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The micro-caddisflies of Sumatra and Java (Trichoptera: Hydroptilidae)

A. WELLS & H. MALICKY

A b s t r a c t : New species and new records are added to the hydroptilid (Trichoptera) faunas of the Indonesian islands of Sumatra and Java, to bring the numbers of species to 32 and 21 respectively. Among sixteen species which are newly described, are six in *Chrysotrichia,* two in *Hydroptila*, four in *Orthotrichia*, one in *Stactobia* two in *Scelotrichia* and one in *Ugandatrichia.* New records are given for eighteen species, some from other Indonesian islands, from Vietnam, Malaysia and Hong Kong; several are widespread in the Oriental/Australian Region. *Hydroptila triangulata*, described from Hong Kong, is synonymised with the Vietnamese *H. thuna.*

Introduction

A number of Trichoptera have been described from the Indonesian islands of Sumatra and Java in the last decade, but since the work of ULMER in 1951, only one further Sumatran hydroptilid has been described and no Javanese Hydroptilidae have been described or recorded. ULMER (1951), in what was the first study to include Indonesian micro-caddisflies, named five species from Sumatra and ten from Java, two species being recorded from both islands. Subsequently, he described immatures of some of these species (ULMER 1957) as well as those of several unassociated species. MALICKY & CHANTAMARANGKOL, in 1991, described a single Sumatran species, *Ugandatrichia kanikar*. We now introduce sixteen new species, thirteen Sumatran and three Javanese, and another common to both, and give new records for 18 established species. Thus, we extend the distributions of some of Ulmer's species as well as several others from Vietnam, Borneo, West Malaysia and the more general Oriental-Australasian Region. *Hydroptila triangulata* WELLS & DUDGEON 1990, described from Hong Kong, is synonymised with the Vietnamese *H. thuna* OLÁH 1989.

The hydroptilid fauna of Indonesia and, at the broader level, that of the Malay Archipelago, are proving to be quite diverse at both the genus and the species level. The tribe Stactobiini is well represented with five genera recorded: *Stactobia*

MCLACHLAN 1880, *Plethus* HAGEN 1887, *Chrysotrichia* SCHMID 1958, *Parastactobia* SCHMID 1958 and *Scelotrichia* ULMER 1951. Species are known in six Hydroptilini genera: *Ugandatrichia* MOSELY 1939, *Macrostactobia* SCHMID 1958, *Hydroptila* DALMAN 1819, *Oxyethira* EATON 1873, *Hellyethira* NEBOISS 1977 and *Tricholeiochiton* KLOET & HINCKS 1879. Both Orthotrichiini genera occur in the region: *Orthotrichia* EATON 1873 is quite diverse, and *Ithytrichia* EATON 1873 is recorded from only one species from Java (as *Sarangani otrichia decussata* ULMER 1951, see MARSHALL 1977: 216).

Collecting in the Malay Archipelago has been rather scattered and restricted to particular islands or areas, and usually to few localities. Thus, it is too early to be sure of patterns in distributions. Nonetheless, it is of interest to note that among the thirty-two species presently recorded for Sumatra, eight also occur in Java, three in West Malaysia, five in north-west Borneo, one in Hong Kong, and three in Vietnam. The three species in *Oxyethira* are widespread in the Oriental Region, two also occurring in New Guinea and Australia. The new species include six in *Chrysotrichia,* two in *Hydroptila*, one in *Ugandatrichia*, five in *Orthotrichia* and two in *Scelotrichia*. At present twelve species are known from Sumatra only.

Twenty-one species are listed for Java: the eight in common with Sumatra, one of the widespread *Oxyethira* species, two species also found in Bali, and two others in Vietnam, and nine species known only from Java; three new Javanese species are described, one each in *Chrysotrichia, Stactobia* and *Ugandatrichia*.

Far more work is needed in the Malay Archipelago in general and particularly throughout Indonesia. Although several of the micro-caddisfly species found in the region are widespread, for example those *Oxyethira* species occurring from Sri Lanka or Korea, and throughout SE Asia to New Guinea and northern Australia, others appear to be restricted in distribution and are potentially of considerable biogeographic and conservation interest.

Materials and Methods

Specimens collected by H. Malicky from Java in January 1996, and from Sumatra during several separate expeditions, in February and March 1991, and the same months in 1994 were taken at lights. Several samples were donated by Dr. E.W. Diehl. The specimens collected from Java by A. Wells in August 1993 were mostly netted from riparian vegetation. Drs. Ing. Agus Kristyanto kindly donated several samples he collected in Java. Specimens are deposited as indicated in the Australian National Insect Collection, CSIRO, Division of Entomology, Canberra and National Museum of Natural History, Leiden, the Netherlands (ANIC and RMNH respectively), and in the collection of H. Malicky. The Natural History Museum, London, Musei Nationalis

Hungarici, Budapest, and Indian Museum, Calcutta, are abbreviated as BMNH, MNH and IM, respectively.

Material was prepared for study following the methods of WELLS (1992). All primary types of new species, and some paratypes, are mounted on slides as are representatives of most species. All other material is stored in 70% ethanol.

Systematics

Stactobia keluk WELLS

Stactobia keluk WELLS 1993: 354. Holotype, ♂, Bali, NTM.

Material examined: 2♂♂, East Java, Meru Betiri, 27.viii. 1993, A. Wells, ANIC.

Remarks: This species, described from Bali, closely resembles the new Javanese species, *Stactobia betiri* sp.nov., and *S. bersisik* WELLS 1993, although it can be recognised by the narrower sclerotised ridges at the base of the inferior appendages.

Distribution: Indonesia (Bali, Java).

Stactobia bersisik WELLS

Stactobia bersisik WELLS 1993: 253. Holotype, ♂, Bali, NTM.

Material examined: 2♂♂, East Java, Meru Betiri, 27.viii. 1993, A. Wells, ANIC.

Remarks: *Stactobia bersisik*, also described from Bali, resembles *S. keluk* and *S. betiri* sp.nov., but is distinguished readily by the dark scales on the legs and posterior abdomen.

Distribution: Indonesia (Bali, Java).

Stactobia betiri sp.nov. (Figs 1-3)

Type material: Holotype, ♂, East Java, Meru Betiri, 27.viii.1993, A. Wells, ANIC. Paratypes: 13♂♂, same data as for holotype, ANIC, HM coll.; 1♂, Central Java, Kebumen, nr Salatiga, 10.i.1996, H. Malicky, HM coll.

Description: ♂, anterior wing length 1.4-1.6 mm. Tibial spur formula 1,2,4. Antennae 18-segmented, flagellar segments quadrate, with sensilla placodea. A stout posteriorly directed mesal process between abdominal segments VII and VIII. Genitalia (Figs 1-3). Dorso-laterally on tergum IX a pair of irregularly curved processes arise from apodemes and protrude posteriorly and overlap distally. Tergum X short, membranous. Subgenital plate not apparent. Inferior appendages fused to a modified

and sclerotised part of segment IX, at base broad, digitate distally. Aedeagus short, stout.

Remarks: This species closely resembles *Stactobia keluk* and *S. bersisik* from Bali, being distinguished mainly by the dorsal processes on abdominal segment IX, greater modification to the ventral part of the segment at the base of the inferior appendages and absence of dark scales on the legs and posterior abdomen.

Distribution: Indonesia (Java).

Etymology: Named for the park in south-eastern Java, Meru Betiri.

Plethus cruciatus ULMER

Plethus cruciatus ULMER 1951: 62. Holotype ♂, Sumatra, Padang, UZM.

Material examined: 7♂♂, East Java, Meru Betiri, 27.viii. 1993, A. Wells, ANIC, HM coll.

Remarks: *Plethus cruciatus* is closely similar to *P. acutus* ULMER 1951 and *P. bishopi* WELLS & HUISMAN 1993, differing mainly in having stouter postero-lateral lobes on abdominal segment IX and the aedeagus stouter.

Distribution: Indonesia (Bali, Java, Sumatra).

Scelotrichia buluhalus WELLS & HUISMAN

Scelotrichia buluhalus WELLS & HUISMAN 1993: 107. Holotype, ♂, East Malaysia, Sabah, RMNH.

Material examined: ♂, N Sumatra, Huta Padang, 02°45'N 99°14'E, 12.ii.1991, H. Malicky, HM coll.

Remarks: *Scelotrichia buluhalus* is readily recognised by the moth-like appearance of the males, which have a body and wing vestiture of small scales. The male genitalia are relatively simple for the genus. In this Sumatran specimen, the inner distal meso-ventral structure (?subgenital plate) is rather better developed than in the type, however, the differences are considered not sufficient to separate the two at the species level.

Distribution: Brunei; Indonesia (Sumatra); Malaysia (Sabah).

Scelotrichia saranganica ULMER (Figs 4-7)

Scelotrichia saranganica ULMER 1951: 74. Holotype, ♂, Java, Sarangan, UHZM.

Material examined: ♂, N Sumatra, Huta Padang, 02°45'N 99°14'E, 2.iii.1991, H. Malicky, HM coll.; 7♂♂, East Java, Gunung Ijen, stream on road, between G. Ijen and Licin, 1620 m asl, 22.viii.1993, Wells, ANIC, HM coll.

Remarks: One male from N Sumatra and several from Java are referred tentatively to *Scelotrichia saranganica*, the type species for the genus *Scelotrichia*, on the basis of similarities in the overall form of the inferior appendages and tip of the aedeagus shown in the rather inadequate figure given by ULMER (1951). According to MARSHALL (1977), ULMER's holotype is in no condition to recognise. A.W. examined a slide of a paratype male in the collection of the BMNH (#223), finding that it lacked genitalia. The genitalia of a Javanese male are illustrated here (Figs 4-7) for future reference and for comparisons. This species resembles some of the Malaysian species and the new Sumatran species S. *bercabanghalus* sp.nov. in various characters, but is distinguished by the four terminal spines on the aedeagus.

Distribution: Indonesia (Java, Sumatra).

Scelotrichia bercabanghalus sp.nov. (Figs. 8-11)

Type material: Holotype, ♂, N Sumatra, Huta Padang, 02°45'N 99°14'E, 2.iii.1991, H. Malicky, HM coll.

Description: ♂. Antennae 18-segmented. Tibial spurs 0,2,4, a knob on foretibia. Anterior wing length, 1.9 mm. Genitalia, see Figs 8-11. Dorsal plate short, broad-based, abruptly narrowed to a short median part, apically concave. Aedeagus stout, elongate, bilobed beyond two pairs of subapical spines, apices of lobes with fine spicules. Inferior appendages simple, clasper-shaped in ventral view, apices rounded, medially a small group of pale teeth on inner margins.

