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## **Anthoboscinae and Myzininae (Hymenoptera, Tiphidae) from Madagascar**

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**A b s t r a c t :** The new species *Anthobosca dimidiata*, *Anthobosca micromera*, *Mesa krombeini*, *Meria luteipes*, *Meria gradilis* and *Myzinella festiva* are described. The synonymies of *Anthobosca arabica* TURNER 1909 with *Anthobosca suakinensis* MAGRETTI 1883 and *Mesa seyrigi* KROMBEIN 1949 with *Mesa nodosa* GUÉRIN 1837 are established. Lectotype and paralectotype of the latter are designed and partially figured. First records from Comoro islands are given. Some arguments about biogeography of Malagasy tiphid fauna are also proposed.

**K e y w o r d s :** Hymenoptera, Tiphidae, Madagascar, new species.

### **Introduction**

KROMBEIN (1949) made the last contribute to the Anthoboscina and Myzinina fauna of the Madagascar. In his introduction he advised about the incompleteness of the study because of the lack of material from the xeric South Western region of the island: "This strip of semi-desert has an interesting and peculiar xerophilous flora, and it is quite possible that if Tiphidae are present at all, they would be different from the species occurring elsewhere on the island." The study of some material from that region at NHMW partially confirms its guess.

### **Methods**

Terms and morphology descriptions follow the indication previously given (BONI BARTALUCCI 2004). Digits between rounded brackets in the chorological items mean number of specimens. ! means examined type.

### **Abbreviations used**

A = height (Altitudo); CD = discoidal cell (Cella Discoidalis); CM = marginal cell (Cella Marginalis); cOc = carina Occipitis (-alis); CSM = sub marginal cell (Cella Sub Marginalis); ep = epimeron; FoO = oral cavity (Fossa Oris); L = length (Longitudo); La = width (Latitudo); LeM = mesosternal lobes (Lamellae Mesosterni); N<sub>1</sub> = proNotum; N<sub>3</sub> = metaNotum; ol = lateral ocellus (ocellus lateralis); om = median ocellus (ocellus medianus); P = Propodeum; Pal = labial palpus (Palpus labialis); Pam = maxillary palpus (Palpus maxillaris); PoG = genal bridge (Pons Genarum); Sc<sub>1</sub> = Scutum; Sc<sub>2</sub> = Scutellum; Tsa = supra antennal lobes (Tubercula supra antennam).

### Acronyms

BMNH = Natural History Museum, London; CUIC = Cornell University Insect Collection, Ithaca; MHNG = Museum d'Histoire Naturelle, Genève; MHNP = Museum d'Histoire naturelle, Paris; MHNR = Museum d'Histoire naturelle, Reunion; MNHU = Museum für Naturkunde der Humboldt-Universität, Berlin; MSNG = Museo Civico di Storia naturale "G. Doria", Genova; MZUF = Museo Zoologico de "La Specola", Firenze; NHMW = Naturhistorische Museum, Wien.

### Biogeography

In a previous work (BONI BARTALUCCI 2004) the arguments about the Myzinin fauna of Madagascar were argued with too much shallow premises and an outdated supposed age of the severance of Madagascar from Africa.

It is acknowledged enough that the separation of Madagascar from continental Africa traces back since 100 Mya at least, through a process beginning at lower cretaceous (165 Mya), the island remaining severed from continent by a marine channel hundreds kilometres large. Nevertheless there are groups of organisms (primates and carnivore mammals) clearly younger than the age of the severance, therefore their presence is not consistent with a Gondwana vicariance. RAXWORTHY et al. (2002) concluded: "Here we show, using molecular and morphological evidence for 52 Chameleon taxa, support for a phylogeny and area cladogram that does not fit a simple vicariant history. .... Our analysis provide evidence for considerable oceanic dispersal by chameleons and support the hypothesis that dispersal, rather than continental break-up, was the precursor for species radiation." In front of that YODER et al. (2003) through cladistic analysis first argued about a single colonization of the Malagasy Carnivore from an African ancestor, then carried out a comparative age analysis of Lemuriformes and Malagasy Carnivora; their results pointed out very divergent colonization ages for the two groups (65 Mya for Lemuriformes, 24-18 Mya for Carnivora). In their opinion not only vicariance and common dispersal, i.e. the same biogeographical event, but also the putative continuous land bridge (proposed by MCCALL 1997) through the Mozambique channel during a temporal window between middle Eocene (45 Mya) and early Miocene epoch (25 Mya) have to be excluded. YODER et al. concluded that "the entire extant mammal fauna of the island can be explained by only four colonization events and, at least for the two clades compared here, their immigration appear to occurred at random as predicted by SIMPSON's (1952) sweepstakes model of over-water dispersal. It is significant to note that for at least three of the four founding clades of terrestrial mammals, some species have eco physiological specializations, such as the ability to hibernate or go into torpor, which would have predisposed them for enduring long periods of drought and food shortage. ... the over-water dispersal model gains yet more credence".

The Myzinin fauna hitherto found in the island is represented by three genera, *Mesa*, *Meria* and *Myzinella*, which are wide ranging through the whole of Africa; the first one also in the oriental region and with females always fully winged, while the other two are more tied to sub arid habitats and with females always displaying a more or less advanced brachyptery.

As pointed out previously (BONI BARTALUCCI 2004), the origin of the tribal taxa Mesini and Meriini appears to have been placed not only after late (upper) Cretaceous, when Africa and Americas (where the tribe Myzinini only exists) were still connected, but also

after Paleocene (55 Mya) when northern America and Laurasia are supposed to still maintain large territorial connections at latitudes with climates warm enough to permit many types of organisms to pass through them.

Since the origin of the tribe Mesini and Meriini appear really younger than the age of severance of Madagascar both from Africa near the Somali basin (165-140 Mya) (RABINOWITZ et al. 1983) and India (about 80 Mya) (STOREY et al. 1995), they probably reached the island from Eocene onward and their presence is not consistent with a Gondwana vicariance too. All the Malagasy taxa are peculiar and different from any taxon of the continental Africa, we can suppose derived from ancestors reaching the island from the continental Africa. The land bridge hypothesis has been rejected by Yoder since "the geologic data on which is based are extremely frail". Nevertheless the Myzinin wasps prey on coleopteran larvae living into the soil; if that hypothesis seems to be excluded, the sweepstakes route model of over-water dispersal seems more fit to explain the presence in the Madagascar of three different "soil depending" "with low flying capacity" taxa only surmising an islands arch through it and reasonably excluding rafting. The epoch could coincide with the same colonization event for the carnivorans indicated by YODER during the Miocene or afterwards. We could hazard to individuate it through the Comoros islands where the relative distances among them, the African coast and Madagascar are today too by far the smallest ones in the area. Eustatic reduction in sea level since the Paleocene (HAQ et al. 1987) together with probably occurred faulting and raising/subsidence events could have further reduced these distances, promoting the passage from continental coast to the island. The presence of *Mesa hova* and *Mesa krombeini* in the Comoros archipelago seems to support this hypothesis.

The presence in Sri Lanka of an anthoboscin (*Anthobosca ceylonica* KROMBEIN 1982) with strong affinities to the anthoboscin taxa of the *aspericornis* group could give evidence to its more ancient origin, in late Cretaceous (about 100-90 Mya) when Africa, Madagascar and India were still in close proximity (SMITH et al. 1994) and at the same time by far severed from Australia and Antarctica. The absence of taxa of this group from Americas (still connected to Africa at that age) and from main India is hardly explainable. The latter datum is more surprising and probably meaningful. It could be explained either by lacking of researches on the field (not really probable, since main India has been quite deeply investigated) either by extinction from there.

On the other hand *Anthobosca insularis* (SMITH 1869), a Malagasy endemic taxon, shows greater affinities with Australian and American taxa and we could guess its older origin, about 120 Mya, when Madagascar and India seem to have had connections to Australia (SMITH A.G. et al. 1994); this hypothesis too contrasts with the absence of similar taxa from main India, except we admit here too their extinction.

