

Three new species of *Apsilochorema* Ulmer, 1907 from Nepal (Trichoptera: Hydrobiosidae)

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Citation. Kiss O. 2020: Three new species of *Apsilochorema* Ulmer, 1907 from Nepal (Trichoptera: Hydrobiosidae). – e-Acta Naturalia Pannonica 20: 0–00. <https://doi.org/10.24369/eANP.2020.20.55>

Abstract. Three new species of *Apsilochorema* (Trichoptera: Hydrobiosidae), *Apsilochorema biguensis* n. sp., *Apsilochorema tarebhiri* n. sp., and *Apsilochorema yamphudini* n. sp. from Nepal are described and illustrated with drawings of the genitalia. Thus, the number of species in the genus known from the country is increased to 9.

Keywords: Caddisflies, new species, genital structure, Nepal.

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Introduction

The family Hydrobiosidae was originally established by Ulmer (1905) as a subfamily of Rhyacophilidae but Schmid (1970) elevated it to the family level. Later the entire family was revised by Schmid (1989). Mey (1999) rendered an explanation for the distribution of genus *Apsilochorema* on the Asian continent and in the SW Pacific region including Australia. A review of the species of *Apsilochorema* and their relationships was provided by Mey (1999), differentiating 5 groups: *A. indicum*, *A. moselyelum*, *A. excisum*, *A. nigrum* and *A. malayanum*. Strandberg and Johanson (2010) conducted a phylogenetic analysis of the genus *Apsilochorema*. This family is represented by 52 genera, including 410 species. The genus *Apsilochorema* includes a total of 56 species, of which 31 and 12 species are from the Oriental Region and India, respectively (Saini et al 2013, Parey and Pandher 2016, Morse 2017). Kiss and Malicky (2003) reported 3 *Apsilochorema* species, Malicky (2006, 2010, 2017), and Mattern also (2015) reported 6 *Apsilochorema* species from Nepal.

Material and methods

The specimens in this study were captured with light traps and stored in 75% ethanol. The posterior half of the abdomen of the holotype male was cleared in 20% lactic acid and the phallic apparatus everted (Blahnik & Holzenthal 2004). Then they were placed in ethanol for examination under a stereomicroscope (Nikon SMZ–10–2x) and sketched. For the identification of species, the works by Martynov (1935), Mey (1999), Nimmo (1996), Ross (1956) and Schmid (1959, 1970, 1989) were used. The terminology follows that of Mey (1999) and Schmid (1989).

Results – Species description

Apsilochorema biguensis sp. n. (Figs 1L, 1D).

Holotype. ♂, Nepal, Mt. Kalinchok, 5 km W of Bigu, 2300 m elevation, by light trapping, 03 July 1997, leg. Márton Hreblay and Krisztina Csák (gen. prep. No. 136, Ottó Kiss, in coll. Mátra Museum, Gyöngyös, Hungary).

Paratype. 3 ♂, Nepal, Mt. Kalinchok, 8 km NNE of Muldi (Murre), 2835 m elevation, by light trapping, 28 June 1997, leg. Márton Hreblay and Krisztina Csák (in coll. Ottó Kiss). 1 ♂ Nepal, Mt. Kalinchok 4 km SW of Kalinchok peak, 3000 m elevation, by light trapping, 29 June 1997, leg. Márton Hreblay and Krisztina Csák (in coll. Ottó Kiss).

Description – Male (in ethanol, n=1). Body length 5.8 mm, length of each forewing 7.2 mm, width of each forewing 3.0 mm, setae short and brown. Hind wings 3.0 mm long and 2.8 mm wide; length of each antenna 6.0 mm, dark brown, Head, thorax and abdomen dark brownish, legs brownish.

Male genitalia. (Figs 1L, 1D). Proctiger shorter than inferior appendages, with setose lobes curved downward apically. Filipods shorter than proctiger. Dorsal edge of inferior appendages straight. Harpago large, overlapping ventral edge of inferior appendages. Base of phallus broad and straight.

Differential diagnosis. This new species belongs to the *Apsilochorema indicum* Group (Mey 1999). The male genitalia of the new species are similar to those of *Apsilochorema tigmatejanam* Schmid 1970 from India (Pauri, Garhwal, Saran), but differs from it in that:

1. Dorsal edge of inferior appendage dorsally straight (not indented).
2. Harpago large, overlapping ventral edge of inferior appendages (not shorter than the appendage).
3. Base of phallus broad and straight (not narrow and rounded).

Etymology: Named for the place where the new species was collected.

