

[研究文章 Research Article]

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New Records of the Genus *Stenus* Latreille, 1797 in Taiwan with a Literature Review of the Taiwanese Species (Coleoptera: Staphylinidae)

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Abstract. The taxonomy of the genus *Stenus* Latreille, 1797 in Taiwan has been addressed in many papers. Herein, we reviewed previous references on Taiwanese *Stenus*. In addition, based on specimens from wetlands in northern Taiwan, three *Stenus* species are recognized: *Stenus alumoenus* Rougemont, 1981, *S. flavidulus paederinus* (Champion, 1924) and *S. frater* Benick, 1916. Among these species, *S. alumoenus* and *S. frater* are newly recorded from Taiwan. Habitus, bionomics, brief diagnosis and updated distributional records of these three species are provided. Our study provides supplementary data on the fauna of *Stenus* in Taiwan.

Key words: Oriental region, fauna, rove beetle, Steninae, wetland

Introduction

The genus *Stenus* is one of the most species-rich genera in Animalia, containing over 2,900 described species worldwide (Betz et al., 2018; Newton, 2019). In Taiwan, over 100 species have been recorded within the genus (Newton, 2019). These rove beetles are typical of moist habitats such as leaf litter, river banks and ponds (Betz et al., 2018). The biology of the genus has been reviewed in Betz et al. (2018).

Taxonomic studies of *Stenus* in Taiwan have been conducted since the early 1970s. Puthz (1971) described two new species and produced the first key to the Taiwanese species. The author described a few species and proposed the primary checklist for this genus in Taiwan (Puthz, 1981). Since then, multiple works have described a few new species and updated records in separated papers (Puthz, 1984, 2003, 2005, 2008a, 2009a, 2013a). The genus in mainland China has been revised including the Taiwanese species (Puthz, 2008b, 2012a). Puthz (2009b) reviewed the *cirrus* group in Taiwan. After that, Puthz (2011, 2012) reviewed the species with spotted elytra and non-spotted elytra with two respective keys to the species. Puthz (2013) reviewed the Oriental species including a few Taiwanese species. Naomi et al. (2017) reviewed the subfamily Steninae in Japan, with an update of the distributional records of *Stenus* in Taiwan.

This study is based on a field survey in wetlands of Taiwan by the authors. In the present study, we herein report two new records for the Taiwanese fauna: *Stenus alumoenus* Rougemont, 1981 and *S. frater* Benick, 1916, bringing the total species number of *Stenus* that occur in Taiwan to 113.

Materials and methods

The photographic method is modified from Hu (2020): Habitus photos were taken with an Olympus OM-D E-M1 digital camera with Olympus M. ZUIKO DIGITAL ED 30 mm F3.5 macro lens. After photographs were taken, they were montaged by Helicon Focus 7 software. Habitat photos were taken with an iPhone XR. Figures were modified using Adobe Photoshop CS5 as needed. Plates were created using Adobe Illustrator CS5 and Adobe Photoshop CS5. Voucher specimens were deposited in FSHc (Fang-Shuo Hu, private collection, Taichung, Taiwan) and NMNS (National Museum of Natural Science, Taichung, Taiwan).

Results

Stenus alumoenus Rougemont, 1981

(Fig. 1)

Material examined. TAIWAN: New Taipei City: 1 ♂ and 1 ♀, Wanggu Village (望古里), Pingxi Dist., 25.0316, 121.7560, ca. 206 m, 30-III-2020, leg. H. C. Liu (FSHc; NMNS).

Diagnosis.

In Taiwan, *Stenus alumoenus* is similar to *S. electrigenmatus* Puthz and *S. frater* Benick. It can be separated from *S. electrigenmatus* by its orange spots which are not extended to the posterior margin of the elytra. It can be separated from *S. frater* by the presence of entirely black abdominal segments 3–5.

Distribution.

Stenus alumoenus is known from China (Guangdong, Zhejiang), Thailand, Laos (Tang et al., 2017). The species is newly recorded from Taiwan.

Bionomics.

