

**SETTLING UP MATTERS OF TAXONOMY, NOMENCLATURE, AND  
SYNONYMY IN THE GENUS *AUSTROAGRION* TILLYARD  
(ZYGOPTERA: COENAGRIONIDAE)**

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The article mainly concerns the confused state of affairs existing in 2 out of 4 well-known yet wrongly interpreted species of *Austroagrion*, a genus centred in Australia but with 2 members occurring also outside the continent. The history of these is analysed and their correct status definitely established, using distinctive characters of structure and colour design, which are illustrated. An examination of the holotype of *A. cyane* (Selys), the type-species of the genus, revealed that it is conspecific with the West Australian *A. coeruleum* Tillyard, the last-mentioned name thus becoming a synonym of *cyane*. Inferentially, the species so far mistaken for *cyane* by all post-Selysian authors, is the widespread and locally common damselfly chiefly occurring in the eastern States of the continent. Consequently, this eastern opponent of *A. cyane* now requires a new name, for which *watsoni*, nom. nov., is here proposed as a substitute. The above explanation is followed by a new descriptive key to the identification of all 4 taxa so far known. After that, 3 of these species are briefly discussed, each supplied with a bibliography and locality lists of the material examined. A brief characterization is also given of a slightly aberrant population of *A. watsoni*, recently discovered in New Caledonia, a new element in the dragonfly fauna of that island.

**INTRODUCTION**

In an attempt to identify a little coenagrionine damselfly of the genus *Austroagrion*, recently discovered in the island of New Caledonia, some quite unexpected facts were brought to light, chiefly concerning the nomenclature and synonymy of certain species. Both male and female of that species were collected in the low coastal areas of the island by the French bio-ecologist, Louis Bigot and his companions, of Marseille. As the discovery of an *Austroagrion* in New Caledonia marks an important expansion of the known range of the genus, the

identity of the species also needed special attention. I observed that the colour-pattern of the male abdomen corresponded with that characteristic of a well-known Australian species generally taken to be *A. cyane* (Selys). The male of this so-called "cyane" has dark bronze-black markings extending over most of its abdomen, very similar to our New Caledonian specimens. It is widely distributed and locally common in many parts of the Australian continent and Tasmania. So far so good. Intrigued by the seemingly inappropriate name given to a rather dull-coloured insect, I decided to be quite on the safe side by consulting the original diagnosis of "*Pseudagrion cyane* Selys 1876". To all appearances, this had never been done before; and in view of what follows, it is not surprising to see that some important verbal incongruities had escaped notice of all later authors dealing with the genus. For, if the necessary information had been sought by reading the above description, later students would undoubtedly have noticed the striking colour differences between the unique type of *cyane* and the pattern shown by a closely related, but much darker species so far erroneously considered to be identical with the former. MARTIN (1901) was probably the first who mistook the Australian specimens from Victoria for *Pseudagrion cyane*. These eastern individuals had been collected by Billingham, who lived in Alexandra and very probably obtained his dragonflies at or near that city, as witness Martin's quotation: "assez commune en Victoria". TILLYARD (1908) followed Martin in this by comparing his *Austroagrion* (gen. nov.) *coeruleum* Till., from southwest Australia, with the species "from the eastern States", which he also wrongly assigned to *cyane*. As a matter of fact, Selys's diagnosis of the imperfect type of *P. cyane* is explicit enough, as it agrees in every respect with the original description of *A. coeruleum* TILLYARD (1908, 1913) and the definitions of it published by all writers of later time. Now, the diagnosis of *cyane* was based on a single male lacking the terminal segments of its abdomen, and labelled "Nelle hollande". Since its characters all refer to *coeruleum*, needless to say an inspection of the type – still in Selys's collection at Brussels (IRSN) –, should prove them to be conspecific. This was done and came true, which at the same time implied that Selys's remark "indication un peu douteuse", relating to the country of origin, can be dismissed. As a consequence, *coeruleum* falls as a synonym of *cyane*, leaving the much better known *A. cyane* auctt. (nec Selys), without a proper name. A drastic nomenclatural transposition now becoming necessary, I here propose *watsoni*, nom. nov., for the most familiar species of *Austroagrion*. It is named after my colleague, J.A.L. Watson, of the Division of Entomology, CSIRO, Canberra, in recognition of his excellent work on the biology and ecology of the Australian dragonfly fauna and other insect orders.

