

INSECTA MUNDI

A Journal of World Insect Systematics

0193

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Dipseudopsidae) from Vietnam

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Date of Issue: September 16, 2011

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Insecta Mundi 0193: 1-6

Published in 2011 by

Center for Systematic Entomology, Inc.
P. O. Box 141874
Gainesville, FL 32614-1874 U. S. A.
<http://www.centerforsystematicentomology.org/>

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Printed copies deposited in libraries (ISSN 0749-6737)

Electronic copies in PDF format (On-Line ISSN 1942-1354, CDROM ISSN 1942-1362)

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Three new species of *Phylocentropus* Banks (Trichoptera: Dipseudopsidae) from Vietnam

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Abstract. Of the 9 known species of *Phylocentropus* Banks (Trichoptera: Dipseudopsidae), 5 are found in eastern North America, 1 in Japan, and 3 in Southeast Asia. Three **new species** of this genus: *Ph. tohoku*, *Ph. ngoclin*, and *Ph. anas* from Vietnam are described and illustrated herein. Previously, only 1 species, *Ph. vietnamellus* Mey 1995, was known from this country.

Key words. Caddisfly, Trichoptera, Dipseudopsidae, *Phylocentropus*, new species, Vietnam

Introduction

Phylocentropus Banks (Trichoptera: Dipseudopsidae) is a small caddisfly genus of 9 extant species found in eastern North America, Southeast Asia, and Japan. There are also 6 species recorded from Baltic Amber (Ulmer 1912; Wichard and Boelling 2000; Wichard and Lüer 2003). The genus *Phylocentropus* was established by Banks (1907), with *Holocentropus placidus* Banks designated the type and *Polycentropus lucidus* Hagen included. Betten (1934) placed *Phylocentropus* within the subfamily Polycentropodinae of the Polycentropodidae. Citing its primitive wing venation and the plain, unadorned eighth tergite of the female, Ross (1965) suggested that *Phylocentropus* was “an extremely archaic member of the subfamily Polycentropodinae.”

Later, Ross and Gibbs (1973) suggested a relationship between *Phylocentropus* and *Dipseudopsis* Walker based on larval synapomorphies, and proposed placement of *Phylocentropus* in the subfamily Dipseudopsinae of the Polycentropodidae. Schmid (1980) elevated the subfamily Hyalopsychinae to family level, placing *Hyalopsyche* Ulmer and *Phylocentropus* within it. Wells and Cartwright (1993) noted new larval and female synapomorphies between *Hyalopsyche* and *Phylocentropus*, and recommended merging the Hyalopsychidae with the Dipseudopsidae. This move was confirmed by Weaver and Malicky (1994) based on phylogenetic analysis, stating “Monophyly of the Dipseudopsidae, including *Dipseudopsis*, *Hyalopsyche*, ..., *Phylocentropus*, and ... is unequivocal.” They also noted the close phenetic relationship between *Hyalopsyche* and *Phylocentropus*, but cautioned that the similarities between the two genera were “predominantly plesiomorphic”, thus further weakening support for the family Hyalopsychidae.

Five species of *Phylocentropus* are known from eastern North America (Schuster and Hamilton 1984): *Ph. auriceps* (Banks 1905a), *Ph. carolinus* Carpenter 1933, *Ph. harrisi* Schuster and Hamilton 1984, *Ph. lucidus* (Hagen 1861), and *Ph. placidus* (Banks 1905b). Three species of this genus were described heretofore from Southeast Asia: *Ph. orientalis* Banks 1931 (Malaysia, Thailand), *Ph. narumonae* Malicky and Chantaramongkol 1997 (Thailand), and *Ph. vietnamellus* Mey 1995 (Vietnam). One species is known from Japan: *Ph. shigae* Tsuda 1942.

During an examination of Vietnamese caddisflies from a collection of the American Museum of Natural History (AMNH), we found 3 new species of *Phylocentropus*: *Ph. tohoku*, *Ph. ngoclin*, and *Ph. anas*. All new species described and illustrated in this paper are based on male genitalia.

Material and methods

Specimens were collected with Malaise traps. Abdomens were removed and cleared in 10% KOH, then washed in water and put in glycerin for further examination and drawing. All material is stored in 80% ethyl alcohol and deposited in the AMNH. Terminology follows that of Schmid (1998).

