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Some notes on *Bironella* (*Bironella*) *confusa* Bonne-Wepster  
(Diptera; Culicidae; Anophelinae)

by

R. SLOOFF

## INTRODUCTION

The Australasian anopheline genus *Bironella* Theobald 1905 is divided into two subgenera — *Bironella* and *Brugella* — and contains a total of seven valid species. The morphological characters upon which the taxonomy of the genus is based are summarized by SWELLENGREBEL & RODENWALDT (1932), LEE & WOODHILL (1944) and BONNE-WEPSTER & SWELLENGREBEL (1953), while other taxonomic literature of importance has been listed by STONE et al. (1959).

The known adults of species of *Bironella* show a considerable uniformity in ornamental characters, but male terminalia, wing venation, palps and antennae exhibit more diversity than is to be found in the genus *Anopheles*.

Larvae are most often found in running streams, pools in river beds and in jungle pools. Mostly, several species will be found breeding together. The habits of the adults are obscure; only *B. (Bir.) bironelli* (Christophers, 1924) and *B. (Bir.) papuae* (Swell. & Swell., 1919) have been reported to bite man incidentally in the vicinity of abundant breeding grounds (BONNE-WEPSTER, op. cit.), but there is nothing to suggest that these species would be capable of transmitting human diseases.

The present paper deals with *B. (Bir.) confusa* Bonne-Wepster 1951, a very appropriately named species. A lot of confusion started when SOESILO & VAN SLOOTEN (1931) doubtfully associated a male, bred from a breeding place in Bumi or Kota Baru, West New Guinea, of larvae of *B. (Bir.) papuae* and *B. (Bir.) soesiloi* (Strickland & Chowdury, 1931) with the latter species without sufficient evidence that they really were the same. A second and third male, bred from the same lot, were named *B. (Bir.) derooki* and *B. (Bir.) papuae* var. *brugi*. This doubtful procedure was definitely taken over by SWELLENGREBEL & RODEN-

WALDT (op. cit.). Later, LEE & WOODHILL (op. cit.) more accurately bred species of *Bironella* from breeding places with mixed populations and found sufficient evidence to protest against the correlation of the bred male with a larva from the same lot. On studying several series of *B. (Bir.) bironelli* (= *B. (Bir.) gracilis* Theobald 1905), *B. (Bir.) papuae* and *B. (Bir.) soesiloi* from a collecting site in North New Guinea, BONNE-WEPSTER (1951) proved that a *B. (Bir.) soesiloi* male, thus obtained, was definitely different from *B. (Bir.) soesiloi* sensu SWELL. & RODENW., but identical with *B. (Bir.) derooki* Soesilo & van Slooten. The latter name was therefore invalid. The male, wrongly described as *B. (Bir.) soesiloi* (No. 22147), now in the British Museum, has subsequently been described as *B. (Bir.) confusa* by the same author (1951) who at the same time draw the attention to a male specimen and a larva, collected and described from Milne Bay, T.P.N.G., by LEE & WOODHILL (op. cit.), which might belong to the same species. The description of *B. (Bir.) confusa* is very scanty and, according to STONE (pers. comm.), incorrect in some minor details. Pupal exuviae of *B. (Bir.) confusa* have been described by PENN (1949) as *B. (Bir.) soesiloi* sensu SWELL. & RODENW., after material also from Milne Bay, T.P.N.G.

Under the circumstances, a redescription of *B. (Bir.) confusa* seems to be necessary. Several series of this species have recently been collected during routine collections of larvae in the Kota Baru area, West New Guinea. Of these, a number of males and male terminalia were sent to Mr. P. F. MATTINGLY, London, for comparison with the type of *B. (Bir.) soesiloi* no. 22147. These proved to be identical. On these findings *B. (Bir.) confusa* is redescribed and figured as follows.

