

# Little-known meganomiine bees with a key to the genera (Hymenoptera: Melittidae)

Charles D. MICHENER, Robert W. BROOKS & Alain PAULY

Michener, C. D., Brooks, R.W. & Pauly, A. 1990. Little-known meganomiine bees with a key to the genera (Hymenoptera: Melittidae). *J. Afr. Zool.* 104: 135-140.

"*Nomia*" *flaviventris* Benoist, 1963, from Madagascar is placed in the Melittidae, subfamily Meganomiinae, as a new subgenus of *Uromonia*, Michener, 1961, a genus hitherto known only from Africa. *U. (Nesomonía) flaviventris* possesses various characters ancestral to those of *U. (Uromonia)* from Africa. The first record of Meganomiinae outside Africa and Madagascar is a damaged specimen of *Meganomia* from South Yemen.

*Abeilles Meganomiinae peu connues, avec une clé des genres (Hymenoptera: Melittidae).* – "*Nomia*" *flaviventris* Benoist, 1963, de Madagascar est placé dans les Melittidae, sous-famille Meganomiinae comme un nouveau sous-genre de *Uromonia* Michener, 1961, un genre jusqu'à présent connu seulement de l'Afrique. *U. (Nesomonía) flaviventris* possède divers caractères ancestraux à ceux de *U. (Uromonia)* de l'Afrique. Le premier record de Meganomiinae en dehors de l'Afrique, et de Madagascar est un spécimen endommagé de *Meganomia* du Sud-Yémen.

Key words: Meganomiinae, Apoidea, Madagascar, Yémen.

C.D. Michener, R.W. Brooks, Snow Entomological Museum, University of Kansas, Lawrence, KS 66045, U.S.A. – A. Pauly, Faculté des Sciences Agronomiques de l'Etat, Zoologie Générale et Faunistique, B-5800 Gembloux, Belgium.

## INTRODUCTION

The subfamily Meganomiinae was first recognized and revised by Michener (1981), the species known at that time all being from Africa. Subsequently a new subgenus and species of *Agemmonia* were described from Madagascar (Michener & Brooks, 1987): its characters required modifications in the generic key and in fact in the subfamilial characterization, for it lacks a pygidial plate in the male, a feature of all other known species.

Now another Malagasy species, previously described in the genus *Nomia*, has come to our attention, as well as a species from Asia Minor. This second Malagasy species belongs to the genus *Uromonia* but is so distinctive as to require a new subgeneric name as well as a revision of the key to genera.

## GENUS UROMONIA MICHENER, 1981

This genus has hitherto included only *U. stagei* Michener from the Kenya coast. That species is the smallest known meganomiine, with many unusual derived features including 14-segmented antennae in the male and unusual male genitalia and eighth metasomal sternum (S8). The subgenus described below necessitates changes in the characterization of the genus.

### *Nesomonía* new subgenus

Type species: *Nomia flaviventris* Benoist, 1963.

Although "*Nomia*" *flaviventris* Benoist is quite different from other known meganomiines, it seems closest to *Uromonia*, as indicated particularly by the relatively conservative proboscival cha-



