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The Real Status of *Chlorogomphus splendidus* (Selys, 1878) in Taiwan (Odonata: Chlorogomphidae)

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Abstract: The single record of *Chlorogomphus splendidus* (Selys, 1878) in Taiwan was based on a single female specimen collected from Lanyu Island in eastern Taiwan. The status of this species in Taiwan has remained uncertain for nearly a century, as no new material is available for study. Upon the capture of a female *C. risi* Chen, 1950 in 2010 from the island, we decided to re-examine the voucher specimen of *C. splendidus* and compared it with the female *C. risi*. The result reveals that Lanyu *C. splendidus* is a pale-winged female *C. risi*. Hence, *Chlorogomphus splendidus* has to be excluded from the list of Taiwanese Odonata.

Keywords: Dragonfly, Anisoptera, Lanyu Island, misidentification

Introduction

Chlorogomphus Selys is a large genus that includes 47 species (Schorr et al., 2022). Among them, 3 species have beenrecorded from Taiwan, viz., *C. brevistigma* Oguma, 1926, *C. risi* Chen, 1950, and *C. splendidus* (Selys, 1878). Both *C. brevistigma* and *C. risi* are endemic to Taiwan and generally widespread on the island and have been well-documented (Matsuki, 1983; Matsuki & Lien, 1983). *Chlorogomphus splendidus* was described from Luzon, Philippines, based only on a single female specimen (Selys, 1878). The species was subsequently reported also from different countries, including Taiwan, northern Vietnam and Malaysia (Borneo) (Martin 1904; Ris 1912; Laidlaw 1914; Fraser 1929;). In Taiwan, Ris (1912) reported three males of *C. splendidus* from Jiaxian (= Kosempo) and Fengshan (= Hoozan or Hozan), both located in Kaohsiung City. The statuses of these males were doubted by Fraser (1929) and subsequently clarified by Chen (1950) to represent a new species, *Chlorogomphus risi*. Chujo (1930) reported a female of *C. splendidus* from Lanyu Island of Taitung County in eastern Taiwan. Chen (1950) examined this female and also recognized it as *C. splendidus,* albeit with some doubt. Chen's concept of the Lanyu female as *C. splendidus* was generally followed by later authors who listed this species in the dragonfly fauna of Taiwan (Matsuki & Lien, 1983; Lieftinck et al., 1984). So far, the male of *C. splendidus* remains unknown, making the identity of this species uncertain and confusing.

In 2010, a female *C. risi* (Fig. 2E) was collected from Lanyu Island, and this led to a question about whether the female *C. splendidus* reported by Chujo from the island is, in fact, a female *C. risi.* To answer this question, we re-examined the voucher specimen of Lanyu *C. splendidus* deposited in Taiwan Agricultural Research Institute (TARI) and compared it with the female specimens of *C. risi* from the main island of Taiwan.

Materials and methods

The habitus photos were taken by Nikon D60 SLR digital camera with a Micro-Nikkor 60 mm f/2.8 lens. The photos were then edited by Adobe Photoshop CS5 if needed. Plates were prepared by Adobe Illustrator CS5 and Adobe Photoshop CS5. The voucher specimen of *C. splendidus* of Chujo (1930) was deposited in TARI (Taiwan Agricultural Research Institute, Taichung, Taiwan) and the other specimens of *C. risi* were collected by the first author and deposited in TFRI (Taiwan Forestry Research Institute, Taipei, Taiwan).

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Results and discussion

Materials examined.

Chlorogomphus splendidus – 1 female, 10.III-14.IV.1920 (J. SONAN & T. OKUNI) (TARI).

Chlorogomphus risi - Taipei City: 1 female (teneral), Neishuangxi, 1997/VI/29; 1 female, Shilin, Qixingshan summit, 2014/6/27; 1 female (teneral), Mucha, Taipei Zoo, 2008/4/27. New Taipei City:1 female, Shiding, 1995/2/13; 1 female, Xindian, Guishan, 1995/6/2; 1 female, Pinglin, 1996/6/29; 1 female, Gongliao, Hemei, 1998/6/27; 1 female, Xizhi, Kezilin, 2002/5/5. Yilan County: 1 female, Yuanshan, Fushan Botanical Garden, 1995/6/27; 1 female, ditto., 1997/6/22; 1 female, ditto., 1997/7/7. All specimens were collected by WCY (TFRI).

According to Chen (1950), the female Lanyu *C. splendidus* differs from the female *C. risi* as follows: wings brown on bases, nodal areas and apex in the Lanyu *C. splendidus* (Fig. 1A) but entirely golden yellow in *C. risi* (Fig. 1B); ante-alar ridges are black in the Lanyu *C. splendidus* (Fig. 2C) and yellow in *C. risi* (Fig. 2D). However, the wing pattern is variable in female *C. risi*, of which at least three types can be clearly defined, viz. pale- (Fig. 1C & D), semi-dark-(Fig. 2A) and dark-winged (Fig. 2B). The female wing pattern of Lanyu *C. splendidus* doesn't differ from the first type. Direct inspection on the Lanyu female also revealed the black ante-alar ridges, in fact, retained some yellowish traces, suggesting the black was probably caused by postmortem discoloration; hence, the Chen's arguments to separate the female Lanyu *C. splendidus* from female *C. risi*is not feasible.