A tentative key to the identification of the four species so far known will be followed by some additional notes on the type of *cyane* compared to its allies, and a brief characterization of the *watsoni* variety, or subspecies, from New Caledonia.

## DESCRIPTIVE KEY TO THE SPECIES

- 1 App. sup. subequal in length to inferior pair, both directed almost straight back (LIEFTINCK, 1933, fig. 6); superiors conical, slightly diverging, pale and hairy, armed with conspicuous, hairless, glossy black intero-basal spur, which in caudal view is inclined freely downward and inward, the recurved tips of each directed toward depression at base of pale main trunk of inferior apps; the latter only with pale, subtriangular intero-basal tubercle beside (but not in contact with) opposite long spur of app. sup. Mid portion of trilobed posterior lobe of prothorax markedly protuberant, distinctly triangular, yellow-tipped, longer than rim-like, partly yellow-bordered side lobes (cf. LIEFTINCK, 1949, fig. 242). Legs pale, outer faces of femora and tibiae either unmarked, or only incompletely striped with black. Main longitudinal wing veins generally pale-coloured. Abdomen: dorsum of all segments predominantly black, marks on 1-3 extending from base to apex, the one on 3 strongly constricted at about 4/5 length from base, recalling note of exclamation (!), on 4-5 similar or even subinterrupted beyond halfway length, the blue ground colour well visible from above and also more extensive basally; 6-7 black except blue just near base narrowly interrupted by black in median line; 8-9 blue, marked much as in *watsoni*, each with large, subtriangular, dorso-apical spot directed toward – though not reaching – base of tergite ..... *exclamationis*
- App. sup. longer than inferior pair, apices of the latter shorter and thicker, not at all forcipate in ventral view; intero-basal processes of both pairs well visible in side view. Mid portion of trilobed posterior lobe of prothorax not triangular. Legs pale, outer faces of femora and tibiae heavily striped with black. Main longitudinal wing veins obscured. Dorsum of most abdominal segments predominantly black but markings, where present, only slightly constricted subapically, barely visible from above blue ground colour ..... 2
- 2 Posterior lobe of prothorax trilobed, apparently anchor-shaped much as in female (cf. WATSON, 1969, fig. 10), apex of mid portion after constriction a little expanded; whole posterior lobe largely blue. Anal wing vein leaving posterior margin proximal to Ac, the latter situated much nearer Ax<sub>1</sub> than Ax<sub>2</sub>. Anal apps pale, black-tipped; intero-basal process of both pairs well separated in side view, inferior branches of app. sup. robust, blunt, converging towards the midline, not in contact with the smaller spines of app. inf. (WATSON, 1969, figs 4-5). Abdominal tergites 1-7 marked with metallic green-black much as in *watsoni* (Figs 7-8), but all basal blue bands narrower and finely interrupted by black in the median line; dorsal marks of 1-2 extending from base to apex, 2 broadly sessile posteriorly, those on 8-9 occupying most of dorsum, "arrow-shaped, the points of the arrows abutting on the membrane behind the preceding segment" (WATSON, 1969: 70, fig. 6) ..... *pindrina*
- Mid portion of trilobed posterior lobe of prothorax black, broader than long, less protuberant, hind border evenly rounded in dorsal view, side lobes shorter, usually blue-spotted. Opposite tips of intero-basal processes of anal apps in contact or very closely approximated (Figs 9-10). Anal wing veins Ab en Ac coinciding at posterior margin, Ac generally almost exactly midway between the two antenodals ..... 3
- 3 Abd.-segment 1 with squarish black dorsal mark restricted to basal portion of tergite, on 2 running from base to apex but usually distinctly stalked posteriorly; 3 largely blue with spear-shaped black mark pointing cephalad arising from expanded posterior portion, rarely indistinctly prolonged forward in the median line, though never reaching base of segment (Figs 3-4); dorsum of 4-6 black, except that all tergites are blue-spotted basally; 7 with black mark abbreviated, strikingly incomplete posteriorly: distal portion of tergite always for the most part blue; 8-9 almost wholly blue, dorsum of 8 occasionally with tiny, paired black specks or points. Yellow or bluish patch bordering orbits ventrally extensive, variable in shape and size, occupying from slightly less to much more than one-half of lower surface (Fig. 2). Pale main body of app. inf. broader, placed more transversely in ventral view, than in *watsoni* (Fig. 9) ..... *cyane*

