

Two new dragonfly species from Yapen and Biak, Papua (Irian Jaya), Indonesia (Odonata)

V.J. Kalkman

Kalkman, V.J. Two new dragonfly species from Yapen and Biak, Papua (Irian Jaya), Indonesia (Odonata). Zool. Med. Leiden 82 (11), 1.i.2008: 81-89, figs 1-6, tables 1-2.— ISSN 0024-0672.

Vincent Kalkman, National Museum of Natural History, P.O. Box 9517, 2300 RA Leiden, The Netherlands (kalkman@naturalis.nl).

Key words: Odonata; Coenagrionidae; Macromiidae; *Teinobasis*; *Macromia*; new species; New Guinea; Papua; Yapen; Biak.

During fieldwork on the island of Yapen (Indonesia, Papua (Irian Jaya)), conducted in July 2006, several undescribed species of Odonata were collected. Two of these are described based on material from Yapen and Biak (Papua (Irian Jaya), Indonesia): *Teinobasis sjupp* spec. nov. (type locality: Yapen Island) and *Macromia holthuisi* spec. nov. (type locality: Biak Island).

Introduction

With over 425 species, New Guinea and the Solomon Islands hold a very rich dragonfly fauna. Many of the regional species and 28 of the 90 genera, are endemic to the region giving the fauna its unique character. A staggering 60 percent of the taxa has been described by Maurits Lieftinck, mostly in a series of seven extensive papers published in period 1932 to 1949. The majority of the New Guinean species has never been observed by odonatologists in the field and information on distribution, habitat and behaviour is scarce. Since the work of Lieftinck mostly smaller contributions have appeared and an increase in the number of published papers on the fauna is notable only during the last decade (e.g. Gassmann, 1999, 2000; Kalkman, 2007; Michalski, 1996, 2006; Michalski & Oppel, 2007; Oppel, 2005, 2006a, 2006b, 2006c; Theischinger & Richards, 2005, 2006a, 2006b, 2006c).

The author participated in an expedition by the Kelompok Entomologi Papua (KEP) and Universitas Cenderawasih (UNCEN) in New Guinea in July 2006, during which fifteen days were spent on the island of Yapen. This island of approximately 160 by 25 km, situated in the Teluk Cenderawasih (Geelvinkbaai) between the Bird's head peninsula and the main body of New Guinea, is in fact an isolated continuation of the Van Rees Mountains of northern New Guinea. The mountains of Yapen reach over 1400 meter and are largely covered with primary forest. Only thirteen odonate species had been recorded previously and no real collecting efforts for Odonata had been executed before (Lieftinck, 1949). At least 54 species were found during our fieldwork, bringing the total to 61. It is likely that the actual number of species of the island will be over eighty. A faunistic paper on the dragonflies of Yapen is in preparation (Kalkman et al. in prep), while the present paper describes two species new to science. Terminology largely follows Watson & O'Farrell (1991).

Acronyms for collections:

RMNH Nationaal Natuurhistorisch Museum Naturalis, Leiden, The Netherlands;

MBBJ Museum Zoologicum Bogoriense, Cibinong, Java, Republic of Indonesia.

Systematic part

Teinobasis sjupp spec. nov.

(figs 1, 2)

Type material. — **Holotype**, ♂, Indonesia, Papua, Yapen island, Yobi, degraded forest with small pools and brooks, (01°42.262S, 136°27.836E), sealevel, 19.vii.2006, leg. V.J. Kalkman, coll. MBBJ. — Paratypes 5 ♂: same locality and date, RMNH.

Male. Head.— Labium including labial palps yellow, median cleft very deep and both halves of the central lobe very slender (fig. 1a). Labrum bright yellow with a well defined black line in the upper corners and two tiny black spots in the upper corners close to anteclypeus. Mandibles, lower corner of genae and anterior border of anteclypeus bright yellow, remainder of head black. A sharp, transverse ridge is present in front of the antennae. Antennae slender and black.

Thorax.— Prothorax and pronotum completely bright yellow, except for a thin black line on top of anterior lobe. Posterior lobe of pronotum large and erect, with lateral margins almost vertical and dorsal margin relatively narrow and slightly depressed in middle. Synthorax slender with sides yellow except for a few small black markings on posterior border and a black marking on the metapleural suture; dorsally black with yellow spot on posterior end of middorsal carina. Coxae, trochanters and femora of all legs bright yellow, femora with black tip, tibiae and tarsi yellow but less brightly, tibiae near tarsi and top of second segment of tarsi black. Claws dark brown without inferior hook.

