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TRICHOPTERA HYDROPTILIDAE (INSECTA) FROM SOVIET UNION FAR-EASTERN TERRITORIES

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SUMMARY

This is a contribution to the study of the scarcely known Trichoptera Hydroptilidae from Soviet Far-East (Primorye, Amur River basin, Kuril Islands, Kamtschatka, Chukotka). The discovery of a new species of *Stactobia* McL. on Kunashir Island, very far from the known distribution area of the genus, was quite unexpected. *Agraylea multipunctata* Curt., 1834, and *A. cognatella* McL., 1880, certainly are distinct species, both present in the Soviet Far-East, but apparently not sympatrically. *Oxyethira ecornuta* Morton, 1893, previously known from Fennoscandia and from eastern Canada, is redescribed from Primorye. *Orthotrichia tragetti* Mosely, 1830, with eastern-most known localities in Ukraina and Finland, is another surprising discovery for Primorye.

INTRODUCTION

During the last few years several contributions were made to the study of the interesting caddisfly fauna of the Soviet Far-East. Certainly the most neglected group were the hydroptilids, practically no mention of these micro-caddisflies from the Far-eastern zones of Soviet Union being traceable after the scanty information in A.V. Martynov's publications, the remarkable *Palaeagapetus finisorientis* Botosaneanu & Levanidova, 1987, excepted (Botosaneanu & Levanidova, 1987). During several decades after World War II a collection of Hydroptilidae - mainly adults - slowly accumulated at the Biology and Pedology Institute, Far-Eastern Branch Soviet Academy of Sci-

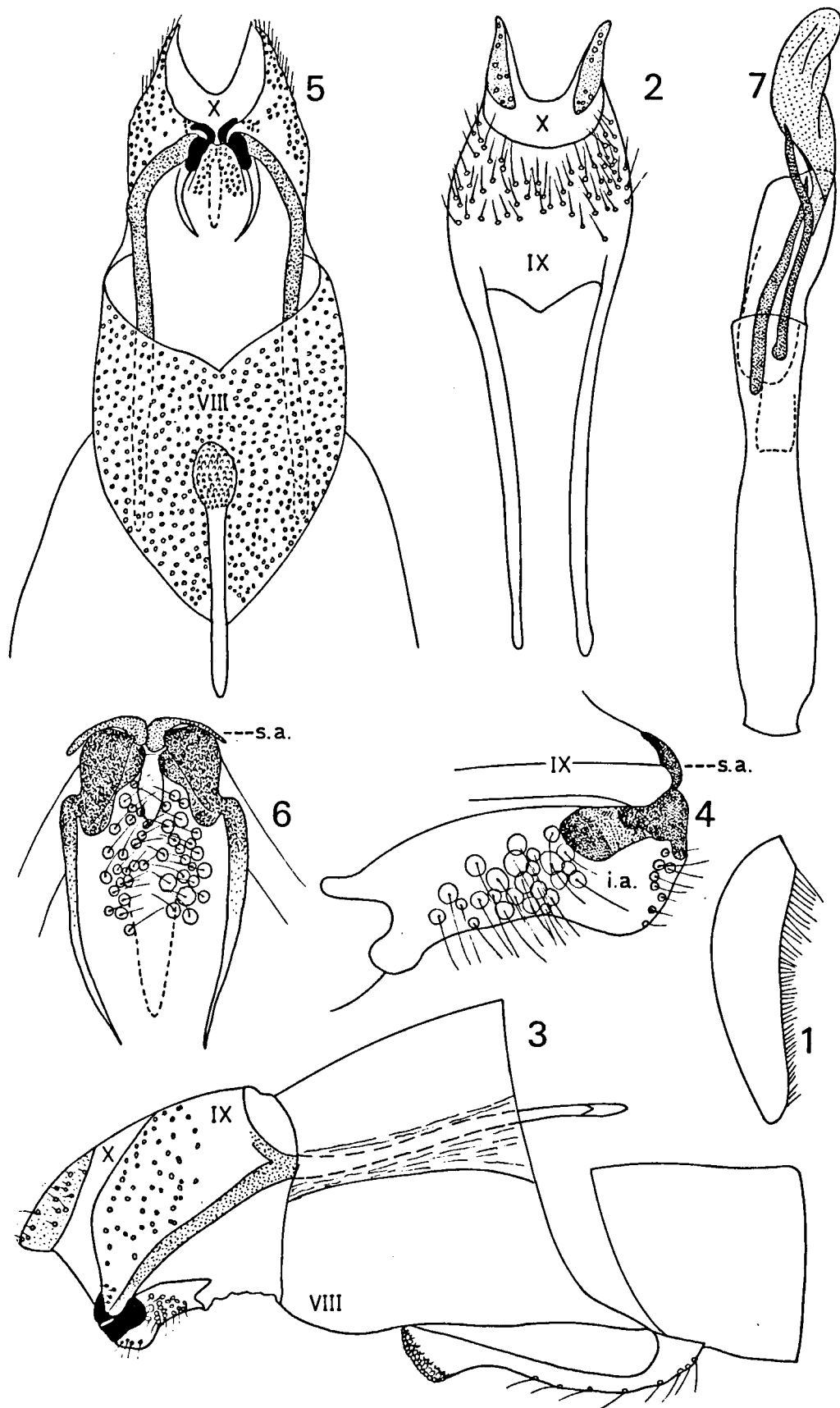
ences, Vladivostok, and this collection is here studied, with some unexpected systematic and distributional results. All the specimens mentioned in this paper are preserved in alcohol.

