

Two new and two unrecorded species of Drosophilidae from Sikkim, India

(Insecta: Diptera).

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With 14 figures.

Abstract: Described are *Mulgravea ranipoolensis* n. sp. and *Scaptomyza tistai* n. sp.; provided are new distribution records of two known species, *Scaptomyza clavata* OKADA 1973 and *Liodrosophila quadrimaculata* OKADA 1974, from India.

Sikkim, a small mountainous state of the Indian Union in eastern Himalayas, has about one-third of its land covered with dense forests. Our earlier surveying studies in this region have yielded interesting data on Drosophilidae (GUPTA & GUPTA 1991; KUMAR & GUPTA 1990 in press). The present paper deals with the description of two more new and two other known species of Drosophilidae from this region.

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Genus *Mulgravea*.

1982 *Mulgravea* BOCK, Austr. J. Zool., Suppl., 89: 122; type species: *Mulgravea minima* BOCK 1982.

1985 *Thyrecephala* OKADA, Kontyu, 53: 338; type species: *Lissocephala asiatica* OKADA 1964.

Mulgravea ranipoolensis n. sp.

Figs. 1–5.

Holotype: ♂ (Accession No. GS-119), Ranipool, Gangtok Distr., Sikkim, India, III.1989, KUMAR & GUPTA leg.

Paratypes: 3♂♂ 2♀♀ (Genetics Laboratory, Varanasi), 1♂ 2♀♀ (SMF D 3451), 1♂ 1♀ (*Drosophila*-Collection, Dept. Biology, Tokyo Metropolitan University), all same data as holotype.

The remaining alcoholic preserved specimens of the paratype series bearing Accession No. GS-120 along with the mounted slides of genitalia and other taxonomic structures are at present deposited in the Genetics Laboratory, Zoology Dept., Banaras Hindu University, Varanasi.

Diagnosis: Small yellowish species, scutellum laterally black.

Description: Head (σ \varnothing): Arista with 6 dorsal and 2 ventral branches in addition to large terminal fork. Antennae with 2. segment yellowish brown; 3. segment much darker. Frons including ocellar triangle brownish black. Orbitals in ratio of 6:1:4. Second oral thin and equal to vibrissa. Palpi black, with one prominent apical seta. Face and cheek black, greatest width of cheek $\frac{1}{4}$ greatest diameter of eye. Carina vestigial. Clypeus black. Eyes red.

Thorax (σ \varnothing): Acrostichal hairs in 2 rows in front of dorsocentrals. Anterior scutellars divergent; posterior scutellars convergent. Distance between anterior and posterior dorsocentrals $\frac{2}{3}$ of distance between two anterior dorsocentrals. Mesonotum pale brown to dark brown, lighter at humerals. Scutellum pale yellow, black laterally. Thoracic pleura dull yellow to brownish yellow. Sterno-index 0.50.

Wings (σ \varnothing): Dusky. Approximate wing vein indices: C-index 1.12–1.18; 4V-index 2.65; 4C-index 2.18–2.2; 5X-index 2.25; heavy bristles on about basal $\frac{2}{3}$ of 3. costal section. Halteres with dorsal surface of stalk and knob brownish (Fig. 4).

Legs (σ \varnothing): Yellowish brown, preapicals on all tibiae; apicals on fore and mid tibiae.

Abdomen (σ \varnothing): 1 T yellowish, 2 T–4 T and 7 T uniformly dark brown, 5 T with broad black band in middle and yellowish laterally, 6 T yellowish with a broad median black patch (Fig. 5).

Average length of body: σ 1.61 mm, \varnothing 1.82 mm.

Periphallalic organs (Fig. 1): Epandrium elongate, pubescent, with 5 long bristles on lower half. Surstylus quadrate, with 6 marginal teeth arranged in a straight row and 5–6 small setae behind teeth. Cercus with 12–13 large bristles and 3–4 small setae below.

