

A systematic and biogeographic study of the caddisfly fauna of Jamaica (Insecta: Trichoptera)

by Lazare BOTOSANEANU & Eric J. HYSLOP

Abstract

Results of the travel to Jamaica (1997) of the first author with strong support from the University of the West Indies - Kingston, a travel devoted to intensive sampling of adult caddisflies especially in the western part of the island, previously almost unexplored in this respect. 35 taxa were sampled, elevating to 52 the number of species and subspecies presently recorded from Jamaica. Seven species and two subspecies are described as new (in the genera *Cubanoptila*, *Alisotrichia*, *Ochrotrichia*, *Metrichia*, *Neotrichia*, *Smicridea*, *Nectopsyche*, *Helicopsyche*). Genus *Cubanoptila* and subfamily Macronematinae are new for Jamaica. The status of several taxa has needed changes. The previously expressed opinion that the Jamaican fauna has only weak ties with that of the other Greater Antilles, should certainly be "shaded." There is presently good evidence about the existence on the island of an East/West faunistic disjunction, with two centres of endemism and several clear cases of geographic vicariance. Among other discoveries should be stressed that of the first known case in insects (or arthropods) of a species existing in two enantiomorphic aspects, a dextral and a laeval one.

Key words: Insecta, Trichoptera, Jamaica, Greater Antilles, systematics, biogeography.

Résumé

L'article présente les résultats d'un voyage (1997) entrepris en Jamaïque par le premier auteur, grâce à une aide importante de l'University of the West Indies - Kingston, et ayant pour but la récolte intensive de Trichoptères adultes, surtout dans la partie occidentale de l'île pratiquement inexplorée pour ce qui concerne ce groupe. Au total 35 taxons ont été récoltés, ce qui porte à 52 le nombre des espèces et sous-espèces actuellement connues de la Jamaïque. Sept espèces et deux sous-espèces nouvelles (dans les genres *Cubanoptila*, *Alisotrichia*, *Ochrotrichia*, *Metrichia*, *Neotrichia*, *Smicridea*, *Nectopsyche*, *Helicopsyche*) sont décrites. Le genre *Cubanoptila* et la sous-famille des Macronematinae sont des nouveautés pour la faune de la Jamaïque. Le statut de plusieurs taxons a dû être modifié. L'opinion précédemment exprimée quant au faible degré de parenté entre la faune de la Jamaïque et celle des autres Grandes Antilles, doit être nettement nuancée. Il existe actuellement de solides preu-

ves de l'existence sur l'île d'une importante disjunction faunistique est/ouest, correspondant à deux centres d'endémisme avec plusieurs cas de vicariance géographique. Parmi d'autres découvertes, il faut souligner celle du premier cas connu chez les insectes (et chez les arthropodes) d'une espèce existant en deux aspects énantiomorphes (dextre et senestre).

Mots-clefs: Insecta, Trichoptera, Jamaïque, Grandes Antilles, systématique, biogéographie.

Introduction

In September-October 1997 adult Trichoptera were intensively sampled, mostly with a portable UV lamp, in a small number of good localities, during a journey of the first author to Jamaica.

For a long time the Trichoptera of Jamaica have remained practically unknown. An end came to this situation only in 1968, when an important publication by O. S. Flint appeared. This was based mainly on material intensively sampled in the beautiful Blue Mountains of eastern Jamaica, whereas our efforts were mainly directed towards sampling in the western parishes.

The sampled material (a few thousands of specimens), entirely preserved in alcohol, is mostly kept in the collections of the Zoological Museum of the University of Amsterdam, where the holo- and allotypes of the new taxa are deposited. A selection of specimens was offered to the Institut Royal des Sciences Naturelles de Belgique, Brussels. Several pinned specimens belonging to the NMNH, Washington, have also been examined.

In the systematic part of this paper, for sampling localities only the respective Roman numerals in the part "Sampling localities" are given, the only exceptions being for holotypes and allotypes of the newly described taxa (names of localities given in full).

Sampling localities (from E. to W.)

I. Portland, Blue Mountains: upper reach of Buff Bay River in Green Hill, at "Regale". Buff Bay River is one

of the many water courses flowing from the Blue Mountains to the N coast of the island. Sampling point in its upper reach, near the Great Ridge of the Blue Mountains, at 1080 m.a.s.l. Rather small, turbulent stream flowing through narrow and very rough, forested valley (sharp slope here and there; row of small "waterfalls") on a bed filled with boulders and big stones. Practically no pollution. 7.10.1997; light; L. BOTOSANEANU, Meshagae HUNTE, M. HIBBERT.

II. St. Ann, Ocho Rios: one of the streams in Shaw Park Gardens.

In this Park run for tourism and with abundant plant growth, almost at sea level, two beautiful, small, stony, briskly flowing streams – one with a waterfall – are fed by strong karst springs. Water with high contents of CaCO₃ precipitating on all substrates. No pollution. 28.09.1997; sweeping the vegetation with a net (attempt to catch insects by light, almost without results); L. BOTOSANEANU, Silvia KOUWENBERG.

III. St. Ann: upper reach of Roaring River, W. from Ocho Rios.

This very short water course flows to the sea a few km. W. from Ocho Rios. In its lower course it is practically inaccessible for research, but it could be sampled in its upper reach (Steertown Village; near "Roaring River Estate"; very low altitude) where it is a streamlet no more than 2 m. wide, gently flowing on a bed of small gravel through secondary forest. Apparently no pollution. 28.09.1997; light; L. BOTOSANEANU, Silvia KOUWENBERG.

IV. Clarendon, Crofts Hill: Pindar's River at Arthur's Seat.

This, the largest water course sampled (hyporhithral, 10 m. width at most) is one of the many flowing to Rio Minho in its middle reach. At 280 m.a.s.l. where it was sampled, the river flows quietly or more swiftly, through secondary forest, on a bed either filled with small and medium-sized gravel or paved with limestone slab, and the flow is rather important – despite the drought. There is some domestic pollution. 26.09.1997; light; L. BOTOSANEANU, H. RILEY.

V. Clarendon: Rio Minho in its upper reach at Grantham, a few km. W. of Frankfield. Here, at 340 m.a.s.l., Rio Minho is an attractive "small metarhithral" about 3-4 m. wide, with water swiftly flowing on gravel and small cobbles; water generally very shallow, but there are deeper portions, too. Upstream from Grantham the valley is narrow and with abundant vegetation, but downstream from this village valley width and flow rapidly increase; the banks were not forested near the sampling point. Very slight domestic pollution. 1.10.1997; light; L. BOTOSANEANU, Meshagae HUNTE, M. HIBBERT.

VI. St. Elizabeth: Black River in its upper course at Windsor.

A few km. upstream (E.) from Appleton, and several

more from Magotty, the Black River splits into two streams, one of them being "One Eye River" which was sampled. The altitude is here about 140 m. Despite the fact that this is an upper course, the river, about 5 m. wide, is sluggish here, flowing on a heavily silted bed (possibly with sand), through sugar cane plantations, and with common marsh vegetation along the banks. Probably water pollution from insecticides (downstream, at Appleton, there is a serious pollution problem from the distillery). 30.09.1997; light; L. BOTOSANEANU, Meshagae HUNTE, M. HIBBERT.

VII. St. Elizabeth: the Y.S. Falls on Y.S. River.

Y.S. River is a tributary of Black River in its lower course. It flows mainly through a beautiful Park (tourist attraction) being a very powerful hyporhithral with water swiftly flowing on stony (limestone) substrates. The magnificent waterfall (probably the most important of Jamaica; altitude from 120 to 40 m., the sample having been taken at the foot of the waterfall) is at ca. 8 km downstream from the frontal springs of the river – which are probably karstic. No water pollution. 30.09.1997; light; L. BOTOSANEANU, Meshagae HUNTE, M. HIBBERT. 20.03.1998; light; E.J. HYSLOP, K. JOHN, J. LA HÉE, M. HIBBERT.

VIII. Hanover, Lucea: streamlet tributary of East Lucea River at ca. 2 km. upstream from its mouth.

East Lucea River, flowing to the sea at short distance E. from Lucea – and thus not far from the N.W. end of the island – is one of the surprisingly numerous water courses originating in the low hills running here parallel to the seashore. The sample was taken on a small tributary at about 2 km. upstream from East Lucea River mouth (place known as "Georgia", on the road to Tom's Spring). The stony streamlet, at very low altitude, flows through secondary forest. 7.10.1997; light; L. BOTOSANEANU, E.J. HYSLOP, Meshagae HUNTE, M. HIBBERT.

IX. Westmoreland, Savanna la Mar: Roaring River at Fort William.

Roaring River is a short but powerful tributary of Rio Cabarita, reaching the S. coast of the island a few km. W. from Savanna la Mar; it is fed by several astonishingly strong karstic springs, some of them emergences from caves. At Fort William (NE from Savanna la Mar; some 40 m.a.s.l.) Roaring River is already, at some distance from the springs, 5-10 m. wide, its laminar flow is impressive, the water flowing through sparse secondary forest on a substrate of limestone cobbles and gravel. Possibly some contamination with insecticides. 5.10.1997; light; L. BOTOSANEANU, E.J. HYSLOP, Meshagae HUNTE, M. HIBBERT.

X. Westmoreland, Savanna la Mar: one of the karstic springs in Fort William, feeding Roaring River (See IX). 5.10.1997. Young instars collected on limestone cobbles near the source (team: see IX).

Systematic part

GLOSSOSOMATIDAE PROTOPTILINAE

Cariboptila jamaicensis FLINT, 1968

I: 2♂, 1♀

Jamaican endemic species. Fig. 14 in FLINT (1968) is ventral, not dorsal.

Campiophora arawak FLINT, 1968

III: 1♀; IV: 4♂, 86♀; V: 12♀; VI: 1♀; VII (20.03.1998): 14♀; IX: 6♂, 280♀.

Jamaican endemic species.

Cubanoptila tridens BOTOSANEANU n. sp. (Figs. 1-7)

♂ holotype and ♀ allotype from Rio Minho in its upper reach at Grantham, a few km. W. of Frankfield, Clarendon. 1.10.1997. II: 2 ♂ paratypes; IV: 228 ♂, 136 ♀ paratypes; V: 41 ♂, 184 ♀ paratypes (besides the ♂ holotype and the ♀ allotype); VI: 1 ♂ paratype; VII (20.03.1998): 11 ♀ paratypes; IX: 8 ♀ paratypes.

Description of male

Forewing length of holotype: 3.3 mm. Antennae quite typical for *Cubanoptila*, scapus with concave lateral face, article 3 with two rows of minute hooks. Forewing in its basal half with wide zone covered by minute spines in three groups; the spinules in these 3 groups differ in length and are variously oriented. Hindwing typical for *Cubanoptila*.

Abdominal tergite VIII strongly developed, having the shape of a wide sack. The complex shape of segment X in lateral view, with its numerous appendages, is represented in fig. 4; the posterior, rather strongly protruding end of the segment, is split into several humps each with apical spines; in dorsal view segment X shows a rather short, bluntly ending median appendage having near its base a pair of laterally placed short vesicles; it is flanked by a pair of longer, strongly sclerotized appendages from common stem, with downwards curved and converging apices; more laterally a pair of shorter, strongly sclerotized appendages with broad bases and ending in sharp points; from near the base of each of these last appendages, a much shorter one. The complex ventral capsule of the genitalia ends in a pair of massive dark appendages which are without doubt the gonopods; in lateral view they are basally high, they end in a strong point directed dorsad, and from their ventral margin a short but rather strong prong protrudes; in ventral view the gonopods are characteristically clearly tridentate. Inside the ventral capsule three pairs of shorter or longer spiniform appendages curved in various manners (certainly part of the phallic complex), all from a strong common root with a single

median prong protruding distad. Dorsally the ventral capsule is topped by a bilobed plate (fig. 5), and there is a pair of digitiform appendages with long, curled apical seta, near the base of this plate.

Description of female

Forewing length of allotype: 3.2 mm.

In abdominal segment VI, a pair of flat, wrinkled sacks. Segment VIII with crown of very long curled setae. Segment IX ventrally with pair of longitudinal sclerotized plates medially separated by a narrow cleft. The spermatheca is very strongly developed, dark, easily seen also in non-macerated specimens; it is much wider distally than proximally and has strong latero-distal "wings". On a more dorsal level than the spermatheca, distally in segment IX, a very dark formation (plate?) of rather complex shape.

Remarks

From genus *Cubanoptila* SYKORA, 1973, endemic for the Greater Antilles, five recent species have been described from Cuba, whereas from Hispaniola, with no recent species known, three fossil species from Miocene amber of the Dominican Republic were described. The genus is new for Jamaica, an interesting discovery.

