with preocular sulcus for reception of antennal scape in repose and with portion of gena between eye and mouth margins broader than scape. Mentum lacking tooth.

Thorax. Pronotum narrow, elongate; distance from anterior margin of prosternum to anterior rim of front coxal cavity twice or more distance from latter point to tip of prosternal intercoxal process; anterior bead complete, flattened and strongly broadened medially; posterior bead complete, moderately broad; anterior and posterior angles well rounded.

Legs. Stout. Middle femora of males angulate or denticulate distally on posterior margins. Middle tarsi of males not laterally expanded and not with ventral biseriate vestiture. Front tarsi of females with basitarsi moderately laterally expanded and approximately twice as wide as tarsomeres 2 to 4 (Fig. 36).

Elytra. Scutellar interneurs long.

Male genitalia. Median lobe relatively small, slightly sclerotized; dorsal membranous area extended to basal bulb. Internal sac with enlarged microtrichia.

Ovipositor. Valvifers very lightly sclerotized; distal portions semi-membranous. Styli (Fig. 37), stylomeres 1 each with median projection on ventral side over base of stylomeres 2; stylomeres 2 each doubled distally.

Species Identification. Darlington (1936) provided a key to the nine species then known and (1937) described *S. cubanus*.

Geographical Distribution and Notes about Way of Life. The aggregate range of this genus is the southern southwestern United States south into northern South America, with *S. cubanus* present in Cuba and *S. manni* in Haiti. Approximately six species occur in the Neotropical Region, three in the Nearctic and at least one (*S. convexior*) in both faunal regions. Adults are common at lights at night and apparently fly readily. The cylindrical body form of adults suggests a burrowing mode of life.

Included Species (10): *S. alius* Darlington, 1936 *; *S. angustatus* Dejean, 1831 *; *S. brasiliensis* Darlington, 1936 *; *S. californicus* Ménétriés, 1843; *S. convexior* Notman, 1922; *S. cubanus* Darlington, 1937 *; *S. dentifemoratus* Chaudoir, 1844 *; *S. manni* Darlington, 1934 *; *S. pencillatus* Darlington, 1936 *; and *S. sinaloae* Darlington, 1936 f*.

genus *Discoderus* LeConte

(Figs. 13, 14, 31, 32)

Discoderus LeConte, 1853: 381. Type species: *Selenophorus parallelus* Haldeman, 1843, designated by Lindroth, 1968: 830.

Selenalius Casey, 1914: 135, 153. Type species: *Discoderus cordicollis* Horn, 1891, by original designation. NEW SYNONYMY.

Recognition. Some members of *Discoderus* and *Selenophorus sensu lato* occur together in the New World and have similar appearances. Most *Discoderus* have extra apical spines on the front tibiae and are more convex and cylindrical in body form than most *Selenophorus*. Female *Discoderus*, unlike those of *Selenophorus sensu lato*, share with females of *Anisocnemus* a median enlarged plate-like area (Fig. 31) on the apex of the sixth abdominal sternum. They lack the elongate pronotum characteristic of *Stenomorphus* and lack the modified front tibiae characteristic of *Anisocnemus*. Males are best identified by use of the keys.

Description. Body convex, subcylindrical; length approximately 6 to 11 mm.

Color. Dorsum and venter reddish brown to black. Appendages varied in color.

Dorsal Luster. Partially (elytra in most specimens) or completely with bluish or greenish tinges.

Dorsal Microsculpture. Mesh isodiametric except in a few species irregular or obsolete medially on frons and pronotal disc.

Punctuation, Pubescence, and Setation. Short setae present on: genae between mouth and eyes margins (very short and fine); pronotal lateral and posterior margins (sparse); prosternum; mesepisterna; metepisterna; metasternum; abdominal sterna; all of or approximately anterior and posterior 1/3 of elytral intervals 8; apices of all elytral intervals; and in most species dorsa of tarsi. Submentum in most species with 1 short seta laterad to long one at each side. Elytral intervals 3, 5, and 7 each with row of setigerous punctures situated on interneurs 2, 5, and 7 respectively, except in *D. cordicollis* some punctures removed from these interneurs. Abdominal sternum 6 of some males lacking medio-lateral pair of ambulatory setae. Ovipositor, valvifers each with 1 to 3 distal ventral setae; stylomeres 1 each ventrally with 1 to 3 distal lateral setae and in some species with additional setae situated more proximally.

Head. Frontal foveae punctiform, lacking clypeo-ocular prolongations. Mentum lacking median tooth.

Thorax. Pronotum (Figs. 13, 14) with sides convergent posteriorly; anterior angles moderate; posterior angles broadly rounded; posterior bead complete in some species.

Legs. Front tibia with 6 or more spines along outer distal margin except only 3 to 4 such spines in *D. cordicollis*. Middle tibiae of males or of both sexes bowed in some species. Front and middle tarsi of some males not laterally expanded and not with ventral biseriate vestiture.

Elytra. Scutellar interneurs absent in *D. cordicollis*. Subapical sinuations varied.

Abdomen. Apex of female sixth sternite with median plate-like area (Fig. 31) in most species, in a few species only thickened medially.

Male genitalia. Median lobe with moderate apex; dorsal membranous area varied from short to extended approximately 4/5 distance to basal bulb.

Discussion. Selenalius has had varied treatments, as congeneric with *Selenophorus* (Noonan, 1976), as a possible subgenus of *Selenophorus* (Ball, 1963, 1968; Lindroth, 1968), and as a separate genus (Casey, 1914). However, the apex of the sixth abdominal sternum of females of *D. cordicollis* has the apomorphic median plate characteristic of specimens of *Discoderus*. Reconstruction of the phylogeny of species of *Discoderus* may indicate subgeneric status for *Selenalius* since *D. cordicollis* is the only

species known to: lack elytral scutellar interneurs; have only three spines on the outer distal margin of each front tibia; and have part of the setigerous punctures on elytral intervals 3, 5 and 7 not situated in or confluent with interneurs 2, 5, and 7 respectively.

Species Identification. Recourse to original descriptions and types is necessary for identification; G. E. Ball is revising the species.

Geographical Distribution and Notes about Way of Life. Species are most abundant and diverse in warm temperate or subtropical, xeric to semi-xeric portions of Mexico and to a lesser degree in the southwestern United States; one species reaches southern Canada, and one is present in both Mexico and Jamaica. Approximately 23 species seem restricted to or predominately Nearctic in distribution while only three seem restricted to the Neotropical Region. At least two species occur in both faunal regions. *Discoderus beauvoisi* occurs both in Mexico and Jamaica; other species are restricted to the mainland. The genus apparently does not extend southward into Central or South America. Ball (1977) noted that *Discoderus* has species adapted to basically dry habitats, and ranges from upland oak forests in Chiapas, Mexico to the North American desert and grasslands, with one species reaching southern Canada. Adults are abundant at lights at night and apparently fly readily.

Included Species (28): *D. acinopoides* Bates, 1884 *; *D. aequalis* Casey, 1914; *D. amoenus* Casey, 1914; *D. arcuatus* Putzeys, 1878; *D. beauvoisi* Dejean, 1829; *D. congruens* Casey, 1914 *; *D. cordicollis* Horn, 1891; *D. crassicollis* Horn, 1891 *; *D. crassiusculus* Putzeys, 1878; *D. dallasensis* Casey, 1924 *; *D. difformipes* Bates, 1882; *D. dislocatus* Bates, 1891 *; *D. distortus* Bates, 1882; *D. impotens* LeConte, 1858; *D. melanthus* Bates, 1884 *; *D. obsidianus* Casey, 1914; *D. papagonus* Casey, 1924; *D. parallelus* Haldeman, 1843; *D. parilis* Casey, 1914 *;*D. peregrinus* Casey, 1924; *D. piger* Bates, 1882; *D. pinguis* Casey, 1914 *; *D. pulvinatus* Bates, 1884; *D. robustus* Horn, 1883; *D. subviolaceus* Casey, 1914; *D. symbolicus* Casey, 1914 *; *D. tenebrosus* LeConte, 1848 *; *D. texanus* Casey, 1924 *.

genus *Anisocnemus* Chaudoir
(Figs. 12, 28, 35)

Anisocnemus Chaudoir, 1843: 391. Type species: *Anisocnemus validus* Chaudoir, 1843, by monotypy.

Recognition. Members are identified by their front tibiae (Fig. 35), expanded and with outer distal margins crenulate.

Description. Body cylindrical; length approximately 13 to 16 mm.

Color. Body reddish brown, reddish black to black; elytra faintly bronze to black. Antennae, mouthparts, and legs reddish brown to reddish yellow.

Dorsal Luster. Moderate, shiny, faintly bronze.

Dorsal Microsculpture. Isodiametric mesh, except slightly transverse on elytra.

Punctuation, Pubescence, and Setation. Abdominal sterna 2 and 3 each with median patch of fine scattered setae, otherwise dorsum and venter of body impunctate and glabrous except for usual fixed setae. Dorsa of tarsi glabrous. Submentum with 1 short seta laterad to long seta at each side. Posterior margins of hind femora each

with 2 long setae. Elytral intervals 3 each with row of 5 to 16 setigerous punctures, most or all of such punctures adjacent to or confluent with interneurs 2; intervals 5 each with row of 5 to 6 setigerous punctures, most or all of such punctures adjacent to or confluent with interneur 5. Ovipositor, valvifers each with 3 to 5 distal setae on venter; stylomeres 1 each with 3 to 4 distal lateral setae on venter.

Head. Frontal foveae moderately deep, lacking clypeo-ocular prolongations. Antennae short, not extended to posterior margin of pronotum. Mandibles striate dorsally. Eyes small. Genae between eye and mouth margins each with faint preocular sulcus. Mentum with prominent lateral lobes; lacking tooth. Ligular sclerite with apex strongly expanded laterally.

Thorax. Pronotum transverse, markedly convex; sides rounded, sinuate or not posteriorly; anterior and posterior beads complete, very broadly flattened medially; anterior angles broadly rounded; posterior angles broadly obtuse to rectangular.

Legs. Stout. Front tibiae (Fig. 35) expanded (more so in males than in females); outer distal margins each crenulate. Middle tibiae distally moderately expanded laterally. Middle tarsi of some males not laterally expanded and not with ventral biseriate vestiture. Hind tarsi short, basitarsi shorter than tarsomeres 2 + 3.

Elytra. Convex. Humeri angulate. Scutellar interneurs short.

Abdomen. Apex of female sternum 6 thickened medially (Fig. 28).

Male genitalia. Median lobe with dorsal membranous area broad, extended almost to basal bulb; eversion point of internal sac mediad. Internal sac with two groups of ten spines visible laterally and ventrally.

Ovipositor. Valvifers lightly sclerotized. Stylomeres 1 each with projection medially over base of stylomere 2.

Species Identification. Shpeley and Ball (1978) characterized the two species.

Geographical Distribution and Notes about Way of Life. This genus is restricted to the Neotropical Region; *A. amblygonus* occurs in lowland tropics from Mazatlan, Mexico on the Pacific Coast to Colombia; and *A. validus* occurs in Venezuela (Shpeley and Ball, 1978). Shpeley and Ball (1978) provided information on habitats and way of life for *A. amblygonus*; adults were collected in Mexico at elevations between 0 and approximately 800 m; those few adults taken during the day were found on damp to saturated clay soil in palm forest, near roadside ditches, in meadows, either under debris or in burrows in the soil; the species' natural habitat is probably savanna or open areas in palm forests; adults apparently fly readily since most were collected at light; and adults appear to be adapted for a burrowing mode of life.

Included Species (2): *A. amblygonus* Shpeley and Ball, 1978; and *A. validus* Chaudoir, 1843 *.

genus *Phyrometus* Basilewsky

Phyrometus Basilewsky, 1946: 253, 257. Type species: *Phyrometus seriepunctatus* Basilewsky, 1946, by original designation and monotypy.

Recognition. Members are best identified by use of the keys.

Description. Body length approximately 7 mm.

Color. Head and pronotum shiny black except latter somewhat reddish black lat-

erally. Elytra bronzish black. Venter shiny black. Legs shiny brown except tibiae yellowish medially. Palpi yellowish brown. Antennae with antennomeres 1 and 2 yellowish and remainder brownish.

Dorsal Microsculpture. Mesh, on frons weak and isodiametric in female and obsolete in male; on pronotum isodiametric in female and in male obsolete medially and weak and isodiametric elsewhere; on elytra prominent and isodiametric.

Punctuation, Pubescence, and Setation. Frons glabrous and impunctate. Pronotum with very slight and weak scattered non-setigerous punctures in and around posterior lateral impressions, glabrous elsewhere. Prosternum and extreme anterior margin of proepisterna with scattered fine short setae. Metasternum with scattered short fine setae near coxae. Remainder of thoracic venter glabrous. Dorsa of tarsi glabrous. Abdominal sterna impunctate and glabrous except for: scattered fine short setae on sterna 2 and 3 beneath trochanters; and normal ambulatory setae. Posterior margins of hind femora each with 2 long setae. Elytra impunctate and glabrous except: intervals 3 each with approximately 8 moderately large setigerous punctures in row along middle and 1 smaller setigerous puncture against interneur 2; and intervals 8 with usual ocellate punctures. Ovipositor, valvifers each with or without 1 distal seta on venter.

Head. Frontal foveae punctiform, small, lacking clypeo-ocular prolongations. Mentum with slight median tooth.

Thorax. Pronotum with sides evenly rounded from anterior to posterior angles; anterior angles moderately prominent; posterior angles broadly rounded; lateral depressions obsolete; posterior lateral impressions slight.

Elytra. Humeral angles obtusely and broadly angulate. Subapical sinuations slight.

Male genitalia. Median lobe with apex moderate in length and width; dorsal membranous area short, extended approximately 1/5 distance to basal bulb. Inverted internal sac with approximately 10 spines.

Species Identification. Basilewsky (1950) provided a key to this monobasic genus.

Geographical Distribution. The single included species is known from South West Africa.

Included Species (1): *P. seriepunctatus* Basilewsky, 1946.

genus *Xenodochus* Andrewes

Xenodochus Andrewes, 1941: 317. Replacement name for *Xenodus*. Type species: *Xenodus dabreui* Andrewes, 1924, since Article 67 (i) of the International Code of Zoological Nomenclature states the replacement genus name must have the same type species as the original one.

Xenodus Andrewes, 1924: 92. Type species: *Xenodus dabreui* Andrewes, 1924, by monotypy. (*Xenodus* Andrewes, 1924, is a junior homonym of *Xenodus* Miller, 1892).

Afropangus Jeannel, 1946: 159, 161. Type species: *Selenophorus senegalensis* Dejean, 1829, by original designation.

Recognition. Members are best identified by use of the keys. The prominent non-

setigerous punctures along the elytral interneurs distinguish included species from those of most other supraspecific taxa in the Old World.

