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Notes on the genus *Metanepsia* EDWARDS and its relatives from East Asia (Insecta: Diptera: Mycetophilidae)

With 18 Figures

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Abstract. Two new species, one Palaearctic and one Oriental, are described in the tribe Metanepsiini: *Metanepsia malaysiana* spec. nov. and *Chalastonepsia hokkaidensis* spec. nov. A third species is described in the genus *Chalastonepsia* SÖLI, but its identity is uncertain and it is not named. The genus *Chalastonepsia* is redefined and its systematic position is discussed.

Introduction

The genus *Metanepsia* was established by EDWARDS (1927) for the single species *M. javana* EDWARDS from Java. The tribe Metanepsiini was erected by MATILE (1971) to include *M. javana* and two additional species from the Afrotropical region, *Metanepsia tsacasi* MATILE and *M. africana* MATILE. Subsequently MATILE described five more species of *Metanepsia* from Africa (1972, 1975, 1980). The genus *Chalastonepsia* was erected for the new species *orientalis* from Malaysia by SÖLI (1996), who placed it in the tribe Metanepsiini and who provided a revised diagnosis of the tribe.

The present study is based on further material from Malaysia and from Japan. It widens the definition of *Chalastonepsia* considerably, and as a result the definition of the tribe Metanepsiini becomes less clearcut. The specimens described below are in the Staatliches Museum für Tierkunde, Dresden.

Chalastonepsia hokkaidensis spec. nov.

Specimen examined: Holotype male [Fig. 1], Japan, Hokkaido: Otaru, Okusawa-Suigenchi area, 27–28 August 1996 (M. Ohara, A. Yamamoto).

Description:

Male.

Head [Fig. 7]: Head capsule dark brown, palpi and labella pale brown. Antennae yellow; scape, pedicel and the apical four flagellomeres slightly darkened. Ocelli three, the median one about half

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the diameter of each lateral one, the latter separated from the eye margin and from the median ocellus by about 1.5 times its own diameter. Eyes slightly emarginate above base of antennae, sparsely covered with fine hairs. Frons bare. Face densely bristled, shield-like. Clypeus bare, slightly longer than broad, not longer than face. Palpus with one visible palpomere (probably third palpomere), which bears a large shallow sensory pit. Antennae pectinate, with 14 flagellomeres. Flagellomeres 1–10 each with one conspicuous side extension. Flagellomere 11 only slightly extended. Flagellomeres 12–14 not modified. Flagellomeres 1–13 with a short bare stalk apically. All flagellar segments hairy. Scape and pedicel with some stronger bristles. Antenna about 1.5 times as long as thorax. Postcranium and genae bristled. With a distinct furrow between median ocellus and tip of the frontal tubercle. No suture present between eye margin and lateral ocellus.

Thorax: Mostly brown; posterior part of anepisternum, upper part of anepimeron and upper edges of the mediotergite paler. Anepimeral cleft narrow but distinct. Scutum with relatively short acrostichal, dorsocentral and sublateral setae, the intervening areas bare. No prescutal suture. Scutellum with a transverse row of longer setae (about 10–12, all of them lost) and with numerous weaker setae scattered over upper half. Mediotergite and metepisternum bare. Laterotergites with 15 or 18 central setae respectively. Prosternum, metepisternum and mesopleuron bare. Nine proepisternal bristles present. Lateral ends of metanotum each with a pair of erect setae.

Wings [Fig. 4]: Length 3 mm. Wing unmarked, with dense, remarkably short microtrichia, without macrotrichia on membrane. Microtrichia irregularly arranged. R, R₁ and R₅ with strong setae above. Other postcostal veins without setae. C produced for about one-quarter of the distance between R₅ and M₁, hardly reaching wing tip. Sc long, ending in R well before level of base of Rs. Rs distinct, about $\frac{3}{4}$ as long as crossvein r-m. M-branches reaching wing margin; M₁ four times as long as m-stalk, M₂ a little shorter. Point of furcation of CuA very slightly beyond base of crossvein r-m. M-stalk, M₁, M₂ and CuA₁ faint; CuA₂ more distinct. CuP and An ending at about level of CuA-furcation. Haltere whitish.

Legs: Entirely yellow, except for a small dark apical patch on inner side of mid and hind coxae. Hind coxae with a complete vertical row of setae (about 9) along outer hind margin. Fore tibia as long as fore femur. Spurs yellow, with pale vestiture. Spur formula after VOCKEROTH (1980, length of each tibial spur divided by the maximum width of tibial apex, in the following order: spur of fore tibia, anterior spur of mid tibia, posterior spur of mid tibia, anterior spur of hind tibia, posterior spur of hind tibia): 1.25; 1.8, 2.3; 2.5, 3.2. Anteroapical tibial organ of fore tibia much reduced, untraceable. Fine tibial and tarsal setae irregularly arranged, dark. Fore leg without strong bristles, except for 3–4 subapicals on tibia. Tibiae and tarsomeres 1–4 of mid leg and hind leg with rather short but distinct bristles, the longest about half as long as tibial diameter at apex. These bristles strongly modified, bearing 4–5 narrow leaf-like lateral processes [Fig. 8]. Processes radiating from the setal base, reaching about half length of the bristle. Tibial bristle formula: mid tibia 3a, 0–1d, 7–8pd, 11p, 9pv; hind tibia 19a, 3d, 9pd, 0–2p; in addition, 7–9 subapicals on mid tibia and 10–11 subapicals on hind tibia. Tarsal claws each with three small ventral teeth. Empodium small but well developed.

