

DROSOPHILA PSEUDOMAYRI, A NEW SPECIES FROM NEW GUINEA (Diptera : Drosophilidae)

By Visut Baimai¹

Abstract: The new species *Drosophila pseudomayri* is described. It is a sibling species of *D. mayri* and belongs to the *D. montium* species subgroup.

The dense tropical rain forests in most parts of the territories of Papua-New Guinea provide favorable natural habitats for a substantial *Drosophila* fauna. Recent exploration these areas has indeed disclosed many interesting species of *Drosophila*, in particular those belonging to the *melanogaster* species-group of the subgenus *Sophophora*, which breed well in laboratory cultures and have been studied genetically to some extent, e. g. the *D. serrata* complex (Dobzhansky & Mather 1961; Ayala 1965; Baimai 1969). *D. mayri*, another Australasian member of the *melanogaster* species-group, is a species originally described by Mather & Dobzhansky (1962). From recent collection of living specimens obtained by members of the Genetics Laboratory, in several localities in the Papua-New Guinea areas, numbers of flies were found to be morphologically similar to but slightly smaller in size than *D. mayri*. Sexual isolation studies between the two forms which are sympatric in these populations revealed that they are, in fact, two fully reproductively isolated species. The purpose of this paper is to present a description of the new species which is named *Drosophila pseudomayri*.

Reproductive isolation. After the first attempts at crossing between the strains of these two species had failed, sexual isolation between them was studied using the no-choice method. Groups of 10 virgin ♀♀ of one species were confined with about 10 ♂♂ of the other species in a half-point culture bottle and kept at 25°C. At the 5th day, the flies were transferred without etherization to a fresh culture bottle. About a week later, the surviving females were dissected and their ventral receptacles were examined for the presence or absence of sperm. The results are summarized in Table 1.

Table 1. Sexual isolation between *D. mayri* and *D. pseudomayri*.

♀♀	♂♂	♀♀ tested	♀♀ inseminated	% inseminated
<i>D. pseudomayri</i>	<i>D. pseudomayri</i>	56	55	98
<i>D. mayri</i>	<i>D. mayri</i>	64	64	100
<i>D. pseudomayri</i>	<i>D. mayri</i>	153	0	0
<i>D. mayri</i>	<i>D. pseudomayri</i>	153	0	0

It can be seen that these two forms are completely reproductively isolated from each other since no inseminations were observed in the attempted interpopulation crosses.

1. Genetics Laboratory, Department of Zoology, Queensland University, Brisbane, Australia.
Present address : Dept. Biology, Faculty of Science, Mahidol University, Rama VI Road, Bangkok, Thailand.

***Drosophila pseudomayri* Baimai, new species**

Type culture source. Bulolo, New Guinea, 1967.

Body length. ♂, 1.71–1.89 mm (mean 1.81 mm); ♀ 2.03–2.23 mm (mean 2.15 mm) (30 specimens measured).

Head (♂ and ♀). Arista with 9 branches (counting the terminal fork as 2). Antennae and front brownish yellow. Face, cheeks, and proboscis yellow, bristles black. Middle orbital bristle about 1/3 length of each of the other two. Carina rounded. Greatest width of cheek about 1/7 greatest diameter of eye. Eyes bright red.

Thorax (♂ and ♀). Thorax brown, legs lighter, bristles black. Pleurae brownish yellow. Acrostical hairs in 6 rows. Prescutellars absent. All scutellars convergent. Sterno index about 0.8. Sex-combs on the first 2 joints of the front tarsi in ♂♂. The sex-comb consists of 2 sections: proximal and distal with about 18 and 14 teeth respectively.

