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ODONATA OF THE 1948 ARCHBOLD
CAPE YORK EXPEDITION, WITH A
LIST OF THE DRAGONFLIES
FROM THE PENINSULA

BY MAURITS ANNE LIEFTINCK¹

INTRODUCTION

The present paper is based on a small collection of Odonata, from the extreme northeastern point of Australia, made by Mr. Geoffrey M. Tate of the 1948 Archbold Cape York Expedition from March until September, 1948.

The writer is indebted to Dr. Mont A. Cazier, Mr. John C. Pallister, and Mr. Geoffrey M. Tate for the privilege of studying this collection, which, though it does not give us a full acquaintance with the Cape York fauna, is of great interest. The most important discoveries are the highly peculiar zygopterid *Lestoidea conjuncta* Tillyard, which has not been found since it was described over 35 years ago; the rare endemic *Petalura ingentissima* Tillyard, one of the largest and certainly the bulkiest of existing dragonflies; and a number of imperfectly known Libellulidae.

Descriptions of and notes on new or imperfectly known species from the same or adjacent areas, but from other collections, are also included.

The late Dr. R. J. Tillyard published his last important papers on Australian dragonflies more than a quarter of a century ago. As the present writer believes that a list of the Odonata so far

¹ Director, Museum Zoologicum Bogoriense, Bogor, Java.

known from the Cape York Peninsula will be useful, he is glad to have been given the opportunity of appending such a list, which is not only based on the collection of the recent Archbold expedition but is drawn from the existing literature, from various collections sent to him by correspondents in Australia and elsewhere, or from sundry notes made while the author was studying the material in European and Australian museums.

Scattered references to literature occurring in the text are assembled at the end of this article in a short bibliography. No full bibliographies have been given; where necessary, references have been placed under each species.

In the preparation of the list of Odonata from the area, it was deemed advisable to extend the limits of the territory under discussion southward across the somewhat vague boundary of what is known as the Peninsula, by way of including also the whole of the York district in north Queensland, approximately as far south as a line drawn from Karumba (on the south coast of the Gulf of Carpentaria) in the west to Innisfail (south of Cairns) in the east (between latitudes 17° and 18° S.).

Far from being a zoogeographically defined territory, the inclusion of the Atherton and Cairns districts within the area has the advantage of showing that many species of a more southern distribution do occur there and may be expected also to turn up sooner or later even farther north. It will be seen from our list of species that the odonate fauna of this part of Australia is a very rich and varied one, as might have been expected from a country marked by a diversified topography and climate (Tillyard, 1914). It comprises no fewer than 140 species and subspecies, i.e., about 54 per cent of the whole of the Australian fauna. Of these species 56, or about 40 per cent, have been found also in New Guinea, but it must be emphasized that at least 35 of these do not belong to the entogenic, or autochthonous, fauna of Australia, about 70 per cent having a much wider distribution outside Australo-Papua, and are of Oriental origin (Lieftinck, 1949).

The localities visited by the 1948 Archbold Cape York Expedition at which dragonflies were collected (cf. fig. 15) and the collecting dates are as follows:

3. Mossman River Gorge, Rain Forest, 200-500 feet, March 10-15
4. Upper Clohesy River, Speewah Camp, 1500 feet, March 24-30
7. Lockerbie, 10 miles west-southwest of Somerset, April 22-May 3
8. Newcastle Bay, Naru Point, 2 1/2 miles south of Somerset, May 8-11

9. Jardine River, Telegraph Crossing, May 19-21
12. Iron Range, June 8-20
14. Pascoe River, middle, June 13
13. Tozer Range, north foot, 400 feet, June 28-July 10
14. Pascoe River, Brown's Creek, 200 feet, July 13-19
16. Batavia (Wenlock) River, Wenlock, 500 feet, July 26-27
17. Archer River Crossing, 400 feet, July 31-August 1
18. Coen, 700 feet, August 4-7
19. Upper Peach River, Shephard's Battery Site, 800 feet, August 12
20. Upper Nesbit River, Rocky Scrub, Leo Creek, 1500 feet, August 16-21
29. Mt. Finnegan, upper Parrot Creek, 1150 feet, September 14
28. Shipton's Flat, 900 feet, September 17
27. Annan River, The Forks, 250 feet, September 22

SYSTEMATIC DESCRIPTIONS

ZYGOPTERA

AMPHIPTERYGIDAE

Diphlebia euphaeoides euphaeoides Tillyard

Diphlebia euphaeoides TILLYARD, 1907, Proc. Linnean Soc. New South Wales, vol. 32, pp. 394-398 (male and female, Kuranda, north Queensland); 1912, *ibid.*, vol. 36, pp. 591 (key), 592-593, pl. 19, fig. 10 (female, head), pl. 20, fig. 3 (male, appendages), fig. 7 (male, abdomen); 1913, *ibid.*, vol. 38, pp. 235-236 (comparative notes).

Diphlebia euphaeoides SJÖSTEDT, 1917, Arkiv f. Zool., vol. 11, pp. 23-24 (male and female, north Queensland). TILLYARD, 1926, Insects of Australia and New Zealand, p. 80, pl. 11, fig. 7 (male insect, colored figure).

MATERIAL: Three males (juvenal), 10 females (juvenal and adult), Mossman River Gorge, Rain Forest, 200-500 feet, March 10-15; one male, one female, Mt. Finnegan, upper Parrot Creek, 1150 feet, September 14.

I possess a good series of both sexes, unfortunately most of them not fully adult, from Redlynch and Botinda (north Queensland), taken from September to December, 1938, by R. G. Wind.

Apparently not rare in north Queensland. The subspecies *caeruleascens* Tillyard occurs in south Queensland (Mt. Tambourine).

DISTRIBUTION: North Queensland.

LESTIDAE

Lestes alleni (Tillyard)

Figures 1, 2

Austrolestes alleni TILLYARD, 1913, Proc. Linnean Soc. New South Wales, vol.

37 (1912), p. 425, pl. 45, figs. 11-12 (male, appendages), (male, Cairns, north Queensland).

Lestes albicauda RIS, 1913, Abhandl. Senckenbergischen Naturf. Gesellsch., vol. 34, pp. 505 (key, *pars*), 506 (*pars*), pl. 23, fig. 2, male, appendages, Cape York (male and female, Cape York; female, Aru Islands, *ex errore*).

Austrolestes albicauda TILLYARD, 1925, Rec. South Australian Mus., vol. 3, pp. 41-42 (north Queensland).

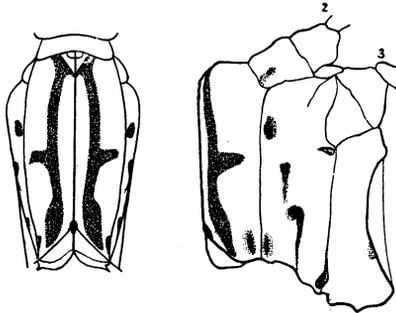


FIG. 1. *Lestes alleni* (Tillyard), male, Jardine River. Color pattern of meso-metathorax, dorsal and right lateral views.

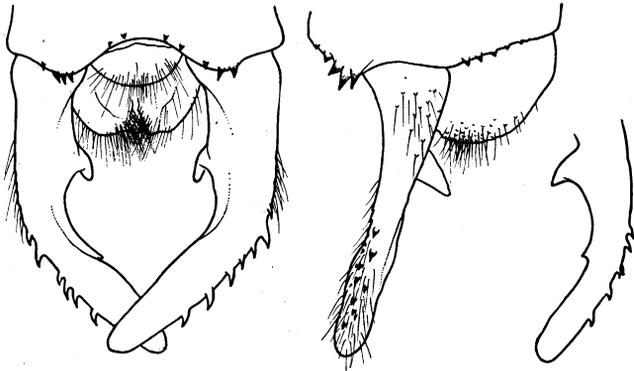


FIG. 2. *Lestes alleni* (Tillyard), male, Jardine River. Anal appendages, dorsal and right lateral views, and part of right superior appendage, interrodorsal view.

MATERIAL: One male (semi-adult), Jardine River, Telegraph Crossing, May 19-21.

ADDITIONAL MATERIAL: Three females (juvenile and semi-adult), north Queensland, Edge Hill near Redlynch, August 22, and October 3, 1938, R. G. Wind.

It is unfortunate that Tillyard did not compare his new species with its nearest relative, *albicauda* McLachlan, but with *tenuissimus* Tillyard and *paludosus* Tillyard. In 1925 an aberrant individual from Groote Eylandt, in the Gulf of Carpentaria, was classified by Tillyard as a new subspecies of *albicauda* under the name of *tindalei*, on which he remarks: "The colouration of this male, however, is much darker than that of the specimens [of *albicauda* McLachlan] which I have examined from North Queensland, and the appendages are uniformly dark all over; the thorax is much darker, the head also darker, but with pale blue labrum; the abdomen has segment 10 pale bluish."

Now it is interesting to observe that in none of Tillyard's earlier publications was the species *albicauda* McLachlan ever mentioned. This leads me to conclude that Tillyard in 1925 considered *alleni* to be synonymous with *albicauda*, the description of which was unknown to him when he described *alleni*.

It is beyond doubt, however, that *alleni* is not the same species as *albicauda*, discussed hereafter. Our examples agree tolerably well with Tillyard's description, which is rather brief and leaves some doubt as to the shape and armature of the male anal appendages. The superiors are said to be ". . . brownish, slender, forcipate, hairy: the inner side slightly swollen near base, and carrying a distinct spine low down just beyond half-way; outer surface furnished with several small spines not arranged in a definite row; some long hairs towards tips." This statement is not in accordance with figure 12 on plate 45, in which a large, sub-basal interior spine, or tooth, is clearly shown. The said spine, in our example, is also very distinct but directed ventrad and hence not always visible in dorsal aspect; this may account for the discrepancy in the description quoted above. The postmedian (or anteapical), tooth-like projection is only small and much shorter than it is in *albicauda*. In the accompanying sketches the color pattern of the thorax (fig. 1) and the appendages of the male from Jardine River (fig. 2) are figured.

The three females from Edge Hill correspond very closely with the male in our collection. All individuals agree in having the triangles of the wings a little wider than in *albicauda*, the costal side in hind wing triangle being a little shorter than the distal side in *alleni*, whereas in *albicauda* both sides are either equally long or the costal side is distinctly the longer. A further means of distinction between the two species is found in the greater reduction

of the bronzy green markings on the head and thorax of *alleni*. In *albicauda* the postclypeus and most of the upper side of the head are dark metallic green, whereas in *alleni* these parts are preponderantly yellow or brown, the dark marks being restricted to an irregular band along the eye margin and four or five more or less confluent spots upon the middle above. Also, in *alleni*, the thoracic bands are narrower and the spots decidedly smaller than in *albicauda*.

MEASUREMENTS: Male: abdomen and appendages 29.0 mm., posterior wing 17.5 mm.; female (allotype): 28.5 mm., 19.5 mm.

Ris' specimens from Cape York, referred to *albicauda* with some misgivings, very probably also belong to *alleni*.

DISTRIBUTION: North Queensland.

Lestes albicauda McLachlan

Figure 3

Lestes albicauda McLACHLAN, 1895, Ann. Mag. Nat. Hist., ser. 6, vol. 16, pp. 23-24 (*pars*: male and female, New Guinea; male, Aru Islands, *ex errore*).

MATERIAL: One male, one female (adult), New Guinea (both with a large, purple, pin label in Selys' handwriting) and "M" (round white label). Holotype and allotype by present designation in the type collection, British Museum. Four males, one female (adult), Misool Island (northwest), Waima, September 13, 1948, M. A. Lieftinck. Twenty-three males, 15 females (adult), northwest New Guinea, Sorong, August 9 to September 2, 1948, and eight males, two females (adult), same area (50 kilometers inland), Klamono oil fields, August 19-20, 1948, M. A. Lieftinck.

A recent (1947) examination of the three available specimens of *albicauda* McLachlan in the type collection of the British Museum, from New Guinea and the Aru Islands, has brought to light that two closely allied species from New Guinea (male and female) and the Aru Islands (male) have been confounded in the original description. The species being a composite one, I have selected the pair from New Guinea as the types of *albicauda*, the male from the Aru Islands being made the type of a new species, which I propose to name *aruanus*.

If the types of *albicauda* were collected by Wallace' assistant Allen at Sorong (northwest coast of the Vogelkop), which is not unlikely, then our specimens are almost exact topotypes. They conform closely with McLachlan's description, except that the

latter contains some remarks which clearly apply to his second male (of *aruanus*) from the Aru Islands. The presence of a "smoky band" following the irregular metallic green stripe on the thoracic dorsum is entirely due to discoloring by decomposition.

The anal appendages of the type are here figured (fig. 3).

