

Six new species of *Integripalpia* (Trichoptera) from Southern China

Yang Lianfang

Department of Plant Protection, Nanjing Agricultural University,
Nanjing, Jiangsu Province 210095 PRC
and

John C. Morse

Department of Entomology, Clemson University,
Clemson, South Carolina 29634-0365 USA

Abstract: Six new species of Trichoptera are described and figured, belonging to the families Goeridae and Leptoceridae. The goerid species are *Goera baishanzuensis* new species and *Goera recta* new species. The leptocerid species are *Setodes chlorinus* new species, *Ceraclea (Athripsodina) semicircularis* new species, *Ceraclea (Athripsodina) brachyclada* new species, and *Ceraclea (Athripsodina) vaciva* new species (Leptoceridae).

Introduction

The diversity of Trichoptera in southern China is very rich. The new species described here are in addition to new species recorded in two papers in press or in preparation. Yang L. and B.J. Armitage (in press) are reporting on 18 Chinese *Goera* (Goeridae). Yang L. and J.C. Morse (in preparation) are reporting on 107 species of Chinese Leptoceridae.

Types of new species described herein are deposited in the collections of The Department of Plant Protection, Nanjing Agricultural University, and in the Institute of Zoology, Academia Sinica.

Goeridae

Goera baishanzuensis, new species (Figs. 1A-E)

Length of male forewing 4.8 mm. Body and wings yellowish brown. Dry specimen preserved on glue point such that maxillary palpi not visible. Sternite VI bearing forked urosternite ending in pair of clavate processes.

Male genitalia (Figs. 1A-E): Segment IX broad dorsally with ventral half portion missing. Preanal appendages slightly shorter than segment X, broadly lobe-like, with basal half constricted. Tergum X consisting of three thick processes: dorsomesal, digitate projection and pair of lower lateral processes. Basal segment of each inferior appendage enlarged, bearing no processes; distal segment consisting of thick, setose, lateral lobe and slender, sclerotized mesal process with its apical half curved mesad. Phallus short, tubular, ejaculatory duct apparently sclerotized. Parameres absent.

Diagnosis: This species is especially similar to *Goera spinosa* Yang & Armitage (1996), but in *G. baishanzuensis*: (1) the lower lateral processes of segment X are longer than the mesal projection and each bears normal setae; (2) the preanal appendages are huge, lobe like; and (3) the distal segment of each inferior appendage is produced into a lateral lobe and a long, slender, mesal process.

Etymology: "Baishanzu," Chinese phonetic spelling, with reference to the type locality. Holotype: Male, Zhe-jiang Province, Qing-yuan County, Bai-shan-zu mountains, 21 VIII 1993, 1600 m elevation, Coll. Wu Hong (Nanjing Agricultural University).

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

Goera recta, new species (Figs. 2A-E)

Length of male forewing 7.0 mm. Body and wings brown. Scapes of male antennae about as long as head and about 2.2 times as long as wide. Sternite VI urosternite consisting of two separated processes.

Male genitalia (Figs. 2A-E): Tergum IX long in lateral view, sternum IX missing. Preanal appendages slender and clavate, each with apical taper. Dorsal process of tergum X represented by single, capitate lobe; lower, paired processes of tergum X terete, semi-sclerotized. Basal segment of each inferior appendage much enlarged, with apicodorsal end bearing elongate process slightly broadened in middle then tapering to acute apex and with apicoventrolateral end short, triangular;

distal segment represented by long, straight apicomesal process with compressed apex and without basal projection. Phallus tubular, without parameres.

Diagnosis: This species is quite similar to *Goera bicuspidata* Yang & Armitage (1996), but differs from it in that in *G. recta*: (1) the ventral process of the basal joint of each inferior appendage is triangular, about as long as its base is broad; (2) the distal segment of each inferior appendage is straight and compressed with a broad apex in lateral view; and (3) urosternite VI bears two processes that are separated basally.

Etymology: Latin, "straight," with reference to the shape of the distal segment of each inferior appendage.

Holotype: Male, Hu-bei Province, Xing-shan mountains, Xiao-he-kou, 700 m elevation, 11 V 1994, Coll. Yang Xing-ke in light trap (#19471, Institute of Zoology, Academia Sinica).

