

Description of two new damselflies, *Protosticta zhengi* and *Sinosticta sylvatica*, from China (Odonata: Zygoptera: Platystictidae)

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Abstract

Two new species of Platystictidae (*Sinosticta sylvatica*, holotype male: China, Hainan, Diaoluoshan Nature Reserve, 620m, 29-V-2007; and *Protosticta zhengi*, holotype male: China, Yunnan, Xishuangbanna, Menghun, 750m, 30-V-1958; both deposited in Institute of Entomology, Nankai University, Tianjin, China) are described, and a key is provided for the identification of all described species of *Sinosticta* Wilson.

Key words: Odonata, Platystictidae, *Protosticta*, *Sinosticta*, new species, China

Introduction

Sinosticta was established by Wilson (1997) to accommodate *Drepanosticta ogatai* Matsuki & Saito (1996), found in Hong Kong, China. Wilson believed that the wing venation of *Sinosticta ogatai* was archaic and similar to Palaemnematinae Tillyard & Fraser, which is restricted to the New World. Accordingly, he established a new subfamily, Sinostictinae, to accommodate the newly established genus *Sinosticta*, characterized by two principal diagnostic features: (1) MP extending beyond the mid-point of wing and (2) males with stout, relatively simply caudal appendages. van Tol *et al* (2009) confirmed the archaic nature of Sinostictinae as the most basal clade of all Platystictidae and sister group to all other Platystictidae. According to Wilson (1997), diagnostic characters of *Sinosticta* were: (1) MP extending beyond the mid-point of the wing; (2) the presence of at least two cross-veins proximal to Cu crossing (Fig. 1); and (3) males with stout, relatively simply caudal appendages. Three species of *Sinosticta* have thus far been described, all restricted to southern China: *S. ogatai* (Matsuki & Saito, 1996) from Hong Kong, *S. hainanense* Wilson & Reels, 2001 from Hainan, and *S. debra* Wilson & Xu, 2007 from Guangdong.

Protosticta was established by Selys (1885), who included 35 species mostly from Southeast Asia. Three species of *Protosticta* have been recorded from China: *P. beaumonti* Wilson, 1997, *P. kiautai* Zhou, 1986, and *P. taipokauensis* Asahina & Dudgeon, 1987. Here, we describe two new species, *Sinosticta sylvatica* and *Protosticta zhengi* from Hainan and Yunnan province, China, respectively. Diagnostic features for each of these new species and a key for *Sinosticta* Wilson are provided.

Key to species of *Sinosticta* Wilson

- 1 Antehumeral stripe complete, as long as mesothoracic pleural suture 2
- Antehumeral stripe incomplete, only half as long as mesothoracic pleural suture..... *S. ogatai*
- 2 Postocular spots present, lateral synthorax mainly pale 3

- Postocular spots absent, lateral synthorax mainly black..... *S. hainanense*
- 3 A pair of large oval, pale spots on frons (Fig. 7); apex of cerci acute and lacking subdistal inner horns, cerci slightly longer than paraprocts (Figs. 4–5). *S. sylvatica*
- No pale spots on frons; apex of cerci not acute and having subdistal inner horns, cerci shorter than paraprocts.....
..... *S. debra*

***Sinosticta sylvatica* sp. nov.**

(Figs. 1–9)

Material. Holotype: ♂, China, Hainan, Diaoluoshan Nature Reserve, N 18° 39.978', E 109°55.954', 620m, 29-V-2007, leg. Xin Yu. **Paratype:** 1 ♂, China, Hainan, Yinggeling Nature Reserve, Hongmao, N 19°04.343', E 109°31.687', 470m, 25-V-2007, leg. Xin Yu. **Holotype** and **Paratype** will be deposited at Institute of Entomology, Life Sciences College of Nankai University, Tianjin, China.

Etymology. Species epithet is in reference to a deep forest where the new species was collected.

Description. Male. Labium, labrum, bases of mandibles, and genae yellow; anteclypeus and most parts of postclypeus greenish-blue, base of postclypeus black; frons black, with two large pale greenish-blue spots on each side (Fig. 7); vertex including antennae black, with two small yellow spots distal to each lateral ocellus (Fig. 2); postocular spots blue; postoccipital stripe absent. Anterior lobe of prothorax (Fig. 3) blue; middle lobe black dorsally, with two large circular pale blue spots each sides, and yellow laterally; posterior lobe black; synthorax (Fig. 2) black dorsally, with yellow antehumeral stripe; sides yellow, with a black stripe along mesothoracic pleural suture; legs pale yellow, with brown stripes on extensor surfaces of femora and tibiae; wings hyaline; pterostigmata deep brown, braced, each covering two cells; wing base sclerites blue. Abdomen black, with yellow and blue as follows: lateral of S1-2, lateral 0.80 of S3-8 yellow; S9-10 blue dorsally. Cerci blue, longer than S10, a little longer than black paraprocts (Figs. 4–6). Head of genital ligula round, with digit-like apical lobes, short lateral branch on each apical lobe (Figs. 8–9).

