

**SUNDACYPHA STRIATA SPEC. NOV.,
A NEW DAMSELFLY FROM BORNEO
(ZYGOPTERA: CHLOROCYPHIDAE)**

A.G. ORR

CRC-TREM, Griffith University, Nathan, Q4111, Australia

Received September 18, 1998 / Reviewed and Accepted November 3, 1998

Both sexes of the new sp. are described from Brunei (holotype ♂: Belait distr., Sungei Lumut, 16-XII-1995; deposited in RMNH, Leiden), and notes on its ecology and behaviour are provided. This is the second sp. of the hitherto monobasic genus, widespread in Sundaland.

INTRODUCTION

The genus *Sundacypha* is known from a single species, *S. petiolata* (Selys, 1859), widely distributed in Borneo, Sumatra and peninsular Malaysia. LIEFTINCK (1954) records it as occurring in both swiftly flowing and sluggish water in lowland rain-forest. Based on a single female, *S. petiolata* was originally placed by de Selys in *Rhinocypha*, but as the specific name suggests it may be separated from this genus by the greater degree of petiolation at the base of the wings, 1A arising distal to the arculus, whereas in *Rhinocypha* 1A arises proximal to the arculus. Chiefly on this basis, LAIDLAW (1936) initially removed the species to *Calocypha*, then later erected for it a new genus, *Sundacypha* (LAIDLAW, 1950). The male was first described by KRUGER (1898), as *Rhinocypha karschi*, and figured by SCHMIDT, (1934). Although the link between de Selys' type and Krüger's male is based on supposition rather than firm evidence, *petiolata* is by consensus recognized as conforming to KRÜGER's (1898) description (*karschi*!).

During a recent survey of odonates of Brunei Darussalam, North Borneo, I collected both typical *petiolata* and a substantial series of another, similar, but quite distinct species of *Sundacypha*. I present a description of the new species and some notes on its biology. The holotype male and an allotype female are lodged in the National Museum of Natural History, Leiden, the Netherlands (RMNH).

SUNDACYPHA STRIATA SP. NOV.

Figure 1 a, b

Material. — **Holotype** ♂: BRUNEI, Belait District, Sungei Lumut. (4° 39' 28" N, 114° 30' 56" E), 16-XII-1995, A.G. Orr leg. (in RMNH). — **Paratypes**, 8 ♂ (Sg Lumut, BRUNEI, A.G. Orr leg.): 2 ♂, 20-X-1995, 1 ♂, 27-X-1995, 3 ♂ 16-XII-1995 (in A.G. Orr coll.), 1 ♂, 16-XII-1995 (in Cambridge Univ., Zool. Dept. Mus.); 2 ♂, 2 ♀, Sg Ingei, Hot Springs, BRUNEI, A.G. Orr leg., 4/8-III-1996: 1 ♀ (in RMNH), 2 ♂, 1 ♀ (in A.G. Orr coll.).

Etymology. — The name refers to the dorsal and lateral markings of the synthorax.

MALE (Holotype). — **Head.** — Anterior and dorsal surfaces black, with pattern of fine yellow markings as follows: paired elongate spots on the anteclypeus, small lateral marks at the extreme antero-lateral margins of the frons adjacent to the genae, subquadrate patches on the genae sometimes running in a thin line along the eye margin to the level of the anterior ocellus, patches at the base of the mandibles, prominent paired spots between and slightly anterior to the bases of the antennae, tiny spots between the anterior and posterior ocelli and behind each posterior ocellus, tiny postocular spots set close to the occiput and a median triangular mark at the posterior margin of the occiput. Ventrally, labium and maxillae pale yellow, except at extremities, which are black.

Thorax. — Prothorax dorsally mainly black, anterior lobe yellow, median and

posterior lobes with thin, broken median yellow line not expanded laterally in posterior lobe. Ventral side of prothorax mainly pale yellow except the area between the coxae, which is dark. Synthorax black with yellow markings as follows (Fig 1a): Mesepisternum with median carina marked by a thin unbroken line, a little broader and only slightly spatulate anteriorly. On either side are two yellow bands meeting the anterior margin of the mesepisternum about half-way between the mesinfraepisternum and the median carina, continuing obliquely back to meet the humeral suture broadly a little beyond its midpoint. These bands are confluent with a short posthumeral streak on the mesepimeron, and together they form on either side a slightly sinuous band of nearly uniform width, broken only

