

## A New Species of *Prosopistoma* from China (Ephemeroptera: Prosopistomatidae)

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### ABSTRACT

A new species, *Prosopistoma sinense* (Ephemeroptera: Prosopistomatidae), is described and illustrated based on egg and larval material from Hong Kong and Guangdong Province, China.

KEYWORDS: Ephemeroptera, Prosopistomatidae, *Prosopistoma sinense*, new species, China.

### INTRODUCTION

The genus *Prosopistoma*, the only genus in the Prosopistomatidae, was established by Latreille in 1833 based on larvae from Europe and Madagascar. Larval prosopistomatids are distinctive mayflies because they superficially resemble aquatic beetles. *Prosopistoma* is a widely distributed but little-known genus. It ranges from Europe and Africa through the Oriental Region to Australia (Gillies, 1954; Peters, 1967; Alouf, 1977; Koch, 1988; Dudgeon, 1990; Campbell & Hubbard, 1998). Of the 16 known species, eight occur in the Oriental Region (Peters, 1967; Soldán & Braasch, 1984). The first known Oriental species was *P. wouter-ae* described by Lieftinck (1932) from Java. Later Ulmer (1940) recorded the same species from Sumatra. Peters (1967) gave a generic diagnosis for the larvae and described five new species from the Oriental Region. Soldán and Braasch (1984) added two additional new species from Vietnam and presented a key to the larvae of Oriental *Prosopistoma*. In this paper, a new species of *Prosopistoma* is described from China.

Abbreviations used for deposition of types are as follows: the insect collection of the South China Agricultural University, Guangzhou, P. R. China (SCAU); Department of Ecology & Biodiversity, The University of Hong Kong (HKU); the insect collection of the Agriculture and Fisheries Department of Hong Kong Government (AFDHK); and the collection of Florida A & M University, Tallahassee, Florida (FAMU).

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*Prosopistoma sinense* sp. n. ( Figs. 1–14)

*Material examined:* Mature larva (Holotype), CHINA, Hong Kong, near the Lower Waterfall, Lam Tsuen River, Ng Tung Chai (22°26' N, 114°08' E), 6.IV.1998, leg. Tong Xiaoli (SCAU). Paratypes, CHINA, Hong Kong: 5 larvae, collected with holotype (SCAU); 5 larvae, near the Lower Waterfall, Lam Tsuen River, Ng Tung Chai, 25.II.1997, leg. Tong Xiaoli (3 in SCAU, 2 in FAMU); 4 larvae, Ng Tung Chai, 28.IV.1993, leg. Tony K. T. Chan (HKU); 2 larvae, small stream, Shing Mun Country Park (22°24' N, 114°09' E), 29.IV.1993, leg. Tony K. T. Chan (HKU); 1 larva, Tai Po Kau Nature Reserve (22°25' N, 114°11' E), 25.V.1997, leg. Tong Xiaoli (AFDHK); 1 larva, Chung Lung (22°24' N, 114°06' E), 11.II.1998, leg. Tong Xiaoli (SCAU); CHINA, Guangdong Province: 1 larva, Long Men Xian, Nankunshan Nature Reserve, 20.III.1997, leg. Tong Xiaoli (SCAU); 1 larva, Wu Hua Xian, Qimuzhang Nature Reserve (23°51' N, 115°22' E), 5.IV.1997, leg. Maggie Verrall (SCAU); 6 larvae, Xin Yi Xian, Dawuling Nature Reserve (22°14'–22°17' N, 111°08'–111°15' E), 26–28.IV.1997, leg. Maria L. Salas (SCAU).

*Mature larva.* Body length excluding cerci 2.8–3.7 mm.

Head yellowish-brown, with dark brown transverse marking over median ocellus.

