Zootaxa 957: 1–16 (2005)
www.mapress.com/zootaxa/
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ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

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Onconeura, a new Neotropical orthoclad genus (Chironomidae, Orthocladiinae)

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Abstract

Diagnoses of all stages of the new genus *Onconeura* are given. The genus includes *O. undecimata* new species, from Chile, described as male, female, and pupa, and *O. semifimbriata* (Sæther) new combination from the Caribbean and Mexico. The genus belongs to the *Corynoneura* group of genera and appears to form the sister group of *Corynoneura* Winnertz, *Tempisquitoneura* Epler, *Thienemanniella* Kieffer, and perhaps *Notocladius* Harrison combined. The following combination of characters will separate the genus from the other members of the group: bare eyes; tergites without raised, median area of setae; all trochanters with dorsal keel; hind tibial apex not broadened; male transverse sternapodeme well developed with strong oral projections; female gonocoxite IX well developed but adpressed, with a few setae; coxosternapodeme with a few spine-like anterior projections; and apodeme lobe and labia large. The pupa differs by having 4–7 rows of pearls on the wing sheath, one weak non-taeniate macroseta, and tergal conjunctives with posterior rows of up to 10 strong recurved spines (hooklets). The larva differs from that of *Corynoneura* and *Thienemanniella* by having the antenna shorter than half the length of the head, but about one third the length, as opposed to one fourth in *Tempisquitoneura*.

Key words: Chironomidae, Orthocladiinae, *Onconeura*, new genus, new species, Neotropical, systematics

Introduction

Sæther (1981) described *Thienemanniella semifimbriata* from St. Vincent in the Caribbean, stating that the species "should be placed in a separate genus which either forms the sister genus of *Corynoneura*, or of *Corynoneura* and *Thienemanniella* combined." However, because of the great similarity with *Thienemanniella* as imagines and larva and the numerous Neotropical types of the *Corynoneura* group remaining to be described, erection of a new genus was postponed. An additional reason was that the material from St. Vincent

Accepted by P. Adler: 14 Apr. 2005; published: 26 Apr. 2005

not was in particularly good shape and the description of the female imago was based on mature pupae only.

Recently, the first author collected numerous specimens from Chile of a species closely related to *T. semifimbriata*, confirming the statement that a new genus is warranted.

Material and Methods

The general terminology follows that of Sæther (1980), with the additions and corrections given in Sæther (1989) and Langton (1994) and the wing terminology as in Sæther & Kristoffersen (1996). The specimens were mounted on slides in Canada balsam following the procedure outlined in Sæther (1969). The measurements are given as ranges followed by a mean when 4 or more measurements are made, followed by the number measured in parentheses (*n*).

The holotype and paratypes of the new species are deposited at the Museum of Zoology (ZMBN), University of Bergen, Norway; paratypes are also deposited at the Zoologisches Staatssammlung (ZSM), Munich, Germany; the Museu de Zoologia da Universidade de São Paulo, Brazil (MZUSP), and Museo Nacional de Historia Natural, Santiago, Chile (MNNC).

Onconeura new genus

Thienemanniella sensu Sæther 1981, pro parte nec Kieffer 1911.
Gen. n. near *Thienemanniella* Mendes *et al.* 2004.

Type species

Onconeura undecimata new species by present designation.

Other included species

Thienemanniella semifimbriata Sæther 1981.

Generic diagnosis

The imagines are separable from those of other Orthocladiinae except *Corynoneura* Winnertz 1846, *Thienemanniella* Kieffer 1911, *Physoneura* Ferrington & Sæther 1995, *Tempisquitoneura* Epler *in* Epler & de la Rosa 1995, *Ichthyocladius* Fittkau 1974, and *Notocladius* Harrison 1997 by having R_1, R_{2+3}, and the costa retracted and swollen forming a thick clavus which terminates at or before the midpoint of the wing. The following combination of characters will separate the genus from the other members of the group: bare eyes; female pedicel without setae; tergites without raised, median area of setae and

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with 4–8 setae in median transverse row; posterior sternites with single median and 2 very weak posterior setae; anal lobe well developed; all trochanters with dorsal keel; hind tibial apex not broadened; tarsomere 4 not noticeably cordiform; male transverse sternapodeme well developed with strong oral projections; superior volsella separate, low but distinct; female gonocoxite IX well developed but adpressed, with a few setae; coxosternapodeme with a few spine-like anterior projections; and apodeme lobe and labia large.

The pupa differs from that of other genera without a thoracic horn and with an anal lobe fringe by having 4–7 rows of pearls on the wing sheath, one weak non-taeniate macroseta, anal lobe with strong seta on inner margin, and tergal conjunctives with posterior rows of up to 10 strong recurved spines (hooklets).

The larva has the antennae about 1/3 the length of the head, as opposed to 1/4 in *Tempisquitoneura*, about 1/2 to 3/4 in *Thienemanniella*, and about as long as the head in *Corynoneura*. The S I is simple while it is bifid in *Tempisquitoneura* and *Notocladius*; the mentum has 3 subequal teeth and 5 pairs of lateral teeth of which the first is adpressed to the outer median tooth. The posterior parapods are more than 5X as long as medially wide.

Etymology

From the Greek *oncos*, hook, referring to the *Eukiefferiella*-like conjunctive hooklets and *-neuron*, nerve, sinew, but here used as an indication of relationship with similar genera.

Description

Imago

Small species, wing length about or less than 1.0 mm.

Eye bare, reniform, without dorsomedian elongation. Antenna with 11–12 flagellomeres in male, 5 in female; fully plumed; groove in male beginning on flagellomere 2; sensilla chaetica present on flagellomeres 2, 3, and ultimate; apex strongly clubbed and rounded; male AR lower than 1.0. Palpomeres normal; palpomere 3 with 1–2 short lanceolate sensilla clavata. Temporals reduced in number. Tentorium long, narrow, tapering to point. Stipes normally developed. Cibarial pump with anterior margin deeply concave, cornua strongly developed. Clypeus with several setae.