Description. Body length approximately 9 to 16 mm.

Color. Body reddish black to black.

Dorsal Luster. With or without greenish tinges.

Dorsal Microsculpture. Mesh, on frons isodiametric to obsolete; on pronotum transverse to obsolete; on elytra transversely isodiametric or obsolete.

Punctuation, Pubescence, and Setation. Non-setigerous punctures present on pronotal lateral and posterior regions and in some species also on disc. Very small punctures, each with or without short fine seta, present on elytral intervals 8 to 10 and in some species on bases and apices of other intervals. Moderately dense small punctures, each with fine short seta, present on venter in some species. Elytral interneurs with prominent non-setigerous punctures along entire length. Dorsa of tarsi with sparse to moderately dense short setae. Elytral intervals 3, 5, and 7 each with or without row of 4 to 10 setigerous punctures, small in most specimens. Ovipositor, valvifers each with 2 to 8 setae on venter; stylomeres 1 each with 2 distal mesal setae on venter; stylomeres 2 each with 1 to 4 proximal setae on dorsum, scrobes of *X. mediocris* each with 1 proximal seta near ventral margin.

Head. Frontal foveae punctiform to elliptical, each with clypeo-ocular prolongation complete to eye or not. Antennae short, stout, barely extended to pronotal base. Mandibles stout. Mentum lacking tooth. Ligular sclerite apex strongly to slightly emarginate and in many species moderately to strongly expanded laterally.

Thorax. Pronotum with anterior and posterior beads present in some species.

Legs. Hind basitarsi approximately 0.8 to 1.1 length of tarsomeres 2 + 3.

Male genitalia. Median lobe with dorsal membranous area broad, extended to basal bulb; in some species distal 1/2 to 1/3 of venter with serrate carina or approximately 3 rows of longitudinally stretched teeth on each side of median; venter between serrate carina or longitudinally stretched teeth normally to weakly sclerotized. Internal sac with 3 to 4 enlarged spines.

Ovipositor. Styli with broad scrobes.

Species Identification. Basilewsky (1950) provided a key to the seven species of the Ethiopian Region. A revision of all species is needed.

Geographical Distribution. This genus contains 6 species in the Ethiopian Region of Africa and one each in Ceylon, southern China, India, and Madagascar.

Included Species (10): *X. dabreui* Andrewes, 1924; *X. eichingeri* Jedlička, 1965 *; *X. exaratus* Dejean, 1829 f*; *X. mediocris* Andrewes, 1936; *X. melanarius* Boheman, 1848; *X. micans* Dejean, 1831; *X. nigerianus* Basilewsky, 1946; *X. penthicus* Jeannel, 1948 f*; *X. senegalensis* Dejean, 1829; *X. usambaranus* Basilewsky, 1948.

genus *Prakasha* Andrewes
(Fig. 29)

Prakasha Andrewes, 1919: 474. Type species: *Platymetopus* (?) [sic] *amariformis* Bates, 1892, by monotypy and original designation.

Recognition. The sole included species is the only selenophorine with four, rather

than two, distal ventral setae on the ligular sclerite.

Description. Body length approximately 8 mm.

Color. Body light reddish black. Appendages reddish yellow to reddish brown.

Dorsal Luster. Dull to slightly shiny.

Dorsal Microsculpture. Mesh, on frons of head reduced medially but elsewhere isodiametric; on pronotum transverse but reduced medially; on elytra transverse.

Punctuation, Pubescence, and Setation. Frons of head impunctate. Pronotum with moderately dense moderate sized punctures along base; lateral margins with very sparse and mostly small punctures; anterior margin with sparse small to moderate sized punctures; each pronotal puncture with very short fine seta. Dorsa of tarsomeres 1 to 3 with moderately dense short fine setae. Elytral intervals 9 and 10, lateral portions of 8, and extreme bases and apices of intervals 1 to 8 with moderately dense moderate size punctures, each with short fine seta. Ligular sclerite with 2 short distal ventral setae in addition to normal 2 long distal ventral ones. Elytral intervals 3, 5, and 7 each with row of 8 to 10 setigerous punctures, mostly associated with interneurs 2, 5, and 7 respectively. Ovipositor, valvifers each with 6 distal setae on venter; stylomeres 1 each with 3 distal lateral setae on venter; stylomeres 2 each with 1 long proximal seta on dorsum and with 1 long proximal seta near ventral margin of scrobe.

Head. Frontal foveae punctiform, each with clypeo-ocular prolongation to eye. Mentum lacking tooth.

Thorax. Pronotum wider than long in appearance; basal bead complete; anterior angles obtuse, not prominent; posterior angles prominent, subdentate; lateral depression obsolete.

Legs. Hind basitarsi approximately equal in length to tarsomeres 2 + 3.

Elytra. Scutellar interneurs elongate, joined or not distally with interneurs 1. Subapical sinuations moderate.

Abdomen. Apex of sternum 6 of females thickened medially (Fig. 29). Apex of tergum 8 of females angulate and thickened medially into plate-like disc similar to that of apex of sternum 6.

Male genitalia. Median lobe with dorsal membranous area narrowed proximally but extended to basal bulb; distal 1/2 of venter with median invagination of sclerotized venter, such invagination very deep and moderately wide distally, narrowed and shallower proximally until obsolete.

Ovipositor. Valvifers lightly sclerotized; distal lateral and mesal margins membranous.

Discussion. This genus contains *P. amariformis* Bates, 1892, from Burma. This species is characterized by the apomorphies of: ligular sclerite with 2 short distal ventral setae (in addition to 2 normal distal ventral long ones); ventral invagination on the median lobe of the male genitalia; apex of female abdominal sternum 6 thickened medially; and tergum 8 of female abdomen angulate and swollen medially into plate-like disc.

genus *Hyphaereon* W. S. MacLeay

Hyphaereon W. S. MacLeay, 1825: 22. Type species: *Harpalus (Hyphaereon) reflexus* W. S. MacLeay, 1825, by monotypy.

Calathomimus Bates, 1886: 77. Type species: *Calathomimus maculatus* Bates, 1886, designated by Andrewes, 1939: 131.

Coleolissus Bates, 1892: 338. Type species: *Hypolithus perlucens* Bates, 1878, designated by Andrewes, 1939: 132. NEW SYNONYMY.

Recognition. Adults are recognized by the combination of: body form not subcylindrical; inner elytral intervals lacking pubescence; third elytral interval with row of setigerous punctures; mentum with median tooth; mandibles elongate and in repose both with apices projected beyond apex of labrum; apex of clypeus not deeply emarginate medially and not exposing base of labrum; and frontal fovea not modified except for the clypeo-ocular prolongations present in some species. Some adults resemble those of genus *Trichotichnus* but are distinguished by having a row of setigerous punctures on each third interval of the elytra.

Description. Body length approximately 7 to 12 mm.

Dorsal Luster. Shiny or iridescent.

Dorsal Microsculpture. Mesh isodiametric to obsolete on frons of head; transverse and regular to slightly isodiametric, or obsolete on pronotum; very fine and transverse on elytra.

Punctuation, Pubescence, and Setation. Frons of head glabrous. Pronotum with or without moderately dense non-setigerous moderate size punctures in areas except median of disc. Venter with or without moderately dense to sparse small punctures, each with short fine seta. Dorsa of tarsi glabrous. Submentum of some specimens with 1 short seta laterad to long seta at each side. Elytral intervals 3 each with row of 3 to 8 setigerous punctures adjacent to or confluent with interneurs 2 and in some species with 1 to 2 small punctures not adjacent to such interneurs; intervals 5 and 7 lacking setigerous punctures in most species. Abdominal sternum 6 lacking lateromedial pair of ambulatory setae in both sexes of some species. Ovipositor, valvifers each with 1 to 3 distal lateral setae on venter; stylomeres 2 each with 1 stout seta on venter near mid point or just inside scrobe, in some species also with 1 seta on dorsum near midpoint and/or 1 or 2 setae in scrobe and/or 1 proximal moderate length seta on venter.

Head. Frontal foveae punctiform, each with or without clypeo-ocular prolongation. Mandibles moderately elongate; apices projected beyond labral apex in repose. Mentum with moderate median tooth.

Thorax. Pronotum with posterior angles very broadly rounded to prominent; lateral depressions in most species prominent and rapidly widened posteriorly.

Legs. Hind tarsi elongate; basitarsi approximately 0.9 to 1.2 length of tarsomeres 2 + 3.

Elytra. Humeri rounded to strongly angulate. Scutellar interneurs short to moderately long, joined distally to interneurs 1 in some species. Intervals 7 varied basally near humeri from flat to moderately convex, to carinate; other intervals medially slightly convex. Sutures each with prominent spine in some species.

Male genitalia. Median lobe with apical disc in some species; dorsal membranous areas moderately long, extended nearly to basal bulb. Internal sac with microtrichia, spines, or scales in many species.

Ovipositor. Styli elongate in some species.

Discussion. Members are characterized by the synapomorphy of mandibles elongate

and separated from adults of *Trichotichnus* by having a row of setigerous punctures on each third interval of the elytra.

Calathomimus was formerly a separate genus because its adults have angulate humeri and have elytral intervals 7 carinate basally near the humeri. Specimens of *H. reflexus* have the humeri slightly angulate and the seventh elytral intervals moderately convex basally near the humeri; elytral characters formerly used to distinguish *Calathomimus* are not as stable as previously believed and do not warrant separate status for it. Adults of *Calathomimus* share with those of *Hyphaereon* (as more restrictively defined before this paper) the apomorphies of: apex of sixth abdominal sternum of males with median emargination; and sixth abdominal sternum lacking latero-medial pair of ambulatory setae in both sexes of all species but *H. maculatus* (latero-medial pair present in females of this species).

Coleolissus was previously a separate genus with adults lacking these two apomorphies. I have seen males of *Coleolissus* species with slight emarginations of the apex of the sixth abdominal sternum. As noted above, at least one species of *Hyphaereon sensu stricto* has the normal complement of latero-medial pair of setae on the sixth abdominal sternum of females.

Species Identification. Darlington (1968) provided a key to the three New Guinea species. For other forms one must resort to original descriptions and to comparisons with type specimens.

Geographical Distribution and Notes about Way of Life. This genus has a large aggregate range extending from Ceylon and India and Burma onto the Indo-Australian Archipelago to New Guinea and extreme northern Australia and north eastward to the Ryukyu Islands near Formosa. Darlington (1968) noted that: specimens of *Hyphaereon* (as then defined) were taken in New Guinea at elevations from approximately 280 to 2300 m and those of the former *Coleolissus* at elevations from 150 to 250 m; his series of *H. levis* were probably taken among dead leaves and vegetation on the ground near water; the apparent abundance of *H. cordens* in the field and rarity in lights traps suggest its winged adults rarely fly; some specimens of *H. angulatus* were probably taken at lights; and one undetermined specimen of the former genus *Coleolissus* was collected by him on the Cape York Peninsula of Australia.

Included Species (25): *H. angulatus* Darlington, 1968 *; *H. azumai* Habu, 1973 *; *H. bicoloripes* Bates, 1892 f*; *H. celebensis* Louwerens, 1951 *; *H. consors* Bates, 1886 *; *H. cordens* Darlington, 1968; *H. drescheri* Andrewes, 1937; *H. eulamprus* Bates, 1892 *; *H. hornianus* Schauberger, 1938 *; *H. iris* Andrewes, 1924; *H. kalisi* Louwerens, 1952 f*; *H. lamprotus* Bates, 1892 *; *H. lautulus* Andrewes, 1929 *; *H. leveri* van Emden, 1937; *H. levis* Darlington, 1968 *; *H. limbatus* Andrewes, 1937 m*; *H. maculatus* Bates, 1886 m*; *H. nitens* Andrewes, 1933 *; *H. noeli* Andrewes, 1930 f*; *H. papua* Darlington, 1968 *; *H. perlucens* Bates, 1878 *; *H. reflexus* MacLeay, 1825; *H. timidus* Darlington, 1968; *H. viridellus* Bates, 1892 *; and *H. vittatus* Andrewes, 1926 *.

genus *Oxycentrus* Chaudoir
(Fig. 1)

Oxycentrus Chaudoir, 1854: 345. Type species: *Oxycentrus parallelus* Chaudoir, 1854, by monotypy.

Agreuter Schmidt-Goebel, 1846: plate 3, figure 2 on back cover. Type species: *Agreuter melas* Schmidt-Goebel, by monotypy (Since Schmidt-Goebel, 1846, illustrated *A. melas*, Habu, 1973, was incorrect to declare *Agreuter* a *nomen nudum*. *Agreuter* Schmidt-Goebel, 1846, is a junior homonym of *Agreuter* Lepeletier and Serville, 1828).

Oxycentropsis Schauberger, 1934: 89. Type Species: *Trichotichnus orinus* Andrewes, 1931, by original designation. NEW SYNONYMY.

Recognition. Species are characterized by the elongate deep pit like frontal foveae, each with clypeal prolongation (Fig. 1), cylindrical body form, and flattened but complete pronotal anterior bead.

Description. Body cylindrical in most species, subcylindrical in a few species; length approximately 7 to 12 mm.

Color. Body reddish black to dark red; appendages same as body or red to reddish yellow.

Dorsal Luster. Dull to slightly shiny.

Dorsal Microsculpture. Mesh obsolete on frons of head; obsolete or fine to very fine transverse mesh elsewhere.

Punctuation, Pubescence, and Setation. Dorsum of head impunctate. Pronotum in *O. rugifrons* nearly impunctate, in other species with dense non-setigerous punctures posteriorly, narrow row of such punctures along each lateral margin and the median longitudinal line. Venter in *O. rugifrons* nearly impunctate and glabrous except for usual ambulatory setae on abdominal sterna. In all species but *O. rugifrons*, moderate size punctures, each with 1 very short fine seta, present on lateral margins of prosternum, anterior margins of proepisterna, all of mesosternum and metepisterna, anterior portion of mesepisterna, and all of metasternum except median area. Small punctures, each with a short fine seta, present on areas beneath coxae and trochanters on abdominal sterna 2 to 3 in all species but *O. rugifrons*; some specimens of some species with fine short setae on all or most sterna. Dorsa of tarsi glabrous except for few very sparse and very short fine setae. Elytral intervals 3 each with 0 to 7 setigerous punctures confluent with interneur 2. Ovipositor, valvifers each with 2 or 3 distal setae on venter; stylomeres 1 each with 3 to 4 distal lateral setae on venter; stylomeres 2 each with 1 stout, short proximal seta on venter and in some species with 1 short proximal seta on dorsum.