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

Leptoceridae

Ceraclea (Athripsodina) vaciva, new species

(Figs. 3A-D, 4E-G)

Length of forewing: male 6.4 - 6.6 mm, female 5.7-6 mm. Head and thorax dark brown, frons yellowish brown, setae on frons and dorsum of head white. Forewing yellowish brown, covered with golden brown setae with light and dark brown setae in small patches.

Male genitalia (Figs. 3A-D): Superior appendages fused basally for about one-third their length, each apex blunt and curved downward. Tergum X broad at base, tapering to narrow apex, sub-apical sensilla-bearing lobes projecting laterally and forming tri-lobed apex in dorsal view. Main body of each inferior appendage and harpago absent; its basoventral lobe huge, sinuous with apical one-third narrowed and curved ventrad and mesad, with 4-5 protuberances apically; mesal ridge slightly produced with many setae. Phallus (phallobase) tubular, apex of apicoventral lobe with short mesal cleft. Paramere spines fused for five-sixths of their length.

Female genitalia (Figs. 4E-G): Pleural regions of segment IX distinctively striated. Superior appendages small, triangular, not quite reaching mid-distance of lamellae. Lamellae elliptical, two times as long as wide, sparsely covered with short

setae. Gonopod plates semitransparent, slightly striated on lateral margins; apicomesal processes about 2.5 times as long as wide. Spermathecal sclerite broadest one-third distance from posterior end in ventral view.

Diagnosis: This species is a member of the *Ceraclea (Athripsodina) marginata* Group, very similar to *Ceraclea (A.) foensis* from southeastern China, keying with it in the work of Yang and Morse (1988) wherein the main body of each inferior appendage is absent and the parameres are fused into one. *Ceraclea (A.) vaciva* differs from it, however, in that (1) the male superior appendages are fused for one-third of their length; (2) the apex of male tergum X is without an apicomesal cleft and its subapical sensilla lobes are large; (3) the mesal ridge of each male inferior appendage is without processes; and (4) the fused paramere spines in the male are separated at the base.

Etymology: Latin, "empty, free from," with reference to the absence of the main body of each inferior appendage.

Holotype: Male, Si-chuan Province, Feng-du County, Shi-ping, 6 X 1994, 610 m elevation, Coll. Li Fa-sheng (#148947 Institute of Zoology, Academia Sinica). Paratypes: eight males (#148895, #151008, #148898, #148899, #148957, #148962, #148951, #151031, Institute of Zoology, Academia Sinica) and five females (#148983, #148987, #148977, #151043, #148971, Institute of Zoology, Academia Sinica), same data as holotype.

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

Ceraclea (Athripsodina) brachyclada, new species

(Figs. 5A-E)

Length of male forewing 6.4 mm. Head and dorsum of thorax dark brown, legs light yellow. Forewing light brown, covered with golden yellowish setae.

Male genitalia (Figs. 5A-E): Segment IX gradually narrowed dorsally in lateral view, apices of superior appendages abruptly narrowed and widely separated. Tergum X broad, apex blunt with short mesal cleft. Main body of each inferior appendage and its harpago absent. Basoventral lobe of each inferior appendage short, about half as long as segment IX is tall, constricted near middle, apex tapered and directed mesad and with apical crown of very small protuberances, mesal ridge produced and bearing many setae. Phallobase tubular, api-

coventral lobe with short cleft at apex. Paramere spines, stout, fused for entire length, about half as long as phallus.

Diagnosis: This species is also a member of *Ceraclea (Athripsodina) marginata* Group, closely related to the previous new species and keying with it and *C. foensis* in the work of Yang and Morse (1988), but differing from them in that *C. brachyclada* has (1) the superior appendages not fused basally; (2) tergum X is broad with a bilobed apex; (3) the ventral lobe of each inferior appendage is short, only half as long as segment IX is tall, with the protuberances of the apical crown much smaller.

Etymology: Greek, "short branch," with reference to the relatively short basoventral lobe of each inferior appendage.

Holotype: Male, Si-chuan Province, Feng-du County, Shi-ping, 6 X 1994, 610 m elevation, Coll. Li Fa-sheng (#148939 Institute of Zoology, Academia Sinica). Paratypes: three males, same data as holotype (#148992, #151010, #148901 Institute of Zoology, Academia Sinica).

