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## Description of *Atrocalopteryx fasciata* spec. nov. from Yunnan, China (Odonata: Calopterygidae)

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### Abstract

*Atrocalopteryx fasciata* Yang, Hämäläinen & Zhang, spec. nov. (holotype ♂, from China, Yunnan, Dehong, Yingjiang, deposited at Odonata Collection of College of Agriculture and Life Sciences, Dali University, Dali, Yunnan, China) is described and illustrated from the male sex. It is compared with *Atrocalopteryx laosica* (Fraser, 1933).

**Key words:** Odonata, Calopterygidae, *Atrocalopteryx*, new species, Yunnan, China

### Introduction

During a trip to Yunnan surveying dragonflies in December 2012, the third author Hao-miao Zhang (HMZ) visited Guo-hui Yang (GHY) at Dali University and studied odonate specimens in her personal collection. The material originated mainly from the following areas of Yunnan: Bai Autonomous Prefecture of Dali, Dai-Jingpo Autonomous Prefecture of Dehong, Zang Autonomous Prefecture of Diqing, Baoshan City, Lijiang City and Zhaotong City. The collection contained many interesting species, especially of the families Gomphidae, Libellulidae and Calopterygidae. Among the calopterygid material was one envelope that contained three male specimens of a strange calopterygid species. One specimen was retained by HMZ collection for further study. As it was thought to represent a potential new species, he sent photographs of it to Matti Hämäläinen (MH). MH provisionally determined it as a new species of *Atrocalopteryx*, this opinion being confirmed when another male specimen from Yang's collection was sent to him for examination in late November 2013.

***Atrocalopteryx fasciata* Yang, Hämäläinen & Zhang, sp. nov.**

(Figs. 1–2, 4–5, 8–10)

**Material studied: Holotype** ♂: China, Yunnan Province, Dai-Jingpo Autonomous Prefecture of Dehong, Yingjiang County, 18 August 1998, Ying-ju Zhang leg. Deposited in the Odonata Collection of the College of Agriculture and Life Sciences, Dali University, Yunnan, China.

**Paratypes:** 2 ♂, same data as for the holotype. Deposited in the collections of M. Hämäläinen and H-m. Zhang, respectively.

**Etymology.** The specific epithet *fasciata*, a Latin adjective meaning ‘banded’, refers to the opaque, brownish transverse band in the central part of the wings.

**Description of holotype male** (Fig. 1). Head: Labium yellow and black; middle lobe largely black with lateral borders yellow; lateral lobes largely yellowish with black areas, the hooks being black. Labrum black with a pair of conspicuous yellow spots; base of mandibles yellow; clypeus, frons and vertex dark metallic green; anteclypeus with small yellow marking; base of antennae with yellow markings on scape and pedicel; tiny, vestigial postocular tubercle present.

Thorax: Prothorax dark, lustrous, metallic green throughout. Synthorax dark lustrous metallic green; metepimeron with broad yellowish ochre borders, same colour extending apicad over apical corner of metepisternum below stigma and over entire metinfraepisternum. Apical border of mesepimeron also obscurely yellowish. Ventral side of synthorax yellow-ochre, except poststernum which has a blackish triangular mark. Legs largely black; hind coxa largely yellow-ochre; fore and middle coxa with yellow-ochre marks. Middle and hind femora with yellowish stripes, more distinct in hind femur. Hind tibiae distinctly curved; middle tibiae slightly curved (Fig. 1).

Wings: Wings lightly tinted with amber brown, with distinct dark brown, opaque, transverse bands centrally (cf. Figs. 4–5). Brownish colour extending obliquely toward wing bases, more distinctly so in fore wing, in which the subcostal field has a distinct brownish colour. Main longitudinal veins brown throughout wings, seemingly paler within the brown bands due to the contrasting background. Median space open, without cross veins. Cubital field with 17–18 cross veins in fore wing, 16–18 in hind wing. Quadrangle with 11–12 cross veins in fore wing, 10–12 in hind wing. Antenodals (the first series) number 43–46 in fore wing and 39–40 in hind wing.

