

New species of *Eumanota* Edwards, 1933 (Diptera : Mycetophilidae)

Geir E. E. SÖLI

Zoological Museum, University of Oslo,
Sars' gt. 1, N - 0562 Oslo, Norway.

Abstract – An emended diagnosis of *Eumanota* Edwards, 1933 is given. All available material of previously described species has been studied, and three new species are described, *E. malukuensis* from Maluku (Moluccas), Indonesia, *E. racoli* sp. n. from Thailand, and *E. suthepensis* sp. n. from Thailand and Laos. The monotypic genus *Promanota* Tuomikoski, 1966 is considered to be a subjective junior synonym of *Eumanota*. In all, six species are included in the genus, all from the Oriental region.

Résumé – Une nouvelle espèce d'*Eumanota* Edwards, 1933 (Diptera : Mycetophilidae). – Une diagnose modifiée de *Eumanota* Edwards, 1933 est donnée. L'ensemble du matériel rapporté aux espèces précédemment décrites a été étudié, et trois nouvelles espèces sont décrites : *E. malukuensis* de Maluku (Moluques) en Indonésie, *E. racoli* n. sp. de Thaïlande, et *E. suthepensis* n. sp. de Thaïlande et du Laos. Le genre monotypique *Promanota* Tuomikoski, 1966 est considéré comme synonyme subjectif junior de *Eumanota*. Le genre comprend ainsi 6 espèces, toutes de la région orientale.

The four genera *Eumanota* Edwards, 1933, *Manota* Williston, 1896, *Paramanota* Tuomikoski, 1966 and *Promanota* Tuomikoski, 1966 are today commonly treated as a subfamily, Manotinae, in the family Mycetophilidae. Of these four genera, *Paramanota* and *Promanota* are both monotypic, each described on single males from NE Burma; *Eumanota* has up to now been represented by two species, both from N Borneo (Edwards 1933), while *Manota* is a rather species-rich genus recorded from all biogeographical provinces. Altogether 30 species of *Manota* have been described so far (one from Baltic amber), most of them from Africa (e.g. Söli 1993), and still more await description.

It appears likely that the four genera *Eumanota*, *Manota*, *Paramanota* and *Promanota* make up one monophyletic entity, but their systematical position remains enigmatic (see Tuomikoski 1966, Hennig 1973). Until recently they were treated as a family in the Sciaroidea (Hennig 1973), and still are by some authors (e.g. Soós & Papp 1988), but in accordance

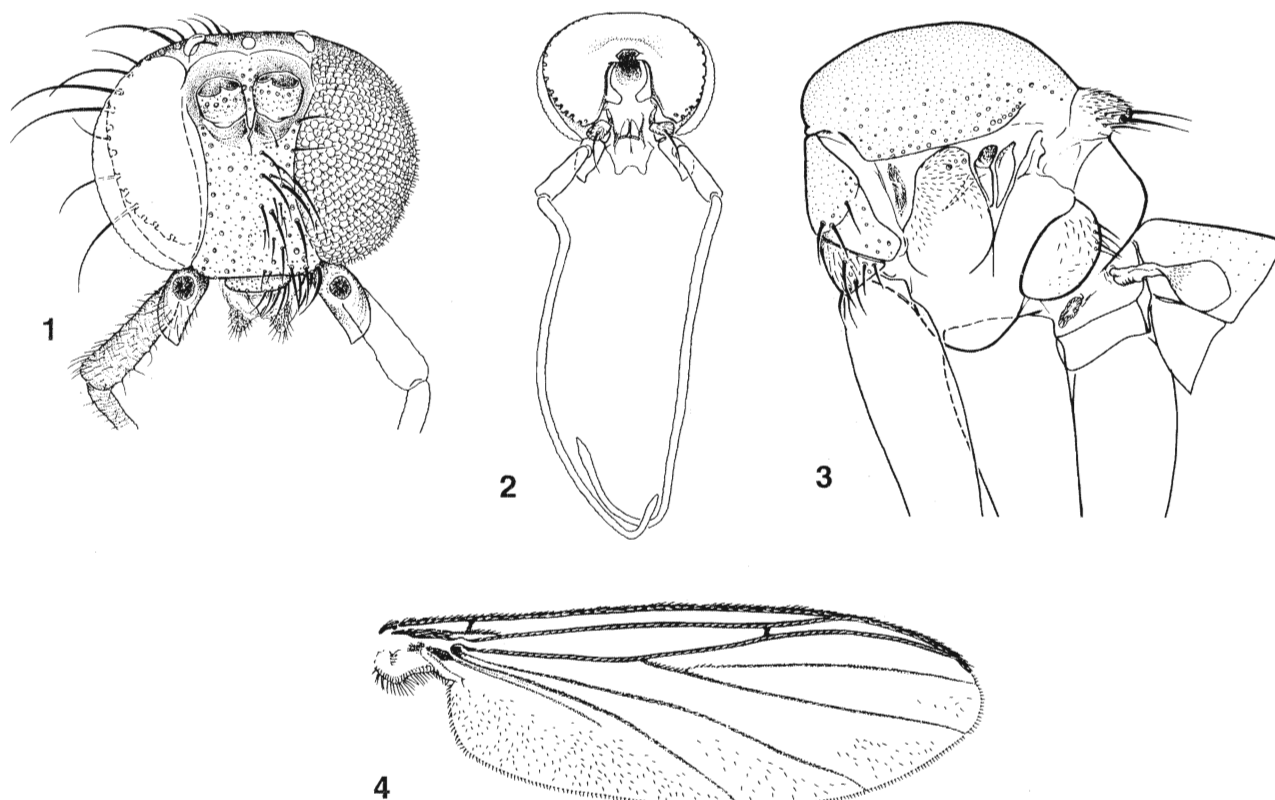
with Tuomikoski (1966) most authors today treat them as a subfamily in the Mycetophilidae (e.g. Vockeroth 1981, Matile 1990). As already pointed out by Edwards (1933), *Eumanota* has several features in common with genera in the tribe Leiini in the subfamily Sciophilinae, and several authors suggest that the two groups are closely related (Zaitzev 1990, Söli 1997, Söli *et al.* 2000).

