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A new species of *Microtrigonia* Förster (Anisoptera, Libellulidae) from Papua New Guinea

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Abstract

A new species recently collected in Papua New Guinea, *Microtrigonia sinuosa* sp. nov. (Holotype ♂ from upper Sepik Basin), is described, illustrated and discussed. A revised key to the genus is presented.

Key words

Dragonfly, Libellulidae, new species, *Microtrigonia*, Papua New Guinea

Introduction

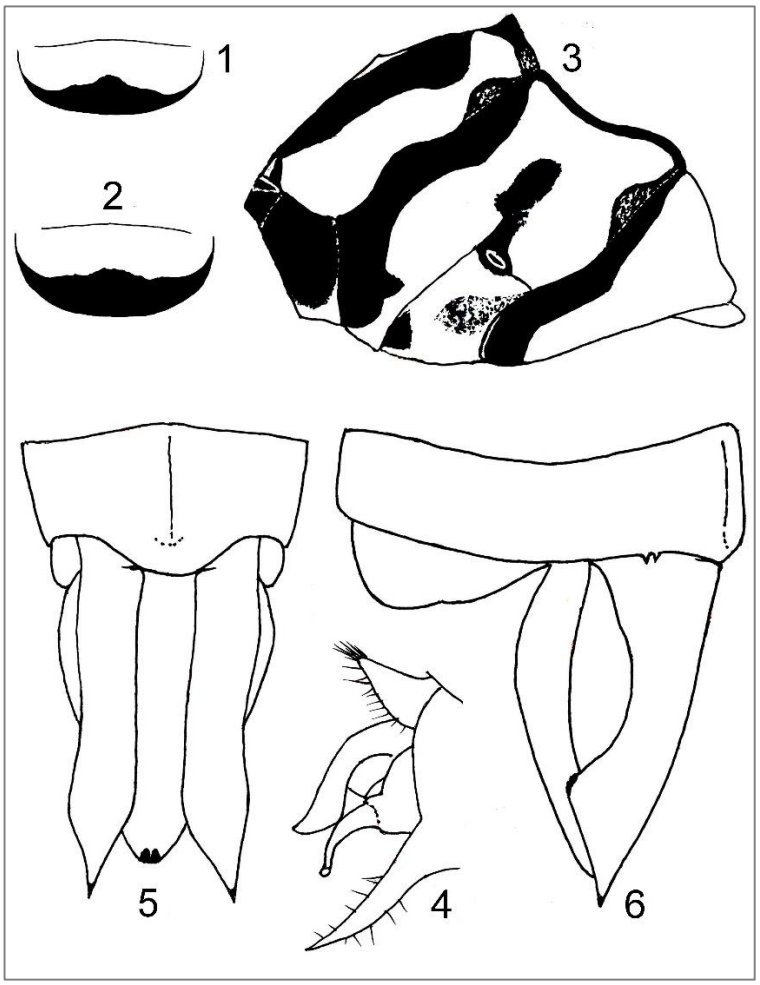
Four species of the endemic New Guinean libellulid genus *Microtrigonia* Förster, 1903 are currently known, described by Förster (1903), Lieftinck (1933, 1949) and Theischinger & Richards (2014). Apart from a summary of existing knowledge gleaned from the literature by Michalski (2012) the genus remained largely unstudied after Lieftinck's 1949 monograph until Theischinger and Richards (2014) reviewed the three known species based on re-examination and re-interpretation of features of the type material, and described as new the recently discovered *M. curvata*. Here we describe the fifth known species of *Microtrigonia* and provide a revised key to the genus.

Material and Methods

Descriptive terminology largely follows Watson & O'Farrell (1991). Colouration is given as detectable from the preserved material, supplemented with photographs of a specimen taken in life. Measurements are given in millimeters (mm). All illustrations were done with the aid of a camera lucida and are not to scale. Coordinates are presented using the GPS datum WGS 84.
Type material is deposited in the South Australian Museum, Adelaide, Australia (SAMA).

