

DESCRIPTIONS OF THREE NEW SPECIES OF *DROSOPHILA* (DROSOPHILIDAE) FROM NORTHEAST INDIA

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ABSTRACT. Three new species, *D. bimorpha*, *D. tetradentata* and *D. penniclobata*, belonging to *histro* group of the subgenus *Drosophila* are described. Their taxonomic relationships, based on morphology and male genital structures, are discussed.

Recent collections of Drosophilid fauna from different localities of north-east India have yielded several interesting species (Gupta and Singh, 1977, 1979; Singh and Gupta, 1977; Dwivedi, 1979; Dwivedi, Singh and Gupta, 1979; Dwivedi and Gupta, 1979, 1980; Gupta and Dwivedi, in press). The present paper deals with the descriptions of three new species of *Drosophila* collected at and around Rimbick, Darjeeling, at an elevation of about 2286m above sea level.

***Drosophila* (*Drosophila*) Fallen**

Drosophila Fallen, 1823, Diptera *Sueciae Geomyz.*, 2:4. Type-species : *Musca funebris* Fabricius; Sweden; Sturtevant, 1939, *Proc. Nat. Acad. Sci.*, 25 : 139 ; Sturtevant, 1942, *Univ. Texas Publ.*, 4213 : 30.

1. *Drosophila* (*Drosophila*) *bimorpha*, sp. nov. (Fig. 1, A-D)

Male and female : Pale yellow. Mean body length : ♂, 3.61 mm; ♀, 4.47 mm.

Head (♂, ♀) : Arista with 3 dorsal and 2 ventral branches, in addition to terminal fork. Antennae with second segment brown; third segment yellow. Frons tan, ocellar triangle pale brown, lighter along eye margin. Orbitals in the ratio of 7:3:10. Second oral subequal to vibrissa. Palpi yellow, with one prominent apical and one ventral setae. Carina pale brown, narrow and high. Face and cheek pale, greatest width of cheek one-sixth the greatest diameter of eye. Clypeus brown. Eyes dark red.

Thorax (♂, ♀) : Acrostichal hairs regular, in 8 rows. Anterior scutellars convergent; posterior scutellars crossing each other. Anterior dorsocentral half the length of posterior dorsocentral; distance from anterior dorsocentral to posterior dorsocentral half that between the two anterior dorsocentrals. Mesonotum and scutellum unicolorous, pale, with a broad median brown stripe in

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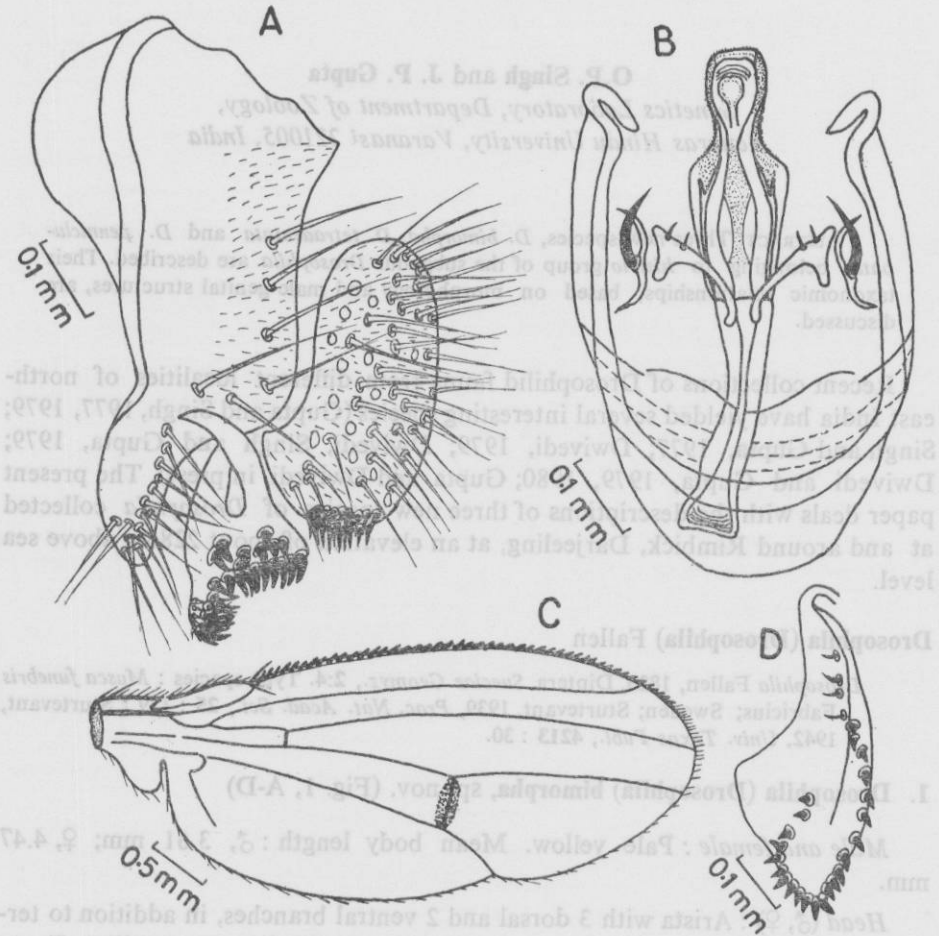