Abdomen: First segment pale yellow. Segments 2–8 and terminalia brown. Segment 2 yellowish at extreme base. Sternites 1 and 8 bare. Tergite 1, segments 2–7 and tergite 8 covered with dark setae. Sternites 2 to 6 each with a pair of pale, well-defined, submedian fold-lines. Sternite 6 with fold-lines on basal quarter only. Tergite 7 about a third as long as tergite 6, Tergite 8 a fifth as long as tergite 6. Sternite 7 about 0.8 times as long as sternite 6, sternite 8 about 0.15 times as long as sternite 6. Terminalia [Figs 9–12] rotated clockwise through 270°, the rotation beginning with segment 7. Tergite 9 large, not fused with gonocoxites, about 2.2 times as wide as long; apical edge rounded; dorsally and apical quarter ventrally with setae. Cerci rounded, subapically with few setae. Hypoproct subtriangular, with 2–3 setae on either side of the apex. Gonocoxal apodemes long. Parameres with few short setae near base, probably not fused apically. Parameres and aedeagus not clearly separable. Aedeagus stalk-like. Gonocoxites fused ventrally; little longer than tergite 9; with dark bristling on ventral surface, except for a bare median stripe.

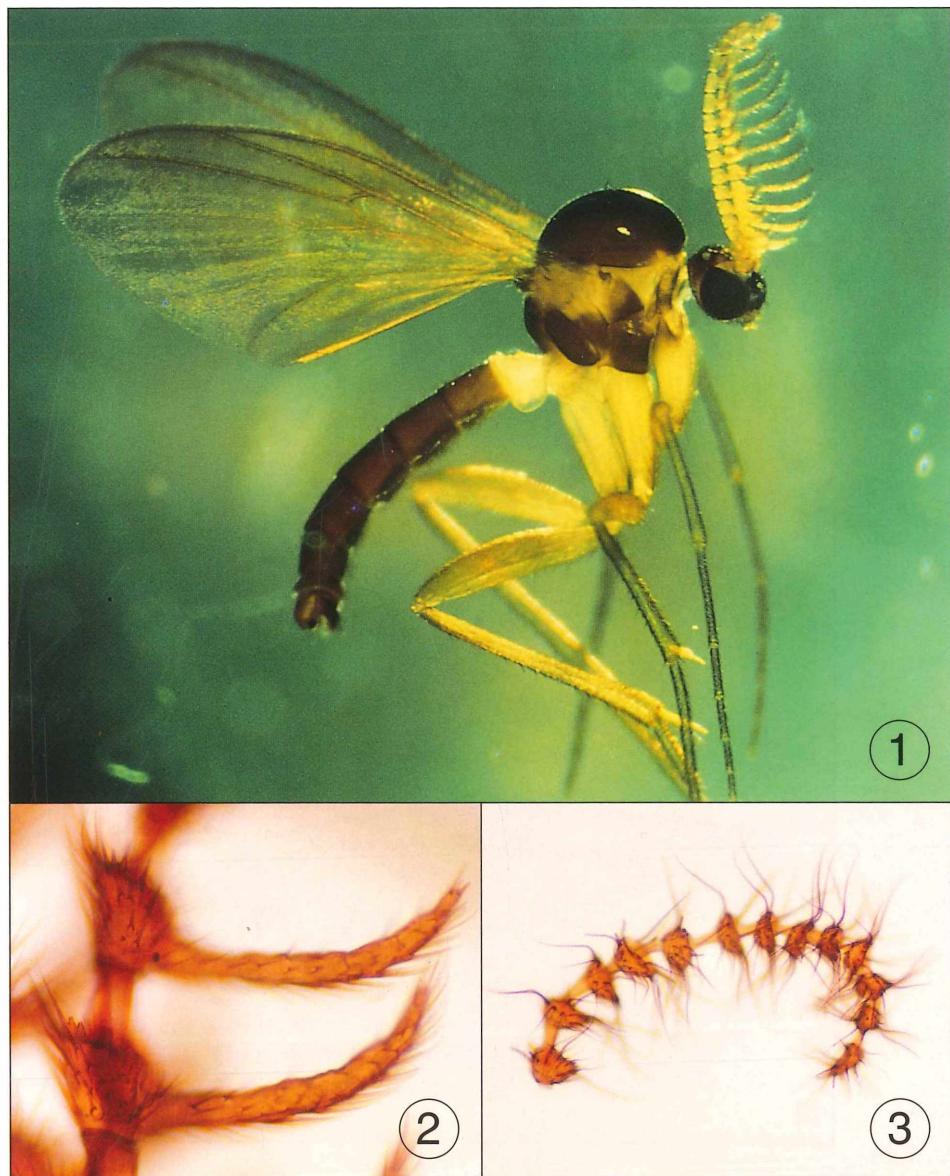
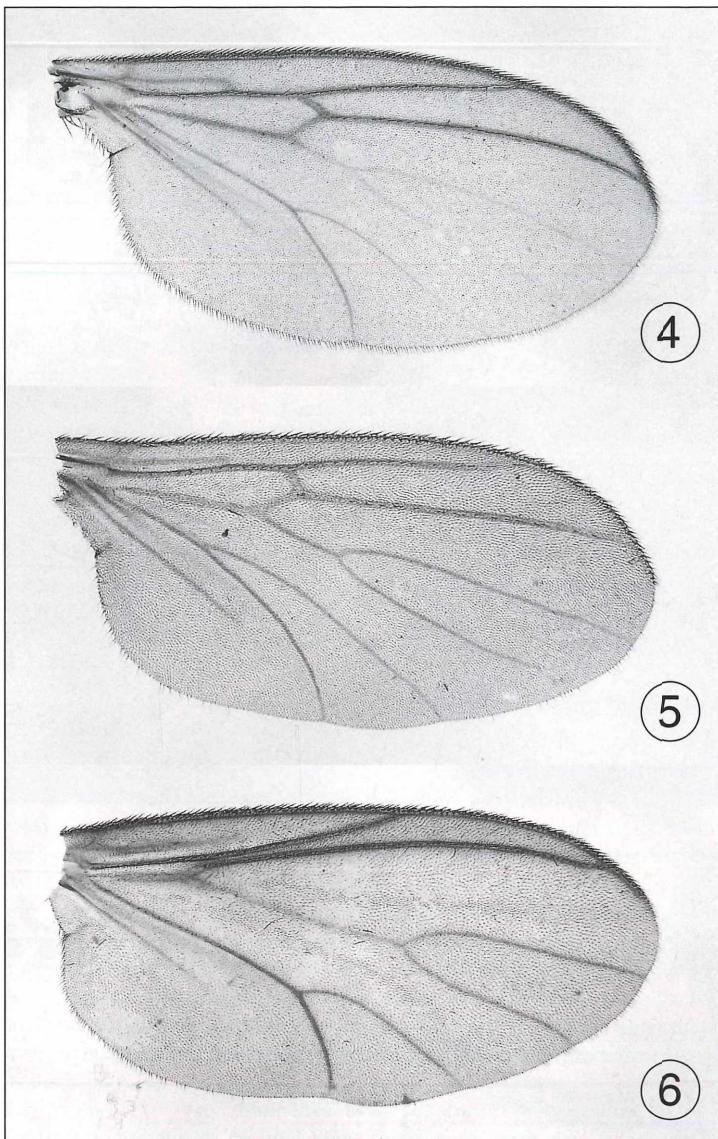


