

Further Notes on Odonata from Northern Vietnam

1. Cordulegasteridae

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Abstract On the basis of the collection made by the expeditions by the National Science Museum in 1997, collecting records are given for three northern Vietnamese dragonflies of the family Cordulegasteridae, *Anotogaster klossi* Fraser, *Chlorogomphus auratus* Martin and *Ch. takakuwai* Karube.

Key words: Odonata, Anisoptera, Cordulegasteridae, collection records, northern Vietnam.

Following the entomological expeditions to northern Vietnam in 1994 and 1995, the staff of the Department of Zoology, National Science Museum, Tokyo, started in 1997 the next project, entitled “Study on the fauna of the northeastern Indochinese Peninsula”, and brought further interesting Odonata specimens to my hands.

As the first part of this new series of reports, which takes over my previous series of papers (Asahina, 1995, 1996 a, b, c, 1997 a, b), three species of large-sized dragonflies belonging to the family Cordulegasteridae will be recorded.

Before going further, I wish to thank all the members of these expeditions for their efforts paid in their field works, and in particular, Dr. Mamoru Owada and Dr. Shun-Ichi Uéno of the National Science Museum, Tokyo, who helped me in preparing the present paper.

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Subfamily Cordulegasterinae

1. *Anotogaster klossi* Fraser

(Fig. 1)

Anotogaster klossi Fraser, 1919, pp. 456–457, pl. 9, figs. 1–5 A–B. — Fraser, 1929, p. 96, “Coll. Brit. Mus., 1 ♀, the type, Daban, Pharang Province, 650 ft., Mar. 1918,” “Hind wing 67 mm, abdomen 80 mm (Male unknown);” “The unique specimen is from “Siam” [southern Annam!]. This magnificent insect, one of the largest dragonflies known, is distinguished at once from all other of its genus by the great extent of yellow, especially on the abdomen, which is almost entirely of that colour.”

Specimen examined. 1 ♀, Nang Oa, 700 m alt., nr. Mt. Pia Oac, Cao Bang Prov., 12. V. 1997, T. Yamasaki leg.

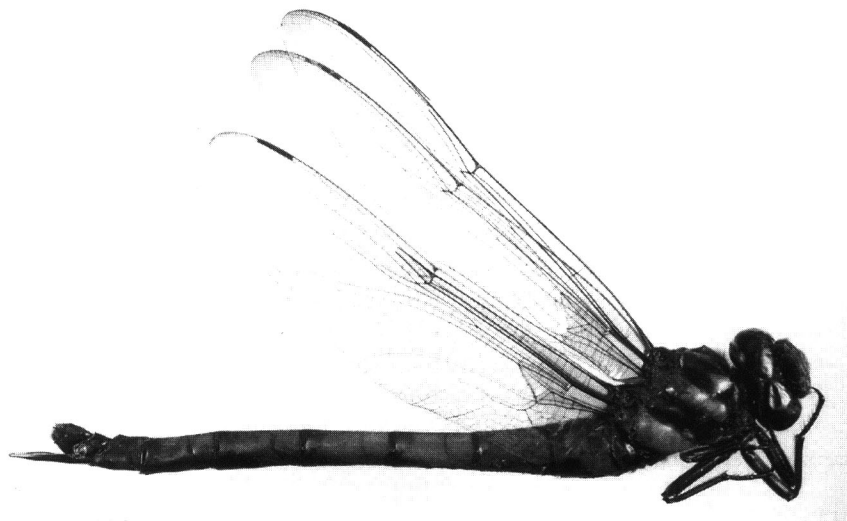


Fig. 1. *Anotogaster klossi* Fraser, ♀, natural size.

Description. ♀: Abd.+app. 105 mm; hindwing 62 mm. A typical *Anotogaster* species. In this mature specimen, the yellowish tint of body changed into dark brownish yellow.

Head deep black, with a single dark yellowish stripe on postclypeus and on labrum, respectively, the latter divided at the middle. Labrum entirely dull yellowish. Occipital triangle small and black, fringed with black bristles posteriorly.

Prothorax almost entirely brownish black, lateral side dull yellowish. Pterothorax deep black, covered with long hairs; three yellow bands present on pleurites, i.e., a short anterior stripe with pointed lower end, a broad lateral stripe on epimeron 2, and an anterior broad band covering almost entire epimeron 3; the small shining triangular metapostepimeron entirely black.

Legs all black, femora of usual length and deep black tinted.

In the abdomen the first and the two terminal segments are entirely black, other segments (from 2nd to 8th) yellowish or pale brownish tinted almost entirely, with a narrow but gradually broadened black ring on 2–8 segmental ends, respectively.

Short cerci, epiproct and paraprocts all black.