Remarks: Superficially, this species resembles *S. saranganica*, but it differs in having the apices of the aedeagus finely spined and apices of inferior appendages evenly rounded, not produced on inner side. Only a single male has been collected.

Distribution: Indonesia (Sumatra).

Etymology: Indonesian - „bercabang", divided and „halus", finely for the apex of the aedeagus.

Scelotrichia simplex sp.nov. (Figs 12-14)

Type material: Holotype, ♂, N Sumatra, Huta Padang, 02°45'N 99°14'E, 2.iii.1991, H. Malicky, HM coll. Paratypes, 3♂♂, same locality as for holotype, 8.ii.1991, 25.ii.1991, HM coll.

Description: ♂. Antennae 20-segmented. Tibial spurs 0,2,4, a knob on foretibia. Anterior wing length, 2.3 mm. Genitalia, see Figs 12-14. Dorsal plate short, membranous, truncate apically. Aedeagus stout, simple. Inferior appendages simple, clasper-shaped in ventral view, tapered distally to rounded apices, dorsally about 4 prominent setae subapically. Laterally and dorsal to the inferior appendages a pair of processes with deep apodemes.

Remarks: This species resembles *S. kait* from Sabah in East Malaysia, but differs in lacking teeth on the inner margin of the inferior appendages and in that the lateral processes above the inferior appendages are only slightly curved, whereas in *S. kait* similar processes (previously postulated to be part of the dorsal plate or tergum X) are hooked.

Distribution: Indonesia (Sumatra).

Etymology: named for the relatively simple male genitalia.

***Chrysotrichia margemiring* sp.nov. (Figs 15,16)**

Type material: Holotype, ♂, N Sumatra, Huta Padang, 02°45'N 99°14'E, 2.iii.1991, H. Malicky, HM coll. Paratypes, N Sumatra: 32♂♂, same data as for holotype, HM coll.; ♂, Huta Padang, 02°45'N 99°14'E, 8.ii.1991, H. Malicky, HM coll.; ♂, Huta Padang, 02°45'N 99°14'E, 12.ii.1991, H. Malicky, HM coll.; ♂, Huta Padang, 02°45'N 99°14'E, 17.ii.1991, H. Malicky, HM coll.; 7♂♂,♀, Bukit Maratya, Sungai Bahapal, 03°00'N 99°14'E, 200 m asl, 19.ii.1991, H. Malicky, HM coll.; 1♂, Huta Padang, 02°45'N 99°14'E, 20.ii.1991, H. Malicky, HM coll.; 13♂♂, Huta Padang, 02°45'N 99°14'E, 25.ii.1991, H. Malicky, HM coll.; 1♂, Simarito, 15 km N Sindar Raya, 03°09'N 98°57', 400 m asl, 3.iii.1991, H. Malicky, HM coll.; ♂,♀, Aek Tarum, 2°40'32"N 99°18'30"E, 180 m asl, 21.ii.1994, H. Malicky, HM coll.

Description: Males small, anterior wing length 1.2-1.5 mm. Antennae 19-segmented, flagellar segments elongate, with dense sensilla placodea. Tibial spurs 1,3,4. Genitalia (Figs 15, 16) asymmetrical. Abdominal segment IX with long anterior apodemes, laterally a pair of stout unequal strap-like processes extending from base of segment almost to tip of tergum X; on left the segment extends forward within segment VIII to its anterior margin. Tergum X slightly longer than inferior appendages, rounded to truncate apically. Subgenital plate slightly divided apically. Inferior appendages equal, slightly tapered distally, several moderate length setae apically. Aedeagus slender almost straight, apically slightly narrowed.

Remarks: This species is placed in *Chrysotrichia* although it differs in having the tibial spur formula 1,3,4, not 0,2,4, and the male is unusual in having asymmetrical genitalia. This spur formula occurs in a new Javanese species *C.duatali* sp.nov. also described here, and has been recorded for several other *Chrysotrichia* species (WELLS & HUISMAN 1993). *C. maratya* sp.nov. differs from *C. margemiring* in having abdominal segment IX strongly asymmetrical and dorso-lateral processes on segment IX expanded mesally below the apex.

Distribution: Indonesia (Sumatra).

Etymology: Indonesian - „marge", margin and „miring", skew for the unusual asymmetry of the anterior margin of abdominal segment IX.

***Chrysotrichia duatali* sp.nov. (Figs 17, 18)**

Type material: Holotype, ♂, East Java, Meru Betiri, stream in savannah, 27.viii.1993, A. Wells, ANIC.

Description: ♂, anterior wing length 1.3 mm. Antennae 18-segmented, flagellar segments rectangular, with dense sensilla placodea. Tibial spurs 1,3,4, foretibial spur tiny. Genitalia (Figs 17, 18). Abdominal segment IX with dark stout internal apodemes from which extend dorso-laterally a pair of long stout, unequal sclerotised strap-like processes, each with a long, stout internal apodeme, the right process rounded apically, the left acute, both expanded subapically on the mesal margin. Tergum X membranous, rounded apically. Inferior appendages subtriangular in ventral view, stout and apically rounded in lateral view. The short sclerotised bar and unequal lobes dorsal to the inferior appendages may represent the ventral plate. Aedeagus simple.

Remarks: *Chrysotrichia duatali* resembles *C. margemiring* in general form of male genitalia and spur formula, differing mainly in the genitalia being more symmetrical and having the more irregular-shaped dorso-lateral processes on segment IX.

Distribution: Indonesia (Java).

Etymology: Indonesian: „dua", two and „tali", strap, for the two lateral processes on segment IX.

***Chrysotrichia sukamade* sp.nov. (Figs 19, 20)**

Type material: Holotype, ♂, East Java, Meru Betiri, stream in savannah, 27.viii.1993, A. Wells, ANIC. Paratype ♂, N Sumatra, Huta Padang, 25.ii.1991, H. Malicky, HM coll.

Description: ♂ tiny, anterior wing length 1.1 mm. Antennae damaged, flagellar segments quadrate. Tibial spurs 0,2,4. Genitalia (Fig. 19, 20). Abdominal segment VIII broad, clusters of strong, dark setae apico-laterally. Segment IX narrow, posteriorly with unequal internal apodemes; a pair of spiny sclerotised processes dorso-laterally. Tergum X membranous. Subgenital plate also membranous, truncate apically. Inferior appendages fused to form a subtriangular structure. Aedeagus slender distally.

Remarks: As with so many species in this genus, the male genitalia are difficult to interpret. In the form of the internal apodemes of segment IX of the male, this species groups with *C. margemiring* and *C. duatali*, although in shape and size of segment IX it more closely resembles most of the other species in the genus. The combination of dorsal processes and fused inferior appendages are distinctive.

Distribution: Indonesia (Java, Sumatra)

Etymology: Named for the village near the type locality, Sukamade.

***Chrysotrichia hutapadangensis* sp.nov. (Figs 21-25)**

Type material: Holotype, ♂, N Sumatra, Huta Padang, 2.iii.1991, H.Malicky, HM coll. Paratype, ♂, same data as for holotype.

Description: ♂, anterior wing length, 1.2 mm. Antennae 18-segmented. Genitalia (Figs 21-25). Tibial spurs 0, 2, 4. Abdominal segment IX short, subquadrate dorsally, produced distally in short finger-like processes apico-laterally; internal apodemes about 3X as long as segment. Tergum X shorter than processes on IX, more or less rectangular. Inferior appendages elongate-triangular in ventral view, well separated by a median process which probably represents the subgenital plate and curves slightly downwards in lateral view. Aedeagus tripartite in distal half, ejaculatory duct less than half length of lateral processes which are slightly divided in distal half.

Remarks: This species shows some resemblance to *Chrysotrichia terpisaduri* WELLS 1993 from Bali, particularly in the arrangement of the male genitalic structures including the downturned subgenital plate, and the shape of the aedeagus. *Chrysotrichia hutapadangensis* is distinguished by the apico-lateral processes on segment IX and the shorter subtriangular inferior appendages.

Distribution: Indonesia (Sumatra), known from the type locality only.

Etymology: Named for the type locality.

***Chrysotrichia maratya* sp.nov. (Figs 26-28)**

Type material: Holotype, ♂, N Sumatra, Bukit Maratya, Sungai Bahapal, 03°00'N 99°14'E, 200 m asl, 19.ii.1991, H. Malicky, HM coll. Paratypes, N Sumatra: 7♂♂, 32♀♀, same data as for holotype (4♂♂, 3♀♀, on slides); 1♂, 6♀♀, Dolok Merangir (Brook), 03°07'N 99°11'E, 21.ii.1991, H. Malicky, HM coll.

Description: Anterior wing length, ♂ 1.4-1.5 mm, ♀ 1.4-1.6 mm. ♂antennae 18-segmented. Genitalia (Figs 26-28). Abdominal segment IX narrow, in dorsal view subquadrate, several setae at apico-lateral angles. Tergum X membranous, tapered to rounded apex. Subgenital plate elongate, in ventral view narrow, apically truncate, in lateral view sinuate, broad at base narrowed to acute apex. Inferior appendages fused basally, bilobed and slender distally, a pair of dorso-lateral processes at junction of lobes. Aedeagus slender, trifid distally, outer processes over twice as long as median ejaculatory tube.

Remarks: *Chrysotrichia maratya* closely resembles some of the Malaysian *coodi*-group species, particularly *C. angkup* WELLS & HUISMAN 1993, but is distinguished in the male by the trifid aedeagus and dorso-lateral processes near the base of the inferior appendages.

Distribution: Indonesia (Sumatra).

Etymology: named for the type locality, Bukit Maratya.

Chrysotrichia elongata sp.nov. (Figs 29-31)

Type material: Holotype, ♂, Sumatra, Huta Padang, 2.iii.1991, H. Malicky, HM coll. Paratypes, 24♂♂, same data as for holotype, HM coll.; ♂, Sumatra, Huta Padang, 8.ii.1991, H. Malicky, HM coll.

Description: ♂ tiny, anterior wing length, 1.3-1.5 mm. Antennae 18-segmented. Tibial spurs 0,2,4. Genitalia (Figs 29-31), with main structures extraordinarily elongate, arched ventrally. Abdominal segments VIII and IX slender, segment IX short, but with apodemes elongate, extending anteriorly to the anterior margin of segment VII. Tergum X short, rounded, not clearly delineated from IX, a pair of spine-like processes, each with subsidiary "denticles", arises apico-laterally and curves dorsally. Subgenital plate probably represented by the elongate median structure, slightly divided apically. Inferior appendages fused for about three quarters length, narrowly divided distally, paired long fine setae basally. Aedeagus trifid distally, ejaculatory tube as long as the longer of the two unequal processes.