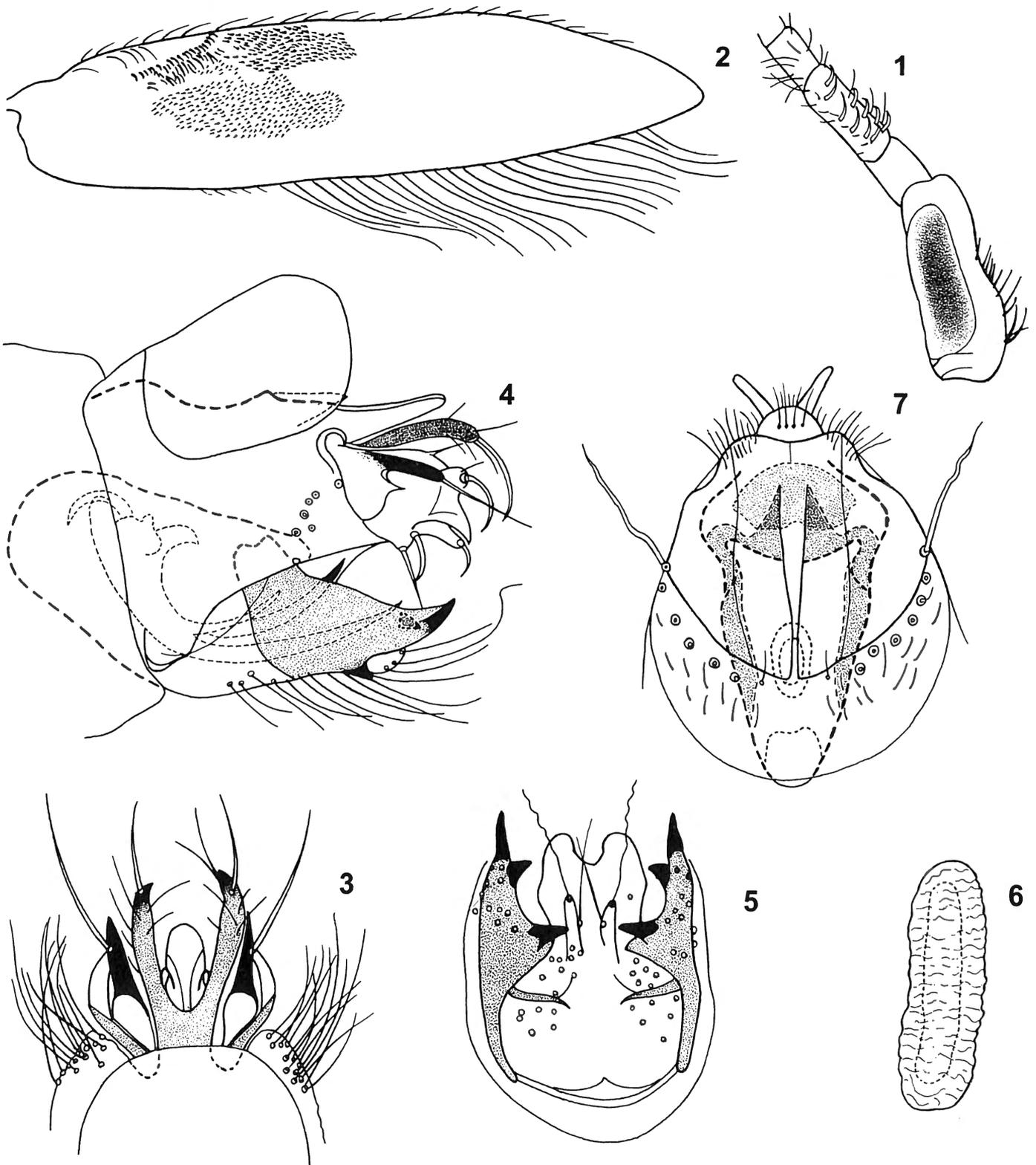
C. tridens n.sp. is in many respects a typical representative of the genus. It shares with *C. muybonita* BOTOSANEANU, 1977 the male forewings with zones of minute spines – but this cannot be evidence for close relationship. Many characters of the male genitalia clearly show that the new species is rather closely related with two of the Cuban species: *C. cubana* SYKORA, 1973 and *C. purpurea* SYKORA, 1973 (BOTOSANEANU & SYKORA, 1973), and not with the remaining described species; we mention the peculiar development of tergite VIII and the general structure of segment X and of the various parts of the ventral capsule. There is, for instance, a rather strong similarity between the lateral shape of the gonopods of the new species and of *C. purpurea*, but the ventral shape of the same clearly distinguishes the two species. Moreover, a large number of male genitalic details differentiate the three related species. Also the structure of the female genitalia (compare with fig. 2 d – ♀ of *C. purpurea* – in KUMANSKI, 1987) and that of the intraabdominal sacks of the female is evidence for the kinship between the three mentioned species.

The specific name *tridens* alludes to the characteristic ventral shape of the gonopods in the new species.

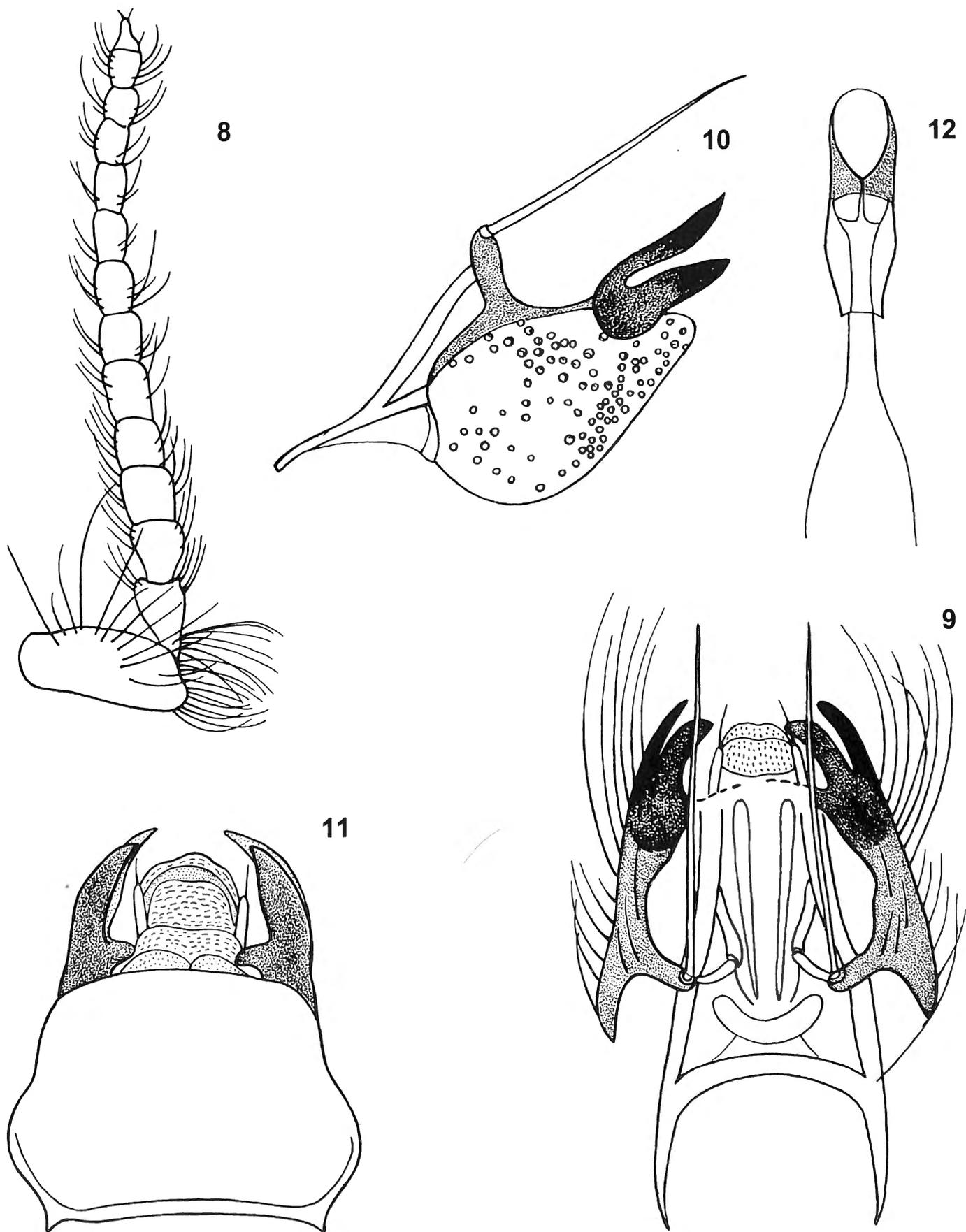
HYDROPTILIDAE

Leucotrichia tubifex FLINT, 1964

I: 1 ♂. Larvae of this species were collected from Buff Bay River by Miss Meshagae HUNTE.



Figs. 1-7. - *Cubanoptila tridens* BOTOSANEANU n.sp. (1: first articles of ♂ antenna; 2: ♂ forewing; 3-5: ♂ genitalia, dorsal, lateral, and ventral - 3 more strongly magnified than 4 and 5; 6: internal sack in ♀ segment VI; 7: ♀ genitalia, ventral).



Figs. 8-12. — *Alisotrichia giampaolina* BOTOSANEANU n.sp., ♂ (8: antenna; 9-11: genitalia, dorsal, lateral, and ventral; 12: phallic apparatus, dorsal).

Alisotrichia giampaolina BOTOSANEANU n.sp.
(Figs. 8-12)

♂ holotype and ♀ allotype from one of the streams in Shaw Park Gardens, Ocho Rios, St. Ann. 28.09.1997. Moreover, 3 ♂ paratypes sampled by D. & W. MATHIS and H. WILLIAMS (15.05.1966) from Reach Falls, Portland (pinned; in the NMNH, Smithsonian Institution, Washington).

Description of male

Forewing length: 1.8 mm. The antennae consist of only 14 unmodified articles – something unique for genus *Alisotrichia* FLINT, 1964, whose species have generally antennae with 18 articles, or very slightly less; the scapus, although longest of all articles, is, too, unmodified; between the two scapi the head has a strong, conical, black protuberance. Maxillary palpi normally developed. Eyes very hairy. Two ocelli. On forewings a broad stripe of silvery hairs along the anterior margin, and a patch of similar hairs before the wing apex; moreover, silvery hairs on head and thorax; all silvery hairs rubbed off in the holotype kept in alcohol. A subapical tuft of stiff black setae only on tibia of the middle leg. Spurs: 0, 2, 4.

Abdominal segment VIII with rather narrow dorso-lateral processes each bearing a long and very slender seta; in lateral view these processes are almost perfectly upright; the segment ends in a pair of very strong, black, sclerotized forks, upper branch slightly longer than lower branch, this last one with broad base which in ventral view looks like a short 3rd (transverse) branch; in dorsal or ventral view both branches directed mediad. Segment IX with rather long apodemes; on its dorsal surface, on each side, two slender sclerites jointed at right angle, and, more proximally, a median transverse sclerite with deep posterior emargination. The membranous median lobe of rather complex structure at the end of the abdomen (segment X?) is flanked by a pair of digitiform processes topped by a short seta.

Description of female

Forewing length: 1.7 mm. Antenna very short, with only 13 articles (!), 2nd article as long as scapus and distinctly longer than the remaining articles. Two ocelli only. Spurs: 0, 2, 4. Tergum VII with the sclerotized triangular zone found in many *Alisotrichia* (this was not illustrated).

Remarks

Alisotrichia giampaolina n.sp. belongs to the *orophila* species-group (HARRIS & HOLZENTHAL, 1993) well characterized especially by the dorso-lateral processes of ♂ segment VIII each bearing a very long seta – an evident apomorphy. From this group no fewer than 11 species have been already described from Cuba, Haiti, and Puerto Rico, only one inhabiting a group of Lesser Antilles. The new species is the first representative of the group on

Jamaica. The antennae with only 14 (♂) or 13 (♀) articles are unique not only in the *orophila* species-group, but also in the genus. All parts of the male genitalia distinguish the new species from all already described, the most original characters being the very robust distal forks of segment VIII, the equipment of sclerites on dorsum IX, and the pair of slender protuberances subterminally placed.

We do not believe that sound speculation is possible on relationships inside the *orophila* group, whose species display a tremendous “chassé-croisé” of characters.

This species is dedicated to the memory of someone having given to the first author many marks of friendship: Professor Giovanni Paolo MORETTI (+ 9 April 1997). The specific name is a noun standing in apposition to the generic name.

Alisotrichia tenuivirga BOTOSANEANU n.sp.
(Figs. 13-18)

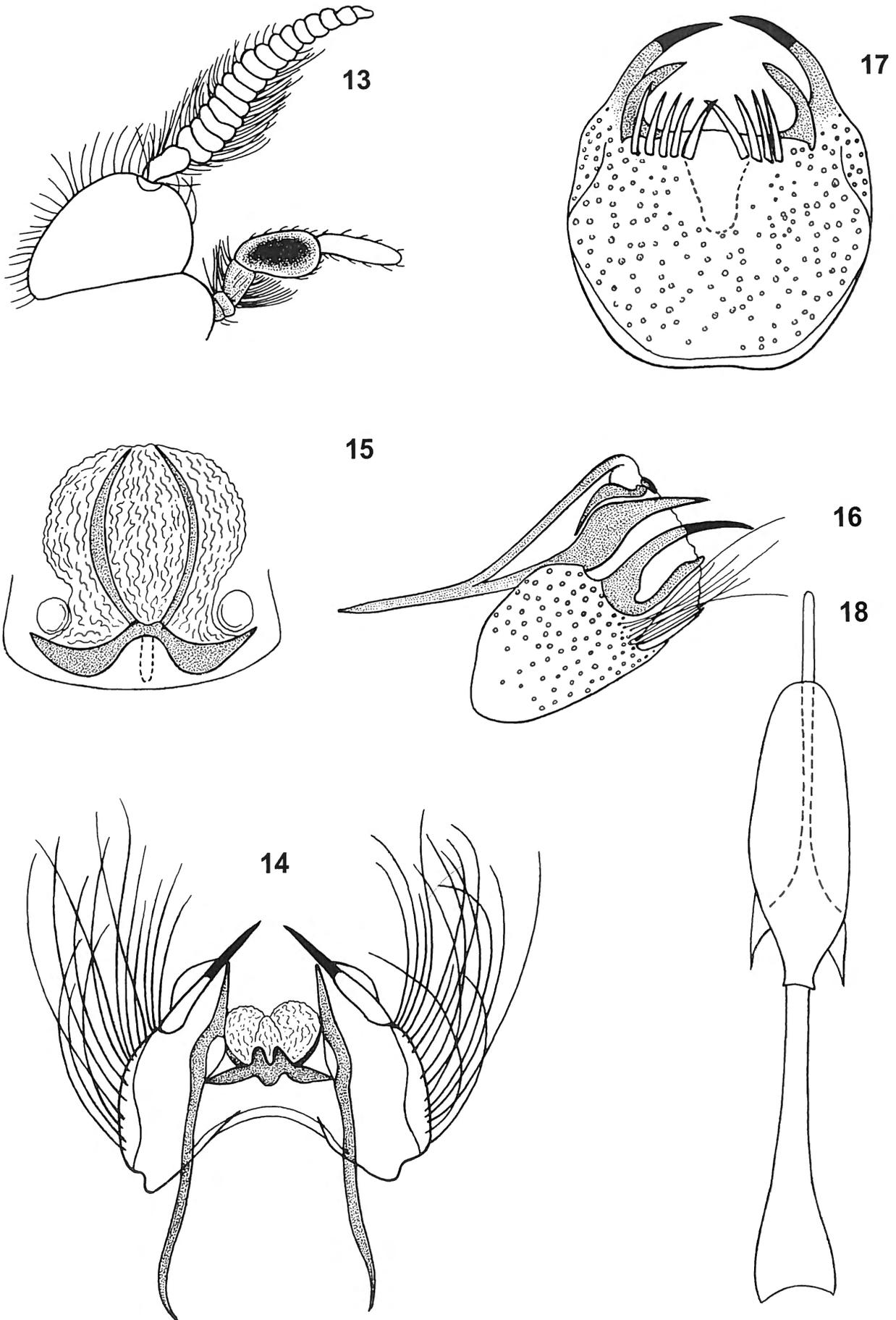
♂ holotype from the upper reach of Buff Bay River in Green Hill at “Regale”, Blue Mountains, Portland. 7.10.1997.