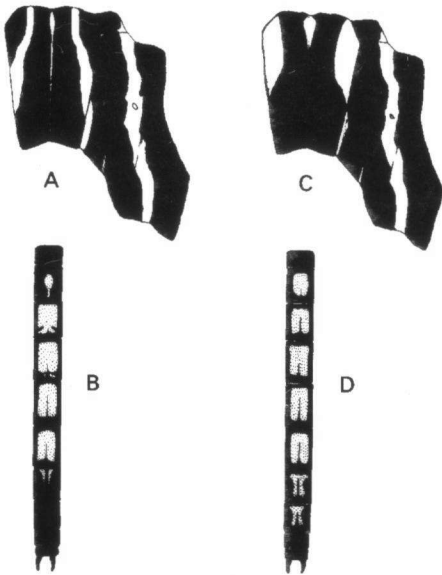


Fig. 1. Dorsolateral view of male synthorax and dorsal view of male abdomen in *Sundacypha striata* sp. n. (A, B) and *S. petiolata* (C, D).

by a fine black line marking the humeral suture. Laterally, running nearly parallel to the above band, is a continuous yellow band running from the dorsal part of the metepimeron to the base of the mid coxa and the posterior angle of the mesinfraepisternum, completely enclosing the metathoracic spiracle. Ventral part of synthorax posterior to meta coxae with four broad, yellow, nearly transverse bands of various shapes, the second and third divided medially. All coxae pale yellow. Remainder of legs dark brown to black with the inner surfaces of the femora and tibiae pale, tending to pruinulent white in mature specimens. Wings with pale brown suffusion. Hindwing with extensive dark brown opaque terminal patch occupying distal 45% of wing.

A b d o m e n. — Ground colour black with dorsal markings of deep orange to brick red and lateral pale yellow markings. Dorsal red markings as follows (Fig. 1b): Segment 1 unmarked, segment 2 with a small spoon shaped mark. Segments 3-6 broadly red, segments 3 and 4 with the red area distally incised on each side by a fine sliver of the black ground colour, which on 4 isolates the distal extremity of the red patch to form two very small triangular spots separated by a median black line. Segments 5 and 6 with broader black posterior border and red patch nearly divided by a fine median black line. Segment 7 with two very thin red streaks on either side of the dorsal carina for about half the length of the segment. Segments 8-10 black. Lateral yellow markings in the form of a simple spot on segment 1, a dorsally excavated spot on 2, a longitudinal streak followed by a separate distal spot on 3-5, and short simple streaks on 6-8, the streaks from 3-8 becoming progressively shorter and more crescent shaped. Anal appendages black. Superiors forcipate, almost equal in length to segment 9; inferior about half this length.

M e a s u r e m e n t s (in mm). — Hindwing 20.8, abdomen including appendages 16.1.

FEMALE (Allotype). — Head black with pale yellow markings very similar to those of male with the addition of lateral elongate marks on the frons below the antennal socket, and no spots between the ocelli. Markings of thorax almost exactly the same as male but humeral bands paler, with a distinct greenish tinge. Wings coloured only slightly with very faint brown suffusion. Hindwing with darker apical patch of transparent brown occupying the outer 20% of the wing. Abdominal colour and marking quite different from that of male. Segments 2-7 with fine dirty yellow streak along the mid-dorsal carina, otherwise dark dorsally. Laterally, segment 1 with a single spot, segments 2-7 with paired upper and lower longitudinal streaks and a single cuneiform or rounded spot distally, the markings becoming progressively fainter in the posterior segments. Segment 8 with a tiny ventro-basal spot.

M e a s u r e m e n t s (in mm). — Hindwing 23.6, abdomen including appendages 16.2.

VARIATION. — Males vary slightly in the extent of yellow and red coloration on the thorax and abdomen: the median yellow line on the mesepisternum is sometimes briefly interrupted, the dorsal red spot on abdominal segment 2 is sometimes reduced and oval in outline. The red spots at the distal extremity of segment 4 are sometimes continuous with the main red area; the median black line dividing the

red patch in segments 5 and 6 is sometimes continuous; the red streaks on segment 8 vary from one quarter to slightly more than half the length of the segment. The extent of the yellow lateral marks varies a little, and a distal spot may be present on segment 6. The two females varied very slightly in the extent of the lateral yellow markings on the abdomen. There is little variation in size (males: hw 20.0-21.2 mm, mean = 20.6, $s = 0.4$, $n = 11$; females: hw 23.4-23.6 mm).