Fig. 1: *Chalastonepsia hokkaidensis*, male, habitus. – Fig. 2: *Metanepsia malaysiana*, male, flagellomeres 4 and 5. – Fig. 3: *Chalastonepsia* spec. indet., male, flagellomeres 2–14.

Posteromedially to gonocoxites a pair of heavily sclerotized appendages, seemingly attached by membrane to gonocoxites posteriorly and each with probably two short median bristles. Gonostylus small, hardly longer than wide; its apical surface slightly convex, with few setae and a group of small spinulae; subapically with a brush of finger-like, blunt, heavily sclerotized lobes attached by membrane.



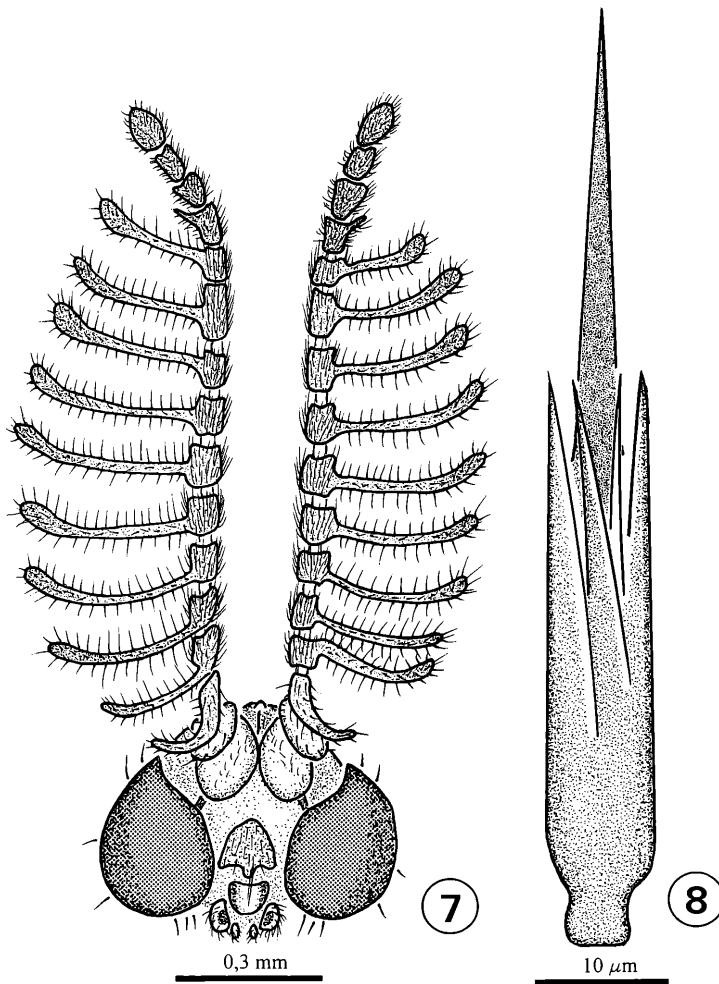
Figs 4–6: Male wings.

Fig. 4: *Chalastonepsia hokkaidensis*. – Fig. 5: *Chalastonepsia* spec. indet. – Fig. 6: *Metanepsia malaysiana*.

Distribution: The species is known only from the type locality in Japan.