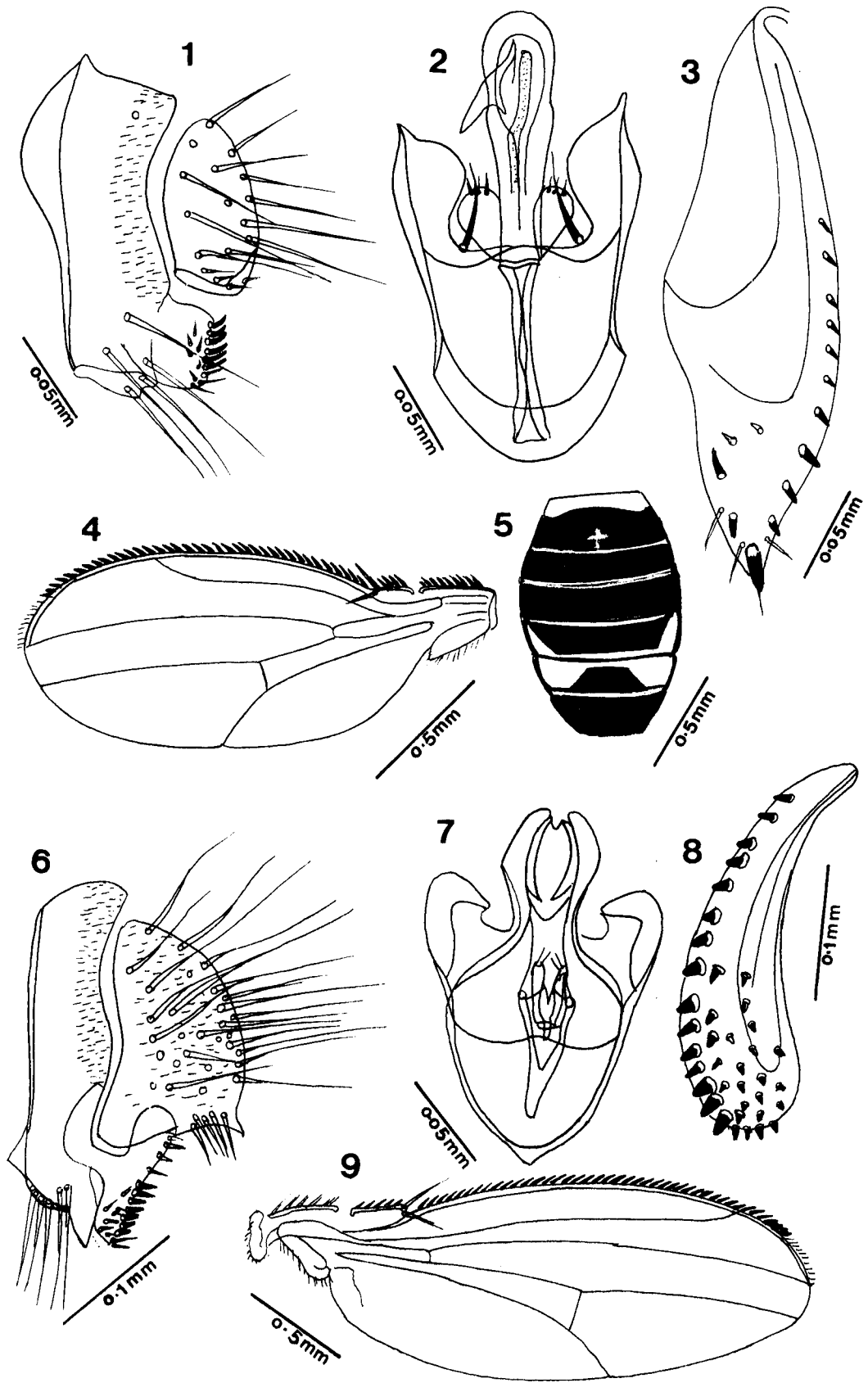
Phallic organs (Fig. 2): Aedeagus elongate, apically globular and subapically with a triangular hook-like process, basal apodeme of aedeagus slightly smaller than aedeagus. Anterior gonapophyses small, broadened dorsally, with 3 apical sensilla. Novasternum deeply notched, with a pair of strong submedian spines. Ventral fragma quadrate.