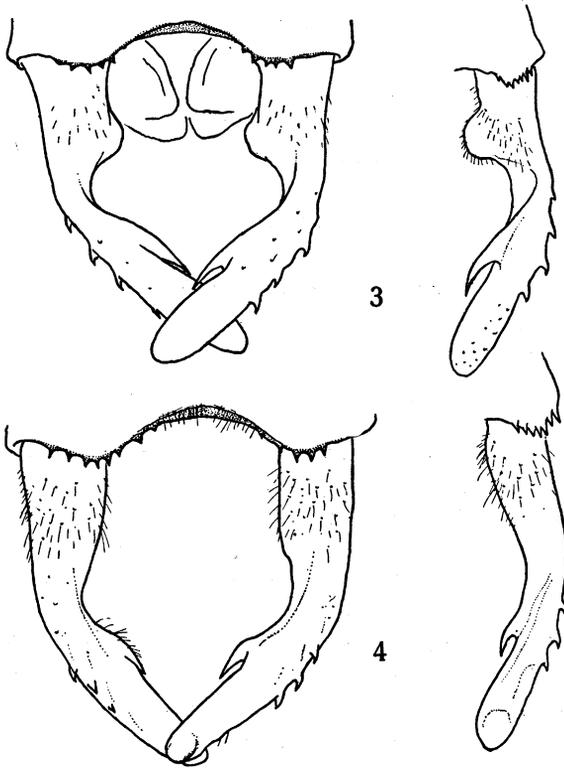


FIG. 3. *Lestes albicauda* McLachlan, male, holotype, New Guinea. Anal appendages, dorsal view, and right superior appendage, interodorsal view.

FIG. 4. *Lestes aruanus*, new species, male, holotype, Aru Islands. Anal appendages, dorsal view, and right superior appendage, interodorsal view. Inferior appendages not shown: abdomen bristled.

As with the allied species of the same cluster, *A. albicauda* is a very variable insect as to the extent of the bronzy green marks on the vertex and epicranium of the head. Also the size and shape of the blackish specks on the thoracic pleurae are subject to considerable variation. The spot on the humeral suture above the base of the anterior wings, the elongate clubbed streak along the

upper end of the first lateral suture, and a triangular spot covering the dorsal fourth of the second suture are invariably present, but the two mesepimeral dots may be either enlarged (the uppermost one fused with the clubbed spot along the first suture) or reduced so much as to become obsolete or absent altogether.

The most noteworthy deviation from the normal condition is found in the subapical interior spine of the upper appendages of the male, which in one specimen from Misool is fused with and melted into the inner (opposite) border of both appendages, so as to disappear completely. In a second male from Klamono, the tooth on the right side is normally developed, while on the left it is dissolved into the appendage itself. The interior subbasal tubercle, however, is invariably present and shaped similarly in all specimens examined.

A number of other characteristics, such as the body size and the number of postnodal cross nerves, seem to be very unstable when good series are examined and compared. In the type of *albicauda* for instance, there are only 10 postnodal cross nerves in the anterior, nine in the posterior wings, whereas in the present series these numbers are 10 to 13 or even 14 in the fore wing, nine to 11 in the hind wing. In the type the vein M_{1a} in both pairs of wings is short, extending basad distal to the middle of the distance between the fork of M_{1-2} and base of pt. In many other specimens from New Guinea, however, the same condition prevails as in *aruanus*, where this vein is much longer, extending basad proximal to the distance mentioned before. The measurements of the male in the additional series are: 29.0 to 33.0, 18.5 to 20.5 mm., respectively.

Adult specimens of both sexes have the ground color of the dorsum of the thorax, as far as the humeral suture, of a ferruginous to dark cinnamon brown tint, while the thoracic pleurae, the sides of abdominal segments 1-2, and the entire tenth segment are light blue. The color of the pterostigma varies from light brown between black nervures to almost black in very old examples.

DISTRIBUTION: West New Guinea and Misool Island.

***Lestes aruanus*, new species**

Figure 4

Lestes albicauda McLACHLAN, 1895, Ann. Mag. Nat. Hist., ser. 6, vol. 16, pp. 23-24 (*pars*: male, Aru Islands; male and female, New Guinea, *ex errore*).

RIS, 1913, Abhandl. Senckenbergischen Naturf. Gesellsch., vol. 34, pp. 505, 506 (*pars*: female, Aru Islands; male and female, Cape York, *ex errore*).

MATERIAL: One male (head wanting), Aru Islands (large, purple, pin label in Selys' handwriting) and "M" (round white label), identified with *L. albicauda* by McLachlan. Holotype in the type collection, British Museum.

This is McLachlan's second male of *albicauda*, which has proved to be a distinct species.

A single female reported from Pulau Wokam (Aru Islands) by Ris and classified as *albicauda* McLachlan probably belongs here.

Although intimately related to *albicauda* and to the Papuan species *luxatus* Lieftinck and *lygisticercus* Lieftinck, *aruanus* differs from these in details of coloring and in the shape of the male anal appendages. It comes closest to *albicauda*. The differences are best given in tabular form.

<i>L. albicauda</i>	<i>L. aruanus</i> (type)
Pterostigma long, 1.0 mm. on forewing	Pterostigma shorter and higher, 0.8 mm. on forewing
Superior anal appendages each with a distinct, rounded, subbasal, interior tubercle	Superior anal appendages without any indication of a subbasal interior projection
Subapical interior spine almost half as long as the distance between its base and the apex of the appendage	Subapical interior spine much shorter and smaller (fig. 4)
Superior appendages in profile view perfectly straight	Superior appendages in profile view perfectly straight, only the tips slightly upcurved
Inferior appendages shaped as shown in figure 3	Inferior appendages, shape not apparent (abdomen bristled)
	Abdomen and appendages 32.3 mm., posterior wing 20.0 mm.

DISTRIBUTION: Aru Islands.

LESTOIDEIDAE

Lestoidea conjuncta Tillyard

Figures 5 to 7

Lestoidea conjuncta TILLYARD, 1913, Proc. Linnean Soc. New South Wales, vol. 37 (1912), pp. 408, 428-429, pl. 46, figs. 1-2 (male, appendages), pl. 47, fig. 1 (wings), (male, Kuranda, north Queensland); 1917, Biology of dragonflies, pp. 279, 293, fig. 154 (wings); 1926, Insects of Australia and New Zealand, p. 78.

MUNZ, 1919, Mem. Amer. Ent. Soc., vol. 3, pp. 17, 41, 45 (keys), pl. 8, fig. 45 (posterior wing). KENNEDY, 1925, Bull. Mus. Comp. Zool. Harvard College, vol. 67, p. 307 (notes). TILLYARD AND FRASER, 1938, Australian Zool., vol. 9, pp. 153 (key), 157-158, fig. 19 (anterior wing).

MATERIAL: One male (adult, distorted), Mossman River Gorge, Rain Forest, 200-500 feet, March 10-15.

Only a single male specimen of this monotypic genus has so far been described, the female being still unknown to science. The discovery of a second example of *L. conjuncta* is of great interest, and I have availed myself of the present opportunity to offer a somewhat more detailed description of this insect.

Head of great size as compared with the slender abdomen, widest across the middle of the compound eyes (ratio between length and width as 1:2.1). Eyes large and globular, their outline almost perfectly circular. Clypeus and labrum typically megapodagrioid. Labrum about three times wider than long, rather protruding, with evenly convex anterior border which is fringed with stiff, dark brown hairs. Anteclypeus separated from postclypeus by an acute transverse carina. Frons declivous, lacking a transverse ridge, but with a shallow depression in front of the median ocellus. Ocelli placed in a regular and but slightly raised triangle, the basal side of which is only little longer than the lateral ones. Vertex and epicranium normal, their surface not corrugated, lusterless. Antennae short; first joint thick and cylindrical, barely one and a half times longer than broad; second joint slenderer, about three times as long as first; flagellar joints indistinctly segmented, together about equal in length to second joint.

Prothorax of large size. Posterior lobe conspicuous, with strongly undulated hind margin, its lateral portions very narrow; mid lobe trapezoidal with rounded side edges and with its margin distinctly raised.

Synthorax robust, shaped much as in *Argiolestes*; mesothoracic triangle of large size, about one and a half times longer than it is broad at base. Laminae mesostigmales conspicuous, in the form of inwardly directed pointed triangles.

Legs of moderate size; posterior femur about equal in length to thorax. Bristles on femora and tibiae rather long, averaging twice the length of the interspaces on hind femora, two and a half to three times on hind tibiae, numbering 10 to 11 on hind femur,

eight to nine on hind tibia. Tarsal claws with distinct inferior tooth near the apex.

Wings hyaline; neuration, including the pterostigma, deep black (fig. 5).

Abdomen of slender form, from base of segment 7 towards the end of 9 considerably expanded in lateral dimension, but dorso-ventrally only slightly so. Tenth segment deeply semicircularly emarginate ventrad.

Penile organ of complex structure. Shaft only slightly curved, strongly compressed laterally and sharply longitudinally carinate ventrally, its ventral part deep black in color, the transition into

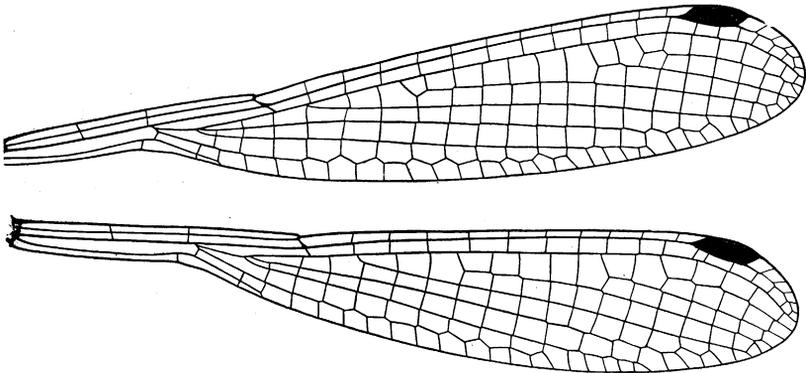
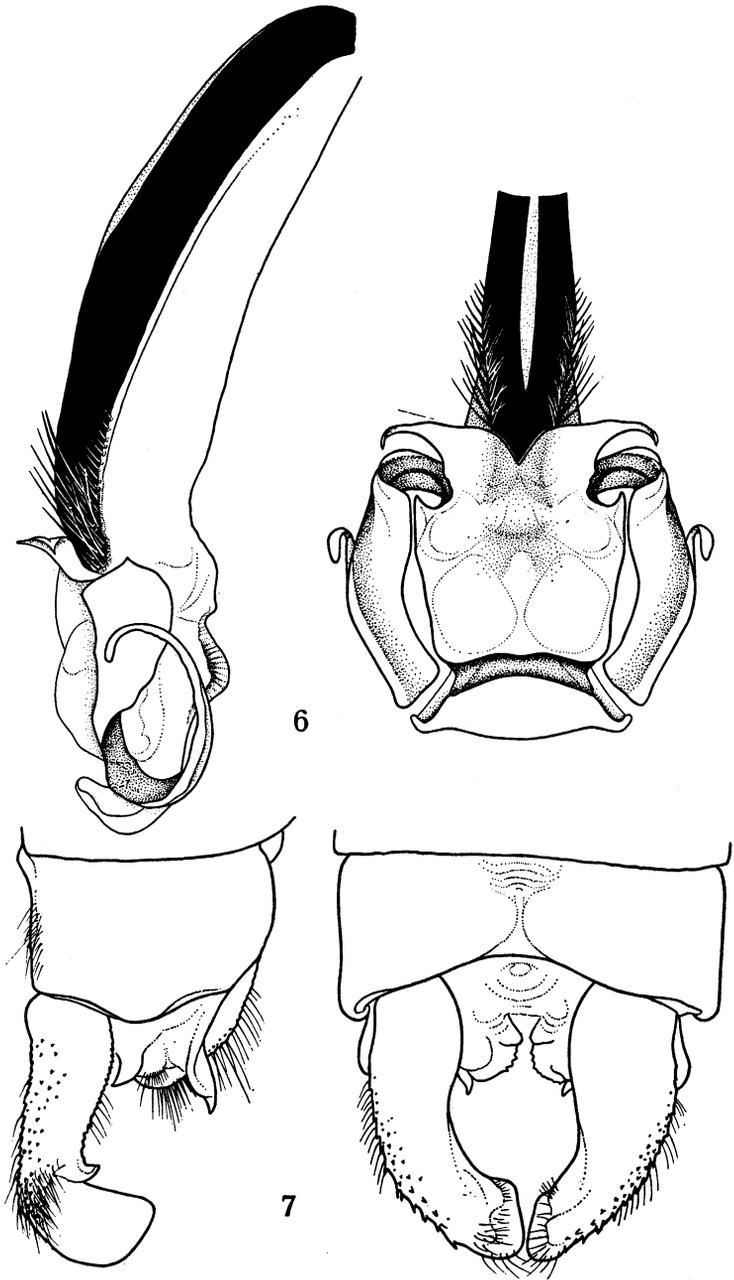


FIG. 5. *Lestoidea conjuncta* Tillyard, male, Mossman River Gorge, Cape York Peninsula. Right pair of wings (drawn from photograph).

the glans indicated by a weak ventral flexure; penis shaft furnished near its end with a double or triple row of long and curved, golden yellow bristles, numbering 25 to 30 on either side and rapidly decreasing in length proximad. Lamina interna, if present, not visible. Glans penis broad, with well-developed limbus membranosus; apical membranous lobe abruptly recurved, somewhat escutcheon shaped, constricted and excised distally so as to form a triangular short projection on either side, the narrowed median portion ending in a wing-like structure, the points of which are directed laterad and curled distad; on each side of the lateral faces of the distal joint of the penis originates a strongly twisted, ribbon-like outgrowth which curves at first backward and slightly



FIGS. 6, 7. *Lestoidea conjuncta* Tillyard, male, Mossman River Gorge, Cape York Peninsula. 6. Lateral and ventral views of penis. 7. Anal appendages, right lateral and dorsal views.

inward, thence upward and forward, and finally curls caudad again (fig. 6).¹

Superior anal appendages much longer than tenth abdominal segment, forcipate, apices compressed and rather abruptly down-bent, the tips nearly meeting in the median line. Inferior appendages considerably shorter than superior pair, each provided with a slightly curved dorsolateral branch that is directed laterad and caudad, and with a somewhat smaller, tooth-like ventral prominence pointing caudad (fig. 7).