Head approximately 2.0 times wider than long. Antennae 4-segmented; segment 2

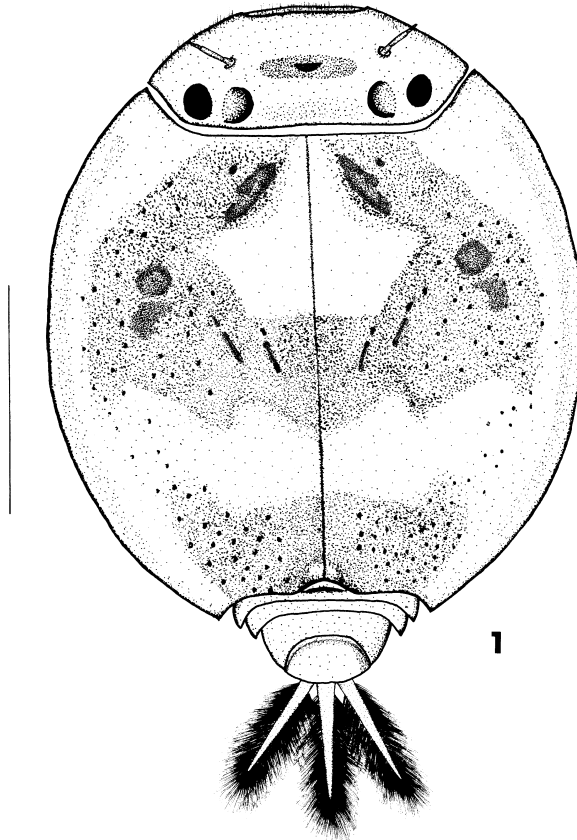
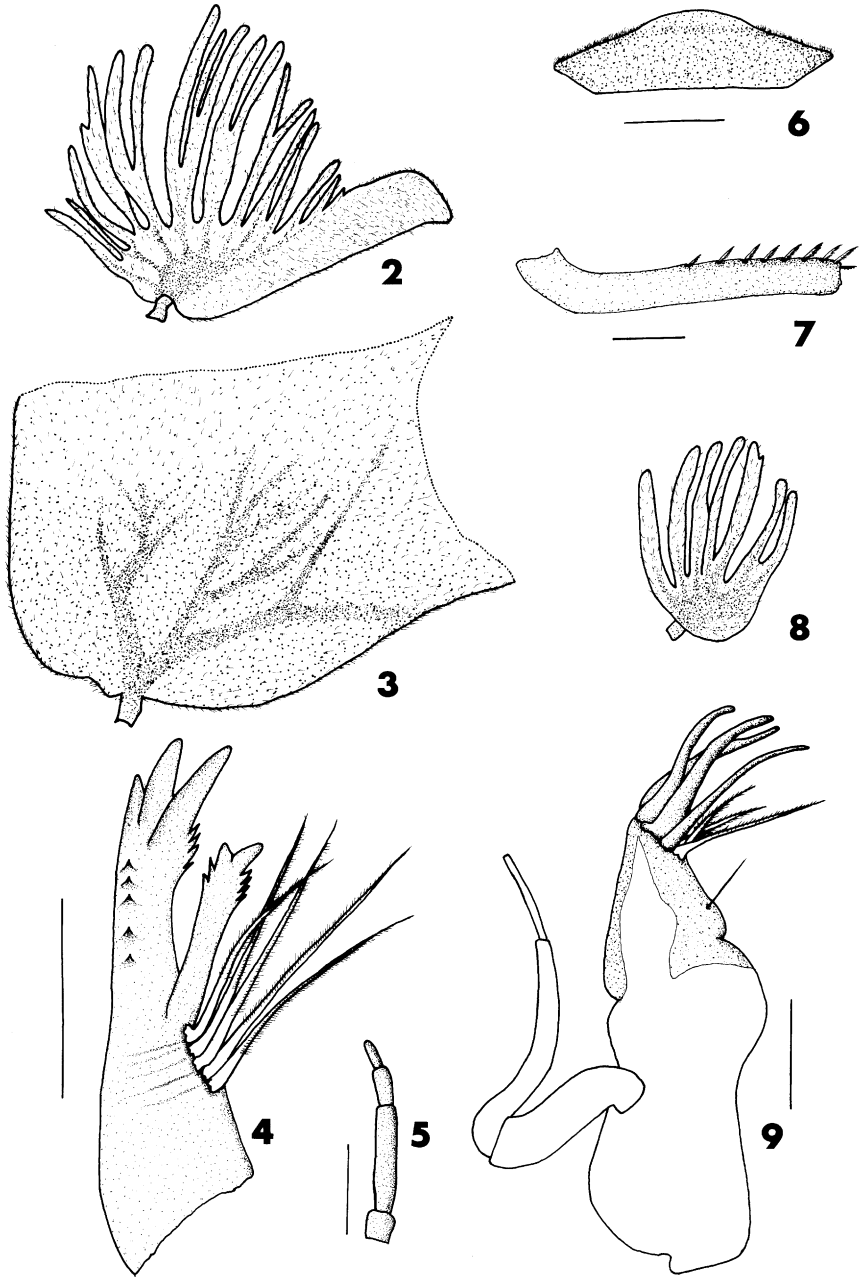


Fig. 1. *Prosopistoma sinense* sp. n. mature larva, dorsal view. Scale line is 1.0 mm.