#### Subfamily **A n t h o b o s c i n a e**

The members of this group are guessed to lack any derived characters (autapomorphies) and otherwise to show only plesiomorphic states (KIMSEY 1991). Nevertheless all the females show a very peculiar shape of the integument on the outer surface of the hind tibia just at the base of the long bristles where it grows up strongly in a sort of an apparent blunt and massive "spine" (Fig. 9). This occurs elsewhere within the family, even if less stressed, only about the representatives of the genera *Epomidiopteron* ROMAND1836

and *Paratiphia* SICHEL 1864 within Tiphiiinae. They also bear a rounded semi transparent expansion of the clypeal disk just above the base of the mandibles, a character state just only weakly expressed within the sole Tiphiiinae. Moreover the back border of the Sc<sub>2</sub> and the fore border of the median portion (the postscutellar area) of the N<sub>3</sub> are more or less distanced (the greater distance occurs in the group of *aspericornis*), a state which occurs elsewhere only in tribe Austromyziniinae.

The fauna of the Ethiopian and Australian regions need a deep revision. DAY (1981) reminded that *Paramyzine* was adopted by BERG (1898) for the taxon *Menius aspericornis* BUYSSON 1898 as the name *Menius* resulted preoccupied. At the same time, in establishing the synonymy of the taxon name *Odonthothynnus* CAMERON 1905 with *Paramyzine* BERG 1898, he argued: "*Paramyzine* would be senior name for the African series of *Anthobosca* in the event that it was thought desirable to partition the genus.". GENISE (1984) too guessed that the taxa of the African and Madagascan faunas probably should be placed in distinct genera from those of the Australian fauna. The examination of the types of *Anthobosca australasiae* GUÉRIN 1839 (♀)<sup>1</sup>, *Cosila signata* SICHEL 1864 (actually the female of *A. australasiae*), *Cosila fasciculata* SICHEL 1864 (♀), *Cosila australis* SICHEL 1864 (♀), *Dimorphoptera clypeata* SMITH 1868 (♀), *Tachypterus crassicornis* SMITH 1869 (♂), *Myzine insularis* SMITH 1869 (♀), *Myzine suakinensis* MAGRETTI 1883 (♀), *Menius aspericornis* BUYSSON 1898 (♂), *Anthobosca arabica* TURNER 1908 (♀) (=suakinensis), *Anthobosca arnoldi* TURNER 1926 (♀♂) (=aspericornis) seems to confirm, at least partially, their intuitions; a deeper study could lead to a taxonomical segregation of the African from Australian forms, split in different taxa at their turn. Nevertheless, because this lot of types of the Australian taxa falls too short and an exhaustive examination of their mouthparts still lacks, any conclusive treatment cannot be performed about and the taxa will be still dealt with under the older name *Anthobosca*.

### Genus *Anthobosca* GUÉRIN 1839

Type species: *Anthobosca australasiae* GUÉRIN 1839 (♂).

All (but *Myzine insularis* SMITH 1869, ♀) the in so far examined afro tropical specimens show the following character states well known from the Australian taxa above named:

- The shape of the fore tibial spur in females (Fig. 7), with a velum longer and bigger than the whole trunk, is unique within the entire family Tiphiiidae.
- The apical opening of the scape in the females is very enlarging ventrally and subtriangular; the pedicel fills only about one sixth of the cavity (Fig. 3).
- The presence of tyloids on the apical flagellomeres of the males; only *Dimorphoptera nigripennis* SMITH 1878 from Australia have very swollen tyloids.
- In both the sexes the apical three elements of Pam are more or less elongated up to twice the basal ones (in the examined Australian forms they appear isometric).

<sup>1</sup> The holotype of *A. australasiae* is in very poor condition lacking most of the head and metasoma. At MSNG there is a specimen, compared with the type, that Brown gifted to the Museum: /Fairburn 152.10E 30.27S 13,6 km NE Wolloombi NSW 8.1.1992 A. Campdell & G. Brown/ *Anthobosca australasiae* det. G.Brown 1999/ MSNG.

- The forecoxa in the resting position of both the sexes (i.e. with the dorsal surface contiguous to the ventral edge of the propleura) covers only about 3/5 the coxal cavity in ventral aspect.
- The inner (back) side of the hind tibia bear two long keels springing from its base delimiting an oblong area (in the Australian forms and *M. insularis* too there is only one keel, more often very short).
- The claw of both the sexes bear a second as long as the apical tooth before the basal process (Fig. 8, 12); only *A. clypeata* among the Australian taxa show a similar shape of the claw, while the other ones have not it (Fig. 11).
- The semicircular border of the 7<sup>th</sup> sternum of the males is set by a dense series of stout spine like bristles (simple in *A. australasiae*, *A. nigripennis* and *A. crassicornis*).
- The apexes of the digitus and cuspis on the volsella bear few short tooth like process; they lack in the examined Australian taxa and in the drawings of the American taxa (GENISE 1984).

Among the afrotropical taxa there are some differences in the mouthparts which recommend a lot of prudence about eventual generic splitting. For example in *A. aspericornis*, *A. bidentatus* and *A. suakinensis* a very long oral fossa, with the hypostoma getting the ventral post occipital areas and forming posteriorly an acute angle between its counterparts, is present; moreover the mouthparts are strongly protruding both ventrally and posteriorly and the mentum and submentum are well exposed too. The last state is present also in *A. clypeata* and seems uniquely derived within the entire family. While the here examined Malagasy species show a rounded base of hypostoma, not protruding mouth parts in the resting position and very long Pam (about twice the stipes), *Myzine insularis* shows a relatively short hypostoma and not protruding mouthparts too, but short palps not overcoming the length of the stipes, a roughly combed apical edge of the metameri, reniform shape of the jugum of the hind wing and normal fore tibial spur, with a shorter velum than trunk. In a generic revision probably it should be handled aside. For all that it has been given preference to maintain these taxa under the older name *Anthobosca*.

The following taxa have been included in this group: *A. aspericornis*, *A. bidentata*, *A. suakinensis*, *A. madecassa* KROMBEIN 1949, *A. ceylonica* KROMBEIN 1982 with the new species *A. dimidiata* and *A. micromera*. A further taxon from SW Madagascar exists, but both the two involved specimens from BMNH (one ♀ and one ♂) lack the whole of the metasoma, therefore it is preferable to suspend their description. Fig. 12 has been drawn from the holotype of *Menius aspericornis* BUYSSON 1898 ♂: /Hebron E.Simon/ /*Menius* n.g *aspericornis* n.sp./ /Type/(red) / /*Paramyzine aspericornis* BUYS/ /Museum Paris/ /*Anthobosca aspericornis* ♂ Det. M.C.DAY 1976/ MHNP.

### ***Anthobosca suakinensis* (MAGRETTI 1883)**

*Myzine suakinensis* MAGRETTI 1883: 248-249 (Holotype ♀: /Coll.<sup>mc</sup>:P.Magretti Suakin I.II.1883/ /*Dimorphoptera* SM (*Plesia*) *suakinensis* MAGR/ (red) MSNG !).

*Myzine sauakinensis*: MAGRETTI 1884: 560-562 (♀).

*Myzine suakinensis*: DALLA TORRE 1897: 127.

*Anthobosca arabica* TURNER 1909 (Lectotype ♀: /Lachey Arabia 6.1.96/(rounded) /*Anthobosca arabica* Type Turner/ /Type/(red, rounded) /B.M.Type hym 15.12.46/ /Lectotype *Anthobosca arabica* TURNER design. Gorbатовsky 1987/ /*Anthobosca arabica* TURN ♀ V. Gorbатовsky det 1987/, BMNH !) *syn. nov.*

*Anthobosca sauakinensis*: TURNER 1912: 740 (♀).

**M a t e r i a l** : Erythrea 1 ♀: /Coll.<sup>no.</sup>:P.Magretti C<sup>A</sup> Eritrea 3-1900/, MSNG.

MAGRETTI first gave the name *suakinensis*, then changed it to *sauakinensis*. From the examination of the type of *A. arabica* springs out their synonymy, formerly discussed by TURNER himself (1912). The basic colour of the latter is not black, but dark brown with lighter metasoma. The second specimen from Erythrea from Magretti's collection has the same coloration of the lectotype of *arabica*.

### *Anthobosca dimidiata spec. nova*

Holotype: ♀: /Madagascar Tul. Berenti 12km NW Amboasary/ /J.S.Noyes, M.C. Day 5-15 V 1983 B.M.1983-201/, BMNH.