Except for *Manota* which may be rather common at some localities, in particular in Malaise trap samples, representatives of the remaining genera appear to be very rare, confirmed by the very restricted material available in museum collections.

Methods and material

In addition to material collected during two field trips to Thailand in 1991 and 1997, all available material of *Eumanota* and related genera in the collections of the Natural History Museum, London, and Museum National d'Histoire Naturelle, Paris, have been studied. Furthermore, Jan Ševčík, the Czech Republic, gave me the opportunity to study an additional male collected from Laos.

Where nothing else is stated, the morphological terminology follows Söli (1997).



Figures 1-4

Eumanota suthepensis n. sp. – 1, head, frontal view. – 2, head, posterior view. – 3, thorax, lateral view. – 4, right wing, dorsal view.

EUMANOTA Edwards

Eumanota Edwards, 1933: 231.

Promanota Tuomikoski, 1966 syn. n.

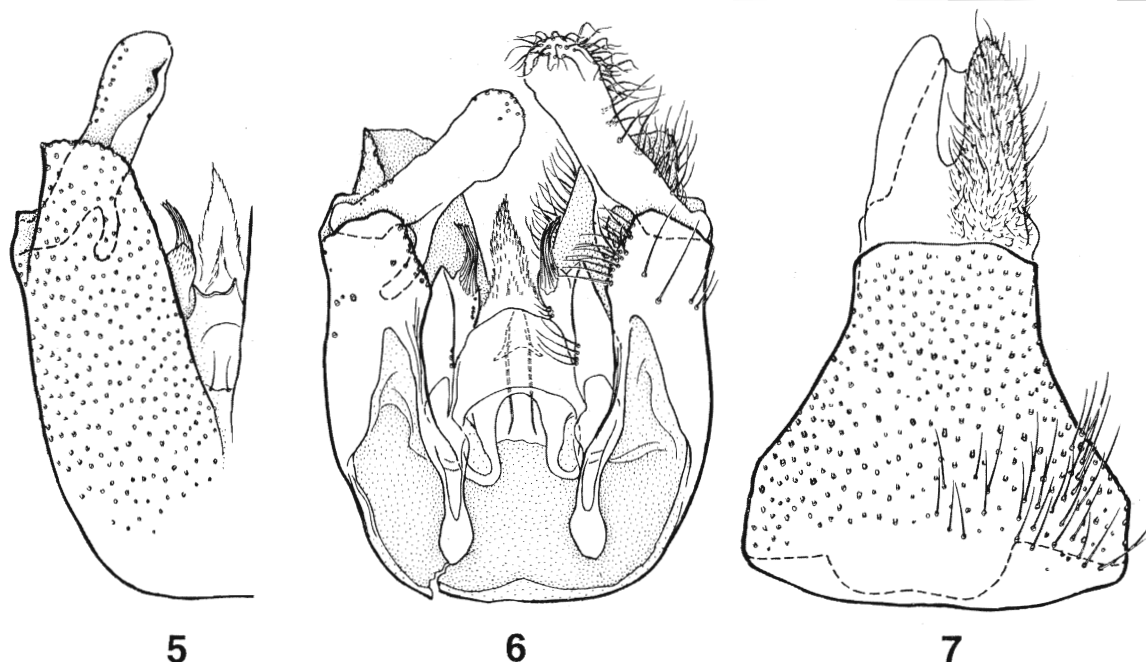
Type species: *Eumanota leucura* Edwards, 1933, by original designation.

Species included: *E. humeralis* Edwards, 1933, *E. leucura* Edwards, 1933, *E. malaisei* (Tuomikoski, 1966) n. comb., *E. suthepensis* n. sp., *E. racola* n. sp., *E. malukuensis* n. sp.