Antepronotal lobes not reduced medially, with several weak lateral antepronotals. Acrostichals absent; dorsocentrals uniserial, few prealars, single supraalar present or absent. Scutellum with few transversely uniserial setae.

Wing membrane without setae, with fine punctuation. Anal lobe well developed, but not projecting. Costa apically fused with R_1 and R_{2+3} forming a thick clavus well proximal to wing midpoint in male, at about mid point in female; R_4 (or R_{4+5}) and R_5 (or M_1) running together from RM to near apex, separated basally, nearly fused and becoming evanescent apically; Cu_1 slightly sinuous; FCu far distal to RM; postcubitus ending far past cubital fork; anal vein ending below or slightly distal to cubital fork. Brachiolum with 1 seta; cla-

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vus with apical seta; R_1 with a few setae on clavus in female, bare in male; other veins bare. Squama bare. Sensilla campaniformia about 7–8 basally on brachiolum as well as apically on brachiolum, 3 below setae on brachiolum; 1 present on RM.

Front leg ratio about 0.7–0.8. Trochanters with dorsal keel, best developed on fore trochanter. Tibial spurs and hind tibial comb normal. Hind margin of tarsomeres 1–3 with double row of shorter, thicker, bluntly tipped setae, best developed on mid and hind tarsomere 1. Tarsomere 4 barely cordiform. Sensilla chaeticae present approximately at basal 1/4 to 1/2 on ta_1 of middle and sometimes hind leg. Pulvilli absent.

Tergites with median transverse band of 4–8 setae. Posterior sternites with 1 median and two very weak posterolateral setae.

Hypopygium short, without anal point; tergite IX with several weak setae, more or less weakly emarginated with two weak protrusions. Laterosternite IX with few setae. Transverse sternapodeme slightly convex, oral projections strongly developed. Phallapodeme well sclerotized, aedeagal lobe well developed with sclerotized apicomedian margin. Virga absent. Gonocoxite well developed; superior volsellae low but relatively well developed at least sometimes fused basally; inferior volsella well developed. Gonostylus without crista dorsalis, widest near apex, megaseta simple.

Female genitalia with straight gonocoxapodeme ending on base of gonapophysis VIII. Gonocoxite well developed, but adpressed, with few setae. Tergite IX with apical notch, with several setae. Segment X normal. Postgenital plate weak, indistinct, bluntly triangular. Cercus relatively large. Gonapophysis VIII not divided. Apodeme lobe large and distinct, partly sclerotized. Labia large and bare, fused basally, notched apically. Coxosternapodeme with median curves and a few spine-like anterior projections. Seminal capsules smaller than cerci, ovoid, darkly sclerotized full length, neck placed anterolaterally. Spermathecal ducts anteriorly narrow, nearly straight or with loop, wider posteriorly and nearly straight, with common opening.

Pupa

Small pupa, less than 3 mm long. Exuviae pale greyish brown.

Cephalic tubercles and frontal warts absent. Frontal setae very weak and transparent, slightly taeniate or long and strong, on sclerotized tubercles on frontal apotome. Frontal apotome wrinkled or smooth. Thoracic horn absent. Thorax tuberculose anteromedially, rugulose and wrinkled laterally and posteriorly. Wing with several rows of pearls, without nose. Three precorneals, 2 median and apparently 1 lateral antepronotals, at least one postorbital, and 4 dorsocentrals arranged in two pairs present. One precorneal and posterior dorsocentral conspicuously strong.

Tergite I without shagreen; II–IX with shagreen; weak on II; strong on III–VI with area in front of posterior spines nearly bare. Posterior margin of II–VIII with 1–3 transverse rows of spines grading over into more anterior coarse shagreen spinules. Conjunctives I/II (II/III) – VI/VII (VII/VIII) with strong hooklets, 3–10 on conjunctives II/III to VI/VII. Sternites I bare; II with sparse median shagreen consisting of fine needle-like, pale

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spinules becoming stronger posteriorly; III–VIII with sparse shagreen becoming coarser on posterior sternites; IX bare. Sternites IV–VIII in male, IV–VII in female with weak posterior spines. Female sternite VIII with broad and low posterior projection with median suture. Pedes spurii A and B absent.

Segment I with 2 L setae, II–VII each with 4, VIII with 3 L setae, L_2 sometimes slightly taeniate. Tergites and sternites apparently with 1 pair of O setae in C5 pattern, i.e., ventral O setae laterad of dorsal O setae.

Anal lobe well developed with fringe in apical 1/3 of uniserial taeniae, anterior few taeniae often spine-like, preapical taeniae sometimes very long, 1–3 spines posterior to apical taenia; inner margin of anal lobe with long non-taeniate seta, one short, non-taeniate macroseta dorsal to bases of anal lobe fringe. Genital sacs of male and female not extending to apex of anal lobe.

Larva

Head capsule about 1 3/4 as long as wide, somewhat wedge shaped. Antenna about 1/3 as long as head capsule; basal segment about twice as long as flagellum, with ring organ 1/3 from base and 2 setae about at 2/3; antennal segment 2 slightly longer than combined length of 3–5. Lauterborn organs well developed, style weak. Blade shorter than flagellum. Labrum with S I and S III apparently weak and simple; S II [labral seta S I in Sæther (1981), see Epler & de la Rosa (1995)] strong, situated on tubercle; at least 3 chaetae. Pecten epipharyngis of 3 simple spines. Chaetulae laterales 4–6 pairs, chaetulae basales apically bifid. Premandible simple, with well developed brush. Maxilla with long lacinial chaetae. Mandible with 4 inner teeth, apical tooth slightly shorter than combined width of first 2 inner teeth, seta interna with about 7 plumose branches. Mentum with 3 subequal teeth and 5 pairs of lateral teeth of which the first is adpressed to outer median tooth. Ventromental plates narrow, broader posteriorly. Setae submenti situated well below base of outer lateral tooth of mentum.

