

FOUR NEW SPECIES OF DROSOPHILIDAE (DIPTERA : INSECTA) FROM SIKKIM, INDIA

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TWO TEXT-FIGURES

Abstract

Two new species of genus *Drosophila* : *D. (L.) peniglobosa*, *D. (L.) parantillaria* and two new species of the genus *Microdrosophila* : *M. (M.) bilineata* and *M. (M.) sikkimensis* are described, and their taxonomic relationships, based on the morphology and male genital structure, are explained.

Introduction

Recent studies on the geographic distribution of the Drosophilidae have accumulated considerable data on the Indian species (Gupta, 1981, 1985). However, many of the states in India still await exploration. Sikkim is one of them which has not yet been surveyed despite its remarkable physiography. This report deals with the description of four new species of the Drosophilidae recently collected from the adjoining areas of Gangtok, Sikkim.

The type-specimens are deposited in the "*Drosophila* Collection" of the Department of Zoology, Banaras Hindu University, Varanasi, India and Department of Biology, Tokyo Metropolitan University, Tokyo, Japan.

Material and Methods

The material for the present study was largely collected from several geographic localities in the vicinity of Gangtok, using different fermenting fruits as baits. Occasionally, flies were also obtained by aspirating them directly while resting on the stems, leaves, flowers etc. The description of the species was made following the procedure adopted by Gupta (1969).

Systematic Account

Genus *Drosophila* Fallén

Drosophila Fallén, 1823, *Geomyzides sueciae*, 2:4.

Type-species : *Musca funebris* Fabricius.

Subgenus *Lordiphosa* Basden

Lordiphosa Basden, 1961, *Beitr. Ent.*, 11:186.

Type-species : *Drosophila fenestrarum* Fallén

Drosophila (Lordiphosa) peniglobosa n. sp.

Mean body-length : 2.03 mm ♂

Head : Arista with 5 dorsal and 2-3 ventral branches in addition to the terminal fork. Antennae with second segment brown; 3rd segment pale brown. Frons including ocellar triangle brownish. Orbitals in the ratio 3:2:5. Vibrissa single, second oral thin and much smaller. Palpus brown, with one prominent apical seta. Carina yellowish brown, narrow and moderately high. Clypeus dark brown. Face and cheek brown; greatest width of cheek one-fifth the greatest diameter of eye. Eyes bright red.

Thorax : Acrostichal hairs in 8 regular rows between dorsocentrals. Anterior scutellars convergent; posterior scutellars crossed each other. Distance between anterior and posterior dorsocentrals $2/5$ of the distance between two anterior dorsocentrals. Mesonotum and scutellum pale brown, darker posteriorly. Thoracic pleura dark brown. Sterno-index 0.5.

