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A REVIEW OF THE GENUS BACHOREMA Mosely, FAM. RHYACOPHILIDAE, TRICHOPTERA.

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Summary.

In this paper, descriptions are given for the first time of females of *Bachorema gisba* Mosely and *B. obliqua* Mosely, and the male genitalia of *B. gisba*. New localities are recorded for both species, and *B. obliqua* is new to Victoria. A key is given for separating the genus *Bachorema* from other genera within the subfamily *Hydrobiosinae*.

Introduction.

Two rhyacophilid pupae were collected during June, 1953, in a small creek about 3 miles south of Clunes, Victoria. From these, early in July, one male and one female emerged. The male was identified as *Bachorema gisba* Mos., but a closed discoidal cell was observed instead of an open one, as in the description given by Mosely. The female specimen was very similar in colouration, slightly larger, and was believed to be the same species. Early in September the locality was visited again, and a number of rhyacophilid pupae collected which were at the point of hatching. During the next two weeks, fifteen specimens of this species emerged and were available for study. Other collecting trips in central Victoria gave further rhyacophilid material, and *B. gisba* pupae were collected in the Moorabool River, Eastern Branch, near Ballan, and 4 miles west of Melton in Djerriwarrh Creek. Amongst the other Rhyacophilidae material were five specimens of *Bachorema obliqua* Mos. This species was described by Mosely from one male specimen from Queensland.

Arising from the above collecting, it is now possible to describe *B. gisba* and *B. obliqua* females, *B. gisba* male genitalia, and add some information to the generic characters, together with changes to the key to the subfamily *Hydrobiosinae*.

Genus BACHOREMA Mosely.

Male genitalia in both species somewhat similar. Inferior appendages two jointed, with long spines arising from the inner surface. Lateral filaments of the fifth segment present.

Short process to the seventh or sixth and seventh sternites. Wing neuration in the female differs from male.

Female anterior wings with closed discoidal cell, apical forks nos. 1, 2, 3, 4, and 5 present, and all stalked. The posterior wings are similar to those of males.

Bachorema obliqua Mos. (figs. 1, 5, and 8).
1953, Mosely and Kimmins. Trich of Austr. and N. Z., p.494.

This species is recorded from Queensland National Park and described from one male only. There are now two males and three females available from Victoria, and a description of the female is given in this paper.

The male specimens from Victoria correspond with the original description. It will be added that in the resting position it has a typical dark appearance with an ochraceous line on the back which is wider in the middle portion as shown in fig. 1. The anterior wings in set specimens show light colouring on the posterior margin. The male specimen from Greendale has the third apical fork in the anterior wings with a very short footstalk. The genitalia of both specimens do not show any differences from the original description.

Females generally larger than males with about the same colouring. Anterior wing neuration differs from male in absence of the pouch. Dicoidal cell closed, forks nos. 1, 2, 3, 4, and 5 present, fork no. 2 sessile. Posterior wing similar to that of male.

Genitalia. Abdomen terminates in a blunt apex. A pair of short curved processes arising from the margin of the dorsal plate. The KOH preparation shows a pair of small sacs produced inwards between eighth and ninth tergites. Dorsal part of ninth tergite with the upper part somewhat flattened. Sixth and seventh sternites with short processes, that of sixth slightly larger, raised from a ridge on the sternite and bearing few stout hairs.

Length of the anterior wing—male 7 mm., female 8-9 mm.

One male Greendale 28th October, 1953 (pupae) em. 20th November, 1953.

One male and two females Kinglake West-King Parrot Creek 18th October, 1953 (pupae) em. 21st October resp. 3rd November, 1953. One female Kinglake West-King Parrot Creek 18th October, 1953.

Allotype female Coll. A. Neboiss.

Bachorema gisba Mos. (figs. 2, 3, 4, 6, 7, and 9.)
1953, Mosely and Kimmins Trich. of Austr. and N. Z., p. 494.

Before finalising this paper, Mr D. E. Kimmins, British Museum (Nat. Hist.), London, was asked for further information regarding the closed discoidal cell in the type specimen of *Bachorema gisba.* Mr. Kimmins examined the type, and found that there is, in some lights, a suggestion of a closed discoidal cell, and also gave some advice regarding corrections to the subfamily key.

