

APISTOMYIA COLLINI BEZZI (DIPTERA, BLEPHAROCERIDAE) IN NORTH QUEENSLAND.

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(Received 24th April, 1950; read before the Royal Society of Queens-
land, 31st July, 1950; issued separately, 5th November, 1951.)

(WITH PLATE I.)

Apistomyia collini Bezzi, 1913, was described from a single female collected by the late F. P. Dodd at Kuranda, North Queensland, in September, 1910. So far as we know, it has not been recorded since, although Mr. D. O. Atherton has informed us that he has seen Blepharoceridae in North Queensland streams. The following notes are based on four adults and a considerable series of larvae and pupae, which we collected near Babinda and Cairns in the same general area as the type locality. The stages were associated by the method of dissection described by Tonnoir (1923).

We are indebted to Mr. T. G. Campbell, Division of Economic Entomology, C.S.I.R.O., Canberra, for the loan of specimens of *A. tonnoiri* Tillyard, 1922, for comparison. Specimens of *A. collini* have been lodged in the British Museum (Natural History), the Division of Economic Entomology, C.S.I.R.O., Canberra, and the Institute's collection.

FEMALE.

Mr. Paul Freeman of the British Museum (Natural History) kindly compared one of our specimens with the type in Mr. Collin's collection, and reported that "they are indeed the same" This sex is to be differentiated most readily from *A. tonnoiri* by the inconspicuous grey dorso-central stripes and barely detectable oblique transverse suture on the scutum, and by the white transverse bands on the abdomen being complete and not interrupted in the mid line. Bezzi's description and Tonnoir's (1930) key are adequate, but the former is not widely available, so a re-description is given.

Length: Body 5 mm.; wing 5.5 mm.; hind leg 13.5 mm.

Head globular. Eyes dark brown, covered with very short, fine, dense hairs; upper zone of enlarged facets about one-third the depth of the lower zone. Frons about three-fifths of head width, greyish black, covered with silvery tomentum, so that the head shows irregular silvery reflections which vary with the incidence of the light. Ocellar triangle raised, prominent, velvety black. Antennae a little longer than the height of the head, ten-segmented, form as in fig. 1; basal segment yellowish to dark brown, silvery at tip, second black, with silvery apical line, remainder black. Face and basal part of the elongate proboscis similarly marked to frons, remainder slender, dark brown; labella black, long and outwardly coiled; palpi very short, one-segmented, black.

Thorax. Scutum covered with velvety, jet black to greyish black tomentum; with narrow grey median and dorso-central lines; and with the following silvery-white markings: a band across the anterior margin, conspicuous patches extending obliquely across the anterior half of the scutum but barely invading the median area between the dorsocentral lines, joining a silvery-white line just above the lateral margin, and a silvery triangle in front of the scutellum, which is black basally, silvery apically (fig. 2); the transverse suture is inconspicuous. Pleurae almost entirely covered with silvery tomentum, but with the sub-alar area brown and dark brown to blackish patches surrounding the anterior and posterior spiracles.

Wings only faintly infusate (not as darkened as would be inferred from Bezzi's description), but darker between C and Sc; veins dark brown to black; the base of Rs is not detectable, An does not reach the wing margin, and the anal angle is strongly developed, though not as produced as in the ♀ of *A. mackerrasi* Tonnoir, 1930. Halteres with long yellowish brown stem and large black knob.

Legs with coxae and trochanters yellow; femora brownish yellow basally, darkening to blackish distally; remaining segments black. Hind tibia with a pair of strong apical spurs. Claws long and slender, finely serrate on basal two-thirds of inner side.

Abdomen. First segment almost entirely covered with silvery tomentum, but with a narrow black apical transverse patch; second to fifth covered with velvety black tomentum, and with narrow, complete, basal, transverse, silvery white bands, which widen considerably at the sides; sixth and seventh greyish black, rather shiny, and with relatively broader silvery bands than on preceding segments; eighth greyish black; terminal appendages greyish black, obtuse. Venter yellowish brown.

MALE.

Description based on spirit specimens dissected from pupae and compared with similarly dissected females.

Head large, globular; eyes holoptic, with upper zone of enlarged facets larger than lower zone; otherwise similar to ♀, except that mandibles are lacking. *Thorax* with basic pattern of pigment similar to ♀ and differing from dried specimens, as shown in figs. 2, 4, 5. The silvery tomentum cannot be distinguished in the spirit material of either sex. *Wings* and *legs* crumpled; vein An does not reach the margin of the wing, and the anal angle appears to be shaped as in the ♀; spurs are present on the hind tibiae, and the claws bear similar serrations to the ♀. *Abdomen* with the tergal plates produced anteriorly to underlie the posterior edge of the preceding segment (fig. 5); whether this indicates that the silvery bands are interrupted in this sex could not be determined. *Hypopygium* similar to that figured by Tonnoir (1930) for *A. mackerrasi*, and differing from *A. tonnoiri* mainly in the relatively shorter, broader ninth tergite and fused coxites and the proportions of the parts as seen in lateral view (figs. 6, 7).

