



Two new species of the *orientalis* group of *Rheocricotopus* (*Psilocricotopus*) from China (Diptera: Chironomidae)

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Abstract

Rheocricotopus (*Psilocricotopus*) *calviculus* sp. n. and *R. (P.) villiculus* sp. n. from China are described as male imagines. The species are closely related to the previously described *R. (P.) orientalis* Wang forming a new group, the *orientalis* group, which eventually may deserve the rank of subgenus or even genus. The group is distinguished by lacking a humeral pit, numerous sensilla clavata on third palpomere, cuneiform wings, no or few setae on squama, long legs, banded abdomen, very long inferior volsella, gonocoxite with apical extensions, and gonostylus with a median triangular projection.

Introduction

The larvae of the genus *Rheocricotopus* Thienemann & Harnisch are rheophilic in streams and rivers with a few species also found in lakes and littoral in lakes. The genus was revised by Sæther (1985) who divided the genus into two subgenera, the nominal subgenus and *Psilocricotopus* Sæther. The subgenera are easily separated as pupae, while the distinctions between the male imagines are less clear. Wang (1995) described a peculiar new species, *R. orientalis*, which he placed in the subgenus *Rheocricotopus* since the crista dorsalis was low apically and sharply triangular medially. He figured a medium large humeral pit. However, reexamination of his species reveals that a lighter area mistakenly was taken as a humeral pit and that there is no humeral pit in *R. orientalis*. Recently two new species clearly related to *R. orientalis* were discovered. They are described here.

Methods

The general morphological terminology follows Sæther (1980). The holotypes are deposited at the Department of Biology, Nankai University, Tianjin.

Rheocricotopus (*Psilocricotopus*) *calviculus* sp. n. (Fig. 1).

Type locality: CHINA, Shaanxi Province, Zhouzhi County.

Type material: Holotype ♂, CHINA: Shaanxi Province, Zhouzhi County, light trap, 1200 m a.s.l., 7 viii 1996, Bingchun Ji, (NU04428).

Diagnostic characters: The imagines are characterized by having tergites I, IV and anterior 1/3 of V pale; a male antennal ratio of about 0.5; 1 inner and 1 outer vertical; no humeral pit; wing cuneiform; squama with about 3 setae; each tibia with one short spur only; tergite IX bare, but the long anal point with about 26 setae; sternapodeme triangular without oral projections; gonocoxite with caudomedial extension; superior volsella relatively low, without projection; inferior volsella very long; gonostylus with triangular median projection; HR 2.27; and HV 3.07.

Etymology: From Latin *calvus*, bald, and *culus*, buttock, referring to the bare tergite IX.

Male imago ($n=1$)

Total length 2.70 mm. Wing length 1.70 mm. Total length/wing length 1.59. Wing length /length of profemur 1.93. Thorax yellow with dark brown confluent vittae, dark brown upper half of antepnotum, scutellum and postnotum, and anepisternum II

and preepisternum ventrally lighter brown. Halter and head brown. Coxa except ventral margin, trochanter and basal 1/10 of femur yellowish; remainder of mid and hind femur legs brown. Abdomen (Fig. 1 C) with tergite I, IV and anterior 1/3 of V yellowish, other tergites and hypopygium brown.

Head: AR 0.51. Ultimate flagellomere 268 μm long. Temporal setae 2, including 1 inner vertical and 1 outer vertical. Clypeus with 7 setae. Tentorium 178 μm long, 24 μm wide. Stipes 134 μm long. Palpomere lengths (in μm): 32, 64, 128, 148, 292. Palpomere 3 with about 20 lanceolate sensilla clavata in one, about 6 in another apical pit.

Thorax (Fig. 1 A): Antepnotum with 2 setae. Dorsocentrals 10, acrostichals about 14, prealars 3. Scutellum with 6 setae.

Wing (Fig. 1 B): VR 1.12. Wing cuneiform. C extension 122 μm long. Brachiolum with 1 seta, R with 12, R₁ with 3, R₄₊₅ with 7, C extension with 5 non-marginal setae. Squama with 3 setae.

Legs: Spur of front tibia 22 μm long, of middle tibia 18 μm long, of hind tibia 54 μm long. Comb with 15 setae, 26–64 μm long. Sensilla chaeticae absent. Lengths (in μm) and proportions of legs:

	fe	ti	ta ₁	ta ₂	ta ₃	ta ₄	ta ₅	LR	BV	SV	BR
p ₁	880	968	784	392	280	192	88	0.81	2.76	2.34	1.3
p ₂	808	776	496	192	128	72	48	0.64	4.73	3.19	2.1
p ₃	872	992	616	248	216	112	64	0.62	3.88	3.03	2.1

Hypopygium (Fig. 1 D): Tergite IX with 26 setae on anal point, otherwise bare. Laterosternite IX with 5 setae. Anal point 96 μm long, sharply triangular. Phallapodeme 120 μm long, sternapodeme triangular without oral projections. Gonocoxite 200 μm long, with caudomedial projection; superior volsella relatively low, without projections; inferior volsella digitiform, 80 μm long. Gonostylus 88 μm long, with median triangular projection; crista dorsalis starting low apically, continuing sharply triangular at projection; megaseta 16 μm long. HR 2.27, HV 3.07.