***Phylocentropus tohoku* sp. n.**

(Figures 1-4)

Diagnosis. The male of *Phylocentropus tohoku* most closely resembles *Ph. narumonae* in the shape of the preanal appendage and the inferior appendage in lateral view. It is distinguished by the shape of segment X in dorsal view, having a roundly bilobed dorsal portion and a slender, acuminate ventral portion, which extends beyond the dorsal portion.

Adult. Length of male forewing 6.8 mm. Color of body and wings light brown. Forewings with venation complete; hind wings with forks I, II, III, and V.

Male genitalia. Sternite IX 2 times as long as wide; in lateral view, anterior portion triangular with acute apex; posterior margin broadly rounded. Segment X long, nearly rectangular in lateral view, with distal margin having shallow concavity; in dorsal view, broadly rounded and bilobed, with ventral processes slender, acuminate, extending slightly beyond dorsal portion. Preanal appendage large, dorsal and ventral margins parallel, apex broadly rounded. Intermediate appendage large, banana-like in lateral view. Inferior appendage mitten-like in lateral view; inner surface of dorsal lobe bearing elongate projection directed posterad in lateral view, same projection with complex shape in ventral view. Phallosome and endotheca almost equal in length; endotheca armed with long, unpaired spiniform process.

Female and immature stages. Unknown.

Holotype male. Vietnam, Ha Tinh, Huong Son, 200 m, 18°21'N, 105°15'E, Malaise trap, 15 May 1998, J. Carpenter, K. Long, D. Grimaldi, L. Herman, D. Silva.

Distribution. Known only from the type locality in Ha Tinh Province (Vietnam).

Etymology. This species is named to honor and remember the many lives lost in the Tohoku District of the Japanese island of Honshu during the March, 2011 earthquake and tsunami. The word “Tohoku” refers to the northeast (to = east; hoku = north) district of Honshu. The Japanese meteorological agency refers to this event as the Tohoku Earthquake.

***Phylocentropus ngoclinh* sp. n.**

(Figures 5-9)

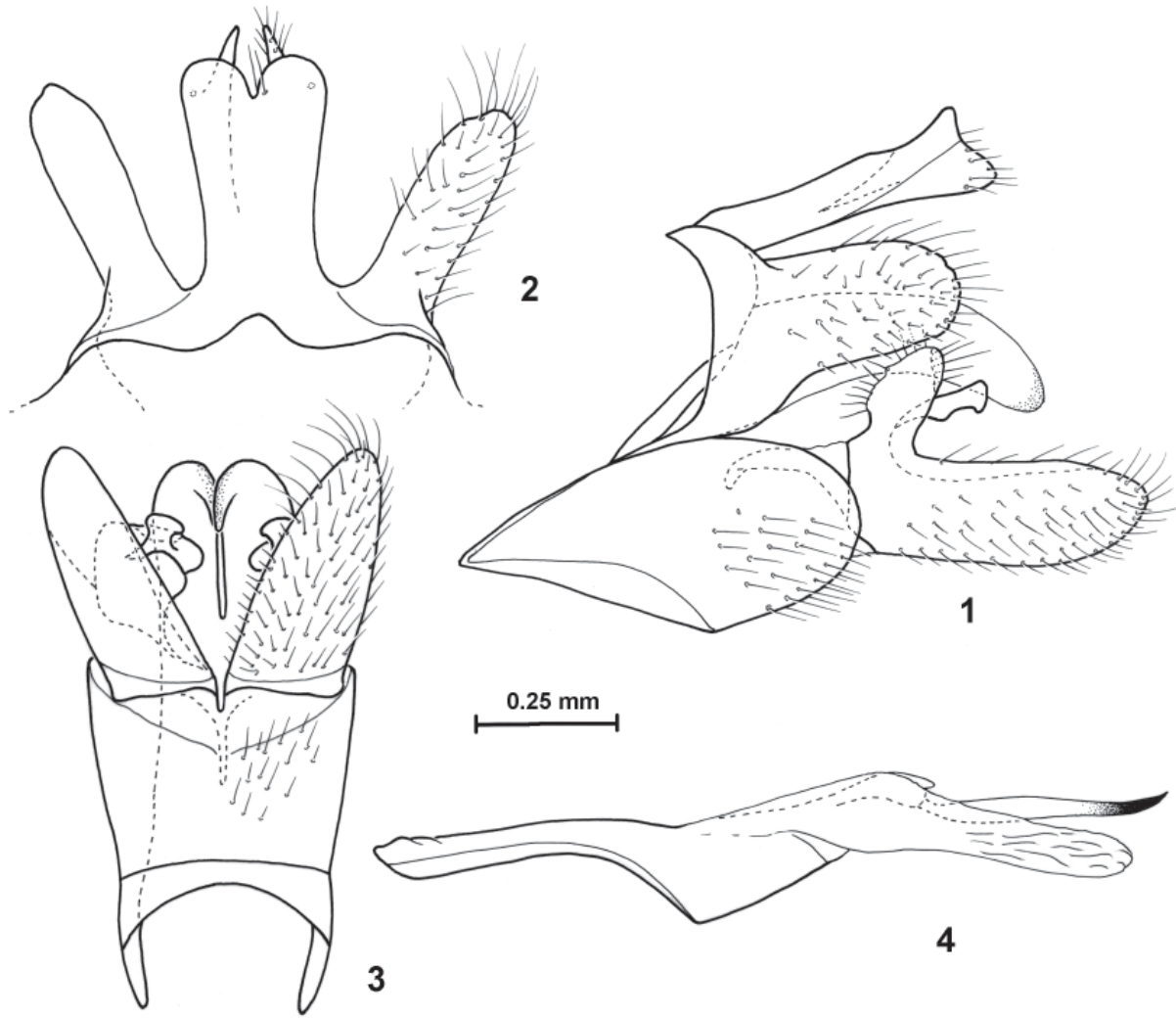
Diagnosis. *Phylocentropus ngoclinh* is similar to *Ph. orientalis* in the shape of segment X and the preanal appendage in lateral view. It differs by the shape of the segment X in dorsal view; by the inferior appendage subquadrate in lateral view; and, by the shape of the phallic apparatus.