- Dorsum of abd.-segment 1 with black marking complete, extending from base to apex, on 2 also complete but longer and sessile posteriorly; 3-7 more extensively black, leaving less of ground colour, these basal blue areas or spots varying in size, progressively smaller from before backwards, whether or not interrupted by black in the median line, the black on 7 reaching apex of tergite for its full length; black marks covering distal parts of 8 and 9 always present but very variable in shape and extent, occasionally even more broken up than shown in Figure 8. Yellow or bluish patch bordering orbits ventrally narrower, more parallel-sided and band-like, leaving off abruptly at level opposite to blue postocular spots (Fig. 6). Pale main bodies of app. inf. narrower and more closely approximated in ventral view, than in *cyane* (Fig. 10) ... *watsoni*

## DISCUSSION OF THE KNOWN TAXA

### *AUSTROAGRION CYANE* (SELYS)

Figures 1-5, 9

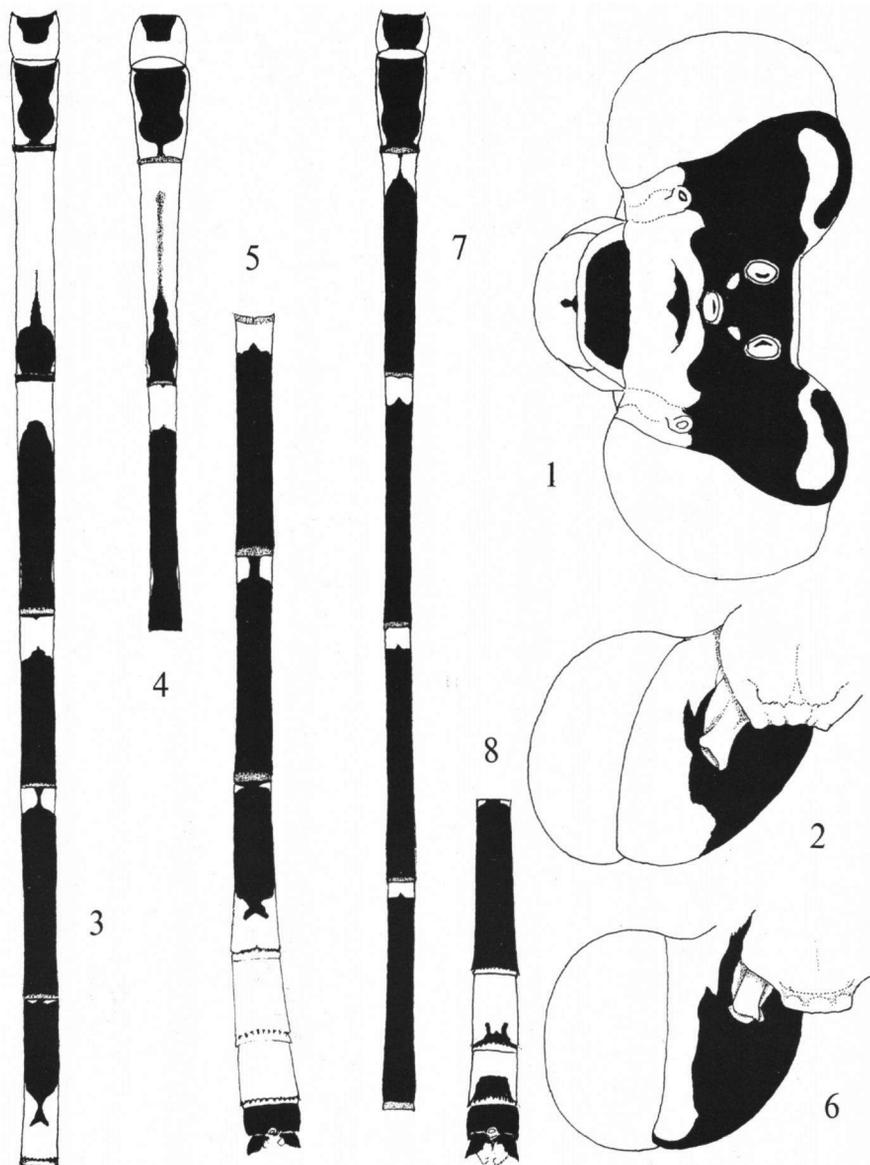
#### [Selected references]