Emended diagnosis – Head (figs. 1, 2). Posterior portion of head somewhat conical; row of strong, recurved bristles behind hind margin of eyes. Antenna inserted above middle of head. Scape and pedicel with small and large setae. Fourteen flagellomeres, all densely clothed with trichia. Flagellum of males about 2 times as long as mesonotum. Three ocelli arranged in straight line, median about half size of laterals. Eyes large, median margin evenly rounded with minute, shallow incision above antennal socket. Eyes with numerous interommatidial setulae. Frons with distinct suture or keel above antennal sockets, and medially produced into distinct frontal tubercle; tubercle with at least some setae. Median lobe of postgena, maxillary segment [following Hoyt (1952) and Matile (1990)], well developed. Face broad, more than 1.5 times as high as wide, with numerous

small and large setae. Clypeus small, ovate, twice as wide as long, clothed with small and larger setae. Labrum small and weakly sclerotized. Cibarial pump short and wide. Prementum with one short median apodeme. Stipes elongate, well sclerotized, each with several minute and, at least in some species, with one strong bristle. Lacinia not observed. Labella small. Palpus with four visible palpomeres, probably due to secondary fusion, or loss of palpomere 1 or 2; “first” palpomere small, hardly visible in dry-mounted specimens. Palpomere 3 somewhat flattened, more or less triangular with median large, circular sensory pit. Palpomere 4 about twice as long as palpomere 3. Palpomere 5 very thin and long, 5 to 6 times as long as palpomere 4.

Thorax (fig. 3). Antepronotum and proepisternum well separated by thin suture, both with numerous small and some large setae; no distinct suture between proepisternum and proepimeron. Basisternum large, shield-like, situated immediately beyond proepisternum, setose with several ventrally projecting setae along ventral border. Anepisternum ovate, with numerous minute setae on upper half and along anterior border; uppermost part also with



Figures 5-7

Terminalia of *Eumanota leucura* Edwards, 1933, holotype, male. – 5, gonocoxites, ventral view. – 6, gonocoxites, dorsal view; tergite 9 and proctiger removed. – 7, tergite 9 and proctiger, dorsal view.

some strong setae. Anapleural suture incomplete. Preepisternum 2 and anepimeron both bare, pleural suture indistinct; preepisternum 2 partly covering basal portion of mid-coxa. Both anterior and posterior basallare well developed, both elongate. Laterotergite ovate, protruding, with several small and some strong setae posteriorly. Mediotergite, metepisternum and metepimeron all bare. Scutum densely clothed with minute setae; some strong setae laterally. Scutellum with 6-10 strong, projecting bristles and usually several smaller lateral setae.

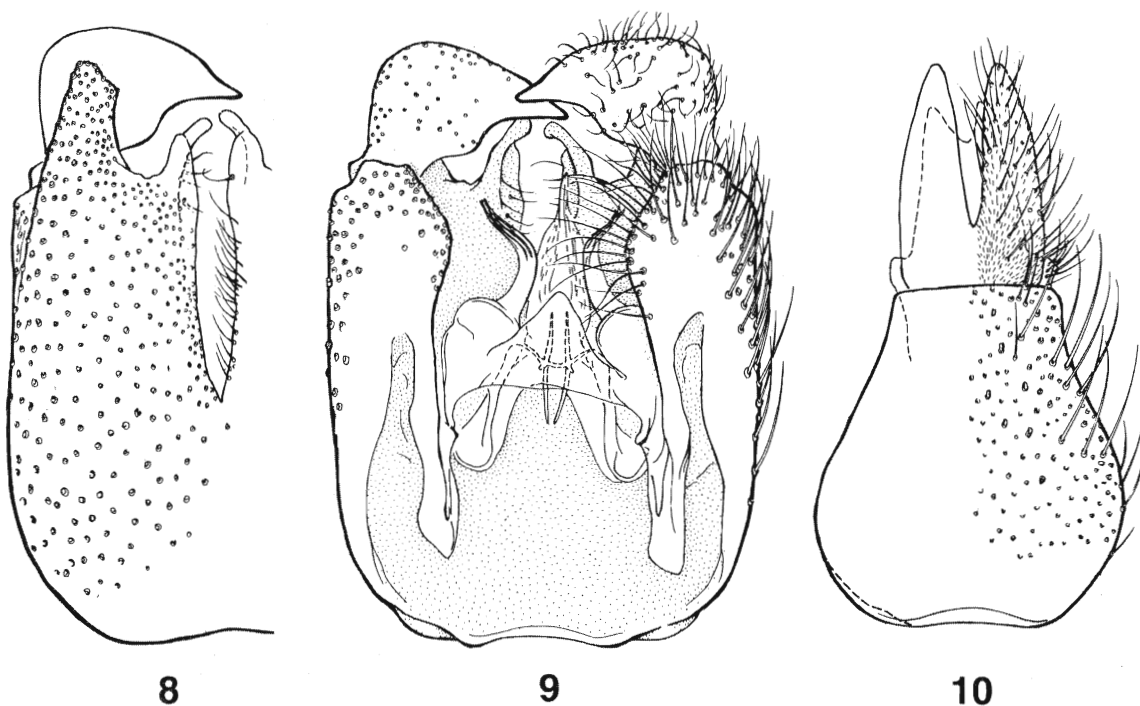
Wings (fig. 4). Wing length about 3.0 to 3.6 times as long as femur of fore leg (profemur). Wing membrane clear or distal half slightly obscured; posterior half with numerous minute, dorsal setae. Subcostal sclerite elongate, with some large setae. Stem vein with several setae. Distal median plate bare. Costa produced well beyond apex of *R*5. *Sc*1 short, ending in *R*; *Sc*2 absent. *R*s short, nearly vertical, bare. *R*1 short. Vein *ta* between 1.5 and 2.0 times as long as *R*1. Media with short common stem; basal most part of *M*1 weakly sclerotized. Two cubital veins runs separate from basis of wing. Anal vein well developed, bare or setose. *Cu*P as weak fold between anal vein and *Cu*A2. Where nothing else is stated above, all veins with numerous dorsal setae; *R* also with ventral setae.