Stactobia makartschenko n.sp.

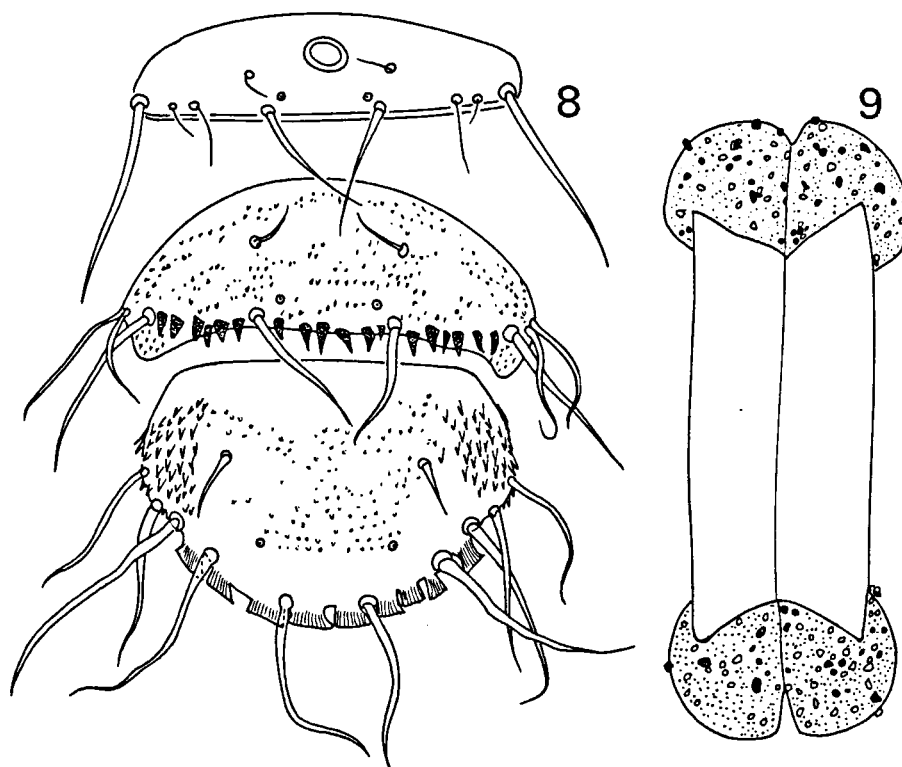
(figs. 1-9)

Material examined

Localities: Kunashir Island (southernmost of the Kuril Islands), Tyurino River at Sernovodsk, 27.05.1976, Vshivkova coll.: 16 ♂, 9 ♀ (♂ holotype, ♀ allotype, 15 ♂ and 8 ♀ paratypes); same locality and date, but Makarchenko coll.: 13 ♂ 2 ♀ paratypes; same locality, but 24.04.1978,



Figs. 1-7. *Stactobia makartschenkoii* n.sp., male. 1, coxa of anterior leg; 2-7, genitalia (2, segments IX and X, dorsal; 3, lateral view; 4, detail of fig. 3, stronger magnified; 5, ventral view; 6, detail of fig. 5, stronger magnified, slightly different position; 7, phallus).