- Pseudagrion cyane* SELYS, 1876: 508-509 (♂ incompl., "Nouvelle-Hollande")  
*Pseudagrion coeruleum* TILLYARD, 1908: 739-741, pl. 35 figs 13-14 (♂♀ SW Australia). **syn. nov.**  
*Xanthagrion coeruleum*, RIS, 1910: 430-432, fig. 10 (♂ apps, compar. notes, ♂♀ W Australia)  
*Austroagrion coeruleum*, TILLYARD, 1913: 467, pl. 48 figs 29-30 (♂ apps, W Australia); CAMPION, 1915: 105 (key & compar. notes); WATSON, 1958: 140 (key), fig. 8F (♀ head marks); 1962: 11 (key, larva), 63-64 (larval ecology); pl. 4 fig. 9 (larval caudal lamella), pl. 5 fig. 14 (larval labium), 19 (key, imago), pl. 18 fig. 103 F (♀ face marks); 1969: 71 (compar. notes & distrib.); 1981: 1146, 1161 (distrib. notes); FRASER, 1960: 17-18 (key & distrib.), pl. 3 fig. r (♂ apps).

Type material. — Australia (SW?): ♂ (ad., abdomen bristled, 8-10 missing, figs. 1, 3), labelled "Nlle hollande" (written on green) and "cyane" (written on lilac, Selys's handwriting). Holotype *Pseudagrion cyane* Selys, labelled as such by present writer (IRSN).

Further material (plesiotypic). — Western Australia: 1 ♂ (ad.), SW-point, Hamelin Bay near Augusta, 11.II.1975, *A. coeruleum* leg. & det. L. Müller, ex coll. G. Theischinger (ML); 1 ♂ (ad., Figs 2, 4-5) 1 ♀ (juv.), Perth-Brookton Road, 27th mile, 20.I. and 2.II.1963, G.F. Mees leg., *A. coeruleum*, det. J.A.L. Watson (ML); 5 ♂ 2 ♀, SW Australia, Kimberley Division, lower reaches of Jerdacuttup River, coastal area S of Ravensthorpe, NE of Hopetoun, 24.XI.1968 (4 ♂ 1 ♀), Coyrecup, 35 km E of Katanning, 21.XI.1968 (1 ♂) and Pallinup River, 26.XI.1968 (1 ♀), leg. G.F. Mees, all *A. coeruleum*, det. J.A.L. Watson (ML); same region, 1 ♀ (ad.), Lort River, between Ravensthorpe and Esperance, 13.II.1975, "at clean spot of river with brackish, clear, stagnant water", leg. G.F. Mees (ML)