Etymology: This new species is named after its origin, the Japanese island of Hokkaido.

Diagnosis: *Ch. hokkaidensis* differs most conspicuously from the other representative of the genus, *Ch. orientalis* SÖLI, by its strongly pectinate antennae, wing vein CuA₂ complete, a much shorter posterior fork, absence of an anteroapical organ on fore tibia, presence of strong tibial setae, and complex terminalia.



Figs 7–8: *Chalastonepsia hokkaidensis*, male.
Fig. 7: head, anterior aspect. – Fig. 8: tibial bristle.

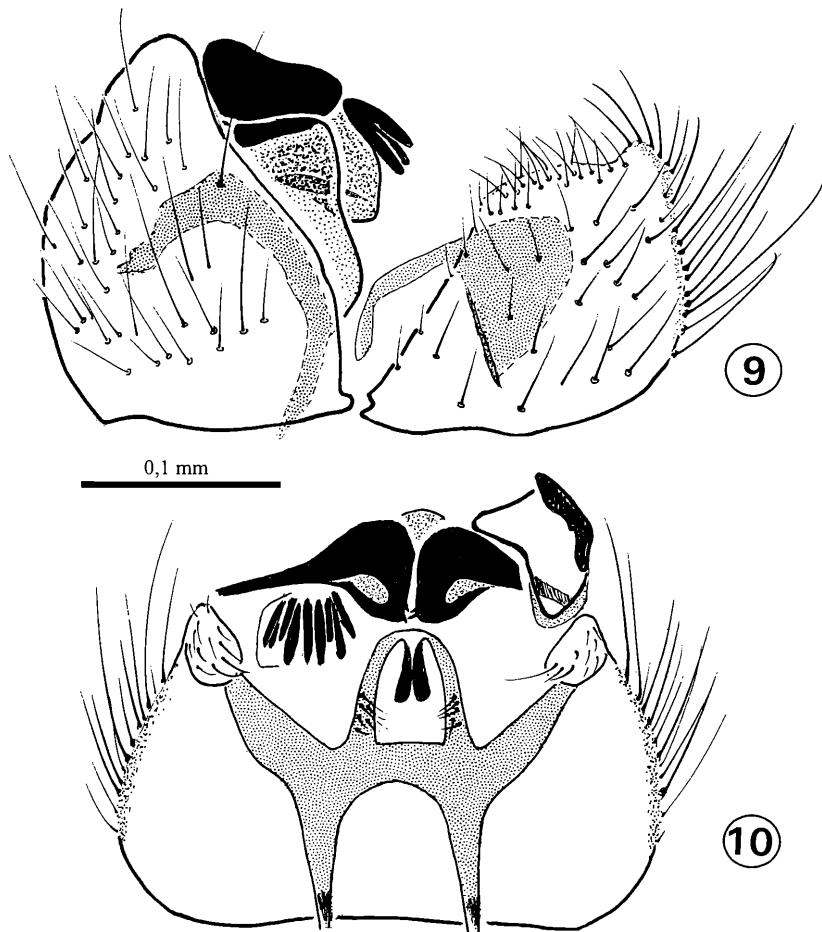
Chalastonepsia spec.

Specimen examined: 1 male, Malaysia: B. Camp; 5°30'07"N, 101°26'21"E; 250 m; 03–13 April 1994 (I. Sivec).

Description:

Male.

Head: Head with its appendages brown. Ocelli three, subequal, lateral ocellus separated from the eye margin and from the median ocellus by about three times its own diameter. Eyes slightly emarginate above base of antennae, sparsely covered with fine hairs. Frons bare. Face densely bristled, subquadrate. Clypeus bare, rounded. Palpus with one visible palpomere, with a large



Figs 9–10: *Chalastonepsia hokkaidensis*, male terminalia.

Fig. 9: gonocoxite and tergite 9, lateral aspect. – Fig. 10: gonocoxites, dorsal aspect.

shallow sensory pit. Antenna with 14 flagellomeres. Flagellomeres 1–13 each enlarged bulbously at base and stalked on about apical half [Fig. 3]. Stalk bare. Flagellomere 14 only slightly extended at base, ending in a stalk with four very small apical cones. Flagellomeres 1–14 densely covered with strong dark setae, some of them conspicuously curved, the others more or less straight; much weaker, almost straight pale setae between; curved setae about 1.5 times as wide as flagellomere at base. Scape and pedicel with some short setae. Antenna about 1.5 times as long as thorax. Postcranium and genae bristled. With a distinct furrow between median ocellus and tip of frontal tubercle. Suture between eye margin and lateral ocellus inconspicuous.

Thorax: Entirely brown. Scutum with short acrostichal, dorsocentral and sublateral setae, the intervening areas bare. Prescutal suture distinct. Scutellum with a transverse row of 8 setae (all of them missing). Mediotergite bare. Anepimeral cleft short. Metepisternum with 2 (maybe 3) setae. Laterotergites with 10 or 13 central setae respectively. Prosternum and mesopleuron bare. Four proepisternal bristles present. Lateral ends of metanotum each with one erect seta.

