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ADDITIONS TO THE DROSOPHILID FAUNA OF NORTHEAST INDIA (*DIPTERA*)

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Key words : *Diptera*, *Drosophilidae*, India, new species.

Summary. — A taxonomic account of three new species, *D. siangensis*, *D. taiensis* and *D. neosignata* is given.

Résumé. — Compléments à la faune des *Drosophilides* du nord-est de l'Inde. — trois nouvelles espèces du genre *Drosophila* sont décrites de l'Inde.

The *Drosophilidae* is a large family of world-wide distribution. In recent years, our studies particularly in the northeast region of the Indian subcontinent have yielded considerable data on the Indian species (Singh & Gupta, 1977; Gupta & Singh, 1979; Dwivedi *et al.*, 1979; Dwivedi & Gupta, 1979, 1980; Gupta & Kumar, 1986). However, the authors believe that these data in no way furnish a complete picture of the drosophilid species inhabiting this region since a vast area still awaits exploration. This paper deals with the description of three new species of *Drosophila* collected from northeastern India.

Materials and Methods

The collections for this study were largely made from two different geographic localities in northeast India, Shillong (Meghalaya) and Tai (Arunachal Pradesh).

Several traps, usually small tin containers containing fermenting banana, pineapple or some other local fruit were placed at different places under cool and shady areas. Flies were obtained by net-sweeping over these traps. In order to procure the maximum number of flies, collections were made several times during the day. The collected flies were then sorted out, some were transferred to culture vials containing *Drosophila* food medium for raising their progeny, and the rest were preserved in 70 % alcohol for further study. The procedure employed for the study of morphological characters and genital structures was that followed by Gupta (1969). All type specimens are deposited in the Banara Hindu University (B.H.U.) except some paratypes deposited in the Tokyo Metropolitan University (T.M.U.).

TAXONOMIC DESCRIPTION

Drosophila (Sophophora) siangensis, n. sp.

This species resembles the members of the *suzukii* subgroup of the *melanogaster* species group in general morphology of the male genital structures and the male wings, but it appears to be an unique species in the subgroup particularly in having two large sex-combs along entire length of male fore metatarsal and second tarsal segments.

Holotype male, India : Tai, West Siang District, Arunachal Pradesh, Sept., 1983 (Colls. *Kumar* and *Gupta*) (in B.H.U.).

Paratypes : 8 males, collection data same as holotype (in B.H.U. ; 1 ex. in T.M.U.).

Male

Head. Arista with 4 dorsal and 2 ventral branches in addition to terminal fork. Antennae with second segment orange yellow; third segment dull yellow. Frons including ocellar triangle tan. Orbital bristles in ratio 4:2:5; anterior reclinate orbital close to proclinate. Second oral thin, subequal to vibrissa. Palpi dull yellow, with one prominent apical seta. Carina pale brown, narrow and high. Face and cheek pale yellow; greatest width of cheek $1/6$ greatest diameter of eye. Clypeus dark brown. Eyes dark red.

Thorax. Acrostichal hairs in 8 regular rows in front of dorsocentral bristles. Anterior scutellars convergent; posterior scutellars crossed each other. Anterior dorsocentrals $2/5$ length of posterior dorsocentrals; distance between anterior and posterior dorsocentrals $1/3$ of distance between two anterior dorsocentrals. Mesonotum and scutellum unicolorous, light tan. Thoracic pleura brownish black. Sterno-index 0.55.

Wings (fig. 1) with large apical black patch. Indices : C-index 1.98; 4V-index 2.65; 4C-index 1.44; 5X-index 0.95. Heavy bristles on about basal $3/4$ of third costal section. Halteres whitish yellow.