Claws of anterior parapods serrate. Procercus higher than wide, with 3–4 anal setae. Posterior parapods long, more than 5X as long as medially wide. Anal tubules much shorter than posterior parapods.

Systematics

The generic assignment of *O. semifimbriata* is discussed by Sæther (1981) and Epler & de la Rosa (1995). *Onconeura* and *Tempisquitoneura* are very similar and closely related. The relationships between these two genera, *Thienemanniella* and *Corynoneura*, remain uncertain because in some features the genera are intermediate between *Corynoneura* and *Thienemanniella*, and in others apparently more plesiomorphic than in *Thienemanniella*. However, the polarity of apparent decisive trends will depend on which genus or group of genera forms the sister group of the *Corynoneura* group. The presence of large caudal hooklets on tergal conjunctives are conspicuous both in *Onconeura* and in *Tempisquitoneura*, and in the new species described here the hooklets are every bit as conspicu-

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ous as those in the *Eukiefferiella* group. Sæther (1977) placed the *Corynoneura* group as sister group to reduced Orthocladiini sensu Brundin and Metriocnemini sensu Brundin combined, i.e., with some plesiomorphic groups removed, with *Heterotanytarsus* Spärck, 1923 as sister group to all three groups combined and the *Eukiefferiella* group as sister to all the above. That is, the *Corynoneura* group was just two nodes removed from the *Eukiefferiella* group. *Onconeura* and *Tempisquitoneura*, however, indicate that the groups either are sister groups or that the *Eukiefferiella* group is paraphyletic because it includes the *Corynoneura* group.

Characters in common for all the genera of the two groups include absence of pedes spurii A and B of the pupa; sexual dimorphism of sternite VIII of the pupa; gonapophysis VIII of the female genitalia undivided; and ventromental plates of the larvae narrow, inconspicuous, widest posteriorly, and without setae underneath.

All imagines of the *Corynoneura* group and several of the *Eukiefferiella* group lack acrostichals, have retracted R_{4+5}, lack a squamal fringe, have cordiform ta_4 shorter than ta_5, and except for *Physoneura* no anal point, and no virga. All pupae of the *Corynoneura* group and many species of the *Eukiefferiella* group lack a thoracic horn. The caudal hooklets on the tergal conjunctives or posterior on the tergites otherwise is found only in *Clunio* Haliday 1855, which could be an aberrant relative. The seta arising from the inner margin of the anal lobe is unique to *Tvetenia* Kieffer 1922, *Corynoneura*, *Tempisquitoneura*, *Thienemanniella*, *Notocladius*, and *Onconeura*. The pupal wing sheaths have pearl rows in *Dratnalia* Sæther & Halvorsen 1981, *Tvetenia*, *Corynoneura*, *Tempisquitoneura*, and *Onconeura*, whereas such rows otherwise among the orthoclads occur only in the *Heterotrissocladius* group. Most larvae of both groups have all S setae simple. The Lauterborn organs usually are well developed. The pecten epipharyngis always consists of three simple spines and often the median chaetulae laterales is of the same shape, making it appear as though there are five spines in the pecten epipharyngis. The posterior parapods often are longer than normal. The above characters clearly support the monophyly of the combined *Corynoneura* and *Eukiefferiella* (or *Cardiocladius*) groups. However, according to Ferrington & Sæther (1995) the placement of *Physoneura* in the *Corynoneura* group is somewhat uncertain because the immatures and the female are unknown.

Within the *Corynoneura* group, large caudal hooklets and pearl rows in the pupa and normal larval antennae should, for instance, be regarded as plesiomorphous features. Schlee (1968) considered five morphoclines for the larvae, all of them involving progressive elongation, i.e., the longest structures are considered apomorphic, of the head capsule, of the antennae, of the anterior parapods, of the posterior parapods, and of the procerci. According to Epler & de la Rosa (1995), *Tempisquitoneura* lies at the plesiomorphic end of the gradient for the second and the last and occupies an intermediate state for the other trends. In *Onconeura*, the antenna is longer than in *Tempisquitoneura*, but not as long as in *Thienemanniella*, whereas the head capsule length/width, elongation of the parapods, and length of the procercus are about as in *Tempisquitoneura*. The reduction of the L setae,

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anal lobe fringe, and anal macrosetae in the pupae of *Onconeura* and *Tempisquitoneura* could be regarded as synapomorphies. However, there is no fringe in the pupae of the *Eukiefferiella* group and the lateral abdominal setae are about as in *Onconeura*. The fringe in the *Corynoneura* group thus could be secondarily developed, making a partly fringed anal lobe more plesiomorphic than a full fringe, and the L setae of *Onconeura* representing the most plesiomorphic step of a trend with reduction in *Tempisquitoneura* and stronger development in the other two genera.

Mendes *et al*. (2004) did a generic-level parsimony analysis of all genera near *Eukiefferiella* Thienemann 1926 and *Corynoneura*, except *Notocladius* and selected genera of Orthocladiinae; *Onconeura* was included as Gen. n. near *Thienemanniella*. In all results, when characters were unweighted, weighted, or reweighted, *Tempisquitoneura* formed the sister group of *Corynoneura* and *Thienemanniella* combined, with *Onconeura* as the sister group of the three combined. Also, in all results, the *Corynoneura* group, which also included *Physoneura* and *Ichthyocladius*, formed a monophyletic group within a paraphyletic *Eukiefferiella* group. *Notocladius* was excluded from the analysis because several of the characters used by Mendes *et al*. (2004), such as presence or absence of a superior volsella, shape of the phallapodeme, and presence or absence of a keel on the trochanter, are not mentioned in the description by Harrison (1979), and because the larva is tentatively associated. However, adding *Notocladius* to the data matrix in Mendes *et al*. (2004) places the genus as the sister group of *Corynoneura, Thienemanniella, Onconeura,* and *Tempisquitoneura* combined when characters are not weighted, but as the sister group of *Corynoneura* and *Thienemanniella* alone when some characters are weighted. While the strict consensus trees for unweighted and reweighted characters differ in several details, no longer indicating the monophyly of a combined *Corynoneura—Eukiefferiella* group, the results when some characters are weighted are identical to those obtained by Mendes *et al*. (2004, Figs. 38, 39) with *Notocladius* inserted above *Tempisquitoneura*.