Figs. 8-9. *Stactobia makartschenkoi* n.sp., larva. 8, tergal sclerites of abdominal segments VII, VIII, IX; 9, case, ventral.

Levanidova coll.: 1 larva, 1 prepupa; Tyurino River at Mendeleev, 22.04.1978, Makarchenko coll.: 2 larvae, 1 prepupa, 1 pupa. Holotype and allotype in the Zoological Institute of the Academy of Sciences, Leningrad; paratypes in the Zoological Museum of the University of Amsterdam or in the Biology and Pedology Institute, Vladivostok. All specimens are in alcohol.

Tyurino is a large mountain stream (Metarhithral) flowing on large boulders and shale plates; flow rate 0.8 - 1 m/s, water temperature 4.8 - 6.2°C (22nd April) and 10.3°C (25th May); large amounts of groundwater are directly discharging into the stream. The following species of Ephemeroptera and Plecoptera are associated with *Stactobia makartschenkoi*: *Paraleptophlebia chocolata* Imanishi, *Drunella aculea* (Allen), *Ephemerella aurivillii* Bengtsson, *E. tenax* Tschernova, *Cincticostella levanidovae* Tschernova (Ephemeroptera), *Stavsolus japonicus* (Okamoto), *Megarcys ochracea* Klapálek, *Skwala pusilla* (Klapálek) (= *Skwala brevis* Kopon., comb. nov.). (Plecoptera).

Description of adults

Wing expanse ca. 6.5 mm (relatively large species). Being preserved since years in alcohol, the specimens are brown. Antennae 18-articulated, as in all *Stactobia*. Coxa of σ anterior leg (fig. 1) with slightly concave external edge with stiff setae.

σ genitalia (figs 2-7). In this description the terminology in Schmid (1959) is followed. Appendage of VIIth sternite reaching beyond middle of VIIIth sternite. VIIIth segment with well developed tergite, IXth segment not telescoped into it; VIIIth sternite posteriorly strongly indented, anteriorly moderately strongly protruding. Dorsal, sclerotized part of IXth segment moderately shortened, not very stout, medio-dorsally with small proximal projection (fig. 2), distal margin in lateral view (fig. 3) obliquely descending posteriad, and somewhat convex; anterior extensions about 1.5 times as long as the segment itself; apico-lateral angles slightly obtuse, without distinct apophyses. Ventral, membranous part of IXth seg-

ment well developed. "Inferior appendages" (belonging to IXth segment) short, in lateral view (fig. 4) higher distally than proximally, basally with distinct sinus; their strongly sclerotized (blackened) distal parts distinctly bilobed; in ventral view, from each of these blackened, bilobed nuclei extends is a slender, proximally pointed, chitinous projection (figs. 5, 6), and on ventral (ventro-lateral) parts of inferior appendages numerous very fine setae are inserted on large alveolae; a median, internal root (or „blade") present. "Superior appendages", belonging to Xth segment, small and slender, well curved, almost adpressed to "inferior appendages" (figs. 4,5,6); no connection between them and the thickenings of Xth segment. Xth segment dorsally and ventrally with deep and large sinus; its thickenings, furnished with short setae, placed on both sides of dorsal sinus, and more or less triangular. Phallus with distal part twisted; two long and slender internal spines, both pointing distad, one of them somewhat longer and more sinuous than other.

Description of larva

(figs. 8-9). Tergal sclerite of 1st abdominal segment transverse-rectangular, devoid of central „window". Tergal sclerites II-VII very similar, with central "windows" (chloride epithelia covered by the plates?) and paler posterior stripe. Segment VIII with plate characterized especially by a row of strong but short spines placed near posterior margin. The large plate on segment IX has lateral zones covered by dense, sharp spinules; posterior margin with row of 9-10 large, distally widened, striped "crenels" (quite laterally there are sometimes a few additional, smaller "crenels"). Larval case not resembling any of those previously described for *Stactobia*; its most interesting peculiarity is the fact that the two ends of its dorsal, convex part are large and clearly bilobed flaps, strongly protruding beyond the two openings of the case, and probably completely concealing the larva when moving around.

