



## A description of *Echo perornata* spec. nov. from Xizang (Tibet), China (Odonata: Calopterygidae)

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### Abstract

*Echo perornata* Yu & Hämäläinen, spec. nov. (holotype ♂, China, Xizang Autonomous Region [Tibet], Motuo [Medog], alt. 850m, 1 vii 1983) is described and illustrated for both sexes. The new species has a pale pterostigma shaped quite similarly to that of *Echo margarita* Selys, 1853, but it differs in wing colour pattern and structure of the penis. *E. margarita* is recorded from China (Yunnan, Ruili) for the first time.

**Key words:** Odonata, Calopterygidae, *Echo perornata*, new species, China, Xizang, Tibet

### Introduction

*Echo* Selys, 1853 is a small genus of oriental calopterygids. In recent checklists of world Odonata four species have been included in this genus, namely *Echo margarita* Selys, 1853 (with its subspecies *tripartita* Selys, 1879), *E. uniformis* Selys, 1879, *E. modesta* Laidlaw, 1902 and *E. maxima* Martin, 1904. However, the latter species is clearly misplaced in this genus (cf. Fraser 1929, Fraser 1934, Phan & Hämäläinen 2011).

While studying the odonate collections of the Institute of Zoology, Chinese Academy of Sciences in Beijing and those of the Shanghai Entomological Museum, Chinese Academy of Sciences in Shanghai, the first author came across two male and three female specimens of an *Echo* species, collected in Motuo [Medog], Xizang [Tibet] in 1979–1983. These specimens, incorrectly identified as *Echo m. margarita* in both museums, represent a new species, which is described here.

### *Echo perornata* Yu & Hämäläinen, spec. nov.

Figs. 1–8, 13

**Material studied:** **Holotype** ♂: China, Xizang [Tibet], Motuo, alt. 850m, 1 vii 1983, Han Yinheng leg. Deposited at Institute of Zoology, Chinese Academy of Sciences, Beijing, China.

**Paratypes:** 1 ♂, China, Xizang [Tibet], Motuo, alt. 850m, 2 vii 1980, Jin Gentao & Wu Jianyi leg.; 1 ♀, China, Xizang [Tibet], Motuo, alt. 800m, 3 vi 1983, Lin Ran leg.; 1 ♀, China, Xizang [Tibet], Motuo, alt. 900m, 20 vi 1980, Jin Gentao & Wu Jianyi leg.; 1 ♀, China, Xizang [Tibet], Motuo, alt. 1200m, 16 ix 1979, Jin Gentao & Wu Jianyi leg. The paratypes collected in 1979–1980 are deposited in the Shanghai Entomological Museum, Chinese Academy of Sciences, Shanghai, China and the specimen collected in 1983 is deposited in the Institute of Zoology, Chinese Academy of Sciences, Beijing, China.

**Etymology.** The Latin adjective *perornata* means 'very ornate' and refers to the coloured wing pattern, which is the finest in the genus.

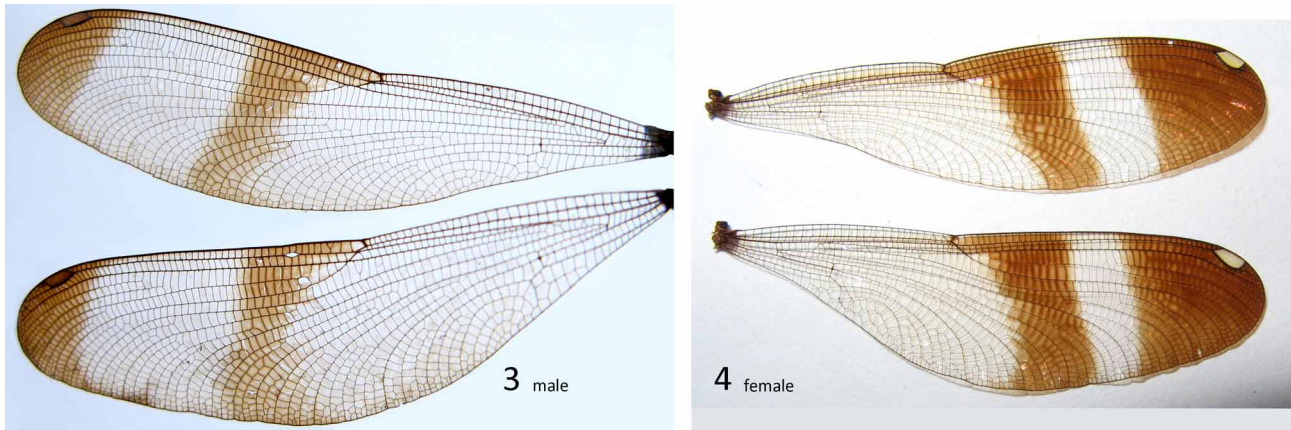
**Diagnosis.** A middle sized *Echo* species with wings with a brownish apical patch and a brownish transverse band just beyond the nodus.