Wings hyaline, veins black, bases of the wings pale brownish, just covering the outer ends of the triangles of both the wings. Forewing apex very palely enfumed, pterostigma narrow and black, 5 mm in length.

Remarks. Fraser (1929) noted the “giant” size of his female specimen. However, we often recognize almost equal-sized ones among the females of Japanese *A.*

sieboldii. It will be interesting to find the still unknown male insect of this species.

Subfamily Chlorogomphinae

2. *Chlorogomphus auratus* Martin

(Fig. 2)

Chlorogomphus auratus Martin, 1910, p. 65. — Fraser, 1929, pp. 147–148, distribution: “Tonkin. The type, the only known specimen, is in the Paris Museum. The male will probably be found to be very similar to that of *magnificus* or *campioni*. If the prolonging of the subcosta beyond the node is a constant character in this species, it should be sufficient to separate it from other, but the females of *campioni* and *freda* closely resemble it.” — Karube, 1995, pp. 48–51, figs. 1–11, “Tamdao, near Hanoi, N. Vietnam, 7 ♂ 7 ♀.”

Specimens examined. 1 ♂, Nang Oa, 700 m alt., nr. Mt. Pia Oac, Cao Bang Prov., 12. V. 1997, T. Yamasaki leg.; 1 ♂, Tam Dao, Vinh Phu Prov., 17. VI. 1997, M. Tomokuni leg.; 1 ♂, Tam Dao, Vinh Phu Prov., 2. VII. 1997, S. Nomura leg.; 1 ♀, Tam Dao, Vinh Phu Prov., 13. VII. 1997, S. Nomura leg.

Description. ♂: abd.+app. 24+3.5 mm, hindwing 50–55 mm. ♀: abd.+app. 61 mm, hindwing 61 mm.

♂: Head deep black (Fig. 3), frontal ridge narrowly striped with pale yellow, clypeus with a broad yellowish transversal stripe; labrum entirely deep black, labium pale brownish. A transverse low swelling present behind the ocelli; occipital edge with a tuft of long hairs.

Pterothorax black, striped with usual three yellow bands; the posterior one broadest, covering episternum 3 and including interalar sclerite 3. Metapostepimeron yellow. Legs black.

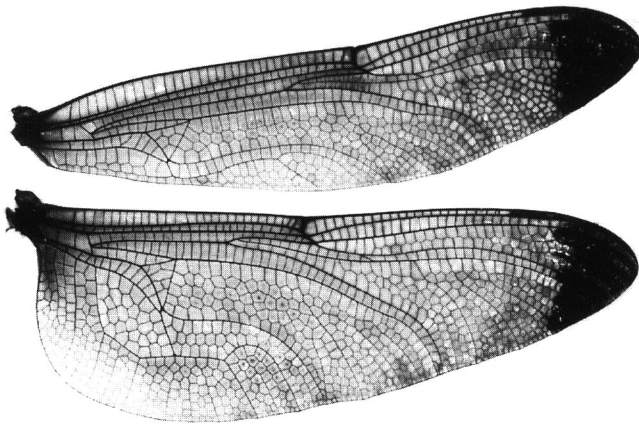


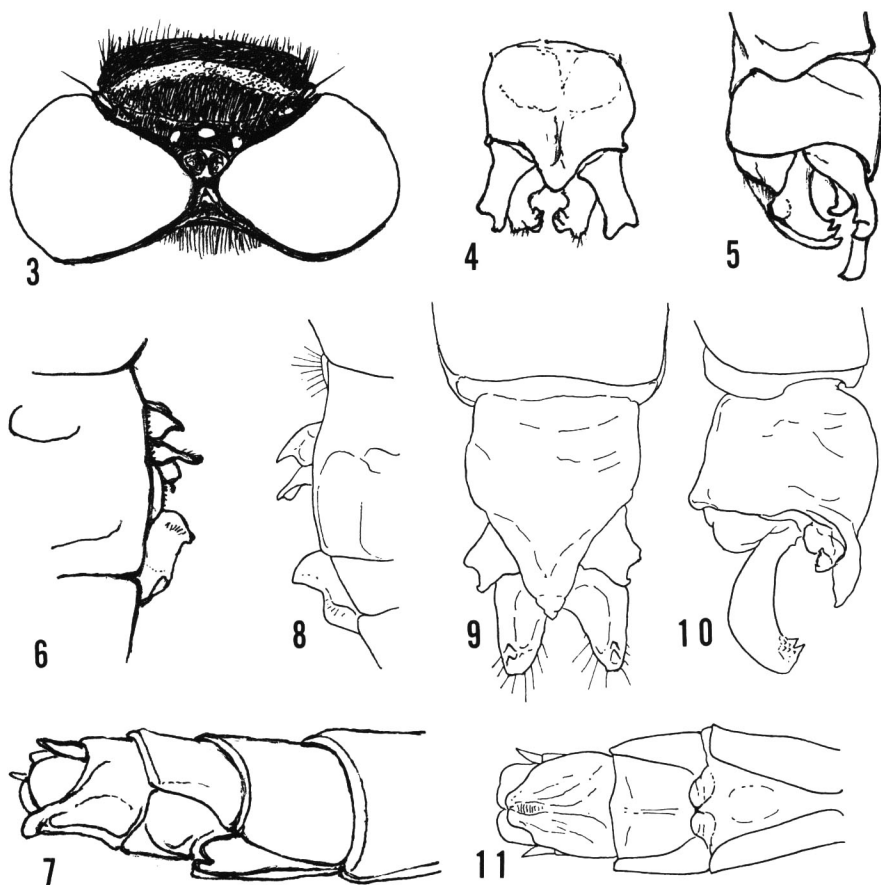
Fig. 2. *Chlorogomphus auratus* Martin, ♀, wing venation.