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

***Ceraclea (Athripsodina) semicircularis*, new species**
(Figs. 6A-D)

Length of male forewing 6.5 mm. Body dark brown. Wing pattern typical of *C. (A.) marginata* Group: medium brown, covered with yellow brown setae in patches especially along veins, forming an irrorate appearance.

Male genitalia (Figs. 6A-D): Superior appendages broad and separate basally, apical half slender, slightly curved inward, blunt apically. Tergum X long and broad with apex produced in the center in dorsal view; in side view, apicolateral sensilla-bearing lobes folded upward. Main body and harpago of each inferior appendage absent; basoventral process huge, erect basally, curved at middle, with small setae-bearing lobe causing dorsal edge to be angled in lateral view; process semi-circular in ventral view, its apex with several small setiferous protuberances; basomesal surface of appendage bearing 6-7 long and stout setae. Phallus tubular, apicoventral process thin, semi-sclerotized, with apex slightly bilobed.

Diagnosis: This species is the member of *Ceraclea (Athripsodina) marginata* Group, somewhat similar to *Ceraclea (A.) foensis* and keying with it

in the work of Yang and Morse (1988), but differing from it in that (1) the basoventral process of each male inferior appendage is strongly curved at mid distance, with its apex bearing 3-4 short, blunt protuberances; the mesal ridge of the huge lobe is not produced into processes but the ventromesal surface is produced and bears 6-7 stout setae and (2) the male parameres are entirely fused, slender and much longer than half the length of the phallus.

Etymology: Latin, "semi-circle," with reference to the arched inferior appendages.

Holotype: Male, Si-chuan Province, Feng-du County, Shi-ping, 6 X 1994, 610 m elevation, Coll. Li Fa-sheng (#151003 Institute of Zoology, Academia Sinica).

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

***Setodes chlorinus*, new species**
(Figs. 7A-D, 8E-G)

Length of male forewing 6.5 mm. Head and thorax pale yellow, abdomen green, forewing covered with golden yellowish setae, scattered with silvery setae in patches, with brown spots along the out margin at the ends of major longitudinal veins.

Male genitalia (Figs. 7A-D): Sternum IX long and setose, sinuately tapering to narrow tergum with several strong seta-bearing processes in upper half of posterior edge. Superior appendages small, triangular, hairy, separated basally. Tergum X long, rectangular in dorsal view, slightly narrowed in basal half with shallow excision at end. Inferior appendages three branched: dorsal branch slender, with apical part biforked, with each fork setose and apically blunt; mesal branch rectangular in lateral view; ventral branch short, about half as long as mesal one, and subdivided into slender and acute outer arcuate lobe and blunt and thumb-like inner lobe. Phallus with short, plate-like phallobase, phallicata long, trough-shaped, evenly curved downward, parameres absent.

Female genitalia (Figs. 8E-G): Segment IX slightly longer dorsally than ventrally. Anterior part of gonopod plate convex, forming transverse, elliptical band; rest of plate concave, except paired apical projections slender, as long as small lamellae lobes, and suspended beneath plate and lamellae. Tergum X broad, slightly narrowed at distal third in dorsal view. Lamellae large, each consisting of two lobes, with ventrolateral lobe much smaller than large dorsal lobe.

Diagnosis: This new species is somewhat similar to the members of Schmid's (1987) Primitive Branch, keying to *Setodes diversus* Yang and Morse of the *S. punctata* Group in the work of Yang and Morse (1989). It differs from it and other members of that Group in the male by (1) the several irregular strong processes on the posterolateral margin of segment IX; (2) the massive, rectangular shape of the mesal branch of each inferior appendage and the division of the ventral branch into an acute and a blunt processes; and (3) the absence of parameres on the phallus.

Etymology: Greek, "green," with reference to the green abdomen of this new species.

Holotype: Si-chuan Province, Feng-du County, Shi-ping, 6 X 1994, 610 m elevation, Coll. Li Fa-sheng (#148896 Institute of Zoology, Academia Sinica). Paratypes: three females, same data as holotype (#148993, #148973, #148990, Institute of Zoology, Academia Sinica).

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

Acknowledgements

Specimens used in this research were provided by the Institute of Zoology, Academia Sinica, and the Zhe-jiang Forest Institute. This work is partly sponsored by Chinese Natural Science Foundation grant number 39470110. This is Technical Contribution No. 4196 of the South Carolina Agricultural Experiment Station, Clemson University.