Measurements (mm): abdomen + appendages 40.0; hind wing 29.0.

Diagnosis. This new species is similar to *Sinosticta debra* in body size and coloration pattern, but differs by cerci a little longer than paraprocts, cerci apex acuter than *S. debra* and without subdistal inner horns. Also, unlike *S. debra*, the new species lacks narrow black stripe along the third lateral suture (Fig. 2) but has a pair of large pale colored spots on the frons (Fig. 7).

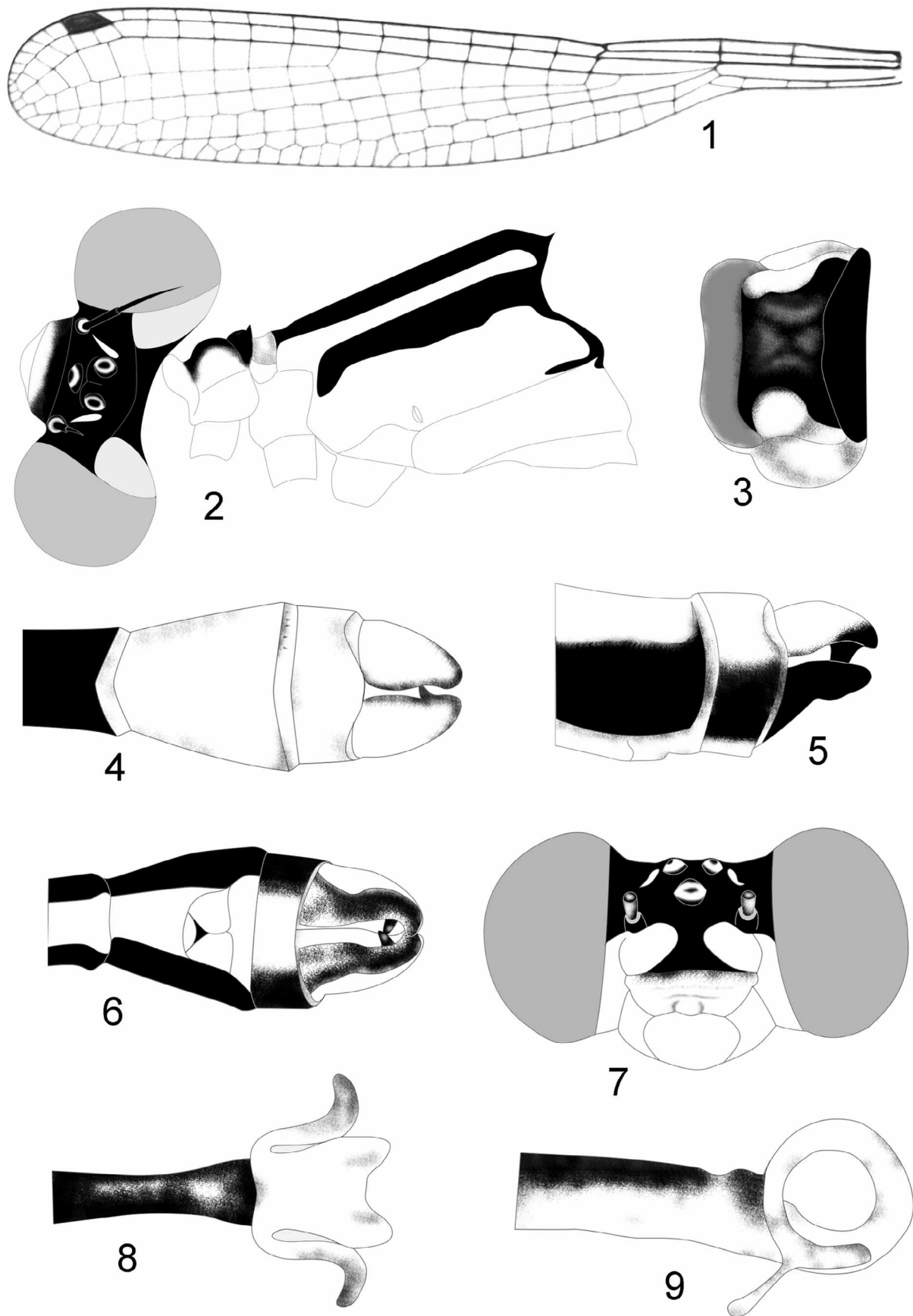
***Protosticta zhengi* sp. nov.**

(Figs. 10–15)

Material. Holotype: ♂, China, Yunnan, Xishuangbanna, Menghun, 750m, 30-V-1958, leg. Leyi Zheng. **Holotype** will be deposited at Institute of Entomology, Life Sciences College of Nankai University, Tianjin, China.