Abdomen: Lustrous metallic green with limited pale markings as follows; lower side of S1 with a tiny yellow spot anteriorly, ventral margin of tergum of S2 with brownish yellow streak, tergum of S8 with pale brownish streak along ventral margin, lower third of tergum of S10 brownish yellow (Fig. 8). Sternites of S8–10 pale ochre. Appendages black, except basal part of inferiors which are pale ochre beneath. Superior appendages somewhat tapered for basal 3/5, then bent inwards, the distal part expanding apically and bearing strong outer spines. Inferior appendages slightly bent inwards subapically (cf. Fig. 9), inner margin with very small apical spine, only visible in oblique lateral view.

**Measurements** (mm): Abdomen (incl. appendages) 55; hind wing 40.

**Variation in paratype males.** The size of the yellow spots on the labrum is somewhat variable; in the first paratype the spots are much larger than in the holotype. In the second paratype (Figs. 2, 4–5) the yellowish stripes on middle and hind tibiae are very obscure. There are small differences in venational details, the greatest deviations being: only 13 cross veins in cubital field in one fore wing of the first paratype, only 9 crossveins in quadrangle in one fore wing of both paratypes, only 39 antenodals in one fore wing and 35 antenodals in one hind wing of the second paratype.

**Measurements** (mm): Abdomen (incl. appendages) 54; hind wing 40.

**Female.** No specimens available for the authors to study, but see below.

**Remarks.** Zhou (1987) recorded "*Calopteryx laosica* Fraser" from Yunnan based on 4 male and 3 female specimens collected in Tongbiguang Village, Yingjiang County, Dai-Jingpo Autonomous Prefecture of Dehong, Yunnan Province, China, on 26 May 1983. He provided short descriptions of both sexes. The description of male matches well with our specimens of *Atrocalopteryx fasciata* spec. nov., and we are convinced that Zhou's specimens are conspecific with it. According to Zhou (text extracts translated from Chinese) the male has "amber-coloured wings, paler at base and apex and deeper coloured in the middle, forming a coloured median band", which is a good character for this new species. Also the size of Zhou's specimens matches *A. fasciata*: abdomen (incl. appendages) 53–57 mm and hind wing 39–43 mm.

Zhou also described the female sex in a few words: "Body colour similar to that of male, differing from the male as follows: labrum yellow, base and anterior margin with black stripes, S8–10 with yellow mid-dorsal stripes and larger yellow spots on ventro-lateral sides. One female with the brown band on wings inconspicuous. Wings without pterostigma". Length of abdomen: 45–46 mm, hind wing 41 mm.

**Distribution.** *A. fasciata* is so far known only from Dehong Prefecture in Yunnan. Its flight period extends at least from late May to late August.

### Distinguishing characters

Hämäläinen (in press) discusses the species presently included in *Atrocalopteryx* Dumont et al., 2005, remarking on the difficulties of finding reliable morphological characters to define the genus. In the same paper *Calopteryx laosica* Fraser, 1933 is transferred to *Atrocalopteryx* and a key to both sexes of the species of *Atrocalopteryx* is included.

Of the known species in the genus, the general habitus of *A. fasciata* resembles most closely that of *A. laosica*, a species originally described from central Laos (Fraser, 1933). *A. laosica* occurs also in northern Vietnam (Do & Dang, 2007; Hämäläinen, in press) and is also believed to occur in southern Yunnan. We have seen a photograph of a male calopterygid taken in nature in Pu'er City, Yunnan, which seems to resemble *A. laosica*, but a voucher specimen is still needed to confirm its occurrence there.

