

*D. tetrachaeta*: A New Species of  
*Drosophila* from New Guinea

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## **D. TETRACHAETA: A NEW SPECIES OF DROSOPHILA FROM NEW GUINEA**

### **Introduction**

Recent collections of *Drosophila* from tropical rain forests in New Guinea have yielded several new species (Mather, 1959; Mather, 1961; Mather & Dobzhansky, 1962). A new species from the same region, of potential genetic interest because of its ease of culture and excellent salivary chromosomes, is described.

### **Type Material**

Holotype and Allotype : deposited as pinned material at the Australian Museum, Sydney. Paratype Material : British Museum; U.S. National Museum; Division of Entomology, C.S.I.R.O., Canberra, A.C.T.; Queensland Museum; the School of Public Health and Tropical Medicine, University of Sydney.

### **Techniques**

The techniques used were similar to those described by Mather (1955); the salivary gland figure was made from larvae raised at 65°F on yeast-enriched media, dissected and squashed in aceto lactic orcein as described by Strickberger (1962), and slides made permanent by sealing with nail polish. The metaphase plate figures were produced by the method described by Lewis & Riles (1960). This yields many good

figures which show excellent separation of sister chromatids, so that rod chromosomes appear V-shaped while metacentric chromosomes appear X-shaped. The split in the dot chromosomes was rarely evident. The photographs were taken on 35 mm Kodak microfilm with a green filter.

*Quadribinota* (deMeijere, 1911) ✓

***Drosophila tetrachaeta* sp. nov.**

Figs. 1, 2, 3

*General.* Yellowish brown, 4 pairs dorso-central bristles, first femur with row of spines. Longitudinal broad black stripes on head, mesonotum, mesopleurum, and scutellum.

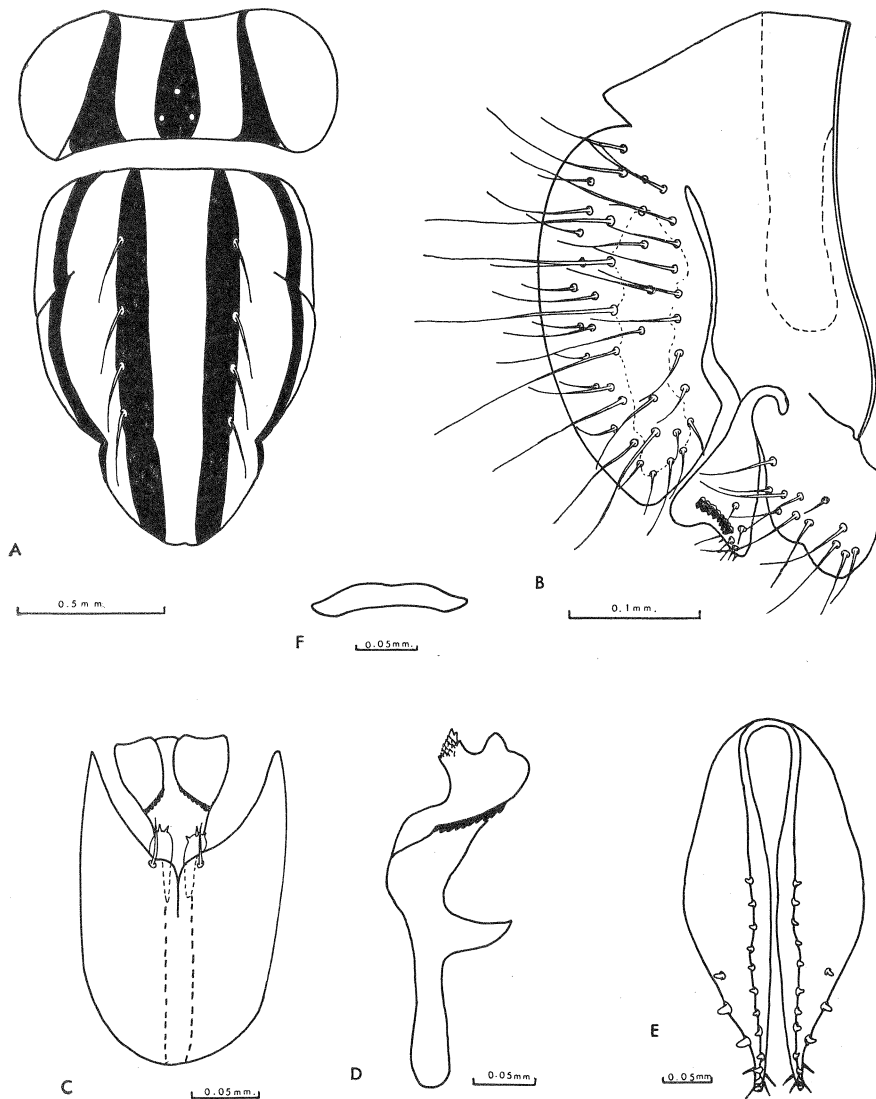


FIG. 1.—A, head and thorax; B, peripheral organs lateral view, C, phallic organs; D, aedeagus lateral view; E, egg guides; F, decasternum.

