

***Pseudagrion lorenzi* sp. nov., a new damselfly species from New Britain island, Papua New Guinea (Odonata: Coenagrionidae)**

D. Gassmann*

National Centre for Biodiversity (NCB Naturalis), PO Box 9517, NL-2300 RA Leiden, the Netherlands

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Pseudagrion lorenzi sp. nov. is described from New Britain island, Papua New Guinea. Male and female characters are illustrated by means of scanning electron microscopy. A differential diagnosis with *Pseudagrion civicum* Lieftinck, 1932 from New Guinea and *Pseudagrion incisurum* Lieftinck, 1949 from the Solomon Archipelago is provided. The female of *P. incisurum* is described for the first time.

Keywords: Odonata; dragonfly; Coenagrionidae; *Pseudagrion lorenzi* sp. nov.; new species; *Pseudagrion incisurum*; New Britain; Bismarck Archipelago; Papua New Guinea

Introduction

With about 144 described species (Schorr, Lindeboom & Paulson, 2010), the damselfly genus *Pseudagrion* Selys, 1876, is one of the largest genera of Coenagrionidae. It has been characterized by Selys (1876) using the following main structural characters: anal vein originating at or slightly proximal to anal crossvein, Pt similar in all wings; male superior appendages usually notched or forked, female posterior pronotal lobe with a pair of anteriorly directed horns; females lacking a vulvar spine on venter of abdominal segment 8. The degree of furcation of the male superior appendage appears to be very variable among the species currently assembled in the genus. We therefore assign the present new species to the genus *Pseudagrion* based on Selys' remaining generic characters. Several of the morphological characters examined here (e.g. of the male ligula) using scanning electron microscopy might prove valuable as taxonomic characters contributing to the distinction between *Pseudagrion* and related genera, as soon as proper illustrations of those characters in more coenagrionid groups become available.

The majority of the *Pseudagrion* species occur in the Afrotropical region. About 40 species occur in the area ranging from southern Asia to Australia (Dijkstra, Groeneveld, Clausnitzer & Hadrys, 2007; J. Michalski pers. comm.; Silsby, 2001). With the new *Pseudagrion lorenzi* included, the number of *Pseudagrion* species recorded from the Papuan region now amounts to 12 taxa (Table 1). *Pseudagrion papuense* Tillyard, 1926, was synonymized with *P. cingillum* (Brauer,

*Email: dirk.gassmann@ncbnaturalis.nl

Table 1. *Pseudagrion* species from the Papuan region.

Species	Distribution	Colour pattern
<i>Pseudagrion civicum</i> Lieftinck, 1932	West and North New Guinea	Predominantly yellow
<i>Pseudagrion incisurum</i> Lieftinck, 1949	Solomon Islands: Guadalcanal	
<i>Pseudagrion lorenzi</i> sp. nov.	Bismarck Archipelago: New Britain	Dark, with thorax bluish pruinose
<i>Pseudagrion silaceum</i> Lieftinck, 1932	North and East New Guinea	
<i>Pseudagrion farinicolle</i> Lieftinck, 1932	West, North & Northeast New Guinea	Dark, with thorax bluish pruinose
<i>Pseudagrion fumipennis</i> Polhemus <i>et al.</i> , 2008	South New Guinea	
<i>Pseudagrion ignifer</i> Tillyard, 1906	Southwest New Guinea, North Australia	Blue-black
<i>Pseudagrion cingillum</i> (Brauer, 1869)	South New Guinea, North Australia	
<i>Pseudagrion coarctatum</i> Lieftinck, 1932	North New Guinea	
<i>Pseudagrion microcephalum</i> (Rambur, 1842)	Widespread through Southeast Asia and the Pacific up to Vanuatu; New Guinea; New Britain; Solomons; Australia	
<i>Pseudagrion pelecotomum</i> Lieftinck, 1932	North New Guinea	
<i>Pseudagrion starreanum</i> Lieftinck, 1949	West New Guinea	

1869) by Lieftinck in 1959. One species, *P. incisurum*, is known from the Solomon Archipelago. In terms of coloration, the Papuan members of the genus readily fall into three groups which do not necessarily reflect relationship. The first group is characterized by the predominantly blue body markings and includes the remarkable and recently described *P. fumipennis* with dark wing apices (Polhemus, Michalski & Richards 2008). The second group comprises dark species with a predominantly dark thorax overlain with bluish pruinosity. The third group contains largely yellow species. The new species described here belongs to the latter group whilst the second New Britain species, *P. microcephalum*, can be grouped with the first group.

Specimens of the present species were collected by the author during an odonatological field trip to Papua New Guinea in 1997 at various localities in New Britain. Further specimens were gathered by Dr Stephen J. Richards and the author during the Conservation International Rapid Biodiversity Assessment of the Nakanai Mountains, East New Britain Province, in 2009 (Gassmann & Richards, 2011).

The present paper is a continuation of the author's previous work on Odonata from the Bismarck Archipelago (Gassmann 1999, 2005, 2008).

Materials and methods

The specimens examined are held in the following collections: ANIC – Australian National Insect Collection, Canberra; BPBM – Bernice P. Bishop Museum, Honolulu; RMNH – National Centre for Biodiversity (Naturalis) Leiden, The Netherlands.

Scanning electron microscopy

Scanning electron microscopy (SEM) was performed at NCB Naturalis (Leiden) using a JEOL JSM 6480. Objects were coated with gold/palladium for 2–4 min.

Coloration characters

If not stated otherwise, the coloration as described in the systematic part refers to preserved specimens.

Measurements

Measurements of the length of wing and abdomen were taken with a precision of 0.5 mm.

Terminology

To denote details of odonate wing venation, we follow the modified Tillyard–Fraser system (Watson & O’Farrell, 1991).

