



## First Description of the Male *Stomis stefanii* Deuve (Coleoptera, Carabidae), a Rare Ground Beetle in Taiwan

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### ABSTRACT

In this paper, the first male specimen found in northern Taiwan is reported, and its genitalia is illustrated. A comparison of both sexes revealed intraspecific variation. The similarities between *Stomis stefanii* and its closely related species *S. prognathus* (Bates) and *S. zaonus* Habu are further discussed.

**Key words:** Carabidae, male genitalia, *Stomis stefanii*, Taiwan

### Introduction

The genus *Stomis* Clairville is a member of the Pterostichini tribe belonging to the Carabidae family. The genus comprises two subgenera, *Stomis* (sensu stricto) and *Neostomis*, distributed in Eurasia and North America, respectively (Sciaky, 1998). In China, 15 species have been documented, mostly from Sichuan, Yunnan, and Gansu (Sciaky, 1998; Tian and Pan, 2004). In Japan, four species have been described, of which *S. prognathus* is believed to be closely related to *S. stefanii*, the only species in the genus reported to be found in Taiwan (Deuve, 2006; Morita, 2010). *Stomis stefanii* was described in 2006 based on a single female specimen collected from Fenchihu by Nègre. The species was found to be different from *S. prognathus*, with a bigger head, more robust mandibles, a wider and less convex pronotum with less punctate at the base, a more convex and more forward-retracted elytra with distinct

posthumeral narrowing, more punctated elytral striations, and slenderer legs. The second record of *S. stefanii* was published 8 years later and reported a female specimen (Sasakawa and Toki, 2014). The only discrepancy between the two specimens was that the punctation near the anterior margin of the pronotum was dense in the holotype but barely punctated in the second reported specimen. Considering that the second reported female specimen was mostly identical to the holotype in morphology and was collected at a place near the type locality, Sasakawa and Toki concluded that the two female specimens belonged to the same species. Notably, the punctation on the pronotum is an important characteristic that facilitates the distinction of *S. stefannii* from its morphologically closest species *S. prognathus* (Bates) (Deuve, 2006). In this study, the first male specimen collected from northern Taiwan was studied and compared with *S. prognathus* and *S. zaonus* Habu.

## Materials and Methods

### Specimen examination

One male specimen was collected by Cheng-Lung Tsai and Yi-Ming Weng in Siyuan-Yakou (思源啞口), Yilan County, Taiwan (24.397N, 121.358E, ca. 1800 m) on June 17, 2014. The specimen was deposited in the Museum of Entomology, National Chung-Hsing University. The male genitalia including the aedeagus and two parameres were dissected and kept in glycerol; the specimens were then mounted on the same insect pin. The last tarsomere of the prothoracic left leg was missing (Fig. 1).



Fig. 1. Habitus of the male *Stomis stefanii* Deuve. Scale bar: 1 mm.

## Results

### Description of the male specimen

Length 10.1 mm, width 3.3 mm. Color glossy black with appendages paler. Eye small, about 1.29 times as long as temporae, with two supraorbital setae, one at the level of middle of eye and the other behind posterior margin of eye. Pronotum wider than head by 1.32 times, 1.16 times as wide as long, 1.5 times as wide as basal width; anterior margin sparsely punctate (Fig. 2); anterior marginal seta situated slightly before widest point. Elytra widest after middle, 1.36 times as wide as pronotum width; humeral angle protrudent laterally and posteriorly. Generally, the morphology of the examined male is mostly concordant to the descriptions of two females.

### Morphology of the male genitalia

Aedeagus curved in lateral view, size 2.05

mm (straight line from base to apical lamella), hardly twisty toward left in dorsal view, with apical lamella simple, curved upward in lateral view but without a tooth on the tip (Fig. 3). Left paramere oval with a nearly quadrate notch on lateral margin (Fig. 4A). Right paramere curved, rounded at apex (Fig. 4B).

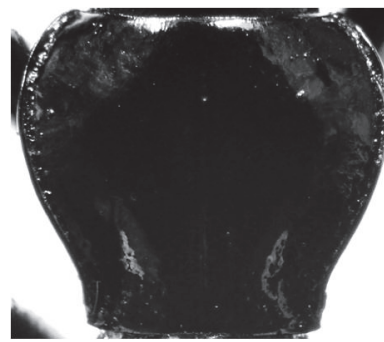


Fig. 2. Dorsal view of the male *Stomis stefanii* Deuve. The punctate on the anterior margin of the pronotum is sparse and weak. Scale bar: 1 mm.