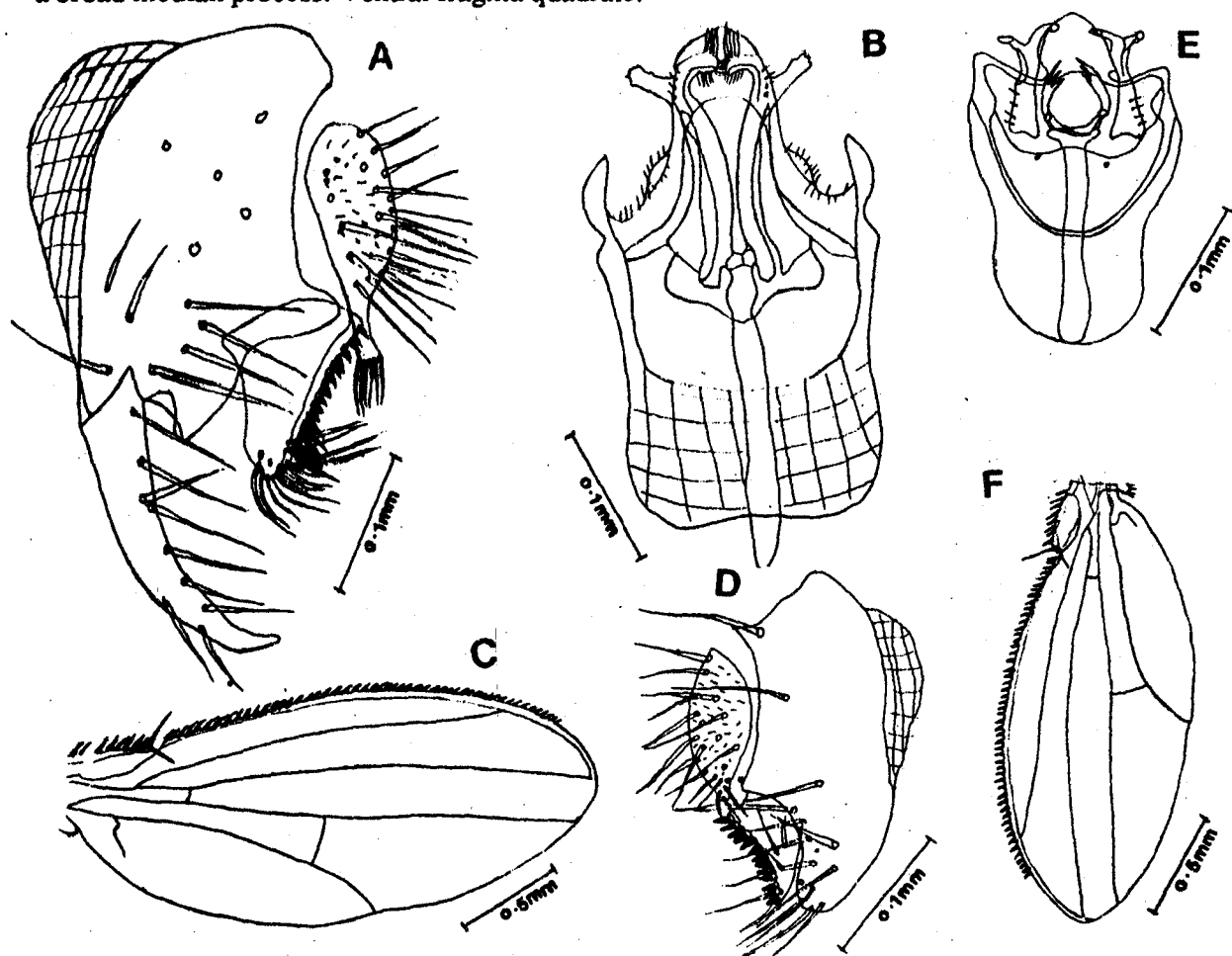
Legs : Dull yellow, preapicals on all three tibiae, apicals on first and second tibiae.

Wings : (Text-fig. 1C) : Clear, 1st costal break with 2 bristles. C_3 fringe $1/3$. Approximate indices: C-index 2.9-3.0; 4V-index 1.8; 4C-index 0.8; 5X-index 1.6-1.7. Halteres white.

Abdominal tergites brownish black. Male genitalia with two curved processes ventrally.

Periphallalic organs (Text-fig. 1A) : Epandrium broad, lower half forming a tubular process with about 20 marginal bristles. Surstylus triangular, with 11 small pointed upper teeth followed by 5 long stout bristles and 12 large bristles ventrally. Cercus swollen apically with about 21 large bristles, and narrowly prolonged downward having a tuft of 7 large spine-like bristles.

Phallic organs (Text-fig. 1B) : Aedeagus broad, basal apodeme little longer than aedeagus. Anterior gonapophysis elongate, branched apically, with 4-5 sensilla subapically. Hypandrium with a broad median process. Ventral fragma quadrate.