Description of male

Forewing length: 1.9 mm. The specimen, indeed in alcohol but not rubbed, is uniformly dark, not showing the pattern described (FLINT, 1968) for the endemic Jamaican *A. argentilinea*: silvery-white hairs on antennae, head and mesonotum, forewings with longitudinal silver-white band and white apex. Two ocelli. Antennae with 18 articles, enormously developed scapus, 2nd article elongate, following articles widened – but not extremely; last 6-7 articles glabrous (or almost glabrous) in contrast with the remaining ones. Maxillary palpus with extremely setose 3rd article, and strongly widened 4th article. Spurs: 0, 2, 3.

In the description of genitalia we shall mainly insist on differences – real or apparent – from the closely related *A. argentilinea* FLINT, 1968.

Venter VIII with medially continuous distal margin; slightly proximad from this margin, a row of 9 strong spines in two groups; and, from the latero-distal angles of the segment, a pair of appendages forming a fork, in ventral view both well curved mediad, lateral (upper) appendage distinctly longer and with black distal part, median (lower) appendage rather robust, slightly sinuous. Tergite IX relatively short, with distal margin strongly sclerotized in a distinctive manner, devoid of the lateral “plates” described in *argentilinea* as “broad plate laterally with strap-like marginal sclerites”. Segment X characteristically shaped (fig. 15): it is mainly membranous, only with a pair of very slender arched sclerites in its middle, converging proximally to reach the distal sclerotized margin of tergite IX.



Figs. 13-18. – *Alisotrichia tenuivirga* BOTOSANEANU n.sp., ♂ (13: head, lateral, with antenna and maxillary palpus; 14: genitalia, dorsal; 15: segment X, apical view; 16-17: genitalia, lateral and ventral; 18: phallic apparatus).

Remarks

This new species clearly belongs to the *hirudopsis* species-group (HARRIS & HOLZENTHAL, 1993) of which 5 species (one with two subspecies) have been already described from Cuba, the Dominican Republic, Puerto Rico, and Jamaica. It is closely related to *argentinae*, from which it differs in the smaller size, the uniformly dark colour (?), and several characters of the male genitalia, most important being the completely different shape of segment X with the pair of slender, arched chitinous stripes replacing the well developed, apically widened sclerites found in *argentinae*.

It is interesting to note that a similar difference exists between the two subspecies of *A. hirudopsis*: *A. hirudopsis hirudopsis* FLINT, 1964, from Puerto Rico, and *A. hirudopsis aitija* BOTOSANEANU, 1995, from the Dominican Republic.

A. argentinae is presently known only from water courses on the northern slopes of the Blue Mountains, whereas the new species was caught on one water course on their southern slopes: could this be a remarkable case of vicariance?

The specific name *tenuivirga* was coined from (Lat.) *tenuis* = narrow and *virga* = stripe.

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Additional note on Alisotrichia

We have seen (sent by Dr. O.S. Flint) 2 ♀ of what seems to be a distinct species of *Alisotrichia* (from Bath, St. Thomas parish; in the NMNH).

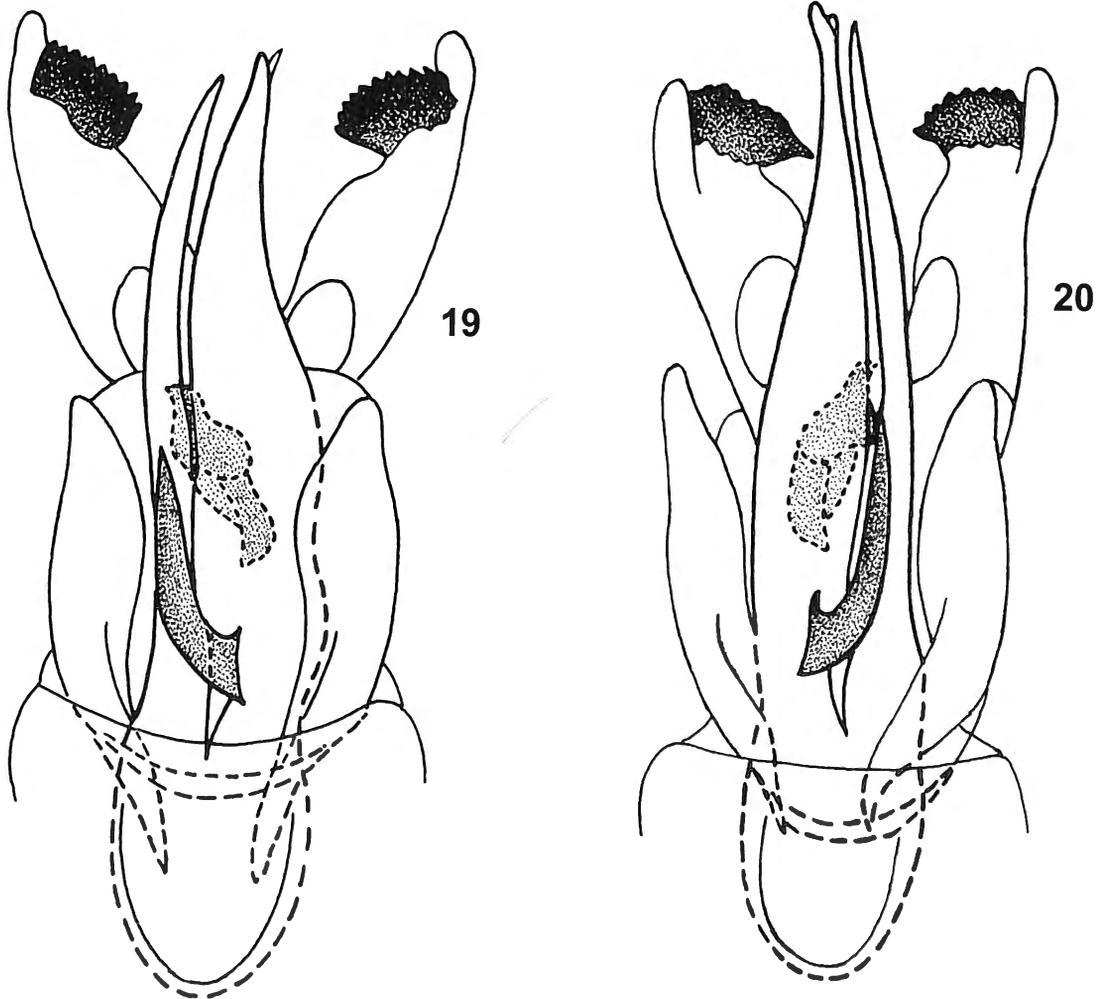
Orthotrichia cristata MORTON, 1905

III: 1 ♀; VI: 1 ♀; VII (20.03.1998): 1 ♀.

Ochrotrichia insularis MOSELY, 1934

III: 1 ♀; IV: 1 ♂ "B"; VI: 2 ♂ "B", 1 ♀; VII: 1 ♂ "A"; VIII: 1 ♀; IX: 8 ♂ "A", 12 ♂ "B", 40 ♀.

This was the second caddisfly species described, as adult, from Jamaica (MOSELY, 1934); it was re-described by FLINT (1968) and is certainly a common species throughout the island in various suitable habitats – probably not high in the mountains. The



Figs. 19-20. – Male genitalia, dorsal, of the two enantiomorphic aspects of *Ochrotrichia insularis* MOSELY, 1934 (19: laeval morph, "A"; 20: dextral morph, "B").

male and female genitalia, and especially the asymmetrical and complex segment X in the ♂, are extremely characteristic.

Examination of the 24 ♂♂ caught during the present study has led to the most astonishing observation that, whereas segment X in some specimens ("A"; fig. 19) is exactly as illustrated in the two existing descriptions, in a larger number of specimens ("B"; fig. 20) we find the perfect mirror image of that situation. No intermediate specimens were found. There is no correlated variability in other parts of the ♂ genitalia. No significant variability was found in the genitalia of the female specimens examined.

At the request of the first author, Dr. O.S. FLINT has re-examined the 12 ♂♂ mentioned in his 1968 publication and sampled in East Jamaica. The results were identical: some specimens belong to "A", some to "B", in some samples both being caught together.

From a total of 37 known male specimens (including the holotype) 24 are dextral, and 13 are sinistral.

It is unquestionable that we have here a clear case of species existing in two enantiomorphic aspects: a dextral and a sinistral (laeval) one, which are mirror-imaged (NEVILLE, 1976).

This phenomenon can be found only in the case of asymmetrical structures; it is relatively common in gastropod shells but quite rarely observed in other animals, and its presence in insects, or other arthropods, was never noticed (NEVILLE, 1976). Sinistrality and dextrality are doubtless genetically controlled. A populational and genetical study of this unique case would be an exciting project.

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A note on *Ochrotrichia insularis ayaya* BOTOSANEANU, 1977.

From Cuba (Oriente) BOTOSANEANU (1977) has described as subspecies of *O. insularis* a taxon which is certainly closely related to the Jamaican species, but which definitely deserves the status of distinct species: *O. ayaya* BOTOSANEANU, 1977 (new status).

***Ochrotrichia cavitectum* BOTOSANEANU n.sp.**
(Figs. 21-27)

♂ holotype from the upper reach of Roaring River W. from Ocho Rios, St. Ann. 28.09.1997. 1 ♀ (not designated as allotype, but probably belonging to this species) from St. IX.

Description of male

Forewing length: 2.7 mm. All parts of genitalia symmetrical. Segment IX with odd apodemes arising from the posterior angles of the tergite, directed ventrad and ante-

riad, and with long, slender common root (broken lines in figs. 22 and 23). Segment X quite characteristically shaped, rather pale, elongate, very slightly tapering to a truncate apex, medio-dorsally with a keel (simple line in fig. 21), basally furnished with dense short setae; ventrally the segment is deeply hollowed, forming a roof for the phallic complex. Inferior appendages of simple shape, roughly quadrangular in lateral and in ventral view, a setose dorso-distal hump in lateral view, oblique apical margin with comb of ca. 9 strong, black spines. Very long phallic apparatus consisting of two strongly contrasting "segments", the narrow distal one anteapically with a minute twisted appendage with two very fine "flagelli" running proximad.

Description of female

Forewing length: 2.4 mm. The association with the ♂ is not sure (sampling localities widely distant) but dark colour, and size, make it plausible. It will be easily recognized by the deep medio-apical sinus of tergite VII, and by the spermathecal sclerites.

Remarks

This new species of *Ochrotrichia* MOSELY, 1937 is clearly distinct from all West-Indian representatives of the genus. The specific name was coined from (Lat.) cavus = hollow and tectum = roof.