Remarks: This species shows extreme development of the male inferior appendages and subgenital plate, so exaggerated as to make it impossible to orientate a preparation in true ventral or dorsal position for viewing microscopically. In general form of male genitalia, it resembles *Chrysotrichia maratya* from Sumatra, *C. coodi* WELLS & HUISMAN 1993 and *C. hermani* WELLS & HUISMAN 1993 from Brunei and Sabah in Borneo, but is distinguished from these species by the much shorter segment IX and easily recognised by the downturned genitalic structures. Several other Malaysian species show some resemblance to this Sumatran form - *C. tajam* WELLS & HUISMAN 1993 and *C. angkup* WELLS & HUISMAN 1993, in having elongate genitalic structures, but in these the aedeagus is simple and undivided distally; each of these species, however, has curved processes apico-laterally on tergum X and the IXth segment short.

Distribution: Indonesia (Sumatra).

Etymology: Named for the very long male genitalic structures.

Ugandatrichia kebumen sp.nov. (Figs 32-35)

Type material: Holotype, ♂, Central Java, Kebumen near Salatiga, 10.i.1996, H. Malicky, HM coll. Paratype, ♂, same data as for holotype.

Description: ♂ anterior wing length, 3-3.5 mm; no round pocket of androconia before the middle of forewing. Tibial spurs 0,3,4. Genitalia (Figs 32-35). Abdominal segment IX round in lateral aspect, with distinctly separated dorsal part. Segment X long and slender, pointed, with a minute subdistal ventral hook. Inferior appendages long and slender, in lateral aspect bent down, in ventral aspect almost straight, equally broad almost the whole length, a dark, short tooth on inner surface at about $^2/_3$ the length of the appendage. Aedeagus without a titillator.

Remarks: This species is similar to *U. honga* OLÁH 1989 (of which *U. navicularis* XUE & YANG 1990, is a synonym), but *U. honga* has no dark tooth on the inner surface of the inferior appendage. The ventral aspect of the inferior appendages resembles that of *U. hairanga* OLÁH 1989, but the lateral aspect as well as the 10th segment are clearly different, and the titillator and the androconial pocket on the forewing are absent in *U. kebumen*.

Distribution: Indonesia (Java).

***Hydroptila tong* sp.nov. (Figs 36, 37)**

Type material: Holotype, ♂, N Sumatra, Sungai Aek Tarum, Labuan Hulu near Aek Tarum, 2°42'18"N 99°22'31"E, 80 asl, 21.ii.1994, H. Malicky, HM coll. Paratypes, N Sumatra: 3♂♂, Simarito, 15 km N Sindar Raya, 03°09'N 98°57', 400 m asl, 3.iii.1991, H. Malicky, HM coll.

Description: ♂ small, with elaborate scent organs beneath post-occipital lobes on dorsal head. Antennae 24-segmented, flagellar segments subquadrate, with sparse sensilla placodea and large pit-like areas. Anterior wing length 1.4-1.5 mm. Genitalia (Figs 36, 37). Abdominal segment VII with a small acute spine mid ventrally. Segment IX elongate, barrel-shaped, postero-ventral margin almost truncate, ventrally a pair of small lobes at about three quarters length. Tergum X triangular, membranous. Dorso-laterally a pair of irregular-shaped sclerotised processes with long apodemes extending almost the length of segment IX, in ventral view swollen basally, apically slightly hooked. Inferior appendages elongate, tapered towards apices, a lateral tab-like seta at about two-thirds length.

Remarks: As with so many of the species in this genus, male genitalia of *H. tong* are distinctive although the inferior appendages are not atypical. The form of the subgenital plate suggests that this species groups with *H. thuna* OLÁH which is a *sparsa*-group species. The most unusual feature of *H. tong* is the presence of sclerotised lobes dorsally which may represent lateral lobes of a tripartite tergum X, but which have deep broad internal apodemes; the barrel shape of segment IX; and the long fine aedeagus which appears to lack a titillator. *Hydroptila tong* and *H. trullata* ULMER show close resemblance. Ulmer's species lacks the very obvious subapical peg-like seta seen on the inferior appendages of *H. tong,* a feature that he would surely have figured if present. The types of *H. trullata* on slides are poor and the spirit specimens are all faded and brittle. None of the Sumatran specimens upon which the new name is based has a long titillator on the aedeagus as shown in Ulmer's figures for *T. trullata*, just a slight twist adpressed to the aedeagus.

Distribution: Indonesia (Sumatra).

Etymology: Indonesian - „tong", barrel, for the shape of abdominal segment IX.

Hydroptila gapdoi OLÁH (Figs 38-41)

Hydroptila gapdoi OLÁH 1989: 281. Holotype, ♂, Vietnam, HNHM.

Material examined: ♂, Sumatra, Huta Padang, 25.ii.1991, H. Malicky, HM coll.

Remarks: *Hydroptila gapdoi* (Figs 38-41) is distinguished from other *sparsa*-group species by the small subapical spur on the inferior appendages, slightly upturned subgenital plate and relatively wide subrectangular segment VIII into which segment IX is retracted. This species and *Hydroptila acrodonta* XUE & YANG 1990 from China are probably synonyms. However, the shape of the titillator or parameres (see fig. 41) does not correspond in XUE & YANG and OLÁH's original descriptions and differs yet again in the Sumatran specimens. This may simply represent geographic variability or have greater significance. For the present, a single species is recognised.

Distribution: Indonesia (Sumatra) and Vietnam, and possibly China.

Hydroptila thuna OLÁH (FIGS 42-44)

Hydroptila thuna OLÁH 1989: 281. Holotype, ♂, Vietnam, HNHM.

Hydroptila triangularis WELLS & DUDGEON 1990: 168. **Syn.nov.** Holotype ♂, Hong Kong, BMNH.

Material examined: N Sumatra: 3♂♂, Dolok Merangir, 10-31.i.1970, E.W. Diehl, HM coll.; ♂, Dolok Merangir, 22.ii-4.iv.1970, E.W. Diehl, HM coll.; ♂, Dolok Merangir, 12.iv-7.v.1970, E.W. Diehl, HM coll.; ♂, ♀, Huta Padang, 02°45'N 99°14'E, 8.ii.1991, H. Malicky, HM coll.; 10♂♂, 14♀♀, Marihat, 03°52'N 99°06'E, 13.ii.1991, H. Malicky, HM coll.; 5♂♂, 3♀♀, Dolok Merangir (Brook), 03°07'N 99°11'E, 21.ii.1991, H. Malicky, HM coll.; ♂, Huta Padang, 25.ii.1991, H. Malicky, HM coll.; ♂, Huta Padang, 2.iii.1991, H. Malicky, HM coll.; 3♂♂, 7♀♀, Dolok Merangir (Spring), 03°07'N 99°11'E, 4.iii.1991, H. Malicky, HM coll.; 184♂♂, 403♀♀, Bukit Maratya, Sungai Bahapal, 03°N 99°14'E, 200 m asl, 19.ii.1991, H. Malicky, HM coll.

Remarks: This *sparsa*-group species is easily recognised by the strap-like process on the aedeagus, triangular subgenital plate and row of setae on outer subapical margin of the inferior appendages (Figs 42, 44). *Hydroptila triangularis* WELLS & DUDGEON 1990, is here synonymised with *H. thuna* OLÁH 1989. The small mound on the inferior appendages (Fig. 45) is pale indistinct in Sumatran specimens, although illustrated as a clear dark spur on the type.

Distribution: Hong Kong, Indonesia (Sumatra), Vietnam.

Hydroptila pintal WELLS & HUISMAN

Hydroptila pintal WELLS & HUISMAN 1992: 99. Holotype ♂, East Malaysia, Sabah, NTM.

Material examined: N Sumatra: 4♂♂, 6♀♀, Huta Padang, 02°45'N 99°14'E, 8.ii.1991, H. Malicky, HM coll.; 1♀, Huta Padang, 02°45'N 99°14'E, 20.ii.1991, H. Malicky, HM coll.; 8♂♂, 15♀♀, Huta Padang, 02°45'N 99°14'E, 25.ii.1991, H. Malicky, HM coll.; 1♂, 3♀♀, Dolok Merangir (Brook), 21.ii.1991, H. Malicky, HM coll.; 50♂♂, 250♀♀, Huta Padang, 02°45'N 99°14'E, 2.iii.1991, H. Malicky, HM coll.; 5♀♀, Dolok Merangir (Spring), 4.iii.1991, H. Malicky, HM coll.; 11♂♂, ♀, Bukit Maratya, Sungai Bahapal, 03°N 99°14'E, 200 m asl, 19.ii.1991, H. Malicky, HM coll.; ♂, Aek Tarum, 2°40'32"N 99°18'30"E, 180 m asl, 21.ii.1994, H. Malicky, HM coll. - Java: ♂, Sungai Awu, below Tuwel, 25.viii.1994, Agus Kristyanto, HM coll.

Remarks: *Hydroptila pintal*, another *sparsa*-group species, most closely resembles the Vietnamese species *H. ngaythibaya* OLÁH 1989, but is distinguished by the slightly divergent, slender spines forming the lateral lobes of the tripartite tergum X and subapical twist on the aedeagus.

Distribution: Malaysia (Sabah); Indonesia (Sumatra, Java).

Hydroptila rumpun WELLS & HUISMAN (Fig. 45)

Hydroptila rumpun WELLS & HUISMAN 1992: 100. Holotype, ♂, West Malaysia, NTM.

Material examined: N Sumatra: 1♂, Huta Padang, 02°45'N 99°14'E, 2.ii.1991, H. Malicky, HM coll.; 1♂, 2♀♀, Huta Padang, 02°45'N 99°14'E, 8.ii.1991, H. Malicky, HM coll.; 17♂♂, 85♀♀, Marihat, 03°52'N 99°06'E, 13.ii.1991, H. Malicky, HM coll.; 10♂♂, 60♀♀, Bukit Maratya, 19.ii.1991, H. Malicky, HM coll.; 3♂♂, 5♀♀, Huta Padang, 02°45'N 99°14'E, 20.ii.1991, H. Malicky, HM coll.; 6♂♂, 76♀♀, Dolok Merangir (Brook), 21.ii.1991, H. Malicky, HM coll.; 28♂♂, 15♀♀, Huta Padang, 02°45'N 99°14'E, 25.ii.1991, H. Malicky, HM coll.; 29♂♂, 106♀♀, Huta Padang, 02°45'N 99°14'E, 2.iii.1991, H. Malicky, HM coll.; 1♂, 6♀♀, Dolok Merangir (Spring), 4.iii.1991, H. Malicky, HM coll.; 90♂♂, 100♀♀, Sungai Aek Tarum, Labuan Hulu near Aek Tarum, 2°42'18"N 99°22'31"E, 80 m asl, 21.ii.1994, H. Malicky, HM coll.; 17♂♂, 2♀♀, Aek Tarum, 2°40'32"N 99°18'30"E, 180 m asl, 21.ii.1994, H. Malicky, HM coll.