Systematic part

Pseudagrion incisurum Lieftinck, 1949, (*Figures 8a–c, 11a, b*)

Pseudagrion incisurum Lieftinck, 1949: 336–338 [orig. descr. male; female unknown], figure 2 [male apps.].

Specimens examined

Solomon Islands, Guadalcanal: 1♂, 1♀, Betikama, October 1960, ex BISH [BPBM]. 1♂, 1♀, Ilu Farm, “sloot” [= ditch], 30 October 1964, leg. G. S. Slooff. 2♂, Ilu Farm, “bos, snelle beek” [= forest, fast running creek], 30 October 1964, leg. R. Slooff & G. S. Slooff. All in RMNH.

Female (first description)

Head. Labium, genae and anterior lateral parts of head bright yellow. Labrum and anteclypeus dirty yellow. Postclypeus with anterior side dirty yellow, dorsal side medium to dark brown. Frons, including antennal socket and scapus, medium brown; antennal pedicellus and flagellum medium to dark brown. Vertex medium brown, posterior two-thirds intermingled with reddish-brown. Posterior ocelli each with adjacent black marking attached to inner and posterior side. In dorsal view, black stripe running diagonally from lateral end of occipital ridge to about halfway along upper eye margin, thereby separating subtriangular postocellar area from vertex; colour of postocellar area medium brown, with posterior reddish stripe separating the medium brown area from black coloration of occiput. Rear of head almost entirely black except for diffuse yellow stripe along eye margin at either side.

Thorax. Anterior pronotal lobe dirty yellow, with anterior border brown-black. Distinct sublateral black spots attached to border between anterior and median pronotal lobe. Median pronotal lobe yellow, with subcircular black marking covering outer two-thirds of each half of median pronotal lobe, the black line being most robust posteriorly. Fine longitudinal black line dividing median pronotal lobe, border between median and posterior pronotal lobe marked in the same way. Posterior pronotal lobe short, raised at about 45° in lateral view; smoothly rounded but subtriangular in dorsal view. Pronotal horns comparatively short, in lateral view reaching anteriorly not beyond posterior fourth of median pronotal lobe, elevated, only slightly curved upwards

(Figure 11b). In dorsal view, distal half of pronotal horns curved outwards, proximal half straight (Figure 11a). Legs yellow, except for some black-brown markings almost entirely restricted to lateral spines. Brown stripe on posterior surface of lower half of each femur and diffuse markings at joints between femora and tibiae as well as at middle and end of metatarsus.

Synthorax with upper part reddish-brown, smoothly grading downwards into (greenish-) yellow. Anterior upper and posterior lower edge of synthorax each black. Black markings covering mesostigmal laminae except for anterior (dorsal) parts. Antehumeral and metathoracic fossae each covered by black spot. Ante-alar ridge at level of mes- and metepisternum marked with a black line; black spot at level of metathoracic suture. Wings clear. Fw with 15 Px, Hw 13–14 Px ($n = 2$). Pt slightly broader than high, anterior side somewhat longer than posterior, distal side distinctly convex; moderately oblique. Colour of Pt light brown.

Abdomen. Lower part yellow, upper part black; extension of black colour varies between segments as follows. S1 with dorsal black spot only, encircling a smaller yellow spot. S2–8 with clear distinction into upper black and lower yellow half, the dorsal black coloration increasing towards S8. S9 in dorsal view black, interrupted halfway by a lateral yellow ellipse at either side. S10 with diffuse dorsal subtriangular black marking. Tergite of S10 dorsally protruded; posterior dorsal margin of S10 in dorsal view slightly incised, in lateral view the dorsal third obliquely cut off. Valvae short, not reaching posterior margin of S10. Cerci three-fourths the length of S10, medium to dark brown. Colour of styli orange-brown.

Measurements

Fw length ♂ 24.0–25.0 mm ($n = 4$), ♀ 24.0–26.0 mm ($n = 2$); Hw length ♂ 22.5–23.5 mm ($n = 4$), ♀ 23.0–24.0 mm ($n = 2$); abdomen length 34.5–38.0 mm ($n = 4$), ♀ 33.0–35.5 mm ($n = 2$).

Altitudinal range

Known only from lowland areas.

Distribution

Guadalcanal (Solomon Archipelago).

***Pseudagrion lorenzi* sp. nov. (Figures 1–5, 6a–c, 9a–e, 12a, b, 13, 14)**

Pseudagrion ustum Selys: Ris, 1900: 198 [descr. male from New Britain]; Schmidt, 1944: 326 [checklist Odonata of Oceania]; Lieftinck, 1932: 566 (note on distributional range *P. ustum*).

?*Pseudagrion ustum* Selys: Lieftinck, 1949: 336 [New Britain record doubted]

Specimens examined

Holotype. Papua New Guinea, East New Britain Province: ♂, tributary to Warongoi, 11 June 1997, leg. D. Gassmann, RMNH.

