

A NEW SPECIES OF *ISCHNURA* FROM NEW CALEDONIA  
(ZYGOPTERA: COENAGRIONIDAE)

G.S. VICK<sup>1</sup> and D.A.L. DAVIES<sup>2</sup>

<sup>1</sup> "Crossfields", Little London, Basingstoke, Hants, RG26 5ET,  
United Kingdom

<sup>2</sup> 94 Thornton Road, Cambridge, CB3 0NN, United Kingdom

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*I. pamelae* sp. n. from New Caledonia is described and figured. (holotype ♂, allotype ♀: Plaine des Lacs, 20-XI-1981, D. Allen L. Davies leg.). The new taxon does not appear to be closely related to other *Ischnura* spp. from Oceania; it is the third member of the genus to be found in New Caledonia.

INTRODUCTION

New Caledonia, in Melanesia, lies between the Solomon Islands and New Zealand and also between E. Australia and Fiji; it has a rich relic and endemic odonate fauna (LIEFTINCK, 1975). The island was "drowned" in the Oligocene (ca. 45 million years B.P.) with probably few, if any, "refuges", as evidenced by the absence of *Peripatus*, and of snakes (except sea-snakes); among the older Odonata there are no representatives of the Petaluridae or Synlestidae. However, early colonists representing *Synthemis* and *Argiolestes* from Australia or New Guinea made a wide adaptive radiation, e.g. the former into niches better known for Gomphines, Aeshnas and Gynacanthas. Several new species will be described, but in this paper we name a new *Ischnura* which will have been a much more recent arrival. It is an isolated member of the genus structurally, is fairly small and breeds in confined areas which have a particular endemic flora. The new taxon is named after the late Pamela Tobin who diligently sought out a fine series.

*ISCHNURA PAMELAE* SPEC. NOV.

Figures 1-11

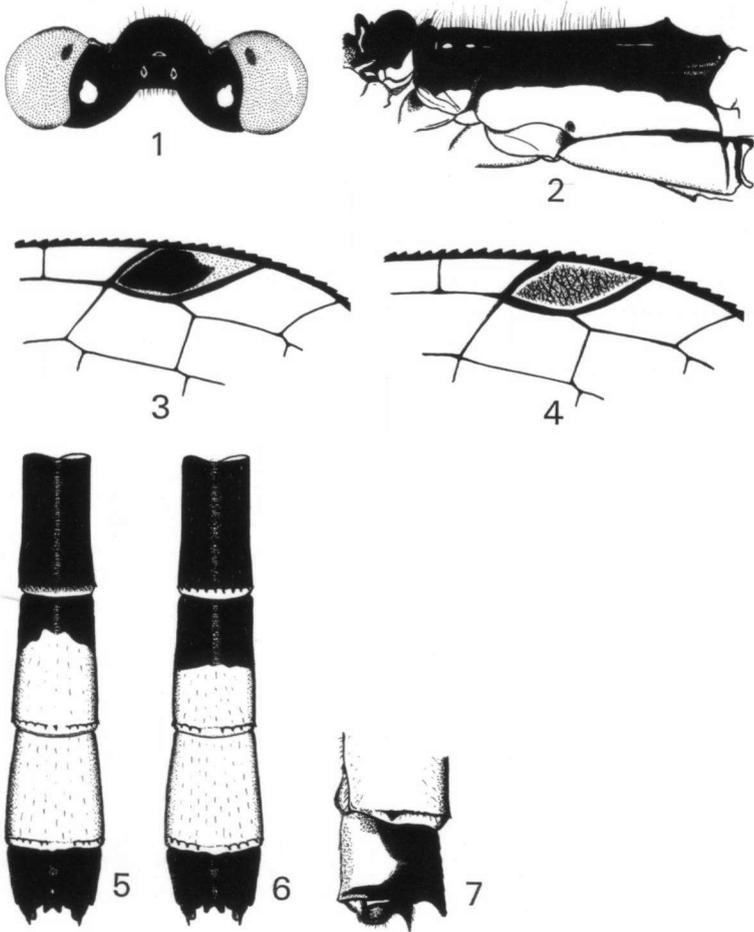
Material. — Holotype ♂: New Caledonia. Plaine des Lacs, 20-XI-1981, D. Allen L. Davies leg.

— Allotype ♀ and 2 Paratype ♂: same data. Also available: series of 12 paratype ♂ taken at same locality in 1983 and 1984.

Colour preservation good (acetone).

Male (holotype) — abdomen + appendages 22.5 mm; hindwing 12.5 mm.

