

***Dysphaea haomiao* sp. nov. from China and Vietnam (Odonata: Euphaeidae)**

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Dysphaea haomiao sp. nov. (holotype ♂, China, Guizhou, Libo County, Xiaoqikong Scenic Area, Zhangjiang River, alt. c.450 m, 7 May 2007) is described and illustrated for both sexes. The male differs from its closest congeners, *Dysphaea basitincta* and *D. gloriosa*, by the blackish, completely opaque coloration of its wings.

Keywords: Odonata; Euphaeidae; *Dysphaea*; new species; China; Guizhou; Vietnam

Introduction

Dysphaea Selys is a small genus of oriental damselflies with half a dozen recognized species. Recently Dr Haomiao Zhang presented to me several interesting specimens of *Dysphaea* for study, which he had collected at the Zhangjiang River in Libo County in the southern part of Guizhou Province. The male specimens have blackish, completely opaque wings, which are proportionally broader than the partly hyaline wings of *D. basitincta* Martin, 1904, as the males had earlier been treated (Zhang, 2010, 2011). The female specimens, collected at the same stream in 2010, differ from the female of *D. basitincta* in many details of colour pattern. This fact, as well as the absence of ‘typically coloured’ *D. basitincta* at the site, led both Haomiao Zhang and me to conclude that the specimens represent a distinct new species, rather than a colour form of *D. basitincta*.

***Dysphaea haomiao* sp. nov.**

(Figures 1, 2, 4–5)

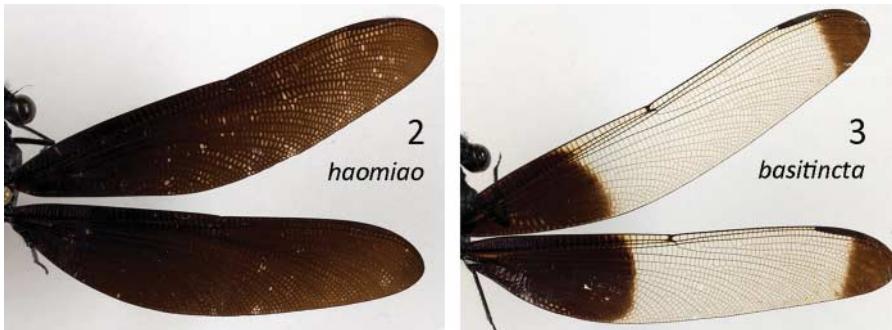
Specimens examined

Holotype ♂. China, Guizhou, Libo County, Xiaoqikong Scenic Area, Zhangjiang River, alt. c.450 m [25° 15' N, 107° 44' E], 7 May 2007, Zhang Haomiao leg. Deposited at RMNH (Leiden, the Netherlands).

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Figure 1. *Dysphaea haomiao* sp. nov., habitus of the holotype male.



Figures 2–3. (2) Wings of *Dysphaea haomiao* sp. nov., paratype male, collected on 7 July 2010. (3) Wings of *Dysphaea basitincta* male from Vietnam, Hoa Binh province, Co Luang, 11 June 2008, M. Hämäläinen leg.

Paratypes (all Zhang Haomiao leg.). 1 ♂, same locality and date as holotype; 8 ♂, 3 ♀, same locality as holotype, 9 June and 6–7 July 2010.