Microtrigonia sinuosa sp. nov.

Figures 1-6, 8



Figs 1-6. *Microtrigonia sinuosa* sp. nov.: (1) ♂, labrum frontal; (2) ♀, labrum, frontal; (3-6) ♂: (3) synthorax, lateral; (4) secondary genitalia, lateral; (5, 6) anal appendages: (5) dorsal; (6) lateral.

Material. - Holotype ♂ (SAMA 07-001314): Papua New Guinea, trail below Survey Site 1, Sepik Basin (4°39.185'S, 141°43.448'E, 850 m asl), 30-XI-2009, S.J. Richards. Paratypes: Papua New Guinea, type locality: 1 ♂ (SAMA 07-001315), 1-XII-2009; 1 ♂ (SAMA 07-001316), 6-8-XII-2009; 1 ♂ (SAMA 07-001317), 06-VI-2010; 1 ♂, 1 ♀ (SAMA 07-001318 and 07-001320), 07-VI-2010; 1 ♂ (SAMA 07-001319), 8-VI-2010; all S.J. Richards.

Etymology: Latin sinuosus 3 = sinuous, referring to the ventral outline of the penis (in profile).

Male. - Head. Labium pale greenish yellow, narrowly lined with black only along inner anterior corner of palps; face largely pale yellowish green, only a wide triangular patch in approximately apical half of labrum and nearly all of anterior frons shiny black; apical portion of mandibles reddish brown to reddish black; top of frons, antennae and vertex shiny black; occiput largely brown, posteriorly yellow; dorsal portion of postgenae brown, more ventral portion, particularly along lateral margins, brownish yellow.

Thorax - Prothorax and cervical sclerites pale yellow merging into greyish brown to nearly black, all without marked definition. Synthorax: spiracular dorsum medially broadly pale brownish yellow, laterally black; middorsal carina yellow; antealar ridge and sinus black; mesepisternum medially black, laterally largely pale greenish yellow (pale patch bottle-necked but not subdivided); other pleura pale brownish yellow, lined rather broadly with black along all of mesopleural and metapleural sutures, at anteroventral corner and at centre of metakatepisternum and along intersegmental suture for some distance dorsal to and including surrounds of metastigma; most of mesokatepisternum and subalar ridges also black or at least markedly darkened; most of terga pale green; postcoxae and poststernum pale greenish yellow. Legs with coxae, trochanters and inner face of femora pale greenish yellow, lower face of femora black and outer face of femora strongly darkened (almost black) in fore and middle leg, barely darkened (greyish yellow) in hind leg; tibiae inside black, otherwise yellow; tarsi largely black, only top and sides of second segment dirty greyish to brownish yellow; claws with base black, merging into brown more apically; all spines and similar structures black. Wing membrane clear and venation and pterostigma black; pterostigma short, overlying 2 crossveins; antenodals 8½-10½/7, postnodals 5-7/5-6; costal side of discoidal cells less commonly broken than unbroken; 2 or 3, most commonly 3, hindwing Cuq; anal loop made up of 9-10 cells.

Abdomen - Dark and pale, very variably defined. Basically terga 1-9 and segment 10 black with rings of yellow as follows: 1 with posterior ring, 2 with median ring; 3 with narrow anterior and much wider median ring; 4-6 with median ring only, that in 6 very wide, and only lateral section of posterior/anterior rings detectable; 7 with semicircular ventral patch at mid-length. Sterna 1-6 black and yellow, sterna 7-9 black; bipartite sternum 11 dirty greyish yellow. Secondary genitalia largely yellow, with ventral edge of penis tip slightly sinuously curved, adjacent ventral process of tergum 2 slim, pointed, very slightly and rather evenly curved forward or straight. Anal appendages yellow, superiors hardly longer than inferior; tips and corners blackened, the subapical ventral corner of superiors seemingly armed with 3-4 tooth-like structures.