Head. (dorsum, Fig. 1) Labrum and clypeus in some species with outer distal seta at each side of clypeus situated in depression and with or without ridge and groove on mesal side and with or without groove on lateral side. Frontal foveae each an elongate deep pit near epistomal suture and with a complete deep sulcus prolonged or not onto clypeus (in *O. rugifrons* foveae surrounded by deep, irregular wrinkles); clypeo-ocular prolongations each extended to eye; deep groove extended from junction of each clypeo-ocular prolongation and eye to base of mandible. Mandibles slender, elongate, in repose projected far beyond anterior margin of labrum. Eyes globular, very strongly projected from head; genae between mouth margins and eyes very

narrow. Mentum with prominent acute median tooth. Ligular sclerite broadly expanded at apex in some species.

Thorax. Pronotum elongate in form, in most species cordate; sides projected outward from anterior margin in approximately anterior 2/3 and then sharply convergent towards base; anterior and posterior beads complete but flattened medially; lateral beads, thick and prominent.

Legs. Front tibial apices enlarged. Hind basitarsi varying within some species from slightly shorter to slightly longer than tarsomeres 2 + 3.

Elytra. Scutellar interneurs very short. Subapical sinuations slight.

Male genitalia. Median lobe with button like apical disc in some species; dorsal membranous area long, extended to or nearly to basal bulb. Internal sac with spines or enlarged microtrichia in most species.

Ovipositor. Valvifers with distal and lateral margins membranous.

Discussion. Species are characterized by the apomorphies of: elongate cylindrical or subcylindrical body; prominent grooves on dorsum of head; elongate mandibles; and cordate to semi-cordate pronotal shape. The two species I saw of the former genus *Oxycentropsis* (*O. grandis* and *O. rugifrons*) share these apomorphies, and descriptions of the other species previously assigned to *Oxycentropsis* suggest they also share them. Csiki (1932) listed *O. melas* Schmidt-Goebel, 1846, as a junior synonym of *O. angustus* Bates, 1876; the former name has priority, and *O. angustus* is the junior synonym.

Species identification. Habu (1973) redescribed *O. argutoroides*, and Schauberger (1938) provided a key to three of the species formerly considered *Oxycentropsis*. A revision is needed.

Geographical Distribution. One species, *O. argutoroides*, occurs in China and Japan of the Palaearctic Region, and the remainder occur in the Oriental Region; five occur on the mainland (Burma, India, and Indochina) the remainder occur in the Indo-Australian Archipelago but do not reach New Guinea.

Included species: (18): *O. acutulus* Bates, 1892 *; *O. argutoroides* Bates, 1876; *O. borneensis* Bates, 1876 *; *O. foveicollis* Bates, 1892 f*; *O. grandis* van Emden, 1937 m*; *O. horni* Schauberger, 1938 *; *O. javanus* Louwerens, 1951 *; *O. kraatzi* Schauberger, 1938 *; *O. matanganus* Schauberger, 1934 *; *O. melas* Schmidt-Goebel, 1846; *O. micros* Schauberger, 1938 *; *O. minor* Louwerens, 1951 *; *O. nitidus* Andrewes, 1930; *O. omaseoides* Bates, 1892 *; *O. orinus* Andrewes, 1931 *; *O. parallelus* Chaudoir, 1854; *O. rugifrons* Louwerens, 1954; and *O. striolatus* Andrewes, 1930.

Incertae Sedis Within Subtribe Harpalina

This section treats nine genera and subgenera of Harpalina which do not belong in any of the present groups of this subtribe.

genus *Axinotoma* Dejean

(Figs. 38, 39)

Description. Body length approximately 17 to 12 mm.

Color. Body reddish brown, reddish black, or black, with yellowish to reddish yellow areas in some specimens.

Dorsal Luster. Dull to shiny; pronotum and elytra of some species of subgenus *Lampetes* with slight greenish tinge.

Dorsal Microsculpture. Mesh obsolete, isodiametric, or transverse.

Punctuation, Pubescence, and Setation. Dorsum with dense non-setigerous punctures on: head and pronotal base in some species; elytral intervals in all species but *A. isabellina*. In *A. isabellina* inner intervals with few extremely irregular and sparsely scattered such punctures. Moderately dense fine short setae on: most of venter in *A. lepersonneae*; prosternum in all species; anterior margins of proepisterna in all species; metasternum in most species; beneath hind femora and trochanters on abdominal sterna 2, and 3 in all species and medially on sternum 4 in some species; on all of abdominal sterna in some species. Dorsa of tarsi glabrous or with scattered to moderately dense short fine setae. Submentum of some species with 1 short seta laterad to long seta at each side. Elytral intervals 3 each with 1 setigerous puncture at approximately apical 1/3 to 1/5, against interneur 2 in most specimens; other intervals lacking setigerous punctures on disc. Ovipositor, valvifers of most species with 1 or more distal setae on venter.

Head. Frontal foveae each varied from obsolete to punctiform or to prominent depression, each with or without clypeo-ocular prolongation, complete to eye or not. Mentum with or without median tooth. Ligular sclerite apex straight to deeply emarginate.

Thorax. Pronotum moderate in size relative to elytra or relatively small, transverse or cordate in form.

Legs. Middle tarsi of some males not laterally expanded and not with ventral biseriate vestiture. Hind basitarsi each slightly shorter to slightly longer than length of tarsomeres 2 + 3.

Elytra. Scutellar interneurs moderate to long, in most specimens of subgenus *Lampetes* each joined distally to interneur 1.

Male genitalia. Median lobe with apical disc present in some species; dorsal membranous area various, extended to basal bulb or not; in *A. isabellina* shaft slightly twisted; in *A. ambigena* and *A. perrieri* ostium removed to left.

Ovipositor. Valvifers reduced in *A. lepersonneae*, in *A. lucens* and *A. marginalis* with proximal sclerotized border and to a lesser degree proximal mesal border enlarged into dorsal projected flange; average in other species. Stylomeres 2 of *A. perrieri* with scrobes shallow; average in other species.

Discussion. Basilewsky (1950) included *Axinotoma* in the Selenophori group on the basis of adults with elongate hind basitarsi. However, as shown by Habu (1968) the length of the hind tarsi is not a worthwhile character for placing taxa in Selenophori. Species of *Axinotoma* and *Lampetes* share: dense non-setigerous punctures on the elytral intervals (except for *A. isabellina* which has such punctures sparse and irregular on inner intervals 3, 5, and 7). It seems most parsimonious to postulate that the two groups of species share these features due to immediate common ancestry. Since species of *Lampetes* appear to differ from all species of *Axinotoma sensu stricto* in having pronota cordate and small relative to the elytra (pronota more transverse and larger in species of *Axinotoma sensu stricto*), I treat *Lampetes* as a separate subgenus. The only consistent differences between the two species of the former genus *Metarpalus* and the nine of *Axinotoma sensu stricto* is

that median lobes of the male genitalia of the former have the ostium deflected to the left while those of species of *Axinotoma sensu stricto* do not. The ostium varies in position within other genera of Harpalina (such as *Trichotichnus*) of selenophorines, and position of the ostium is not constant enough to warrant generic or subgeneric separation of species.

subgenus *Axinotoma* Dejean
(Fig. 39)

Axinotoma Dejean, 1829: 4, 29. Type Species: *Axinotoma fallax* Dejean, 1829, by monotypy.

Metarpalus Jeannel, 1946: 159, 161. Type species: *Metarpalus ambigenus* Jeannel, 1946, by original designation and monotypy.

Recognition. Recourse to the keys is necessary to distinguish members of this subgenus from those of other supraspecific taxa with the elytral disc lacking rows of setigerous punctures on intervals 3, 5 and 7 but having dense non-setigerous punctures on the intervals.

Description. Body length approximately 9 to 12 mm.

Color. Varied as in generic description.

Dorsal Microsculpture. Varied as in generic description.

Punctuation, Pubescence, and Setation. Styli of *A. lepersonneae*: stylomeres 2 each with 2 long setae near distal apex and 6 in scrobe. Styli of *A. ambigena* and *A. perrieri*: stylomeres 1 each with 1 distal lateral setae and 6 short distal mesal setae; stylomeres 2 each with 3 or 4 setae on dorsum and 4 setae in scrobe. Styli of *A. pseudornata*: stylomeres 1 each with 1 distal lateral seta on venter; stylomeres 2 each with 1 proximal seta on venter and 1 on dorsum and 3 in scrobe. Styli of other species: stylomeres 1 each with 1 seta at distal lateral margin on venter; stylomeres 2 each with 2 to 3 proximal setae on venter, the most distal such seta in position of stout peg-like seta of specimens of *Parophonus* and allied genera.

Head. Mentum with or without median tooth.

Thorax. Pronotum (Fig. 39) transverse, not small in size relative to elytra; posterior bead present medially in some specimens.

Species Identification. Basilewsky (1950) provided a key to the 9 species then known (under the generic names *Axinotoma* and *Metarpalus*) and (1968a, 1968b) described a total of two more.

Geographical Distribution. Two species (*A. ambigena* and *A. perrieri*) are endemic to Madagascar; the others occur in tropical and warm temperate areas of the Ethiopian Region portion of Africa.

Included Species (11): *A. ambigena* Jeannel, 1946; *A. decellei* Basilewsky, 1968 *; *A. fallax* Dejean, 1829; *A. hulstaerti* Basilewsky, 1950 *; *A. latipalpis* Basilewsky, 1968 *; *A. lepersonneae* Burgeon, 1942 m *; *A. maynei* Burgeon, 1936 m*; *A. obtuseangula* Péringuey, 1896; *A. perrieri* Jeannel, 1946; *A. posticalis* Péringuey, 1896 *; *A. pseudornata* Basilewsky, 1948.

subgenus *Lampetes* Andrewes NEW STATUS
(Fig. 38)

Lampetes Andrewes, 1940: 536. Type species: *Lamprophonus lucens* Bates, 1890, since Article 67(i) of the International Code of Zoological Nomenclature states that the replacement genus must have the same type species as the original one.

Lamprophonus Bates, 1890: 101. Type species: *Lamprophonus lucens* Bates, 1890, by monotypy. (*Lamprophonus* Bates, 1890 is a junior homonym of *Lamprophonus* Morris, 1837.)

Recognition. Recourse to the keys is necessary to distinguish members of this subgenus from those of other supraspecific taxa with the elytral disc lacking rows of setigerous punctures on intervals 3, 5, and 7 but having dense non-setigerous punctures on the intervals.

Description. Body length approximately 7.7 to 8.8 mm.

Color. Labrum, elytral lateral margins and sutural areas, appendages, and part or all of lateral edges of abdominal sternum 2 to 6 yellow to reddish yellow.

Dorsal Microsculpture. Mesh absent on frons; transverse on pronotum except reduced medially in some specimens; transverse to very fine and transverse on elytra.

Punctuation, Pubescence, and Setation. Ovipositor, stylomeres 1 each with 1 distal lateral seta on venter; stylomeres 2 each in *A. lucens*, and *A. marginalis* with 2 proximal setae on dorsum and with 2 setae in scrobe; stylomeres 2 each in *A. isabellina* with short stout seta on both dorsal and ventral scrobe edges midway between apex and base.

Head. Mentum with moderate median tooth.

Thorax. Pronotum (Fig. 38) small in size relative to elytra, cordate in shape; sides sinuate or not posteriorly; posterior angles prominent, nearly acute.

Discussion. In his key to species Schauberger (1935) treated *A. cribipennis* in the last couplet and stated in a footnote that the description of this form would be published elsewhere. Since the "description" was published subsequently (1938), the last couplet of the 1935 key constitutes the original description, and the one in 1938 is merely a redescription.

Species Indentification. Schauberger (1935) provided a key to the seven species then known. Louwerens (1962) described an eighth species and related it to Schauberger's key.

Geographical Distribution. The species occur in the Oriental Region: four on the Oriental mainland (India and/or Indochina); *A. marginalis* in India and Ceylon; *A. lucens* in India and Java; and *A. circumtincta* and *A. isabellina* in the Indo-Australian Archipelago.

Included Species (8): *A. allorensis* Schauberger, 1935 *; *A. assamensis* Schauberger, 1935 *; *A. circumtincta* Andrewes, 1890 *; *A. cribipennis* Schauberger, 1938 *; *A. lucens* Bates, 1890; *A. marginalis* Walker, 1859; *A. isabellina* Louwerens, 1962; and *A. pseudolucens* Schauberger, 1935.

genus *Harponixus* Basilewsky
(Fig. 22)

Harponixus Basilewsky, 1950: 88. Type species: *Harponixus pubescens* Basilewsky, 1950, by original designation and monotypy.

Recognition. The single included species is distinguished from those of other supraspecific taxa by the combination of: all of elytral disc densely pubescent; elytral intervals 3 lacking any discernible rows of setigerous punctures; pronotal angles lacking mid length setae; clypeal apex unmodified; mentum with median tooth; and ligular sclerite lacking dorsal setae.

Description. Body length approximately 7 mm.

Color. Body dark reddish black. Mandibles reddish brown except black apically and along lateral and mesal edges. Antennae reddish brown; antennomeres 5 to 11 each with rudimentary darkish brown longitudinal stripe.

Dorsal Luster. Slightly shiny.

Dorsal Microsculpture. Mesh obsolete on frons of head and pronotal disc; on pronotal sides weak and isodiametric; on elytra moderate and isodiametric.

Punctuation, Pubescence, and Setation. Moderately dense punctures, each with short seta, on dorsum (except for median V shaped area on frons), and most of venter. Dorsa of tarsi glabrous except for few stout spine like setae on some tarsomeres. Elytral intervals 3, 5, and 7 lacking any rows of setigerous punctures discernibly larger than general punctures or with setae longer than general pubescence. Mentum lacking setae. Posterior margins of hind femora each with 4 to 6 long setae.

Head. Frontal foveae punctiform, lacking clypeo-ocular prolongations. Genae on each side wider than maximum width of antennal scape. Mentum with moderate median tooth. Ligular sclerite broad.

Thorax. Pronotum (Fig. 22) with sides evenly rounded from apex to base; anterior angles slight, rounded; posterior angles broadly rounded; lateral depressions slight, narrow.

Elytra. Scutellar interneurs joined distally with interneur 1. Subapical sinuations obsolete.

Male genitalia. Median lobe with apex moderate in length and width, with prominent apical disc; ostium deflected to left.

Discussion. Basilewsky (1950) included *Harponixus* in the Selenophori group on the basis of adults with elongate hind basitarsi. However, as shown by Habu (1968) the length of the hind tarsi is not a worthwhile character for placing taxa in Selenophori.

Species Identification. Basilewsky (1950) keyed out this monobasic genus.

Geographical Distribution. The single included species is known from Tanzania of the Ethiopian Region.

Included Species (1). I examined the male holotype of the single included species, *H. pubescens* Basilewsky, 1950.

genus *Liodaptus* Bates

Liodaptus Bates, 1890: 102. Type species: *Liodaptus birmanus* Bates, 1890, by monotypy.