TEXT-FIGURE 1. *Drosophila (Lordiphosa) peniglobosa* Kumar and Gupta (A-C). A, periphallalic organs; B, phallic organs; C, male wing. *Drosophila (Lordiphosa) parantillaria* Kumar and Gupta (D-F). D, periphallalic organs; E, phallic organs; F, male wing.

Holotype ♂: INDIA, SIKKIM, Gangtok district, Ranipool, March, 1989, Coll. A. Kumar and J. P. Gupta. Paratypes : 2♂♂ data same as holotype.

Relationships : This species, resembles *Drosophila (Lordiphosa) porrecta* Okada, 1984, but clearly differs from it in having clear posterior cross-vein (somewhat clouded in *porrecta*), C-index 2.9 (2.2 in *porrecta*), and anterior gonapophysis branched apically, with 4-5 sensilla subapically (anterior gonapophysis elongate, subapically hairy, basally with a long branch in *porrecta*).

Drosophila (Lordiphosa) parantillaria n. sp.

Mean body length : 1.95 mm ♂ and 2.2 mm ♀

Head : Arista with 6 dorsal and 2 ventral branches in addition to the terminal fork. Antennae with second segment brown; 3rd segment elongate, little lighter. Frons dark pale. Ocellar triangle brown. Orbitals in the ratio 4:2:9. Vibrissa single, second oral half the length of vibrissa. Palpus darker, with one apical seta. Clypeus brown. Face and cheek pale; greatest width of cheek one-fifth greatest diameter of eye. Eyes bright red.

Thorax : Acrostichal hairs in six regular rows between dorsocentrals. Anterior scutellars divergent; posterior scutellars crossed each other. Distance between anterior and posterior dorsocentrals 1/3 of the distance between two anterior dorsocentrals. Mesonotum and scutellum shiny pale yellow, little darker posteriorly. Thoracic pleura dark brown. Sterno-index 0.6.

Legs : Pale, preapicals on all three tibiae; apicals on first and second tibiae.

Wings (Text-fig. 1F) : Clear, 1st costal break with 2 bristles. Approximate indices : C-index 2.9-3.0; 4V-index 1.7-1.8; 4C-index 0.8; 5X-index 1.6; C₃ fringe 1/3. Halteres white.

Abdominal tergites uniformly dark brown to black.

Periphallial organs (Text-fig. 1D) : Epandrium broad, narrowing below, with about 15 marginal bristles. Cercus elliptical, with about 18 bristles and 2-3 black setae at lower tip. Surstylus with 13 marginal teeth arranged in a concave row and with 3-4 bristles.

Phallic organs (Text-fig. 1E) : Aedeagus small, branched apically, basal apodeme nearly 3 times longer than aedeagus. Anterior gonapophysis elongate and branched apically, with 3 sensilla on basal half. Hypandrium with a broad median process. Ventral fragma longer than broad.

Holotype ♂: INDIA, SIKKIM, Gangtok district, Ranipool, March, 1989, Coll. A. Kumar and J. P. Gupta. Paratypes : 2♂♂, 1♀, data same as holotype.

Relationships : This species closely resembles *Drosophila (Lordiphosa) antillaria* Okada, 1984, but distinctly differs from it in having arista branches 6/2 (6/5 in *antillaria*), 5X-index 1.6 (2.5 in *antillaria*) and anterior gonapophysis with 3 sensilla on basal half (with 9-10 sensilla on entire margin in *antillaria*).

Genus *Microdrosophila* Malloch

Microdrosophila Malloch, 1921, Ent. News, 32:312.

Type-species : *Drosophila quadrata* Sturtevant.

Subgenus *Microdrosophila* Malloch

Type-species : *Drosophila quadrata* Sturtevant

Microdrosophila (Microdrosophila) bilineata n. sp.