References

- Schmid, F. 1987. Considerations diverses sur quelques genres leptocerins (Trichoptera, Leptoceridae). Bulletin de l'Institut royal des Sciences naturelles de Belgique, Entomologie 57 supplement. 147 pp., 29 pls.
- Yang L., and B. J. Armitage. In press. The genus *Goera* (Trichoptera: Goeridae) in China. Proceedings of the Entomological Society of Washington.
- Yang L., and J. C. Morse. 1988. *Ceraclea* of the People's Republic of China (Trichoptera: Leptoceridae). Contributions of the American Entomological Institute 23(4). 69 pp.
- Yang L., and J. C. Morse. 1989. Setodini of the People's Republic of China (Trichoptera: Leptoceridae, Leptocerinae). Contributions of the American Entomological Institute 25(4). 77 pp.

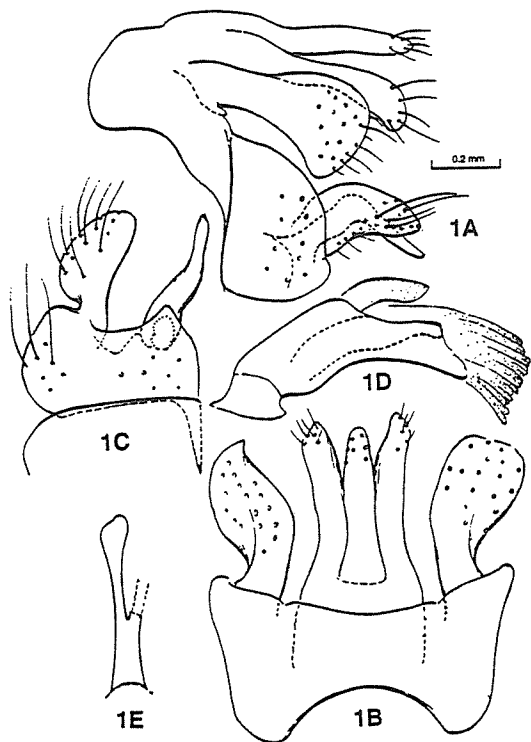


Fig. 1. *Goera baishanzuensis*, new species, male genitalia. A, left lateral view; B, dorsal view; C, ventral view of left inferior appendage; D, left lateral view of phallus; E, process of sternum VI.

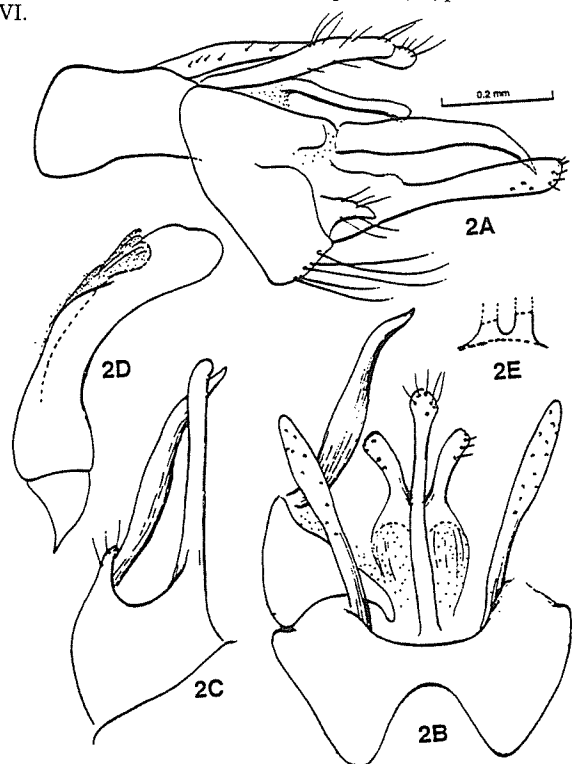


Fig. 2. *Goera recta*, new species, male genitalia. A, left lateral view; B, dorsal view; C, ventral view of left inferior appendage; D, left lateral view of phallus; E, process of sternum VI.