Dimensions. - Hind wing 23.5-25.0 mm; abdomen plus appendages 20.0-21.6 mm.
Female. - Head. Much as in male but apical black triangle of labrum even more obtuse and anterior frons with ill-defined, roughly triangular patch covering only top ¾ of height and maximally ½ of width, pale to dark brown and all of occiput brown.

Thorax - Much as in male but prothorax variably pale and darker greyish brown without marked definition; coxae and trochanters and inner face of femora greyish to brownish yellow, outer face darkened to brown/black; tibiae inside black, otherwise brownish yellow; 9½/7 antenodals and 5-7/5 postnodals; costal side of all discoidal cells unbroken; distal antenodal of both forewings incomplete; 2 Cuq in one hind wing, 3 in the other; anal loop made up of 11 cells in both hind wings.

Abdomen - Much as in male but tergum 1 completely yellowish green; terga 3-6 with medial ring only; an extra posterior/anterior ring between terga 2 and 3 and only small lateral bits of posterior/anterior rings between terga 3 and 4, 4 and 5, and 5 and 6; vulvar scale as long as segment 8, apically very slightly bilobed, black.

Dimensions. Hind wing 26.4 mm; abdomen 21.6 mm.

Habitat - All known specimens of this species were collected from low foliage along a trail adjacent to a steep, boulder-filled stream at ~800 m above sea level in the Sepik River headwaters of northern Papua New Guinea. While only known from the vicinity of the type locality, given the extent of suitable habitat in northern New Guinea the new species almost certainly has a broad distribution in the region.

