

✓ TWO NEW SPECIES OF *DROSOPHILA* FROM INDIA  
(DIPTERA : DROSOPHILIDAE)

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**ABSTRACT.** Two new species, *Drosophila brahmagiriensis* and *D. bhagamandalensis*, members of the *montium* subgroup of the *melanogaster* species-group collected from tropical rain forests of Western Ghats in Brahmagiri hills and Bhagamandala Ghats, Coorg District, Karnataka, India are described. The taxonomic status and relationships are discussed.

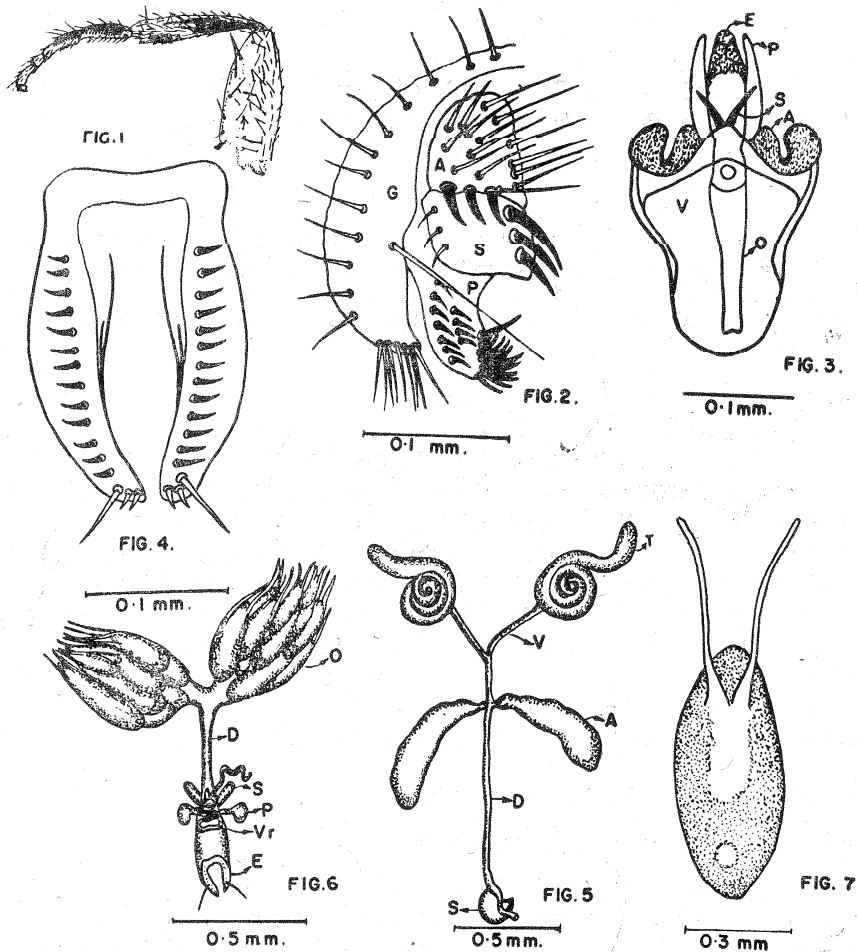
INTRODUCTION

Coorg district lies on the summit of the eastern and western slopes of the Western Ghats. It is situated on the south western part of Karnataka between latitude 11° 56' and 12° 50' and longitude 75° 22' and 76° 11'. The heavy rainfall during the south west monsoons favours thick tropical forest growth with several timber yielding and tropical fruit bearing trees, providing favourable natural habitats for the colonization by the members of the genus *Drosophila*. Recent collection trips undertaken to investigate the *Drosophila* fauna of Brahmagiri hills and Bhagamandala Ghats have yielded two new species, *Drosophila brahmagiriensis* and *D. bhagamandalensis*, belonging to *melanogaster* species-group of the subgenus *Sophophora* which are described here.

2466 / ✓ *Drosophila brahmagiriensis*, sp. nov. (Fig. 1-7)

*Body length* : Male 2.1 mm, Female 2.2 mm.