Recognition. See the keys for identification. Adults have similar appearance to those of genus *Trichotichnus* but differ by lacking a median mental tooth and by having elytra with a darker colored inner macula.

Description. Body moderately convex, more so in elytra; length approximately 7 mm.

Color. Frons and pronotum light to dark reddish brown except extreme lateral edges of pronotum somewhat lighter. Elytra with reddish brown inner macula and yellowish sides, apices and bases in most specimens. Venter reddish brown. Appendages yellowish to brown.

Dorsal Luster. Shiny.

Dorsal Microsculpture. Obsolete.

Punctuation, Pubescence, and Setation. Body impunctate and glabrous except for usual fixed setae and fine short setae present on: prosternum anteriorly; mesosternum; mesal portions of metasternum; beneath hind coxae and trochanters on abdominal sterna 2 and 3. Tarsal dorsa with scattered setae on front basitarsi, glabrous elsewhere. Posterior margins of hind femora each with 2 long setae. Elytral intervals 3, 5, and 7 lacking setigerous punctures on disc. Ovipositor, valvifers lacking setae; stylomeres 1 each with 1 distal lateral seta on venter; stylomeres 2 each with large stout seta proximally on venter against scrobe edge.

Head. Frontal foveae each deep, prominent, crescent shaped and continued as clypeo-ocular prolongation to eye. Eyes large, prominently protruded from sides of head. Mentum lacking median tooth. Ligular sclerite broad, slightly widened apically.

Thorax. Pronotum cordate in shape; anterior angles slight; posterior angles obtusely rectangular; lateral depressions narrow but well delimited internally.

Legs. Front and middle tarsi of males not laterally expanded and not with ventral biseriate vestiture. Hind basitarsi approximately 0.7 to 0.9 length of tarsomeres 2 + 3.

Elytra. Convex in form. Humeri angulate. Scutellar interneurs absent. Subapical sinuations moderate.

Male genitalia. Median lobe with dorsal membranous area extended to basal bulb.

Discussion. This genus appears closely related to *Trichotichnus* but differs by its adults lacking a mental tooth.

Species Identification. Identification is possible only by recourse to original descriptions and types.

Geographical Distribution. This Oriental genus has *L. birmanus* from India and Indochina and *L. longicornis* from Laos.

Included Species (2): *L. birmanus* Bates, 1890 m*; and *L. longicornis* Lesne, 1869 f*.

genus *Nothodaptus* Maindron
(Fig. 21)

Nothodaptus Maindron, 1906: 252. Replacement name for *Agriodus* Péringuey. Type species: *Agriodus simplex* Péringuey, 1896, since article 67(i) of the International Code of Zoological Nomenclature states that the replacement genus must have

the same type species as the original one.

Agriodus Péringuey, 1896: 417, 420. Type species: *Agriodus simplex* Péringuey, 1896, by monotypy. (*Agriodus* Péringuey, 1896 is a junior homonym of *Agriodus* Smith, 1840)

Recognition. The sole included species is most readily identified by use of the keys. Adults have similar appearance to those of genus *Trichotichnus* but differ by lacking a median mental tooth.

Description. Body length approximately 8 mm.

Color. Body and legs light reddish brown. Palpi reddish yellow to reddish brown. Mandibles reddish brown except black apically, proximally at bases, and along lateral and mesal edges. Antennae with antennomeres 1 to 4 dark reddish brown; antennomeres 5 to 11 light reddish brown except for median longitudinal dark reddish brown stripe, such stripe narrowed on successively more distal antennomeres.

Dorsal Microsculpture. Mesh, on frons obsolete; on pronotum obsolete on disc and elsewhere very weak, irregular to slightly isodiametric; on elytra weak and slightly transversely stretched.

Punctuation, Pubescence, and Setation. Dorsum impunctate and lacking pubescence other than usual fixed setae and very fine short setae on approximately anterior 1/10 of intervals 8, 9, and 10. Venter with short fine setae on: prosternum; approximately anterior 2/3 of proepisterna; metasternum; and abdominal sterna 1, 2, and 3. Dorsa of tarsi glabrous except for scattered setae near lateral and posterior margins. Posterior margins of hind femora each with 2 long setae. Elytral intervals 3, 5, and 7 lacking setigerous punctures.

Head. Frontal foveae small, punctiform, each with short clypeo-ocular prolongation. Eyes large, prominently protruded from sides of head. Mentum lacking tooth.

Thorax. Pronotum (Fig. 21) cordate, with sides rounded anteriorly, convergent posteriorly; posterior bead flattened medially but still evident; anterior angles slight; posterior angles broadly rounded; lateral depressions moderate, widened posteriorly and merged with moderately prominent posterior lateral impressions.

Legs. Front tarsi of males (according to Basilewsky, 1950) not expanded laterally but with biseriate vestiture beneath. Hind tarsi short; basitarsi approximately 0.8 length of tarsomeres 2 + 3.

Elytra. Scutellar interneurs short. Subapical sinuations moderate.

Species Identification. Basilewsky (1950) provided a key to this monobasic genus.

Geographical Distribution. The single included species is known from South Africa.

Included Species (1) This genus is known only from a male and female, of *N. simplex* Péringuey, 1896. I examined the female; it lacks the posterior part of its abdomen.

genus *Aztecarpalus* Ball
(Fig. 4)

Aztecarpalus Ball, 1970: 102. Type Species: *Harpalus hebescens* Bates, 1882, by original designation.

Recognition. Members resemble some Old World *Trichotichnus* in lacking pubes-

cence medially on the prosternum but can be identified by their range in the New World and by their frontal foveae lacking or at most having weak clypeo-ocular prolongations which do not reach the eyes.

Description. Body length approximately 7 to 12 mm.

Color. Body black. Elytra black or metallic blue or green. Antennae, mouthparts, and legs black, infuscated, or reddish.

Dorsal Luster. Subopaque, moderately to strongly shiny, or iridescent.

Dorsal Microsculpture. Isodiametric to transverse mesh or line effaced.

Punctuation, Pubescence, and Setation. Dorsum impunctate and glabrous except for usual fixed setae. Thoracic venter glabrous except for long setae at apex of intercoxal process. Dorsa of tarsi glabrous or with sparse short fine setae. Abdominal sterna glabrous except for median patch of very short fine setae on sterna 2 and 3 in most specimens. Submentum with 1 short seta laterad to long one at each side. Elytral intervals 3 each with or without 1 setigerous puncture adjacent to interneur 2. Abdominal sternum 6 of some males lacking latero-medial pair of ambulatory setae. Ovipositor, valvifers each with 1 to 4 distal setae; stylomeres 1 each with 1 to 3 distal lateral setae on venter; stylomeres 2 each with 1 seta at midpoint on dorsum or in scrobe near dorsal edge.

Head. (dorsum, Fig. 4) Frontal foveae broad; clypeo-ocular prolongations absent to weakly developed, not extended to eyes. Eyes small, only slightly protruded from sides of head. Genae between margins of eyes and mouth at least 1.5 times wider than antennal scapes. Mentum with moderate sized median tooth. Mandibles short, broad.

Thorax. Pronotum transverse, weakly convex; in some species anterior and posterior beads complete but flattened medially; anterior angles broadly rounded; posterior angles broadly to narrowly obtuse, or rectangular.

Legs. Hind basitarsi shorter than tarsomeres 2 + 3.

Elytra. Humeri broadly rounded, angulate or feebly denticulate. Scutellar interneurs short in most specimens.

Hind wings. Vestigial in some forms.

Male genitalia. Median lobe with apical disc in some species; dorsal membranous area extended almost to basal bulb. Internal sac with varied armature.

Species Identification. See Ball (1970, 1976a) for keys to species, descriptions, and (1976a) a thorough analysis of the phylogeny and zoogeography of the species.

Geographical Distribution and Notes about Way of Life. The nine species occur in Mexico, with *A. schaefferi* also extending into extreme southeastern Texas. For the most part, species occur in the Neotropical Region near its northern boundaries; *A. marmoreus* appears to have a range within the extreme southern end of the Nearctic Region. Species are generally associated with damp habitats, such as deep leaf litter in oak-pine forests, wet man made meadows near forests or stream sides (Ball, 1970). *Aztecarpalus schaefferi* occurs at elevations from sea level in extreme southeastern Texas and from approximately 400 to 1500 m in Mexico while the other species are montane and found in habitats from approximately 1000 to 3000 m (Ball, 1970, 1976a).

Included Species (9): *A. hebescens* Bates, 1882; *A. hemingi* Ball, 1976; *A. lectocolus* Ball, 1970; *A. liolus* Bates, 1882 f*; *A. marmoreus* Ball, 1970 m*; *A. platyderus* Bates, 1882 f*; *A. schaefferi* Ball, 1970; *A. trochotrichis* Ball, 1970; and *A. whiteheadi* Ball, 1976 m*.

genus *Trichotichnus* Morawitz

(Figs. 2, 3)

Description. Body stout to slender; length approximately 5 to 14 mm.

Color. Varied, but body of most specimens reddish brown, reddish black, or black.

Dorsal Luster. Elytra iridescent in most species.

Dorsal Microsculpture. Mesh on frons obsolete or isodiametric; on pronotum obsolete, irregular mixture of isodiametric and transverse meshes, or completely transverse; on elytra transverse with lines fine to very fine.

Punctuation, Pubescence, and Setation. Pronotum with moderately dense non-setigerous punctures posteriorly and laterally in all species. Elytral intervals in a few Japanese species with dense non-setigerous punctures, lacking such punctures in other species. Dorsum glabrous except for usual fixed setae except *T. longitarsis* with very short fine setae on elytral intervals 8 to 10 and apices of intervals 1 to 7. Prosternum and intercoxal process with moderately dense very fine short setae in most species, sparsely pubescent to glabrous in others. Dorsa of tarsi glabrous. Abdominal sterna 2 to 3 and in some species also 4 each with median patch of very short setae; other sterna with fine sort setae in some species of subgenus *Bellogenus* and most species of subgenus *Harpaloxenus*. Submentum in most specimens with 1 short seta laterad to long seta at each side. Posterior margins of hind femora each with 2 long setae. Elytral intervals 3 of most specimens each with 1 setigerous puncture confluent with interneur 2 in approximately distal 1/2 to 1/3. Abdominal sternum 6 with or without latero-medial pair of ambulatory setae in males. Ovipositor, valvifers each with 1 to 4 distal setae on venter; stylomeres 1 each with 1 to 3 distal lateral setae on venter; stylomeres 2 each with in most species 1 short seta approximately 1/3 to 1/2 way from base to apex on both venter and dorsum, and in a few species with 1 seta on venter slightly distal to the one present in most species and in some species with short peg-like seta proximally on venter.

Head. Frontal foveae small, each continued toward eye as shallow to deep, complete or incomplete clypeo-ocular prolongation. Eyes average to large and prominently protruded from head. Genae between margins of eyes and mouth narrow to moderately wide. Mentum with median moderate sized tooth. Ligular sclerite apex expanded laterally in some species.

Thorax. Pronotum average in form to cordate; anterior and posterior beads complete in some species.

Legs. Front tibiae with enlarged apices in some species of *Harpaloxenus*.

Hind wings. Vestigial in some species.

Male genitalia. Median lobe with apical disc present in some species; dorsal membranous area extended to or approximately 1/3 distance to basal bulb; ostium slightly or strongly deflected to left in some species. Internal sac with or without armature.

Discussion. Darlington (1968) cited *Harpaloxenus* as apparently allied to genus *Trichotichnus* and stated further study might indicate it not worthy of generic separation. It seems best to treat *Harpaloxenus* as a subgenus of *Trichotichnus*. All species of *Harpaloxenus* differ from those of other *Trichotichnus* by their mottled ventral coloration. Some also differ by possession of enlarged apices of the front tibiae. Features shared with other *Trichotichnus* include: moderately sized median tooth; lack of rows of dorsal setigerous punctures on third elytral interval; frontal foveae of head with clypeo-ocular prolongations; and tarsal dorsa generally glabrous.

The genus *Lyter* was proposed by Darlington (1968) based on *L. glaber*, distinguished by: male front and middle tarsi with ventral vestiture irregular and loose, not in form of a dense biseriate vestiture; relatively long ligular sclerite; absence of pubescence on anterior part of prosternum; and "virtual suppression of dorsal elytral punctures." The vestiture of the male front and middle tarsi is indeed irregular, apparently due to loss of most setae; such reduction is similar to that found in males of *Dicheirus dilitatus angulatus* Casey (subtribe Anisodactylina; see Noonan, 1968) and does not warrant separate generic status. The ligular sclerite is no longer than that of many *Trichotichnus*. The glabrous prosternum distinguishes *L. glaber* from New Guinea species of *Trichotichnus* except perhaps *T. medius* which has the pubescence sparse but variable. However some Japanese *Trichotichnus* (see Habu, 1973) have glabrous prosterna, and the prosternum is nearly glabrous in the Oriental *T. flavipes*. Many *Trichotichnus* lack dorsal punctures on the third elytral interval. Since the clypeo-ocular prolongations of the frontal fovea of *L. glaber* are not modified as in subgenus *Bellogenus*, *Lyter* is best treated as consubgeneric with subgenus *Trichotichnus*.

Bellogenus amazeus has a glabrous prosternum (see above for discussion of pubescence of prosternum in *Trichotichnus*) and has the prominent clypeo-ocular prolongations and grooves along the eyes attributed to *Pseudotrichotichnus* by Habu (1973). *Bellogenus* is the senior synonym of the name *Pseudotrichotichnus*.

subgenus *Harpaloxenus* Schauberger NEW STATUS

Harpaloxenus Schauberger, 1933a: 154. Type species: *Harpalus javanus* Schauberger, 1933, by original designation.

Recognition. Members resemble those of other subgenera of *Trichotichnus* but differ by having mottled color on the abdominal sterna.

Description. Body length approximately 6 to 10 mm.

Color. Dorsum predominately reddish brown to brownish reddish black except most specimens yellowish colored along sides of pronotum and elytra (when such yellowish coloration absent, abdominal sterna and in some specimens other areas of venter with irregular yellowish colored patches). Venter predominately yellowish brown to darker brown, mottled in appearance due to irregular shaped areas with lighter coloration. Appendages predominately yellowish to reddish yellow.

Head. Frontal foveae punctiform, each with moderate to prominent clypeo-ocular prolongation to eye.

Male genitalia. Median lobe with apex elongate; with slight to moderately prominent apical disc; ostium slightly deflected to left in *H. wau*.

Species Identification. Schauberger (1933a) provided a key to three species, and Darlington (1968) provided a key to five (including *T. celebensis*, treated by Schauberger) found in New Guinea. A single key to all seven species is needed.