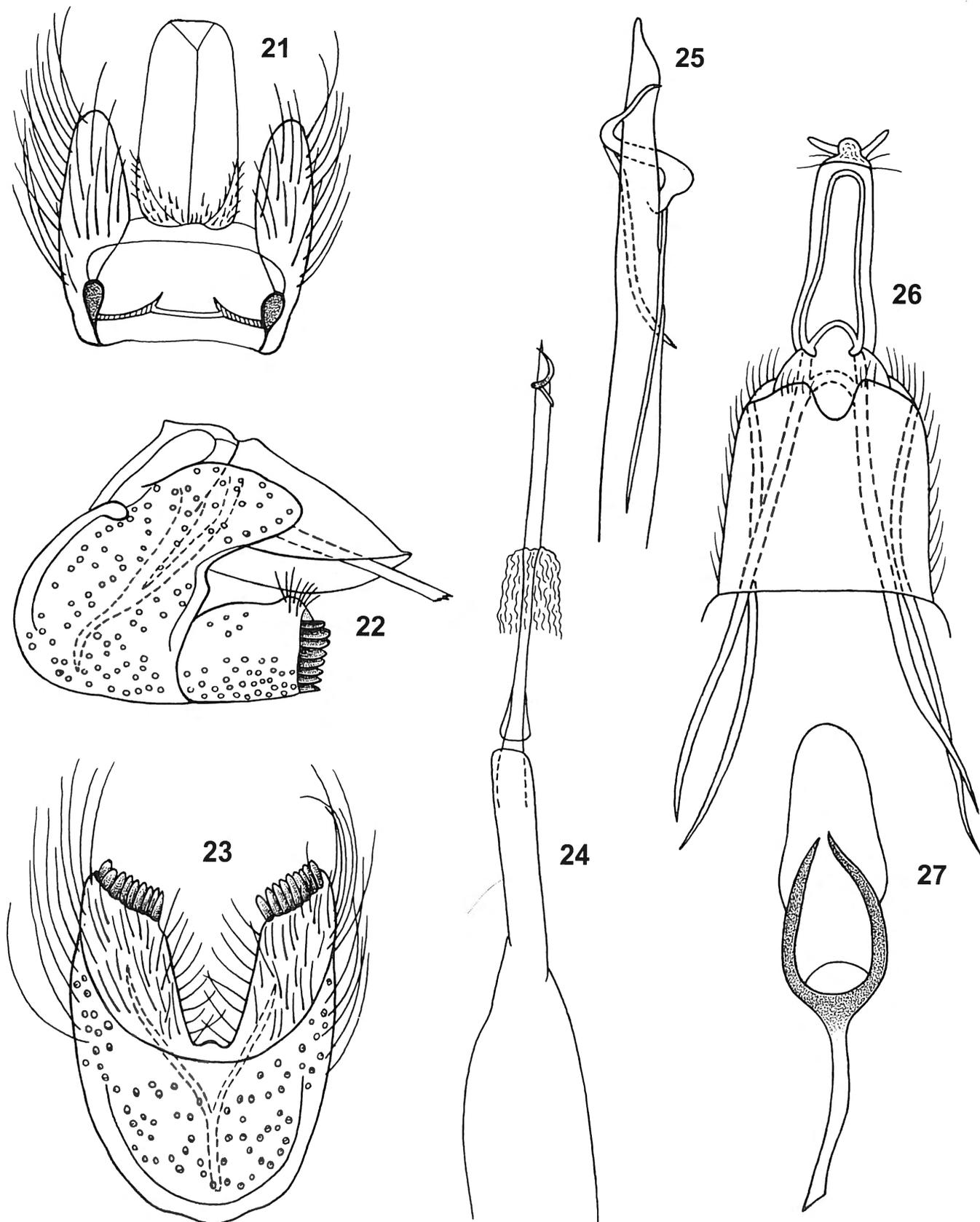
***Metrichia kumanskii jamaicae* BOTOSANEANU n.ssp.**
(Figs. 28-32)

♂ holotype from the upper reach of Buff Bay River in Green Hill at "Regale", Blue Mountains, Portland. 7.10.1997.

Description of male

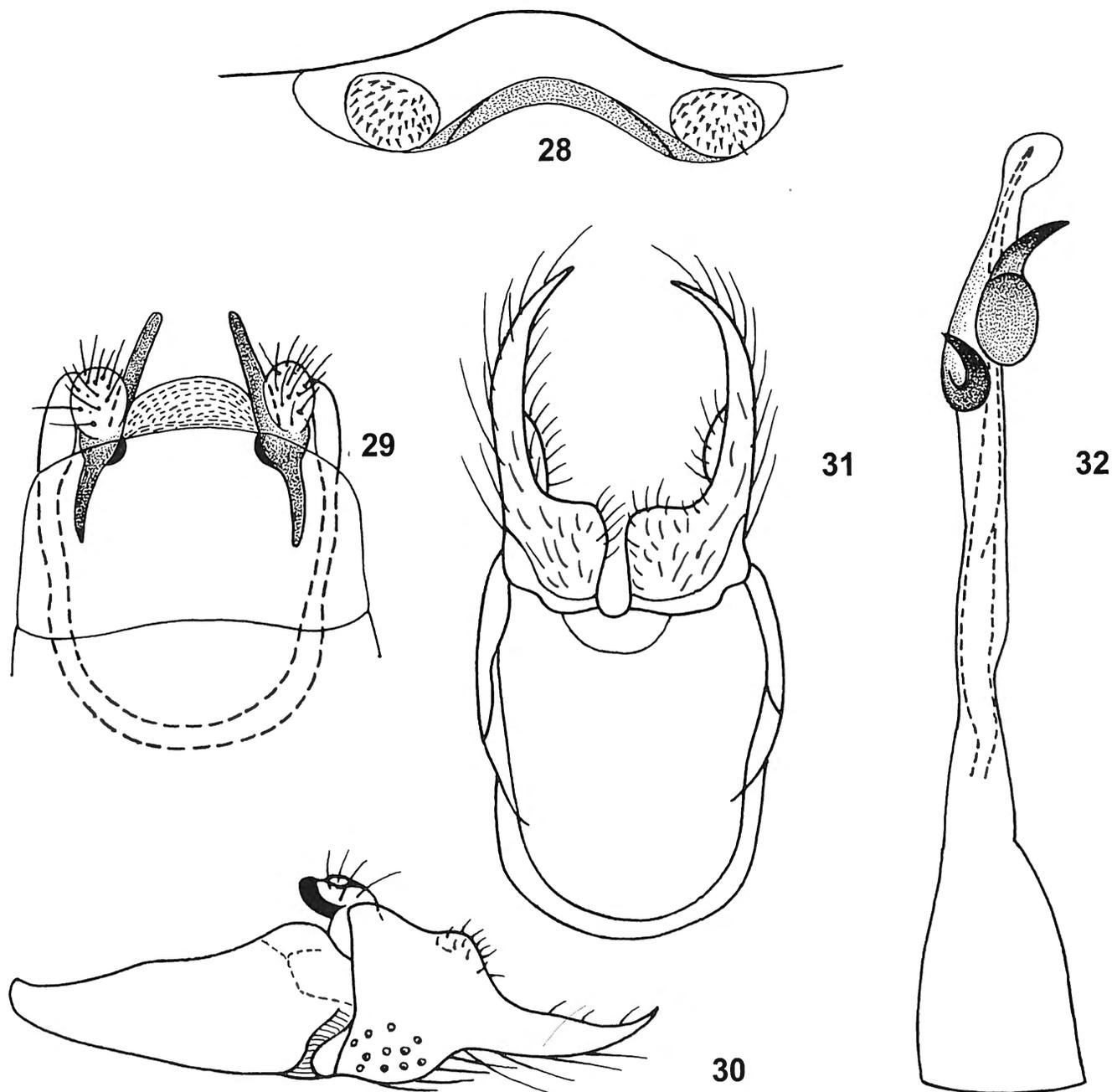
Forewing length: 2 mm. Antennae with 19 articles. The genitalia being very similar to those of *M. kumanskii* BOTOSANEANU, 1991, described from Haiti, in the following description only distinctive characters of the new subspecies will be mentioned. Besides the pair of globular androconial pouches in abdominal segment IV, we find here in segment VI near the limit with segment VII, a transverse, arched formation with androconial pouches near the ends, looking roughly like that described (BOTOSANEANU, 1991) in the Haitian *M. fontismoreaui*. Inferior appendages differing only very slightly from those in the nominative subspecies: terminal lobe maybe still longer and more acuminate, upper lobe (lateral view) seemingly very slightly bilobed. More distinctive is the membranous segment X, here hemispherical and distinctly shorter than the sclerotized dark rods flanking it.

This is clearly a geographic race of *M. kumanskii*. That the androconial equipment in the two subspecies is different is not surprising: in the process of speciation such organs certainly play a role.



Figs. 21-25. – *Ochrotrichia cavitectum* BOTOSANEANU n.sp., ♂ genitalia, dorsal, lateral, and ventral, phallic apparatus, and its more strongly magnified apical part.

Figs. 26-27. – *Ochrotrichia* probably *cavitectum* BOTOSANEANU n.sp., ♀ genitalia (tergite VII and beyond, and spermathecal sclerites).



Figs. 28-32. – *Metrichia kumanskii jamaicae* BOTOSANEANU n.ssp., ♂ (28: complex formation in abdominal segment VI – more strongly magnified than remaining figures; 29-32: genitalia, dorsal, lateral, and ventral, and phallic apparatus, dorsal).

Metrichia sp. (Fig. 33)

IX: 1 ♀.

This female cannot be that of *M. kumanskii jamaicae* n.ssp. (compare with fig. 51 in BOTOSANEANU, 1991: ♀ of *M. kumanskii*) or that of the other species described from Jamaica, *M. yalla* (FLINT, 1968) – compare with fig. 126 in that publication. It is almost certainly a new species, which will remain undescribed in the absence of the male.

Forewing length: 1.7 mm. Antennae of 18 articles. Very distinctive genitalia: sternite VII strongly tapering api-

cally, bilobed, with numerous long, stiff setae; segment VIII a very strongly developed capsule proximally reaching segment VI, its distal part complex with wide median membranous, rounded lobe and lateral zones covered by minute spinules; exceedingly long apodemes of segments VIII and IX, penetrating in segment III. The spermatheca could not be correctly observed and illustrated.

Hydroptila ancistrion FLINT, 1968

III: 2 ♀; IV: 6 ♂, 7 ♀; VII (20.03.1998): 2 ♀; IX: 1 ♂, 3 ♀. Endemic Jamaican species, less frequent and abundant

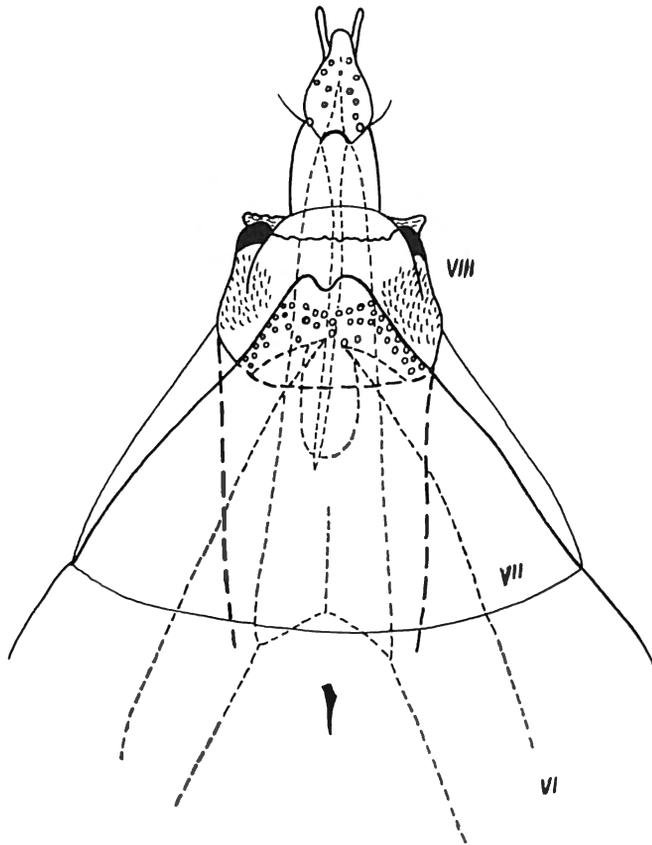


Fig. 33. – *Metrichia* sp., ♀ genitalia, ventral.

than *H. ditalea* – with which it often inhabits the same water courses. The male would have deserved being illustrated with more details than in the original description; it is not easily distinguished from that of *H. ditalea*, whereas the ♀♀ of the two species are readily distinguished.

Hydroptila ditalea FLINT, 1968

III: 7 ♂, 1 ♀; IV: 4 ♂, 232 ♀; V: 1 ♂, 41 ♀; VI: 1 ♂, 4 ♀; IX: 59 ♂ + ♀.

First described from Jamaica, this species proved subsequently to have a wide distribution, being found also in the Dominican Republic, Mexico, Peru and Ecuador.

Oxyethira (sg. *Damphitrichia*) *cirrifer* FLINT, 1964

VI: 1 ♀; IX: 4 ♀.

This species was synonymised (KELLEY, 1984) with *O. arizona*, ROSS, 1948. Not being convinced that it is a synonym, we prefer to label these specimens, for the time being, as *cirrifer*.

Oxyethira (sg. *Damphitrichia*) *tega tega* FLINT, 1968

VI: 4 ♂.

First described from Jamaica, this species is represented

on this island and on Cuba by the nominative subspecies, and on some Lesser Antilles by another one.

Oxyethira (sg. *Damphitrichia*)

sp: either *mirebalina* BOTOSANEANU, 1991, or *longispinosa* KUMANSKI, 1987

VI: ca. 150 ♀.

We have had really bad luck with this species, represented in this sample by large numbers of females, in the absence of any male. Judging from the characteristic shape of the spermathecal sclerites, it could equally well be *mirebalina* (described from Haiti and subsequently discovered also in the Dominican Republic: BOTOSANEANU 1991, 1995) or *longispinosa* (♀ described from Cuba, Pinar del Rio, under “*Orthotrichia* sp. ”: KUMANSKI, 1987, fig. 20a – c). It is, anyway, new for Jamaica.

Oxyethira (*Damphitrichia*) *simulatrix simulatrix* FLINT, 1968

III: 1 ♀.

Oxyethira (*Damphitrichia*) *simulatrix cubana* KUMANSKI, 1987.

VI: 6 ♂, 1 ♀.

Oxyethira simulatrix was described (FLINT, 1968) from East Jamaica; despite the fact that the nominative subspecies is represented in our material (again East Jamaica) only by 1 ♀, the identification is sure.

