



THE GENUS *PERLOMYIA* BANKS IN TAIWAN (PLECOPTERA: LEUCTRIDAE)

Ignac Sivec¹ and Bill P. Stark²

¹ Slovenian Museum of Natural History, Prešernova 20, P.O. Box 290, SLO-1001 Ljubljana, Slovenia
E-mail: isivec@pms-lj.si

² Box 4045, Department of Biology, Mississippi College, Clinton, Mississippi 39058, U.S.A.
E-mail: stark@mc.edu

ABSTRACT

Three previously unrecognized species of *Perlomyia* Banks are described from Taiwan and compared to others in the genus. New taxa include *P. angulata* sp. n., *P. excavata* sp. n. and *P. taiwanensis* sp. n.

Keywords: *Perlomyia*, Leuctridae, Plecoptera, Taiwan, New species

INTRODUCTION

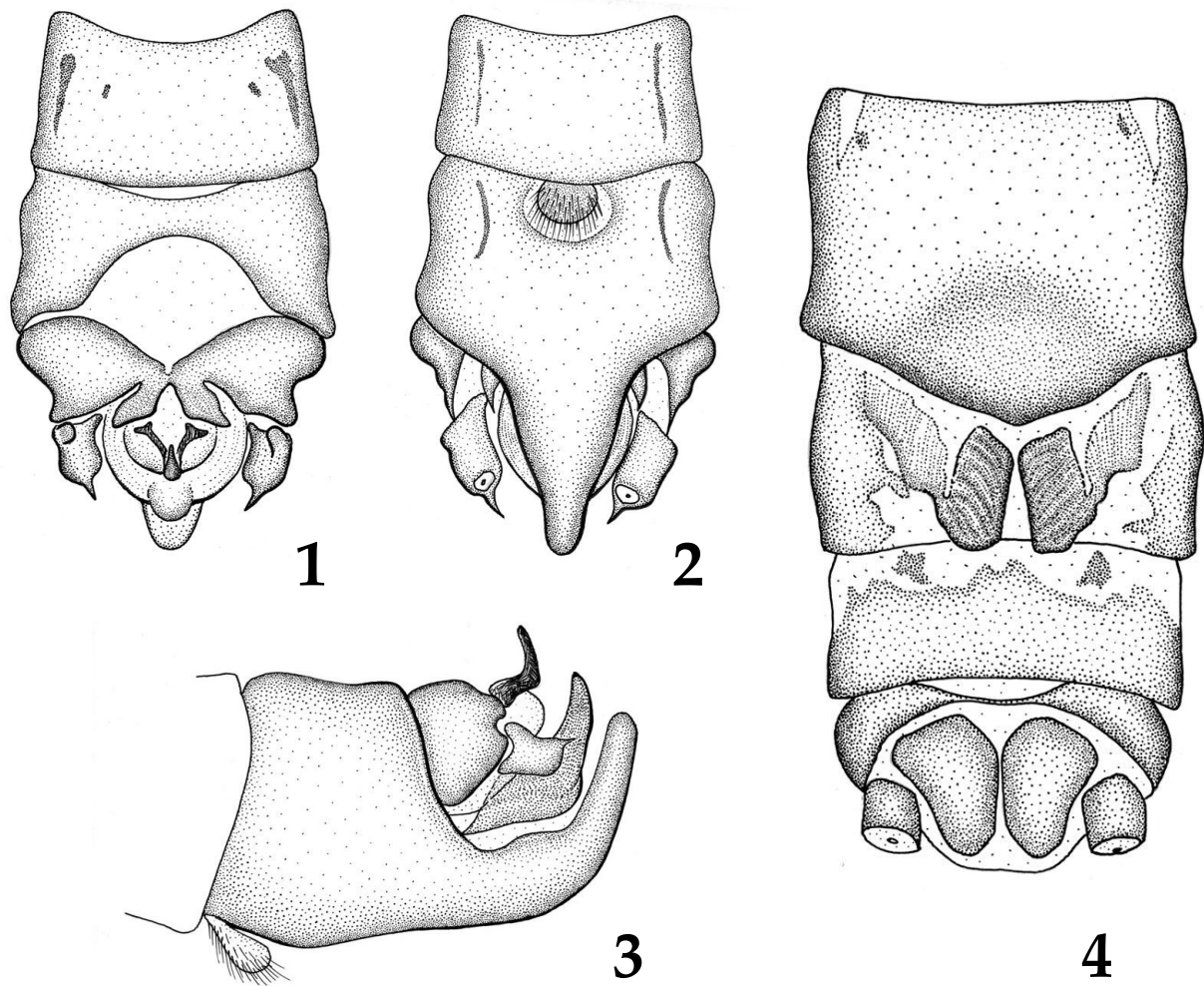
The genus *Perlomyia* Banks, 1906 currently includes 17 species following Sivec & Stark's (2012) study of Japanese species. Nine species are now recognized for Japan (Shimizu 2000; Sivec & Stark 2012), five for mainland Asia (Zhiltzova 2003b), two for North America (Nelson & Hanson 1973) and one from Sakhalin Island and the Kuril Islands (Zhiltzova 1975; 2003a). None are currently known for Taiwan (Sivec & Yang 2001) although a few species of *Rhopalopssole* have been reported (Sivec & Yang 2001; Sivec et al., 1997; Sivec et al. 2008).