*Cultures*—*Type source*. Bulolo New Guinea, 20.viii. 1963. Can be maintained in culture very easily.

*Body length*. ♂ 2.9 mm, ♀ 3.7 mm.

*Head* ♂ and ♀. Arista with 12 branches. Antennae reddish brown. Front broad with 3 broad longitudinal black stripes (Fig. 1A). Ocelli light brown. Orbital bristles in the ratio of about 10:2:5. Second and third oral bristles equal to first. Greatest width of cheek 0.3 greatest diameter of eye. Eye color Mandarin R (2F12) (Maerz & Paul, 1950). Carina broad and flat.

*Thorax* ♂ and ♀. Yellowish brown with 6 broad longitudinal black stripes, 4 on mesonotum and 1 on each mesopleurum. Acrostichal hairs reduced in number, irregular except for 1 median row of about 12 hairs which are twice normal length. Two greatly enlarged bristles in each dorsocentral row in front of the anterior dorsocentral, constituting a third and fourth pair to the series. Scutellum yellowish brown with 4 broad longitudinal black stripes (Fig. 1A). Anterior scutellar bristles convergent. Sterno index 0.5. Apical bristles on first and second tibia, preapicals absent from all 3. No sex combs. Row of about 8 spines on the postero-medial border of first femur.

*Wings* ♂ and ♀. Transparent. Costal index 2.2, fourth vein index 1.3, 5X index 1.0, 4C index 0.9. Third costal section bristled on basal 2/3. Length ♂ 2.8 mm, ♀ 3.3 mm.

*Peripheral organs* (Fig. 1B, F). Genital arch anterior margin hirsute, no heel, under margin directed ventrad, 12 bristles on toe, posterior margin fused with anal plate. Anal plate yellow, oval with about 43 bristles evenly distributed, irregular central portion hirsute, rear angle poorly developed. Claspers with a straight row of about 7-9 teeth and 13 marginal bristles. Decasternum fusiform (Fig. 1F).

*Phallic organs* (Fig. 1C, D). Aedeagus yellow, straight. Apically expanded, bilobed, finely serrate, with about 10 heavily sclerotized comblike black serrations on the postero-lateral margin (Fig. 1D). Anterior paramere articulated with aedeagus, with 3 minute apical sensilla. Ventral fragma quadrate, rounded ventrally, fused with novasternum (Fig. 1C). Phallic formula (after Okada, 1956) a b C d E F G H I k l M N. Phallosomal index 1.0.

*Egg guides*. Yellow, pointed with about 12 marginal and 4 discal teeth and 4 subterminal hairs. Basal isthmus about 1/8 length of lobe (Fig. 1E).

*Internal structures* ♂ and ♀. Intestinal coiling index 3. Rectal index 3.0. Malpighian tubules, 2 anterior, free, common trunk 0.3 total length; 2 posterior fused, common trunk 0.4 total length; anterior and posterior of equal length.

*Internal genitalia* ♂. Testis with 1 creamy coil, vas deferens straight. Sperm pump with a pair of caeca 1.5 times as long as bulb.

*Internal genitalia* ♀. Ventral receptacle 4 folds. Spermathecae hemispheroidal, lightly sclerotized.

*Egg filaments*. 4 (2 long, tapering and 2 short; ratio 5:2).

*Pupae*. Anterior spiracles with 22 branches. Posterior spiracles divergent, 0.1 body length. Pupal stalk length/pupal body length ratio about 0.2.

*Chromosomes*. Larval brain figures show 5 pairs of rods and 1 pair of large dots (Fig. 2A). The characteristic arrangement of the sister chromatids produced by the technique is shown in Figure 2B. The salivary gland figures show 5 long arms and a short arm embedded in heterochromatin (Fig. 3).

*Relationships*. During the description of this fly some doubt has arisen as to whether it should be placed in the genus *Scaptomyza* or *Drosophila*. These two genera differ in a number of respects.