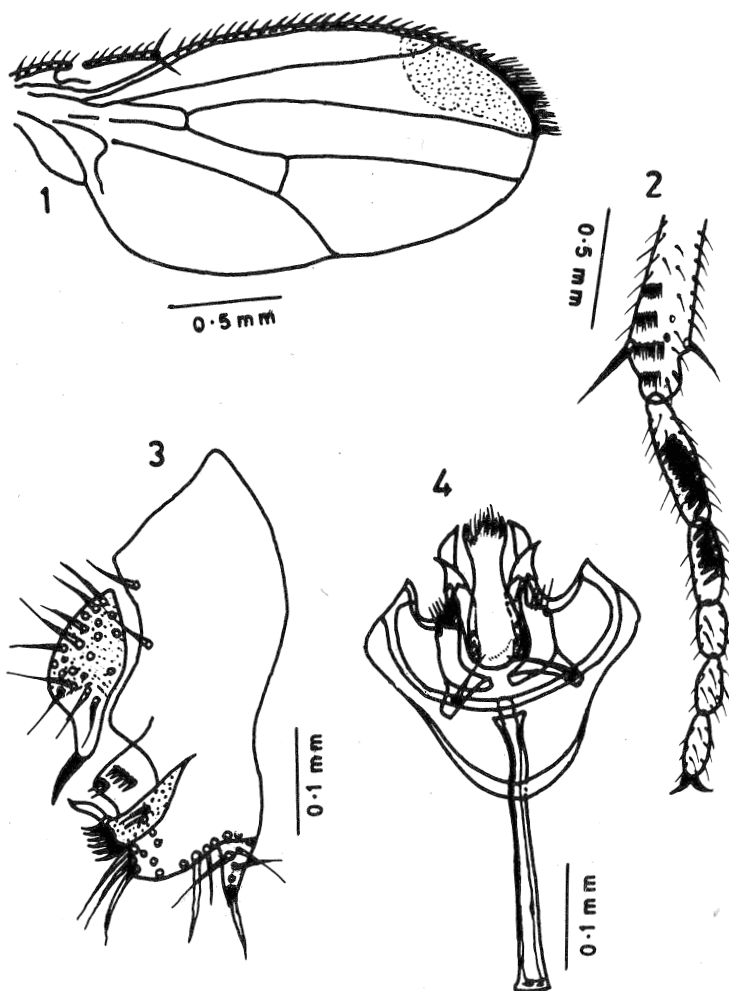


Fig. 1-4, *D. siangensis* n. sp. — 1, male wing. — 2, male fore leg. — 3, periphallial organs. — 4, phallic organs.

Legs (fig. 2) yellow; preapicals on all three tibiae; apicals on fore and mid tibiae. Male fore legs with two longitudinal sex-combs arranged on metatarsal and second tarsal segments having 9-10 and 5-6 large black teeth respectively.

Abdomen narrow, tergites uniformly dark brown, caudal tergites much darker. Coloration intensifies considerably with age. Average length of body : 1.71 mm.

Periphallic organs (fig. 3). Genital arch dark brown, truncate below, with narrowly pointed toe and large process basal to primary clasper, upper portion with 2 bristles, lower one with 24 bristles. Primary clasper broad, with 2 rows of teeth, upper row with one set of 5-6 black teeth and another set of 2 stout large teeth; lower row with only 2 teeth; lower portion of clasper with about 6 stout setae and single large curved tooth-like structure directed upward. Anal plate with numerous bristles and one very large ventromedial tooth.

Phallic organs (fig. 4). Aedeagus slender, swollen basally, mildly constricted subapically, apically expanded and hirsute. Basal apodeme of aedeagus double length of aedeagus. Anterior parameres large, apically pointed and black, subapically with 3-4 lateral sensillae. Posterior parameres large. Hypandrium with a pair of submedian spines. Ventral fragma broader than long.

Distribution : India.

Drosophila (Drosophila) taiensis, n.sp.

This species belongs to the *immigrans* species group wherein it resembles *D. niveifrons* Okada & Carson in having aedeagus with hook-like projections subapically, but distinctly differs from it in having relatively large body size, anterior parameres large, primary teeth on clasper distinctly split in two sets and posterior crossvein deeply fuscous.

