

MICROKEROPLATUS, A NEW GENUS OF KEROPLATIDAE
(DIPTERA) FROM THE ORIENTAL REGION

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Microkeroplatus gen. n. belonging to the tribe Keroplatini of the subfamily Keroplatinae (Keroplatidae) is described. It comprises three new species, *M. longisetosus* sp. n. (type species of the genus) from peninsular Malaysia, *M. minutus* sp. n. from Brunei, and *M. sumatrensis* sp. n. from Indonesia. A brief analysis of its diagnostic characters in comparison to those of the other genera of the tribe is given. With 19 original figures.

Key words: fungus gnats, Sciaroidea, Keroplatidae, Keroplatinae, Keroplatini, new genus, new species, taxonomy, Malaysia, Brunei, Indonesia

INTRODUCTION

During a collection trip of the first author to Malaysia in January 2009, a peculiar small fly of the family Keroplatidae was captured. A short study of the features of the specimen revealed that it must belong to an undescribed genus of the tribe Keroplatini (subfamily Keroplatinae). In order to find related taxa, more Oriental materials have been checked and a further two specimens, each belonging to different species, were found in Malaise trap samples from Brunei and Indonesia.

There are 18 genera of Keroplatini listed in the catalogue by EVENHUIS (2006). An additional genus, *Bisubcosta* PAPP, 2006 (in PAPP *et al.* 2006), was since described from Thailand, and recently AMORIM *et al.* (2008) transferred the genus *Chetoneura* COLLESS, 1962 from the tribe Orfeliini to the Keroplatini. In this paper, a further new genus of Keroplatini is described on the basis of three new species from Malaysia, Brunei and Indonesia, respectively.

The type specimens are preserved in the collections of the Hungarian Natural History Museum, Budapest (HNHM), the Natural History Museum, London (BMNH) and the Museum Zoologi Bogor (MZB), Bogor (Indonesia). The holotype of *M. sumatrensis* is currently deposited in the Royal Ontario Museum, Toronto (ROM), but it will be transferred to MZB. The holotype of *M. longisetosus* was collected into alcohol in the field and mounted and labelled in the HNHM. Figures of body parts were made in glycerol on an excavated slide, where the excavated part was half-covered by a normal cover glass. The morphological terminology principally follows that by MATILE (1990). The other

type specimens are stored in ethanol, including their terminalia cleared in KOH. We found no differences among the three new species in body characters, so they are given only for one species.

Additional material of *Chetoneura cavernae* was also studied – 1 male: Malaysia, Cameron Highlands, Tanah Rata, Robinson Falls, 26.–29. 1. 2009, J. ŠEVČÍK leg. et coll. (Malaise trap); 1 male: Brunei, Ulu Temburong, 14. 2.–9. 3. 1982, M. C. DAY leg. (Malaise trap), coll. BMNH.

Microkeroplatus ŠEVČÍK et PAPP, gen. n.

Type species: *Microkeroplatus longisetosus* ŠEVČÍK & PAPP, sp. n.

Gender: masculine.

Etymology. The name refers to unusually small body size within the tribe Keroplatini.

Body dark brownish grey, thorax and abdomen partly yellowish brown (Fig. 13).

Head as in Figs 1–3. Compound eyes relatively small, occupying at most two thirds of the head in profile. Ommatiditrichia distinct. Two ocelli, the distance between ocelli slightly less than their diameter. Vertex covered with short setae, frons bare. Frons anteriorly pointed, with a short sagittal furrow. Face and clypeus small, bare. Mouth-parts very small, considerably reduced. Maxillary palpus with 2 short palpomeres, the apical palpomere about twice as large as basal one.

Antenna with 14 flagellomeres. Scape and pedicel cylindrical, approximately 1.5 times as broad as long. Flagellomeres strongly compressed laterally, S-shaped (except the apical one), covered with short fine trichia and dorsally also with larger dark setae, not longer than half of the height of the flagellomere.

