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*Zaprionus (Aprionus) flavipennis* (Duda)

# Description of a new species of the subgenus *Hirtodrosophila* (*Drosophila*: *Drosophilidae*: *Diptera*: *Insecta*) from Chandigarh, India

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A new species belonging to the subgenus *Hirtodrosophila* of the genus *Drosophila* is described from Chandigarh, India. The relationship, based on the morphology, periphallallic organs and phallic organs, at the subgeneric and generic levels is discussed in detail. This new species does not resemble, in external morphology, any of the species described so far. However, in the structures of periphallallic and phallic organs it resembles to *D. (H.) nokogiri* Okada (1956) and *D. (H.) histioides* Okada & Kurokawa (1957). The present species is characterized by the presence of a pair of paired black stripes separated by a silvery-white stripe on the mesonotum and scutellum.

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## INTRODUCTION

According to Sturtevant (1921) Bezzi was the first to report *Drosophila repleta* Wollaston from Calcutta. Brunetti (1923) described a new species *Drosophila prashadii* from Calcutta while in the same year Duda (1923) reported *Drosophila bipectinata* Duda from Darjeeling. Sturtevant (1927) studied four species *Drosophila melanogaster* Meigen, *Drosophila ananassae* Doleschall, *Drosophila montium* de Meijer var. *Atropyga* Duda and *Drosophila tristipennis* Duda from the collections of Miss Eleanor D. Mason from Madras. Ray-Chaudhury & Mukherjee (1941) reported two new species; *Drosophila emulata* and *Drosophila brunetti* from Calcutta. Okada (1955) reported five species; *Drosophila bipectinata*, *D. immigrans* Sturtevant, *D. tahakashii* Sturtevant, *D. melanogaster* and *D. kikkawai* Burla and recorded a new species *D. nepalensis* from Nepal (Himalaya).

Judging from the above reports it becomes evident that the information on Indian Drosophilidae is extremely scanty as compared with other parts of the world. Accordingly in 1964, a project "Drosophilid Survey of India" was initiated by the Panjab University, Chandigarh. As a consequence, Parshad and Paika (1964) recorded 11 species of the subgenus *Sophophora* Sturtevant; Parshad & Duggal (1966) reported twenty species belonging to the genera *Scaptomyza* Hardy and *Drosophila* Fallen from the Kashmir Valley; Parshad & Singh (1971) recorded nine species (of which three belonging to genus *Drosophila* were new) from South Andamans; Singh (1972a, b, 1973a, b) recorded 22 species, one belonging to the genus *Sinophthalmus* Coquillett; two to the genus *Scaptomyza* and 19 to the genus *Drosophila* (i.e. one to subgenus *Dorsilopha* Sturtevant; six to subgenus *Drosophila* Fallen, six to subgenus *Sophophora* and six to the subgenus *Paradrosophila* Duda). Of these 22 species 19 were new of which *D. combinatus* and *D. varietas* belonging to subgenus *Sophophora* were placed under the ungrouped species subgroups of the *montium* Okada series.

Besides the above records Gupta (1969) reported one new species of subgenus *Sophophora*; Gupta and Ray-Chaudhury (1970) recorded eight species of genus *Drosophila* from Andamans and Nicobar Islands and Gupta (1970) recorded five species belonging to the genera other than *Drosophila*.

In the present communication the author has described a new species belonging to subgenus *Hirtodrosophila* Duda from Chandigarh, India.

#### MATERIAL AND METHODS

The species which constitutes the material for the present investigation was collected from Chandigarh, India. The collection and the treatment of the flies for various taxonomical studies were carried out in the same way as described by Parshad & Paika (1964). The holotypes and the paratypes, as indicated below, have been deposited and registered with the Museum, Department of Zoology, Panjab University, Chandigarh, India.

#### TAXONOMIC DESCRIPTION

##### Subgenus *Hirtodrosophila* Duda, 1924

*Hirtodrosophila* Duda, 1924. *Arch. Naturgesch.*, 90A(3): 203; Duda, 1924. *Int. Meddel.*, 14: 249; Sturtevant, 1927. *Phil. J.*, 32: 366; Sturtevant, 1942. *Univ. Texas Publ.*, 4213: 27; Patterson, 1943. *Univ. Texas Publ.*, 4313: 53; Burla, 1951. *Revue suisse Zool.*, 58: 69; Patterson & Stone, 1952. *Evol. gen. Dros.*: 8; Burla, 1954. *Revue suisse Zool.*, 61: 108; Okada, 1956. *Syst. St. Drosophilidae Allied Fam. Japan*: 77.  
*Drosophila* group E, Sturtevant, 1921. *Carn. Inst. Publ.*, 301: 75.

*Phorticella flavipennis* (Duda) *Drosophila* (*Hirtodrosophila*) *bicolovittata* sp. nov.

*Holotype*. One male from Chandigarh deposited in the Museum, Department of Zoology, Panjab University, Chandigarh, vide registration No. 118/73, dated 14.4.73.

