

The subfamily classification of the Micropezidae and the genera of Eurybatinae (Diptera : Schizophora)

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ABSTRACT

The classification of the family Micropezidae is re-examined and a key is given to the five subfamilies now recognised, of which Calycopteryginae is described as new and Eurybatinae is raised from tribal rank. Metopochetini is a new tribe of Eurybatinae. A key is given to the nine genera now included in the Eurybatinae, of which *Papeza* is described as new. *P.szentivanyi* is a new species from Papua. Notes on the taxonomy and distribution of genera are included. The position of *Anaeropsis* Bigot in the Micropezidae is confirmed. New synonymies are established as follows: *Crepidochetus* Enderlein (= *Gongylocephala* Czerny syn. n.); *Metopochetus bivittatus* (Macquart) (= *Calobata tenuipes* Walker syn. n.). New generic combinations are as follows: *Metopochetus terminalis* (Walker) and *M.compressus* (Walker) from *Calobata*; *Crepidochetus nigrifemur* (Czerny), *C.pallidus* (Steyskal), and *C.ater* (Steyskal) from *Gongylocephala*; *Crosa fragilis* (Walker) from *Micropeza*; *Crosa nigriventris* (Enderlein) and *C.uneifera* (de Meijere) from *Eurybata*.

This study developed from an attempt to identify the Australian genera of Micropezidae. Difficulty was experienced with those genera which had been placed in the subfamily Calobatinae (Trepidariinae) since all modern keys to the genera are incomplete (Hennig, 1935; Steyskal, 1952; Aczél, 1959; Frey, 1958). All the known genera of the Indo-Australian Region were studied and a new key to these is now provided, together with a revised concept of interrelationships in the family. Because a morphological study has already been made by Aczél (1951), illustrations of most of the morphological characters discussed in this work are not repeated.

The number of families in the complex is not fully agreed upon. Hennig (1958) regarded Trepidariidae and Taeniopteridae as separate families, but this is not accepted by most modern workers. The situation has also been complicated by nomenclatural differences. The generic name *Tylos* Meigen (1800) was suppressed in favour of *Micropeza* Meigen (1803) in Opinion 369 of the International Commission on Zoological Nomenclature (1955). In 1963 the pamphlet by Meigen (1800) entitled *Nouvelle Classification des Mouches à Deux Ailes*, in which the names *Tylos* and *Trepidaria* first appeared, was suppressed for purposes of zoological nomenclature (see *Bull. Zool. Nomen.* 20 : 339-42). Hence the family-group names Tylidae and Trepidariinae are now officially replaced by Micropezidae and Calobatinae respectively.

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Classification

The limits of the family Micropezidae, here accepted, are as used by me previously (McAlpine, 1966) and also by numerous other authors. As my previous work has been vigorously attacked by Hennig (1971), I give here briefly the main reasons which I still consider valid for excluding the Neriidae from the family. We find in the Neriidae a number of characters which resemble those of the Cypselosomatidae and/or Pseudopomyzidae rather than true micropezids. These appear to be plesiomorphic characters compared with the corresponding ones in Micropezidae, and indicate that the Neriidae separated early from the line which, after further modification, led to all modern sub-families of Micropezidae. These neriid characters are as follows: (1) vibrissae sometimes distinct, though often small; (2) in a number of species a complete series of dorsocentral bristles; (3) scutellum less reduced than in Micropezidae, in particular with more definite flat subquadrate dorsal surface area, sometimes with basal pair of bristles strong; (4) without the characteristic micropezid arrangement of the sternopleural bristles, i.e. two or sometimes more bristles one above the other; (5) costa sometimes weakened or almost broken at end of subcosta; (6) anal crossvein (vein *CuA*) often strongly recurved; (7) alula very broad (much narrower in Micropezidae except for some Taeniopterinae which probably have secondarily broadened wing-base); (8) a well-developed apical ventral spur on middle tibia (absent or indistinct in *all* micropezids known to me); (9) ♂ sternite 5 not differentiated from previous sternites; (10) ♂ genital segment of the same peculiar elongate form seen in Cypselosomatidae and such pseudopomyzids as *Heloclusia*.

Apart from an error regarding the presence of a sternopleural bristle in Neriidae, Hennig (1971) has criticised my earlier paper for the method used to determine the direction of evolution of a character (though essentially the same as his own method), for my view on the position of the Megamerinidae (which I intend to make the subject of a separate study), and for misrepresenting his earlier findings. In particular, Hennig (1971 : 25-6) says that I was mistaken in attributing to him a "theory that the absence of vibrissae and the divergent condition of the postvertical bristles are necessarily primitive characters". On the other hand, I would point out that Hennig (1958 : 556) clearly listed the convergent (as opposed to the divergent) condition of the postvertical bristles as an apomorphic character of the Neriidae, and does so elsewhere in the same work for many other families in other superfamilies, sometimes indicating that this is the apomorphic condition in relation to the groundplan of the Schizophora. For at least 12 families in various superfamilies he lists the presence of a vibrissa as an apomorphic character, often indicating that it is apomorphic in relation to the groundplan of the Schizophora. I do not therefore feel that I can have greatly misinterpreted Hennig's meanings.

