

**ARGIOLESTES TRIGONALIS SPEC. NOV.,  
A NEW SPECIES FROM PAPUA NEW GUINEA  
(ZYGOPTERA: MEGAPODAGRIONIDAE)**

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The new sp. is described from lowland rainforest in Gulf Province. Holotype ♂: Papua New Guinea, Gulf prov., Dark-End Lumber, 2-X-1999; deposited at SAMA, Adelaide. Diagnostic characters of the adult ♂ are illustrated and the affinities of the sp. are discussed.

## INTRODUCTION

Damselflies of the megapodagrionid genus *Argiolestes* are rather large, dark and metallic species commonly exhibiting blue or orange markings on the head, thorax, and abdomen. The genus is moderately diverse in Papua New Guinea, and TSUDA (2000) listed 29 species of *Argiolestes* from that country. Recent surveys by the junior author in Papua New Guinea have revealed four more. Three of them were recently described (THEISCHINGER & RICHARDS, 2006c, 2007a). The fourth is described in this paper, which also constitutes the seventh in a series of papers that aims to address taxonomic novelties in New Guinean Odonata collected by SJR between 1996 and 2001 (THEISCHINGER & RICHARDS, 2005, 2006a, 2006b, 2006c, 2007a, 2007b). Even more recently ENGLUND & POLHEMUS (2007) described another new species from New Guinea, listing at the same time 31 *Argiolestes* species which occur on New Guinea and the proximal Raja Ampat and D'Entrecasteaux island (including their species but not yet those of Theischinger & Richards).

## MATERIAL AND METHODS

Descriptive terminology largely follows CHAO (1953) and WATSON & O'FARRELL (1991). Coloration is given as detectable from the preserved material and measurements are given in millimetres (mm). All illustrations were done with the aid of a camera lucida and are not to scale.

If not indicated otherwise the material is deposited in the Insect Collection of the South Australian Museum (SAMA), North Terrace, Adelaide, South Australia.

*ARGIOLESTES TRIGONALIS* SP. NOV.

Figures 1-4

**Material.** – **Holotype** ♂ (SAMA I21812): Papua New Guinea, Gulf prov., Dark-End Lumber (DEL), small stream adjacent DEL camp (144°22.937'E, 7°08.894'S), in dappled sun, 2-X-1999, 2.50 p.m., S.J. Richards (SAM). – **Paratypes:** 1 ♂ (SAMA I21813), along shaded stream adjacent DEL camp, 2-X-1999, 2.20 p.m.; – 1 ♂ (SAMA I21814), small stream along DEL camp, 2-X-1999, 3.15 p.m.; – 1 ♂ (SAMA I21815), in forest above DEL camp, in dappled sun, 5-X-1999, 5.10 p.m.; – 2 ♂ (SAMA I21816, I21817), creek next to DEL camp, in shade, 9-X-1999, 2.00 p.m.; all S.J. Richards.

**Etymology.** – The specific name refers to the shape of the medial flange of the superior anal appendages of the male.

**MALE.** – Ventral face of head including labium pale yellowish brown. Top of head including antennae largely black; postclypeus (except for a brownish yellow patch each side) and labrum shiny black. Following features pale to dark brownish yellow: mandibles, anteclypeus, patch between epistomal suture and eyes including frons, small patch each side and anterior to median ocellus, E-shaped patch between and postero-lateral to lateral ocelli, both ends of occipital ridge. Only anteclypeus clearly and distinctly pale, otherwise pale and dark areas not sharply defined.

**Thorax.** – Prothorax – Pronotum largely dark brown to black with yellow, more or less connected, lateral patches on all lobes; propleura largely black, narrowly brownish yellow along ventral edge. Leg with coxa, trochanter and femur almost completely pale yellowish brown and tibia markedly darker yellowish brown; only extreme apex of femur and extreme base of tibia brown to black; tarsus brown to black and claws reddish- to blackish brown.

**Synthorax.** – Meso- and metapleura, including dorsal carina, antealar ridge and sinus, and mesostigmatic lamina entirely or largely shiny black; following features pale brownish yellow: spiracular dorsum; a narrow wedge across approximately basal ¼ (in more mature specimens), or a more or less curved band across almost basal 2/3 (in less mature specimens), of mesepisternum very close to mesopleural suture; a small posterior portion of mesepimeron and a large anterior portion of metepisternum; much of meso- and metakatepisternum and all of metepimeron and poststernum. Legs much as in prothorax.

**Wings.** – Membrane hyaline. Venation black. Pterostigma of both wings brownish grey to black, marginally longer than wide, normally overlapping less than 2

cells. Postnodals 20-25/20-23. Largely 2 rows of cells in anal field of forewing, largely 3 rows in anal field of hindwing.

**A b d o m e n.** – Largely black; only sides of terga 1-8 merging into brown, and small ill-defined paler basal patches on terga 3-8 and on intersegmental membrane of preceding segments. Terga 8 and 9 appear hollowed and weakened along midline; much of thus divided dorsal area of tergum 9 markedly paler than remaining terga. Approximately median half of posterior edge of tergum 10 slightly prominent and distinctly serrated. Anal appendages very dark; superiors forcipate, with median flange simple, triangular, and with apex long and slightly clubbed; inferiors short, stout, widely rounded laterally, angled or slightly produced medially.