Geographical Distribution and Notes About Way of Life. This subgenus has one species, *T. philippensis*, in the Philippines and six in the Indo-Australian Archipelago. Four of the latter (*T. fortis*, *T. mas*, *T. sedlaceki*, and *T. wau*) are endemic to New Guinea. *T. javanus* is known only from Java. One species, *T. celebensis* is known from New Guinea, Celebes, Java, Sumaba and Halmahera. Label data cited

by Darlington (1968) indicate that specimens in New Guinea: have been taken at elevations from approximately 10 to 1800 m; are most abundant below approximately 1000 m; and have been taken at lights.

Included Species (7): *T. celebensis* Schauberger, 1933; *T. fortis* Darlington, 1968 f*; *T. javanus* Schauberger, 1933 *; *T. mas* Darlington, 1968 *; *T. philippensis* Schauberger, 1933 *; *T. sedlaceki* Darlington, 1968; and *T. wau* Darlington, 1968.

subgenus *Trichotichnus* Morawitz
(Fig. 2)

Trichotichnus Morawitz, 1863: 63. Type species: *Trichotichnus longitarsis* Morawitz, 1863, by monotypy.

Iridessus Bates, 1883: 240. Type species: *Harpalus lucidus* Morawitz, 1863, designated by Habu, 1954: 245.

Amaroschesis Tschitschérine, 1897: 28. Type species: *Zabrus chinensis* Fairmaire, 1886, designated by Andrewes, 1939: 130.

Asmerinx Tschitschérine, 1898: 183. Type species: *Carabus laevicollis* Duftschmid, 1812, designated by Tschitschérine, 1900: 363.

Episcopellus Casey, 1914: 220, 235. Type species: *Feronia autumnalis* Say, 1823, by original designation.

Pteropalus Casey, 1914: 64, 131. Type species: *Harpalus vulpeculus* Say, 1823, designated by Habu, 1954: 245.

Carbanus Andrewes, 1937: 27. Type species: *Carbanus flavipes* Andrewes, 1937, by monotypy.

Velimus Jedlička, 1952: 51. Type species: *Velimus edai* Jedlička, 1952, by original designation and monotypy.

Lyter Darlington, 1968: 40, 63. Type species: *Lyter glaber* Darlington, 1968, by original designation and monotypy. NEW SYNONYMY.

Recognition. Members of this subgenus differ from those of *Bellogenus* by not having the clypeo-ocular prolongations each deep and continued as a deep furrow around the mesal edge of the eye. Also see comments for *Aztecarpalus* and *Harpaloxenus*.

Description. Punctuation, Pubescence and Setation. Sternum 6 of males with or without latero-media pair of ambulatory setae. Ovipositor, stylomeres 1 each with 1 to 3 distal lateral setae on venter.

Head. Clypeo-ocular prolongations (Fig. 2) each shallow to moderately deep, shallow near eye, not continued as prominent furrow around mesal edge of eye. Genae between eyes and mouth margins narrow to moderately wide. Ligular sclerite in most species laterally expanded at apex.

Color. Various, but venter not mottled with irregular shaped lighter colored areas.

Discussion. Darlington (1968) placed *Carbanus straneoi* Louwerens in *Trichotichnus* and suggested further study of the relationship of *Carbanus* and *Trichotichnus*. Such study demonstrates no characters warranting separation of these two former supraspecific taxa. I here propose *Trichotichnus gerni* (an anagram

of "*niger*") as a replacement name for *Trichotichnus niger* Jedlička, 1962, a junior primary homonym of *T. niger* Louwerens, 1951.

Species Identification. See these regional works for keys to species: Darlington (1968) for New Guinea; Habu (1973) for Japan; Lindroth (1968) for northern North America (*T. autumnalis* treated as *Episcopellus autumnalis*); Schauberger (1936) for the Palaearctic *T. laevicollis* and three related Palaearctic species and for 18 species he regarded as members of the former subgenus *Amaroschesis*. A revision of the species is needed.

Geographical Distribution and Notes About Way of Life. This large subgenus occurs in three faunal regions but has the most species in the Palaearctic. There are 54 species in the Palaearctic Region, with 19 of these being endemic to Japan, 3 present in Japan and temperate Asia, one in the Ryukyu Islands and the remainder restricted to mainland temperate Asia. Twenty species occur in the Oriental Region, eight on the mainland, one in the Philippines, two in Formosa, one in the Ryukyu Islands and eight extending along the Indo-Australian Archipelago toward New Guinea; four species occur in New Guinea of the Australian Region; *T. straneoi* occurs in New Guinea and the Moluccas; and three species are in eastern North America of the Nearctic Region. One species, *T. orientalis*, occurs in Japan and China of the Palaearctic Region and Formosa of the Oriental. The group apparently does not reach Australia. Examination of species distribution records suggest that most forms are adapted to moderate temperate climates, less than half to tropical climates, and only a few (or none) to cold temperate conditions. Darlington (1968) reported that adults of all New Guinea species are fully winged (two species are dimorphic) and probably fly, and that many probably live on the ground in the rain forests. Label data in his paper suggest that specimens of at least some species occur from near sea level to approximately 1600 m elevation. Lindroth (1968) reported that *T. dichrous* has been taken beneath logs in dry open woods and at lights in eastern North America.

Included Species (83): *T. aquilo* Andrewes, 1930; *T. autumnalis* Say, 1823; *T. batesi* Csiki, 1932 *; *T. bicolor* Tschitschérine, 1906 *; *T. chinensis* Fairmaire, 1886 *; *T. chuji* Jedlička, 1949 *; *T. congruus* Motschulsky, 1886; *T. consors* Tschitschérine, 1897 *; *T. cordaticollis* Schauberger, 1936 *; *T. coruscus* Tschitschérine, 1895; *T. curtipennis* Schauberger, 1936 *; *T. curtus* Tschitschérine, 1906 *; *T. cyrtops* Tschitschérine, 1906 *; *T. daisenus* Habu, 1973 *; *T. davidi* Tschitschérine, 1897 *; *T. delicatus* Darlington, 1968 *; *T. delavayi* Tschitschérine, 1897 *; *T. denarius* Darlington, 1968; *T. denticollis* Schauberger, 1936 *; *T. dichrous* Dejean, 1829; *T. edai* Jedlička, 1952 *; *T. emarginatus* Andrewes, 1930 *; *T. flavipes* Tschitschérine, 1897 *; *T. formosanus* Jedlička, 1949 *; *T. formosus* Schauberger, 1935 *; *T. fukiensis* Jedlička, 1956 *; *T. fukuharai* Habu, 1957 *; *T. gerni* (Replacement name, see above); *T. glabellus* Andrewes, 1930; *T. glaber* Darlington, 1968; *T. globulipennis* Schauberger, 1935 *; *T. hedini* Schauberger, 1936 *; *T. imafukui* Habu, 1961 *; *T. impunctus* Andrewes, 1947 *; *T. jedlicka* Schauberger, 1932 *; *T. kobayashie* Habu, 1957 *; *T. kantoonus* Habu, 1961 *; *T. knauthi* Ganglbauer, 1900 m*; *T. kurosai* Habu, 1973 *; *T. laevicollis* Duftschmid, 1812; *T. laticeps* Andrewes, 1930 *; *T. lautus* Andrewes, 1947 *; *T. leptopus* Bates, 1883; *T. lewisi* Schauberger, 1936 m*; *T. liothorax* Schauberger, 1935 *; *T. liparus* Andrewes, 1926 f*; *T. longitarsis* Morawitz, 1863; *T. luchti* Louwerens, 1951 *; *T. lucidus* Morawitz, 1863 *; *T. miser*

Tschitschérine, 1897 *; *T. miwai* Jedlička, 1949 *; *T. mixtus* Darlington, 1968; *T. modestus* Tschitschérine, 1897 m*; *T. mongi* Darlington, 1968 *; *T. niger* Louwerens, 1951 *; *T. nipponicus* Habu, 1961 *; *T. nishioi* Habu, 1961 *; *T. nitens* Heer, 1838 *; *T. noctuabundus* Habu, 1954 *; *T. oblongus* Tschitschérine, 1897 *; *T. obtusicollis* Schauberger, 1936 *; *T. oreas* Bates, 1891 *; *T. orientalis* Hope, 1845; *T. pacificatorius* Habu, 1954 *; *T. parallelepunctatus* Louwerens, 1951 *; *T. pauper* Tschitschérine, 1897 f*; *T. philippinus* Jedlička, 1936 *; *T. potanini* Tschitschérine, 1897 *; *T. rimanus* Schauberger, 1936 *; *T. ryukyuensis* Habu, 1969 *; *T. septemtrionalis* Habu, 1947 *; *T. straneoi* Louwerens, 1962; *T. szekessyi* Jedlička, 1954 *; *T. tranquillus* Habu, 1954 *; *T. tschitscherini* Schauberger, 1936 *; *T. tsurugiyamanus* Habu, 1959 *; *T. vespertinus* Habu, 1954 *; *T. vicinus* Tschitschérine, 1897 *; *T. vulgaris* Tschitschérine, 1906 *; *T. vulpeculus* Say, 1823; *T. yukihikoi* Habu, 1961 *; *T. yunnanus* Fairmaire, 1887 *; and *T. zabriformis* Schauberger, 1936 *. Some species not seen by me may belong to subgenus *Bellogenus*.

subgenus *Bellogenus* Clarke
(Fig. 3)

Bellogenus Clarke, 1971a: 264-268. Type Species: *Bellogenus amazeus* Clarke, 1971, by original designation and monotypy.

Pseudotrichotichnus Habu, 1973: 225. Type species: *Trichotichnus nanus* Habu, 1954, by original designation. NEW SYNONYMY.

Recognition. Members have deep clypeo-ocular prolongations somewhat similar in appearance to those of members of *Oxycentrus* but do not have a subcylindrical body form and have the pronotal anterior bead interrupted medially. See comments for subgenera *Trichotichnus* and *Harpaloxenus*.

Description. Punctuation, Pubescence, and Setation. Abdominal sternum 6 with latero-medial pair of ambulatory setae on both sexes. Ovipositor, valvifers each with 2 distal setae on venter; stylomeres 1 each with 1 distal lateral seta on venter; stylomeres 2 each with short stout seta at both ventral and dorsal edges of scrobe at point approximately 1/3 to 1/2 distance from base to distal apex.

Color. Various, but venter not mottled with irregularly shaped lighter areas.

Head. Clypeo-ocular prolongations each deep, continued as deep furrow around mesal edge of eye (Fig. 3). Genae between eyes and mouth margins moderately wide.

Species Identification. Habu (1973) provided a key to the three Japanese species, and Darlington (1968) included a key to those in New Guinea. A revision of all species is needed.

Geographical Distribution and Notes about Way of Life. This subgenus occurs in four faunal Regions: the southern portion of the country of Ethiopia in the Ethiopian Region has *T. amazeus* taken from among roots of grasses and under piles of vegetable material in tropical deciduous forests at elevations of approximately 2000 m (Clarke, 1971a); New Guinea of the Australian Region has 10 species, at least one of which also occurs on islands in the Indo-Australian Archipelago ; western China has one species (Locality data do not permit deciding whether it is in the Oriental or Palaearctic Region.); Sikkim of the Oriental Region has one species; one species occurs in

Ceylon and India of the Oriental Region; three species are in Japan of the Palaearctic Region; and two species occur in Oriental portions of the Indo-Australian Archipelago. The probable center of diversity is the Indo-Australian Archipelago. Habitat adaptations in New Guinea are presumably similar to those cited above for species in the nominate subgenus.

Included Species (19): *T. altus* Darlington, 1968; *T. bouvieri* Tschitschérine, 1897 m*; *T. brandti* Darlington, 1968; *T. dux* Darlington, 1968; *T. guttula* Darlington, 1968; *T. hingstoni* Andrewes, 1930; *T. horni* Schauberger, 1938; *T. javanus* Andrewes, 1926 f*; *T. lamprus* Bates, 1886; *T. medius* Darlington, 1968; *T. modus* Darlington, 1968; *T. nanus* Habu, 1954 *; *T. nigricans* Schauberger, 1935; *T. obscurus* Darlington, 1968; *T. satensis* Habu and Nakane, 1955 *; *T. semimas* Darlington, 1968; *T. semirugosus* Darlington, 1968; *T. sumatrensis* Andrewes, 1926 f*; and *T. uenoi* Habu, 1969.

Taxon Placed in Tribe Other Than Harpalini

genus *Prostalomus* Basilewsky

Prostalomus Basilewsky, 1950: 90, 250. Type species: *Haplocoleus parcepunctatus* Jeannel, 1948, by original designation and monotypy.

Discussion. This genus is known only by the holotype of the type species which occurs in Madagascar. The holotype is housed in the Jeannel Collection at the Museum National dÈHistoire, Paris, in a box labeled: "Coleolissus s. str. box 118". It cannot be a member of Harpalini because: (1) the elytra each have a distinct distal plica: and (2) the general antennal pubescence begins on the fourth, rather than the third antennomeres. These two characters plus the following two suggest placement in the tribe Pterostichini (Carabidae): (1) mental tooth emarginate at apex as in many Pterostichini; and (2) apex of prosternal intercoxal process margined as in many Pterostichini.

The genus is herewith transferred to the tribe Pterostichini.

Concluding Remarks

Biologists working on Carabidae have had difficulty agreeing on the definition and composition of the Selenophori group. Much of the disagreement has been due to the fact that previous studies have been regional in scope. My hope is that the worldwide classification presented here will provide a framework to facilitate further study of this interesting and challenging group of beetles.

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Christina Deniger, Susan Speerbrecher, Mary A. Wagner, and Craig Yanek prepared illustrations. Lisa Lumpkin typed the manuscript.