Figs. 2-9. *Prosopistoma sinense* sp. n.: Fig. 2. gill I; Fig. 3. gill II; Fig. 4. canine area of mandible of mature larva; Fig. 5. antenna; Fig. 6. labrum, dorsal view; Fig. 7. apex of inner margin of fore tibia; Fig. 8. gill IV; Fig. 9. maxilla. Scale lines are 0.1 mm (4, 5, 7, 9) and 0.2 mm (2, 3, 6, 8) long.

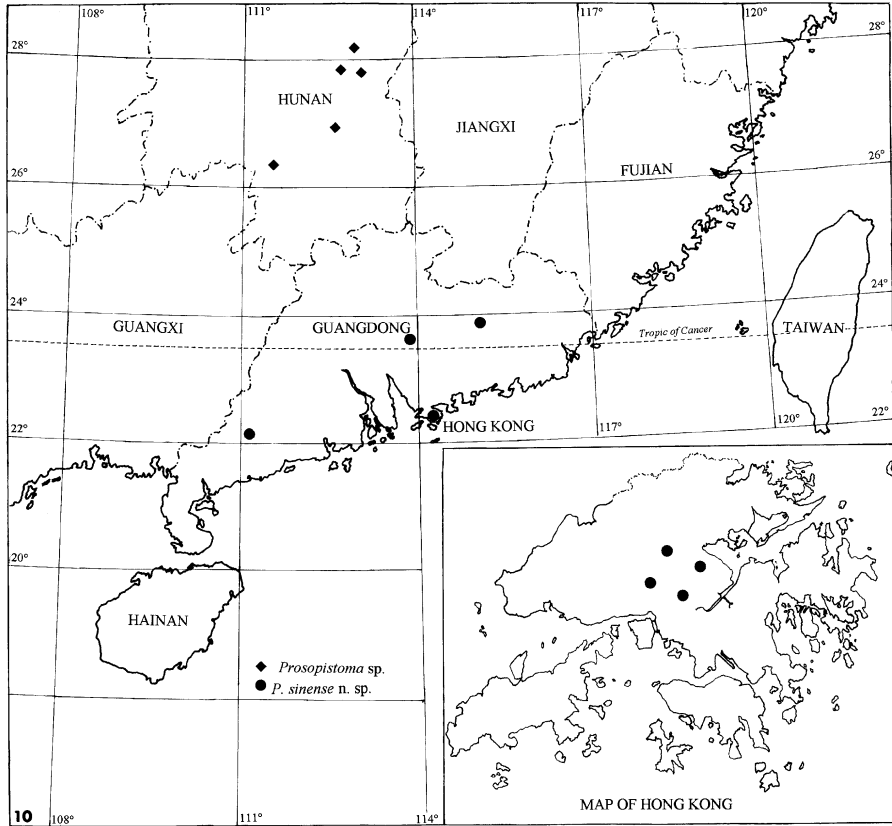
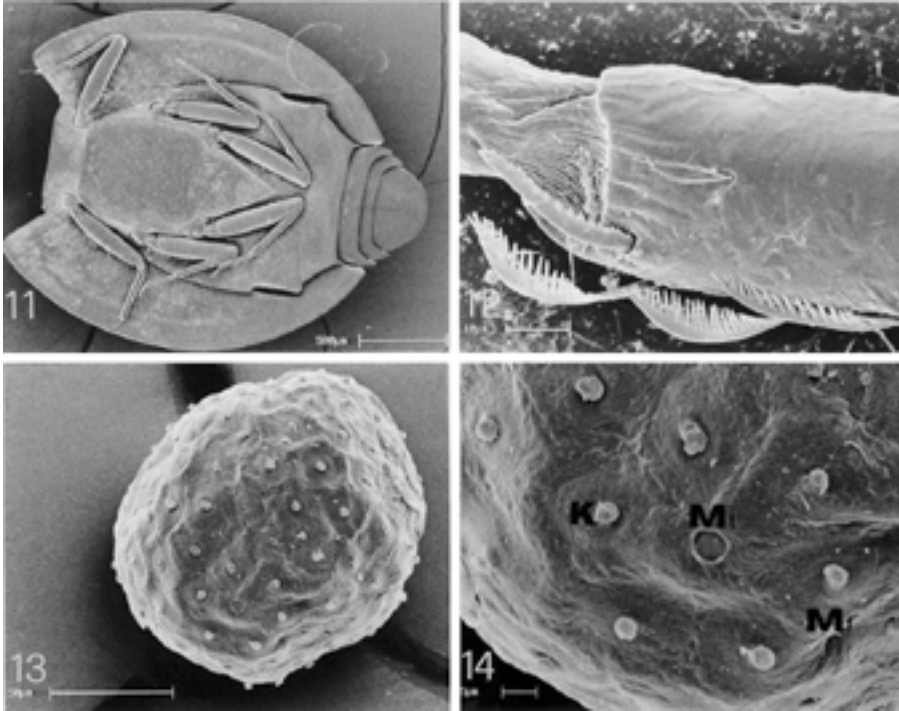


