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Calicnemia soccifera sp. nov. from Yunnan, China (Zygoptera: Platycnemididae)

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A new species, *Calicnemia soccifera* sp. nov. (holotype male: Jinping, Yunnan, China) is described and illustrated for both sexes. *C. miniata* is confirmed to occur in Xizang (Tibet), China, and preliminary taxonomic remarks on some Chinese species of *Calicnemia* are given.

Keywords: *Calicnemia*; new species; Yunnan; China

Introduction

Calicnemia Strand, 1928 is a speciose genus in Southeast Asia, India, and China. According to Lieftinck (1984) this genus can be divided into two groups based on the structure of the penile organ. Group I has the penile lobe terminating in long, curved, ribbon-like filaments (type I) whereas group II has a short, broader, shield-like penile lobe without filaments (type II). During the first decade of the twenty-first century, five new species of *Calicnemia* have been described from China: *C. haksik* Wilson & Reels, 2003; *C. chaoi* Wilson, 2004; *C. gulinensis* Yu & Bu, 2008; *C. porcata* Yu & Bu, 2008; and *C. zhuae* Zhang & Yang, 2008. Yu and Bu (2008) gave a brief synopsis of Chinese *Calicnemia* species, which revealed the high diversity of this genus in China for the first time. To date 20 species of *Calicnemia* have been recorded worldwide, and 10 of them occur in China (Yu, 2013). In addition to the five species listed above, *C. erythromelas* (Selys, 1891), *C. eximia* (Selys, 1863), *C. sinensis* Lieftinck, 1984, *C. miles* (Laidlaw, 1917) and *C. miniata* (Selys, 1886) have also been recorded from China. Although Wilson (2004) listed *C. imitans* Lieftinck, 1948, until now no credible record of this species in China has been published. In this study we describe a new species and confirm the occurrence of *C. miniata* in China. Brief remarks on the taxonomy of some Chinese species of *Calicnemia* are also given.

Calicnemia Soccifera sp. nov. (Figures 1,2)

Specimens examined

Holotype male. China, Yunnan, Jinping, Maandi, 28 May 2012 (22°47′01″ N, 103°29′35″E, altitude 1008 m), leg. Chen Jin. Paratypes: 3 males, 2 females, same data as for holotype. Holotype

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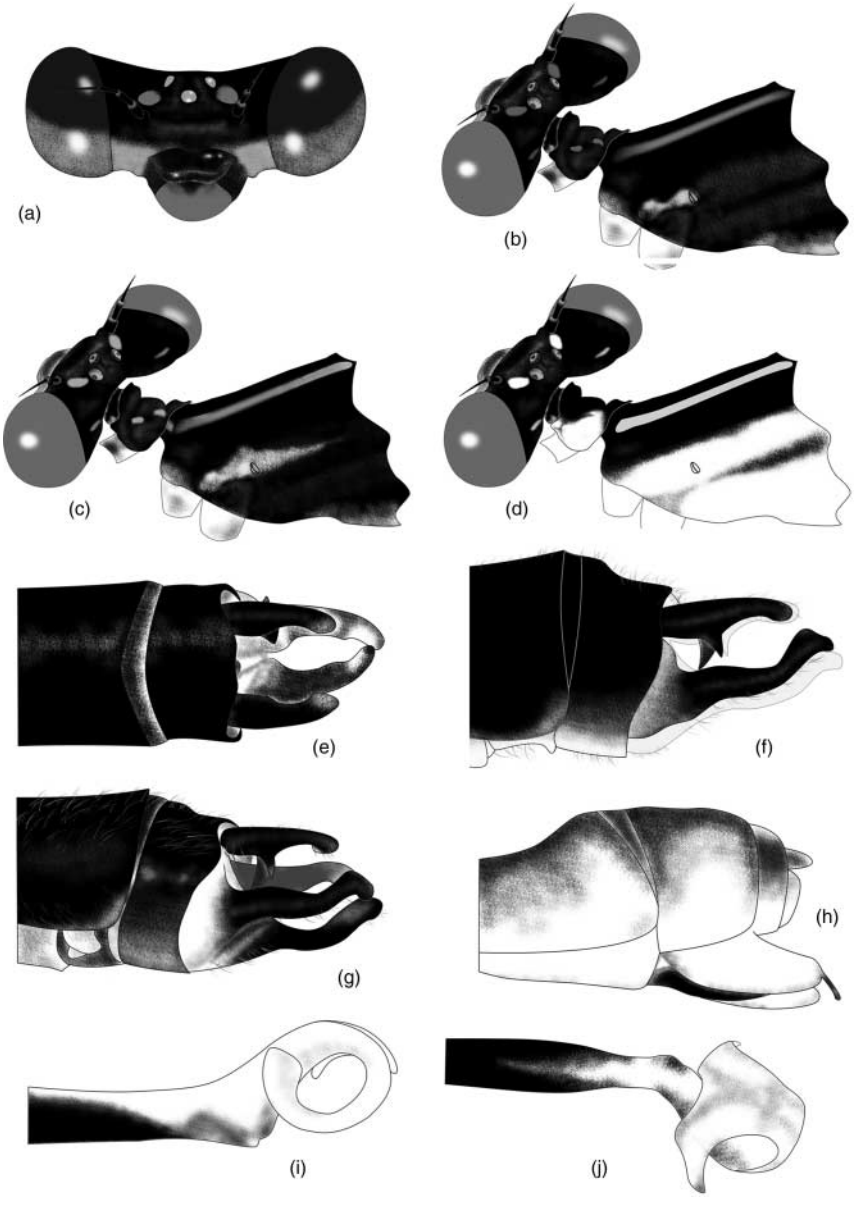