Egg-guide (Fig. 3): Lobe large, broadened at middle and narrowing apically, with about 10 marginal and 3–4 discal teeth, apical tooth largest. Basal isthmus short.

Remarks: This species closely resembles *Mulgravea indersinghi* TAKADA & MOMMA 1975, but clearly differs from it in having $\frac{6}{2}$ arista branches ($\frac{3}{3}$ in *indersinghi*), aedeagus elongate and subapically with a hook like process (aedeagus short and without hook like process in *indersinghi*), and in the abdominal pattern.

Figs. 1–5. *Mulgravea ranipoolensis* n. sp. — 1)Periphallalic organs; 2) phallic organs; 3) egg-guide; 4) σ wing; 5) abdomen.

Figs. 6–9. *Scaptomyza tistai* n. sp. — 6)Periphallalic organs; 7) phallic organs; 8) egg-guide; 9) σ wing.



Genus *Scaptomyza*.

1849 *Scaptomyza* HARDY, Berwickshire Nat. Club, Proc.,: 361; type species: *Drosophila graminum* FALLEN 1823.

Scaptomyza tistai n. sp.

Figs. 6-9.

Holotype: ♂ (Accession No. GS-121), Ranipool, Gangtok Distr., Sikkim, India, III.1989, KUMAR & GUPTA leg.

Paratypes: 30♂♂ 29♀♀ (Genetics Laboratory, Varanasi), 5♂♂ 5♀♀ (SMF D 3452), 5♂♂ 5♀♀ (*Drosophila*-Collection, Dept. Biology, Tokyo Metropolitan University), all same data as holotype.

The remaining alcoholic preserved specimens of the paratype series bearing Accession No. GS-122 along with the mounted slides of genitalia and other taxonomic structures are at present deposited in the Genetics Laboratory, Zoology Dept., Banaras Hindu University, Varanasi.

Diagnosis: 3. antennal segment and palpus pale yellow and pale brown respectively in ♂ and blackish in ♀, terminal two tarsal segments of all legs brownish.

Description: Head (♂ ♀): Arista with 3-4 dorsal and 1 ventral branches in addition to terminal fork. Antennae with 2. segment dull yellow; 3. segment pale yellow in male, 3. segment black in ♀. Frons including ocellar triangle black. Orbitals in ratio of 5:4:7, anterior reclinate much nearer to proclinate than to posterior reclinate orbital. Second oral subequal to vibrissa. Palpi pale brown in ♂ and blackish in ♀, with two unequal apical setae. Face and cheek yellowish, greatest width of cheek $\frac{2}{7}$ greatest diameter of eye. Carina low and narrow, clypeus brownish. Eyes red.

Thorax (♂ ♀): Acrostichal hairs in 4 regular rows between dorsocentrals. Anterior scutellars long, divergent; posterior scutellars small, convergent. Distance between anterior and posterior dorsocentrals $\frac{1}{3}$ of distance between two anterior dorsocentrals. Mesonotum and scutellum unicolourous, brownish black. Thoracic pleura blackish. Sterno index 0.60.

Wings (♂ ♀): Clear, slender. Approximate wing-vein indices: C-index 3.3-3.5; 4V-index 1.45; 4C-index 0.6; 5X-index 1.5; heavy bristles on about basal $\frac{1}{2}$ of 3. costal section. Halteres whitish (Fig. 9).

Legs (♂ ♀): Brownish yellow, last two tarsal segments much darker. Preapicals on all three tibiae, apicals on first and second tibiae.

Abdomen (♂ ♀): Slender, uniformly brownish black, upper tergites little lighter.

Average length of body: ♂ 2.18 mm; ♀ 2.86 mm.

