[研究文章 Research Article]

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New Records of Two Species of the Genus *Neurogenia* Roman, 1910 (Hymenoptera: Ichneumonidae: Ctenopelmatinae: Perilissini) from Taiwan

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Abstract: Two species of the genus *Neurogenia* Roman, 1910 (Hymenoptera: Ichneumonidae: Ctenopelmatinae: Perilissini), *N. fujianensis* He, 1985 and *N. shennongjiaensis* He, 1985, are recorded from Taiwan for the first time. A total of four *Neurogenia* species are recognized in Taiwan: *N. cubitalis* (Uchida, 1932), *N. fujianensis*, *N. shennongjiaensis* and *N. tuberculata* He, 1985.

Key words: Fauna, new records, Oriental region, parasitoid wasps, Taiwan

Introduction

Neurogenia Roman, 1910 is belonging to the tribe Perilissini Thomson, 1883 (Hymenoptera: Ichneumonidae: Ctenopelmatinae) and comprises 15 extant species that are distributed in the Afrotropical, Oriental and Palaearctic regions (Yu et al., 2016). The described species of the genus are usually very easily distinguished from the other Ichneumonidae by their extremely specialized fore wing veins (i.e., fore wing vein M+Cu with a spur or tubercle and Rs+M sometimes decurved and thickened) (Figs 1D, 2D). Little is known about the bionomics of the genus, except for *N. shennongjiaensis* He, 1985 that has been collected at a light (He, 1985).

Neurogenia cubitalis (Uchida, 1932) and *N. tuberculata* He, 1985 have been recorded in Taiwan previously (Uchida, 1932; Reshchikov et al., 2014); however, the Taiwanese species of *Neurogenia* have not been comprehensively studied for a long time (e.g., Uchida, 1932; Chiu et al., 1984). Hence, the author has examined the specimens of *Neurogenia* from Taiwan and recognized four Taiwanese species including two newly recorded species. In the present paper, the author reports two new species records of *Neurogenia* from Taiwan.

Materials and methods

The following abbreviations are used in this paper.

DEI Deutsches Entomologisches Institute, Müncheberg, Germany
TARI Taiwan Agricultural Research Institute, Council of Agriculture, Executive Yuan, Taichung, Taiwan
ZUC Zhejiang University (= Zhejiang Agricultural University), Zhejiang, China

Sixteen specimens of *Neurogenia* from Taiwan were examined. All of them are deposited at TARI.

A stereoscopic microscope (SMZ1500, Nikon, Tokyo, Japan) was used for morphological observation. A digital microscope (VHX-600, Keyence, Osaka, Japan) was used for taking the photographs, and the photographs were stacked using the software Zerene Stacker. All figures were edited by Adobe Photoshop© Creative Cloud.

Morphological terms follow Townes (1970) but terms for wing morphology follow Shimizu and Lima (2018).

The label data for specimens examined followed the original spellings written in labels. Slashes (/) were used for separating the different lines within a same label and double slashes (//) separate different labels.

Results and discussion

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The following four species of *Neurogenia* are recognized in Taiwan: *N. cubitalis* (Uchida, 1932), *N. fujianensis* He, 1985 (Fig. 1), *N. shennongjiaensis* He, 1985 (Fig. 2) and *N. tuberculata* He, 1985. Among them, *N. fujianensis* and *N. shennongjiaensis* are recorded from Taiwan for the first time.

Among the four Taiwanese species of *Neurogenia*, three species expect for *N. cubitalis* have been also recorded in the mainland of China (He, 1985; Sheng et al., 2013): the *Neurogenia* fauna in Taiwan should be similar to the mainland of China.

Subfamily Ctenopelmatinae Förster, 1869

Tribe Perilissini Thomson, 1883

Genus *Neurogenia* Roman, 1910

Neurogenia Roman, 1910: 179. Type species: *Prionopoda testacea* Szépligeti, 1908. Original designation.
Silavoga Cameron, 1911: 190. Type species: *Silavoga longicornis* Cameron, 1911. Synonymized by Townes (1970: 100).
Perilissoides Uchida, 1932: 213. Type species: *Perilissoides cubitalis* Uchida, 1932. Synonymized by Townes (1970: 101).
Incurvarion Kasparyan, 2008: 85. Type species: *Incurvarion gorochovi* Kasparyan, 2008. Synonymized by Reshchikov et al. (2014: 128).