ted for *Uromonia* but about two-thirds as long as prementum; mentum elongate, about two-thirds as long as prementum; stipes with lower margin rounded (Figs. 6, 7). r. Scape reaching beyond anterior ocellus. s. Flagellum eleven-segmented, reaching middle of scutellum, crenulate, without long hairs, segments 1-9 over 1.5 times as long as wide, segment 10 nearly twice as long as wide, flattened but not or scarcely expanded (Fig. 5). u. Dorsum of thorax with hairs of varying lengths, simple or briefly plumose. v. Upper half of propodeal triangle slanting, not as vertical as rest of propodeal profile. y. Front coxa without process. z. Hind trochanter with strong, blunt ventral tooth; hind femur swollen; hind tibia expanded apically, produced to acute but blunt apicoventral tooth, spurs with bases adjacent to one another (Fig. 4). ee. Claws of foreleg with inner ramus pointed, shorter than but similar in shape to outer ramus; on other legs inner rami broad, truncated. ff. Arolia and claws large, orbicula (= manubrium) long, fingerlike. gg. Prestigma as long as stigma. hh. Basal vein of forewing distal to cu-v, nearly three times as long as first abscissa Rs. ii. Second submarginal cell small, second and third together slightly shorter than first (Fig. 1). jj. Marginal cell somewhat more elongate than in *Uromonia*. kk. Metasomal terga without „stridular” areas. ll. T7 with broadly truncate pygidial plate extending beyond apex of rest of tergum, basally plate extending almost half way from apex to gradulus. nn. oo. S1-4 simple, without apical emargination, S5 with small median emargination, these sterna with only sparse, short hairs. pp. S6 with broad median apical emargination lateral to which is small raised area near sternal margin covered with dense, black, simple hairs (Fig. 8). qq. S7 with lateral apical lobes slender, capitate, not overlapping body of sternum (Fig. 9). rr. S8 with a short apical process, as in *Meganomia* (Fig. 10). ss. Gonocoxite with simple apex, abruptly widened at base by a narrow strip extending mesad (Figs. 11, 12). tt. Penis valve slender, without dorsal

or ventral projection, valves fused only at bases. uu. Volsella absent or greatly reduced, probably represented by ovoid weakly sclerotized structure (Fig. 11).

*Comparative Comments.* Characters that agree with or differ only slightly from those of *Uromonia* s. str. are a, b, c, d, e, f, g, h, i, j, l, m, n, o, p, r, u, v, y, z, ee, ff, gg, hh, ii, jj, kk, ll, nn, oo, and uu. These features support the placement of *Nesomoniamonia* in the genus *Uromonia*. Strong characters reinforcing this placement, i.e., synapomorphies of *Uromonia* s. str. and *Nesomoniamonia*, are l (Figs. 6, 7, shape and fringe of the galeal blade), m (Figs. 6, 7, long first segment of the maxillary palpus). s (Fig. 5, first flagellar segment not longer than the second), and perhaps hh and ii (Fig. 1, wing venation).

Characters that are distinct from those of *Uromonia* s. str. and relatively plesiomorphic (i.e., found in other Meganomiinae but not in *Uromonia* s. str.) are s (11-segmented flagellum), pp. (shape and vestiture of S6), rr (shape of S8), ss (simple apex of gonoforceps), and tt (slender and relatively simple penis valves, not fused to one another). The characters of *Nesomoniamonia* are in general plesiomorphic compared to those of *Uromonia* s. str., but the former has some distinctive autapomorphies such as s (long, crenulate flagellum) and qq (S7 with lateral apical lobes slender, capitate). Thus *Uromonia* and *Nesomoniamonia* appear to be sisters, with *Nesomoniamonia* from Madagascar being rather similar to the form from which the African *Uromonia* s. str. was derived. It could be that the ancestral form reached Madagascar and changed relatively little thereafter, while the form remaining in Africa evolved into *Uromonia* s. str.

*Etymology.* From the Greek *nesos*, island, plus *monia*, anagram of *Nomia*, with reference to the insular habitat of *U. flaviventris*.