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1

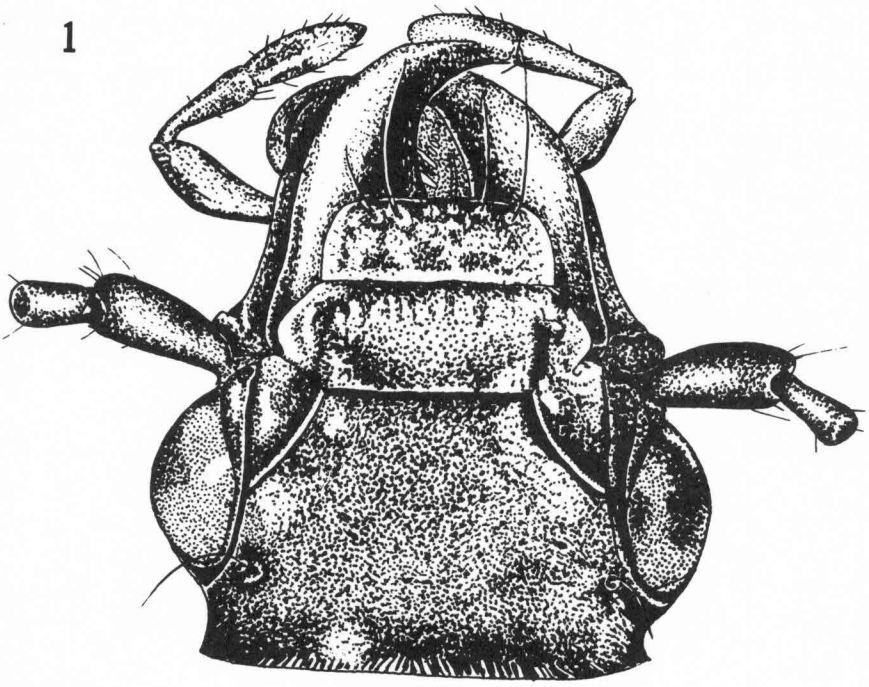
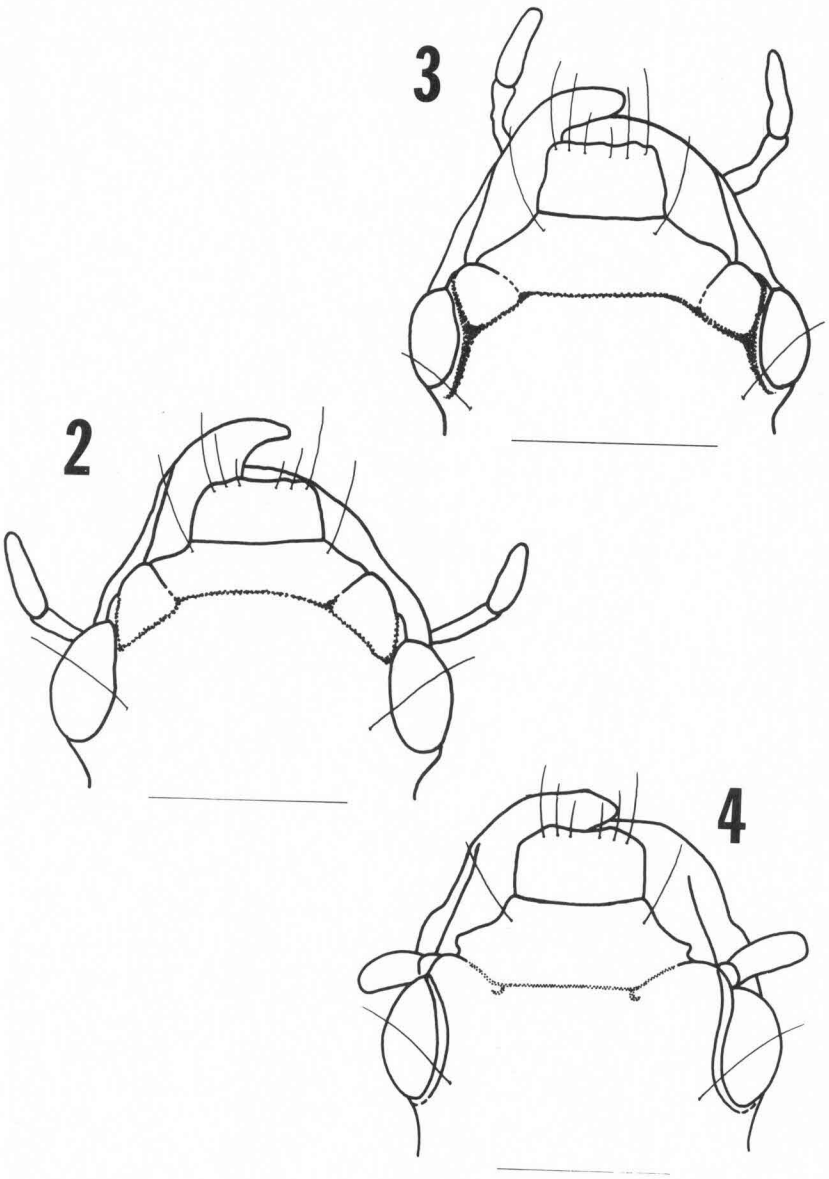
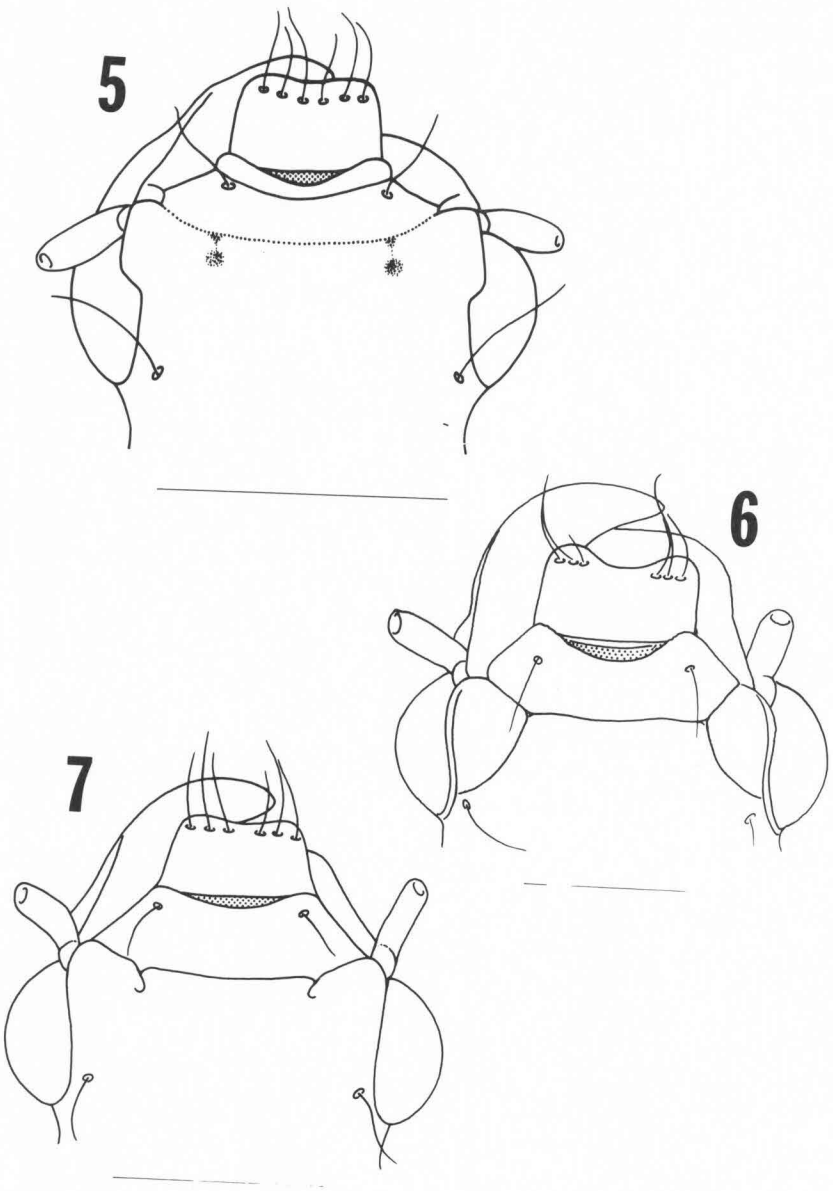


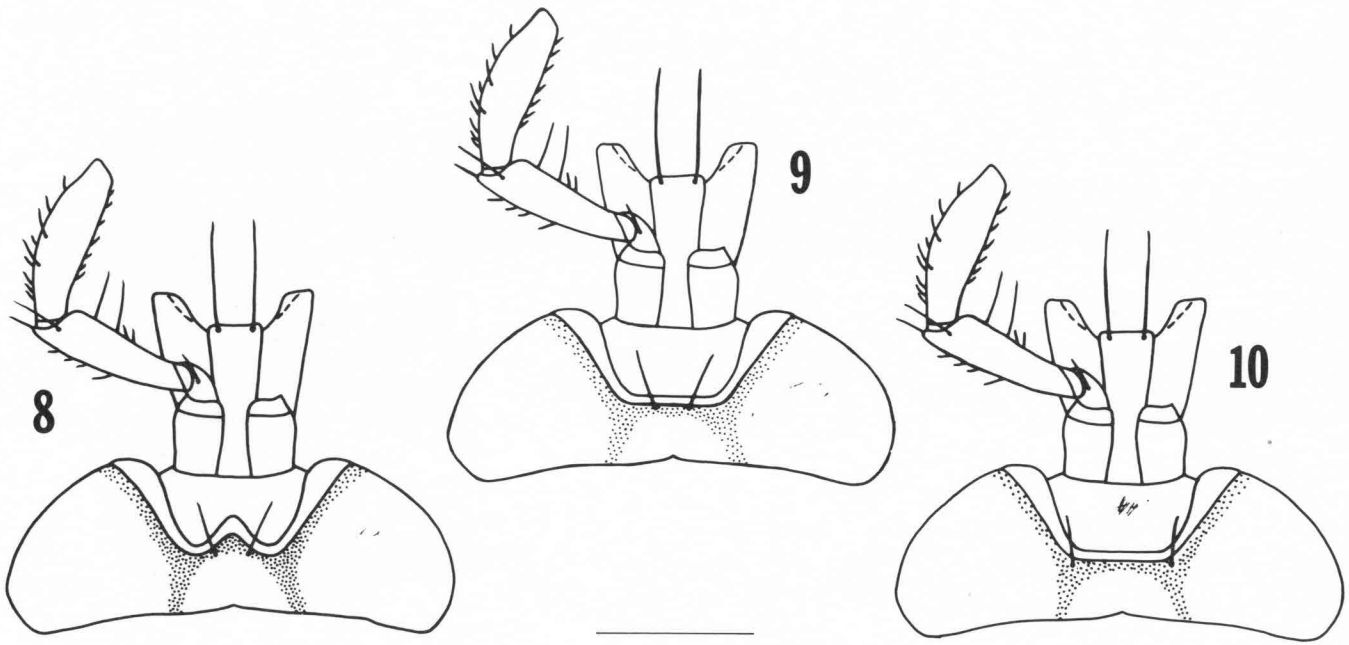
Fig. 1. Head of *Oxycentrus argutoroides*.



Figs. 2-4. Heads. 2. *Trichotichnus (T.) longitarsis.* 3. *Trichotichnus (Bellogenus) bouvieri.* 4. *Aztecarpalus schaeffer.*



Figs. 5-7. Heads. 5. *Amblygnathus subtinctus*. 6. *Kareya sublaevis*. 7. *Dioryche chinnada*.



Figs. 8-10. Generalized drawings of labia, ventral aspect. 8. Mentum with median tooth. 9. Mentum without median tooth. 10. Mentum with setae located laterally rather than medially as in most selenophorines (see figs. 8 and 9).

11

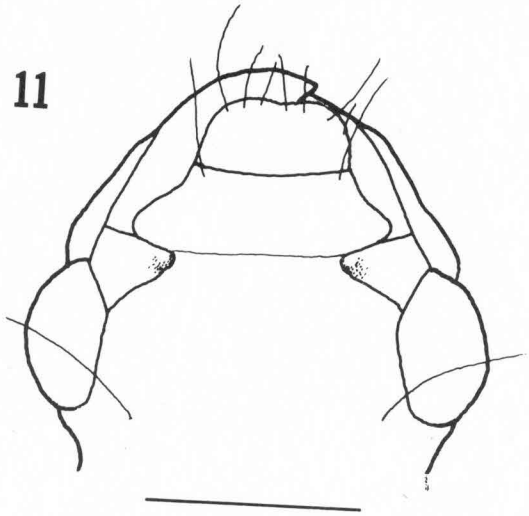


Fig. 11. Head of *Siopelus* (*S.*) *micans*.

12

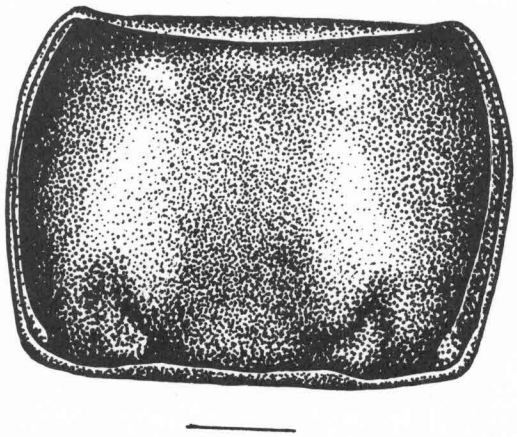
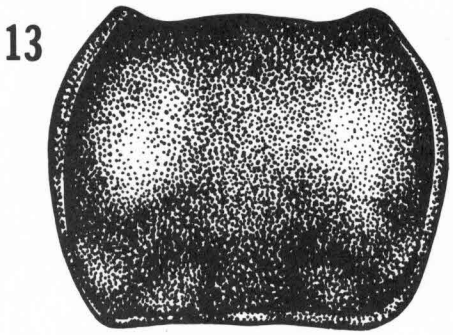
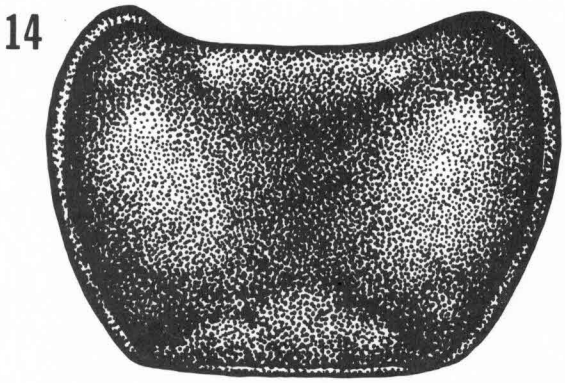
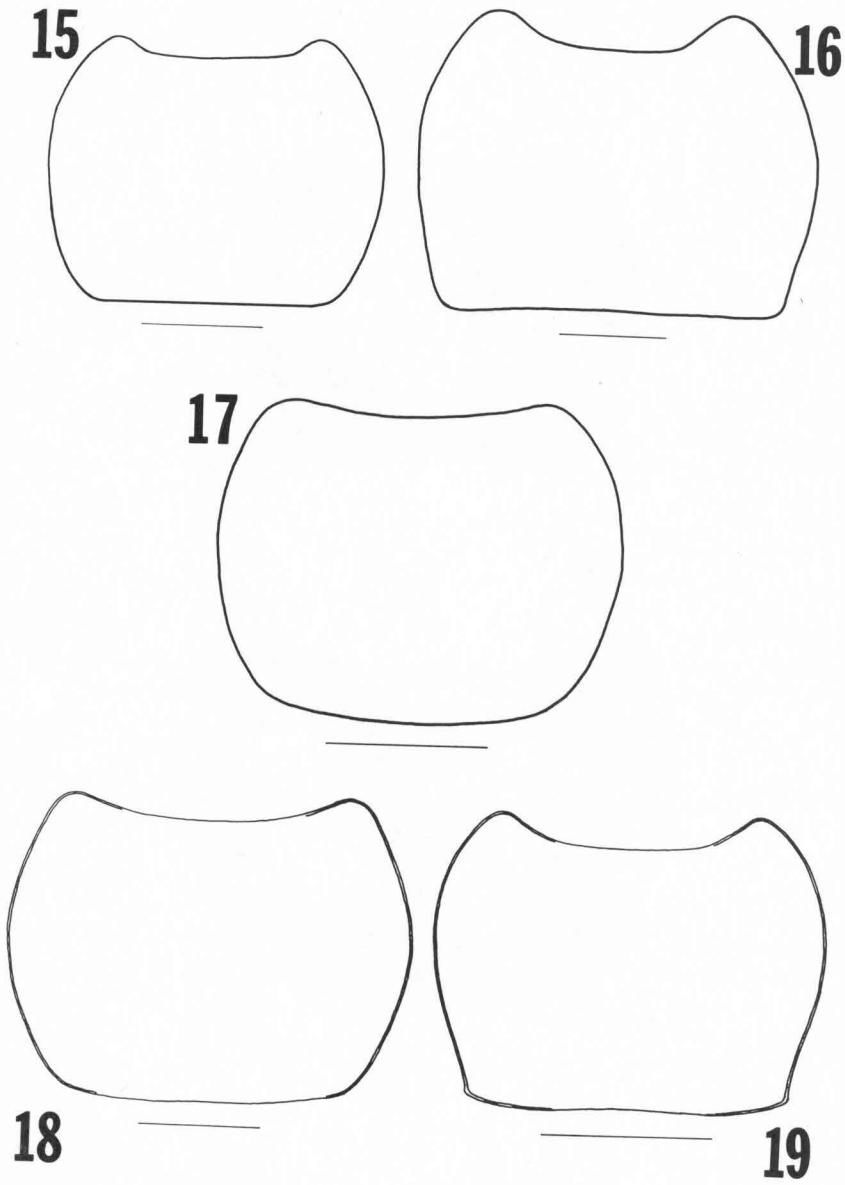


Fig. 12. Pronotum of *Anisocnemus amblygonus*.