MEASUREMENTS: Abdomen and appendages 27.5 mm., posterior wing 20.0 mm., pterostigma posterior wing 1.4 mm.

COLORATION: Labium brownish yellow. Labrum, mandible bases, anteclypeus, and a transverse stripe connecting the eyes in front of frons pale chrome yellow; labrum obscured anteriorly (possibly bluish during life). Postclypeus shining black. Rest of the head mat black with very slight bronzy reflections.

Prothorax brownish yellow, obscured within the depressions. Synthorax with a black band running over the middle of the dorsum and including the mesothoracic and ante-alar triangles; this band gradually increasing in width upward but ill defined laterally; rest of the dorsum and sides dull greenish ochreous, the under surfaces flesh colored.

Legs light brown, femora towards their apices and most of the tibiae and tarsi darker brown.

Abdomen dull bronzy black; sides of segments 1 and 2, a small circular spot on each side at base of 3, and slightly larger dorso-

¹ The penis of *Lestoidea* has been figured from the dry specimen, which was relaxed, the penis itself being extruded and removed from the body so that drawings could be made from every angle of view. It was found that its shape is practically not altered by shrinking in drying, and very little, if any, differences could be detected between the penis observed *in situ* in dry condition or preserved in alcohol after relaxation.

As is shown in our sketch, the ventral part of the shaft and part of the second segment of the penis are very strongly sclerotized and deeply pigmented, the two distal segments being firmly connected by means of a sharply bent "elbow joint," the third segment at the same time fitting tightly against the ventral surface of the main body. The escutcheon-shaped median part of the third segment, with its wing-like apical processes, is wholly transparent. The ribbon-like apical structures, however, which arise from within the ventral surface of the third segment (at the point of constriction near the base of the wing-like apical lobe) are stiff, springy, and deeply stained with yellow over the middle. The point of attachment of these lateral ribbons is not visible in profile view.

lateral basal spots on 4 to 6 chrome yellow. Remaining segments and anal appendages black.

Morphologically, the genus *Lestoidea* is probably the strangest zygopteron among existing Odonata and at the same time one of the most puzzling in the order.

Tillyard, who founded *Lestoidea* in 1913, considered it of the greatest phylogenetic importance and erected the new "Legion" *Lestoidea* for the reception of this aberrant dragonfly. Tillyard was of the opinion that it supplied the missing link between the two "Legions" (now considered families) Lestidae and Protoneuridae, but at the same time admitted that the three forms *Lestes-Lestoidea-Protoneura* do not form links in a single chain of descent.

Munz also points to the lestid affinities in the location of the base of the veins M_3 and R_s , but is of the opinion that many other wing characters do not support the idea of a close relationship to the Lestidae. His remarks on *Lestoidea* may be quoted here:

"This remarkable insect has decided Lestine affinities in the location of the base of M_3 and R_s , but has the vein Cu_2 reduced to a cross-vein and Cu_1 but one cell long. Yet in addition to the above characters it is distinguished from all Protoneuridae by the presence of two sectors between M_1 and M_{1a} .

"The decrease in length of Cu_1 and Cu_2 is one of the most extreme tendencies in specialization occurring in the Zygoptera and its origin in the various groups is an interesting parallelism. As always happens when Cu_2 is thus reduced MA is straightened and the quadrangle ends squarely. The retention of the two sectors between M_1 and M_{1a} is rather remarkable, in view of the fact that all others are gone and that in none of the Lestidae are there any long sectors between these two veins. *Lestoidea* must therefore have arisen from some rather ancient form and is distinct enough to merit a legion for itself or in the system here used, a subfamily" (1919, p. 17).

Kennedy (1925, *loc. cit.*) in his valuable contribution to our knowledge of the Megapodagriidae, agrees with Tillyard and Munz in giving *Lestoidea* subfamily rank, but considering the presence of intercalated sectors on the apical half of the wing, the megapodagriid shape of the pterostigma and the structure of the anal appendages as well, rejects Tillyard's opinion of assigning to it any relationship to the Protoneuridae. In spite of the rectangular shape of the quadrangle, the reduced Cu_1 , and the absence of Cu_2 , the present writer is also strongly of the opinion that all

characters of *Lestoidea* are against such an affinity. Kennedy, in the same paper, is still at a loss to discover its proper place, and remarks that it "is a very aberrant Megapodagrionine, but is left out in this study because it is so strange, its place cannot be stated with any degree of certainty until the penis is studied, and maybe not then" (p. 307).

In 1938, Tillyard and Fraser gave family rank to *Lestoidea* and expressed their views in regard to its affinities in the following way:

"This peculiar form combines the characters found in three different families. The great reduction of the main veins CuP [Cu₁] and 1A [Cu₂] is reminiscent of the Protoneuridae, the positions of the origins of 1R3 [Rs] and R4 + 5 [M₃] resemble those in the Lestidae, and the presence of straight intercalated sectors between R2 [M₁], 1R2 [M_{1a}] and R3 [M₂] reminds one of the Megapodagrionidae. *Lestoidea*, however, differs from all known Megapodagrionidae, and indeed, from all other Zygoptera, in that these intercalated sectors are carried right through from the wing border to the main stem of R2 [M₁], so that they exactly resemble in their structure, the vein 1R2 [M_{1a}] itself."¹

The highly specialized type of penis in *Lestoidea conjuncta* does not support the present classification by venational characters. If this organ had shown some features in common with the characteristic lestid type, for instance by lacking a terminal segment, *Lestoidea* could have been linked with the members of that family. On the contrary, we find in fact not one of the peculiarities of the penis in Lestidae and Synlestidae. By the curious mode of attachment of the lateral, subapical, ribbon-like processes of the apical segment, it differs also from the penis of the Megapodagrionidae and Protoneuridae, being rather reminiscent of that found in *Chalcopteryx*, *Cora*, and a number of other Polythoridae. In its general form, the straightened basal segments, well-developed limbus, and elaborately developed distal part, the penis of *Lestoidea* also very much reminds one of that of *Diphlebia* and *Amphipteryx* among the Amphipterygidae.

¹ It should be noted that, according to Munz' interpretation of the neural characters of *Lestoidea*, the two straight supplementary sectors are intercalated between the veins M₁ and M_{1a}. Tillyard and Fraser, however, are of the opinion that "the first (most proximal) branch is obviously R3 [M₂], the third is almost certainly 1R2 [M_{1a}], while the second and fourth appear to be two intercalated sectors which have lost their original zigzagging and have become straightened so as to resemble branches of main veins" (1938, p. 157).

After reading Kennedy's most interesting account of the South American *Archaeopodagrion bicorne* (1939, pp. 39-41), probably the most archaic among living members of the family Megapodagriidae, I am greatly puzzled at the supposed relationship of *Lestoidea* to that family. Although extremely generalized in its wing characters, *Archaeopodagrion* has retained all essential megapodagriid features, whereas *Lestoidea* does not present anything of the sort. Yet our insect exhibits some very striking superficial points of resemblance to the Megapodagriidae, e.g., structure and shape of the body parts in general, color scheme, and anal appendages.

Summarizing what is known of the morphology of *Lestoidea*, this extraordinary insect in the writer's mind still maintains its isolated position, and a study of its penis has failed to provide the clue in the problem of its affinities.

MEGAPODAGRIIDAE

Podopteryx selysi (Foerster)

Argiolestes Selysi FOERSTER, 1899, Ann. Soc. Ent. Belgique, vol. 43, pp. 70-71 (male, Milne Bay, southeast New Guinea).

Argiolestes roseonotata Subrassé *Selysi* FOERSTER, 1900, Természetrzajzi Füzetek, vol. 23, p. 104 (same specimen).

Podopteryx selysi LIEFTINCK, 1935, Nova Guinea, vol. 17, pp. 207 (key), 208-211 (description, references, notes), fig. 1 (male thorax), fig. 2 (male appendages), north New Guinea (male and female, north New Guinea); 1949, *ibid.*, new ser., vol. 5, pp. 38-39 (additional description and notes), (male, Waigeu Island; female, Salawati Island; male and female, New Guinea, loc. diff.; male and female, north Queensland).

MATERIAL: One female (adult), Mossman River Gorge, Rain Forest, 200-500 feet, March 10-15; one female (adult), upper Clohesy River, Speewah Camp, 1500 feet, March 24-30.

Although the present two females are not accompanied by specimens of the opposite sex, I have but little doubt as to their proper place in *selysi*.

In my 1949 paper (*loc. cit.*, *supra*), I have referred to a pair of this species in the British Museum, collected in 1907 by F. P. Dodd somewhere in Queensland. According to Mr. J. Cowley's notes in a letter to me on these specimens, quoted in my previous paper, the two females now before me agree in every respect with the Queensland examples in the British Museum collection. In both of them the prothoracic spots are pink colored, as in *roseonotata*, and the inferior mesepisternal spot is chrome yellow, detached

from the oblique lateral band as in *roseonotata*, but not inwardly bent. In these and almost all other respects they are in fact practically indistinguishable from a small series of slightly aberrant *selysi*, collected by myself recently in west New Guinea. When at Stockholm, in 1947, I examined five males of the closely allied *roseonotata* Selys, collected by E. Mjöberg near Malanda and Herberton in north Queensland. In four of these the inferior mesepisternal spots are isolated; in one they are similar in form to *selysi*. The prothoracic spots in all of them are pink.

Thus we see that *roseonotata* and *selysi* occur in close proximity to each other not only in some parts of New Guinea but also in north Australia. However, we do not know yet whether they are mutually exclusive in the same restricted habitat or actually live in company. The first supposition seems to be the more likely.

DISTRIBUTION: New Guinea and adjacent islands (except Aru Islands); north Queensland.

***Austroargiolestes aureus* (Tillyard)**

Argiolestes aureus TILLYARD, 1906, Proc. Linnean Soc. New South Wales, vol. 31, pp. 178-179, pl. 17, figs. 1a (male appendages), 1b (female genitalia), (male and female, Kuranda, north Queensland); 1913, *ibid.*, vol. 37 (1912), pp. 415, 421 (key), pl. 45, figs. 1-2 (male appendages); 1917, Biology of dragonflies, pl. 3, fig. 4 (male insect, colored).

Austroargiolestes aureus KENNEDY, 1925, Bull. Mus. Comp. Zool. Harvard College, vol. 67, p. 294.

MATERIAL: One male (adult), Mossman River Gorge, Rain Forest, 200-500 feet, March 10-15.

Previously known only from Kuranda.

DISTRIBUTION: North Queensland.

PROTONEURIDAE

PHASMOSTICTA, NEW GENUS

Figures 8-10

Allied to *Isosticta* Selys.

MALE CHARACTERS: Head large, eyes protuberant; occipital lobes convex posteriorly in dorsal view. Labium with the median lobe produced into a pair of long, narrow, simple processes, which are straight and spine-like, a little shorter than the length of the basal part; cleft deep and narrow, U-shaped. Labrum protuberant, with broadly rounded side edges. Clypeus anteriorly slightly swollen on middle. Frontal ridge distinct. Antennae with

second joint about one and a half times as long as the first, and about half as long as the remaining joints united.

Prothorax and synthorax long and slender. Posterior lobe of prothorax very short, unarmed, simple.

Legs short, with short, widely spaced spines (see specific description). Tarsal claws destitute of an intero-apical tooth.

