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**DROSOPHILA PARAIMMIGRANS, A NEW SPECIES FROM SOUTH
KANARA, INDIA (DIPTERA : DROSOPHILIDAE)**

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(Received 4 December 1984)

Faunistic surveys of *Drosophila* were made from Charmadi Ghats of South Kanara District. A new species of *Drosophila* has been identified, which is a member of the *immigrans* group of subgenus *Drosophila*. It has been named and described as *Drosophila paraimmigrans*. Its taxonomic status and relationships are discussed.

(Key words: *Drosophila paraimmigrans*, new species, *immigrans* group)

The Western Ghats with its varied flora offers a rich variety of insect species. In the recent past, several workers have made faunistic surveys in different regions of the Ghats resulting in descriptions of several species of Drosophilidae (Reddy & Krishnamurthy, 1971, 1974; Ranganath & Krishnamurthy, 1972; Siddaveera Gowda & Krishnamurthy, 1972; Vaidya & Godbole, 1971, 1972, 1973, 1976; Prakash & Reddy, 1978a, 1978b, 1978c, 1980; Hegde & Krishnamurthy, 1980; Nagaraj & Krishnamurthy, 1980; Muniyappa & Reddy, 1980, 1982). Even so, several distinct tracts in the hills remain unexplored and must be the abode of a considerable variety of these dipterans. One such tract is the Charmadi Ghat in South Kanara District (12°25' and 13°58' North latitude and 74°35' and 74°40' East longitude) and a survey of of this region revealed the presence of a hitherto unknown species. This

communication deals with a detailed description of this new species.

***Drosophila paraimmigrans*: sp. nov.**
(Figs. 1-7)

Male and Female: Large brown flies.

Body length: Male 3.32 mm, Female 3.32 mm.

Head ♂ and ♀: Arista with 12 branches (5/7) including terminal fork. Frons brown. Antennae dark brown. Cheek with two vibrassae. Carina broad with few bristles. Palpus brown with a single straight bristle. Orbital bristles in the ratio of 2:1:1. Inner and outer verticals of same length and reclinate. Ocellar triangle small with 2 long bristles. Eyes red.

Thorax ♂ and ♀: Brown, Acrostichal hairs regular, in 8 rows. Anterior dorsocentral half the length of posterior. Scutellum light brown. Anterior scutellars convergent; posterior scutellars convergent and crossed. Prescutellars absent.

Wings ♂ and ♀: Smoky. Wing length 2.55 mm (male) and 2.70 (Female).

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	C-index	4V-index	4L-index	5X-index	M-index
Male	4.46	1.21	0.50	0.82	0.27
Female	4.35	1.23	0.52	0.89	0.30

Third costal section with heavy setation on basal 0.6 (Wing indices calculated after Okada, 1956 and Bock, 1976). Halteres pale brown.

Legs: Preapical bristles on all tibiae, apicals only on 2nd tibia. A row of thick peg like bristles (cuneiform) on the inner side of the first femur. Sex comb absent (Fig.1).

Abdomen ♂ and ♀: The tergites of both the sexes are brown.

Periphallic organs (Fig. 2). Epandrium very broad dorsally. Toe with 11 bristles not covering primary surstylus.

Heel not pronounced, with 3 bristles. Primary surstylus present with 14 stout black teeth arranged in a concave row. 3 elongated brownish bristles present on inner side of the teeth on the primary surstylus. Primary surstylus with a cluster of bristles on the inner margin pointing towards the ventral margin of the cercus. Secondary surstylus absent. Cercus more or less oblong and pubescent bearing 30 bristles. Cercus independent of primary surstylus and in addition bears 6 pointed teeth towards the ventral margin.

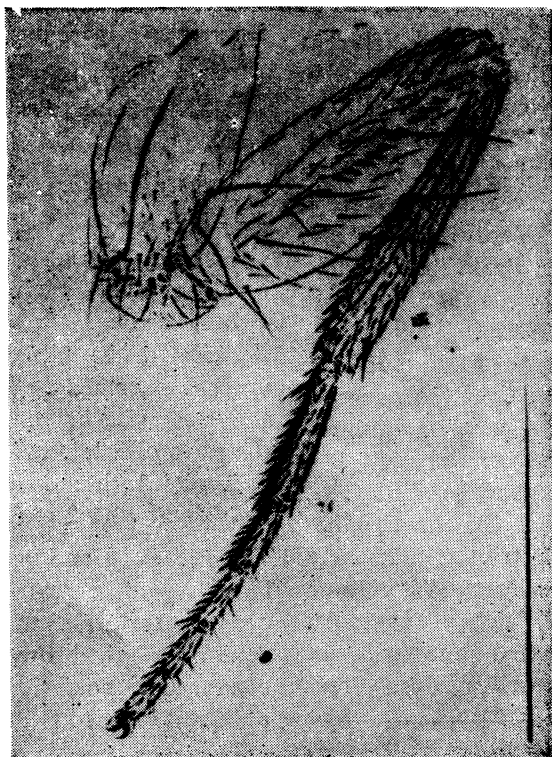


Fig. 1. Fore leg of male showing cuneiform bristles.