Paratypes. Papua New Guinea, East New Britain Province: 5 ♂, 3 ♀, Sikute River, c.130 m, 04°30'41.4" S, 152°12'02.8" E, 11 June 1997, RMNH. 1 ♂, 1 ♀, Sikute River, c.130 m, 04°30'41.4" S, 152°12'02.8" E, 11 June 1997, ANIC. 3 ♂, 1 ♀, small creek at Keravat road,

c.40 m, 04°22'31.5" S, 152°02'40.2" E, 11–12 June 1997. 1 ♂, tributary to Warongoi, 11 June 1997. All leg. D. Gassmann, RMNH. 1 ♂, creek west to Palmalmal, 25 April 2009, leg. D. Gassmann. 2 ♂, creek north to Palmalmal, 26 April 2009, leg. D. Gassmann & S.J. Richards. 2 ♂, 1 ♀ (1 copula), riverine creek between Camp I and south coast, 9 April 2009. 1 ♂ (in alcohol), New Britain nr. Camp I, site III, 8 April 2009, leg. D. Gassmann & S.J. Richards. 1 ♂, Large pond nr. Camp II, 05°26'34.3" S, 151°27'59.4" E, deep in forest, 17 April 2009, leg. D. Gassmann. All in RMNH. Papua New Guinea, West New Britain Province: 2 ♂, Malalimi Creek (south to Hoskins Peninsula), 05°41'37.8" S, 150°29'36.5" E, 20 June 1997, leg. D. Gassmann. 2 ♀, creek nr. Numundo Plantation, 05°32'10.7" S, 150°03'55.4" E, 18 June 1997, leg. D. Gassmann. All in RMNH.

Others. 1 ♂, Willaumez Peninsula, springs and clear outflow creeks above Walindi Plantation, N. of Kimbe, 50 m., 5°25'47" S, 150°04'43" E, water temp. 26°C, 13 January 2005, 09:30–15:30 hrs, CL 7345, D. A. Polhemus, BPBM.

Diagnosis

A largely yellow (males) or brown (females) species with a dorsally black abdomen. From other predominantly yellow coloured Papuan *Pseudagrion* species, the males of the new species can be primarily distinguished by the very simple auricle-shaped superior appendages of the male (Figures 9a–e). In comparison, these structures are most similar to those seen in *P. incisurum* from the Solomon Islands. For a detailed differential diagnosis between the two species see Table 2.

Description of male (holotype [Figure 1])

Head. Labium with median cleft rounded, arc-shaped; colour, including movable hook and end-hook, yellow. Labrum, clypeus and frons up to level of posterior ocelli bright yellow, including antennal socket and scapus. Antennal pedicellus medium brown, flagellum dark brown. Anterior ocellus with triangular black marking at posterior margin. Posterior ocelli at inner sides joined by nearly crescent-shaped distinct black markings. Vertex and postocellar areas medium brown, the latter framed by conspicuous black lines. Occiput largely black, diffusely bordered by yellow along eye margins.

Thorax. Prothorax with median lobe unmodified, pronotal tubercles absent. Posterior pronotal lobe short, broadly rounded, only slightly elevated. Prothorax yellow, marked with broad black lines roughly forming a pair of “U”-shaped markings extending from middle of each half of median pronotal lobe to pronotal pleuron, longitudinal lines concave. Borders between anterior and median lobe, as well as between median and posterior lobe, marked with less robust black lines connecting right and left markings.

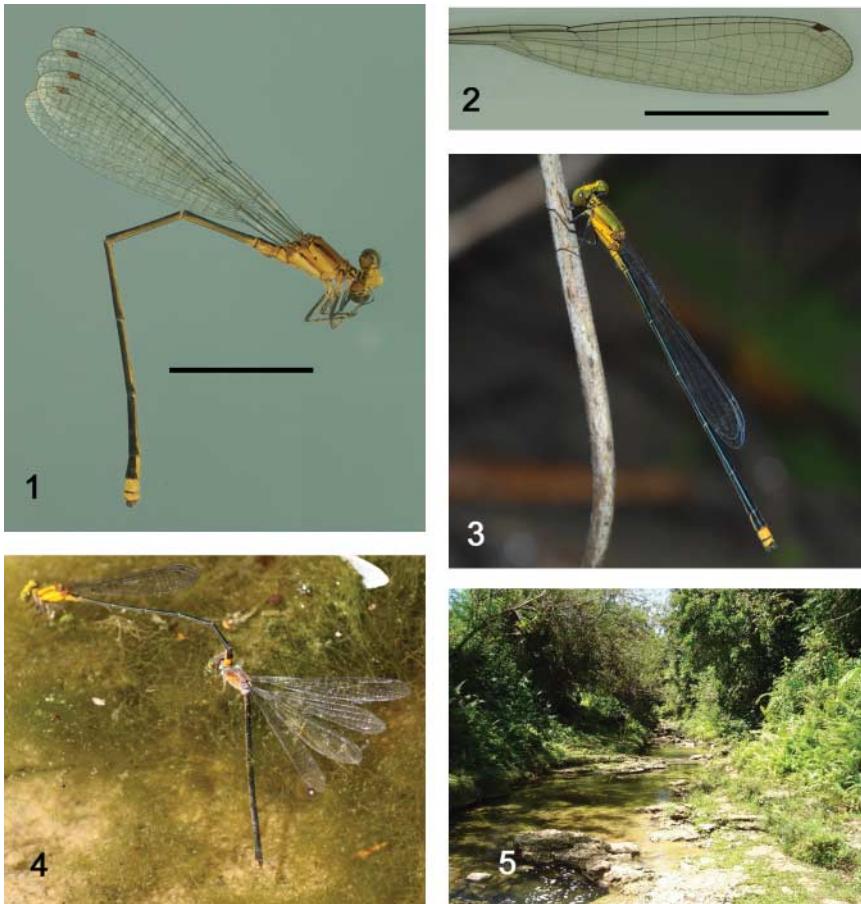
Legs with coxae and trochanter entirely yellow except for minor diffuse brownish marks. Posterior surface of all femora black, interrupted only by oblique subproximal yellow marking. Anterior sides of tibiae with diffuse black-brown coloration, increasingly so from 3rd towards 1st pair of legs. Tarsi black-brown. All femoral and tibial spines black.