Etymology. Species epithet is in honor of the collector Professor Le-yi Zheng.

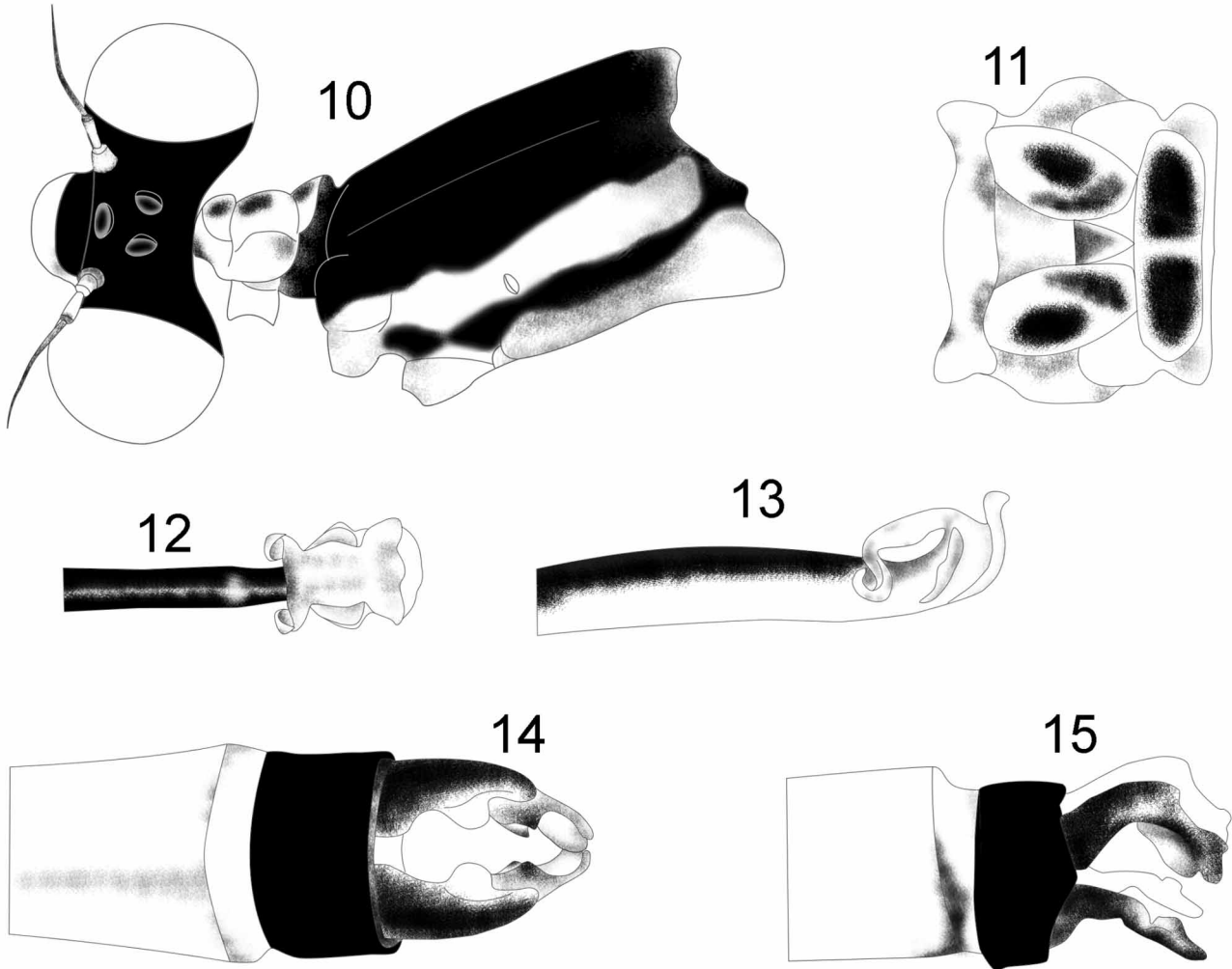
Description. Male. Labium pale yellow; labrum, bases of mandibles, and anteclypeus pale blue; postclypeus, genae, frons, and anterior half of vertex shining black; posterior half of vertex dull black; base of postclypeus and middle of frons with yellow marks; antennae dark brown, except the first two segments pale yellow; postocular spots and postoccipital stripe absent (Fig. 10). Prothorax pale yellow, with black marks (Fig. 11); synthorax (Fig. 10) black dorsally, with pale yellow dorsal carina; antehumeral stripe absent; sides of synthorax black above interpleural suture, pale yellow below, with a black stripe along metathoracic pleural suture; legs pale yellow, with black stripes on extensor surfaces of femora; wings hyaline; pterostigmata trapezoidal, dark brown, each covering two cells. Abdomen black, with pale yellow as follows: lateral of S1-2, 0.20 and 0.6–0.8 of S3-6, lateral 0.20 of S7-8; S9 wholly pale blue, S10 wholly black. Caudal appendages black, cerci longer and more robust than paraprocts (Figs. 14–15). Genital ligula with shield like head and curved apical lobes (Figs. 12–13).