Wings (♂ and ♀). Transparent. Costal index 1.87–2.0 (mean 1.94); 4th-vein index

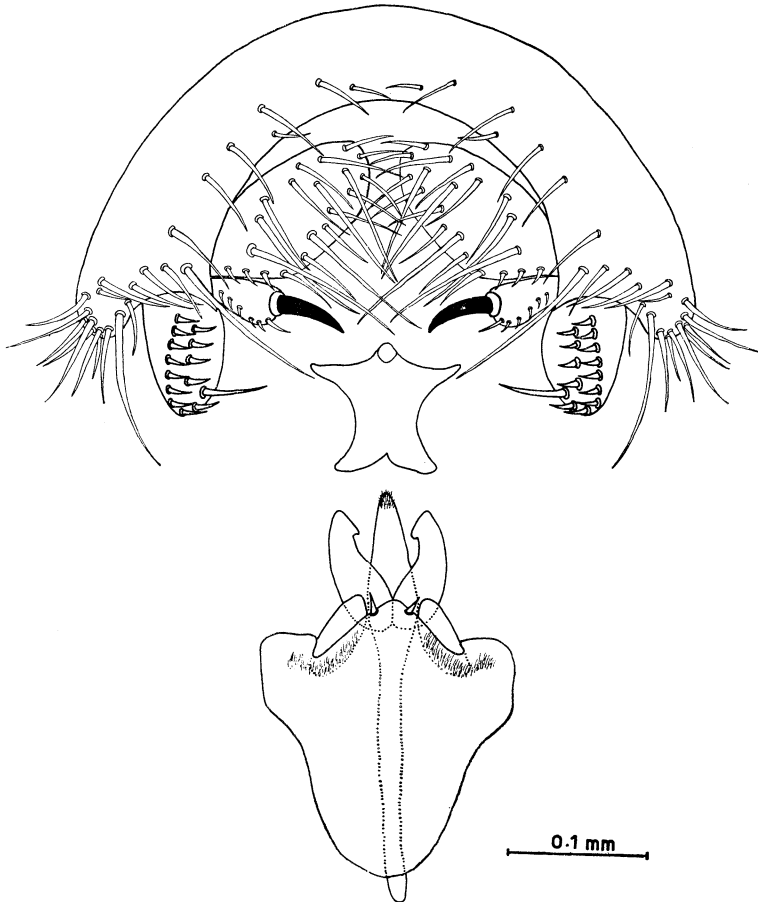


Fig. 1. External genitalia of ♂ of *Drosophila pseudomayri*, new species.

2.55–2.63 (mean 2.6); 5x index 2.50–2.57 (mean 2.51); 4c index 1.5–1.58 (mean 1.53) (30 specimens measured). Third costal section with heavy bristles on basal 1/2. Wing length ♂, 1.48–1.71 mm (mean 1.63 mm); ♀, 1.65–1.89 mm (mean 1.80 mm).

Abdomen (♀). Segment 1 yellow. Tergites 2 to 5 with dark brown to black bands on posterior margins, wider in middle and fading out laterally. Tergites 6 and 7 usually yellowish. Posterior margins of tergites 3 to 5 usually with 3 strongly black hairs on either side, other hairs on these segments not particularly prominent. ♂. Segment 1 yellow. Tergites 2 to 4 with dark brown to black bands on posterior margins similar to those in ♀. Tergites 5 and 6 diffusely brown on posterior margins. Tergite 7 normally light. Tergites 3 to 5 with marginal hairs less strongly enlarged than in ♀.

External genitalia (♂). As shown in fig. 1. ♀. Ovipositor plate with about 12 bristles. **Internal genitalia** (♂). Testes yellow, spiral with 5 coils. Accessory glands large. ♀. Ventral receptacle with about 6 coils, contains sperm in inseminated ♀♀. Spermathecae spheroidal, unchitinized, containing no sperm in inseminated ♀♀.

Egg filaments. Two, expanded in apical 1/5.

Pupae. Anterior spiracles divergent, each with about 12 branches. Posterior spiracles divergent. Ratio pupal stalk length/pupal body length 1/10.

Chromosomes. Larval ganglion metaphase chromosome complement consists of 2 pairs of V's, 1 pair of dots and 1 pair of sex chromosomes. In the ♂, the X is a more or less metacentric chromosome with heterochromatin in one arm and euchromatin in the other, while the J-shaped Y chromosome is composed entirely of heterochromatin. The karyotype is thus like that in *D. birchii* and several closely related species. The salivary gland chromosomes consist of 5 long arms and 1 short arm.

Relationship. *D. pseudomayri* is closely related to *D. mayri* Mather & Dobzhansky. The two species are morphologically very similar except for minor differences in the structure of the genitalia; there are 4 prominent marginal bristles on the primary clasper in *D. mayri* compared with 1 in *D. pseudomayri*. The latter species also possesses a more polished body surface.

DISTRIBUTION. This species comprises a minor fraction of the samples collected at Bulolo and Popondetta in the Territory of Papua and New Guinea. Type in Australian Museum, Sydney.

Acknowledgment: This work was carried out as part of the Research Project "Evolution in the Genus *Drosophila*" directed by Dr Wharton B. Mather, Head of the Genetics Laboratory, Zoology Department, University of Queensland.

REFERENCES

- Ayala, F. J. 1965. *Drosophila dominicana*, a new sibling species of the *serrata* group. *Pacif. Ins.* 7 (3): 620–22.
- Baimai, V. 1969. Cytogenetic studies in *Drosophila birchii*. Ph. D. Thesis, University of Queensland.
- Dobzhansky, Th. & W. B. Mather. 1961. The evolutionary status of *Drosophila serrata*. *Evolution* 15: 461–67.
- Mather, W. B., & Th. Dobzhansky. 1962. Two new species of *Drosophila* from New Guinea (Diptera: Drosophilidae). *Pacif. Ins.* 4 (1): 245–49.