*Head* : ♂ and ♀ : Arista with 10 branches (6/4) including the terminal fork. Front dark brown. Antenna pale brown. Basal segment of the antenna dark tan. Carina prominent; raised, slightly convex. Palpi yellow and slender. Ocellar triangle small and brown. Ocellar bristles long and proclinate. Inner verticals longer, outer verticals shorter than inner. Orbital bristles in the ratio of 3 : 1 : 3. Eyes red. *Thorax* : ♂ and ♀ : Brown. Acrostichal hairs in 8 rows, regularly placed. Ratio anterior : Posterior dorsocentrals 0.6. Scutellum light brown. Anterior Scutellars convergent, posterior scutellars crossed. Sterno-index 0.6. Pre-scutellars absent. *Legs* : Pre-apicals on all tibiae. Apicals on first and second tibiae. Sex-comb of male (Fig. 1) longitudinal along the entire length of metatarsus and second tarsal segment. Metatarsal comb consisting of about 18-20 teeth, smaller above, longer below. The distal 2 displaced from axis of remaining teeth. Comb on second tarsal segment with 10-13 uniform teeth. *Wings* : ♂



Figs. 1-7. *Drosophila (Sophophora) brahmagiriensis*, sp. nov. : 1, Fore leg of male showing sex-combs; 2, Periphallal organs (A=Cerci, E=Epandrium, P=Primary surstylus, S=Secondary surstylus); 3, Phallic organs (A=Anterior gonopophyses, E=Aedeagus, O=Ejaculatory apodeme, P=Posterior gonopophyses, S=Sub median spine of novasternum, V=Ventral fragma); 4, Egg guide; 5, Male reproductive organs (T=Testes, V=Vas deferens, A=Accessory gland, D=Anterior ejaculatory duct, S=Sperm pump); 6, Female reproductive organs (O=Ovary, D=Oviduct, P=Paraovaria, S=Spermatheca, Vr=Ventral receptacle, E=Egg guide); 7, Egg.

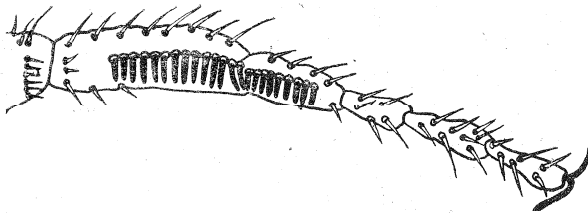
and ♀ : Transparent. *C*-index, 2.5, *4V*-index, 2.3, *5X*-index, 2.7, *M*-index, 0.9 (Wing indices calculated after Bock, 1976); 3rd costal section with heavy setation on basal 0.5. Wing lengths 2.1 mm (male), 2.3 mm (female), Halteres small, yellowish. *Abdomen*, ♂ and ♀ : First 4 tergites of male yellowish, with very distinct apical black bands. Fifth tergite with broader band, sixth tergite shiny yellow. First five tergites of female yellowish with distinct apical black bands. Sixth tergite brownish-yellow. *Periphallic organs* : (Fig. 2) Epandrium (Genital arch) broad dorsally and laterally, toe small with about eight bristles. Primary and secondary surstyli present. Primary surstylus (Primary clasper) broad, yellowish with an upper row of 7 and a lower row of 4 large black teeth and a cluster of 12 bristles on the ventromedial border, one long and slightly curved. Secondary surstylus (Secondary clasper) fused with cerci (Anal plate) and possesses two large curved black medial teeth above and one smaller tooth below, in addition to a row of smaller bristles along lateral borders and three large chitinous bristles dorsally. Cerci with 16-18 bristles. *Phallic organs* (Fig. 3) : Yellowish-brown, Aedeagus large, non-bifid with hairy sensilla at the apical region. Basal apodeme not projecting beyond fragma. Anterior gonopophyses (Anterior parameres) large, broad and triangular. Posterior gonopophyses (Posterior parameres) long, slender and nonserrate reaching the tip of aedeagus. Caudal margin of novasternum with median convexity, bearing a pair of submedian spines. *Egg guide* (Fig. 4) : Brown with 15 teeth and a subterminal hair. *Internal structures* : Testes (Fig. 5) yellowish with 3 coils. Accessory glands transparent and large. Spermathecae (Fig. 6) vestigial. Paraovaria large. Ventral receptacle long, tightly coiled. Malpighian tubules two pairs, free. *Egg filaments* (Fig. 7) : Two long slender filaments not flattened apically.

*Pupae* : Anterior spiracle with 10 black branches.