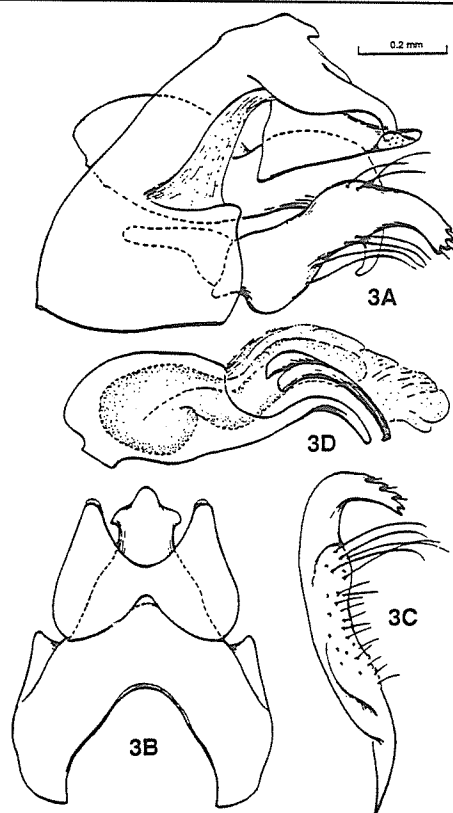


Fig. 3. *Ceraclea (Athripsodina) vaciva*, new species, male genitalia. A, left lateral view; B, dorsal view; C, ventral view of left inferior appendage; D, left lateral view of phallus.

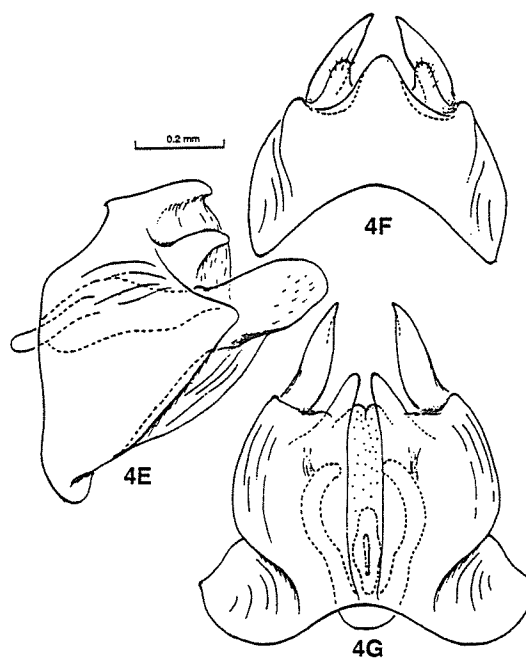


Fig. 4. *Ceraclea (Athripsodina) vaciva*, new species, female genitalia. E, left lateral view; F, dorsal view; G, ventral view.

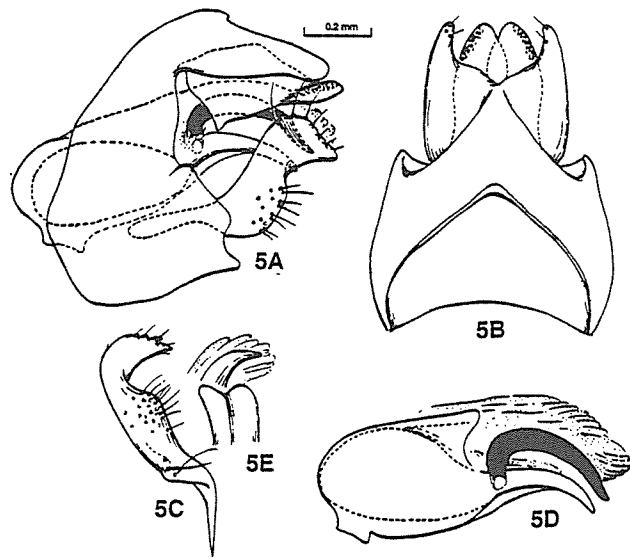


Fig. 5, *Ceraclea (Athripsodina) brachyclada*, new species, male genitalia. A, left lateral view; B, dorsal view; C, ventral view of left inferior appendage; D, left lateral view of phallus; E, apex of phallus in ventral view.