Legs. Fore leg with tibia distinctly shorter than femur; antero-apical depressed area with numerous, evenly disper-

sed trichia. Tibiae and tarsomeres all with trichia arranged in regular rows; tibiae with several small setae, not longer than tibial diameter. Spurs well developed. Empodium well developed. Two tarsal claws, each with one large and, usually, one minute, more blunt, ventral tooth.

Abdomen. Abdominal segments 1-6 well developed, segments 7 and 8 distinctly reduced. Both sexes with well developed proctiger, protruding well beyond tip of gonocoxites in males. Cerci densely clothed by light, silky trichiae and a few setae.

Remarks – Tuomikoski (1966), in describing *Promanota*, probably never studied any species of *Eumanota*. As he seemingly was not aware that both *E. humeralis* and *E. leucura* had setae on most of the wing membrane, he must have relied on Edwards' original descriptions where this fact is not stated unambiguously. *Promanota malaisei* probably differs from the species described in the present paper in having a narrower face and a shorter palpomere 5. However, the additional diagnostic characters mentioned by Tuomikoski (1966), "less marked bristles round the orbits ... almost bristly mesanepisternum, shorter front coxae" remain dubious. Consequently, at present there are no good reasons for retaining *Promanota* as a distinct genus.



Figures 8-10

Terminalia of *Eumanota humeralis* Edwards, 1933, holotype, male. — 8, gonocoxites, ventral view. — 9, gonocoxites, dorsal view; tergite 9 and proctiger removed. — 10, tergite 9 and proctiger, dorsal view.

Eumanota leucura Edwards, 1933
(figs. 5-7)

Eumanota leucura Edwards, 1933: 232

Material examined — **Holotype** (♂), by original designation: Malaysia, Sabah, Borneo, Mt. Kinabalu, Kenokok (5,500 ft.), 12 April 1929, *H. M. Pendlebury*. («B. N. Borneo, Mt. Kinabalu, Lemu Lemu, 5,500 ft., 12th Apr. 1929. Pres. by F.M.S. Museum. B.M. 1930 - 510.»)

Diagnostic characters — The only species with a long, straight gonostylus with a rounded apex. Ventral portion of paramere very short with long, curved, filiform setae.

Description — A detailed description of the external morphology of *E. leucura* is provided by Edwards (1933: 232) and not repeated here.

Male (Holotype): Wing length 4.30 mm, or 3.0 times as long as profemur.

Head. Length of flagellum 2.40 mm or 1.9 times as long as mesonotum.

Thorax. Length of mesonotum 1.28 mm. *Wing.* Vein *ta* 1.0 times as long as *R1* and 3.3 times as long as stem of median fork. Vein *tb* 1.6 times as long as vein *ta*. Anal vein 0.6 times as long as *CuA2*, bare. *Legs.* Ratio of femur to tibia

for leg 1 to 3: 1.60, 0.85, 0.75. Ratio of tibia to first tarsomere for leg 1 to 3: 0.90, 1.45, 1.80. Spur lengths for legs 1 to 3 in relation to tibial diameter, measured apically: 2.9; 2.5, 3.8; 2.5, 3.6.