2 or 4 rows in  
quadrate

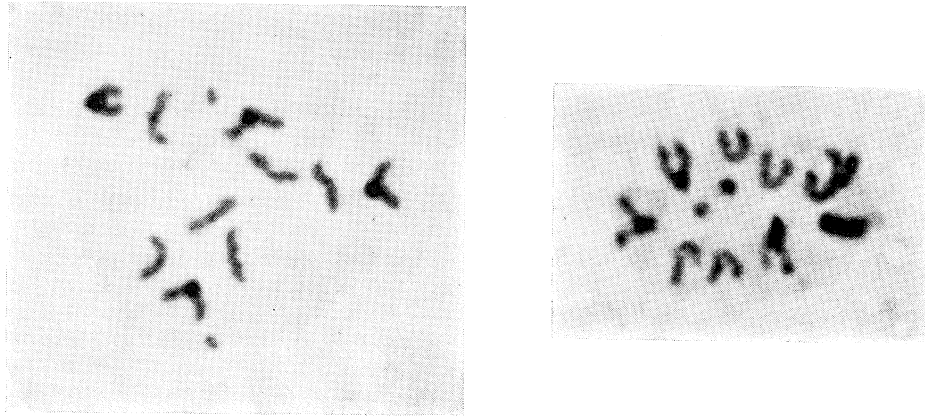


FIG. 2.—A, B, larval brain, metaphase plate chromosomes.

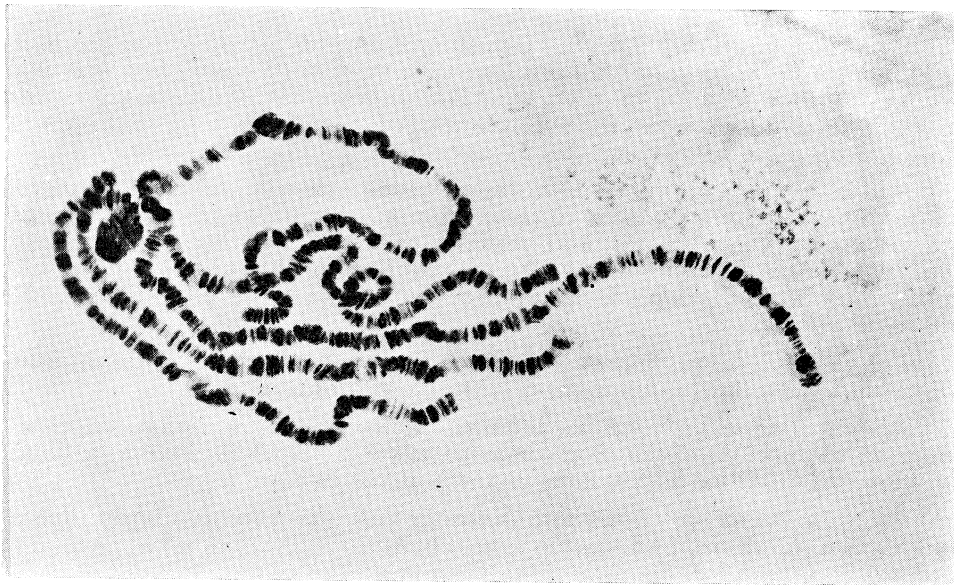


FIG. 3.—Larval salivary giant chromosome.

1. *Scaptomyza* has 4 rows of acrostichal hairs in front of the transverse suture; *Drosophila* has 6 or more.
2. *Scaptomyza* has 2 rows of acrostichal hairs between the dorsocentral bristles; *Drosophila* has 4 or more.
3. In *Scaptomyza* the occiput is more convex than in *Drosophila*.
4. In *Scaptomyza* the thorax, abdomen, and wings are more slender than in *Drosophila*.

From a sample of 10 flies taken from culture the following observations were made.

1. There were at least 4 rows and frequently 6 rows of acrostichals, including the presutural dorsocentrals in front of the transverse suture.
2. There were at least 2 rows and irregularly another 2 rows making in all 4 rows of acrostichal hairs between the post-sutural dorsocentral bristles.
3. The occiput was slightly convex.
4. The slender appearance is more pronounced in the males and appears to be due in part to the longitudinal black stripes on the head and thorax, and due in part to the way in which the wings at rest are closely folded one on top of the other. It is therefore concluded that this species is best placed in the genus *Drosophila*.

#### **Acknowledgments**

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