Relationships of Eurybatini

Hennig (1958) stated that the family Trepidariidae (= subfamily Calobatinae or Trepri-

dariinae of most other authors) was not characterised by any distinctive apomorphic characters which might provide evidence of a monophyletic origin. My own studies support this conclusion. Frey (1958) divided the Calobatinae into two tribes, Calobatini (Holarctic) and Eurybatini (Indo-Australian) in a system which omitted mention of *Calycopteryx* and *Anaeropsis*. My morphological studies indicate that the Calobatini and Eurybatini are not more closely related to one another than to other groups within the Micropezidae and I therefore raise the Eurybatini to subfamily rank. The separation of these two series is not new, for Frey (1927) included the eurybatine genera in his subfamily Tanypodinae, restricting the Calobatinae to *Calobata* and its immediate relatives. The subfamilies Calobatinae and Eurybatinae may be distinguished as shown in the following table:

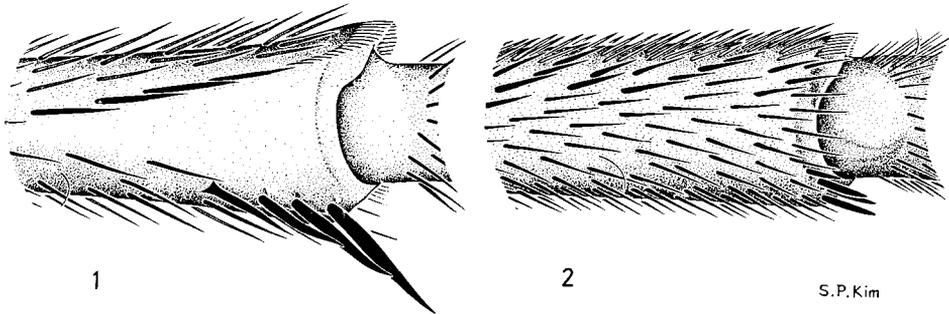
Calobatinae	Eurybatinae stat. n.
Postvertical bristles absent	Postvertical bristles present
Thorax compact and not anteriorly prolonged	Thorax more or less prolonged anteriorly
Humeral callus short and well defined	Humeral callus elongate and often not defined on dorsal side
Fore coxae broad, at rest contiguous and appressed to mesosternal region	Fore coxae slender, cylindrical and very mobile, not usually lying against mesosternal region in repose
Hind tibia without dorsal bristles	Hind tibia with numerous short dorsal bristles
Tarsi long, fore tarsus longer than tibia, hind tarsus more than half as long as tibia	Tarsi short, fore tarsus shorter than tibia, hind tarsus less than half as long as tibia
Anal crossvein transverse, posterodistal angle of anal cell (<i>CuP</i>) therefore not acute	Anal crossvein variably sloping outwards posteriorly to make posterodistal angle of anal cell acute

It is probable, from comparative studies of related groups, that in all but the first character of the postvertical bristles the Eurybatinae are more apomorphic than the Calobatinae. However, these six apparently apomorphic characters are not peculiar to the Eurybatinae, but all are also found in the subfamily Taeniapterinae. The characters which separate the Taeniapterinae from other micropezid subfamilies have been given by Aczél (1959). Those which have been considered peculiar to this subfamily are as follows: mesofrons broadened anteriorly or in middle with ocelli generally situated in front of uppermost fronto-orbital bristle; plates bearing anterior fronto-orbitals well removed from eyes; antennae widely separated at bases: pedicel of haltere very long and fine; sternopleuron with dense vertical fan of bristle-like hairs (instead of few well differentiated sternopleural bristles); epanthrium compressed and a little elongate; surstyli absent. I consider that all these characters are apomorphic in relation to those occurring in other micropezid subfamilies, but find some of the character differences separating them from the Eurybatinae to be less clear-cut than would appear to be the case from recent publications. With regard to the structure of the postfrons, I differ from the views of Hennig (1958, 1971) (see McAlpine, 1966). I find that certain eurybatine genera, particularly, but not exclusively, certain species of *Metopochetus*, have a structure of the fronto-orbital plates somewhat approaching that of Taeniapterinae. The position of the ocelli is rather variable in the taeniapterine genus *Mimegralla s.l.* Some Eurybatinae, especially species of *Metopochetus*, have the antennae moderately

separated. The pedicel of the haltere is very elongate in the eurybatine genus *Nestima*, and in *Metopochetus* it is longer than in most other Eurybatinae. Many Eurybatinae have two or three strong sternopleural bristles placed one above the other, but in *Crosa*, *Nestima*, and *Papeza* these bristles are weak and only slightly differentiated from a row of hairs directly below them, a condition approaching that of the Taeniopterinae. Many of the South American Taeniopterinae are stout insects, with thorax broad and not anteriorly prolonged. There is evidence that this broadening is secondary and that such insects as *Taenioptera* are descended from more slender forms, as typified by most Old World taeniopterines.

Relationships of Metopochetus

All genera of Eurybatinae except *Metopochetus* have an apomorphic condition of the apex of the hind tibia which I have not found in other micropezid subfamilies or in related families. The tibia has an apical dorsal bare area, and along the anterior side of this is a longitudinal series of two or more short, very closely placed anterodorsal bristles (fig. 1).



Figs. 1-2. Apices of hind tibiae, dorsal aspect: (1) *Crepidochetus* sp.; (2) *Metopochetus compressus*.

As already mentioned, the genus *Metopochetus*, although generally agreeing with Eurybatinae, has several other characters which are not altogether typical of the subfamily, but tend in the direction of the Taeniopterinae. The wing pattern is more like that found in many taeniopterines than that in typical eurybatines, as is the deep transverse groove in the middle of the mesonotum, and the antennae are sometimes rather more widely separated than is usual in Eurybatinae. As I have not succeeded in finding a clearly apomorphic character belonging to the groundplan of the whole of the Eurybatinae, but absent from the Taeniopterinae, it cannot yet be demonstrated that the former is a monophyletic group. The above-mentioned modification of the hind tibia is a highly distinctive apomorphic character of all eurybatine genera except *Metopochetus*. If, therefore, *Metopochetus* is more closely related to the other eurybatine genera than to the Taeniopterinae, it is almost certainly a sister group to the rest of the genera. I therefore divide the subfamily Eurybatinae into two tribes, Eurybatini and Metopochetini trib. n., the latter including only *Metopochetus*. An accurate figure of *Metopochetus* by Tibor Binder is given in Colless and McAlpine (1970 : fig. 34.29A). The most useful characters for distinguishing the tribes are as follows:

Metopochetini trib. n.	Eurybatini stat. rev.
Hind tibia without apical modification (fig. 2)	Hind tibia with bare dorsal apical area and a longitudinal series of two or more short, suberect, closely placed subapical anterodorsal bristles (fig. 1)
Axillary lobe (antisquama or upper calyptra) bare on distal part of margin	Axillary lobe with dense tuft of short hairs on distal margin near junction with alula
A broad occipital tubercle above neck	No occipital tubercle
Mesonotum with complete, deep transverse groove connecting the transverse sutures of each side	Mesonotum without distinct transverse groove crossing median line

Relationships of Micropezinae

The subfamily Micropezinae (Tyliinae) has remained the most stable unit in the family since it was defined by Enderlein (1922). Its most distinctive apomorphic characters are the absence of fronto-orbital bristles and of the second basal cell. Although it is almost certainly a monophyletic group, neither of these characters absolutely distinguishes it from the Eurybatinae. In the latter group the vein closing the second basal cell is often weak and has a tendency to disappear, and in the eurybatine genus *Anaeropsis* there are no fronto-orbitals. It is clear that the forms possessing these apomorphic characters in Eurybatinae have no close relationship with the Micropezinae, and have acquired the characters independently. In other characters the Micropezinae are intermediate between the Eurybatinae-Taeniapterinae on one hand and the more plesiomorphic Calobatinae on the other. The fore coxa is of the very mobile type but is not slender and cylindrical. The tarsi are shortened, but are not as short as in Eurybatinae and Taeniapterinae. The form of the anal cell is as in Calobatinae. Dorsal bristles are often present on middle and hind tibiae, but may be reduced. The humeral callus is not defined. For these reasons I consider that the Micropezinae are derived from the stem leading to Eurybatinae and Taeniapterinae but branched off before the full complement of apomorphic characters, shared by the two latter, had evolved.

Relationships of Calycopteryx

The subapterous genus *Calycopteryx* from Kerguelen and Heard Island is both geographically and morphologically isolated from other micropezid groups. Characters associated with flightlessness are unlikely to provide evidence of relationships of the genus, and the vestigial nature of the wings prevents reference to wing characters, for this evidence. Some of the remaining characters are similar to those of Calobatinae: the humeral callus is very well defined, the fore coxae are broad, contiguous, and appressed to the mesosternum, the middle and hind tarsi are moderately long, and the middle and hind tibiae have no dorsal bristles. Hennig (1958) placed this genus in the family Trepidariidae, and later (1965) in the tribe Eurybatini of the Calobatidae. However, the genus is not referable to the Eurybatinae as it has none of the apomorphic characters which distinguish Eurybatinae from Calobatinae. On the other hand its resemblance to the Calobatinae is due solely to symplesiomorphy. An apomorphic character of the Calobatinae, the absence of postvertical bristles, does not apply to *Calycopteryx*. The structure of the antenna in *Calycopteryx* is different from that of other

Micropezidae. There is no trace of a dorsal notch or emargination in the distal margin of the second segment, the arista is inserted mid-dorsally on the third segment instead of sub-basally, the third segment is discoid, not reflexed in relation to segment 2, but the antenna is deflexed from the base of segment 2. Thus the antenna closely resembles that of Megamerinidae and probably also the fossil *Cypselosomatites*, which I have not seen. There is also a strong resemblance to the antenna of the micropezoid family Pseudopomyzidae, though the members of this family have the antenna correct. In view of the greater resemblance in the antennal structure of *Calycopteryx* to that of other micropezoid families than to that of typical members of the Micropezidae, I regard the antennal structure of this genus as markedly plesiomorphic in relation to that of other micropezids. Another plesiomorphic character is the presence of ocellar bristles, which are generally absent in Micropezidae. They are often present in *Metopochetus* (Eurybatinae), but are always very minute despite the otherwise well developed cephalic chaetotaxy. In *Calycopteryx* the cephalic bristles in general are somewhat shortened, yet the ocellar bristles are better developed than in *Metopochetus*. This suggests that the winged form, from which *Calycopteryx* was derived, may have had quite well developed ocellars. I regard *Calycopteryx* as a relict form, perhaps a sister group to the rest of the Micropezidae, which cannot be included in any of the established subfamilies. It is possible that it has remained isolated in its island habitat since the middle Tertiary. A detailed comparison with the Oligocene fossil *Cypselosomatites* would be of interest. I have seen no material of the latter (see Hennig, 1965).

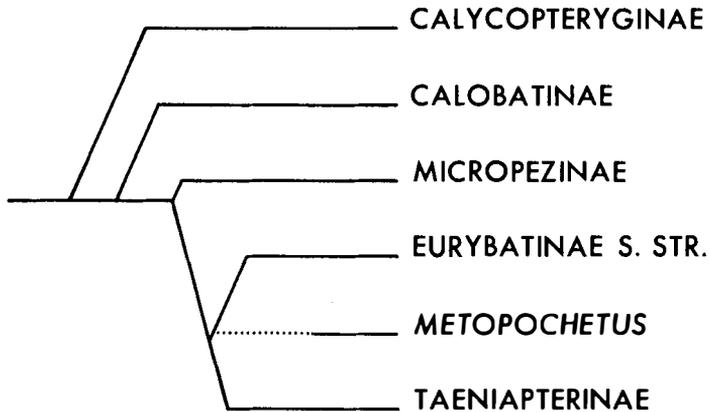


Fig. 3. Diagram of most probable phylogenetic lines in Micropezidae.