Mean body length : 2.3 mm ♂ and 3.0 mm ♀

Head : Arista with 7 dorsal and 3 ventral branches in addition to the terminal fork. Antennae with second segment dark brown; third segment whitish yellow. Frons pale. Ocellar triangle brownish. Orbitals two, posterior reclinate little longer than proclinate, anterior reclinate minute. Vibrissa single. Palpus dark brown, with three prominent setae. Carina pale brown, narrow and moderately high. Face and cheek yellowish; greatest width of cheek one-seventh greatest diameter of eye. Eyes dark red.

Thorax : Acrostichal hairs in 6 irregular rows. Anterior scutellars small, convergent; posterior scutellars large, divergent. Anterior dorsocentrals placed near sutural line. Distance between anterior and posterior dorsocentrals $\frac{2}{3}$ of the distance between two anterior dorsocentrals. Mesonotum and scutellum dark brown, with two broad whitish yellow longitudinal stripes along dorsocentral lines. Throacic pleura dark brownish. Sterno-index 0.5.

Legs : Yellowish, distal portion of femora and proximal portion of tibiae little darker, preapicals on all three tibiae; apicals on first and second tibiae.

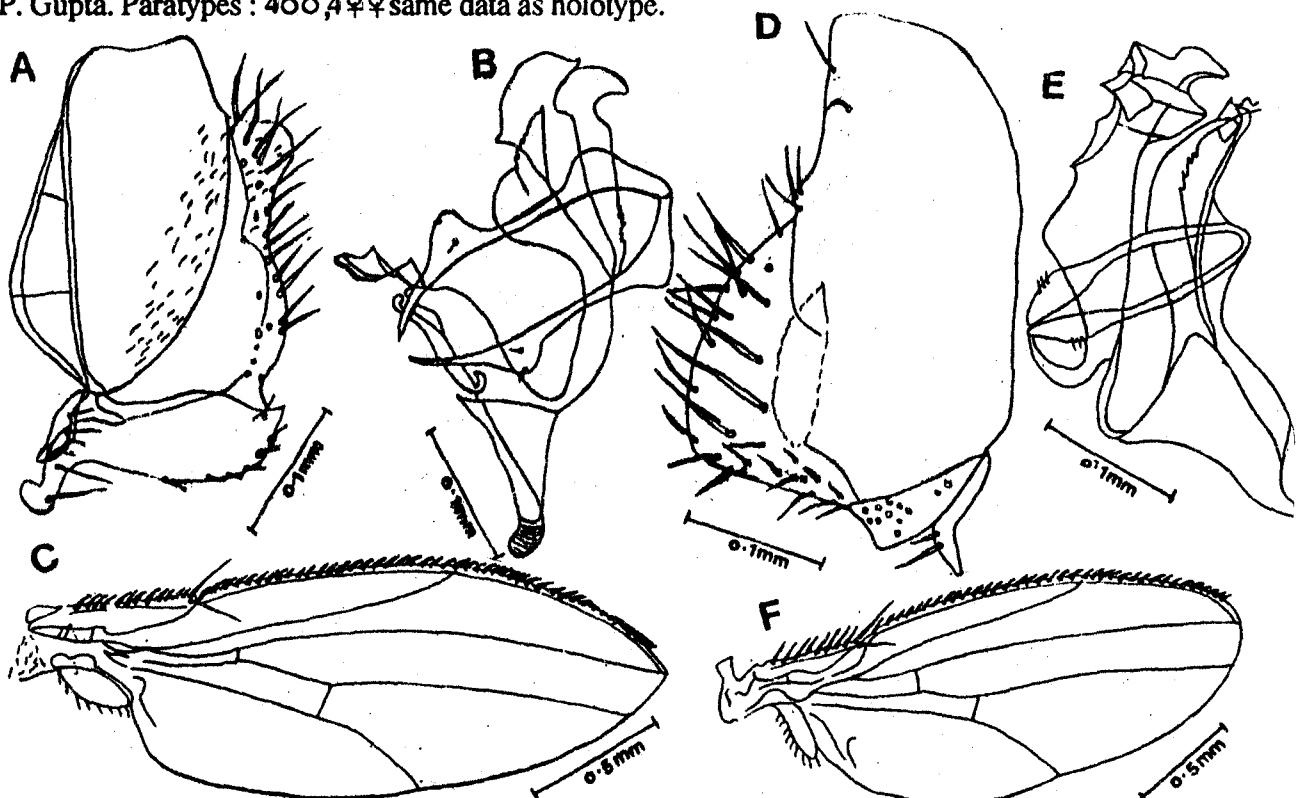
Wings : (Text-fig. 2C) : Clear, tip narrow. Halteres brown. C₃ fringe 9/10. Approximate indices: C-index 1.2; 4V-index 3.2-3.3; 4C-index 2.4-2.5; 5X-index 3.7.