This study, based on a small sample of *Perlomyia* specimens collected by the senior author and a colleague in 1996, includes the first records of this genus from Taiwan. The sample includes adults of three previously unrecognized species which we describe below. The holotype and most paratype specimens are deposited in the Slovenian Museum of Natural History, Ljubljana, Slovenia (PMSL). Some paratypes are deposited in the B.P. Stark Collection, Clinton, Mississippi, U.S.A. (BPS).

RESULTS AND DISCUSSION

Perlomyia angulata sp. n. (Figs. 1-4)

Material examined. Holotype ♂, paratypes 2♂, 1♀, **Taiwan:** Taichung County, W Lishan, 1600 m, 24°16'39"N, 121°13'28"E, 22 March 1996, I. Sivec, B. Horvat (holotype, paratype ♀ PMSL, 2♂ paratypes BPS). Additional paratypes: **Taiwan:** Hualien County, S Tayuling, 2330 m, 24°11'17"N, 121°20'30"E, 13 April 1996, I. Sivec, B. Horvat, 2♂, 5♀ (PMSL). Nantou County, Chiton, 4 February 1995, 2♂, 1♀ (PMSL); E Songchuangkang, 2570 m, 24°11'21"N, 121°18'35"E, 22 March 1996, I. Sivec, B. Horvat, 1♂ (PMSL). Taichung County, E Chuyunshan, 2200m, 24°24'16"N, 120°52'45"E, 24 March 1996, I. Sivec, B. Horvat, 2♂ (PMSL); Wulin, Sheipa National Park, 1950 m, 29 October 1996, I. Sivec, 11♂, 13♀, 1 larva (PMSL), 5♂, 5♀ (BPS); Wulin, Sheipa National Park, 1900 m, 24°23'46"N, 121°18'31"E, 28 October 1996, I. Sivec, 2♀ (PMSL).



Figs. 1-4. *Perlomyia angulata*. 1. Male abdominal terga 8-10. 2. Male abdominal sterna 8-10. 3. Male abdominal segments 9-10, lateral aspect. 4. Female abdominal sterna 7-10.

Adult habitus. General color dark brown to black, typical of genus.