Figure 1. *Calicnemia soccifera* sp. nov. (a) Male face, holotype. (b–d) Variation in the color pattern of male head and thorax according to the degree of maturity: (b) fully mature, holotype; (c) mature; (d) semimature. (e–g) Caudal appendages of male, holotype: (e) dorsal view; (f) lateral view; (g) lateroventral view. (h) Paratype female, caudal appendages, lateral view. (i, j) Genital ligula, paratype male: (i) ventral view; (j) lateral view.

and paratypes will be deposited at Institute of Entomology, College of Life Sciences of Nankai University, Tianjin, China.

Etymology

The Latin adjective *soccifera* [soccus + ferre] means "sock-wearing" and refers to the remarkable black colored tibiae and tarsi compared to the reddish brown femora.

Figure 2. *Calicnemia soccifera* sp. nov., field photos, paratypes: (a) mature male; (b) semimature male; (c) female.

Diagnosis

Male with thorax black, marked with uniform yellow stripes that become obscured by pruinosity in mature individuals, reddish femora contrasting with black tibiae and tarsi, basal segments of

abdomen bright red and distal segments black. Female with thorax similar but more extensively yellow, not becoming pruinose, abdomen generally yellow brown, darker distally.

Description of holotype male

Head. Labium pale yellow. Labrum, bases of mandibles, genae reddish brown. Anteclypeus reddish brown with two black spots at distal border. Postclypeus black centrally and reddish brown laterally. Frons and top of head matt black, with a pair of irregular reddish brown spots between lateral ocelli and base of antennae. Antennae wholly black. Postocular spots reddish brown, stripe-like, very small (Figure 1a, b).

Thorax. Prothorax wholly black with sides finely pruinose, two indistinct reddish brown spots at upper lateral margin. Synthorax black dorsally, with only indistinct, finely pruinose stripes. Sides of synthorax almost wholly black, except an indistinct pruinose narrow yellow stripe, just above second lateral suture, that covers spiracle (Figure 1b). Coxae, trochanters and femora reddish brown except one dark pruinose mark at outer faces of coxae, two dark spots at outer face of trochanters. Tibiae and tarsi blackish brown. Wings hyaline, pterostigma dark brown, braced, covering one cell.

Abdomen. Predominantly brick red. Segment 1 yellow with pale dark brown dorsal mark and dark brown distal ring. Segments 2 to 5 wholly brick red with dark brown distal rings. Segment 6 brick red on proximal 2/3 but black gradually to distal part. Segments 7–10 including caudal appendages black (Figure 2a, b). Caudal appendages as figured in Figure 1e–g with superior appendages 1/4 shorter than inferiors, which are twice as long as abdominal segment 10. Cerci furnished with two long sharp middle teeth. Penile organ as in Figure 1i, j with short, shield-like lobe.

Measurements (mm). HW 23.0; abdomen + appendages 31.0.

Description of a paratype female

Head. Labium and labrum pale yellow. Base of mandibles and genae greenish blue. Anteclypeus greenish blue with two black spots at distal border. Postclypeus black centrally and greenish blue laterally. Frons and top of head matt black, with a pair of irregular yellow spots between lateral ocelli and base of antennae. Antennae wholly black. Postocular spots yellow, very small, stripe-like.