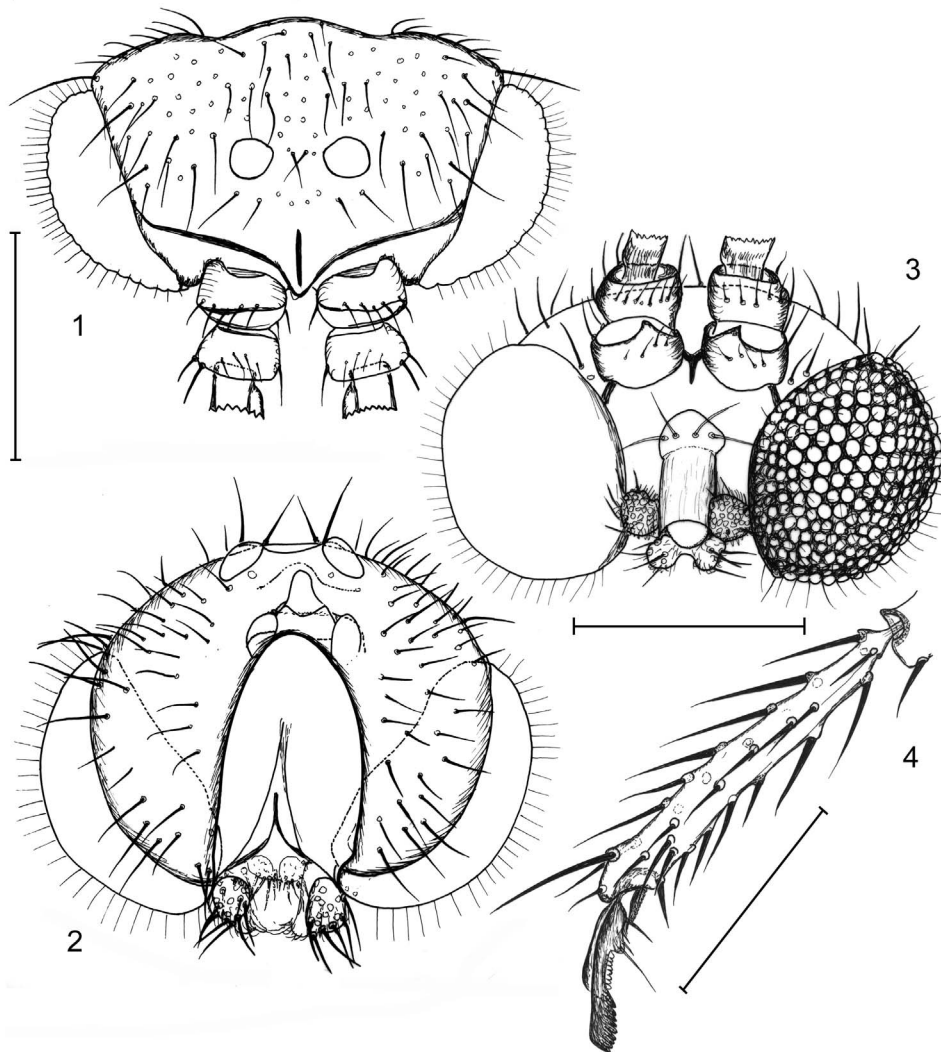
Thorax. Scutum dark brown, along margins lighter, evenly setose. Scutellum dark brown, with a transverse row of fine apical setae. Mediotergite bare, dark brown, not much bulging. Subscutellar membranous area small. Lateral thoracic sclerites mostly dark brown, partly yellowish brown. Anepisternum with several setae on its upper half. Katepisternum bare. Laterotergite with several short setae posteroventrally. Haltere brown, slightly longer than the first abdominal tergite.

Wing (Fig. 14) hyaline, its membrane covered with microtrichia, without macrotrichia. Costa long, almost reaching the tip of M_1 . Costa, radial veins, R-M fusion and M_3 dark and distinct. C densely covered with macrotrichia. R_1 rather short, reaching approximately to a half of the wing, with sparse macrotrichia. Sc simple, ending in C. Radio-median fusion distinct, as long as a third of the stem of M-fork. Basal portion of media and vein Tb indistinct. M_3 weak, less sclerotized than Cu_1 , reaching Cu_1 at base of wing. Cu_2 fold-like, dark and distinct, reaching to about two thirds of Cu_1 . Vein A_1 less distinct and shorter than Cu_2 .

Legs dark brown, covered with black trichia. Fore coxa setose on front side (setae as long as its diameter), mid coxa setose anteriorly at apical half and hind coxa with several posterolateral setae. Femora clothed with fine dark trichia. Fore tibia about as long as fore femur and about half as the first tarsomere. All tibiae with numerous trichia not longer than half of tibial diameter, tending to form more or less distinct longitudinal rows. The apex of fore tibia without distinct antero-apical depressed area. Fore tibia with one apical spur, about 1.5 times as long as maximum tibial diameter. Two spurs present on both mid and hind tibia, posterior spur shorter, about half as long as anterior one. Tarsal claws shining black, as on Fig. 4. Pulvilli not developed.

