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Description of *Sarasaeschna kaoi* sp. nov. in Taiwan, with notes on the proposed differentiating characters of the *pyanan*-group (Odonata, Aeshnidae)

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Abstract

Sarasaeschna kaoi **sp. nov.** collected from Yuli, Hualien County in eastern Taiwan, is easily distinguished from all known congeners by its male having short and straight cerci. Judging from male penile structure, it is considered to belong to the *pyanan*-group of species and resembles in general appearance the Chinese *S. zhuae* described from Fujian. The only known habitat of *S. kaoi* is a muddy and grassy swamp in natural evergreen forest. The diagnostic characters of the *pyanan*-group proposed by Karube & Yeh are also discussed.

Key words: new species, *Sarasaeschna*, *pyanan*-group, Hualien, Taiwan

Introduction

Sarasaeschna is a group of aeshnid dragonflies mainly distributed in East Asia and the Indo-Chinese region (Karube & Yeh 2001). The peculiar male penile characters in this genus have supported its relationship with the Nearctic genus *Gomphaeschna* Selys (Karube & Yeh 2001; von Ellenrieder 2002). Karube & Yeh (2001) recognized three groups of species in *Sarasaeschna*, viz., *pyanan*-, *pryer*i- and *niisatoii*-groups, based mainly on the male penile structures. The *pyanan*-group is chiefly characterized in male by flat and elongate flagella that protrude in perpendicular to the longitudinal axis of the apical penile segment, with apex more or less recurved (cf. Karube and Yeh 2001, figs. 11, 12, 29, 30; Xu 2008, figs. 7 & 8). Three species have been allocated to the *pyanan*-group (Karube & Yeh, 2001; Xu 2008), i.e. *S. pyanan* (Asahina, 1951) in Taiwan, *S. speciosa* (Karube, 1998) in Darjeeling, Himalaya, and *S. zhuae* Xu, 2008, in Fujian, China. These species all live in high mountains above 1000 m (Chen & Yeh 2014; Karube 1998; Xu 2008) and are widely disjunct from each other.

In Taiwan, four species of *Sarasaeschna* have been recorded, including *S. pyanan*, *S. lieni* (Yeh & Chen, 2000), *S. tsaopiensis* (Yeh & Chen, 2000) and the most recently described *S. chiangchinlii* (Chen & Yeh, 2014). These species were generally segregated though loosely from each other by different altitudinal ranges, but neighbouring species were often found to coexist at the same sites in their overlapping zones (Chen & Yeh 2014). In Matailin Swamp in Yuli, Hualien County, where both *S. lieni* and *S. tsaopiensis* have been recorded (Chen & Yeh, 2014), a new species of the *Sarasaeschna pyanan*-group was collected unexpectedly and is described here.

Material and methods

Adults were collected with insect nets and treated subsequently with acetone for 24 hrs for permanent preservation. Description is based on inspection of acetone-treated specimens by naked eye or under 10× magnifier and 45× stereomicroscope, with reference to colour photos of living insects. Morphological terminology and methodology

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