

PARASITIC BITING MIDGES OF DRAGONFLIES
FROM NEW CALEDONIA
(Diptera: Ceratopogonidae)*

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Recently I have had an opportunity to examine some ectoparasitic midges of dragonflies collected by Dr. M. Ogata, a member of the Expedition of New Caledonia held by the Osaka Museum of Natural History and found out following three species of *Forcipomyia* (*Pterobosca*) including a peculiar species thought to be new to science: *adhesipes*, *ariel* and *ogatai*. The female sex of the subgenus *Pterobosca* habitually sucks the blood of dragonfly piercing the vein at the basal part of the wing, excepting only one species which attacks lacewings, and the male sex is quite unknown.

At this time I intend to express my appreciation to Dr. S. Asahina of Tokyo, who has kindly trusted me for the investigation on these specimens. Thanks are also extended to Dr. M. Ogata of Osaka for the collection of the insects and to Mr. Y. Tsutsui, the Director of the Museum, for the publication of this paper.

Abbreviations used in this paper are as follows. AR (antennal ratio) is the relative length of the six distal segments taken together to that of the combined seven basal short segments. TR (tarsal ratio) is the relative length of the first tarsal segment to the second. PR (palpal ratio) is the relative length of the third palpal segment to the width of the segment. RL is the relative lengths of the segments (in the case of the leg, coxa and trochanter are excluded). Relative lengths of the leg segments and wing veins are measured by an ocular micrometer under magnification of 150 (1 unit is 0.013 mm). Those of the palpal and antennal segments, the male hypopygia and spermathecae are measured under magnification of 600 (1 unit is 0.003 mm).

Forcipomyia (*Pterobosca*) *adhesipes* Macfie

Macfie, J. W. S., 1932, Tijdschr. Ent., 75:270.

Tokunaga, M. and Murachi E, K., 1959, Ins. Micronesia (Bishop Mus.), 12: 235.

This is a dark or dark brown small species (size rather variable, wing varying from 0.8 mm by 0.3 mm to 1.3 mm by 0.5 mm). The halteres and abdominal tergites are far darker than in the Micronesian specimens. The sensory pore of third

* Contribution from the Osaka Museum of Natural History, no. 62

Scientific Results of the Melanesia Expedition, no. 6

Contribution from the Entomological Laboratory of Kyoto Prefectural University, no. 67

segment of palp is rather deeper than in other specimens from other localities. The main specific characters observed on the present specimens are as follows:

RL of palp 5.3:7.7:9.3:5.7:8.5. PR 1.21 (1.13-1.33). Mandible broad and round at tip, with 13-15 teeth. AR 2.53 (2.44-2.59). RL of distal eight antennal segments 4.5:4.8:11.3:12.3:11.8:13.2:13.3:23; basal flagellar segments discoidal and half as long as wide, ultimate segment 2.5 and segments III-VIII about 1.1-1.3 times as long as wide. Scutellum with 6 bristles and 10 or more small setae. Legs with claws highly reduced; hind tibial comb with 5-6 spines: empodium with 13-15 rays. Fore TR 3.37 (3.27-3.54), middle TR 3.28 (3.18-3.31), hind TR 3.48 (3.4-3.56). Wing with both radial cells stit-like or second very narrow, RL of wing veing R, M, stem of fMCu, R₁ and Rs about 16:14:30.7:10:19, second radial cell almost as long as first (8.3:8.7), costa ending slightly beyond middle of wing length (41.5:77.7) and above tip of Cu₁, fMCu under end of R₁. Abdominal sternite I, III and IV far smaller, variously shaped, being shield-shaped, obcordate-oval, or hexagonal (Figs. 1-2); spermatheca oval, about 2.3+17.3 units by 13.3 units.

This species is rather widely distributed on the south-west region of Pacific Ocean being known from New Guinea, Indonesia, Caroline Islands and Ryukyu Islands. New Caledonia is the first record for the distribution of this insect. Three females examined were found on *Orthetrum caledoniacum* Brauer which is new to record of the host (12 species of dragonflies have been known already as the hosts of this species).

Specimens: - 3 females, Koghi, New Caledonia, 11 Oct., 1958, Ogata and Shibata.

Forcipomyia (Pterobosca) ariel Macfie

Macfie, J. W. S., 1932, Tijdschr. Ent., 75:275

This is a dark brown small species known as a parasite of *Orthetrum sabina* Drury at Boeroe Island, Moluccas. I intend to supplement the original description, which was made on an incomplete specimen, with the observation on a new complete specimen from New Caledonia, but unfortunately the species name of the host of the present specimen is not known.

Body length about 1.95 mm. Wing 0.98 mm by 0.4 mm. Head with eyes bare and broadly contiguous. Palp rather slender, third segment with shallow sensory pore beyond middle; PR about 2.0; RL of segments 7:8:14.5:8:11. Mandible (Fig. 4) broad and round at tip, with 9 teeth. Antenna (Fig. 3) with segments III-VIII discoidal, only slightly longer than half of wide (4.5-5:7.5-8), following five segments equal (successively a little longer in original description) and fully twice as long as basal discoidal segment and about 1.4 times as long as wide, last segment almost twice as long as preceding one and fully 2.4 times as long as wide; RL of segments 11:8:

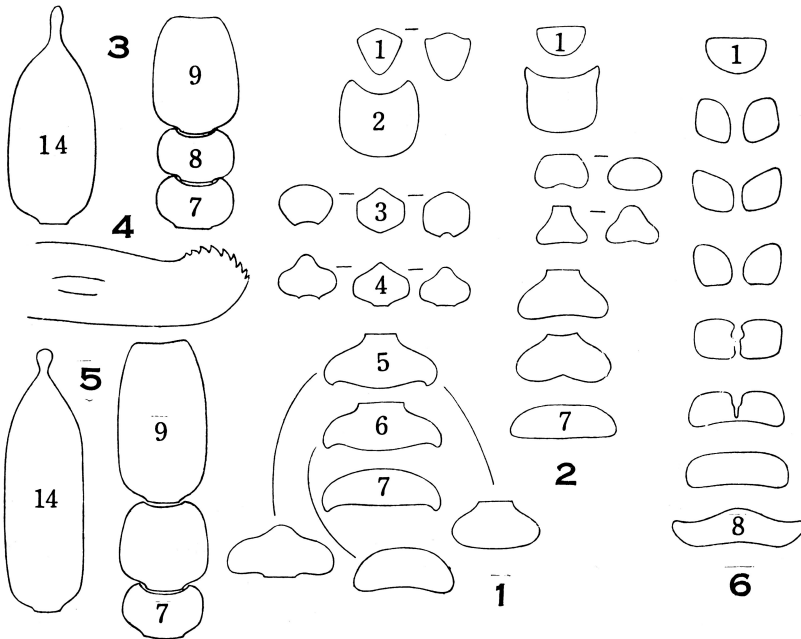
4.8:4.5...4.5:5:11...11:20; AR about 2.12 (2.2 in original description). Scutellum with 6 strong bristles and about 10 small setae. Legs with slender simple claws, empodium with 12 rays, hind tibial comb with 6 apical spines; fore TR 3.64, middle 3.27 and hind 3.58 (3.1 in original description); fore RL 92:93:51:14:11.5:10:15; Middle 104:102:54:16.5:14:11.5:16, hind 110:108:59:16.5:14:12:17; in all legs fourth tarsal segments subcordiform, obliquely truncate and dorsal lengths about half of fifth. Wing with veins brown, macrotrichia dense, but bare areas along veins wide, both radial cells slit-like, veins related second radial cell thickened; RL of R, M, stem of fMCu, R₁ and Rs 14:13:29:10:19, costa ending above tip of Cu₁ and extending slightly beyond middle of wing (41:75), fMCu under tip of R₁. Halteres dark brown. Abdominal sternites II-V rather deeply constricted; spermathecae two, subequal, oval, 18 units by 13 units and 21 units by 14.5 units respectively, without chitinized neck part

of duct.

The above description on New Caledonia specimen almost coincides with the original description on Mollucas specimen, except for slight differences of AR, TR, relative lengths of distal antennal segments and those of two apical tarsal segments.

Specimen :-

1 female, Poupou, New Caledonia, 4 Dec., 1958, Ogata.



F. (P.) adhesipes. Fig. 1: various shapes of abdominal sternites I-VII of New Caledonia specimens. Fig. 2: various shapes of abdominal sternites I-VII of Ryukyu specimen.

F. (P.) ariel. Fig. 3: antennal segments VII-IX and XIV. Fig. 4: mandible.

F. (P.) ogatai. Fig. 5: antennal segments VII-IX and XIV. Fig. 6: abdominal sternites I-VIII.

Forcipomyia (Pterobosca) ogatai n. sp.

This is a dark brown species with distal 6 antennal segments normally elongate and segment VIII is almost twice as long as preceding discoidal basal segment and 2/3 as long as following. Other structures are similar to those of *ariel* generally.

Host insect is not known.

Female:—Body length 1.76 mm. wing 1.04 mm by 0.45 mm. General color dark brown or brown, but abdominal membranes paler.

Eyes bare and widely contiguous. Palp somewhat slender, PR 2.15; third segment subfusiform and with sensory pore at middle; last segment not distinctly tapered but subcylindrical, RL of palpal segments 6:9:14:6.5:10. Mandible very closely similar to that of *ariel* and with 9 teeth. Antenna (Fig. 5) with basal short segments III–VII discoidal, a little longer than half of wide (5–5.5:8.5–9), VIII large and as long as wide (9:8.5); RL of segments 12:7:5...5:5.5:9:14.5:14.5:14.5:15:16:24; AR 3.82 (VIII–XIV:II–VII) and 2.82 (IX–XIV:II–VIII).

Thorax entirely dark brown, without scales. Scutellum with 6 strong bristles and 13 small setae. Legs without scales, generally dark brown, but tarsi pale; claws slender and simple; hind tibial comb with apical spines 5; empodium with 10 rays. TR about 3.5 in fore, 3.17 in middle and 3.2 in hind leg; RL of segments 100:103:56:16:14:12:16 in fore, 118:119:57:18:17:12:15 in middle and 122:121:64:20:18:14:16 in hind leg. Wing closely similar to that of *ariel*, both radial cells slit-like, costa ending above tip of Cu_1 and extending slightly beyond middle of wing length (44:80), RL of R, M, stem of fMCu, R_1 and R_s 15:14:32:11:21, fMCu under tip of R_1 . Halteres dark brown.

Abdomen with tergites and sternites brown, membranes pale brown, without scales; sternites II–VI completely or incompletely separated into paired hemisternites. (Fig. 6). Cerci brown; spermathecae 2, brown, equal short-oval, with very short chitinized neck part of duct, 0.5 +15 units by 13 units.

Locality:—New Caledonia.

Holotype:—Female, Ouare, Hienghène, New Caledonia, 19 Nov., 1958, Ogata.

This insect is closely allied to *ariel*, but from which it may be easily distinguished by the structure of the antenna. Another allied species may be *latipes* Macfie, but in this allied species the antennal segment VIII is quite flat and discoidal, AR is smaller, being 2.03 instead of 2.82, palpal segment III almost as long as V (10:9) instead of 14:10. *F. (P.) feminae* Tokunaga has elongated 7 distal segments of antenna, but segment VIII is more distinctly cylindrical and the spermatheca is single, obviously differing from the present new species.