Abdomen mostly dark brown, segments 1 to 6 lighter. All segments cylindrical, covered with dark setae. Tergite 8 and sternite 8 as in Figs 5 and 6.

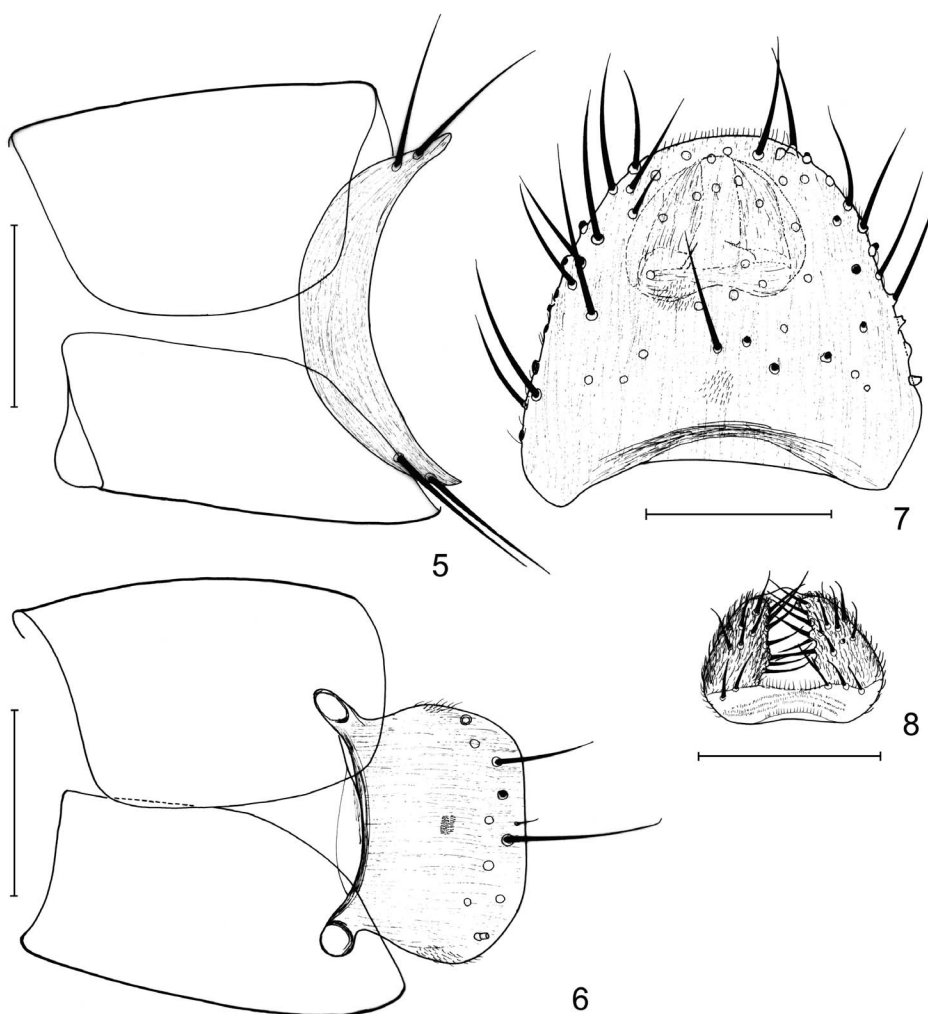
Male terminalia (Figs 7–12, 15–19) dark brown. Tergite 9 subquadrate, almost as long as broad. Cerci small, setose. Posteroventral margin of gonocoxites medially deeply excavated, with characteristic patches of thick black setae dorsolaterally to that excavation. Gonocoxites fused only narrowly on anteroventral side. Basiphallus and parameres sclerotised, arched. Gonocoxal apodemes well developed. Distiphallus membranous, except for sclerotized medial ejaculatory apodeme. Gonostylus simple, elongated, with apical setae.