Derivatio nominis

This species is dedicated to one of its collectors, Dr. E.A. Makarchenko, Biology and Pedology Institute,

Vladivostok.

DISCUSSION

Stactobia makartschenkoi n.sp. belongs to the *martyнови* group of species, as defined by Schmid(1959, 1983); for the time being, we feel unable to make more precise statements about its relationships. From this group 24 species are presently known; most of them are distributed in the northern parts of the Indian Subcontinent, one species being known from Ceylon; 3 species are known from Tien Shan; and 7 are Western Palaearctic, being distributed either in Cyprus, Lebanon, Anatolia, or in northern Iran. The discovery of a *Stactobia* on the Kuril Islands is surprising: this is by far the easternmost known species of the genus (no *Stactobia* is presently known from Japan, Korea, or Siberia; but it is likely that many species of this genus await discovery in China, for instance; and we have seen *Stactobia* larvae from a locality in Primorye: Ussuriisky Reservation, Komarovka River, 1.06.1984, Vshivkova coll.). Moreover, the new species is one of the northernmost representatives of the genus: only 3 European species, belonging to another group (*furcata* group) are known from the same - or slightly higher - latitudes.

It is almost certain that *S. makartschenkoi* n.sp. is unlike most *Stactobia* - a benthic rhithrobiont, not a hygropetric (madicolous) species.

THE GENUS *AGRAYLEA* CURTIS IN THE FAR EAST

This genus was recorded before from the Palaearctic Far-East by Levanidova (1975: 86) as *A. cognatella* McL. from Kamtschatka, and by Levanidova (1976: 44) as *A. multipunctata* Curt. from Chukotka; from Siberia only *A. cognatella* McL. was mentioned - with some hesitation - by Martynov (1910: 424) from the Lower Tunguska (based on a single ♂). The present collection contains four samples with adult *Agraylea* which we were able to determine without any difficulty as *A. cognatella* McL., 1880 (Kamtschatka, Azabachye River, 6.08.1969,

Levanidova coll.: 7♂, 2♀; Kamtschatka, Azabachye lake basin, Raduga River, 9-11.08.1967, Vronsky coll.: 1♂; Amur River basin, Kenuschen lake, 17.07.1965, Vronsky coll.: 1♂) and, respectively, *A. multipunctata* Curt., 1834 (southern Primorye, lake at the Khasan railway station, 24.07.1975, Vshivkova coll.: 41♂).

A. cognatella is sometimes considered hardly distinct from *A. multipunctata*, and it was even not included in the Atlas of European Trichoptera (Mallik, 1983). It is, nevertheless, certain that the two species are distinct, although closely related. McLachlan (1880: 506-507, Pl. LVIII) already found good distinctive ♂ genitalic characters, which he illustrated, be it rather crudely; the ventral aspect of ♂ genitalia of *A. cognatella* was figured by Martynov (1934, fig. 46) who also considered the two species as being distinct, like Tobias & Tobias (1981: 147) who published more detailed figures of ♂ (and ♀) genitalia. Finally, useful figures of ♂ genitalia of the two species were published by Andersen & Wi-

berg-Larsen (1987, figs. 1-4), clearly emphasizing the distinctive characters.

Our observations on specimens from the Soviet Far-East, and comparison with previously published data, enable us to summarize the distinctive ♂ genitalic characters of the two species (Table I).

On the other hand we did not see in the specimens of *multipunctata* from Primorye, the short mesal appendage of VIIIth sternite illustrated by Andersen & Wiberg-Larsen (1987, fig. 4). And, in the specimen of *cognatella* from Raduga River (Kamtschatka) the appendage of the VIth abdominal sternite is lacking - a rather curious anomaly.

As far as the ♀ is concerned, the possibility to distinguish between the two species is still not clear. Tobias & Tobias (1981: 147, fig. 5) illustrated the posterior margin of VIIIth venter in *A. cognatella* (note: their figures 5 and 6 are ventral and dorsal respectively, not vice-versa as in the caption) with a distinct median incision, which is absent, for instance, in the figure published by Ross (1944, fig.