Paratypes: 1 ♀: /Madagascar Tul. Berenti 12km NW Amboasary/ /J.S.Noyes, M.C. Day 5-15 V 1983 B.M.1983-201/, BMNH; 2 ♂♂: /Madagascar Tul. Berenti 12km NW Amboasary/ /J.S.Noyes, M.C. Day 5-15 V 1983 B.M.1983-201/, BMNH.

Female (Holotype): figs. 1-10.

Measurements: body = 7 mm.

The general habitus and size are like *A. madecassa*, but the coloration.

Pitch black, dark brown and bright ferruginous, without any light markings.

The whole of the metasoma is bright ferruginous with darker shadows near the attachment. Flagellum and legs are dark brown. The apical epipygium and the lateral clypeal expansion are semitransparent. There is no detectable micro reticulation at x50 magnifications. In the basal portion (1/4) of the epipygium there are strong pits and bristles; the remainder has only shallow sculpture.

Besides the coloration it strongly differs from *A. madecassa* in:

- the shape of the head
- flagellomeres are longer than thick (Fig. 2), while in *madecassa* they are as long as thick (Fig.13); the ratio L/A of the 7<sup>th</sup> flagellomere is about 1.15 in front of about 1
- shorter basal Pal and shorter apical Pam (Figs 4, 5, 14, 15)
- the lesser area enclosed by the keels on the inner (back) surface of the hind tibia (Fig. 9, 16)
- different disposition of the spine-like bristles on the underside of the basal hind tarsomeres
- not detectable micro reticulation (detectable almost everywhere in *madecassa* at x 40 magnifications too).

Male: figs. 17-26.

Measurements: body = 5,5 mm.

Pitch black, brown and pale yellow.

Pale yellow: Pal, Pam, narrow stripe along the inner border of the eye, a small spot on the temple, a transversal stripe on the N<sub>1</sub>, tegulae and humeral plates, apical femurs, tibiae and most of tarsi.

Brown: shadows on the mandible and flagellum, the remainder of legs and apical metasoma (7<sup>th</sup> metamerus).

The most significant differences from *A. madecassa* are:

- the shape of the head, mainly from above; in frontal aspect the ratio La/A is 1.3 in *A. dimidiata* (Fig. 18) in front of 1.5; in dorsal aspect the ratio La/L is 1.6 (Figs. 17) instead of 1.9 (Fig. 27)
- the last flagellomerus is as long as the penultimate (1.4 times in *A. madecassa*) (Figs. 19, 28)
- different ratio La/A of the postscutellar area of the metanotum
- different basal metamerus (Figs 23, 31)
- different 7<sup>th</sup> tergum and sternum in dorsal aspect (Figs. 24, 32)
- different genitalia (Figs. 25, 26, 33).

Ecology. Unknown.

Distribution. Endemic to Madagascar.

Derivatio nominis. From the Latin name indicating the half divided coloration of the body.

Variability. The paratype ♀ is 5,2 mm long; the 2<sup>nd</sup> paratype ♂ is 4,5 mm long. No other differences has been detected.

Note. The figures about *A. madecassa* are drawn by the paratypes so labelled:

♀: /Betroka Madag. 1.33 A.Seyrig Coll/ /Paratype ♀ *Anthobosca madecassa* Karl V. Krombein/ /Paratype Cornell U. N°2424.1/ CUIIC. Figs. 13-16.

♂: /Madagascar Bekily III 28 A.Seyrig/ /Paratype ♂ *Anthobosca Madecassa* Karl V. Krombein/ /Paratype Cornell U. N°2424.6/ CUIIC. Figs 27-33.

### ***Anthobosca micromera* spec. nova**

Holotype: ♂ /Madagascar; Tulear Morondava 17.V.1983 J.S.Noyes, M.C.Day/, BMNH.

Male (Holotype). Figs. 34-42.

Measurements: body = 3,85 mm.

Pitch black, brown and yellow.

Brown: scape, pedicel, anteroventral surface of the flagellum, legs but yellow portions, metasoma.

Yellow: underside of the scape, posteroventral surface of the flagellum, most of the clypeus and mandibles, palps, a long stripe along the inner border of the eye, a small spot on the temple, a transversal stripe on the fore half and small spot on the posteroventral corner of the N<sub>1</sub>, tegulae and humeral plates, most of the legs (but hind coxae), LeM, tip of gonostylus.

Ecology. Unknown.

Distribution. Endemic to Madagascar.

Female: unknown.

Derivatio nominis. From the Greek μικρομερής = made by small portions, because of its small size.

Very distinct from all other known malagasy taxa by the shape of the head in dorsal aspect, the clypeus, the stouter final flagellomeres, mesososomal upper outline in lateral aspect, first metamerus in dorsal aspect, 7<sup>th</sup> sternum in dorsal aspect, genitalia.

### Subfamily Myziniinae

#### Tribe Mesini

#### Genus *Mesa* SAUSSURE 1892

KROMBEIN (1949) explicitly admitted to have not seen the type of *Myzine nodosa* Guérin 1837 at MHNP and inferred its identification from the descriptions by Saussure and Guérin themselves. The examination of the type of *nodosa* forces to modify his arrangement about the genus *Mesa*. Beyond the argumentations developed within the relative issues, in the present study the taxa *M. madecassa*, *M. tandraona*, *M. marovatana* have not been criticized and the Krombein's action has been fully accepted. About *M. saussurei* his conclusions has been left unmodified too, even though there is no definitive proof of the proposed coupling; theoretically the male classified as *saussurei* could be likewise classified as *hova* and vice versa. However, facing two equivalent hypothesis the old one has to be retained.

#### *Mesa nodosa* (GUÉRIN 1837)

*Myzine nodosa* GUÉRIN, 1837 [Lectotype ♂ here designated: /Goudot Madagascar 1829/(rounded label) /Museum Paris Madagascar Goudot 86-39/ /Myzine nodosa guer. mag. zool./(autographic) /Type/(red), MHNP !. Paralectotype ♂ here designated: /Myzine nodosa guer. monogr Madagascar/(autographic) /Coll Guerin/ /Collezione Gribodo/ /lectotype/(partially red), MSNG].

*Myzine nodosa*: SAUSSURE (1892: 240, pl 22, fig. 6).

*Elis (Mesa) nodosa* (GUÉRIN): TURNER (1912: 704).

*Mesa seyrigi* KROMBEIN 1949: 64-66 (♀ only) *syn. nova*.

**Material**: 1 ♂ /Madagascar/, MSNG; 7 ♂ /Madagascar Ste Marie Umgeb. Cocoteraie Robert 15-20.10.1992 Madl/, NHMW. 5 ♀ /Madagascar Ste Marie Umgeb. Cocoteraie Robert 15-20.10.1992 Madl/, NHMW; 1 ♀ /Madagascar Sainte Marie Foret de Kalalao 6.-15.6.1995 Madl/, NHMW.

Male: Figs. 43-47 from the lectotype. Figs. 48 from the paralectotype.

Pitch black, brown, ferruginous and creamy white.

Pitch black: most of the head, with antennae, and mesosoma. Dark brown: hind coxae and metasoma. Ferruginous: most of the legs. Creamy white: lower portion of the clypeus, a subtle apical stripe on the Tsa, palpi, ventral surface of fore coxa, most of mid coxa and LeM.

Female well distinct by the darkened CM.

Discussion. The types examined reveal to belong definitely to a different taxon from the males described under *nodosa* by KROMBEIN. We are dealing with two male taxa having very similar general habitus, size and coloration, but they are easily distinguishable in the following essential character states (*hova* ♂ values and figures between rounded brackets).

- Shape of the head; ratio La/A of the head = 1.6 in frontal aspect (1.5, Fig. 49)



- Ratio L/A of the 7<sup>th</sup> flagellomeres = 3.1 (1.8, Fig. 50)
- Shape of the N<sub>1</sub> and fore border of the pronotal disk (Fig. 51)
- 7<sup>th</sup> tergum in dorsal aspect (Fig. 52)
- Genitalia (see KROMBEIN 1949: 51)
- White coloration of the ventral surface of the fore coxa (brown).