Furthermore, the color pattern on the lateral side of the 2nd abdominal segment is usually species-specific in the females of *Chlorogomphus* and this feature is not different between the female Lanyu *C. splendidus* and *C. risi*. In conclusion, we confirm that the female Lanyu *C. splendidus* is a misidentification of a pale-winged female *C. risi*.

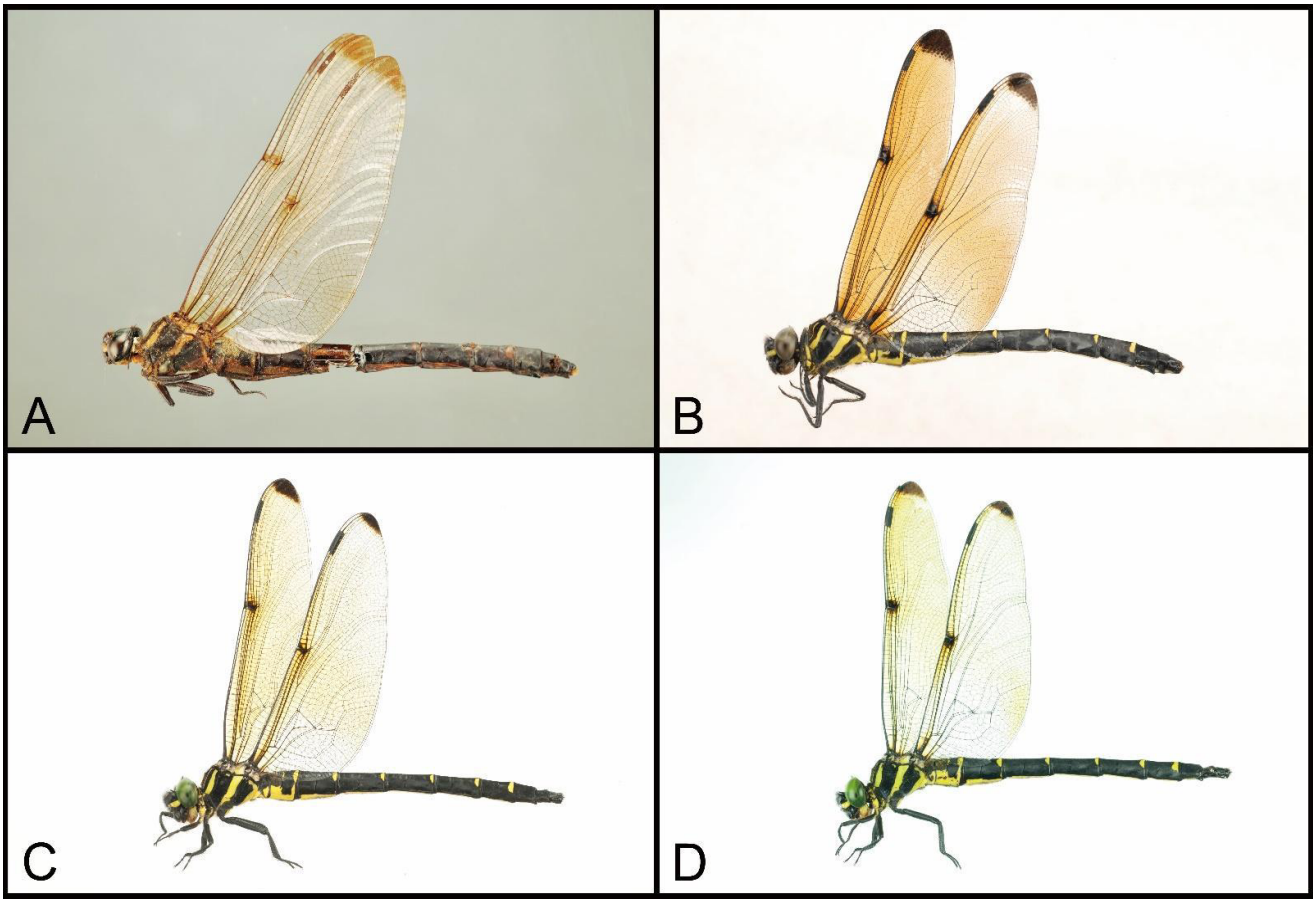


Figure 1. Female specimens of *Chlorogomphus risi*. A, the voucher specimen of *C. splendidus* in Chujo (1930); B, teneral female; C, D, pale-winged females.