**Description of holotype male** (Fig. 1). Head: Labium, labrum and base of mandibles black. Anteclypeus blackish brown; postclypeus shining metallic black with green reflections. Frons and vertex velvety black with hint of green coloration; obscure brown mark just outside each lateral ocellus. Antennae brown-black.

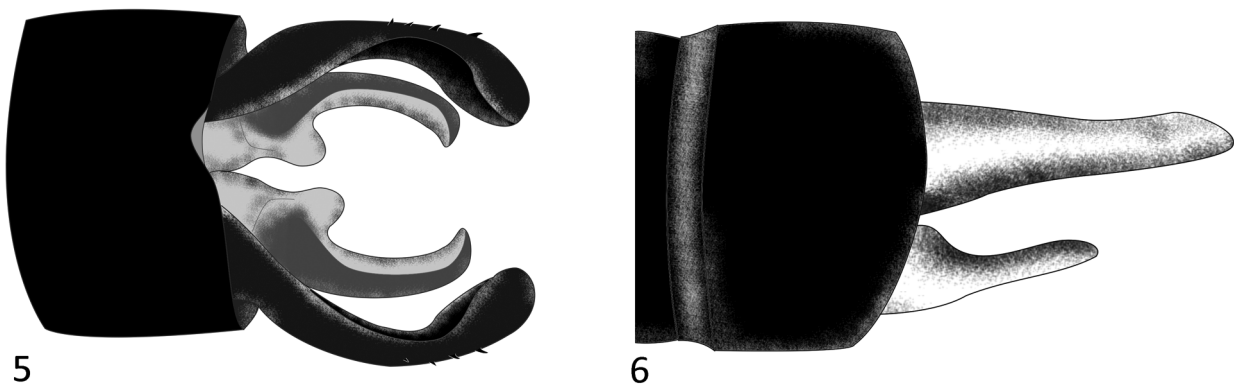
Thorax: Prothorax black with hint of green coloration. Synthorax dull metallic green, not shining. First and second lateral sutures delineated by black bands which encircle the stigma and continue around the metepimeron. Venter of synthorax black, finely pruinose. Legs: blackish brown, finely pruinose.



**FIGURES 1–2.** *Echo perornata* spec. nov.; 1) habitus of holotype male; 2) habitus of paratype female.



FIGURES 3-4. *Echo perornata* spec. nov.; 3) wings of holotype male; 4) wings of paratype female.



FIGURES 5-6. *Echo perornata* spec. nov., anal appendages of male; 5) dorsal view; 6) lateral view. Since the appendages are distorted in the teneral holotype specimen, these drawings are reconstructions of the supposed shape.

Both wings hyaline, wing tips pale reddish umber, narrow pale umber band on each wing just distal to nodus (Fig. 3). Venation dark brown. Pterostigma a rounded rhomboid shape in forewing, teardrop shaped in hindwing, pale brown, covering 6–7 underlying cells. Wings narrow; hindwing length/breadth ratio 3.9. Median space with 7–8 crossveins. Cubital field with 17–18 crossveins in forewing, 16–17 in hindwing. Quadrangle with 7–7 crossveins in forewing, 8–9 in hindwing. Antenodals (the first series) number 38–39 in forewing and 33–35 in hindwing.

