

Two new species of *Hydropsyche* from Taiwan (Trichoptera: Hydropsychidae)

Ottó Kiss

Abstract. Two new species of the *Hydropsyche formosana* Group in the genus *Hydropsyche* (Trichoptera, Hydropsychidae), i.e. *Hydropsyche hortensis* n. sp. and *Hydropsyche egerensis* n. sp. from Taiwan (Republic of China) are described and illustrated with drawings of genitalia.

Keywords. Trichoptera, *Hydropsyche hortensis* n. sp., *Hydropsyche egerensis* n. sp., description, Taiwan.

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Introduction

The genus *Hydropsyche* Pictet, 1834 is among the largest genera of Trichoptera, which more than 300 species belong to (Morse 2016). Mey (1999) gives the definition of *Hydropsyche formosana* Group and listed 12 species from the Oriental Biogeographic Regio. The genitalia structure of the group is characteristic segment IX sometimes grows narrower in ventral view, segment X has a single or a paired dorsomeridian bulge on its dorsal edge. Segment IX and segment X can be united or can be separate, the shape of segment X is crest-like and it has paired apical appendages. The harpago of inferior appendages is triangular or finger-like without thorns. Phallosome bends towards the base, its shape is globular or it is broken and wide but grows narrower caudally. The endophallus is almost as long as the phallosome. Malicky (2010) from Southeast Asia publishes 70 species described by several authors which can be classified among *Hydropsyche formosana* Group.

Material and methods. The specimen in this study were captured in light traps and are stored in 75% ethanol. The posterior half of the holotype male imago was cleared in 20% lactic acid and the phallic apparatus everted (Blahnik & Holzenthal 2004). Then it was placed in ethanol for examination under a stereomicroscope (Nikon, SMZ-10-2x) and sketched. For the identification of species the works Kobayashi (1997), Malicky (2007, 2010, 2014), Mey (1998), Ulmer (1911) were used. The terminology follows that of Mey (1998), Oláh & Johanson (2008), Oláh (2013).

Species description

Hydropsyche hortensis new species | Figs 1–4.

Type material — Holotype. ♂, Taiwan, 16 km E of Kuohsing, Prov. Nantou, Ursun F. (Republic of China) 24°06'N, 121°00'E, 560 m elevation by light trapping, 10 November 1996, leg. Tibor Csővári and Csaba Szabóky (gen. prep. No. 133, Ottó Kiss, in coll. Mátra Museum, Gyöngyös, Hungary).

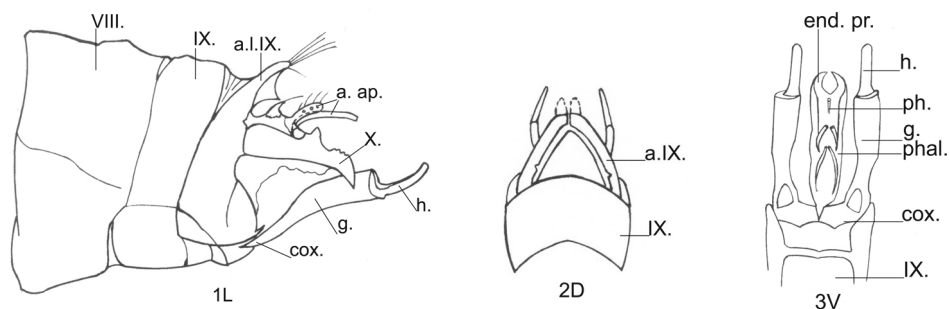
Paratypes. 1 ♂, 1 ♀, Taiwan, 16 km E of Kuohsing, Prov. Nantou, Ursun F. (Republic of China) 24°06'N, 121°00'E, 560 m elevation by light trapping, 10 November 1996, leg. Tibor Csóvári and Csaba Szabóky (in coll. Ottó Kiss). 2 males, 1 female Taiwan, 2 km N of Tupan, Prov. Taitung, (Republic of China) 22°29'N, 120°52'E, 500 m elevation by light trapping, 24 October 1995, leg. Tibor Csóvári and Pál Stéger, (in coll. Ottó Kiss). 6 males, 9 females, Taiwan, 4 km N of Tupan, Prov. Taitung, (Republic of China) 22°28'N, 120°52'E, 390 m elevation by light trapping, 17 August 1996, leg. Tibor Csóvári & László Mikus (in coll. Ottó Kiss). 1 male, 1 female Taiwan, 26 km SE of Taoyüan, Prov. Kaoshiung, (Republic of China) 24°09'N, 121°17'E, 1370 m elevation by light trapping, 15 November 1996, leg. Tibor Csóvári & Csaba Szabóky (in coll. Ottó Kiss)

Description – Male (in ethanol, n.= 12). Body length 12.3 mm, length of each forewing 14.6 mm width of each forewing 5.0 mm, many, small circle shaped, one after the other pale yellow with spots. Hind wings 11.5 mm long and 4.7 mm width, length of each antennae 7.2 mm. Body, antennae, palpi, wings, abdomen and legs yellowish brown, in alcohol.

