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Dr. Bächli with best compliments  
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## Two new and two unrecorded species of *Drosophila* FALLÉN 1823 from Arunachal Pradesh, India

(Insecta: Diptera: Drosophilidae).

By

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With 16 figures.

**Abstract:** The present report describes *Drosophila pentafuscata* n. sp. and *Drosophila metasetigerata* n. sp., and also gives new distribution records of two more known species, *D. tongpua* LIN & TSENG 1973 and *D. synpanishi* OKADA 1964 from India.

In view of the great importance of Drosophilidae in genetic and evolutionary studies, the drosophilid faunas of most of the countries are now well established. However, the Indian subcontinent still remains an exception. Although our collections particularly in the northeast region of India have yielded considerable data of Indian drosophilid species (SINGH & GUPTA 1977; GUPTA & SINGH 1979; DWIVEDI & GUPTA 1979, 1980; DWIVEDI et al. 1979; SINGH & GUPTA 1981), many of the states in this region still await exploration. The present paper deals with the results of our surveying studies undertaken in Arunachal Pradesh, a previously unexplored state of India in this region.

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### *Drosophila (Drosophila) pentafuscata* n. sp.

Figs. 1-5.

**Holotype:** ♂ (Accession No. TA-211), Tai, West Siang Distr., Arunachal Pradesh, India, IX. 1983, KUMAR & GUPTA leg.

**Paratypes:** 6 ♂♂ 1 ♀ (Genetics Laboratory, Varanasi), 2 ♂♂ 1 ♀ (SMF D 3144), 2 ♂♂ 2 ♀♀ (*Drosophila*-Collection, Dept. Biology, Tokyo Metropolitan University), all same data as holotype.

The remaining alcoholic preserved specimens of the paratype series bearing Accession No. TA-212 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:** Distal portion of Vth longitudinal vein fuscous; ♂ fore metatarsal segment without a tuft of dense hairs.

**Description:** Head ( $\sigma^7\text{♀}$ ): Arista with about 6-7 dorsal and 3-4 ventral branches in addition to terminal fork. Antennae with 2. segment brown; 3. segment yellowish brown. Frons including ocellar triangle tannish brown. Orbitals in ratio of 7:3:10; anterior orbital equidistantly placed. Second oral nearly half the length of vibrissa. Palpi pale brown, with one prominent apical and 2 marginal setae. Carina brownish, ridged and broadened below. Face and cheek yellowish brown, greatest width of cheek  $\frac{1}{2}$  greatest diameter of eye. Clypeus brown. Eyes bright red.

**Thorax ( $\sigma^7\text{♀}$ ):** Acrostichal hairs in 8 regular rows between dorsocentrals. Anterior scutellars convergent; posterior ones crossing each other. Anterior dorso-central  $\frac{1}{2}$  length of posterior dorsocentral; distance between anterior and posterior dorsocentral  $\frac{1}{2}$  of distance between two anterior dorsocentrals. Mesonotum and scutellum yellowish brown, darkening with age. Humerals 2, unequal. Thoracic pleura yellow, middle sternopleural bristles well developed. Sternoindex 0.70.

**Wings ( $\sigma^7\text{♀}$ ):** Dusky, posterior crossvein and the distal portion of Vth longitudinal vein extending up to posterior crossvein largely fuscous. — Approximate indices: C-index 4.23; 4V-index 1.24; 4C-index 0.52; 5x-index 0.95. Two equal bristles at the apex of 1. costal section; heavy bristles on about basal  $\frac{1}{2}$  of 3. costal section. Halteres yellowish brown.

**Legs ( $\sigma^7\text{♀}$ ):** Straw yellow, preapicals on all tibiae; apicals on fore and mid tibiae. Inner side of fore femora of both sexes with a row of 10-12 spinules.

**Abdomen ( $\sigma^7\text{♀}$ ):** Yellow, tergites with narrow, medially interrupted brown apical bands.

Average length of body: 2.82 mm ( $\sigma^7$ ), 3.04 mm ( $\text{♀}$ ).

**Periphallallic organs:** Genital arch brown, dorsally broadened, ventrally constricted, with 10 bristles, 2 large bristles at the insertion of surstylus. Surstylus long, broadened distally, with 11 small black and 2 yellow teeth arranged in a concave row at upper portion, 13 small setae at lower portion and a few medial bristles. Cerci yellow, pubescent, with 32 large bristles and 5 small setae at lower tip.

**Phallic organs:** Aedeagus yellow, robust, mildly curved, narrowing apically and subapically with serrated processes and a strong black spine. Basal apodeme of aedeagus as long as aedeagus, vertical rod developed. Anterior gonapophyses fused with hypandrium, each with 4 sensillae. Hypandrium with a pair of apartly placed submedian spines. Ventral fragma nearly quadrate.