Adult. Length of male forewing 6.9-7.0 mm. General color yellowish-brown, wings pale. Forewings with venation complete; hind wings with forks I, II, III, and V.

Male genitalia. Sternite IX 2.5 times as long as wide; in lateral view, anterior portion with acuminate apex, posterior margin rounded. Segment X long, trapezoidal in lateral view, bifurcate in dorsal view. Preanal appendage large, elongate, broad basally, gradually tapering apically, with rounded apex in lateral view. Intermediate appendage absent. Inferior appendage subquadrate in lateral view, distal margin with shallow rounded concavity; posterodorsal portion of inferior appendage producing lobe, resembling bird head in ventral view. Phallic apparatus long and slender; endotheca short, with apex rounded in lateral view, acuminate in dorsal view.

Female and immature stages. Unknown.

Holotype male. Vietnam, Quang Nam Province, Ngoc Linh, 950 m, 15°10'N, 108°5'E, Malaise trap, 16 April 1999, K. Long, C. Johnson. **Paratype:** 1 male, same data as holotype, 11-18 March 1999.



Figures 1-4. *Phylocentropus tohoku* sp. n., male genitalia. 1) Lateral view. 2) Dorsal view. 3) Ventral view. 4) Phallic apparatus, lateral view.

Distribution. Known only from the type locality in Quang Nam Province (Vietnam).