Abdominal tergites mat dark brown.

Periphallalic organs (Text-fig. 2A) : Epandrium broad, bifurcated below. Cercus fused to epandrium.

Phallic organs (Text-fig. 2B) : Aedeagus bilobed.

Holotype ♂: INDIA, SIKKIM, Gangtok district, Ranipool, March, 1989, Coll. A. Kumar and J. P. Gupta. Paratypes : 4♂♂ 4♀♀ same data as holotype.



TEXT-FIGURE 2. *Microdrosophila (Microdrosophila) bilineata* Kumar and Gupta (A - C). A, periphallalic organs; B, phallic organs; C, male wing. *Microdrosophila (Microdrosophila) sikkimensis* Kumar and Gupta (D - F). D, periphallalic organs; E, phallic organs, F, male wing.

Relationships : This species closely resembles *Microdrosophila bicornua* Okada, 1985, but clearly differs from it in having mesonotum with 2 broad whitish yellow longitudinal stripes along dorsocentral lines (brownish black in *bicornua*), aedeagus bilobed (broad and triangular in *bicornua*).

Microdrosophila (Microdrosophila) sikkimensis n. sp.

Mean body length : 2.4 mm ♂

Head : Arista with 10 dorsal and 2 ventral branches in addition to the terminal fork. Antennae with second segment dark brown; third segment pale brown. Frons including ocellar triangle pale brown. Orbitals two, posterior reclinate little longer than proclinate. Vibrissa single and strong. Palpus brownish, with 2-3 marginal setae. Carina pale, narrow and moderately high. Cheek brown. Face yellowish, greatest width of cheek one-fifth greatest diameter of eye. Eyes bright red.

Thorax : Acrostichal hairs in 8 irregular rows between dorsocentrals. Anterior scutellars small and parallel; posterior scutellars large and divergent. Distance between anterior and posterior dorsocentrals 3/5 of the distance between two anterior dorsocentrals. Mesonotum yellowish brown, with 3 faint longitudinal stripes. Scutellum little lighter. Thoracic pleura with a dark brown longitudinal stripe.

Legs : Yellowish, preapicals on all three tibiae; apicals on first and second tibiae.

Wings (Text-fig. 2F) : Clear, C₃ fringe 5/6, Halteres whitish. Approximate indices : C-index 1.4; 4V-index 4.6; 4C-index 2.9; 5X-index 4.7.

Abdominal tergites uniformly dark brown, last two tergites yellowish laterally.

Periphallalic organs (Text-fig. 2D) : Epandrium broad, with a small process below. Cercus fused to epandrium, with many bristles. Surstylus absent.

Phallic organs (Text-fig. 2E) : Aedeagus broad, with many fine projections apically.

Holotype ♂ : INDIA, SIKKIM, Gangtok district, Ranipool, March, 1989, Coll. A. Kumar and J. P. Gupta. Paratype : 1♂ same data as holotype.

Relationships : This species closely resembles *Microdrosophila vittata* Okada, 1985, but clearly differs from it in having arista branches 10/2 (7/2 in *vittata*), epandrium broad, with a small process below (epandrium angular below in *vittata*); aedeagus broad with many fine projections apically (aedeagus globular and angular in *vittata*).

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