**Egg-guide:** Lobe pale yellow, broad and pointed apically, with 23 marginal and 6 discal teeth.

**Remarks:** This species resembles the members of the group represented by *immigrans* STURTEVANT 1942 in having a row of spinules on the inner side of fore femora, but is unique in having the distal portion of Vth longitudinal vein extending up to the posterior crossvein largely fuscous.

### *Drosophila (Drosophila) metasetigerata* n. sp.

Figs. 6-10.

**Holotype:**  $\sigma^7$  (Accession No. TA-213), Tai, West Siang Distr., Arunachal Pradesh, India, IX, 1983, KUMAR & GUPTA leg.

Paratypes: 16 ♂♂ (Genetics Laboratory, Varanasi), 1 ♂ 1 ♀ (SMF D 3145), 2 ♂♂ (*Drosophila*-Collection, Dept. Biology, Tokyo Metropolitan University), all same data as holotype.

The remaining alcoholic preserved specimens of the paratype series bearing Accession No. TA-214 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:** Distal portion of Vth longitudinal vein not fuscous; ♂ fore metatarsal segments with a tuft of dense hairs.

**Description:** Head (♂♀): Arista with 5-6 branches above and 3 below in addition to the terminal fork. Antennae with 2. segment pale yellow; 3. segment yellowish. Frons including ocellar triangle yellowish brown. Orbitals in ratio of 5:3:7. Second oral thin, half the length of vibrissa. Palpi yellow, with one prominent apical and 2-3 marginal setae. Carina dark brown, high and broadened below. Face and cheek brown, greatest width of cheek  $\frac{1}{4}$  greatest diameter of eye. Clypeus brown. Eyes bright red.

Thorax (♂): Acrostichal hairs in 8 regular rows between dorsocentrals. Anterior scutellars moderately convergent; posterior ones crossing each other. Anterior dorsocentral  $\frac{2}{3}$  length of posterior dorsocentral; distance between anterior and posterior dorsocentral  $\frac{1}{3}$  of distance between two anterior dorsocentrals. Mesonotum and scutellum unicolorous, shiny yellow. Humerals two, equal. Thoracic pleura yellow. Sterno-index 0.36.

Wings (♂): Hyaline. Approximate indices: C-index 4.8; 4V-index 1.32; 4C-index 0.49; 5x-index 1.27. Two bristles at the apex of first costal section; heavy bristles on about basal  $\frac{1}{2}$  of third costal section. Halteres yellowish brown.

Legs (♂): Straw yellow, preapicals on all three tibiae; apicals on 1. and 2. tibiae. Inner side of fore femora with 10-12 small spinnules. Male fore metatarsal segment as long as succeeding two tarsal segments, and with a tuft of dense brown short hairs.

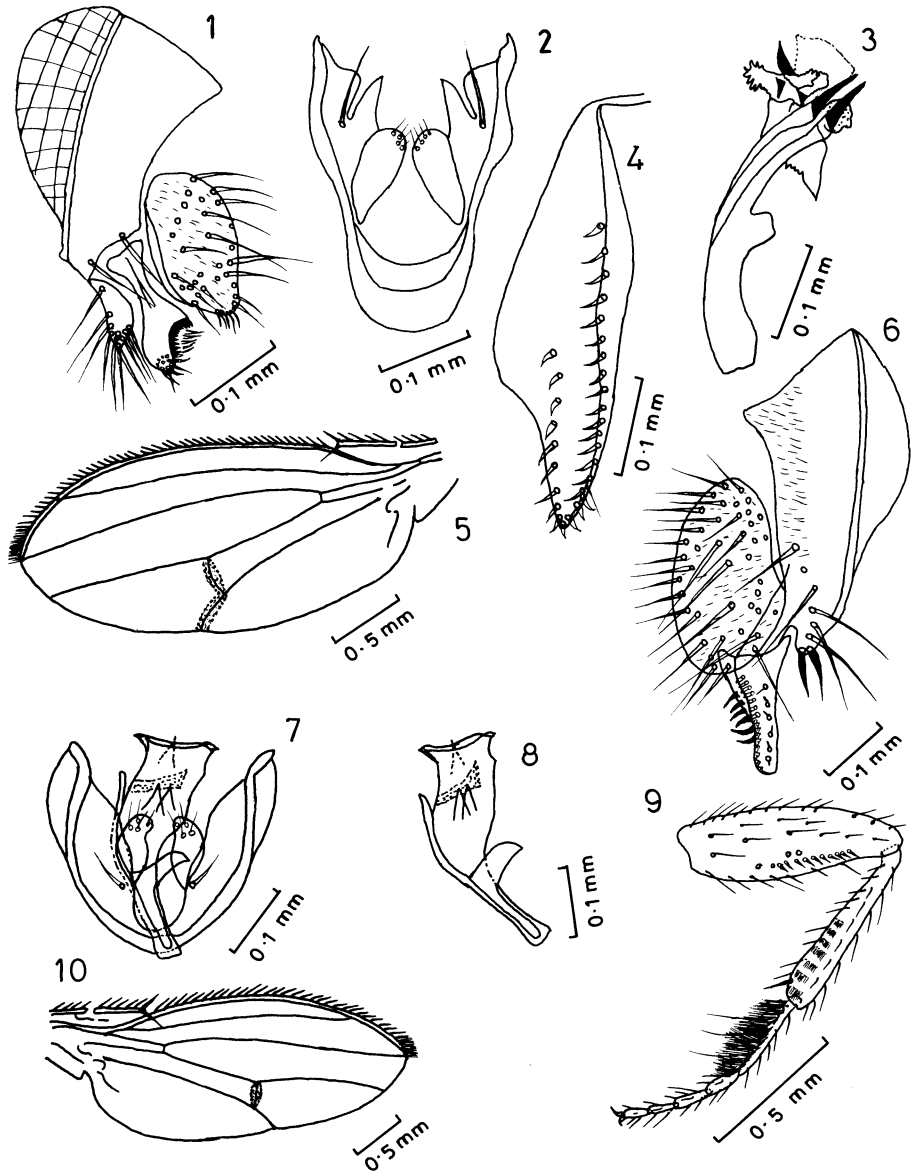
Abdomen (♂): Yellow, 2T and 3T with dark brown medially interrupted apical bands, the remaining tergites with no distinct bands.