Its distribution area is not well defined but appears to range through the whole island. In the lot of specimens from NHMW (all of them with the same labels from the restricted surrounding of the small island of Sainte Marie, NE Madagascar) together with 7 specimens of males perfectly identical with the types of *nodosa* there are 5 females which are identical to the female types of *seyrigi* (two specimens coming from Bekily, a southern locality). To consider the females named "*seyrigi*" as the female sex of *nodosa* seems the more natural and consistent action with the actually disposable data (KROMBEIN himself expressed strong doubts about the coupling between these females and the unique male he described under *seyrigi*).

### *Mesa saussurei* (TURNER 1910)

*Plesia (Mesa) saussurei* TURNER 1910 (Holotype ♀: /Madagascar Antananarivo Sikora S./ /Type/(red) /*Plesia saussurei* TURN Type/ MNHU!).

*Elis (Mesa) saussurei* TURNER 1912: 709, ♀.

*Mesa saussurei*: KROMBEIN (1949: 59-62, ♀ and ♂).

**M a t e r i a l** : 5 ♀ ♀: /Madagascar: prov. Mahajanga Umgeb. Katsepy 12.28.12.1993 Madl/ NHMW. 1 ♂: /Madagascar/ MHNG; 2 ♂ ♂: /Sikora Madagascar/ /*nodosa* GUÉR. Det Kohl/ NHMW.

### *Mesa hova* (TURNER 1908)

*Plesia (Mesa) hova* TURNER 1908: 504, ♀.

*Elis (Mesa) hova* TURNER 1912: 707, ♀.

*Mesa nodosa*: KROMBEIN (1949: 62-64, ♀ and ♂).

**M a t e r i a l** : 1 ♀: /Tanatore/ /*Buyssoni* n. sp/ MHNG; 1 ♀: /Madagascar/ MZUF. 1 ♂: /Coll. Gribodo Madagascar/ /*Mesa nodosa* GORBATOVSky det. 1987/ MSNG; 7 ♂ ♂: /Sikora madagascar/ /*nodosa* GUÉR. Det. Kohl/ NHMW; 1 ♂: Comoros: /Gde Glorieuse 19.11.2000 rèc Museum/ /MHN rin ins. 4395/ MHNr.

Male: Figs. 49-52.

The female sex of this taxon can be easily recognised by the shape of the hind tibial spur (KROMBEIN 1949). The performed coupling of sexes by KROMBEIN (even if under the taxon *M. nodosa* through its misinterpretation) on the basis of the overlapping of their distribution areas all over the islands (but the xeric south west) seems reasonable and consistent enough with the data. Since the synonymy *M. hova* = *nodosa* can not be upheld anymore, all these specimens have to be considered under the taxon name *M. hova*, taken off from the synonymy with *M. nodosa* and restored to the rank of good species. The male specimens here ascribed perfectly correspond to the male described by KROMBEIN (1949) under the name *M. nodosa* in the external morphology and structure of the genitalia.

***Mesa krombeini* spec. nova**

Holotype ♂: *Mesa seyrigi* KROMBEIN 1949 allotype ♂ (/Tanarive Madag. Cornell Univ. Lot 679 sub 1/ /Hym slide 2447/ /♂ Allotype *Mesa seyrigi* KROMBEIN Det. Karl V. Krombein 1948/ /Allotype Cornell U N° 2429/ CUIIC !).

**M a t e r i a l** : 1♂ Comoros: /Mt Choungi MAYOTTE 9 Février 2004 Rèc Parmaudeau/ /MHN Run Ins. 4237/ MHNH.

This male is very distinct from other known males in the genitalia. Since the taxon name *seyrigi* has been here considered not anymore disposable (see above), it is compulsory to create a new taxon name for this male. To dedicate it to Dr. KROMBEIN seems the best action to do.

**Tribe M e r i n i**

**Genus *Meria* ILLIGER 1807**

All the Malagasy taxa show peculiar processes on the inner surface of the volsella. This a unique character state (autapomorphy) within the genus, not occurring in other taxa from elsewhere.

***Meria vonizongo* KROMBEIN 1949**

*Meria vonizongo* KROMBEIN 1949 (Holotype ♂: /Tanarive MADAGASCAR Cornell Univ Lot 619 sub 1/ /Hym slide 2448/ /Holotype Cornell U N°2425/ /♂ Type *Meria Vonizongo* Krombein Det. Karl V. Krombein 1948/ CUIIC !).

**M a t e r i a l** : 2♂♂: /Madagascar Toliara Sarodrano 26.5.1998 Madl/, NHMW.

Male: Figs 53-55 from Holotype.

The genitalia of these males from Sarodrano (15 km south of Toliara) differ slightly in the shape of the cuspis and digitus from the drawn by Krombein about the genitalia of *vonizongo* (conserved under slide). Nevertheless their direct examination has revealed that during the preparation the volsella has been slightly compressed, so that its aspect results deformed. Holotype is 11 mm long, like one specimen from Sarodrano; the other one is 12,5 mm long.

***Meria luteipes* spec. nova**

**M a t e r i a l** : Holotype ♂: /Madagascar Toliara Toliara-Sakaraha Flußtal 9 km vor Sakaraha 22-25.V.1998 Madl/, NHMW.

Paratypes 3♂♂: /Madagascar: Toliara Toliara-Sakaraha 22-25.V.1998 Madl/, NHMW; 1♂: /Madagascar Toliara Sarodrano 26.5.1998 Madl/; 2♀♀: /Madagascar: Toliara Toliara-Sakaraha 22-25.V.1998 Madl/, NHMW.

Male: Holotype. Figs. 56-62.

Measurements: body = 13.5 mm.

Black, light brown, creamy white.

Light brown: tip of mandibles, pterostigma and veins, trochanters, femurs, most of tibiae and half tarsi.

Creamy white: half ventral clypeal disk, most of the mandibles, two small spots on the

fore border and a very tiny pre apical stripe on the pronotal disk, a subtriangular spot on the basal tegula (the remainder transparent), humeral plate, the remainder of fore and mid tibiae, most of tarsi, tips of LeM, two small apical spots on the sides of 1<sup>st</sup> tergum, three small apical spots on 2<sup>nd</sup> to 6<sup>th</sup> terga and 3<sup>rd</sup> to 6<sup>th</sup> sterna.

Base of hypostoma very narrow and only slightly swollen; PoG narrow but clearly expressed. The stripe with sensilla curvata and most of sensilla basiconica covers all the visible surface of the flagellum. N<sub>1</sub> without keel along its fore border. Propodeum with hardly detectable sub horizontal and sub vertical areas; their border line rounded. em3 mostly smooth, with rough wrinkles only in its upper portion. Fore (outer) surface of median femurs with weak pits bearing weak hair throughout. 1<sup>st</sup> tergal surface severed from petiolar surface by an horizontal shallow impression.

Dense pits, bearing hair not covering the underlying integument, all over the head but area before om, near ol and along the upper cOc, mesosoma but em<sub>3</sub> and LeM. P densely sculptured throughout by coalesced pits. Puncturation of the metasoma like in *tripunctata*.

Female: Figs. 63-64.

Pitch black, brown, light brown, creamy white.

Light brown: mandibles, tips of the Tsa, clypeus, antennae, palps, apical tarsomeri, apical 4<sup>th</sup> and the whole of the 5<sup>th</sup> and 6<sup>th</sup> metameri.

Brown: legs, pterostigma, veins.

Creamy white: two lateral spots close to the apical border of 2<sup>nd</sup> and 3<sup>rd</sup> terga. One specimen bears two spots on the 4<sup>th</sup> tergum too.

Vertex almost rectilinear and ocellar triangle very close to its top in frontal aspect. Base of the hypostoma slightly swollen and semitransparent; PoG short with a large median suture. Anterior genae, between hypostoma and clypeus with dense pits bearing as long as apical foretarsomerus bristles. Upper surface of the scape with a stripe of densely set pits bearing as long as its length bristles; the stripe gets its end.

Propodeal disk with a very short median furrow and with transversal wrinkles along its lateral borders; lateral propodeal areas completely wrinkled. All the remainder looks very like *tripunctata*.