MH has studied the holotype of *A. laosica* (a rather teneral male specimen) and several specimens of *A. laosica* collected in Vietnam (from Sapa in Lao Cai province, near the Yunnan border) and from an unspecified locality in northern Vietnam. *A. laosica* is larger than *A. fasciata* (cf. Figs 1–3), the measurements of male being: abdomen (incl. appendages) 59–61, hind wing 43–46. In *A. laosica* male the brownish opaque area on both wings (Figs. 6–7) is much more extensive than in *A. fasciata* (Figs. 4–5). In the hind wing of *A. laosica*, within the opaque section, there is a somewhat darker transverse infuscation near the apical end of the opaque section; the darker colour extends basad and apicad near the lower border of wing. This infuscation is most visible in teneral specimens. The venation of *A. fasciata* is distinctly more "open" than that of *A. laosica*, i.e. there are fewer cross veins throughout the wings. This is best seen in the tips of wings (cf. Figs. 10–11). Other structural differences include the presence of a tiny postocular tubercle in *A. fasciata*; in *A. laosica* it is absent. In *A. laosica* the yellowish markings on head, thorax and abdomen are somewhat more restricted.

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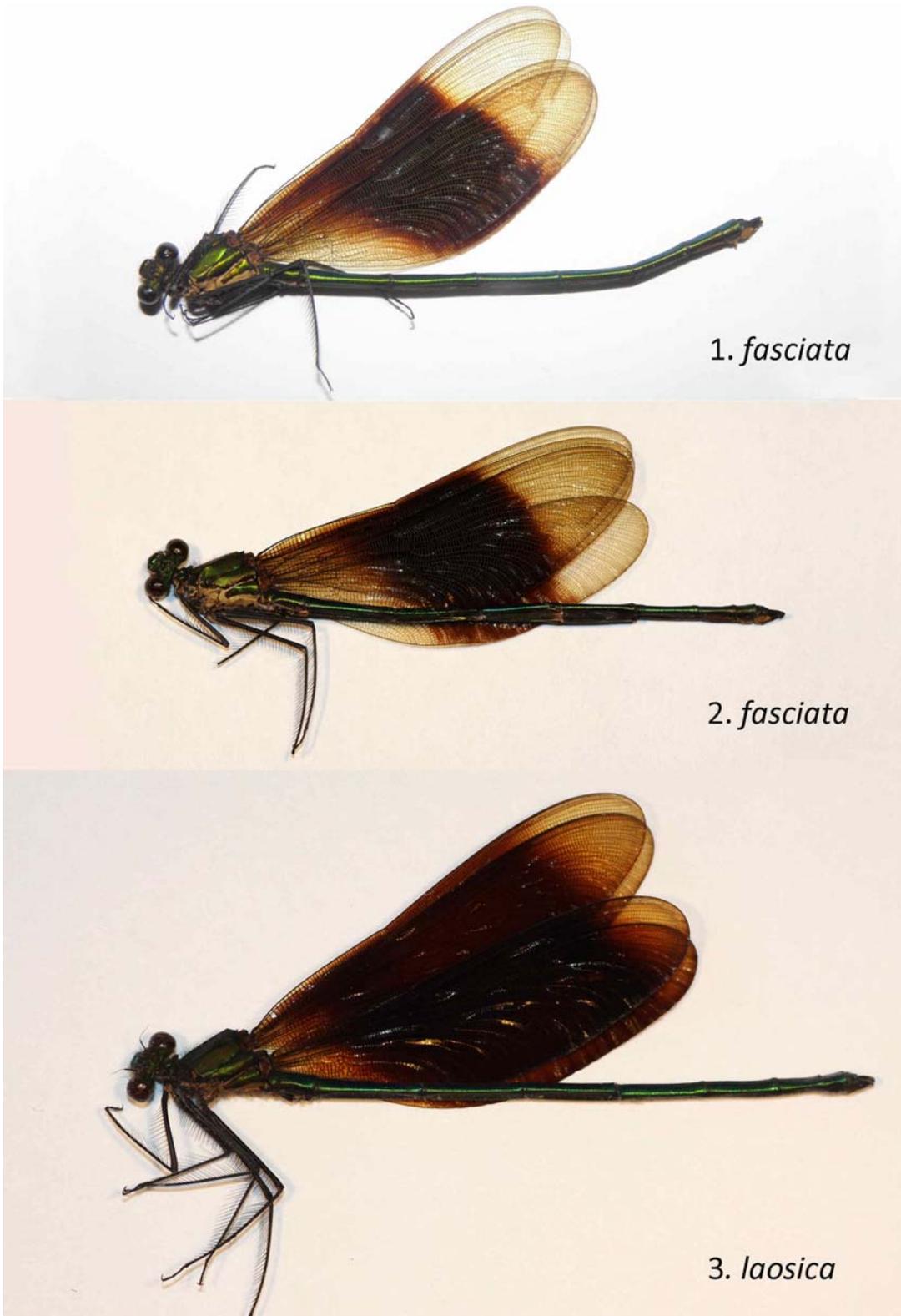
## References

