Table 1. Numbers of drosophilid flies collected from Bangladesh

Genus	Subgenus	Species	Dhaka Total (M / F)	Rajshahi Total (M / F)
Drosophila	*Sophophora*	*kikkawai*	172(105 / 67)	180 (113 / 67)
		ananassae	166 (67 / 99)	158 (79 / 79)
		melanogaster	17 (8 / 9)	23 (10 / 13)
		takahashii	8 (2 / 6)	13 (5 / 8)
		bipectinata	- - -	3 (1 / 2)
	Dorsilopha	*busckii*	5 (2 / 3)	4 (2 / 2)
	Drosophila	*sulfurigaster albostrigata*	- - -	1 (1 / 0)
Total			368 (184 / 184)	382 (211 / 171)

time from Bangladesh. The present data in no way provide a complete picture about the drosophilid fauna of Bangladesh since many areas of this country still remain unexplored.

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Acharyya, M., and R.N. Chatterjee. Department of Zoology, University of Calcutta, 35 Ballygunge Circular Road, Calcutta, India. Differentiation of the male specific internal reproductive organs of *Drosophila melanogaster* does not require the sex determining gene *transformer* (*tra*).

In the adults of *D. melanogaster*, the last abdominal segments, the anal plates, and the genitalia show a strong sexual dimorphism. Clearly, all the structures derived from the genital disc in the female are different from those in the male. Various lines of evidence indicate that the sexual dimorphism which appears at the end of the second instar larva gives rise to different structures according to the positions of the cells within each disc (Nothiger *et al.*, 1977; Lauge, 1980, 1982). Littlefield and Bryant (1979) noted that male and female genital discs begin development with initially identical arrays of positional values *i.e.*, they represent a single field. Later, the anal plates develop in response to the same positional values in both sexes whereas the genitalia would develop in response to different subsets of positional values according to the sexes. Thus, the entire adult terminalia (*i.e.*, the analia and the whole genital apparatus without gonads) are produced by the genital disc.

Several lines of evidence indicate that the recessive mutation *tra* (*transformer*) alleles have no effects on males but transform females into sterile pseudomales that are identical to males in every respect except for their non-functional gonads and female size (Sturtevant, 1945; Baker and Ridge, 1980; Baker and Belote, 1983). In order to know how sexual morphology of XX, *tra/tra* flies is specifically sculpted the internal organization of terminal abdominal segments, we have examined the histological structures of the terminal segment of the body of XX, *tra/tra* flies of *D. melanogaster*.

For the investigations, the histological preparations of terminal abdominal segments of adult flies were made as described by Miller (1950). The tissues were stained in eosin hematoxylin as described by Chayen *et al.* (1973).

Figure 1a-d shows the histological differences including the skeletal musculature pattern of wild type male and female. As noted earlier (Miller, 1950), our data also reveal that there is strong sexual dimorphism in the internal organization and histological structures of the adult flies. Segment specific muscle patterns are also apparent in the histological sections of the adult flies of the two sexes (Figure 1a,c), although the muscles of the genital organs are comparatively few and are concerned with the morphological interpretation of some of the skeletal frame work of the body to such an extent that they should be considered. Most of the muscles appear to be special adaptations to the functions of the fly genitalia. In males, two pairs of movable structures are associated with the genitalia. These are the