Fig. 1. *Drosophila bimorpha*, sp. nov. : A, peripheral organs; B, phallic organs; C, wing; D, egg guide.

Thorax (♂): Acrostichal hairs regular, in 8 rows. Anterior scutellars convergent; posterior scutellars crossing each other. Anterior dorsocentral half length of posterior dorsocentral; distance from anterior dorsocentral to posterior dorsocentral half that between the two anterior dorsocentrals. Meso- notum and scutellum unicolorous, pale, with a broad median brown stripe in

older specimens. Humerals two, subequal. Thoracic pleura straw-yellow. Sterno-index about 0.7.

Wings (♂, ♀) (Fig. 1C) : Transparent, posterior cross vein fuscous. Indices : C-index, 4.94; 4V-index, 1.27; 4C-index, 0.46; 5X-index, 1.19. Two equal bristles at the apex of first costal section; heavy bristles on about basal one-third of the third costal section. Halteres yellowish-brown.

Legs : Straw-yellow, pre-apicals on all tibiae; apicals on first and second tibiae.

Abdomen (♂, ♀) : Tergites shiny yellow, with medially interrupted dark brown, broad apical bands.

Periphallic organs (Fig. 1A) : Genital arch (epandrium) dark brown, pubescent, dorsally broadened, narrowing ventrally, with 6 upper and 15 large lower bristles. Clasper (surstylus) large, triangular, with 34 black, stout teeth arranged in two closely placed sets, upper with 22 and lower with 12 relatively thinner teeth, and a few fine setae ventrally. Anal plate (cerci) yellowish brown, large, pubescent, with about 50 bristles, and 14-16 stout, black setae ventrally.

Phallic organs (Fig. 1B) : Aedeagus yellowish-brown, straight, apically rounded, subapically compressed and finely serrated, broadened at middle and slightly narrowing basally. Basal apodeme of aedeagus nearly equal. Anterior parameres (anterior gonopophyses) elongate, distally triangular, articulated to aedeagus, each with 2 minute sensilla. Posterior parameres (posterior gonopophyses) obscure. Caudal margin of hypandrium with a pair of curved submedian spines. Ventral fragma pale yellow, broadly rounded distally.

Egg-guides (Fig. 1D) : Lobe pale yellow, medially swollen, apically somewhat conical, with 22 marginal and 5 discal teeth. Basal isthmus narrow and short.

Holotype ♂, INDIA : WEST BENGAL : Darjeeling District, Rimbick, 15.ix.1979, Coll. O.P. Singh and J.P. Gupta. Deposited in the Department of Zoology, Banaras Hindu University, Varanasi. *Paratypes* : 4 ♂♂, 3 ♀♀, same locality and collectors as holotype : in the Department of Zoology, B.H.U. Varanasi and Department of Biology, Tokyo Metropolitan University, Tokyo, Japan.

Relationship : This species somewhat resembles *D. ramamensis* Dwivedi in having posterior cross-vein deeply fuscous and clasper with two closely placed sets of teeth, but remarkably differs in the absence of hook-like lateral processes on aedeagus, hypandrial plate without tubercles and lower portion of genital arch (epandrium) with 15 large bristles instead of 2 in *D. ramamensis*.

Distribution : India : West Bengal.

Remarks : The natural populations of this species are found to contain two types of males, the yellow and the dark forms. The yellow form differs from the latter in not having antennal segments, carina, cheek, face, clypeus, coxae, femora and tibiae of all legs, brown to black. In addition, the entire abdomen in dark form appears smoky.

2. *Drosophila (Drosophila) tetradentata*, sp. nov. (Figs 2, A-D)

Male and female dull yellow. Body length; ♂, 3.17 mm; ♀, 3.4 mm.