Abdomen dark brown, gradually darkening terminally, with the ventral side finely pruinose. Appendages black; cerci forcipate, apex somewhat expanded, a little longer than S10; paraprocts forcipate, as long as S10 (Figs. 5–6). Glans of the genital ligula with a long, narrow, apically bifurcated, Y-shaped median process and a pair of relatively broad, convex downcurved lateral processes. The end of the lateral processes slightly expanded transversely, somewhat T-shaped laterally, both apexes bent outside. Ligula covered with long, stiff setae (Figs. 7–8).

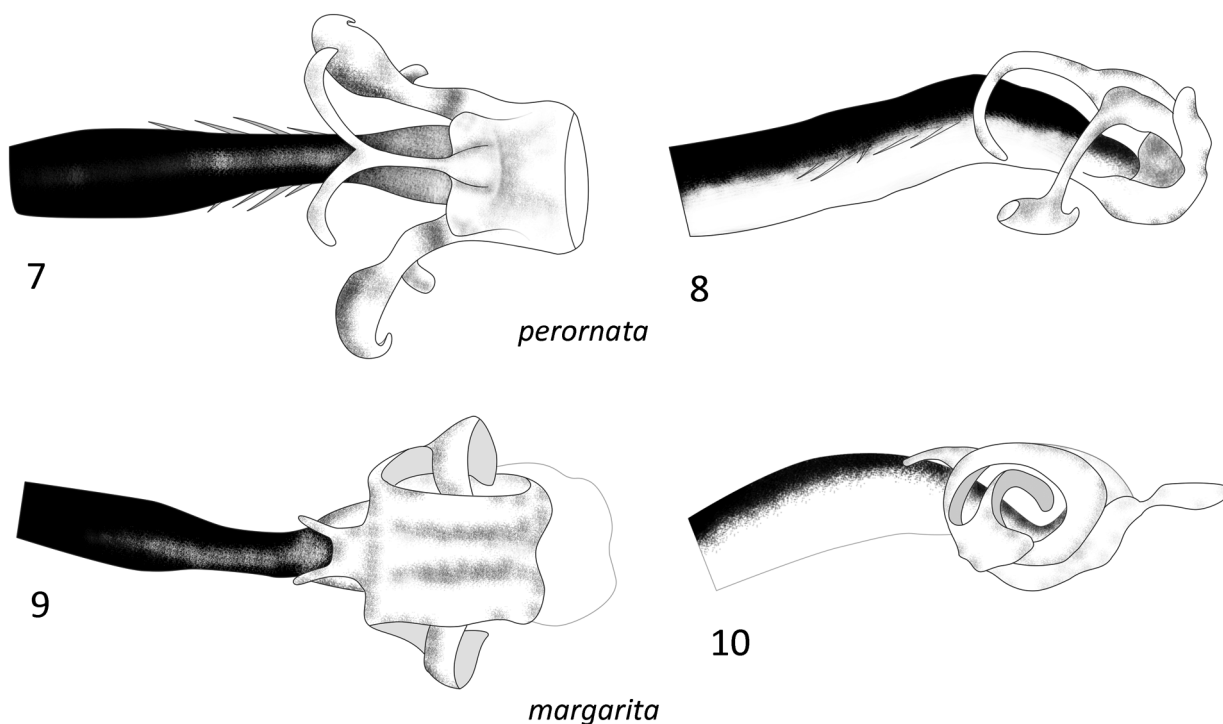
**Measurements** (mm): abdomen + appendages 41; hind wing 35.

**Variation in paratype male.** An incomplete specimen; abdominal segments 4–10 are missing and the wings are partly broken. Colour pattern of body and wings similar to the holotype. Minor differences in venation. Length of hind wing 33 mm.