Diagnosis. The described species of *Neurogenia* can be easily distinguished from other ichneumonids by the extremely specialized fore wing veins (i.e., fore wing vein M+Cu with a spur or tubercle and Rs+M sometimes decurved and thickened) (Figs 1D, 2D). According to Wharton (2018), fore wing vein M+Cu of some Afrotropical undescribed species does not bear a spur/ tubercle and nor is vein Rs+M decurved and thickened. Hence, some undescribed species are not readily distinguishable from the genus *Lathrolestes* Förster, 1869 based on only the shape of the fore wing veins, and future studies are required to determine the precise relationship of *Neurogenia* to *Lathrolestes*.

Distribution. Afrotropical, Oriental and Palaearctic* regions (Reshchikov et al., 2014; Yu et al., 2016). *Only from the far eastern part of the Palaearctic region.

Bionomics. *Neurogenia shennongjiaensis* was collected at lights (He, 1985) and some specimens of the genus were collected in Malaise traps (cf. specimens examined of *N. cubitalis* and *N. shennongjiaensis* and some specimens in Reshchikov et al., (2014)). The genus is possibly a koinobiont endoparasitoid of sawfly larvae, like many other Ctenopelmatinae (Reshchikov et al., 2014).

Remarks. Summary information on the genus and all described species is available electronically (Wharton, 2018).

Incurvarion is a monotypic genus and comprises only the type species (*I. gorochovi*). The type species of this genus has been already transferred to *Neurogenia* by Reshchikov et al. (2014). Reshchikov et al. (2014) had not examined the type specimen of the type species, but the description and figures of it in the original description demonstrate that the type has typical morphological characters of *Neurogenia* and it undoubtedly belongs to *Neurogenia*. Hence, the author agrees with Reshchikov et al. (2014) on the taxonomic treatment of the type species of *Incurvarion*. However, Reshchikov et al. (2014) did not including *Incurvarion* in their synonym list of *Neurogenia*.

For all Asiatic described species of *Neurogenia*, a key has been provided by Reshchikov et al. (2014).

***Neurogenia cubitalis* (Uchida, 1932)**

Perilissoides cubitalis Uchida, 1932: 213. Holotype: male, Taiwan (DEI). [not examined, but see Figs 8–10 in Reshchikov et al. (2014) for photos of the holotype].

Specimens examined. 3♀♀, "C. TAIWAN: Wanfeng / Hill, Taichung Hsien / IV. 1984 / K. S. Lin & K. C. Chou / Malaise trap // [Ctenopelmatinae:Perilissini] / *Neurogenia cubitalis* / He, 1985 / det. So SHIMIZU, 2018" (TARI). 1♂, "CHINA: C. Taiwan / Wanfeng, Taichung / Hsien 18. IV / 1980 KSLin // [Ctenopelmatinae:Perilissini] / *Neurogenia cubitalis* / He, 1985 / det. So SHIMIZU, 2018" (TARI). 1♀, "TAIWAN: Taichung / Wufeng, Wanfeng / 18–22. V. 1979 / K. C. Chou // Malaise trap //

[Ctenopelmatinae:Perilissini] / *Neurogenia cubitalis* / He, 1985 / det. So SHIMIZU, 2018" (TARI). 1♀, "TAIWAN: Taichung / Wufeng / 26. X – 5. XI 1979 / K. C. Chou // Malaise trap // [Ctenopelmatinae:Perilissini] / *Neurogenia cubitalis* / He, 1985 / det. So SHIMIZU, 2018" (TARI). 1♀, "CHINA: C. Taiwan / Sunmoon Lake / 15–21. IX. 1970 / Malaise trap // Neurogenia / Tow. 198 // [Ctenopelmatinae:Perilissini] / *Neurogenia cubitalis* / He, 1985 / det. So SHIMIZU, 2018" (TARI).