Average length of body: 2.55 mm (♂).

Periphallic organs: Genital arch yellow, pubescent, dorsally broadened and markedly narrowing below, lower portion with 6 long and 2 thick short bristles. Surstylus black, tapering below, with 7-8 peg-like small teeth, 4 stout bristle-like teeth, and 2 bristles as well as a few fine setae. Cerci large, oval, with numerous bristles.

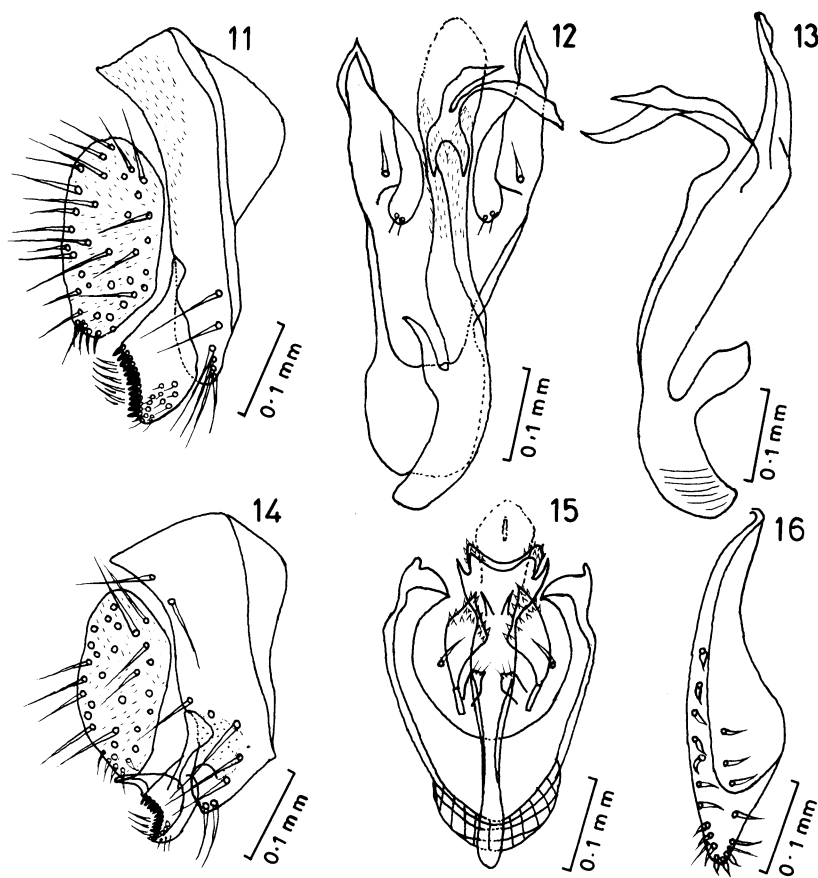
Phallic organs: Aedeagus yellow, stout and broad, apically concave, subapically with an elongate process and with a pair of hook-like projections. Basal apodeme of aedeagus nearly equal, ventral rod small. Anterior gonapophyses small, with 4 sensillae apically. Hypandrium with a pair of apartly placed submedian spines. Ventral fragma broader than long.