Figs 1–4. *Microkeroplatus longisetosus* sp. n., holotype male. 1–3 = head: 1 = anterior view, 2 = posterior (occipital) view, 3 = dorsal view, 4 = fore 5th tarsomere with claws. Scale: 0.1 mm for all

***Microkeroplatus longisetosus* ŠEVČÍK et PAPP, sp. n.**
(Figs 1–14)

Holotype male (HNHM): Malaysia, Cameron Highlands, Tanah Rata, near Robinson Falls, 26. 1. 2009, J. ŠEVČÍK leg. (sweeping undergrowth in a rainforest). [The specimen is mounted from alcohol, pinned, left wing prepared on a slide, head, right fore leg, 7th and 8th abdominal segments and genitalia in a plastic microvial with glycerol].

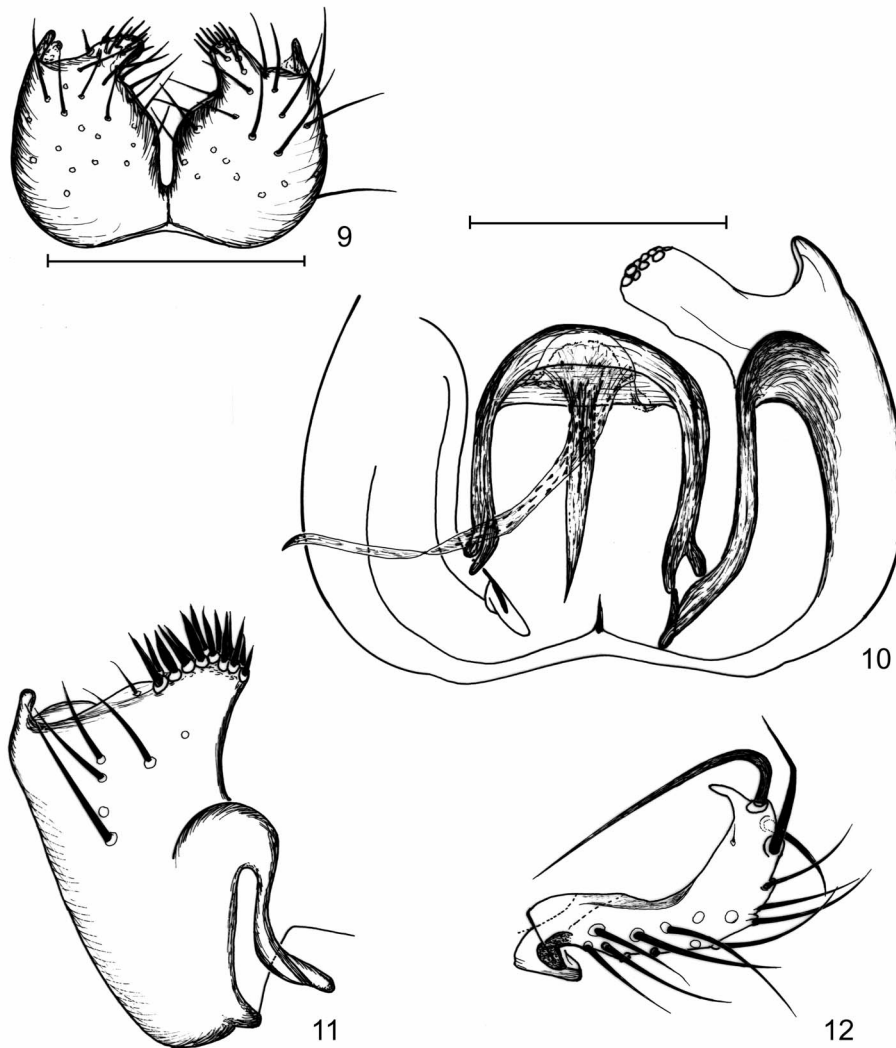


Figs 5–8. *Microkeroplatus longisetosus* sp. n., holotype male: 5–6 = segment 8 with contours of tergite 7 and sternite 7, perpendicular views: 5 = sternite 8, 6 = tergite 8, 7 = tergite 9 with proctiger, ventral view, 8 = proctiger, inner (dorsal). Scale: 0.1 mm for all

Measurements in mm: body length 2.7, wing length 2.5, wing width 1.0.

Male terminalia as in Figs 7–12. Tergite 9 trapezoid, distinctly tapering, with posterior margin rounded. Gonocoxites posteroventrally partly separated, forming a shallow triangular excavation extending anteriorly as a narrow medial incision. Gonostylus narrow, 4 times as long as broad, curved inwards, apically pointed, bearing a long curved subapical seta, about as long as the entire gonostylus, and several shorter setae along its dorsal edge.

Female unknown.



