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DESCRIPTIONS OF MALE AND LARVAL STAGES FOR *NEOPERLOPS OBSCURIPENNIS* BANKS (PLECOPTERA: PERLIDAE)

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ABSTRACT

Putative male and larval specimens of *Neoperlops obscuripennis* Banks are described from a small series of specimens collected in Vietnam and compared with *N. gressitti* Banks and *N. cheni* (Wu).

Keywords: Plecoptera, Perlidae, Vietnam, *Neoperlops obscuripennis*, redescription

INTRODUCTION

Neoperlops was proposed by Banks (1939) for *N. gressitti* and *N. obscuripennis*, a pair of poorly known Chinese species, and the genus remained in obscurity until Zwick (1984) reviewed the group, gave the first modern diagnosis, and removed it from the synonymy of *Neoperla* where it had been placed by Illies (1966). The data from Zwick's (1984) study provide the basis for the summary of characters given by Sivec et al. (1988). Zwick(1984) redescribed male, female and eggs for *Neoperlops gressitti* and the female and eggs for *N. obscuripennis* from type material, but the types for *N. cheni* (Wu) are lost and the status of that species remains in doubt. It may, in fact, represent the same species we currently know as *N. gressitti*, but collections from the type locality in Guangxi Province [Lo Ch'eng, Kwangsi] are needed to help resolve this issue.

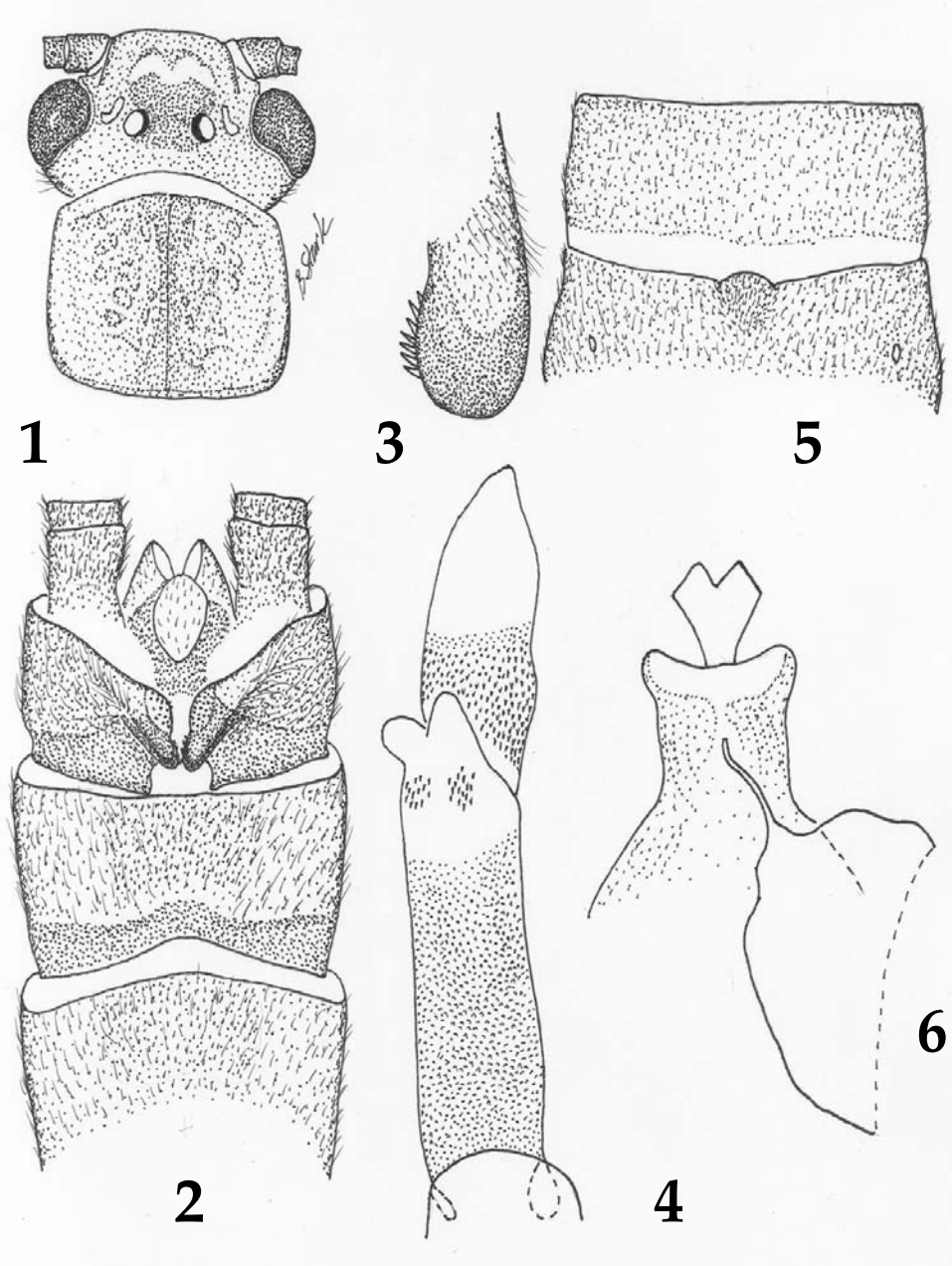
Recently we acquired light trap samples of male and female specimens and kick samples of larvae we determine as *N. obscuripennis* Banks from sites in northern Vietnam. Because these life stages are not known for this species, and the larval stage is unknown for any *Neoperlops*, we take this opportunity to provide these descriptions. Specimens are deposited in the Royal Ontario Museum, Toronto (ROM), the Institute of Ecology and Biological Resources, Hanoi (IEBR) and the Zoologisches Museum der Humboldt-Universität, Berlin (ZMB) as indicated in the text.

