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Generic synopsis of Scoliidae (Hymenoptera, Scolioidea)

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Abstract – The classification and nomenclature of Scoliidae is reviewed and a comprehensive key to genera is presented. A new subfamily (Colpinae), together with 21 new tribes (Agombardini, Ascoliini, Austroscoliini, Betremiini, Carinoscoliini, Colpacampsomerini, Colpini, Curtaurgini, Dasyscoliini, Dielidini, Discoliini, Dobrobetini, Hangasornini, Heterelini, Lisocini, Megascoliini, Pseudotrielidini, Tetrascitonini, Trisciloini, Triscoliini, Ycasbraini) are described. In order to accommodate natural groups of species, there are 62 new genera proposed (*Agombarda, Bagonasuna, Batalanga, Borongorba, Burgamurga, Buzatlana, Citberaysa, Curtaurga, Dobrobeta, Elpaholta, Fiharbuxa, Gondiconda, Hangasorna, Haralambia, Hayderiba, Hitfoidra, Iforborha, Iksalonca, Ilkamilka, Jupadora, Katapolda, Kokarevta, Kukkiya, Laskariska, Lobhargita, Molzinarda, Mookitena, Murahutka, Naysebwa, Niyaranta, Nokbibula, Noybarilta, Onkoknoa, Ordatirga, Orlovinga, Oscalosca, Paconzitva, Pardesiya, Pupunhuga, Rahosmula, Rihamlika, Rostopasca, Rucarcana, Sisakrosa, Sobolpiha, Stiboranna, Sugorpilfa, Susaynata, Tatusdayca, Titbisayda, Tonsoygata, Torbesula, Turturayca, Ululanca, Uthakkara, Vardombra, Vobalayca, Wogungela, Xirgoniqua, Ycasbraia, Yohaida, Zazilayza*). Keys to 143 genera, with concise generic diagnoses, remarks on nomenclature, type designations, synonymy, distribution and bibliography are given. The neotype of *Lacosia pygmaea* SAUSSURE is described. With 109 figures.

INTRODUCTION

The large and flagrant aculeate wasps of the family Scoliidae are natural enemies of the white grubs (larvae of Scarabaeidae and Lucanidae). These hosts are underground dwellers, inhabiting cultivated soils, roots, tubers, decaying logs and trees. Biological control methods have been most effective against these grubs, as they are difficult to control via conventional procedures. Certain introduced and acclimatized wasp species are successful agents against the palm- and sugarcane-pest rhinoceros beetles. Despite their important role, there is a lack of systematic knowledge of the representatives of the Scoliidae.

Prior to 1972, all scoliid genera were included in the nominal subfamily Scoliinae. In that year, BETREM (1972) established a second subfamily, Campsomerinae. Five years later, however, the discovery of a new subfamily, Proscoliinae, induced RASNITSYN (1977) to consider that separation of the Scoliidae into Scoliinae and Campsomerinae was not justified; this due to the huge differences occurring between his Proscoliinae and

the rest of the family. For that reason, he maintained only Scoliinae and Proscoliinae. Further discoveries (DAY *et al.* 1981) pointed to similar results for the classification. Afterwards, RASNITSYN (1993) described a new fossil subfamily, Archaeoscoliinae, based on *Archaeoscolia senilis*, from the late Early Cretaceous period.

Beginning with the first classification of the Scoliidae, by GUÉRIN-MENEVILLE (1839), all consecutive authors dealing with this task (SAUSSURE 1863, SAUSSURE & SICHEL 1864, COSTA 1858, BINGHAM 1897, ASHMEAD 1903, SCHROTTKY 1910, MICHA 1927, BETREM 1928–72), have based their system on the characteristics of the wing venation. Only cautious trials were attempted for the use of other morphological features, such as the tubercle of mesopleuron (BETREM 1928, BRADLEY 1928*a*, KROMBEIN 1963). Besides, BETREM (1935) in his species-concept, was heavily influenced by the studies of RENSCH. All these works (*cf.* RENSCH 1933, 1934) are very important for a biologist, emphasizing continuity in a character-release and evolution. Almost all living organisms may be arranged in a firmly related species-realms (the "Artenkreis" of RENSCH, of BETREM 1935 and of BETREM & BRADLEY 1964: 440). These realms share overlapping features at the frontiers of their systematic separation. I have investigated this problem in some detail (NAGY 1968, 1969, 1978). Hence, I now contend that an entomologist must have access to a taxonomic system with a steadfast limits and a concise nomenclature. Nevertheless, BETREM (1972) identified the common (and otherwise independent) Hungarian species as *Trielis* (*Heterelis*, *Heterelis*) *quinquecincta quinquecincta* FABRICIUS, 1793 forma geogr. *abdominalis* SPINOLA, 1806. This perplex nomenclature was motivated by his recognition of the categories: genus, subgenus, section, species-group, super-species, species, subspecies and the local form. Is such a terminology adequate for general biology, collegiate zoology, comprehensive ecology, and theoretical or applied entomology? Cumbersome nominalistics disturbed the classification of the family Scoliidae for the last fifty years. Analogously, BETREM & BRADLEY (1964) regard *haemorrhoidalis* FABRICIUS, 1787, described from Hungary, to be a subspecies of *flavifrons* FABRICIUS, 1775, described from Spain. Both were placed in *Regiscolia*, a subgenus of *Megascolia*. In the classification proposed below, none of them are placed in *Regiscolia*. These are not even considered congeneric. Further, *Regiscolia* belongs to a different tribe than *Megascolia*. Both the classification and nomenclature advanced herewith are drastically different from those proposed by early students. Previous, accidental or tendentious, misinterpretations of genera are reconsidered where possible. The case of *Sphex maculata* DRURY, 1773 was discussed by numerous authors (BRADLEY 1928*c*). As stated by MICHA (1927), it was originally described from Morea (Greece). The name was rejected in order to conserve another name, *haemorrhoidalis* (BETREM 1963). None of the authors achieved the goal of comparing the species distributed in Peloponnesos (*maculata*) with that species they proposed to save (*haemorrhoidalis*). In reality, *maculata* is not identical with *haemorrhoidalis*; each of these belongs into a different genus.

The purpose of the present work, that began in 1964, is to elaborate a concise, and if possible, a workable key for the genera of Scoliidae. It was facilitated through the study of the scoliids in the Zoological Department of the Hungarian Natural History Museum, Budapest, in four consecutive visits. During this study numerous new and prevalently strong apomorphous character states were discovered. These enabled me to conclude that

there are four leading taxa occurring within Scoliidae. Each of them receive subfamily rank: Campsomerinae, Colpinae, Proscoliinae, Scoliinae. Colpinae is proposed here as new. The fossil Archaeoscoliinae, having the mesoscutum armed with deeply engraved notaulices, evidently belongs into Anthoboscidae and not to Scoliidae; as the notaulices are never developed in the latter family. An analysis of the character states demonstrates that, whereas subfamily Proscoliinae is the sister group of the Colpinae + Scoliinae, the distinct Campsomerinae is the sister group of the entire complex Proscoliinae + (Colpinae + Scoliinae). The submandibular triangle of male is developed in all scoliids, except Campsomerinae. In this subfamily, similarly, the outermost furrow of female mandible is entirely covered dorsally by a lobular projection of the mandible. Not covered so in the remaining subfamilies. Campsomerinae is less closely related to the Scoliinae than the subfamilies Proscoliinae and Colpinae.

NOMENCLATURE

The nomenclature of Scoliidae is, at the least, disastrous. There are some 1,273 species-group names already described. FABRICIUS (1775) established the genus *Scolia*. GUÉRIN (1839) proposed the genera *Ascoli*, *Campsomeris*, *Lacosi* and *Liacos*. SAUSSURE (1863) enlarged the list of the genera with *Discolia* and *Triscolia*. SAUSSURE & SICHEL (1864) contributed *Diliacos* and *Triliacos*. COSTA (1858, 1887) proposed the genera *Lisoca* and *Heterelis*. But in the world catalogue of DALLA TORRE (1897) only *Scolia* was admitted, generating in this way numberless homonyms. Owing to the efforts of SCHROTTKY (1910) and ILSEMARIE MICHA (1927) *Liacos*, *Diliacos*, *Discolia* and *Triscolia* survived. For the rest of the genera, intentional actions were taken to reject them.

JAMES CHESTER BRADLEY, who contributed so much to the study of the Scoliidae of the World, was also member of the International Commission of Zoological Nomenclature, his deliberate purpose was to establish the nomina nuda (BRADLEY 1964*c*: 101). For instance, he proposed a new genus and new species of the Mutillidae, *Physetapsus papaga* BRADLEY, 1916, but never described it afterward. (It was fully described later by SCHUSTER 1958, as *Physetapsis papaga*, but this is a different spelling.) Because that new generic-group name, *Physetapsus*, was based on an undescribed species, it is a true nomen nudum. In contrast, within the Scoliidae BRADLEY has introduced an appreciate number of new generic-group names; combined with valid, already described species-group names. Hence, these names are not true nomina nuda, are available names. Some of these genera were fully described by BETREM in the ensuing period. The Code is considering these as "available generic-group names without Type species designated up to now". In view of the stability and continuity of the Zoological Nomenclature, their corresponding types are designated below. These types are selected in accordance with their original combinations, although sometimes causing undesired changes of the standing nomenclature. All the alterations result from the intentional proposals of the nomina nuda concluded by BRADLEY.

Individual generic-group names suffer from the nominalistics mentioned above. Older names are often intentionally dropped, creating empty places for newly proposed

ones. But nowhere in the systematics has this occurred as extensively as in Scoliidae. Certain examples merit mention here:

The generic-group name *Ascoli* GUÉRIN, 1839, an anagram of *Scolia*, established without an original designation of type. The name was proposed for rejection, considered unavailable, by JACOT-GUILLARMOD *et al.* (1963). Their recommendation was motivated by the following three circumstances: **1.** Assumption that it was established for a hypothetical group; **2.** It was not validated by an earlier inclusion of a nominal species; **3.** It is a grammatically invalid arbitrary combination of letters; which if used, had to be amended in *Ascolia*. In fact, the first argument depends on opinions of GUÉRIN himself, and better left for him to judge. The second argument not hold at all. The authors simply overlooked the fact that SAUSSURE & SICHEL (1864) validated the name including it in synonymy of their genus *Triscolia*. The decisive fact was, that KROMBEIN (1951) designated *Scolia flavifrons* FABRICIUS as the type of the genus. The third argument is contained in the Code, "an invalid initial spelling to be corrected, and attributed to its original author". Therefore, in agreement with the concrete provisions of the Code, *Ascoli* GUÉRIN, 1839 is being amended in *Ascolia* GUÉRIN, 1839 with *flavifrons* as its type. The Opinion requested by the authors mentioned above rejects *Ascoli* GUÉRIN, but not the herewith rectified *Ascolia* GUÉRIN.

Lacosi GUÉRIN, 1839, an anagram of *Scolia*, was also proposed without the original designation of Type species. It is rectified here into *Lacosia* GUÉRIN, for the same reasons as above. The type is *Scolia pygmaea* SAUSSURE, 1858, through the inclusion by SAUSSURE (1858); but neither is the type *Scolia quadripunctata* FABRICIUS, as designated by BEQUAERT (1926), nor *Scolia quadripustulata* FABRICIUS, as designated by BETREM (1928), because both of these species were selected as type of *Lacosi*, a generic group name without status in nomenclature. PETERSEN (1970) intensively searched for the type of *pygmaea*, but failed to find it. In view of the stability and continuity of the nomenclature, the neotype of this species is therefore designated in the appendix of the present work.

Campsomeris GUÉRIN, 1839, was also proposed without an original designation of Type species. BEQUAERT (1926) selected *Scolia atrata* FABRICIUS as its type. This designation escaped to BETREM (1927*a*), who selected *Campsomeris aureicollis* LEPELETIER as type of *Campsomeris*. This selection of BETREM is unjustified since *aureicollis* was later included in *Campsomeris* by LEPELETIER (1845). Correspondingly, BETREM (1927*b*, 1928: 125) correcting his former erroneous type selection, designated *Scolia thoracica* FABRICIUS, 1787, as type of *Campsomeris*. This second selection is perfectly justified. It is in accordance with prescriptions of the Code. The species *thoracica* was included in *Campsomeris* by GUÉRIN himself. Subsequently, BETREM (1941) to avoid confusion with the early selection of BEQUAERT, established another new genus, *Campsomeriella*, with *thoracica* as its type. The movement of BETREM was in perfect concordance with the principle of priority of type designations, and altogether respectable. But *Campsomeris* sense BEQUAERT (1926) is different from *Campsomeris* sense BETREM (1927*a*). So that the latter needed a replacement name. In the same work BETREM (1927*a*) published an available generic-group name, whose type was not designated till now. As a first reviser,

I am selecting *Campsomeris aureicollis* LEPELETIER, 1845 as the type of *Tetrasciton* BETREM, 1927.

Liacos GUÉRIN, 1839, an anagram of *Scolia*, was published without original designation of type, but with an included species, *dimidiata* GUÉRIN, which is the type by monotypy. BINGHAM (1897) separately, designated *Scolia analis*, sense BINGHAM, not FABRICIUS, as the type of *Liacos*. BINGHAM mentions that this species is common and widely distributed "throughout India, Burma, and Tenasserim". BETREM (1928), stated that in fact BINGHAM intended *Scolia erythrosoma* BURMEISTER (and mistakenly called it *analis*). *Erythrosoma* is the species occurring in India. The genuine *Scolia analis* FABRICIUS is restricted to the Moluccas and the Philippines. BINGHAM kept *erythrosoma* as a synonym of *analis*. After all, BETREM (l.c.) again selected *Scolia dimidiata* GUÉRIN as the type of *Triliacos* SAUSSURE & SICHEL, 1864. This designation is questionable, as *dimidiata* was not originally included in *Triliacos* by SAUSSURE & SICHEL. A condition which, if accepted, would render *Triliacos* a synonym of *Liacos*. Hence, I would be obligated to propose a new generic-group name for *erythrosoma*. Accordingly, in order of the stability and continuity of zoological nomenclature, I selected *erythrosoma*, one of the originally included species, as the type of *Triliacos* SAUSSURE & SICHEL. This selection causes no undesired changes in the existing nomenclature. Previously BRADLEY (1964*b*) regard *dimidiata* as a junior synonym of *analis*. ASHMEAD (1903) also chose *dimidiata* as the type of *Liacos*. He was unaware of the designation effectuated by BINGHAM. His new genus, *Tetrascolia* ASHMEAD, 1903, established for *Campsomeris urvillii* LEPELETIER, 1845 is regarded as isogenotypic with *Liacos*. Since SAUSSURE & SICHEL (1864) placed *urvillii* in synonym with *analis*. Although the holotype of the former species was not restudied till now (BRADLEY 1964*a*), this synonymy is accepted by recent workers. This due to the fact, that it was assumed that originally, both *analis* and *urvillii* were described from material collected in Buru. This was assumed because FABRICIUS described *analis* as originating from New South Wales; whereas LEPELETIER described *urvillii* from Buru. BRADLEY (1964*b*) contended, however, that *analis* was described also from Buru (Indonesia). Subsequently, nonetheless, BETREM (in BRADLEY 1972: 4–5) admitted that *dimidiata* is not a synonym of *analis*, and the latter was probably described from material collected in Ambon (Indonesia), this being the reason for the transfer of *amboinae* MICHA, 1927 into synonymy with *dimidiata*.

Scolioides GUIGLIA & CAPRA, 1934, proposed as a subgenus, was correctly established, and type species was originally designated. Despite these facts, it was neglected by the former classifications. I have tried (NAGY 1967) to raise it to generic rank, but it was sunk again in the synonymy of *Discolia*. These two taxa are not related at all, as is demonstrated by the classification presented here.

The genus *Heterelis* COSTA, 1887, was discussed but not accepted by BRADLEY (1951). I regarded at that time this genus as valid (NAGY & STAMP 1966, NAGY 1967). Soon, also BETREM (1972) acclaimed my views.