### *Bironella (Bironella) confusa* Bonne-Wepster, 1951

#### MATERIAL EXAMINED

A.P.O.-camp, Kota Baru, small stream, sea-level; April 1962: one male and one female with associated pupal skins, no's 2054 and 2055; May 1962: two males and thirteen females with associated pupal skins and ten associated larval skins, no's 2096 to 2110.

Ifar, Kota Baru, small stream, 570 ft; April 1962: twenty-three males and seventeen females with associated pupal skins, no's 2056 to 2095, and thirteen larvae, no's L 84 to L 96.

Of this material, series of five males and five females, all with associated pupal skins and with associated larval skins as far as available, have been deposited in the Museum for Natural History, Leiden, Holland, and in the British Museum, London, U.K.

#### DESCRIPTION

##### LARVA (Fig. 1).

Head — Inner clypeals long, stout, simple, set close together; outer clypeals minute, bifurcate near base; posterior clypeals minute, bi- or trifurcate near base, set far back, slightly laterally to the outer clypeals. Frontals medium, plumose. Inner suturals small, bifurcate; outer suturals small, trifurcate. Antennae normal,

with spines on inner side; antennal shaft hair medium, about six-branched, placed medially at one-quarter from the base; terminal hair medium, plumose.

**T h o r a x** — Inner submedian prothoracic hair small, three-branched; middle submedian prothoracic hair medium, five- or six-branched; outer submedian prothoracic hair small, simple; fourth shoulder hair medium, three- or four-branched. Rudimentary fans present on the meso- and metathorax. Further as figured.

**A b d o m e n** — Tergal plates normal, except on segment VIII, which is covered by a large sclerotization; secondary tergal plates present on segments III to VII. Fans rudimentary on segment I, but more normally developed on segments II to VII, with fine, tapering, transparent leaflets.

**PUPA** (Figs. 2 and 3). The classification of pupal setae, as used below, is modified after the system of BAISAS (1936), as suggested by PENN (op. cit.).

**C e p h a l o t h o r a x** — Trumpets: as figured.

**P o s t o c u l a r**: 1 medium, five- to eight-forked near base; 2 medium, six- to seven-forked near middle; 3 medium, six- to seven-forked near base.

**A n t e r o t h o r a c i c**: 4 medium, three- to six-branched; 5 long, four- to six-branched; 6 medium, four-forked near middle; 7 long, five- to eight-forked near basal third.

**D o r s a l**: 8 medium, simple or finely two- or three branched near apex.

**S u p r a - a l a r**: 9 long, four-forked near middle.

**M e t a n o t u m**: 10 medium, simple or finely two- to six-branched; 11 small, three- to five-forked near middle; 12 long, five to seven-forked near basal third.

**A b d o m e n** — Segment I: H small, two- to four-forked near basal third; K medium, five- to six-forked near basal third; L small, three- to five-forked near basal third; M small, four- to six branched; S medium, four- or five-branched; T long, five-branched; U small, three- or four-forked near middle.

Segment II: A very small; B medium, with five to ten fine branches; C medium, with many branches and secondary branches; C' small, four- to seven-branched; 1 medium, four-branched; 2 medium, four- or five-branched; 3 small, four- to eight-branched; 4 small, four- to seven-branched; 5 minute, simple on this and all following segments.

Segment III: A small, somewhat longer than A-II; B medium, nine- to fifteen-branched; C long, eighteen- to twenty-eight branched; C' medium, stout, with eight to fifteen side branches; 1 medium, three to five-branched; 2 small, three- to five-branched; 3 represented only by its socket on this and segments IV and V; 4 small, five- to seven-forked near base.

Segment IV: A medium, slightly curved and tapered to a fine point; B medium, ten- to twelve-branched; C medium, nine or ten-branched; C' small, seven- or eight-branched; 1 medium, three- or four-branched; 2 small, two- to six-branched; 4 small, seven- to ten-branched.

Segment V: A as A-IV; B medium, seven- to thirteen-branched; C medium, six- to thirteen-branched; C' medium, three- to six-forked near middle; 1 medium, three- or four-forked near middle; 2 small, three- or four-branched; 4 medium, five- to seven-branched.