RESULTS AND DISCUSSION

Neoperlops obscuripennis Banks
(Figs. 1-14)

Neoperlops obscuripennis Banks, 1939:445. Holotype ♀ (MCZ), Yim Na San, E Kwantung [Guangdong Province], China
Neoperlops obscuripennis: Zwick, 1984:174.

Material examined. Vietnam: Lao Cai, tributary Golden River, ca. 4 km W Sapa Village, 22° 19′ N, 103° 49′ E, Malaise trap, 16-23 May 1999, ROM 992020, A. Lathrop,1 ♂ (ROM). Lao Cai, tributary Muong Hoa Ho River, 15 km E Sapa, 926 m, UV light, 10 May 1995, ROM 956033, D. Currie, B. Hubley, J. Swann, 4 ♂ (ROM, IEBR). Same location, 11 May 1995, ROM 956034, D. Currie, B. Hubley, J. Swann, 3 larvae (ROM). Nghe An, ca. 25 km SW Con Cuong, Khe Moi Forest Camp, tributary Khe Moi River, 4 June 1995, ROM 956158, B. Hubley, J. Swann, 1 ♀ (ROM). Vinh Phu, Tam Dao, 50 km N Hanoi, 900 m, 1 April 1995, W. Mey, 1 ♂ (ZMB).



Figs. 1-6 . *Neoperlops obscuripennis* adult structures. 1. Head and pronotum, 2. Male terminalia, 3. Right male hemitergum, lateral aspect, 4. Aedeagus, oblique dorsolateral aspect, 5. Female terminalia, 6. Vagina.

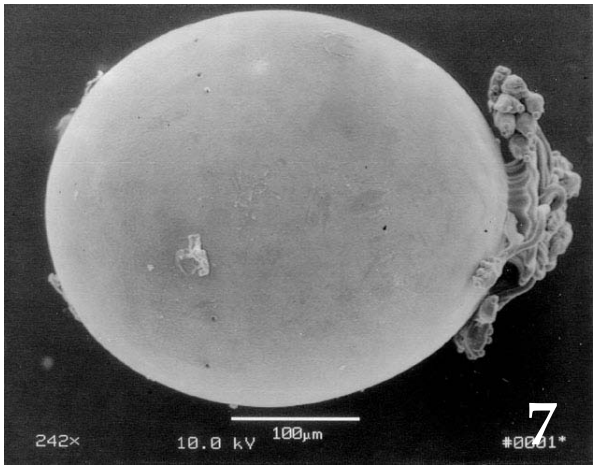
Adult habitus. Biocellate. General color brown. Head brown with darker pigment over ocellar area and extending forward to pale M-line; tentorial callosities linear with curved tips, lying adjacent to ocelli (Fig. 1). Pronotum pale brown with darker rugosities; posterolateral margins dark. Wings brown with darker veins. Legs pale brown but darker distally on femur and tibiae, and proximally along outer edge of tibiae.

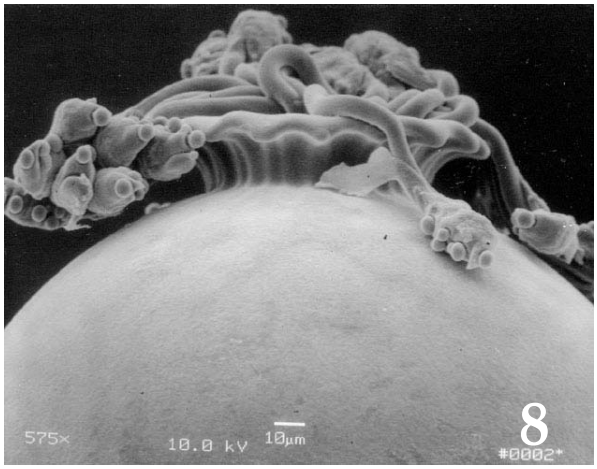
Putative male. Forewing length 22-23 mm. Hemitergal lobes flattened, spatula shaped in lateral aspect and usually armed along venter with several