The most complicated question concerns the genus *Lisoca* COSTA, 1858. It was originally established with three included nominal species (and their varieties), without designation of type by COSTA. These were: *unifasciata* CYRILLO, *bifasciata* ROSSI, and *quadripunctata* FABRICIUS. BETREM (1928) selected *Lisoca citreozonata* COSTA, as the

type of *Lisoca*. BETREM was unaware that this species was later described by COSTA, in the year 1861, and not in 1858, as was the genus. The circumstance was first recognized by GUIGLIA & CAPRA (1934). Moreover, KROMBEIN (1951) designated *quadripunctata* FABRICIUS as the type of *Lisoca*. This fact escaped the attention of BETREM & BRADLEY (1964). They again reconsidered the selection of *citreozonata*, declaring it invalid; since this species was not originally included. Their final conclusion was, however, inaccurate. If one will accept it, then *Lisoca* became a synonym, and a new name is to be proposed for the group it represents. Such a redundancy of the generic-group names is frustrating. In conformity with the Code (Art. 69a, iv), with respect to the principle of stability and continuity of Zoological Nomenclature, the selected type, despite the fact that it was not originally included, automatically is considered as the type of that genus, as it was subsequently synonymized with one of the originally included species. Hence *Lisoca citreozonata* COSTA, 1858 was synonymized with *Scolia bifasciata* ROSSI, 1790, by SAUSSURE & SICHEL (1864), COSTA (1887), GUIGLIA & CAPRA (1934), and by BETREM (1935). As *bifasciata* was originally included, it is thus type of *Lisoca*. Different subsequent designations for *quadripunctata* were needless. The above mentioned problem is furthermore complicated by the fact that *Scolia bifasciata* ROSSI, 1790, is a junior homonym of *Scolia bifasciata* SVEDERUS, 1787, and hence not applicable. It was recognized, however, that *bifasciata* ROSSI is a junior synonym of *Scolia quadricincta* SCOPOLI, 1786, which is the replacement name. The latter species was included in *Lisoca* by COSTA, under the name *notata* FABRICIUS, 1798, as a variety of *bifasciata*. The implications involved by nominalistics are not finished. Respective to another originally included species, *Scolia unifasciata* CYRILLO, BETREM & BRADLEY (1964) asserted that: "his description [of COSTA] made clear that he meant by this *S. erythrocephala nigrescens* SAUSSURE". Such a verdict is again false. SAUSSURE & SICHEL (1864) never described it, as they never gave a Latin name to a variety. They simply registered them with Greek letters or numbers (see pages 273–274 in their work for illustrations). The hypothetical name *nigrescens*, attributed to SAUSSURE by BETREM (1935), resulted from a misunderstanding of the distribution data; conferred in Latin text by SAUSSURE & SICHEL (1864: 75) as: "Chersonneso Taurica (var. nigra, Klug). Sicilia (var. nigrescens, Mus. Saussureanum). Africa septentrionali, Nubia (var. rufescens, Klug), Abyssinia (Mus. Sichelianum)". A liberal translation might be: "In Cherson of Tauria (the black form of KLUG). Sicily (the blackish form, from the collection of SAUSSURE). In North Africa, Nubia (the reddish form of KLUG), Abyssinia (in collection of SICHEL)". Correspondingly, KLUG never described any variety called *nigra* or *rufescens*. In addition, BISCHOFF & BRADLEY (1929) restudied the types of PALLAS, deposited in the Museum of Humboldt University in Berlin. At that time, a specimen, probably a female (having second and third terga with yellow bands), was selected lectotype of *Scolia galbula* PALLAS, 1771. Another specimen, probably also a female (having second and fourth terga with lateral yellow spots, third with transverse yellow band), was selected lectotype of *Scolia tricolor* PALLAS, 1771. This selection caused no changes in the existing nomenclature. And BETREM (1935) accurately interpreted the species *galbula*. Afterward, BRADLEY (1972) stated, however, that the specimen with two yellow bands is *tricolor*, while that with spots and a band is *galbula*. In addition, contended BRADLEY, both *bifasciata* and *quadricincta* were junior synonyms

of *galbula*. Why was necessary to alter the types after half a century? This was in order to remove another name, *quadricincta*. The type-locality of *galbula* was Crimea, while that of *tricolor* Lake Inder, near the Ural River in Kazakhstan; these two localities being separated by about 1,600 kilometers. It was known from STEINBERG (1962), that one male specimen of *quinquecincta* was collected only once in the former USSR, in the southern part of the Ukraine. Only an interchange of the types will eliminate it from the list of valid species. The so-called lectotype specimen in the Berlin collection is labelled "Tauria". It is therefore not true type of *tricolor*. I have studied the type material of all species concerned. Both *tricolor* and *galbula* are valid species. The former is distributed in Kazakhstan and Transcaucasus. Incidentally, STEINBERG (1962) also collected it at the type-locality (Inder), and as first reviser of the dispute, I selected his Fig. 70, as representing the type of *tricolor* (with yellow band on the third tergum). The second species, *galbula* (with yellow bands on both second and third terga), is distributed in the Balkans and Crimea. These two are somewhat related (but not identical), and both are placed in *Pardesiya*, a new genus described below. They are not related to *quinquecincta*, placed here in the genus *Lisoca* COSTA.

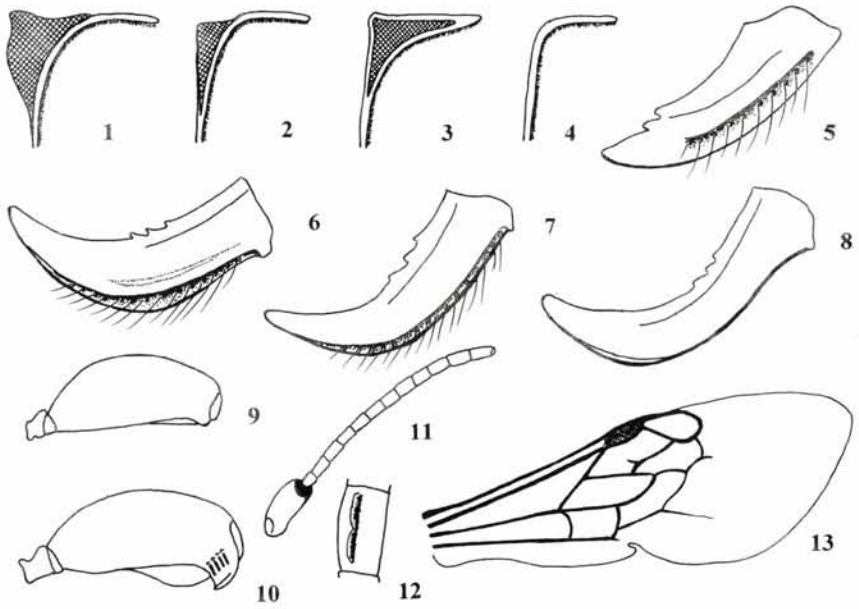
Other erroneous lectotype selections and synonyms are disputed by PETERSEN (1970).

STRUCTURE AND TERMINOLOGY

The family Scoliidae is separated from other families of Aculeata through the presence of the following plesiomorphous character-states: **1**. The ring-segment of antennae are always developed; **2**. Cenchri exposed as translucid semicircular sclerites under postero-lateral margin of the metanotum; **3**. Propodeum is almost always tripartite by longitudinal furrows. At the same time, the family possesses the following apomorphous character-states: **1**. Hypostomal carina of female prolonged anteriorly and connected to the clypeus (not connected in Vespidae); **2**. Metasternum enlarged, covering base of hind coxae (tight in Vespidae); **3**. Wing membranes with longitudinal striations; **4**. Hind tibia without a calcar and hind basitarsus without strigil (present in Vespidae); **5**. Pygidium of female delimited by lateral carinae (not in Vespidae); **6**. Hypopygium of female with a lateral spine; **7**. Subgenital plate of male with three acute spines. The disassociated digitus and cuspis of male genitalia in Proscoliinae is an incontestable plesiomorphy, which places this subfamily at the base of the dendrogram. As these pieces are separated in families considered primitive on the basis of other features, as with Bethylidae. The compact volsella of Scoliinae is an autapomorphy for this subfamily. The male of *Proscolia* is wholly black. An entirely black integument represents the plesiomorphous character-state, as this condition occurs within the Bethylidae. Red integument and/or pubescence manifest an advanced state; while the presence of (sometimes very rich) yellow or pale whitish integumental maculation constitutes the highest apomorphy within this family. This character trait provide natural camouflage on flowers; and insures survival of the insect through the mimicry of poisonous social vespids. (This especially true for male scoliids, which possess no stinging organs). The sex-linked selection pressure of this trait

was discussed by BRADLEY (1952) and BETREM (1967*b*). Selection pressure generated different degrees of development of features considered diagnostic in the generic key. Sometimes, only females or only males of a species manifest characters, to enable the rapid and easy identification of the target taxon. The development of an anterior tubercle on first tergum of the apparent abdomen is, similarly, an apomorphy; an acquirement which does not yet occur with the *Proscolia*. This tubercle facilitates opening of the cocoon wall during the adult emergence.

The glossary of special terms used herein are: **Pecten** – is a transverse row of stout spines on inner apical end of female tibia (Figs 18, 20, 83). Occasionally only one spine occurs above the articulation of tibial spurs. **Scopa** – if developed on the inner aspect of hind basitarsus, it is a dense patch of subdecumbent, apically acute, pale setae (Fig. 22). If developed on inner apical end of hind tibia, it is a patch of suberect, usually pale, apically conspicuously widened and bifid setae (Figs 28, 84). The scopa is always developed on the hind basitarsus of the males. It is developed or not in the females. The presence of a pecten and of a scopa on the female's hind leg is to be regarded as a plesiomorphous character-state since both are developed (in an incipient or primitive state) in *Proscolia*. The development of a pecten on the middle tibia of the females of *Laskariska* is an auta-



Figs 1–13. Distal end of the hypostomal carina of male Scoliidae, the oblique shading respresents the subandibular triangle. 1 = Proscoliinae, 2 = Colpinae, 3 = Scoliinae, 4 = Campsomerinae. 5–8: Left mandible of the female Scoliidae. 5 = Proscoliinae, 6 = Colpinae, 7 = Scoliinae, 8 = Campsomerinae. 9–10: Hind femur of female Scoliidae. 9 = Proscoliinae, 10 = Campsomerinae, Colpinae, Scoliinae. 11–13: *Proscolia*: 11 = male antenna, 12 = eleventh antennal segment of male antenna with tyloids, 13 = female fore wing

pomorphy of that genus, occurring uniquely within the family Scoliidae. Pterostigma of fore wing is, relatively, completely sclerotized in *Proscolia*, almost completely sclerotized in *Dasyscolia* and *Carbonelis*, and unsclerotized and entirely cell-like in all other genera.

KEY TO GENERA OF SCOLIIDAE

1 Hypostomal carina of male bisected, narrowly foveolate apically, forming a very long and acute, narrow, sometimes broader submandibular triangle (Figs 1–3); outermost furrow of female mandible freely exposed, completely visible in lateral view (Figs 5–7) 2

– Hypostomal carina of male compact, without trace of submandibular triangle (Fig. 4), genitalia with digitus and cuspis separated (Fig. 48); outermost furrow of female mandible covered, not visible in lateral view (Fig. 8); palpal formula is 6–4 in both sexes, tibial spur formula of female 1–1–2, of male variable; outer ventral lobe of hind femur, of both sexes armed with stout spines arranged in an oblique row (Fig. 10); epipleurite of first tergum smooth (Fig. 23); male flagellum clavate in one genus, filiform and tapering to apex in all other genera. Subfamily **Campsomerinae** BETREM, 1972 5

2 Fore wing with two recurrent veins reaching second submarginal cell Figs 13, 34–35, 58–59, 68–69); metasternum straight (Fig. 41) or convex (Figs 16, 40) at apical margin; third abdominal segment always with raised basal gradulus, on tergum or sternum (Figs 25, 44), or on both; male genitalia with digitus and cuspis entirely separated (Figs 47, 49) 3

– Fore wing with only one recurrent vein reaching second submarginal cell (Figs 79–80, 90–91); metasternum concave (Fig. 78), except in one genus with moderately convex (Fig. 75) apical margin; palpal formula 6–4, tibial spur formula 1–1–2 in both sexes; outer apical lobe of hind femur armed with stout spines in an oblique row in both sexes (Fig. 10); third abdominal segment without gradulus in either sex; epipleurite of first tergum covered with a row of some large setigerous punctures proximally (Fig. 24) in both sexes; inner spur of female hind tibia never spatulate; genitalia of male with the digitus and cuspis invariably consolidated in a unique segment, called volsella (Figs 51–52, 89). Subfamily **Scoliinae** LATREILLE, 1802 20

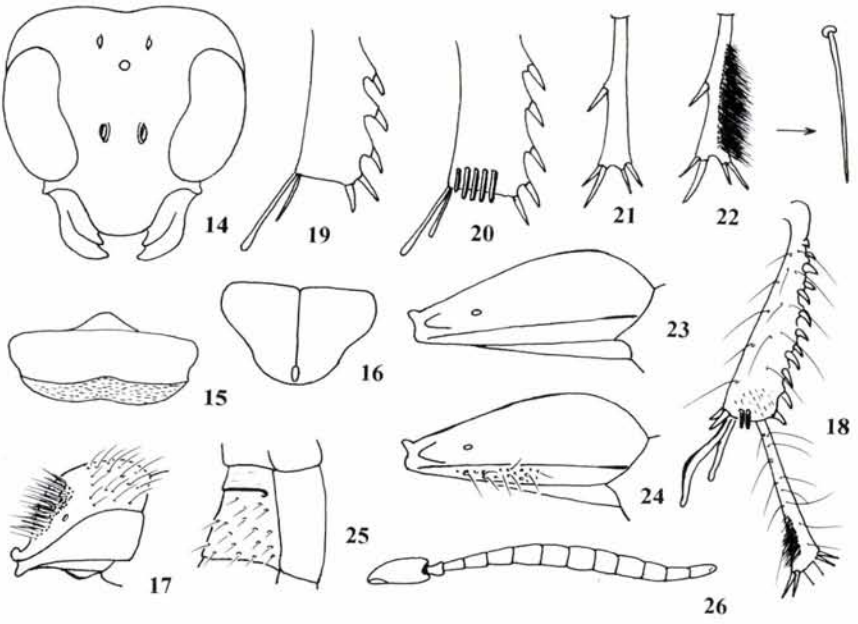
3 Palpal formula 5–4, tibial spur formula 1–2–2 in both sexes; inner margin of mandible with two teeth before apex (Fig. 5); male flagellum cylindrical (Fig. 11), provided with tyloids (Fig. 12); outer apical lobe of hind femur unarmed (Fig. 9) in both sexes; fore wing with two submarginal and three discoidal cells (Fig. 13); apical margin of metasternum convex (Fig. 16); female hind tibia armed with a pec-

ten, hind basitarsus with scopa (Fig. 18), inner spur not spatulate; epipleurite of first tergum smooth (Fig. 17); male genitalia (Fig. 47). Subfamily **Proscoliinae** RASNITSYN, 1977. – Palaearctic Region (Eastern Mediterranean and Caucasus). Type species: *Proscolia archaica* RASNITSYN, 1977

Proscolia RASNITSYN, 1977

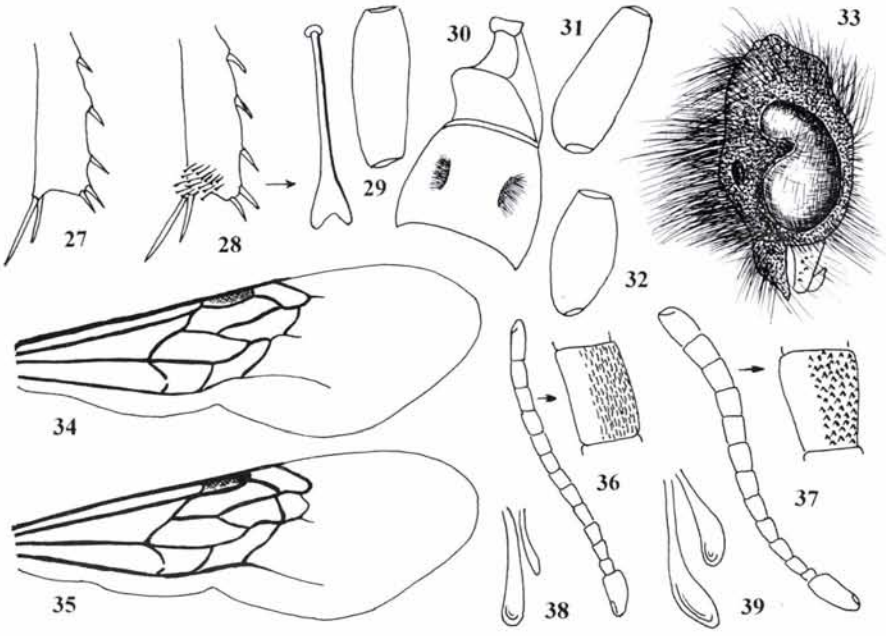
– Palpal formula 6–4 in both sexes; tibial spur formula of female 1–1–2, of male is variable; flagellum cylindrical (Fig. 36), fusiform (Fig. 26) or clavate apically (Fig. 37), without any tyloids; outer apical lobe of hind femur armed with some stout spines in an oblique row in both sexes (Fig. 10); epipleurite of first tergum covered with rows of some large setigerous punctures proximally (Fig. 24). Subfamily **Colpinae** subfam. n. 4

4 **Colpinae**. Bee-like, body densely clothed with long erect hairs, hairs on clypeus and front longer than scape length (Fig. 33); male flagellar segments are covered with salient black spiculae (Figs 36–37); inner margin of mandible with two teeth