**Remarks:** This species belongs to the group represented by *immigrans* STURTEVANT 1942, superficially resembling *D. mucunae* OKADA & CARSON 1982, but clearly differs from the latter in having a tuft of dense small hairs on ♂ fore metatarsus only (on 1. and 2. tarsi in *mucunae*), cerci large and oval (ventrally tubular with a curved tooth in *mucunae*), and in several other details of the phallic organs.



Figs. 1-5. *Drosophila pentafuscata* n. sp. — 1) periphallallic organs; 2) phallic organs without aedeagus; 3) aedeagus; 4) egg-guide; 5) ♂ wing.

Figs. 6-10. *Drosophila metasetigerata* n. sp. — 6) periphallallic organs; 7) phallic organs; 8) aedeagus; 9) ♂ fore leg; 10) ♂ wing.



Figs. 11-16. *Drosophila* FALLÉN 1823. — 11-13) *tongpua* LIN & TSENG 1973; 14-16) *synpanishi* OKADA 1964. — 11, 14) peripheral organs; 12, 15) phallic organs; 13) aedeagus; 16) egg-guide.

*Drosophila (Drosophila) tongpua* LIN & TSENG 1973.

Figs. 11-13.

1973 *Drosophila tongpua* LIN & TSENG, Bull. Inst. Zool. Acad. Sin., 12 (1): 13; loc. typ.: Tong-pu, Nan-Tou, Taiwan.

Material: 22 ♂♂ 59 ♀♀ (Genetics Laboratory Varanasi), 3 ♂♂ 1 ♀ (SMF D 3146), Tai, West Siang Distr., Arunachal Pradesh, IX. 1983, KUMAR & GUPTA leg.

Distribution: Taiwan, India (new record).

**Description:** ( $\sigma^7\text{♀}$ ): Arista with about 5-6 dorsal and 3 ventral branches in addition to terminal fork. Orbitals in ratio of 7:3:9. Second oral nearly equal to vibrissa. Face and cheek yellowish brown, greatest width of cheek  $\frac{1}{4}$  greatest diameter of eye. Anterior scutellars convergent; posterior ones crossing each other. Sterno-index 0.64. Other characters as described by LIN & TSENG (1973).

**Periphallic organs:** Genital arch dark brown, elongate, narrowing below, lower portion with 6 bristles. Surstylus large, with about 13 black small teeth arranged in a concave row and several medioventral stout bristles, inner surface with many fine setae. Cerci brown, with 33 large bristles and 5 small black setae at lower portion.

**Phallic organs:** Aedeagus yellowish brown, apically ending into a flap-like structure and 2 dark brown processes, medially covered with fine setae. Basal apodeme of aedeagus half the length of aedeagus, vertical rod developed. Anterior gonapophyses fused, each with two sensillae. Hypandrium with one pair of stout black submedian spines. Ventral fragma elongate.

### *Drosophila (Drosophila) synpanishi* OKADA 1964.

Figs. 14-16.

1964 *Drosophila synpanishi* OKADA, Nature & Life in Southeast Asia, 3: 439; loc. typ.: Borneo.

**Material:** 23  $\sigma^7\sigma^7$  5  $\text{♀}\text{♀}$  (Genetics Laboratory Varanasi), 4  $\sigma^7\sigma^7$  (SMF D 3147), Tai, West Siang Distr., Arunachal Pradesh, IX. 1983, KUMAR & GUPTA leg.

**Distribution:** Borneo; India (new record).

**Description** ( $\sigma^7\text{♀}$ ): Arista with about 7-8 dorsal and 3-4 ventral branches in addition to terminal fork. Orbitals in ratio 6:3:9. Second oral equal to vibrissa. Distance between anterior and posterior dorsocentral  $\frac{2}{3}$  of distance between two anterior dorsocentrals. Sterno-index 0.56. Other characters as described by OKADA (1964).

**Periphallic organs:** Genital arch pale brown, dorsally broadened and rectangular ventrally, with 9 large bristles along posterior margin. Surstylus broadened distally, with 10 black and 2 yellow small teeth arranged in a concave row along entire margin, with 3 medial bristles and a few fine setae ventrally. Cerci pale brown, with 26 large bristles and 5-6 short setae ventrally.

**Phallic organs:** Aedeagus yellowish brown, robust, apically broadened, with 2 medial spines. Basal apodeme of aedeagus as long as aedeagus. Anterior gonapophyses small, each with 4 sensillae. Posterior gonapophyses large, broadened distally, with numerous thorn-like projections. Hypandrium with one pair of submedian spines. Ventral fragma narrowly rounded distally.

**Egg-guide:** Lobe pale yellow, elongate, narrowing at tip, with 13 marginal and 4 discal teeth. Basal isthmus narrow and short.

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