Figs. 13-14. Pronota. 13. *Discoderus robustus*. 14. *Discoderus cordicollis*.



Figs. 15-19. Outlines of pronota. 15. *Parophonus caffer*. 16. *Parophonus integer*. 17. *Siopelus* (*S.*) *gracilis*. 18. *Kareya sublaevis*. 19. *Dioryche torta*.

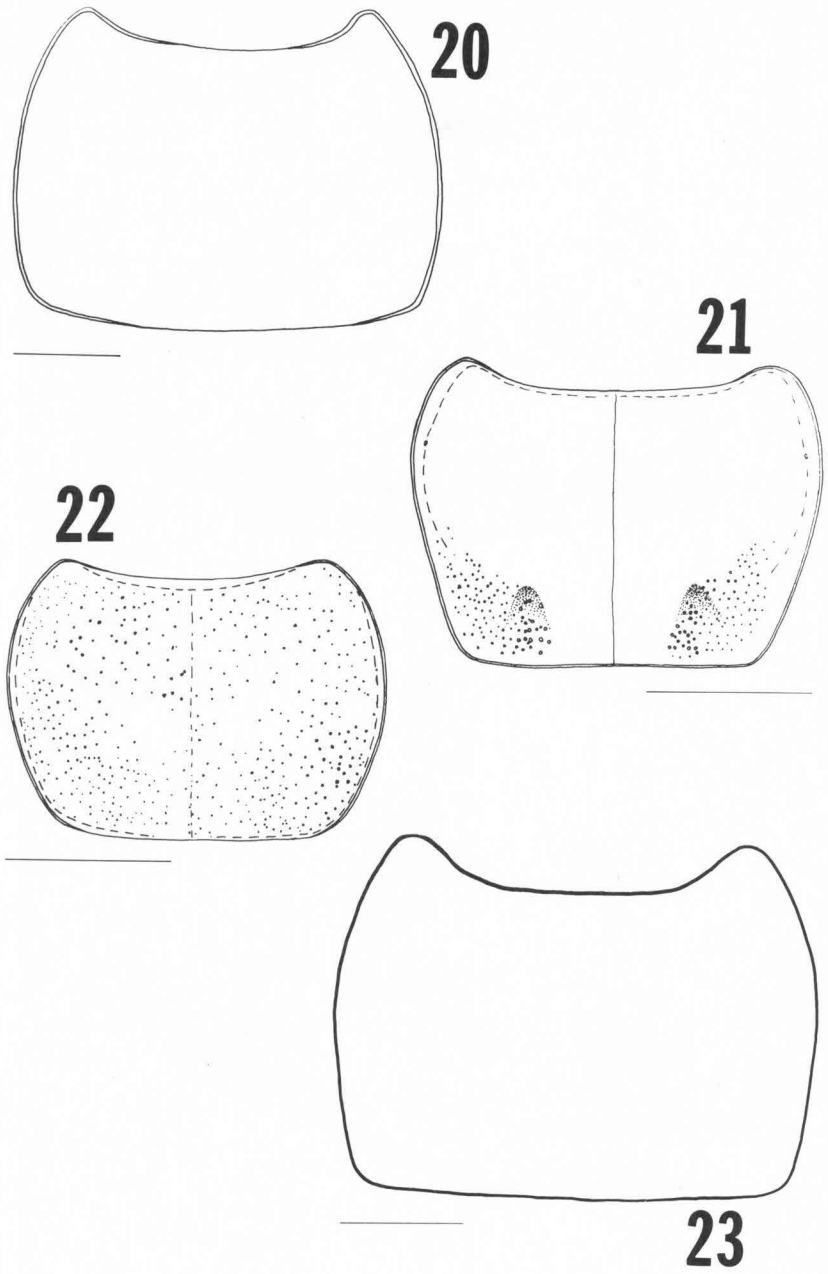
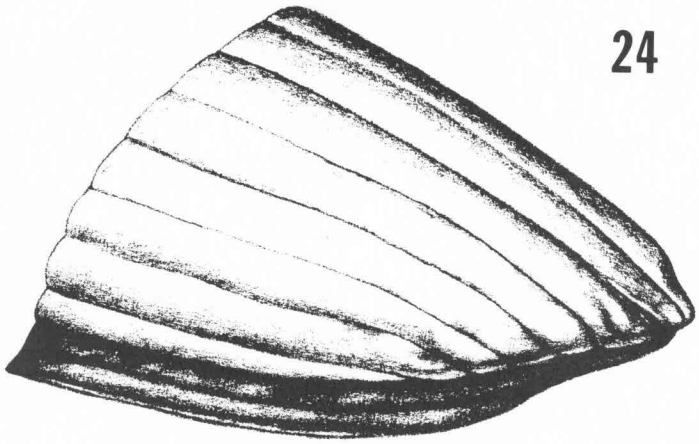
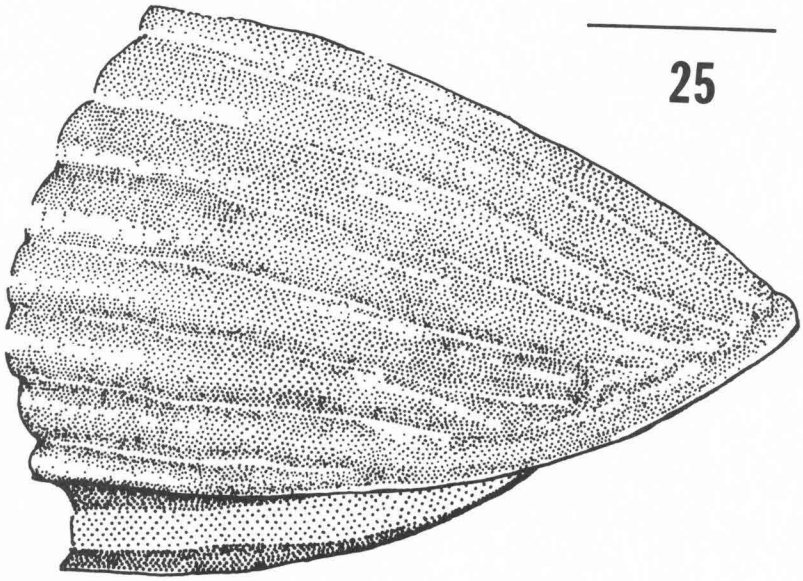


Fig. 20. Outline of pronotum of *Athrostictus luctuousus*. 21. *Nothodaptus simplex*. 22. *Harponixus pubescens*. 23. *Neoaulacoryssus cupripennis*.





Figs. 24-25. Posterior portion of left elytron, dorso-lateral aspect. 24. *Neodiachipteryx cariniger*. 25. *Pseudodiachipteryx expansipennis*.

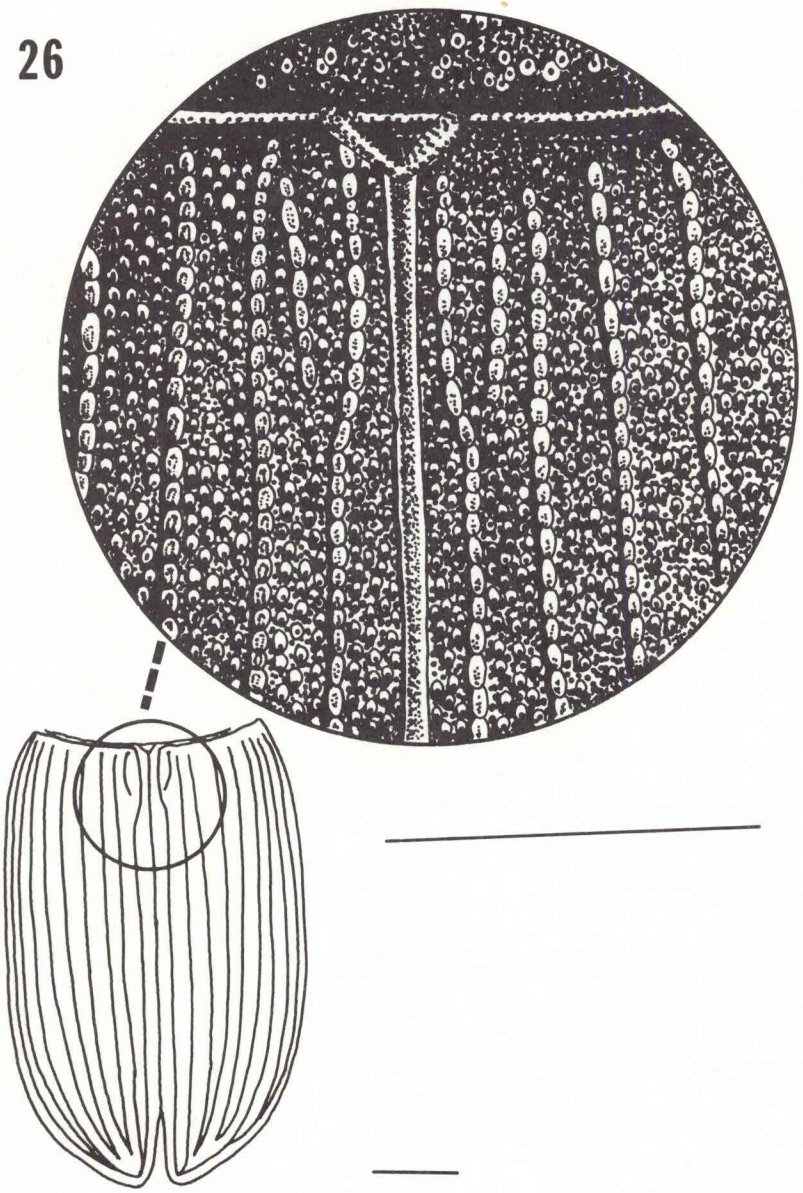


Fig. 26. Macrosculpture of elytra, *Siopelus* (*Aulacoryssus*) *aciculatus*.

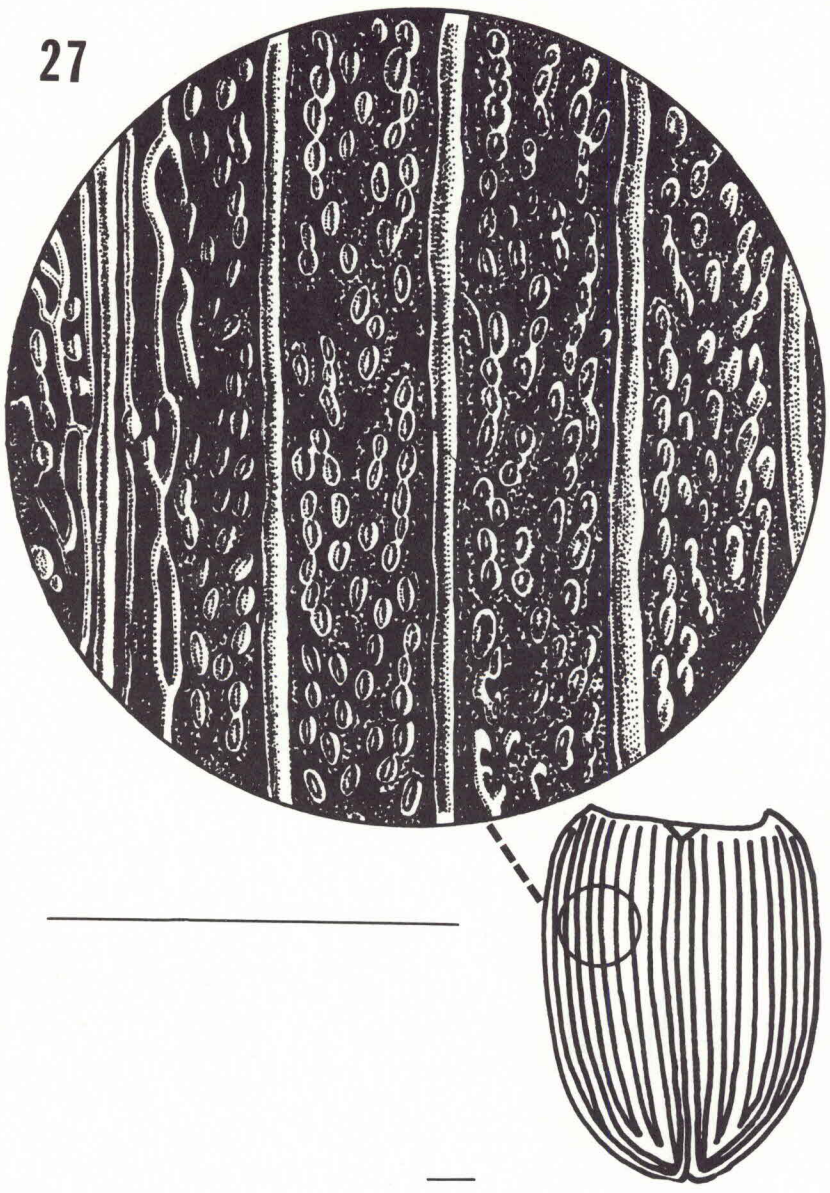
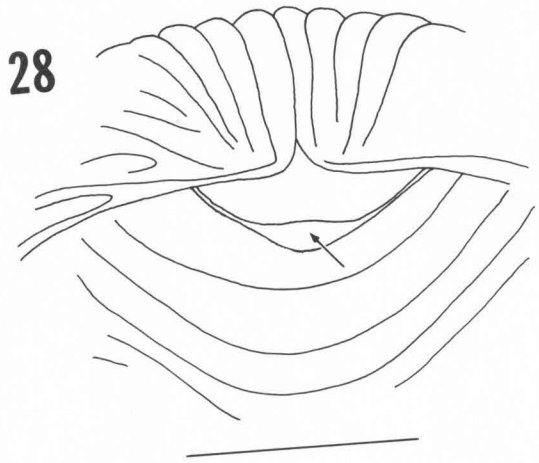
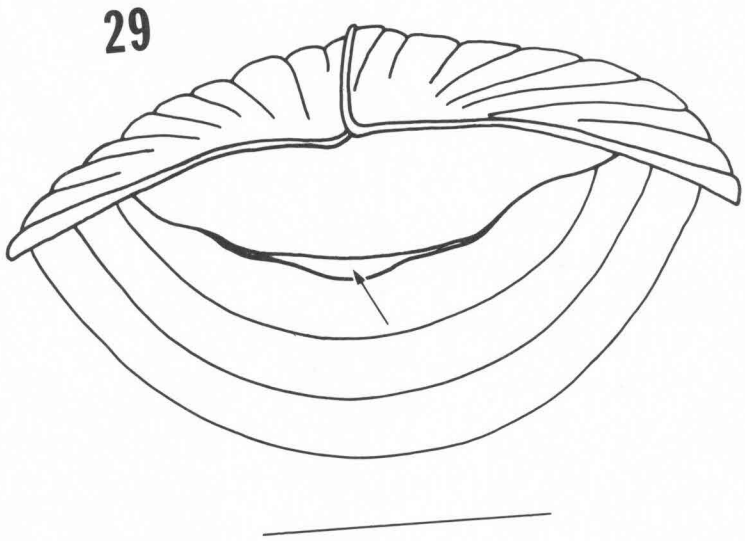