Periphallic organs (Fig. 6): Epandrium narrow, brownish black and pubescent, with 5-6 long bristles below. Surstylus narrow, triangular and with a straight row of about 7 small black pointed teeth on lower half and about 6 sparsely placed bristle-like teeth on upper half and 5-6 small stout setae. Cercus nearly quadrate, ventrally narrowing at distal end, with numerous large bristles and 4-5 small setae ventrally.

Phallic organs (Fig. 7): Aedeagus large, basal apodeme much smaller. Anterior gonapophyses small, with 2 apical sensilla. Novasternum with a pair of large submedian processes. Ventral fragma triangular.

Egg-guide (Fig. 8): Lobe large, black, distally broadened, with about 15 stout marginal and 22 small scattered discal teeth. Basal isthmus short.

Remarks: This species closely resembles *Scaptomyza melanissima* OKADA 1966, but clearly differs from it in having 3-4/1 arista branches (5 dorsal and no ventral branch in *melanissima*), surstylus with a straight row of 7 pointed teeth on lower half and about 6 sparsely placed bristle-like teeth on upper half (surstylus with a concave row of about 12 pointed teeth in *melanissima*), aedeagus large (elliptical and ventral margin serrated in *melanissima*), novasternum with a pair of large submedian processes (absent in *melanissima*), and ventral fragma triangular (deeply notched in *melanissima*).

Scaptomyza clavata OKADA 1973.

Figs. 10-11.

1973 *Scaptomyza clavata* OKADA, Kontyu, 41 (4): 435; loc. typ.: Choo, Mt. Fuji, Japan.

Material: 1♂ (Genetics Laboratory Varanasi), 1♂ (SMF D 3453), Ranipool, Gangtok Distr., Sikkim, III.1989, KUMAR & GUPTA leg.

Distribution: Japan, India (new record).

Description (♂): External features as described by Okada (1973).

Periphallalic organs (Fig. 10): Epandrium black, broad, mildly narrowing below, with about 10-12 bristles on lower half. Surstylus stout and large, with 10 small black teeth on upper half and numerous stout large setae on lower half. Cercus pubescent, slightly broadened below, with about 25 bristles.

Phallic organs (Fig. 11): Aedeagus elongate, club-shaped in lateral aspect, basal apodeme small and broad. Anterior gonapophyses pubescent, with about 4-5 sensilla. Novasternum with lateral processes and a pair of small submedian spines. Ventral fragma triangular.

Liodrosophila quadrimaculata OKADA 1974.

Figs. 12-14.

1974 *Liodrosophila quadrimaculata* OKADA, Mushi, 48 (5): 34; loc. typ.: Chitou, Taiwan.