Conclusions

The family Micropezidae can be divided into five subfamilies: Calycopteryginae, Calobatinae, Micropezinae, Eurybatinae, and Taeniapterinae. The last two are closely related as they share six characters which are apomorphic in relation to those of the Calobatinae. The Eurybatinae are further divided into the tribes Metopochetini and Eurybatini. The subfamily Micropezinae shows some development of these apomorphic characters and is probably the sister group to Eurybatinae plus Taeniapterinae. *Calycopteryx* is an isolated genus which in antennal structure and development of the ocellar bristles appears to be more plesiomorphic than other micropezids. It is possible that it has a sister-group relationship to the rest of the family.

Calycopteryginae subfam. n.

Subapterous flies inhabiting Heard Island and Kerguelen in the south Indian Ocean. Ocellar and postvertical bristles present; two pairs of fronto-orbital bristles; prelabrum large and prominent; antennal segment one porrect and exserted; segment 2 shortly trumpet-shaped, somewhat deflexed, without dorsal emargination of distal margin; segment 3 short, subdiscoid, aligned with segment 2, arista inserted near or very slightly beyond middle of its dorsal margin; humeral callus compact and well defined dorsally by a groove; scutellum not differentiated; two distinct sternopleural bristles placed one above the other, not intergrading with hairs; fore coxae broad, more or less contiguous, very oblique at bases; tibiae without dorsal bristles; fore tarsus about as long as tibia; middle and hind tarsi more than half as long as tibiae; wings and halteres minute; sternite 5 of male bilobed, the lobes short; genital segment of male short, compact, not bilaterally compressed, with large surstyli; segment 7 of female forming a prominent, elongate-oval ovipositor sheath.

Key to subfamilies of Micropezidae

- 1 Wings and halteres vestigial; scutellum not differentiated; second antennal segment without trace of notch on dorsal margin; third segment aligned with second, almost circular, with arista inserted mid-dorsally.
Kerguelen and Heard IslandCALYCOPTERYGINAE
- Wings, halteres and scutellum perfectly developed; second antennal segment with notch (sometimes rather broad and shallow) on dorsal margin; third segment oval, deflexed in relation to second, with arista inserted much closer to base than apex. *Not occurring beyond 45° S latitude*.....2
- 2 Fore coxae broad, at rest contiguous and appressed to mesosternal region; hind tibia without dorsal bristles; tarsi long, fore tarsus longer than tibia, hind tarsus more than half as long as tibia; thorax compact and not anteriorly prolonged; humeral callus short and well defined; postvertical bristles absent. *Holarctic Region*.....CALOBATINAE
- Fore coxae very mobile, not usually lying against mesosternal region in repose, and, except in Micropezinae, usually slender and cylindrical; hind tibiae usually with numerous short dorsal bristles (except some Micropezinae); tarsi relatively short, fore tarsus shorter than tibia, hind tarsus less than half as long as tibia; thorax more or less prolonged anteriorly, with humeral callus elongate or not defined on dorsal side; postvertical bristles present, except in some Taeniapterinae.....3
- 3 Fronto-orbital bristles absent; second basal and discal cells confluent; anal cross-vein transverse, posterodistal angle of anal cell therefore not acute.
Holarctic and Neotropical RegionsMICROPEZINAE
- Fronto-orbital bristles present (except *Anaeropsis* from Indonesia with stalk-eyed male); second basal and discal cell usually separated; anal crossvein variably sloping outwards posteriorly to make posterodistal angle of anal cell acute4
- 4 Ocelli generally situated at or near posterior end of mesofrons; antennae usually only narrowly separated; up to about three or four sternopleural

bristles in a vertical row, sometimes hair-like; surstyli of ♂ present.

Oriental and Australian RegionsEURYBATINAE

- Ocelli situated further forwards on mesofrons; antennae widely separated; a dense vertical fan of numerous bristle-like hairs on sternopleuron; surstyli of ♂ absent. *Pantropical with Holarctic extensions*.....TAENIAPTERINAE

Key to genera of Eurybatinae

- 1 Complete metathoracic postcoxal bridge present.....2
- Postcoxal bridge absent or very incomplete.....5
- 2 Subscutellum very prominent, conical, exceeding scutellum; mesonotum anteriorly produced and subacute above pronotum.....**Nestima**
- Subscutellum not prominent; mesonotum anteriorly tumid, but not usually produced.....3
- 3 One strong fronto-orbital bristle, only; head depressed with postfrons only slightly convex in profile; postcoxal bridge sclerotised on upper part only and continuous with first abdominal sternite.....**Trepidarioides**
- Two strong fronto-orbital bristles; head rounded, with postfrons strongly convex in profile; postcoxal bridge very deep and sclerotised from bases of hind coxae to base of abdomen.....4
- 4 Arista plumose; mesonotum with shallow transverse depression between the (vestigial) humeral calli, at anterior extremity narrowly gibbous and overhanging pronotum; mid and hind femora with small ventral spines distally**Crosa**
- Arista pubescent on basal third, bare beyond; mesonotum without such transverse depression, at anterior extremity broadly convex, not overhanging pronotum; femora without ventral spines.....**Papeza**
- 5 Fronto-orbital bristles absent, whole thorax with fine soft covering of pile-like pubescence; mesonotum with transverse depression between humeral calli, eyes of ♂ stalked (♀ unknown).....**Anaeropsis**
- At least one pair of fronto-orbital bristles; thoracic pubescence reduced to pruinescence; mesonotum without transverse depression in humeral region (except in *Eurybata*); eyes not stalked.....6
- 6 Mesonotum with transverse depression between humeral calli; hind femur with small anteroventral and posteroventral spines distally.....**Eurybata**
- Mesonotum without transverse depression anteriorly; hind femur unarmed ventrally7
- 7 Scutellum directed upwards; mesonotum gradually sloping downwards anteriorly to junction with pronotum where it is a little convex.....**Crepidochetus**
- Scutellum directed posteriorly; mesonotum not gradually sloped, but high and gibbous anteriorly, more or less overhanging pronotum.....8
- 8 Head with median occipital tubercle just above neck; mesonotum with complete, deep transverse groove connecting transverse sutures on each side; fronto-orbital plate entirely dull, pruinescent, with three or more fronto-orbital bristles**Metopochetus**
- Head without such occipital tubercle; groove connecting transverse sutures more or less obsolete in middle; posterior section of fronto-orbital plate

glossy; two fronto-orbital bristles, the posterior one situated on the glossy section **Cothornobata**

Metopochetus Enderlein, 1922

The Baltic amber genus *Electrobata* appears to have some features in common with *Metopochetus* but is known to me only from descriptions (see especially Hennig, 1965). Hennig considers it to be closest morphologically to the "Eurybatini" (i.e. Eurybatinae in the present work).