Segment VI: A as A-V, but somewhat longer; B medium, ten- or eleven-

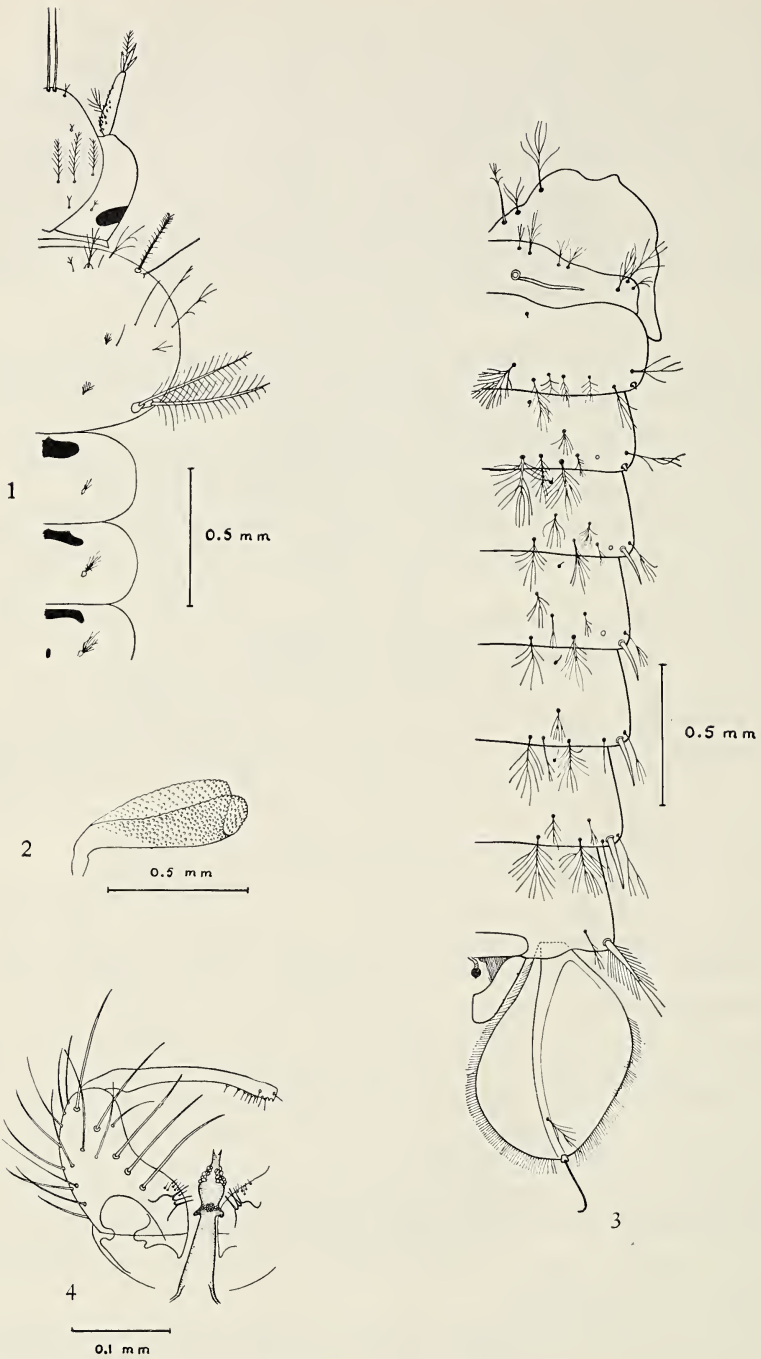


Fig. 1. *Bironella confusa*, details of larva. Fig. 2. *Bironella confusa*, pupal trumpet. Fig. 3. *Bironella confusa*, abdominal chaetotaxy of pupa. Fig. 4. *Bironella confusa*, male terminalia.

branched; C long, six- to eight-branched; C' medium, with three or five fine branches; 1 long, three- or four-forked near middle; 2 medium, simple or up to three-forked near apex; 4 small, four- to seven-branched.