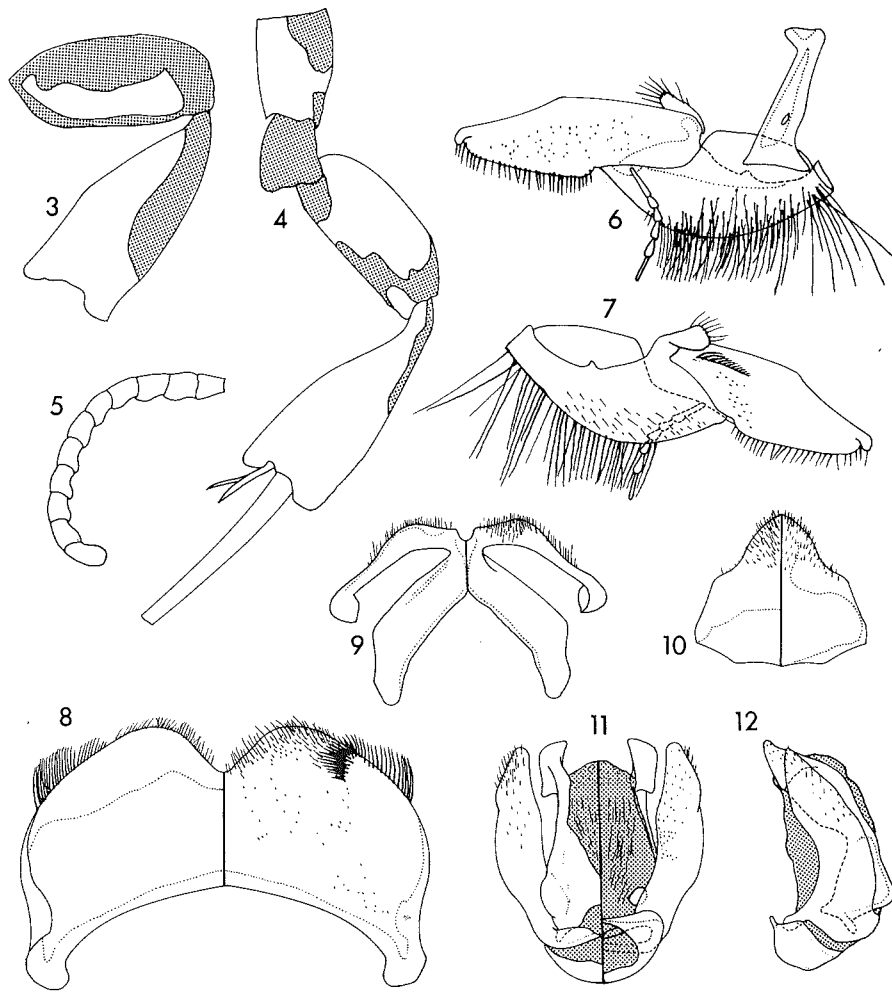


Fig. 3-12.- *Uromonia (Nesomonina) flaviventris* (Benoist), "paratype" male (except 3). (3). Hind femur and tibia of holotype male, anterior (= outer) view, stippling indicates dark areas and white indicates yellow. (4). Hind leg (coxa to basitarsus), anterior (= outer) view, stippling as for 3. (5). Flagellum, anterior view. (6, 7). Maxilla outer and inner views, respectively. (8-10). S6, S7, S8, respectively, dorsoventral views. (11, 12). Genital capsule, dorsoventral and side views, respectively, stippling indicates the penis.

### *Uromonia (Nesomonina) flaviventris* (Benoist)

*Nomia flaviventris* Benoist, 1963: 208.

The subgeneric description and associated figures, plus Benoist's description, characterize this species. In form and general color pattern it resembles the other Malagasy meganomiine, *Agemmonia (Dicromonia) wenzeli* Michener and Brooks, 1987. The generic characters, however, easily separate the two forms,

and *A. wenzeli* does not have the yellow T7 and metasomal and thoracic venter of *U. flaviventris*.

The following remarks supplement Benoist's description of *U. flaviventris*: There is a small yellow spot on the upper gena behind the posterior orbit and a small yellow area on the anterior lateral part of the axilla. The metanotal yellow band is interrupted by brown medially and the anterior margin of the metanotum is black. The „quatre lignes longitu-

dinales" on the mesosoma consist of a small one on each side and a slender one on the midline, the latter of the type. The mesosternal areas are entirely yellow. The mesosoma has a large infuscated venation (Fig. 1). The tergal bands are on the raised parts of the broad, strongly depressed marginal zones. The bands, especially the broad sublateral emarginate wing bands in the emargination the band on T1. Posteriorly the bands are progressively narrower and the band of T5 is largely absent except for the broad posterior marginal zone and T7, like the sterna (without the yellow area as stated by Benoist). The yellow area on the lower mesepisternum. The lower and posterior surfaces are yellow; the large pretergite is black and the distitarsus is stained brownish. The brown areas on other surfaces and posterior surface of coxae, most of mid coxae of front and mid trochanters, hind trochanter; the lower and posterior surfaces of mid femora, hind femora, hind tibiae, light brown and yellow area on lower tibiae, light brown and yellow in paratype (Figs. 3, 4, 5, 6, 7, 8, 9, 10, 11, 12). brown, darker above.