Figs 9–12. *Microkeroplatus longisetosus* sp. n., holotype male, terminalia. 9 = gonocoxites in ventral view, 10 = genitalia in dorsal (tergal) view; 11 = medial process of gonocoxite in a subdorsal-subposterior view (broadest extension); 12 = gonostylus, dorsal view. Scale: 0.1 mm for all

***Microkeroplatus minutus* ŠEVČÍK et PAPP, sp. n.**
(Figs 15–17)

Holotype male (BMNH): Brunei, Ulu Temburong, 14. 2.–9. 3. 1982, M. C. Day leg. (Malaise trap) [the specimen with genitalia cleared in KOH is stored in ethanol].

Measurements in mm: body length 2.1, wing length 1.8, wing width 0.7.



Fig. 13. *Microkeroplatus longisetosus* sp. n., holotype male. Habitus

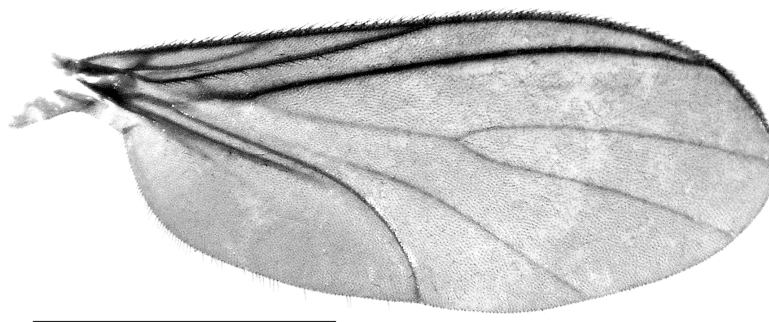


Fig. 14. *Microkeroplatus longisetosus* sp. n., holotype male. Wing venation. Scale: 1 mm

Male terminalia as in Figs 15–17. Tergite 9 subquadrate, slightly tapering, with posterior margin straight. Gonocoxites ventrally almost fully separated, forming a deep posteroventral triangular excavation. Gonostylus straight, 4 times as long as broad, apically slightly wider, bearing two apical setae, about as long as the apical diameter of gonostylus.

***Microkeroplatus sumatrensis* ŠEVČÍK et PAPP, sp. n.**
(Figs 18–19)

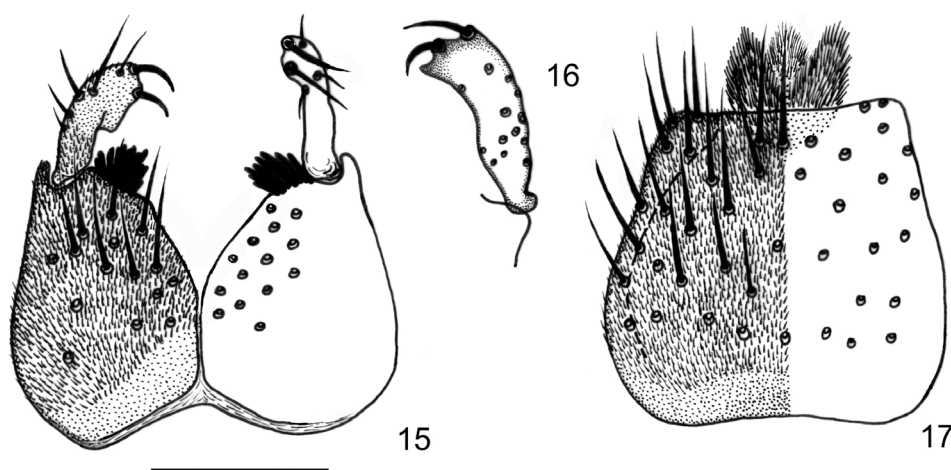
Holotype male (MZB): Indonesia, Sumatra, Aceh, Gunung Leuser Nat. Park, Ketambe Res. Stn., 1° rainforest – light gap, young forest, terrace 3, 350 m, 3°41'N, 97°39'E, 9.–21. Sep. 1989, D.C. Darling, Malaise trap head (ROM 893089) [the specimen with genitalia cleared in KOH is stored in ethanol].

Measurements in mm: body length 2.3, wing length 2.1, wing width 0.8.

Male terminalia as in Figs 18–19. Tergite 9 subquadrate, with a pair of long lateral projections directed posteriorly. Gonocoxites ventrally fused, with a membranous medioventral rounded depression. Gonostylus broad, curved inwards, about twice as long as broad, with several setae along its dorsal surface. The apex and ventral surface of gonostylus bare.