Discussion. The densely pitted stripe on the upper surface of the scape reaching its apex is a character state of *Poecilotiphia* and differs from typical *Meria* females where it stops well before the apex. All the other characters are well typical of the genus *Meria*.

The proposed coupling is only inferred by the identity of labels.

This taxon is well known from the other ones by the dark coloration, the compressed hypopygial lobes in lateral aspect and by the strong processes on the inner surface of the volsella.

Derivatio nominis. From the light brown colour of the legs.

Ecology. Unknown.

### ***Meria gradilis spec. nova***

**M a t e r i a l .** Holotype ♂: /Madagascar Toliara Toliara-Sakaraha flußtal 9km vor Sakaraha 22-25.V.1998 Mad/, NHMW.

Male: Holotype. Figs. 65-72.

Measurements: body = 15 mm.

Black, brown, pale yellow, ferruginous.

Brown: tip of mandible, shadows on tarsi, pterostigma and nervulations, dark portions of the legs.

Pale yellow: tips of *Tsa*, most of the clypeal disk and mandibles; two large lateral spots along the fore border and a large pre apical stripe on the pronotal disk, most of tegula, large spot on *Sc*<sub>2</sub> and mesopleura, a smaller one on the postscutellar area and *LeM*; a spot on the coxae and most of tibiae and tarsi; narrow apical stripe with waving fore edge on 1<sup>st</sup> tergum, apical stripes with twice indented fore edge on 2<sup>nd</sup> to 6<sup>th</sup> terga, two small lateral spots and one central stripe along the apical border of 2<sup>nd</sup> to 6<sup>th</sup> sterna.

Ventral clypeal border semitransparent.

Ferruginous: most of 1<sup>st</sup> tergum and upper petiole, 2<sup>nd</sup> to 6<sup>th</sup> lateroterga, apical shadows of 2<sup>nd</sup> to 6<sup>th</sup> sterna, most of 7<sup>th</sup> tergum but basal stripe and lobes, apical 7<sup>th</sup> sternum and anal hook (8<sup>th</sup> sternum).

Base of hypostoma narrow and semitransparent, moderately swollen; *PoG* short but expressed. Fore border of *N*<sub>1</sub> without keel; the fore border of the visible *Sc*<sub>1</sub> is strongly thickened and prominent above its surface and *N*<sub>1</sub> disk; *P* shows a median impression and a flattened sub vertical area; postscutellar area moderately swollen; apical half of the fore surface of the median femurs with sparse pits and hair. Strong constriction among metameri in dorsal aspect, greatest between 1<sup>st</sup> and 2<sup>nd</sup>; weak furrow between 1<sup>st</sup> tergal and upper petiolar surfaces; the latter is corrugated and different from the former but no solution of the integument appears to occur.

Dense pits (bearing hair not covering the underlying integument) all over head, but areas about ocelli, and mesosoma, *LeM*, *em*<sub>3</sub> = metapleurae (mostly wrinkled), anteroventral corner of *P*.

Well distinct taxon by the strong gradulus on the fore border of *Sc*<sub>1</sub>, the strong constriction among the metameri and (less meaningful) the extensive ferruginous colour on the metasoma.

Derivatio nominis: From the gradulus on *Sc*<sub>1</sub>.

Female: Unknown.

Ecology: Unknown

### **Genus *Myzinella* GUIGLIA 1959**

#### ***Myzinella festiva spec. nova***

**M a t e r i a l :** Holotypus ♂ /Madagascar Tulear Tulear Morombe pk 32 (slb) 21-23.V.97 Madl/, NHMW.

Male: Holotype. Figs. 73-82.

Measurements: body = 9 mm.

Black, brown, pale yellow and ferruginous.

Ferruginous: most of the 1<sup>st</sup> metamerus, basal 2<sup>nd</sup> tergum and most of the 2<sup>nd</sup> sternum

Brown: shadows on the petiole, 1<sup>st</sup> laterotergum and 2<sup>nd</sup> and 3<sup>rd</sup> sterna; legs but yellow portions.

Pale yellow: most of the mandibles and clypeus; two large lateral stripes along the foreborder and one along the apical border of the pronotal disk; most of tegulae and humeral plates; tip of LaM; most of tarsi and tibiae, tip of femur, a spot on the 1<sup>st</sup> coxa, three spots on the apical border of 2<sup>nd</sup> to 6<sup>th</sup> terga.

FoO large and rounded with a large convex base of hypostoma; PoG narrow. Low distinct keel along the foreborder of the N<sub>1</sub>. Elongated tegulae, more than twice longer than wide, with a backward concave appendice. Apical cells of the fore wing close to its apical border: M-a and Cu1-a veins reaching it.

Deep furrow, with a clear solution of the integument between 1<sup>st</sup> tergal and upper petio-lar surfaces.

Head covered by dense shallow pits, but areas around ocelli and temples along the cOc.

Dense, deeper pits on the mesosoma but ep3.

Propodeum with a broad central impression on the sub horizontal area, a distinct concave sub vertical area and a rounded angle between them. Metasoma with shallower and scarcer pits.

Discussion. This is a first record for the island of this genus, otherwise widely distributed all over Africa (but the equatorial belt) and SW Asia till NW India and Caspian areas (Turanic region).

It has some peculiarities, the most showy but less significant being the size and the ferruginous colour of the basal metameres, not present in no other african taxa of the genus; only *clavicornis* (TURNER 1909) from NW India possess it. It differs from the other taxa of the genus in the less distanced Tsa, rounded instead of subtriangular shape of the FoO, closer proximity of the CM, CSMIII and CDII to the apical border of the fore wing (with M-a and Cu1-a veins reaching it), elongated tegulae which are uniquely occurring within the entire subfamily.

The shape of the terga, with the abruptly elevated post gradular surfaces, the 7<sup>th</sup> tergum and the genitalia well belong to the genus *Myzinella*.

### Zusammenfassung

Es werden die neuen Arten *Anthobosca dimidiata*, *Anthobosca micromera*, *Mesa krombeini*, *Meria luteipes*, *Meria gradilis* und *Myzinella festiva* beschrieben. Es wird die Synonymie von *Anthobosca arabica* TURNER 1909 mit *Anthobosca suakinensis* MAGRETTI 1883 und *Mesa seyrigi* KROMBEIN 1949 mit *Mesa nodosa* GUËRN 1837 bestätigt. Es wurden Lectotypus und Paralectotypus von *Mesa nodosa* festgelegt. Die Erstnachweise für die Comoros-Inseln werden wiedergegeben, auf die Biogeographie der Tiphiiidae von Madagascar wird eingegangen.