Holotype male. India : Tai, West Siang district, Arunachal Pradesh, Sept., 1983 (Colls., Kumar and Gupta) (in B.H.U.)

Paratypes : 4 males, 5 females, same data as holotype (in B.H.U.; 1 male and 1 female in T.M.U.)

Male and female

Head. Arista with 6-7 dorsal and 3-4 ventral branches in addition to terminal fork. Antennae with second segment brown; third segment pale brown. Frons including ocellar triangle pale brown to dark brown. Orbital bristles in ratio of 8:5:11, anterior reclinate as nearer to proclinate as to posterior reclinate. Second oral strong, nearly equal to vibrissa. Palpi pale yellow, with 3-4 marginal setae. Carina yellowish brown, high. Face and cheek yellowish brown; greatest width of cheek 1/6 greatest diameter of eye. Clypeus brown. Eyes dark red.

Thorax. Acrostichal hairs in 8 regular rows between dorsocentrals. Anterior scutellars nearly convergent; posterior ones crossed each other. Anterior dorsocentrals 3/5 length of posterior dorsocentrals; distance between anterior and posterior dorsocentrals 1/3 of distance between two anterior dorsocentrals. Mesonotum and scutellum unicolorous, tan. Humeral two, equal. Thoracic pleura pale yellow. Sterno-index 0.56.

Wings (fig.5) dusky, posterior crossvein deeply fuscous. Indices : C-index 4.66; 4V-index 1.41; 4C-index 0.48; 5X-index 0.88; two unequal bristles at apex of first costal section; heavy bristles on about basal 1/3 of third costal section. Halteres yellowish brown.

Legs pale yellow, preapicals on all tibiae, apicals on fore and mid tibiae, inner surface of fore femora with row of 10-12 spinules.

Abdomen pale tan, tergites with brownish, narrow apical bands, bands on tergites 2-3 weakly interrupted in mid-line.

Average length of body : 4.42 mm (male); 4.33 mm (female)

Periphallic organs (fig. 6). Genital arch pale yellow, elongate, narrowing ventrally, lower portion with 5 bristles at insertion of clasper, and 5-6 bristles at lower margin. Clasper large, broadened distally, with two sets of marginal teeth; upper set with 5 black small teeth and lower one with 4 similar black and 2 yellowish teeth, and with 9-10 ventromedial small setae. Anal plate yellow, broad, with 24 large bristles and two small setae at lower tip.

Phallic organs (fig. 7). Aedeagus yellow, slender, apically concave, with two lateral hook-like projections subapically. Basal apodeme of aedeagus nearly equal to the aedeagus. Anterior parameres large, with 4 minute sensillae apically. Hypandrium with a pair of rather widely separated submedian spines. Ventral fragma nearly quadrate.

Egg guide (fig. 8). Lobe pale yellow, pointed apically, with 25 marginal and 5 discal teeth. Basal isthmus short.

Distribution : India.