Wings.— Wings slender, venation black, all wings with two Ax, 14 Px in hind wing, 14-15 Px in fore wing (fig. 1b). Discoidal cell acute, in hind wing a fifth longer than in fore wing; posterior border in fore wing slightly more than twice as long as anterior border; posterior border in hind wing slightly less than twice as long as anterior border. Pt small, only slightly broader than long, black and thinly bordered with white. Veins R4+5 and IR3 at origin very close together.

Abdomen.— Abdomen long and slender (fig. 2). Segment 1 yellow with posterior one-fourth black, segments 2-8 dorsally black, laterally yellow, segments 9-10 black. Intersegmental annulae between last four segments yellow. Especially basal half of abdomen with slight metallic shine. Hind margin of segment 10 slightly raised. Superior appendages dark brown to black; both upper and lower branch slender (fig. 1c-d). Upper branch of superior appendages slightly longer than segment 10; lower branch is slightly longer than half the length of upper, both with simple shape, the lower with acute tip. Lower appendages simple and sturdy, shorter than lower branch of superiors, base dirty yellow, tip dark brown.

Measurements (in mm).— Total length: 52, abdomen length: 45, fore wing length: 29, hind wing length: 28, pterostigma in fore wing (costal length): 0.7, pterostigma in fore wing (longest length): 1.1.

Female.— Unknown.

Variation.— The paratypes do not show any noteworthy differences from the holotype.

Diagnosis.— Distinguished from other genera in the Papuan region by the sharp, transverse ridge on the frons just in front of the antennae (shared with *Ceriagrion*, *Pa-*

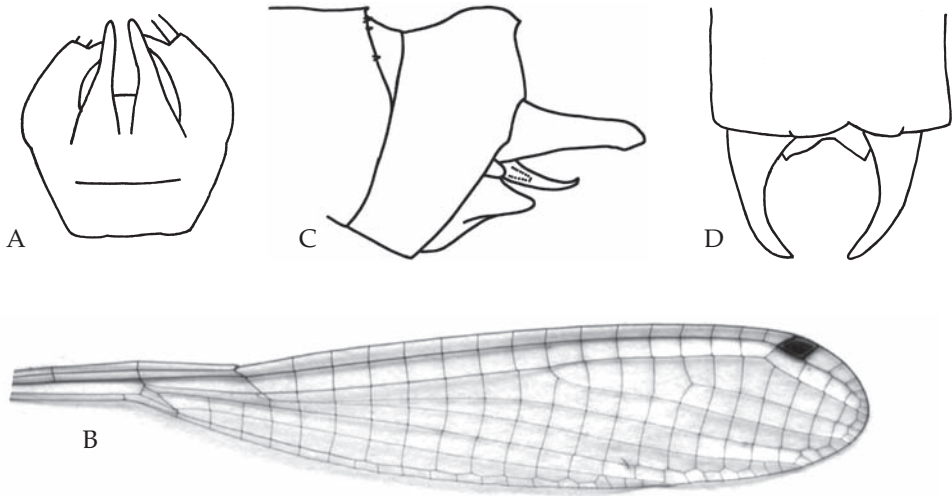


Fig. 1. *Teinobasis sjupp* spec. nov. A, labium; B, fore wing; C, appendages from lateral; D, appendages from dorsal.

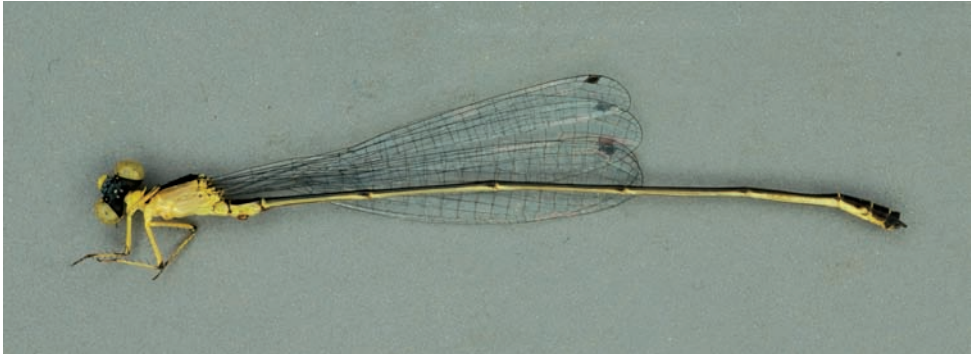


Fig. 2. *Teinobasis sjupp* spec. nov., holotype.

