

Forficula

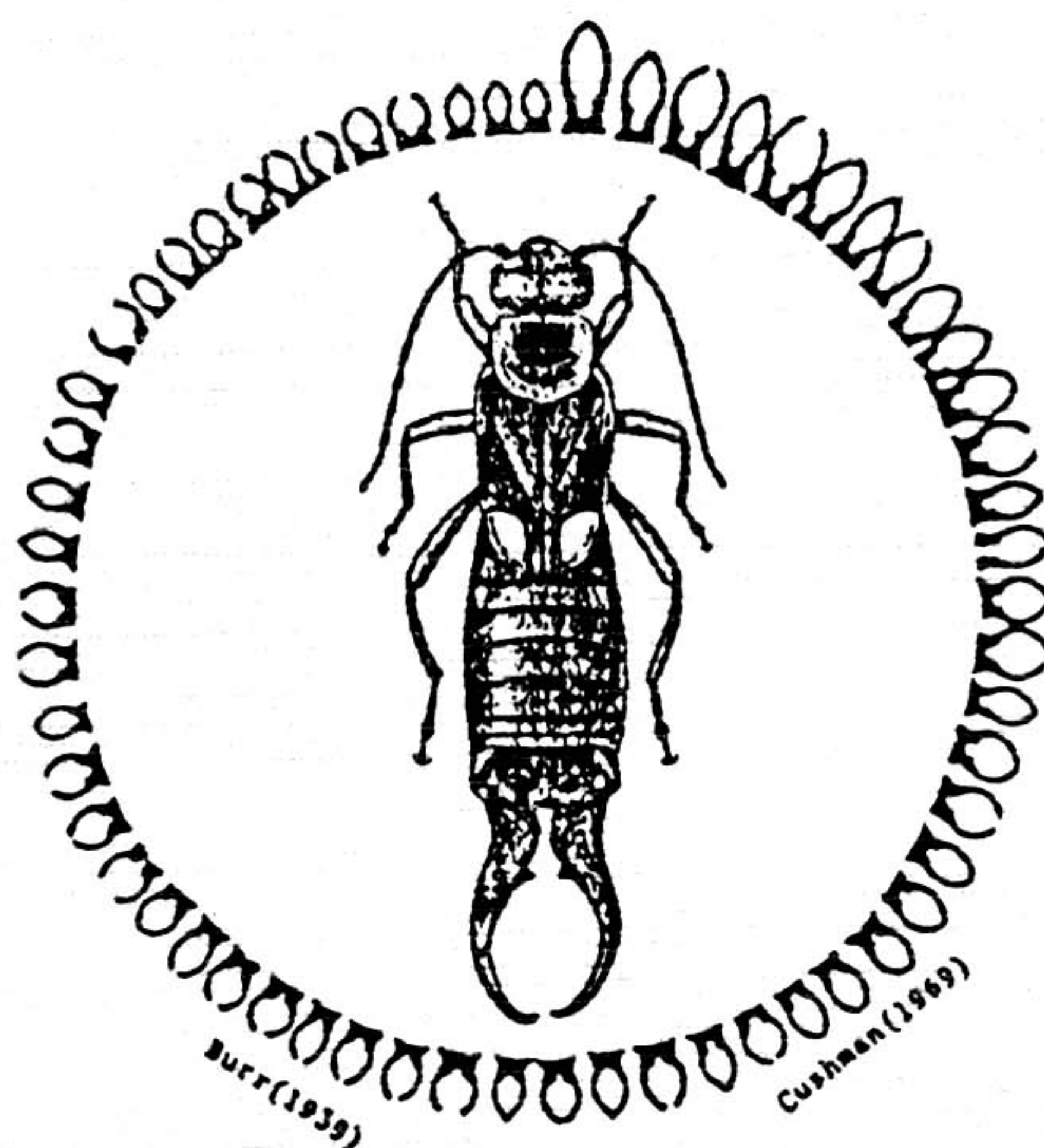
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A Basic Survey for Integrated Taxonomy
of
the Dermaptera of the World

In this Issue.....Recent Dermapteran Information

by Seiroku SAKAI

Further alphabetical bibliography
and Contribution to Dermapterology



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Recent Dermapteran information

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Abstract:

The author presents recent new species since Dermapterorum Catalogus XXXI(1996) and XX International Congress of Entomology,IG-3, Proceeding;Taxonomy of the Dermaptera(1996/1997).There are 4 superfamilies,11 families,54 subfamilies,11 groups,3 tribes,221 genera, 40 subgenera. 2011 species,37 subspecies,34 varieties and 13 forma including 79 fossil species. Further alphabetical bibliographies are cited and also recent contribution to the Dermaptera by several authors are cited.