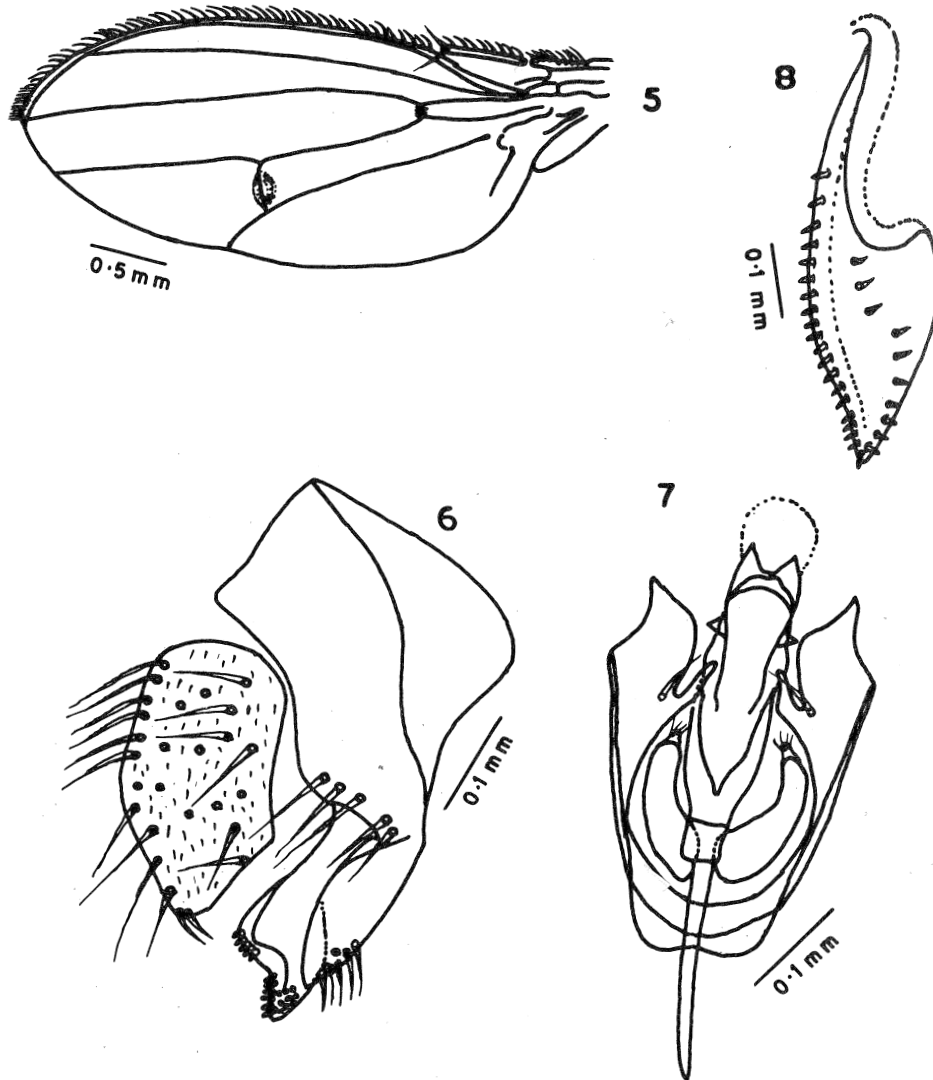


Fig. 5-8, *D. taiensis*, n.sp. — 5, wing. — 6, periphallallic organs. — 7, phallic organs. — 8, egg guide.

***Drosophila (Drosophila) neosignata*, n.sp.**

Drosophila (Drosophila) signata sensu Okada, 1964, *Nature and Life in Southeast Asia*, III : 457, Borneo not *D. signata* Duda, 1923.

Body length?

This species belongs to the *immigrans* species group of the subgenus *Drosophila* wherein it closely resembles *D. signata* Duda in general morphology and the ornamentation of the male fore tarsal segments (fig. 10). However, it differs from *D. signata* particularly in the details of genital structures such as the slender aedeagus and apically tapering (bifid and complicated in *D. signata*) lower portion of genital arch with one long seta and two thick stout bristles (with 5 long bristles on upper portion and similar 5 on lower portion in *D. signata*). The C-index of 2.35 is also lower (3.35 in *D. signata*) and the mesonotum has no faint black stripes (with two faint black stripes in *D. signata*). The Indian strain

of this species closely resembles that of Borneo described by Okada (1964), differing only in not having a fuscous anterior margin along the wing.