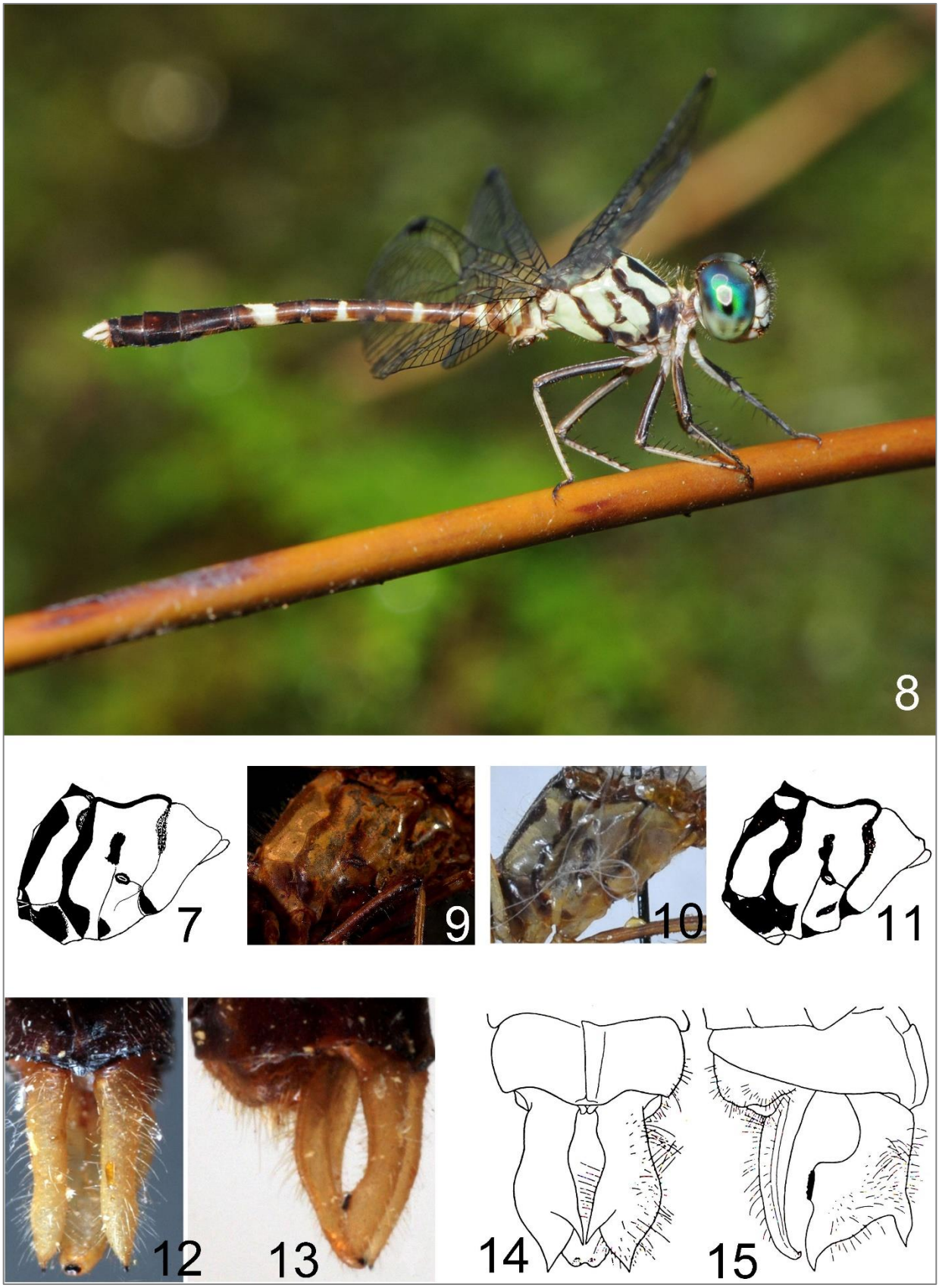
Comparison with other species

Microtrigonia sinuosa sp. n. is similar *to M. marsupialis*, *M. gomphoides* and *M. curvata* sp. n. in the general shape of the elements of the secondary genitalia and to *M. marsupialis* and *M. curvata* also in the structure of the male anal appendages. However it differs from them all in details like the slender, slightly S-curved penis (vs stouter, simply curved or double-curved) and the long almost straight and sharply pointed (vs shorter, less sharply pointed) ventral process of tergum 2. It further differs in the subapical ventral dark-armed area on the superior anal appendages which is clearly longer than in *M. curvata*, the congener with the most obtusely pointed appendages, and distinctly shorter than in *M. marsupialis* and in *M. gomphoides* which also has appendages of a very different shape. Both sexes can be distinguished from all congeners including *M. petaurina* (which is unfortunately known only from the female) by the broad black lining of the entire metapleural suture.

Revised key to the species of *Microtrigonia* Förster

1 Dark patch along intersegmental suture not reaching or covering surrounds of metastigma (Fig. 7) ..... *M. curvata*

- Dark patch along intersegmental suture reaching and covering surrounds of metastigma (Figs 3, 8-11) 2



Figs 7-15. ***Microtrigonia*** **spp.: (7, 9-11) synthorax, lateral: (7)** ***M. curvata*** **Theischinger & Richards; (9)** ***M. petaurina*** **Lieftinck; (10)** ***M. marsupialis*** **Förster; (11)** ***M. gomphoides*** **Lieftinck; (8)** ***M. sinuosa*** **sp. nov., ♂ in life; (12- 15) ♂, anal appendages: (12, 13)** ***M. marsupialis*** **Förster: (12) dorsal; (13) lateral; (14, 15)** ***M. gomphoides*** **Lieftinck: 14) dorsal; (15) lateral. Fig. 8 by S. Richards, Fig. 9 by V.J. Kalkman, and Figs 10, 12, 13 by M. O'Brien. Figs 11, 14, 15 modified from Lieftinck (1933).**

2 All of metapleural suture broadly lined with black (Figs 3, 8)……*M. sinuosa* sp. n.

- Not all of metapleural suture broadly lined with black (Figs 9-11) ……3

3 Species (known only from female) with 3 Cuq in hindwing …….. *M. petaurina*

- Species (known from both sexes) with 2 Cuq in hindwing 4

4 Male anal appendages shallow and simple (Figs 12, 13) ..... *M. marsupialis*

- Male anal appendages deep and bifid (Figs 14, 15) ……*M. gomphoides*

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