Figs 14–26. *Proscolia*: 14 = male head frontal, 15 = female clypeus, 16 = female metasternum, 17 = female first tergum lateral, 18 = inner aspect of female hind tibia and basitarsus. 19–20: Inner aspect of female hind tibia of Scoliidae, 19 = tibia without pecten, 20 = tibia with pecten. 21–22: Inner aspect of female hind basitarsus of Scoliidae, 21 = basitarsus without scopa, 22 = basitarsus with scopa. 23–24: First tergum of Scoliidae lateral, 23 = Campsomerinae, 24 = Colpinae and Scoliinae. 25: *Heterelis*: male second sternum sublateral. 26: *Trielis*: male antenna

Figs 27–39. Inner aspect of female hind tibia of Scoliidae, 27 = tibia without scopa, 28 = tibia with scopa. 29: *Zazilayza*, female scape. 30: *Curtaurga*, male first and second sterna ventral and sublateral. 31: *Pygodasys*: female scape. 32: *Regiscolia*: female scape. 33–34: *Dasyscolia*, 33 = male head lateral, 34 = female fore wing. 35–36: *Carbonelis*, 35 = female fore wing, 36 = male antenna with eleventh segment enlarged showing wave-like spiculae. 37: *Dasyscolia*: male antenna with eleventh segment enlarged showing conical spiculae. 38–39: Spurs of female hind tibia, 38 = *Heterelis*, 39 = *Colpa*



before apex, seldom with an indication of a third tooth; tibial spur formula of male inconstant, often vary on sides of same specimen; abdomen black in both sexes. Tribe **Dasyscoliini** trib. nov. 5

– Wasp-like, body less densely pubescent, hairs of head shorter than scape length; flagellum of male smooth, or covered with microscopically small spiculae; inner margin of mandible with three teeth before apex 6

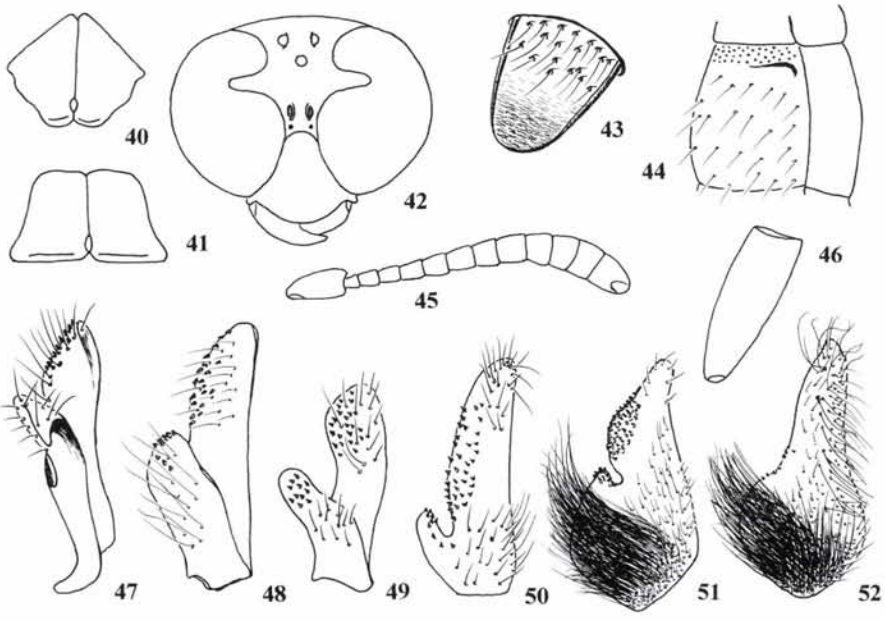
5 **Dasyscoliini**. Fore wing with two submarginal cells (Fig. 34); metasternum wider apically than long mesally (Fig. 41); antenno-ocular distance of male plentiful longer than diameter of anterior ocellus (Fig. 33); flagellar segments are covered with conical spiculae (Fig. 37); volsella of male (Fig. 49); hind tibia of male without scopa; hind tibia of female without a pecten. – Palaearctic Region. Type species: *Tiphia ciliata* FABRICIUS, 1787 **Dasyscolia** BRADLEY, 1951

– Fore wing with three submarginal cells (Fig. 35); metasternum narrower apically than long mesally (Fig. 40); antenno-ocular distance of male much shorter than diameter of anterior ocellus, flagellar segments are covered with wave-like spiculae (Fig. 36), hind tibia with scopa; female hind tibia armed with a pecten. – Palaearctic Region. Type species: *Scolia carbonaria* KLUG, 1832

Carbonelis BETREM, 1968

6 Metasternum wider apically than long mesally, its posterior margin straight (cf. Fig. 41); fore wing with three submarginal cells (cf. Fig. 35); head of female without any polished transverse stripe beyond antennal tubercles; male head (Fig. 42), tibial spur formula 1–1–2, second sternum with sublateral brush of hairs in a deep groove (Fig. 30)(imitating the felt-line of the Mutillidae); abdomen black in both sexes. Tribe **Curtaurgini** trib. n. 7

– Metasternum narrower apically than long mesally, especially in males, its posterior margin arched (cf. Fig. 40), second sternum not grooved so as above; if the meta-



Figs 40–52. Male metasternum, 40 = *Carbonelis*, 41 = *Dasyscolia*. 42: *Curtaurga*: male head. – 43: *Heterelis*: male pygidium. 44: *Yohaida*: male third sternum ventral and sublateral. 45: *Crioscolia*: male antenna. 46: *Tatusdayca*: female scape. 47–52: Digitus and cuspis, or the volsella of the male genitalia of Scoliidae, 47 = *Procolia* (Proscoliinae), 48 = *Trisciloa* (Campsomerinae), 49 = *Dasyscolia* (Colpinae), 50 = *Laskariska* (Scoliinae, Ascoliini), 51 = *Scolia* (Scoliinae, Scoliini), 52 = *Lisoca* (Scoliinae, Lisocini)

sternum of some females almost as wide as long, then the head accomplished with a polished transverse stripe, separating antennal tubercles from the upper front 10

7 **Curtaurgini**. Lower half of female mesopleuron smooth, yield into sharply acute vertical crest (cf. Fig. 100); male first sternum divided crosswise by an extremely strong transverse ridge into an anterior concave and a posterior inclivous sectors (Fig 30); head of male (Fig. 42). – Afrotropical Region, including the Arabian Peninsula. Type species: *Scolia aliena* KLUG, 1832 (= *Guigliana* BETREM, 1967 nec BRADLEY, 1964) **Curtaurga** nom. n.

– Lower half of female mesopleuron rounded, without vertical crest above the middle coxae, only remotely covered with large setigerous punctures; males unknown in the following genera 8

8 Clypeal disc elevated and delimited above by semicircular carina; both vestiture and tibial spurs yellowish brown; inner spur of female hind tibia not spatulate; pygidial disc clothed with short setae. – Afrotropical Region. Type species: *Guigliana hexensis* BETREM, 1972 **Hexelis** BETREM, 1972

– Clypeal disc neither elevated nor delimited as above; both vestiture and tibial spurs black; inner spur of hind tibia at least slightly spatulate apically 9

9 Anterior clypeal rim narrowly interrupted at sides by deep incision, surface of clypeal disc smooth; pygidial disc clothed with short setae. – Afrotropical Region. Type species: *Trielis nyasensis* BETREM, 1972 **Nyaselis** BETREM, 1972

– Anterior clypeal rim entire at sides, surface of clypeal disc covered with certain irregular, coarse wrinkles; pygidial disc clothed with rather long setae. – Malagasy subregion. Type species: *Elis elliotiana* SAUSSURE, 1891 **Malagaselis** BETREM, 1972

10 Female hind tibia equipped with pecten; tibial spur formula of male 1–0–2, hind tibia with scopa, first tergum never entirely yellow on its dorsal disc 11

– Female hind tibia without pecten; male hind tibia without scopa, or if developed, then first tergum entirely yellow on its dorsal disc; fore wing with three submarginal cells developed in both sexes. Tribe **Trielidini** BETREM, 1965 18

11 Outer spur of female hind tibia not spatulate, female abdomen entirely black or partly red, seldom with rather narrow apical yellow stripe on basal three terga; third sternum of male always with gradulus complete from side to side, basal terga with yellow apical band; two or three submarginal cells developed in both sexes. Tribe **Heterelini** trib. n. 12

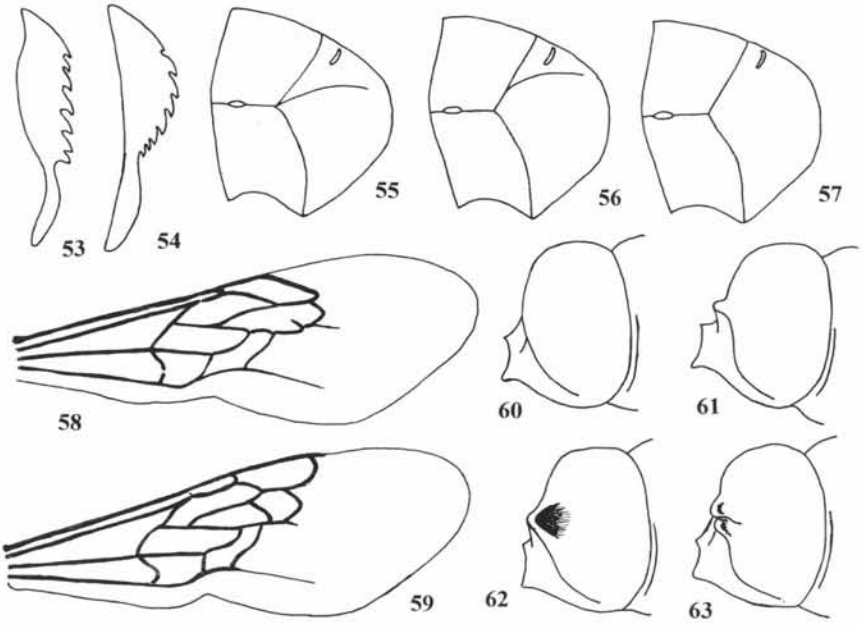
– Both inner and outer spurs of female hind tibia are rather strongly spatulate (Figs 38–39), female abdomen seldom black or wholly yellow, very often is spotted with yellow; third sternum of male always with an incomplete gradulus only at the extreme sides (Fig. 44), first three terga maculated with lateral yellow spots; three submarginal cells are developed in both sexes (Fig. 69). Tribe **Colpini** trib. n. 15

12 **Heterelini**. Male pygidium on posterior half sharply margined by an acute keel (Fig. 43), lateral carina of propodeum developed (cf. Fig. 55); female pterostigma at most as long as height of first submarginal cell (Fig. 58). – Palaearctic and Oriental Regions. Type species: *Scolia quinquecincta* FABRICIUS, 1793

Heterelis COSTA, 1887

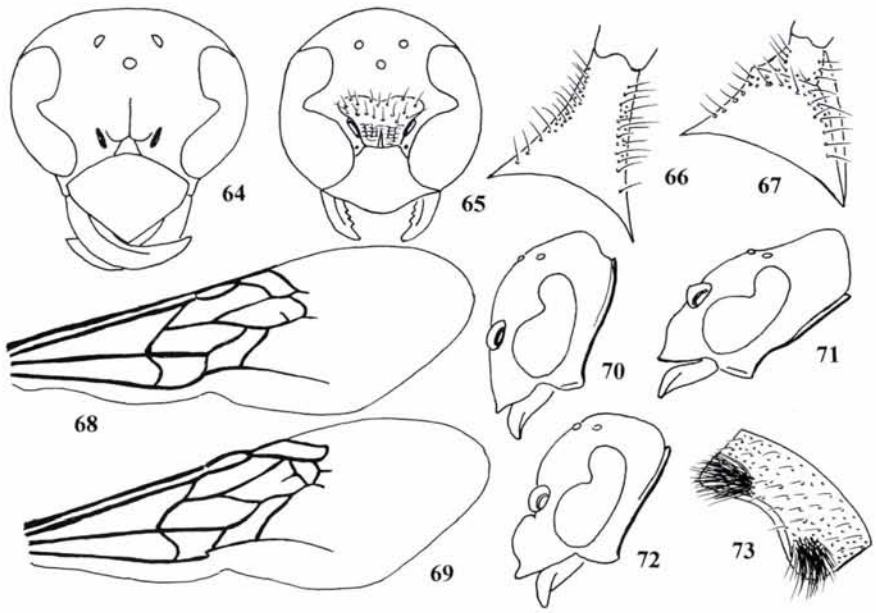
– Male pygidium nowhere margined by keel; female pterostigma much longer than height of first submarginal cell (Fig. 68) 13

13 Male second and third sterna with isolated, sublateral yellow spots, placed before of their apical yellow margin; female metasternum semicircular, as wide apically



Figs 53–63. Aedeagus of the male genitalia of Scoliidae, 53 = aedeagus with straight ventral margin, 54 = aedeagus with convex ventral margin. 55–57: Metapleuron and lateral propodeum of male Scoliidae, 55 = *Ascolia*, 56 = *Laskariska*, 57 = *Enigmatimeris*. 58–59: *Heterelis*: fore wing, 58 = female, 59 = male. 60–63: First abdominal abdominal tergum of female Scoliidae dorsal and sulateral. 60 = *Rostopasca*, 61 = *Regiscolia*, 62 = *Laskariska*, 63 = *Austroscolia*

Figs 64–73. Head frontal. 64 = *Orlovinga* female, 65 = *Tonsoygata* male. 66–67: First sternum of female ventral and sublateral. 66 = *Discolia*, 67 = *Vardombra*. 68–69: Female fore wing. 68 = *Stigmatelis*, 69 = *Yohaida*. 70–72: Female head lateral. 70 = *Lisoca*, 71 = *Scolioides*, 72 = *Vobalayca*. – 73: *Vobalayca*: male sixth sternum ventral and sublateral



as long mesally (cf. Fig. 75); female fore wing (Fig. 68). – Afrotropical Region. Type species: *Elis stigma* SAUSSURE, 1859 **Stigmatelis** BETREM, 1972

– Male second and third sterna are ornamented only with very narrow apical yellow stripes; female metasternum rectangular, much wider apically than long mesally (cf. Fig. 41) 14

14 Male front between antennal tubercles accomplished with a furrow, basal terga of the abdomen ornamented with narrow apical yellow stripes; female pygidium entirely clothed with unusually dense, decumbent strong setae. – Afrotropical Region. Type species: *Dielis mima* BUYSSON, 1897 **Ordatirga** gen. n.

– Male front between antennal tubercles accomplished with a thin crest, basal terga of the abdomen is ornamented with broad apical yellow bands; surface of female pygidium wholly glabrous, any without setae or spines, disc coarsely rugose. – Afrotropical Region. Type species: *Elis punctum* SAUSSURE, 1891
Punctelis BETREM, 1972

15 **Colpini**. Male scutellum maculated with a yellow spot, dentate ventral margin of the aedeagus convex (Fig. 54); female mesopleuron yield into a sharp, impunctate vertical carina above middle coxae (cf. Fig. 100), head and abdomen black. – Afrotropical Region. Type species: *Trielis junodi* BETREM, 1972

Junodelis BETREM, 1972

– Male scutellum maculated with two yellow spots, or wholly black, without any spot, dentate ventral margin of aedeagus straight (Fig. 53); female mesopleuron is rounded, remotely punctate all over, without vertical carina above middle coxae; head and abdomen with yellow maculation 16

16 Male antenna short, reach at most apex of scutellum, third sternum with a distinctly raised gradulus basally (cf. Fig. 25), subalar scale of mesopleuron black; female vertex broadly black beyond the ocellar triangle, fourth tergum of the female abdomen with a transverse, completely punctate preapical stripe; spurs of female hind tibia (Fig. 39). – Palaearctic and Oriental Regions. Type species: *Scolia interrupta* FABRICIUS, 1781 (= *Campsoscolia* BETREM, 1933) **Colpa** DUFOUR, 1841

– Male antenna long, reach up to middle of first tergum, third sternum with deeply excavated transverse colpus basally (cf. Fig. 44), subalar scale of mesopleuron yellow; female vertex also all over yellow, fourth tergum with broad, entirely impunctate preapical stripe 17

17 Male antenna black; third submarginal cell of female triangular in form, third transverse-medial vein yield in additional, straight veinlet, directed outwardly (Rs–2, characteristic to the Mutillidae) (Fig. 69), front rather flat, not elevated over level of antennal tubercles, both thorax and first tergum is entirely black. – Palaearctic Region. Type species: *Scolia klugi* LINDEN, 1829 **Yohaida** gen. n.

– Male scape and pedicellus wholly yellow; third submarginal cell of female fore wing rectangular, transverse-medial vein not produced in outer veinlet, frons strongly elevated over the antennal tubercles, thorax and first tergum is yellow. – Palaearctic Region. Type species: *Trielis tartara* MORAWITZ, 1897

Bagonasuna gen. n.