Male genitalia (Figs 1–4). The basal part of the apicodorsal lobe of segment X (Figs 1–2) grows wider in lateral view and its apical part is a curved band in dorsal view. Segment X (Fig. 1) is long, crest-like, there are a longer and a shorter apical appendages on its dorsal edge and far from each other there are two smaller lobes. The coxopodit of the gonopod (Fig. 1) grows thinner in caudal view and it is evenly wider in lateral view; the harpago of inferior appendages (Figs 1, 3) is medium long, finger-like and its basal corner is cut out in lateral and ventral views. By the details of the phallic organ structure (ph. o., Fig. 4) the phalotheca (phallobase) grows wider towards the base and it bends in caudal view and grows evenly narrower in lateral view. There is a sclerotized ring standing proximally athwart on the first part of the endophallus which grows dilater caudally then approaching the dorsalis edge of the phalotheca it ends in a pipe growing narrower in lateral view. The caudal end of the phallic organ (ph. o., Fig. 4) is club-like and ends ventrally in two endothelial process in lateral view. From the basal edge of the phalotheca paired strong shorter bristle and paired strong longer bristle stand in proximal direction in lateral and ventral views.

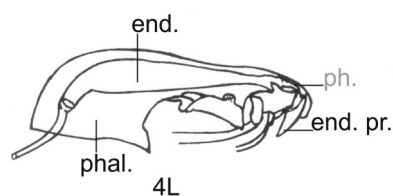
Differential diagnosis. These species belong to the *Hydropsyche formosana* Group, the largest spreading area of which species is from Taiwan and East China to Southern Malaysia, Mey (1999, 227–236, figs 10–12). The male genitalia of the new species are similar to those of *Hydropsyche formosana* Ulmer 1911, from Taiwan, but differs from them in that:

1. Segment X is separated from segment IX, on its long crest-like dorsal edge there are a longer and a shorter apical appendages and far from each other there are two smaller lobes (there are no shorter and longer paired apical appendages and two smaller lobes in *H. formosana*).
2. The apicodorsal lobe of segment X is a curved band (not, in *H. formosana*).
3. The corner of the harpago basalis is cut out (not, in *H. formosana*).
4. The caudal end of the phallic organ is club-like and ends ventrally in two endothelial process, pair of shorter strong and a pair of longer strong bristle bend downwards and proximally (its caudal end is not club-like and does not end in



Figures 1–4. *Hydropsyche bortensis* new species holotype male genitalia. **1L**, left lateral view; **2D**, apicodorsal lobe of segment X, segment IX, dorsal view; **3V**, gonopod and phallic organ, ventral view; **4L**, phallic organ, lateral view.

Abbreviations: a. ap.= apical appendages; a.l.X.= apicodorsal lobe of segment X; cox.= coxopodit; end.= endotheca ("endophallus" of Mey 1991); end. pr.= endothecal process; g.= gonopod; h.= harpago; ph.= phallicata, (aed= "aedéage" of Schmid 1970); phal.= phallotheca ("phallotreme" of Mey 1999); ph. o.= phallic organ; IX.= segment IX; X.= segment X.



endothecal process, and the four strong bristles are missing in *H. formosana*).

Etymology. This fine species is cordially dedicated to Hort from village, in Hungary.

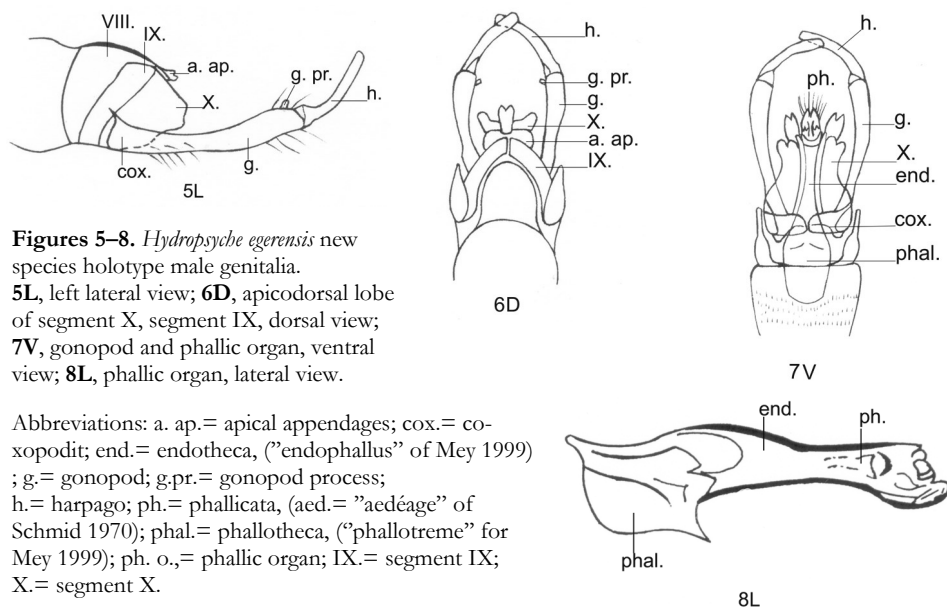
Hydropsyche egerensis new species | Figs 5–8.