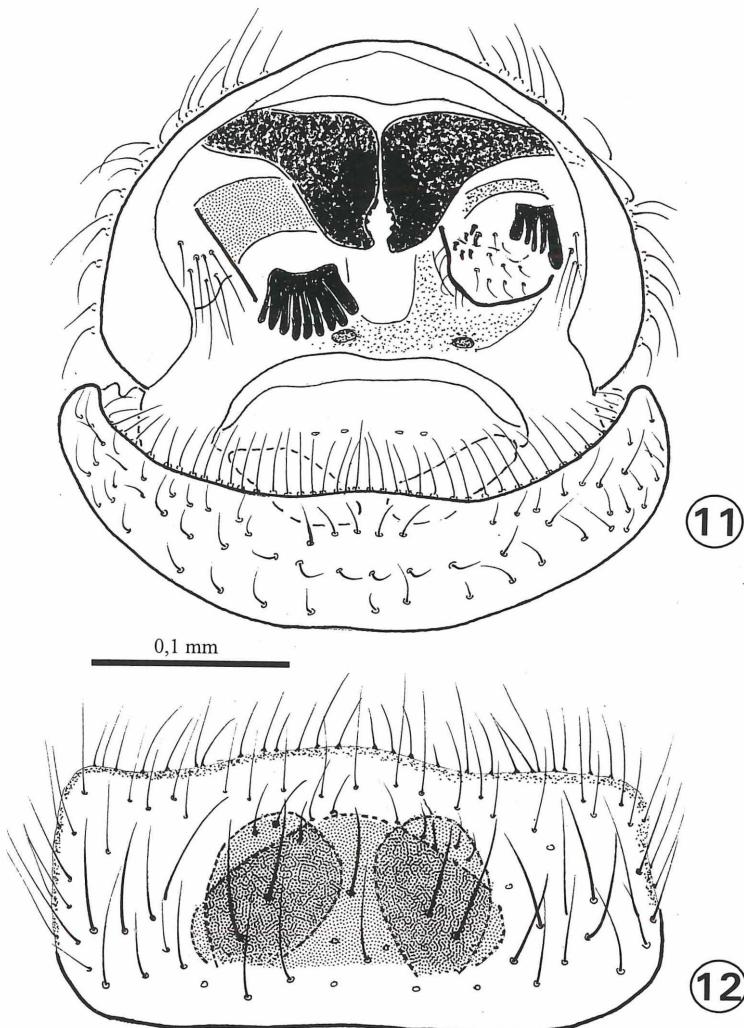
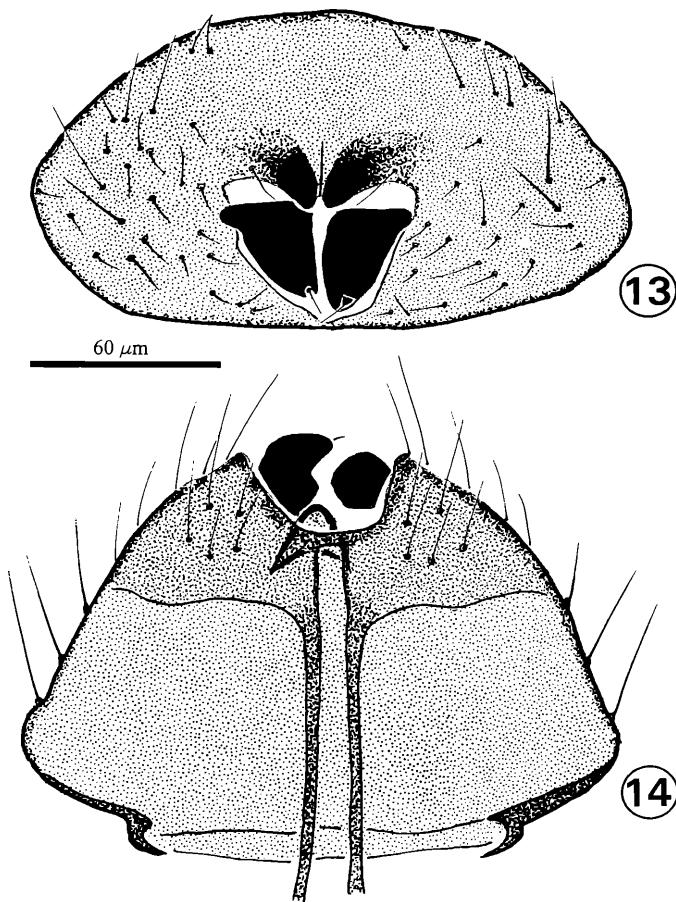
Figs 11-12: *Chalastonepsia hokkaidensis*, male terminalia.

Fig. 11: general view, posterior aspect. – Fig. 12: tergite 9 and proctiger, dorsal aspect.

Wings [Fig. 5]: Length 1.8 mm. Wing unmarked, with very dense, short microtrichia, without macrotrichia on membrane. Microtrichia irregularly arranged. R, R1 and R5 with strong setae above. Sc with 9 or 11 alveoli respectively on basal third, the setae perhaps abraded. Other postcostal veins without setae. C produced for about one-third of the distance between R5 and M1, hardly reaching wing tip. Sc long, ending in R well before level of base of Rs. Rs distinct, about $\frac{2}{3}$ as long as crossvein r-m. M1 nearly four times as long as m-stalk, reaching wing margin; M2 shorter, not reaching wing margin. Point of furcation of CuA well in front of base of crossvein r-m. M and CuA of similar strength. CuP indistinct. CuP and An ending at about level of base of r-m. Halteres pale brownish.