The ♂ of *A. collini* may be separated from *A. mackerrasi* by the incomplete vein An; it is probably best to distinguish it from *A. tonnoiri* by the hypopygial characters until fully developed specimens have been discovered.

PUPA.

Length 4 to 4.5 mm.; breadth 1.7 to 2 mm.; general form as in fig. 8. Dorsum dark brown, coarsely tuberculate all over, except on head capsule and bases of wing sheaths; indistinct sublateral foveae present on tergites 3 to 7 and traces on 1 and 2. Outer respiratory lamellae vertical, broadly triangular, the anterior taller and with rounded apex, the posterior shorter, truncate. The lateral internal lamella is broadly triangular, with a rounded or pointed shoulder but no projecting basal lobe; the medial is acutely triangular (fig. 9). There is some variation in shape of the lamellae, and the tips appear to have broken off in some specimens, but all the pupae appear to belong to one species.

The pupa is to be distinguished from that of *A. tonnoiri* by the vertical rather than forwardly directed anterior outer respiratory lamellae, and by the shape of the internal lamellae (cf. our fig. 9 and fig. 6C of Tonnoir, 1923).

LARVA.

Length in last instar 5 to 6 mm. Dorsum dark brown, with brownish black markings. Antennae black, the distal segment as long as the basal. Cephalic division finely rugose, with a sublateral pit on each side in its posterior fifth, a conspicuous black pattern anteriorly (fig. 11), a row of scale-like spines between the pits, a short black ridge posterior to these, and a longer black ridge leading to a postero-lateral row of black spines on each side. Cephalic hairs numerous, projecting beyond the anterior and antero-lateral margins of the division. The median divisions have conspicuous black transverse ridges anteriorly and posteriorly, leading to antero- and postero-lateral rows of strong black spines. The anterior edge of each division is marked by a row of broad, brown, scale-like spines, and there are similar but larger spines between these and the anterior black ridge. The posterior section of these divisions is unarmed. The anal division has one transverse black ridge leading to a row of black spines anterior to the lateral appendage; a constriction behind the appendage, with a reduced row of black spines anterior and posterior to it; and a reduced second appendage, which is dark in colour and bears only two to four long, strong hairs. There are a few fine submarginal hairs posteriorly on this division.

The lateral appendages (except the last) are long and conspicuous, and bear long, dense hairs on their dorsal surface and distal margin; the ventral surface and anterior and posterior margins are bare.

Ventral surface creamy brown; suckers normal; ventral gill-tufts long and slender, three directed forward and two backward; anal gills globular, the laterals being larger than the medials (fig. 10). Younger larvae have three gill-filaments (two forward, one backward) and the cephalic division is relatively larger, but are otherwise similar to the older ones.

These larvae differ from Tonnoir's (1923) figures and description of *A. tonnoiri* in the more conspicuous pattern of black pigment, the larger lateral appendages, bare on their ventral surfaces, and the longer, slenderer ventral gill-filaments. In some respects they are closer to his (1930) larva A from Java, but this species has four of the ventral gill-filaments directed anteriorly, one posteriorly.

HABITAT.

The early stages were found on rocks and dead timber, where thin sheets of water were running fast over steep surfaces at the edges of medium and fairly large cataracts. Some of the larvae in Freshwater Creek were attached to deeper ledges of rock, where the rush of water was very powerful and the larvae of *Cnephia strenua* M. & M. (Simuliidae) occurred in considerable numbers. Four adult females were captured flying in the spray at the edge of the falls; no males were seen. These habitats are typical for the genus, and it is curious that no specimens have been found so far in apparently equally suitable situations in southern Queensland.

DISTRIBUTION.