Careful examination of the available *B. gisba* male material showed that the crossvein closing the discoidal cell under some light conditions is more clearly visible than in others, and also the definition in some specimens is better than in others, but it was always present.

Male genitalia relatively shorter than that of *B. obliqua.* Dorsal plate narrow with two broad downturned hooks at the apex and a pair of warts at the base. Superior appendages very broad, as long as the dorsal plate. Inferior appendages long and stout with curved second joint and long spines arising from the inner surface. Short process arising from the seventh sternite. Discoidal cell in the anterior wing closed.

Female genitalia: The abdomen terminates in a blunt apex, more or less triangular from the side. A pair of small curved processes arise from the margin at the apex of the dorsal plate. Ventrally there is a sub-ellipsoidal plate. Seventh sternite with short process. Another longer one is raised from a ridge of sixth sternite and bears a few stout hairs. Wing neuration differs from the male in a normally formed discoidal area. Anterior wing with apical forks nos. 1, 2, 3, 4, and 5 present and all with footstalks. Discoidal cell closed. The posterior wing similar to that of the male with fork no. 1 wanting. Forks nos. 2, 3, and 5 with footstalks. (There is one aberrant female from Clunes with fork no. 1 absent in the anterior wing and one male with fork no. 3 absent in the anterior wing.)

Specimens from Clunes and Ballan bred from pupae collected during June-September, 1953 and from Melton, August, 1954 appear to be larger than those from Melton, December, 1953 and the type specimen from Gisborne, collected in February, 1917. In my opinion the early spring specimens are larger in size due to a supply of rich food in the water, but in the sparsely running water during summer, the food and oxygen supply for larvae are

apparently so poor that it was affecting the size of the adult insect. No structural differences in the wing neuration or genitalia were observed.

	Gisborne (Type)	Clunes and Ballan	Melton (Dec., 1953)	Melton (Aug., 1954)
Males	5 mm.	7- 9 mm.	6-7 mm.	9 mm
Females ..	—	9-10 mm.	7-8 mm.	—

Altogether 44 specimens were examined—from these 13 males and 22 females were pinned, and 4 males and 4 females placed in alcohol. One female—allotype Clunes, 7th September, 1953 (pupae) em. 15th September, 1953, 9 females—Clunes, 7th September, 1953 (pupae) em. 8th to 17th September, 1953 (one with fork no. 1 absent in the anterior wings). One female—Clunes, 11th June, 1953 (pupa em. 2nd July, 1953, 10 females—Melton, 31st December, 1953 (pupae) em. 3rd to 6th January, 1954, 1 female—Melton, 31st December, 1953 (ad.), 1 female—Avenel, 24th November, 1953, 1 male—Clunes, 11th June, 1953 (pupa) em. 5th July, 1953 (drawing of male genitalia prepared from this specimen), 5 males Clunes, 7th September, 1953 (pupae) em. 13th to 17th September, 1953, 7 males—Melton, 31st December, 1953 (pupae) em. 4th to 6th January, 1954, 4 males—Melton, 31st December, 1953 (pupae) em. 4th to 10th January, 1954 in alcohol (3 in Coll. W. Döhler), 4 females—Melton, 31st December, 1953 (pupae) em. 4th to 10th January, 1954 in alcohol (3 in Coll. W. Döhler).

Additional material. Three males—Melton, 18th August, 1954 (pupae) em. 18th to 20th August, 1954. (In National Museum of Victoria.)

Allotype in Coll. A. Neboiss.

In the genus *Bachorema* there are two major points separating both species and sexes within one species:—

1. Discoidal cell is open in *B. obliqua* male, but closed in *B. obliqua* female and *B. gisba* both sexes;
2. In the posterior wing apical forks nos. 1, 2, 3, and 5 present in *B. obliqua* (both sexes), but forks nos. 2, 3, and 5 present in *B. gisba* (both sexes).

These points enable the genus to be separated in to three couplets instead of one, and this key will be subject to further revision when more information is available for other species and sexes. The following is the modified key from Mosely and Kimmins (1953), p. 405, omitting couplets not necessary for the indentification of the genus *Bachorema* Mos.