Remarks: This species is assigned to the *vectis*-group which also includes two Palaearctic species. *Hydroptila rumpun* is distinguished by its robust inferior appendages, bifid subgenital plate and apico-lateral hair tufts on tergum X. The lateral aspects of the male genitalia, not illustrated with the original description are shown here in Fig. 45, drawn from Sumatran material.

Distribution: Malaysia (West Malaysia); Indonesia (Sumatra).

Hydroptila sabit WELLS & HUISMAN (Fig. 46)

Hydroptila sabit WELLS & HUISMAN 1992: 106. Holotype, ♂, West Malaysia, NTM.

Material examined: N Sumatra: 3♂♂, Huta Padang, 02°45'N 99°14'E, 25.ii.1991, H. Malicky, HM coll.; 5♂♂, Huta Padang, 02°45'N 99°14'E, 2.iii.1991, H. Malicky, HM coll.; 1♂, Tonduhan, waterfall, 2°48'28"N 99°11'03"E, 300 m asl, 8.iii.1994, H. Malicky, HM coll.

Remarks: This species, also described from a single specimen from peninsular Malaysia, was not placed in any species group. The male genitalia are distinctive with groups of dark setae dorsally on tergum IX, stout inferior appendages, subgenital plate apically bifid and tergum X with a pair of lateral processes apically. The la-

teral aspects of the male genitalia, not illustrated with the original description are shown here in Fig. 46, drawn from Sumatran material.

Distribution: Malaysia (West Malaysia); Indonesia (Sumatra).

Hydroptila tombolhitam sp.nov. (Figs 47-49)

Type material: Holotype, ♂, N Sumatra, Huta Padang, 02°45'N 99°14'E, 2.iii.1991, H. Malicky, HM coll. Paratypes: N Sumatra: 12♂♂, 7♀♀, same data as for holotype, HM coll.; 1♂, Dolok Merangir, 2-21.xi.1970, E.W. Diehl, HM coll.; ♂, Huta Padang, 02°45'N 99°14'E, 8.ii.1991, H. Malicky, HM coll.; 2♂♂, Dolok Merangir (Brook), 03°07'N 99°11'E, 21.i.1991, H. Malicky, HM coll.; ♂, Marihat, 13.ii.1991, H. Malicky, HM coll.; 10♂♂, Huta Padang, 02°45'N 99°14'E, 25.ii.1991, H. Malicky, HM coll.; 3♂♂, Dolok Merangir (Spring), 4.iii.1991, H. Malicky, HM coll.; ♂, Aek Tarum, 2°40'32"N 99°18'30"E, 180 m, 21.ii.1994, H. Malicky, HM coll.; 2♂♂, Sungai Aek Tarum, Labuan Hulu near Aek Tarum, 2°42'18"N 99°22'31"E, 80 m asl, 21.ii.1994, H. Malicky, HM coll.; 1♂, (4♀♀), 8 km S Sindar Raya, 23.ii.1994, H. Malicky, HM coll.

Description: ♂ anterior wing length 1.6-1.8 mm. Antennae long, 31-segmented, flagellar segments quadrate, with small sparse sensilla placodea and one large sensory pit apically on segments. Genitalia (Figs 47-49). Abdominal segment IX stout, produced ventro-laterally to form a pair of robust lobes which are sclerotised apically, also produced medially to form a short rounded knob. Tergum X membranous, bifid, apices out-turned. Subgenital plate probably represented by a pair of elongate processes that cross subapically. Inferior appendages short, stout, sclerotised and turned downwards apically. Aedeagus slender, with a bend distally.

Remarks: Males of this species appear to conform in general features with Marshall's (1977) *consimilis*-group, although differing particularly in the far greater development of segment IX apico-laterally.

Distribution: Indonesia (Sumatra).

Etymology: Indonesian - „tombol", knob and „hitam", black, for the black knobs on the inferior appendages.

Tricholeiochiton fortensis (ULMER)

Synagotrichia fortensis ULMER 1951: 82. Holotype, ♂, Sumatra, Fort de Kock, UHZM.

Material examined: Sumatra: ♂, Dolok Merangir, 22.ii-4.iv.1970, E.W. Diehl, HM coll.; 2♂♂, 44♀♀, Dolok Merangir (Brook), 03°07'N 99°11'E, 21.ii.1991, H. Malicky, HM coll.; 2♂♂, Bukit Maratya, 19.ii.1991, H. Malicky, HM coll.; 4♀♀, Dolok Merangir (Spring), 03°07'N 99°11'E, 21.i.1991, H. Malicky, HM coll. - Java: ♂, Sungai Awu, below Tuwel, 26.i.1995, Agus Kristyanto, HM coll.

Remarks: This species closely resembles the type species for the genus, *T. fagesii* (GUINARD 1879), a Palaearctic species, *T. lacustris* KIMMINS 1951, Burmese and *T. fidelis* WELLS 1982, Australian. It is distinguished by the form of the aedeagus and the subgenital plate.

Distribution: Indonesia (Java, Sumatra); Malaysia (West Malaysia).

Oxyethira (*Oxyethira*) *bogambara* SCHMID

Oxyethira bogambara SCHMID 1958: 67. Holotype, ♂, Sri Lanka, USNM.

Material examined: N Sumatra: 2♂♂, 2♀♀, Huta Padang, 02°45'N 99°14'E, 12.ii.1991, H. Malicky, HM coll.; 3♀♀, Marihat, 03°52'N 99°06'E, 13.ii.1991, H. Malicky, HM coll.; 1♂, 1♀, Aek Tarum, 21.ii. 1994, H. Malicky, HM coll.; 1♀, Sungai Aek Tarum, Labuan Hulu near Aek Tarum, 2°42'18"N 99°22'31"E, 80 asl, 21.ii.1994, H. Malicky, HM coll.; 2♂♂, 40♀♀, 8 km N Sindar Raya, *c.* 3°12'N 98°55'E, 700 m asl, 23.ii.1994, H. Malicky, HM coll.

Remarks: This is surely the most widespread of the Oriental-Australasian micro-caddisfly species. It is easily recognised by the shape of the male genitalia with the spiral titillator encircling the aedeagus.

Distribution: Australia (NE Queensland); Hong Kong; Indonesia (Sumatra); Malaysia (Sabah); New Guinea; Sri Lanka; Vietnam.

Oxyethira (*Oxyethira*) *campanula* BOTOSANEANU

Oxyethira campanula BOTOSANEANU 1970: 291. Holotype, ♂, Korea, ZMA.

Material examined: 2♂♂, N Sumatra, Sitahoan, 02°40'N 99°05'E, 1400 m asl, 17.ii.1991, H. Malicky, HM coll.

Remarks: *Oxyethira campanula* can be recognised by the distinctive aedeagus of the male which is stout distally and has the titillator short, rather stouter than in most species, and pressed against the aedeagus.

Distribution: Hong Kong; Indonesia (Sumatra); Korea; Malaysia (West Malaysia, Sabah).

Oxyethira (*Dampfitrichia*) *incana* ULMER

Oxyethira incana ULMER 1907: 227

Gnathotrichia isabellina ULMER 1951: 60. — KELLEY 1984: 436, 439

Stenoxyethira excisa Kimmins 1951: 207. — KELLEY 1984: 436, 439

Gnathotrichia australis WELLS 1981: 112. — KELLEY 1984: 436, 439

Type material: Holotype, ♂, Java, UHZM.

Material examined: N Sumatra: ♂, Dolok Merangir, 3.ii-13.iii.1972, E.W. Diehl, HM coll.; 1♂, 19♀♀, Dolok Merangir (Brook), 03°07'N 99°11'E, 21.ii.1991, H. Malicky, HM coll.; 7♀♀, Huta Padang, 02°45'N 99°14'E, 2.iii.1991, H. Malicky, HM coll.; 7♀♀, Dolok Merangir (Spring), 03°07'N 99°11'E, 4.iii.1991, H. Malicky, HM coll.; 1♂, 1♀, Aek Tarum, 2°40'32"N 99°18'30"E, 180 m asl, 21.ii.1994, H. Malicky, HM coll.; ♂, ♀, Sungai Aek Tarum, Labuan Hulu near Aek Tarum, 2°42'18"N 99°22'31"E, 80 m asl, 21.ii.1994, H. Malicky, HM coll.; 5♂♂, 60♀♀, 8 km N Sindar Raya, *c.* 3°12'N 98°55'E, 700 m asl, 23.ii.1994, H. Malicky, HM coll.

Remarks: *Oxyethira incana* is widespread from South-East Asia to northern Australia. The male is rather difficult to identify with certainty until a slide prepara-

tion is made, but the females are distinctive with a dark area on the IXth abdominal segment.

Distribution: Burma, Indonesia (Java, Sumatra), New Guinea, Australia (N Northern Territory, NE Queensland).

Hellyethira bulat WELLS & HUISMAN

Hellyethira bulat WELLS & HUISMAN 1993: 110. Holotype, ♂, East Malaysia, Sabah, RMNH.

Material examined: N Sumatra: 5♂♂, Huta Padang, 02°45'N 99°14'E, 25.ii.1991, H. Malicky, HM coll.; 4♂♂, ♀, Huta Padang, 02°45'N 99°14'E, 2.iii.1991, H. Malicky, HM coll.; ♀, Tonduhan waterfall, 2°48'28"N 99°11'03"E, 300 m asl, 8.iii.1994, H. Malicky, HM coll.

Remarks: *H. bulat* is recognised by the aedeagus with a twist apically and inferior appendages which are short relative to the elongate lateral lobes on abdominal segment IX.

Distribution: Brunei; Indonesia (Sumatra); Malaysia (Sabah, Sarawak).

Orthotrichia maeandrica (ULMER) (Figs 50, 51)

Javanotrichia maeandrica ULMER 1951: 76. Holotype, ♂, Java, Bogor (as Buitenzorg), UHZM.