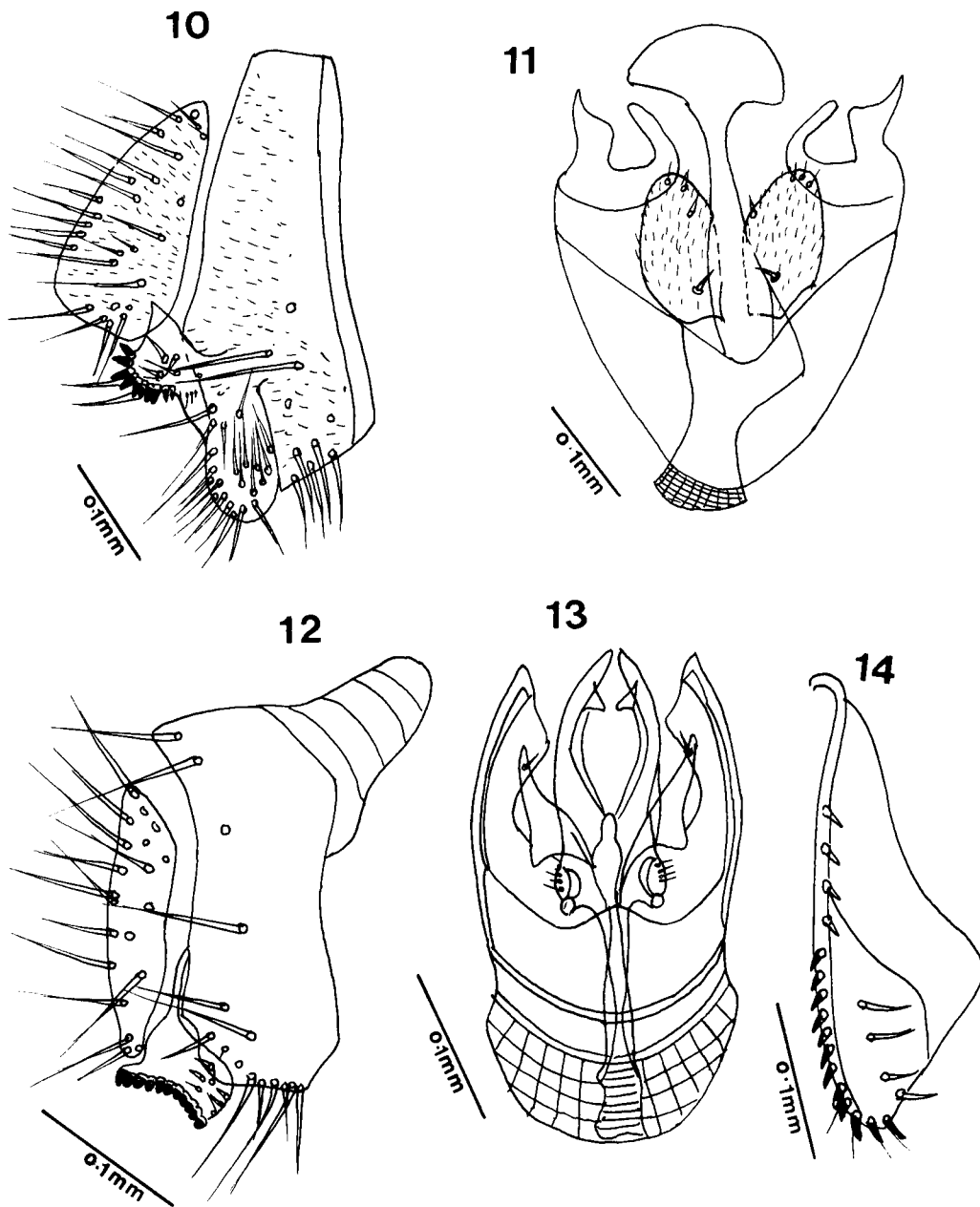
Material: 4♂♂ 2♀♀ (Genetics Laboratory Varanasi), 2♂♂ 1♀ (SMF D 3454), Ranipool, Gangtok Distr., Sikkim, III.1989, KUMAR & GUPTA leg.

Distribution: Taiwan, India (new record).

Description (♂ ♀): External features as described by OKADA (1974).

Periphallalic organs (Fig. 12): Epandrium broad, with about 16 bristles along posterior margin. Surstylus triangular, with 11 small teeth arranged in a concave row and 5-6 small setae below. Cercus elongate with 16-18 large bristles.

Phallic organs (Fig. 13): Aedeagus bifid, each lobe subapically with dorsally recurved claw, basal apodeme slightly longer than aedeagus. Anterior gonapophyses



Figs. 10–14. 10–11) *Scaptomyza clavata* OKADA 1973; 12–14) *Liodrosophila quadrimaculata* OKADA 1974. — 10, 12) Periphallial organs; 11, 13) phallic organs; 14) egg-guide.

with apical sensilla. Novasternum medially notched and with a pair of short submedian spines. Ventral fragma rounded distally.

Egg-guide (Fig. 14): Lobe elongate, triangular medially, with 15 small marginal and 4–5 discal teeth. Basal isthmus short.

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