**Description of female** (Fig. 2). Colour pattern of head similar to the male, but postclypeus, frons and vertex shining metallic green. Thorax coloured as in male, and the metallic green colour somewhat shining. Legs: deep brown, finely pruinose. Wings (Fig. 4) hyaline, pattern similar to that of male with the brown colour deeper and the brown marking, especially on the tips broader than in male. Pterostigma white, an angulated pear-shaped shape in both wings, covering 6–7 cells, and distinctly broader than in male. In hindwing the length/breadth ratio is 3.2–3.5. Median space with 5–8 crossveins. Cubital space with 14–17 crossveins in forewing, 15–18 in hindwing. Quadrangle

gle with 7–9 crossveins in forewing, 7–10 in hindwing. Antenodals (the first series) number 29–33 in the forewing and 25–29 in the hindwing.

Abdomen dark brown with the colour deeper than in male, with the ventral side finely pruinose. Appendages black.



**FIGURES 7–10.** Penis head, ventral (i.e. when viewed in situ in the male abdomen) and lateral views; **7–8)** *Echo perornata* spec. nov., holotype; **9–10)** *Echo m. margarita* male from Khasia Hills, Meghalaya, India.

**Measurements** (mm): abdomen + appendages 36–37; hind wing 34–35.

**Distribution.** So far this species is known only from Motuo, in the south-eastern part of Xizang [Tibet], China (Fig. 13).

## Discussion

This new species is quite similar to *Echo margarita* in body coloration, wing venation and shape of the pterostigma, but it can be separated by several characters. Whereas in both sexes of *E. margarita* the wing tips alone are darkened (Figs. 11–12), in both sexes of *E. perornata* there is also a brownish postmedian transverse stripe, just apicad the nodus, in addition to the darkened wing tip (Figs. 3–4). The holotype male of *E. perornata* is a rather young specimen. It is likely that in older specimens the wing band is a darker brown and the pterostigma becomes paler, possibly cream white; the pterostigma in *E. perornata* is clearly rhomboid or teardrop shaped, whereas in *E. margarita* it is a slightly rounded trapezium with its costal margin clearly shorter than the posterior margin. The penis of *E. perornata* differs greatly from that of *E. m. margarita*. In *E. perornata* the glans of the genital ligula bears a long, apically bifurcated, Y-shaped median process, longer than the length of glans; a pair of lateral processes, downwardly convex, with the ends slightly expanded transversely, both apices bent outward, and somewhat T shaped laterally; long stiff setae cover the ligula (Figs. 7–8). By contrast, in *E. m. margarita* the median process of the glans is distinctly shorter than the length of glans and apically bifurcated but never Y shaped; the lateral processes of the glans are curved down and backward, with the ends expanded transversely in one direction, bent inward; the ligula lacks setae (Figs. 9–10). Superficially the penis of *E. perornata* resembles that of *E. modesta* and *E. uniformis*. For illustrations of the penis of *E. modesta*, see Kennedy (1920) and Asahina (1985).





**FIGURE 11.** Wings of *Echo m. margarita* male specimen from Khasia Hills, Meghalaya, India.



**FIGURE 12.** Field photo of *Echo m. margarita* female taken in Pakhai Tiger Reserve, Arunachal Pradesh, India, by Krushnamegh Kunte.