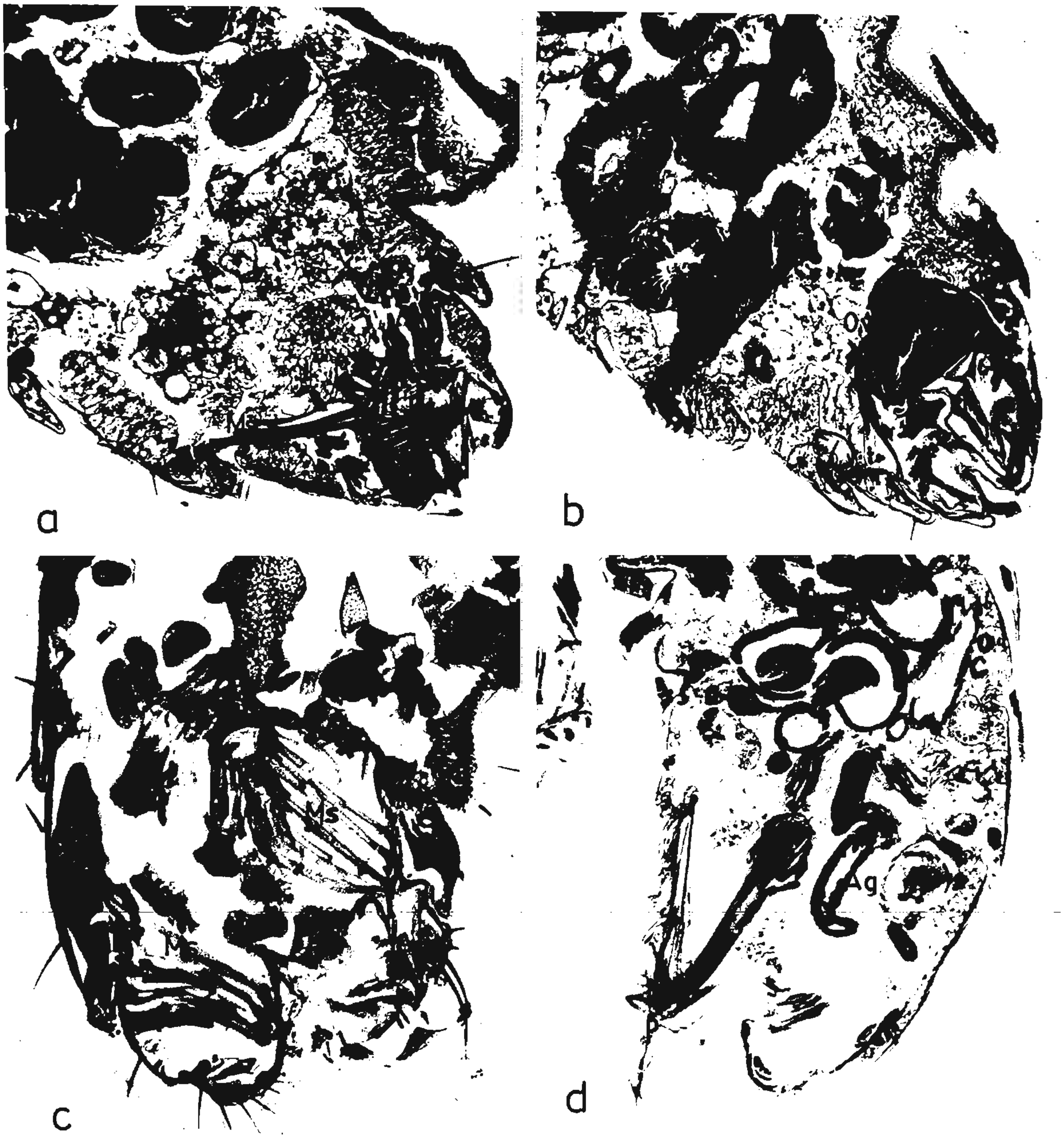

Figure 1a-d: Longitudinal sections through the terminal abdominal segments of adult male and female. (a) Longitudinal section showing some female specific musculature pattern of terminal abdominal segment of a female, (b) Longitudinal section showing female reproductive system, (c) Longitudinal section showing male specific musculature pattern of the terminal segment of a male and (d) Longitudinal section showing terminalia and genitalia of the male. Note the penis structure of the male in Figure (d). Ms-muscles; Ut-uterus; Ov-ovary; p-penis; Ag-accessory gland.

styles or claspers of the ninth segment with their coxites and the parameres. The second pair of muscles originates upon the inner face of the basal phargma of the nine sternite and insert upon the base of the penis itself (Figure 1d). These evidently function to retract that structure and they may therefore be designated as the retractor muscles of the penis. Similarly, in females, comparatively few muscles are concerned with the morphological interpretation of some of the skeletal parts of the body (Figure 1a).