Though having its body mended in some places, the type is still in fair condition, its blue-and-black colour pattern standing out clearly (Figs 1, 3). The description is very full, as far as it goes, and hardly needs completion. A slight error relates to segment 7 of the abdomen, stated to be missing with the rest of the body, which is in fact still present but poorly mended by pasting it on to the preceding segments of the body, the latter itself being "bristled". There are 9 Px of first series in both fore wings, 8 in the hinder pair; 3 postquadrangular antenodal



Figs 1-5. *Austroagrion cyane* (Selys), "Nouvelle-Hollande": (1) incomplete ♂ holotype, dorsal view of head; — (2) ♂ from Perth (W.A.), right half of head, ventral view; — (3) abdomen of incomplete ♂ holotype (8-10 missing); — (4-5) ♂ from Perth (W.A.), abdominal segm. 1-4 and detached segm. 5-10 with apps. — Figs 6-8. *A. watsoni* nom. nov., Sydney (N.S.W.): (6) right half of head, ventral view; — (7-8) same specimen, abdominal segm. 1-6 and detached segm. 7-10 with apps.

cells in all wings. Fore wing pterostigma distinctly smaller and less deep than the underlying cell, its distal side only a trifle shorter than the anal; colour ochreous-brown finely yellow-lined roundabout. In *cyane* a point of concern is the large size of the pale area covering the occiput ventrally (Fig. 2) which, although somewhat varying in extent, is always broader than the band-like one as seen in typical *watsoni* (Fig. 6); amongst the other males before me, the type takes an intermediate position as to that feature. The slightly aberrant male from Perth (possibly a near toptype?), is here figured and selected to serve as an example of individual variation. In that male the lance-shaped mark on the dorsum of segment 3 is prolonged farther basad, its apex, though slightly blurred, reaching a more advanced point than in the type and other specimens (Fig. 4).

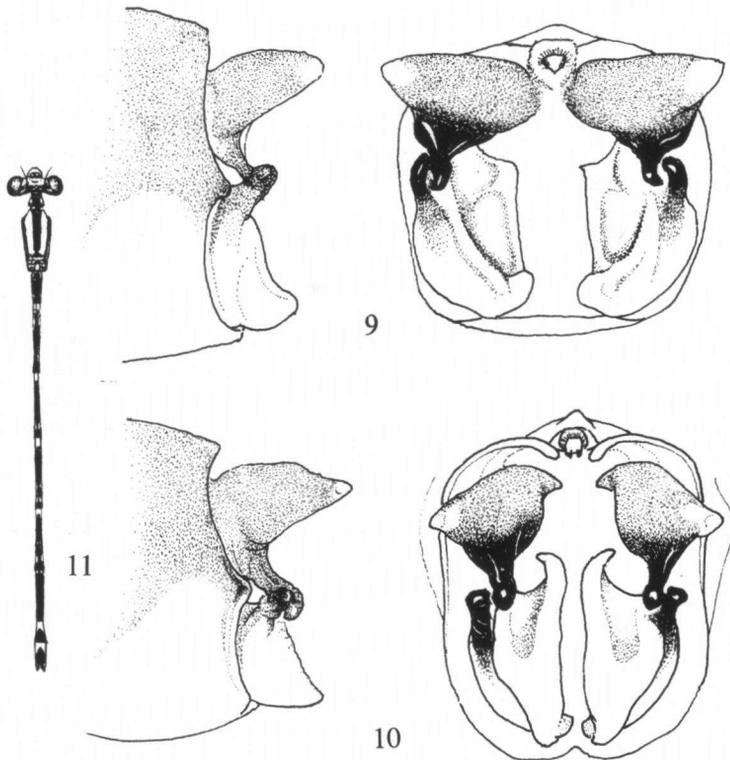


Fig. 9. *Austroagrion cyane* (Selys), ♂ from Perth (W.A.), anal apps, left lateral and caudal view.  
 Fig. 10. *A. watsoni* nom. nov., ♂ from Sydney (N.S.W.), anal apps, same positions. Stippled areas obscured or black, rest blue and yellow. — Fig. 11. *A. exclamatoris* Campion, ♂ from the Kimberley Division (NW Australia), showing markings.