*Paratype*. One male collected along with the holotype.

*Description**Male imago*

*External characters.* Arista with five dorsal and three ventral branches, in addition a very small terminal fork; antenna yellowish brown, third joint large and silvery white. Front over  $1/4$  the greatest width of head, wider above, longer than broad, periorbits silvery-white. Orbs<sub>2</sub>  $1/3$  of either Orbs<sub>1</sub> or Orbs<sub>3</sub>. Or<sub>2</sub> scarcely discernible, vibrissa very prominent and arising from a black spot. Carina brownish yellow, raised, narrow both above and below, short, absent on lower part of face; clypeus brownish yellow. Palpus blackish yellow, club-shaped, with two prominent bristles one at the tip and the other in the middle and a few short bristles. Cheeks yellow, with two prominent bristles, their greatest width  $1/6$  the greatest diameter of eye. Eyes red; ocelli shining brown, ocellars divergent.

Acrostichal hairs in six regular rows; a pair of prominent prescutellars present, anterior scutellars convergent, posterior crossed in the middle. Mesonotum and scutellum brownish yellow, a pair of black stripes (with a silvery-white streak in between the black stripes) run along the dorso-lateral position on the mesonotum and on lateral sides of the scutellum. Humeral two equal. Pleura yellow, bare with a faint brown stripe across it. Sterno-pleura with a faint brown stripe, middle sterno-pleural bristle very minute. Sterno-index 0.77.

Legs pale: preapicals only on hind tibia, apicals absent; fore and hind coxa with a dark brown spot at its apex.

Body light brownish yellow, abdominal tergites yellow, with dark brown uninterrupted caudal bands, all the bristles on abdominal tergites arise from a brown spot.

Wing (Fig. 1A) clear: C-1 bristle one; C-3 bristles on basal  $3/4$  the third costal section; C-index about 1.54, 4V-index about 1.61, 4C-index about 1.33 and 5X-index about 1.83. Halteres pale, balloon-shaped.

Length of the wing: 3.06 mm.

Length of the body: 3.6 mm.

*Periphallitic organs* (Fig. 1B). Genital arch pale, broad above narrow below, anterior margin thick, upper posterior margin with four bristles with two more in front, middle portion with eight bristles, lower part with three bristles; a conical projection on the anterior side at  $1/4$  distad from ventral (lower) side, genital arch truncate below. Heel distinctly pronounced. Toe indistinctly rounded, higher with 1-2 bristles. Anal plate large, fusiform, round above and pointed below, contiguous with the genital arch in the middle, with 32 bristles on the upper  $2/3$  portion, lower  $1/3$  devoid of bristles, the pointed tip with nine short and thick bristles. Clasper one, creamy, triangular with 5-6 delicate teeth decreasing in size from top to bottom, arranged in a straight row, marginal bristles 9-10, they too decrease in size like the teeth of clasper.

*Phallic organs* (Fig. 1C). Brownish pale. Aedeagus bifid, broad at the base, tapers towards the apex, contiguous at the base. Anterior parameres slender, round at the apex, without any sensilla and fused at the base. Posterior parameres contiguous with the aedeagus at the base, large, truncate at the apex



Figure 1. *Drosophila (Hirtodrosophila) bicolorvittata* sp. nov.: A, wing; B, periphallic organs; C, phallic organs.

with 6-8 well developed setae. Novasternum biramous each arm U-shaped, the inner arms of the U, with two pairs of exceedingly long and flexible submedian spines. Ventral phragma extremely reduced, approximately triangular, deeply sinuated at its anterior end. Basal apodeme very small, ventrally gives a basal branch which unites with ventral phragma.

*Remarks.* The present species belongs to the subgenus *Hirtodrosophila* because of the following characters (Sturtevant, 1942).

Third antennal segment large, covered with unusually long hairs. Carina narrow, short, partially absent on lower part of face. Sturtevant (1942) mentions that the arista usually has one branch below in addition to terminal fork but Okada (1956) described a number of species with 2-3 branches below the arista, even *D. duncani* (Sturtevant, 1918) has two branches below it, so this feature does not seem to be characteristic. The same is true of the sterno-index which is as high as 1.8 in *D. (Hirtodrosophila) sexvittata* Okada (1956) and in other species described from Asia.

In the external characters the present species does not resemble any of the species described so far. However, with regard to the periphallic organs, it resembles *Drosophila (Hirtodrosophila) nokogiri* Okada (1956) in having its genital arch broad and truncate below; primary clasper with five black teeth in a straight row. It differs from *D. nokogiri* in the following structures:

*D. nokogiri*

1. Genital arch black
2. Upper marginal bristles seven
3. Clasper black
4. Primary teeth of clasper of equal size
5. Primary teeth surrounded by ten setae of equal size
6. Anal plate black and separate from the genital arch
7. Anal plate pentagonal and without thin projection at the lower end and with fifty hairs

*D. bicolorvittata* sp. nov.