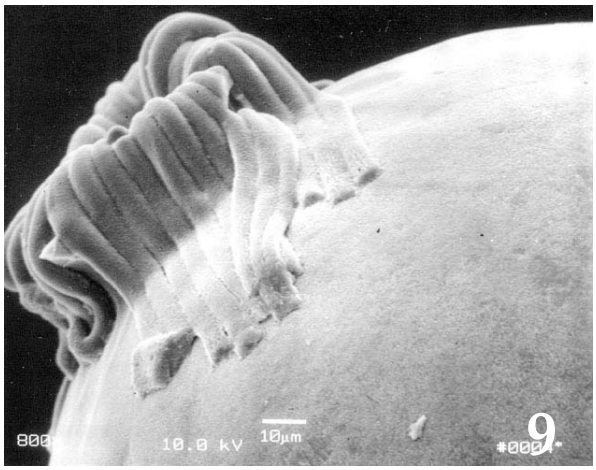
(ca. 8) prominent spines; inner basal margin of hemiterga inflated, cushion-like and covered with minute sensilla basiconica (Figs. 2-3). Terga 7-9 bear prominent mesal patches of sensilla basiconica and hairbrushes are present on the metasternum, and on abdominal sterna 5-7. Aedeagus mostly membranous but weak sclerotization occurs in base; dorsum covered in basal half with small triangular, scale-like spines; apical region with a pair of small membranous lobes; fine triangular spines occur in patches proximal to lobes, and a broad, ventrally expanded band of spines occurs distal to lobes (Fig. 4); apex of aedeagus bare.

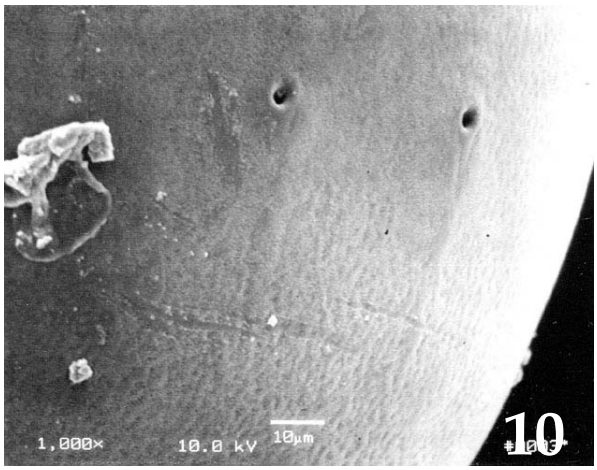
Female. Forewing length 25 mm. Subgenital plate reduced to a low mesal knob on the posterior margin of sternum 8 (Fig. 5). Vagina membranous with a weak lining of fine setal spines; accessory glands absent (Fig. 6). Seminal receptacle balloon-like.

Egg. Outline oval, length ca. 0.39 mm, width ca. 0.31 mm (Fig. 7). Collar short, ca. 0.14 mm wide with flanged and incised rim. Anchor consists of tentacle-like fibers with swollen ends (Figs. 8-9). Chorion with a smooth or slightly granular texture (Fig. 10); micropyles with long canals.

