Description of Three New Chinese Species of the Genus Mesonemoura (Plecoptera: Nemouridae)

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Description of three new Chinese species of the genus Mesonemoura (Plecoptera: Nemouridae)

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Abstract

Three new Chinese species of the genus Mesonemoura (Plecoptera: Nemouridae), Mesonemoura dilatata Du & Ji, sp. nov., and M. sinistracurva Du & Wang, sp. nov., are described and illustrated. Mesonemoura dilatata is characterized by the flagellum of the epiproct being long and curved, forming a swollen membranous apex. Mesonemoura sichuanensis is characterized by tergum 9 forming a pair of obtuse angles mid-posteriorly, and by the ventral sclerite of the epiproct being basally broad, 2 × the width of the dorsal sclerite. Mesonemoura sinistracurva is characterized by the presence of a long stylus that curves abruptly to the left as it leaves the tip of the epiproct. A key to the Chinese species of this genus is presented.

Key Words: Plecoptera; Nemouridae; Mesonemoura; new species; China

Resumen

Se describen e ilustran tres nuevas especies del género Mesonemoura (Plecoptera: Nemouridae) de China, Mesonemoura dilatata Du & Ji, sp. nov., M. sichuanensis Du & Ji, sp. nov. y M. sinistracurva Du & Wang, sp. nov.. Se caracteriza M. dilatata por el flagelo del epiprocto largo y curvado, formando un ápice membranoso hinchado. Se caracteriza M. sichuanensis por tener el tergo 9 formando un par de ángulos obtusos mediados-posteriores, y por el esclerito ventral del epiprocto basal amplio, 2 × la anchura del esclerito dorsal. Se caracteriza M. sinistracurva por la presencia de un largo estílulo que se curva bruscamente a la izquierda al salir de la punta de la epiprocto. También se presenta una clave para las especies de este género en China.

Palabras Clave: Plecoptera; Nemouridae; Mesonemoura; nuevas especies; China

Material and Methods

All type specimens were preserved in 75% or 99% ethanol and deposited in the Insect Collection of Yangzhou University. The abdomens of the specimen were cut from the bodies, then treated in 5% NaOH, slowly heated to 40-50 for 1-3 min, and then the specimens were cleared rinsing in clean water. The specimens were examined and illustrated using Leica stereomicroscope model MZAPO. The morphological terminology follows that of Baumann (1975).

Results

Mesonemoura dilatata Du & Ji, sp. nov. (Figs. 1–4)

MATERIAL EXAMINED

HOLOTYPE ♂, CHINA, Tibet, Leiwuqi county, Jiasangka township, 25-VI-2009, N 31° 52.494' E 96° 17.573', 3,722 m asl, Leg. Qian Yu-Han. PARATYPES, 2 ♀, the same data as holotype.

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MALE

Head and antennae dark brown; pronotum dark brown, transverse oblong, with rugosities. Wings hyaline, veins brown. Legs brown, the middle of femora slightly brown.

Forewing length 6.3-6.5 mm, hind wing length 5.3-5.4 mm. Tergum 9 (Fig. 2) slightly sclerotized, with a small, asymmetrical notch mid-posteriorly, bearing several spines posteriorly. Tergum 10 sclerotized, with several spines each side of middle line. Hypoproct (Fig. 1) broad basally, abruptly tapering toward the apex; vesicle long, more than half length of hypoproct, length 3 × width, ventral membranous, but slightly sclerotized dorsally, sclerotized laterally. Paraprocts (Figs. 1, 3) divided into 3 lobes; inner lobe small, slightly sclerotized, fused with middle lobe; median lobe broad basally, slightly sclerotized, branched into 2 portions, inside portion of median lobe membranous, bearing many hairs, fused with outer lobe, another portion sclerotized, slender, shorter than membranous portion; outer lobe slender, sclerotized, basal part recurved along basal of cerci, other part fused with membranous portion of median lobe. Epiproct (Figs. 2, 4) long and narrow; dorsal sclerite mostly slightly sclerotized, apical portion membranous, extending over onto ventral sclerite; lateral sclerite slender, sclerotized; ventral sclerite slightly sclerotized, broad basally, tapering towards apex, apical portion inserted between folds of dorsal sclerite, the apex extended distally forming a long flagellum; the flagelliform projection sclerotized, slender; with a swollen membranous apex, length of the flagellum about 1.5 × length of the epiproct; epiproct ventral sclerite with 2 rows of spines.