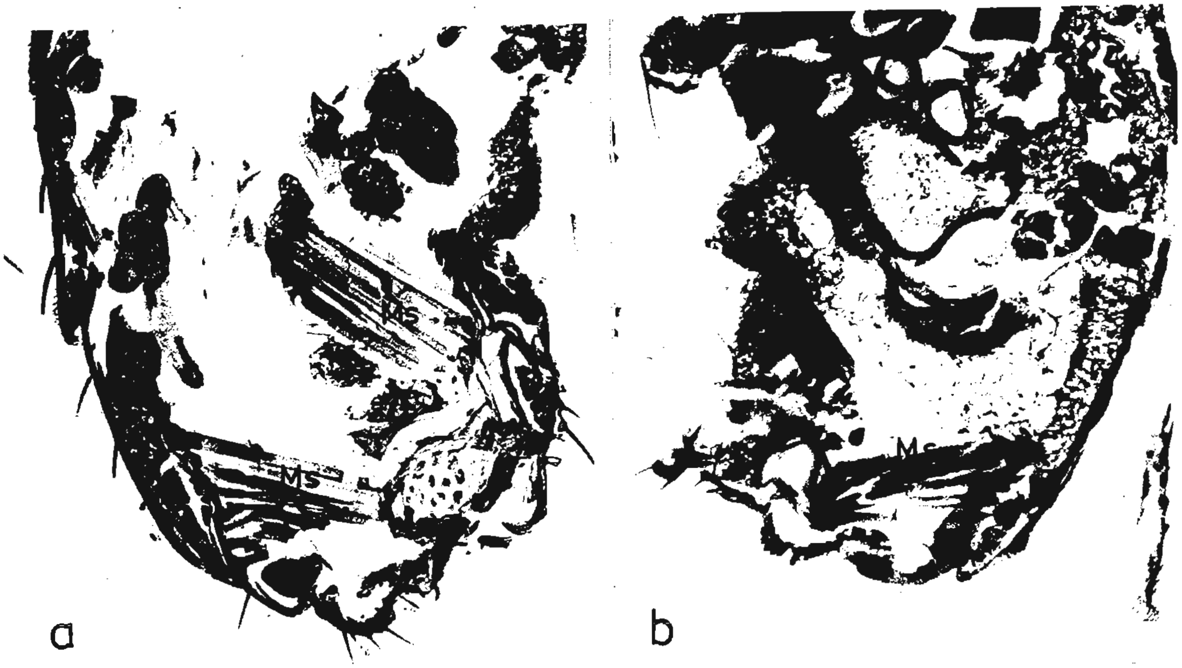

Figure 2a-b: Longitudinal sections through the terminalia of (a) an XY, *tra/tra* male and (b) an XX, *tra/tra* pseudomale. Note that the male specific abdominal muscles (a) were not affected by *tra/tra* mutation. Symbols as in Figure 1.

When the internal organization and histological structures of XY, *tra/tra* males were examined under the microscope, it has been noted that all male limited internal organization and histological structures are apparent in the tissues of the terminal segment of *tra/tra* males (Figure 2a). However, not all male specific muscles were developed in sexually transformed, XX, *tra/tra* females as they regulate the differentiation of sex specific cuticular structures. Some internal organization of the terminal segment of the body and the muscle patterns are male like (Figure 2b). These observations clearly suggest that determination of male specific internal organization of the terminal segment of the body (including muscle patterns) does not require the sex determining gene *tra*.

As the sexual dimorphism which appears at the end of the second instar larva gives rise to different structures according to the positions of the cells within each disc, it is expected that the growth dynamics of primordia of *tra/tra* females is set before second instar larval development. However, as it appears from our data presented in Figure 2a,b, the *tra* gene is not required for the development of internal organization of male flies (as there are no significant changes of internal organization of histological structures of XY, *tra/tra* male). It is, therefore, reasonable to believe that the *tra* gene is not required for the development of the internal organization of the terminal segment of the males including muscle patterns as they regulate the differentiation of sex specific cuticular structures in null mutation of *tra*.

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