Distribution and ecology

The species is known from the type locality only, a mountainous area in Shanxin Province. The specimen was collected by a light trap without proximity to water and may be terrestrial.

Rheocricotopus (Psilocricotopus) villiculus sp. n. (Fig. 2)

Type locality: CHINA, Henan province, Jigong Mt.

Type material: Holotype ♂, CHINA: Henan province, Jigong Mt., 700 m a. s. l., sweep net, 11 vii 1997, Yuzhou Du, (NU012777).

Diagnostic characters: The imagines are characterized by having all of tergites I, IV and VIII, median part of II, and anterior 1/4–1/10 of remaining tergites yellowish; male antennal ratio of about 0.6; 1 inner and 1 outer vertical; no humeral pit; wing cuneiform; squama bare; mid tibia with one spur only; tergite IX with 13 stiff setae and in addition a long anal point with about 26 setae; sternapodeme triangular without oral projections; gonocoxite with caudomedial extension; superior volsella relatively low, without projection; inferior volsella very long; gonostylus with triangular median projection; HR 1.69 and HV 1.56.

Etymology: From Latin *villus*, tuft of hair, and *culus*, buttock, referring to the tufts of stiff setae to each side of the anal point on tergite IX.

Male imago ($n = 1$) Total length 2.64 mm. Wing length 1.61 mm. Total length/wing length 1.64. Wing length /length of profemur 1.73. Thorax yellow with blackish brown vittae; upper half of antepnotum, scutellum, dorsal half of postnotum, and part of antepisternum II dark brown. Halter brown. Head with yellow frons and brown vertex. Coxa except ventral margin, trochanter and basal 1/10 of femur yellowish; remainder of mid and hind femur legs brown. Abdomen (Fig. 2 C) with tergite I, median part of II, all of IV and VIII, and anterior 1/10–1/4 of remaining tergites yellowish, other part of tergites and hypopygium brown.

Head: AR 0.62. Ultimate flagellomere 304 μm long. Temporal setae 2, including 1 inner vertical and 1 outer vertical. Clypeus with 8 setae. Tentorium 144 μm long, 24 μm wide. Stipes 140 μm long. Palpomere lengths (in μm): 28, 72, 140, 160, 320. Palpomere 3 with about 12 lanceolate sensilla clavata in one, about 7 in another apical pit.

Thorax (Fig. 2 A): Antepnotum with about 3 setae. Dorsocentrals 8, acrostichals probably about 10, prealars 3. Scutellum with 4 setae.

Wing (Fig. 2 B): VR 1.08. Wing cuneiform. C extension 110 μm long. Brachiolum with 1 seta, R with 13, R₁ with 4, R₄₊₅ with 9, C extension with 6 non-marginal setae. Squama bare.

Legs: Spur of front tibia 36 μm long, of middle tibia 20 μm long, spurs of hind tibia 44 μm long and broken. Comb with 13 setae, 28–50 μm long. Sensilla

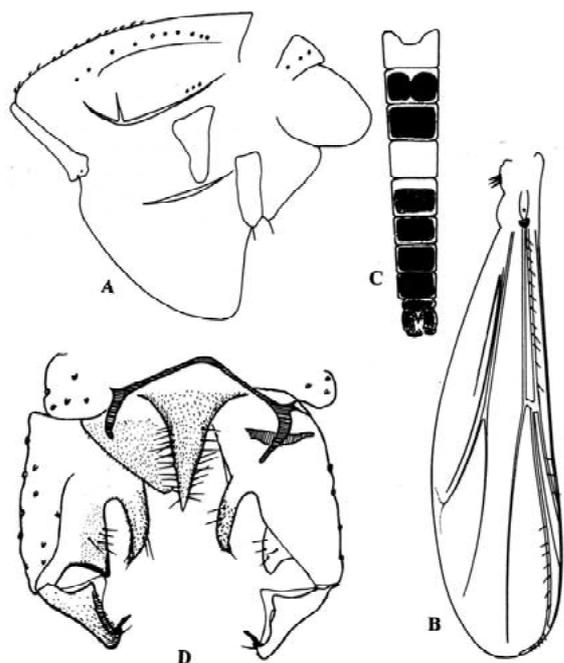


Figure 1. *Rheocricotopus (Psilocricotopus) calviculus* sp. n., male imago. (A) Thorax. (B) Wing. (C) Abdomen. (D) Hypopygium.