Male. Forewing length 6 mm. Epiproct short in dorsal aspect, slender and bent sharply near midlength in lateral aspect (Figs. 1, 3). Sclerite of tergum 9 broadly excavated posteromesally, small knobs absent from tergum 10 (Fig. 1). Cerci bearing a small dorsobasal lobe and a small apical spine (Figs. 1-3). Paraprocts fused into a broad, thick process, bent dorsad at a right angle on the ventrocaudal margin (Fig. 3). Apex of sternum 9 triangular in

ventral aspect (Fig. 2) and curved upward in lateral aspect (Fig. 3). Vesicle short and rounded on apical margin.

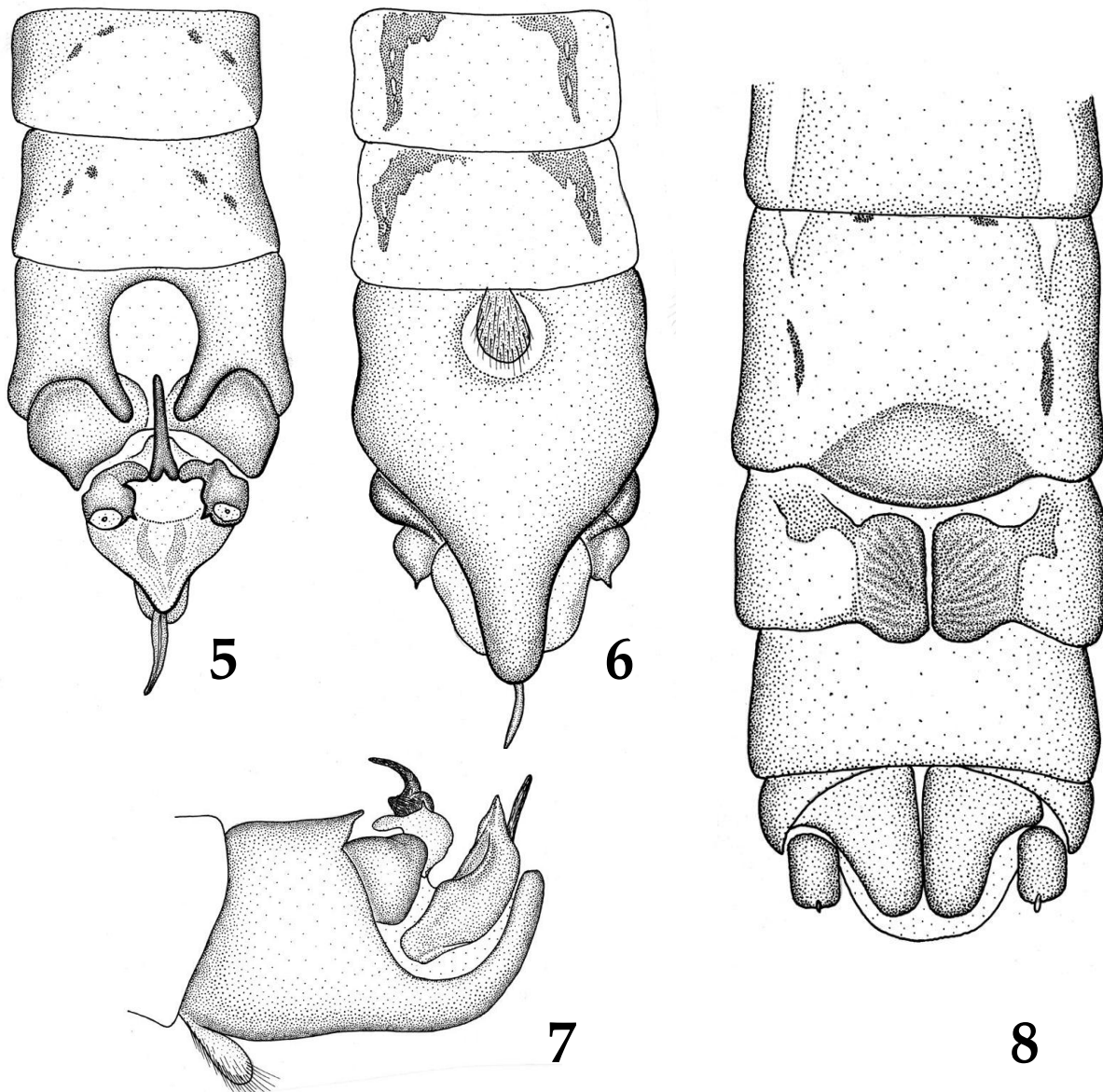
Female. Forewing length 7 mm. Posterior margin of sternum 7 produced into a rounded or slightly triangular projection which slightly overlaps the base of sternum 8. Sternum 8 bearing a pair of median, rectangular shaped sclerites, narrowly separated by a membranous strip; sclerites extend over apex of sternum 9 (Fig. 4); basolateral wing-like sclerites attached at mesolateral margins of median sclerites.