**M e a s u r e m e n t s** (in mm). – Hindwing 27.6, abdomen (incl. appendages) approximately 35.

**FEMALE** unknown.

**HABITAT.** – Dark-End Lumber is lowland rainforest (40-60 m asl) in the Kikori River Basin. The type locality is in primary forest at the base of a low, heavily forested ridge drained by several small, clear and heavily shaded streams.

**DISCUSSION.** – Like the recently described (THEISCHINGER & RICHARDS, 2006) *A. indentatus*, *A. trigonalis* keys out to *A. montivagans* (Förster) in the key given by LIEFTINCK (1956) and reproduced by J. Michalski (manuscript) and may therefore be considered most similar to that species. Even though the available specimens are not fully mature or aged and the brownish and yellowish colouration of some body parts may be darker, possibly partly blue, in fully mature individuals, the new species appears to belong to the group of species that have the posterior edge of the male segment 10 dorsally finely denticulate or serrat-



Figs 1-4. *Argiolestes trigonalis* sp. n., ♂: (1) synthorax, lateral view; – (2) base of mesepisternum of a subadult individual; – (3) anal appendages, dorsal view; – (4-6) right superior anal appendage, dorsal view; – (5) *A. pectitus* Lieftinck; – (6) *A. lamprostomus* Lieftinck.

ed and the inner face of femora and tibiae bright yellow or orange. They are *A. ochrostomus* Lieftinck, *A. montivagans* (Förster), *A. kirbyi* (Förster) and *A. indentatus* Theischinger & Richards. The character combination of a metallic black labrum and postclypeus, pale bands on the front of the synthorax and simple triangularly flanged superior anal appendages of the male, however, is diagnostic within the group. *A. ochrostomus* has a yellow labrum, *A. montivagans* lacks a pale antehumeral pattern, both *A. montivagans* and *A. kirbyi* have the median flange of the male superior anal appendages bilobed, and *A. indentatus* has the median flange of the male superior appendages set off from the apex by a distinct notch. Species with the male anal appendages most similar to *A. trigonalis* are *A. lamprostomus* Lieftinck and *A. pectitus* Lieftinck. Both of them, however, have, even in fully mature individuals, a completely or largely pale postclypeus and a longer pterostigma in both wings than has *A. trigonalis*. Their male anal appendages are illustrated in Figures 5 and 6.

The genus *Wahnesia* was established by FORSTER (1900) for species with curiously modified terminal segments in the male. That genus is currently regarded as a junior synonym of *Argiolestes* Selys but should *Wahnesia* have to be re-instated in future, then *A. trigonalis* may also have to be included in it.

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#### REFERENCES

- CHAO, H.F., 1953. The external morphology of the dragonfly *Onychogomphus ardens* Needham. *Smithson. misc. Collns* 122(6): 1-56.
- ENGLUND, R.A. & D.A. POLHEMUS, 2007. *Argiolestes kula*, a new species of damselfly from eastern New Guinea (Odonata: Megapodagrionidae). *Jl N. Y. ent. Soc.* 114(3): 95-107.
- FORSTER, F., 1900. Odonaten aus Neu-Guinea. *Termesz. Füzetek* 23: 81-108.
- LIEFTINCK, M.A., 1956. Revision of the genus *Argiolestes* Selys (Odonata) in New Guinea and the Moluccas with notes on the larval forms of the family Megapodagrionidae. *Nova Guinea (N.S.)* 7(1): 59-121.
- THEISCHINGER, G. & S.J. RICHARDS, 2005. Two new species of *Drepanosticta* Laidlaw from Papua New Guinea (Zygoptera: Platystictidae). *Odonatologica* 34(3): 307-312.
- THEISCHINGER, G. & S.J. RICHARDS, 2006a. Two new species of *Nososticta* Hagen in Selys from Papua New Guinea (Zygoptera: Protoneuridae). *Odonatologica* 35(1): 75-79.
- THEISCHINGER, G. & S.J. RICHARDS, 2006b. Two new Zygoptera species from Papua New Guinea (Protoneuridae, Coenagrionidae). *Odonatologica* 35(2): 199-204.

- THEISCHINGER, G. & S.J. RICHARDS, 2006c. *Argiolestes indentatus* spec. nov. from Papua New Guinea (Zygoptera: Megapodagrionidae). *Odonatologica* 35(4): 385-388.
- THEISCHINGER, G. & S.J. RICHARDS, 2007a. Three new damselfly species from Papua New Guinea (Odonata: Megapodagrionidae, Coenagrionidae). In: B.K. Tyagi, [Ed.], *Odonata: Biology of dragonflies*, pp. 33-43, Scient. Publishers (India), Jodhpur.
- THEISCHINGER, G. & S.J. RICHARDS, 2007b. *Teinobasis kiautai* spec. nov., a new species from Papua New Guinea (Zygoptera: Coenagrionidae). *Odonatologica* 36(1): 85-88.
- TSUDA, S., 2000. *A distributional list of the World Odonata 2000*. Tsuda, Osaka.
- WATSON, J.A.L. & F.A. O'FARRELL, 1991. Odonata (dragonflies and damselflies). In: CSIRO, [Ed.], *The insects of Australia*. [2nd edn], Melbourne Univ. Press, Melbourne.