Fig. 27. Macrosculpture of elytra, *Neoaulacoryssus speciosus*.





Figs. 28-29. Posterior view of female beetles showing medially enlarged areas (marked by arrows) of apices of abdominal sterna 6. 28. *Anisocnemus amblygonus*. 29. *Prakasha amariformis*.

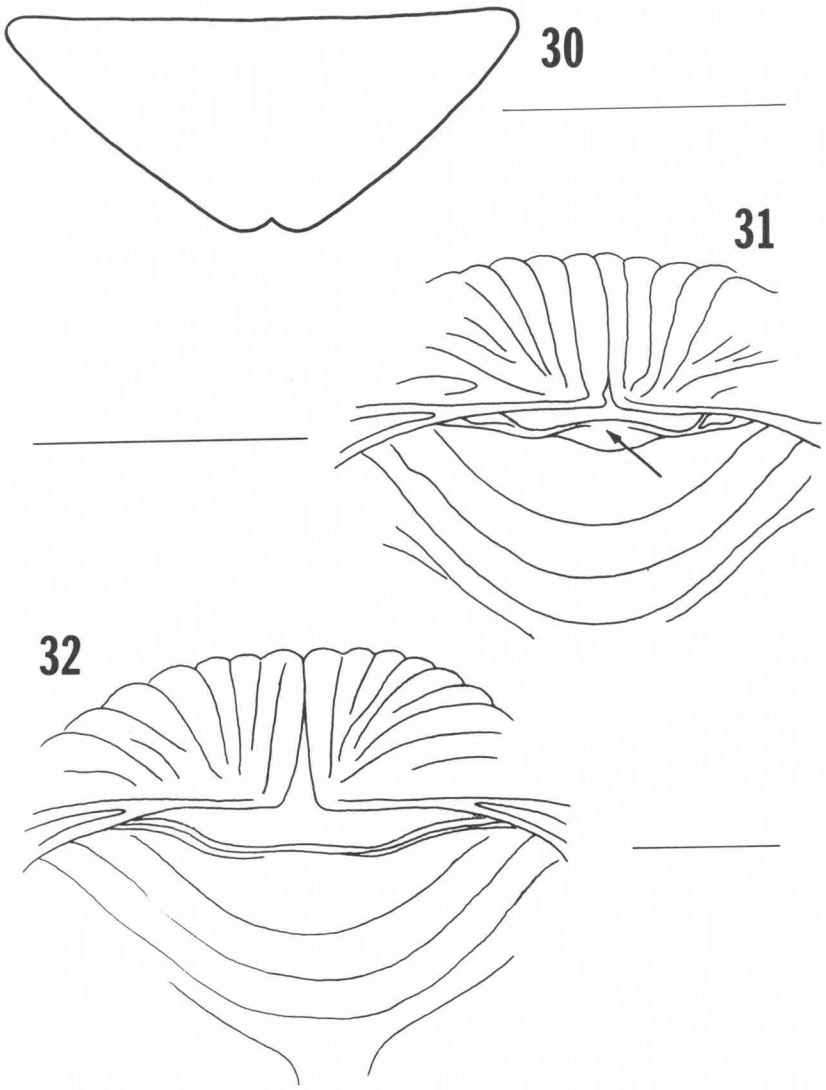
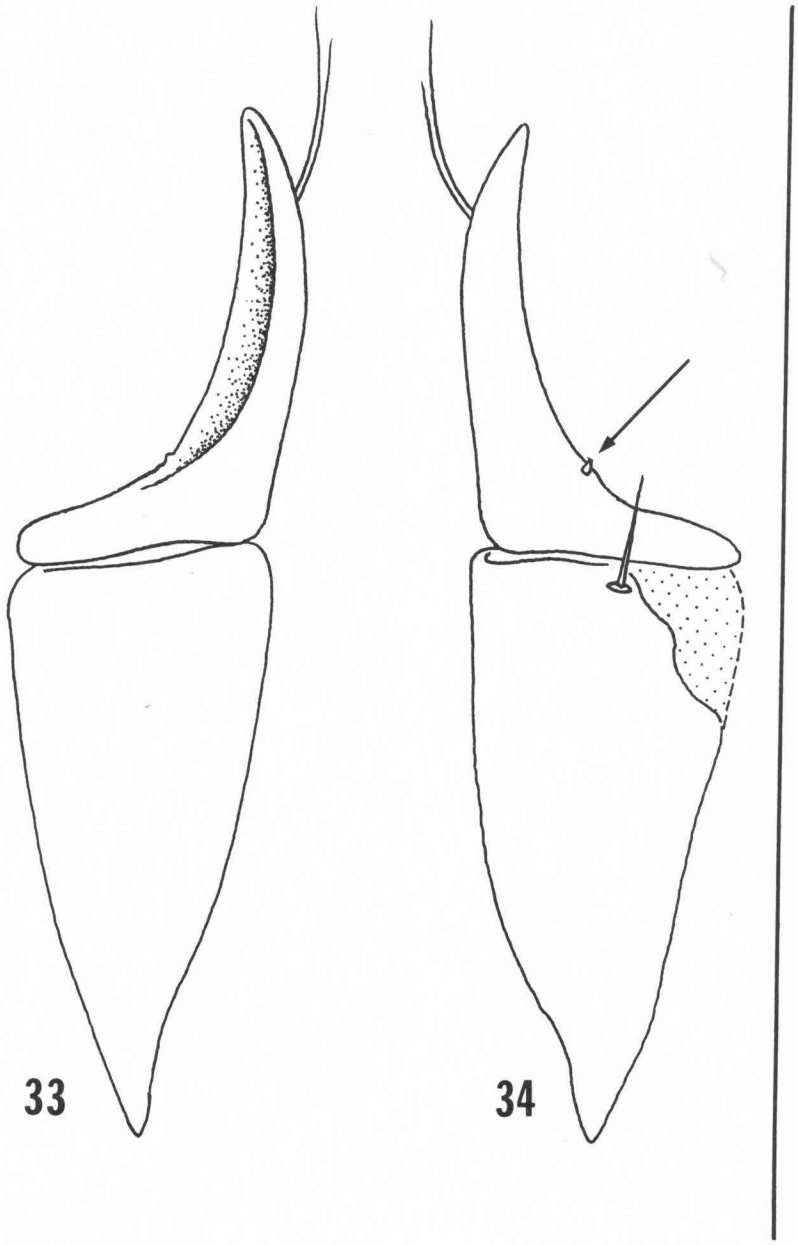
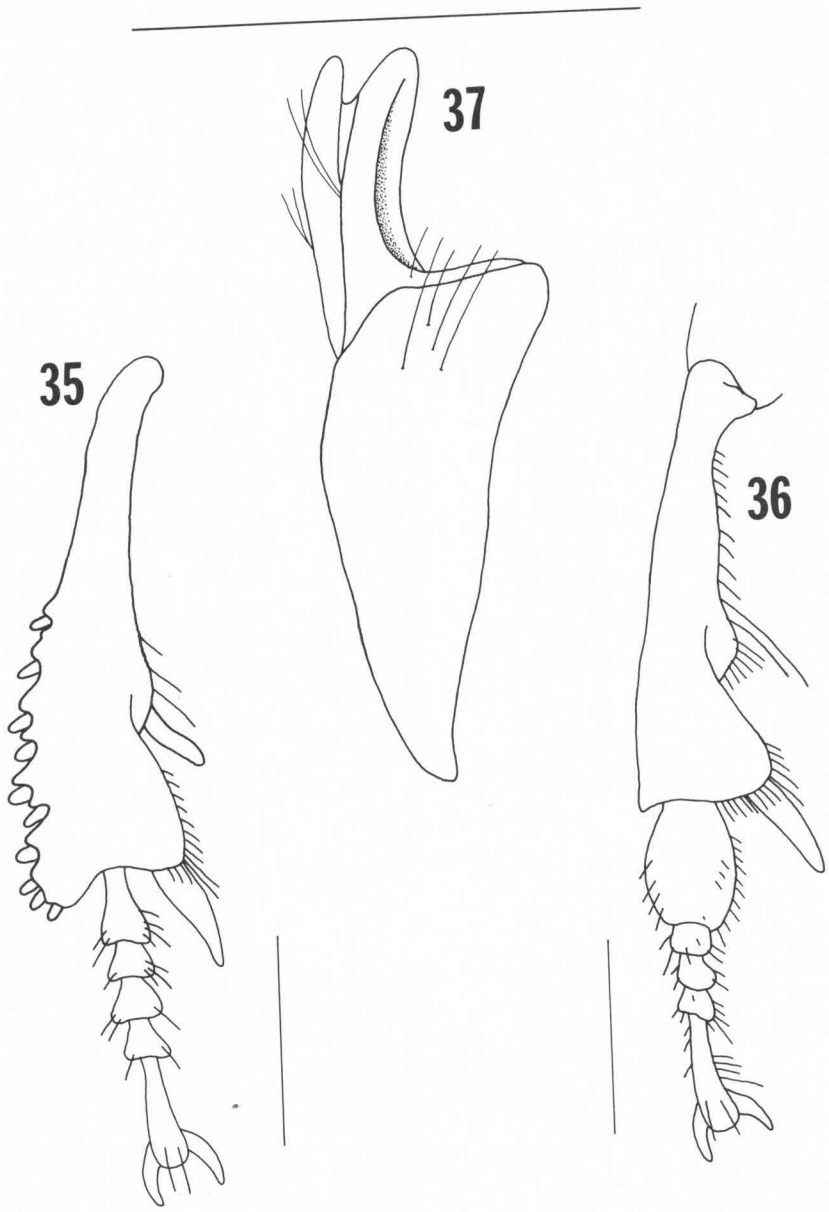


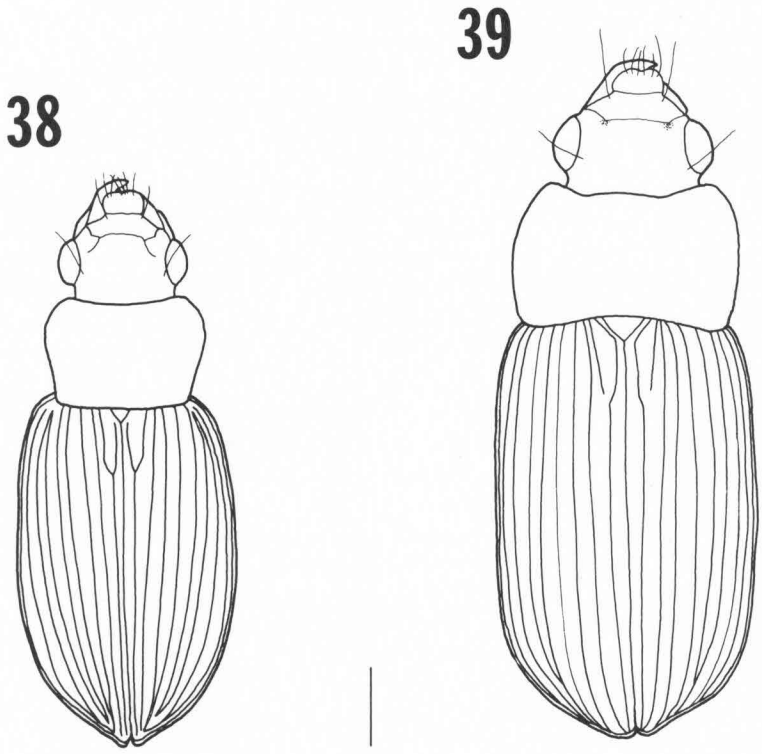
Fig. 30. Abdominal sternum 6 of male *Hyphaereon lautulus*, ventral aspect. Figs. 31-32. Posterior view of *Discoderus robustus* showing apex of abdominal sterna 6. 31. Female (medially enlarged area of apex marked by arrow). 32. Male.



Figs. 33-34. Stylus of ovipositor of *Parophonus lugubricus*. 33. Dorsal aspect. 34. Ventral aspect (arrow marks "peg-like" seta referred to in text).



Figs. 35-36. Front legs. 35. *Anisocnemus amblygonus*. 36. *Stenomorphus convexior*, female. Fig. 37. Stylus of ovipositor of *Stenomorphus convexior*, dorso-lateral aspect.



Figs. 38-39. Drawings showing generalized body forms of members of the two subgenera of *Axinotoma*. 38. subgenus *Lampetes*. 39. subgenus *Axinotoma*.

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