Wings narrow, forewing about 6.35 times longer than wide (311:49), the greatest breadth far beyond the middle of the wing. Distance between base and Nod and between Nod and apex of forewing in the ratio of about 1:2.3 (19:43). Petiolation commencing at level of Ax_2 . First antenodal costal space about one and one-third as long as second in both pairs of wings; second

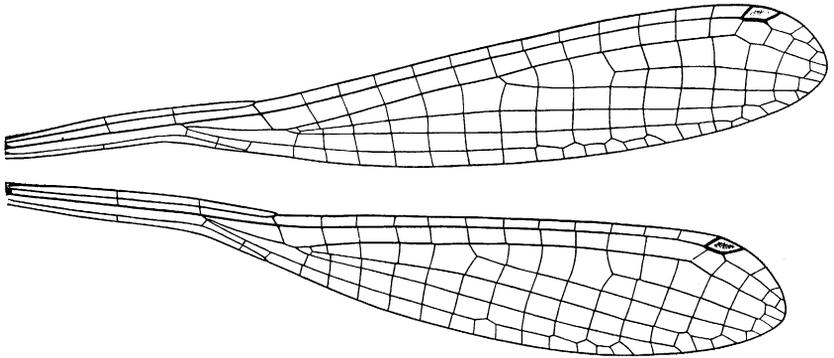


FIG. 8. *Phasmosticta interposita*, new genus and species, male, holotype, Redlynch. Right pair of wings (drawn from photograph).

antenodal costal space a little shorter than third in forewing, but a little longer than same in hind wing. Ac situated distinctly proximal to the level of Ax_1 in forewing, at that level in hind wing. Arc slightly but distinctly distal to Ax_2 for about one-half of the length of Arc itself. Quadrilateral small, much shorter than the second antenodal costal space. Cu_1 one cell long, entering the wing border just beyond the first cross vein following the quadrilateral, which itself is situated before level of subnodus. Cu_2 absent. First cross nerve between M_3 and M_4 not in alignment with the subnodus, but situated far beyond that level. Bases of M_3 and R_s approximated, yet distinctly separated from one another, situated about midway between the subnodus and Px_1 , M_3 a little before, R_s a little beyond, the middle of that distance. M_2 arises

at the sixth postnodal in forewing, at the fifth in hind wing; M_{1a} three to four cells farther distad in forewing, four cells in hind wing. Course of M_4 straight to much beyond halfway the distance between Nod and pt, only the distal course zigzagged. Pterostigma small, oblique, costal side much longer than anal side, and distal side more oblique than proximal side.

Abdomen very slender. Segments 2 to 7 long; segment 2 twice as long as 3; segments 3 to 7 two and a half to three times as long as 2, these segments subequal in length to one another; segment 8 about one-third as long as 7 and a little longer than 9; segment 10 short, about half as long as 9.

Superior anal appendages subequal in length to tenth abdominal segment, forcipate and incurved. Inferior appendages less than half as long as the superior pair.

Penis (fig. 9) without shaft spines, membranous and hyaline, only the ventral part of the shaft and the basal parts of the second segment more strongly chitinized and pigmented. Lamina interna and limbus membranosus well developed. Third segment recurved, with rudiments of lateral lobes pointing inward (dorsad), the lateral apical lobes long and narrow.

Female unknown.

GENOTYPE: *Phasmosticta interposita*, new species.

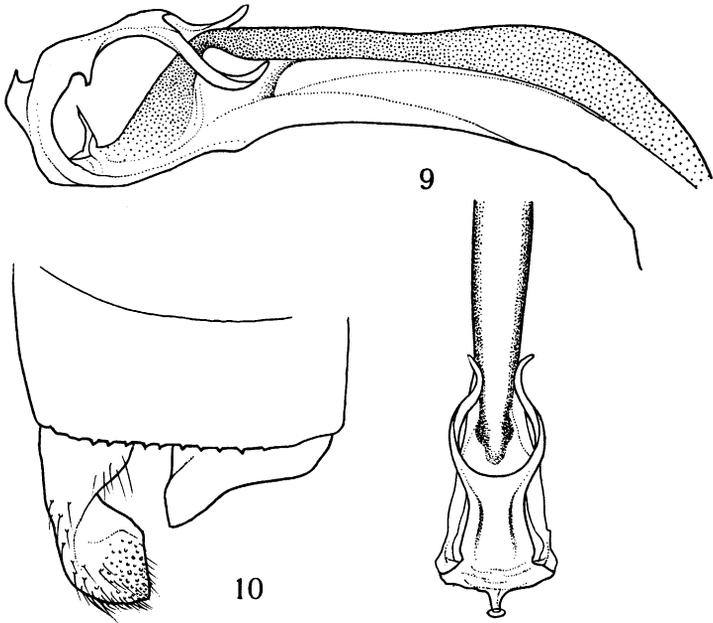
HABITAT: North Queensland.

This new genus finds its place in a group of small protoneurid genera, most of them occurring in Australia and surrounding archipelagos.

In its venational characters, *Phasmosticta* most nearly approaches *Isosticta* Selys, *sensu stricto* (type *spinipes* Selys), but unless the generic diagnosis of *Isosticta* be again considerably modified, our new species *interposita* cannot be included in that genus. In *Phasmosticta* the antenodal cross veins are widely separated from one another (see generic description), whereas in *Isosticta* the first antenodal space is more than twice as long as the second; the quadrilateral is much shorter than the second antenodal space, instead of being about equal in size in *Isosticta*. In *Phasmosticta* the nervure Ac is situated a little proximal to Ax_1 in forewing, or at the same level in hind wing, whereas in both wings of *Isosticta* Ac is placed well in advance of Ax_1 . Lastly, in *Phasmosticta* the vein Cu_1 is only one cell long, but in *I. spinipes* and *tillyardi* it ends two to three cells beyond the quadrilateral. The posterior lobe of the prothorax of *Phasmosticta* is short and simple,

whereas in *Isosticta* it is strongly modified. The anal appendages of the male of *Phasmosticta* are considerably longer than the inferiors and widely different in shape from those of *Isosticta*, *sensu stricto*, in which the superiors are equal in length to the inferior pair and armed with an interior subbasal tooth.

From the Australian members of *Isosticta* our new genus differs in the more distal position of the nervures M_3 and R_s and in the widely different appendages, which, in the three known species, are highly characteristic.



FIGS. 9, 10. *Phasmosticta interposita*, new genus and species, male, holotype, Redlynch. 9. Lateral and ventral views of penis. 10. Right lateral view of anal appendages.

On two previous occasions I have expressed the view that the genus *Isosticta* Selys, even in its restricted sense, is not a natural one, as it includes within its limits a number of discordant species (Lieftinck, 1932, pp. 552-555; 1933, pp. 415-417; see also Champion, 1921, pp. 36-38). The genotype is the New Caledonian *spinipes* Selys, and *I. tillyardi* Champion is a close ally. In all probability these species are generically distinct from the Australian group of *simplex* Martin, which includes also *banksi*

Tillyard and *handschini* Lieftinck. Lastly, *I. robustior* Ris, from New Caledonia and the Loyalty Islands, is so different from the rest that its removal from *Isosticta* would seem to be equally justified. More material and a better knowledge of the genital organs of both sexes are necessary before deciding in favor of this proposal.

From *Oristicta* our new genus can be at once distinguished by the more basal position of Ac, the smaller amount of petiolation and different shape of the wings, the non-aberrant pterostigma, and by the different color scheme of the body.

Phasmosticta is also somewhat related to the monotypic genera *Neosticta* and *Amphisticta* and has approximately the same "facies" as these. However, in these two genera the nervure Ac is situated distal to Ax₁, while the vein Cu₁ is prolonged far beyond the subnodus, forming five to six cells before reaching the wing margin. Moreover in *Neosticta*, the vein M₃ arises before and Rs at the subnodus instead of midway between the subnodus and Px₁, as in *Phasmosticta*. In *Amphisticta* these veins are shifted somewhat farther outward, M₃ originating a little before, Rs just after, the subnodus. Both genera can be further differentiated from *Phasmosticta* by the well-developed interior tooth near the apex of the tarsal claws.

The remaining Australo-Papuan genera of the protoneurid assemblage have little in common, or no concern at all, with *Phasmosticta* and can be left out of consideration here.

NOTE ON THE *Isosticta* SERIES OF GENERA

With a better knowledge of the generic and specific characters of the imagines and larval forms of the Protoneuridae, the present writer is more and more inclined to consider the Australo-Papuan *Isosticta* complex as forming a group of its own. The current confusion in the classification of the Indo-Australian Protoneuridae is probably due to the failure to recognize this eastern group as a distinct subfamily, the characterization of which, it is hoped, will soon be carried into effect. As at present understood, this complex would contain the following genera: *Amphisticta* Sjöstedt, *Austrosticta* Tillyard, *Isosticta* Selys, *Neosticta* Tillyard, *Oristicta* Tillyard, *Phasmosticta*, new genus, *Selysioneura* Foerster, and *Tanymecosticta* Lieftinck.

Phasmosticta interposita, new species

Figures 8-10

MATERIAL: One male (juvenal), north Australia, north Queensland, Redlynch, November 5, 1938, R. G. Wind. Holotype in the Leiden Museum.

Stature of *Isosticta banksi* Tillyard, from the same country, and of the same slender build as that species, but with a larger head and with the occipital lobes less protruding, more evenly rounded posteriorly in dorsal aspect.

MALE (JUVENAL): Structure of mouth parts, including the labium, as in *I. banksi*. Labium, labrum, genae, and anteclypeus yellowish. Postclypeus dark brown. Frons also dark in color, except for a transverse stripe connecting the eyes in front, which is pale yellow and only finely interrupted by black in the median line. Antennae yellowish. Head otherwise greenish black, the rear of the head yellowish.

Posterior lobe of prothorax reduced to a very short and slightly upcurved ridge, which is unarmed, of even width throughout and simply rounded.

Coloring of prothorax and synthorax not fully developed. Dorsum of prothorax pale brownish, including the posterior lobe; sides very pale yellow. Thorax mainly dark above, as far down as the humeral suture, with a fine but distinct yellow line over the middorsal carina; narrow straight antehumeral stripes, widest ventrally and apparently incomplete above. Mesepimera with a dark (probably black) stripe parallel to the humeral suture, incomplete above but gradually widening ventrad and occupying at least the upper half of the mesinfra-episternite. A similar, though much narrower stripe joins the upper half of the second lateral suture, where it ends at about 1 mm. dorsal to the spiracle. There are, in addition, two black points, one each at the dorsal ends of the humeral and second lateral suture, just behind the anterior alar processes. Sides and under surfaces otherwise pale yellow.

Legs comparatively short; posterior femur, when adpressed to the body, ending about 0.5 mm. before hind border of metasternum. Color throughout pale yellowish, the coxae more ochreous, and all femora with two sharply delimited pale brown rings. Armature brown, very similar to *Isosticta*: eight short spines in outer row on posterior and intermediate femora, spines gradually

but slightly increasing in length from base to apex, shorter than the interspaces. Tibial spines also short, nine to 10 in outer row on posterior pair. Tarsal claws lacking an inferior subapical tooth.

Wings very narrow, shape and neuration as in figure 8, practically identical in both pairs. Postnodals 12.13 of first series, 12.11 of second series in forewing, 11.11 of both series in hind wing. Nervures light brown. Pterostigma pale yellowish, light brown in the center.

Abdomen (deformed by pressure) very slender, shape and ratio in length of separate segments apparently similar to those of *I. banksi*. Segments 1 to 8 mainly bronzy black or black, the sides of 1 to 2 and 3 broadly yellow, the dark marks being mainly restricted to the dorsum of these, but becoming gradually more enlarged on the succeeding segments. On segments 2 to 7 these dorsal marks are widened posteriorly, forming complete black apical rings, but they are abruptly cut off anterad so as to leave conspicuous pale basal rings, which are broadest on 4 to 6, occupying about one-fifteenth of the length of these segments. Segments 9 to 10 pale colored (possibly blue in life), 9 slightly obscured laterally.

Anal appendages light brownish. Superior pair much longer than the inferior. Shape of superiors slightly distorted but clearly forcipate, slightly twisted before the middle and laterally compressed, the apical leaf-like portion of each hollowed out and closely beset with numerous small blackish warts; tips bluntly rounded. Inferior appendages about one-third of the length of the superior pair, triangular in outline, and directed obliquely upward and backward (fig. 10).

MEASUREMENTS: Abdomen and appendages 32.0 mm., posterior wing 21.0 mm. Female unknown.

This new species resembles *Isosticta banksi* Tillyard and *handschini* Lieftinck fairly closely in general appearance, but it has a larger head and slightly shorter legs than do these species. The widely different anal appendages, the distal shifting of the origin of the nervures M_3 and Rs, the position of the anal crossing in the hind wing, and the simple structure of the posterior lobe of the prothorax are all characters that may serve to separate *Phasmosticta* from the members of the Australian section of the genus *Isosticta*. Further characteristics of this species are the pale-colored terminal segments of the abdomen and the ringed femora.

DISTRIBUTION: North Queensland.

Notoneura solitaria (Tillyard)

Alloneura solitaria [*lapsus calami*] TILLYARD, 1906, Proc. Linnean Soc. New South Wales, vol. 31, pp. 182-184, pl. 17, figs. 4a (male appendages), 4b (female genitalia), (male and female, north Queensland).

Caconeura solitaria RIS, 1913, Abhandl. Senckenbergischen Naturf. Gesellsch., vol. 34, pp. 509-511 (male and female, key), 514 (male and female, north Queensland).

Notoneura solitaria TILLYARD, 1913, Proc. Linnean Soc. New South Wales, vol. 37 (1912), p. 431, pl. 46, figs. 5-6 (male, appendages), pl. 47, fig. 3 (male, posterior wing).