## Discussion

### Diagnosis: variation in pronotal punctuation, interspecific or intraspecific?

Until now, the only two known specimens of *S. stefanii* showed varying punctuation degrees on the pronotum. Although the second reported female specimen was identified as *S. stefanii* by Sasakawa and Toki (2014), the diagnosis of *S. stefanii* remains uncertain because a similar comparison of pronotal punctuation degrees was used to separate the species from *S. prognathous* in Japan (Deuve 2006). More robust diagnostic characteristics are required for distinguishing *S. stefanii*, and the newly found male specimen provided such evidence. In general, the genitalial characters of *S. stefanii* are sufficiently distinct from those of *S. zaonus*, and the external morphology can be used to distinguish *S. stefanii* from *S. prognathous* (Table 1). The external morphology of this male specimen is consistent with the descriptions of the two female specimens reported previously. No sexual dimorphism can be observed. The punctate on the anterior margin of the pronotum is sparse and weak and is identical to that of the female specimen reported by Sasakawa and Toki

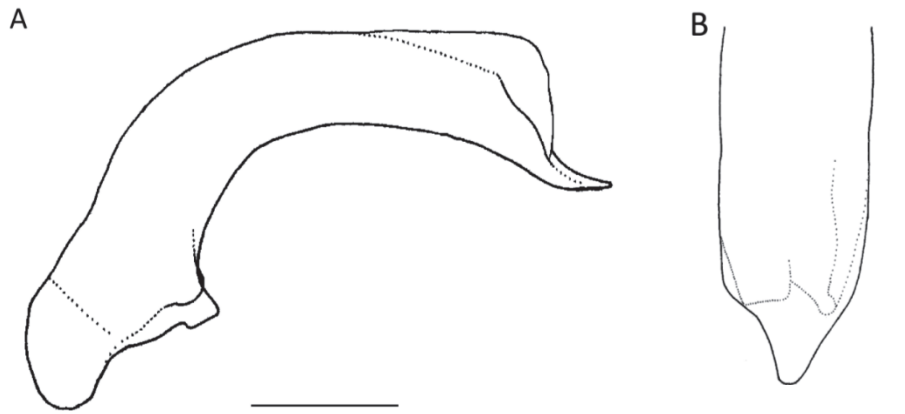


Fig. 3. Lateral view (A) of the aedeagus and dorsal view (B) of the apical lamella. Scale bar: 0.5 mm.

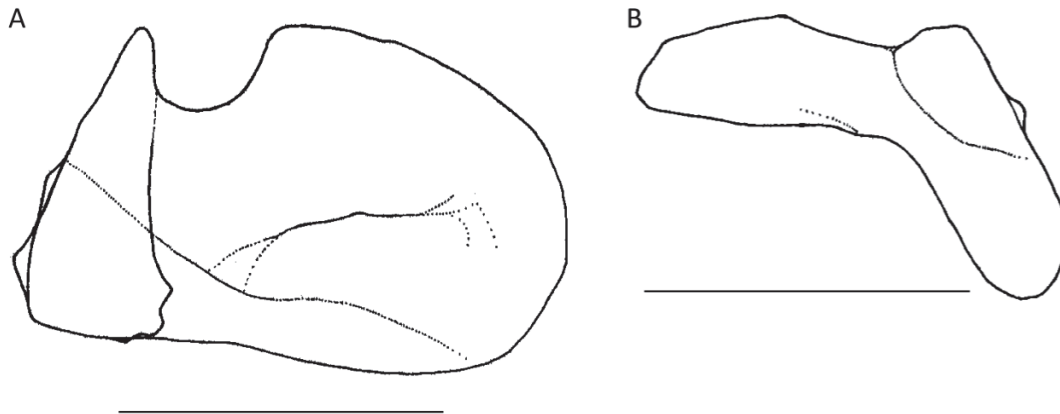


Fig. 4. Left paramere (A) and right paramere (B). Scale bar: 0.5 mm.

Table 1. Morphological comparisons between the three closely related *Stomis* species

|                        | Outer area of elytra1<br>base | humeral<br>tooth | basal border of<br>elytra | aedeagus         | apical part of aedeagus<br>in lateral view | apical lamella |
|------------------------|-------------------------------|------------------|---------------------------|------------------|--|----------------|
| <i>S. zaonus</i> *     | less rounded                  | large            | sinuate                   | twisted to right | not slender                                | short          |
| <i>S. prognathus</i> * | more rounded                  | small            | not sinuate               | hardly twisted   | rather slender                             | rather long    |
| <i>S. stefanii</i>     | least rounded                 | intermediate     | intermediate              | hardly twisted   | rather slender                             | rather long    |

\* The descriptions of characters are adapted from Habu, 1954 and Habu, 1981.

(2014) but differs from the holotype female. The consistency in the overall external morphology among three specimens indicates that the discrepancy in pronotal punctation is likely an intraspecific variation among populations rather than an interspecific difference.

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# 台灣產稀有史氏長顎步行蟲 *Stomis stefanii* Deuve (鞘翅目：步行蟲科) 之首次記錄雄蟲

翁逸明

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## 摘 要

2006 年 Deuve 根據在奮起湖採得的單一雌蟲標本發表第一種產於台灣的 *Stomis* 步行蟲 *S. stefanii* Deuve，迄今只新增另一筆採自溪頭的雌蟲紀錄。然而兩件標本在前胸背板前緣刻點密集度有所差異。正模式標本刻點密集，而溪頭的標本則無明顯刻點。本研究首度描述本種的雄蟲，該標本乃 2014 年採自宜蘭縣思源啞口。檢視標本後發現其前胸背板前緣刻點特徵與溪頭之雌性標本一致而異於正模式標本。種內變異為此特徵於個體間不一致較可能之解釋。文中描述本雄性外性器，並與外觀相似的種 *S. prognathus* (Bates) 及 *S. zaonus* Habu 比較。

**關鍵詞：**步行蟲、思源啞口、雄性生殖器、*Stomis stefanii*