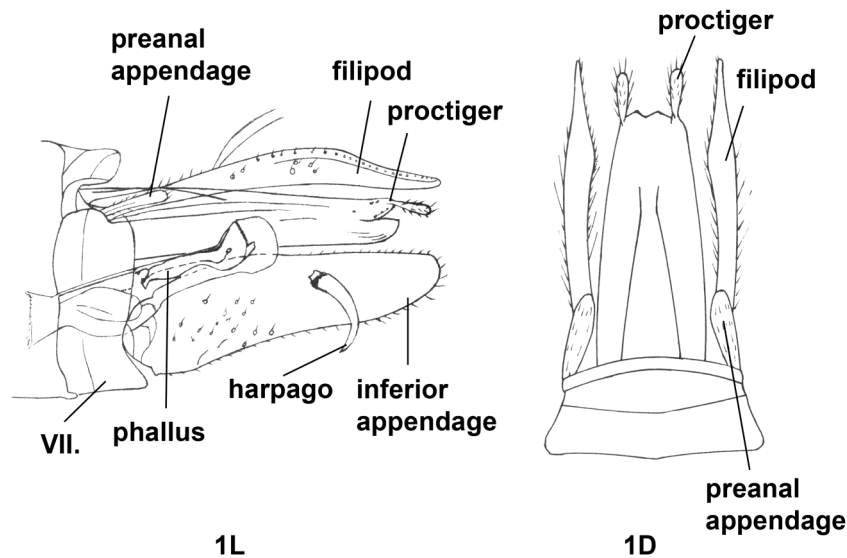


Fig. 1. *Apsilochorema biguensis* new species; holotype male genitalia: 1L, lateral view; 1D, proctiger, filipod, preanal appendage, dorsal view.

***Apsilochorema tarebhiri* sp. n.** (Figs 2L, 2D).

Holotype. ♂, Nepal, Mt. Kalinchok, 2 km N of Tarebhir, 2600 m elevation, by light trapping, 02 July 1997, leg. Márton Hreblay and Krisztina Csák (gen. prep. No. 137, Ottó Kiss, in coll. Mátra Museum, Gyöngyös, Hungary).

Paratype. ♂, Nepal, East Nepal, Deorali Danda, 6 km NW of Yamphudin, 2900 m elevation, by light trapping, 13 May 1997, leg. Márton Hreblay and Lajos Szécsényi (in coll. Ottó Kiss).

Description. Male (in ethanol, n=1). Body length 6.65 mm, length of each forewing 92 mm, width of each forewing 2.8 mm, setae short and brown. Head, thorax and abdomen dark brownish, legs brownish. Hind wings brown, 7.4 mm long and 2.4 mm wide; antennae dark brown, length of each antenna 4.5 mm.

Male genitalia. Figs 2L, 2D.

Proctiger shorter than inferior appendages and longer than filipod. Filipods shorter than proctiger and inferior appendages. Apical segment of each inferior appendage with parallel dorsal and ventral edges and rounded tip. Harpago long, in a parallel direction with inferior appendages. Phallus with short, dorsal spine proximally and broad base, curved downwards.

Differential diagnosis. This species belongs to the *Apsilochorema excisum* Group (Mey 1999). The male genitalia of the new species are similar to those of *Apsilochorema annandalei* Martynov 1935, from India (Punjab, Phagu, Simla Hills) but differs from it in that:

1. Apical segment of inferior appendages with parallel dorsal and ventral edges (not tapering apically).
2. Harpago long, in a parallel direction with inferior appendages (not short hook).
3. Phallus with short, dorsal spine proximally (not without spine).

Etymology. Named for the place where the new species was collected.

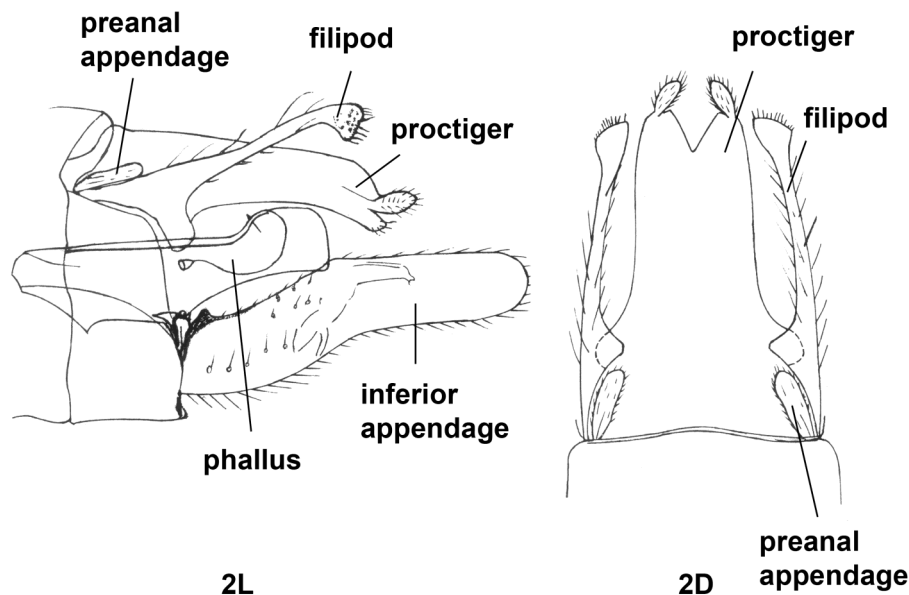


Fig. 2. *Apsilochorema tarebhiri* new species; holotype male genitalia: 2L, lateral view; 2D, proctiger, filipod, preanal appendage, dorsal view.