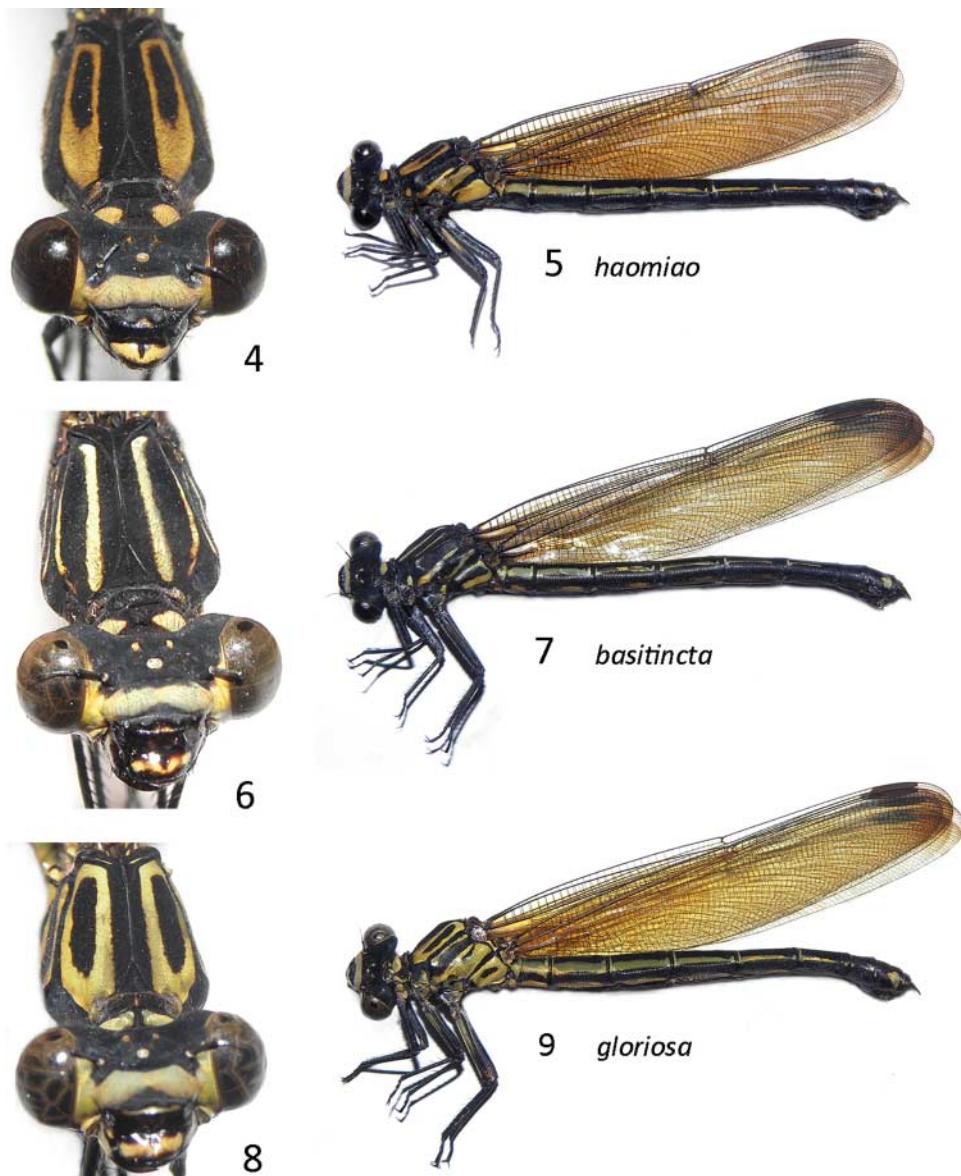
Other specimens. 3 ♂, Vietnam, Cao Bang province, Pac Nga, Trung Khanh, 30 May 2009, Phan Quoc Toan leg.

Etymology

The new species is named after Dr Haomiao Zhang, an enthusiastic and gifted odonatologist, in recognition of his achievements in the study of Chinese dragonflies and in appreciation of his fruitful collaboration with the author and generosity in sharing specimens and information. The specific epithet *haomiao* is a noun in apposition (in the nominative case).

Diagnosis

A *Dysphaea* species with male wings black and opaque throughout.



Figures 4–9. (4–5) *Dysphaea haomiao* sp. nov., paratype female, collected on 6 July 2010. (6–7) *Dysphaea basitincta*, female from Hainan, Yinggeling Reserve, Nankai River, 1–4 May 2011, Zhang Haomiao leg. (8–9) *Dysphaea gloriosa*, female from Hainan, Yinggeling Reserve, Nankai River, 1–4 May 2011, Zhang Haomiao leg.

Description of male holotype (Figures 1–2)

Head. Labium, labrum, base of mandibles and clypeus shining black, frons and vertex matt black with a largely obscured yellowish band across frons.

Thorax. Matt black, with obscure yellowish brown markings as follows: round spot on middle lobe of prothorax; synthorax with narrow stripe on mesepimeron above the first lateral suture extending 3/4 length of suture from the base; very obscure yellow band on metepisternum above

running along much of second lateral suture and continuing on to posterior part of metinfraepisternum and metacoxa; metepimeron with broad dull yellow band along posterior margin and small dorsal yellow spot anteriorly, the two patches almost connected to form an incomplete loop delineating the dorsal margin of the metepimeron; pale yellow spots posteriorly in mesinfraepisternum and coxae. Legs otherwise black.

Wings. Wholly opaque black, slightly less darkened in apical fourth (Figure 2). Venation typical of the genus. Forewings with 34–35 antenodals in the first row; hind wings correspondingly with 27–28 antenodals. Quadrangle with 3 crossveins in forewing, 2–3 in hind wing. Cubital space with 3 crossveins in forewing and 3–4 in hind wing. Pterostigma long, covering 8–9 underlying cells.