Onconeura undecimata **new species**
(Figs. 1A–H, 2A–I, 3A–E)

Type material. Holotype male, CHILE: Region VI, Rio Mataquito west of Curico, 34°59.393'S, 71°25.913W, 150 m a.s.l., 18.xi.1998, net, T. Andersen (ZMBN Type no. 290). *Paratypes:* Allotype female, Region Metropolitana, Cajon del Maipo, Puente el Yeso, 33°47.127'S, 70°13.625'W, 1.842 m a.s.l., 16.ii.1999, net, T. Andersen; 3 males as for holotype; 7 mature male pupae, 5 mature female pupae, 89 pupal exuviae as for holotype, except driftnet; 14 males as for allotype; 8 males as for allotype, except 26.i.1996; 41 pupal exuviae, Region Metropolitana, Cajon del Maipo, Rio Vulcan at Los Valdes, 33°49.682'S, 70°03.260W, 1.924 m a.s.l., 10.xi.1998, driftnet, T. Andersen; 17 pupal exuviae, Region VI, Rio Claro south of Molina, 35°09.171'S, 71°17.054'W, 212 m a.s.l., 18.xi.1998, driftnet, T. Andersen.

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Diagnostic characters.The imagines are separable from those of *O. semifimbriata* by having 11 flagellomeres in the male, larger size, and darker coloration without distinctly ringed legs. The pupa is distinguished by having a reduced frontal seta, larger hooklets on tergal conjunctives, and anal lobe with 16–21 taeniae in the fringe, of which the anterior ones are short and spine-like and the preapical ones very long.

Etymology. From the Latin *undecim*, eleven, and the suffix *-atus*, equipped with, referring to the eleven flagellomeres.

Male imago (*n* = 10)

Total length 1.68–2.09, 2.88 mm. Wing length 0.90–1.18, 1.08 mm. Total length/wing length 1.69–1.87, 1.75. Wing length/length of profemur 2.71–2.98, 2.87. Thorax yellowish brown with blackish brown vittae, scutellum, postnotum, preepisternum, parts of anterior and median anepisternum II and part of epimeron II. Legs with pale trochanter and in most specimens slightly paler basiventral parts of femora and median parts of hind tibia and hind metatarsus.

Head (Fig. 1A). AR 0.60–0.71, 0.66. With 11 flagellomeres, ultimate flagellomere 195–263, 231 µm long (Fig. 1C). Temporal setae 3–5, 4; including 1 inner vertical, 1–2, 2 outer verticals and 1–2, 1 postorbital. Clypeus with 10–16, 12 setae. Tentorium, stipes, and cibarial pump as in Fig. 1B. Tentorium 116–158, 141 µm long; 19–34, 26 µm wide. Stipes 90–120, 110 µm long; 26–38, 29 µm wide. Palpomere lengths (in µm): 26–41, 35; 34–45, 40; 60–75, 69; 83–109, 96; 109–141, 124. Third palpomere with 1 sensilla clavata.

Thorax (Fig. 1D). Antepronotum with 4–7, 6 setae. Dorsocentrals 12–19, 15; prealars 3, supraalar 1. Scutellum with 6–8, 7 setae.

Wing (Fig. 1F). VR 1.68–1.83, 1.75. Clavus 26–45, 35 µm wide; ending 128–169, 153 µm from arculus; with 0–1, 1 seta at apex.

Legs (Fig. 1E). Spur of front tibia 34–41, 38 µm long; spurs of middle tibia 23–28, 25 and 13–19, 18 µm long; of hind tibia 38–49, 45 and 17–23, 21 µm long. Width at apex of front tibia 28–34, 31; of middle tibia 26–34, 31 µm; of hind tibia 34–39, 37 µm. Length (in µm) and proportions of legs as in Table 1.

TABLE 1. Lengths (in µm, as range followed by the mean) and proportions of legs of *Onconeura undecimata* new species, male (*n* = 10).

	fe	ti	ta_1	ta_2	ta_3	ta_4	ta_5	LR	BV	SV	BR
p_1	331–406, 375	335–435, 399	255–312, 291	80–104, 95	47–66, 56	24–33, 29	33–38, 36	0.72–0.76, 0.73	4.72–5.11, 4.99	2.60–2.71, 2.66	1.6–2.2, 2.0
p_2	406–501, 456	383–482, 442	250–302, 282	104–132, 109	57–76, 62	24–38, 28	33–43, 39	0.62–0.65, 0.64	4.49–4.98, 4.76	3.11–3.25, 3.18	1.8–2.2, 2.0
p_3	331–416, 384	406–501, 458	269–326, 304	142–165, 152	57–76, 68	24–38, 27	38–47, 39	0.63–0.70, 0.67	3.80–4.55, 4.03	2.67–2.91, 2.77	2.0–3.5, 2.6

