

## Descriptions of two interesting chironomid pupae collected in Yunnan Province, China (Chironomidae: Chironominae)

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### Abstract

Descriptions of two Chironominae pupal types collected in Yunnan Province are given. Among known genera, both types closely resemble that of the North American *Hyporhygma* Reiss, 1982, but the spine and spinule pattern of the dorsal abdomen does not fit within the current taxonomic boundaries, and represent an endemic component in the Oriental region. A new genus description is expected when associated adults are available.

### Introduction

The tribe Chironominae has a nearly worldwide distribution and comprises about 60 genera in Holarctic region (Epler *et al.* 2013). In the Oriental region, 43 Chironominae genera were listed in the most recent catalogue (Hazra *et al.* 2016), and 28 of them were recorded from China (Yamamoto *et al.* 2018).

In an expedition along the borders of Yunnan Province, China, we collected two pupal exuviae belonging to Chironominae from macrophyte-dominated ponds. Close examination revealed that the two pupae are similar to each other in the truncated cephalic tubercle with an apical crown of many spines, and the dark anteromedian mounds bearing strong spines on the abdominal tergites II–VI, but significantly different in the body size. The pupae are distinct from other Chironominae pupae by the combination of having a cephalic tubercle with apical spines, a thoracic horn with several branches, an abdominal tergite II with a posterior band of spines and an abdominal conjunctive IV/V with many spines. Here we describe and illustrate the two pupal types under the names of taxon 1 and taxon 2 in order to promote chironomid studies in Oriental region.

### Materials and Methods

Pupal exuviae were collected by a hand net (mesh size 250 µm). Specimens examined were slide-mounted in Euparal. Morphological terminology and abbreviations follow Sæther (1980) and Langton and Visser (2003). All the specimens examined are deposited in the Institute of Groundwater and Earth Science, Jinan University (EJNU), Guangzhou, China.

### Description

#### *Pupal Diagnosis.*

Pupae conform mostly to the generic pupal description of *Hyporhygma* Reiss, 1982 (Pinder and Reiss 1986), except for the following characters: Antepnotals absent; thoracic horn with 6–8 branches, one of the basal branches distinctly stronger than others (Fig. 1b). Wing pad brown, with two vein stems darkened in basal 1/2; nose absent. Strong anterior spines on T II–VI located on sclerotized mounds. T II with posterior band of spines; III–VI without distinct posterior spine band of points. Conjunctive III/IV bare; IV/V with band of spinules. Paratergite II–V present or weak. Anal lobe without dorsal seta. Male genital sac extending beyond the outer margin of anal lobe.

#### *Taxon 1*

*Pupa* (n = 1). Total length 9.9 mm, abdominal length 7.7 mm.

*Coloration:* Exuviae brown, abdominal apophyses dark brown. T II–VI darkened on anteromedian mounds. T II dark on posterior spine patch.

*Cephalothorax*: Cephalic tubercles rounded apically, ca. 120  $\mu\text{m}$  in outer diameter, central spine crown consisting of many spines 10–12 long; frontal seta weak, 20  $\mu\text{m}$  long (Fig. 1a). Precorneals 2, longest ca. 100  $\mu\text{m}$ . Thoracic dorsum pebbled along anterior 1/3 of median suture. Lengths of dorsocentrals 1–4 ( $\mu\text{m}$ ): 80, 50, 60, 70. Dc1 and Dc4 stronger than Dc2 and Dc3 (Fig. 1c). Tracheal bundle simple; basal ring elliptical, longest diameter about twice as long as broad.

*Abdomen* (Fig. 1d): T II–VI with extensive spinulation; T VII–VIII with anterolateral spinulation. T II with anteromedian and posteromedian transverse bands of strong spines, posterior band narrowly interrupted by posterior muscle marks. T III–VI each with anteromedian spine patch laterally accompanied by sparse spines. T II with row of about 70 caudal hooklets; its row 2/3 times as long as segment width. A I with anterolateral tubercle; A II with PSB; A IV with vortex. Paratergite II–V weak or absent S II–VIII with extensive anterolateral spinulation. A V–VI with 3 Lt-setae; A VII–VIII with 4 Lt-setae. Anal comb on segment VIII with 1 large and 4 smaller yellow teeth, largest 50  $\mu\text{m}$  (Fig. 1e). Anal lobe 550  $\mu\text{m}$  long, with 1–2 irregular rows of 100 lateral taeniae; ALR 1.57.

*Specimen Examined*. Pe (female), CHINA, Yunnan Province, Xishuangbanna Dai Autonomous Prefecture, Jinghong City, Menglun Town, Xishuangbanna Tropical Botanical Garden, 19.ii.2019, H.Q. Tang.

### **Taxon 2**

*Pupa* (n = 1). Abdomen length 5.0 mm, total length 6.5 mm.

Coloration: As the above taxon.

*Cephalothorax*: Cephalic tubercles ca. 90  $\mu\text{m}$  in outer diameter central spine crown consisting of many spines 8–10 long; frontal seta hard to observe. Lengths of dorsocentrals 1–4 ( $\mu\text{m}$ ): 50, 30, 25, 50. Dc1 and Dc4 stronger than Dc2 and Dc3. Tracheal bundle as previous taxa.

*Abdomen* (Fig. 1f): Spinulation pattern as previous taxa except the weak developed accompanied sparse spines lateral to anteromedian spine patch. Hook row on tergite II with 58 caudal hooklets, 2/3 of width of tergal II. Paratergite II–V present, well-developed on IV–V Anal comb VIII with 1 larger and 3 small yellow teeth, largest 45  $\mu\text{m}$  long (Fig. 1g). Anal lobe 375  $\mu\text{m}$  long, with one row of 60 lateral taeniae, ALR 1.58.