Recent new species since Dermapterorum Catalogus XXXI (1996) and XX International Congress of Entomology,IG-3, Proceeding:Taxonomy of the Dermaptera(1996/1997)

The following species of Dermaptera are recently described until April 1st,1997.

Diplatyidae

Haplodiplatys(Eudiplatys) murzini Anisyutkin (1995) :Anisyutkin's opinion: Eudiplatys:Valid genus;Body length with Forceps:14.4 mm,Equatorial Africa.

Paradiplatys (Lobodiplatys) serranoi Bivar de Sousa(1996) Guiné-Bissau.

Nannopygia daviesi (Srivastava,1990) Borneo:Sabah,**comb.nov.**

Anisolabididae

Anisolabis guineensis Bivar de Sousa(1996)Guiné-Bissau .

Epilangex wagneri Srivastava (1990):Indonesia,Moluccas,Ambon Isl.

Gonolabis emarginata Srivastava (1990):Malay:Singapore,Bukit Timah.

Paralabis rossi Srivastava (1990):Philippines:Mindoro.

Isolabis rossi Srivastava (1990):Malaya:G.Batu,Brinchang.

Labiduridae:

Forcipula caussaneli Waller,Jamet et Albouy (1996):Mauritania.

Spongiphoridae

Spongovostox riedeli Sakai(1995):Irian Jaya,Manokwari-Prov.,Dermapt.Cat XXX:9303

Paralabella cicero Steinmann(1989):Costa Rica.

Paralabella profana Steinmann (1989):Brazil.

Vostox comitatus Steinmann(1989) :Ecuador.

Auchenomus extractus Steinmann(1989):Fiji.

Auchenomus porrectus Steinmann(1989):Malaysia.

Chaetospania assamensis Sakai(1997):Assam;Bull.Biogeogr.Soc.Japan,52(2) in press.

Chaetospania acuminata Srivastava (1990):India,Mysore(Now Karnataka).

Recent contribution to the Dermaptera Dermaptera and Protelytroptera --One order?

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Zoological Institute, Russian Academy of Sciences

Saint-Petersburg, 199034 (Received on 18, III, 1997 at Tokyo)

Please see also XX ICE, IG-3, Proceeding (1996): 214-215, Firenze.

Dermaptera and Protelytroptera-one order?

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A.V.Gorochov, L.N.Anisyutkin, S.Sakai (St.Petersburg-Russia, Tokyo-Japan)

:No.01-043:PM:15:45. August 27, 1996

A.V.GOROCHOV (Zoological Institute, Russian Academy of Sciences, S.Petersburg, 199034)

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Abstract:

The orthopteroid orders Orthoptera, Dictyoptera (Blattodea+Mantodea), Plecoptera, Grylloblattida, Phasmoptera have very long and rich history (from Palaeozoic). Sometimes these orders are presented by 2 or more recent stocks diverging from Palaeozoic or Triassic (for example Orthoptera). These stocks we usually consider as suborders or infraorders. Sometimes the orders are presented only by 1 recent stock of the same age (for example Dermaptera). Nevertheless this stock usually also subdivide into suborders and infraorders (inequivalent to the analogous taxa of previous orders as the rate of evolution of different orders of orthopteroids was more or less similar except maybe Isoptera).

Dermaptera sensu stricto (without Archidermaptera and enigmatic Hemimerina) appear from late Jurassic. Their morphological diversity is almost

equal to that of the superfam. Grylloidea (from late Triassic or early Jurassic). On the other hand the permian Protelytroptera is undoubted ancestral group for recent earwigs (all peculiarities of skeleton and wing venation confirm this origin). Therefore we propose to consider the Protelytroptera as a suborder of Dermaptera (sensu lato) and to consider the Dermaptera sensu stricto (+Archidermaptera) as other suborder. This conception allows to lower the ranks of other higher taxa of the order. In that case order Dermaptera become comparable with other large orders of orthopteroids by age and level differentiation.