Head (♂, ♀) : Arista with 4-5 dorsal and 2 ventral branches in addition to terminal fork. Antennae with second segment orange-brown; third segment yellowish. Frons including ocellar triangle dark tan. Orbitals in the ratio of 7:2:8, the three spaced well apart. Second oral nearly equal to vibrissa. Palpi yellow, with one apical and 3 strong ventral setae. Carina pale yellow, high and slightly broadened below. Face and cheek pale yellow, greatest width of cheek from base of oral to eye border one-eighth the greatest diameter of eye. Clypeus pale brown. Eyes bright red.

Thorax (♂, ♀) : Acrostichal hairs regular in 8 rows between dorsocentrals. Anterior scutellars convergent; posterior scutellars crossing each other. Anterior dorsocentral three-fifths the length of posterior dorsocentral; distance from anterior dorsocentral to posterior dorsocentral one-third that of the two anterior dorsocentrals. Mesonotum and scutellum unicolorous, dull yellow. Thoracic pleura pale. Sterno-index 0.8, middle sternopleural bristle nearly equal to anterior sternopleural bristle.

Wings (♂, ♀) (Fig. 2C) : Clear, cross veins fuscous. Indices : C-index, 4.2; 4V-index, 1.61; 4C-index, 0.61; 5X-index, 1.35. Two unequal bristles at the apex of first costal section; heavy bristles on basal two-fifths of third costal section. Halteres light yellow.

Legs : Yellow, pre-apicals on all tibiae; apicals on first and second tibiae.

Abdomen (♂, ♀) : Tergites dull yellow, with black apical bands becoming more thinner laterally.

Periphallic organs (Fig. 2B) : Genital arch (epandrium) yellowish-brown, pubescent, dorsally broadened and narrowing ventrally, with 1 upper long bristle; lower bristles in two groups, 6 at the insertion of clasper (surstylus) and 4 bristles at lower tip. Clasper (surstylus) large, with a row of about 15 black stout teeth arranged in a straight row, medially with 4 small dark brown bristles and a few fine setae ventrally. Anal plate (cerci) yellowish-brown, large, with about 25 long bristles, and 4 stout black teeth of uniform thickness ventrally.

Phallic organs (Fig. 2A) : Aedeagus orange-brown, robust, curved, medially covered with fine setae, subapically swollen and ending into a pointed apex followed by 4-5 serrations on ventral margin, and sub-basally with an elongate dorsal process. Basal apodeme of aedeagus one-fourth as long as aedeagus, vertical rod developed. Anterior parameres (anterior gonopophyses) fused with hypandrium, each with one sensillum. Posterior parameres (posterior gonopophyses) obscure. Caudal margin of hypandrium with one pair of black stout submedian spines. Ventral fragma yellowish-brown and quadrate.

Egg guides (Fig. 2D) : Lobe yellow, elongate, with 6 upper bristle-like and

16 other marginal teeth. Discal teeth 6 bristle-like present. Basal isthmus narrow and short.

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Relationship : This species closely resembles *D. guptai* Dwivedi in possessing fuscous cross-veins and robust aedeagus but differs in having only one pair of submedian spines, subapically swollen aedeagus with an elongate dorsal process, and the anal plate with four short stout teeth ventrally.

Distribution : India : West Bengal.

3. *Drosophila* (*Drosophila*) *penniclubata*, sp. nov. (Fig. 2E-H)

Male and female : yellowish-brown to dark brown. Body length : ♂, 2.83 mm; ♀, 3.51 mm.

Head (♂, ♀) : Arista with 3-4 dorsal and one ventral branches in addition to terminal fork. Antennae with second segment brown; third segment yellowish-brown. Frons including ocellar triangle tanish-brown, lighter anteriorly. Orbitals in the ratio of 7 : 3 : 8, the three spaced well apart. Second oral very thin, slightly differentiated from other oral setae, about one-third vibrissa. Palpi pale brown, with two setae. Carina pale brown, narrow and high. Face and cheek dark brown, greatest width of cheek from base of oral to eye border about one-seventh greatest diameter of eye. Clypeus brown. Eyes bright red.

Thorax (♂, ♀) : Acrostichal hairs regular in 6 rows. Anterior scutellars convergent; posterior scutellars crossing each other. Anterior dorsocentral two-fifths the posterior dorsocentral; distance from anterior dorsocentral to posterior dorsocentral half that between two anterior dorsocentrals. Mesonotum tanish-brown, with 3 yellowish stripes in the middle, outers broad and the whole area becoming smoky in older specimens. Scutellum dark brown. Humeral two, upper longer. Thoracic pleura yellowish-brown. Sterno-index 0.6.

Wings (♂, ♀) (Fig. 2G) : Transparent, posterior cross vein fuscous. Indices : C-index, 4.1; 4V-index, 1.57; 4C-index, 0.62; 5X-index, 1.22. Two subequal bristles at the apex of first costal section; heavy bristles on basal one-third of third costal section. Halteres yellow.