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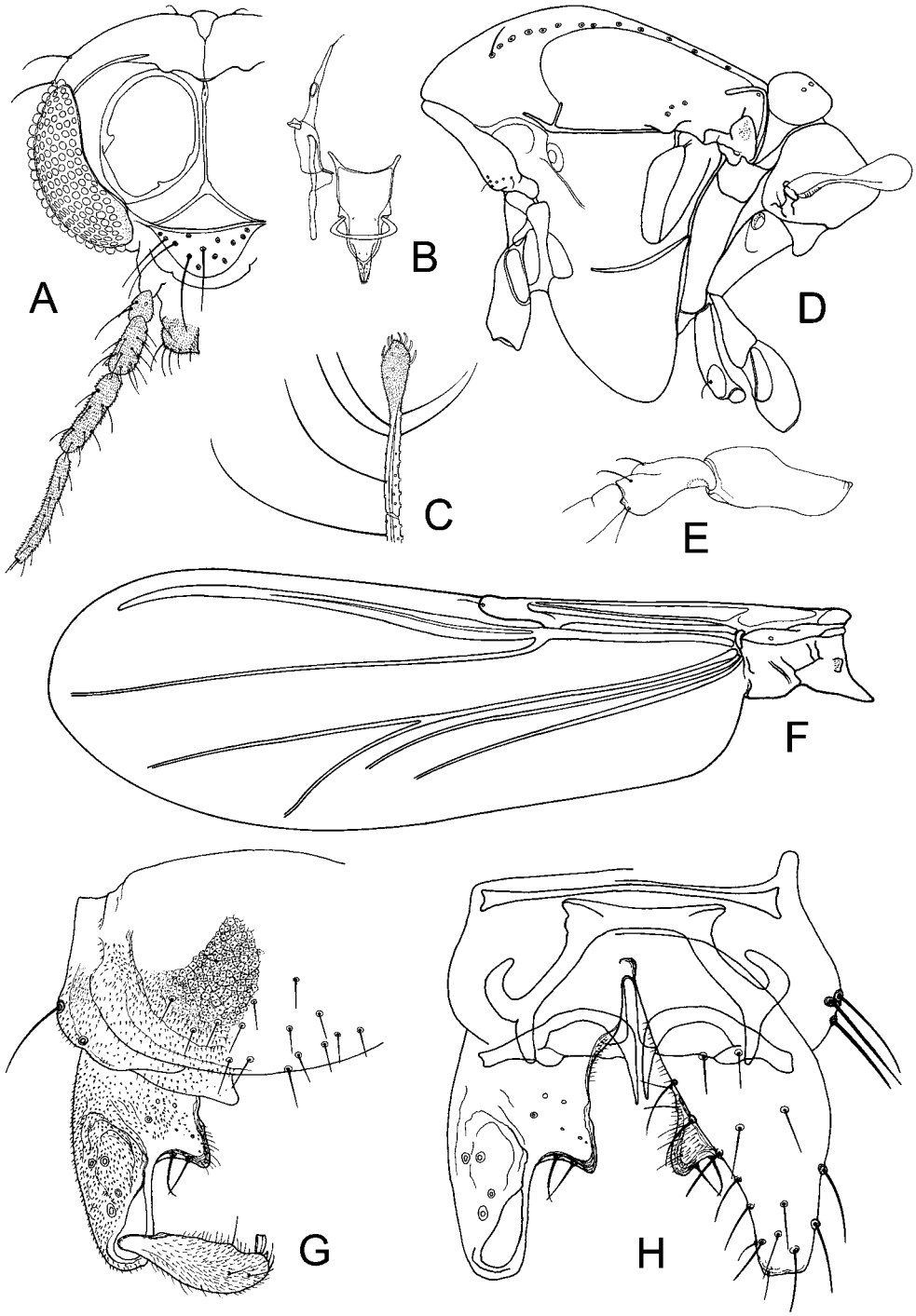

FIGURE 1. *Onconeura undecimata* new species, male imago. A. head; B. tentorium, stipes, and cibarial pump; C. apex of antennae; D. thorax; E. trochanter of front leg; F. wing; G. tergite IX and dorsal aspect of left gonocoxite and gonostylus; H. hypopygium with anal point and tergite IX removed, left dorsal aspect, right ventral aspect.

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Hypopygium (Fig. 1G–H). Tergite IX with 12–21, 17 minute setae; laterosternite IX with 2–3, 3 setae. Phallapodeme 49–56, 53 µm long; transverse sternapodeme 30–53, 40 µm long. Gonocoxite 109–143, 124 µm long; superior volsella 8–15, 11 µm wide, barely joined basally. Gonostylus 49–60, 56 µm long; megaseta 9–11, 10 µm long. HR 2.18–2.38, 2.24; HV 3.06–3.73, 3.38.

Female imago (*n* = 1, except when otherwise stated)

Total length 1.73 mm. Wing length 0.98 mm. Total length/wing length 1.77. Wing length/length of profemur 3.04. Coloration patterns as in male, but slightly more pale.

Head (Fig. 2A). AR 0.38–0.53, 0.46 (5). Flagellomere lengths (in µm, *n* = 5): 38–45, 44; 26–36, 34; 30–36, 34; 34–36, 35; 38–64, 57. Temporal setae 4–5 (2), including 1–2 (2) inner verticals, 2–3 (2) outer verticals, and 1 (2) postorbital. Clypeus with 11–15, 13 (4) setae. Tentorium, stipes, and cibarial pump as in Fig. 2B. Tentorium 101 µm long, 15 µm wide. Stipes 105 µm long, 26 µm wide. Palpomere lengths (in µm): 34, 34, 60, 90, 128.

Thorax (Fig. 2C). Antepronotum with 5 setae. Dorsocentrals 11–15, 13 (4); prealars 3 (2), supraalar 1 (2). Scutellum with 4–6 (2) setae.

Wing (Fig. 2D). VR 1.74. Clavus 30 µm wide, ending 203 µm from arculus; with 10 setae.

Legs. Spur of front tibia 30 µm long, spurs of middle tibia 23 long and lost, of hind tibia 41 and 15 µm long. Width at apex of front tibia 30 µm, of both middle and hind tibia 34 µm. Length (in µm) and proportions of legs as in Table 2.

TABLE 2. Lengths (in µm) and proportions of legs of *Onconeura undecimata* new species, female (*n* = 1).

	fe	ti	ta_1	ta_2	ta_3	ta_4	ta_5	LR	BV	SV	BR
p_1	331	354	255	104	57	24	38	0.72	4.19	2.65	1.5
p_2	416	392	255	80	47	24	38	0.64	5.65	3.19	1.8
p_3	369	416	284	132	52	24	38	0.68	4.35	2.77	2.4

Abdomen. Number of setae on tergite I 8, on each of tergites II–VI 5–7, on VII 4, on VIII 5. Sternite I bare, sternites II–VII with or without 1–2 (3) stronger median seta and with 2 weak posterolateral setae, sternite VIII with 4–8, 7 (5) setae.