Synthorax medium brown, intermingled with yellow. Rudimentary, weak bright yellow-white antehumeral stripe in middle of mesepisternum, reaching both anterior and posterior ends of the latter. Yellow hue extending above and along 1st lateral suture as well as below 2nd lateral suture and on anterior lower parts of synthorax. Lateral sutures marked with black as follows: meso- and metathoracic fossae each covered by elongate black spot, both upper and lower spot with their

Table 2. Differential diagnosis of *Pseudagrion civicum* / *P. incisurum* / *P. lorenzi* sp. nov.

Character		<i>P. civicum</i>	<i>P. incisurum</i>	<i>P. lorenzi</i> sp. nov.
<i>Male</i>				
Black spot on humeral suture		Extended into a very fine black line, just covering suture	Not extended into black line, or only very weakly so	Extended into a distinct black line covering suture for its entire length
Legs: colour		Femora with posterior surface largely black; black coloration extending onto tibiae	Femora usually with a weak brown-black line posteriorly; remainder of legs not darkened except for the lateral spines	Femora with posterior surface largely black; black coloration extending onto tibiae
Superior appendages: shape	lateral view	Straight, slender, rather pointed; upper distal corner distinctly incised (Fig. 7a)	Upper margin nearly straight, lower margin rounded; upper distal corner not incised (Fig. 8a)	Upper margin distinctly rounded, lower margin straight; upper distal corner not incised (Fig. 9a ,d)
	dorsal view	Straight, but outer side distinctly convex (Fig. 7b)	Straight, conical (Fig. 8b)	Straight, slightly rounded in outline (Fig. 9b)
Superior appendages: upper subbasal inlet in dorsal view		Nearly one-half the length of appendage (Fig. 7b)	Nearly one-third the length of appendage (Fig. 8b)	No longer than one-fourth of appendage (Fig. 9b)
<i>Female</i>				
Labrum: colour		Greenish-brown	Dirty yellow	Reddish-brown
Pronotal horns: (lateral view)		Slightly elevated above median lobe but still close to it (almost parallel); comparatively long, nearly reaching up to halfway the median lobe; nearly perfectly straight in lateral view (Fig. 10b), distinctly diverging in dorsal view (Fig. 10a)	Distinctly elevated above median lobe for entire length, only slightly curved upwards (Fig. 11b)	Resting along median lobe for basal 2/3 of their length, apical 1/3 curved upwards (Fig. 12b)
Legs: colour		Yellow, with distinct black markings	Almost entirely yellow	Yellow, with distinct black markings
Median black spot at the level of metathoracic suture		Weak, intersected by 2nd lateral suture	Weak, intersected by 2nd lateral suture	Distinct, below metathoracic suture
Pruinence on pro- and synthorax		Present	Present	Absent
Cerci: shape		Slender, semi-acute	Slender, semi-acute	Stout, slightly rounded
Cerci: length		Subequal in length to S 10	Only slightly shorter than S 10	Slightly exceeding 1/2 the length of S 10
Cerci: colour		Dark brown to black	Medium to dark brown	Yellow-orange/black

larger parts above the suture. From the lower spot, a slightly anteriorly directed extension descending; upper spot anteriorly extended into thin but distinct line covering mesothoracic suture along its entire length, tapering anteriorly. Distinct circular black spot roughly situated in middle of synthorax in lateral view, just below 1st lateral suture. The latter with posterior one-fourth covered by distinct black line. Mesokatepisternum framed by distinct black line, except for lower side, which



Figures 1–5. (1) *Pseudagrion lorenzi* sp. nov., holotype ♂, Gazelle Peninsula, tributary of Warongoi, deposited in RMNH. Scale line: 1 cm. (2) *Pseudagrion lorenzi* sp. nov., ♀, Gazelle Peninsula, left forewing. Scale line: 1 cm. (3) *Pseudagrion lorenzi* sp. nov., ♂, East New Britain Province, Jacquinot Bay area, creek near Palmamal. Photo: S.J. Richards. (4) *Pseudagrion lorenzi* sp. nov., ♂, ♀, East New Britain Province, inland from Jacquinot Bay. Female ovipositing, contact-guarded by male; photograph taken just after the male had been attacked by a competing male. Photo: D. Gassmann. (5) Habitat *P. lorenzi* sp. nov. Small river inland from Jacquinot Bay. Photo: D. Gassmann.

is unmarked. Comparatively weak and diffuse dark spot on upper anterior part of mesepimeron, well separated from humeral suture and from mesokatepisternum. Venter of synthorax yellow, with diffuse brownish markings, slightly pruinose.

Wings. Hyaline. Pt rhombic, posterior distal corner slightly rounded; medium brown (Figure 2). Fw with 11–12 Px, Hw 10–11 Px. Fw length 22.5 mm, Hw length 21.0 mm.

Abdomen. Ventral part yellow. Dorsum of S1 to 8 entirely black in dorsal view, in life with a shiny greenish hue (Figure 3). Black coloration expanding downwards as shown in Figure 1. S9 to 10 almost entirely yellow, except for black line along upper posterior margin of S9, reaching halfway down the pleura, and on S10 where it covers area of the dorsal incision (Figures 1, 3). S9 dorsally with pair of weakly marked small brown spots, covering tiny and shallow pits. S10 with upper third cut off in lateral view (Figure 9a), excavated in dorsal view (Figure 9b). In posterior view, the corresponding area is covered by a field of minute sharp spines (visible under the scanning electron microscope: Figure 9b, c).