Wings hyaline, the apices slightly dark spotted. Pterostigma black, 4 mm in length.

Abdomen black; in lateral view, a broad yellow band running from metapostepimeron to the basal yellow spot on the third abdominal segment; a small yellow spot present at the bases of 4–7 segments, respectively.

Caudal appendages are shown in Figs. 4 and 5, both superior and inferior appendages being provided with incurved claws for grasping. In addition, even a strong claw developed at the end of the tergite of the last segment.

Accessory genitalia on the second abdominal segment as shown in Fig. 6, the



Figs. 3–7. *Chlorogomphus auratus* Martin, northern Vietnam. —3, ♂ head, dorsal; 4, ♂ caudal appendages, dorsal; 5, ♂ caudal appendages, lateral; 6, ♂ accessory genitalia, lateral; 7, ♀ distal abdominal segments, lateroventral. 8–11. *Chlorogomphus arooni* Asahina, Thailand, after Asahina (1981). —8, ♂ Accessory genitalia, lateral; 9, ♂ caudal appendages, dorsal; 10, ♂ caudal appendages lateral; 11, ♀ abdominal segments, ventral.

genital hamuli not developed in particular.

♀: Head deep black, antefrons very palely outlined with yellow, ante- and post-clypeus almost entirely yellow; labrum black with paired minute yellowish spots at the centre; occipital triangle connected with low postocellar tubercle.

Pterothorax black, striped with three ordinary yellow lines; metathoracic episternal stripe broadest, metapostepimeron yellow.

Wings (Fig. 2) pale brownish, entirely smoked in this mature specimen; wing apices deep brown from the level of pterostigma leaving a very small anterior hyaline area under pterostigma, the latter ca. 4 mm in length. The median space crossed by two (in fore- and right hindwings), and by three (in left hindwing) cross-veins in this specimen.

Abdomen black, basal three segments patterned with broad but irregularly shaped yellow patches on lateral and dorsal sides; 4–7 segments with proximal broad yellow patches. Final three segments (Fig. 7) entirely black.

As the characteristics of chlorogomphines, the sternite of the last abdominal segment of this species is extremely degenerated, i.e., the sternal sclerite of the last abdominal segment seems to extend to form a spoon-like process accompanied with the pleurites.

Remarks. In observing the male caudal appendages, accessory genitalia, and female valvula vulvae, I was inclined to believe that these organs are fundamentally similar to those of *Ch. arooni* Asahina, 1981 (Figs. 8–11). The latter is at present the only representative of *Chlorogomphus* species from Thailand, occurring in the southern peninsular area. Another related species may be *Ch. vietnamensis* Asahina, 1969, described from southern Vietnam. This last species is only the known species from southern Vietnam, and only a single female specimen has been available.

3. *Chlorogomphus takakuwai* Karube

Chlorogomphus takakuwai Karube, 1995, pp. 59–62, figs. 78–84, “♂ holotype: Tamdao, N. Vietnam, 19. V. –2. VI., 1993; 1 ♀ (allotype), same as the holotype, 31. V. 1991; 2♂2♀ (paratypes).” — Asahina, 1995, pp. 225–226, figs. 30–34, “1♀, Ban Khoang, 1,400 m alt., Sa Pa, Lao Cai Prov., N. Vietnam, 12–V–1995, A. Saito leg.”

Specimen examined. 1♀, Tam Dao 1,230 m, Vinh Phu Prov., 2. VII. 1997, M. Owada leg.

This species was described on the basis of specimens collected at Tam Dao. My previous record (Asahina, 1995) was made on a single female specimen from Sa Pa in northwestern corner of Vietnam, and our present female is almost identical with it.

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