Distribution. India (Jonathan, 1975) and Taiwan (Uchida, 1932).

Bionomics. Almost unknown. Some specimens were collected by Malaise traps. The Taiwanese specimens were collected in spring and autumn.

***Neurogenia fujianensis* He, 1985**

(Fig. 1)

Neurogenia fujianensis He, 1985: 318. Holotype: female, China (ZUC). [not examined, but see Wharton (2018) for photos of the holotype].

Specimens examined. 1♀, "Suigen / Suogun / 12 VII 1939 / J. Sonan // [Ctenopelmatinae:Perilissini] / *Neurogenia fujianensis* / He, 1985 / det. So SHIMIZU, 2018" (TARI). 1♀, "Kahodai / 15 V 1933 / Col. J. Sonan // [Ctenopelmatinae:Perilissini] / *Neurogenia fujianensis* / He, 1985 / det. So SHIMIZU, 2018" (TARI).

Distribution. China (He, 1985; Sheng et al., 2013) and Taiwan*. *Newly recorded from Taiwan.

Bionomics. Unknown. The Taiwanese specimens were collected in late spring and summer.

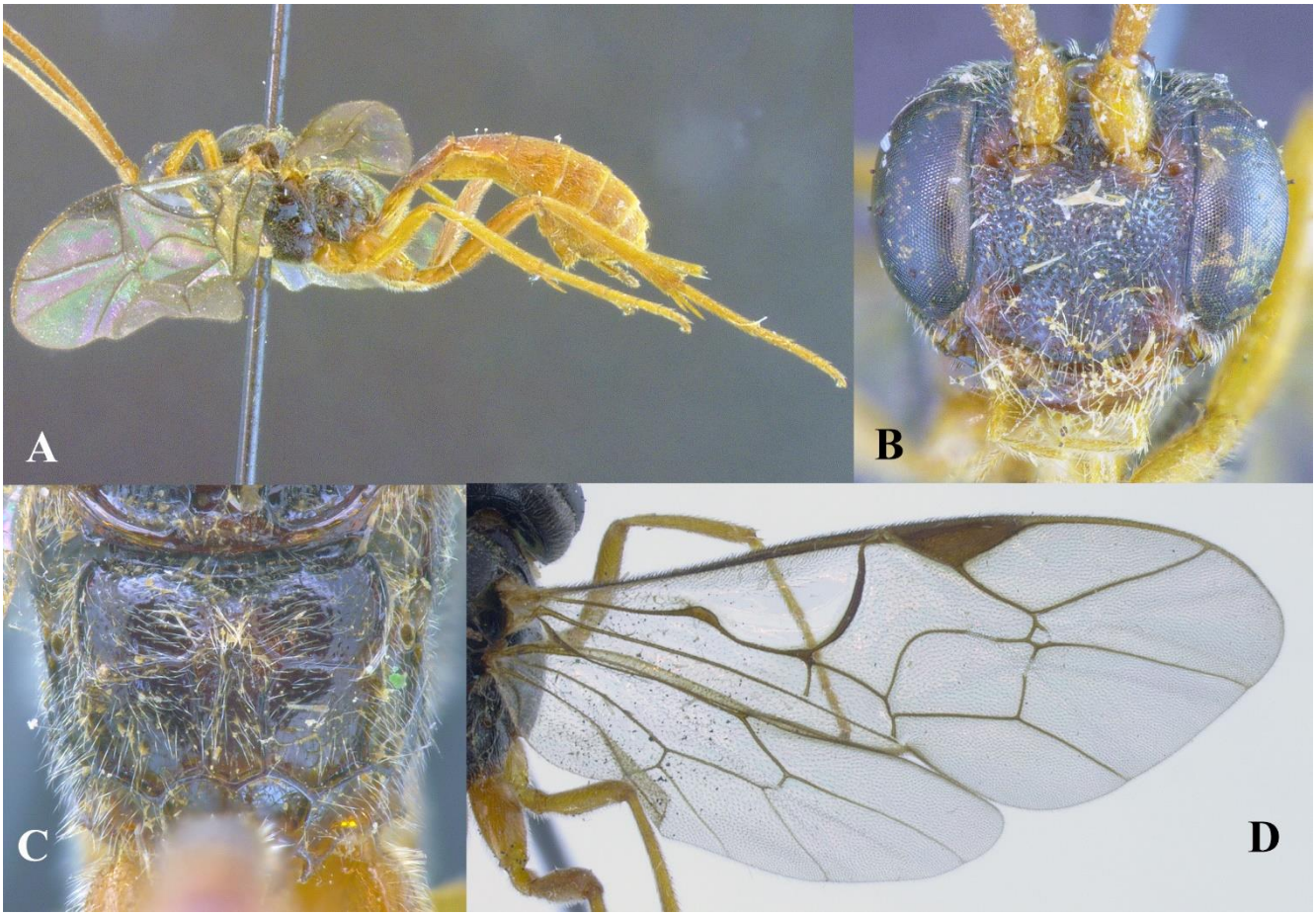

Figure 1. *Neurogenia fujianensis* He, 1985 from Taiwan. A - habitus, in lateral view; B - head, in frontal view; C - propodeum, in dorsal view; D - fore wing.

***Neurogenia shennongjiaensis* He, 1985**

(Fig. 2)

Neurogenia shennongjiaensis He, 1985: 318. Holotype: female, China (ZUC). [not examined, but see Wharton (2018) for photos of the holotype and allotype].