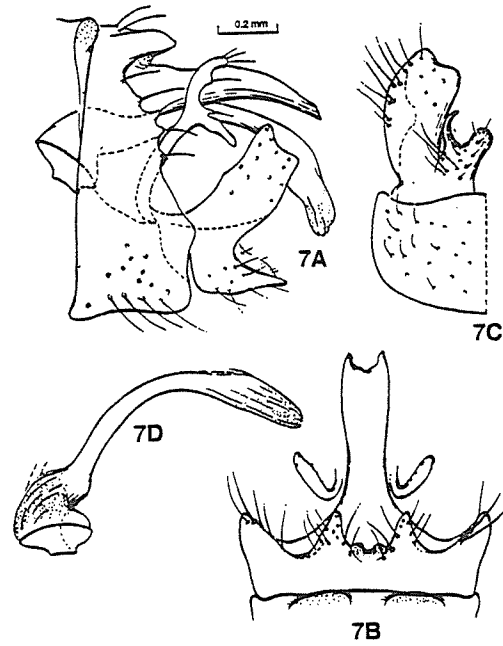


Fig. 7, *Setodes chlorinus*, new species, male genitalia. A, left lateral view; B, dorsal view; C, ventral view of left inferior appendage; D, left lateral view of phallus.

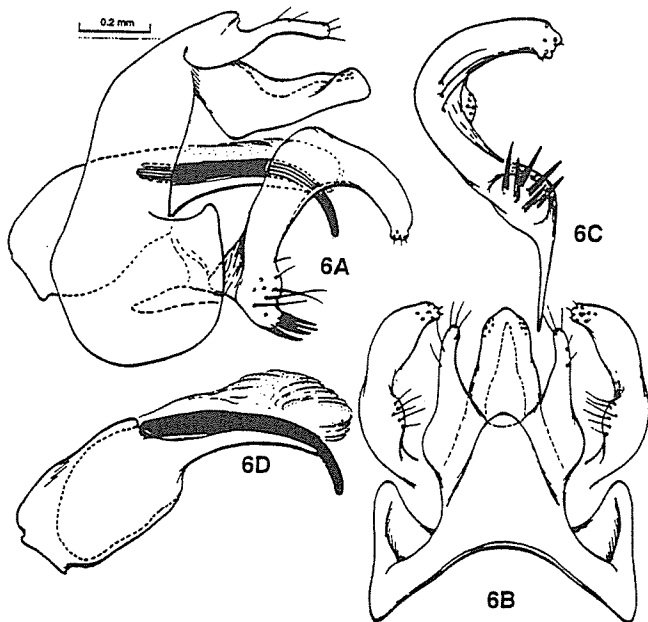


Fig. 6, *Ceraclea (Athripsodina) semicircularis*, new species, male genitalia. A, left lateral view; B, dorsal view; C, ventral view of left inferior appendage; D, left lateral view of phallus.

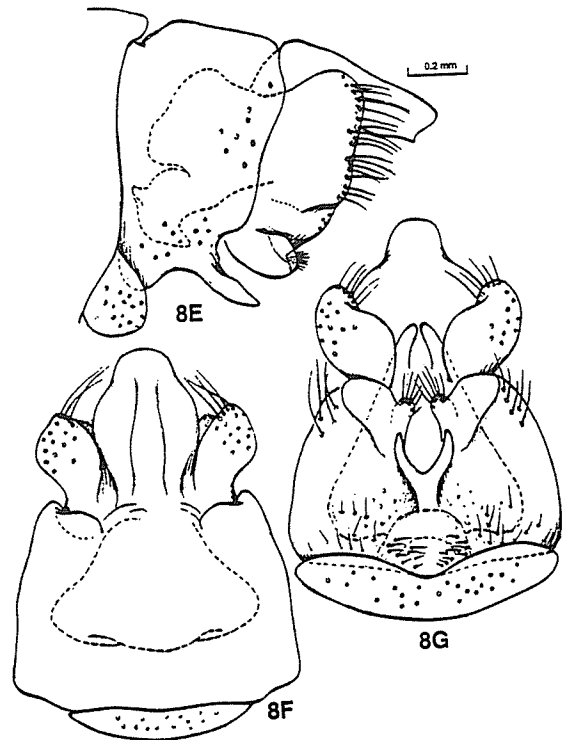


Fig. 8, *Setodes chlorinus*, new species, female genitalia. E, left lateral view; F, dorsal view; G, ventral view.