

***ARCHBOLDARGIA SCISSORHANDSI* SPEC. NOV.
FROM PAPUA, INDONESIA
(ZYGOPTERA: COENAGRIONIDAE)**

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The new sp. is described, based on a single ♂. Holotype ♂: Indonesia: Papua (formerly Irian Jaya), Pass Valley, Ibem R., 13/20-V-1999; deposited in ZMAN, Amsterdam. A key to the *Archboldargia* ♂♂ is given and some notes on the distribution of the genus are provided.

INTRODUCTION

LIEFTINCK (1949) described the genus *Archboldargia* for two new species of Coenagrionidae, *A. mirifica* and *A. gloriosa*. While dealing with these species, Lieftinck used words like “bizarre” and “gigantesque” and described the males as “very handsomely coloured ‘damselflies’, the vivid green, bright blue, and red colours of their body, contrasting with deep black, coupled with their huge size, far outrivalling the appearance of any other Caenagriid [coenagriid] known to me”. Since their original description no new information on this genus has been published, and their habitats and habits are still unknown. In a small collection of dragonflies from Papua (formerly Irian Jaya), Indonesia I discovered a male of an undescribed *Archboldargia*, which caught my eye due to its spectacular appendages.

***ARCHBOLDARGIA SCISSORHANDSI* SP. NOV.**

Figures 1-3a

Material. – Holotype ♂: INDONESIA: Papua, Pass valley, Ibem R., 1800 m, 13/20-V-1999, Henk van Mastrigt leg., deposited in Zoological Museum, University of Amsterdam. Additional in-

formation on the location as provided by the collector: "The specimen was collected near the airport 'Pass Valley' which lies along the road from the Baliem Valley to Jayapura, approximately 25 km from Wamena. Coordinates: 03°52' S 139°04' E; 1828 m asl".

E t y m o l o g y. – The inferior appendages resemble pairs of scissors and therefore the species is named after the title character in Tim Burton's movie, 'Edward Scissorhands'.

MALE (holotype) (Fig. 1). – Head broken from prothorax; antennae wanting. Left lateral extension of posterior ridge of pronotum broken and lost. Large damselfly with stout abdomen. Agrees in all respects with the generic diagnosis given by LIEFTINCK (1949) unless otherwise stated.

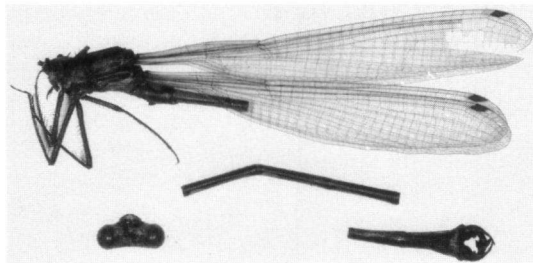


Fig. 1. *Archboldargia scissorhandsi* sp. n., holotype ♂.

H e a d. – Dorsal and posterior part of head black with round, large, yellowish brown postocular spots. Median part of frons, postclypeus and anteclypeus black. Face below the antennae, socket of antennae, genae, mandibles and labrum yellowish brown, the latter two with black borders; labrum with median black cleft running down to about two-thirds of the height of labrum. Labium and maxillae black.

T h o r a x. – Prothorax largely black with posterior margin and part of the median division of the pronotum more greyish; anterior margin of pronotum simple, collar-shaped, with rounded margins; posterior margin large with a small, asymmetrical median spine and large paddle-shaped rims (Fig. 2). Synthorax black with dirty yellowish brown markings on lower two-thirds of the metepimeron, an ill-defined stripe on mesepimeron, which starts at lower corner of mesepimeron, running from just above spiracle until anterior border at about two-thirds of length of mesepimeron.

Legs black, coxae black with pale spots on anterior and posterior side. Legs long and slender with long bristles on femur and tibia; fore femur with 10+, middle with 10-12, hind with 15 spines on the lateral side; fore tibiae with 14, middle with 10-12, hind with 12 spines on the lateral side; bristles on femora of equal length about twice as long as interspaces; bristles on tibiae decreasing in length from base to apex, the longest being about three times as long as the interspaces.