*Distribution* : India : Karnataka : Coorg district (Western Ghats) : Brahmagiri hills.

*Taxonomic status* : The nature of the banding pattern of the abdominal tergites, the presence of 2 egg filaments and the puparia warrant its inclusion in the subgenus *Sophophora*. The characters such as the presence of long ventral receptacle, coiled testes, convergent scutellars and two pairs of malpighian tubules qualify its inclusion in the *melanogaster* species-group (Patterson and Stone, 1952). Further, the prominent sex-comb extending beyond the tips of the tarsal joints, the presence of two claspers in the male and secondary surstylus with curved black median teeth permit its inclusion in the *montium* sub-group (Bock and Wheeler, 1972).

*Relationships and Remarks* : Okada (personal communication, Nov. 1980) pointed out that the new species resembled *Drosophila punjabiensis* Parshad and Paika, 1964, but differs from it in details. On comparison, it was found that the new species resembled *punjabiensis* in the sex-comb pattern but differed greatly in other morphological characters such as the abdominal banding pattern, number of rows of acrostichal hairs, the number of teeth in the sex-combs, number of arisal branches (6/4), wing indices, third costal section with heavy



0.2 mm

FIG. 8

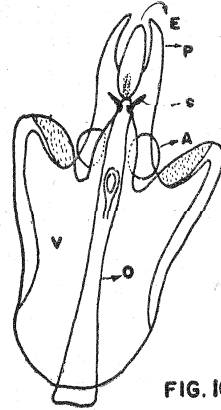


FIG. 10

0.1 mm.

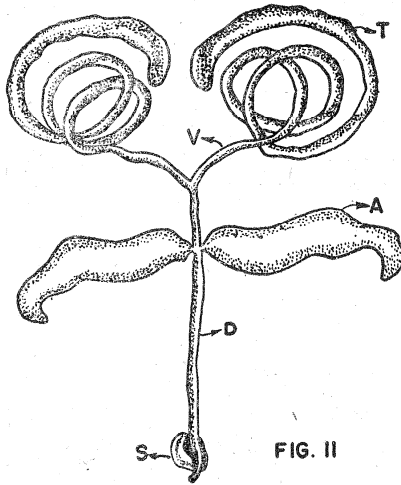


FIG. 11

0.5 mm

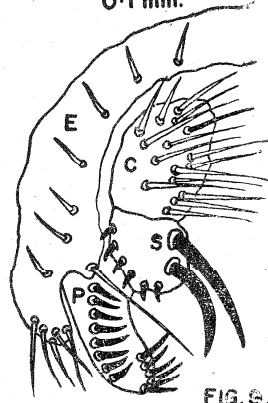


FIG. 9

0.1 mm

Figs. 8-11. *Drosophila (Sophophora) bhagamandalensis*, sp. nov. : 8, Fore leg of male showing sex-combs; 9, Peripheral phallic organs (C=Cerci, E=Epandrium, P=Primary surstylus, S=Secondary surstylus); 10, Phallic organs (A=Anterior gonopophyses, E=Aedeagus, O=Ejaculatory apodeme, P=Posterior gonopophyses, S=Submedian spine of novasternum, V=Ventral fragma); 11, Male reproductive organs (D=Anterior ejaculatory duct, A=Accessory gland, S=Sperm pump, T=Testes, V=Vas deferens).

setation on basal half, periphallic and phallic organs. In addition, the new species differed from the other known species of *montium* sub-group in possessing unique combination of characters, such as the nature of the sex-comb pattern in male, abdominal banding pattern, structure of periphallic and phallic organs. Hence it deserves the status of a new species in the *montium* sub-group.

The species can be cultured in the laboratory with standard wheat-cream-agar medium. It is named after Brahmagiri hills where it was collected for the first time.

*Holotype* ♂, INDIA : KARNATAKA : Coorg District, Brahmagiri hills, 3.x.80, Coll. N. Muniyappa, G. Sreerama Reddy, H.S. Prakash, D. Theertha Prasad, G.R. Shivakumar and S. Murali. Deposited in the museum of Department of Zoology, Manasagangotri, University of Mysore, Mysore. *Paratypes* : 10♂♂, 10♀♀, data as above. Deposited in the Department of Biology, Tokyo Metropolitan University setagaya-Ku, Tokyo, Japan and some will be deposited in the Zoological Survey of India, Calcutta, and some in IARI, New Delhi.