1. Discoidal cell in anterior wing closed. 2
   Discoidal cell in anterior wing open. 10
2. Apical forks no. 1, 2, 3, and 5 present in posterior wing. .. 3
   Apical forks nos. 2, 3, and 5 present in posterior wing. 8
3. Fork no. 2 in anterior wing with footstalk. .. .. .. *Hydrobiosis* McL.
   Fork No. 2 in anterior wing sessile. 4
4. Median cell in anterior wing closed. 5
   Median cell in anterior wing open. 5
5. (As before—see Mosely and Kimmins, p. 405.)
6. Fork no. 1 in posterior wing sessile. .. .. *Anachorema* Mos. (except *Anachorema evansi* Mos.)
   Fork No. 1 in posterior wing with footstalk 7
   (except *Notiobiosis pallescens* Banks).
7. Fork no. 2 in posterior wing sessile .. .. 7a.
   Fork no. 2 in posterior wing with footstalk .. .. *Bachorema obliqua* Mos. females.

7a. In posterior wing of ♂ a narrow, cell-like structure, lined with fine hairs, situated between Cu2 and IA .. .. *Taschorema* Mos.
   No such structure in posterior wing of ♂ .. .. *Notiobiosis* Banks.
8. A secondary fusion of R4 with R5 in the anterior wing enclosing the facetic spot in a small cell .. .. *Synchorema* Till.
   No such secondary fusion of R4 and R5 9
9. Fork no. 1 in anterior wing sessile; neuration similar in both sexes *Hydrochorema* Till.
   Fork no. 1 in anterior wing with footstalk; neuration differing in the sexes 9a

9a. Males .. .. 9b.
   Females .. .. 9c.

9b. Anterior wing with an oblique pouch or fold on media and a fringe of long hairs on stalk of fork no. 1 .. .. *Bachorema gisba* Mos. males
   No oblique pouch or fold and no long hairs on stalk of fork no. 1 *Neurochorema* Till. males

9c. Fork no. 2 in anterior wing with footstalk .. .. *Bachorema gisba* Mos. females.
   Fork no. 2 in anterior wing sessile .. .. *Neurochorema* Till. females.

10. Forks nos. 1, 2, 3, and 5 in posterior wing 11
    Forks nos. 1, 2, 3, and 5 *not* all present in posterior wing .. 12
11. Fifth abdominal segment without lateral filaments (New Zealand) *Costachorema* McF.
    Fifth abdominal segment with lateral filaments (Australia) .. 11a.

11a. Forks nos. 1 and 2 in anterior wing with footstalk .. .. *Bachorema obliqua* Mos. males.
    Forks nos. 1 and 2 in anterior wing sessile .. .. *Austrochorema* Mos.

12. (Stays unchanged—see Mosely and Kimmins, p. 405.)
13. Second line: delete "15" and insert "*Allochorema*".
14. (Stays unchanged—see Mosely and Kimmins, p. 405.)
    Delete couplet 15. (M. and K. p. 406.)

ACKNOWLEDGMENTS.

Grateful acknowledgment is made to Mr. D. E. Kimmins, British Museum (Nat. Hist.), London, for the checking of discoidal cell of *Bachorema gisba* Mos. male type specimen and valuable suggestions to the revision of the subfamily key, and to Mr. A. N. Burns, National Museum of Victoria, who read the early drafts and helped in the preparation of this paper.

REFERENCES.

Mosely, M. E., and Kimmins, D. E., (1953). The Trichoptera (Caddis-Flies) of Australia and New Zealand. British Museum (Nat. Hist. London.

EXPLANATION OF PLATES.

PLATE I.—

Fig. 1. *Bachorema obliqua* Mos. (male).

Fig. 2. *Bachorema gisba* Mos. male genitalia lateral.

Fig. 3. *Bachorema gisba* Mos. male genitalia dorsal.

Fig. 4. *Bachorema gisba* Mos. male genitalia ventral.

PLATE II.—

Fig. 5. *Bachorema obliqua* Mos. female anterior and posterior wings.

Fig. 6. *Bachorema gisba* Mos. male anterior wing discoidal cell area showing cross vein.

Fig. 7. *Bachorema gisba* Mos. female anterior and posterior wings.

PLATE III.—

Fig. 8. *Bachorema obliqua* Mos. female genitalia lateral.

Fig. 9. *Bachorema gisba* Mos. female genitalia lateral.

