

Description of two new species of subgenus *Drosophila* (Drosophilidae : Diptera) from Darjeeling, India

Y N DWIVEDI

Genetics Laboratory, Department of Zoology, Banaras Hindu University,
Varanasi 221 005

MS received 8 January 1979; revised 16 April 1979

Abstract. Two new species, *D. guptai* and *D. ramamensis*, belonging to the *histrio* group of subgenus *Drosophila* of the genus *Drosophila* are described from Darjeeling, India. Their taxonomic relationships, based on the morphology and male genital structures, are established.

Keywords. Drosophilidae; *Drosophila*; *Drosophila guptai* and *Drosophila ramamensis*.

1. Introduction

Recent studies on the systematics of *Drosophila* and allied genera of the family Drosophilidae have indicated that the family is fairly distributed throughout the subcontinent of India. Altogether 100 species belonging to the genus *Drosophila* have been recorded from India to date (Parshad and Paika 1964; Parshad and Duggal 1966; Gupta 1969, 1971, 1972, 1973, 1974a, b; Gupta and Ray-Chaudhuri 1970a, b, c; Parshad and Singh 1971; Reddy and Krishnamurthy 1968, 1970, 1971, 1973; Nirmala Sajjan and Krishnamurthy 1972, 1973, 1975; Nirmala Sajjan and Reddy 1975; Vaidya and Godbole 1976; Godbole and Vaidya 1973; Singh 1974, 1976; Bächli 1973; Prakash and Reddy 1977; Singh and Gupta 1977).

However, in view of the great size of the country and its considerable variety of habitats, it is believed that there are undoubtedly more species awaiting discovery. The present paper deals with the description of two new species of *Drosophila* recently collected from the nearby areas of Darjeeling at an altitude of 2520 m.

2. Taxonomic description

2.1. Genus *Drosophila* Fallén

Drosophila Fallén 1823, *Geomyzides Sueciae* 2 : 4. Type-species : *Musca funebris* Fabricius, Sweden.

2.2. Subgenus *Drosophila* Fallén

Drosophila Fallén 1823, *Diptera Sueciae Geomyz.* 2 : 4. Type-species : *Musca funebris* Fabricius, Sweden ; Sturtevant 1939, *Proc. Nat. Acad. Sci.* 25 : 139 ; Sturtevant 1942, *Univ. Texas Publ.* 4213 : 30.

2.3. The *histrio* group

Both species warrant their inclusion in *histrio* group because of the following characters : anterior reclinate minute ; second oral nearly as long as vibrissa ; palpus with a few prominent ventral setae ; posterior parameres apparently absent.

2.4. *Drosophila (Drosophila) guptai* sp. nov.

Male and female : Arista with about 4–5 dorsal and 2 ventral branches in addition to terminal fork. Antennae with second segment brown and third segment yellowish brown. Frons including ocellar triangle yellowish orange. Orbitals in ratio of 8 : 3 : 12. Second oral equal to vibrissa. Palpi yellow, with one prominent apical and 2–3 marginal setae. Carina yellowish orange, high and broadened below. Face and cheek yellowish orange, greatest width of cheek one-seventh greatest diameter of eye. Clypeus orange brown. Eyes dark red.

Acrostichal hairs in six regular rows. Anterior scutellars slightly divergent ; posterior ones crossing each other. Anterior dorsocentral two-third length of posterior dorsocentral ; distance between anterior and posterior dorsocentral two-fifth of distance between two anterior dorsocentrals. Mesonotum and scutellum unicolourous, reddish brown. Thoracic pleura yellowish brown. Sterno-index 0.66.

Legs greyish yellow, preapicals on all tibiae ; apicals on fore- and midtibiae.

Abdominal tergites yellow, 2–4T with medially interrupted V-shaped apical bands, 5T with medially projected apical band, and terminal tergites completely black.