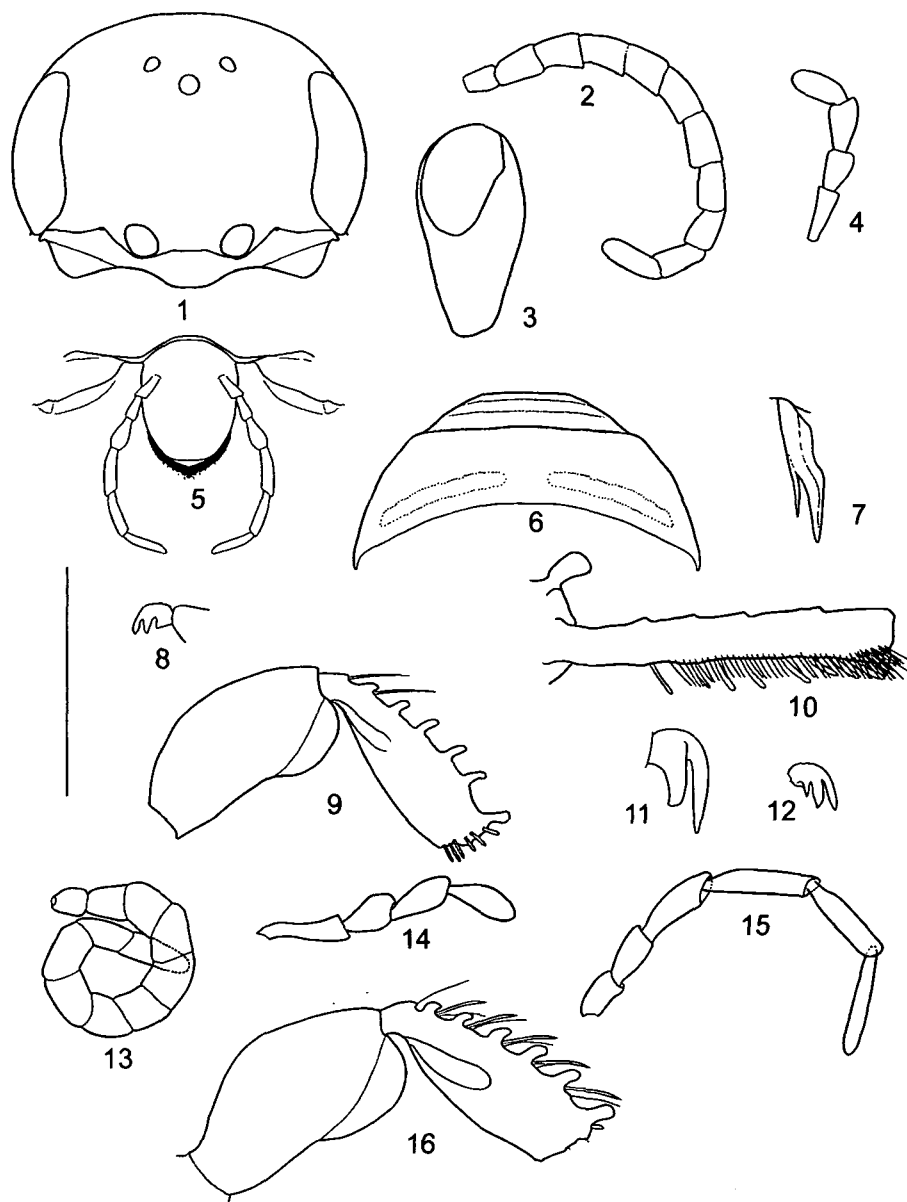
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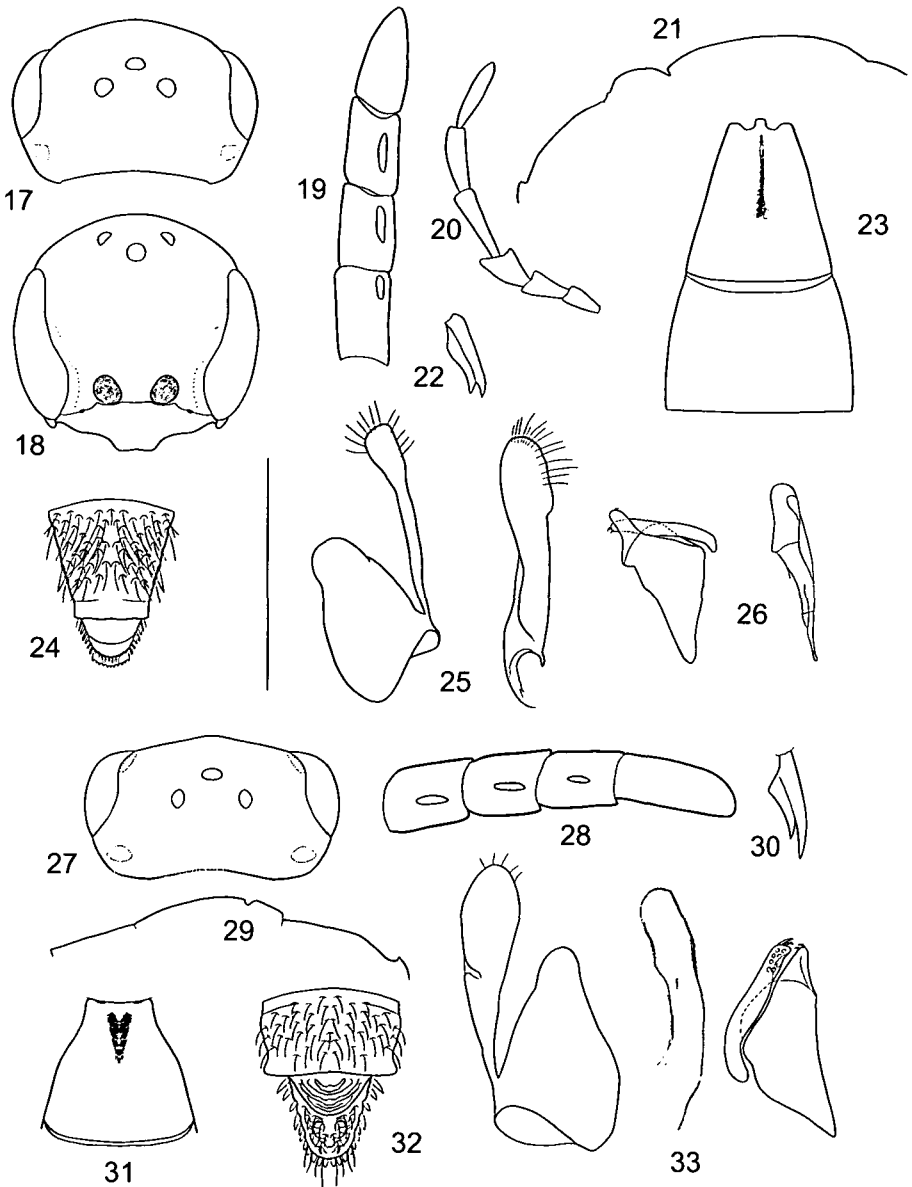
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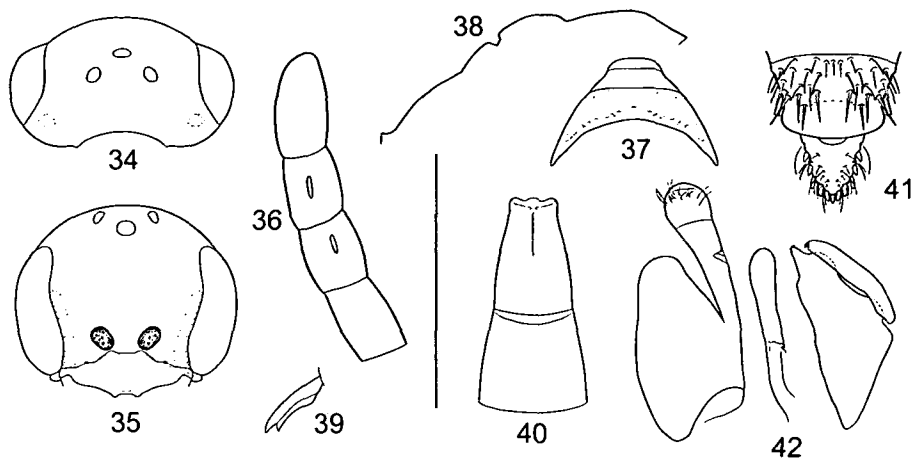


Figs 1-16: *Anthobosca dimidiata* ♀; head (frontal aspect) (1); flagellum (dorsal aspect) (2); scape (lateral aspect) (3); labial palp (4); head (ventral aspect, partim) (5); pronotum (dorsal aspect) (6); foretibial spur (left leg, frontal aspect) (7); middle leg tarsal claw (lateral aspect) (8); hind femur and tibia (back or inner aspect) (9); hind basal taromerus (back aspect) (10); *Anthobosca australasiae* ♂ (11), middle leg tarsal claw (lateral aspect) *Menius aspericornis* ♂ (12), middle leg tarsal claw (lateral aspect); *Anthobosca madecassa* ♀ (13), flagellum (dorsal aspect); labial palp (14); maxillary palp (15); hind femur and tibia (back or inner aspect) (16). (1, 2, 5, 6, 9: scale bar = 1mm) (3, 4, 7, 8, 10 = scale bar = 0.5mm).

