

## Two new species of *Coenagrion* Kirby, 1890, from China (Odonata: Zygoptera: Coenagrionidae)

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### Abstract

Two new species of *Coenagrion* Kirby (*Coenagrion aculeatum*, **sp. nov.**, holotype male, China, Chongqing, Jiangjin, 23-V-2001, deposited in Life Sciences College of Hebei University, Baoding, China; and *C. tengchongensis*, **sp. nov.**, holotype male, China, Yunnan, Tengchong, Zhengding, 1800m, 15-VIII-2006, deposited in Institute of Entomology, Nankai University, Tianjin, China) are described, and diagnostic figures of caudal appendages and genital ligulae are provided.

**Key words:** Odonata, *Coenagrion*, China, new species

### Introduction

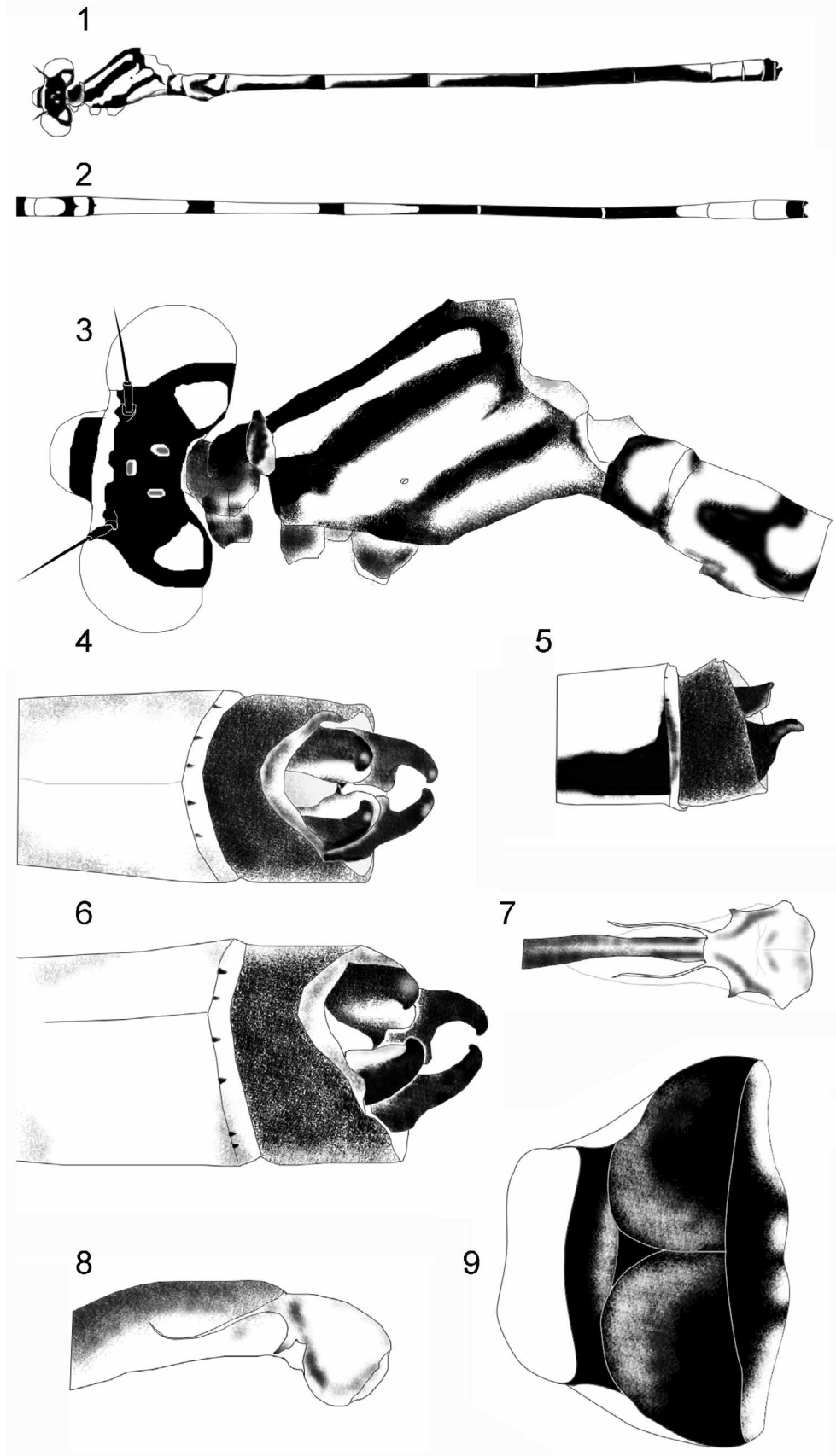
*Coenagrion* was established by Kirby (1890) to accompany some species different from the inclusive genus *Agrion* Fabricius (1775). Bridges (1994) and Tsuda (2000) listed 38 species of *Coenagrion*. In 2000, Zhu and Ou-yang added one species (*C. bifurcatum*) to *Coenagrion*. Twelve species of *Coenagrion* are known from China (Yang, 1998; Tsuda, 2000; Zhu, 2000; Dumont, 2003): *C. armatum* (Charpentier), *C. bifurcatum* Zhu and Ou-yang, *C. chusanicum* Navás, *C. dorothea* Fraser, *C. ecornutum* (Selys), *C. glaciale* (Selys), *C. hastulatum* (Charpentier), *C. holdereri* (Förster), *C. hylas* (Trybom), *C. johanssoni* (Wallengren), *C. lanceolatum* (Selys) and *C. lunulatum* (Charpentier). Here, we describe two new species, *Coenagrion aculeatum* and *Coenagrion tengchongensis* from Chongqing City and Yunnan province, China and provide diagnostic features for each species.