- Pale
- Four such bristles, with another row of two bristles in front (anterior)
- Creamy
- Decrease in size from top to bottom
- Decrease in size just like the primary teeth
- Creamy and fused with the genital arch
- Fusiform with a finger like projection at lower end which bears nine short thin bristles and with thirty-two bristles on the upper 2/3; lower 1/3 devoid of bristles

With regard to the phallic organs the present species resembles *D. (Hirtodrosophila) histiroides* Okada & Kurokawa (1957) in having its novasternum biramous and U-shaped. The present species is very peculiar in having:

- (1). Mesonotum and scutellum with a pair of paired black stripes separated by a silvery white stripe. Consequently this species has been named as *D. bicolorvittata*.
- (2). Anal plate fused with genital arch.
- (3). Primary teeth of primary clasper decrease in size above downwards.
- (4). No bristles in the lower 1/3 of

anal plate. (5). Two rows of posterior marginal bristles. (6). Posterior parameres truncate. (7). Two pairs of flexible and exceedingly long submedian spines on the novasternum.

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## REFERENCES

- BRUNETTI, E., 1923. A new Indian Drosophilid fly. *Rec. Indian Mus.*, 25: 303-4.
- DUDA, O., 1923. Die Orientalischen und Australischen Drosophiliden-Arten (Dipteren) des hungarischen Nationalen Museums Zu Budapest. *Ann. Mus. Nation Hung.*, 20: 24-59.
- GUPTA, J. P., 1969. A new species of *Drosophila* Fallen (Insecta: Diptera: Drosophilidae) from India. *Proc. zool. Soc., Calcutta*, 22: 53-61.
- GUPTA, J. P., 1970. Description of a new species of *Phorticella*, *Zaprionus* (Drosophilidae) from India. *Proc. Indian nat. Sci. Acad.*, 36: 62-70.
- GUPTA, J. P. & RAY-CHAUDHURY, S. P., 1970. The genus *Drosophila* (Diptera: Drosophilidae) in Andaman and Nicobar Islands, India. *Oriental Insecta*, 4(2): 169-75.
- OKADA, T., 1955. Fauna and Flora of Nepal, Himalaya. *Sci. Result. Japan. Exped. Nepal, Himalaya*, 1: 387-90.
- OKADA, T., 1956. *Systematic study of Drosophilidae and allied families of Japan*. Tokyo: Gihodo Co., Ltd.
- OKADA, T. & KUROKAWA, H., 1957. New or little known species of Drosophilidae of Japan (Diptera). *Kontyu*, 25: 1-12.
- PARSHAD, R. & PAIKA, I. J., 1964. Drosophilid survey of India. II. Taxonomy and Cytology of the subgenus *Sophophora* (*Drosophila*). *Res. Bull. Panjab Univ. Sci.*, 15: 225-52.
- PARSHAD, R. & DUGGAL, K. K., 1966. Drosophilid Survey of India. III. The Drosophilidae of Kashmir Valley. *Res. Bull. Panjab Univ. Sci.*, 17: 277-290.
- ✓ PARSHAD, R. & SINGH, A., 1971. Drosophilid Survey of India. IV. The Drosophilidae of South Andamans. *Res. Bull. Panjab Univ. Sci.*, 22: 385-99.
- RAY-CHAUDHURY, S. P. & MUKHERJEE, D. P., 1941. Genetic and systematic studies on Indian *Drosophila*. *Indian J. Ent.*, 3(2): 215-24.
- ✕ SINGH, A., 1972a. Descriptions of five new species of the subgenus *Drosophila* (*Drosophila*: Drosophilidae: Diptera: Insecta) from India. *Res. Bull. Panjab Univ. Sci.*, 23.
- ✕ SINGH, A., 1972b. Drosophilid Survey of India. V. The Drosophilidae of Ootacamund. *Res. Bull. Panjab Univ. Sci.*, 23.
- SINGH, A., 1973a. Descriptions of new species of the genera *Sinophthalmus* and *Scaptomyza* (Insecta: Diptera: Drosophilidae) from Chandigarh, India. *Z.S.I. Records*.
- ✕ SINGH, A., 1973b. Descriptions of the six new species of the subgenus *Paradrosophila* (*Drosophila*: Drosophilidae: Diptera: Insecta) from India. *Zool. Anz.*
- STURTEVANT, A. H., 1918. A synopsis of the Nearctic species of the genus *Drosophila*. *Bull. Am. Mus. nat. Hist.*, 38: 441-6.
- STURTEVANT, A. H., 1927. Philippine and other oriental Drosophilidae. *Philipp. J. Sci.*, 32: 361-74.
- STURTEVANT, A. H., 1942. The classification of the genus *Drosophila*, with descriptions of nine new species. *Univ. Texas Publ.*, 4213: 5-66.
- STURTEVANT, A. H., 1921. The North American species of *Drosophila*. *Carnegie Inst. Publ.*, 391: 1-150.