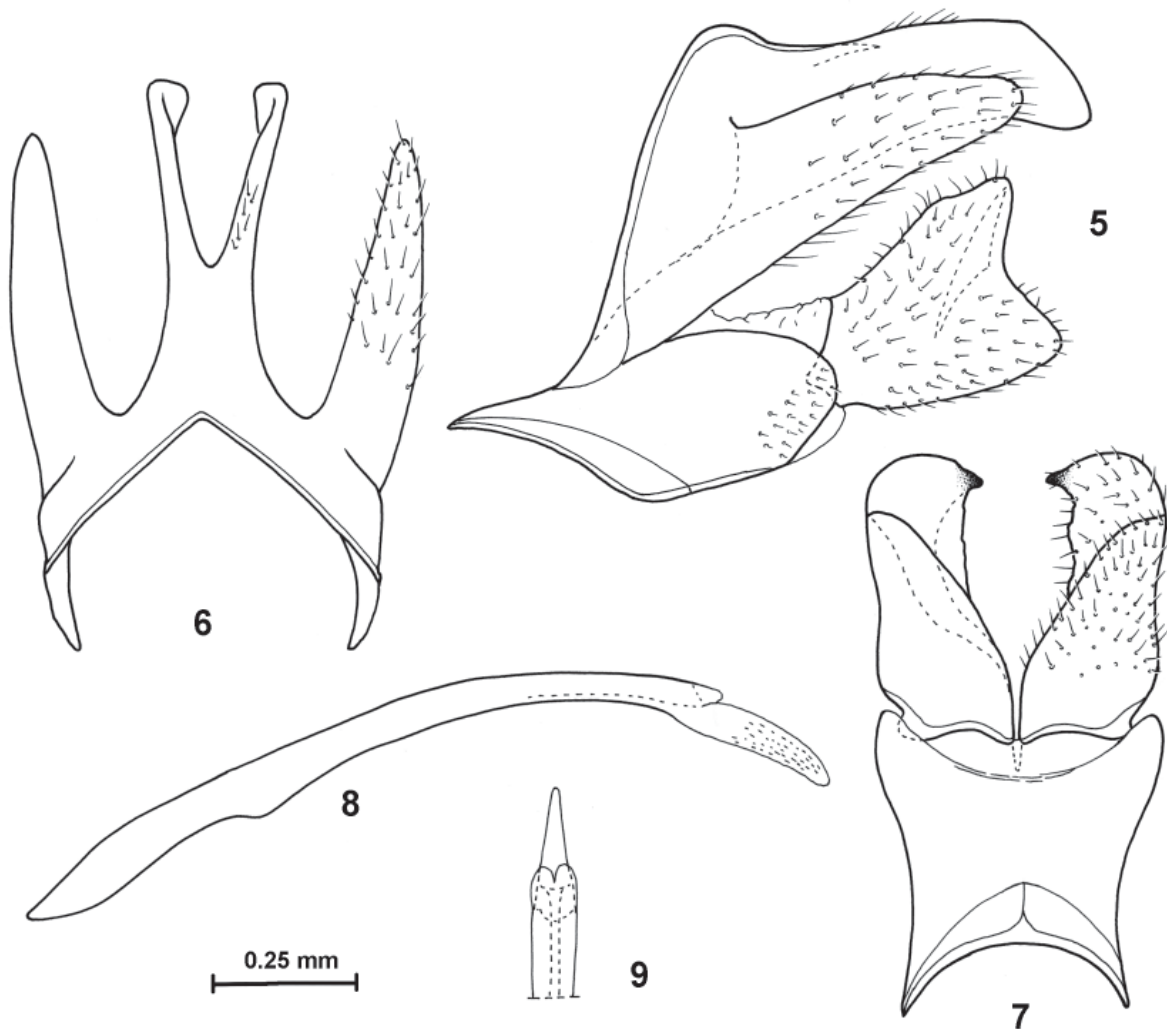
Etymology. This species is named for the mountain, Ngoc Linh, referred to as the “the roof of Vietnam”, wherein this species was collected.

***Phylocentropus anas* sp. n.**

(Figures 10-13)

Diagnosis. The male genitalia of this species closely resemble those of *Ph. vietnamellus* primarily in the shape of segment X in dorsal view, and somewhat in the shape of the inferior appendage in lateral view. However, *Ph. anas* is distinguished from *Ph. vietnamellus* by segment X bifurcate for half of the entire segment length; by the triangular preanal appendage with broad base; and, by the shape of the inferior appendage in ventral view.

Adult. Length of male forewing 7.0 mm. Main color of body and wings yellowish-brown. Forewings with venation complete; hind wings with forks I, II, III, and V.



Figures 5-9. *Phylocentropus ngoclinh* sp. n., male genitalia. **5)** Lateral view. **6)** Dorsal view. **7)** Ventral view. **8)** Phallic apparatus, lateral view. **9)** Distal portion of phallic apparatus, dorsal view.