FIGURES 1–9. *Sinosticta sylvatica* sp. nov., male: (1) left forewing; (2) head and thorax; (3) pronotum, dorsal; (4) caudal appendages, dorsal; (5) caudal appendages, lateral; (6) caudal appendages, ventral; (7) face; (8) genital ligula, ventral; (9) genital ligula, lateral.

Measurements (mm): abdomen + appendages 44.0; hind wing 21.0.

Diagnosis. This new species is similar to *Protosticta beaumonti* and *Protosticta curiosa*, but differs from *P. beaumonti* by having dark marks on dorsum of prothorax (Fig. 11) and lacking an apical thorn on paraprocts (Figs. 14–15), and differs from *P. curiosa* by having curved apical lobes on top of genital ligula (Figs. 12–13).



FIGURES 10–15. *Protosticta zhengi* sp. nov., male: (10) head and thorax; (11) pronotum, dorsal; (12) genital ligula, ventral; (13) genital ligula, lateral; (14) caudal appendages, dorsal; (15) caudal appendages, lateral.

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References

Asahina, S. (1978) Notes on Chinese Odonata, 9. Kellogg Collection in the U.S. National Museum of Natural History. *Tombo*, 21(1–4), 2–14.

- Asahina, S. (1997) Records of the northern Vietnamese Odonata taken by the expedition members from the National Science Museum, Tokyo. 6. Platystictidae, Megapodagrionidae, Lestidae and Synlestidae. *Bulletin of the National Science Museum, Series A (Zoology)*, 23(2), 107–113.
- Asahina, S. & Dudgeon, D. (1987) A new platystictid damselfly from Hong Kong. *Tombo*, 30(1–4), 2–6.
- Davies, D.A.L. & Tobin, P. (1984) The Dragonflies of the World. Vol. 1. Utrecht: *Societas Internationalis Odonatologica Rapid Communications (Supplements)* No.3. [ix]+127pp.
- Fraser, F.C. (1933) Dragonflies from the Laos Country. *Journal of the Siam Society, Natural History Supplement*, 9(1), 109–141.
- Matsuki, K. & Saito, Y. (1996) A new species of *Drepanosticta* from Hong Kong (Odonata: Platystictidae). *Nature & Insects*, 31(3), 39–43.
- Rehn, A. C. (2003) Phylogenetic analysis of higher-level relationships of Odonata. *Systematic Entomology*, 28, 181–239.
- Selys-Longchamps, Edm. de. (1885) Programme d'une révision des Agrionines. *Comptes-rendus de la Société Entomologique de Belgique* 29: cxli–cxlvi (reprint 1–8).
- Tsuda, S. (2000) *A distributional list of world Odonata*. privately published, Osaka, 430 pp.
- van Tol, J. (2005) Revision of the Platystictidae of the Philippines (Odonata), excluding the *Drepanosticta halterata* group, with descriptions of twenty-one new species. *Zoologische Mededelingen*, 79(2), 195–282.
- van Tol, J., Reijnen, B. T. & Thomassen, H. A. (2009) Phylogeny and biogeography of the Platystictidae (Odonata). pp. 3–70 *In*: van Tol, J. Phylogeny and biogeography of the Platystictidae (Odonata). PhD. thesis, University of Leiden. x + 294pp.
- Wilson, K.D.P. (1997) The Platystictidae of Hong Kong and Guangdong, with descriptions of a new genus and two new species (Zygoptera). *Odonatologica*, 26(1), 53–63.
- Wilson, K.D.P. & Reels, G.T. (2001) Odonata of Hainan, China. *Odonatologica*, 30(2), 145–208.
- Wilson, K.D.P. (2003) *Field guide to the dragonflies of Hong Kong*. Agriculture, Fisheries and Conservation Department, Hong Kong. 381 pp.
- Wilson, K.D.P. & Reels, G. T. (2003) Odonata of Guangxi Zhuang Autonomous Region, China, part I: Zygoptera. *Odonatologica*, 32(3), 237–279.
- Wilson, K.D.P. & Xu, Z.F. (2007) Odonata of Guangdong, Hong Kong and Macau, South China, part 1: Zygoptera. *International Journal of Odonatology*, 10(1), 87–128.
- Zhou, W.B. (1986) *Protosticta kiautai* spec. nov., a new platystictid dragonfly from China (Zygoptera). *Odonatologica*, 15(4), 465–467.