### *Coenagrion aculeatum* sp. nov.

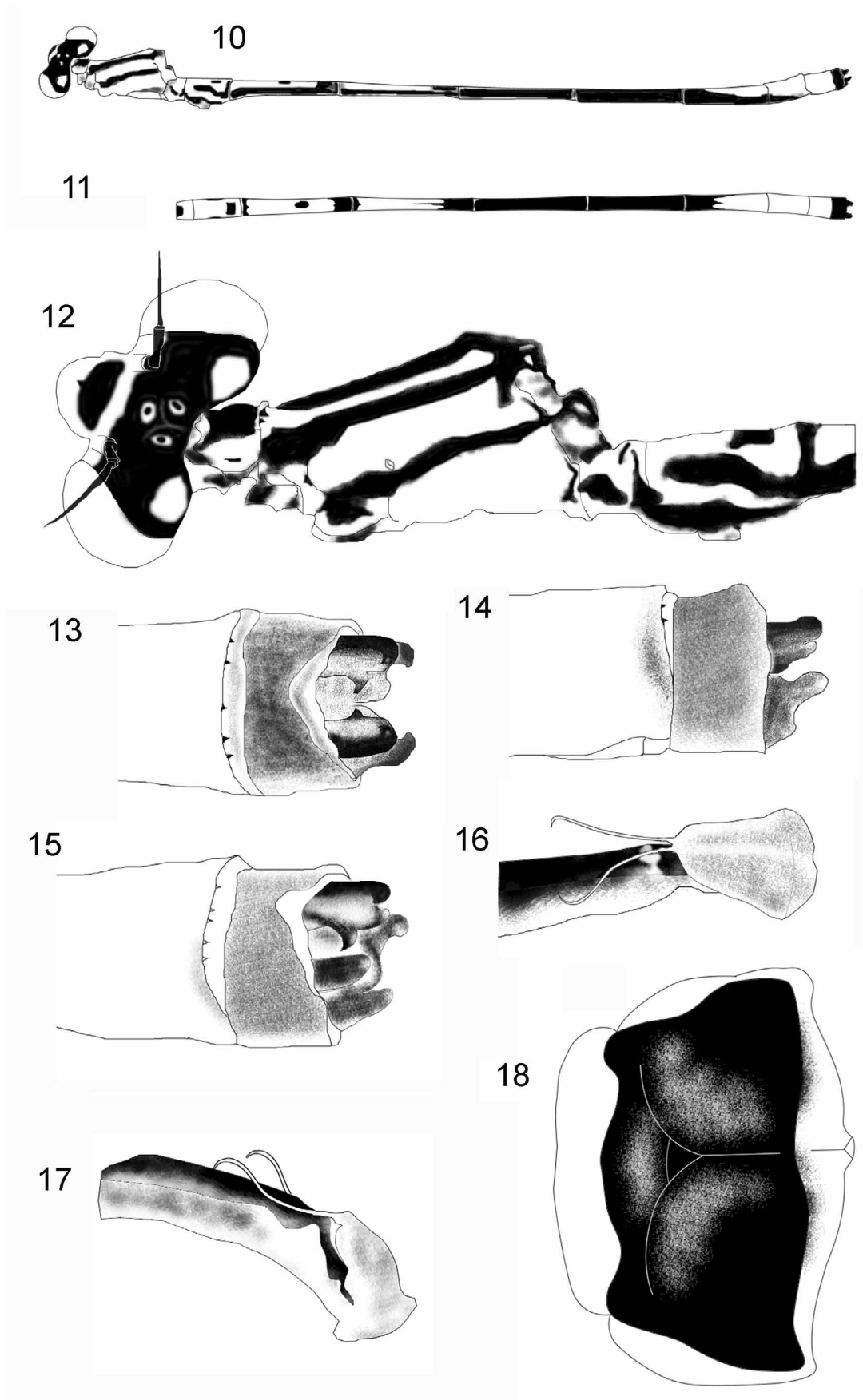
**Material. Holotype:** male, China, Chongqing, Jiangjin, 23-V-2001, Haijiang Yan leg. **Paratype:** 1 male, same data but 21-V-2001. **Holotype** will be deposited in Life Sciences College of Hebei University, Baoding, China. **Paratype** will be deposited in Institute of Entomology, Life Sciences College of Nankai University, Tianjin, China.