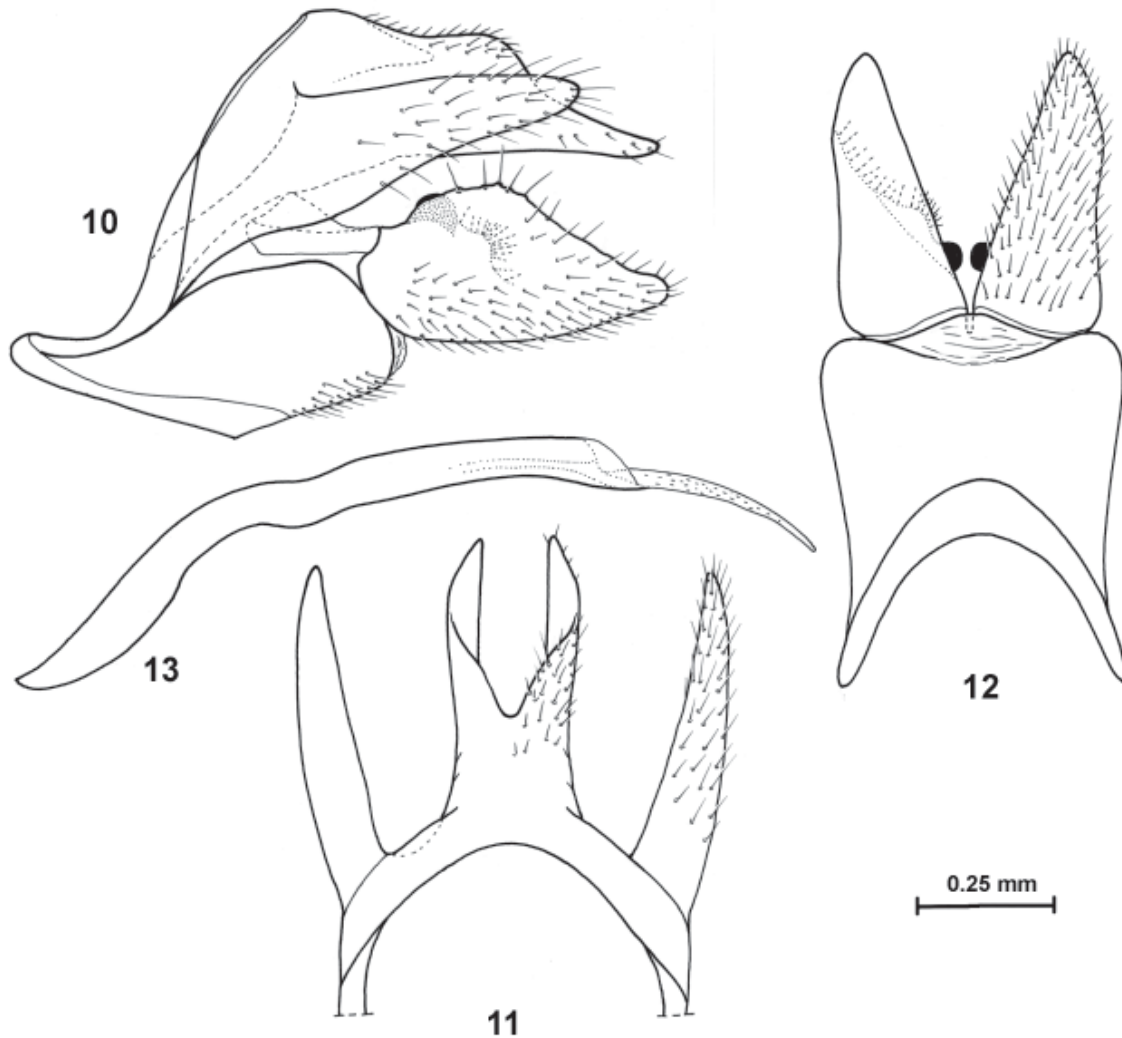
Male genitalia. Sternite IX 2.5 times as long as wide; in lateral view, anterior portion tapering to blunt apex, posterior portion broadly quadrate with rounded corners. Segment X long, duck head-shaped in lateral view, bifurcate in dorsal view. Preanal appendage large, elongate, broad basally, gradually tapering apically, with rounded apex in lateral view. Intermediate appendage absent. Inferior appendage leaf-like in lateral view; inner surface with dark bump, located dorsobasally; and, with undulate row of setae going across appendage. Phallic apparatus long and slender; endotheca very narrow, tapering to acute apex, slightly bent ventrocaudad.

Female and immature stages. Unknown.

Holotype male. Vietnam, Ha Tinh, Huong Son, 1240 m, 18°21'N, 105°15'E, Malaise trap, 14 May 1998, J. Carpenter, K. Long, D. Grimaldi, L. Herman, D. Silva.

Distribution. Known only from the type locality in Ha Tinh Province (Vietnam).

Etymology. This species is named for segment X, duck head-shaped, in lateral view (“anas” is Latin for duck).



Figures 10-13. *Phylocentropus anas* sp. n., male genitalia. **10)** Lateral view. **11)** Dorsal view. **12)** Ventral view. **13)** Phallic apparatus, lateral view.

Acknowledgments

We express our gratitude to the American Museum of Natural History for providing caddisfly material from Vietnam for our study. We thank Drs. Guenter A. Schuster – Eastern Kentucky University and Stephen W. Hamilton – Austin Peay State University for their helpful reviews.

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Received August 2, 2011; Accepted August 27, 2011.