Genitalia (*n* = 6, Fig. 2E–I). Gonocoxite with 4–6, 5 setae. Tergite IX with 11–15, 13 setae. Cercus 71–105, 82 µm long. Seminal capsules 49–56, 54 µm long; 38–45, 42 µm wide. Notum 43–68, 56 µm long.

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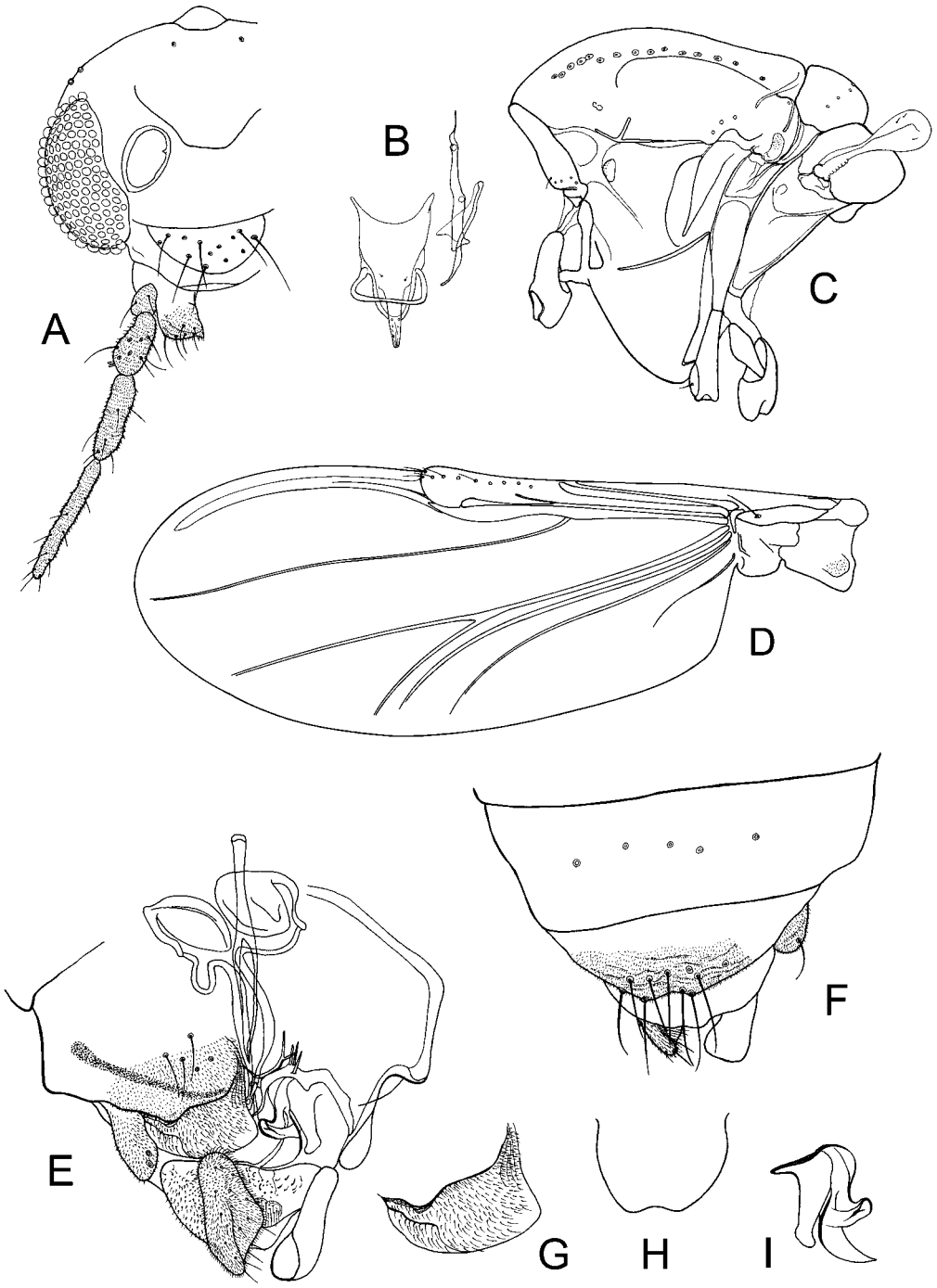

FIGURE 2. *Onconeura undecimata* new species, female imago. A. head; B. tentorium, stipes, and cibarial pump; C. thorax; D. wing; E. genitalia, ventral view; F .genitalia, dorsal view; G. gonapophysis VIII; H. apodeme lobe; I. labium.

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Pupa (*n* = 9–10, except when otherwise stated)
Total length 2.32–2.66, 2.47 mm.