Material examined: N Sumatra: 2♀♀, Huta Padang, 02°45'N 99°14'E, 8.ii.1991, H. Malicky, HM coll.; 3♂♂, Huta Padang, 02°45'N 99°14'E, 12.iii.1991, H. Malicky, HM coll.; 3♂♂, ♀, Marihat, 03°52'N 99°06'E, 13.ii.1991, H. Malicky, HM coll.; 3♀♀, Bukit Maratya, 19.ii.1991, H. Malicky, HM coll.; ♂, Dolok Merangir (Brook), 21.ii.1991, 03°07'N 99°11'E, H. Malicky, HM coll.; 3♀♀, Huta Padang, 02°45'N 99°14'E, 2.iii.1991, H. Malicky, HM coll.; 3♂♂, 3♀♀, Dolok Merangir (Spring), 03°07'N 99°11'E, 4.iii.1991, H. Malicky, HM coll.; 6♂♂, 9♀♀, Sungai Aek Tarum, Labuan Hulu near Aek Tarum, 2°42'18"N 99°22'31"E, 80 m asl, 21.ii.1994, H. Malicky, HM coll.

Remarks: The type specimen of *Orthotrichia maeandrica*, a male mounted in lateral aspect in Canada Balsam, has been examined by AW. New figures are supplied here (Figs 50, 51), drawn from a freshly collected Sumatran specimen. MARSHALL (1977) placed this curious species in the *angustella*-group which is characterised by "... the development of the lateral processes of segment IX in the males and the row of subcostal scales on the forewings of the males of most species". *Orthotrichia maeandrica* is readily recognised in the SE Asian fauna by the row of black wing scales and the strongly asymmetrical male genitalia.

Distribution: Indonesia (Sumatra, Java).

Orthotrichia tombak sp.nov. (Figs 52, 53)

Type material: Holotype, ♂, N Sumatra, "Holzweg 2", 10 km NE Prapat, 1050 m asl, 2°44'N 98°57'E, 23.ii.1991, H. Malicky, HM coll. Paratypes, N Sumatra: ♂, Huta Padang,

02°45'N 99°14'E, 2.ii.1991, H. Malicky, HM coll.; ♂, Huta Padang, 02°45'N 99°14'E, 8.ii.1991, H. Malicky, HM coll.; ♂, Huta Padang, 02°45'N 99°14'E, 12.ii.1991, H. Malicky, HM coll.; 2♂♂, Huta Padang, 02°45'N 99°14'E, 20.ii.1991, H. Malicky, HM coll.; ♂, Huta Padang, 02°45'N 99°14'E, 25.ii.1991, H. Malicky, HM coll.; ♂, 5♀♀, Huta Padang, 02°45'N 99°14'E, 2.iii.1991, H. Malicky, HM coll.; ♂, 8 km S Sindar Raya, 23.ii.1994, H. Malicky, HM coll.

Description: ♂, anterior wing length 2.8-3.1 mm. Antennae 29-segmented, flagellar segments elongate, covered densely with sensilla placodea and with 1 to 4 or 5 sensory pits of varying size per segment. Genitalia (Figs 52, 53), highly asymmetrical. Abdominal segment IX broad; dorsally a stout, sclerotised spine on left, on right a protruding process with its apex rounded and with a long internal apodeme; apico-laterally two small unequal spurs. Tergum X obliquely truncate apically, a small forward-directed spur on left margin, right margin sclerotised. Inferior appendages fused to form a short, wide structure; dorsal process in form of a pair of stout unequal lobes, apical setae short; ventral apodeme long, slender. Aedeagus narrow, elongate. Paramere long, slender.

Remarks: In general form of the male genitalia this species is similar to *Orthotrichia momanga* OLÁH 1989 from Vietnam, but is distinguished particularly by the sclerotised spur on tergum X and small dorsal spurs on segment IX.

Distribution: Indonesia (Sumatra).

Etymology: Indonesian - *tombak* - lance, for the lateral spine.

Orthotrichia indica MARTYNOV (Figs 54-56)

Orthotrichia indica Martynov 1935: 116. Holotype, ♂, India, IM.

Material examined: Central Java: numerous ♂♂, numerous ♀♀, 400 m, Danau Rawa Pening, outlet: Sungai Tuntang, 7°16'S 110°27'E, 11.ii.1996, H. Malicky, HM coll.; 8♂♂, 21♀♀, same locality, 21.v.1994, Agus Kristyanto, HM coll.

Remarks: Figures are given for this species (Figs 54-56) drawn from this new Javanese material to illustrate features that have been omitted in previous accounts, particularly the fine short setae terminally on the long lateral lobes on segment VIII and the dorsal process of the inferior appendages. These new records extend considerably the known distribution of this apparently widespread species.

Distribution: India; Burma; Sri Lanka; Vietnam; Indonesia (Java).

Orthotrichia berbaring sp.nov. (Figs 59, 60)

Type material: Holotype, ♂, N Sumatra, Dolok Merangir (Spring), 4.iii.1991, 03°07'N 99°11'E, H. Malicky, HM coll. Paratypes: N Sumatra: 14♂♂, same data as for holotype, HM coll.; 12♂♂, 6♀♀, same collector and locality, except Brook, 21.ii.1991, HM coll.

Description: ♂, small, body pale. Anterior wing length 1.7-2.1 mm. Antennae damaged, long, segments elongate with scattered sensilla placodea and one sensory pit per segment. Genitalia (Figs 59, 60), asymmetrical. Abdominal segment IX far

shorter than wide. Tergum X narrow, rounded apically, on left margin a sclerotised band, a sclerotised spur protruding from mid right margin. Inferior appendages asymmetrical curved lobes, right longer than left, left with a dark spur apico-ventrally; dorsal process of inferior appendages a simple undivided lobe with paired setae apically; ventral apodeme slender, short. Aedeagus slender, elongate, a slight twist medially. Paramere slender, about as long as right inferior appendage.

Remarks: This *costalis*-group species closely resembles *Orthotrichia suchiara* OLÁH 1989 from which it differs in lacking the elongation of the postero-lateral angles on abdominal segment IX and bilobed dorsal process on the inferior appendages.

Distribution: Indonesia (Sumatra).

Etymology: Indonesian - „berbaring" - recumbent, for the appearance of the inferior appendages in ventral view.

Orthotrichia menjonkok sp.nov. (Figs 57, 58)

Type material: Holotype, ♂, N Sumatra, Huta Padang, 02°45'N 99°14'E, 2.iii.1991, H. Malicky, HM coll. Paratypes, N Sumatra: 7♂♂, 55♀♀, same data as for holotype, HM coll.; ♂, Dolok Merangir (Spring), 4.iii.1991, 03°07'N 99°11'E, H. Malicky, HM coll.

Description: ♂, small, wings narrow with venation reduced. Anterior wing length 1.4-1.5 mm. Antennae 26-27-segmented, flagellar segments elongate with dense sensilla placodea and one sensory pit per segment. Genitalia (Figs 57, 58) short and broad in general appearance. Abdominal segment IX wider than long, symmetrical anteriorly, clusters of short, stoutish setae apico-laterally. Tergum X also wider than long, broadly rounded apically, a fine, spine lying along right margin and curving around apex. Inferior appendages short, broad throughout length, apices slightly concave; dorsal process wide, setae at posteriorly produced apico-lateral angles; ventral apodeme long, slender. Aedeagus elongate, no paramere evident.

Remarks: This species, distinguished by very irregular, asymmetrical male genitalia, is difficult to place.

Distribution: Indonesia (Sumatra).

Etymology: Indonesian - „menjonkok" - squat, for the general appearance of the male genitalia.

Orthotrichia asimetris sp.nov. (Fig. 61)

Type material: Holotype, ♂, N Sumatra, 8 km N Sindar Raya, 23.ii.1994, H. Malicky, HM coll. Paratype, N Sumatra: ♂, Sungai Aek Tarum, Labuan Hulu near Aek Tarum, 2°42'18"N 99°22'31"E, 80 m asl, 21.ii.1994, H. Malicky, HM coll.

Description: ♂ small, anterior wing length 1.7-2.1 mm. Antennae 29-segmented, flagellar segments densely covered with sensilla placodea, one pit per segment. Ge-

nitalia (Fig. 61) highly asymmetrical. Abdominal segment IX extended well forward into VIII, a fine spine extended posteriorly from a long internal apodeme on the right. Tergum X a simple membranous plate, broadly rounded apically in ventral view. Inferior appendages highly irregular, with their dorsal process forming a more or less rounded structure with various irregularities and setae distally. Aedeagus slender, very long. Paramere fine, extending well into segment VIII.

Remarks: The affinities of this species are obscure. The very elongate, internally skewed abdominal segment IX and the form of aedeagus most closely resemble *O. newi* WELLS & HUISMAN 1993 from Sabah in West Malaysia. Other species are known with highly irregular genitalic structures, but they generally appear to have more typical processes associated with their inferior appendages. Distinguishing features are the extreme fusion of the inferior appendages and their dorsal process.

Distribution: Indonesia (Sumatra).

Etymology: Indonesian - „asimetris" - asymmetrical, for the asymmetry of the male genitalic structures.

Orthotrichia litoralis (ULMER) (Fig. 62)

Baliotrichia litoralis ULMER 1951: 89. Holotype, ♂, Bali, Batur-See, UHZM;

Orthotrichia litoralis (ULMER), MARSHALL 1979: 213.

Material examined: N Sumatra: ♂, Aek Tarum, 2°40'32"N 99°18'30"E, 180 m asl, 21.ii.1994, H. Malicky, HM coll.

Remarks: This species is remarkable in the male (Fig. 62) having the aedeagus and paramere unusually long and the mesal lobe on sternite VII larger than in other species. It closely resembles a New Guinean species, *O. veikaba* WELLS 1991 but has stouter inferior appendages and a smaller lateral spine on abdominal segment IX. It conforms in general features with species in the *kokodana*-group.

Distribution: Indonesia (Bali, Sumatra).

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Addresses of the authors: Dr. Alice WELLS,
Australian Biological Resources Study,
PO Box 636, Canberra, ACT 2601 Australia.

Univ.-Prof. Dr. Hans MALICKY,
Sonnengasse 13, A-3293 Lunz am See, Austria.