Larva. Undescribed.

Etymology. The species name refers to the angular form of the epiproct in lateral aspect.

Diagnosis. *Perlomyia angulata* does not appear to be closely related to any of the known species. The strongly bent epiproct in lateral aspect, with blunt apex and the absence of knobs on tergum 10 is apparently unique to this species. Among Taiwanese species the male is more similar to *P. taiwanensis*

(described below) but that species lacks the slender angular epiproct and also has knobs on tergum 10. Females are similar to *P. excavata* in having abdominal sternum 7 projecting over the base of 8, but these are distinct by virtue of the lateral wing-like sclerites of sternum 8 being connected to the posterolateral margins of the median sclerites in *P. angulata* but connecting to the anterolateral margins in *P. excavata*.



Figs. 5-8. *Perlomyia excavata*. 5. Male abdominal terga 7-10. 6. Male abdominal sterna 7-10. 7. Male abdominal segments 9-10, lateral aspect. 8. Female abdominal sterna 6-10.

***Perlomyia excavata* sp. n.**
(Figs. 5-8)

Material examined. Holotype ♂, paratypes 4♂, **Taiwan:** Kaohsiung County, E Tientzu, 2400 m, 23°15'24"N, 120°54'51"E, 29 March 1996, I. Sivec, B. Horvat, (PMSL). Additional paratypes: **Taiwan:** Hualien County, Tzuen, Taroko National Park, 1890 m, 24°11'35"N, 121°23'43"E, 13 April 1996, I. Sivec, B. Horvat, 1♀ (PMSL). Kaohsiung County, E Tientzu, 2450 m, 23°15'15"N, 120°55'52"E, 30 March 1996, I. Sivec, B. Horvat, 2♂, 2♀ (PMSL); E Tientzu, 2450-2500 m, 23°15'25"N, 120°54'42"E, 23 October 1996, I. Sivec, 4♂, 1♀ (PMSL), 2♂, 1♀ (BPS); Hsinan shan, 2200 m, 23°04'24"N, 120°50'28"E, 31 March 1996, I. Sivec, B. Horvat, 1♀ (PMSL). Taichung County, Wulin, Sheipa National Park, 1820 m, 24°22'56"N, 121°18'43"E, 28 October 1996, I. Sivec, 2♂, 2♀ (PMSL). Taitung County, W Hsiangyang, 2580 m, 23°15'48"N, 120°59'27"E, 30 March 1996, I. Sivec, B. Horvat, 1♀ (PMSL).

Adult habitus. General color dark brown to black, typical of genus.

Male. Forewing length 7 mm. Epiproct long, slender in dorsal aspect and hook shaped in lateral aspect (Figs. 5, 7). Tergum 9 notched along posterior margin, forming a prominent U-shaped cleft which extends nearly to the anterior margin of the segment; posterolateral margins of notch produced into slender finger-shaped processes. Small knobs absent from tergum 10. Cerci bearing a prominent basal lobe with rounded distal margin visible in dorsal aspect, and a small subapical spine. Paraprocts fused into a broad, thick process bearing a slender, retractable, sclerotized rod (Fig. 7). Apex of sternum 9 produced into a triangular, upwardly curved structure (Figs. 6-7). Vesicle longer than wide (Fig. 6).