Abdomen. Matt black, with narrow, pale half rings dorsally at apex of S3–8, interrupted by black middorsally. Obscure, pale dots posteriorly on sides of S1–2 and narrow stripe of the same colour on S3. Appendages of typical shape for genus; entirely black.

Penis. The structure resembles that illustrated for *D. basitincta* by Wilson and Reels (2003, p. 251, figure 24).

Measurements (mm). Forewing 38, hind wing 36, abdomen 39.

Variation in paratype males

In teneral specimens the pale markings on the synthorax are more distinct and broader and there is also a narrow stripe along the humeral suture. In old specimens the frons is entirely black and the markings on the pro- and synthorax turn reddish brown and are reduced or partly absent. In some specimens there is also a yellow lateral stripe on S4–5. The number of antenodals varies to some extent. The number of crossveins varies from 2 to 4 in the quadrangle and from 2 to 4 in the cubital space.

Measurements (mm). Forewing 39–41, hind wing 36.5–38.5, abdomen 40–42.

Description of female (Figures 4–5)

Head. Labium black, lateral lobes yellow with black hooks. Centre of labrum broadly yellow, with long, narrow black indentation posteriorly. Base of mandibles largely yellow. Clypeus black. Frons with broad transverse yellow band connected to yellow area of genae. Vertex matt black (Figure 4).

Thorax. Prothorax black with rounded large yellow spots on either side of dorsum of middle lobe. Synthorax matt black, with broad yellow bands and patches as in Figures 4–5. Yellow area on mesepisternum completely encircling black area in upper half. Yellow stripe on mesepimeron above first lateral suture extending 3/4 length of suture from the base, as in male. This stripe centrally contiguous with broad yellow band on metepisternum. Metepimeron with broad yellow band. Pale spot ventrally on mesinfraepisternum. Legs black with yellowish outer streaks on middle and hind femora.

Wings. Hyaline with strong brownish tint throughout. Venation as in male. Forewings with 29–33 antenodals in first row; hind wings with 25–29. Quadrangle with 2–3 crossveins in forewing, 2–3

in hind wing. Cubital space with 3–5 crossveins in forewing and 3–5 in hind wing. Pterostigma long, covering 9–12 underlying cells.

Abdomen. Matt black, with yellow markings as follows. Broad, anteriorly incised triangle on side of S1. Lateral bands or streaks on S2–7, broadest on S2–3 and narrowing towards apical segments. On S2–5 band occupies almost whole segment except posterior segmental rings, and projects to form dorsal tooth at its posterior margin; on S4–7 pale area also projecting dorsally to form tooth at base of segment; on S6–7 band does not reach apex of segment. Tiny lateral dots are present basally and apically on S8. Distinct, triangular or square lateral spot present at apical part of S9. Ventral edge of segments S1–9 very narrowly pale. Appendages black.

Measurements (mm). There is a considerable variation in the proportional lengths of wings and abdomen in the three female specimens available, the ratio hind wing/abdomen ranging from 1.01 to 1.10. Therefore the measurements are given separately for each specimen.

(1, specimen in Figure 5): forewing 38, hind wing 36, abdomen 35.5; (2) forewing 40, hind wing 38, abdomen 34.5; (3) forewing 37, hind wing 36, abdomen 33.

Habitat and notes on biology

The type locality of this species, the Zhangjiang River, is about 30 m wide, shallow (about 30–100 cm deep) and slow flowing. Its banks are well vegetated. *D. haomiao* is very abundant on the river. According to observations by Haomiao Zhang, males are active during the daytime, holding their territories near the river's edge. Most of the time they perch on the tips of emergent plants or on large boulders. Sometimes when flying they spend long periods gliding like anisopterans with wings held outspread. During territorial contests males fly very rapidly and on occasion they also fight with the males of another euphaeid species, *Euphaea superba* Kimmins, 1936, which is also plentiful on the river. Females usually remain in trees not far from the water where they often perch very high. When a female arrives at the river, males soon spot it and give chase; copulation takes place perching on a plant. Then the pair will fly in tandem for a long time to find a suitable place for oviposition. *D. haomiao* has been recorded on the wing from early May to late July.

Other calopterygoid damselflies on the same stream include the chlorocyphids *Indocypha katharina* (Needham, 1930) and *Heliocypha perforata* (Percheron, 1835) and the calopterygid *Neurobasis chinensis* (Linnaeus, 1758) (Zhang, 2010, 2011).