Type material — Holotype. ♂, Taiwan, 16 km E of Kuohsing, Prov. Nantou, Ursun F. (Republic of China) 121°00'E, 24°05'N, 560 m elevation by light trapping, 29–30. October 1996, leg. Tibor Csóvári & Pál Stéger (gen. prep. No 134, Ottó Kiss, in coll. Mátra Museum).

Paratype. ♂, Taiwan, 16 km E of Kuohsing, Prov. Nantou, Ursun F. (Republic of China) 121°00'E, 24°05'N, 560 m elevation by light trapping, 29–30. October 1996, leg. Tibor Csóvári & Csaba Szabóky (in coll. Ottó Kiss).

Description — Male (in ethanol, n.=2). Body length 7.2 mm, length of each forewing 9.3 mm, brown width of each forewing 3.2 mm, hind wings 5.9 mm long and 3.8 mm width. Length of each antenna 8 mm. Body, legs, palpi, , abdomen, genitalia brown, antennae yellow, and is a border of the article rather thin, brown ring-shaped line, in alcohol.

Male genitalia (Figs 5–8). Segment IX (IX., Fig. 5) is a quadrangle growing narrower in lateral view. Segment X (X., Figs 5, 6) is a band-like belt in lateral and dorsal views. Segment X (X., Figs 5, 6) is a polygonal lobe with short flat apical appendages on its dorsal edge. The base of the coxopodit (g., Figs 5, 7) is wide, its dorsal edge is bent and sharp. The middle part of the gonopod is thinner and grows a bit wider caudally with a minor process in lateral and ventral views; the harpago of inferior appendages (h., Figs 5, 6, 7) is flat and band-like, it bends curved and its length is 1/3 of the gonopod in lateral, dorsal and ventral views.



Figures 5–8. *Hydropsyche egerensis* new species holotype male genitalia. **5L**, left lateral view; **6D**, apicodorsal lobe of segment X, segment IX, dorsal view; **7V**, gonopod and phallic organ, ventral view; **8L**, phallic organ, lateral view.

Abbreviations: a. ap.= apical appendages; cox.= coxopodite; end.= endotheca, ("endophallus" of Mey 1999); g.= gonopod; g.pr.= gonopod process; h.= harpago; ph.= phallicata, (aed.= "aedeage" of Schmid 1970); phal.= phalotheca, ("phallotreme" for Mey 1999); ph. o.,= phallic organ; IX.= segment IX; X.= segment X.

The phalotheca, a part of the phallic organ (ph. o., Fig. 8) is proximally globe-like, its angle is 90°, the endophallus is proximally a semi-elliptic pipe growing narrower medially, its caudal top is club-like, the first part of the phallicata is a tunnel in lateral and ventral views.

Differential diagnosis. This species similar to the *Hydropsyche sagittata* Martynov 1936, but differs from them in that.

1. Segment IX is a band-like belt; segment X is polygonal, with short, flat apical appendages on its dorsal edge (segment IX is not band-like, on the dorsal edge of segment X there are no apical appendages in *H. sagittata*).

2. There is short process on the dorsal edge of the apical part of the gonopod (it is missing in *H. sagittata*).

3. The harpago of inferior appendages is flat and bend-like, its length is nearly 1/3 of the gonopod (not, bluntly pointed, it is 1/7 in *H. sagittata*).

4. Phalotheca part of the phallic organ is proximally globe-like, its angle is nearly 90°, the middle part of the endophallus is a pipe growing narrower its caudal point is club-like, the first part of the phallicata is a tunnel (not, growing wider with two thorns, there is a U-shape cut in the middle of it in *H. sagittata*).

Female. Unknown

Etymology. This fine species is cordially dedicated to Eger from town, in Hungary.

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