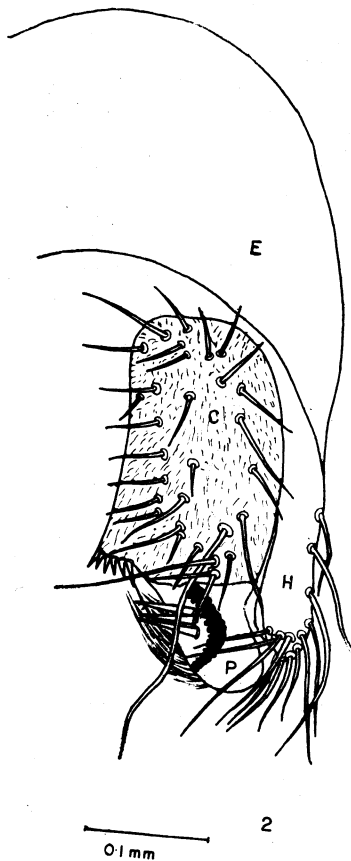


Fig. 2. Peripheral phallic organs: C = Cercus; E = Epandrium; H = Heel; P = Primary surstylus

Phallic organs (Fig. 3): Aedeagus pointed, cone shaped, non-bifid. Basal apodeme projects beyond ventral fragma. Anterior gonapophyses elongated and cylindrical. Posterior gonapophyses long, reaching tip of aedeagus. Caudal margin of novasternum concave bearing 6 short and 2 long spines. Ventral fragma broad with a spine arising at the base of novasternum.

Egg guide (Fig. 4): Pale yellow with 17 median teeth and 10 marginal teeth.

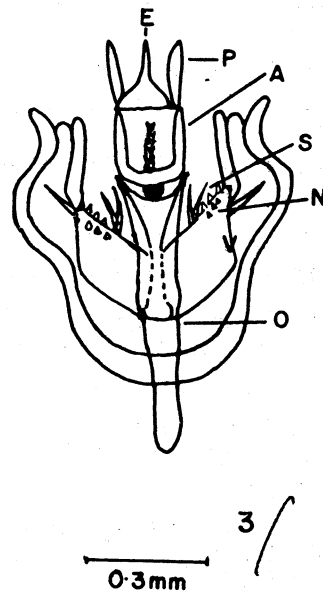


Fig. 3. Phallic organs: A = Anterior gonapophyses; E = Aedeagus; N = Novasternum; O = Basal apodeme; P = Posterior gonapophyses; S = Submedian spine of novasternum; V = Ventral fragma.

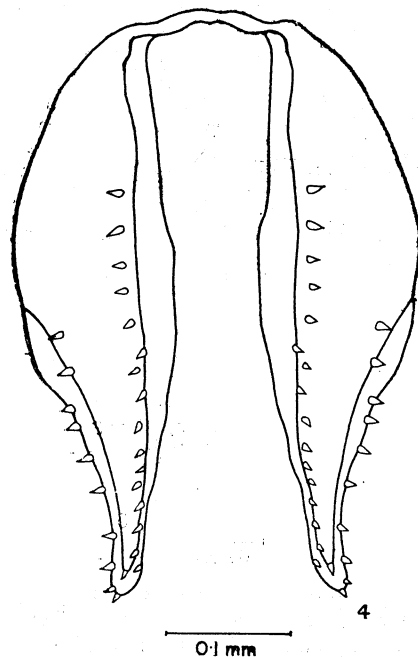


Fig. 4. Egg guide.

Internal structures: Testis (Fig. 5), Orange with coils. Accessory gland medium and transparent. Ejaculatory bulb oval. Spermatheca (Fig. 6) round. Paraovaria large and round. Ventral receptacle with several coils. Malpighian tubules two and fused.

Egg filaments: (Fig. 7), Four long slender filaments with tapering ends.

Pupa: Anterior spiracle with 25 branches arranged in a rosette like manner.

Distribution: INDIA, KARNATAKA, South Kanara District, Charmadi Ghats (Western Ghats).