Legs: Fore legs missing. Coxae brown; femora, tibiae and tarsi of mid and hind legs somewhat paler than coxae. Hind coxae with a rather incomplete vertical row of setae (5-6) along outer hind



Figs 13–14: *Chalastonepsia* spec. indet., male terminalia.
Fig. 13: gonocoxites, posterior aspect. – Fig. 14: same, dorsal aspect.

margin. Spurs yellow, with pale vestiture. Spur formula: mid tibia 1.2, 2.0; hind tibia 1.6, 2.6. Fine tibial and tarsal setae irregularly arranged, dark. Legs without strong bristles, except for a few short subapicals on tibiae and a few ventrals on tarsomeres. Tarsal claws each with two small ventral teeth. Empodium small but well developed.

Abdomen: Entirely brown. Sternite 1 bare. Tergite 1, segments 2–7 and tergite 8 with remarkably few dark setae. Sternite 8 with a few marginal setae on posterior side only. Fold-lines which may be present on sternites invisible because of the laterally compressed abdomen. Abdominal segments 5 to 6 damaged. Tergite 8 about 1.2 times as long as tergite 7, sternite 8 about 0.65 times as long as sternite 7. Tergite 9 large [Fig. 15], not fused with gonocoxites [Figs 13–14], about 1.2 times as wide as long; apical edge rounded; dorsally and a little more than apical half ventrally with setae. Cerci rounded, with few setae subapically. Hypoproct subtriangular, with 8–10 setae near apical edge. Gonocoxal apodemes very long. Parameres untraceable. Aedeagus small, subtriangular. Gonocoxites fused ventrally; little shorter than tergite 9; with dark bristling on apical two thirds of ventral surface, except for a bare median stripe; with two rather heavily sclerotized, moderately tapering processes projecting posteriorly. Gonostylus heavily sclerotized, small, little longer than wide, with one short median bristle.

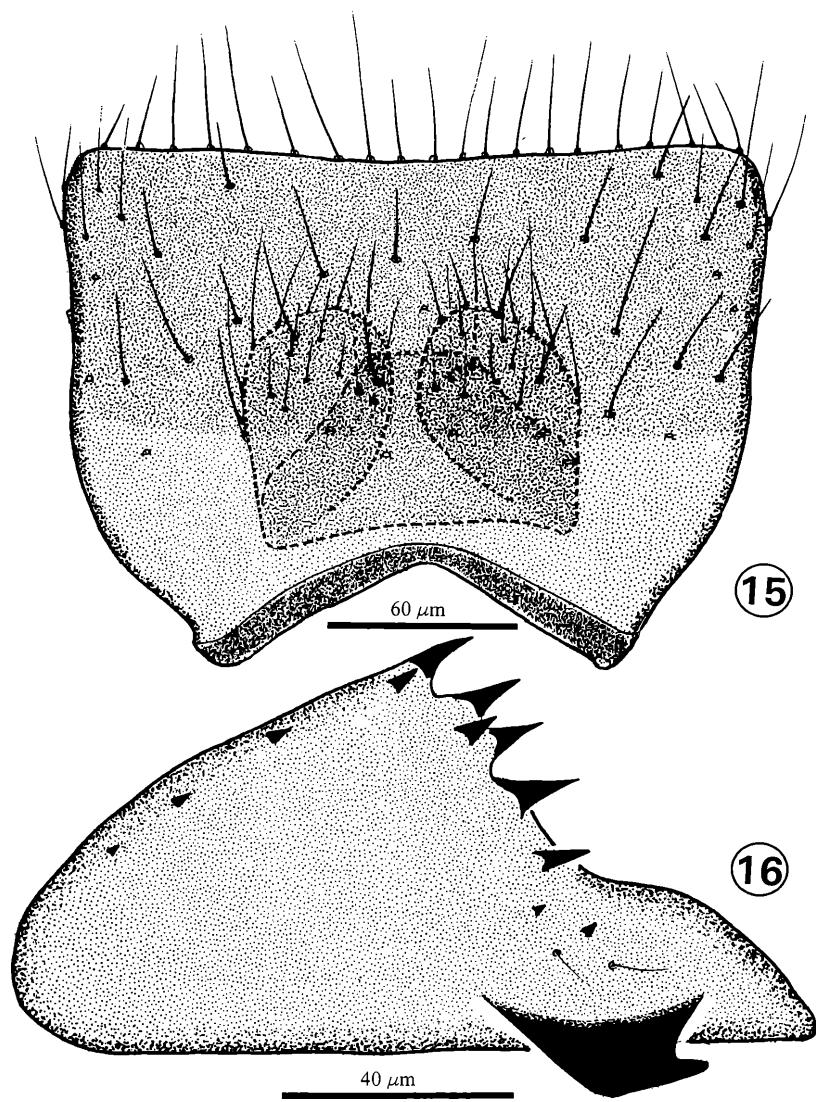


Fig. 15: *Chalastonepsia* spec. indet., male, tergite 9 and proctiger, dorsal aspect. –
 Fig. 16: *Metanepsia malaysiana*, male terminalia, gonostylus, posterior aspect.

Remark: This species is probably conspecific with *Chalastonepsia orientalis* SÖLI.

Distribution: The type of *Chalastonepsia orientalis* SÖLI is from the central area of Peninsula Malaysia. The specimen described above was captured in a more northeastern region of the peninsula.

Diagnosis: Most of the characters of *Ch. orientalis* given by SÖLI fit this specimen well. However, it differs from the type of *Ch. orientalis* by its smaller size, the absence of strong bristles on postradial veins and on basisternum. The outer shape of tergite 9 and the gonocoxites seems to be slightly different from that of *orientalis*.