FEMALE

Unknown.

DISTRIBUTION

CHINA (Tibet Autonomous Region).

ETYMOLOGY

The Latin “dilatata” refers to the flagelliform projection with a swollen membranous apex.

REMARKS

This species is characterized by the flagellum of the epiproct being long and curved, forming a swollen membranous apex. The new species is close to *M. spiroflagellata* (Wu 1973) in having the median lobe branched into 2 portions. But in *M. spiroflagellata*, the sclerotized portion is equal to the membranous portion, ventral sclerite of epiproct without spines, and the apex of flagellum narrow.

*Mesonemoura sichuanensis* Du & Ji, sp. nov. (Figs. 5–8)

MATERIAL EXAMINED

HOLOTYPE ♂, CHINA, Sichuan province, Litang county, 25-VI-2009, N 30° 01.1' E 100° 31.7', 4,300 m asl, Leg. Qian Yu-Han. PARATYPES, 1 ♂, the same data as holotype; 2 ♂♂, Sichuan province, Luding county, Hailuogou, 3-VII-2009, N 29° 60.3' E 102° 07.6, 2,200m, Leg. Qian Yu-Han; 66 ♂♂, Sichuan province, Luding county, Yangjiageng river,
MALE

Head and antennae dark brown; pronotum brown, angles blunt rounded. Wings hyaline, veins brown. Legs brown, the middle of femora slightly brown. Forewing length 6.2-6.7 mm, hind wing length 5.2-5.6 mm. Tergum 1-8 sclerotized at anterior margin laterally. Tergum 9 (Fig. 6) sclerotized, with a small notch mid-posteriorly, both sides of the notch forming an obtuse angle with several short spines. Tergum 10 sclerotized. Hypoproct (Fig. 5) broad basally, abruptly tapering towards the apex; vesicle slender, length 3 × width. Paraprocts (Figs. 5, 7) divided into 3 lobes; inner lobe sclerotized, large, triangular; median lobe branched into 2 portions, inside portion of median lobe membranous, bearing many hairs, fused with outer lobe, another portion sclerotized, slender, slightly longer than membranous portion; outer lobe slender, sclerotized, basal part recurved along basal of cerci, other part fused with membranous portion of median lobe. Epiproct (Figs. 6, 8) dorsal sclerite sclerotized basally, apical portion membranous; lateral sclerite sclerotized; ventral sclerite slightly sclerotized, basal broad, 2 × width of dorsal sclerite, apex narrowed distinctly, apical portion inserted between folds of dorsal sclerite, apex extended distally, forming a long slightly sclerotized flagellum; the flagellum broad basally, tapering towards the apex, with a pointed tip; epiproct ventral sclerite with several spines.

FEMALE

Unknown.

DISTRIBUTION

CHINA (Sichuan province; Tibet Autonomous Region).

ETYMOLOGY

The new species is named for the type locality, Sichuan.

REMARKS

This species is characterized by tergum 9 forming a pair of obtuse angle mid-posteriorly, and by the ventral sclerite of epiproct basal broad, 2 × width of dorsal sclerite. The new species is close to M. spiroflagellata (Wu 1973). But in the new species, basal of ventral sclerite 2 × width of dorsal sclerite, while ventral sclerite is not much wider than basal of dorsal sclerite in M. spiroflagellata. In M. spiroflagellata, tergum 9 does not form angles.

Mesonemoura sinistracurva Du & Wang, sp. nov.