DISCUSSION

The closest relative of *Microkeroplatus* is probably *Chetoneura* COLLESS, 1962. Both genera share several apomorphies which are unique or rare within the tribe Keroplatini, mainly the absence of vein R4 and reduced A1. If we accept the

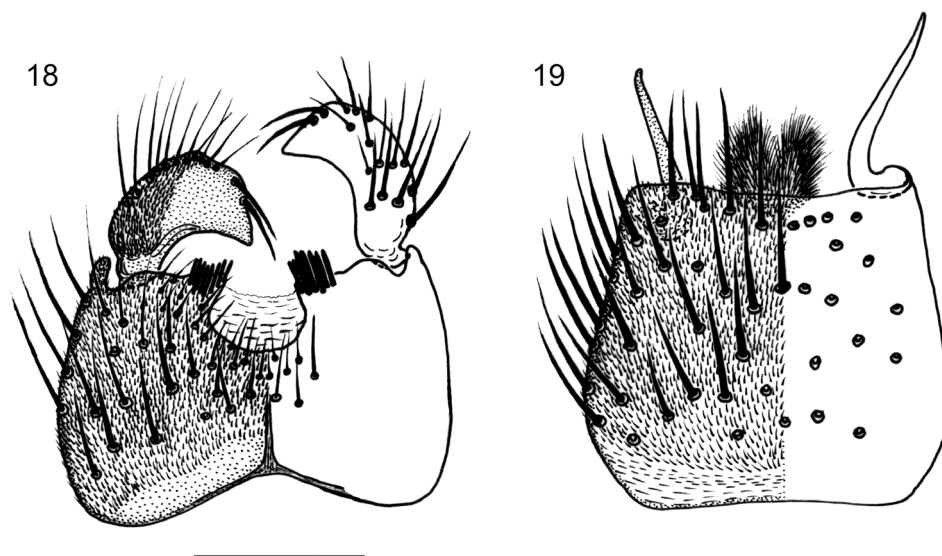


Figs 15–17. *Microkeroplatus minutus* sp. n., holotype male. 15 = terminalia in ventral view, 16 = detail of gonostylus, 17 = tergite 9, dorsal view. Scale: 0.1 mm

new diagnosis of *Chetoneura*, as was recently widened by AMORIM *et al.* (2008), it is possible that the genus *Bisubcosta* (with a single species *Bisubcosta oligoradiata* PAPP, 2006 from Thailand) is a junior synonym of *Chetoneura*. But there still remains a question if *Ch. shennonggongensis* AMORIM *et* NIU, 2008 (different from *B. oligoradiata*) really belongs to the same genus as *Ch. cavernae* COLLESS, 1962. The relationships among those taxa require further study, which is outside the scope of this paper.

The new genus differs from both *Chetoneura* and *Bisubcosta* in the shape of flagellomeres, smaller eyes, bare mediotergite, setose laterotergite, simple vein Sc (not forked apically), indistinct Tb, weak M_4 reaching Cu_1 at wing base, and details on the male terminalia. All hitherto known species of the new genus are also substantially smaller, with wing length maximally 2.5 mm (more than 4 mm in *Chetoneura cavernae* and 3.37 in *Bisubcosta oligoradiata*; the size of *Ch. shennonggongensis* was not stated in the original description).

The systematic position of the new genus is not fully clear. The reduced mouthparts and strongly compressed antennae suggest it belongs to the tribe Keroplattini. Its sister group is most probably *Chetoneura* (and or including *Bisubcosta*). All those three genera, however, represent rather isolated position within the tribe. AMORIM *et al.* (2008) considered *Chetoneura* as related to *Heteropterna* SKUSE, 1888 and *Ctenoceridion* MATILE, 1972 of the tribe Keroplattini. On the other hand,



Figs 18–19. *Microkeroplatus sumatrensis* sp. n., holotype male. 18 = terminalia in ventral view, 19 = tergite 9, dorsal view. Scale: 0.1 mm

COLLESS (1962) considered *Chetoneura* more related to *Tylparua* EDWARDS, 1929 of the tribe Orfeliini. MATILE (1990) excluded *Chetoneura* from his phylogenetic analysis of the tribe Keroplatini, because he apparently followed the opinion by COLLESS (1962) and placed *Chetoneura* to the tribe Orfeliini. In any case, a careful phylogenetic analysis of the entire family Keroplatidae is needed, based on both morphological and molecular characters.

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