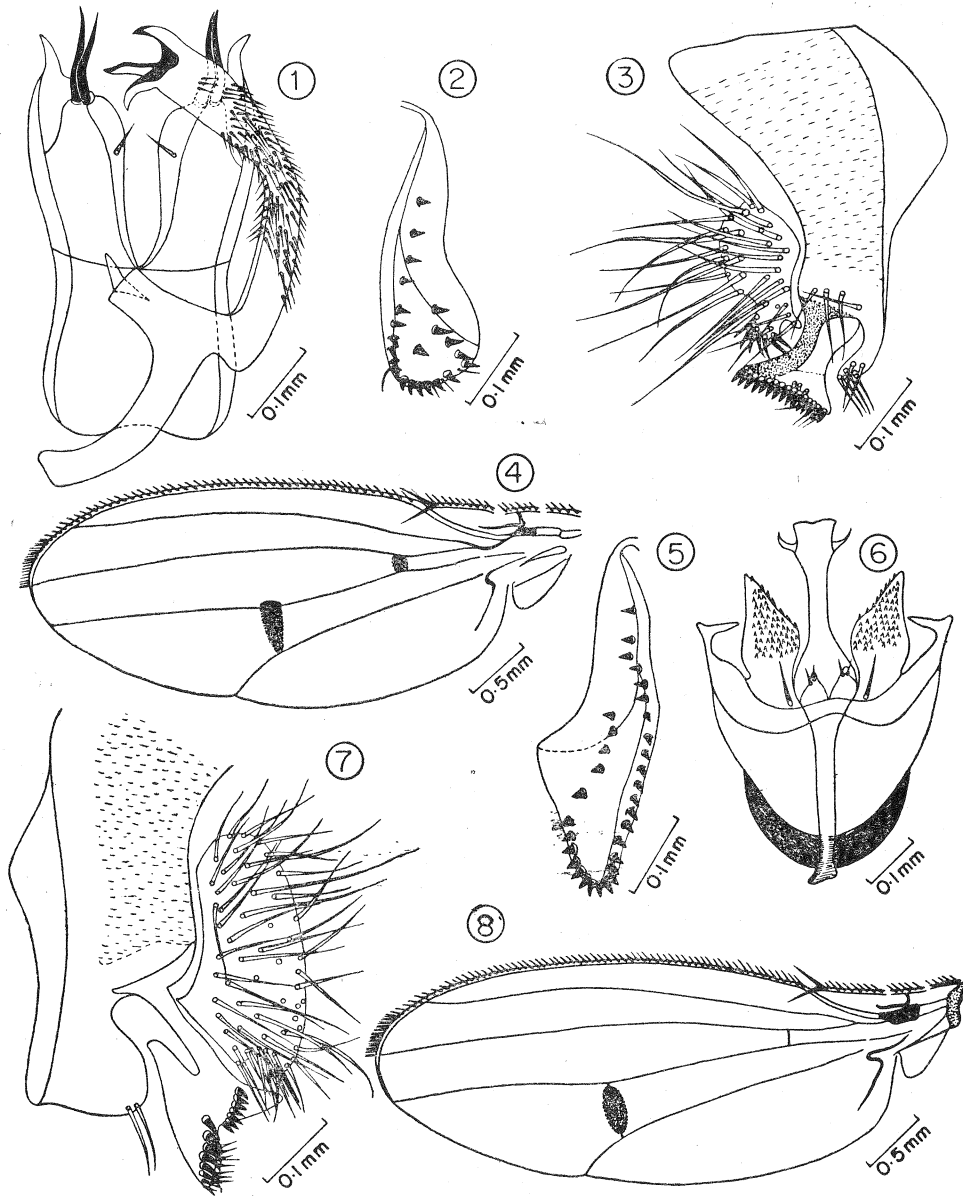
Wings (figure 4) transparent, cross veins deeply fuscous : C-1 bristles two ; C-3 bristles on basal half of third costal section. Indices : C-index 4.21 ; 4V-index 1.6 ; 4C-index 0.6 ; 5X-index 1.24. Halteres yellowish.

Average length of wing : 3.74 mm (♂) ; 4.1 mm (♀).

Average length of body : 3.45 mm (♂) ; 4.3 mm (♀).

Periphallalic organs (figure 3) : Genital arch dark brown, pubescent, dorsally broadened and narrowly projected ventrally like a gently curved tubular process, upper margin bare ; lower margin with 4 bristles at the insertion of clasper and 6 bristles at lower tip. Clasper large with 15 stout black teeth arranged in a straight row covering entire outer margin, medially with 3 small bristles, and with 4 fine setae ventrally. Anal plate brown, with about 28 bristles including some unusually long ones, ventrally narrowing and with 5–7 short stout black setae.

Phallic organs (figure 1) : Aedeagus yellowish brown, robust, gently curved, apically ending into three claw-shaped projections, medially covered with fine setae. Basal apodeme of aedeagus one-third as long as aedeagus, vertical rod developed. Anterior parameres fused with novasternum, each with one sensillum. Posterior parameres obscure. Caudal margin of novasternum with two pairs of very stout black submedian spines. Ventral fragma quadrate.



Figures 1-8. 1-4. *D. guptai*. 1. Phallic organs. 2. Egg-guide. 3. Periphallic organs. 4. Wing. 5-8. *D. ramamensis*. 5. Egg-guide. 6. Phallic organs. 7. Periphallic organs. 8. Wing.

Egg-guides (figure 2) : Lobe yellowish, narrowing proximally and broadly rounded distally, with 17 marginal and 5 discal stout black teeth. Basal isthmus narrow.

Holotype ♂, India : Ramam, Darjeeling District, West Bengal, May 1977, Colls. Dwivedi and Gupta.