APPENDIX 1

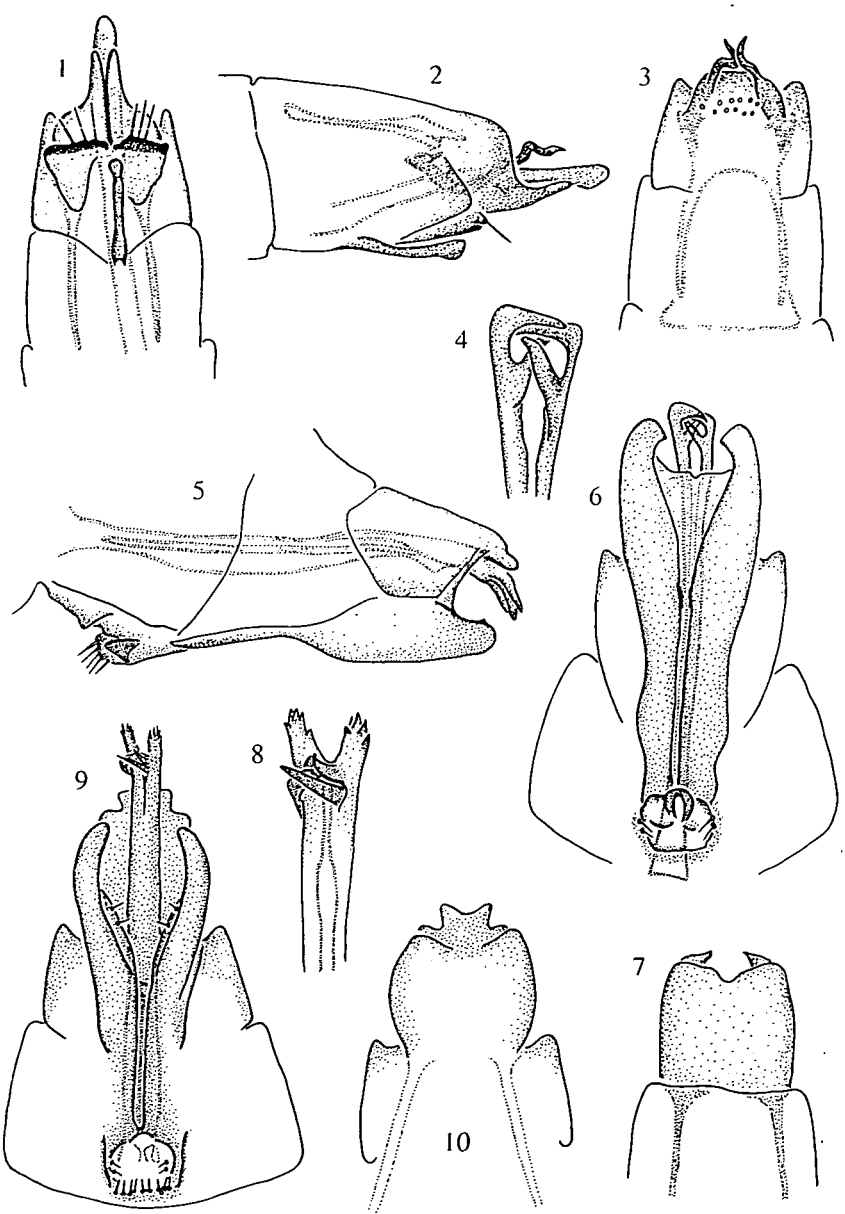
Checklist of Hydroptilidae from Sumatra and Java

Sumatra

Chrysotrichia elongata sp.nov.
Chrysotrichia maratya sp.nov.
Chrysotrichia margemiring sp.nov.
Chrysotrichia sukamade sp.nov.
Chrysotrichia hutapadangensis sp.nov
Hellyethira bulat WELLS & HUISMAN 1992
Hydroptila gapdoi OLÁH 1989
Hydroptila pintal WELLS & HUISMAN 1992
Hydroptila rumpun WELLS & HUISMAN 1992
Hydroptila sabit WELLS & HUISMAN 1992
Hydroptila thuna OLÁH 1989
Hydroptila tombolhitam sp.nov.
Hydroptila tong sp.nov.
Hydroptila trullata (ULMER 1951)
Orthotrichia asimetris sp.nov.
Orthotrichia berbaring sp.nov.
Orthotrichia litoralis (ULMER 1951)
Orthotrichia maeandrica (ULMER 1951)
Orthotrichia menjonkok sp.nov.
Orthotrichia ranauana (ULMER 1951)
Orthotrichia tombak sp.nov.
Oxyethira bogambara SCHMID 1958
Oxyethira campanula BOTOSANEANU 1970
Oxyethira incana (ULMER 1951)
Plethus baliana ULMER 1951
Plethus cruciatus ULMER 1951
Scelotrichia berzabanghalus sp.nov.
Scelotrichia buluhalus WELLS & HUISMAN 1993
Scelotrichia saranganica ULMER 1951
Scelotrichia simplex sp.nov.
Tricholeiochiton fortensis ULMER 1951
Ugandatrichia kanikar MALICKY & CHANTARAMONGKOL 1991

Java

Chrysotrichia duatali sp.nov.
Chrysotrichia sukamade sp.nov.
Hydroptila crenata (ULMER 1951)
Hydroptila elongata (ULMER 1951)
Hydroptila pintal WELLS & HUISMAN 1992
Ithytrichia decussata (ULMER 1951)
Orthotrichia curvata (ULMER 1951)
Orthotrichia indica MARTYNOV 1935
Orthotrichia maeandrica (ULMER 1951)
Orthotrichia ranauana (ULMER 1951)
Oxyethira incana (ULMER 1951)
Plethus acutus ULMER 1951
Plethus baliana ULMER 1951
Plethus cruciatus ULMER 1951
Scelotrichia saranganica ULMER 1951
Stactobia bersisik WELLS 1993
Stactobia betiri sp.nov.
Stactobia crassa (ULMER 1951)
Stactobia keluk WELLS 1993
Tricholeiochiton fortensis (ULMER 1951)
Ugandatrichia kebumen sp.nov.



Figs 1-3: *Stactobia betiri* sp.nov., male genitalia, ventral, lateral and dorsal views. **Figs 4-7**: *Scelotrichia saranganica* ULMER 1951, ♂, tip of aedeagus, genitalia in lateral ventral and dorsal views. **Figs 8-10:** *Scelotrichia bercabanghalus* sp.nov., ♂, tip of aedeagus, genitalia in ventral and dorsal views.