Head (Fig. 1). — Labium white with a small brown longitudinal streak on each lateral lobe; labrum shining-black with transverse greenish-blue band on apical third; anteclypeus greenish-blue; post-clypeus greenish-blue with indistinct



Figs 1-5, 7. *Ischnura pamelae* sp. n., male holotype; Fig. 6 male paratype: (1) head, dorsal view, — (2) thorax, lateral view, — (3) Pt of forewing. — (4) Pt of hindwing. — (5-6) abd. segments 7-10, dorsal view, — (7) anal appendages, lateral view.

brown lateral and basal markings on vertical surface (possibly partly due to post-mortem discoloration) and shining-black on dorsal surface; mandible bases and genal area greenish-blue extending as a vertical streak along orbits as far as antennal bases; frons and entire dorsal surface of head black, except for 2 transverse sky-blue streaks on frons (between the antennal bases) and 2 small sky-blue postocular spots; rear of head pale bluish-white, only the surroundings of the foramen black.

Prothorax (Fig. 2). — Matt black; anterior lobe with a pair of transverse streaks of sky-blue; sides marked with sky-blue; posterior lobe black, scarcely developed, with posterior ridge tipped with white on lateral margins.

Pterothorax (Fig. 2). — Dorsum matt-black, this colour occupying about one-third of mesepimeron and upper three-quarters of mesinfraepisternum; antehumeral stripe sky-blue, vestigial, broken into 3 well-separated spots above the mesostigmal lamina and a narrow streak below the antealar carina; thoracic sides sky-blue, metapleural suture narrowly dark-brown, widening towards posterior alar process; venter bluish-white, sutures brown; coxae brown marked with sky-blue on exterior surfaces.

Legs. — Femora black, interior surfaces pale (almost white); tibiae dark-brown extensively marked with yellowish-brown on interior surfaces; tarsi yellowish-brown, each segment ringed with reddish-brown apically; claws yellowish-brown, apically dark-brown.

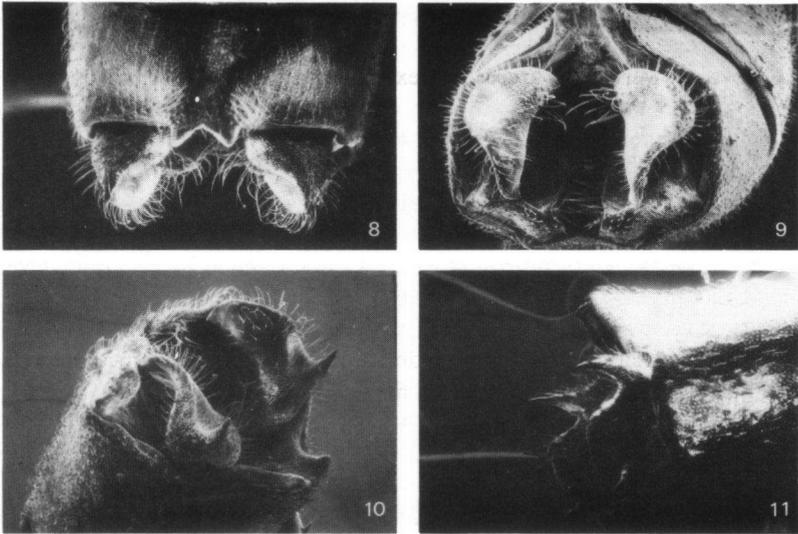
Wings. — Hyaline, neuration brown; 9 post-nodals in fore-wing, 7 in hind-wing; 3 cells between C and  $R_1$ , posterior to Pt in fore-wing, 4 in hind-wing; arculus at 2nd antenodal in forewing, that of hindwing just distal to it; Pt very similar in shape and size in fore- and hind-wing, that of fore-wing (Fig. 3) containing a dark-brown quadrilateral surrounded by a hyaline border (widest at the outer angle) with the distal side streaked with chalky-white, while that of hind-wing (Fig. 4) contains a pale-brown quadrilateral surrounded by a uniformly narrow hyaline border.

Abdomen. — Cylindrical, slender, dorsum of segment I weakly raised posteriorly, with triangular depression in anterior half, its base close to beginning of segment and its apex reaching about two-thirds of length of segment; bright sky-blue, fading to greenish-blue on segments 3-6, marked broadly with brownish-black on dorsum of segments 1-7 (intersegmental rings showing blue on bases of segments 3-6) and on basal third of segment 8; segment 9 entirely sky-blue; segment 10 marked extensively with brownish-black on dorsum, apex of segment raised and produced into a bifurcated tubercle; sternites of segs. 1-7 dark-brown, of 8 sky-blue with narrow longitudinal dark-brown streak in basal half, of 9 and 10 sky-blue, unmarked.

Penis. — Typically ischnurine, close to that of the Samoan *I. sanguinostigma* Fraser, figured by Fraser (1953), except that the apical horns are more strongly curved and relatively longer; the spines are similarly divergent and of about the

same relative length as in that species but more strongly hooked apically.