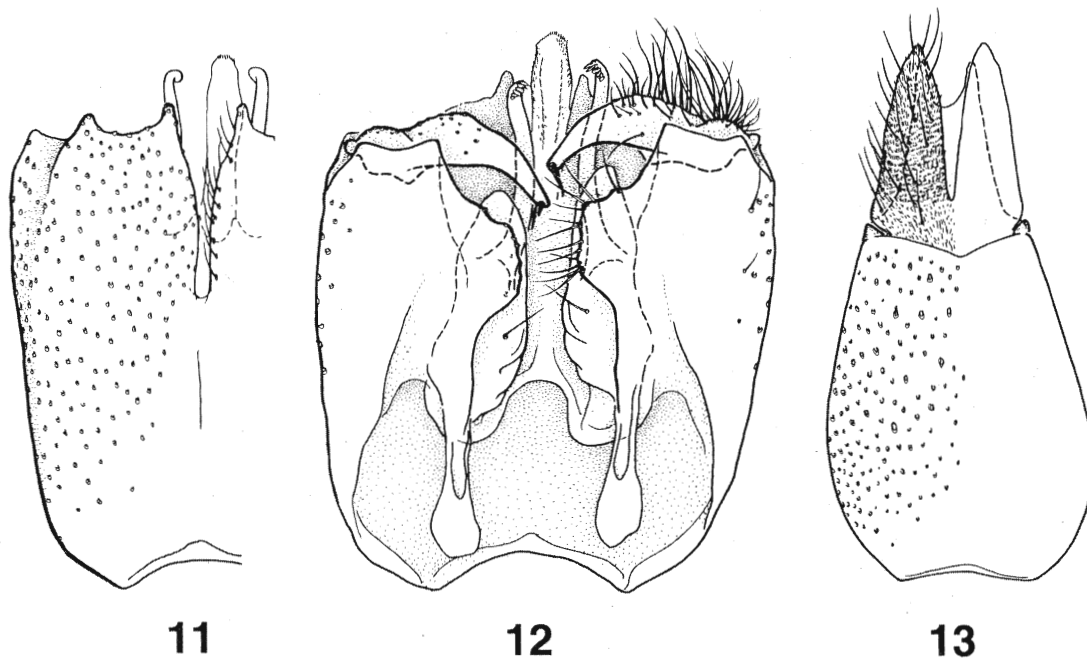
Terminalia. Gonocoxites ventrally fused for less than 1/2 of their length, slightly diverging posteriorly; dorsal border with numerous setae distally. Gonostylus elongated, apex rounded with numerous curved setae. Parameres with ventral portion short and stout with dense collection of curving, filiform setae apically; dorsal portion with distinct dorsal keel and 3-4 setae. Aedeagus broad and stout, pointed. Tergite 9 about as long as broad, distal width 0.5 times width basally. Length of tergite 9 and proctiger 1.4 times length of gonocoxites.

Distribution — Malaysia, Borneo.

Eumanota humeralis Edwards, 1933
(figs. 8-10)

Eumanota humeralis Edwards, 1933: 232

Material examined — **Holotype** (♂), by original designation: Malaysia, Sabah, Borneo, Mt. Kinabalu, Kenokok (3,200 ft.), 24 April 1929, *H. M.*



Figures 11-13

Terminalia of *Eumanota malukuensis* n. sp., holotype, male. – 11, gonocoxites, ventral view. – 12, gonocoxites, dorsal view; tergite 9 and proctiger removed. – 13, tergite 9 and proctiger, dorsal view.

Pendlebury. («B. N. Borneo, Mt. Kinabalu, Kenokok, 24th Apr. 1929. Pres. by F. M. S. Museum. BM 1930 - 510.»)

Diagnostic characters – Broad, more or less triangular gonostylus with a sharp distal point. Dorsal portion of paramere minute, visible as a blunt swelling only.

Description – A detailed description of the external morphology of *E. humeralis* is provided by Edwards (1933: 232) and not repeated here.

Male (Holotype): Wing length 3.30 mm, or 3.0 times as long as profemur.

Head. Length of flagellum 1.90 mm or 1.85 times as long as mesonotum.

Thorax. Length of mesonotum 1.05 mm. **Wing**. Vein *ta* 1.5 times as long as *R1* and 2.9 times as long as stem of median fork. Vein *tb* 1.4 times as long as vein *ta*. Anal vein 0.5 times as long as *CuA2*, with some dorsal setae. **Legs**. Ratio of femur to tibia for leg 1 to 3: 1.50, 0.85, 0.70. Ratio of tibia to first tarsomere for leg 1 to 3: 0.90, 1.45, 1.90. Spur lengths for legs 1 to 3 in relation to tibial diameter, measured apically: 3.6; 2.3, 4.2; 3.3, 5.0.

Terminalia. Gonocoxites fused for about 1/2 of their length ventrally; dorsal border of gonocoxite with numerous setae. Gonostylus broad, nearly triangular

with sharp distal point. Parameres with ventral portion slender and curved with numerous long, translucent setae apically; dorsal portion blunt and swollen, bare. Aedeagus relatively broad, with pointed apex. Tergite 9 somewhat longer than broad. Length of tergite 9 and proctiger 1.4 times length of gonocoxites.

Distribution – Malaysia, Borneo.

Eumanota malaisei (Tuomikoski, 1966), **comb. n.**

Promanota malaisei Tuomikoski, 1966: 216.

Type material – According to Tuomikoski (1966: 218) the description was based on 5 males collected in NE Burma, Kambaiti, May 11 and June 4, 1934, R. Malaise.

Remarks. Nothing is mentioned about the place of deposition in the original description. The specimens have been search for, in vain, at the Finnish museum of natural history, Helsinki, Swedish museum of natural history, Stockholm, and at The natural history museum, London.

Diagnostic characters – According to Tuomikoski (1966) this appears to be the only species with a narrow face ("face

narrow, a little wider below") and a short 5. palpomere ("somewhat longer than the preceding [palpomere]").