It should be noted that the hairing of the arista and numbers of sternopleural bristles, though previously used as key characters, are variable in *Metopochetus*.

Distribution. New Guinea and adjacent islands; Australia, from the Cairns district to Tasmania and South Australia (Adelaide district), also south-western Australia and Lord Howe Island.

Type species: *M. ralumensis* Enderlein.

Other species: *M. tipuloides* (Walker); *M. perclusus* (Walker); *M. bivittatus* (Macquart) (= *picea* Walker, *tenuipes* Walker **syn. n.**); *M. terminalis* (Walker) **comb. n.**, figured by Colless and McAlpine (1970) under the incorrect name *tenuipes*; *M. compressus* (Walker) **comb. n.**

Cothornobata Czerny, 1932

The correct status and relationships of this genus have been recognised by Frey (1958). It is apparently most closely related to *Crepidochetus* but is distinguished as indicated in the key.

Distribution. South-East Asia; ? Reunion. I have also seen] species from Mauritius, New Guinea, Queensland, and northern New South Wales. I have not compared the Mauritius material (British Museum (Natural History)) with *Calobata taeniata* Macquart from Reunion (Bourbon) which Hennig (1938) refers to the genus *Trepidarioides*. However, it seems quite possible that the latter species also belongs in *Cothornobata*.

Type species: *C. cyanea* (Hendel) (= *striatifrons* Czerny).

Other species: *C. nigrigenu* (Enderlein); (?) *C. taeniata* (Macquart); also at least two undescribed species.

Crepidochetus Enderlein, 1922

Gongylocephala Czerny, 1932 : 292-3. **syn. n.**

The general characters of the types of these two nominal genera (*C. forcipatus* Enderlein and *G. nigrifemur* Czerny) coincide, so the genera must be regarded as synonyms. No modern author appears to have made a comparison of specimens from each genus up to the present, although Hennig (1935-36) saw material of both concepts. The basal swelling of middle and hind femora (not tibiae as indicated by Frey), often supposed to be characteristic of *Crepidochetus*, is not always very noticeable.

Distribution. Philippines, Borneo, and Sumatra, to New Guinea, Solomon Islands, New Caledonia, and North Queensland.

Type species: *C. forcipatus* Enderlein.

Other species: *C.debilis* (Walker); *C.varipes* (Walker); *C.argenteofasciata* Frey; *C.nigrifemur* (Czerny) **comb. n.**; *C.pallidus* (Steyskal) **comb. n.**; *C.ater* (Steyskal) **comb. n.**; also at least two undescribed species from Queensland and New Caledonia respectively. *C.boninensis* Hennig from Micronesia is a taenipterine, referred to the genus *Rainieria* by Hennig (1938). There may well be some synonymy among the nominal species here listed.

Eurybata Osten Sacken, 1882

The genus has been restricted by Steyskal (1952) and Frey (1958). There is no metathoracic postcoxal bridge; a shallow transverse depression is present on the anterior part of the mesonotum, but there is no transverse groove connecting the transverse sutures. The number of fronto-orbital bristles is variable; in the specimens of *E.hexapla* examined by Frey and the author there is only one, but Steyskal (1952) figures a specimen with two bristles, the anterior one being much shorter.

Distribution. Philippines only, judging from available authentic records.

Type species: *E.hexapla* Osten Sacken.

Other species: *E.nigritibia* Steyskal; *E.tessellata* Steyskal.

Anaeropsis Bigot, 1866

This genus has been generally omitted from works on Micropezidae since Hennig (1936 : 229) gave it as a synonym of *Phytalmia* (Tephritidae, Phytalmiini). Although its correct position has been indicated by Osten Sacken (1882) and Hennig (1938), it does not appear in any key to micropezid genera after that of Enderlein (1922). I now confirm that *Anaeropsis* is a micropezid closely related to *Eurybata*. It is the only known micropezid with stalked eyes (at least in the male, the female being still unknown), and apparently the only micropezid outside the subfamily Micropezinae in which fronto-orbital bristles are absent. The thorax is very similar to that of *Eurybata*. As in that genus, the metapleura encroach on the sides of the postcoxal area, but do not form a bridge. The middle and hind tibiae have minute ventral spines distally.

Distribution. Celebes (Sulawesi); Waigeo (Waigeu), near West New Guinea.

Type species: *A.lorquini* Bigot, 1866 (? = *Phytalmia guttipennis* Walker, 1861).

Osten Sacken (1882) synonymised *A.lorquini* with *Phytalmia guttipennis* Walker after seeing the types of both. Bigot's species was from Waigeo and Walker's form Tondano, Celebes (erroneously given as "Tond" by Walker). As no later worker has compared specimens from the two islands, it remains possible that they are specifically distinct. I have examined Walker's type in the British Museum (Natural History) and a further series from Ile-Ile, Celebes, in the Zoological Museum, Berlin. Dr H.Schumann has kindly provided one of the latter for illustrating. One specimen in the Zoological Museum, Berlin, has been determined by the late Dr Enderlein as a separate species, the name being apparently unpublished. It differs from more typical specimens of *A.guttipennis* in its smaller size and less developed eye-stalks. I regard it as probably a variant of *A.guttipennis*, as in the analogous genus *Achias* (family Platystomatidae) very small individuals generally have reduced eye-stalks.