18 **Trielidini**. Male flagellum fusiform, tapering both to base and to apex (Fig. 26), anterior half of wings membrane pubescent, tibial spur formula 1–1–2, hind tibia without scopa (cf. Fig. 27), third sternum with a deep colpus at the extreme sides (cf. Fig. 44), basal terga of the abdomen are ornamented with lateral yellow spots; female metasternum rectangular in outline, wider apically than long mesally (cf. Fig. 41), lower front not elevated above level of antennal tubercles, inner spur of hind tibia spatulate. – Nearctic and Neotropical Regions. Type species: *Elis xantiana* SAUSSURE, 1863 **Trielis** SAUSSURE, 1863

– Male flagellum strongly clavate (Fig. 45), wings membrane glabrous, save a narrow stripe along costal the margin is pubescent, hind tibia with scopa (cf. Fig. 28), basal terga of the abdomen are ornamented with broad yellow bands; female metasternum is semicircular, as wide apically as long mesally (cf. Fig. 40), lower front strongly elevated above, up to level of antennal tubercles, inner spur of hind tibia not spatulate 19

19 Mid dorsal area of propodeum much shorter than metanotum; tibial spur formula of male 1–1–2, third sternum entirely smooth, without basal gradulus, lateral carina of propodeum absent, genitalia with the cuspis twice as long as the digitus; female clypeus shorter than scape length, both head and thorax is completely black. – Nearctic Region. Type species: *Campsomeris flammicoma* BRADLEY, 1928
Crioscolia BRADLEY, 1951

– Mid dorsal area of propodeum much longer than metanotum; tibial spurs formula of male 1–0–2, third sternum with complete basal gradulus, lateral carina of propodeum developed, genitalia with cuspis thrice as long as digitus; female clypeus as long as scape length, head and thorax yellow. – Palaearctic Region. Type species: *Scolia moricei* SAUNDERS, 1901 **Kukkiya** gen. n.

20 **Scoliinae**. Female hind basitarsus accomplished with a scopa (cf. Fig. 28); basivolsella of the male always very sparsely pubescent, with rather short setae (Fig. 50) 21

– Female hind basitarsus without trace of scopa (cf. Fig. 27); basivolsella of male often also sparsely, but sometimes very densely pubescent, bearing compactified and unusually long setae (Figs 51–52) 58

21 Mid dorsal area of propodeum at most as long as metanotum; dentate ventral margin of aedeagus of male genitalia always straight (Fig. 53). Tribe **Ascoliini** trib. n22

– Mid dorsal area of propodeum distinctly longer than metanotum; dentate ventral margin of aedeagus of male genitalia convex or straight 26

22 **Ascoliini**. Fore wing with two closed submarginal cells; first tergum entirely smooth, with no trace of an anterior tubercle (Fig. 60); male unknown. – Palaearctic Region (Caucasus). Type species: *Scolia erivanensis* RADOSZKOWSKI, 1879
Rostopasca gen. n.

– Fore wing always with three closed submarginal cells (Fig. 91) in both sexes; first tergum with an anterior tubercle (Figs 61–62) invariably developed in both sexes23

23 Flagellum dull or opaque black in both sexes; ocello-ocular line of male 1.5 times as long as diameter of anterior ocellus; female hind tibia implemented with a pecten 24

– Flagellum rather shining, light red in both sexes; ocello-ocular line of male exactly as long as diameter of anterior ocellus; female hind tibia without any trace of a pecten 25

24 Lateral carina of male propodeum fit proximally metapleural-propodeal suture at junction of the episternal crest of metapleuron (Fig. 55); inner aspect of female mid tibia entirely smooth without trace of a pecten. – Palaearctic and Oriental Regions. Type species: *Scolia flavifrons* FABRICIUS, 1775 (= *Regiscolia* BETREM & BRADLEY, 1964 nec BRADLEY, 1964) **Ascolia** GUÉRIN, 1839

– Lateral carina of male propodeum fit proximally metapleural-propodeal suture far above of the junction of episternal crest of metapleuron (Fig. 56); inner aspect of female mid tibia always equipped, with at least one or two stout spines of a primitive pecten, but sometimes on right side only. – Palaearctic Region (Especially in the Carpathian Basin). Type species: *Scolia haemorrhoidalis* FABRICIUS, 1787 **Laskariska** gen. n.

25 Both the integument and the vestiture black; scape short and oval (Fig. 32), its sides distinctly tapering both to base and to apex; costal margin of marginal cell of male fore wing as long as height of that cell; first tergum of female with entirely compact tubercle (Fig. 61). – Palaearctic Region. Type species: *Sphex bidens* LINNAEUS, 1767 **Regiscolia** BRADLEY, 1964

– Both the integument and the vestiture are red; scape long, parallel-sided (Fig. 29); costal margin of marginal cell of male fore wing twice as long as height of that cell; tubercle of female first tergum deeply excavated behind, forming a conspicuous basin (cf. Fig. 62). – Palaearctic and Oriental Regions. Type species: *Scolia rubida* GRIBODO, 1893 **Zazilayza** gen. n.

26 Mid dorsal area of the propodeum conspicuouly narrower posteriorly than the posterior width of the latero-dorsal area; fore wing always with one recurrent nervure and with three closed discoidal cells developed in both sexes (Figs 79–80); dentate ventral margin of the aedeagus of male genitalia is convex (Fig. 54). Tribe **Liacosini** SCHROTTKY, 1910 27

– Mid dorsal area of the propodeum obviously wider posteriorly than the posterior width of the latero-dorsal area; fore wing always with one recurrent nervure and with two closed discoidal cells developed in both sexes (cf. Figs 90–91) 34

27 **Liacosini**. Mesoscutum built with deeply engraved parapsidal furrows throughout; inner margin of female mandible with two teeth before apex; fore wing always with three closed submarginal cells developed in both sexes 28

– Mesoscutum without any trace of engraved parapsidal furrows, their place solely indicated by an unusually narrow and delicate longitudinal suture, which discer-

nible in an incident ligth; inner margin of female mandible with one sole tooth before apex 30

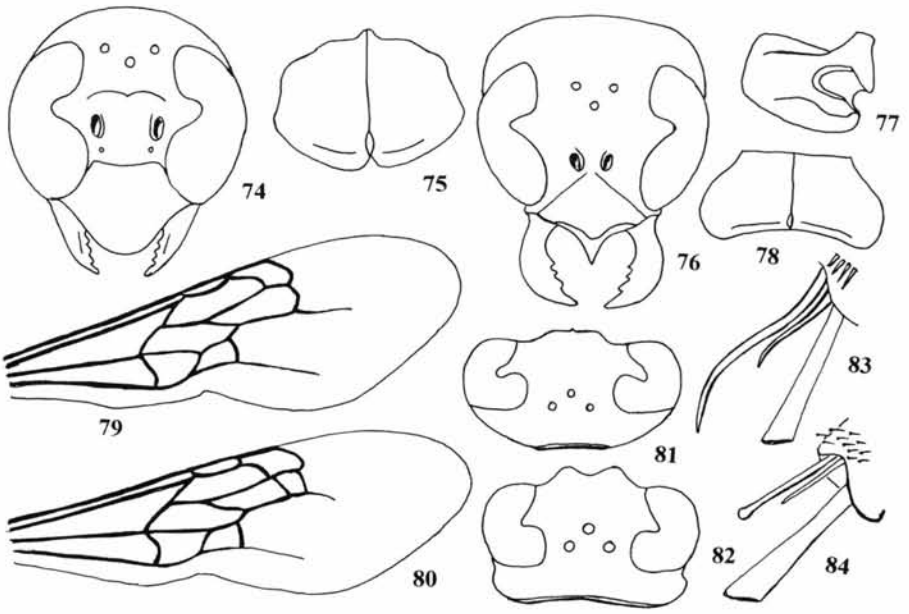
28 First tergum with an anterior tubercle strongly developed in both sexes (cf. Fig. 61); inner margin of male mandible with two teeth before apex, male scape parallel-sided, male hind tibia with a scopa; female hind tibia equipped with a pecten. – Afrotropical Region. Type species: *Scolia nigrita* FABRICIUS, 1782

Ululanca gen. n.

– First tergum without any trace of a tubercle (cf. Fig. 60); inner margin of male mandible with three teeth before apex, male scape conspicuously conical, tapering to base (cf. Fig. 46), male hind tibia without scopa; female hind tibia without pecten 29

29 Male scutellum with narrow medial, deeply engraved longitudinal furrow; first tergum of the female abdomen with a sharply acute, longitudinal crest anteriorly. – Oriental Region. Type species: *Scolia erythrosoma* BURMEISTER, 1853

Triliacos SAUSSURE & SICHEL, 1864



Figs 74–84. *Megascolia*: 74 = male head frontal, 75 = female metasternum. 76–77: *Ycasbraia*: female, 76 = head frontal, 77 = hind coxa dorsal and sublateral. 78: *Lisoca*: female metasternum. – 79–80: Female fore wing. 79 = *Turturayca*, 80 = *Ululanka*. 81–82: Male head dorsal. 81 = *Vobalayca*, 82 = *Lisoca*. 83–84: Spurs of female hind tibia. 83 = *Pseudotrielis*, 84 = *Rucarcana*

– Male scutellum without trace of a longitudinal furrow, or with a very short one posteriorly; female first tergum without crest, but sometimes with rounded tubercle. – Oriental Region. Type species: *Scolia dimidiata* GUÉRIN, 1839 (= *Tetrascolia* ASHMEAD, 1903) **Liacos** GUÉRIN, 1839

30 First tergum of the abdomen with an anterior tubercle (cf. Fig. 61); inner margin of male mandible with three teeth before apex; mid clypeal lobe of female is much wider apically than width of the lateral lobes; fore wing with three closed submarginal cells developed in the male, only two in the female. – Oriental and Australian Regions. Type species: *Scolia fulgidipennis* SMITH, 1859 **Turturayca** gen. n.

– First tergum without tubercle (cf. Fig. 60); inner margin of male mandible with two teeth before apex; mid clypeal lobe of the female distinctly narrower apically than width of the lateral lobes; fore wing with two closed submarginal cells in both sexes (Fig. 79) 31

31 Distivolsella of the male genitalia distinctly much shorter than basivolsella; mid clypeal lobe of female conspicuously emarginate apically, arched and concave, having acute corners. – Oriental and Australian Regions. Type species: *Scolia quadriceps* SMITH, 1859 **Murahutka** gen. n.

– Distivolsella of the male genitalia clearly longer than basivolsella; mid clypeal lobe of female straight, or slightly convex on its apical margin, without acute corners 32

32 Apical rim of female clypeus distinctly raised above the general surface; apical terga of the abdomen yellow, also bearing yellow pubescence; male not yet known. – Oriental Region. Type species: *Scolia sicheli* SAUSSURE, 1859 **Rahosmula** gen. n.

– Apical rim of the female clypeus flat or slightly impressed under the general surface; abdominal terga are wholly black, bearing black pubescence in both sexes 33

33 Metasternum raised above along the mid line; lateral carina of propodeum run on lateral margin of dorsal surface of propodeum, beyond the level of propodeal spiracle, posterior declivity of the propodeum not bordered. – Afrotropical, Oriental and Australian Regions. Type species: *Campsomeris violacea* LEPELETIER, 1845 **Diliacos** SAUSSURE et SICHEL, 1864

– Metasternum very flat throughout; lateral carina of propodeum run on the lateral aspect, below the lateral margin and well below the level of the propodeal spiracle, parallel with the dorsal surface of the propodeum, posterior declivity of propodeum bordered on its lower half or more, with an altogether blunt, but vertically emerging ridge. – Oriental and Australian Regions. Type species: *Scolia ribbei* BETREM, 1928 **Sobolpiha** gen. n.

34 Frontal ridges of the female head flattened, they widened below, flushing into extreme lower front and the supraclypeal triangle; inner margin of male mandible with three teeth before apex, dentate ventral margin of the aedeagus of male genitalia arched, distinctly convex (Fig. 54) 35

– Frontal ridges of the female head protruding, uniformly wide throughout, well raised above the level of the extreme lower front and the supraclypeal triangle, aedeagus of male genitalia of variable shape, straight or convex 43

35 Inner margin of female mandible always with only one tooth before the apex; first tergum of the abdomen without any trace of medial tubercle developed anteriorly in either sex (cf. Fig. 60). Tribe **Carinoscoliini** trib. n. 36

– Inner margin of female mandible with two or three teeth before apex; first tergum of the abdomen sometimes with an acute medial tubercle developed anteriorly in both sexes (cf. Fig. 61) 37

36 **Carinoscoliini**. Frons between antennal tubercles and anterior ocellus smooth, without a transverse ridge; fore wing with two submarginal cells developed (cf. Fig. 90); head and the abdomen ornamented with yellow maculation in both sexes. – Palaearctic Region. Type species: *Scolia vittifrons* SICHEL, 1864
Nokbibula gen. n.

– Frons between antennal tubercles and the anterior ocellus with a slightly sinuate transverse ridge, strongly developed in the male, weakly in the female; fore wing with two or three submarginal cells developed in different species; head and abdomen completely black. – Oriental and Australian Regions. Type species: *Scolia opalina* SMITH, 1858 **Carinoscolia** BETREM, 1927

37 Inner margin of female mandible with two teeth before apex; fore wing with two or three closed submarginal cells developed in both sexes. Tribe **Austroscoliini** trib. n. 38

– Inner margin of female mandible with three teeth before apex; fore wing always with two closed submarginal cells developed in both sexes. Tribe **Ycasbraini** trib. n. 42

38 **Austroscoliini**. Fore wing with only two submarginal cells developed, seldom a third cell also partially enclosed by an incomplete vein; head of female either completely black, or mostly black and ornamented with yellow maculation 39

– Fore wing with three submarginal cells always developed in both sexes; head of the female either wholly chestnut brown or light red, but never black with yellow maculation 41

39 First tergum of the abdomen with a longitudinal depression anteriorly in both sexes; male head with a blunt ridge surpassing and connecting the antennal toruli above. – Afrotropical Region. Type species: *Scolia ebenina* SAUSSURE, 1858
Citberaysa gen. n.

– First tergum of the abdomen with a transversely enlarged and blunt medial tubercle at its anterior margin, between the anterior declivity and the dorsal disc, usually developed in both sexes (cf. Fig. 63) 40

40 Frons between antennal toruli rugosely punctate; head completely black in both sexes; male head with an arched transverse ridge, running laterally from the inner ocular sinus of eye, traversing vertex behind the anterior ocellus. – Oriental and Australian Regions. Type species: *Scolia nitida* SMITH, 1858
Molzinarda gen. n.

– Frons between antennal toruli striate, with some superimposed, much stronger longitudinal grooves (Fig. 65); frons and vertex widely lemon yellow in both sexes; male head with a slightly sinuate transverse ridge running from one ocular sinus of eye to the other, on the front, before the anterior ocellus. – Oriental and Australian Regions. Type species: *Scolia verticalis* FABRICIUS, 1775 **Tonsoygata** gen. n.

41 First tergum of the abdomen without trace of a medial tubercle; wings entirely hyaline, with a conspicuous yellow tinge on the costal margin; the female head chestnut brown, also bearing brown pubescence, second and third terga with white apical fringes; second sternum of the male abdomen arched, very gradually declivous anteriorly. – Malagasy subregion. Type species: *Scolia carnifex* COQUEREL, 1855 **Hitfoidra** gen. n.

– First tergum of the abdomen equipped with blunt transverse tubercle (Fig. 63) having a weak longitudinal keel; wings are black, with a bluish reflection; female head light red, bearing red pubescence, abdominal fringes completely black; second sternum of the male abdomen very abruptly, almost angularly declivous anteriorly. – Oriental Region. Type species: *Scolia ruficeps* SMITH, 1855
Austroscolia BETREM, 1928

42 **Ycasbraini**. Mid clypeal lobe of the female exactly as wide apically as width of lateral lobes; metasternum perfectly flat on the mid line; the trochantinal cavity of hind coxa flanked inwardly by a unique keel; second sternum without trace of a tubercle; male not yet known, the discovery of the male may prove that this genus belongs elsewhere. – Australian Region. Type species: *Scolia vulsa* KROMBEIN, 1963 **Bradleyella** KROMBEIN, 1963

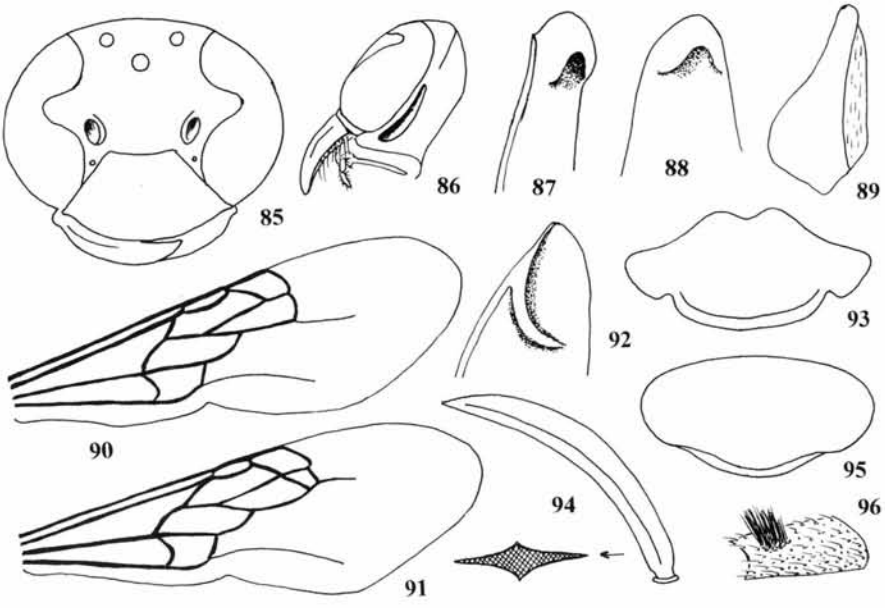
– Mid clypeal lobe of female pointed apically, rather acute (Fig. 76); metasternum raised on the mid line, longitudinally crest-like; trochantinal cavity of hind coxa flanked by two keels, the innermost one upraised in an apical, quadrate lamella

(Fig. 77), very large in *rufiventris*, moderate in *drewseni* SAUSSURE; second sternum with a transverse tubercle anteriorly (general habitus of these wasps remind genus *Fedtschenkia* of the Sapygidae). – Neotropical Region. Type species: *Scolia rufiventris* FABRICIUS, 1804 **Ycasbraia** gen. n.