puagrion, *Plagulibasis*), the lack of an inferior hook on the tarsal claws (present in *Papua-grion* and *Ceriagrion*) and R4+5 and IR3 being very close at origin (not so in *Ceriagrion*, *Papua-grion* and *Plagulibasis*). Distinguished from other *Teinobasis* species by the following combinations of characters: (1) Upper branch of superiors slightly longer than S10, lower branch slightly longer than half the length of the upper, (2) inferior appendages shorter than lower branch of superiors, (3) prothorax and pronotum yellow and posterior lobe of the prothorax large and erect, (4) labrum, mandibles, lower corner of gena and the anterior border of the anteclypeus bright yellow, remainder of head black.

Habitat.— Found in degraded forest with small pools and brooks within a few hundred metres from the sea. The specimens were not directly associated with any of the aquatic habitats but were found sitting on twigs, half a meter to one meter above the ground.

Etymology.— Sjupp was the beloved pet common raccoon of Carolus Linnaeus (Nicholls, 2007). In 1747 Sjupp had an unfortunate encounter with a dog, after which he became the type specimen of *Procyon lotor* (Linnaeus, 1758). No other pet was so closely involved in the birth of binomial nomenclature. A noun in apposition.

Macromia holthuisi spec. nov.
(figs 3-6)

Macromia chalciope subsp. nov.— Lieftinck (1971: 33-35, fig. 17-18, one male, three females from Biak; male and female described, genitalia and anal appendages illustrated).

Specimens studied

Type material.— **Holotype**, ♂, Indonesia, Biak Island, Base, 29.xii.1954, leg. L.B. Holthuis, RMNH.— Paratypes: 1 ♀: same date and locality, RMNH.— 2 ♀: Indonesia, Biak Island, Sorido, 28.xii.1954, leg. L.B. Holthuis, RMNH.

Other material studied but excluded from the type series. 1 ♂, 2 ♀: Indonesia, Papua, Yapen island, Ambaidiru village, brook (kali Manatiuna) running through village and degraded forest (01°45.799S, 136°10.732E), a.s.l. 600 m, 13.vii.2006, leg. V.J. Kalkman, RMNH. — 1 ♀, idem, 14.vii.2006. — 1 ♂: Indonesia, Papua, Yapen island, Ambaidiru village, brook (kali Manatiuna) running through village and degraded forest (01°45.799S, 136°10.732E), 600m, 15.vii.2006, leg. J. Keize, RMNH. — 1 ♂: idem, 16.vii.2006. — 1 ♂: Yobi, river partly in degraded forest and partly in virgin forest (aprox. S01°42.334 E136°28.663), a.s.l. <50 m, 18.vii.2006, leg. V.J. Kalkman, RMNH.

This species was already thoroughly described by Lieftinck (1971) as '*Macromia chalciope* subsp. nov.'. Lieftinck had one male and three females at his disposal and wrote:

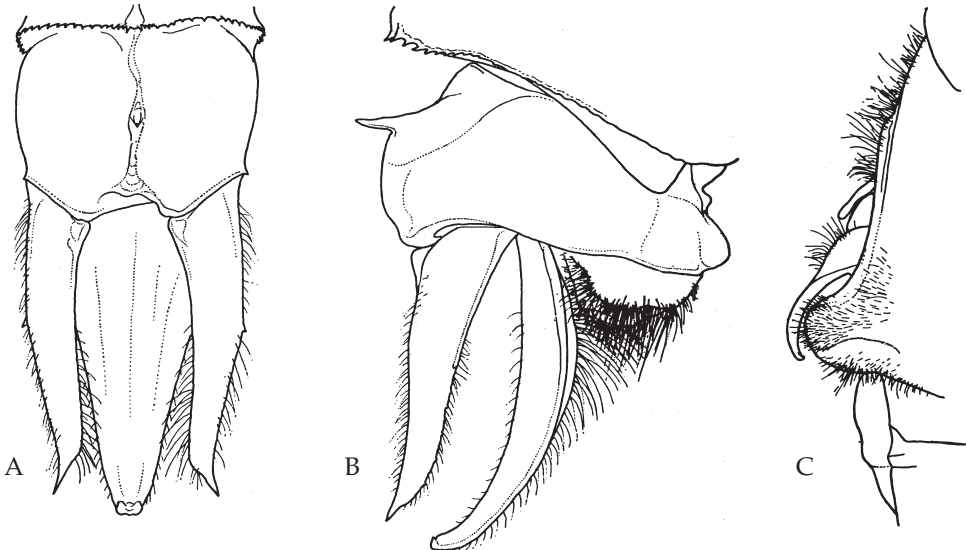


Fig. 3. *Macromia holthuisi* spec. nov. A, appendages from dorsal; B, appendages from lateral; C, accessory genitalia (from Lieftinck, 1971). *Macromia chalciope*. D, appendages from dorsal; E, appendages from lateral; F, accessory genitalia (from Lieftinck, 1952).

'In spite of the above differences [referring to his description], the present individuals are determined, with some reserve as *M. chalciope*. More material, especially of the male, will be necessary to establish its proper identity, - most likely as a subspecies of the better known Moluccan dragonfly [referring to *chalciope*].'. The morphology of the four males and three females from Yapen fit the description given by Liefstinck (1971) for the material collected on Biak and it is concluded that the material from Biak and Yapen belong to the same species. The differences with *M. chalciope* are slight but constant. The taxon from Yapen and Biak belongs a closely related and probably monophyletic group of species containing *M. chalciope* and *M. holthuisi* spec. nov. and twelve other species confined to Cape York (Australia), New Guinea and adjacent islands, Halmahera and Bacan (van Tol, 1994). This group can be distinguished from other species of *Macromia* by (1) an exceptional small discoidal triangle of the hind wing, (2) a minute pterostigma of ca. one mm, (3) a sharply acute anal angle of the wing in the male and (4) long and slender genital hamules in the male (Van Tol, 1994). The differences between the species of this group are often small and I therefore decided with some hesitation to describe the taxon as a new species and not as a subspecies. For a full description I refer to Liefstinck (1971), here a diagnosis is presented together with the illustrations (figs. 3a-f) of *M. chalciope* from Liefstinck (1952) and *M. holthuisi* spec. nov. from Liefstinck (1971: as *Macromia chalciope* subspec?). A photo of the type of *M. holthuisi* spec. nov. is given in figure 4.

Variation.— The specimens from Yapen and those from Biak are morphologically identical, but show differences in size and colouration. The specimens from Yapen are smaller (table 2) than those of Biak and the extent of the spot on S7 is greater (fig. 5a-c) with the base of the spot connecting with the base of S7. Besides, the wings of the females are smoky brownish in two of the females from Yapen and less so in the third, while the

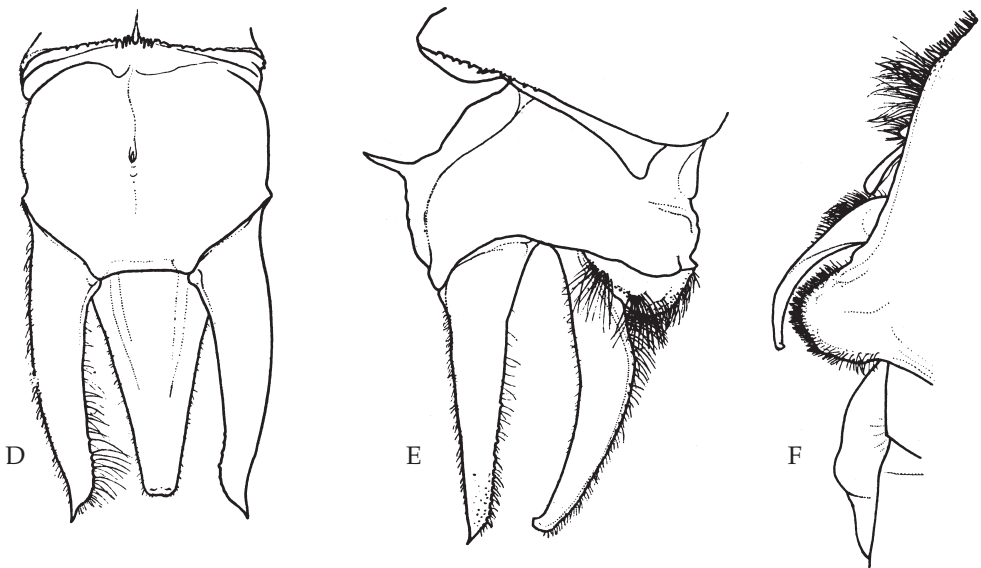




Fig. 4. *Macromia holthuisi* spec. nov., holotype and upper and underside of label (enlarged).

wings of the three Biak females are hyaline save for a yellow patch in the base of the wings. The smoky colouration of the wing might, however, be age related.