Paratypes : 11 ♂♂, 16 ♀♀, collection data same as holotype.

All type specimens are at present deposited in the Museum, Department of Zoology, Banaras Hindu University, Varanasi, India. 2 ♂♂ and 2 ♀♀ from the paratype series are also deposited in the "*Drosophila* Collection" of the Department of Biology, Tokyo Metropolitan University, Setagaya-Ku, Tokyo, Japan. 1/82♀
2353/

Distribution : India.

This species somewhat resembles *D. trisetosa* Okada in abdominal tergites coloration, but distinctly differs from it in having anal plate with 5-7 short stout black setae ventrally (anal plate ventrally with a tuft of short fine hairs in *D. trisetosa*), aedeagus more robust, medially covered with fine setae and apically ending into three strong claw-shaped projections (aedeagus apico-dorsally with a short projection in *D. trisetosa*).

The species is named in honour of Dr J P Gupta of the Department of Zoology, Banaras Hindu University, Varanasi, India.

2.5. *Drosophila (Drosophila) ramamensis* sp. nov.

Male and female : Arista with 4 dorsal and 2 ventral branches in addition to terminal fork. Antennae with second segment brown and third segment yellowish brown. Frons including ocellar triangle yellowish brown. Orbitals in ratio of 9 : 3 : 12. Second oral stout, nearly equal to vibrissa. Palpi yellowish orange, with one prominent apical and few marginal seta. Carina orange, high and broadened below. Face and cheek orange, greatest width of cheek one-seventh greatest diameter of eye. Eyes dark red.

Acrostichal hairs in six regular rows. Anterior scutellars parallel, posterior ones crossing each other. Distance between anterior and posterior dorsocentral two-fifth of distance between two anterior dorsocentrals. Mesonotum and scutellum unicolourous, yellowish brown. Thoracic pleura brown. Sterno-index 0.61.

Legs yellow, preapicals on all tibiae; apicals on fore and midtibiae.

Abdominal tergites yellow, with medially interrupted V-shaped apical black bands.

Wings (figure 8) transparent, posterior cross vein deeply fuscous : C-1 bristles two; C-3 bristles on basal one-third of third costal section. Indices : C-index 5.6; 4V-index 1.1; 4C-index 0.36; 5X-index 0.75. Halteres yellow.

Average length of wing : 4.4 mm (♂); 4.8 mm (♀).

Average length of body : 3.84 mm (♂); 4.16 mm (♀).

Periphallalic organs (figure 7): Genital arch yellowish brown, broad, pubescent, heel rectangular, toe rounded and with 2 bristles. Clasper triangular, with 12 black teeth arranged in two closely placed sets; upper with 7 and lower with 5 relatively larger teeth, and with several fine short setae ventrally. Anal plate large, broadly truncate below, with several large bristles and 14-16 smaller bristles ventrally.

Phallic organs (figure 6) : Aedeagus yellowish brown, straight, narrowing in middle, apically expanded, and with hook-like processes laterally. Basal apodeme of aedeagus nearly equal. Anterior parameres small, conical, articulated to aedeagus, with two minute apical sensilla. Hypandrial plate broad at middle, narrowing apically with numerous tubercles. Caudal margin of novasternum with a pair of submedian spines. Ventral fragma broadly rounded distally.

Egg-guides (figure 5) : Lobe pale yellow, narrowing apically, with 27 marginal and 5 discal teeth. Basal isthmus short and narrow.

Holotype ♂ : India : Ramam, Darjeeling District, West Bengal, May 1977, Colls. Dwivedi and Gupta.

Paratypes : 3 ♂♂, 3 ♀♀, collection data same as holotype.

All type specimens are at present deposited in the Museum, Department of Zoology, Banaras Hindu University, Varanasi, India. 1♂ and 1♀ from the paratype series are also deposited in the "*Drosophila* Collection" of the Department of Biology, Tokyo Metropolitan University, Setagaya-Ku, Tokyo, Japan.

Distribution : India.

D. ramamensis appears to be an unique species in the *histrion* group in having two closely placed sets of black teeth on clasper, straight aedeagus which is narrow in middle, apically expanded and bearing hook-like processes laterally, and hypandrial plate with numerous tubercles.

The specific name of *D. ramamensis* is coined to denote the place, Ramam, from where it was collected for the first time.

Acknowledgements

The author is grateful to Dr T Okada, Emeritus Professor, Tokyo Metropolitan University, Setagaya-Ku, Tokyo, Japan for his help in confirming the identification. Thanks are also due to Prof C J Dominic, Head of the Zoology Department, for providing necessary laboratory facilities, and to the University Grants Commission for financial assistance.