Holotype ♂: INDIA, KARNATAKA: Charmadi ghats, South Kanara District,

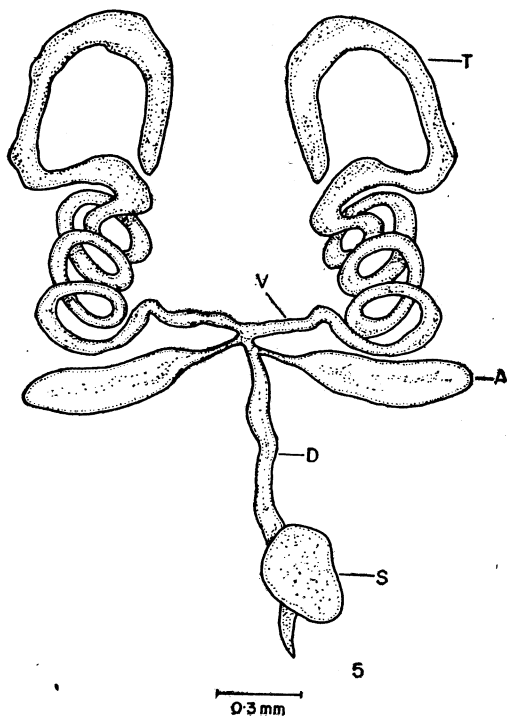


Fig. 5. Male reproductive organs: A = Accessory gland; D = Anterior ejaculatory duct; S = Ejaculatory bulb; T = Testis; V = Vas deferens.

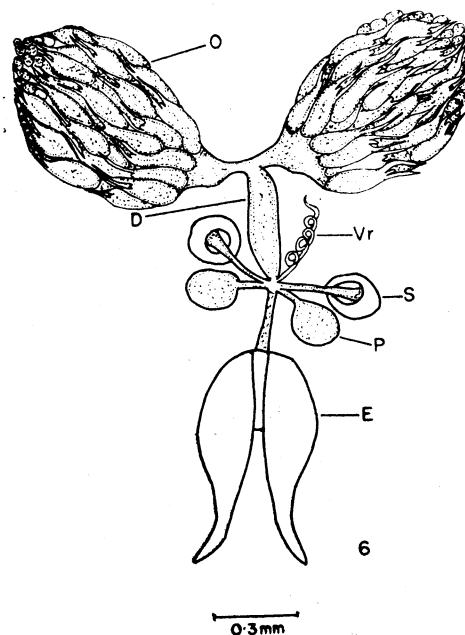


Fig. 6. Female reproductive organs: E = Egg guide; D = Oviduct; O = Ovary; P = Paraovaria; S = Spermatheca; Vr = Ventral receptacle.

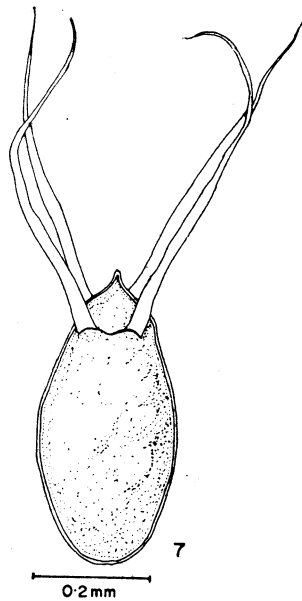


Fig. 7. Egg.

7×72. Colls. P. G. Gai, N. B. Krishnamurthy, S. N. Hegde. **Paratypes:** 12 ♂♂ and 8 ♀♀: same data as holotype. The holotype and some paratypes deposited in the Department of Zoology, University of Mysore, Manasagangotri, Mysore. 4 ♂♂ and 3 ♀♀ are deposited in the Department of Biology, Tokyo Metropolitan University, Setagaya-ku, Tokyo, Japan.

Relationships and Remarks: The presence of 4 egg filaments with tapering ends and testis with 4 coils justifies its inclusion in the subgenus *Drosophila* (Patterson and Stone, 1952). A row of 10 short thick peg like bristles (cuneiform) on the inner side of the first femur; heel not very pronounced; toe pointing downward and not covering primary surstylus; cerci oblong; presence of only primary surstylus with a single concave row of teeth warrants the inclusion of this species in the *immigrans* species group (Hsu, 1949; Okada, 1956; Wilson *et al.*, 1969).

Okada (personal communication, December, 1982) has pointed out that the new species belongs to the *immigrans* species group. A unique feature of this new species is that the epandrium is very broad towards the dorsal side of the cercus, which is not found in any other members of this group. On comparison with other members of the *immigrans* group, it shows resemblance to *D. immigrans* in having a heel not very pronounced; pointed toe; protruded primary surstylus and also in the arrangement of teeth on the primary surstylus. It also resembles *D. immigrans* in the structure and number of coils of the testis; in the shape and size of the spermathecae and paraovaria

(Throckmorton, 1962). Hower, it distinctly differs from *D. immigrans* in the absence of pigmentation at the posterior tip of abdomen of males. The presence of 11 long bristles on toe, 14 black stout teeth on primary surstylus, cluster of bristles on the inner margin of primary surstylus pointing towards ventral margin of cerci and an oblong pubescent cercus with about 30 bristles demands an independent status for this new species. This species is named as *Drosophila paraimmigrans*.