Diagnosis.— *Macromia holthuisi* can be distinguished from all other Papuan *Macromia* species by the combination of the following characters: (1) postclypeus reddish brown to black without yellow; (2) dorsum of thorax with a pair of short yellow or orange antehumeral bands. Characters distinguishing the new species from the Moluccan *Macromia chalciope* are given in table 1. The inferior appendage being longer than the superior appendages and the larger size of the spot on segment 7 are by far the easiest way to distinguish *M. holthuisi* spec. nov. from *M. chalciope*. Other characters can be used only when specimens are directly compared.

Lieftinck (1971) states that typical *chalciope* (meaning *chalciope* from Halmahera) lacks the minute exterior tooth at about halfway the length of the superior appendages. However this is incorrect. In both species specimens can be found with or without those spines and sometimes this even varies between the two axis of the appendages.

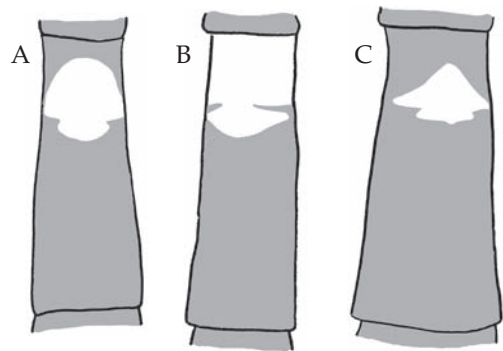


Fig. 5. Pattern on segment 7. A, *Macromia holthuisi* spec. nov. from Biak; B, *Macromia holthuisi* spec. nov. from Yapen; C, *Macromia chalciope* from Halmahera.



Fig. 6. Habitat of *Macromia holthuisi* spec. nov., Indonesia, Papua, Yapen Island, Yobi, 18.vii.2006. Photo: V.J. Kalkman.

Table 1. Comparison between *Macromia holthuisi* spec. nov. and *Macromia chalciope*.

Character	<i>chalciope</i>	<i>holthuisi</i> spec. nov.
♂ inferior appendages	slightly shorter than superiors	longer than superiors
♂ inferior appendages	less upturned than in <i>holthuisi</i> spec. nov.	more upturned than in <i>chalciope</i>
♂ superior appendages	slightly thicker than in <i>holthuisi</i> spec. nov.	slightly more slender than in <i>chalciope</i>
♂ orange spot on 7 th segment	smaller, about 20% of the length of S7	larger, about 33% of the length of S7
♀ orange spot on 7 th segment	smaller, about 25% of the length of S7	larger, about 40% of the length of S7

Table 2. Size of males and females of *Macromia holthuisi* spec. nov. from Biak and Yapen and and *Macromia chalciope* from Halmehera.

	Sex	N	Total length	Hind wing length
<i>M. holthuisi</i> spec. nov. from Yapen	♂	4	61-63	42-43
	♀	3	62-63	45-46
<i>M. holthuisi</i> spec. nov. from Biak	♂	1	65	43
	♀	3	63-66	47-48
<i>M. chalciope</i> from Halmehera	♂	8	67-71	43-47
	♀	3	68-69	49-50

Habitat.— On Yapen three males and three females were caught at a largely shaded, stony, brook of 3–4 m wide and mostly less than 0.5m deep, running through degraded forest at 600 m above sea-level. Another male was caught at a shaded and stony brook of 3 to 5m wide and mostly less than 0.5m deep running through largely untouched forest near sea-level (fig. 6).

Etymology.— Named after Prof. dr L.B. Holthuis, the collector. Dr Holthuis is a specialist of Crustacea at the National Museum of Natural History Naturalis. The name is a noun in the genitive case.

Acknowledgements

Jan van Tol commented on the manuscript and made the pictures of the holotypes. Henk van Mastrigt gave me the opportunity to join the fieldwork of the Kelompok Entomologi Papua (KEP) and the Universitas Cenderawasih (UNCEN) on Yapen.