*Specimen Examined*. Pe (male), CHINA, Yunnan Province, Pu'er City, Ximeng Va Autonomous County, Mengsuo Lake, 27.viii.2014, H.Q. Tang.

### **Discussion**

These two taxa are characterized by the pupal cephalic tubercle with an apical whirl of spines, which also occurs in *Endochironomus* Kieffer, 1918, *Endotribelos* Grodhaus, 1987, *Hyporhygma*, *Phaenopsectra* Kieffer, 1921 and *Sergentia* Kieffer, 1922 (Grodhaus 1987). Among these genera, the pupae of the present taxa most closely resemble those of North American *Hyporhygma* Reiss as the abdominal tergite II has a posterior transverse band of strong spines, but are distinct in the thoracic horn bearing 6–8 branches, the absence of posterior spine bands on the abdominal tergites III–VI and the bare abdominal conjunctive III/IV. In *Hyporhygma*, the pupal thoracic horn is plumose, the pupal abdomen bears posterior spine bands on the tergites III–VI and two groups of strong spines on the conjunctive III/IV (Pinder and Reiss 1986). The species group A of *Endochironomus* possesses a posterior transverse spine band on the tergite II, but lacks spines on the cephalic horn (*l.c.* p. 322).

Although those two types are similar to each other, the smaller taxon apparently represent an independent status, based on the weak lateral sparse spines and extensive spinulation on paratergite IV–V. Since the extent of morphological variations are hard to detect in small samples, we here treat the two taxa separately.

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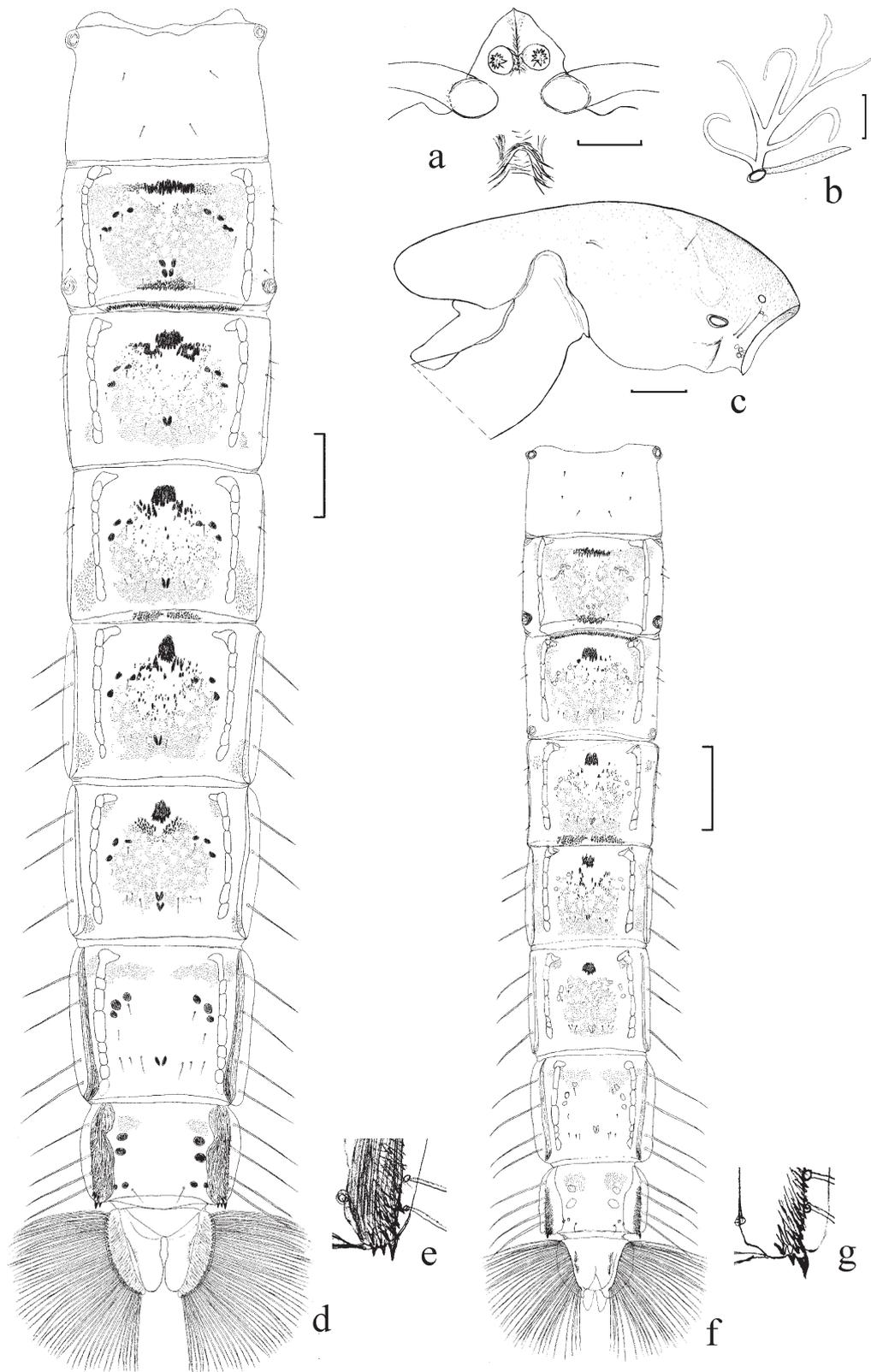


Figure 1. Taxon 1: a) frontal apotome; b) thoracic horn; c) thorax; d) abdomen dorsal view; e) posterolateral spines of segment VIII. Taxon 2: f) abdomen dorsal view; g) posterolateral spines of segment VIII. Scale bar = XX  $\mu$ m.

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