A conspicuous feature is that the lower surface is finely and rather sparsely so, like the face.

We have examined a "paratype" of *U. flaviventris* Bekily, „reg sud de l'il

dinales" on the mesoscutum are small, at the anterior end of the mesoscutum, and consist of a small anterolateral spot on each side and a slender streak lateral to the midline, the latter absent in the holotype. The mesosternal and metasternal areas are entirely yellow. The forewing has a large infuscated area beyond the venation (Fig. 1). The yellow metasomal tergal bands are on the posterior margins of the raised parts of T1-5, basal to the broad, strongly depressed, posterior marginal zones. The anterior margins of the bands, especially on T1 and T2, have broad sublateral emarginations narrowing the bands in these areas. Lateral to the emargination the band is rather broad on T1. Posteriorly the bands are progressively narrower and in the paratype the band of T5 is largely absent. T6 is yellow except for the broad posterior depressed marginal zone and T7 is entirely yellow, like the sterna (without a transverse band as stated by Benoist). The paratype has a yellow area on the lower anterior part of the mesepisternum. The legs are largely yellow; the large pretarsi are brownish black and the distitarsi and mediotarsi are stained brownish. The following are dark brown areas on other leg segments: base and posterior surface of front and hind coxae, most of mid coxa; upper surfaces of front and mid trochanters, almost entire hind trochanter; variable areas on lower and posterior surfaces of fore and mid femora, hind femur except large yellow area on lower anterior surface; elongate posterior and basal areas on tibiae, light brown and fading into yellow in paratype (Figs. 3, 4). The flagellum is brown, darker above than below.

A conspicuous feature of the punctation is that the lower half of the clypeus is finely and rather closely punctate, while the upper half is more coarsely and sparsely so, like the adjacent parts of the face.

We have examined the holotype and a "paratype" of *U. flaviventris*, both from Bekily, „reg sud de l'ile". This locality is in

Tulear Province. Both specimens were kindly lent by the Muséum national d'Histoire naturelle, Paris. Benoist indicated that the type was the specimen collected in January, 1939. It has a handwritten label "*flaviventris*," no type label by Benoist, but a red typewritten label "*Nomia flaviventris* Benoist holotype". Benoist published nothing about paratypes, merely recording two other specimens, taken in November, 1936. The specimen before us, however, has a yellow typewritten paratype label, although there are presumably no legitimate paratypes.

### MEGANOMIA SP.

The first Asiatic record of *Meganomia* is from a specimen in the British Museum (Natural History). It is a male taken in a light trap, and lacks wings and metasoma except for the first segment. Although related to *M. andersoni* (Meade-Waldo), it is a new species, but there is no need to describe it from such a damaged specimen. The data are South Yemen: El Kod, February, 1972 (S. A. Ba-Angood).

### GENERA AND SUBGENERA OF MEGANOMIINAE

The discovery of two distinctive Malagasy species of this subfamily has necessitated a revision of the key to genera. One couplet was modified by Michener and Brooks (1987) but now a new version of the whole key seems desirable, to include both Malagasy forms. Unfortunately females are unknown for these two species and subgenera.