References

- Gassmann, D., 1999. Taxonomy and distribution of the *inornata* species-group of the Papuan genus *Idiocnemis* Selys (Odonata: Zygoptera: Platycnemididae).— *Invertebrate Taxonomy* 13: 977-1005.
- Gassmann, D., 2000. Revision of the Papuan *Idiocnemis bidentata*-group (Odonata, Platycnemididae).— *Zoologische Mededelingen Leiden* 74: 325-402.
- Kalkman, V.J., 2007. *Archboldargia scissorhandsi* spec. nov. from Papua, Indonesia (Zygoptera: Coenagrionidae).— *Odonatologica* 36: 203-208.
- Lieftinck, M.A., 1949. The dragonflies (Odonata) of New Guinea and neighbouring islands. Part VII. Results of the Third Archbold expedition 1938-1939 and of the Le Roux Expedition 1939 to Netherlands New Guinea (II. Zygoptera).— *Nova Guinea (N.S.)* 5: 1-271.
- Lieftinck, M.A., 1952. On the Papuan representatives of the genus *Macromia* Rambur, with descriptions of five new species and some larval forms.— *Treubia* 21: 437-468.
- Lieftinck, M.A., 1971. Studies in Oriental Corduliidae (Odonata) I.— *Tijdschrift voor Entomologie* 114: 1-63.
- Michalski, J.C., 1996. Description of *Hylaeargia magnifica* Michalski, a damselfly from Papua New Guinea (Odonata: Zygoptera).— *Tijdschrift voor Entomologie* 139: 29-32.
- Michalski, J.C., 2006. *Neurobasis awamena* sp. nov. from New Guinea, with a discussion of the Sulawesi and Papuan species in the genus (Odonata: Calopterygidae).— *International Journal of Odonatology* 9: 185-195.
- Michalski, J.C. & S. Oppel, 2007. *Papua-grion carcharodon* sp. nov. from New Guinea (Odonata: Coenagrionidae).— *International Journal of Odonatology* 10: 81-86.
- Nicholls, H. Linnaeus at 300: The royal raccoon from Swedesboro.— *Nature* 446: 255-256.
- Oppel, S., 2005. Odonata in the Crater Mountain Wildlife Management Area, Papua New Guinea.— *IDF-Report* 7: 1-28.
- Oppel, S., 2006a. Comparison of two Odonata communities from a natural and a modified rainforest in Papua New Guinea.— *International Journal of Odonatology* 9: 89-102.
- Oppel, S., 2006b. Using distance sampling to quantify Odonata density in tropical rainforest.— *International Journal of Odonatology* 9: 81-88.
- Oppel, S., 2006c. Site fidelity and dispersal of adult *Neurobasis awamena* Michalski in tropical rainforest streams in Papua New Guinea (Zygoptera: Calopterygidae).— *Odonatologica* 35: 331-339.
- Theischinger, G. & S.J. Richards, 2005. Two new species of *Drepanosticta* Laidlaw from Papua New Guinea (Zygoptera: Platystictidae).— *Odonatologica* 34: 307-312.
- Theischinger, G. & S.J. Richards, 2006a. Two new species of *Nososticta* Hagen in Selys from Papua New Guinea (Zygoptera: Protoneuridae).— *Odonatologica* 35:75-79.

- Theischinger, G. & S.J. Richards, 2006b. *Argiolestes indentatus* spec. nov. from Papua New Guinea (Zygoptera: Megapodagrionidae).— *Odonatologica* 35: 385-388.
- Theischinger, G. & S.J. Richards, 2006b. Two new Zygoptera species from Papua New Guinea (Protoneuridae, Coenagrionidae).— *Odonatologica* 35: 199-204.
- Tol, J. van, 1994. The Odonata of Sulawesi and adjacent Islands. Part 3. The genus *Macromia* Rambur (Corduliidae).— *Tijdschrift voor Entomologie* 137: 87-94.
- Watson, J.A.L. & F.A. O'Farrell, 1991. Odonata (dragonflies and damselflies). In: CSIRO, [Ed.], *The insects of Australia*. 2nd edn.— Melbourne University Press, Melbourne.

Received: 8.xi.2007

Accepted: 20.xi.2007

Edited by: J. van Tol