***Apsilochorema yamphudini* sp. n.** (Figs 3L, 3D).

Holotype. ♂, Nepal, East Nepal, Deorali Danda, 6 km NW of Yamphudin, 2900 m elevation, by light trapping, 20 June 1998, leg. Márton Hreblay and Balázs Benedek (gen. prep. No. 138, Ottó Kiss), in coll. Mátra Museum, Gyöngyös, Hungary.

Paratype. ♂, Nepal, East Nepal, Deorali Danda, Anpan, 1900 m elevation, by light trapping, 11 May 1997, leg. Márton Hreblay and Lajos Szécsényi (in coll. Ottó Kiss)

Description – Male (in ethanol, n=1): Body length 6 mm, length of each forewing 7.15 mm, width of each forewing 1.9 mm, setae short and dark. Head, thorax, and abdomen dark brownish, legs brownish. Hind wings brown, 5.8 mm long and 2.3 mm wide; antennae dark brown, length of each antenna 3.5 mm.

Male genitalia. Figs 3L, 3D.

Proctiger shorter than inferior appendages and longer than filipod. Filipod narrow from the middle and shorter than proctiger. Apical tip of filipod elongate with curved dorsal edge and tip pointed upwards in lateral view. Inferior appendage with short lobe in the middle of dorsal edge. Harpago large, base of harpago with two narrow stalks. Phallus half-length of inferior appendage, base of phallus rounded.

Differential diagnosis. This species belongs to the *Apsilochorema excisum* Group. The male genitalia of the new species are similar to those of *Apsilochorema vaneyam* Schmid 1970 from India (India, Assam, NEFA, Kameng Frontier Divison, Chug) and *Apsilochorema tanum* Schmid 1970 from India (Manipour, Sirohi Kashong), but differs from them in that:

1. Filipod narrow from the middle and shorter than proctiger (width of filipod nearly uniform throughout in *Apsilochorema vaneyam* and filipod longer than proctiger in *Apsilochorema tanum*).

2. Apical tip of filipod elongate with curved dorsal edge and tip pointed upwards (apical tip of filipod not curved or pointed upwards as in *Apsilochorema vaneyam* and *Apsilochorema tanum*).

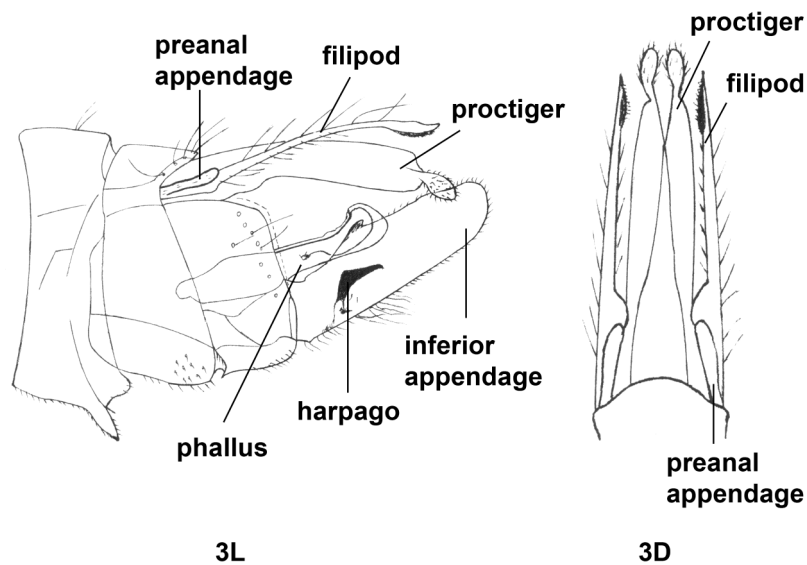


Fig. 3. *Apsilochorema yamphudini* new species; holotype male genitalia: 3L, lateral view; 3D, proctiger, filipod, preanal appendage, dorsal view.

3. Harpago large, base of harpago with two narrow stalks (*Apsilochorema vaneyam* and *Apsilochorema tanum* without narrow stalks of harpago, harpago claw-like in *Apsilochorema tanum*).

4. Inferior appendages with short lobe in the middle of dorsal edge (inferior appendage without short lobe in *Apsilochorema vaneyam* and *Apsilochorema tanum*).

Etymology. Named for the place where the new species was collected.

Acknowledgements

I am grateful to Márton Hreblay, Krisztina Csák and Lajos Szécsényi for the light trap material as well as to Imre Fazekas (Editor) for his guidance and publishing this paper.

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