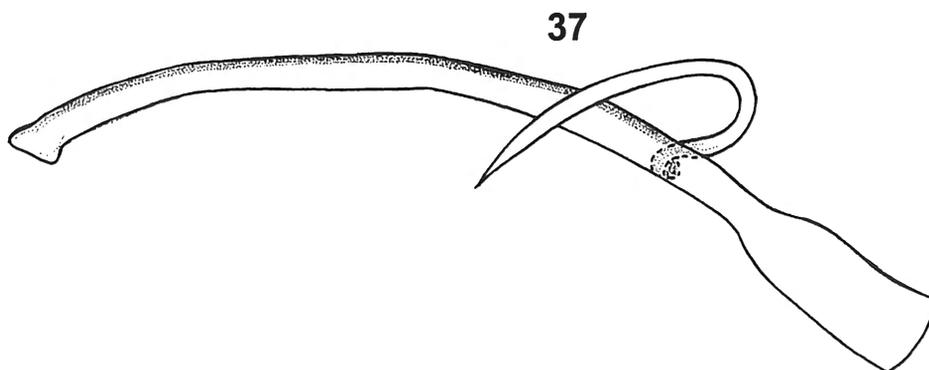
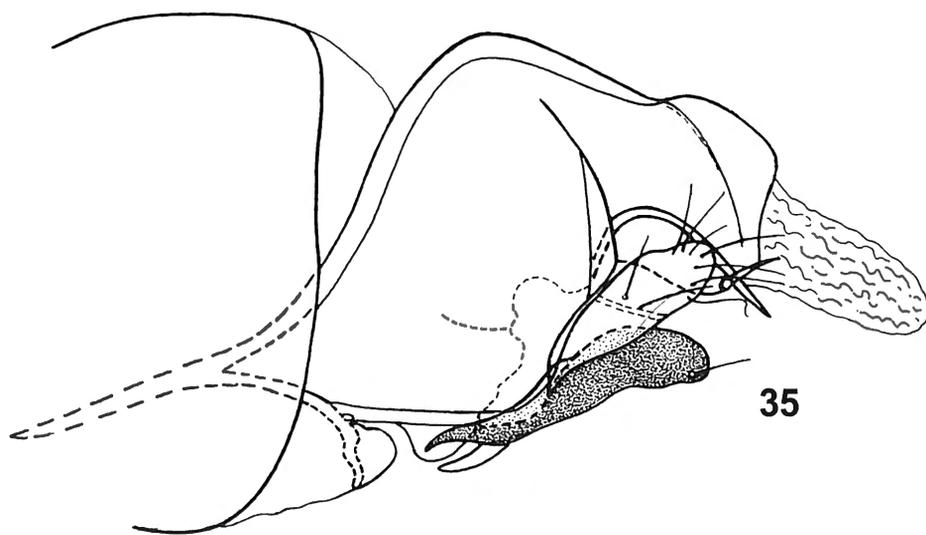
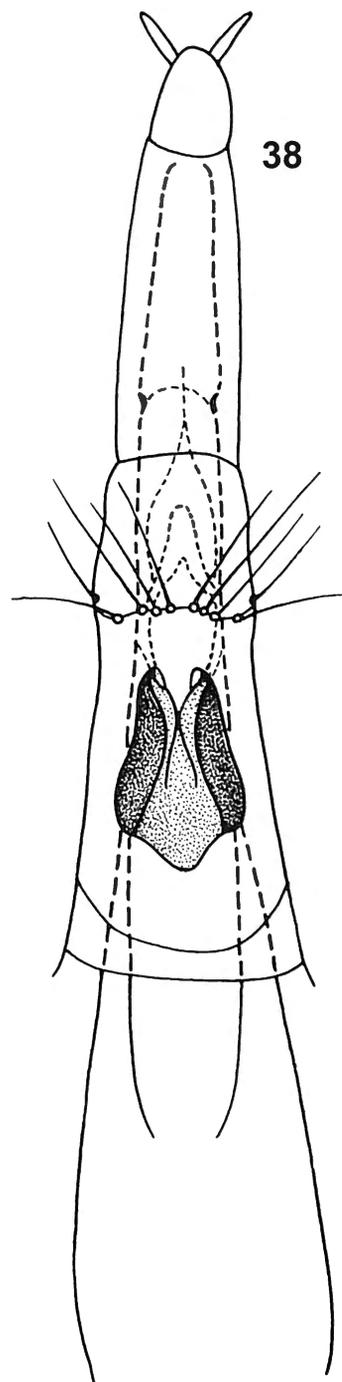
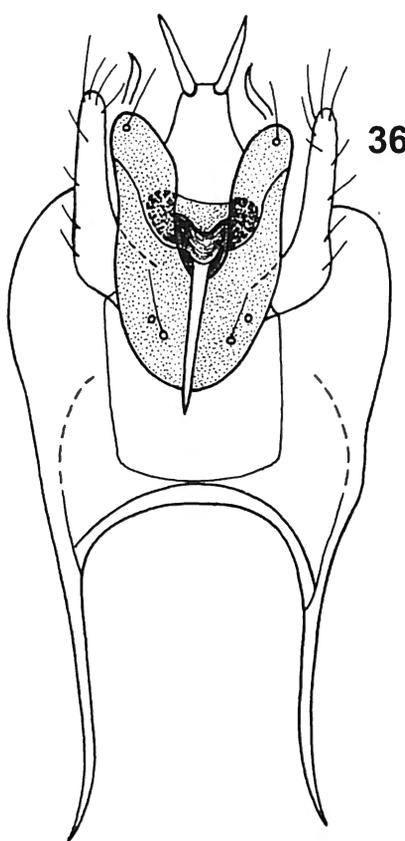
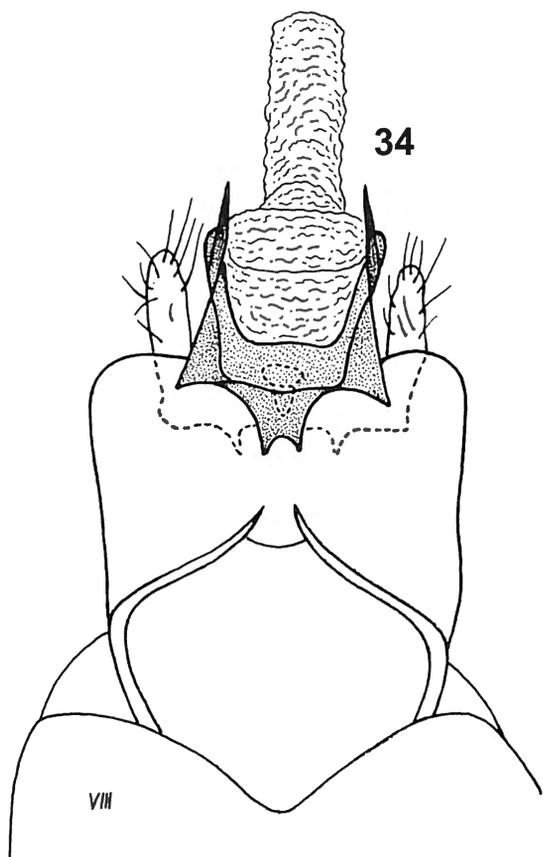
O. simulatrix cubana, described from Cuba, Pinar del Rio (KUMANSKI, 1987) has a wider distribution, having been found also in Haiti, Guadeloupe, and now in Jamaica (West).

The differences in the genitalia (♂, ♀) between the two subspecies, although not conspicuous, are rather numerous and reliable. If further sampling in Jamaica will show that the two subspecies are really restricted in their distribution on this island to the eastern and, respectively, to the western parts, this would be a fine example of geographic vicariance of closely related taxa.

Oxyethira (*Loxotrichia*) *janella* DENNING, 1948

I: 1 ♂, 1 ♀; III: 11 ♀; IV: hundreds of ♂ and ♀; V: 2 ♂, 96 ♀; VI: 4 ♂, 64 ♀; IX: 44 ♂, 170 ♀.

Figs. 34-38. – *Neotrichia soleaferrea* BOTOSANEANU n.sp. (34-37: ♂ genitalia, dorsal, lateral, and ventral, and phallic apparatus, lateral; 38: ♀ genitalia – segment VIII and beyond –, ventral).



Oxyethira (Loxotrichia) puertoricensis FLINT, 1964

III: 4 ♀; IV: hundreds of ♂ and ♀; V: 9 ♂, 36 ♀; VI: 14 ♂; VII (20.03.1998): 1 ♀; IX: 1 ♂.

Neotrichia soleaferrea BOTOSANEANU n.sp.
(Figs. 34-38)

♂ holotype and ♀ allotype, as well as 6 ♂ and 24 ♀ paratypes, from Black River in its upper course at Windsor, St. Elizabeth. 30.09.1997. VII (20.03.1998): 17 ♀ paratypes; IX: 5 ♀ paratypes.

Description of male

Forewing length: 1.3 – 1.5 mm. Last 4 or 5 articles of antenna white. Abdominal segment VII with medio-ventral “tooth”.

Segment VIII with distal margin ventrally straight, dorsally widely but not very deeply cleft. Segment IX with long, slender anterior appendages; sternite with paler quadrangular median zone, and posteriorly with pair of well developed setose appendages (“bracteoles”) which are widely distant but with bases convergent towards the median line. The gonopods are conspicuously and very characteristically developed, strongly sclerotized and dark (easily seen in non-macerated specimens), fused in their basal half from which two strong, bluntly ending branches separated by a deep sinus slightly diverge. Above the gonopods, at level with the anterior part of the sinus which separates them, a median dark formation (“subgenital plate”) sending proximad a long, freely hanging “styletto” (in fig. 36 this looks like a keel, which does not correctly reflect the reality). More dorsally a large lobe topped by two strong spines (fig. 36); in lateral view (fig. 35) also a long, slender, curved spine becomes apparent above this lobe – but it could not be ascertained that it is connected to it. Segment X roughly rectangular with large median membranous core proximally and laterally surrounded by a complex sclerotized frame (represented with details in fig. 34 but not in fig. 35); proximally this frame has lateral “wings” and a median projection ending in two points; posterior angles of the frame ending in slender, pointed appendages (their tips represented also in fig. 36). Phallic apparatus with small widened basal part followed by a long tube curved downwards and with slightly widened apex; a short curved paramere starts from the tube slightly distad from the widened base.

Description of female

Forewing length: 1.4-1.5 mm. Last articles of antenna white – like in the ♂. Posterior margin of sternite VII straight. Ventrally on abdominal segment VIII a very characteristic formation, easily seen on non-macerated specimens: a shield with sinuous proximal and lateral margins, its lateral parts black and embossed, with long apodemes from its latero-proximal angles.

Remarks

This species is closely related to- and possibly sister-species of – *N. heleios* FLINT, 1968, described from E. Jamaica and possibly restricted to that part of the island. It is apparently slightly smaller than *heleios*; the main differences in the male genitalia (in as far as comparison is possible) are: stronger gonopods proximally fused for ½ of their length; different shape of the “subgenital plate” sending proximad a “styletto”; phallus with much shorter, and strongly curved, paramere. The sclerotized formation on sternite VIII of the ♀ is very different from that illustrated (FLINT, 1968: fig. 77) for a ♀ identified with some doubt as *heleios* as well as from that of the other known Jamaican *Neotrichia*.

Solea ferrea (Lat.; = horse-shoe) was used for the new species because of the shape of the gonopodial complex.

Neotrichia iridescens FLINT, 1964

III: 1 ♂; IV: several hundreds of ♂ and ♀; V: 6 ♂, 9 ♀; VI: 9 ♂, 8 ♀; VIII: 1 ♂, 17 ♀; IX: 18 ♂+ ♀.

Neotrichia pequenita BOTOSANEANU, 1977

VII: 1 ♂, 4 ♀ (30.09.1997) and 5 ♂, 23 ♀ (20.03.1998). This species is new for the fauna of Jamaica; it has been described from Cuba, and subsequently found in Haiti, Barbados, and Trinidad.

XIPHOCENTRONIDAE

Xiphocentron cubanum nesidion FLINT, 1968

II: 1 ♀; VII: 2 ♂, 1 ♀ (30.09.1997) and 3 ♂ (20.03.1998)

X. nesidion was described from Jamaica by FLINT (1968). We could examine the ♂ holotype, as well as an additional ♂ specimen labelled as *nesidion* (from Portland: Reach Falls, 15.05.1996) both in the NMNH, Smithsonian Institution, Washington. These two specimens were compared with the ♂♂ caught by us (forewing length: varying between 3 and 4.9 mm), and found to belong to the same taxon.

Taking into account all published evidence (*inter alia*: KUMANSKI, 1987; BOTOSANEANU, 1993, 1996) we decided that it would be preferable to consider *nesidion* as being a subspecies of the Greater Antillean *X. cubanum* (BANKS, 1941) which consists of an unquestionably monophyletic bundle of distinct geographic races distributed on the various islands:

– *X. cubanum caimitense* KUMANSKI, 1987: Cuba (Pinar del Rio)

- *X. cubanum cubanum* (BANKS, 1941): Cuba (Las Villas)
- *X. cubanum orientale* BOTOSANEANU, 1993: Cuba (Oriente)
- *X. cubanum haitiense* (BANKS, 1941): Hispaniola (Haiti, Dominican Republic), Puerto Rico
- *X. cubanum nesidion* FLINT, 1968: Jamaica.

