XII. NOTES ON ORIENTAL DRAGONFLIES IN THE INDIAN MUSEUM

By F. F. LAIDLAW.

No. I. THE GENUS *OROGOMPHUS*.

Order ANISOPTERA.

AESCHNIDAE.

CHLOROGOMPHINAE.

So far as at present known only the genus *Orogomphus* occurs in the Indian area. The other genus of the family, *Chlorogomphus* is found in Sumatra, Java and Tonkin, whilst *Orogomphus* has representatives in Bengal, Burma and the Himalayas, as well as in Borneo, the Philippine Islands and Formosa. The subfamily is the only one confined to the Oriental region.

Four species of *Orogomphus* are known. They are—

Orogomphus atkinsoni, de Selys. Bengal, Assam.
,, *speciosus*, de Selys. Burma, Darjiling.
,, *splendidus*, de Selys. Philippine Islands, Borneo, Formosa.
,, *dyak*, Laidlaw. Borneo.

For figures of *O. splendidus* see Ris in *Supplementa Entomologica*, No. 1, 1912: text-fig. 15 *a-b*; taf. iii, fig. 1-6; taf. v, fig. 5 In this paper Dr. Ris also discusses the venation and characters of the male previously unknown (*loc cit.* pp. 77-79).

The wings of a female presumed to belong to this species, collected in Borneo, are figured by myself (*Proc. Zool. Soc. London*, 1914, pl. i, fig. 8). Selys's original account of the type female from Luzon is given in his 4me additions. Synops. Gomph *Bull. Acad. Roy. Belg.* xlvi (2), 1878, pp. 681-682.

Orogomphus atkinsoni, de Selys.

O. atkinsoni, Selys, 4me add. *Synops. Gomph.*, p. 682 (1878).
Kirby, *Cat. Odonata*, p. 79 (1890).
Selys, *Ann. Mus. Civ. Genova* (2) x, pp. 481-482 (1891).
Williamson, *Proc. U.S. Nat. Mus.* xxxii, pp. 278-279, fig. 5-6 (1907).
Laidlaw, *Proc. Zool. Soc. Lond.*, pp. 61-62 (1914).

1 ♂ $^{5}\frac{4}{2}\frac{4}{0}\frac{4}{}$ 1 ♀ $^{5}\frac{4}{2}\frac{4}{0}\frac{3}{}$. Both specimens are named; the male is without a locality, the female from Sibsagar, Assam. The specimen recorded by me (*loc. cit.*) is from Kumaon, de Selys's type is

from 'Bengal.' He was not acquainted with the male at the date of publication of the species (1878). Both the present specimens are in poor condition, but fortunately the abdomen of the male is complete. I take the opportunity of figuring the anal appendages of the male. These bear a close resemblance to the corresponding structures of *O. dyak*.

Orogomphus speciosus, de Selys.

O. speciosus, Selys, *Ann. Mus. Civ. Genova* (2) x, pp. 481-482 (1891).
Kirby, *Cat. Odonata*, p. 79 (1890).

1 ♂ $\frac{cc}{1170}$. Lord Carmichael's collection, Darjiling District, 1000-3000 ft., May, 1912.

The male of this species has not been described.

The dimensions of the specimen are as follows:—

Length of abdomen 54 mm., of hind-wing 40 mm., breadth of h. w. 12·5 mm.; of the type female, length of abdomen 57 mm., of hind-wing 46 mm., breadth of h. w. 15 mm.

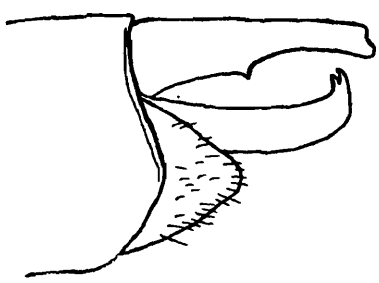

FIG. 1.—Profile of anal appendages of *O. atkinsoni* ♂.

There is thus a considerable difference in size, scarcely greater than occurs in other species of the genus.

In colouring the present example shows the following points of disagreement with the account of the type.

i. The occiput is black not yellow.

ii. Abdominal segment 2 is largely yellow above, with a transverse black band not touching either extremity.

iii. Segment 8 shows no lateral yellow spot.

Venation-formula:

	Anal loop.	An. n.	Pn. n.	M.	Cu.	t. (cells)	supra. t.
basal post-costal	___	21—22	11—12	1—1	7—7	2—2	4—3
+	9—9	20—22	16—15	1—1	5—6	2—2	3—3
♀ type		23—23	13—13	2	7—8	2—2	4—4
		17—19	17—17	2		3—3	4—4

In other respects there is close agreement between the characters of the male here recorded and those of the female as described by de Selys, so that I have little hesitation in referring them both to the same species.

The wing of the male is colourless and is very like that of the male *O. atkinsoni*, broadly speaking.

The anal appendages differ markedly in detail from those of the allied species. The upper pair are stout, a trifle shorter than the lower appendage, and are curved inwards towards each other; bifid at the extremity, and with a very small ventro-

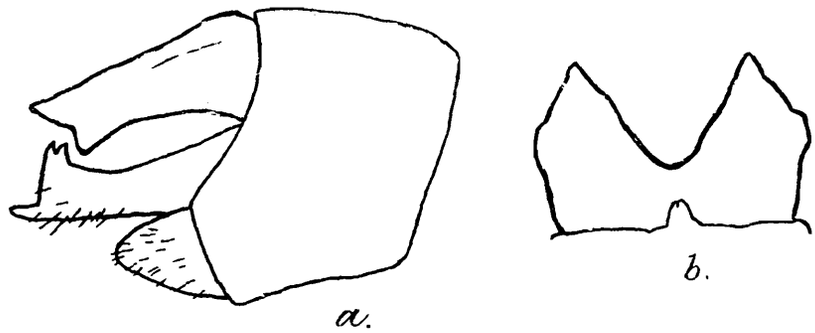

FIG. 2*a*.—Profile of anal appendages of *O. speciosus* ♂.
,, 2*b*.—Lower anal appendage of *O. speciosus* ♂, viewed from below.

internal tubercle on each just beyond its middle and scarcely visible in profile.

The lower appendage likewise is stout; its two limbs each carry a projection directed straight upwards. This terminates in a doubly toothed point. Beyond the projection each limb ends in a pointed, backwardly directed spur. When looked at from below the lower appendage appears as ending in a pair of triangular processes not divaricated from each other.