### Key to the Genera and Subgenera

1. Arolia absent (although long, hairy, yellow planta projects between the claws); flagellum of male with apical segment curled and attenuate; hind basitarsus of male bent or contorted, or at least with curved carina on outer side. ...  
.....*Meganomia*

- Arolia present, conspicuously black among associated, usually pale, interungual structures; flagellum of male with apex simple or expanded as a plate; hind basitarsus of male simple. .... 2
- 2. Ocelli much in front of posterior edge of vertex, posterior ocellus separated from that edge by more than two ocellar diameters; upper part of head gently convex seen from front; front edge of median ocellus little if any nearer to posterior edge of vertex than to antennal bases; glossa as long as prementum or nearly so. .... 3
- Posterior ocellus separated from posterior edge of vertex by an ocellar diameter or little more; upper part of head seen from front feebly convex or flat or with ocellar region slightly elevated; front edge of median ocellus much nearer to posterior edge of vertex than to antennal bases; glossa three fifths as long as prementum or shorter. .... 4
- 3. T 7 of male bifid, without pygidial plate; galeal blade broad, shorter than stipes. .... *Agemmonia (Dicromonia)*
- T 7 of male simple, with pygidial plate; galeal blade tapering, about as long as stipes. .... *Agemmonia (Agemmonia)*
- 4. Flagellum of male not expanded at apex; terga IV and V without sublateral stridulating areas; basitibial plate of female not defined (female unknown in *Nesomonina*); glossa one half to three fifths as long as prementum. .... 5
- Flagellum of male with apical segment expanded, plate-like, black; terga IV and V (both sexes) with sublateral stridulating areas hidden under preceding tergal margins; glossa less than one third as long as prementum. .... *Ceratomonina*

- 5. Flagellum of male crenulate, 11-segmented (Fig. 5); S8 of male with apical process narrower than body of sternum (Fig. 10). .... *Uromonia (Nesomonina)*
- Flagellum of male not crenulate, 12-segmented; S8 of male tapering toward subtruncate apex, without recognizable apical process. .... *Uromonia (Uromonia)*

#### ACKNOWLEDGMENTS

We thank J. Casevitz Weulersse of the Muséum National d'Histoire Naturelle, Paris; for lending the type material of *Nomia flaviventris* Benoist and George R. Else of the British Museum (Natural History) for the loan of the *Meganomia* from South Yemen.

CDM's part in this study was supported by National Science Foundation (USA) grant No. BSR87-16817.

#### REFERENCES

- Benoist, R. 1963. Contribution à la connaissance des *Nomia* malgacher. *Bull. Soc. Entom. France*, 68: 207-220.
- Michener, C. D. 1981. Classification of the bee family Melittidae with a review of species of Meganomiinae. *Contr. Amer. Entom. Inst.*, 18: i-iii+1-135.
- Michener, C.D. & Brooks, R. W. 1987. The family Melittidae in Madagascar. *Annls. Soc. Entom. France (NS)*, 23: 99-103.

(Manuscript received 3 October 1988, revised 29 March 1989, accepted 6 April 1989).

## *Pachnodus* (a closely related Pulmonata)

Justin GERLACH

Gerlach, J. 1990. Enidae (Mollusc)

The status of *Pachnodus* species, *P. pras*

*Pachnodus* (Nesomonina) des Seychelles est clarifié suite

Key words: Enidae

J. Gerlach, P.O.

#### INTRODUCTION

The Enidae of Seychelles described by many collectors in the one-and-a-half century since these was Dufo in 1843. In these three species from Maldives (= *Pachnodus ornatus* (= *Pachnodus niger* (= *Pachnodus strigilosus* Ferussac (= *Bulimus strigilosus*)))). Subsequent collectors described all species since Dufo's original description of *nodus ornatus* as this Pfeiffer listed two new species, *fulvicans* (= *Pachnodus fulvicans*?) and *Bulimus velutinus* (= *nodus velutinus*). The former is too vague which species it refers to. The type specimens of the shell given by Pfeiffer type specimen was pro-

Nevill listed three species: *Bulimus fulvicans* (= *fulvicans/kantilali*?), *Bulimus niger* (= *Pachnodus niger*), *velutinus* (= *Pachnodus velutinus*)