Specimens examined. 1♂, "Arisan / 29 – IV – 1931 / Col. K. Fukuda // [Ctenopelmatinae:Perilissini] / *Neurogenia* / *shennongjiaensis* / He, 1985 / det. So SHIMIZU, 2018" (TARI). 1♂, "Kuandouchi / 6–12. IV. 1971 / Malaise Trap // [Ctenopelmatinae:Perilissini] / *Neurogenia* / *shennongjiaensis* / He, 1985 / det. So SHIMIZU, 2018" (TARI). 3♂♂, "Kuandouchi / 20–26. IV. 1971 / Malaise Trap // [Ctenopelmatinae:Perilissini] / *Neurogenia* / *shennongjiaensis* / He, 1985 / det. So SHIMIZU, 2018" (TARI). 1♂, "Kuandouchi / 15–21. VI. 1971 / Malaise Trap // [Ctenopelmatinae:Perilissini] / *Neurogenia* / *shennongjiaensis* / He, 1985 / det. So SHIMIZU, 2018" (TARI). 1♂, "Formosa / Karenko, –19. / VII 20– VIII 4. / T. Okuni, / J. Sonan / K. Miy., M. Yosh. // [Ctenopelmatinae:Perilissini] / *Neurogenia* / *shennongjiaensis* / He, 1985 / det. So SHIMIZU, 2018" (TARI).

Distribution. China (He, 1985) and Taiwan*. *Newly recorded from Taiwan.

Bionomics. Unknown. This species was collected at light (He, 1985). Also, five of seven specimens examined were collected by Malaise traps. The Taiwanese specimens were collected from spring to summer.