Wings long and elongated, about six times as long as wide with drawn out apices, and almost straight posterior margin, membrane suffused with yellow, veins black. Pterostigma small, dark brown, costal length in fore wing 1.1 mm and costal length in hindwing 1.3 mm. Petiolation short and ceases at level of Ax1. Discoidal cell with acute distal lower angle, costal vein about two times as long as proximal vein in forewing and about three times as long in hindwing. Px 18-19 in hindwing,

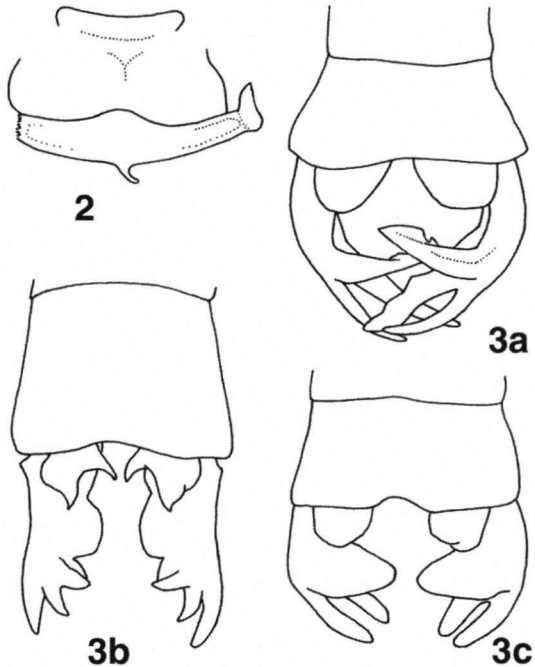
and 21-22 in forewing.

Abdomen. — Black with blue spots as follows: s1 with small dorsal mark; s2 with square dorsal mark on anterior half of segment; s3 with mark beginning at the anterior border of the segment and covering two-thirds of the dorsum slightly tapering towards posterior part of the segment; dorsum of s9 and s10 largely blue. Segments 3-7 with latero-ventral markings near the anterior corner of the segments, markings on ventral side only separated from each other by wide black sternites. Segments 9 and 10 expanded, posterior end of s10 almost twice as wide as s8. Superior appendages short and simple; inferior appendages almost as long as s9 and s10 combined and with a complex structure (Fig. 3a).

Measurements (mm). — Total length (including appendages) 53; abdomen, including appendages 42; hindwing 33.

FEMALE unknown.

DIFFERENTIAL DIAGNOSIS. — Males of the genus *Archboldargia* are easily differentiated from other Papuan species of coenagrionids by their impressive size combined with the expanded segments 9 and 10, the reduced superior appendages and the large and complex inferior appendages. The *A. scissorhandsi* sp. n. males are easily differentiated from the known congeners by the absence of an antehumeral stripe and the shape of the inferior appendages.



Figs 2-3. Details of the morphology of *Archboldargia* males: (2) synthorax of *A. scissorhandsi* sp. n. (left rim of posterior ridge broken), dorsal view; — (3) appendages, dorsal view: (a) *scissorhandsi* sp. n.; — (b) *A. mirifica*; — (c) *A. gloriosa*.

KEY TO THE MALES OF ARCHBOLDARGIA

- 1 Posterior margin of prothorax with a large and sturdy median tubercle which is about as high as the thorax itself. Inferior appendages not deeply divided; superior appendages with interior tooth (Fig. 3b). Antehumeral stripe present and conspicuous *mirifica*
- Posterior margin of prothorax with a small, thin median spine. Inferior appendages deeply di-

- vided; superior appendages without interior tooth (Figs 3a, c). Antehumeral stripe absent 2
- 2 Apices of inferior appendages blunt (Fig. 3c). Anterior surface of head largely greyish blue. Svnthorax largely purplish-blue *gloriosa*
- Apices of inferior appendages pointed (Fig. 3a). Anterior surface of head largely yellow-brown. Synthorax largely black *scissorhandsi* sp. n.