The specimen shown in figure 4 has the following measurements (in mm.): total length 13.8, length of thorax 4.1, length of wing 9.9.

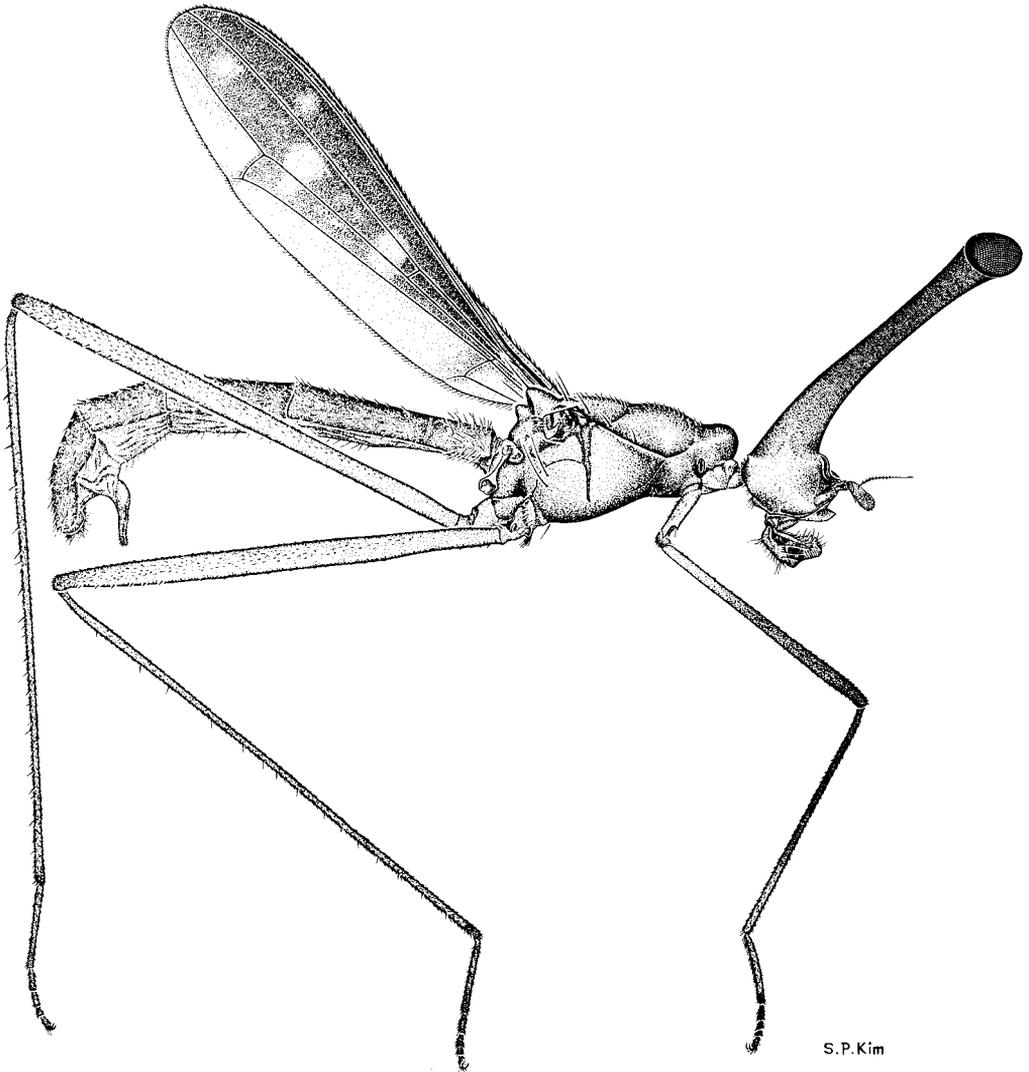


Fig. 4. *Anæropsis guttipennis*, male. The eye-stalks of this specimen seem to have been pressed upwards after death.

Trepidarioides Frey, 1927

Frey (1958) has given the main distinguishing characters of this apparently monotypic genus. Aczél (1959) interprets the genus more broadly, giving the distribution as "Tonkin, Siam, Burma, Formosa, Sumatra, Philippines, New Guinea". Following Hennig, he included species of *Cothornobata*, which tend to run to *Trepidarioides* in his key. He gives as a key character: "Only single pair of *orsa* present", but *Trepidarioides* is typically without any anterior supra-orbital bristles (*orsa*). In this, he apparently follows an error by Hennig (1935 : 305). Aczél also gives the characters of the arista incorrectly.

Distribution. Only reliably reported from the Philippines.

Type species: *T. territa* (Osten Sacken).

Papeza gen. n.

Head subspherical with convex postfrons; lunule forming an exposed shelf which is only a little prominent in profile; mesofrons matt, densely finely pubescent, widening anteriorly; fronto-orbital plates shining; face with rather broad triangular sclerotized area; two fronto-orbital bristles, inner and outer verticals, and divergent postvertical bristles present. Prelabrum rather prominent; palpus slender and rather short. Antenna moderately short, of similar proportions to that of *Crosa* but segment 3 distinctly wider and more rounded; arista pubescent basally, otherwise almost completely bare.

Thorax only moderately elongate, without dorsal depression between the sub-obsolete humeral calli; no transverse groove in median part of mesoscutum connecting the lateral transverse sutures; anterior end of mesonotum convex but not vertical or overhanging neck region; scutellum directed more or less posteriorly, with two or three lateral hairs on each side; subscutellum convex, but not visible from above; mesothoracic postcoxal bridge very broadly sclerotised as in *Crosa* and *Nestima*; a weak posterior dorsocentral bristle, the dorsocentral series continued as a row of hairs to well in front of suture; pair of apical scutellar bristles; one or two small, weak propleurals; a row of 4-9 long fine sternopleurals. Wing with subcosta ending quite close to R_1 ; vein 2 ending closer to apex than to level of discal crossvein; vein 6 complete, more than twice as long as anal crossvein. Femora very slender, slightly thickened apically, without distinguishable ventral spinules.