Female. Forewing length 8 mm. Sternum 7 produced into a rounded plate which overlaps the base of sternum 8 (Fig. 8). Mesal, rectangular sclerites of sternum 8 narrowly divided by membrane; mesal sclerites extend slightly beyond base of sternum 9; lateral wing-like sclerites somewhat foot shaped and attached to anterolateral margins of mesal sclerites.

Larva. Undescribed.

Etymology. The species name refers to the U-shaped, excavated area of tergum 9 of the male.

Diagnosis. This is the only known *Perlomyia* species

in which the male 9th tergum exhibits a U-shaped cleft, similar to that found in males of the eastern Nearctic genus *Zealeuctra* (Ricker & Ross 1969). A similar structure also occurs on tergum 7 for *Leuctra fusca* (Linnaeus) (Zhiltzova 2003a). As noted above the female is similar to *P. angulata* among Taiwanese species, but is distinguished by the location of the attachment points between sclerites on sternum 8.

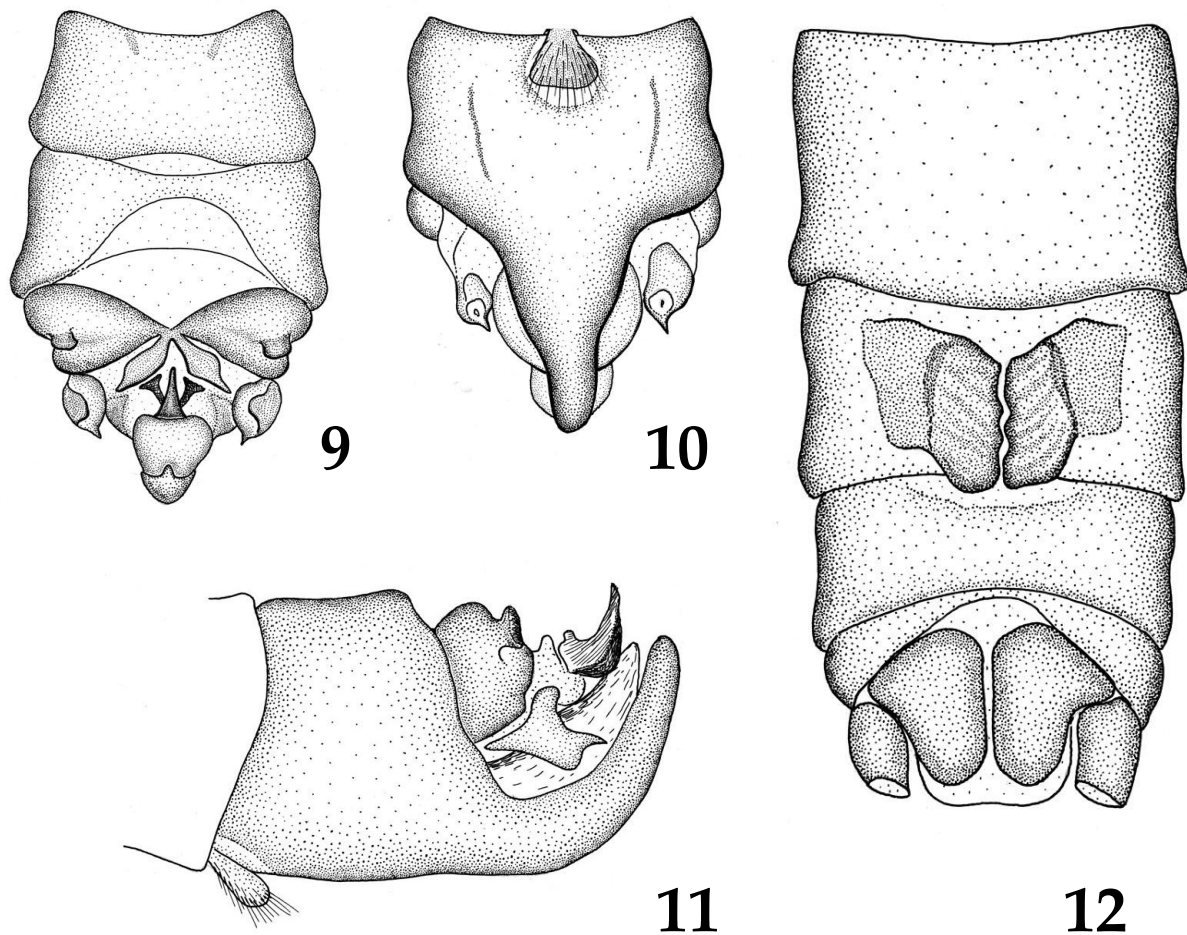
***Perlomyia taiwanensis* sp. n.**
(Figs. 9-12)