Do, M.C. & Dang, T.T.H. (2007) Checklist of dragonfly from Vietnam. Vietnam National University Publisher, Hanoi, 4 + 182 pp.

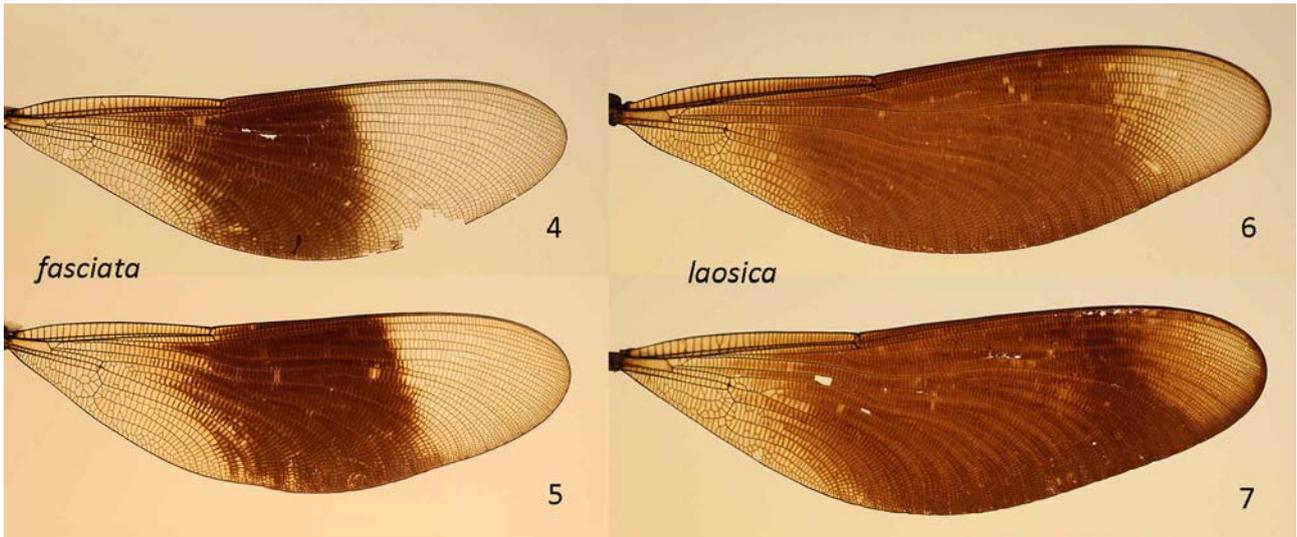
Fraser, F.C. (1933) Dragonflies from the Laos country. The journal of the Siam Society, Natural History Supplement, 9, 109– 141.

Hämäläinen, M. (2014) *Atrocalopteryx auco* spec. nov. from Vietnam, with taxonomic notes on its congeners (Odonata: Calopterygidae). Zootaxa, in press.