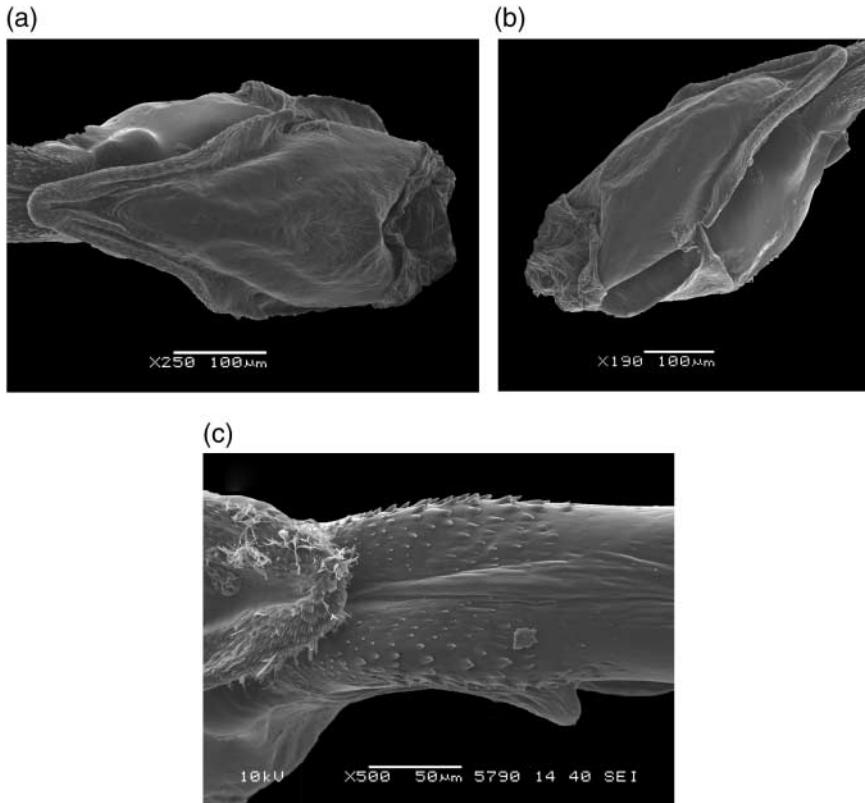


Figure 6. *Pseudagrion lorenzi* sp. nov., ♂, Sikute River, East New Britain Province (a, c), and Malalimi Creek, West New Britain Province (b) Genital ligula (a) ventral view, (b) ventral view (detail) and (c) ventro-lateral view.

Superior anal appendages simple, auricle-shaped (Figure 9b–c, e), about same length as S10 (Figure 9a). In lateral view simple (Figure 9a, d), upper and distal margin rounded, lower margin straight. Outline in dorsal view straight, but slightly rounded (Figure 9b). Margin of “auricle” breached only by lower subapical and upper subbasal notch (Figure 9b, e), distal corner of the latter pointed (Figure 9b). Upper and distal margin of superior appendage swollen, curved inwards (Figure 9c, e). Colour of superior appendages medium to dark brown, inner parts yellow. Inferior appendages about two-third length of superior appendages (Figure 9a), rounded apically; colour dirty yellow. Abdomen length 32.5 mm.

Genital ligula (not examined in holotype). Slender in ventral view, with one single subtriangular terminal lobe (Figure 6a). Terminal lobe with marginal ridge. Two hook-like protrusions at about half its length (Figure 6a). Marginal ridge covered with comb-like array of minute spines (Figure 6a–c), continuing on the inner side of terminal lobe. Distal part of ligula shaft furnished with small but robust spines (Figure 6c).

Variation in paratype males. Fw with 13–15 Px; Hw 11–14 Px. Antehumeral stripe in all specimens rudimentary, very diffuse, even so in life (Figure 3), in preserved specimens just recognizable as a bright area which is only weakly contrasting with the surrounding medium brown coloration. Humeral and lateral sutures variably marked with black, stripes on humeral and 2nd lateral sutures sometimes much stronger than in the holotype. The diffuse dark spot on the anterior part of mesepimeron varies in strength and distinctiveness from just a hue of brown to a distinct deep

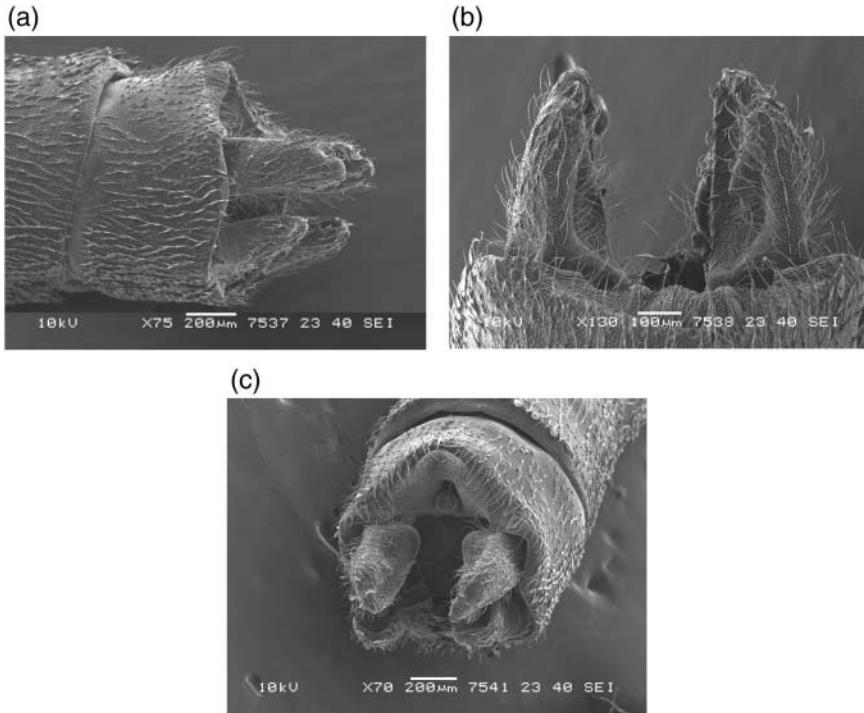


Figure 7. *Pseudagrion civicum*, ♂, Madang Province, anal appendages in (a) lateral view , (b) dorsal view and (c) dorso-lateral view.