DISCUSSION

The coenagrionid genus *Archboldargia* is placed in the subfamily Argiinae together with the New Guinean genera *Palaiargia* Förster, 1903, *Hylaeargia* Lieftinck, 1949 and *Papuargia* Lieftinck, 1938, the American genus *Argia* Rambur, 1842; the oriental *Onychargia* Selys, 1865 and the Philippine *Moroargion* Needham & Gyger, 1939 (DAVIES & TOBIN, 1984). This subfamily is characterised by the spines on the tibia which are at least twice as long as the intervening spaces; petiolation of the wing ending well before Ac, so that the distance between the end of petiolation and the origin of Ac is longer than Ac; discoidal cell short and wide, dilating outwardly; antenodals close and converging posteriorly; arc at level of distal antenodal, anal vein arises proximal to Ac; vulvar spine in females absent (DAVIES & TOBIN, 1984; WESTFALL & MAY, 1996).

The largely African genera *Mesocnemis* Karsch, 1891, *Metacnemis* Selys, 1863 and *Arabicnemis* Waterston, 1984, with respectively 4, 3 and 1 known species, have often been attributed to Argiinae based on larval as well as adult characters. However, the placement of these species has long been under debate and since the publication of DAVIES & TOBIN (1984) they have most often been placed in Platycnemididae (for discussion see GASSMANN, 2004; LIEFTINCK, 1949, 1957; RIS, 1921, 1924; WATERSTON, 1984).

Although the above characters distinguish the Argiinae from most other coenagrionids, it is not certain whether they really reflect taxonomic affinity. Recently, a phylogenetic analysis using morphological characters failed to support the widely used Coenagrionidae subdivisions as proposed in 1984 by DAVIES & TOBIN (O'GRADY & MAY, 2003). They argued that "subfamilies should not be recognised within Coenagrionidae until well-supported subdivisions are demonstrated". Although present knowledge is not sufficient to state whether or not the subfamily Argiinae is a monophyletic group, it seems reasonable to assume that the four New Guinean genera do form a monophyletic group. Besides the above-mentioned characters the species are all of moderate to large size and many of them are strikingly coloured with blue, red or purple markings. A strong indication for their close affinity are the larvae described of the New Guinean *Hylaeargia simulatrix* Lieftinck, and *Palaiargia ceyx* Lieftinck, both by supposition. These are short, with a rather large head which is, compared to other coenagrionids relatively long with prominent postocular lobes, the labial mask is rather short and broad with a prominent, broadly rounded median lobe, premental setae absent (LIEFTINCK, 1957) These characters are shared with the American

Argia (WESTFALL & MAY, 1996). The caudal appendages in the *Argia* larvae are lamellate and held in a vertical plane or are of the saccoid type (CORBET, 1999). In the two described New Guinean species these consist of a basal saccus and a thin, strongly expanded apical membranous part which is irregularly folded (LIEFTINCK, 1957). The only caudal appendages of a larva faintly reminding one of this structure are those of *Lieftinckia* Kimmins, which is considered to belong to the Platynemididae or Megapodagrionidae (LIEFTINCK, 1963; CORBET, 1999). The shape of the appendages in *Hylaeargia* and *Palaiargia* is unique within the Coenagrionidae and strongly supports the affinity of at least these two genera.

The genera *Archboldargia*, *Palaiargia*, *Hylaeargia* and *Papuargia* have 3, 20, 2 and 1 known species respectively. Four *Palaiargia* species are endemic to the North Moluccan islands of Obi and Halmahera, the rest being endemic to New Guinea (including Misool and Waigeo). *Palaiargia* is found in a broad altitudinal range from sea level to 2100 m. *Hylaeargia* and *Papuargia* are known from only a few records and so far confined to the elevations of 1150-1600 m and 250 m, respectively. *Archboldargia* is confined to higher altitudes, with the records of *A. mirifica* Lieftinck, *A. gloriosa* Lieftinck and *A. scissorhandsi* sp. n. ranging from 1740 to 2100 m asl (Fig. 4). *A. mirifica* is known from three males and two females from two localities, while *A. gloriosa* is only known from a single male. Details of the habitat and life history of *Archboldargia* are lacking. The supposed larvae of *Hylaeargia simulatrix* and *Palaiargia ceyx* were found under stones in torrential mountain streams (LIEFTINCK, 1957) making it likely that *Archboldargia* is also to be found in fast running waters.



Fig. 4. Map of New Guinea showing the distribution of the species of the genus *Archboldargia*.

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