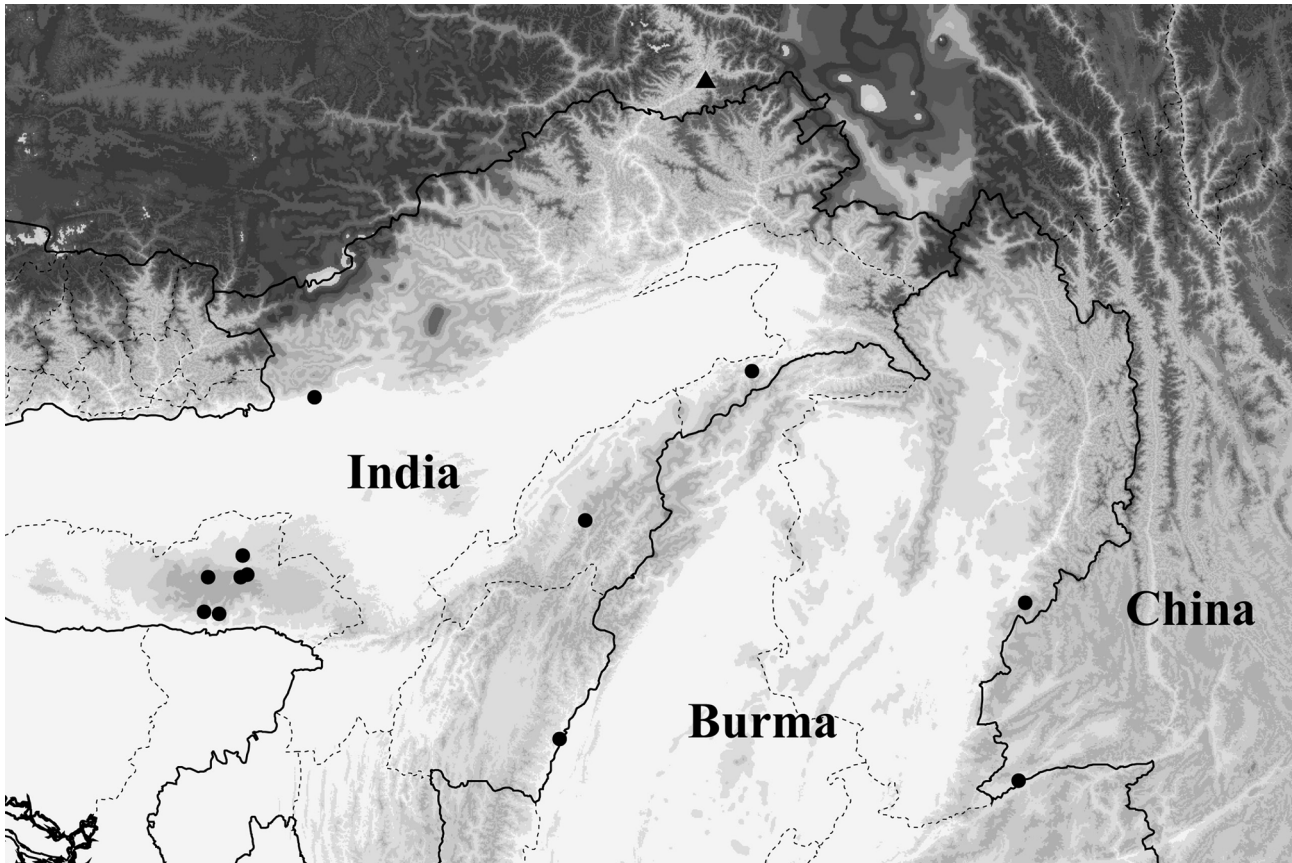


FIGURE 13. Distribution map showing the known locations for *Echo margarita* (circle) and *E. perornata* **spec. nov.** (triangle).

*E. margarita* is known to occur in a restricted area in North-east India: i.e. Meghalaya, Arunachal Pradesh, Manipur and Nagaland (Mitra 2002), and there is a single record from Burma (Sadon, Kachin State) published by Schmidt (1964). The taxonomic status of the subspecies *E. margarita tripartita* Selys, 1879 (type locality “Khasyia Hills” in Meghalaya), is in need of further study. Both ‘subspecies’ have been found in nearby locations in Meghalaya, cf. Fraser (1929). The first confirmed record of *E. m. margarita* from Chinese territory is that noted here. The first author has studied a female specimen collected in Ruili, Yunnan, near the Burmese border (China, Yunnan, Ruili, Rare Botanical Garden, alt. 1200m, 1 viii 2006, Fan Zhonghua leg.). In this specimen the apical opaque area is slightly less than 1/5 of the wing length. The known locations of *E. margarita* (sensu lato) and *E. perornata* are shown in Fig. 13.

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