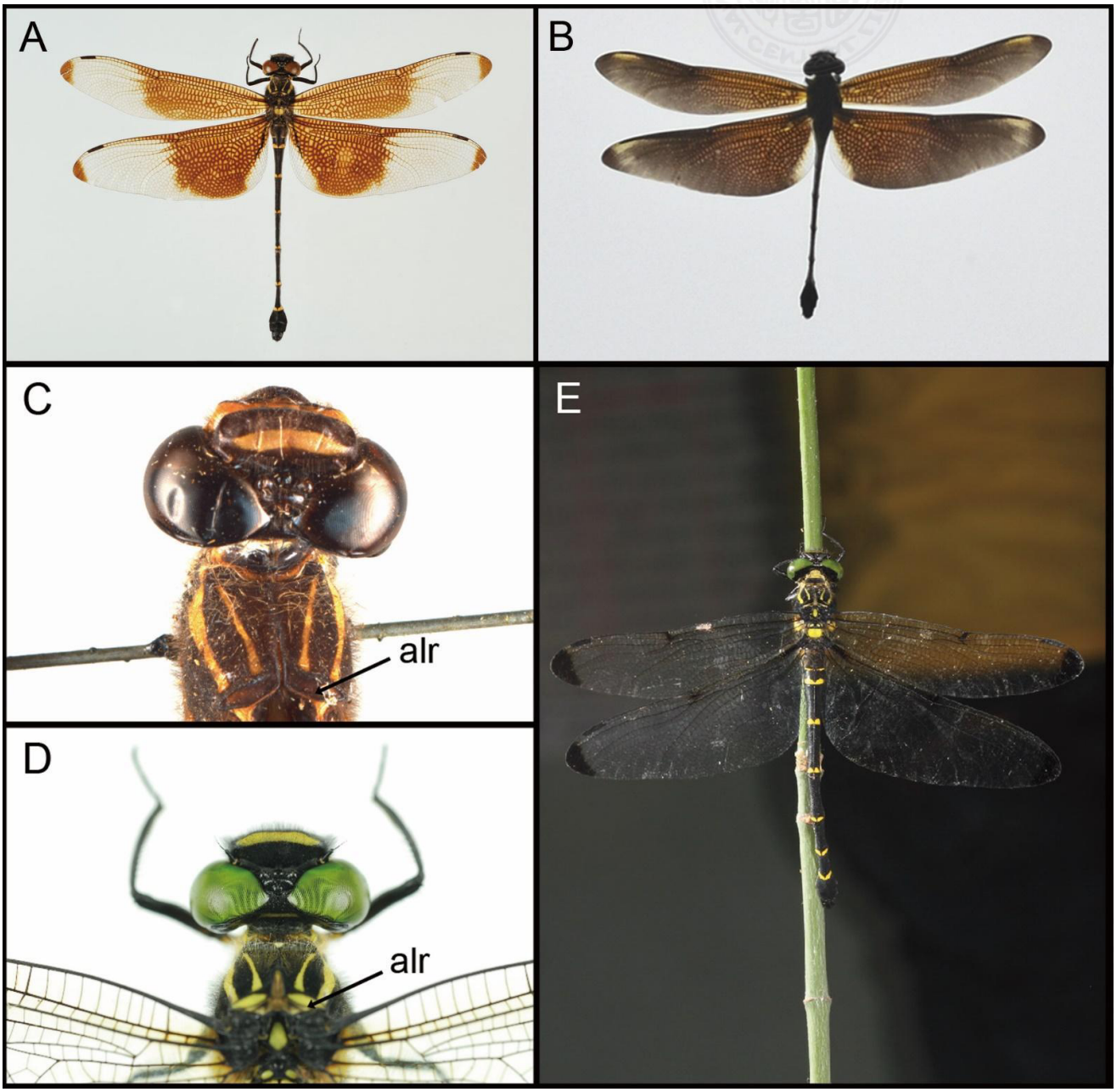


Figure 2. Female specimens of *Chlorogomphus risi.* A, semi-dark-winged female; B, dark-winged female; C, head and thorax of voucher specimen of *C. splendidus* in Chujo (1930); D, head and thorax of *C. risi*; E, the female *C. risi* photographed by Chia-Hung Lin in 2010 from Lanyu Island, Taitung. Abbreviation: alr: ante-alar ridge.

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臺灣產闊翼斑蜓的真實身分（蜻蜓目：斑蜓科）

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摘要: 臺灣產闊翼斑蜓 (*Chlorogomphus splendidus* (Selys, 1878)) 的紀錄原本是根據一隻採自蘭嶼的雌性標本，由於後續沒有新採集的標本，本種是否分布於臺灣的問題已將近百年仍未確定。2010 年因為有人在蘭嶼採集到臺灣本島特有的褐翼斑蜓 (*C. risi* Chen, 1950)，我們決定重新檢視蘭嶼產闊翼斑蜓的存證標本，並與褐翼勾蜓互相比對，結果顯示該蘭嶼闊翼斑蜓標本實際為褐翼斑蜓淡翅型雌蟲的錯誤鑑定，據此，我們將闊翼斑蜓從臺灣的蜻蜓目名錄中排除。

關鍵詞: 蜻蜓、不均翅亞目、蘭嶼、錯誤鑑定