A few observations on the ♂ genitalia of *nesidion* will follow (in italics: characters more clearly distinguishing the Jamaican taxon). Posterior limit of sternite IX (not illustrated in the original description) almost straight, only with minute median emargination. Tergite IX with deep, narrow distal sinus almost reaching the proximal sinus (distance between the two sinuses shorter than in fig. 31 of the original description). *Segment IX (lateral) with upper anterior angle of sternite relatively long and slender. Segment X (dorsal) relatively thick-set, well widened basally, this base with very shortly produced lateral angles, distal part slightly separated from the rest (generally less strongly capitate than in fig. 31 of the original description). Superior appendages (lateral) strongly sinuous proximally. Gonopods (unmistakably of the cubanum – type) distinctly shorter than superior appendages, in dorsal view their basal half well widened (but less angular than in fig. 31 of the original description).*

HYDROPSYCHIDAE

Three species of *Smicridea* Mcl., 1871, have been described from Jamaica (FLINT, 1968); although their ♂ genitalia (not to speak of those of the ♀!) are extremely similar, not allowing safe identification, they can be distinguished by their size and by the pattern of their forewings (pattern unfortunately disappearing in specimens preserved in alcohol – like all ours). Two of FLINT's species, *jamaicensis* and *grandis*, were found during the

present study, the first one in large numbers, the second one represented by only one specimen.

No specimen could be sampled of the 3rd species, *minima* (possibly again a Jamaican endemic element, although there is some vague evidence of its possible occurrence in Cuba: see discussion in BOTOSANEANU, 1994: 464). Nevertheless, 1 ♂ of a similarly small species was sampled in our sta. VII, with a clearly distinctive character in the forewing, certainly absent in *minima* this will be described here as a new species. It should be added that BOON (1988: 428) records from tree localities in East or Central Jamaica “extremely small” larvae of an apparently undescribed species, named in that publication *micridea* sp. A”; it cannot be excluded that these larvae belong to the new species we shall describe below; consulted by the first author of the present paper, Dr. O.S. FLINT replied that he was unable to find any material of “*Smicridea* sp. A”.

Smicridea jamaicensis FLINT, 1968

I: 9 ♂, 9 ♀; III: 71 ♂ + ♀; IV: 249 ♂ + ♀; V: 75 ♂, 170 ♀; VI: 4 ♂, 7 ♀; VII: 2 ♂ (30.09.1997), and 3 ♂, 1 ♀ (20.03.1998); VIII: 3 ♂, 2 ♀; IX: 8 ♂, 18 ♀.

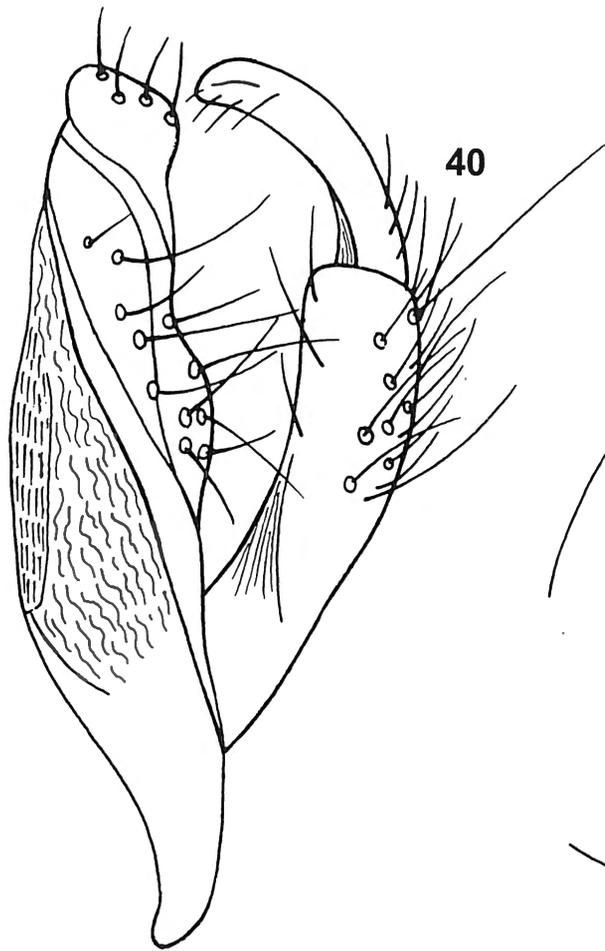
Despite the fact that the smallest males sampled have a forewing length of only 5.8-6 mm, (and not “at least 7 mm.”), there is no doubt that all these specimens belong to this extremely frequent and abundantly represented Jamaican endemic species.

Smicridea grandis FLINT, 1968

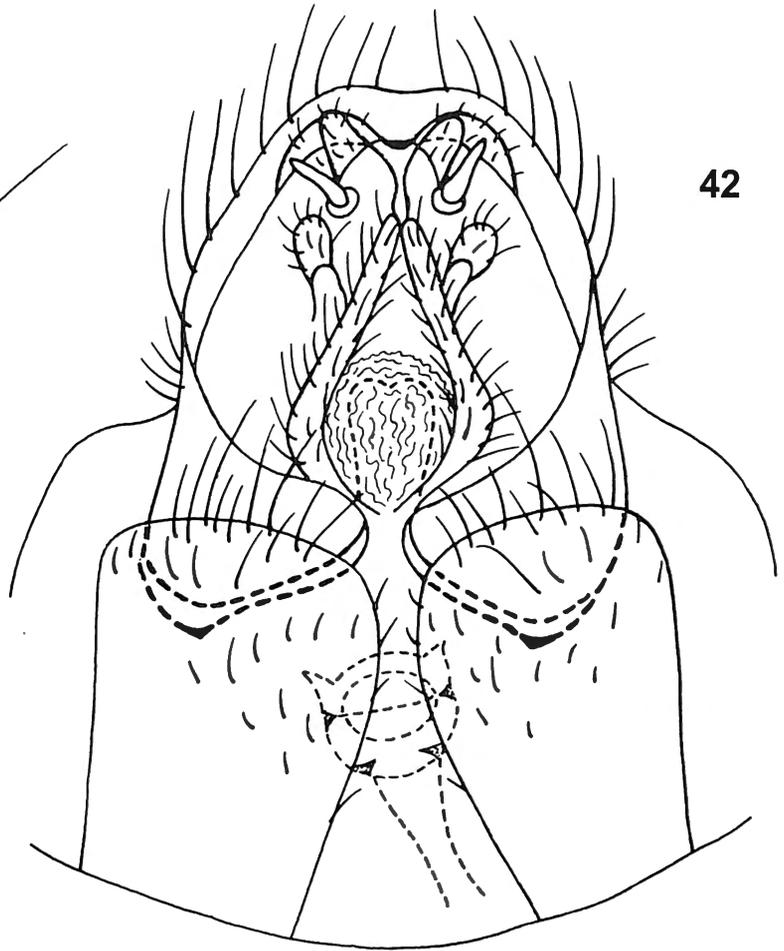
I: 1 ♀.
Again a Jamaican endemic element.



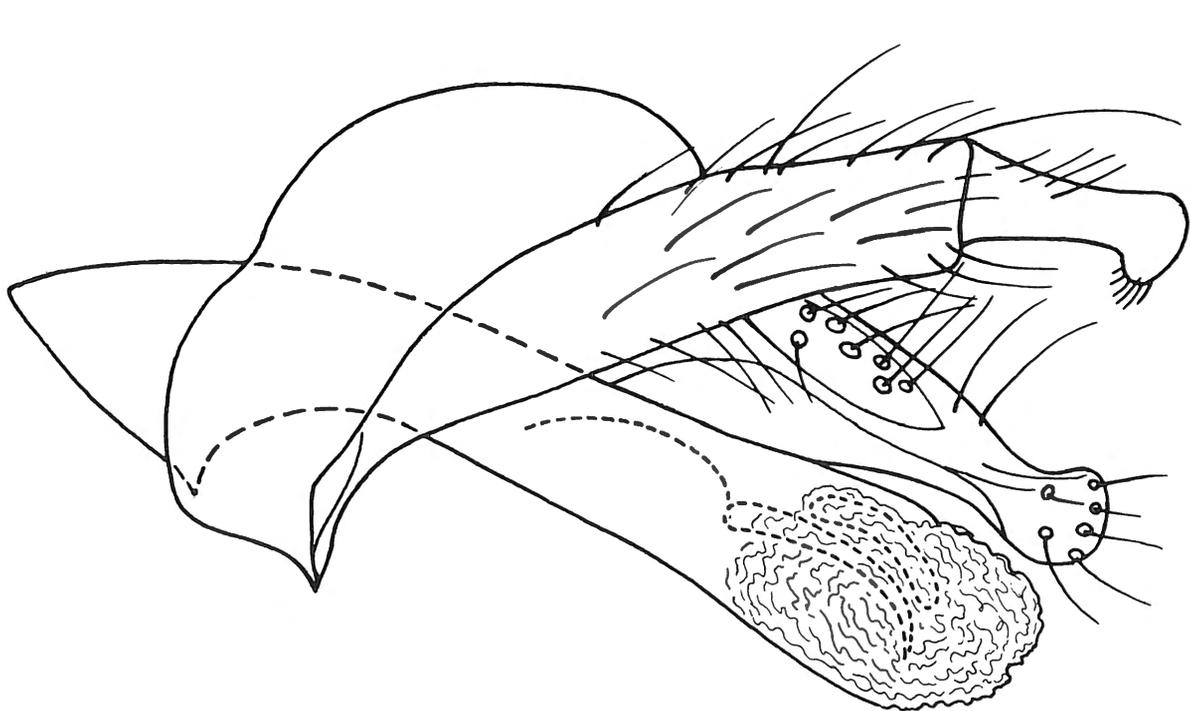
Fig. 39. – *Smicridea fuscifurca* BOTOSANEANU n.sp., ♂ forewing.



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Figs. 40-41. - *Smicridea fuscifurca* BOTOSANEANU n.sp., ♂ genitalia, dorsal - left half -, and lateral.

Fig. 42. - *Macronema* sp., ♀ genitalia, ventral.

Smicridea fuscifurca BOTOSANEANU n.sp.
(Figs. 39-41)

♂ holotype from Y.S. Falls on Y.S. River, St. Elizabeth. 30.09.1997.

Forewing length: 4.9 mm. *In alcohol* the forewings are almost uniformly dark; the zone (i.e.: wing membrane) limited by the branches of fork 1 is still darker, in contrast with the paler zone above it; moreover the branches of fl and most of its stem are distinctly darkened.

If the genitalia are compared with the published illustration for the three Jamaican species, several differences can be observed – in particular from the similarly small *minima*; but only direct comparison will allow correct description of these differences.

Macronema sp. (Fig. 42)

VII: 2 ♀ (30.09.1997); 2 ♀ (20.03.1998).

This is one of the unfortunate cases encountered during our study. Not only is genus *Macronema* PICTET, 1836, new for Jamaica, but also the subfamily Macronematinae was never recorded from this island. The species is almost doubtless new, but will not be described in the absence of the male.

Forewing length: 13 mm (largest caddisfly of Jamaica). The forewings are yellowish/ very pale brownish, without any pattern of the membrane, or given by coloured scales, etc.; this was clearly observed on freshly caught specimens, as well as the absence of scales on head etc. The ♀ genitalia are here illustrated. From the West Indies, three species of *Macronema* were described: *gundlachi* BANKS, 1924 from Cuba (Pinar del Rio, Las Villas); *matthewsi* FLINT, 1964, from Puerto Rico; and *tremenda* BOTOSANEANU, 1980, from Cuba (Oriente). Only *gundlachi* has unmarked wings, whereas those of the two other species are beautifully marked.

CALAMOCERATIDAE

Phylloicus farri FLINT, 1968

III: 1 ♂, 3 ♀

This is one of the most remarkable Jamaican endemic caddisflies.

LEPTOCERIDAE

Nectopsyche? cubana (BANKS, 1938)

I: 1 ♀.

The genitalia of this unique specimen sampled by us are exactly like in the illustration published by FLINT

(1968: fig. 132) for the ♀ of a species from E. Jamaica identified “with some hesitancy” as *N. cubana* (BANKS) – a species known from Cuba and the Dominican Republic and recorded with an interrogation mark also from Puerto Rico. This hesitancy seems justified if the figure (fig. 130) given in the same publication for the ♂ is compared with illustration of the ♂ genitalia of *N. cubana* in FLINT, 1967 (made from the type) and in BOTOSANEANU, 1979 (fig. 15), but experience tells that simply comparing illustrations is not enough for distinguishing species in this genus. Anyway, based on this unique ♀ specimen we are unable to make a step further.

Nectopsyche globigona BOTOSANEANU n.sp.
(Fig. 43-47)

♂ holotype, as well as 1 ♂ paratype, from Rio Minho in its upper reach at Grantham, a few km. W. of Frankfield, Clarendon. 1.10.1997. VII (20.03.1998): 1 ♂ paratype, IX: ♂ paratype, X: 1 larva.