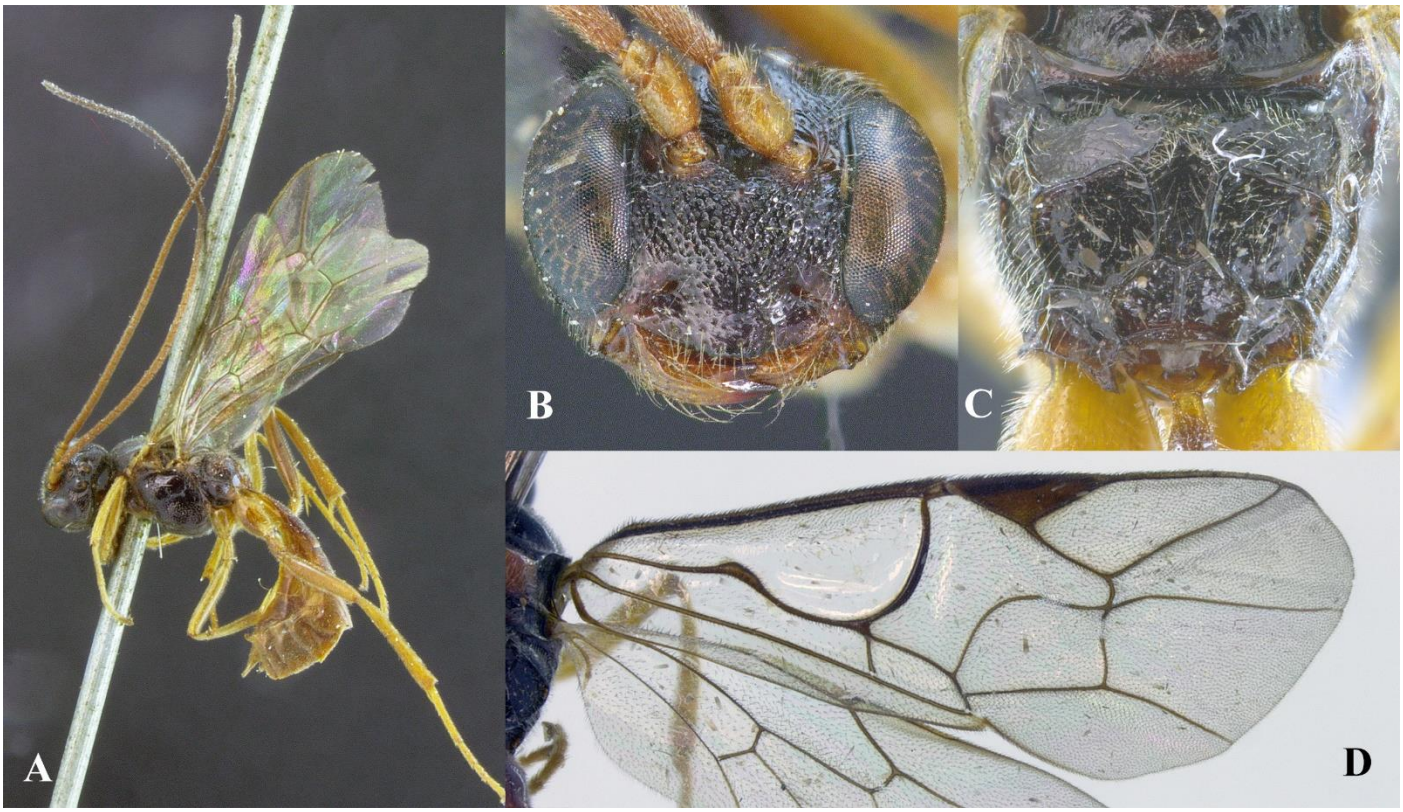

Figure 2. *Neurogenia shennongjiaensis* He, 1985 from Taiwan. A - habitus, in lateral view; B - head, in frontal view; C - propodeum, in dorsal view; D - fore wing.

***Neurogenia tuberculata* He, 1985**

Neurogenia tuberculata He, 1985: 316. Holotype: female, China (ZUC).

Specimen examined. Holotype: ♀, Mt. Fengyangshan, Longquan (28° N, 119° 1` E), Zhejiang Prov. 1400–1600 m, 1982. VIII. 16, Yang Yao-guang, No. 826668 (ZUC).

Distribution. China (He, 1985) and Taiwan (Reshchikov et al., 2014).

Bionomics. Almost unknown. The Taiwanese specimen was collected in spring (Reshchikov et al., 2014), and the Chinese specimens were collected in summer (He, 1985).

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摘要:. 共計四種畸脈姬蜂屬 *Neurogenia* Roman, 1910 姬蜂被記錄於臺灣，分別為肘畸脈姬蜂 *N. cubitalis* (Uchida, 1932)、福建畸脈姬蜂 *N. fujianensis*、神農架畸脈姬蜂 *N. shennongjiaensis* 及瘤畸脈姬蜂 *N. tuberculata* He, 1985，其中福建畸脈姬蜂及神農架畸脈姬蜂為臺灣新紀錄種。

關鍵字: 動物相、新紀錄、東方區、寄生蜂、臺灣