Fig. 10. Distribution of *Prosopistoma* in China.

about 1.6 times combined length of segments 3 and 4 (Fig. 5). Labrum (Fig. 6) narrow, approximately 4.0 times wider than long. Outer canine of mandibles with three apical teeth, outer tooth reduced, inner tooth larger with inner margin serrated near apex with 3 or 4 small teeth, outer margin serrated near apex with 5 or 6 small spines. Inner canine with two apical teeth, inner one a little larger; outer margin serrated near apex with 1 or 2 small spines, inner margin serrated near apex with 3 or 4 small spines. Five (rarely 4 or 6) long, finely serrated bristles at base of inner canine (Fig. 4). Segment 2 of maxillary palpi approximately 1.5 times length of segment 1, segment 3 a little more than one third as long as segment 2 (Fig. 9); three long finely serrated bristles proximal to apical spines on galea-lacinia (Fig. 9).

Mesonotum and abdomen light yellowish-brown, mesonotum with brown or dark brown colour pattern with some irregular dark brown recessed areas as in



Figs. 11–14. SEM view of *Prosopistoma sinense* sp. n. Fig. 11. ventral view of mature larva; Fig. 12. apex of inner margin of fore tibiae; Fig. 13. general view of egg dissected from completely mature larva; Fig. 14. detail. (K: knob-terminated coiled thread; Mt: tageniform micropyle; Mf: funnelform micropyle).

Figure 1, maximum width of mesonotum a little longer than length median suture or subequal in length. Meso- and metasternum as in Figure 11. Apex of inner margin of fore tibiae with 6–8 (sometimes up to 10) pectinate spines as in Figures 7 and 12. Six pairs of abdominal gills; gill I large and branched, gill II largest, leaf-like, unbranched, and covering the gills on segments 3–5 (Figs. 2, 3, 8), gill VI tiny, unbranched.

*Egg*: Size approximately  $150 \times 110 \mu\text{m}$ . General shape ovoid (Fig. 13); the chorion has two micropyle types: one is tageniform (Fig. 14, Mt) and the other is funnelform (Fig. 14, Mf); knob-terminated coiled threads (Fig. 14, K) are almost uniformly dispersed.

*Adult*: Unknown.

*Etymology*: Sina, L., meaning China.

*Distribution*: Hong Kong and Guangdong Province, China.

*Remarks:* *Prosopistoma sinense* sp. n. can be distinguished from all other known species of *Prosopistoma* by the following combination of characters of the larvae: (1) the colour pattern of the mesonotum with dark brown recessed areas; (2) antennae 4-segmented; (3) apex of inner margin of fore tibiae usually with 6-8 pectinate spines; and (4) five long, finely-serrated bristles arising at base of inner canine and outer canine of mandibles with three distinctive apical teeth, progressively larger from outer tooth to inner one.

## DISCUSSION

Liu et al. (1984) collected many specimens of *Prosopistoma* sp. using basket-type artificial substrate samplers along the Xiang Jiang River, Hunan Province, China (Fig. 10). Geographically, this record represents the farthest distribution northward of the genus in the Oriental Region. We have not examined these specimens and do not know if they are conspecific with *P. sinense*. Their habitat is however quite different. The larvae of *P. sinense* inhabit shallow water (5-30 cm deep) under small stones in third- or fourth-order streams with moderate to fast current. *Prosopistoma* sp. was collected from a large river at depths of 2 m to 4 m.

Koch (1988) discussed the global distribution of *Prosopistoma* and divided the genus into two groups based on mandibular structure. In the northern group, the mandibles have a short and thick "neck" bearing 5-12 bristles and a short prostheda; the mandibles of the southern group have a long and slender "neck" and always bear 3 bristles and a long prostheda. Compared to the mandibles of other species presented by Peters (1967) and Koch (1988), *P. sinense* clearly belongs to the northern group.

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