***Metanepsia malaysiana* spec. nov.**

Specimen examined: Holotype male, Malaysia: B. Camp; 5°30'07"N, 101°26'21"E; 250 m; 03–13 April 1994 (I. Sivec).

Description:

Male.

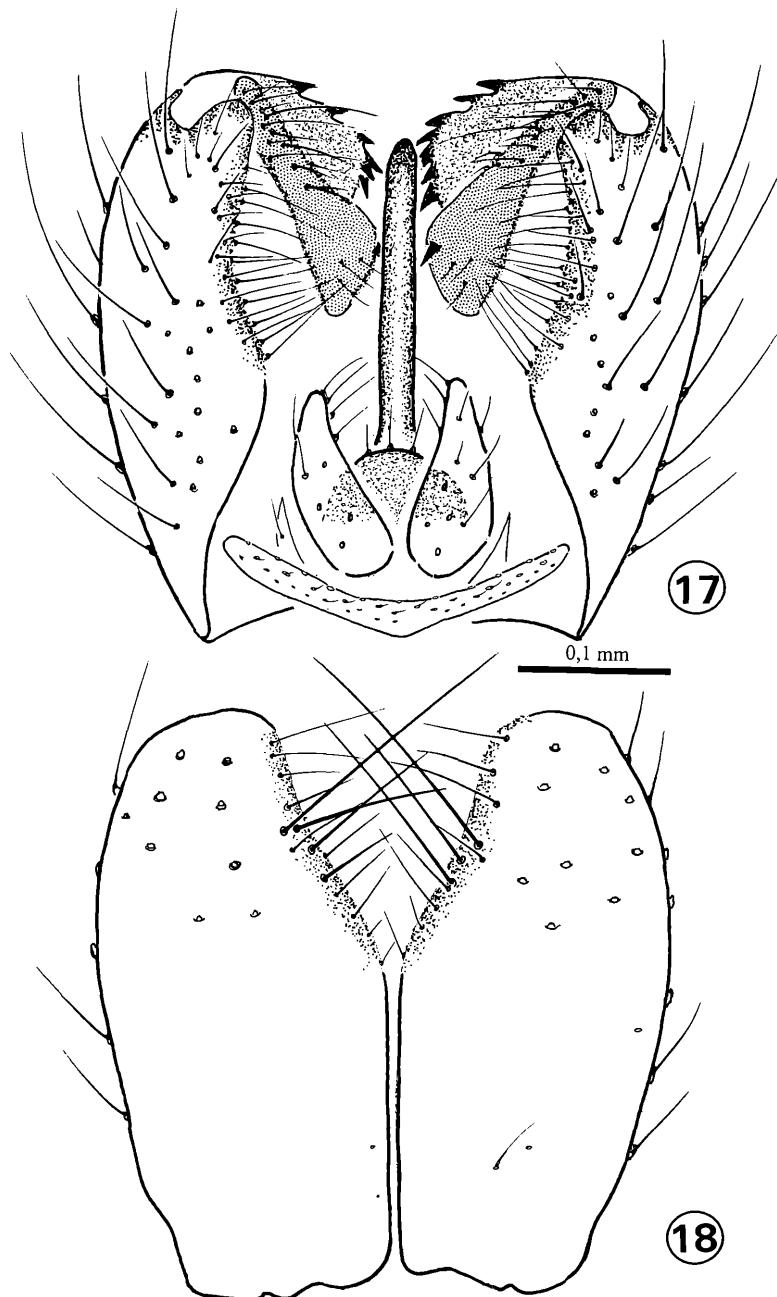
Head: Head capsule, palpi and labella dark brown. Antennae somewhat paler brown. Ocelli three, the median about 0.9 times as wide as each lateral, the latter separated from the eye margin by about 1.6 times its own diameter and from the median ocellus by about 1.3 times its own diameter. Eyes slightly emarginate above base of antennae, sparsely covered with fine hairs. Frons bare. Face densely bristled, shield-like. Clypeus rounded, bristled, slightly longer than broad, not longer than face. Palpus with one visible palpomere, with a large shallow sensory pit. Antennae pectinate, with 14 flagellomeres. All flagellomeres with one conspicuous long side extension [Fig. 2]. Flagellomeres 1–13 with a short bare stalk apically. All flagellar segments densely setose, with a few much weaker pale setae between. Scape and pedicel sparsely covered with short bristles. Antenna nearly twice as long as thorax. Postcranium and genae bristled. Sagittal furrow incomplete, median part absent. Frontal tubercle distinctly bilobate. Suture between eye margin and lateral ocellus distinct.

Thorax: Mostly brown; Propleuron, mesopleuron and mediotergite somewhat paler than scutum and laterotergite. Scutum with relatively short acrostichal, with longer dorsocentral and sublateral setae, the intervening areas bare. No prescutal suture. Scutellum with a transverse stripe of different strong setae and with numerous setae scattered over the extreme lateral part. Prosternum, mesopleuron, mediotergite and metanotum bare. Anepimeral cleft short but distinct. Laterotergites with 16 or 18 central setae respectively. Metapleuron with a patch of very small setae near dorsal edge. Metepisternum bare. 6–7 proepisternal bristles present.