43 Fore wing always with two closed submarginal cells (cf. Fig. 90) developed in both sexes. Tribe **Agombardini** trib. n. 44

– Fore wing constantly with three closed submarginal cells (cf. Fig. 91) developed in both sexes. Tribe **Triscoliini** trib. n. 51

44 **Agombardini**. Female clypeus half as long mesally as the scape length, vertex rather large, the distance between eye tops and the occipital carina is exactly as long as maximum length of an eye, measured in lateral view of head; male unknown. – Afrotropical Region. Type species: *Scolia cerberia* BRADLEY, 1959 **Jupadora** gen. n.



Figs 85–96. *Colpacampsomeris*: male head frontal. 86: *Turbatimeris*: female head lateral and subventral. 87–88: *Buzatlana*: apex of left paramere of male genitalia, 87 = lateral, 88 = ventral. 89: *Naysebwa*: volsella of male genitalia ventral, hairs omitted. 90–91: Female fore wing. 90 = *Scolia*, 91 = *Laskariska*. 92: *Scolia*: apex of left paramere of male genitalia ventral. 93: *Hayderiba*: female clypeus. 94: *Stygocampsomeris*: lanceolate hair on female vertex. 95: *Trisciloa*: female clypeus. – 96: *Gondiconda*: male fifth sternum ventral and sublateral

– Female clypeus fully as long mesally as the scape length, vertex not exceptionally large nor lengthened so much behind the eyes 45

45 First tergum of the male abdomen with a longitudinal groove anteriorly, dentate ventral margin of the aedeagus of male genitalia is curved, convex (cf. Fig. 54); the female front between the antennal tubercles and the anterior ocellus with a slightly arched, otherwise deep crosswise furrow. – Afrotropical Region. Type species: *Scolia fax* BRADLEY, 1957. **Pyrrhoscolia** BRADLEY, 1959

– First tergum of the male without groove anteriorly, dentate ventral margin of the aedeagus of male genitalia is straight (cf. Fig. 53); female frons without trace of any deep crosswise furrow 46

46 Inner margin of female mandible with two teeth before apex; scape of the male conical, with sides tapering to base (cf. Fig. 46), first tergum of the abdomen with anterior tubercle always developed (cf. Fig. 61) 47

– Inner margin of female mandible with three teeth before apex; male scape parallel-sided (cf. Fig. 29), first tergum of the abdomen without tubercle (cf. Fig. 60), distivolsella about thrice as long as basivolsella 49

47 Female clypeus flat, with radiating striae above; vertex of the female and the inner eye orbits of the male reddish; flagellum of the male fusiform, tapering to base and to apex (cf. Fig. 26), the distivolsella of the male genitalia thrice as long as basivolsella. – Oriental Region. Type species: *Scolia fulvifrons* SAUSSURE, 1854
Elpaholta gen. n.

– Female clypeus entirely smooth and rather convex; head black, a round spot in ocular sinus of the male, and whole flagellum of both sexes sometimes red or testaceous 48

48 Mid clypeal lobe of the female narrower apically than the lateral lobes, female scape parallel-sided; male flagellum fusiform, tapering both to base and to apex (cf. Fig. 26), the distivolsella of the male genitalia well thrice as long as basivolsella. – Afrotropical Region. Type species: *Scolia atra* ILLIGER, 1802
Agombarda gen. n.

– Mid clypeal lobe of the female twice as wide apically as the lateral lobes, scape oval, with arched sides (cf. Fig. 32); male flagellum cylindrical, uniformly wide throughout (cf. Fig. 36), the distivolsella of the male genitalia only twice as long as basivolsella. – Oriental Region. Type species: *Scolia cyanipennis* FABRICIUS, 1804
Burgamurga gen. n.

49 Female vertex rather wide, the distance between eye tops and occipital carina longer than maximum width of an eye (Fig. 71), head completely black; the male

flagellum rather strongly clavate apically (cf. Fig. 45). – Palaearctic Region. Type species: *Apis hirta* SCHRANK, 1781 **Scolioides** GUIGLIA et CAPRA, 1934

– Female vertex much shorter than width of an eye, frons and vertex maculated with yellow; male flagellum filiform, wide basally and conspicuously tapering to apex 50

50 Wings entirely hyaline, with a yellow tinge on the costal margin; lateral carina of the propodeum meet proximally metanotal-propodeal suture at the junction of episternal crest (cf. Fig. 55); first tergum of the female abdomen with a prominent tubercle anteriorly (cf. Fig. 61). – Oriental Region. Type species: *Scolia venusta* SMITH, 1855 **Rihamlika** gen. n.

– Wings entirely black, with a strong violaceous reflection; lateral carina of the propodeum meet proximally metanotal-propodeal suture well above the junction of the episternal crest (cf. Fig. 56); first tergum of the female abdomen equipped with a small tubercle. – Oriental Region. Type species: *Scolia bilunulata* SAUSSURE, 1858 **Onkoknoa** gen. n.

51 **Triscoliini**. Mesopleuron entirely covered with rather large, dense and extremely deep polygonal punctures, the interspaces are narrow, merely acute septa; body and appendages completely black. – Oriental and Australian Regions. Type species: *Scolia cephalotes* BURMEISTER, 1853 **Microscolia** BETREM, 1927

– Mesopleuron partially covered with small and scattered, only reasonably deep setigerous punctures, interspaces flat, at least comparable with own diameter of the punctures 52

52 Posterior margin of the propodeum round and evenly declivous throughout; first tergum of the abdomen as long as wide, or longer, always bell-shaped; body black, or black and red, wings membrane flagrant orange-yellow. – Malagasy subregion. Type species: *Scolia campanulata* BRADLEY, 1959

Mutilloscolia BRADLEY, 1959

– Posterior margin of propodeum subangular to very acute and abruptly declivous behind; first tergum of the abdomen much wider than long, transverse in outline 53

53 Mid dorsal area of the propodeum, on its posterior margin, equipped with a pair of flat tubercles; anterior margin of the female clypeus slightly concave; body ornamented with yellow maculation in both sexes; membrane of wings black, with steel-bluish reflection. – Australian Region. Type species: *Scolia frontalis* SAUSSURE, 1854 **Laeviscolia** BETREM, 1928

– Mid dorsal area of the propodeum perfectly flat on its dorsal aspect; anterior margin of the female clypeus transversely truncate or convex 54

54 First tergum of the abdomen without any tubercle, well twice as wide as long; female scutellum equipped with a longitudinal furrow mesally; apical abdominal segments red, also bearing reddish apical fringes. – Nearctic and Neotropical Regions. Type species: *Scolia badia* SAUSSURE, 1863 **Triscolia** SAUSSURE, 1863

– First tergum of the female abdomen with a median tubercle anteriorly always developed (cf. Fig. 61) 55

55 Mid dorsal area of the propodeum ornamented with yellow spots, also bearing yellow pubescence, as long as scutellum; first tergum of the abdomen less than twice as wide as long, first tergum of male without any tubercle; wings black, with purple and green reflection; abdominal fringes black. – Oriental Region. Type species: *Scolia capitata* FABRICIUS, 1804 **Xirgoniqua** gen. n.

– Mid dorsal area of the propodeum completely black, also bearing black pubescence, shorter than scutellum; first tergum of the abdomen twice or more than twice as wide as long, transverse in outline 56

56 Female scutellum equipped with a longitudinal furrow mesally; tubercle of the male first tergum situated below the dorsal surface of the tergum; wings black, with bluish and greenish reflection; abdomen entirely black, also bearing black apical fringes. – Oriental Region. Type species: *Scolia philippinensis* ROHWER, 1921 **Sugorpilfa** gen. n.

– Female scutellum without any trace of a distinct furrow; tubercle of the male first tergum situated on same level with the dorsal surface of the tergum 57

57 Tubercle of the female first abdominal tergum followed by an acute longitudinal crest; male clypeus and front maculated with reddish-yellow; wings black, membrane of wings with a violaceous reflection; abdomen black, bearing black or red apical fringes. – Oriental Region. Type species: *Scolia alecto* SMITH, 1858 **Paconzitva** gen. n.

– Tubercle of the female first abdominal tergum followed by a deep longitudinal groove; male clypeus and frons black; wings black, the membrane of wings with purple or bluish reflection; apex of the abdomen maculated with red integumental spots, its apical fringes black and red. – Oriental Region. Type species: *Scolia azurea* CHRIST, 1791 **Guigliana** BRADLEY, 1964

58 Basivolsella of the male genitalia clothed with relatively short and widely scattered pale setae (cf. Fig. 50); there are no particular morphological characters until now

discovered in view for separating the corresponding females from those of the following group 59

– Basivolsella of the male genitalia clothed with a compact brush of rather long and dense silky hairs (cf. Figs 51–52), these hairs often having a flagrant steel-bluish effulgence; there are no particular morphological characters yet discovered for separating the corresponding females from those of the preceding group 67

59 Propodeum compact, not divided by longitudinal furrows; declivity of the propodeum and of the first tergum of the abdomen bearing a patch of decumbent velvety pubescence, individual setae of which trifid at the apex. Tribe **Betremiini** trib. n. – Afrotropical Region. Type species: *Scolia apicipennis* TURNER, 1901

Betremia BRADLEY, 1948

– Propodeum always divided by longitudinal furrows into medial and lateral areas at least at the base of the dorsal surface; declivity of the propodeum and of the first tergum of the abdomen bearing normal, apically acute setae 60

60 Hind tibia of male without scopa (cf. Fig. 27); first sternum of the female abdomen flat, polished and completely glabrous, with some longitudinal rows of setigerous punctures along the extreme sides but none of them passing across the middle of sternal disc, which is rather shining (Fig. 66); first tergum of the abdomen without an anterior tubercle (cf. Fig 60); wings black with bluish reflection; abdominal terga of both sexes usually maculated with red or yellow integumental spots. Tribe **Discoliini** trib. n. – Nearctic and Neotropical Regions. Type species: *Scolia nobilitata* FABRICIUS, 1804 **Discolia** SAUSSURE, 1863

– Male hind tibia equipped with a scopa (cf. Fig. 28); first sternum of the female abdomen armed with a strong transverse ridge, paralleled by transverse rows of large setigerous punctures, some of the rows always complete across the middle of the sternal disc (Fig. 67), or nearly so, if uncertain, then first tergum equipped with a tubercle, or the wings hyaline, or the abdomen without yellow or red maculation 61

61 Frontal ridges of the female head flat, widened below, flush extreme lower front and supraclypeal triangle; male flagellum strongly clavate (cf. Fig. 45); the lateral carina of the propodeum meet metapleural-propodeal suture at the junction of the episternal crest (cf. Fig. 55); first tergum of the abdomen with an anterior tubercle; wings black, with strong bluish reflection; abdomen black, with orange-yellow lateral spots, but sometimes completely black. Tribe **Hangasornini** trib. n. – Oriental Region. Type species: *Scolia quadripustulata* FABRICIUS, 1782

Hangasorna gen. n.

– Frontal ridges of the female head protruding, almost uniformly wide throughout, raised above level of the extreme lower frons and supraclypeal triangle; flagellum

of male always narrower apically than wide at middle; the lateral carina of propodeum meet metapleural-propodeal suture well above the level of junction of the episternal crest (cf. Fig. 56). Tribe **Lacosiini** SCHROTTKY, 1910 62

62 **Lacosiini**. Antenno-ocular distance of the male extremely large, twice as long as the diameter of a lateral ocellus, sixth sternum of the abdomen is equipped with a copulatory brush, seventh with a longitudinal ridge; first tergum of the female abdomen with a deep longitudinal groove anteriorly; wings black, with a bluish reflection; abdomen black. – Afrotropical Region. Type species: *Scolia micromelas* SICHEL, 1864 **Wogungela** gen. n.

– Antenno-ocular distance of male small, at most equaling the diameter of lateral ocellus, sixth sternum simple, sparsely pubescent, without copulatory brush, seventh with glabrous longitudinal stripe; first tergum of the female abdomen never with a groove 63

63 Membrane of the fore wing completely hyaline in both sexes, having a distinct yellow stripe along the costal margin 64

– Membrane of the fore wing completely black in both sexes, having bluish or violaceous reflections 66

64 Occipital carina not developed in either sex; propodeum of the male not divided by longitudinal furrows except at its extreme base, but there the furrows relatively deep, comma-shaped; female head dark red; abdomen completely black in both sexes. – Malagasy subregion. Type species: *Scolia hova* SAUSSURE, 1891 **Stiboranna** gen. n.

– Occipital carina developed; propodeum of the male completely divided in medial and lateral areas by ordinarily deep longitudinal furrows; female head black; abdomen ornamented with yellow maculation 65

65 Head and hind tibial spurs black; antennal toruli of the male very close to, almost touching the inner eye orbits; mid dorsal area of the female propodeum unusually short, only half length of the scutellum. – Palaearctic and Oriental Regions. Type species: *Scolia desidiosa* BINGHAM, 1896 **Katapolda** gen. n.

– Head and hind tibial spurs yellow; antennal toruli of male separated from the inner eye orbits by half diameter of a lateral ocellus; mid dorsal area of the female propodeum as long, or even much longer than the scutellum. – Oriental Region. Type species: *Scolia picteti* SAUSSURE, 1854 **Vardombra** gen. n.

66 Occipital carina not developed; antennal toruli of male almost touching inner eye orbits, antenna rather long, reach second tergum; metanotum and propodeum of the

female smooth, covered with rare, small and shallow punctures. – Oriental Region. Type species: *Scolia jurinei* SAUSSURE, 1854 **Iksalonca** gen. n.

– Occipital carina well developed dorsally; antennal toruli of male separated from inner eye orbits by the diameter of a lateral ocellus, antenna very short, reach apex of propodeum; metanotum and propodeum of the female densely covered with numerous large, deep setigerous punctures, often rugosely so. – Palaearctic, Oriental and Afrotropical Regions. Type species: *Scolia pygmaea* SAUSSURE, 1858 **Lacosia** GUÉRIN, 1839

67 Fronto-clypeal suture of the male situated well below the level of anterior tentorial pit (Fig. 74); apical margin of the female metasternum convex, with rounded postero-lateral corners (Fig. 75); side lobes of the propodeum, of both sexes, very strongly prolonged postero-laterally over the basal articulation of the abdomen. Tribe **Megascoliini** trib. n. – Oriental Region. Type species: *Scolia procer* ILLIGER, 1802 **Megascolia** BETREM, 1928

– Fronto-clypeal suture of male situated well above the level of anterior tentorial pit (cf. Fig. 85); apical margin of the female metasternum concave apically, sometimes very deeply so (cf. Fig. 78); side lobes of the propodeum not prolonged as above 68

68 Volsella of the male genitalia retained its primordial separation into digitus and cuspis, via a deep notch on its outer margin (Fig. 51); mid dorsal area of the propodeum always as long as scutellum; first tergum of the abdomen without an anterior tubercle (cf. Fig. 60). Tribe **Scoliini** LATREILLE, 1802 69

– Volsella of the male genitalia without any trace of a deep notch on its outer margin (Fig. 52), sometimes at most with a shallow and rather wide emargination; first tergum of the abdomen often with an anterior tubercle. Tribe **Lisocini** trib. n. 73

69 **Scoliini**. Ventral margin of the clypeus triangular in outline, sharply protruding in both sexes (Fig. 64); wings hyaline, the membrane of wings completely glabrous, except for a narrow stripe along the costal margin, which is pubescent; body and the appendages pale yellow, with several rather reduced black marking. – Palaearctic Region. Type species: *Scolia gussakovskii* STEINBERG, 1953 **Orlovinga** gen. n.

– Ventral margin of clypeus always semicircular in female (cf. Fig. 95), although often slightly bisinuate on the sides, clypeal margin always broadly truncate in the male; wings yellow or black, the membrane almost completely pubescent throughout; body and the appendages more extensively black or red 70

70 Parameres of the male genitalia accomplished with a rather thick, conspicuous, V-shaped smooth tubercle, developed on its apical inner corner (Figs 87–88); second

sector of radial vein of the fore wing longer than height of the marginal cell. – Palaearctic Region. Type species: *Scolia fuciformis* SCOPOLI, 1786

Buzatlana gen. n.