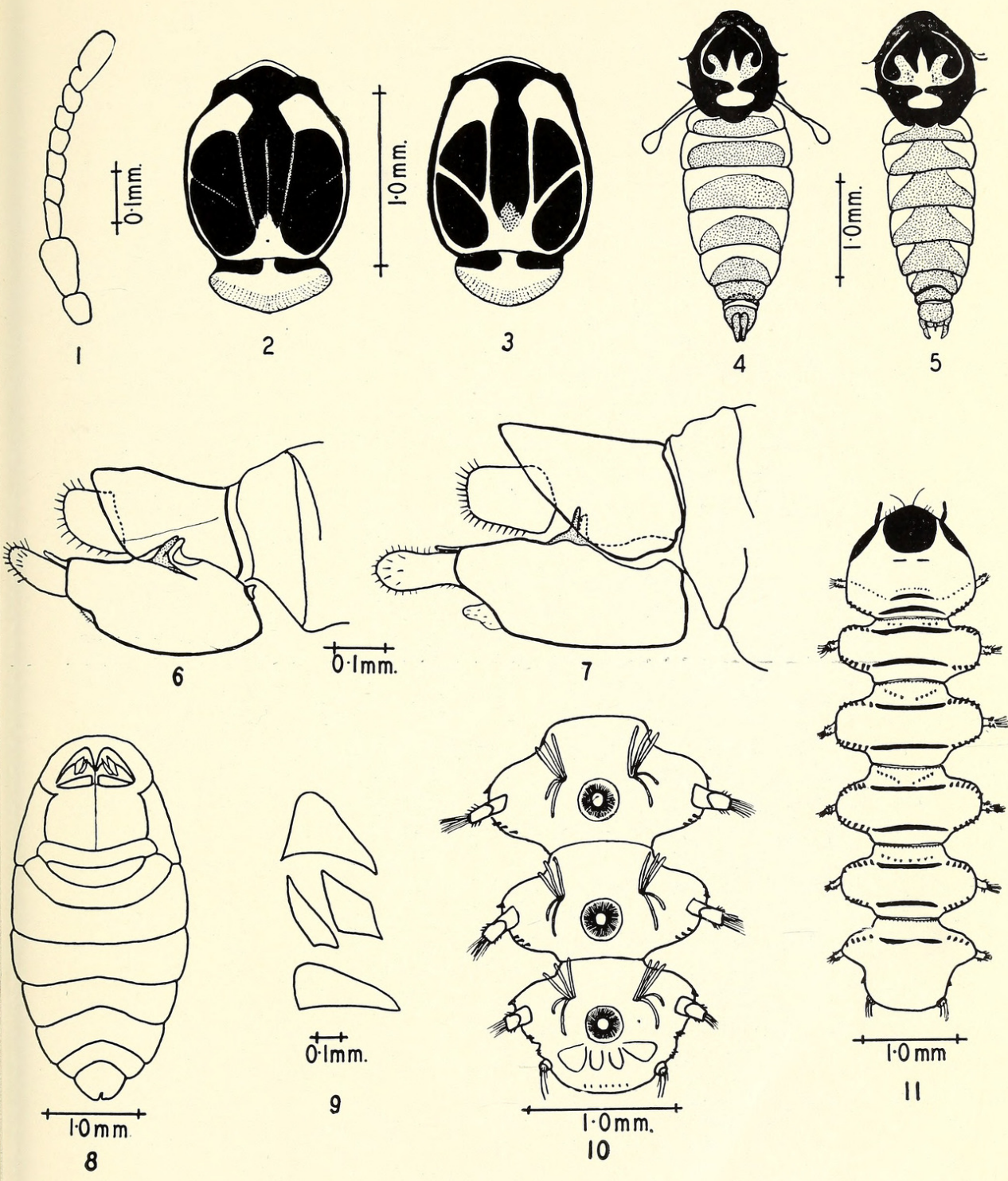
North Queensland: Kuranda, September, *F. P. Dodd* (TYPE ♀); The Cascades, Freshwater Creek, near Cairns, September-October; The Boulders, Babinda Creek, near Babinda, September.

The distribution of the genus is linear but curiously discontinuous, comprising Corsica and Cyprus, the Himalayas, Java, North Queensland (the present species), and New South Wales (*A. tonnoiri* Till. from the Blue Mts. and Mt. Kosciusko). Most of the species seem to be restricted to high country, over 2,000 ft.; but *A. collini* is an exception, in that Kuranda is only 1,080 feet above sea-level and the other localities are much lower.

Related genera have been found in New Zealand and southern New South Wales, and the dispersal of the group presents an interesting problem in zoogeography, on which we do not propose to speculate here.

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Apistomyia collini Bezzi. 1, antenna of ♀. 2, dorsal view of thorax of ♀. 3, same of *A. tonnoiri* for comparison. 4, dorsal view of ♀ dissected from pupa. 5, same of ♂. 6, hypopygium of ♂, lateral view. 7, same of *A. tonnoiri* for comparison. 8, Dorsal view of pupa. 9, respiratory lamellae of pupa (separated and mounted flat). 10, ventral view of posterior divisions of larva. 11, dorsal view of larva.



Mackerras, I M and Mackerras, M Josephine. 1951. "Apistomyia collini Bezzi (Diptera, Blephariceridae) in North Queensland." *The Proceedings of the Royal Society of Queensland* 62, 29–32. <https://doi.org/10.5962/p.272107>.

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