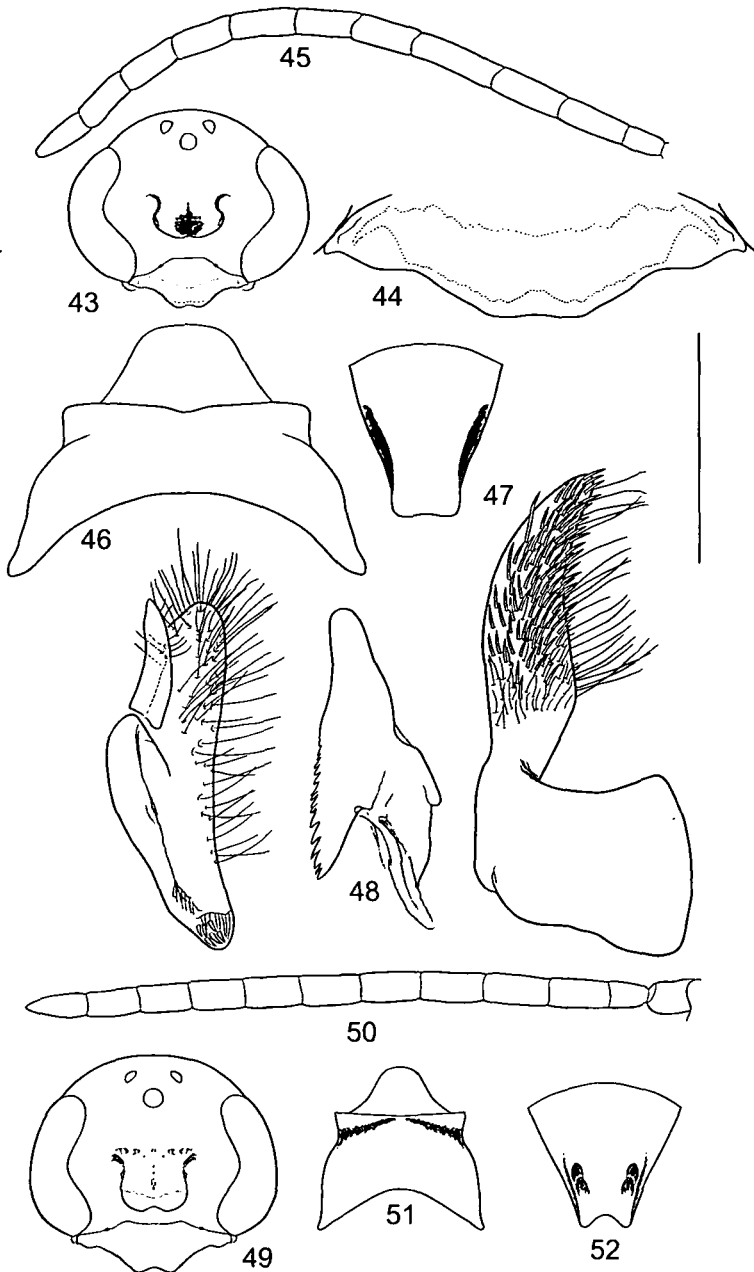


**Figs 17-33: *Anthobosca dimidiata* ♂; head (dorsal aspect) (17); head (frontal aspect) (18); final three flagellomeri (19); maxillary palp (20); mesosoma, lateral upper outline (21); foretibial spur (22); basal two metameri (dorsal aspect) (23); 7<sup>th</sup> tergum and apex of 7<sup>th</sup> sternum in dorsal aspect (24); gonostylus (lateral and dorsal aspect) (25); volsella and aedeagus (26). *Anthobosca madecassa* ♂; head (dorsal aspect) (27); final three flagellomeri (28); mesosoma, lateral upper outline (29); foretibial spur (30); basal metamerus (dorsal aspect) (31); 7<sup>th</sup> tergum and apex of 7<sup>th</sup> sternum in dorsal aspect (32); gonostylus, aedeagus and volsella (33). (21, 29: scale bar = 2mm) (17, 18, 21, 23, 24, 27, 31, 32: scale bar = 1mm) (19, 20, 22, 25, 26, 28, 30, 33: scale bar = 0.5mm).**