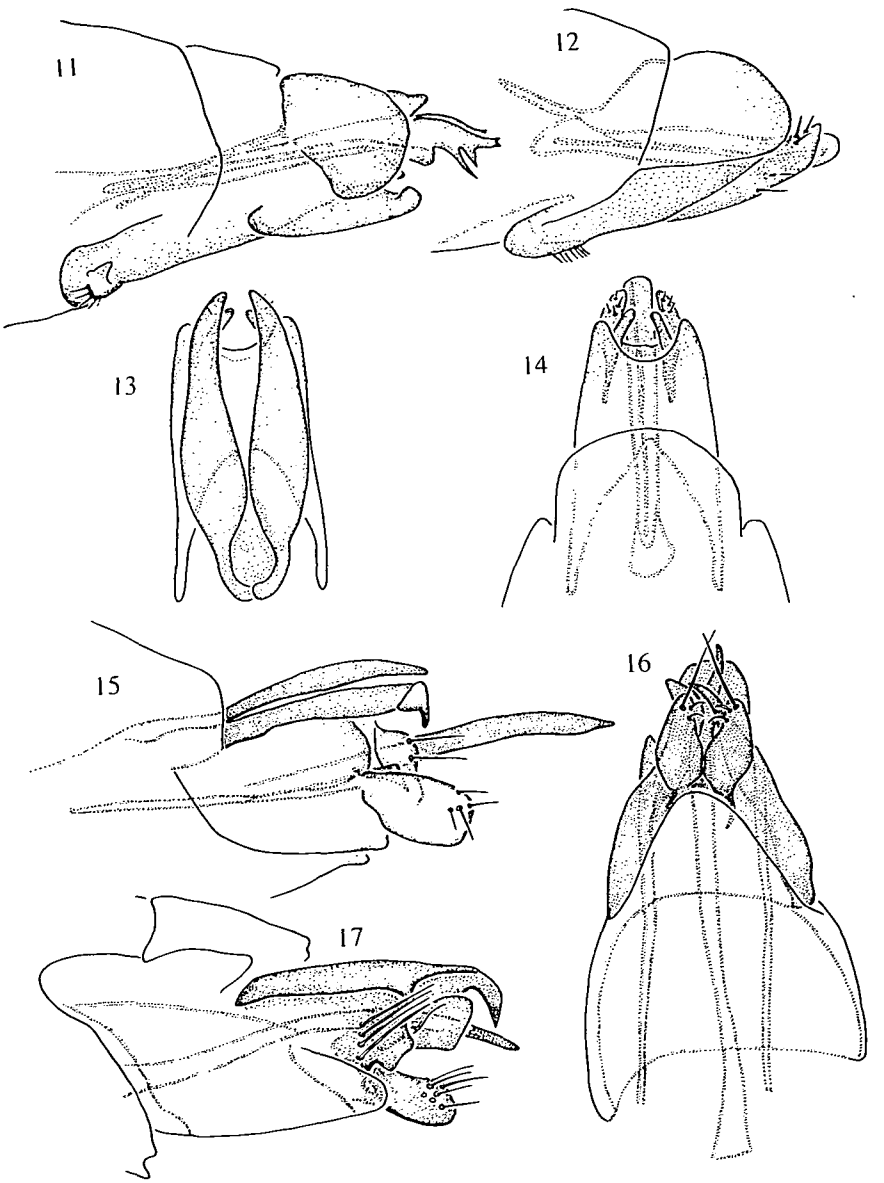
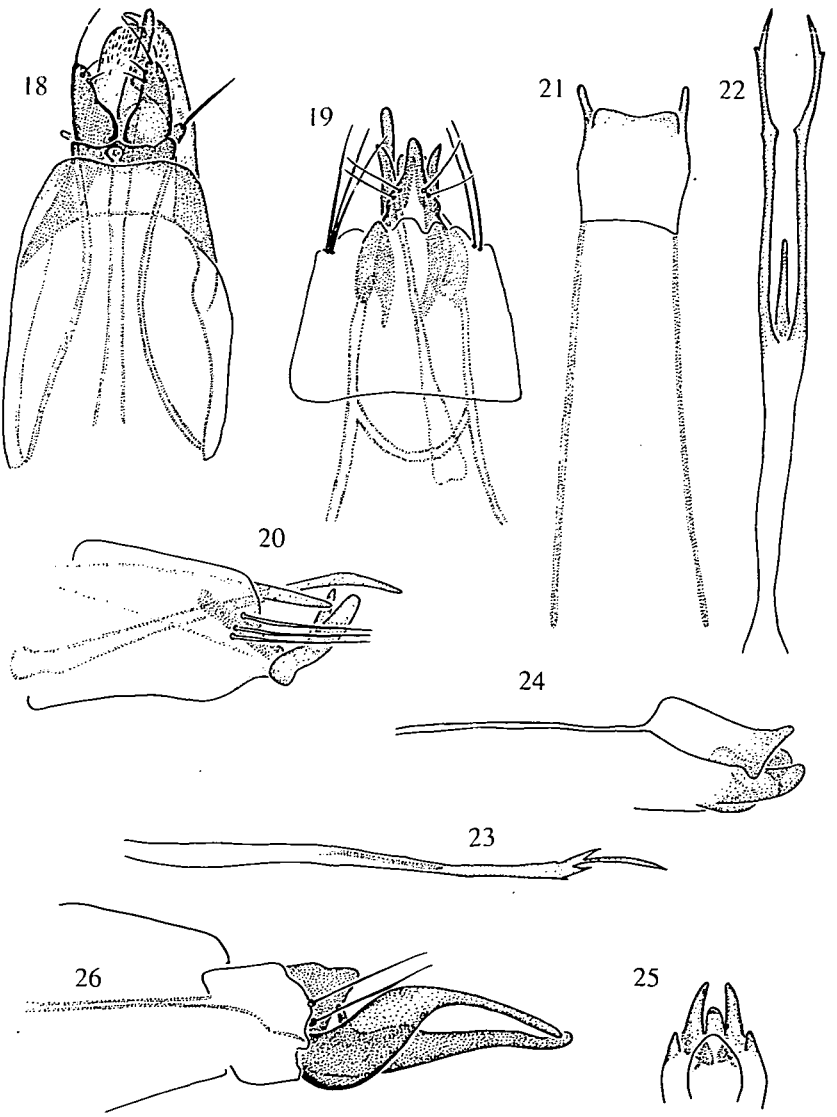
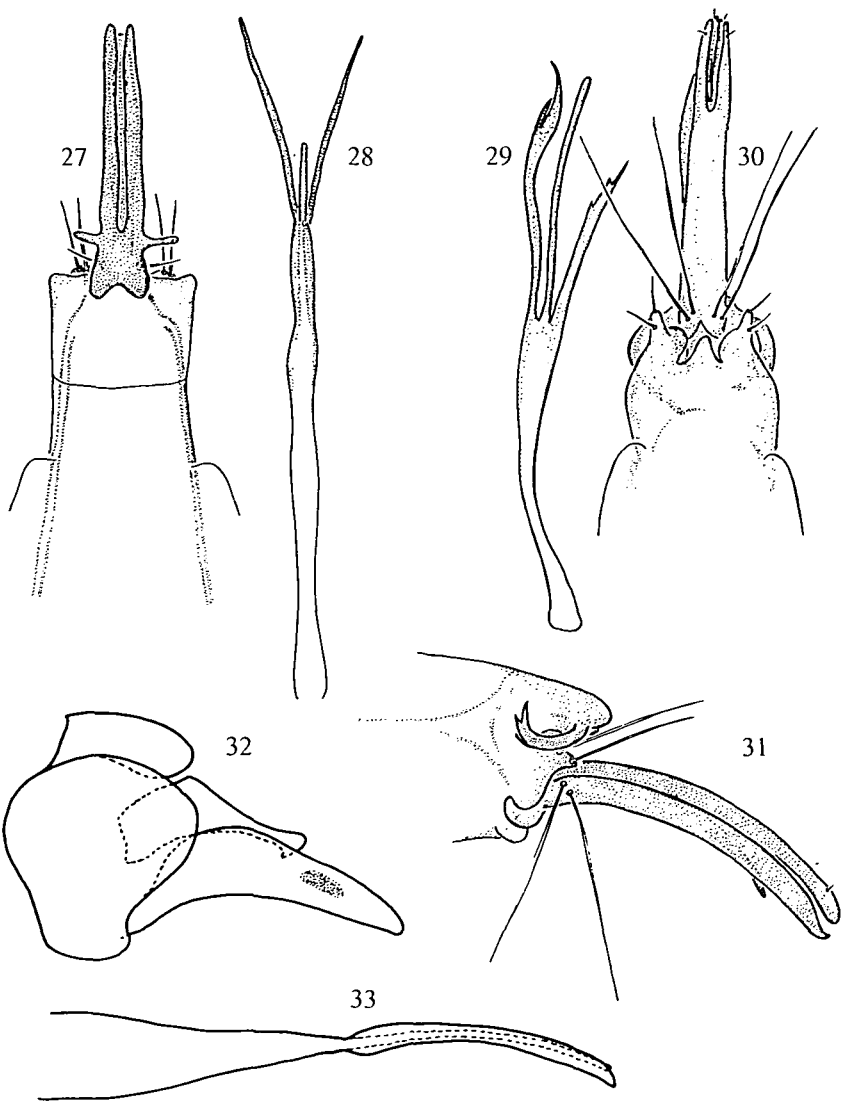


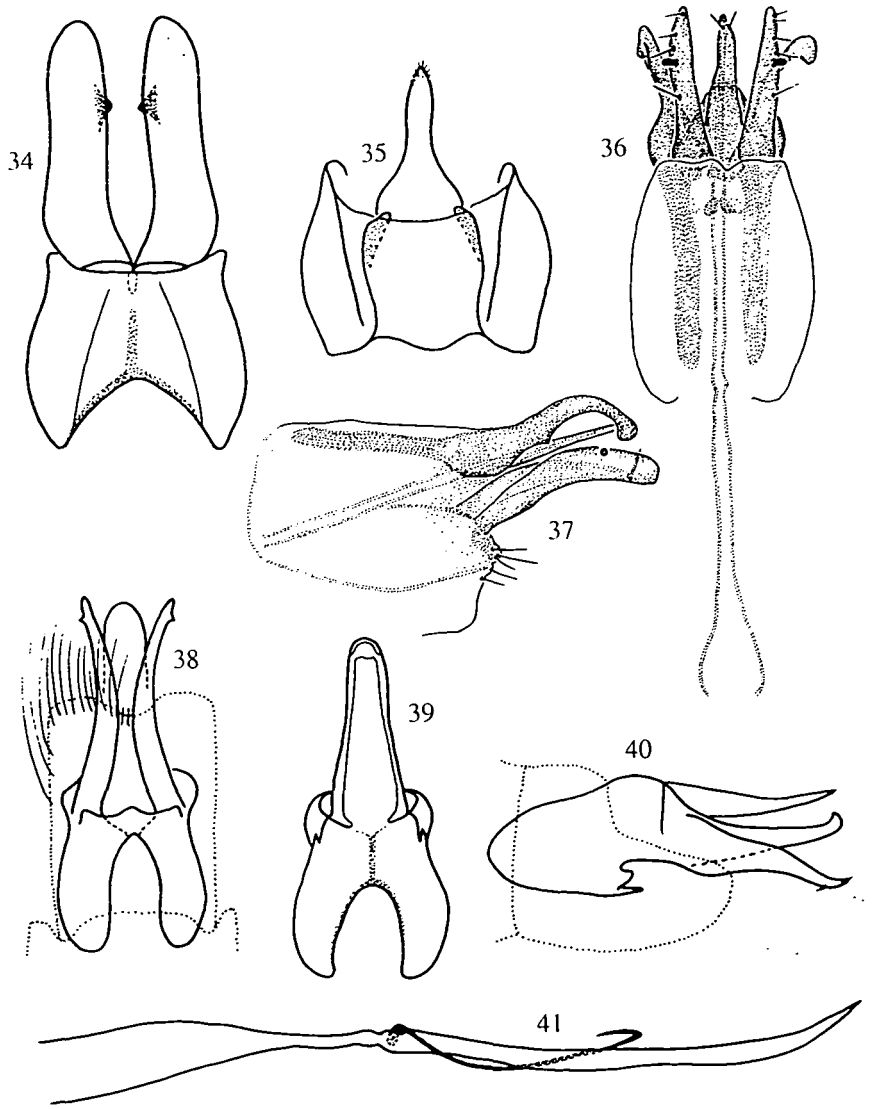
Fig. 11: *Scelotrichia bercabanghalus* sp.nov., ♂ genitalia, lateral view. **Figs 12-14**: *Scelotrichia simplex* sp.nov., ♂ genitalia, lateral, ventral and dorsal views. **Figs 15, 16**: *Chrysotrichia margemiring* sp.nov., ♂ genitalia, ventral and lateral views. **Fig. 17**: *Chrysotrichia duatali* sp.nov., ♂ genitalia, lateral view.



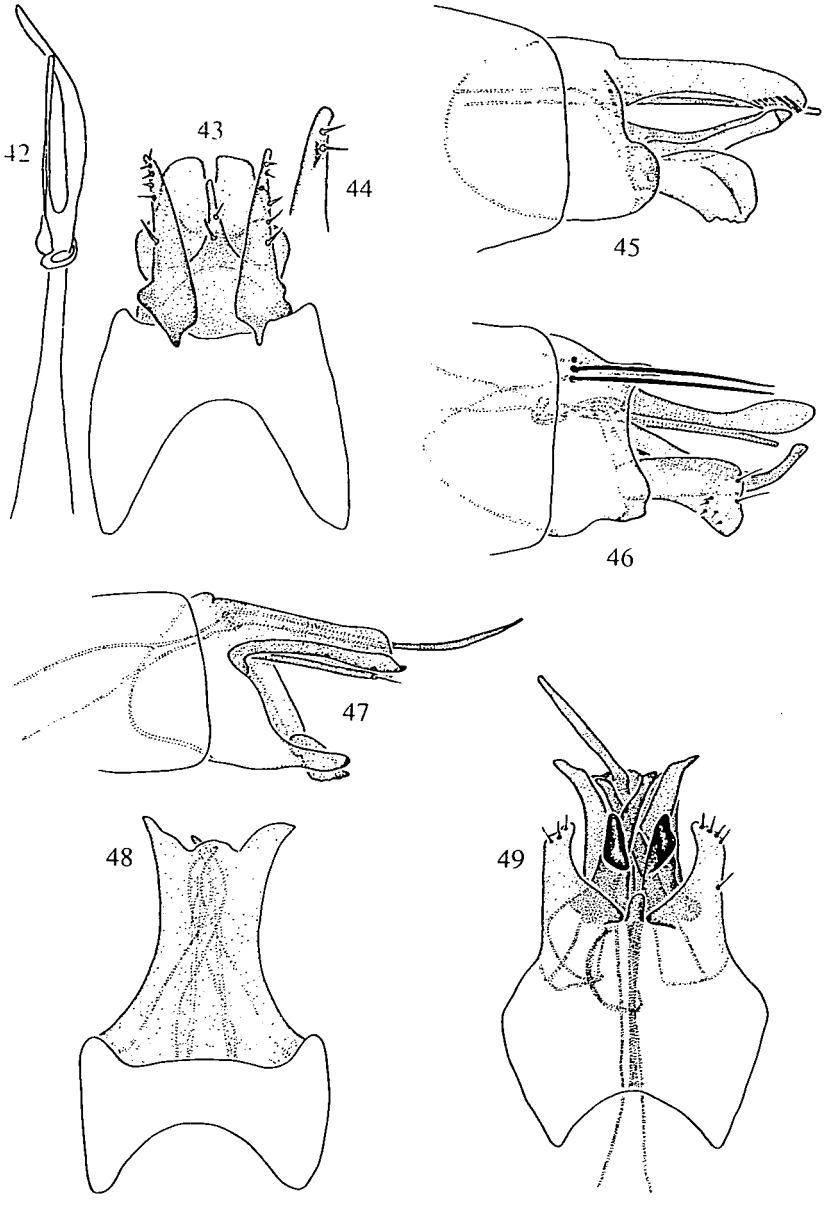
Figs 18: *Chrysotrichia duatali* sp.nov., ♂ genitalia, ventral view. **Fig. 19, 20**: *Chrysotrichia sukamade* sp.nov., ♂ genitalia, ventral and lateral views. **Figs 21-25**: *Chrysotrichia hutapadangensis* sp.nov., ♂ genitalia dorsal view, aedeagus ventral and lateral, and genitalia ventral view. **Fig. 26**: *Chrysotrichia maratya* sp.nov., ♂ genitalia, lateral view.