– Parameres of the male genitalia thin, blade-like on apical inner corner; second sector of the radial vein of fore wing shorter than height of the marginal cell 71

71 Parameres of the male genitalia bisected on apical outer corner (Fig. 92), producing in downward and then inwardly bent, smooth and prominent blunt ridge. – Palaearctic Region. Type species: *Scolia quadripunctata* FABRICIUS, 1775

Scolia FABRICIUS, 1775

– Parameres of the male genitalia without any ridge on the apical outer corner 72

72 Volsella of the male genitalia equipped with a broad and transparent blade along the inner margin (cf. Fig. 89); mid dorsal area of the propodeum rather convex, evenly declivous throughout; occipital carina of male not developed; entire ventral aspect of thorax bearing flagrant snow-white pubescence. – Palaearctic and Oriental Regions. Type species: *Scolia histrionica* FABRICIUS, 1787

Kokarevta gen. n.

– Volsella of the male genitalia without an additional blade along inner margin; mid dorsal area of the propodeum horizontal, at least on its basal half; occipital carina of male well developed dorsally, beyond the ocellar triangle; entire ventral aspect of the thorax bearing shiny black pubescence. – Palaearctic and Oriental Regions. Type species: *Scolia neglecta* CYRILLO, 1787 **Pardesiya** gen. n.

73 **Lisocini**. Anterior margin of the anterior ocellus of the male, in dorsal view of the head, situated exactly on line connecting inner eye orbits (Fig. 82); clypeus of female flat (Fig. 70), clypeal disc longitudinally canaliculate; first tergum of the abdomen very often with an anterior tubercle (cf. Fig. 61) developed in both sexes, seldom without any tubercle (cf. Fig. 60). – Palaearctic and Oriental Regions. Type species: (*Lisoca citreozonata* COSTA, 1861) = *Scolia quadricincta* SCOPOLI, 1786

Lisoca COSTA, 1858

– Anterior margin of the anterior ocellus of the male situated well beyond line connecting inner eye orbits (Fig. 81); female clypeus convex (Fig. 72), clypeal disc smooth; first tergum of the abdomen seldom with an anterior tubercle 74

74 Volsella of the male genitalia implemented with a broad, transparent blade along the inner margin (Fig. 89), sixth sternum of the abdomen rather sparsely pubescent, covered with broadly scattered setigerous punctures all over; mid dorsal area of the female propodeum fully as long as scutellum. – Afrotropical Region. Type species: *Scolia fulvofimbriata* BURMEISTER, 1853 **Naysebwa** gen. n.

– Volsella of the male genitalia without additional blade along inner margin, sixth sternum of the abdomen with a copulatory brush on sides, constituted of dense patch of long, dark, suberect pubescence (Fig. 73); mid dorsal area of the female propodeum only half length of scutellum. – Palaearctic Region. Type species: *Scolia hortorum* FABRICIUS, 1787 **Vobalayca** gen. n.

75 **Campsomerinae**. Third sternum of the male abdomen with a gradulus always developed basally, at least on the extreme sides of the sternum (cf. Figs 25, 44); tibial spur formula of male always 1–0–2 76

– Third sternum of the male abdomen perfectly smooth basally, with no trace of gradulus or a colpus in either sex; fore wing with two submarginal cells developed in both sexes (cf. Fig. 34) 103

76 Third sternum of the abdomen implemented with an incomplete gradulus, developed only at the extreme sides of the sternal disc (cf. Fig. 44), at the very base, uniformly developed and detectable in both sexes 77

– Third sternum of the male abdomen implemented with a complete gradulus, developed from side to side (cf. Fig. 25); third sternum of the female abdomen without any trace of a gradulus 92

77 Mesoscutum at the location of the habitual notaulices of other wasps, the place of furrows substituted with rather strong and blunt longitudinal ridges; fore wing with three closed submarginal and four discoidal cells (Fig. 107) developed in both sexes; the female clypeus transversely truncate apically, very blunt (Fig. 95). Tribe **Trisciloini** trib. n. – Oriental and Australian Regions (Papuan subregion). Type species: *Trisciloa saussurei* GRIBODO, 1893 (= *Tetrasciloa* BETREM, 1927)
Trisciloa GRIBODO, 1893

– Mesoscutum without any indication of the notaulices; fore wing with three discoidal cells developed in both sexes (cf. Fig. 35); female clypeus either semicircular or acutely triangular (cf. Fig. 64) in outline. Tribe **Tetrascitonini** trib. n. 78

78 **Tetrascitonini**. Hind tibial spurs always black; female clypeus semicircular in ouline (cf. Fig. 95); mid tibia of the male armed with only one erect, long spine on outer ventral edge 79

– Hind tibial spurs always white in male; white, yellow, red or seldom wholly black in female, then female clypeus is sharply, acutely triangular in outline (cf. Fig. 64); mid tibia of the male armed with two spines on outer ventral edge 82

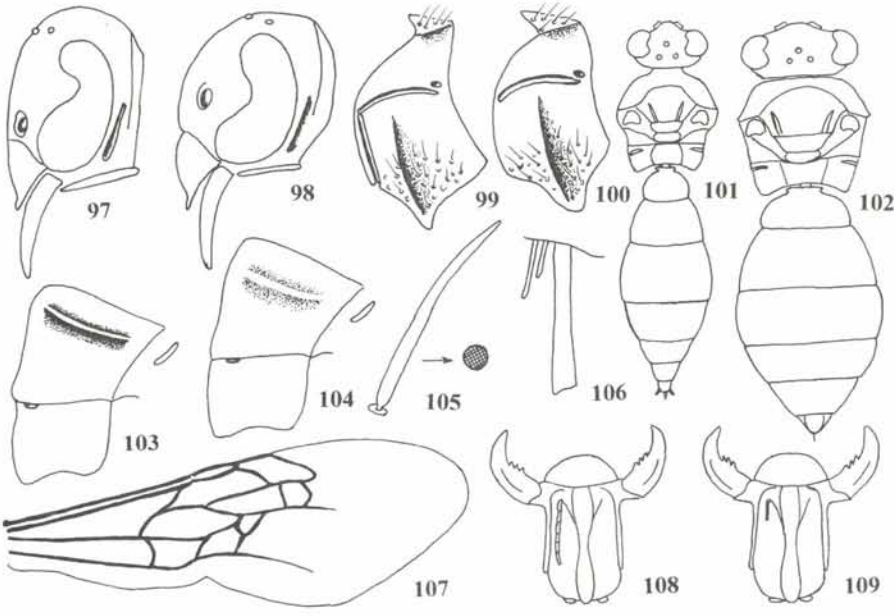
79 Fore wing with three closed submarginal cells (cf. Fig. 35); frons and vertex of the female clothed with normal, thin setae troughout, female hind tibia with scopa; male abdomen black, with yellow lateral spots. – Australian Region. Type species:

Elis consanguinea SAUSSURE, 1853 (= *Campsomeria* BRADLEY, 1966 nec PETERSEN, 1970) **Australelis** BETREM, 1962

– Fore wing with two closed submarginal cells (cf. Fig. 34); frons and vertex of the female are clothed with basally conspicuously inflated setae, tapering toward apex (Fig. 105), disc of the pronotum clothed with lanceolate setae (Fig. 94), female hind tibia without scopa; male abdomen without yellow spots 80

80 Apical abdominal segments completely red and bearing red pubescence; female hind tibia is armed with a pecten (cf. Fig. 20). – Oriental Region. Type species: *Campsomeris celebensis* BETREM, 1928 **Uthakkara** gen. n.

– Abdominal segments and their apical fringes black; female hind tibia without trace of a pecten (cf. Fig. 19) 81



Figs 97–109. Female head lateral. 97 = *Iforborha*, 98 = *Campsomeriella*. 99–100: Female mesopleuron. 99 = *Hayderiba*, with prepectal furrow, 100 = *Campsomeris*, without prepectal furrow. – 101–102: *Lacosia pygmaea* SAUSSURE, 101 = male, 102 = female. 103–104: Female metapleuron. 103 = *Garantimeris*, with subalar carina, 104 = *Dobrobeta*, with blunt subalar ridge. 105: *Sericocampsomeris*: cylindrical, apparently tubular, hair on female vertex. 106: *Noybarilta*: female hind tibial spurs. 108–109: Male hypostoma. 108 = *Susaynata*, with long maxillary palpus, 109 = *Haralambia*, with short maxillary palpus

81 Disc of the male clypeus black; mesopleuron of the female armed with a strong, acute subtegular tubercle, projecting sideward, the pronotal disc rather sparsely pubescent. – Oriental Region. Type species: *Campsomeris javana* LEPELETIER, 1845 (= *Tristimeris* BETREM, 1967) **Tristomeris** BETREM, 1966

– Disc of the male clypeus maculated with yellow spots on the sides; mesopleuron of the female completely flat, pronotal disc rather rugosely punctate and extremely densely covered with lanceolate setae. – Oriental Region. Type species: (*Scolia quadriguttulata* BURMEISTER, 1854) = *Scolia stygia* ILLIGER, 1802 **Sericocampsomeris** BETREM, 1941

82 Sixth sternum of the male abdomen densely punctate, bearing a copulatory brush, first tergum equipped with a minute medial tubercle (cf. Fig. 61); mid clypeal lobe of female triangular in outline (cf. Fig. 64), spurs of the hind tibia black or red 83

– Sixth sternum of the male abdomen sparsely punctate throughout, without any trace of a copulatory brush, first tergum without tubercle (cf. Fig. 60); spurs of the female hind tibia always white or pale yellow 88

83 Vestiture of the body orange-red; sternal part of the male abdomen ornamented with transverse yellow stripes; spurs of the female hind tibia correspondingly are orange-red. – Malagasy subregion. Type species: *Campsomeris fax* BRADLEY, 1936 **Rodriguimeris** BETREM, 1967

– Vestiture of the body white, black or partly yellowish-brown; sternal part of the male abdomen completely black, or ornamented with lateral yellow spots; spurs of the female hind tibia black 84

84 Ocelli of the male exceptionally small, the lateral ocellus separated from the inner eye orbits by twice as far as diameter anterior ocellus; striations of the female clypeal disc converge above, membrane of the fore wing obscurely hyaline, bearing white pubescence. – Oriental Region. Type species: *Campsomeris sauteri* BETREM, 1928 **Pupunhuga** gen. n.

– Ocelli of the male are normal, the lateral ocellus separated from the inner eye orbits by diameter of anterior ocellus; striations of female clypeal disc parallel, both membrane and the pubescence of fore wing completely or mostly black 85

85 Scutellum and metanotum of the male ornamented with yellow maculation, veins and pubescence of the wings membrane black; pubescence of female occiput and pronotal collar flagrant snow-white, the lower front, supraclypeal triangle and clypeal disc of the female forming continuous straight line (Fig. 97), mesosternum with a longitudinal keel. – Oriental Region. Type species: *Tiphia collaris* FABRICIUS, 1775 **Iforborha** gen. n.

– Scutellum and metanotum of the male entirely black, veins and pubescence of wings membrane orange; pubescence of female occiput and pronotal collar light brown, golden yellow or seldom gray, lower front, supraclypeal triangle and clypeal disc forming evenly curved line (Fig. 98), mesosternum very often without a longitudinal keel 86

86 Fifth tergum of the male abdomen black pubescent; female scutellum, metanotum and mid dorsal area of the propodeum impunctate, polished and shining, pygidium clothed with very long and thin setae, which everywhere twice as long as diameter of anterior ocellus. – Oriental Region. Type species: *Scolia hirticollis* FABRICIUS, 1804 **Hirtimeris** BETREM, 1967

– Fifth tergum of the male abdomen white pubescent; female scutellum, metanotum and mid dorsal area of the propodeum fairly densely punctate throughout, pygidium clothed with relatively short and stronger setae, at most 1.5 times diameter of anterior ocellus 87

87 Sixth tergum of the male abdomen black pubescent; female anterior ocellus rather small, only 0.6 times the distance that separates it from lateral ocellus, inner spur of hind tibia spatulate (*aureicollis*) or not (*quadrifasciata* FABRICIUS, 1798). – Oriental Region. Type species: *Campsomeris aureicollis* LEPELETIER, 1845 **Tetrasciton** BETREM, 1927

– Sixth tergum of the male abdomen pale pubescent, usually orange, seldom white and mixed with few dark hairs; female anterior ocellus large, 1–1.5 times the distance that separates it from the lateral ocellus, inner spur of hind tibia not spatulate. – Palaearctic and Afrotropical Regions. Type species: *Scolia thoracica* FABRICIUS, 1787 **Campsomeriella** BETREM, 1941

88 Fore wing of the male with three submarginal cells developed (cf. Fig. 35), male clypeus entirely yellow; metapleuron of the female completely divided by the episternal crest. – Palaearctic Region. Type species: *Dielis angulata* MORAWITZ, 1888 **Sisakrosa** gen. n.

– Fore wing of the male with two submarginal cells developed (cf. Fig. 34), male clypeus yellow only on the sides; episternal crest of the female metapleuron always incomplete, vanished anteriorly at level of the metapleural spiracle 89

89 First to fifth terga of the male abdomen ornamented with apical yellow bands; clypeus of the female semicircular in outline (cf. Fig. 95), the marginal rim of clypeus uniformly wide throughout, abdomen black, with white apical fringes 90

– First to fourth terga of the male abdomen ornamented with an apical yellow band; clypeus of the female pointedly triangular (cf. Fig. 64), the marginal rim of clypeus

only half as wide at sides as wide in the middle, abdomen black, ornamented with transverse yellow stripes 91

90 Sixth tergum of the male abdomen with an apical yellow band; head of the female with a shallow temporal groove beyond the outer eye orbits (cf. Fig. 86), pubescence of the head brown. – Afrotropical Region. Type species: *Dielis madonensis* BUYSSON, 1910 **Madonimeris** BETREM, 1967

– Sixth tergum of the male abdomen completely black; head of the female with a deep temporal groove beyond the outer eye orbits (cf. Fig. 86), pubescence of the head white. – Oriental Region. Type species: *Scolia annulata* FABRICIUS, 1793 (= *Phalerimeris* BETREM, 1966; *Annulimeris* BETREM, 1967)
Phaleromeris BRADLEY, 1964

91 Sixth and seventh terga of the male abdomen black pubescent, the clypeus yellow on the sides and at the base; disc of the female clypeus canaliculate, raised upwardly, and margined above by a ridge, inner-ventral lobe of the hind femur wholly as long as the femur, hind tibial spurs spatulate. – Afrotropical Region. Type species: *Scolia mansueta* GERSTAECKER, 1857 **Mansuetimeris** BETREM, 1972

– Fifth to seventh terga of the male abdomen black pubescent, the clypeus yellow on sides and at the apex; disc of the female clypeus flat, polished and shining, inner-ventral lobe of the hind femur only half as long as the femur, hind tibial spurs not spatulate. – Palaearctic and Oriental Regions. Type species: *Elis phalerata* SAUSSURE, 1858 (= *Phalerimeris* BETREM, 1967 nec BETREM, 1966)
Batalanga gen. n.

92 Fore wing with three closed submarginal cells developed in both sexes (cf. Fig. 35); mid clypeal lobe of the female transversely truncate apically, very broad (cf. Fig. 95). Tribe **Pseudotrielidini** trib. n. 93

– Fore wing with only two closed submarginal cells developed in both sexes (cf. Fig. 34); mid clypeal lobe of the female acutely triangular in outline, almost pointed (cf. Fig. 64). Tribe **Dobrobetini** trib. n. 94

93 **Pseudotrielidini**. Male abdomen with the transverse yellow bands situated on the anterior half of the terga; female mesopleuron with a subtegular tubercle, third submarginal cell of the female fore wing rectangular, the transverse-medial vein not produced, hind tibia of the female with a pecten (Fig. 83), inner spur of the hind tibia longer than the basitarsus, curiously bent, and tapering to apex (Fig. 83). – Australian Region. Type species: *Scolia zonata* SMITH, 1855
Pseudotrielis BETREM, 1928

– Male abdomen with the transverse yellow bands situated on the posterior half of the terga; female mesopleuron flat under the tegula, third submarginal cell of the

female fore wing roughly triangular in outline, third transverse-medial vein produced an additional veinlet, directed outwardly (Rs–2, characteristic to the Mutillidae)(cf. Fig. 69), hind tibia of female with scopa (Fig. 84), inner spur of the hind tibia shorter than the basitarsus, straight and spatulate apically (Fig. 84). – Australian Region. Type species: *Campsomeris congener* TURNER, 1909
Rucarcana gen. n.

94 **Dobrobetini**. Male antenna short, reach base of the scutellum, flagellum clavate (cf. Fig. 45), recurrent veins of the fore wing joined above, so that only one vein reach the second submarginal cell (cf. Fig. 79), hind basitarsus with four ventral spines; the upper platform of female metapleuron sharply defined but not carinate (Fig. 104), inner spur of hind tibia acute. – Palaearctic and Afrotropical Regions. Type species: *Campsomeris socotrana* KIRBY, 1900 **Dobrobeta** gen. n.