Anal appendages (Figs 7-11). — Superiors brownish-black, strongly drawn out into long parallel apices, with a large ventrally- directed lobe; inferiors yellowish-brown, darkening apically, slightly shorter than superiors.



Figs 8-11. *Ischnura pamela* sp. n., male paratype. SEM photographs of anal appendages, views: (8) dorsal, (9) caudal, (10) latero-caudal, (11) lateral.

Female (allotype- heterochrome). — Abdomen + appendages 22 mm; hindwing 13.5 mm.

Head. — Labium cream; labrum shining black, reddish-brown in apical third; anteclypeus lemon-yellow; post-clypeus reddish-brown on vertical surface, shining-black on dorsal surface; frons black with irregular orange-brown apical streak; top of head black with two small circular post-ocular spots which appear as if they would be sky-blue (as in male) in life; genal area yellow, extending as a vertical streak along orbits nearly to antennal bases; behind head pale yellowish-white, except for foramen which is dark brown.

Prothorax, pterothorax, legs. — Marked as male except that blue coloration of male is replaced by orange-brown, antehumeral stripes are not interrupted and coxae are entirely pale-yellow.

Wings. — As male except for differences in Pt; that of forewing slightly larger than that of hindwing, both more regularly rhomboidal than in the male and coloured greyish-brown, framed by a hyaline border of uniform width.

Abdomen. — Yellowish-brown, marked dorsally with a continuous dark

brown band which stretches from segment 1-10, this band of approx. uniform width (occupying about half total area of each tergite) and only interrupted by very narrow yellowish-brown basal rings on segments 3-5 which are narrowest on dorsum and widen slightly laterally; appendages dark-brown; sternites yellowish-brown marked with dark-brown point on segment 1 and dark-brown longitudinal streaks, interrupted apically on segments 2-8; spine on venter of segment 8 present and of similar (relative) length to that of *heterosticta* but slightly less acute apically. Valves very pale, apices just exceeding apices of appendages.

#### VARIATION

Although very little structural variation was noted, there was considerable variation in two important features of the males. In some specimens the ante-humeral stripes were more strongly evident than in the holotype and extended almost continuously from the mesostigmal lamina to within 0.5 mm of the ante-alar carina, with only a narrow interruption at about the lower third. Also, the extent of the black marking on the dorsum of seg. 8 varied from about a third (as the holotype) to about a half (Fig. 6).

#### DISCUSSION

The only previously published records of species of *Ischnura* from New Caledonia are: *I. aurora* Brauer (= *delicata* Hagen), *I. heterosticta* (Burmeister) and *I. torresiana* Tillyard (SELYS, 1876; SCHMIDT, 1938; KIMMINS, 1953). However, WATSON (1976), working with Australian material, showed that *torresiana* and *heterosticta* do not show diagnostic structural characters but constitute the ends of a range of forms varying slightly in the structure of the appendages and in body coloration and so *torresiana* falls as a synonym of *heterosticta*.

The new species differs markedly from *I. heterosticta* and *I. aurora* in colour pattern, male anal appendages and penis; indeed the morphology of the anal appendages is quite different from that of all regional *Ischnura* and the relationships of the new taxon to other taxa are difficult to decide. It seems probable that the new taxon is endemic to New Caledonia.

An example of a new species of *Ischnura* (which we presume to be of *pamelae* sp. n.) seems to have existed in a small local collection at O.R.S.O.M. Institute in Noumea and was noticed by Dr F.C. Fraser when he visited there. He seems to have sent it to Dr M.A. Lieftinck (in the Netherlands) who sent it on to Paris. It was not named or described, perhaps because little or nothing was known about it, and no series existed.

While *I. heterosticta* is found widely, though sparsely, in ponds in New Caledonia, *I. pamelae* has only been found in the small region (ca. 50 km by 20

km) in the relatively low-lying area south of Noumea. The mountains of the Massif Central, rising to over 3000 m, occupy much of the island and drain abruptly to the sea all down the east coast. Ponds are therefore confined to the west and south coastal strips which are about 2 to 20 km wide. This species breeds in both deep rocky ponds and muddy ponds and probably requires reeds to attract it for shelter, in a typical ischnurine manner. The flora in the area where it breeds is a curious endemic dwarf assemblage accounted for by limited phosphorus in the soil. This feature is co-extensive with rich nickel deposits which have attracted extensive and destructive open-cast mining, from which regeneration is slow. There are areas of high Ni/low P elsewhere in the island but it is not known if the species breeds there also; it has not been seen but it has not been adequately sought.

The new species may be seen at least from November to March. It disappears within a few seconds of the sun being obscured by cloud. Its known range is centred round an area known as Plaine des Lacs, lying south of the east-west road from Noumea to Yaté.

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