References

- Bächli G 1973 Beitrag zur Kenntnis der Drosophiliden Fauna (Diptera) des Kanha Nationalparkes; *Vjschr. Naturf. Ges. Zürich* **118** 23-30
- Godbole N N and Vaidya V G 1973 Drosophilid Survey of Mahabaleshwar; *Drosophila Inform. Serv.* **50** 141
- Gupta J P 1969 A new species of *Drosophila* Fallén (Insecta : Diptera : Drosophilidae) from India; *Proc. Zool. Soc. (Calcutta)* **22** 53-61
- Gupta J P 1971 A new species of *Drosophila* (*Scaptodrosophila*) from Varanasi, India; *Amer. Midl. Naturalist* **86** 493-496
- Gupta J P 1972 *D. orissaensis* : A new species of *Drosophila* from Orissa; *Orient. Insects* **6** 491-494
- Gupta J P 1973 A preliminary report on Drosophilids of Manipur, India; *Drosophila Inform. Serv.* **50** 112
- Gupta J P 1974a The family Drosophilidae in India; *Indian Biologist* **5** 7-30
- Gupta J P 1974b Indian species of Drosophilidae exclusive of the genus *Drosophila*; *J. Ent.* **B43** 209-215
- Gupta J P and Ray-Chaudhuri S P 1970a Drosophilidae of Chakia forest, Varanasi, India; *Drosophila Inform. Serv.* **45** 168
- Gupta J P and Ray-Chaudhuri S P 1970b The genus *Drosophila* (Diptera : Drosophilidae) in Andaman and Nicobar Islands, India; *Orient. Insects* **4** 169-175
- Gupta J P and Ray-Chaudhuri S P 1970c Some new and unrecorded species of *Drosophila* (Diptera : Drosophilidae) from India; *Proc. R. Ent. Soc. London* **B39** 57-72
- Nirmala Sajjan S and Krishnamurthy N B 1972 Report on two new species of *Drosophila* from Mysore; *Drosophila Inform. Serv.* **48** 56

- Nirmala Sajjan S and Krishnamurthy N B 1973 *Drosophila neonasuta*—a new species of *Drosophila* from Mysore (Diptera : Drosophilidae); *Orient. Insects* **7** 267-270
- Nirmala Sajjan S and Krishnamurthy N B 1975 Two new Drosophilids from South India (Diptera : Drosophilidae); *Orient. Insects* **9** 117-119
- Nirmala Sajjan S and Reddy G S 1975 Two new species of *Drosophila* (*Scaptodrosophila*) (Diptera : Drosophilidae); *Orient. Insects* **9** 93-97
- Parshad R and Paika I J 1964 Drosophilid Survey of India. II. Taxonomy and cytology of the subgenus *Sophophora* (*Drosophila*); *Res. Bull. Punjab Univ.* **15** 225-252
- Parshad R and Duggal K K 1966 Drosophilid Survey of India. III. The Drosophilidae of Kashmir Valley; *Res. Bull. Punjab Univ.* **17** 277-290
- Parshad R and Singh A 1971 Drosophilid Survey of India. IV. The Drosophilidae of South Andamans; *Res. Bull. Punjab Univ.* **22** 385-399
- Prakash H S and Reddy G S 1977 Two new species of *Drosophila* (*melanogaster* species group) (Diptera : Drosophilidae); *Orient. Insects* **11** 597-604
- Reddy G S and Krishnamurthy N B 1968 *Drosophila rajasekari*—a new species from Mysore (India); *Proc. Indian Acad. Sci.* **68** 202-205
- Reddy G S and Krishnamurthy N B 1970 *Drosophila mysorensis*—a new species of *Drosophila* (Diptera : Drosophilidae) from Mysore, South India; *J. Biol. Sci.* **13** 24-29
- Reddy G S and Krishnamurthy N B 1971 Preliminary survey of Drosophilids in Nilgiris and Kodaikanal ranges; *Drosophila Inform. Serv.* **47** 116-117
- Reddy G S and Krishnamurthy N B 1973 Two new species of *montium* subgroup of genus *Drosophila* (Diptera : Drosophilidae); *Orient. Insects* **7** 259-265
- Singh A 1974 Description of a new species of the subgenus *Hirtodrosophila* (*Drosophila* : Drosophilidae : Diptera : Insecta) from Chandigarh, India; *Zool. J. Linn. Soc.* **54** 161-166
- Singh A 1976 Descriptions of new species of the genera *Sinophthalmus* and *Scaptomyza* (Insecta : Diptera : Drosophilidae) from Chandigarh, India; *Rec. Zool. Surv. India* **69** 187-202
- Singh B K and Gupta J P 1977 The subgenus *Drosophila* (*Scaptodrosophila*) in India (Diptera : Drosophilidae); *Orient. Insects* **11** 237-241
- Vaidya V G and Godbole N N 1976 Systematic study of Drosophilidae in Poona and neighbouring area IV; *J. Univ. Poona, Sci. Tech.* **48** 85-92