Description – A description with fairly good drawings of the wing and the male genitalia is given by Tuomikoski (1966: 215-218, figs. 1, 2, 5).

Distribution – Burma.

Eumanota malukuensis n. sp.
(figs. 11-13)

Material examined – Holotype (♂): Indonesia, Maluku Utara, Bacan, Makian, 1.5 km E of Labuha, 23-26.ix.1985, A. H. Kirk-Spriggs. Malaise trap sample, forest trail, secondary area. (NMW Indonesia Expedition 1985 (Project Wallace) NMW.Z. 1985.078. The type is deposited in the Museum national d'Histoire naturelle, Paris, France.

Diagnostic characters – The only species with a slender gonostylus, ending in a tip equipped with 2 dark setae.

Description – Male (Holotype). Total length 4.30 mm. Wing length 3.65 mm, or 2.8 times as long as profemur.

Head. Head capsule brown. Length of flagellum 2.15 mm or 1.9 times as long as mesonotum. Frontal tubercle with 2 distinct, dark setae, frons bare in front of ocelli. Face and clypeus brown with numerous dark setae. Face 1.7 times as long as wide. Mouthparts and palpomeres light yellowish.

Thorax. Length of mesonotum 1.15 mm. Pronotum and propleuron brown, with several dark setae. Mesonotum brown, somewhat lighter at shoulders; scutellum with 6 strong setae and some additional small setae laterally. Mesothoracic sclerites light brown; anepisternum with several minor setae along anterior border and on upper half. Mediotergite and laterotergite brown, latter with numerous small and some larger setae. Metathorax light brown, bare. Halteres whitish. **Wing.** Distal half brownish. Vein *ta* 1.6 times as long as *R1* and 5.4 times as long as stem of median fork. Vein *tb* 1.4 times as long as vein *ta*. Anal vein 0.6 times as long as *CuA2*, bare. **Legs.** Coxae yellowish, slightly darkened apically. Femora light brown, tibiae and tarsi light brown to yellowish with trichia and setae in regular rows. Leg ratios for fore leg (remaining legs missing): femur to tibia 1.55; tibia to first tarsomere 0.75; spur length 3.7.

Abdomen and terminalia. Both sternites and tergites brown. Gonocoxites fused for about 2/5 of their length ventrally; dorsal border of gonocoxite with well sclerotized portion above gonocoxal apodemes, bordered by several long setae. Posterior border of gonocoxites bare, with sharp cor-

ner. Gonostylus slender, slightly bent with 2 dark setae apically, one distinctly longer than the other. Parameres with ventral portion long and slender with a short row of membranous setae apically, dorsal portion broad with one setae only. Aedeagus slender, protruding beyond tip of parameres. Tergite 9 distinctly elongated. Total length of tergite 9 and proctiger 1.6 times length of gonocoxites.

Etymology – From the type locality, Maluku (Moluccas).

Distribution – Indonesia, Maluku.

Eumanota racola n. sp.
(figs. 14-16)

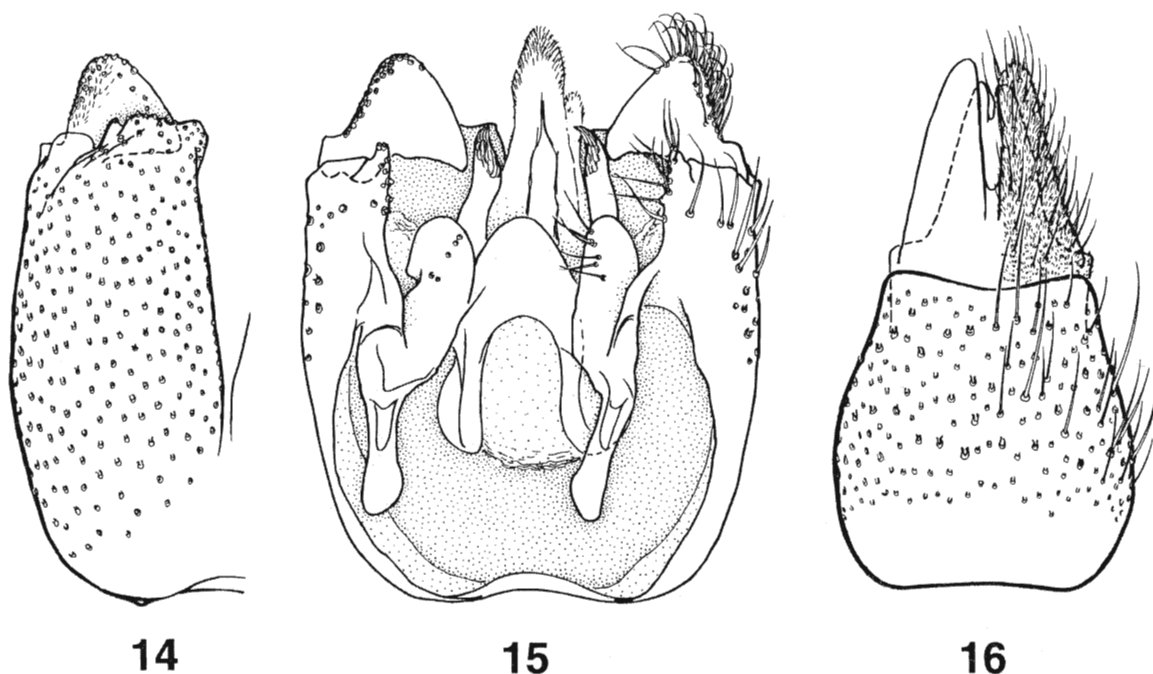
Material examined – Holotype (♂): Thailand, Phang Nga Province, Koh Ra, 26.01/4.02.1997, L. O. Hansen/ G. Söli (Malaise trap). **Paratype** (♂): same data as for holotype. Both types are deposited in the Zoological Museum, University of Oslo, Norway.