Risioneura solitaria MUNZ, 1919, Mem. Amer. Ent. Soc., vol. 3, pl. 19, fig. 141 (male, posterior wing).

Notoneura solitaria LIEFTINCK, 1933, Rev. Suisse Zool., vol. 40, p. 413 (male, key). COWLEY, 1936, Ann. Mag. Nat. Hist., ser. 10, vol. 17, pp. 522, 526.

MATERIAL: One male (juvencal), Mossman River Gorge, Rain Forest, 200-500 feet, March 10-15.

I have before me also several individuals from other localities in north Queensland, collected by R. G. Wind near Redlynch, August-December, 1938, and by H. L. Pottinger on Peach River, November 30, 1947, and the Blue Mountains on the Cape York Peninsula, January 14, 1947.

DISTRIBUTION: North Queensland.

COENAGRIIDAE

Pseudagrion ignifer Tillyard

Pseudagrion ignifer TILLYARD, 1906, Proc. Linnean Soc. New South Wales, vol. 31, pp. 188-189, pl. 17, figs. 7a (male, appendages), 7b (female genitalia), (male and female, north Queensland); 1913, *ibid.*, vol. 37 (1912), p. 469, pl. 48, figs. 21-22 (male appendages), (male and female, north Queensland; New South Wales). RIS, 1915, Nova Guinea, vol. 13, Zool., pp. 97 (key), 98, fig. 17 (male appendages), (male and female, New South Wales; north Queensland). SJÖSTEDT, 1917, Arkiv f. Zool., vol. 11, p. 37 (male and female, north Queensland). TILLYARD, 1926, Insects of Australia and New Zealand, p. 77, pl. 3, fig. 1 (male insect, photograph). LIEFTINCK, 1933, Rev. Suisse Zool., vol. 40, p. 420 (male and female, description, Northern Territory).

MATERIAL: One male, Iron Range, June 8-20; one female, Batavia (Wenlock) River, Wenlock, 500 feet, July 26-27.

DISTRIBUTION: Australia (Northern Territory, Queensland, and New South Wales).

Aciagrion fragilis (Tillyard)

Aciagrion fragilis TILLYARD, 1925, Rec. South Australian Mus., vol. 3, p. 41

(female, Groote Eylandt, Gulf of Carpentaria). LIEFTINCK, 1937, Nova Guinea, new ser., vol. 1, pp. 48-49 (full references), fig. 33 (male appendages), (male and female, New Guinea; Northern Territory of Australia); 1949, *ibid.*, new ser., vol. 5, p. 261 (distribution).

MATERIAL: One female, Jardine River, Telegraph Crossing, May 19-21.

DISTRIBUTION: North Australia; north New Guinea; Tanimbar Islands (Timorlaut).

Archibasis mimetes (Tillyard)

Archibasis mimetes LIEFTINCK, 1949, Nova Guinea, new ser., vol. 5, pp. 185, 187 (keys), 191-192 (full references), figs. 175, 224-225, 240 (structures), (male and female, New Guinea; type male restudied, north Queensland).

MATERIAL: One male, Pascoe River, Brown's Creek, 200 feet, July 13-19.

DISTRIBUTION: North Australia, New Guinea.

Austroagrion exclamationis Campion

Austroagrion exclamationis LIEFTINCK, 1949, Nova Guinea, new ser., vol. 5, pp. 199-200 (full references), fig. 242 (female prothorax), (female, south New Guinea).

MATERIAL: One female, Jardine River, Telegraph Crossing, May 19-21.

Not previously reported from Queensland. The specimen corresponds very closely with material in our collection from the Northern Territory, and the Digul River in south New Guinea.

DISTRIBUTION: North Australia (Northern Territory, Queensland), south New Guinea.

Austroagrion coeruleum (Tillyard)

Pseudagrion coeruleum TILLYARD, 1908, Proc. Linnean Soc. New South Wales, vol. 32, pp. 739-741, pl. 35, figs. 13 (male appendages), 14 (female genitalia), (male and female, southwest Australia).

Xanthagrion coeruleum RIS, 1910, Fauna Südwest-Australiens, vol. 2, pt. 24, pp. 430-432, fig. 10 (male appendages), (male and female, west Australia).

Austroagrion coeruleum TILLYARD, 1913, Proc. Linnean Soc. New South Wales, vol. 37 (1912), p. 467, pl. 48, figs. 29-30 (male appendages). CAMPION, 1915, Ann. Mag. Nat. Hist., ser. 8, vol. 16, p. 106 (key, male).

MATERIAL: One female (juvenal), upper Clohesy River, Speewah Camp, 1500 feet, March 24-30.

The specimen is immature, and the identification remains a

little uncertain. It is a true *Austroagrion*, but it differs from both *cyane* (Selys) and *exclamationis* Champion in the structure of the posterior lobe of the prothorax. I have no authentic females of *coeruleum* for comparison, but the present example tallies very well with the original description, although no description has been given of the prothorax of the female.

DISTRIBUTION: West Australia, ?Queensland.

***Ischnura torresiana* Tillyard**

Ischnura torresiana LIEFTINCK, 1949, Nova Guinea, new ser., vol. 5, p. 230 (principal references), (male and female, south New Guinea).

MATERIAL: One male, one female, Tozer Range, north foot, 400 feet, June 28 till July 10.

DISTRIBUTION: South New Guinea, Aru Islands, Torres Strait isles, north Australia (*terra typica*), New Hebrides, Banks Island.

***Ischnura aurora aurora* (Brauer)**

Ischnura aurora aurora LIEFTINCK, 1949, Nova Guinea, new ser., vol. 5, pp. 220-222 (selected references), 249, 251, 261 (notes, distribution).

MATERIAL: One female, Iron Range, June 8-20.

DISTRIBUTION: See Lieftinck (*loc. cit.*).

***Agriocnemis* spec. indet.**

MATERIAL: One female (juvenal), upper Clohesy River, Speewah Camp, 1500 feet, March 24-30.

This is a freshly emerged specimen that cannot be identified with any amount of certainty.

ANISOPTERA

PETALURIDAE

***Petalura ingentissima* Tillyard**

Petalura ingentissima TILLYARD, 1908, Proc. Linnean Soc. New South Wales, vol. 32, pp. 715-718, pl. 33, figs. 1 (male insect), 3-4 (structures), (male and female, north Queensland); 1917, Biology of dragonflies, p. 325, figs. 15, 18 (structures). SJÖSTEDT, 1917, Arkiv f. Zool., vol. 11, p. 18 (male and female, north Queensland). TILLYARD, 1926, Insects of Australia and New Zealand, p. 83. FRASER, 1933, Mem. Indian Mus., vol. 9, pp. 234-235, fig. 16 (male, appendages).

MATERIAL: One female (adult), Mossman River Gorge, Rain Forest, 200-500 feet, March 10-15.

As far as I know, this gigantic species, the largest dragonfly so far discovered, is known only from north Queensland (Cairns, Kuranda, Atherton, Herberton, and Evelyne).

The present female is a very old and much discolored specimen, measuring 92.0 mm. for the abdomen, 72.0 mm. (approx.) for the posterior wing.

DISTRIBUTION: North Queensland.

GOMPHIDAE

Austrogomphus bifurcatus Tillyard

Austrogomphus bifurcatus TILLYARD, 1909, Proc. Linnean Soc. New South Wales, vol. 34, pp. 244–245, pl. 22, fig. 2 (male, thorax), pl. 23, figs. 7–8 (male, appendages), (male, north Queensland). SJÖSTEDT, 1917, Arkiv f. Zool., vol. 11, pp. 16–17, pl. 2, fig. 10 (female, genitalia), (male and female, including allotype, north Queensland).

MATERIAL: One female (adult, discolored, in fragments), Mossman River Gorge, Rain Forest, 200–500 feet, March 10–15.

In the absence of associated males the identification of this single female remains a little uncertain.

Differs from the original description of the male in the following respects.

Labrum with the ground color green, but with a large, dark brown, median patch, ill defined anteriorly, upon the middle, the anterior margin also finely bordered with brown. Anteclypeus olive green, postclypeus brown with a greenish dot on either side. Thorax with the ground color yellow green, most of the dorsum and part of the sides dark bronzy brown; markings similar to those in Tillyard's figure, except that the pale mesepimeral offshoot extending upward towards the base of the forewing is considerably widened dorsally.

Conforms closely to Sjöstedt's description of certain females of *bifurcatus*, from which it appears evident that this species is a variable insect as regards coloring.

DISTRIBUTION: North Queensland (*terra typica*, Atherton).

AESHNIDAE

Acanthaeschna SELYS

Acanthaeschna SELYS, 1883, Bull. Acad. Roy. Sci. Belgique, ser. 3, vol. 5, pp. 718–719 (key), 725–726 (characters), 731–732. "Espèces: *A. victoria* Selys,—*unicornis* Selys." KARSCH, 1891, Ent. Nachr., vol. 17, p. 279. MARTIN, 1901, Mém. Soc. Zool. France, vol. 19, pp. 233–234 (*Acanthaeschna victoria* Selys and

unicornis Selys described). FOERSTER, 1908, Ann. Soc. Ent. Belgique, vol. 52, pp. 190–192 (key to genera *Acanthaeschna*, *Austroaeschna*, and *Dromaeschna*; genotype of *Acanthaeschna: victoria* Selys).

Austroaeschna SELYS, 1883, Bull. Acad. Roy. Sci. Belgique, ser. 3, vol. 5, pp. 718–719 (key), 725–726 (characters), 732–733. “Espèce: *A. parvistigma* Selys.” MARTIN, 1908, Collections zoologiques. . . Selys. . . catalogue systématique, Aeschnines, fasc. 18, p. 7 (key); 1909, *op. cit.*, fasc. 19, pp. 88–89, 104–105 (first species described and figured: *victoria* Selys and *unicornis* Selys); 1911, in Wytsman, Genera Insectorum, fasc. 115, Aeschninae, pp. 46, 47 (key). TILLYARD, 1916, Jour. Linnean Soc. London, Zool., vol. 33, pp. 45–47 (genotype of *Austroaeschna: parvistigma* Selys). LAIDLAW, 1923, Proc. U. S. Natl. Mus., vol. 62, pp. 5 (key), 9. FRASER, 1936, Fauna of British India, Odonata, vol. 3, pp. 56 (key), 61–62 (genotype of *Austroaeschna: parvistigma* Selys).

The genus *Acanthaeschna*, with affix “n. g.,” was founded by de Selys Longchamps in 1883 to include two Australian species, *victoria* Selys and *unicornis* Selys, both sexes of which were characterized in the generic diagnosis. This characterization is followed by some explanatory remarks on the venation and genital organs of these species. Next to follow the description of *Acanthaeschna*, a second genus, *Austroaeschna*, was founded by de Selys Longchamps for the reception of a third Australian species, *parvistigma* Selys, which was characterized also in the generic diagnosis.

In 1901 complete descriptions of the first-mentioned species, *victoria* Selys and *unicornis* Selys, were given by Martin, both species being correctly referred to *Acanthaeschna*.

In 1908, Foerster attempted to subdivide the Australian Brachytrinae, three genera being recognized by him:

1. *Acanthaeschna* Selys, genotype: *A. victoria* Selys
2. *Austroaeschna* Selys, genotype: *A. parvistigma* Selys
3. *Dromaeschna* Foerster, genotype: *D. severini* Foerster

In the same year, Martin, for reasons unknown to me, suppressed the genus *Acanthaeschna* and united all known Australian species of this group under *Austroaeschna*.

As *victoria* Selys, 1883 (Martin, 1901, *emend.*), is clearly the first-described species of *Acanthaeschna* Selys, this species should be considered the genotype. As has been pointed out by Martin (1908, pp. 104–105) and Tillyard (1916, pp. 45–47),¹ any attempt at further splitting into genera of the present species group has proved impossible. Thus *Austroaeschna* Selys *ipso facto* becomes a synonym of *Acanthaeschna*.

¹ No mention was made of *Acanthaeschna* by Tillyard.

***Acanthaeschna forcipata* (Tillyard)**

Figures 11, 12

Planaeschna forcipata TILLYARD, 1907, Proc. Linnean Soc. New South Wales, vol. 31, pp. 726-727, pl. 68, fig. 1 (male, appendages), (male, north Queensland).

Dromaeschna severini FOERSTER, Ann. Soc. Ent. Belgique, vol. 52, pp. 191-192 (male, north Queensland).

Austroaeschna forcipata + *severini* MARTIN, 1909, Collections zoologiques. . . Selys. . . catalogue systématique, Aeschnines, fasc. 19, pp. 102, 106 (key), fig. 98 (male, appendages, *forcipata*), 103, fig. 99 (male, appendages, *severini*).

Austroaeschna forcipata MARTIN, 1911, in Wytzman, Genera insectorum, fasc. 115, Aeschninae, p. 17. TILLYARD, 1913, Proc. Linnean Soc. New South Wales, vol. 37 (1912), pp. 581-582 (male and allotype female, north Queensland); 1916, Jour. Linnean Soc. London, Zool., vol. 33, pp. 47, 48 (key), 77 (male and female, north Queensland).