*AUSTROAGRION WATSONI* NOM. NOV.

Figures 6-8, 10

## [Selected references]:

*Pseudagrion cyane*, MARTIN, 1901: 246 (no descr., Victoria); TILLYARD, 1908: 741 (♂♀ compar. notes, with *P. coeruleum* sp.n.; E Australia).

*Xanthagrion cyane*, RIS, 1910: 430-431, fig. 11 (♂ apps, compar. notes; ♂♀ E Australia).

*Austroagrion cyane*, TILLYARD, 1913: 467-468, pl. 48 figs 27-28 (♂ apps, E Australia); CAMPION, 1915: 105 (key & compar. notes); LIEFTINCK, 1953: 161, 163, figs 12, 21 (♂ wings & penis, New South Wales); FRASER, 1960: 17-18 (key & distrib.), pl. 3 fig. 5 (♂ apps); WATSON, 1969: 71 (compar. notes & distrib.); 1981: 1146, 1161 (distrib. notes); ALLBROOK, 1979 (key larva), fig. 22 (larva, struct. prementum), 41 (key imago), fig. 67 (head imago), 57 (distrib. & ecol. notes, map).

Material. — Western Australia: 1♂ (ad.), NW Australia, Kimberley Division, "at brook", King Leopold Range, 6.XI.1974, leg. G.F. Mees, together with 2♂ (ad.), *A. exclamatoris* Campion! (ML). Queensland: 2♂ (ad.), Twelve Mile Creek near Bororen, 4.X.1971, leg. L. Oosterweghel (ML); New South Wales: 2♂ 1♀ (ad.), Brisbane, 27.IX.1967, R. Geijskes leg., *A. cyane* (Selys), det. J.A.L. Watson (ML); 1♂ (ad.), Pymble, 18.XII.1968, leg. G.F. Mees, *A. cyane* (Selys), det. J.A.L. Watson (ML); 1♂ 1♀ (ad.), Hornby, Berowra Creek, 20.XII.1968, leg. G.F. Mees, *A. cyane* (Selys), det. J.A.L. Watson (ML); 3♂ (ad.), Gara River near Rockvale, 4.I.1949, leg. A.F. O'Farrell (ML); 3♂ (ad.), near Guyra, 4500 ft, 13.I.1950, leg. A.F. O'Farrell (ML); 1♀ (ad.), Sydney, XI.1967, G. Theischinger leg. & det. *A. cyane* (ML); 11♂ 3♀ (ad., one pair in cop.), Figs. 6-8, 10, Sydney, pond in National Park at Dudley, I.III.1949, M.A. Lieftinck leg. & det. *A. cyane* Selys (ML). — South Australia: 1♂ (ad.), Murray River at Denmark, 8.V.1948, leg. L. Humphries, *A. cyane*, det. M.A. Lieftinck (ML). — New Caledonia: 4♂ 2♀ (2♂ freshly emerged), Plaine des Lacs, Grand Lac, "embarcadère du village abandonné", 29.II.1980, leg. L. Bigot et al. (MP & ML).

*A. watsoni* nob. is a recent addition to the dragonfly fauna of New Caledonia. Both sexes average a little smaller in size than our series from the National Park, near Sydney. Structural differences between them are quite unapparent but the insular examples are darker than usual: the blue markings on all body parts being more reduced than in any of the Australian specimens still before me. Here follows a brief representation of these New Caledonian insects.