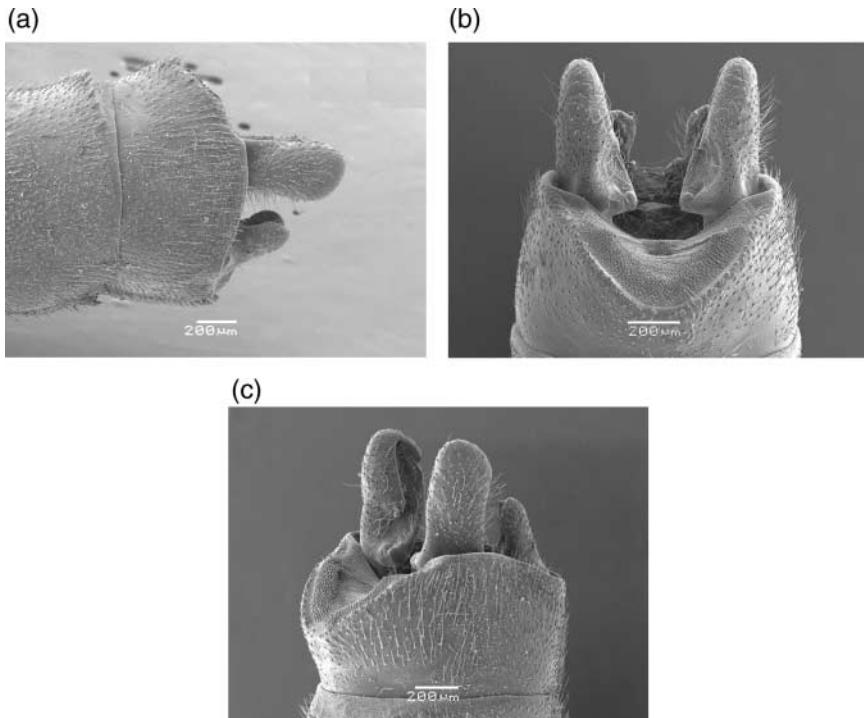


Figure 8. *Pseudagrion incisurum*, ♂, Guadalcanal, anal appendages in (a) lateral view , (b) dorsal view and (c) dorso-lateral view.

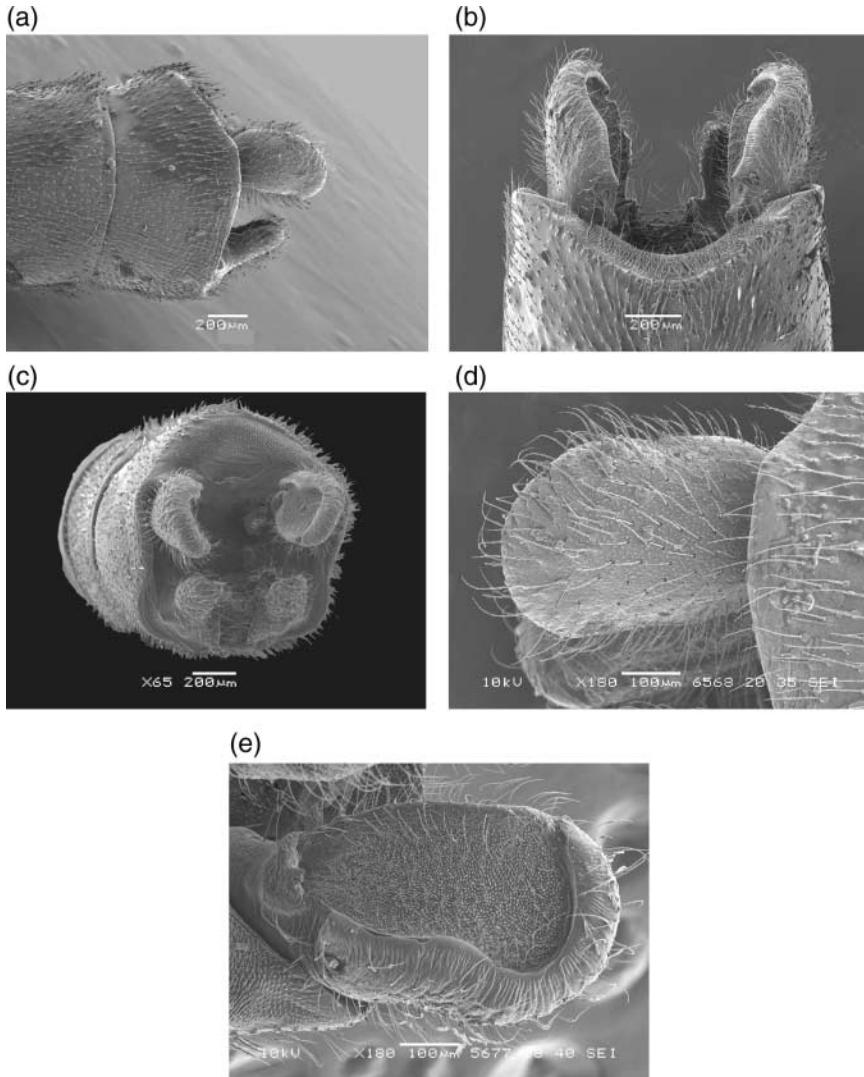


Figure 9. *Pseudagrion lorenzi* sp. nov., ♂, Malalimi Creek, West New Britain Province, anal appendages in (a) lateral view, (b) dorsal view and (c) posterior lateral view; left superior anal appendage in (d) lateral view and (e) inner view.

black spot. The male specimen from Willaumez Peninsula (D. A. Polhemus, pers. comm.), was not examined by the author and therefore is not included among the paratypes.