Austroaeschna severini SJÖSTEDT, 1917, Arkiv f. Zool., vol. 11, p. 21 (notes), (male, north Queensland).

MATERIAL: One female (adult, discolored), Mossman River Gorge, Rain Forest, 200-500 feet, March 10-15.

It is extremely unfortunate that only the female is available for study, as the correct identification of certain species in this genus is very difficult without having access to males, which in most cases are easily separated.

The present example is characterized chiefly by a pair of conspicuous, brown, spine-like, postorbital lamellae, which project backward from the occipital margin (fig. 11). Unfortunately, no mention has been made of these processes in Tillyard's description of the allotype, and whether they are present or absent cannot now be decided. In the color of the head and thorax our example corresponds closely to the description as given by Tillyard for the male.

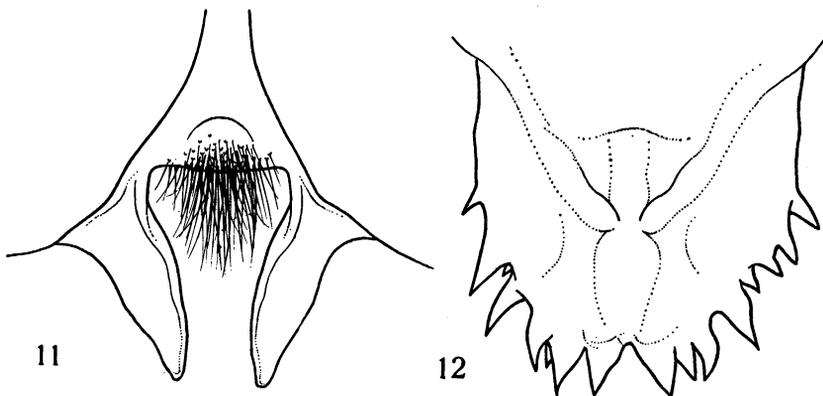
Wings shaped as in typical *Austroaeschna* (as restricted by Foerster). Veins M_3 and M_4 but slightly convex, the latter distinctly waved halfway on its course so as to increase the intervening cell rows from one to two for a variable distance. Rspl short, incomplete basally and not preceded by a second supplementary sector. One row of cells between R_s - R_{spl} and M_3 - M_{spl} . R_s fork slightly narrowed apicad, with two rows of cells between.

Triangles with two (rarely three) cross nerves. Pterostigma short, strongly braced, covering three underlying cells, deep black in color. Antenodals 21 to 24 on forewings, 16 on hind wings; postnodals 16 on all wings. Membranula very short, grayish black.

Abdomen as described for the allotype female (colors much faded). Ovipositor reaching to end of segment 10. Anal appendages very short, about two-thirds of the length of segment 10, almost straight, spine-like, but distinctly flattened dorsoventrally and a little upcurved, black. Supragenital plate bluntly triangular, shorter than appendages, slightly denticulate apically and fringed with black hairs. Dentigerous plate of segment 10 strong, its ventral margin straight in profile view, black in color, the median area brown, shaped as shown in figure 12.

MEASUREMENTS: Abdomen and appendages 54.0 mm., posterior wing 48.0 mm., pterostigma 2.4 mm.

DISTRIBUTION: North Queensland.



FIGS. 11, 12. *Acanthaeschna forcipata* (Tillyard), female, Mossman River Gorge. 11. Dorsal view of occiput, showing processes. 12. Caudal view of dentigerous plate of segment 10.

***Gynacantha rosenbergi* Brauer**

Gynacantha rosenbergi TILLYARD, 1916, Jour. Linnean Soc. London, Zool., vol. 33, pp. 71-72, pl. 4, fig. 10 (male, wings), pl. 5, figs. 11, 16, pl. 7, figs. 12, 25, pl. 9, fig. 3 (larval structures), (imago and larva, Northern Territory and Queensland; Torres Strait isles). LIEFTINCK, 1942, Treubia, vol. 18, pp. 573-574 (principal references, distribution).

Gynacantha rosenbergi TILLYARD, 1917, Biology of dragonflies, figs. 14 (male, appendages), 32 (larval labium), 100 (female, dentigerous plate), 124 (male, wings).

MATERIAL: One female (adult), Iron Range, June 8-20.

DISTRIBUTION: From the southern Moluccas eastward as far as the New Hebrides; Torres Strait isles; north Australia.

LIBELLULIDAE

***Tetrathemis irregularis cladophila* Tillyard**

Figure 13

Tetrathemis irregularis cladophila LIEFTINCK, 1942, Treubia, vol. 18, pp. 449, 451 (key), 454 (descriptive notes, references), pl. 23, fig. 12 (female, thorax), (female, Aru Islands; female, north Queensland).

MATERIAL: One male, one female, Mossman River Gorge, Rain Forest, 200–500 feet, March 10–15.

During a recent visit to the Sydney Museum, I was able to examine one male and one female (paratypes) collected by Tillyard and Allen near Cooktown and Cairns. With the pair from Mossman River before me, I am now able to furnish the necessary particulars (especially as regards the anal appendages of the male) which were lacking in the existing descriptions.

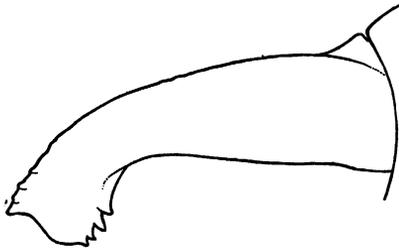


FIG. 13. *Tetrathemis irregularis cladophila* Tillyard, male, Mossman River Gorge. Right superior appendage, exterior view.

MALE (MOSSMAN RIVER): Labium yellow, the lateral lobes bordered with black along mesal margin. Labrum black with traces of yellow basal spots. Face and frons yellow, the latter metallic blue black dorsally along base and in the median furrow.

Thorax as described for typical *cladophila* and dark colors only slightly more extensive than in the female from Aru (Lieftinck, 1942, pl. 23, fig. 12).

Wings strongly tinged with yellow from base as far as Nod. Cubito-anal cross veins 2 + 1 in both pairs of wings.

Superior anal appendages strongly curved, shaped as in figure 13, which should be compared with the sketches of the same organ in other subspecies (Lieftinck, 1942, pl. 23).

FEMALE (MOSSMAN RIVER): Black line along inner border of lateral lobes of labium extremely fine. Labrum with a median

black patch from base to apex. Face yellow, only the vertex metallic blue black, and a dark spot in the median furrow of frons.

Thorax generally paler than in male, pattern exactly as in plate 23, figure 12 (Lieftinck, 1942). Wings flavescent as far out as Nod, the color less intensive than in the male. Only 1-2+1 cubito-anal cross veins in all wings.

These specimens differ from Tillyard's examples in details of coloring and venation, but the shape of the anal appendages is identical. Apparently a variable insect in respect of coloration.

DISTRIBUTION: Aru Islands, north Queensland.

***Nannophlebia eludens* Tillyard**

Nannophlebia eludens TILLYARD, 1908, Proc. Linnean Soc. New South Wales, vol. 33, pp. 645-647, pl. 14, fig. 4 (male insect), (male and female, north Queensland); 1913, *ibid.*, vol. 37, pp. 712-716, pl. 74, fig. 5 (structures). LIEFTINCK, 1933, Rev. Suisse Zool., vol. 40, pp. 426-427 (female described), (female, Northern Territory).

MATERIAL: Five females, upper Clohesy River, Speewah Camp, 1500 feet, March 24-30; Lockerbie, 10 miles west-southwest of Somerset, April 22-May 3; Archer River Crossing, 400 feet, July 31-August 1; Coen, 700 feet, August 4-7; upper Peach River, Shephard's Battery Site, 800 feet, August 12.

DISTRIBUTION: North Australia.

***Agrionoptera insignis allogenens* Tillyard**

Agrionoptera insignis allogenens LIEFTINCK, 1942, Treubia, vol. 18, pp. 468 (key), 471-472 (full references, notes), pl. 24, figs. 25-28 (male, thorax), (male, north Queensland, *inter alia*).

MATERIAL: Five males, five females, Jardine River, Telegraph Crossing, May 19-21.

The present very homogeneous series is of exceptional interest as it offers a welcome opportunity to discuss again the status of the Australian race (or races) of the polytypic species *Agrionoptera insignis*.

The individuals from the Jardine River, now before me, are surprisingly similar *inter se* and at the same time approach subspecies *papuensis* from west, north, and east New Guinea much more closely than does the pale-colored *allogenens* from other parts of north Australia, the Aru Islands, and southern New Guinea.

A brief characterization may be given as follows.

MALE: Thoracic color pattern well delimited and sharply con-

trasting, bright lemon yellow and deep metallic greenish black. Yellow color predominating, but only little more extensive than in *papuensis*, exactly intermediate in fact between our sketches of male *papuensis*, from north New Guinea (Lieftinck, 1942, pl. 24, fig. 24) and of male *allogenes*, from south New Guinea (Lieftinck, 1942, pl. 24, fig. 25). The dorsal prolongation of the yellow mesepimeral band obliterated, as in *papuensis*. Ventral surface of thorax mainly black, with a yellow spot over the middle of the anterior part and a larger transverse patch on the posterior part.

Wings narrow; neuration open. Membrane clear, base of hind wings only in one specimen with vestige of an ochreous spot. Only one Cux in all wings, all triangles free, only a single cross vein in ti of forewing, and discoidal field of forewing invariably with two rows of cells; distal side of forewing triangle slightly fractured, 13 to 14 antenodals in forewing, 10 to 13 in posterior wing; postnodals nine to 12 and nine to 11, respectively.

Abdomen very slender. Segment 1 reddish, or yellow, the dorsum with a sharply defined black patch; base of 2 as far as the transverse suture also black dorsally. Suture between 2 and 3 finely black. Remainder of segments 2 and 3 to 7 scarlet, each segment with a well-defined narrow black apical ring, progressively a little larger from in front backward, the lateral tergal margins of 3 to 7 or 4 to 7 also distinctly and increasingly more broadly black; 8 to 10 and appendages black.

FEMALE: Similar to the male, except for the sexual characters.

MEASUREMENTS: Male: Abdomen and appendages 25.5–27.5 mm., posterior wing 29.5–31.0 mm.; female: 27.0, 31.5 mm.

As follows from this description, these examples are superior in size to Tillyard's type of *allogenes*, and in other respects also are slightly different from his description of specimens from Cairns and Cooktown (Tillyard, 1906, pp. 486–487).

It is interesting to note that a single male in our collection from Redlynch, also in north Queensland, differs markedly from the above discussed series not only in being of smaller size and slightly more slender build, but also in the greater reduction of the dark thoracic bands and the terminal rings on the abdominal segments (Lieftinck, 1942, pl. 24, fig. 28). Unfortunately, I have only a single mature individual from that locality, but so much is certain, that it corresponds closely with similarly pale colored individuals of typical *allogenes*, reported by Ris and myself from Aru and south New Guinea. The Redlynch example measures only 24.5 mm.

for the abdomen, and 27 mm. for the posterior wing. It has 14 antenodal cross nerves on the anterior wing, 12 on the posterior wing.

As I have shown elsewhere (Lieftinck, 1942, pp. 466-468), the characterization of some of the races of the polytypic species *insignis* is a matter of great difficulty, and until more material from many localities in north Australia becomes available, it seems best to refer to the different strains only in a descriptive way.

DISTRIBUTION: Southwest and south New Guinea, Aru Islands, north Australia (*terra typica*), New Caledonia, and Loyalty Islands.

Agrionoptera longitudinalis Selys

Agrionoptera regalis TILLYARD, 1908, Proc. Linnean Soc. New South Wales, vol. 33, pp. 643-645, pl. 14, fig. 3 (male insect), (male, north Queensland).

Agrionoptera longitudinalis biserialis RIS, 1910, Collections zoologiques. . . Selys. . . catalogue systématique, Libellulinen, fasc. 10, p. 144 (male, Cooktown, *inter alia*).

Agrionoptera longitudinalis RIS, 1919, Collections zoologiques. . . Selys. . . catalogue systématique, Libellulinen, fasc. 16, pt. 2, pp. 1069-1070 (notes). LIEFTINCK, 1942, Treubia, vol. 18, pp. 473-478 (references, distribution), (male and female, New Guinea).

MATERIAL: Nine males, upper Nesbit River, Rocky Scrub, Leo Creek, 1500 feet, August 16-21.

The fine series from Leo Creek now before me are the first examples from Australia that have come under my notice.

MALE: Averages smaller in size than Tillyard's examples from Cooktown, the latter measuring 33 mm. for the abdomen, 40 mm. for the posterior wing.

Thorax very dark blackish brown with metallic purplish hue dorsally; sides still darker with slight metallic blue reflections. Otherwise similar to southern specimens. Segments 3 to 4 or 3 to 5 with traces of small basal streaks at the middorsal carinae.

Wings entirely hyaline. Discoidal field of forewing with two rows of cells, or commencing with one row of three cells; two cell rows in the anal field, three to four basal cells undivided. One row of cells between Rs-Rspl. Triangle of anterior wing with one cross-vein; ti with three to four cells.