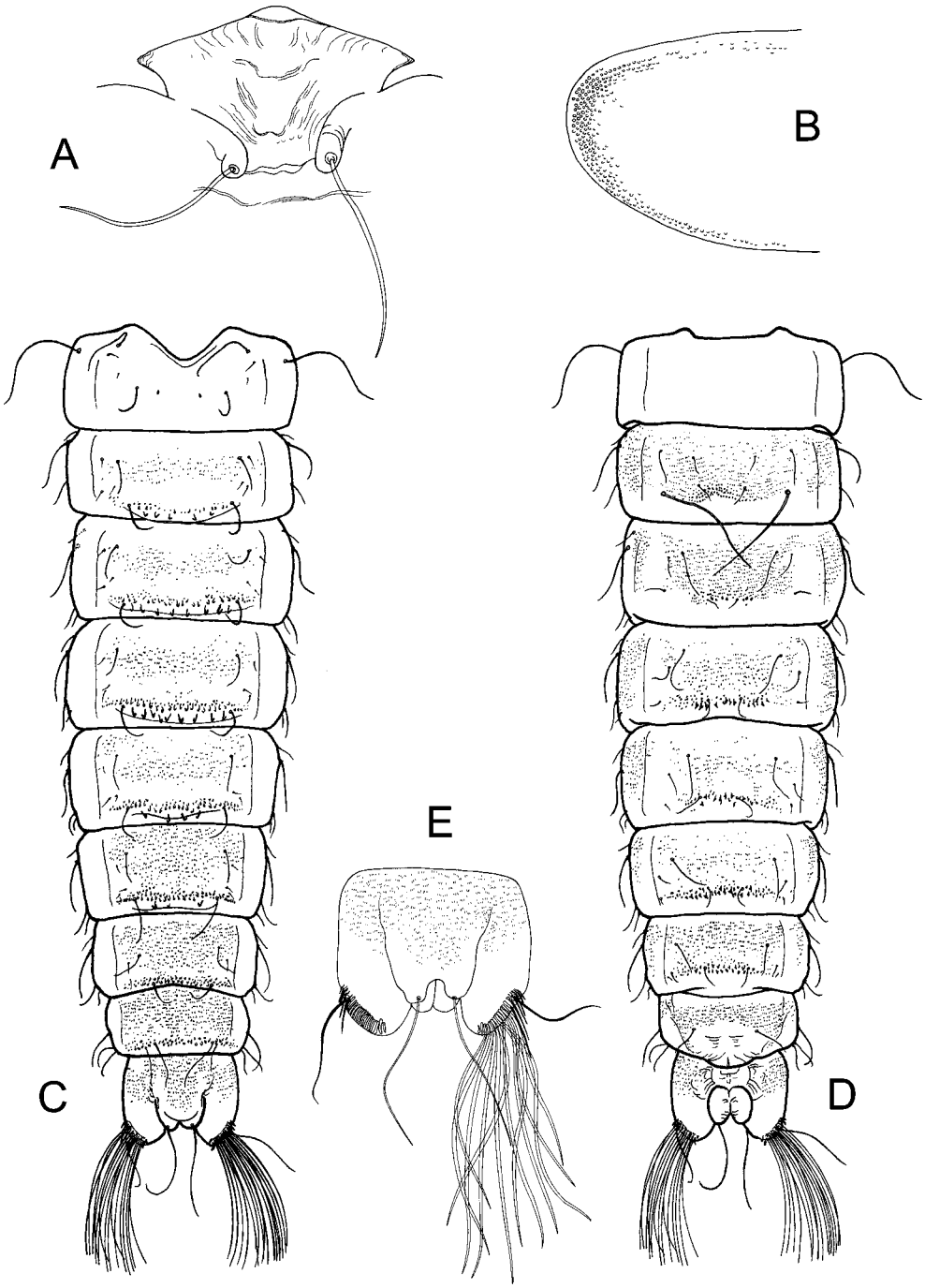

FIGURE 3. *Onconeura undecimata* new species, pupa. A. frontal apotome; B. wing sheath; C. tergites; D. sternites; E. detail of anal lobe.

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Cephalothorax. Frontal setae (Fig. 3A) taeniate 19–30, 25 µm long; on 11–13, 12 µm high, 9–11, 10 µm wide tubercle. Longest precorneal seta 94–113, 98 µm long; other preconeals and lateral antepronotals less than 40 µm long. Median antepronotals 75–113, 94 µm (4) long; and 38–75, 55 µm (5) long. Anterior dorsocentral (Dc_1) 56–75, 65 µm long; Dc_2 34–60, 45 µm; Dc_3 11–38, 27 µm (8); Dc_4 75-124, 104 (7) µm long and taeniate. Distances (in µm): Dc_1-Dc_2 6-15, 10; Dc_2-Dc_3 124-176, 149, Dc_3-Dc_4 4–30, 10. Wing sheath (Fig. 3B) with 5–7, 6 rows of pearls.

Abdomen (Fig. 3C–D). Shagreen and chaetotaxy as in generic diagnosis. Anal lobe (Fig. 3E) 91–221, 209 µm long; with 16–21, 18 taeniae; anterior 3–7, 4 taeniae spine-like, preapical taeniae very long, up to 188–345, 290 µm in length; anal lobe in addition with 1–3, 2 apical spines. Anal macroseta 56–124, 75 µm long. Median seta 131–206, 171 µm long. Apex of genital sac of male 19–30, 22 µm (5) short of apex of anal lobe; female 49–64, 55 µm short.

Ecology and distribution. The species has been collected from rivers in central Chile, from 150 meters up to nearly 2000 meters altitude in the western slopes of the Andes. The species can be very abundant in water channels along the larger rivers when they cross the central valley in Chile, and it has also been taken in smaller, faster flowing rivers with gravel and stony substrate in the foothills of the Andes.

Onconeura semifimbriata (Sæther) new combination

(Fig. 4A–C)

Material examined. MEXICO: Nuevo León, Allende, Rio Ramos at Raices, 25°14.53'N 100°02.07'W, 20.ix.1998, 2 males, 5 pupal exuviae, net & driftnet, T. Andersen & A. Contreras-Ramos. In addition, the material mentioned in Sæther (1981: 32) was re-examined.

Diagnostic characters. The male imago is separable from that of *O. undecimata* by having 12 flagellomeres, smaller size, and more pale coloration with distinctly ringed legs. Having a well-developed frontal seta, smaller hooklets on tergal conjunctives, and an anal lobe with 26–31 equal-sized taeniae in the fringe can distinguish the pupa. The larva has a mentum with a single median tooth and six pairs of lateral teeth (Fig. 4C).

Remarks. The type material was based on bleached, brittle, and teneral specimens. The coloration thus was not possible to observe, the number of sensilla chaeticae was overstated, and, as seen from the material of *O. undecimata*, the female coxosternapodeme had not reached full sclerotization. The two males from Mexico, which also are somewhat smaller, thus are described here.