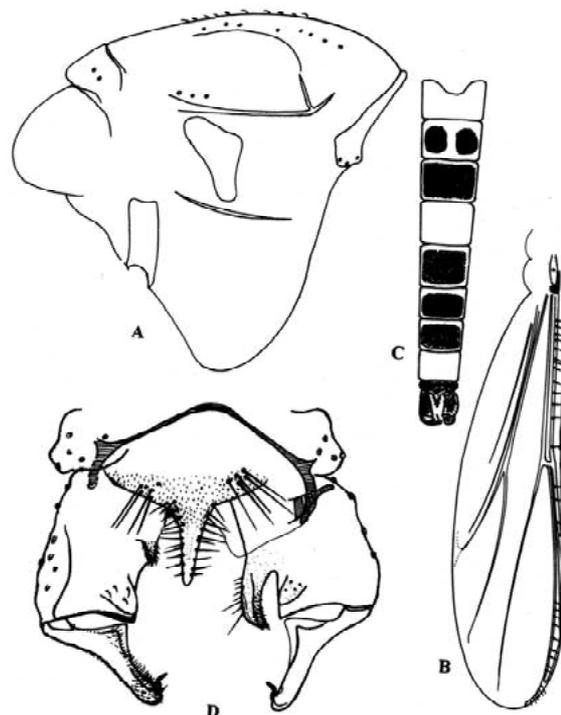


Figure 2. *Rheocricotopus (Psilocricotopus) villiculus* sp. n., male imago. (A) Thorax. (B) Wing. (C) Abdomen. (D) Hypopygium.

chaeticae absent. Lengths (in μm) and proportions of legs:

	fe	ti	ta ₁	ta ₂	ta ₃	ta ₄	ta ₅	LR	BV	SV	BR
p ₁	928	1016	828	424	296	208	84	0.81	2.74	2.35	2.1
p ₂	848	832	544	200	144	80	48	0.65	4.71	3.09	2.6
p ₃	928	1072	682	248	216	112	56	0.59	3.70	3.16	2.9

Hypopygium (Fig. 2 D): Tergite IX with 13 stiff, bristle-like setae in two tufts on each side of anal point, anal point with 26 setae. Laterosternite IX with 8 setae. Anal point 70 μm long, sharply triangular. Phallapodeme 90 μm long, sternapodeme triangular without oral projections. Gonocoxite 176 μm long, with caudomedial projection; superior volsella relatively low, without projections; inferior volsella digitiform, 54 μm long. Gonostylus 104 μm long, with median triangular projection; crista dorsalis starting low apically, continuing sharply triangular at projection; megaseta 16 μm long. HR 1.69, HV 1.56.

Remarks

The inferior volsella on one side is lost or reduced. It thus may seem unwarranted to describe a species

based on a single specimen which, in addition, could be aberrant. However, all three members of the group probably are terrestrial, unlikely to be found in large numbers, and the immatures may never be found. We find it important to describe also this species since it strengthens the possibility that this group may represent a separate subgenus or even genus.

Distribution and ecology

The species is known from the type locality only, a mountainous area in Jigong Mt., Henan province. The specimen was collected by a sweep net where there was no proximity to water and may be terrestrial.

Systematics

The three species *R. orientalis*, *R. calviculus* and *R. villiculus*, clearly form a monophyletic group distinguished by a number of synapomorphies. The group can be distinguished by lacking a humeral pit, numerous sensilla clavata on third palpomere, cuneiform

wings, no or few setae on squama, long legs, banded abdomen, very long inferior volsella, gonocoxite with apical extensions and gonostylus with a median triangular projection.

However, their systematic position is somewhat unclear. The synapomorphies for the subgenus *Psilocricotopus* are based on immatures (Trends 18 in Sæther 1985) and the synapomorphies given for the nominal subgenus (Trends 17 in Sæther 1985) are contradictory for the *orientalis* group. The crista dorsalis is low apically, but pronounced and triangular medially, and the superior volsella is relatively small and rounded. As mentioned in the 'Introduction', Wang (1995) misinterpreted a clear area on the thorax as a humeral pit. None of these species possess a humeral pit, i. e. they differ from all previously described species which at least have some indication of one or more pits. Wang (1995) also gives the number of sensilla clavata on palpomere 3 as 5–6. However, as can be seen from Figure 2 this pertain to one of the pits, while the other has about 10. Such high number of sensilla clavata often are found in terrestrial or semiterrestrial species. The *orientalis* group possesses all the synapomorphies and symplesiomorphies of the basal *godavarius* group of the subgenus *Psilocricotopus*

(Trends 23 and 24 in Sæther 1985) and could be included in that group. However, the striking coloration, peculiar genitalia, complete absence of humeral pit and the crista dorsalis which do not conform to any of the subgenera lead us to suggest that the *orientalis* group form the sister group of the subgenus *Psilocricotopus* or of the full genus and may deserve subgeneric or even generic rank.

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