Description of female (Figure 4)

Head. Labium with median cleft rounded, arc-shaped; colour including movable hook and end-hook yellow. Genae and anterior lateral parts of head bright yellow. Labrum reddish-brown, upper part darkening. Anteclypeus and anterior side of postclypeus reddish-brown. Dorsal side of postclypeus dark brown, with a pair of sublateral black spots. Frons, up to level of anterior ocellus, including antennal socket and scapus, grey-greenish (in some specimens medium brown), pedicellus reddish-brown, flagellum dark-brown. Vertex reddish-brown. Occiput of same colour as frons, but with grey-greenish (or reddish-brown) subtriangular postocellar areas, each anteriorly

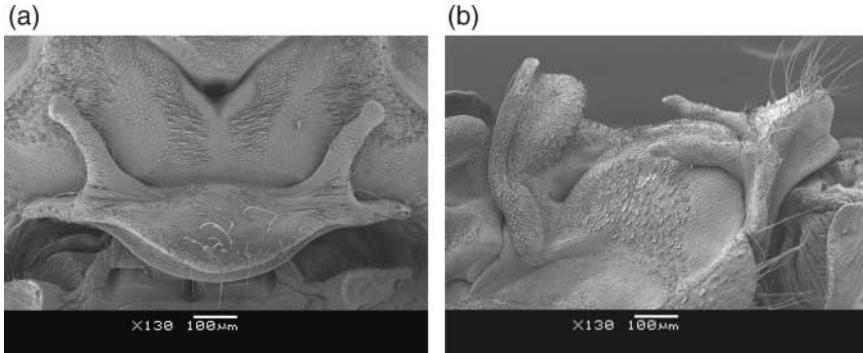


Figure 10. *Pseudagrion civicum*, ♀, Madang Province, prothorax (a) in dorsal view and (b) in lateral view.

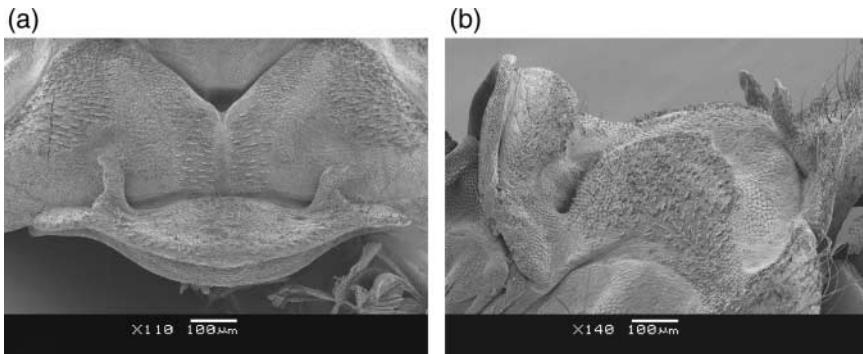


Figure 11. *Pseudagrion incisurum*, ♀, Guadalcanal, prothorax (a) in dorsal view and (b) in lateral view.

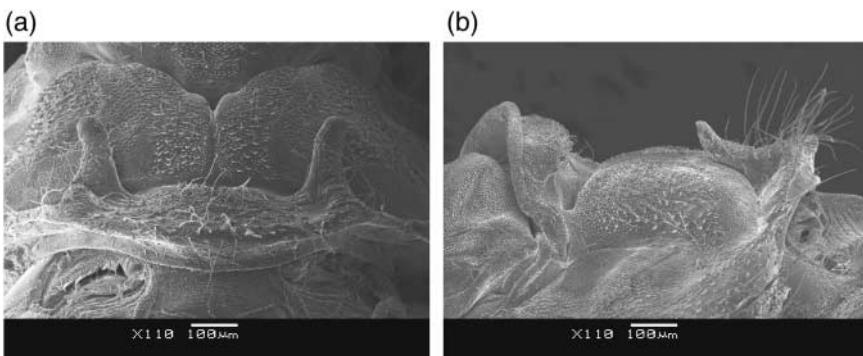


Figure 12. *Pseudagrion lorenzi* sp. nov., ♀, Sikute River, East New Britain Province, prothorax (a) in dorsal view and (b) in lateral view.

and laterally delimited by oblique black line and posteriorly by black area covering almost the entire rear of head. Some specimens with entire dorsal surface of head obscured by medium to dark brown coloration.

Thorax. Prothorax with median pronotal lobe only slightly convex, lacking distinct pronotal tubercles. Posterior pronotal lobe rounded in dorsal view, not elevated in lateral view; posterior margin slightly bulged out. Two anteriorly directed horns arising from posterior margin, not

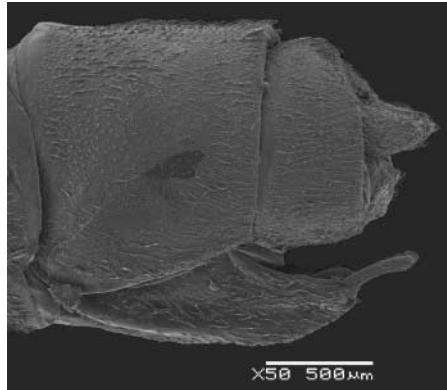


Figure 13. *Pseudagrion lorenzi* sp. nov., ♀, Sikute River, East New Britain Province, end of abdomen.

reaching halfway across median lobe; apical third of each pronotal horn distinctly bent upwards in lateral view (Figure 12b), only slightly bent laterally in posterior dorsal view (Figure 12a). Prothorax greenish above, bright yellow laterally.