TABLE I

	<i>multipunctata</i>	<i>cognatella</i>
Appendage of VIIth sternite	Broad, still broadened distally, often with a proximal „tooth” or, at least, with a rudiment of it	Very narrow, parallel sided, without any proximal „tooth”
IXth tergite	Completely bipartite medially	With narrow and deep median incision not reaching anterior margin
Lateral branches of inferior appendages	Digitiform	Broader, and slightly (bluntly) produced medially

445) for *A. multipunctata* from North America; this difference is mentioned by Andersen & Wiberg-Larsen (1987). There is, nevertheless, one interrogation mark: in the two females from Kamtschatka accompanying males of *cognatella*, this meso-ventral

incision was not observed.

A small number of larvae and pupae of *Agraylea* is present in the material examined. Two larvae from a lake on Chukotka Peninsula (coll. Budnikova, 9.07.1973) have a head and thorax pattern reasona-

bly well corresponding with that described by Solem (1972) for *A. cognatella*; but the left mandible of these larvae has a well developed penicillus, said by this author to be absent in *cognatella*: We suppose this is an error.

***Oxyethira (O.) ecornuta* Morton, 1893**
(figs. 10-14)

An illustrated redescription of this species is necessary: it is provided below, based on the following specimens: Southern Primorye, lake at Khasan railway station, 24.07.1975, Vshivkova coll.: 1♂; Primorye, „Kedrovaya Pad” nature reserve, Kedrovaya River, 1975 (exact date and collector unknown): 8♂, 1♀. Moreover, *Oxyethira* larvae and pupae, possibly belonging to this species, were collected in a river from the Amur basin: river Khor (25.08.1949 and 26.07.1950, Levanidova coll.).

Redescription of ♂

Antennae 32 to 34-articulated. In the description of genitalia (figs. 10-14) the terminology in Kelley (1984) is followed.

VIIIth segment forming a complete cylinder without conspicuous lobes, appendages, or very deep excisions; distal margin of tergite (fig. 10) excised but not very deeply, furnished with row of setae; latero-posterior margin with small, rounded sinus in middle; distal margin of sternite (fig. 12) with regular, broad, semielliptical excision; antero-laterally the VIIIth segment seems to extend into VIIth, more so in upper and middle parts than in lower part. Proximal margin of IXth segment in lateral view (fig. 11) excised in such a way that a broader dorsal „lobe” is separated from a narrower and longer ventral “lobe”; venter (fig. 12) very broadly obtuse proximally; long tergum clearly distinct, except for distal end.

Characteristic is the distal part of segment IX, the inferior appendages being completely coalescent with it; in ventral view this part looks like a broad plate with slightly emarginated distal margin bordered by blackened, round lobes followed laterally by lower, paler lobes; in lateral view this plate looks massive,

upper margin proximally with sinus followed distally by the larger, paler lobe, and then by the blackened lobe forming the plate’s tip. „Setal lobes” much shorter (stouter) than cylindrical lobes of „bilobed process”, and furnished with several short spines and one longer seta. Above the „bilobed process” is a pair of sclerotized structures representing the „subgenital plate”; this plate is thus completely divided medially, the two halves having a rather complex ventral appearance (fig. 12: dotted); in lateral view these sclerites are like strong hooks apparently forming forceps with the terminal part of IXth segment. Phallus with apex capitate, projecting ventrad, without spines or distinct lobes; titillator originating proximally from middle of phallus, turning only half-way around it, particularly broad in proximal part, and splitting in three strands of unequal length (the strand of medium length has a dorsal, antepical „tooth”).