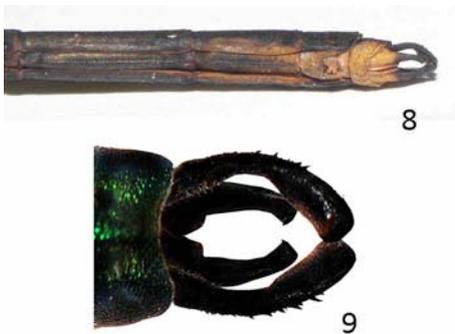
Zhou, W.-B. (1987) *Calopteryx laosica* – new record from China. Entomotaxonomia, 9, 248. [in Chinese]



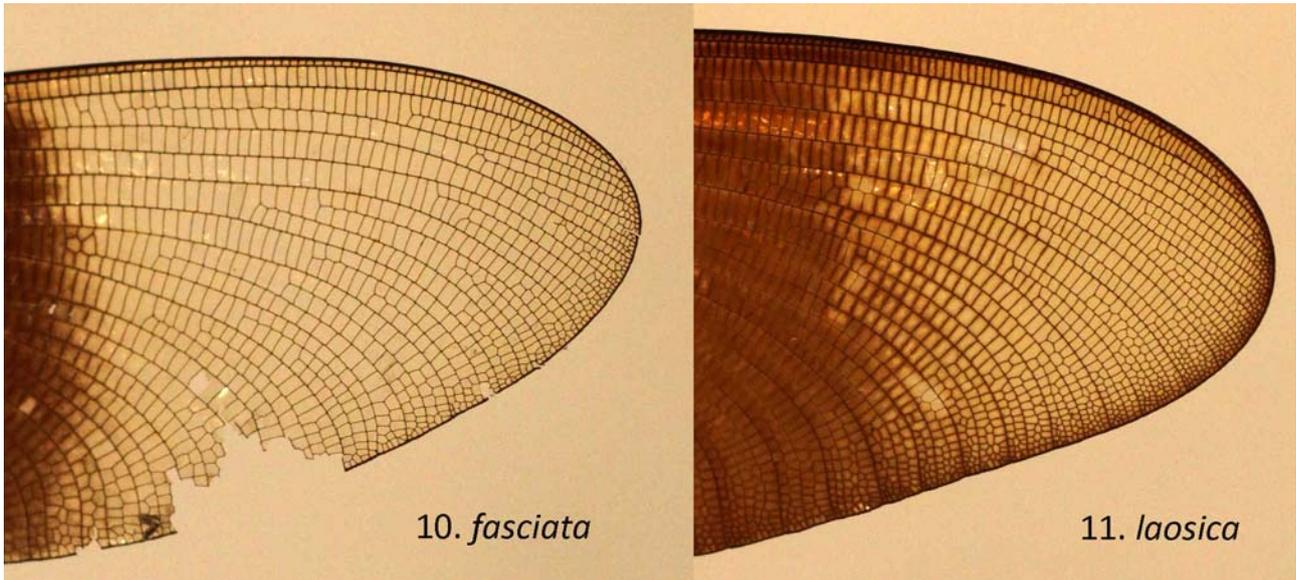
**FIGURES 1–3.** Habitus. 1) *Atrocalopteryx fasciata* spec. nov., holotype male; 2) *Atrocalopteryx fasciata* spec. nov., paratype male; 3) *Atrocalopteryx laosica*, a male specimen from Vietnam (Sapa). Specimens shown at the same scale.



**FIGURES 4–7.** Wings. 4) *Atrocalopteryx fasciata* spec. nov., fore wing of paratype male; 5) *Atrocalopteryx fasciata* spec. nov., hind wing of paratype male; 6) *Atrocalopteryx laosica*, fore wing of a male specimen from Vietnam (Sapa); 7) *Atrocalopteryx laosica*, hind wing of a male specimen from Vietnam (Sapa).



**FIGURES 8–9.** *Atrocalopteryx fasciata* spec. nov. 8) underside of abdomen tip of holotype male; 9) dorsal view of anal appendages of paratype male.



**FIGURES 10–11.** Tip of forewing. 10) *Atrocalopteryx fasciata* spec. nov., paratype male; 11) *Atrocalopteryx laosica*, a male specimen from Vietnam (Sapa).