Legs : Dull yellow, with terminal tarsal segments dark brown, inner side of fore femora with a row of 10-11 black spine-like bristles, pre-apicals on all tibiae, apicals on first and second tibiae.

Abdomen (♂, ♀) : Tergites shiny yellow, with dark apical bands partially interrupted at middle and expanded laterally, terminal tergites completely black.

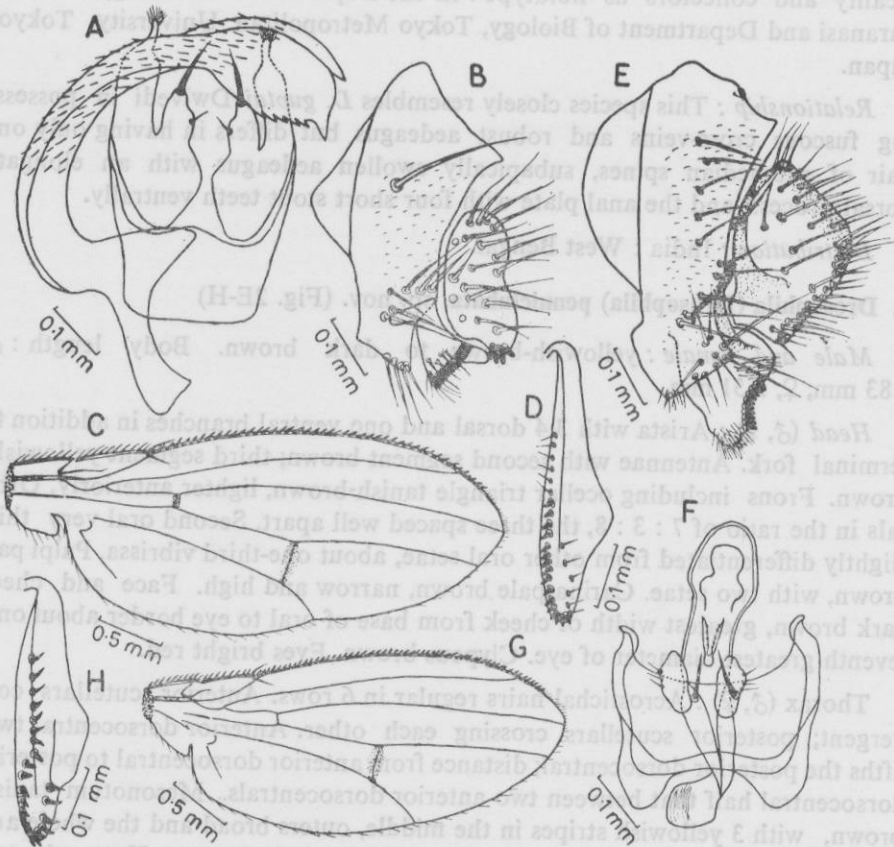


Fig. 2. A-D, *Drosophila tetradentata*, sp. nov. : A, phallic organs; B, periphallic organs; C, wing; D, egg guide. E-H, *Drosophila penniclubata*, sp. nov. : E, periphallic organs; F, phallic organs; G, wing; H, egg guide.

Periphallidic organs (Fig. 2E) : Genital arch (epandrium) dark brown, pubescent, broadened below, with 5 upper and 16 lower marginal bristles and a few fine setae. Clasper (surstylus) dark brown, large with 9-10 stout black teeth arranged in a concave row at middle on outer margin, and with several fine ventral setae. Anal plate (cerci) somewhat oval, large, dark brown, with about 40 bristles.

Phallic organs (Fig. 2F) : Aedeagus dark brown, robust, somewhat club-shaped, mediobasally with a minute claw. Basal apodeme as long as aedeagus. Anterior parameres (anterior gonopophyses) yellowish-brown, small, broad and subapically with 3 sensilla. Posterior parameres (posterior gonopophyses) obscure. Caudal margin of hypandrium with a pair of submedian spines. Ventral fragma quadrate, ventrally with a median depression.

Egg guides (Fig. 2H) : Lobe pale yellow, elongate, with 18 marginal and 5 discal black stout teeth. Basal isthmus short.

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Relationship : This species in the *histrion*-group somewhat resembles the foregoing species, *D. bimorpha*, but differs in the shape of aedeagus, anterior parameres, ventral fragma and also in having clasper with 9-10 teeth, while in *D. bimorpha* 22 and 12 large stout teeth in two closely placed sets.

Distribution : India : West Bengal.

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