Male imago (n = 2)

Total length 1.29–1.43 mm. Wing length 0.68–0.71 mm. Total length/wing length 1.90–2.01. Wing length/length of profemur 2.68–2.71. Thorax yellowish brown, with vittae, scutellum except central parts, postnotum, preepisternum, parts of anterior and median

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anepisternum II, and part of epimeron II blackish brown. Legs with dark spot on coxae, fore trochanter dark, femora dark apically, base of tibiae and apex of mid and hind tibiae dark, central parts of mid and hind tibiae and basal half of mid and hind metatarsi whitish.

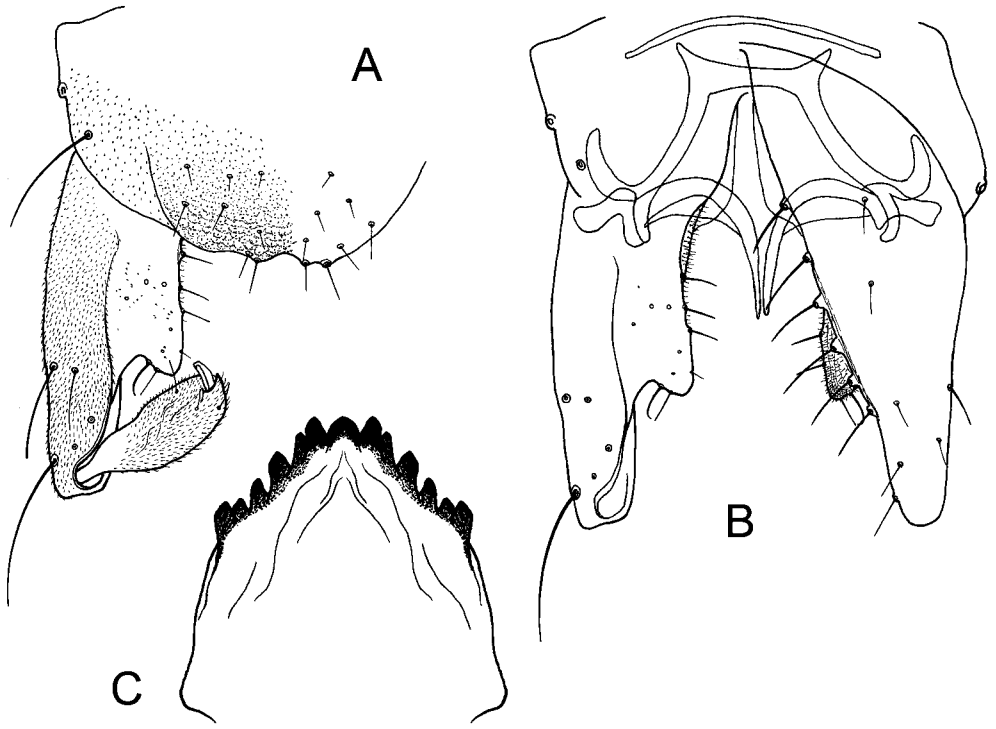

FIGURE 4. *Onconeura semifimbriata* (Sæther), (A–B) male imago from Mexico, (C) larva from St. Vincent. A. tergite IX and dorsal aspect of left gonocoxite and gonostylus; B. hypopygium with anal point and tergite IX removed, left dorsal aspect, right ventral aspect; C. mentum.

Head. AR 0.17–0.28. With 12 flagellomeres, ultimate flagellomere 92–94 µm long. Temporal setae 2, including 1 outer verticals and 1 postorbital. Clypeus with 8–10 setae. Tentorium 113–124 µm long, 11–15 µm wide. Stipes 83–94 µm long, 19 µm wide. Palpomere lengths (in µm): 26, 26–30, 41–43, 64–68, 83–94.

Thorax**.** Antepronotum with 2 setae. Dorsocentrals 10–12, prealars 2–3, supraalar apparently absent. Scutellum with 4 setae.

Wing. VR 1.70–1.84. Clavus 19–26 µm wide, ending 240–255 µm from arculus, with 1–2 setae at apex.

Legs. Spur of front tibia 30–34 µm long, spurs of middle tibia 23–26 and 11–13 µm long, of hind tibia 34 and 19 µm long. Width at apex of front tibia 23–24, of middle tibia 26 µm, of hind tibia 30 µm. Length (in µm) and proportions of legs as in Table 3.

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TABLE 3. Lengths (in μm, as range) and proportions of legs of *Onconeura semifimbriata* (Sæther), male (*n* = 2).

	fe	ti	ta_1	ta_2	ta_3	ta_4	ta_5	LR	BV	SV	BR
p_1	246–265	250–265	203–217	57–61	33–38	19	28	0.81–0.82	5.10	2.43–2.44	1.8–2.0
p_2	302–312	293–312	189–203	85–90	38–47	19	38	0.65	4.49–4.61	3.07–3.15	1.6–1.8
p_3	265–269	288–312	198–213	104	33–38	19	28	0.68–0.69	4.00–4.28	2.71–2.80	1.7–2.4

Hypopygium (Fig. 4A–B). Tergite IX with 16–17 minute setae, laterosternite IX with 2 setae. Phallapodeme 43–45 μm long, transverse sternapodeme 24–26 μm long. Gonocoxite 105–107 μm long, superior volsella 8 μm wide, barely joined basally. Gonostylus 39–41 μm long, megaseta 9 μm long. HR 2.59–2.67, HV 3.29–3.48.

Ecology and distribution. The species is known from streams and rivers in St. Vincent, Costa Rica, Guatemala, and Mexico (Spies & Reiss 1996).

Acknowledgements

We are indebted to Dr. Atilano Contreras-Ramos, Centro de Investigaciones Biológicas, Universidad Autonoma del Estado de Hidalgo, Mexico, for company during field work in Mexico, and to Gladys Ramirez, Zoological Museum, University of Bergen, for making the slide preparations. The study was supported by the Norwegian Research Board (NF) project no. 121975/720.

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