Abdomen only moderately slender, not markedly attenuated basally. Sternite 5 of male with a pair of elongate, rod-like lobes.

Type species: *Papeza szentivanyi* sp. n.

The very broadly developed postcoxal bridge in this genus is comparable only with that of *Crosa* and *Nestima* among the Micropezidae. The new genus differs from both of these in its non-plumose arista, broader third antennal segment, lack of even a slight depression on anterior part of mesoscutum, and absence of ventral spines on middle and hind femora.

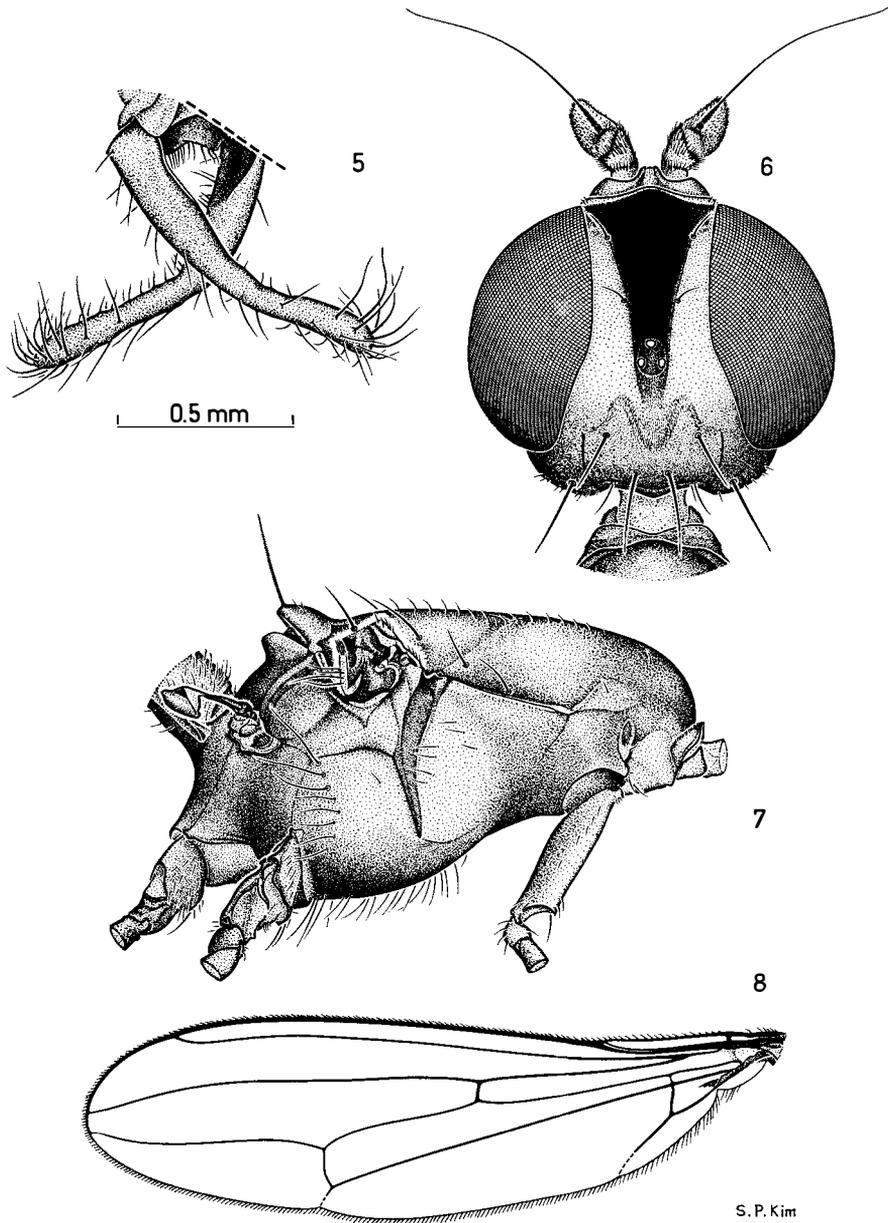
The generic name is a contraction of the words Papua and *Micropeza*, and is feminine.

Papeza szentivanyi sp. n. (figs. 5-8)*Male*

Head fulvous, paler ventrally; mesofrons dull black, except on anterior margin; lateral plates of lunule shining; prelabrum shining fulvous. Antenna orange-fulvous. Palpus pale fulvous.

Thorax fulvous, thinly pruinulent dorsally; mesopleuron, most of propleuron and a large part of sternopleuron strongly shining. Wing with tawny-fulvous veins and faintly yellowish-brown tinged membrane, without any markings. Haltere fulvous. Legs fulvous; fore femur gradually becoming brown on distal half; fore tibia brown; other tibiae tawny, dark brown at apical extremities; fore tarsus creamy white with two distal segments yellowish; other tarsi tawny.

Abdomen fulvous to tawny. Main body of sternite 5 reduced to a vestige but its paired lobes large, elongate, rod-like, slightly bent inwards near middle, slightly clavate and rounded apically, apparently flexible from their bases, furnished with numerous hairs, those near apex longer and incurved, those on inner surface of basal half short and slightly thickened.



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Figs. 5-8. *Papeza szentivanyi* sp. n.: (5) sternite 5 of paratype ♂, posterior aspect; (6) head of holotype; (7) thorax of holotype; (8) wing of holotype.

Dimensions (in mm.). Total length 5.6-7.8; length of thorax 3.0-3.6; length of wing 7.0-8.3.