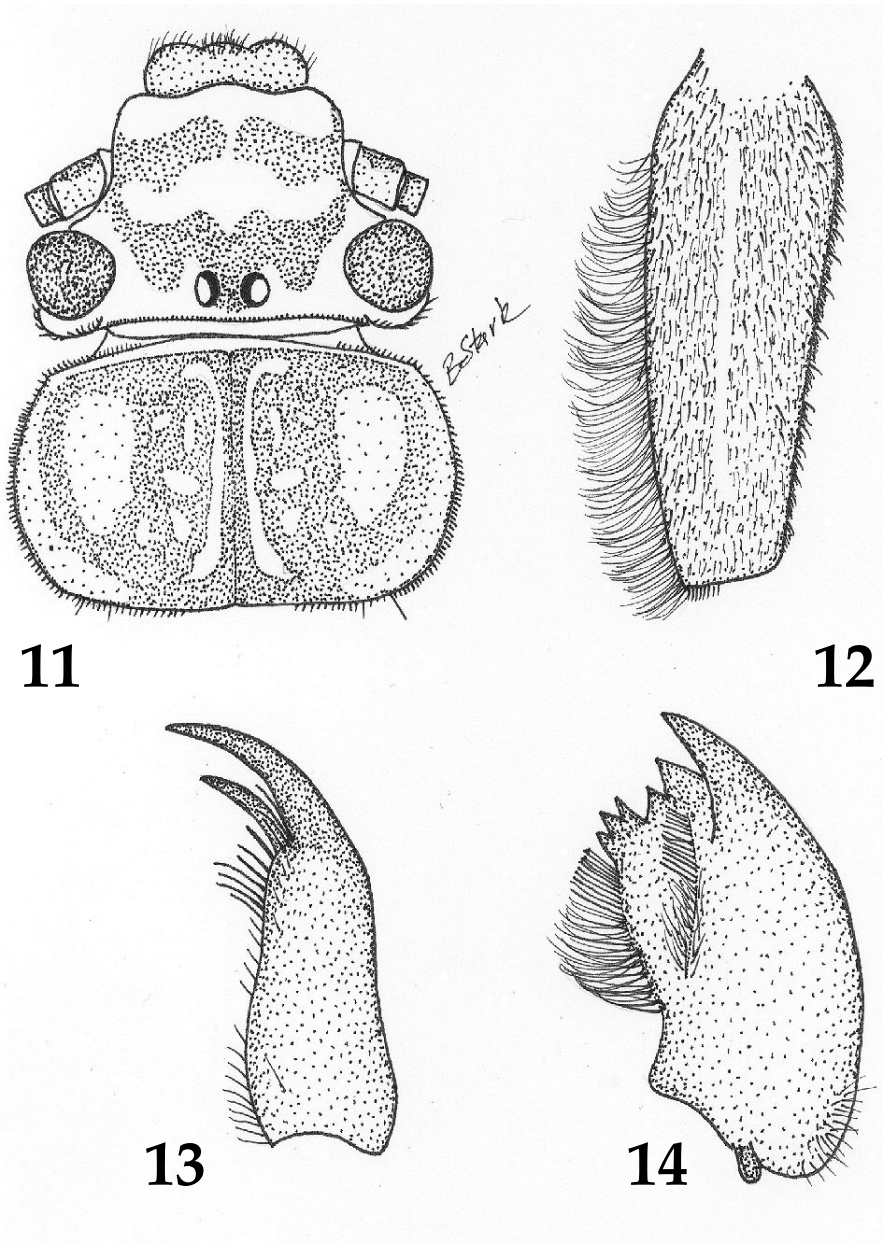








Figs. 7-10. Scanning electron micrographs of *Neoperlops obscuripennis* eggs. 7. Entire egg, 8. Collar and anchor, 9. Detail of anchor fibers, 10. Chorionic and micropylar detail.



Figs. 11-14. *Neoperlops obscuripennis* nymphal structures. 11. Head and pronotum, 12. Fore femur, 13. Lacinia, 14. Mandible.

Putative larva. Pre-emergent body length ca. 19-24 mm. General color brown, patterned with yellow; much of surface covered with dark clothing hairs. Head with distinctive pale M-line and pale transverse clypeal band (Fig. 11). Occipital spinule line relatively straight and armed along most of length with short peg sensilla. Pronotum patterned with large areas of pale pigment; margins of pronotum armed with close-set row of short pegs. Mesonotum and metanotum mostly pale; fore femora slightly swollen at base, armed with numerous thick bristles on upper half and bearing a dense fringe of swimming hairs on dorsal margin (Fig. 12). Abdominal terga without intercalary bristles but surface appearing very dark due to clothing hairs. Abdominal sterna 6-10 with complete, or almost

complete, posterior fringe. Cercal segments armed with whorls of short, thick bristles but swimming fringe absent. Inner lacinial tooth reaches beyond mid-point of outer tooth; inner margin of lacinia armed along most of length with fine hairs and thick bristles (Fig. 13). Mandible bearing six teeth and a pair of bristle rows on ventral surface (Fig. 14). Gills ASC_1, PSC_1, AT_2 (triple trunk), PSC_2, AT_3 (triple trunk), PSC_3, PT_3 (double trunk) and anal (SL) gills present. Most gill trunks are elongate and filaments are short.

Remarks. The larval specimens key to *Tetropina* in Sivec et al. (1988), but they differ from known *Tetropina* in the absence of a mid-dorsal row of long silky setae, in having the lateral pronotal fringe complete and in the absence of intercalary bristles on the dorsal surface of abdominal terga. In addition, they were collected from the same site as four males in an area where no *Tetropina* are known to occur. Despite these supporting data we regard this larval association as tentative since no eggs or adult genitalic structures could be dissected from the larvae.

The eggs and female agree closely with Zwick's (1984) redescription of *N. obscuripennis*, and the males, taken at other regional sites have similar color patterns, consequently we regard this as a tentative, but likely, association. The males are easily separated from *N. gressitti* (and *N. cheni*) on the basis of the dorsal shape of the hemiterga. The other species of *Neoperlops* have the anterior process of the hemiterga prolonged and apically acute, whereas in *N. obscuripennis* the anterior process is a compressed, disk-like structure with rounded apex. In one of the specimens the ventral, spine-like structures are missing from the hemiterga and may have been broken.

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