– Male antenna long, reach beyond base of the abdomen, flagellum filiform, tapering to apex, fore wing with two recurrent veins are reaching the second submarginal cell (cf. Fig. 34), only one ventral spine on the hind basitarsus; upper platform of female metapleuron rounded or carinate, inner spur of the hind tibia parallel-sided or spatulate 95

95 Apical two segments of the male abdomen clothed with black setae, the third sternum with a basal colpus, complete from side to side (cf. Fig. 25); postero-lateral corners of the female propodeum angular and delimited at the sides by a longitudinal keel 96

– Apical two segments of the male abdomen are clothed with yellow setae, the third sternum frequently with a deep colpus on the extreme sides only, substituted by a gradulus at the middle of sternal disc; postero-lateral corners of the female propodeum are evenly rounded and not delimited at the sides 99

96 Inner margin of the male mandible with two teeth before apex but which sometimes worn out, the mid dorsal area of the male propodeum convex, bulging, evenly declivous; hind tibia of the female always implemented with pecten (cf. Fig. 20). – Palaearctic, Oriental and Afrotropical Regions, including the Malagasy subregion. Type species: *Scolia marginella* KLUG, 1805 (= *Micromeris* BETREM, 1964, nom. preocc.) **Micromeriella** BETREM, 1972

– Inner margin of the male mandible with three teeth before apex but which occasionally worn out, mid dorsal area of the male propodeum flat, at least on its basal half; female hind tibia without pecten (cf. Fig. 19) 97

97 Apical two sterna of the male abdomen equipped with a copulatory brush of rather dense, decumbent dark setae, lateral carina of the propodeum totally absent (Fig.

57); the outer spur of the female hind tibia also spatulate. – Afrotropical Region, including Malagasy. Type species: *Scolia fasciatella* KLUG, 1832
Enigmatimeris BETREM, 1972

– Abdominal sterna of the male abdomen without trace of a copulatory brush, pubescence sparse throughout, lateral carina of propodeum developed, reach level of the spiracle; outer spur of female hind tibia not spatulate 98

98 Mid and hind femora of the male black; clypeus of the female entirely canaliculate, inner spur of the hind tibia slightly spatulate; wings hyaline. – Afrotropical Region. Type species: *Elis africana* SAUSSURE, 1859 **Aureimeris** BETREM, 1972

– Mid and hind femora of the male light reddish-brown, with a conspicuous bluish shine; clypeus of the female canaliculate on lower half only, inner spur of the hind tibia firmly spatulate; membrane of wings smoky. – Afrotropical Region. Type species: *Elis xanthura* SAUSSURE, 1858 **Xanthimeris** BETREM, 1972

99 Frons of the male with a crest between the antennal tubercles; the mid dorsal area of the female propodeum with sharp tubercle on apical margin, upper platform of metapleuron with a subalar carina, inner spur of the hind tibia not spatulate 100

– Frons of the male flat between antennal tubercles; mid dorsal area of female propodeum without tubercle, upper platform of the metapleuron without a subalar carina, inner spur of hind tibia rather strongly spatulate 102

100 Excavations of the female pronotum before the tegulae sharply delimited above by a raised ridge, disc of the the pygidium clothed with golden-yellow setae; male unknown. – Afrotropical Region. Type species: *Elis auraria* SAUSSURE, 1858
Garantimeris BETREM, 1972

– Excavations of the female pronotum before the tegulae loosely defined above, without a distinct ridge, disc of the pygidium clothed with black setae 101

101 Membrane of the male fore wing with a conspicuous dark spot apically; hind tibia of the female with pecten (cf. Fig. 20), abdominal fringes black. – Afrotropical Region. Type species: (*Campsomeris lundi* BETREM, 1964) = *Scolia deserta* TULLGREN, 1904 **Catharinimeris** BETREM, 1964

– Membrane of the male fore wing weakly but uniformly smoky throughout; hind tibia of the female without pecten (cf. Fig. 19), abdominal fringes white or yellow. – Afrotropical Region. Type species: *Scolia hymenaea* GERSTAECKER, 1871
Cathimeris BETREM, 1972

102 Mandible of the male completely black; head of the female with a rather deep temporal groove beyond the outer eye orbits (Fig. 86), mid dorsal area of propodeum half as long as scutellum. – Afrotropical Region. Type species: *Turbatimeris turbata* BETREM, 1972 **Turbatimeris** BETREM, 1972

– Mandible of the male black with yellow maculated base; head of the female without any trace of a temporal groove, mid dorsal area of the propodeum fully as long as scutellum. – Palaearctic and Afrotropical Regions. Type species: *Scolia aureola* KLUG, 1832 **Lobhargita** gen. n.

103 Mid clypeal lobe of the female transversely truncate apically, with a conspicuous deep notch separating the lateral lobes (Fig. 93), marginal rim of the clypeus uniformly wide throughout. Tribe **Campsomerini** BETREM, 1972 104

– Mid clypeal lobe of the female acutely triangular in outline, apex acute and protruding, without deep notch separating lateral lobes (cf. Fig. 64) 109

104 **Campsomerini**. Second and third terga of the abdomen with a lateral yellow spot; male metasternum much wider apically than long mesally (cf. Fig. 41); female scape conical, much narrower apically than wide basally (Fig. 31). – Nearctic Region. Type species: *Scolia quadrimaculata* FABRICIUS, 1775
Pygodasis BRADLEY, 1957

– Second and third terga of the abdomen black or with a transverse yellow band; male metasternum narrower apically than long mesally (cf. Fig. 40); female scape cylindrical or conical, then much wider apically than wide basally 105

105 Second and third terga of the abdomen with a transverse yellow band in both sexes; tibial spur formula of the male 1–1–2; female scape distinctly conical, wider apically than wide basally. – Nearctic and Neotropical Regions. Type species: *Scolia ephippium* SAY, 1837 **Tatusdayca** gen. n.

– Abdomen completely black in both sexes; tibial spur formula of the male 1–0–2; female scape cylindrical (cf. Fig. 29) 106

106 Occipital carina of the male developed; lateral spine of the female hypopygium short, concealed under long vestinture. – Nearctic and Neotropical Regions. Type species: *Scolia mexicana* CAMERON, 1893 **Rhabdotomeris** BRADLEY, 1957

– Occipital carina of the male absent; the lateral spine of the female hypopygium long, protruding 107

107 Second to fourth terga of the male abdomen implemented with a broad apical impunctate stripe; vertex of the female dull and densely punctate throughout, clothed

with distinctly flat and lanceolate hairs (cf. Fig. 94). – Neotropical Region. Type species: *Scolia servillei* GUÉRIN, 1831 **Stygocampsomeris** BRADLEY, 1964

– Male terga much more densely punctate on the apical stripe than before it; vertex of the female perfectly smooth or sparsely punctate, clothed with normal hairs 108

108 Lateral carina of the male propodeum not developed (cf. Fig. 57); mesopleuron of the female with a vertical prepectal furrow strongly developed, deep, and connected above with the transverse scrobal furrow (Fig. 99). – Neotropical Region. Type species: *Colpa peregrina* LEPELETIER, 1845 (= *Colpa* LEPELETIER, 1845 nec DUFOUR, 1841) **Hayderiba** nom. n.

– Lateral carina of the male propodeum developed basally up to the level of the propodeal spiracle; mesopleuron of the female without any trace of a prepectal furrow (Fig. 100) and not connected as above. – Neotropical Region. Type species: *Scolia atrata* FABRICIUS, 1775 **Campsomeris** GUÉRIN, 1839

109 Hind tibial spurs of the male black, or if their tops narrowly white, then mesopleuron spotted with yellow; anterior pronotal margin of the female thorax clothed with entirely black pubescence. Tribe **Colpacampsomerini** trib. n. 110

– Hind tibial spurs of the male white, mesopleuron completely black; anterior pronotal margin of the female thorax without any vestige of black hairs 122

110 **Colpacampsomerini**. Fore wing with only one recurrent vein, and two closed discoidal cells developed in both sexes (cf. Fig. 90) 111

– Fore wing with two recurrent veins, and three discoidal cells developed in both sexes (cf. Fig. 34) 112

111 Mid dorsal area of the male propodeum bordered behind by a sharp transverse ridge; second and the following terga of the female abdomen bearing red pubescence. – Oriental Region. Type species: *Scolia indica* SAUSSURE, 1854 **Colpacampsomeris** BETREM, 1941

– Mid dorsal area of the male propodeum rounded, not bordered behind; all abdominal terga of the female bearing black pubescence. – Oriental and Australian Regions. Type species: *Scolia nigerrima* SMITH, 1861 **Laevicampsomeris** BETREM, 1933

112 Marginal rim of the female mid clypeal lobe uniformly wide throughout, wings black, membrane with violaceous reflection; male unknown. – Neotropical Region. Type species: *Campsomeris tenebrica* BRADLEY, 1957 **Tenebromeris** BETREM, 1963

– Marginal rim of the female mid clypeal lobe twice as wide mesally as wide on the sides 113

113 Male mesopleuron maculated with yellow spot; upper half of the female mesopleuron highly polished and shining throughout, completely devoid of large setigerous punctures. – Neotropical Region. Type species: *Colpa wesmaeli* LEPELETIER, 1845
Lissocampsomeris BRADLEY, 1957

– Male mesopleuron wholly black; upper half of female mesopleuron with numerous large setigerous punctures, especially on its anterior half 114

114 Sixth sternum of the male abdomen with a copulatory brush of short, pale and erect silky setae on densely punctate background, propodeum of the males ornamented with yellow maculation; mid dorsal area of the female propodeum shorter than the metanotum 115

– Sixth sternum of the male abdomen without trace of short silky setae, propodeum black; mid dorsal area of the female propodeum much longer than the metanotum 116

115 Tibial spur formula of the male 1–1–2, fifth sternum without a copulatory brush, covered with scattered setigerous punctures; subtegular tubercle of the female mesopleuron situated on level with the lateral pronotal lobe. – Neotropical Region. Type species: (*Campsomeris costalis* LEPELETIER, 1845) = *Scolia variegata* FABRICIUS, 1793 **Aelocampsomeris** BRADLEY, 1957

– Tibial spur formula of the male 1–0–2, fifth sternum with a copulatory brush on a densely punctate background; the subtegular tubercle of the female mesopleuron projecting well beyond the level of lateral pronotal lobe. – Neotropical Region. Type species: *Scolia obesa* SAUSSURE, 1859
Sphenocampsomeris BRADLEY, 1957

116 Membrane of the wings entirely hyaline, with a broadly yellow costal margin 117

– Membrane of the wings either entirely black, with strong bluish or violaceous reflection, or if hyaline, then black fumose, but nowhere yellow 118

117 Fifth to seventh sterna of the male abdomen with a copulatory brush of long, erect black pubescence on a densely punctate background (Fig. 96); female abdomen basically black, with a discal yellow spot on third tergum. – Neotropical Region. Type species: *Elis vittata* SICHEL, 1864 **Gondiconda** gen. n.

– Male sterna without trace of any copulatory brush, the sternal discs sparsely punctate throughout; the female abdomen entirely black, without yellow marking. – Neotropical Region. Type species: *Elis columba* SAUSSURE, 1858
Torbesula gen. n.

118 Thorax of the male entirely black; second recurrent vein of fore wing incomplete above in both sexes, not quite reach the level of medial vein. – Afrotropical Region. Type species: *Megameris penicillifera* BETREM, 1972
Cillimeris BETREM, 1972

– Male thorax ornamented with yellow maculation; second recurrent vein of the fore wing complete above, reach the level of the medial vein 119

119 Male mandible ornamented with a yellow spot, lateral carina of the propodeum sharply developed basally; second and third terga of the female abdomen very often maculated with a pair of lateral yellow spot, hind tibial spurs rather distinctly, obliquely truncate apically (Fig. 106); wings black with a violaceous reflection. – Neotropical Region. Type species: *Scolia hoffmannseggii* KLUG, 1805
Noybarilta gen. n.

– Male mandible entirely black, lateral carina of the propodeum absent; female abdomen without lateral spots, the hind tibial spurs of ordinary length and spatulate apically; wings hyaline and slightly black fumose 120

120 Antennal scrobe of the male ornamented with a yellow spot; the mid dorsal area of the female propodeum rounded behind, not bordered, second and third abdominal terga of the abdomen maculated with a rather narrow, apical yellow stripe. – Afrotropical Region. Type species: *Scolia quinquefasciata* FABRICIUS, 1781
Fasciomeris BRADLEY, 1964

– Antennal scrobe of the male completely black; the mid dorsal area of the female propodeum sharply bordered behind, the abdomen wholly black 121

121 Abdomen of the male entirely black; the declivity of the female propodeum densely punctate, especially on the middle area. – Afrotropical Region. Type species: *Megameris immanis* BETREM, 1972 **Immanimeris** BETREM, 1972

– Abdomen of the male ornamented with very abundant yellow maculation; declivity of the female propodeum broadly impunctate on the middle area. – Afrotropical Region. Type species: *Megameris pseudofasciatipennis* BETREM, 1972
Penimeris BETREM, 1972

122 Combined length of the male maxillary palp segments from two-thirds to three-fourths as long as hypostoma (Fig. 108); inner spur of the female hind tibia tapering to apex, rather acute apically. Tribe **Megacampsomerini** trib. n. 123

– Combined length of the male maxillary palp segments from one-fourth to one-third as long as hypostoma (Fig. 109); inner spur of the female hind tibia very distinctly spatulate apically. Tribe **Dielidini** trib. n. 133

123 **Megacampsomerini**. Fore wing with one recurrent vein and two discoidal cells (cf. Fig. 90); the male abdomen bluish-violaceous, without yellow maculation; female scutellum with a broadly impunctate disc. Oriental Region. Type species: *Campsomeris luzonensis* ROHWER, 1921 **Ilkamilka** gen. n.

– Fore wing with two recurrent veins and three discoidal cells (cf. Fig. 34); male abdomen almost always ornamented with yellow maculation; female scutellum with a conspicuously punctate disc 124

124 Abdomen of the male entirely clothed with yellowish-red pubescence, wings yellowish hyaline, with a conspicuous violaceous spot situated subapically; female not yet known. – Oriental Region. Type species: *Campsomeris cochinensis* BETREM, 1928 **Susaynata** gen. n.

– Apical three abdominal segments of male bearing black apical fringes 125

125 Disc of the male fifth sternum bearing white pubescence, in contrast with the black apical fringe; third and fourth terga of the female with a densely punctate preapical stripe 126

– Male fifth sternum bearing exclusively black pubescence, both on the sternal disc and on the apical fringe; third and fourth terga of the female with a broadly impunctate preapical stripe 127

126 Basal terga of the male abdomen bearing brown pubescence, wing membrane are hyaline, apical margin of the fore wing very dark; fronto-vertex of the female broadly smooth, devoid of any large setigerous punctures. – Oriental Region. Type species: *Campsomeris lindenii* LEPELETIER, 1845

Lindenimeris BRADLEY, 1964

– Basal terga of the male abdomen bearing white pubescence, membrane of the fore wing uniformly infuscated; fronto-vertex of the female rather dull, densely covered with large setigerous punctures. – Palaearctic and Oriental Regions. Type species: *Scolia prismatica* SMITH, 1855 **Fiharbuxa** gen. n.

127 Gena of the male beyond lower margin of the eye and above the base of mandibles with a broad yellow spot; mid dorsal area of the female propodeum with distinct, sharp, acute tubercle posteriorly 128

– Gena of the male entirely black; mid dorsal area of the female propodeum very broadly rounded, without any tubercle posteriorly 129

128 Vertex of the male perfectly flat between lateral ocelli, metanotum black, scutellum with a very small lateral spot; first to third terga of the female abdomen ornamented with a narrow apical yellow stripe, interrupted and incomplete at the middle. – Oriental Region. Type species: *Elis bella* BINGHAM, 1897
Bellimeris BETREM, 1972

– Vertex of the males strongly raised between lateral ocelli, metanotum black, with one, scutellum with a pair of very large yellow spots, separated by a very narrow black stripe; first to fourth terga of the female abdomen ornamented with broad apical stripes, complete and widened at the middle. – Oriental Region. Type species: *Scolia aurulenta* SMITH, 1855 **Niyaranta** gen. n.