Material examined. Holotype ♂, paratypes 32♂, 25♀, **Taiwan:** Nantou County, W Songchuangkang, 2110 m, 24°13'24"N, 121°18'55"E, 21 March 1996, I. Sivec, B. Horvat, (PMSL). Additional paratypes: **Taiwan:** Hualien County, Tayuling, 2440 m, 24°11'03"N, 121°19'55"E, 22 March 1996, I. Sivec, B. Horvat, 1♂ (PMSL). Ilan County, Taipingshan, 2000 m, 24°29'27"N, 121°32'10"E, 10 April 1996, I. Sivec, B. Horvat, 3♀ (PMSL). Nantou County, E Songchuangkang, 2570 m, 24°11'21"N, 121°18'35"E, 22 March 1996, I. Sivec, B. Horvat, 1♂ (PMSL). Taichung County, Wulin, Sheipa National Park, 24°23'45"N, 121°18'50"E, 20 March 1996, I. Sivec, B. Horvat, 36♂, 44♀, 2 larvae (PMSL), 10♂, 10♀ (BPS); Wulin, Sheipa National Park, 1820 m, 24°21'23"N, 121°18'55"E, 20 March 1996, I. Sivec, B. Horvat, 6♂, 10♀ (PMSL).

Adult habitus. General color dark brown to black, typical of genus.

Male. Forewing length 6 mm. Epiproct short, thick at the base and curved slightly in lateral aspect, and somewhat triangular in dorsal aspect (Figs. 9, 11). Sclerite of tergum 9 broadly excavated posteromesally; tergum 10 with a small pair of round knobs located near mesolateral margins. Cerci bearing a wide, dorsally projecting, basal lobe with rounded distal margins and an apical spine (Fig. 11). Paraprocts fused into a broad, thick process, upper margin scarcely curved. Apex of sternum 9 strongly narrowed apically and curved upward in lateral aspect. Vesicle truncate along posterior margin (Fig. 10).

Female. Forewing length 6.5-7 mm. Posterior margin of sternum 7 relatively straight and only slightly produced. Sternum 8 with mesal sclerites narrowly divided by membrane (Fig. 12); wing-like sclerites somewhat quadrangular in shape and attached along



Figs. 9-12. *Perlomyia taiwanensis*. 9. Male abdominal terga 8-10. 10. Male abdominal sterna 9-10. 11. Male abdominal segments 9-10, lateral aspect. 12. Female abdominal sterna 7-10.

the entire lateral margins of mesal sclerites.

Larva. Undescribed.

Etymology. The species name is based on the type locality on the island of Taiwan.

Diagnosis. This species is the only one of the known Taiwanese species of *Perlomyia* in which males have knobs on tergum 10. This character is shared with both Nearctic species and with several from Asia, however, the epiproct shape will distinguish this species from all known members of the genus. Females are generally similar to others from Taiwan but differ in having the lateral wing-like sclerites of sternum 8 attached along the entire length of the

mesal sclerites.

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