REMARKS

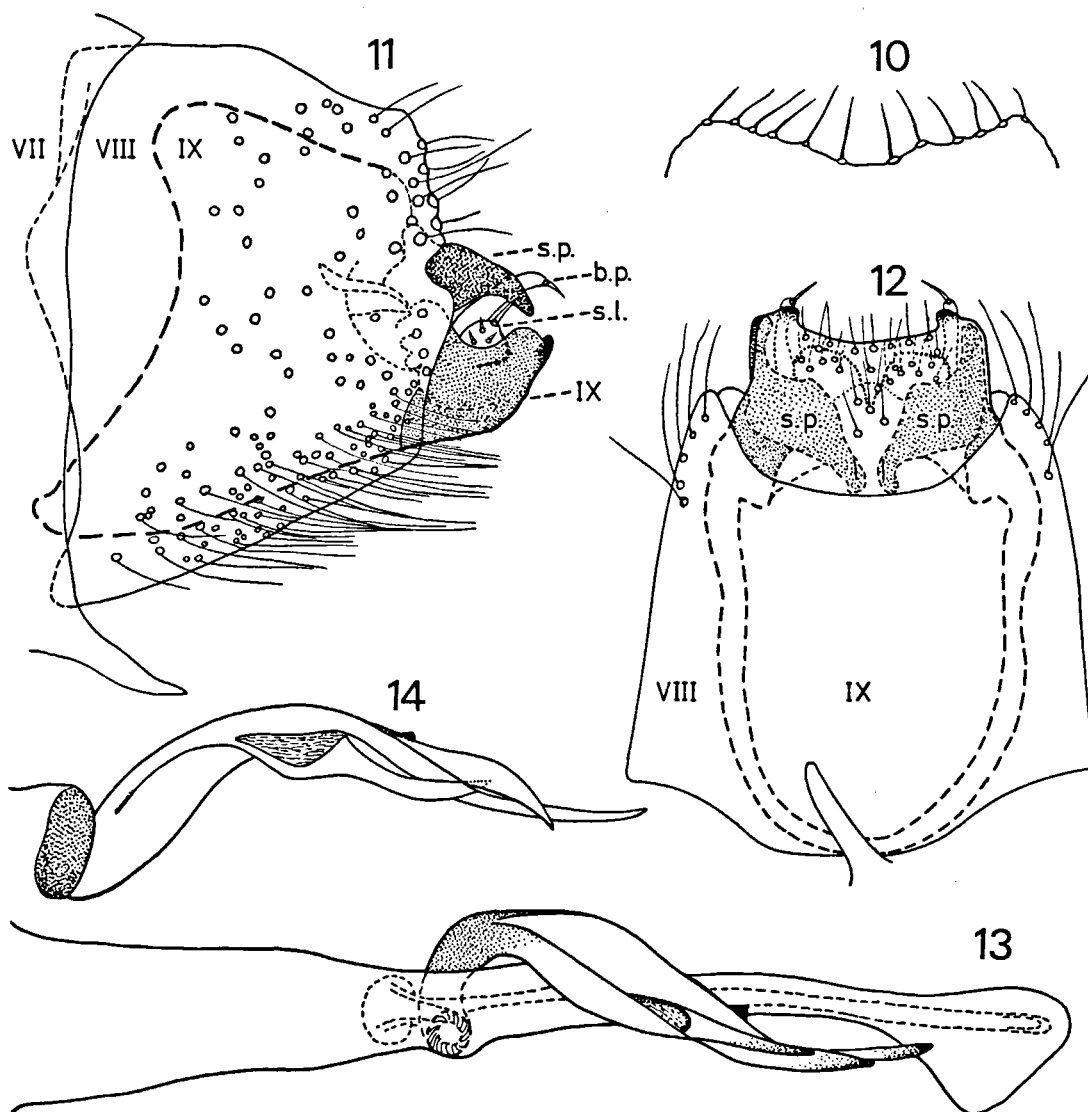
Oxyethira ecornuta belongs to the *flavicornis* species-group in the nominative subgenus (Kelley, 1985), also comprising *O. flavicornis* (Pictet, 1834), a species rather widely distributed in Europe. *O. ecornuta* was previously known only from Fennoscandia and from Ontario.

The previous descriptions of this species are not fully satisfactory. For instance, the titillator was not observed by Morton (1893); it is figured unsplit in Tobias (1970); and in the figure and description by Kelley (1985) it is considered split into two long strands. In fact, the titillator is very characteristically split into three strands of unequal length and shape.

Comparison with specimens from Finland showed almost perfect similarity, the differences being extremely slight, not relevant.

***Orthotrichia tragetti* Mosely, 1930**

One ♂ and 1 ♀ of this species were caught in 1975 (exact date unknown) near Kedrovaya River,



Figs. 10-14. *Oxyethira (O.) ecornuta* Morton, male genitalia; 10, distal margin of VIIIth tergite; 11, lateral view; 12, ventral view; 13, phallus, lateral; 14, titillator, position slightly different from that in fig. 13.