**Etymology.** Species epithet refers to the second pair of short spine-like lateral lobes (Battin, 1993) of the genital ligula.

**Description.** Male. Labium pale yellow. Labrum, bases of mandibles, genae, anteclypeus and frons blue; base of labrum and postclypeus black; top of head including antennae black, postocular spots blue, almost triangular; postoccipital stripe absent. Prothorax almost entirely black, blue laterally (Fig. 9); synthorax black



**FIGURES 1–9.** *Coenagrion aculeatum*, male: (1) body, lateral; (2) abdomen, dorsal; (3) head and thorax; (4) caudal appendage, dorsal; (5) caudal appendage, lateral; (6) caudal appendage, dorsal oblique; (7) penile organ, ventral; (8) penile organ, lateral; (9) pronotum.



**FIGURES 10–18.** *Coenagrion tengchongensis*, male: (10) body, lateral; (11) abdomen, dorsal; (12) head and thorax; (13) caudal appendage, dorsal; (14) caudal appendage, lateral; (15) caudal appendage, dorsal oblique; (16) penile organ, ventral oblique; (17) penile organ, lateral; (18) pronotum.

dorsally, with blue antehumeral stripes; sides blue, with a black stripe along second lateral suture (Fig. 3). Legs pale yellow with extensor surfaces of femora, flexor surfaces of tibiae, tarsi and claws black. Wings hyaline, pterostigmata brown, braced, each covering one cell. Abdomen blue with black as follows: basal half of segment 1, segment 2 with an irregular longitudinal stripe laterally and connecting above at 0.70 (Fig. 3), lateral and apical 0.20 of segments 3 and 4, almost all of segment 5 except for basal half dorsally, all of segment 6, all of segment 7 except distal dorsal 0.30 (Fig. 1); segments 8 and 9 blue except for black laterally, segment 10 entirely black. Caudal appendages black, as figured in figures 4–6. Cercus as long as segment 10, a little shorter than paraproct. Genital ligula (Figs. 7–8) with shield-like head and apical lobes in the form of a pair of flagella and with a second pair of short spine-like lateral lobes.

**Measurements** (mm): abdomen + appendages 27. 5; hind wing 18. 5.

**Diagnosis.** This new species is similar to *C. puella* (Linnaeus) in body size, coloration pattern (except for marks on the second abdominal segment), and shape of ligula, but differs by lacking the interior tooth (Battin, 1993) on the tip of the cercus. It is similar to *C. bifurcatum* in body size and coloration pattern, but lacks the bifurcate paraproct.

### *Coenagrion tengchongensis* sp. nov.

**Material. Holotype:** male, China, Yunnan, Tengchong, Zhengding, 1800m, 15-VIII-2006, Xin Yu leg. **Holotype** will be deposited at Institute of Entomology, Life Sciences College of Nankai University, Tianjin, China.

**Etymology.** Named after the name of type locality.

**Description.** Male. Labium pale white. Labrum, bases of mandibles, genae, anteclypeus and frons blue; base of labrum and whole postclypeus black; top of head including antennae black, postocular spots blue, almost circular; postoccipital stripe absent. Prothorax black dorsally, blue laterally (Fig. 18). Synthorax black dorsally, with narrow blue antehumeral stripes. Sides of synthorax blue, with a black stripe along second lateral suture (Figs. 10, 12). Legs pale blue with extensor surfaces of femora, flexor surfaces of tibiae, tarsi and claws black. Wings hyaline, pterostigmata brown, braced, each covering one cell. Abdomen blue with black as follows: segment 1 with a big basal dorsal mark and short lateral stripes, segment 2 ventrally and with a rectangular dorsal mark subdistally, long lateral stripes, and distal annulus (Fig. 12); segment 3 black ventrally and distally, with a small spot dorsally; laterally along segment 4 and apical one fourth dorsally; segments 5 and 6; segment 7 ventrally, as well as distal 0.30 dorsally and 0.50 laterally (Figs. 10–11); segments 8 and 9 almost blue except for short lateral stripes on sides of segment 8; segment 10 black. Caudal appendages (Figs. 13–15) black; cercus as long as paraproct, both a little shorter than segment 10. Genital ligula (Figs. 16–17) with shield-like head and flagella.

**Measurements** (mm): abdomen + appendages 27. 0; hind wing 19. 0.

**Diagnosis.** This new species is similar to *C. hylas* in coloration pattern and caudal appendage structure, but the genital ligula of *C. hylas* has no flagella and lacks black on the ventral surface of synthorax. The type locality for *C. tengchongensis* also includes *C. dorothea* but they can be separated from each other easily by body coloration pattern, and caudal appendage morphology; the cercus of *C. dorothea* is longer than the paraproct. *Coenagrion tengchongensis* differs from *C. aculeatum* by lacking the short spine-like lateral lobes on the genital ligula.

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