Diagnostic characters – Very close to *E. suthepsensis*, but can be identified by the less pronounced posterior, ventromedian corner of the gonocoxites; also the gonostylus is not produced into a small hook distally.

Description – Male (n=2). Total length 3.45 – 3.55 mm. Wing length 2.75-3.05 mm, or 3.05-3.45 times as long as profemur.

Head. Head capsule light brown to yellowish, darkened at top, around ocelli. Length of flagellum 2.00-2.05 mm or 2.0-2.4 times as long as mesonotum. Frontal tubercle with 3 distinct dark setae; frons yellowish and bare in front of ocelli. Face and clypeus yellowish with several setae.

Thorax. Length of mesonotum 0.90 mm. Pronotum and propleuron yellowish, with several setae; setae long lower border dark. Mesonotum light brown, yellowish towards and at shoulders, somewhat darkened medially and posteriorly; except for some lateral setae, densely clothed with minute setae. Scutellum brown, with 8-10 strong setae and some additional small setae laterally. **Wing.** Vein *ta* 1.6-1.7 times as long as *R1* and 3.9-4.1 times as long as stem of median fork. Vein *tb* 1.7-1.8 times as long as vein *ta*. Anal vein 0.5-0.6 times as long as *CuA2*, 6-11 dorsal setae. **Legs.** Coxae yellowish, slightly darkened apically. Femora light brown, tibiae and tarsi light brown to yellowish. Ratio of femur to tibia for leg 1 to 3: 1.40-1.45, 0.80-0.90, 0.75-0.80. Ratio of tibia to first tarsomere for leg 1 to 3: 0.90-0.95, 1.40, 1.90-2.00. Spur lengths for legs 1 to 3 in relation to tibial diameter, measured apically: 3.2-3.3; 1.7-2.0, 3.2-3.8; 2.7-3.0, 4.0-4.3.



Figures 14-16
Terminalia of *Eumanota racola* n. sp, holotype, male. – 14, gonocoxites, ventral view. – 15, gonocoxites, dorsal view; tergite 9 and proctiger removed. – 16, tergite 9 and proctiger, dorsal view.

Abdomen and terminalia. Both sternites and tergites brown. Gonocoxites ventrally fused for about 1/2 of their length; dorsal border of gonocoxite with well-defined posterior corner with numerous setae. Gonostylus broad, more or less triangular and relatively flat. Parameres with ventral portion long with numerous translucent setae apically; dorsal portion broad with 5-6 setae. Aedeagus relatively broad, protruding beyond tip of parameres. Tergite 9 about as long as broad. Length of tergite 9 and proctiger 1.6 times length of gonocoxites.

Etymology – From Koh Ra (Ra Island), the type locality, and from Latin, *-cola*, inhabitant.

Distribution – Thailand.

Eumanota suthepensis n. sp.
(figs. 1-4, 17-19)

Material examined – **Holotype** (♂): Thailand, Chiang Mai, Doi Suthep, 9-15 April 1991, G. Söli (malaise trap). **Paratype** (♂), Laos, Phrabang province, Louang, Ban Song Cha (5 km W) (20 33-4N 102 14'E) (about 1200 masl.), 24 April-16 May 1999, Vit. Kubañ leg. The holotype is deposited in the