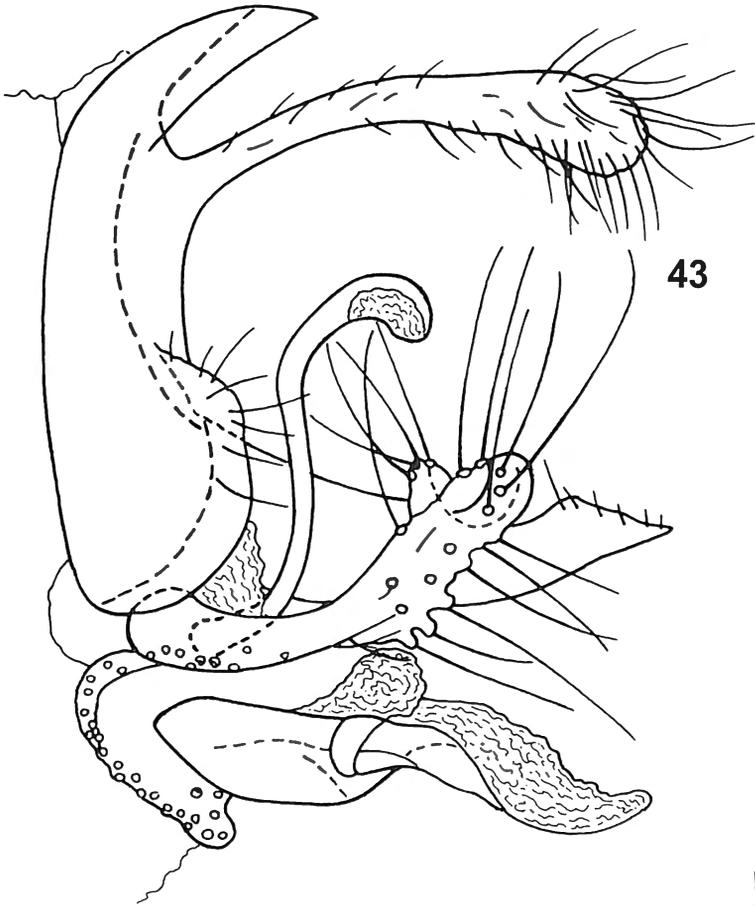
Description of male

Forewing length: 9.2-10 mm. If the wings had a distinct pattern (one could not be distinguished in the field) nothing of it was left in alcohol.

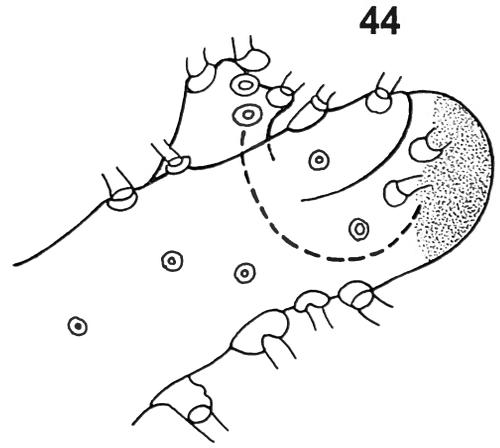
The description of the genitalia will be restricted to that of the inferior appendages which enable secure distinction of the new species – for instance from the two *Nectopsyche* species already recorded from Jamaica: *cubana* and the endemic *lewisi* FLINT, 1968. In lateral view these appendages are slightly curved upwards, narrow basally, then somewhat widened – this widened zone with setae arising from swollen alveolae; their distal part is characteristically tribranched: a short antepical, setose, dorsal branch (not seen in ventral view) and two apical branches, the lateral one digitiform and setose, the median one strongly swollen (globose), hollow dorsally and with darkened distal part.

Description of the larva

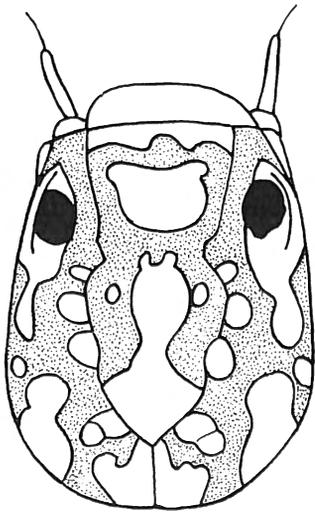
Sampling of aquatic instars has been beyond the scope of our sampling programme; nevertheless, in one of the few samples taken (st. X, being one of the karstic springs feeding Roaring River, st. IX) one last instar larva of the new species was caught. This larva resembles in some respects that of *cubana*: both have swimming hairs on the hind tibiae and a distinct pattern of dark and light fields on the head capsule. Nevertheless the head pattern of the new species differs from that seen in *cubana* (BOTOSANEANU, 1994: fig. 44) this difference being, particularly clear on the frontoclypeus; moreover, the frontoclypeus has a different shape, with more sinuous lateral margins. The larva of *N. lewisi* (FLINT, 1968) is very different: head (and pronotum) uniformly coloured, no swimming hairs on tibiae, and also the cases are very different from those of *cubana* and of the new species.



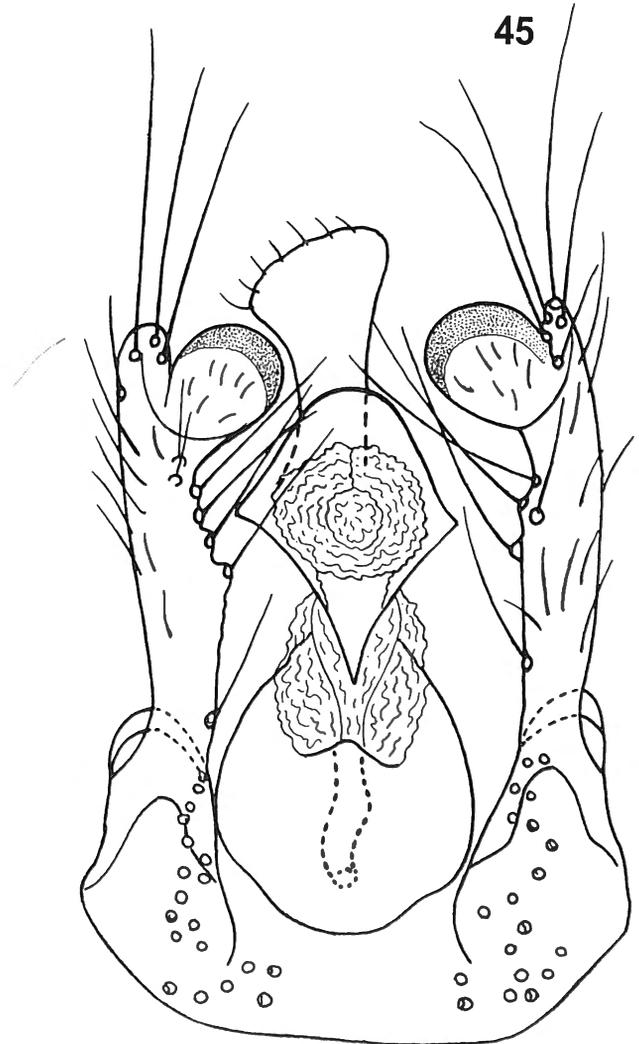
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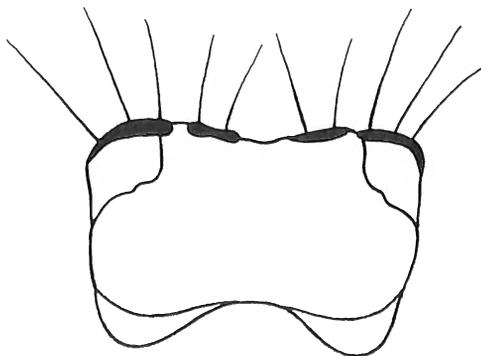
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Remarks

No sound speculation is possible at this point concerning the relationships of the new species. The specific name points to the highly characteristic globose medio-apical branch of the gonopods.

HELICOPSYCHIDAE

Helicopsyche ochtheiphila ochtheiphila FLINT, 1968
(Fig. 48)

III: 1 ♂; IV: 2 ♂; V: 4 ♂; VII (20.03.1998): 9 ♂; VIII: 3 ♂; X: 1 ♂ metamorphotype, 1 larva, cases.

H. ochtheiphila was described from E. Jamaica; the type material (♂♂) was reexamined by Dr. O.S. FLINT on request of the first author of the present paper. Study of the ♂♂ specimens sampled by us from Central and W. Jamaica, and comparison with the results of the type material reexamination, showed that *ochtheiphila* is very similar to a species described from Western Cuba including Isla de Pinos: *H. falcigona* BOTOSANEANU & FLINT, 1991; we decided that they deserve no more than the

status of geographic races (subspecies): *H. o. ochtheiphila* in Jamaica, *H. o. falcigona* in Cuba.

In the original descriptions of both *ochtheiphila* and *falcigona* two interesting morphological features remained unnoticed. On the head of the males there is a conspicuous black medio-longitudinal formation at first sight looking like a keel; in fact, we have here a pair of tufts of long, agglutinated black setae, starting ventrad from the antennal bases and adpressed to the head. This very distinctive formation is identical in the Jamaican and in the Cuban populations (in the specimen from our sta. III the tufts seem to be shorter and more swollen). Moreover, the second article of the ♂ maxillary palpus has near the base a median pit in which is inserted a tuft of pale setae, almost as long as the 2nd and 3d articles of the palpus.

The forewing length in the ♂ specimens examined varied between 4 and 5.4 mm., a majority of specimens having 5 mm. or less. Body and wings are very pale (yellowish). Only very slight differences in the genitalia allow distinction from the Cuban subspecies: appendage of abdominal sternite VI more slender, sternite IX somewhat shorter, basomedian branches of the gonopods maybe slightly more squarish.

It should be added that in the original description of *ochtheiphila* (FLINT, 1968) a ♀ considered as being of this species was illustrated.

Concerning the larva, the pattern of the head and the spinulation of the anterior margin of the pronotum are practically identical in the two subspecies, but there is also an interesting difference: whereas in *H. o. falcigona*

←

Figs. 43-47. – *Nectopsyche globigona* BOTOSANEANU n.sp. (43-45: ♂ genitalia, lateral, more strongly magnified apex of left gonopod in lateral view, and ventral – ventrolateral lobes of segment IX illustrated only on one side –; 46-47: larval head and pronotum – pattern on pronotum incompletely illustrated).

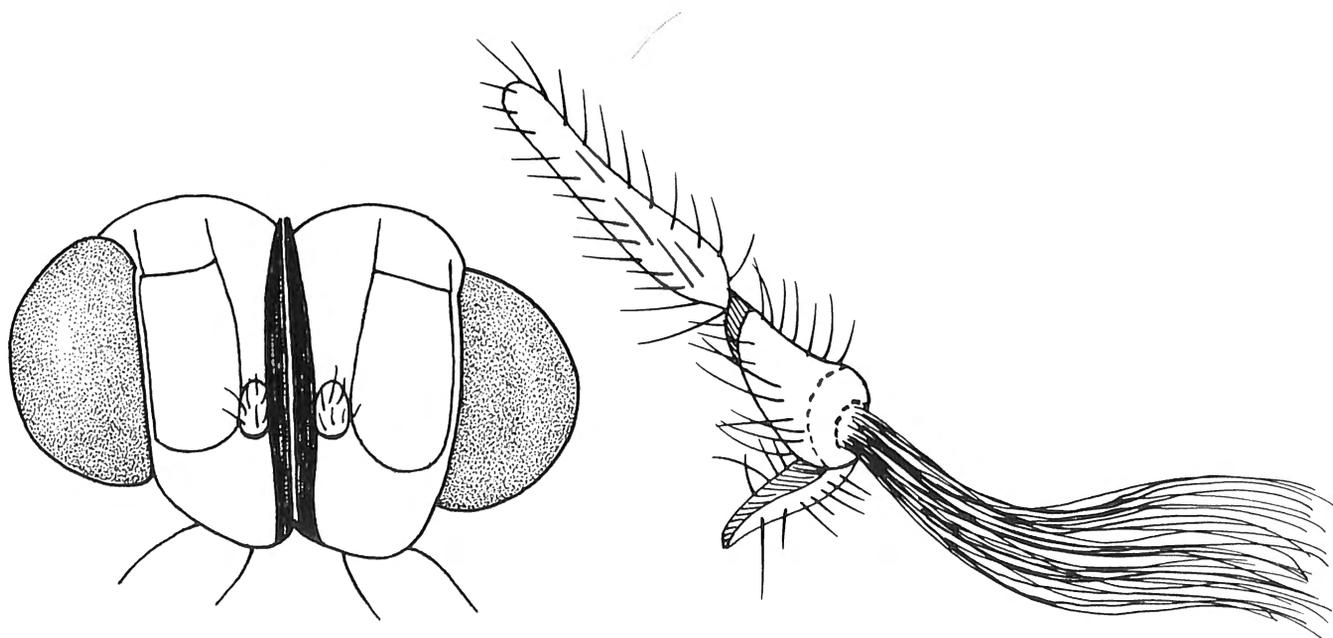


Fig. 48. – *Helicopsyche ochtheiphila ochtheiphila* FLINT, 1968. Head of ♂, frontal view, and ♂ maxillary palp.

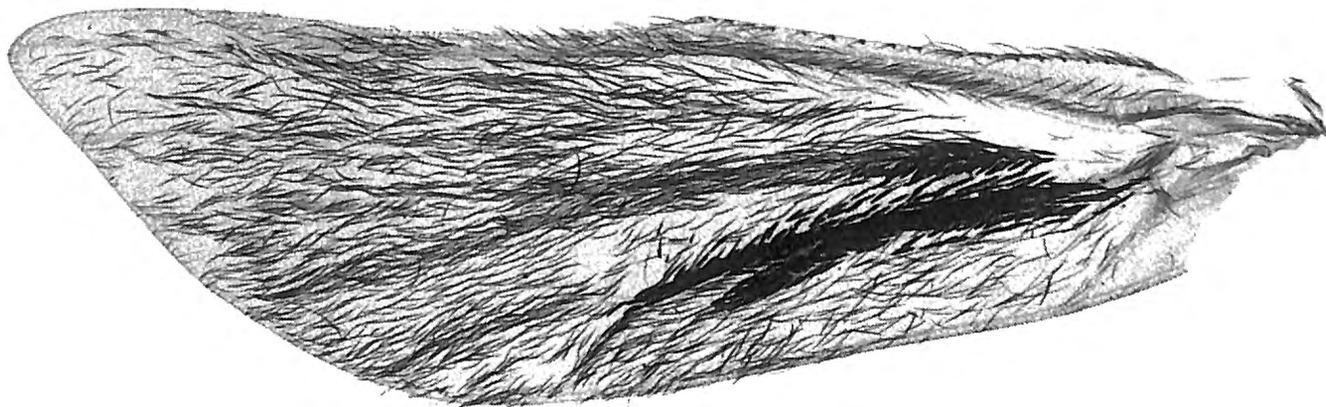


Fig. 49. – *Helicopsyche* sp., ♀, hindwing reverse with the pattern of black, thickened setae.