Male (ad.). — Head lacking any trace of blue postclypeal and interocellar spots; blue stripe at occipital ridge narrow, reduced to a short median stripe, i.e., detached from postocular spots, which are more linear than usual, pointed inward, little expanded and rounded off laterally. Pale stripe bordering orbits ventrally also narrower, occupying about one-sixth or less of the deep black rest of occiput. Antehumeral blue stripes complete but hardly one-half width of black humeral band at level of black mesinfraepisternum; the antehumerals slightly narrowing and a little constricted before reaching ante-alar triangles, apex truncated. Legs yellow, outer faces of all femora heavily black-striped from end to end, tibiae and tarsi likewise obscured externally. Wings clear, neuration black; venation as in typical *watsoni*, Ac-Ab as for genus, Ac exactly midway between Ax<sub>1</sub>-Ax<sub>2</sub>. Abdomen with shiny dark bronze-green dorsal spots and bands, more extensive than in most Australian *watsoni*: 1 running from base to apex, intersegmental halfring and sides bright blue; 2 similar to typical male (Fig. 7), but blue basal spots on 3-7 narrower than usual, becoming more annular posteriorly, all interrupted by black on middorsum, on 7 reduced to a pair of linear streaks; intersegmental membranes obscured; on 8-9 black marks are restricted to dorsum, covering about distal half of tergites, tapering basad though not nearly reaching base of segments; membranes and sides bright blue. Anal appendages shaped and coloured as in typical *watsoni* (Fig. 10). Abdomen 18.5 mm, hind wing 12 mm.

*AUSTROAGRION EXCLAMATIONIS* CAMPION

Figure 11

*Austroagrion exclamationis* CAMPION, 1915: 105-108 (incl. key), fig. (♂ apps; ♂♀ Australia, N.T.); LIEFTINCK, 1933: 423-424, fig. 6 (♂ apps, ♂♀ Australia, N.T.); 1949: 199-200 (notes & distrib.), fig. 242 (♀ proth.; S New Guinea); 1951: 25 (♀ Cape York, record only); WATSON, 1969: 71 (notes distrib.); ARTHINGTON & WATSON, 1982: 82 (habitat), 84 (distrib.).

Additional material. — Western Australia: 2 ♂ (ad.), NW Australia, Kimberley Division, "at brook" King Leopold Range, 6.XI.1974, leg. G.F. Mees, together with 1 ♂ (ad.), *A. watsoni* nom. nov.! (ML).

It is worth noting that the few males from the Kimberley District (Fig. 11), are slightly darker, having all bronze-black body marks (save on the legs) more pronounced than seen in the bluer individuals collected at Koolpinyah, Darwin, etc., in the Northern Territory, i.e., localities whence the types came; see, however, WATSON, 1969: 65. Unfortunately, to my knowledge only females of *exclamations* have become known from the lowlands of southern New Guinea.

More new localities for this species are to be expected, which are very likely included in Dr Watson's unpublished material; he found it also amongst specimens of "*cyane*", reported already years ago by Tillyard from Cape York (WATSON, 1969).

*AUSTROAGRION PINDRINA* WATSON

*Austroagrion pindrina* WATSON, 1969: 68-71, figs 2-10 (details of structure & colour; ♂♀ NW of Western Australia).

This, venationally somewhat peculiar, species was not yet studied by me, all key characters being taken from Watson's full account.

## ACKNOWLEDGEMENTS

I wish to express my warm thanks to Mons. LOUIS BIGOT, ecologist at the Laboratoire de Biologie Animale of the Université d'Aix-Marseille, for the privilege of studying and identifying an interesting collection of dragonflies made by him and his colleagues during February and March 1980, in the coastal districts of NE and SW New Caledonia. I am also grateful to Mons. P DESSART, of the Institut Royal des Sciences Naturelles de Belgique (IRSN) in Brussels, for the prompt loan of the unique type of *Pseudagrion cyane* Selys, lodged in Selys's collection of that institute. Finally, I am much indebted to my colleague Dr G.F. MEES, ornithologist at the Rijksmuseum van Natuurlijke Historie, Leiden, for his diligent interest in the Odonata, whilst journeying in various provinces of the Australian continent during 1963, 1968 and 1974-75.

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