Legs yellow; black longitudinal stripes on posterior lateral parts of femora, decreasing in strength from 1st to 3rd pair of legs as follows: femora of 1st pair of legs posteriorly almost entirely black, 2nd and 3rd pairs of legs with the black markings mostly split up into two or more fine black lines. 3rd legs usually with a weak dark stripe covering distal third of femur.

Wings clear. Fw with 14–15 Px, Hw 12–13 Px ($n = 3$).

Synthorax with upper (anterior) part, up to middle of mesepimeron, reddish-brown, except for pair of dirty yellow (in some specimens greenish) antehumeral stripes. Below that level, synthorax mainly olive-green, shading into yellow anteriorly, bright yellow coloration including anterior parts of mesepimeron, metepisternum and metepimeron, lower and central parts of mesokatepisternum, as well as entire metakatepisternum. Mesokatepisternum framed by black markings of varying degree, most distinctly so at upper and posterior margins. Remaining black markings on synthorax as follows: humeral suture marked with black for entire length, increasing in strength posteriorly (dorsally) and ending up in a sub-oval black spot. Mesothoracic suture marked with a very fine black line covering posterior fourth of suture; distinct black spot just below suture, roughly at middle of lateral synthorax. Metathoracic suture marked similarly to humeral suture but less distinct; posterior spot with a slightly anteriorly directed extension going downwards, anterior spot lacking extension.

Venter of synthorax yellow except for a black spot in the middle of anterior half, a pair of lateral black spots at about the level of the beginning of posterior third of synthorax and some diffuse brownish markings. Pro- and synthorax, proximal parts of legs and anterior part of abdomen white-pruinescent.

Abdomen. Largely yellow-orange; dorsal surface marked with black as follows. S1 with black spot covering anterior two-thirds of dorsal surface. S2 to 8 with black dorsal markings clearly delimited from yellow-orange ground colour, the former subapically slightly bulged out downward; black coloration increasing laterally towards S8. Black coloration of S2 to 8 interrupted by yellow basal rings. S9 coloured as preceding segments, but light colour extending dorsally into black marking, forming a half-circle-inlet. S10 entirely yellow-orange except for a weak diffuse subtriangular marking extending laterally into diffuse black lines on anterior margin of segment. S10 with posterior dorsal edge in lateral view cut off (Figure 13). Valvae yellow-orange. Cerci about half length of S10, slightly directed downwards. Cerci and styli darker than abdominal ground colour, turning to medium to dark brown, tips of styli yellow-orange.

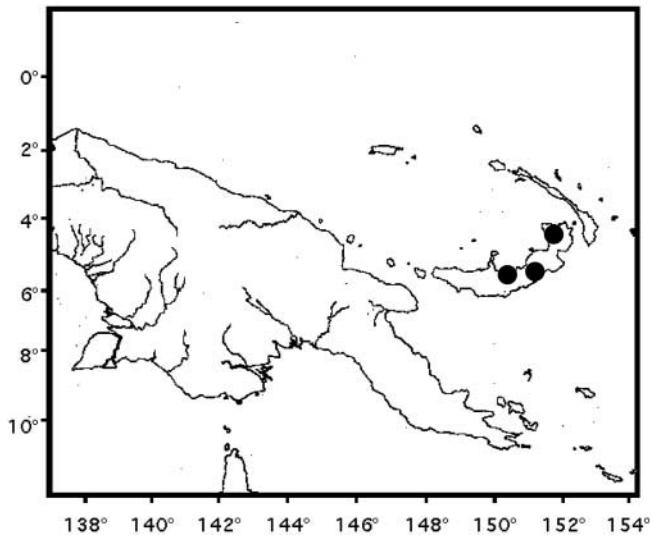


Figure 14. Known distribution of *Pseudagrion lorenzi* sp. nov.

Variation in females. In a female from Sikute River, the frons and vertex are dark reddish-brown; a diffuse median black spot at upper end of frons.

Measurements

Fw length ♂(including holotype) 21.5–24.5 mm; ♀22.5–25.0 mm ($n = 5$). Hw length: ♂(including holotype) 20.5–23.0 mm ($n = 10$); ♀21.5–24.0 mm ($n = 5$). Abdomen length: ♂(including holotype) 31.0–37.0 mm ($n = 10$); ♀29.5–32.5 mm ($n = 4$).

Etymology

On special request by Mr Martin Schorr (International Dragonfly Fund), we name the present new species after his son, Lorenz Bier-Schorr. Mr Schorr made two appropriate donations to the International Dragonfly Fund e.V. to facilitate this publication and to celebrate the coming 18th birthday of Lorenz.

Habitat and altitudinal range

Pseudagrion lorenzi was mainly found at medium-sized, sun-exposed and fast flowing stony streams (Figure 5). However, it was also sighted at larger and more shady creeks (Malalimi), or even at large ponds (near Camp II in the Nakanai Mountains at about 850 m) where the individuals were found flying at sunny spots. The creek at Numundo Plantation was situated in a partially logged area; however, *P. lorenzi* could still be found not far from the clearing. Altitudinal range c.0–860 m.

Distribution

New Britain (Figure 14)

Discussion

The new species described herein is likely to be identical with the “*Pseudagrion ustum*” described by Ris from New Britain (1898). *Pseudagrion ustum* is otherwise only known from South Sulawesi and the Moluccas. The New Britain specimen of Ris was incomplete, lacking the male appendages which bear taxonomically important characters.

So far, *Pseudagrion lorentzi* sp. nov. is known from localities in north-central New Britain south to the Hoskins and Willaumez Peninsulas, from the eastern Gazelle Peninsula, and from the Jacquinot Bay area. It was mostly found along moderately fast flowing streams, and more rarely at still waters. However, the species may be considered common throughout New Britain, in particular because it is not restricted to undisturbed forest.

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