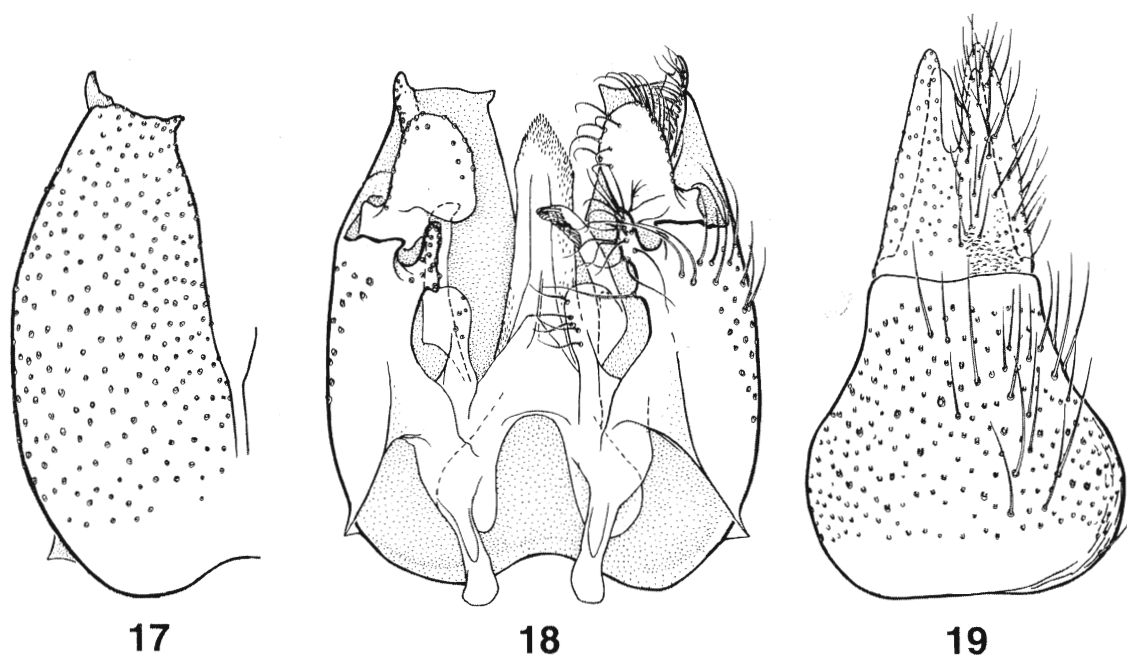
Zoological Museum, University of Oslo, Norway; the paratype in the private collection of Jan Ševčík, Ostrava, Czech Republic.

Diagnostic characters – Close to *E. racola*, but dorsal border of gonocoxite with a well-defined, nearly knob-like posterior corner with numerous thin setae.

Description – **Male** (n=2). Total length 4.25-4.70 mm. Wing length 2.95-3.05 mm, or 3.0 times as long as profemur.

Thorax. Mesonotum, most of mesopleuron, laterotergite and mediotergite brown. Prothorax light brown, katapisternum whitish. Scutellum with 8 strong, erect setae and several smaller laterally. Anepisternum with 2-3 strong setae on uppermost part. Halteres whitish. **Wing.** Vein *ta* 1.6-1.7 times as long as *R1* and 2.9-3.2 times as long as stem of median fork. Vein *tb* 1.5-1.7 times as long as vein *ta*. Anal vein 0.6 times as long as *CuA2*, bare. **Legs.** Coxa whitish, except for brown apices; tibia and tarsi light brown. Ratio of femur to tibia for leg 1 to 3: 1.40-1.45, 0.80-0.90, 0.75. Ratio of tibia to first tarsomere for leg 1 to 3: 0.95, 1.40-1.45, 2.05. Spur lengths for legs 1 to 3 in relation to tibial diameter, measured apically: 3.3-3.5; 2.0, 3.8-4.2; 2.6-3.0, 4.2-4.7.

Abdomen and terminalia. Brown, sternites with lateral



Figures 17-19

Terminalia of *Eumanota suthepensis* n. sp., holotype, male. – 17, gonocoxites, ventral view. – 18, gonocoxites, dorsal view; tergite 9 and proctiger removed (Note, the terminalia are slightly tilted down in front!). – 19, tergite 9 and proctiger, dorsal view.

margins light brown. Gonocoxites ventrally fused for about 1/3 of their length; dorsal border of gonocoxite with well demarked, nearly knob-like posterior corner with numerous thin setae. Gonostylus broad, rounded; distal portion bent downwards, forming a small hook. Parameres with ventral portion long with numerous translucent setae apically; dorsal portion broad with 5-6 setae. Aedeagus long and broad, protruding beyond tip of parameres. Tergite 9 elongated, broadest basally; length of tergite 9 and proctiger 1.6 times length of gonocoxites.

Etymology – Named after the type locality, Doi Suthep (Suthep Mountain).

Distribution – Thailand and Laos.

DISCUSSION

The new species here described are clearly closely related to the two species previously ascribed to *Eumanota*; unfortunately their relationship to *E. malaisei* can not be established until new material of this species is available.

Of the two genera *Eumanota* and *Manota*, the latter is undoubtedly the most apomorphic, visible, among other characters, in the strongly reduced wing venation. Nevertheless, both genera have several unique characters in common, presumably good synapomorphies, e.g. a broad, rectangular and setose face, a reduced prementum with one minor median apodeme, and a well developed median lobe of the postgena. Other characters, like the row of strong bristles bordering the back of the head and, to a certain extent, the regular arrangement of the tibial and tarsal trichia are probably less unique. One or both of these features are expressed in representatives among the Leiini. *Sticholeia* Söli, 1996 has both, and seems to confirm the close relationship between “Manotinae” and the tribe Leiini. Interestingly, *Sticholeia* has also an outline of basisternum 1 quite similar to that in *Eumanota*. For a more detailed discussion of these features, see Söli (1996).

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