Distribution. Papua—Central District highlands.

Holotype ♂: WOITAPE, Wharton Range, 1600 m., 20.x.1963 (*D.K.McAlpine*) (Australian Museum).

Paratypes, same data as holotype (1 ♂ British Museum, 1 ♂ Australian Museum).

I believe this species to be previously undescribed because I cannot find any description of a New Guinea micropezid in reasonably close agreement, and because my study of type material in European museums has not brought to light any species which I regard as congeneric. Although numerous other species of Eurybatinae await description, this species, the type of *Papeza*, is now described to enable a more complete treatment of the genera to be made.

Crosa Steyskal, 1952

This genus was formerly confused with *Eurybata* from which it is very distinct structurally. Aczél (1959) pointed out the extreme development of the metathoracic postcoxal bridge in this genus. This character is shared with the genera *Nestima* and *Papeza*. *Trepidarioides territa* has by comparison a very narrow postcoxal bridge. I have not observed postcoxal bridges in any other micropezids. In his key to the genera, Frey (1958) gives *Crosa* as having "Mesonotum . . . vorn gerade, nicht eingedrückt". In the three species available to me, including the type species, there is a shallow saddle-like depression dorsally in the humeral region as in *Eurybata* and *Nestima*. A further interesting character is seen in the presence of up to four or five long, fine sternopleural bristles in a vertical row. This condition, found also in *Nestima* and *Papeza*, somewhat approaches that seen in the Taeniapterinae.

Distribution. Malaya (in Australian Museum), Philippines, Caroline Islands, Indonesia, New Guinea, Solomon Islands.

Type species: *C.semilauta* (Osten Sacken).

Other species: *C.tetras* Steyskal, *C.yapensis* Steyskal, *C.fragilis* (Walker) **comb. n.**, *C.cuneifera* (de Meijere) **comb. n.**, *C.nigriventris* (Enderlein) **comb. n.** Several other species which have been placed in *Eurybata* may prove to belong here.

Nestima Osten Sacken, 1881

This genus is very closely related to *Crosa*, and only a few consistent differences occur: the subscutellum is greatly developed as in the family Nothybidae; the anterior prominence of the mesonotum is subacute (more rounded in *Crosa*); the ocelli are situated distinctly closer to the posterior fronto-orbital bristles than to the postverticals.

Distribution. New Guinea; Bismarck Archipelago; ? Moluccas.

Type species: *N.polita* Osten Sacken.

Other species: *N.pleuralis* Steyskal; *N.viridinsula* Steyskal; ? *N.prolixa* Walker.

REFERENCES

- ACZÉL M.L. 1951. Morfología externa y division sistemática de las "Tanypezidiformes" con sinopsis de las especies Argentinas de "Tylidae" ("Micropezidae") y "Neriidae" (Dipt.). *Acta Zool. Lilloana* **11** : 483-589, pl. 1-4.
- ACZÉL M.L. 1959. Diptera: Neriidae and Micropezidae (Tylidae). *Ins. Micronesia* **14** : 47-90.
- COLLESS D.H. & McALPINE D.K. 1970. Diptera. In *The Insects of Australia*, pp. 656-740. Melbourne.
- CZERNY L. 1932. Tyliden und Neriiden des zoologischen Museums in Hamburg (Dipt.). *Stett. ent. Zeit.* **93** : 267-302.
- ENDERLEIN G. 1922. Klassifikation der Micropeziden. *Arch. Naturgesch. A* **88** (5) : 140-229.
- FREY R. 1927. Zur Systematik der Diptera Haplostomata. III. Fam. Micropezidae. *Notul. Ent.* **7** : 65-76.

- FREY R. 1958. Studien über ostasiatische Dipteren. VI. Nothybidae, Micropezidae, Opomyzidae. *Notul. Ent.* **38** : 37-51.
- HENNIG W. 1935-36. Revision der Tyliden (Dipt., Acalypt.). II Teil: Die ausseramerikanischen Taeniapterinae, die Trepidariinae und Tyliinae. Allgemeines über die Tyliden. *Konowia* **14** : 68-92, 192-216, 289-310; **15** : 129-44, 201-39.
- HENNIG W. 1938. Neue Beiträge zur Systematik der Richardiiden und Tyliden (Diptera, Acalyptata). *Arb. morph. taxon. Ent.* **5** : 8-15.
- HENNIG W. 1958. Die Familien der Diptera Schizophora und ihre phylogenetische Verwandtschaftsbeziehungen. *Beitr. Ent.* **8** : 505-688.
- HENNIG W. 1965. Die Acalyptratae des Baltischen Bernsteins und ihre Bedeutung für die Erforschung der phylogenetischen Entwicklung dieser Dipteren-Gruppe. *Stuttgart. Beitr. Naturkunde* **145** : 215 pp.
- HENNIG W. 1971. Neue Untersuchungen über die Familien der Diptera Schizophora (Diptera : Cyclorrhapha). *Stuttgart. Beitr. Naturkunde* **226** : 76 pp.
- MCALPINE D.K. 1966. Description and biology of an Australian species of Cypselosomatidae (Diptera), with a discussion of family relationships. *Aust. J. Zool.* **14** : 673-85.
- OSTEN SACKEN C.R. 1882. Enumeration of the Diptera of the Malay Archipelago collected by Prof. Odoardo Beccari etc. Supplement. *Ann. Mus. Civ. Stor. Nat. Genova* **18** : 10-20.
- STEYSKAL G.C. 1947. Micropezidae (Diptera) from the Solomon Islands. *Occ. Pap. Mus. Zool. Univ. Mich.* **502** : 9 pp., 1 pl.
- STEYSKAL G.C. 1952. Australasian stilt-legged flies (Diptera : Tylidae) in the United States National Museum. *Proc. U.S. Nat. Mus.* **102** : 161-80.

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