PLATE I

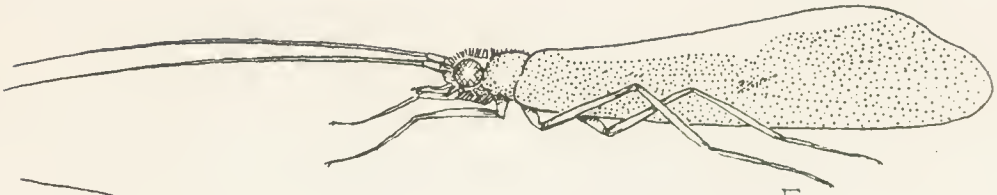

FIG. 1.

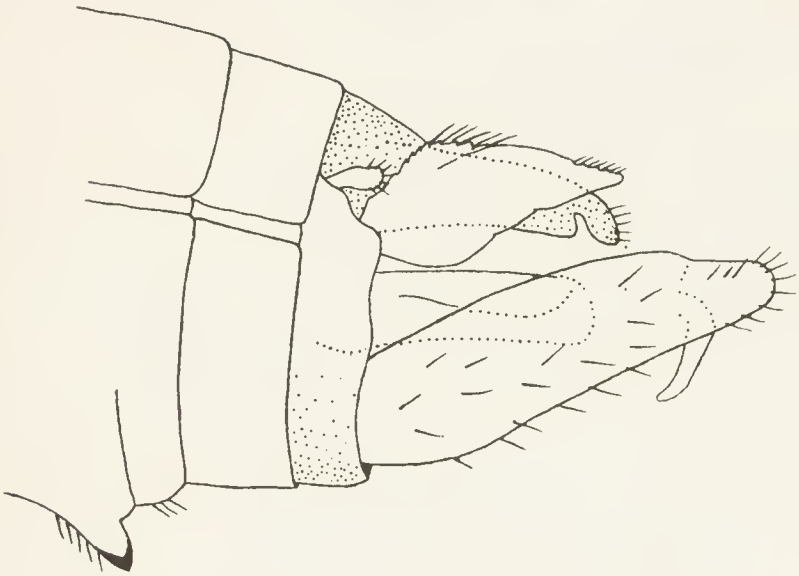

FIG. 2.

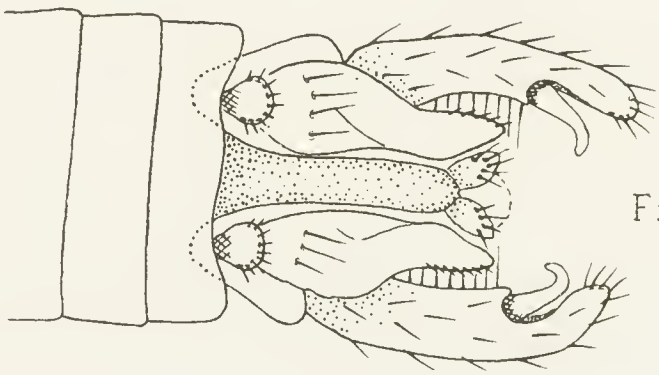

FIG. 3

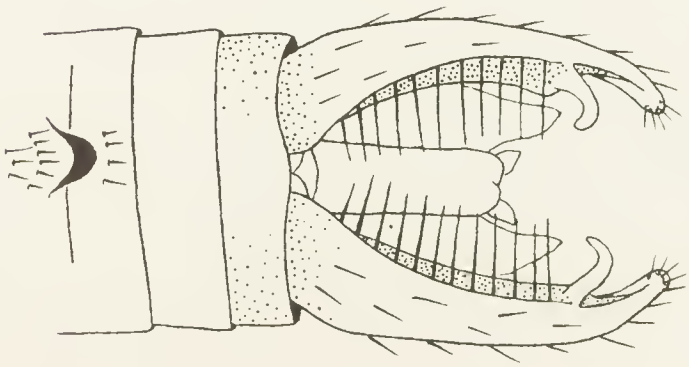

FIG. 4.

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PLATE II

Fig. 5.

Fig 6.