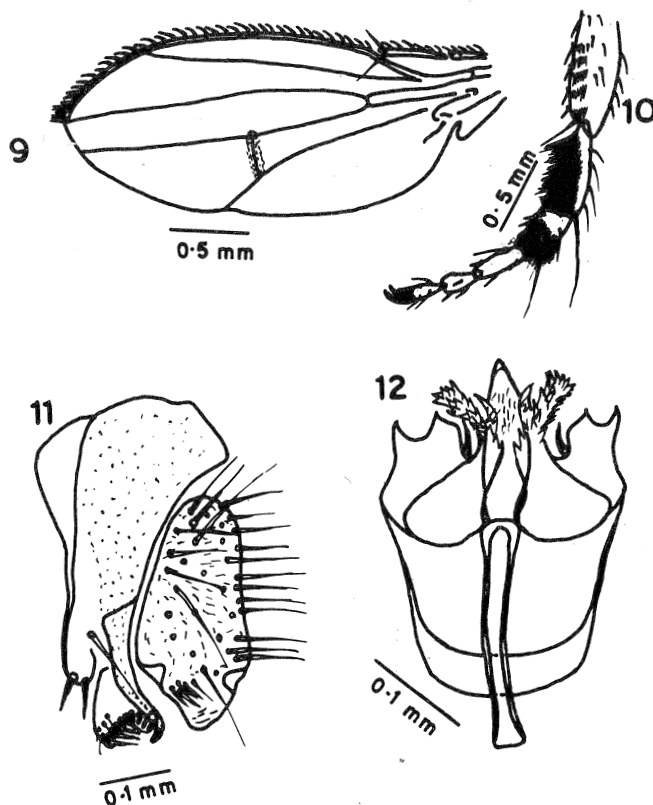


Fig. 9-12, *D. neosignata* n.sp. — 9, wing. — 10, male fore leg. — 11, peripheral phallic organs. — 12, phallic organs.

Holotype male, India : Shillong, Meghalaya, Sept., 1983, (Colls. *Kumar and Gupta*) (in B.H.U.)

Paratypes : 2 males, collection data same as holotype, (B.H.U.; 1 ex. in T.M.U.).

Male.

Head. Arista with 7 dorsal and 3 ventral branches in addition to terminal fork. Orbital bristles in ratio 6:3:9. Second oral equally as strong as vibrissa.

Thorax. Anterior dorsocentral $2/3$ length of posterior dorsocentral; distance between anterior and posterior dorsocentrals $3/8$ of distance between two anterior dorsocentrals. Thoracic pleura yellow. Sterno-index 0.60. Other characters as described by Okada (1964).

Wing (fig. 9). Hyaline, posterior crossvein fuscous. Indices : C-index 2.35; 4V-index 1.40; 4C-index 0.90; 5X-index 1.12. Male fore legs (fig. 10) and other characters as described by Okada (1964).

Peripheral organs (fig. 11). Clasper large, broadened distally, with 10 stout dissimilar black teeth arranged in concave row and with several setae ventrally. Other characters as described by Okada (1964).

Phallic organs (fig. 12). Aedeagus slender, somewhat tapering apically. Ventral fragma quadrate. Other characters as described by Okada (1964).

Distribution : Borneo, India.

DISCUSSION

It is now clear that the drosophilid fauna of northeastern India is quite rich. During the present study a total of eighteen species including the present three species was collected. The other species are *D. coonorensis* Reddy & Krishnamurthy, *D. ficusphila* Kik-

kawa & Peng, *D. bryani* Malloch, *D. neoimmigrans* Gai & Krishnamurthy, *D. lacertosa* Okada, *D. tongpua* Lin & Tseng, *D. siamana* Hihara & Lin, *D. synpanishi* Okada, *D. trisetosa* Okada, *D. setitarsa* Gupta & Dwivedi, *D. pentafuscata* Gupta & Kumar, *D. metasetigerata* Gupta & Kumar, *Zaprionus obscuricornis* Meijere, *Z. multistriatus* Duda & *Liodrosophila penispinosa* Dwivedi & Gupta. Among the above species, *D. neoimmigrans*, *D. lacertosa*, *D. bryani* and *D. coonorensis* have also been recorded from some other parts of India, while the remaining species are found to be endemic to this region only.

The interesting feature revealed from the data of surveys in this region is that the species of the two subgenera, *Sophophora* and *Drosophila* of the genus *Drosophila* have radiated widely, and none of the eight cosmopolitan species represented in the present collections made exclusively in the wild.

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