The specimens of *S. alumoenus* were collected by aquatic netting in densely vegetated shallow wetland located on a low mountain. The wetland is surrounded by a primary forest (Fig. 4) in northern Taiwan. The species is sympatric with *Stenus flavidulus paederinus* and *Stenus frater*.

Stenus flavidulus paederinus (Champion, 1924)

(Fig. 2)

Material examined. TAIWAN: New Taipei City: 1 ♂, Wanggu Village (望古里), Pingxi Dist., 25.0316, 121.7560, ca. 206 m, 30-III-2020, leg. H. C. Liu (FSHc).

Diagnosis.

In Taiwan, *Stenus flavidulus paederinus* can be readily separated from other *Stenus* by presence of orange pronotum and abdominal segments 3–6.

Distribution.

Stenus flavidulus paederinus is known from China (Yunnan, Guangdong, Hainan, Fujian, Hongkong), Taiwan, Japan (Ryukyu Islands), India, Thailand, Vietnam, Malaysia (Borneo), Indonesia, Philippines and Brunei (Naomi et al., 2017; Tang et al., 2017).

Bionomics.

The specimens of *S. flavidulus paederinus* were collected by aquatic netting in a densely vegetated shallow wetland located on a low mountain. The wetland is surrounded by a primeval forest (Fig. 4) in northern Taiwan. The species is sympatric with *S. alumoenus* and *Stenus frater*.

Stenus frater Benick, 1916

(Fig. 3)

Material examined. TAIWAN: New Taipei City: 3 specimens, Wanggu Village (望古里), Pingxi Dist., 25.0316, 121.7560, ca. 206 m, 30-III-2020, leg. H. C. Liu (FSHc); 1 male and 5 specimens (sex unknown), Lingjiaoliao (嶺腳寮), Pingxi Dist., ca. 214 m, 31-VII-2020, leg. H. C. Liu, F. S. Hu, C. H. Ma (FSHc; NMNS).

Diagnosis.

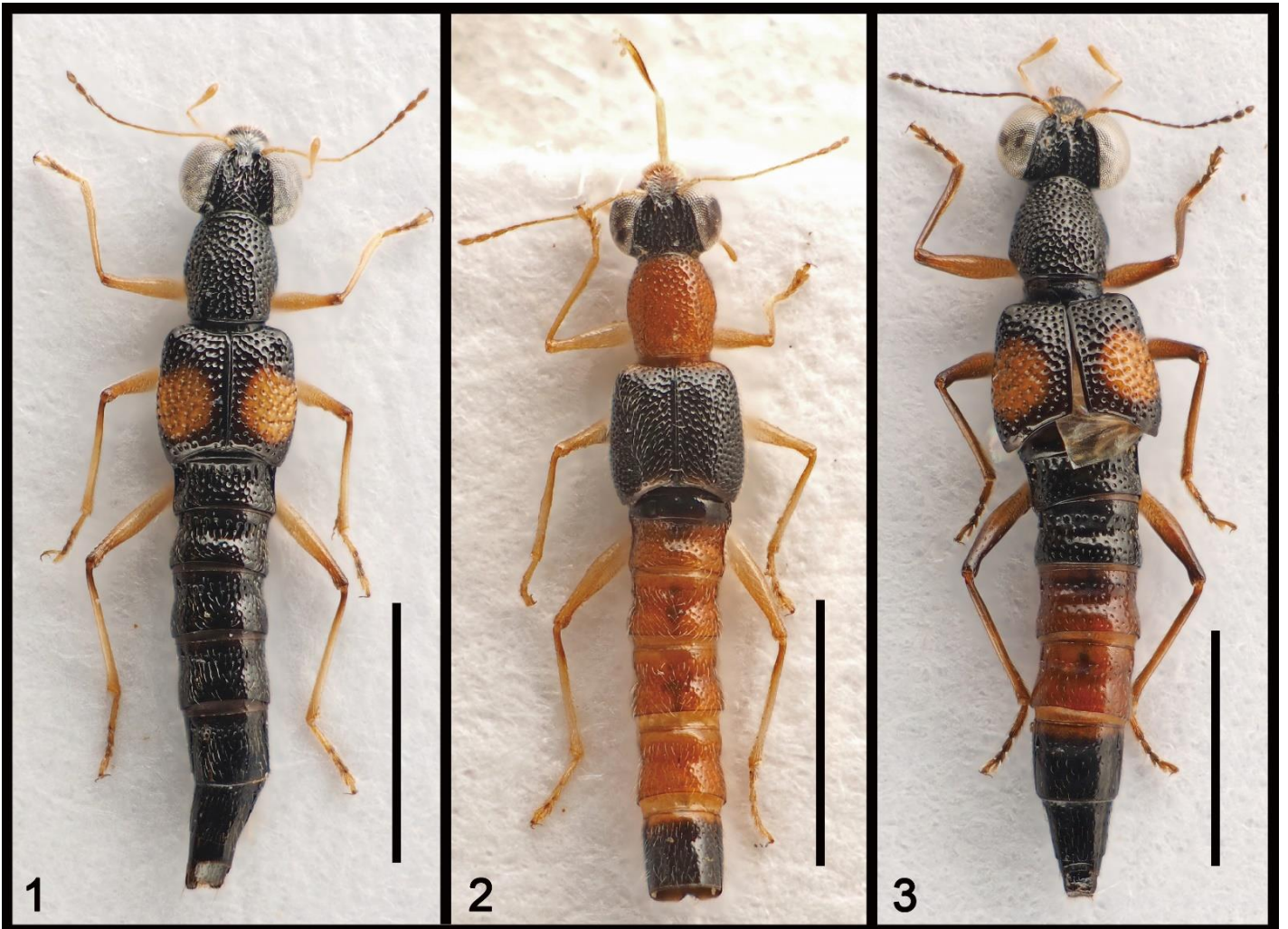
In Taiwan, *Stenus frater* is similar to *S. alumoenus*. It can be separated from *S. alumoenus* by presence of brick red abdominal segments 5 and 6.