Segment VII: A as A-VI; B long, ten- to fifteen-branched; C long, eight- to fourteen-branched; C' small, four- to six-branched; 1 long, forked or three- or four-branched; 2 medium, simple or forked or three-branched; 4 small, four- or five-branched.

Segment VIII: A slightly longer than A-VII, with fifteen to twenty-one side branches; A' medium, with two to six fine, short side branches.

Paddle: Midrib strong, reaching apex; almost the entire lateral and the whole of medial margin fringed with fine hairs; terminal seta long, simple, hooked or bent; accessory seta medium, four- to six-branched.

#### MALE (Fig. 4).

**Head** — Dark brown, sparsely covered with brown hairs and dark bristles; frontal tuft much reduced. First eleven antennal segments brown, with densely set, dark verticillate hairs; last two segments elongate without verticillate hairs; total length of antenna two-third that of proboscis. Palpi nearly as long as the proboscis, brownish; clubs not very pronounced. Proboscis brownish above, lighter below; at tip dark-brown all round, just behind the labella; labella yellowish.

**Thorax** — Dark-brown, sparsely covered with dark bristles and pale hairs; no ornamental characters. Fore- and midfemora with a yellowish caudal stripe, basal two-thirds of hind femora silvery white all round; light markings are also present at apex of hindtibiae, basally and apically on hindtarsi I to IV and basally on hindtarsi V; remaining parts of legs dark-brown. Wings without ornamental characters; veins with transparent light-brown scales; first fork cell open at base, middle cross-vein proximal to both other cross-veins. Halteres with blackish knobs.

**Abdomen** — Dark-brown, covered with rather long shiny hairs; no ornamental characters.

**Terminalia:** As figured. Coxite covered with strong bristles and stiff hairs; near the base, a broad elevation is present medially, carrying four or five bristles; a normal basal arm is absent. Clasper with about eight to ten tooth-like bristles near apex. Phallosome prominent, darkly pigmented; basal two-thirds conical, ending in a flattened, broad part covered with tiny wart-like processes; apical third bottle-shaped with wart-like processes around the "neck"; no typical appendages present.

#### FEMALE

**Head** — Verticillate hairs of antennae short and not so dense; antennae about as long as the proboscis. Palpi with a tuft of fine, pale hairs at apex, no clubs.

In other characters, except for those of the terminalia, the female resembles the male.

#### DISCUSSION

Considering the various assumptions expressed in the literature concerning the identity of the several life stages of *B. (Bir.) confusa*, in the light of the present results, we may be able to clarify the hitherto existing uncertainties.

In her original description, BONNE-WEPSTER (op. cit.) although overlooking the proboscis which is present in the type specimen (STONE, pers. comm.), was correct in assuming that *B. (Bir.) confusa* would, apart from characters of the male terminalia, also differ from *B. (Bir.) papuae* in the ornamentation of the proboscis, which is described as being dark-brown in the latter species. The male from Milne Bay and the larva from the same locality are indeed identical with *B. (Bir.) confusa*, as has been suggested by LEE & WOODHILL (op. cit.) who referred to the species as *B. (Bir.) soesiloi* sensu SWELL. & ROD. PENN's (op. cit.) description of pupal skins from Milne Bay — also as *B. (Bir.) soesiloi* sensu SWELL. & ROD. — certainly applies to *B. (Bir.) confusa* as well. Minor differences may be noted between the Milne Bay pupae and the pupae from Kota Baru. These differences concern several setae which, on the average, are more heavily branched in the Kota Baru specimens. Little however is as yet known of the importance of such differences in the identification of *Bironella* pupae; while those observed here may not only be due to geographical differentiation but, more probably, to the greater numbers of pupae that have been examined from the Kota Baru localities.

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