Distribution

China (Guizhou and Guangxi) and Vietnam (Cao Bang and Quang Binh).

Discussion

Although not available for this study, I am strongly inclined to think that the black winged male specimens from Guangxi, identified as *D. basitincta* [1 ♂, Nonggang, 23 May 1998; 1 ♂, Mulun, 20 July 1998] by Wilson and Reels (2003) also belong to *D. haomiao*. The colour pattern and shape of wings they illustrate support this conjecture. In addition it is likely that *D. haomiao* occurs also in Quang Binh province in central Vietnam. I have seen field photos of male individuals of

a black winged *Dysphaea* species photographed at Phong Nha-Ke Bang national park by Philip Steinhoff on 6 July 2011 and 24 July 2011. No specimens were collected there.

Three species of the genus *Dysphaea* are now known from China and Indochina: *D. basitincta*, *D. gloriosa* Fraser, 1938 and *D. haomiao*. *Dysphaea basitincta* is known to occur in Hainan and Guangxi in China and in northern Vietnam, where it has been recorded from Ninh Binh, Hoa Binh, Lang Son and Bac Can provinces. *D. gloriosa* has a wider distribution; it is known from central and northern Thailand, Cambodia, Laos and southern and northern Vietnam. In China it is known to occur in Hainan and Yunnan. It has also been reported from the northern Cachar Hills in Assam by Asahina (1985) and from East Khasi Hills in Meghalaya by Terzani and Carletti (1998). *D. gloriosa* undoubtedly occurs also in Burma, although no records are yet available.

Distinguishing characters

Males of these three *Dysphaea* species are easy to separate by the colour pattern of the wings. The wings of *D. gloriosa* have a golden amber tint, which is somewhat less intense in the apical third; the tips of both wings are slightly darkened. In *D. basitincta* the base and apex is black and opaque in both wings, the intermediate area being hyaline (Figure 3). In *D. haomiao* the wings are opaque black throughout (Figure 2). In *D. haomiao* males the wings are proportionally slightly broader than in *D. basitincta*.

Females are more difficult to separate. In *D. haomiao* the wings are proportionally slightly broader and more rounded at the apex than in *D. basitincta* or *D. gloriosa*. The mature females of *D. basitincta* and *D. haomiao* differ in many points of colour pattern (cf. Figures 4–7). In *D. haomiao* the broad yellow antehumeral and humeral bands on the mesepisternum are combined and form a complete loop encircling a black area in the apical part (Figure 4); in *D. basitincta* the antehumeral and humeral (narrower) bands on the mesepisternum are completely separate, the antehumeral band being broader (Figure 6). In *D. haomiao* the lateral bands on the sides of synthorax are broad (Figure 5); whereas in *D. basitincta* the yellow bands on the side of the synthorax are separate or broadly invaginated with black (Figure 7). In *D. basitincta* the legs are black, but in *D. haomiao* there are conspicuous exterior yellow streaks on mid and hind femora. The wing tips of *D. basitincta* are darkened, whereas in *D. haomiao* they are uniformly tinted. Unlike *D. haomiao*, in *D. basitincta* the lower edges of the abdominal terga on S1–6 bear yellowish streaks.

The colour pattern of *D. gloriosa* females is somewhat more variable. In all (mature) specimens studied the pale bands on the mesepisternum (Figure 8) form a complete loop (as in *D. haomiao*). The size of the encircled black area is variable and there appears to be some variation (perhaps partly age dependent) in the form of the pale bands on the side of the synthorax. Since only a small number of female specimens were available for study, no definite conclusions can be drawn from this variation. However, in *D. gloriosa* specimens from western and northern Thailand and from Hainan (Figure 9) the bands on the metepisternum and metepimeron are broad with relatively slight black intrusions, resembling the condition found in *D. haomiao*. In a specimen from southern Vietnam, illustrated by Asahina (1985, p. 30, figure 33), these bands have more extensive black markings, and in available specimens from Chantaburi in south-east Thailand and Cambodia these bands are quite similar to *D. basitincta* (cf. Figure 7). In *D. gloriosa* the middle and hind femora also have yellow streaks. In *D. gloriosa* the lower edge of the abdominal terga on S1–6 bear yellowish streaks, absent in *D. haomiao*. The differences in the proportional lengths of wings and abdomen (as evident in Figures 5, 7, 9) are not diagnostic. Considerable individual variation in the hind wing/abdomen length ratio is known at least in females of *D. haomiao* and *D. gloriosa*.

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