The orthopteroid orders Orthoptera, Dictyoptera (Blattoidea + Mantodea), Plecoptera, Grylloblattida, and Phasmoptera have very long and rich history (from Palaeozoic). Sometimes

these orders are presented by 2 or more recent stocks diverging from Palaeozoic or Triassic (Orthoptera, Plecoptera, Dictuoptera). The suborder Ensifera is known from Carboniferous, suborder Caelifera, infraorders Tettigoniidea, Gryllidea, Acrididea, and possibly Tridactylidea (Dzhajloutshellidae) - from Triassic (Gorochov, 1994a, 1995a, b); the suborders Perlina (Systelognatha + Antarctoperlaria) and Nemourina (Euholognatha) are known from Permian and Triassic correspondingly; the recent Blattodea and Mantodea have independent history maybe from Carboniferous as they are possible descendants of Poroblattinidae and Mesoblattinidae (it seems that the Jurassic predatory family Raphidiomimidae is probable intermediate stage between Mesoblattinidae and Mantodea) (see also Vishniakova, 1971, 1980a, Gratshev, Zherikhin, 1993). These above-mentioned stocks are usually considered by us and 2 many other authors as suborders or infraorders.

Sometimes the orders are presented only by 1 recent stock of the same (Palaeozoic or Triassic) age. The recent Grylloblattida, Phasmoptera, and Dermaptera are represented only by younger taxa diverging apparently from Caenozoic (first), Cretaceous (second), and late Jurassic (third) (see Sharov, 1968; Rasnitsyn, 1976, 1980; Vishniakova, 1980a, b; Storozhenko, 1992; Gorochov, 1993, 1994b). Nevertheless this stock usually also subdivides into suborders and infraorders (inequivalent to the analogous taxa of previous orders as the rate of evolution of different orders of orthopteroids was more or less similar excepting maybe Isoptera).

Dermaptera sensu stricto (without Archidermaptera and enigmatic Hemimerina) appear from late Jurassic. Their morphological diversity is almost equal to that of the recent superfamily Grylloidea known from late Triassic or early Jurassic. On the other hand the Permian Protelytroptera is undoubtedly ancestral group for recent earwigs (all peculiarities of skeleton and wing venation confirm this origin). Therefore we propose to consider Dermaptera and Protelytroptera as the same order characterised by the trend to strong sclerotization of tegmina (fore wings) which begin to resemble elytra of beetles.

The origin of Dermaptera sensu lato (including Protelytroptera and Archidermaptera) was possibly connected with transfer from cockroach-like mode of life among crumbly ground cover (characteristic for primitive carboniferous or early Permian representatives of Grylloblattida) to use of more dense ground cover or wood decomposed. The most primitive Dermaptera sensu lato (Apachelytridae, Lower Permian) had leathery tegmina-elytra extending to the apex of abdomen and provided with visible venation (Carpenter, Kukalova, 1964). Their rather small hind wings cannot be folded in two - the costal ^{part}~~area~~ (from C or Sc to 1A) reaches the apex of wing and R, RS, M, MA, MP+CuA, CuP+1A are free (Fig. 1). Protelytridae (Lower Permian) had similar fore wings. But their large hind wings can be folded in two (as in most of Coleoptera and several Dictyoptera) - the costal ^{part}~~area~~ divides into larger proximal part and smaller distal part which is able to

be tucked under proximal one (Tillyard, 1931; Carpenter, 1933); many veins of costal ^{part}~~area~~ are fused and it becomes very similar to that of Dermaptera sensu stricto (Fig. 3, 4).

The latter have elytra much shorter than body and practically without venation. Their hind wings are much larger than elytra and can be folded in three. Similar condition of wings takes place in Staphylinidae - one of coleopteran families. Distinctions between Dermaptera sensu stricto and Protelytridae are practically equal to those between Staphylinidae and most of other Coleoptera. The origin of this Dermaptera from Protelytridae or their relatives may be connected with adaptation to Staphylinidae-like mode of life accompanied by rather small change in hind wing venation: fusion 1A and CuP + 1A with stem of 2A, sclerotization of area between C or Sc and MA, rise of the second bend along edges of proximal piece of costal ^{part}~~area~~, and some others (Fig. 4). The primitive representatives of Dermaptera sensu stricto have M and MA isolated from R (more primitive state than in Protelytron permianum). It is possible that Dermaptera sensu stricto are descendants of some more primitive representatives of Protelytridae than P. permianum. 4

In connection with above-mentioned reasonings we can propose 2 ways to classify this order into suborders. 1) The first suborder Blattelytrina consists of several Permian families including the most primitive Apachelytridae (Fig. 1) and somewhat specialised Blattelytridae (Fig. 2); this suborder is characterised by hind wings without transverse bends.