(BOTOSANEANU, 1994: fig. 60) there are numerous minute pale spines on the surface of the anterior half of the pronotum, these are completely absent in the Jamaican race.

Helicopsyche sp. (Figs. 49-50)

I: 1 ♀; III: 3 ♀.

Description of the female

Forewing length: 4.6-5 mm. Body and wings very pale (yellow-brownish). On the hindwing reverse an androconial system consisting of black thickened setae, in strong contrast with the pale wing membrane, along: a small part of M, the bottom of a furrow in the space between M and Cu, most of Cu before branching, most of A1; there is some individual variation in the development of this system. From Dr. O.S. FLINT we know that there are several Jamaican ♀♀ (pinned, or in alcohol) with these thickened setae, in the NMNH. He is inclined to believe that they belong to what was called ‘*cubana*’ in his 1968 publication (i.e. *occidentale molesta*); but the male specimens of *H. occidentale molesta* sampled by us were not caught in company of ♀♀ with androconial setae on the hindwings. The reticulation of the abdominal ventra is: very faint on II, well developed on III but only on half of the length of its middle part, very well developed on IV and entirely covering the middle part of the venter, rather indistinct on V and VI; on VII, on each side, a pattern of dark spots leaving free a median field; venter VIII entirely darkened, without reticulation but with pale setal alveolae. The appendage on venter VI is relatively short (only ½ of the venter length), strongly tapering towards the pointed apex. Genitalia: fig. 50.

Helicopsyche occidentale molesta BOTOSANEANU n.ssp.
(Figs. 51-54)

♂ holotype from a streamlet tributary of East Lucea River

at ca. 2 km. upstream from its mouth, Hanover (Lucea). 4.10.1997. Two ♂ paratypes: same locality.

Description of male

Forewing length: 4.6, 5.3. and 5.7 mm. Forewings and body pale brown. Reticulation on the abdominal ventra: absent on segment II, well developed on III, even better on IV where it covers the whole sternite, feebly distinct and “loose” on V, absent on VI and VII.

The genitalia are very similar to those of *H. occidentale* BOTOSANEANU & FLINT (1991: figs. 35-42). This is valid especially for the characteristically shaped segment X (dorsal view) and gonopods (ventral view). Accordingly, we insist here only on the slight differences enabling distinction of the new subspecies. The appendage of venter VI is short, strong, devoid of a distinct “strangulation” in its middle. Sternite IX with distal margin perfectly straight (not sinuous). Gonopods in lateral view slightly less wide distally (in other words: with their anterodistal angle less protruding). In segment X some differences in the setation were observed, the most significant being the presence of rather long setae (one row) along the basal portion of the lateral setose keels; the minute apical sinus in fig. 52 is, maybe, another slight difference.

An additional difference from *H. occidentale* is the larger size, resembling that of another closely related species, *H. cubana* KINGSOLVER, 1964 (forewing length 3.7-4.3 mm. in *occidentale*, 4.7-5.8 mm. in *cubana*).

Remarks

One of the *Helicopsyche* species recorded from Jamaica (FLINT, 1968) was *H. cubana* KINGSOLVER, 1964, described from the Oriental province of Cuba: the Jamaican specimens (♂♂) identified as *cubana* were reexamined by Dr. O.S. FLINT, and there is no doubt that they belong to *H. occidentale molesta* n.ssp.

The newly described geographic race is very similar with, and closely related to *H. occidentale occidentale* BOTO-

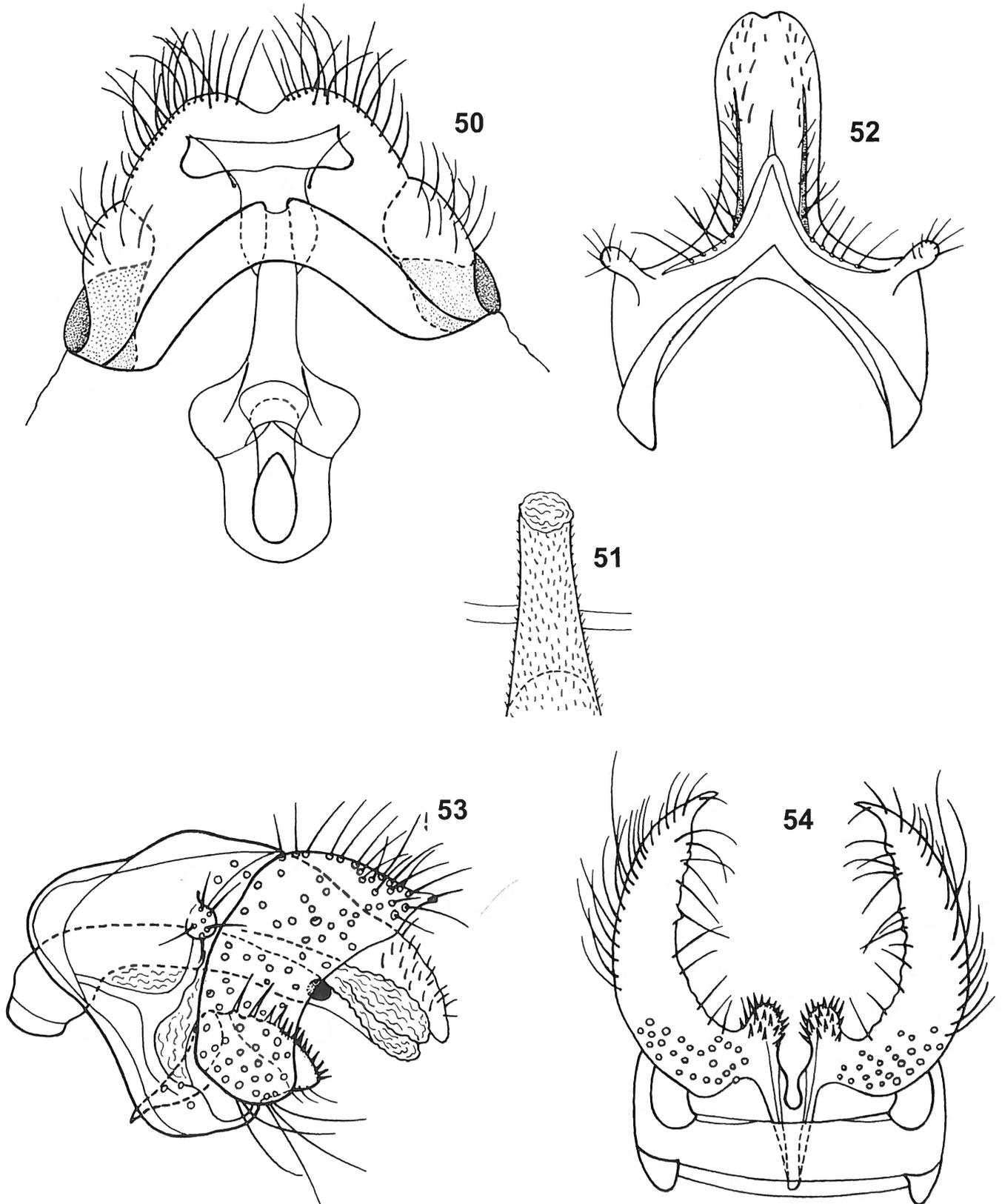


Fig. 50. – *Helicopsyche* sp., ♀ (same as in fig. 49), genitalia, ventral.

Figs. 51-54. – *Helicopsyche occidentale molesta* BOTOSANEANU n.ssp., ♂ (51: appendage on abdominal venter VI – more strongly magnified than remaining figures; 52-54: genitalia, dorsal, lateral, and ventral).

Table I. – Taxa presently known as having restricted distributions in Jamaica.

<i>W (sometimes & Central)</i>	<i>E (sometimes & Central)</i>
<i>Cubanoptila tridens</i> n.sp.	<i>Atopsyche brachycerca</i> FLINT, 1968 <i>Atopsyche macrocerca</i> FLINT, 1968 <i>Cariboptila jamaicensis</i> FLINT, 1968 <i>Leucotrichia tubifex</i> FLINT, 1964 * <i>Alisotrichia argentilinea</i> FLINT, 1968 <i>Alisotrichia giampaolina</i> n.sp. <i>Alisotrichia tenuivirga</i> n.sp.
<i>Ochrotrichia cavitectum</i> n.sp.	<i>Ochrotrichia caligula</i> FLINT, 1968 <i>Ochrotrichia lobifera</i> FLINT, 1968
<i>Metrichia</i> sp. (present paper)	<i>Metrichia yalla</i> (FLINT, 1968) <i>Metrichia kumanskii jamaicae</i> n. ssp.
<i>Oxyethira tega tega</i> FLINT, 1968 *	<i>Oxyethira jamaicensis</i> FLINT, 1968
<i>Oxyethira simulatrix cubana</i> KUMANSKI, 1987 *	<i>Oxyethira simulatrix simulatrix</i> FLINT, 1968
<i>Neotrichia soleaferrea</i> n.sp.	<i>Neotrichia alata</i> FLINT, 1968 <i>Neotrichia heleios</i> FLINT, 1968 <i>Chimarra jamaicensis</i> FLINT, 1968 <i>Chimarra machaerophora</i> FLINT, 1968 <i>Cernotina caliginosa</i> FLINT, 1968 <i>Polycentropus jamaicensis</i> FLINT, 1968
<i>Smicridea fuscifurca</i> n.sp.	<i>Smicridea minima</i> FLINT, 1968
<i>Macronema</i> sp.	<i>Smicridea grandis</i> FLINT, 1968
<i>Nectopsyche globigona</i> n.sp.	<i>Nectopsyche lewisi</i> FLINT, 1968 <i>Marilia amnicola</i> FLINT, 1968

Most taxa in this table are endemic for Jamaica; the exceptions are marked with an asterisk.

SANEANU & FLINT, 1991, from western Cuba, initially described as subspecies of *cubana*, but elevated to species rank (BOTOSANEANU, 1994) based on the major differences in larval morphology. But there is some similarity also with other species: *cubana* (size), and *falcigona* (appendage on sternite VI).

Molesta (Lat.) = troublesome, pointing to the difficulty we had in finding a reasonable solution for the status of the new taxon.

Helicopsyche spp.

Female specimens of this genus which could not be firmly associated, were sampled in our stations I, III, IV, V, and VIII.

Faunistic and biogeographic observations

Presently 52 caddisfly species and subspecies are recorded from Jamaica. Only the following taxa have a situation needing revision or additional information: *Metrichia* sp., *Oxyethira cirriferra*, *Oxyethira* sp., – either

mirebalina or *longispinosa*, *Macronema* sp., *Nectopsyche? cubana*, *Helicopsyche umbonata*, *Helicopsyche* sp. (♀♀ with hindwing androconia from our sta. I and III). Only 12 or 13 taxa (some 25% of the total) are known also from outside Jamaica which means a very high level of endemism.

In several publications, including some by the first author of this paper, the opinion was expressed that if the fauna of Jamaica is compared to those of the other Greater Antilles, it appears as being the most isolated. In some cases this is certainly true, as exemplified, for instance, by species like *Oxyethira jamaicensis*, *Phylloicus farri*, or *Ochrotrichia cavitectum*. But it is presently clear that this opinion has to be seriously “shaded”, as shown in the present paper by evidence coming from taxa like *Cubanoptila tridens*, *Ochrotrichia insularis*, *Metrichia kumanskii jamaicae*, *Oxyethira tega tega*, *O.* either *mirebalina* or *longispinosa*, *O. simulatrix* with its two subspecies, *Xiphocentron cubanum nesidion*, *Helicopsyche ochtheiphila ochtheiphila* or *H. occidentale molesta*. As a matter of fact, this is not surprising. There is presently evidence that Jamaica was possibly never directly connected to other land masses, having been submerged until relatively recently (some 20 – 25 million years ago? some 5 -10 million years ago?) when it rose permanently

above sea level in its present aspect (PORTER et al., 1982; SYKES et al., 1982; PERFIT & WILLIAMS, 1989; ROBINSON, 1994; SCHUBART et al., 1997).

This implies that the island had to be colonized, by dispersal, by elements originating from land blocks antedating the formation of the remaining present-day Greater Antilles – colonization in many cases followed by speciation with more or less spectacular results.

It is presently clear that (Table 1) there are two distinct faunal zones in Jamaica, in as far as the caddisfly fauna is concerned: one eastern (centred around the high, strongly dissected, mainly igneous Blue Mountains), and a second one in the western, mostly carbonate and karstic zones of the island, looking like an extensively dissected plateau with elevations of less than 1000 m. Of course, eastern and western taxa also penetrate/meet in the central parts of the island; and subsequent sampling will doubtless somewhat modify the image offered by Table 1. But the existence of two distinct faunistic (and endemism) zones, with a good number of vicariant taxa, seems to be a firmly established fact. In contrast with Hispaniola Jamaica was not formed by coalescence (accretion) of several land blocks of different origin, and its case should be rather compared with that of Cuba, with its impressive endemism zones in the western provinces, in Las Villas and in Oriente (isolation by distance and/or geographic/habitat barriers).

The main explanation of the isolation of the eastern and of the western fauna could be found possibly in the fact that during the geological history (late Tertiary, Pleistocene) of Jamaica, parts of the island were repeatedly isolated as a result of frequent changes in sea level (PREGILL & OLSON, 1981; SCHUBART et al., 1997). But, of course less dramatic but still efficient hydrographic barriers have certainly also played a role in this process.

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