Thorax. Prothorax black dorsally, yellow laterally. Synthorax black dorsally, with yellow antehumeral stripes. Sides of synthorax black above middle lateral suture and yellow below, except a black stripe along second lateral suture, starting from wing base and ending just above spiracle (cf. Figure 2c). Coxae and trochanters yellow except two small dark spots at distal margin of trochanters. Femora, tibiae and tarsi dark brown. Wings hyaline, pterostigma dark brown, braced, covering one cell.

Abdomen. Segment 1 yellow with dark brown dorsal mark and dark brown distal ring. Segments 2 to 5 brown dorsally and yellow ventrally, with dark brown distal rings. Segment 6 brown at dorsal proximal 3/4, then darker gradually to distal part, yellow ventrally. Segments 7–10 black dorsally and yellow ventrally. Caudal appendages black, as long as segment 10. Ovipositor robust, extending to the end of abdomen as shown in Figure 1h.

Measurements (mm). HW 22.0; abdomen + appendage 28.0.

Variation in male paratypes

Measurements (mm). HW 21.5–23.0; abdomen + appendages 30.5–31.0. The body color pattern varies depending of the degree of maturity (cf. Figure 1c, d). Younger individuals exhibit reduced

pruinosity. Labium, labrum, genae, anteclypeus, and spots on vertex mainly greenish brown. Postocular spots brown. Prothorax black dorsally and yellow laterally. Synthorax black above middle lateral suture and yellow below, with yellow antehumeral stripes and a black stripe along second lateral suture. Coxae and trochanters yellow, femora orange-yellow. Abdomen color paler in the mature individuals.

Variation in female paratypes

Measurements (mm). HW 22.0–22.5; abdomen + appendages 28.0–28.5. Both available female specimens have the same color pattern, though the younger one has a little pale yellow color.

Habitat

Found in a montane stream at about 1000–1300 m, no more than 50 m away from a waterfall. Also occurring in the same area are *Calicnemia eximia*, the amphipterygid *Devadatta ducatrix* Lieftinck, 1969 and the megapodagrionid *Agriomorpha fusca* May, 1933.

Discussion

Calicnemia soccifera resembles *C. erythromelas* in its body colors, but differs in the shape of the penile organ and caudal appendages. The penile lobe (Figure 1i) of *C. soccifera* is typical of type II species (Lieftinck, 1984) whereas that of *C. erythromelas* belongs to type I, since it is divided into a pair of shorter, broadly ribbon-like processes separated by a V-shaped incision (cf. Lieftinck, 1977, p. 23, figure 15). Cerci of *C. erythromelas* bear very strongly developed middle teeth (cf. Lieftinck, 1977, p. 23, figures 16–17; Yu & Bu, 2008, p. 249, figures 1–3) that are longer than in *C. soccifera* (Figure 1f). In addition *C. soccifera* lacks a distinct broad pale stripe on the top of its head. The body color pattern of *C. soccifera* somewhat resembles also that of *C. uenoi* Asahina, 1997 from Vietnam, but in *C. uenoi* the shape of caudal appendages is very different, with only a short middle tooth on each cercus (cf. Asahina, 1997, p. 21, figure 15).

With the exception of *C. erythromelas*, *C. eximia*, and *C. sinensis*, the Chinese *Calicnemia* species belong to the Group II in the classification by Lieftinck (1984). All the recently described species (*C. chaoi*, *C. haksik*, *C. gulinensis*, *C. porcata*, *C. zhuae* and the present *C. soccifera*) belong to this group, all of which have broader and shield-like penile lobes without filaments, as in *C. miles* (cf. Lieftinck, 1977, p. 21, figure 12). Some of these species seem to be closely related, and more detailed studies are needed to clarify their true relationships. Yu and Bu (2008) pointed out that the only published record of *C. miniata* from China by Sui and Sun (1984) in fact refers to *C. sinensis*. Therefore the occurrence of *C. miniata* in China remained questionable. However, recently, the first author (XY) found one unidentified male specimen (Motuo, Xizang [Tibet], 1 July 1983, altitude 850 m, leg. Yinheng Han) from the Institute of Zoology, Chinese Academy of Sciences, Beijing, which belongs to *C. miniata*. Therefore, *C. miniata* is confirmed to occur in China.

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