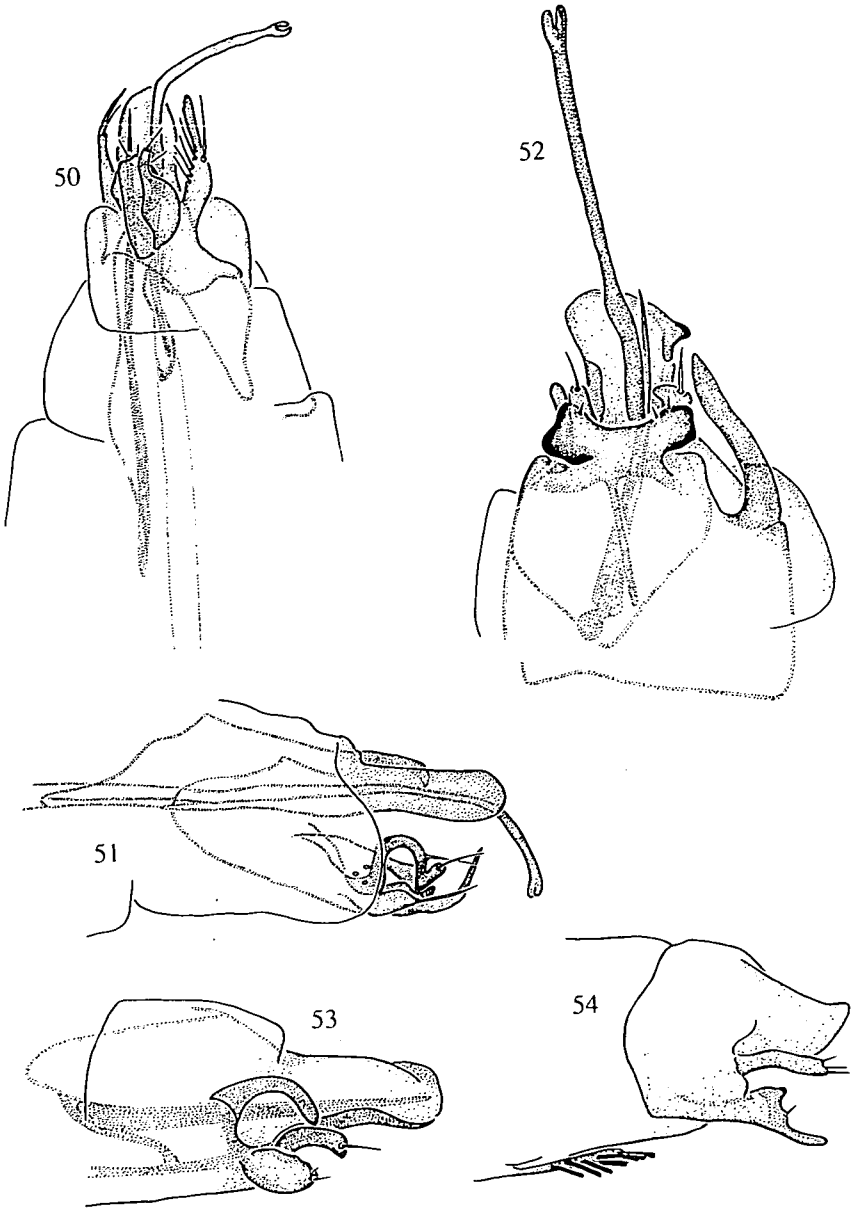
Figs 27, 28: *Chrysotrichia maratya* sp.nov., ♂ genitalia, ventral view, aedeagus in lateral view. **Figs 29-31**: *Chrysotrichia elongata* sp.nov., ♂ genitalia, aedeagus, ventral and lateral views. **Figs 32, 33**: *Ugandatrichia kebumen* sp.nov., ♂ genitalia, lateral view and aedeagus in lateral view.



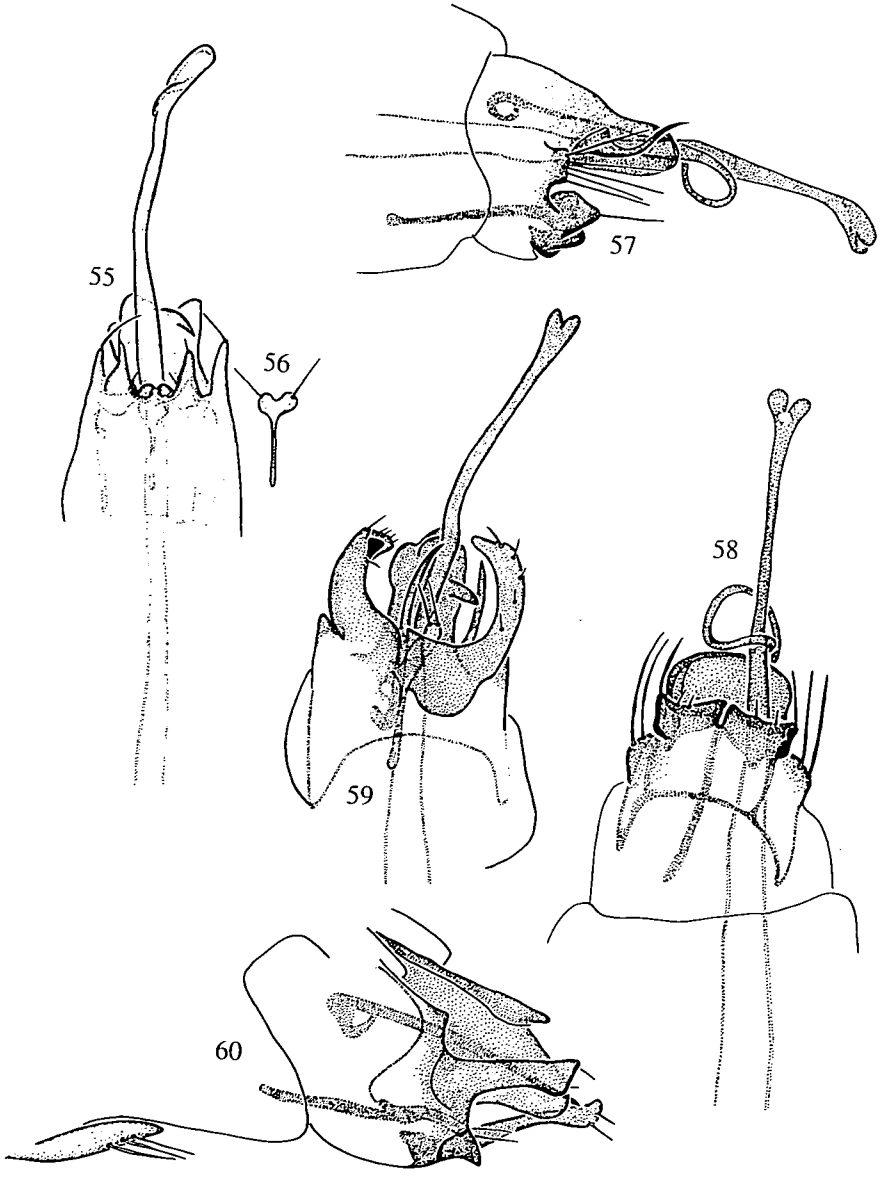
Figs 34, 35: *Ugandatrichia kebumen* sp.nov., ♂ genitalia, ventral and dorsal views. **Figs 36, 37**: *Hydroptila tong* sp.nov., ♂ genitalia, ventral and lateral views. **Figs 38-41**: *Hydroptila gapdoi* OLÁH 1989, ♂ genitalia, ventral, dorsal and lateral views and aedeagus in lateral view.



Figs 42-44: *Hydroptila thuna* OLÁH 1989, ♂ genitalia, aedeagus, ventral view and tip of right inferior appendage in ventral view. **Fig. 45**: *Hydroptila rumpun* WELLS & HUISMAN 1992, ♂ genitalia, lateral view. **Fig. 46**: *Hydroptila sabit* WELLS & HUISMAN 1992, ♂ genitalia, lateral view. **Figs 47-49**: *Hydroptila tombolhitam* sp.nov., ♂ genitalia, lateral, dorsal and ventral views.



Figs 50, 51: *Orthotrichia maeandrica* ULMER 1951, ♂ genitalia, ventral and lateral views. **Figs 52, 53**: *Orthotrichia tombak* sp.nov., ♂ genitalia, ventral and lateral views. **Fig. 54**: *Orthotrichia indica* MARTYNOV 1935, ♂ genitalia, lateral view.



Figs 55, 56: *Orthotrichia indica* MARTYNOV 1935, ♂ genitalia and dorsal process of inferior appendages in ventral views. **Figs 57, 58**: *Orthotrichia menjonkok* sp.nov., ♂ genitalia, lateral and ventral views. **Figs 59, 60**: *Orthotrichia berbaring* sp.nov., ♂ genitalia, ventral and lateral views.