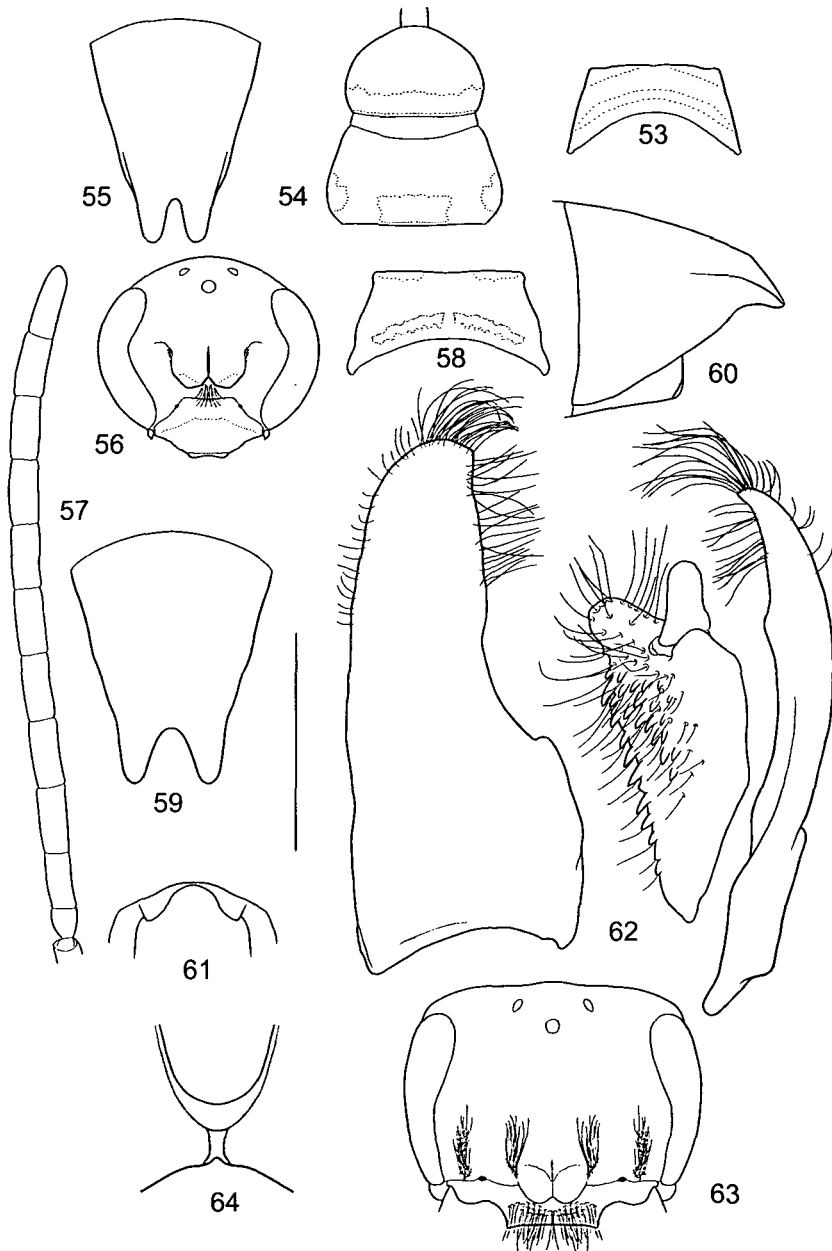




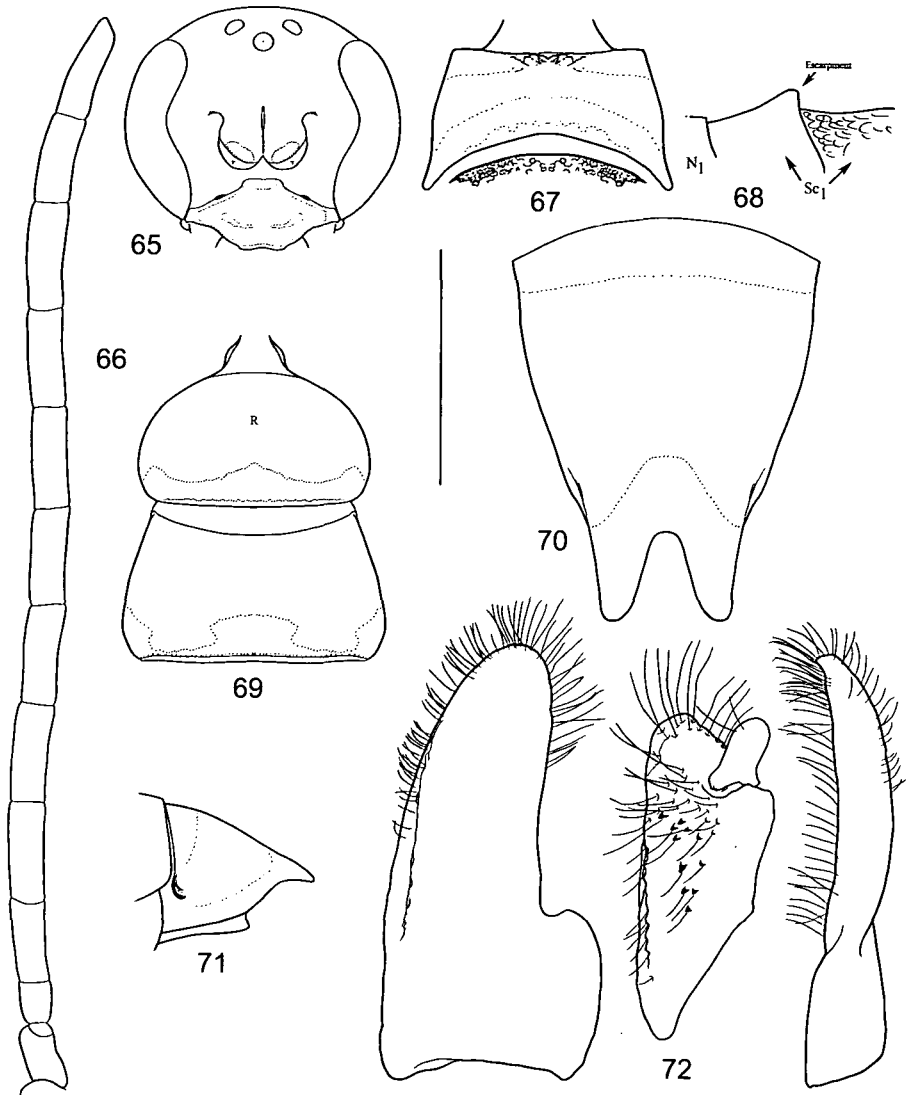
Figs 34-42. *Anthobosca micromera* ♂; head (dorsal aspect) (34); head (frontal aspect) (35); final three flagellomeri (36); pronotum (dorsal aspect) (37); mesosoma, lateral upper outline (38); foretibial spur (39); basal two metameri (dorsal aspect) (40); 7<sup>th</sup> tergum and apex of 7<sup>th</sup> sternum in dorsal aspect (41); gonostylus, aedeagus and volsella (42).  
(38: scale bar = 2mm) (34, 35, 37, 40, 41: scale bar = 1mm) (36, 39, 42: scale bar = 0.5mm).



**Figs 43-52.** *Mesa nodosa* ♂. head (frontal aspect) (43); lower clypeal profile (44); flagellum (45); pronotum (dorsal aspect) (46); 7<sup>th</sup> tergum in dorsal aspect (47); volsella, aedeagus and gonostylus in lateral aspect. *Mesa hova* ♂. head (frontal aspect) (49); flagellum (50); pronotum (dorsal aspect) (51); 7<sup>th</sup> tergum in dorsal aspect (52). (43, 45, 49, 50, 51: scale bar = 2mm) (46, 47, 52: scale bar = 1mm) (44, 48: scale bar = 0.5mm).

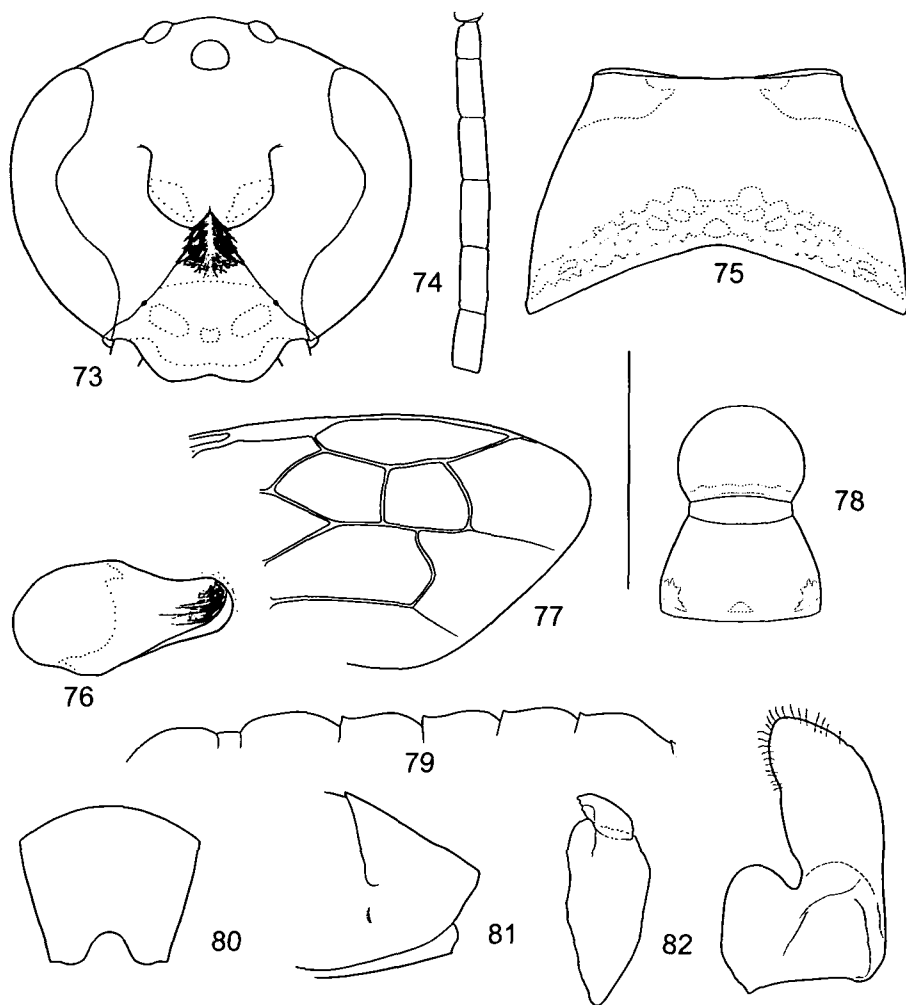


**Figs. 53-64.** *Meria vonizongo* ♂. pronotum (dorsal aspect) (53); basal two metameri (dorsal aspect) (54); 7<sup>th</sup> tergum in dorsal aspect (55); *Meria luteipes* ♂. head (frontal aspect) (56); antenna (57); pronotum (dorsal aspect) (58); 7<sup>th</sup> tergum in dorsal aspect (59); 7<sup>th</sup> metamerus in lateral aspect (60); 7<sup>th</sup> tergum in back aspect (61); gonostylus and volsella (62); *Meria luteipes* ♀. head (frontal aspect) (63); head, genal bridge and oral fossa (partim) (64). (53, 54, 56, 58: scale bar = 2mm) (55, 59, 60, 61, 63: scale bar = 1mm) (62, 64: scale bar = 0.5mm).



**Figs. 65-72.** *Meria gradilis* ♂. head (frontal aspect) (65); antenna (66); pronotum (dorsal aspect) (67); basal pronotum in lateral spect (68); basal two metameri (dorsal aspect) (69); 7<sup>th</sup> tergum in dorsal aspect (70); 7<sup>th</sup> metamerus in lateral aspect (71); gonostylus and volsella (72).  
(65, 66, 67, 69, 71: scale bar = 2mm) (70: scale bar = 1mm) (68, 72: scale bar = 0.5mm).

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**Figs. 73-82.** *Myzinella festiva* ♂. head (frontal aspect) (73); flagellum (partim) (74); pronotum (dorsal aspect) (75); tegula (sublateral aspect) (76); apex of the fore wing (77); basal two metameri (dorsal aspect) (78); mesosoma, lateral upper outline (79); 7<sup>th</sup> tergum in back aspect (80); 7<sup>th</sup> metamerus in lateral aspect (81); volsella and gonostylus (82).  
(74, 77, 78, 79: scale bar = 2mm) (73, 75, 80, 81: scale bar = 1mm) (76, 82: scale bar = 0.5mm).

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