Wings [Fig. 6]: Length 2.4 mm. Wing unmarked, with dense microtrichia, without macrotrichia on membrane. Microtrichia irregularly arranged. R, R1 and R5 with strong setae above, base of CuA with 24 weaker setae above, sc with one weak seta above. Other postcostal veins without setae. C produced for about one-third of the distance between R5 and M1, not reaching wing tip. Sc long, ending free well beyond level of base of m-stalk; Sc2 absent. Rs untraceable. M-branches reaching wing margin; M1 about 1.1 times, M2 about 0.9 times as long as m-stalk. Point of furcation of CuA well beyond base of m-stalk. M-stalk, M1, M2 and CuA1 faint; CuA2 more distinct. CuP and An ending at about level of base of m-stalk. Haltere stalk pale brownish, knob dark brown.

Legs: Entirely yellow, except for a small dark apical patch on inner side of mid and hind coxae. Hind coxae with a rather complete vertical strip of setae (about 10–11) along outer hind margin. Fore tibia hardly longer than fore femur. Spurs yellow, with pale vestiture. Spur formula: 1.0; 0.7, 1.4; 0.8, 2.0. Anteroapical tibial organ of fore tibia much reduced, untraceable. Fine tibial and tarsal setae irregularly arranged, dark. Tibiae without strong bristles. Basitarsus of mid leg and of hind leg ventrally with a few short stronger bristles. Tarsal claws each with a small ventral tooth. Empodium small but well developed.

Abdomen: First segment dark yellow. Segments 2–8 and terminalia [Figs 16–18] brown. Sternite 1 bare. Tergite 1 and segments 2–8 sparsely covered with dark setae. Fold-lines that may be present on sternites invisible because of the laterally compressed abdomen. Abdominal segment 7 and tergite 8 damaged. Tergite 9 short, not fused with gonocoxites, about 2.3 times as wide as long; dorsally with weak setae. Cerci subtriangular, with few scattered setae, mostly near tip. Hypoproct semicircular, with 3 apical setae. Parameres not clearly distinguishable. Aedeagus long, tubular, strongly curved, heavily sclerotized. Gonocoxites separated ventrally by a narrow parallel-sided membranous area, leaving a V-shaped gap posteroventrally; with dark bristling on entire surface. Gonostylus heavily sclerotized, with several pointed teeth near apex and further teeth dispersed over the outer surface along a rather inconspicuous ridge; few weak setae near apical margin.



Figs 17–18: *Metanepsia malaysiana*, male terminalia.
Fig. 17: general view, dorsal aspect. – Fig. 18: gonocoxites, ventral aspect.

Distribution: This species is known only from the type locality in Malaysia.

Etymology: The species is named after Peninsular Malaysia, the region in which the type locality is situated.

Diagnosis: The new species differs most distinctly from others in the genus by the shape of the antennae, especially the one-sided extension of each flagellomere. *M. javana* has the gonostylus rather similar to that of *M. malaysiana*.

Discussion

The genus *Metanepsia* EDWARDS is based on the following characters (MATILE, 1971): reduced mouthparts, modified antennae, fine tibial setae irregularly arranged, absence of strong tibial bristles, anteroapical tibial organ of fore tibia reduced, wings without macrotrichia on membrane, Rs short, median fork as long as m-stalk, posterior fork short and widely open. SÖLI (1996) gave the following characters for his new genus *Chalastonepsia*: reduced mouthparts, modified antennae, fine tibial setae irregularly arranged; absence of strong tibial bristles, except for a few subapicals; anteroapical tibial organ of fore tibia reduced; wings without macrotrichia on membrane, Rs distinct, median fork much longer than m-stalk, posterior fork much longer than its stalk and widely open. The newly described *Chalastonepsia hokkaidensis* differs from the type species of the genus mainly in the much shorter posterior fork and in having distinctly developed strong tibial bristles; also, in the absence of metepisternal bristles, a complete wing vein CuA2 and a gonostylus of completely different structure. In some respects *Ch. hokkaidensis* is morphologically intermediate between *Metanepsia* (sensu MATILE) and *Chalastonepsia* (sensu SÖLI). In common with *Metanepsia*, it has a rather short posterior fork, a complete vein CuA2, metepisternal bristles absent and prescutal suture absent. Otherwise it appears to be closely related to *Chalastonepsia* in having Rs complete, a short m-stalk and above all a large tergite 9 and ventrally fused gonocoxites. The male terminalia of *Ch. hokkaidensis* seem to be of the same type as *Ch. orientalis*, but a more detailed comparative study of its elements is needed.

In the light of these characters, the delimitation of the Metanepsini against the Gnoristinae (sensu VÄISÄNEN, 1986) becomes less clearcut, especially because of the presence of strong tibial bristles. Clarification of its position within the Mycetophilidae, however, must await a thorough revision of the subfamily Gnoristinae.

Revised diagnostic description of the genus *Chalastonepsia*:

- strongly modified antennae, bead-like or pectinate
- reduced mouthparts, third palpomere with a sensory pit
- anteroapical organ of fore tibia more or less reduced
- distinct frontal tubercle
- prescutal suture present or absent
- scutum with bare intervening areas
- mediotergite bare, laterotergites with a few short bristles
- metepisternum with few setae or bare
- wings with a complete Rs; median fork much longer than its stalk
- point of furcation of CuA well in front of base of crossvein r-m or slightly beyond base of r-m
- strong tibial bristles much reduced or distinct
- empodia present
- abdominal segments 7 and 8 rather small
- tergite 9 large, gonocoxites ventrally fused.

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