The second suborder Forficulina includes infraorders Protelytridea (Permian Protelytridae) and Forficulidea (Dermaptera sensu stricto + Archidermaptera); this suborder has hind wings with transverse bends (1 or 2) (Fig. 3, 4). 2) The first suborder Protelytrina (Protelytroptera) consists of all Permian families and characterised by symplesiomorphic peculiarities: hind wings without transverse bends or with only 1 transverse bend, fore wings (tegmina - elytra) extending to the apex of abdomen and with visible venation, tarsi with 5 segments, besides cerci soft, with segmentation, ovipositor external. The second suborder Forficulina includes only superfamilies Protodiplatyoidea (Archidermaptera) and Forficuloidea (Dermaptera sensu stricto); its hind wings with 2 transverse bends, fore wings (elytra) strongly shortened and practically without venation (tarsi, cerci, and ovipositor varied).

The superfamily Protodiplatyoidea (Archidermaptera) is known from early Jurassic (Whalley, 1985) to late Jurassic. It is represented only by the family Protodiplatyidae provided with 4-5 segmented tarsi, soft cerci with segmentation, and external ovipositor. The proximal cercal segment of Dermapterinae (one of subfamilies of this family) is large and almost hook-like (Fig. 5). The superfamily Forficuloidea consists of 2 or 3 recent families: Pygidicranidae (Protodermaptera + Paradermaptera) (from late Jurassic), Forficulidae (Eudermaptera) (from Paleogene), and possibly Arixeniidae (Arixeniina) (commensals of Chiroptera) unknown in fossil form (Vishniakova, 1980a, b). This superfamily is character-

ised by 3 segmented tarsi, hard forceps-like or rather soft cerci represented by only proximal segment in imago and in 6 most of larvae, and usually the internal ovipositor reduced or partly atrophied (the external one is known only in late Jurassic Semenoviolineae - the most primitive group of Pygidicranidae).

Forficuloidea are also characterised by the similar structure of the male genitalia. The primitive genitalia consist of pair of proparameres provided with sclerotized hook-like metaparamere and genital lobe at the apex of every proparamere; the bases of proparameres are united and form unpaired apodeme; every branch of paired ejaculatory duct is opened at the apex of genital lobe. This scheme of genitalia is represented in Pygidicranidae (divided into several subfamilies) (Fig. 7) and apparently in Protodiplatyidae (Fig. 6). There is the slight trend to reduction of one of genital lobes in Pygidicranidae. This trend is the most noticeable in Karschiellinae (Fig. 8). The male genitalia of Forficulidae (also divided into several subfamilies) show very strong atrophy of one of genital lobes. These genitalia become unpaired and almost symmetrical (Fig. 9). The same type of genitalia takes place in apterous Arixeniidae (Fig. 10). If it is not parallelism we must include this taxon in to Forficulidae as one of their subfamilies (see also Popham, 1965). 7

The position of the enigmatic family Hemimeridae (Hemimerina) (apterous parasites of Rodentia) is less clear. It has only 3 segmented tarsi, rather soft cerci without segmentation, and almost atrophied ovipositor. These characters can

demonstrate belonging of this group to Forficuloidea but as deviated specialised family. The male genitalia are similar to those of Forficulidae but with both branches of ejaculatory duct opened on the apex of the same genital lobe (Fig. 11). It is possible that these genitalia originate from those of Pygidicranidae as a result of fusion of left and right proparameres and their genital lobes (Qadri, 1940; Snodgrass, 1957).

New conception of higher classification of Dermaptera proposed by us allows to lower the ranks of many higher taxa of the order. In this case the order Dermaptera becomes comparable with other large orders of orthopteroids by age and level of differentiation.

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Figs 1-5. Scheme of venation of hind wing (1-4) and cercus from above (5): 1 - Apachelytron transversum (Permian), 2 - Parablattelytron subincisum (Permian), 3 - Protelytron permianum (Permian), 4 - Cranopygia appendiculata (recent), 5 - Dermapteron incertae (Jurassic).

Figs 6-11. Reconstruction (6) and scheme (7-11) of male genitalia: 6 - Dermapteron incertae (Protodiplatyidae), 7 - Pygidicraninae (Pygidicranidae), 8 - Karschiellinae (Pygidicranidae), 9 - Forficulinae (Forficulidae), 10 - Arixeninae

(Forficulidae?), 11 - Hemimeridae.