MEASUREMENTS: Abdomen and appendages 30-32 mm., posterior wing 36-39 mm.

DISTRIBUTION: Moluccas (*terra typica*, Halmahera), western Papuan islands and New Guinea, Aru Islands, north Queensland.

Lathrecista asiatica festa (Selys)

Agrionoptera festa SELYS, 1879, Ann. Mus. Civ. Genova, vol. 14, p. 300 (male, Queensland).

Lathrecista asiatica festa RIS, 1910, Collections zoologiques. . .Selys. . . catalogue systématique, Libellulinen, fasc. 10, pp. 129 (key), 133 (description and references), (male and female, Queensland; male, Cooktown); 1919, *ibid.*, fasc. 16², p. 1068 (Torres Strait, Cape York, Cooktown); 1913, Abhandl. Senckenbergischen Naturf. Gesellsch., vol. 34, p. 528 (Aru Islands, Torres Strait isles, Cooktown). TILLYARD, 1926, Insects of Australia and New Zealand, p. 86, pl. 5, fig. 9 (female insect).

MATERIAL: Eight males, four females, Lockerbie, 10 miles west-southwest of Somerset, April 22–May 3; Newcastle Bay, Naru Point, 2 1/2 miles south of Somerset, May 8–11; Iron Range, June 8–20; Pascoe River, Brown's Creek, 200 feet, July 13–19; upper Peach River, Shephard's Battery Site, 800 feet, Aug. 12.

Apparently a common insect in north Australia.

DISTRIBUTION: New Guinea (parts), Aru Islands, Tanimbar Islands (Timorlaut), Torres Strait isles, north Australia (*terra typica*, Queensland).

Orthetrum pruinorum migratum, new subspecies

Figure 14

Orthetrum pruinorum TILLYARD, 1908, Proc. Linnean Soc. New South Wales, vol. 33, p. 641 (descriptive notes), (male, Cairns, north Queensland). RIS, 1910, Collections zoologiques. . .Selys. . . catalogue systématique, Libellulinen, fasc. 10, p. 242 (male, same specimen).

MATERIAL: One male (head gone), Newcastle Bay, Naru Point, 2 1/2 miles south of Somerset, May 11; paratype. One male (adult), north Australia, Cape York Peninsula, Coen, November 10, 1947, H. L. Pottinger; holotype in the Leiden Museum.

Differs considerably from typical *pruinorum* (Burmeister) of Java, in the darker color of the thorax and in the absence of pruinescence from the abdomen; also distinct by the larger and lighter pterostigma and the reddish nervures on the basal and costal parts of the wing. Our two males are the first specimens reported from Queensland after the discovery by Tillyard of a single male near Cairns, in December, 1907. They agree in almost every detail with Ris' description of the Cairns specimen.

MALE (HOLOTYPE, COEN): Labium and inner mouth parts

light yellow brown; labrum and anteclypeus reddish brown, the latter intermingled with greenish; postclypeus and lateral portions of frons dark brown. Frons and vertex black, rather shiny.

Thorax dark reddish brown, more evenly and rather more densely pruinose than in typical *pruinose*, of a light grayish purple blue tint all over the surface.

Legs black; coxae and trochanters brown, as are also the inner surfaces of the anterior femora.

Wings hyaline; neuration mainly dark, but all cross veins in c,

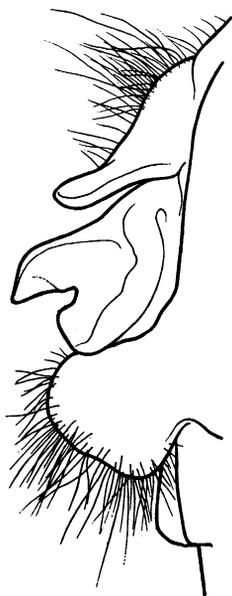


FIG. 14. *Orthetrum pruinose migratum*, new subspecies, male, holotype, Coen. Genitalia of second segment, left side view.

sc, and m, from base as far out as the nodus and including the subnodal cross nerves, yellow. Costa also yellowish interiorly, the basal wing veins pruinose. Pterostigma distinctly larger than in typical *pruinose* (ratio in length of forewing pt to total length of forewing in *pruinose pruinose* = 1:12.33; in *pruinose migratum* = 1:8.7). Base of forewing with golden yellow point in cu, of posterior wing with vestiges of same in c and sc, in cu almost as far as Cux, and two cells in the anal field. Membranula dark gray.

Abdomen shaped as in *pruinorum pruinorum*, entirely carmine, the transverse carina of segment 3 and the lateral carinae of all segments very finely black; segment 10 in addition with traces of blackish laterobasal spots and the apical border also black.

Genitalia shaped as in figure 14. Lobus anterior very similar to typical *pruinorum*, but hamuli more deeply cleft, the inner branch of each distinctly longer, and more slender, with their upper margin in side view strongly convex instead of nearly straight, and the outer branch comparatively much smaller, less broad and shelf-like, than in the typical race (see Ris, 1900, pl. 9, fig. 3).

Anal appendages light red, very similar in shape to those of *pruinorum pruinorum*.

MEASUREMENTS: Abdomen and appendages 27.0 mm., posterior wing 29.0 mm., pterostigma of anterior wing 3.5 mm. (type and paratype).

Female unknown.

Regarding the habitat of this interesting subspecies, the following remarks of the two authorities who first recognized the Cape York population as a peculiar and distinct race are well worthy of quotation:

"Your specimen extends the limits of the concern (*O. pruinorum*) to Queensland in a form that is certainly not of the *clelia* type, but of the true *pruinorum* type, and thus must suggest its origin from the Sunda region, and its way to Australia probably has been across Timor" (Ris, in Tillyard, 1908, p. 641).

"The specimen is chiefly of interest as affording direct evidence of a stream of immigration to the Cape York Peninsula independent of that across Torres Strait from New Guinea" (Tillyard, 1908, p. 641).

DISTRIBUTION: Cape York Peninsula.

***Orthetrum sabina sabina* (Drury)**

MATERIAL: One male, one female, Jardine River, Telegraph Crossing, May 19-21; Tozer Range, north foot, 400 feet, June 28 until July 10.

DISTRIBUTION: Egypt, through Asia to north Australia and Oceania.

***Orthetrum villosovittatum villosovittatum* (Brauer)**

MATERIAL: Eight males, Mossman River Gorge, Rain Forest,

200–500 feet, March 10–15; Iron Range, June 8–20; upper Nesbit River, Rocky Scrub, Leo Creek, 1500 feet, August 16–21.

DISTRIBUTION: Moluccas to New Guinea, and Australia into New South Wales.

Nannodiplax rubra Brauer

MATERIAL: Ten males, two females, Lockerbie, 10 miles west-southwest of Somerset, April 22–May 3; Jardine River, Telegraph Crossing, May 13–19; Batavia (Wenlock) River, Wenlock, 500 feet, July 26–27.

DISTRIBUTION: South New Guinea, Torres Strait isles, north Australia.

Diplacodes bipunctata (Brauer)

MATERIAL: Two males, upper Clohesy River, Speewah Camp, 1500 feet, March 24–30.

DISTRIBUTION: Kei and Aru Islands; New Guinea (central); Australia and New Zealand; Micronesia, Melanesia, and Polynesia (*terra typica*, Tahiti), as far east as the Marquesas Islands.

Diplacodes haematodes (Burmeister)

MATERIAL: Twenty-one males, 16 females, Mossman River Gorge, Rain Forest, 200–500 feet, March 10–15; Lockerbie, 10 miles west-southwest of Somerset, April 22–May 3; Jardine River, Telegraph Crossing, May 19–21; Iron Range, June 8–20; Tozer Range, north foot, 400 feet, June 28–July 10; Pascoe River, Brown's Creek, 200 feet, July 13–19; upper Peach River, Shephard's Battery Site, 800 feet, August 12; upper Nesbit River, Rocky Scrub, Leo Creek, 1500 feet, August 16–21; Mt. Finnegan, upper Parrot Creek, 1150 feet, September 14, and Shipton's Flat, 900 feet, September 17.

DISTRIBUTION: New Guinea; Torres Strait isles; throughout Australia; New Caledonia; New Hebrides.

Diplacodes nebulosa (Fabricius)

MATERIAL: One male, Jardine River, Telegraph Crossing, May 19–21.

In spite of its enormous distribution, this is a somewhat rare species, which occurs in scattered colonies throughout its range. Unlike *haematodes*, it is never found away from water; marshes,

abandoned rice fields (sawahs), and heavily weeded tanks are favored habitats.

DISTRIBUTION: From western India and Ceylon through south-east Asia to New Ireland and north Australia.

***Neurothemis stigmatizans stigmatizans* (Fabricius)**

MATERIAL: Sixteen males, 15 females, Lockerbie, 10 miles west-southwest of Somerset, April 22–May 3; Jardine River, Telegraph Crossing, May 19–21; Iron Range, June 8–20; Tozer Range, north foot, 400 feet, June 28–July 10; Batavia (Wenlock) River, Wenlock, 500 feet, July 26–27.

DISTRIBUTION: North Australia, Torres Strait isles.

***Pantala flavescens* (Fabricius)**

MATERIAL: One male, Lockerbie, 10 miles west-southwest of Somerset, April 22–May 3.

DISTRIBUTION: The tropics and warmer temperate countries of the globe; almost cosmopolitan.

***Tramea loewi tillyardi* Lieftinck**

Tramea loewi tillyardi LIEFTINCK, 1942, Treubia, vol. 18, pp. 527 (key), 528–529 (description, references), pl. 33, fig. 97 (male, genitalia), pl. 34, fig. 103 (female, genitalia), (male and female, north Australia, New Guinea, Tanimbar Islands, Kei Islands).

MATERIAL: Five males, one female, Lockerbie, 10 miles west-southwest of Somerset, April 22–May 3; Newcastle Bay, Naru Point, 2 1/2 miles south of Somerset, May 8–11; Coen, 700 feet, August 4–7.

DISTRIBUTION: Throughout Australia (*terra typica*, Redlynch, north Queensland) as far south as Sydney; south New Guinea; Aru and Kei Islands; Tanimbar (Timorlaut).

***Rhyothemis graphiptera* (Rambur)**

MATERIAL: One female, Jardine River, Telegraph Crossing, May 19–21.

DISTRIBUTION: Buru (Moluccas), south New Guinea, Aru Islands, Torres Strait isles, north Australia.

***Rhyothemis phyllis chloe* Kirby**

Rhyothemis phyllis chloe LIEFTINCK, 1942, Treubia, vol. 18, pp. 507 (key), 510–

511 (descriptive notes, references), pl. 29, figs. 57, 61 (wings), (female, Aru Islands; male and female, North Australia).

MATERIAL: One male, Mossman River Gorge, Rain Forest, 200–500 feet, March 10–15.

DISTRIBUTION: Aru Islands, north Australia as far south as Brisbane, New South Wales (north?). *Terra typica*, Mackay, Queensland.

Rhythemis princeps princeps Kirby

Rhythemis princeps princeps LIEFTINCK, 1942, *Treubia*, vol. 18, pp. 513 (key), 513–514 (descriptive notes, references), pl. 12, figs. 78–85 (wings), (male and female, south New Guinea; female, Torres Strait isles; male and female, north Queensland).

MATERIAL: One male, two females, Jardine River, Telegraph Crossing, May 19–21.

DISTRIBUTION: South New Guinea, Torres Strait isles, north Australia (Queensland, *terra typica*, Mackay).

LIST OF ODONATA FROM CAPE YORK PENINSULA¹

SUBORDER ZYGOPTERA

AMPHIPTERYGIDAE

1. *Diphlebia euphaeoides euphaeoides* Tillyard, 1907
2. *Diphlebia hybridoides* Tillyard, 1912

CHLOROCYPHIDAE

3. *Rhinocypha tincta* Rambur, 1842, subspec. indet.

AGRIIDAE (CALOPTERYGIDAE AUCT.)

4. *Neurobasis* spec. indet. (aff. *australis* Selys, 1897)

SYNLESTIDAE

5. *Chorismagrion risi* Morton, 1914
6. *Synlestes albicauda* Tillyard, 1913
7. *Synlestes tropicus* Tillyard, 1917
8. *Synlestes weyersi weyersi* Selys, 1869

Reported by Sjöstedt, 1917, from Malanda. It is a southern species.

LESTIDAE

9. *Lestes alleni* (Tillyard, 1913)
10. *Lestes insularis* (Tillyard, 1913)
11. *Lestes leda* Selys, 1862

¹ Species found also in New Guinea are marked with an asterisk.

Reported by Sjöstedt, 1917, from Atherton, Herberton, Evelyne, etc. It is a more southern species.