DIFFERENTIAL DIAGNOSIS. — Males differ clearly from *S. petiolata* in the form of the antehumeral bands, which are thin and run obliquely across the anterior corner of the mesepisternum, not touching the mesinfraepisternum (Fig. 1a), whereas in *petiolata* they are broad, and continuous anteriorly with the humeral suture and the margin of the mesinfraepisternum (Fig. 1c). In *striata* they are slightly paler in colour than in *petiolata*. In *striata* the fine mid-dorsal line reaching the posterior margin of the mesepisternum is only slightly expanded anteriorly, whereas in *petiolata* this marking is broadly expanded. The red dorsal markings on abdominal segments 2 especially, and also 5 and 6 differ markedly, and in *striata* there are no markings on segment 8, almost always present in *petiolata* (Fig. 1b, d). In *striata* the lateral yellow abdominal markings are narrower and more obviously crescent shaped in distal segments. At present I am unable to distinguish females, owing to a lack of suitable material of *petiolata*, but evidently any differences are slight.

HABITAT AND BEHAVIOUR

Thus far *S. striata* is known from two well separated and distinct localities in Brunei. Sungei Lumut is a small sluggish stream with steep banks flowing through swampy riverine forest. The species was found only in the upper reaches of the stream, thickly vegetated with *Pandanus*, the lower reaches being occupied by *Libellago aurantiaca* Selys. The Sungei Ingei site is on a swiftly flowing clear open stream in mixed dipterocarp forest, but *S. striata* appeared to be commonest in a silty backwater, also with a thick growth of *Pandanus* around the margins. *L. aurantiaca* was also present here. *S. petiolata* has not been recorded from either site but is common at an intermediate locality on a clear swiftly flowing forest stream with a stony substrate. At Sg Lumut, males of *S. striata* perch on overhanging vegetation and on twigs or logs near the water surface. Agonistic interactions between territorial males involve a slow ascending flight, in which the pair face each other closely, and include a display in which the hindwing, which bears the dark apical patch, is briefly held stationary and canted towards the opponent. This is the reverse of the display in many *Libellago* species in which the forewing, which bears the dark apical mark, is held stationary at times during agonistic displays (ORR, 1996). A female was once observed laying in a rotting log, and a male courted her with a typical semicircular dance in which the white tibiae were displayed, as occurs in many other chlorocyphids (ORR, 1996).

ACKNOWLEDGEMENTS

I would like to express my gratitude to Dr ALLEN DAVIES for assistance with the initial identifications and for the provision of literature. Collecting at Sungei Ingei was made possible by the Universiti Brunei Darussalam, the Department of Forestry, and the Ministry of Defence Brunei. I thank Drs JOSEPH CHARLES and IDRIS MD. SAID for their part in organizing the expedition.

REFERENCES

- LAIDLAW, F.F., 1936. Note on some species of *Rhinocypha* with description of a new species. *J. fed. Malay St. Mus.* 18: 60-64.
- LAIDLAW, F.F., 1950. A survey of the Chorocyphidae (Odonata, Zygoptera) with diagnoses of proposed new genera and description of a new geographical subspecies. *Trans. R. ent. Soc. Lond.* 101: 257-280.
- KRÜGER, L., 1898. Die Odonaten von Sumatra. 1. Familie Agrioniden. *Stett. ent. Ztg* 59: 64-90.
- LIEFTINCK, M.A., 1954. Handlist of Malaysian Odonata. A catalogue of the dragonflies of the Malay peninsula, Sumatra, Java and Borneo, including the adjacent small islands. *Treubia* (Suppl.) 22: 1-202.
- ORR, A.G., 1996. Territorial and courtship displays in Bornean Odonata. *Odonatologica* 25: 119-141.
- SCHMIDT, E., 1934. Odonata der Deutschen Limnologischen Sunda-Expedition. 1. Imagines. Mit Beschreibung zweier neuer Ictinus aus Celebes und Neu-Guinea. *Arch. Hydrobiol.* (Suppl.) 23: 316-397, pls 14-17 excl.
- SELYS LONGCHAMPS, E. de, 1859. Synopsis des caloptéridines, troisième addition. *Bull. Acad. Belg.* (II) 7: 441-450.