„Kedrovaya Pad" natural reserve, Primorye. This is certainly a surprising discovery: the easternmost known localities for this very sporadically occurring species were in Finland and in the Ukraina. The σ genitalia of specimens from Europe and from Soviet Far-East (Primorye) are identical.

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sending to L.B. σ specimens of *Oxyethira ecornuta* from Finland, necessary for a comparison with our specimens from Primorye

REFERENCES

- ANDERSEN, T. & P. WIBERG-LARSEN, 1987. Revised check-list of NW European Trichoptera. - *Ent. Scand.*, **18**: 165-184.
 BOTOSANEANU, L. & I.M. LEVANIDOVA, 1987. The remarkable genus *Palaeagapetus* Ulmer, 1912 (*Hydroptili-*

- dae). - Proc. of the 5th Int. Symp. on Trichoptera (M. Bournaud & H. Tachet, eds.): 43-46 (Dr. W. Junk Publishers, Dordrecht).
- KELLEY, R.W., 1984. Phylogeny, morphology and classification of the micro-caddisfly genus *Oxyethira* Eaton (Trichoptera: Hydroptilidae). - Trans. Am. ent. Soc., 110: 435-463.
- KELLEY, R.W., 1985. Revision of the micro-caddisfly genus *Oxyethira* (Trichoptera: Hydroptilidae). Part II: subgenus *Oxyethira*. - Trans. Am. ent. Soc., 111: 223-253.
- LEVANIDOVA, I.M., 1975. Ruceiniki Kamtschatskago poluostrova (ekologo-faunisticeskii obzor).- Izv. tichookean. nauchno issled. inst. ryb. Khoz. Okeanogr., 97: 83-114.
- LEVANIDOVA, I.M., 1976. Ephemeroptera i Trichoptera Chukotskogo poluostrova.- Trudy biol.- pochvenn. Inst. Vladyvostok, 36 (139): 38-56.
- MCLACHLAN, R., 1874-1880. A monographic revision and synopsis of the Trichoptera of the European fauna: 1-523 (with supplement pp. XIII-LXXIV), Plates I-LIX (Reprint Classey, Hampton Middlesex, 1968).
- MALICKY, H., 1983. Atlas of European Trichoptera: 1-298 (Junk, The Hague-Boston-London).
- MARTYNOV, A., 1910. Les Trichoptères de Sibérie et des régions adjacentes. Ite partie. - Ezheg. zool. Muz. (Petrograd), 15: 351-429.
- MARTYNOV, A.V., 1934. Ruceiniki Trichoptera Annulipalpia. - Opred. Faune S.S.S.R., 13: 1-343.
- MORTON, K.J., 1893. Notes on Hydroptilidae belonging to the European fauna, with descriptions of new species. - Trans. ent. Soc. London, 1893: 75-82, Pl. V & VI.
- ROSS, H.H., 1944. The Caddis Flies, or Trichoptera, of Illinois. - Bull. nat. Hist. Surv. Division, 23(1): 1-326.
- SCHMID, F., 1959. Le genre *Stactobia* McL. - Miscelánea zool. (Barcelona), 1(2): 1-56.
- SCHMID, F., 1983. Encore quelques *Stactobia* McLachlan (Trichoptera, Hydroptilidae). - Natural. Can. (Rev. Ecol. Syst.), 110(3): 239-283.
- SOLEM, J.O., 1972. The larva of *Agraylea cognatella* McLachlan (Trichoptera, Hydroptilidae). - Norsk ent. Tidsskr., 19(1): 77-79.
- TOBIAS, W., 1970. Die Trichopteren der Lule Lappmark (Schweden), IV Taxonomie, Verbreitung und Ökologie einiger *Oxyethira* - Arten (Hydroptilidae). Ent. Z., Frankf. a. M., 80(22): 225-231.
- TOBIAS, W. & D. TOBIAS, 1981. Trichoptera Germanica. Bestimmungstabellen für die deutschen Köcherfliegen. Teil I: Imagines. - Cour. Forsch. - Inst. Senckenberg, 49: 1-671.

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