24/11/2 ***Drosophila bhagamandalensis*, sp. nov. (Fig. 8-11)**

*Body length* : Male 2.4 mm, Female 2.6 mm.

*Head*, ♂ and ♀ : Arista with 8 branches (5/3) including the terminal fork. Front light brown. Antenna light yellow. Palpi pale-yellow. Carina narrow. Eyes orange red. Orbital bristles in the ratio 2 : 1 : 2. Inner and outer verticals are of the same size. Ocellar triangle small, with two long ocellar bristles. *Thorax*, ♂ and ♀ : Pale brown. Acrostichal hairs in 8 rows, regularly placed. Ratio anterior : Posterior dorsocentrals 0.5. Scutellum light yellowish-brown. Anterior scutellars convergent, posterior scutellars crossed. Sterno-index 0.5. Prescutellars absent. *Wings*, ♂ and ♀ : Transparent, *C*-index, 2.43, *4V*-index 2.5, *5X*-index, 2.15. *M*-index, 1.00 (Wing indices calculated after Bock, 1976), 3rd costal section with heavy setation on basal 0.5 wing lengths : 2.4 mm (male) 2.5 mm (female). Halteres small, yellowish. *Legs* : Pre-apical bristles on all tibiae. Apicals on first and second tibiae. Sex-comb of male (Fig. 8) longitudinal on the metatarsus and second tarsal segment. Metatarsal comb consisting of about 15 teeth, smaller basally, longer distally, the distal 2 displaced from axis of remaining teeth. Comb on second tarsal segment with 8-9 uniform teeth. *Abdomen*, ♂ and ♀ : Tergites of both sexes yellowish with dark apical bands. The last tergite of male is shiny black. *Periphallic organs* (Fig. 9) : Epandrium (Genital arch) shiny black, broad dorsally and laterally. Toe round with 4-5 bristles. Primary and Secondary surstyli (Claspers) present. Primary surstylus with a lateral row of 7-8 teeth and a cluster of 6 strong ventro-medial bristles. Secondary surstylus fused with cerci (anal plate) and possesses two large curved black medial teeth, in addition to a row of smaller bristles along ventral and lateral borders. Cerci with 16 bristles. *Phallic organs* (Fig. 10) : Dark brown. Aedeagus large with sensilla at the basal region. Basal apodeme projecting beyond fragma. Anterior gonopophyses egg-shaped, posterior gonopophysis long, slender, non-serrate, reaching the tip of aedeagus. Caudal margin of novasternum with

median convexity, laterally with fine hairs and apically with a pair of submedian spines. *Internal structures* : Testes (Fig. 11) yellowish with 3 coils. Accessory glands transparent and large. Ventral receptacle long, tightly coiled. Malpighian tubules two pairs, free.

*Holotype* ♂, INDIA : KARNATAKA : Bhagamandala ghats, Coorg district, 3.x.80, Coll. N. Muniyappa, G. Sreerama Reddy, H.S. Prakash, D. Theertha Prasad and S. Murali. Deposited in the Department of Zoology, University of Mysore, Manasagangotri, Mysore. *Paratypes* : 5♂♂, 5♀♀, data as for holotype. Deposited in the Department of Biology, Tokyo Metropolitan University setagaya-ku, Tokyo, Japan.

*Distribution* : India : Karnataka : Coorg district (Western Ghats) : Bhagamandala Ghats.

*Relationships and Remarks* : Okada (Personal communication, Nov. 1980) pointed out that the new species resembled *D. jambulina* Parshad and Paika, 1964, but differed from it in details. On comparison, it was found that the new species resembled *D. jambulina* in the general coloration of the body, but differed in other morphological characters such as the number of teeth in the sexcombs, number of rows of acrostichal hairs, wing indices, 3rd costal section with heavy setation on basal half, Periphallic and phallic organs. In addition, the new species differed from other known species of *montium* sub-group in possessing the unique combination of characters such as the number of teeth in the sexcombs, abdominal banding pattern, structure of phallic and periphallic organs. Hence it deserves the status of a new species in the *montium* sub-group.

The new species could be cultured in the laboratory for two generations. The progeny obtained were very few and were used for the analysis of wing indices and other morphological characters. The new species is named after Bhagamandala, where it was collected for the first time.

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