129 Fifth tergum of the male abdomen ornamented with a tranverse, very narrow, yellow apical stripe; the female abdomen also with yellow maculation 130

– Fifth tergum of the male and female abdomen completely black 131

130 First to third terga of the female abdomen almost entirely yellow, the temporal groove beyond the outer eye orbits is deep, very distinct; male unknown. – Afrotropical Region. Type species: *Peltatimeris peltata* BETREM, 1972
Peltatimeris BETREM, 1972

– First to fourth terga of the female abdomen ornamented with a very narrow apical yellow stripe, the temporal groove beyond the outer eye orbits shallow, indistinct; fifth, seldom sixth tergum of the male abdomen with a transverse yellow apical stripe. – Afrotropical Region. Type species: *Megameris canens* BETREM, 1972
Canimeris BETREM, 1972

131 Mandible of the male black; basal terga of abdomen with narrow apical yellow stripes in the male, and with white apical fringes in the female. – Palaearctic and Oriental Regions. Type species: *Tiphia grossa* FABRICIUS, 1804
Megacampsomeris BETREM, 1928

– Mandible of the male ornamented with a yellow spot, abdomen black, or the yellow stripes incomplete at the middle; the female abdomen with black apical fringes 132

132 Basal terga of the male abdomen ornamented with some incomplete apical yellow stripes; wings are black, with darkened costal margin; vertex of the female completely smooth. – Palaearctic and Oriental Regions. Type species: *Campsomeris binghami* BETREM, 1928 **Titbisayda** gen. n.

– Abdomen of the male black; wings hyaline, with a conspicuous yellow stripe along the costal margin; vertex of the female dull, densely punctate throughout. – Oriental Region. Type species: *Scolia habrocoma* SMITH, 1855 **Borongorba** gen. n.

133 **Dielidini**. Scape of the male red or yellow; anterior pronotal margin of female clothed with red pubescence; tibiae and tarsi wholly red or yellow 134

– Scape of the male entirely black; anterior pronotal margin of female clothed with white or yellow pubescence; tibiae black 135

134 Femora of the male wholly lemon yellow; abdomen of the female ornamented with four transverse yellow bands, stripe of the second tergum at most slightly emarginate at the middle; the membrane of the fore wing yellowish hyaline. – Oriental and Australian Regions. Type species: *Tiphia radula* FABRICIUS, 1775
Radumeris BETREM, 1962

– Femora of the male wholly black; the female abdomen ornamented with three yellow bands, the posterior two deeply are emarginate at the middle; membrane of fore wing yellowish hyaline, with a large violaceous spot subapically. – Neotropical Region. Type species: *Tiphia tricincta* FABRICIUS, 1775
Xanthocampsomeris BRADLEY, 1957

135 Upper plate of female metapleuron gradually declivous, round, without a crest delimiting the subalar sector from the metapleural disc 136

– Upper plate of female metapleuron with horizontal, abrupt subalar sector and delimited by a sharp longitudinal crest from the metapleural disc, top of the crest reaching beyond to the metapleural-propodeal suture 139

136 Clypeus and mandible of the male entirely black; temporal groove of female beyond the outer eye orbits rather deep (cf. Fig. 86); the mid dorsal area of the propodeum at most as long as metanotum 137

– Clypeus and mandible of the male spotted with yellow; the temporal groove of female beyond the outer eye orbits indistinct; mid dorsal area of propodeum distinctly longer than the metanotum 138

137 Abdomen of both sexes with three basal segments having yellow maculation and yellow apical fringes; the excavations of the female pronotum before the tegulae delimited by a raised carina above. – Afrotropical Region. Type species: *Scolia leonina* DALMAN, 1823 **Leomeris** BETREM, 1972

– Male abdomen with five, female abdomen with four segments having yellow maculation and yellow apical fringes; the excavations of the female pronotum before the tegulae not delimited in any way. – Nearctic Region. Type species: *Elis pilipes* SAUSSURE, 1858 **Oscalosca** gen. n.

138 All segments of the abdomen ornamented with yellow apical fringes in both sexes; the excavations of the female pronotum before the tegulae delimited by strongly

raised ridge above, mid dorsal area of the propodeum armed with a medial, longitudinal keel. – Neotropical Region. Type species: *Campsomeris hesterae* ROHWER, 1927 **Mookitena** gen. n.

– Apical two segments of the abdomen with black apical fringes in both sexes; excavations of the female pronotum before the tegulae not delimited above, the mid dorsal area of the propodeum with a medial, triangular tubercle, having sharp and acute posterior margin. – Afrotropical Region. Type species: *Extrameris mansuefactoides* BETREM, 1972 **Extrameris** BETREM, 1972

139 Mandible of the male yellow basally; the female mesopleuron round, pygidium clothed with short setae, shorter than transverse diameter of the anterior ocellus, the spines on outer face of the hind tibia emerging from blunt transverse ridges 140

– Mandible of the male black; the female mesopleuron yield in ver sharp vertical crest, pygidium clothed with rather long setae, longer than transverse diameter of the anterior ocellus, the spines on the outer aspect of the hind tibia emerging from convex, round, sharp individual scales 141

140 Disc of the male clypeus black; metasternum of the female flat along mid line, mid dorsal area of the propodeum bordered behind by a sharp edged, horizontal, backward projecting, transverse crest, lateral carina of the propodeum discontinuous beyond the spiracle. – Nearctic and Neotropical Regions. Type species: (*Scolia radula* FABRICIUS, 1775) = *Sphex plumipes* DRURY, 1770

Dielis SAUSSURE et SICHEL, 1864

– Disc of the male clypeus yellow on the sides; metasternum of the female tumid along mid line, rounded but somewhat crest-like, mid dorsal area of the propodeum not bordered behind, but equiped with a rather obtuse tubercle, lateral carina of propodeum continuous, reach the posterior declivity of the propodeum. – Nearctic and Neotropical Regions. Type species: *Tiphia dorsata* FABRICIUS, 1787

Haralambia gen. n.

141 Scutellum of the male completely black; abdomen of the female also entirely black, both spurs of the hind tibia white. – Afrotropical Region. Type species: *Charimeris jacoti* BETREM, 1972 **Charimeris** BETREM, 1972

– Scutellum of the male spotted with yellow; abdomen of the female ornamented with transverse apical yellow bands, both spurs of the hind tibia dark brown 142

142 Clypeus of the male completely yellow; female head without temporal groove beyond outer eye orbits. – Afrotropical Region. Type species: *Megameris calcigera* BETREM, 1972 (= *Megameris talagougensis* BETREM, 1972)

Fascimeris BETREM, 1972

– Clypeus of the male yellow only on the sides; female head with a deep temporal groove beyond outer eye orbits. – Afrotropical Region. Type species: (*Campsomeris mansuefacta* BRADLEY, 1931) = *Elis soleata* GERSTAECKER, 1871

Megameris BETREM, 1967

APPENDIX

The identity of the species *Lacosia pygmaea* SAUSSURE is imperative for the stability and universality of Zoological Nomenclature. The type material of SAUSSURE was examined and discussed by BETREM (1928: 207), BRADLEY (1958: 103), KROMBEIN (1963: 625), and conclusively by PETERSEN (1970: 58). This species was originally described as coming from Australia, but PETERSEN assumed that the material actually came from South Africa. The specimens found by him in the collection of the Museum of Natural History, Geneva, are identical with *Scolia hottentotta* SAUSSURE, 1858, but one of the specimens was deprived of its genitalia. The lectotype was, however, not found. It is necessary to designate a neotype in view to conserve the generic-group name *Lacosia*. The material I am selecting is from the same source as those studied by PETERSEN. The original description of SAUSSURE refers to a species with: Body black, with blackish-violaceous wings, gray pubescence, abdomen long, iridescent, first tergum rather narrow, without tubercle. Length 12.0 mm. From all material studied by me, the diagnosis given by SAUSSURE fits the best *Scolia laeviceps* SMITH, 1855 from Hong Kong. There exists no evidence, however, that the SAUSSURE's material came from there. He described variants with the clypeus and eye orbits partly red. One of these is being selected as a neotype.

Lacosia pygmaea SAUSSURE
(Figs 101–102)

Scolia (Lacosi) pygmaea SAUSSURE, 1858, Ann. Soc. ent. France 3 (6): 217, male. Locus classicus: "Nova Hollandia, Swan River, Domine DREWSEN".

M a l e . Length 14.0 mm, length of fore wing 11.0 mm. Body black; ocular sinus, a narrow stripe along outer eye orbits, two ill-defined spots on sides of clypeus and knees of fore leg are reddish-yellow. Mandibles, apical border of clypeus and antennae red. Legs and apical half of abdominal segments piceous. Basal half of abdominal terga bluish iridescent. Vestiture white, to soiled yellowish-white on head, pronotum, propleura and fore leg; hairs of thoracic dorsum, abdomen, wings, middle and hind legs black. Wings black, with strongly metallic violaceous reflection; veins dark brown. Hind tibial spurs piceous. Head circular in outline, as high as wide. Inner eye orbits slightly diverging above, deeply sinuate within. Clypeus convex, delicately alutaceous, sparsely punctate above, densely on the sides, middle of the disc devoid of punctures. Mid clypeal lobe slightly convex, apical rim is separated by a transverse row of large setigerous punctures. Supraclypeal triangle impunctate mesally, punctate on the sides. Lower front sparsely punctate, interspaces as wide as punctures themselves. Front without transverse furrow, with a narrow longitudinal furrow reaching from the supraclypeal triangle to anterior ocellus. Upper front and vertex sparsely punctate. Ocello-ocular line 1.5 times diameter of anterior ocellus. Inner margin of mandible with

three teeth before apex. Scape slightly conical, tapering to base, flagellum cylindrical, antenna reach apex of propodeum. Occipital carina developed on sides, incomplete beyond ocellar triangle. Thorax rather uniformly punctate throughout, interspaces as wide as punctures themselves, save inner basal corner of latero-dorsal area of propodeum broadly shining. Lateral carina of propodeum developed basally, spiracular area and spiracular corner impunctate. Mesopleuron punctate, except lower half with a vertical stripe smooth. Metapleuron punctate above and below. Mid dorsal area of propodeum as long as scutellum, posterior declivity rather sparsely punctate. Marginal cell of fore wing 1.3 times as long on costal margin as high. Inner aspect of hind tibia with scopa. Abdomen uniformly punctate throughout, more densely on second sternum. Dorsal aspect of first tergum twice as wide as long, without anterior tubercle. First sternum with a blunt, rugose transverse ridge, seventh with short, erect pubescence, no copulatory brush. Parameres of male genitalia are flat, thick, lustrous, with widely spaced strong setae on inner margin. Distivolsella as long as basivolsella, latter clothed with sparse, short, erect yellowish setae, but absolutely not with silky or compactified hairs. Dentate ventral margin of aedeagus straight. – F e m a l e . Length 12.0 mm, length of fore wing 9.5 mm. Body black, overall with bluish iridescence, save head. Mandibles, dorsal aspect of head, antennae, lateral lobes of pronotal dorsum, fore leg, mid leg and hind tibia are red. Apex of mandibles, center of clypeus, legs and antenna darker red. Vertex beyond upper half of eyes light red, tinged with yellow. Front and vertex uniformly right red. Hind tibia and tarsi, tegulae and pygidium piceous. Wings are black, with strong steel-bluish reflection. Vestiture black, except head and middle of pronotum clothed with yellow pubescence. Head slightly wider than high (1.1 times), mid clypeal lobe triangular, clypeal disc smooth, with one apical row of large setigerous punctures, marginal rim well twice as wide at middle as on sides. Inner margin of mandible too worn off to determine dentition. Scape short oval, tapering to base and apex, surface smooth and glabrous. Lower front punctate along antennal tubercles and scrobe, impunctate mesally, the longitudinal furrow reach middle of front; upper front smooth, without furrow or punctures, except near to the inner orbits some isolated ones. Vertex smooth, ocello-ocular line about 2.3 times diameter of anterior ocellus. The occipital carina as described for the male. Thorax with large impunctate areas. Anterior margin of pronotal disc and mid dorsal area of propodeum are more densely punctate. Mesoscutum with punctures along parapsidal furrows. Scutellum and metanotum with a basal row of punctures, otherwise impunctate. Marginal cell of fore wing as long on costal margin as high. Hind tibia without pecten, inner aspect of hind basitarsus without scopa. Abdomen less densely punctate that in male. Disc of first tergum broadly smooth, without tubercle. First sternum with transverse rows of large setigerous punctures. Pygidium clothed with long setae, but not densely.

M a t e r i a l . – Neotype male, right antenna missing, labelled: "Transvaal, Zebediela" (Republic of South Africa). Female same label, with no date or collector.

N o t e : This species within the genus *Lacosia* belongs to the group of species containing *miniata* SAUSSURE, *turkestanica* BETREM, *dispar* KLUG, *lateralis* KLUG and *luteicornis* WALKER. It is most closely related to the male of *senescens* PERINGUEY, but that species, although has white pubescence throughout the body, differs, possessing light orange flagellum. In any case, this species closely resembles, but is not identical with *hottentotta* SAUSSURE, which is a true *Scolia* (according to BETREM, pers. comm.). It is also different from *edwardsi* SAUSSURE, which has a small tubercle on the first tergum.

RELATIONSHIPS AMONG GENERA OF SCOLIIDAE

Proscoliinae
Proscoliini
1. *Proscolia*
Colpinae
Dasyscoliini
2. *Dasyscolia*
3. *Carbonelis*
Curtaurgini
4. *Curtaurga*
5. *Hexelis*
6. *Nyaselis*
7. *Malagaselis*
Heterelini
8. *Heterelis*
9. *Stigmatelis*
10. *Ordatirga*
11. *Punctelis*
Colpini
12. *Junodelis*
13. *Colpa*
14. *Yohaida*
15. *Bagonasuna*
Trielidini
16. *Trielis*
17. *Crioscolia*
18. *Kukkiya*
Scoliinae
Ascoliini
19. *Rostopasca*
20. *Ascolia*
21. *Laskariska*
22. *Regiscolia*
23. *Zazilayza*
Liacosini
24. *Ululanca*
25. *Triliacos*
26. *Liacos*
27. *Turturayca*
28. *Murahutka*
29. *Rahosmula*
30. *Diliacos*
31. *Sobolpiha*
Carinoscoliini
32. *Nokbibula*
33. *Carinoscolia*
Austroscoliini
34. *Citberaysa*
35. *Molzinarda*
36. *Tonsoygata*
37. *Hitfoidra*
38. *Austroscolia*
Ycasbraini
39. *Bradleyella*
40. *Ycasbraia*
Agombardini
41. *Jupadora*
42. *Pyrrhoscolia*
43. *Elpaholta*
44. *Agombarda*
45. *Burgamurga*
46. *Scolioides*
47. *Rihamlika*
48. *Onkoknoa*
Triscoliini
49. *Microscolia*
50. *Mutilloscolia*
51. *Laeviscolia*
52. *Triscolia*
53. *Xirgoniqua*
54. *Sugorpilfa*
55. *Paconzitva*
56. *Guigliana*
Betremiini
57. *Betremia*
Discoliini
58. *Discolia*
Hangasornini
59. *Hangasorna*
Lacosiini
60. *Wogungela*
61. *Stiboranna*
62. *Katapolda*
63. *Vardombra*
64. *Iksalonca*
65. *Lacosia*
Megascoliini
66. *Megascolia*
Scoliini
67. *Orlovinga*
68. *Buzatlana*
69. *Scolia*
70. *Kokarevta*
71. *Pardesiya*
Lisocini
72. *Lisoca*
73. *Naysebwa*
74. *Vobalayca*
Campsomerinae
Trisciloini
75. *Trisciloa*
Tetrascitonini
76. *Australelis*
77. *Uthakkara*
78. *Tristomeris*
79. *Sericocampsomeris*
80. *Rodriguimeris*
81. *Pupunhuga*
82. *Iforborha*
83. *Hirtimeris*
84. *Tetrasciton*
85. *Campsomeriella*
86. *Sisakrosa*
87. *Madonimeris*
88. *Phaleromeris*
89. *Mansuetimeris*
90. *Batalanga*
Pseudotrielidini
91. *Pseudotrielis*
92. *Rucarcana*
Dobrobetini
93. *Dobrobeta*
94. *Micromeriella*
95. *Enigmatimeris*
96. *Aureimeris*
97. *Xanthimeris*
98. *Garantimeris*
99. *Catharinimeris*
100. *Cathimeris*
101. *Turbatimeris*
102. *Lobhargita*
Campsomerini
103. *Pygodasis*
104. *Tatusdayca*
105. *Rhabdotomeris*
106. *Stygocampsomeris*

107. *Hayderiba*
108. *Campsomeris*

Colpacampsomerini
109. *Colpacampsomeris*
110. *Laevicampsomeris*
111. *Tenebromeris*
112. *Lissocampsomeris*
113. *Aelocampsomeris*
114. *Sphenocampsomeris*
115. *Gondiconda*
116. *Torbesula*
117. *Cillimeris*
118. *Noybarilta*
119. *Fasciomeris*
120. *Immanimeris*
121. *Penimeris*

Megacampsomerini
122. *Ilkamilka*
123. *Susaynata*
124. *Lindenimeris*
125. *Fiharbuxa*
126. *Bellimeris*
127. *Niyaranta*
128. *Peltatimeris*
129. *Canimeris*
130. *Megacampsomeris*
131. *Titbisayda*
132. *Borongorba*

Dielidini
133. *Radumeris*
134. *Xanthocampsomeris*
135. *Leomeris*
136. *Oscalosca*
137. *Mookitena*
138. *Extrameris*
139. *Dielis*
140. *Haralambia*
141. *Charimeris*
142. *Fascimeris*
143. *Megameris*

* * *

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