12. *Lestes paludosus* Tillyard, 1906
 *13. *Lestes tenuissimus* Tillyard, 1906

LESTOIDEIDAE

14. *Lestoidea conjuncta* Tillyard, 1913

MEGAPODAGRIIDAE

- *15. *Podopteryx roseonotata* Selys, 1871
 *16. *Podopteryx selysi* (Foerster, 1899)
 17. *Austroargiolestes aureus* (Tillyard, 1906)
 18. *Austroargiolestes icteromelas* (Selys, 1862), subsp.
 19. *Argiolestes metallicus* Sjöstedt, 1917

PROTONEURIDAE

20. *Amphisticta silvarum* Sjöstedt, 1917
 21. *Isosticta banksi* Tillyard, 1913
 22. *Isosticta handschini* Lieftinck, 1933
 23. *Isosticta simplex* Martin, 1901
 24. *Nososticta solida* Selys, 1860
 25. *Notoneura coelestina* (Tillyard, 1906)
 26. *Notoneura solitaria* (Tillyard, 1906)
 27. *Oristicta filicicola* Tillyard, 1913
 28. *Phasmosticta interposita* Lieftinck, this paper

COENAGRIIDAE (AGRIONIDAE AUCT.)

- *29. *Archibasis mimetes* (Tillyard, 1913)
 30. *Pseudagrion aureofrons* Tillyard, 1906
 31. *Pseudagrion ignifer* Tillyard, 1906
 *32. *Pseudagrion microcephalum* (Rambur, 1842)
 *33. *Pseudagrion papuense* Tillyard, 1926
 *34. *Teinobasis rufithorax* (Selys, 1877)
 *35. *Ceriagrion erubescens* Selys, 1891
 36. *Austrocnemis splendida* (Martin, 1901)
 *37. *Argiocnemis rubescens rubescens* Selys, 1877
 38. *Austroagrion coeruleum* (Tillyard, 1908)
 Of doubtful occurrence in north Queensland (see above)
 39. *Austroagrion cyane* (Selys, 1876)
 Teste Sjöstedt, 1917.
 *40. *Austroagrion exclamationis* Campion, 1915
 *41. *Aciagrion fragilis* (Tillyard, 1906)
 *42. *Ischnura aurora aurora* (Brauer, 1865)
 *43. *Ischnura pruinescens* (Tillyard, 1906)
 *44. *Ischnura torresiana* Tillyard, 1913
 45. *Argiocnemis argentea* Tillyard, 1906
 46. *Argiocnemis australis* Selys, 1877
 Position doubtful. Habitat "?Queensland."
 *47. *Argiocnemis femina* (Brauer, 1868)

- *48. *Agriocnemis pygmaea* (Rambur, 1842)
 49. *Agriocnemis rubricauda* Tillyard, 1913
 50. *Agriocnemis thoracalis* Sjöstedt, 1917
 Position doubtful; possibly synonymous with *rubricauda*.
 51. *Agriocnemis trilobatus* Sjöstedt, 1917
 Position doubtful; probably the female of the last.

SUBORDER ANISOPTERA

PETALURIDAE

52. *Petalura ingentissima* Tillyard, 1908
 53. *Petalura pulcherrima* Tillyard, 1913

GOMPHIDAE

54. *Austrogomphus acolythus* Martin, 1901
 Position doubtful. Habitat "?Queensland."
 55. *Austrogomphus amphiclitus* (Selys, 1873)
 Habitat "Queensland."
 56. *Austrogomphus arbustorum* Tillyard, 1906
 Probably synonymous with *prosellythus* Martin, 1901.
 57. *Austrogomphus arenarius* Tillyard, 1906
 58. *Austrogomphus bifurcatus* Tillyard, 1909
 59. *Austrogomphus doddi* Tillyard, 1909
 60. *Austrogomphus lateralis* (Selys, 1873)
 Habitat "Nord de l'Australie."
 61. *Austrogomphus manifestus* Tillyard, 1909
 62. *Austrogomphus prasinus* Tillyard, 1906
 63. *Austrogomphus proselythus* Martin, 1901
 64. *Austrogomphus risi* Martin, 1901
 65. *Austrogomphus turneri* Martin, 1901
 66. *Hemigomphus comitatus* (Tillyard, 1909)
 67. *Ictinogomphus australis australis* (Selys, 1873)

AESHNIDAE

68. *Telephlebia godeffroyi tillyardi* Campion, 1916
 T. godeffroyi mjobergi Sjöstedt, 1917, is synonymous.
 69. *Acanthaeschna forcipata* (Tillyard, 1907)
 70. *Acanthaeschna speciosa* (Sjöstedt, 1917)
 71. *Acanthaeschna weiskei* (Foerster, 1908)
 72. *Austrogynacantha heterogena* Tillyard, 1908
 *73. *Gynacantha mocsaryi* Foerster, 1898
 *74. *Gynacantha rosenbergi* Brauer, 1867
 *75. *Agyrtacantha dirupta* (Karsch, 1889)
 *76. *Anax gibbosulus* Rambur, 1842
 *77. *Anax guttatus* (Burmeister, 1839)
 78. *Anax papuensis* (Burmeister, 1839)

CORDULIIDAE

79. *Cordulephya bidens* Sjöstedt, 1917

- 80. *Austrophya mystica* Tillyard, 1909
- 81. *Austrocordulia refracta* Tillyard, 1909
- 82. *Pseudocordulia circularis* Tillyard, 1909
- 83. *Pseudocordulia elliptica* Tillyard, 1913
- 84. *Syncordulia atrifrons* McLachlan, 1883

The habitat of *S. gracilis* (Burmeister, 1839) is still unknown.

- 85. *Pentathemis membranulata* Karsch, 1890
- 86. *Hemicordulia australiae* (Rambur, 1842)
- 87. *Hemicordulia continentalis* Martin, 1907
- 88. *Hemicordulia intermedia* Selys, 1871
- 89. *Hemicordulia tau* Selys, 1871
- 90. *Anacordulia maccullochi* Tillyard, 1926

Probably synonymous with the next species, the name *tillyardi* then having precedence. *Anacordulia* Tillyard, 1926, is probably inseparable from *Metaphya* Laidlaw, 1912, which would have priority.

- *91. *Anacordulia tillyardi* (Ris, 1913)
- 92. *Eusynthemis nigra nigra* (Tillyard, 1906)
- 93. *Eusynthemis paradoxa* Foerster, 1908
- 94. *Eusynthemis ptilorhina* Foerster, 1908
- 95. *Synthemis claviculata* Tillyard, 1909
- 96. *Choristhemis flavoterminalis* (Martin, 1901)
- 97. *Choristhemis oliveri* (Tillyard, 1909)
- 98. *Macromia tillyardi* Martin, 1907
- 99. *Macromia viridescens* Tillyard, 1911

Almost certainly the same species as *nigra* Tillyard.

LIBELLULIDAE

- *100. *Tetrathemis irregularis cladophila* Tillyard, 1908
- 101. *Nannophlebia eludens* Tillyard, 1908
- 102. *Nannophlebia risi* Tillyard, 1913
- *103. *Agrionoptera insignis allogenes* Tillyard, 1908
- *104. *Agrionoptera longitudinalis* Selys, 1878
- *105. *Lathrecista asiatica festa* (Selys, 1879)
- *106. *Potamarcha obscura* (Rambur, 1842)
- *107. *Orthetrum caledonicum* (Brauer, 1865)
- 108. *Orthetrum pruinosum migratum* Lieftinck, this paper
- *109. *Orthetrum sabina sabina* (Drury, 1770)
- *110. *Orthetrum villosovittatum villosovittatum* (Brauer, 1868)
- 111. *Nannophya australis* Brauer, 1866
- *112. *Brachydiplax denticauda* (Brauer, 1867)
- *113. *Brachydiplax duivenbodei* (Brauer, 1866)
- *114. *Nannodiplax rubra* Brauer, 1868
- *115. *Diplacodes bipunctata* (Brauer, 1866)
- *116. *Diplacodes haematodes* (Burmeister, 1839)
- *117. *Diplacodes nebulosa* (Fabricius, 1793)
- *118. *Diplacodes trivialis* (Rambur, 1842)
- *119. *Raphismia bispina* Hagen, 1867
- *120. *Neurothemis oligoneura* Brauer, 1867

121. *Neurothemis stigmatizans stigmatizans* (Fabricius, 1775)
 *122. *Crocothemis servilia novaguineensis* Foerster, 1898
 *123. *Crocothemis nigrifrons* (Kirby, 1894)
 *124. *Rhodothemis rufa* (Rambur, 1842)
 *125. *Zyxomma elgneri* Ris, 1913
 *126. *Zyxomma petiolatum* Rambur, 1842
 *127. *Tholymis tillarga* (Fabricius, 1798)
 *128. *Pantala flavescens* (Fabricius, 1798)
 *129. *Tramea eurybia eurybia* Selys, 1878
 *130. *Tramea loewi tillyardi* Lieftinck, 1942
 *131. *Tramia propinqua* Lieftinck, 1942
 *132. *Camacinia othello* Tillyard, 1908
 *133. *Hydrobasileus brevistylus* (Brauer, 1866)
 134. *Rhyothemis braganza* Karsch, 1890
 *135. *Rhyothemis graphiptera* (Rambur, 1842)
 *136. *Rhyothemis phyllis chloe* Kirby, 1894
 *137. *Rhyothemis princeps princeps* Kirby, 1894
 *138. *Rhyothemis resplendens* Selys, 1878
 *139. *Macrodiplax cora* (Brauer, 1867)
 140. *Aethriamanta subsignata circumsignata* Selys, 1897

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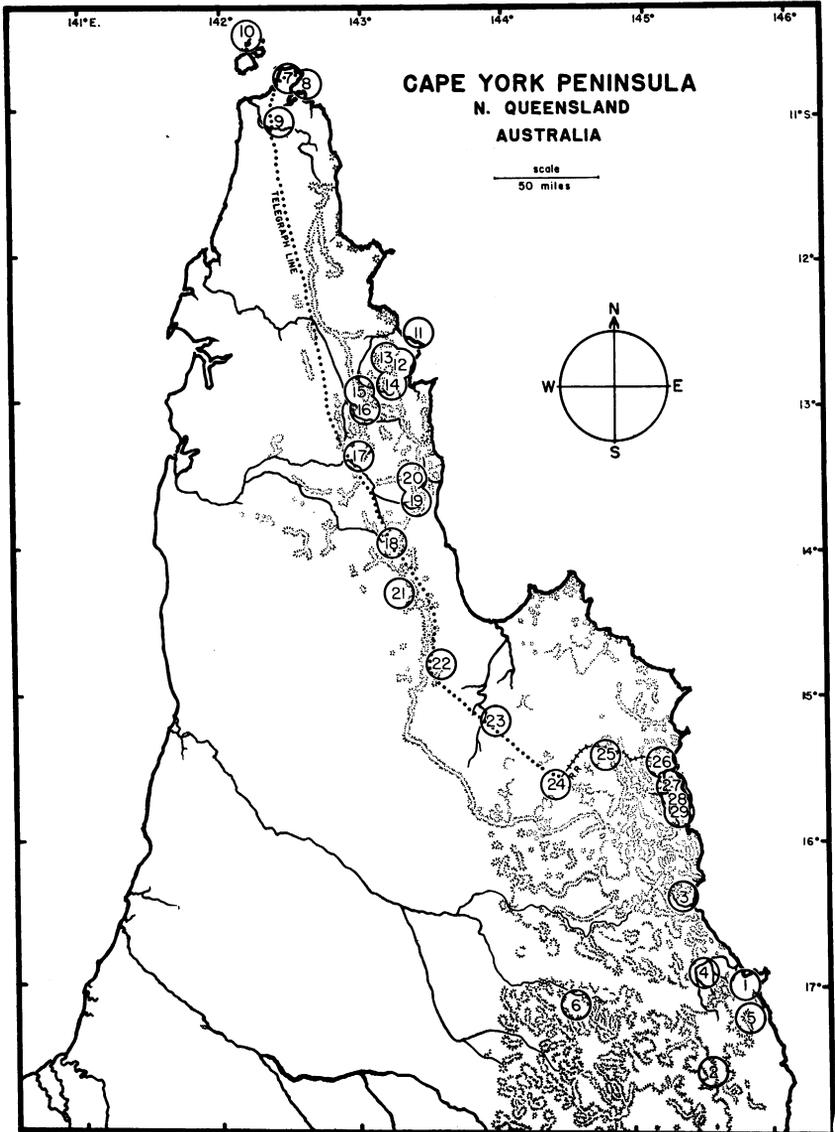


FIG. 15. Map of the Cape York Peninsula, showing localities visited by the 1948 Archbold Cape York Expedition. Odonata collected only at the following: 3, Mossman River Gorge, Rain Forest; 4, upper Clohesy River, Speewah Camp; 7, Lockerbie; 8, Newcastle Bay, Naru Point; 9, Jardine River, Telegraph Crossing; 12, Iron Range; 13, Tozer Range; 14, Pascoe River and Brown's Creek; 16, Batavia (Wenlock) River, Wenlock; 17, Archer River Crossing; 18, Coen; 19, upper Peach River, Shephard's Battery Site; 20, upper Nesbit River, Rocky Scrub, Leo Creek; 27, Annan River, The Forks; 28, Shipton's Flat; 29, Mt. Finnegan, upper Parrot Creek.