Distribution.

Stenus frater is known from China (Hongkong, Guangdong), Vietnam, Indonesia (Tang et al., 2019). The species is newly recorded from Taiwan.

Bionomics.

The specimens of *S. frater* were collected by aquatic netting in densely vegetated shallow wetlands located on a low mountain. The wetlands are surrounded by primary forests (Fig. 4–5) in northern Taiwan. The species co-occurs with *S. alumoenus* and *S. flavidulus paederinus*.



Figures 1–3. Habitus. 1, *Stenus alumoenus* Rougemont, 1981; 2, *S. flavidulus paederinus* (Champion, 1924); 3, *S. frater* Benick, 1916. Scale bars: 2 mm.



Figures 4–5. Habitats of *Stenus alumoenus* Rougemont, 1981, *S. flavidulus paederinus* (Champion, 1924) and *S. frater* Benick, 1916. 4, Wanggu Village; 5, Lingjiaoliao.

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臺灣產突眼隱翅蟲新紀錄種及文獻回顧（鞘翅目：隱翅蟲科）

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摘要: 臺灣產突眼隱翅蟲屬 *Stenus* Latreille 的分類處理被發表於多篇文章，本文回顧這些文章，除此之外，根據北臺灣濕地所採集的標本，鑑定出三種突眼隱翅蟲：美艷突眼隱翅蟲 (*Stenus aluoenus* Rougemont, 1981)、金黃突眼隱翅蟲 (擬毒隱翅蟲亞種) (*S. flavidulus paederinus* (Champion, 1924))、親緣突眼隱翅蟲 (*S. frater* Benick, 1916)，其中，美艷突眼隱翅蟲及親緣突眼隱翅蟲首次記錄於臺灣，並提供這三個物種的整體照、生物學資訊、鑑定方法及更新後的分佈紀錄，本研究補充了臺灣產突眼隱翅蟲的物種相資料。

關鍵詞: 東方區、動物相、隱翅蟲、突眼隱翅蟲亞科、濕地