(Figs. 9–15)

MATERIAL EXAMINED

HOLOTYPE ♂, CHINA, Zhejiang province, Tianmu Mountain, Lao-dian to Xianrending, 6-V-1999, Leg. Zhou Pei.

MALE

Head and antennae dark brown; pronotum transverse oblong, brown, with rugosities. Cervical gills single, short and oval, each one is located outside of lateral cervical sclerite. Wings subhyaline, slightly brown, veins brown. Legs brown. Abdomen pale except for terminalia darker. Forewing length 8.9 mm, hind wing length 7.6 mm. Tergum 9 (Fig. 9) slightly sclerotized, with a small, asymmetrical notch mid-posteriorly, left side of the notch forming an acute angle, and right side of the notch forming an obtuse angle, each lobe of the notch bearing a row of short, stout spinules. Tergum 10 with a median, thin concavity running the length of the tergum. Hypoproct (Fig. 10) broad basally, tapering towards a small blunt rounded apex; vesicle slender, 2 × width. Paraprocts (Figs. 11-13) divided into 3 lobes; inner lobe small, slightly sclerotized, with an acute tip directed outward; median lobe membranous, broad basally, with a rounded apical portion, bearing many hairs; outer lobe narrow and long, sclerotized, with the apex curved inward to a large hook, bearing several hairs, basal part elongated and recurved dorsally alongside cerci. Epiproct (Figs. 9, 13-15) narrowed basally, enlarged near apex; dorsal sclerite extending dorsolaterally towards apex, apical portion enlarged and extending over onto ventral sclerite, lateral margins of dorsal sclerite darkly sclerotized; ventral sclerite broad basally and becoming narrower towards apex, apical portion inserted between folds of dorsal sclerite, the apex extended distally forming a long flagelliform, sclerotized structure that curves strongly to the left side; the flagelliform projection broad basally, and tapering to apex, having a slightly sclerotized dorsal and membranous ventral surface, length of the projection equal to the epiproct; epiproct ventral sclerite with spines (Fig. 14).
**Key to the males of the Chinese species of Mesonemoura Baumann**

1. Tergum 9 not produced at posterior margin .......................................................... 2
2. Flagellum with entire apex .......................................................... M. sbordonii
3. Flagellum with acute apex .......................................................... 4
4. Median of tergum 9 extending acutely backward .................................. M. aberransterga
5. Inner lobe of paraproct with bifurcate tip .......................................................... M. vaillanti
6. Tergum 9 with finger-like produced lobes .......................................................... M. lii
7. Apex of flagellum furcate and greatly enlarged ............................................... M. yulongana
8. Flagellum with acute apex .............................................................................. 8
9. Paraproct outer lobe shorter than median lobe ................................................. M. tibetensis
10. Paraproct outer lobe longer than median lobe, ventral sclerite of epiproct basal broad, 2 × width of dorsal sclerite ................................. M. sichuanensis, sp. nov.
11. Flagellum with truncate apex ............................................................................ 11
12. Median lobe of paraproct with apical spine .................................................. M. multispira
13. Tergum 9 weakly produced at posterior margin ............................................ 13
14. Paraproct outer lobe broad, flagellum with small notch ................................ M. membranosa
   —. Paraproct outer lobe bulbous, flagellum not notch ........................................ M. tritaenia

FEMALE

Unknown.

DISTRIBUTION

CHINA (Zhejiang province).

ETYMOLOGY

The name "sinistracurva" is derived from Latin, meaning that the epiproct terminal process curves abruptly to the left.

REMARKS

This species is characterized by the presence of a long stylus that curves abruptly to the left as it leave the tip of the epiproct. The new species is close to *M. sbordonii* Fochetti & Sezzi in the shape of the epiproct. The apical style of the new species is long and curved to the left, whereas in *M. sbordonii*, the style is longer still and only barely curved to the left. *M. sbordonii* also lacks the notch and spines on the posterior margin of tergum 9 found in the new species.
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