Fig 7

A. Neboiss

PLATE. III

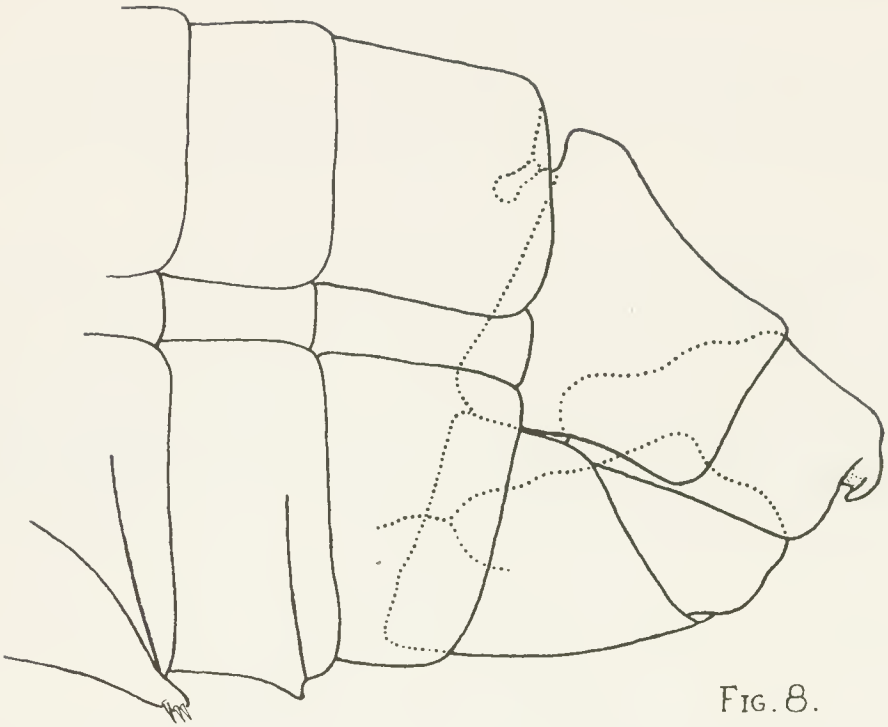

FIG. 8.

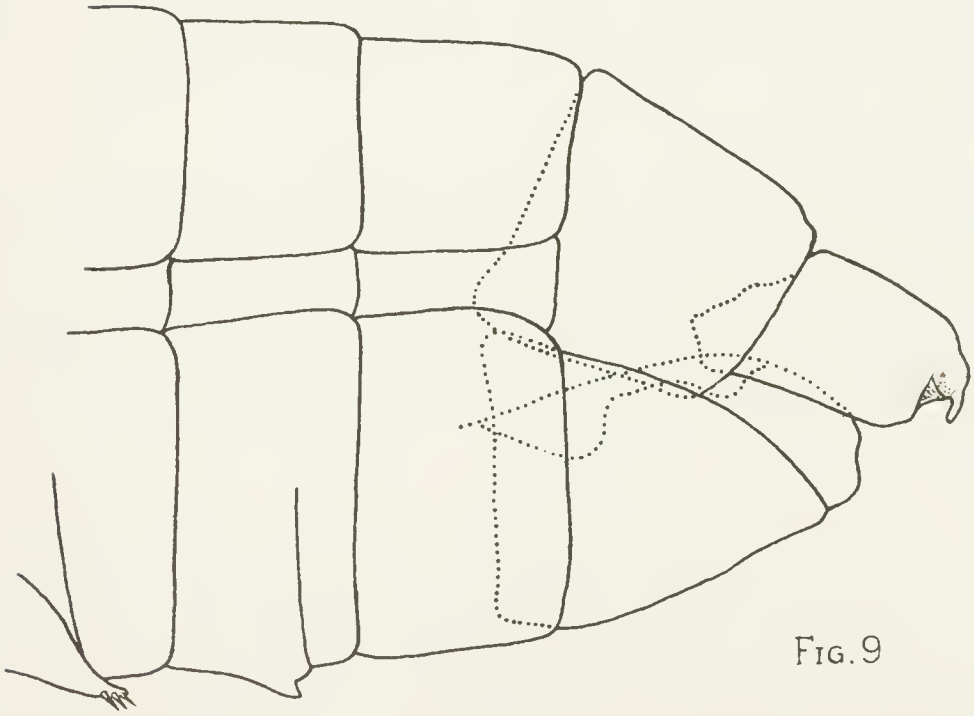

FIG. 9

A. NEBOISS