Acknowledgements: The authors are grateful to Prof. T. Okada, (Emeritus Scientist), 2-30-18 Setagaya-ku, Tokyo, Japan for his help in confirming the identity of the species. One of us (P G G) is thankful to the University of Mysore and U G C for the award of Teacher-Fellowship under F I P and also to the authorities of Vijaya College, Bangalore. for deputing him to the University of Mysore, Mysore. We thank Dr. S. N. Hegde and Dr. V. Vasudev for their helpful discussions and Dr. S. R. Ramesh for the drawings.

REFERENCES

- BOCK, I. R. (1976) *Drosophilidae* of Australia-I. *Drosophila* (Insecta : Diptera). *Aust. J. Zool., Suppl. Serv.*, 40, 1-105.
- GOWDA, S. S. & N. B. KRISHNAMURTHY (1972) Report on *Drosophila* species in Charmadi Ghats (Mysore State, India). *Dros. Inf. Serv.*, 48, 38.
- HEGDE, S. N. & N. B. KRISHNAMURTHY (1980) Studies on the *Drosophila* fauna from three different localities of Maharashtra State, India. *Dros. Inf. Serv.*, 55, 60-61.
- Hsu, T. C. (1949) The external genital apparatus of male *Drosophilidae* in relation to systematics. *Univ. Texas Publ.*, 4290, 80-142.
- MUNIYAPPA, N. & G. S. REDDY (1980) *Drosophila madikerii*, sp nov. from Coorg District (Western Ghats), Karnataka, India (Diptera: *Drosophilidae*). *Oriental, Ins.*, 14 (4), 449-502.
- MUNIYAPPA, N. & G. S. REDDY (1982) *Drosophila cauverii*, a new species of *Drosophila*

- from Coorg District, Western Ghats, South India. *Entomon*, 7 (1), 1—6.
- NAGARAJ, H. J. & N. B. KRISHNAMURTHY (1980) *Drosophila* fauna of Dandeli and Ambikanagar. *Dros. Inf. Serv.*, 55, 114.
- OKADA, T. (1956) *Systematic Study of Drosophilidae and Allied Families of Japan*. Gihodo Co. Ltd., Tokyo, Japan.
- PATTERSON, J. T. & W. S. STONE (1952) *Evolution in Genus Drosophila*. The MacMillan Co., New York, U. S. A.
- PRAKASH, H. S. & G. S. REDDY (1978a) *Drosophila agumbensis*, sp. nov. from Karnataka, South India (Diptera: Drosophilidae). *Oriental: Ins.*, 12 (2), 259—263.
- PRAKASH, H. S. & G. S. REDDY (1978b) *Drosophila* fauna of Sahyadri Hills (Western Ghats) with description of a new species. *Proc. Indian Acad. Sci.*, 88B (1), 65—72.
- PRAKASH, H. S. & G. S. REDDY (1978c) *Drosophila* fauna of Bababudangiri and Kemmangundi Hill ranges (Western Ghats). *Entomon*, 3 (1), 85—90.
- PRAKASH, H. S. & G. S. REDDY (1980) *Drosophila* fauna of Nagarhole, South India, including description of a new species (Diptera: Drosophilidae). *Proc. Indian Acad. Sci.*, 89 (3), 235—241.
- RANGANATH, H. A. & N. B. KRISHNAMURTHY (1972) Preliminary survey of *Drosophila* in Biligirirangana Hills (Mysore, India). *Dros. Inf. Serv.*, 48, 132—133.
- REDDY, G. S. & N. B. KRISHNAMURTHY (1971) Preliminary survey of Drosophilids in Nilgiris and Kodaikanal ranges. *Dros. Inf. Serv.*, 47, 116—117.
- REDDY, G. S. & N. B. KRISHNAMURTHY (1973—1974) Systematics and distribution of *Drosophila* fauna of South India. *J. Mys. Univ.*, 26 (B), 54—64.
- THROCKMORTON, L. H. (1962) The problem of phylogeny in the Genus *Drosophila*. *Univ. Texas Publ.*, 207—344.
- VAIDYA, V. G. & N. N. GODBOLE (1971) Systematic study of Drosophilidae in Poona and neighbouring areas. I. *J. Univ. Poona*, 40, 49—61.
- VAIDYA, V. G. & N. N. GODBOLE (1972) Systematic study of Drosophilidae in Poona and neighbouring areas. II. *J. Univ. Poona*, 42, 93—94.
- VAIDYA, V. G. & N. N. GODBOLE (1973) Systematic study of Drosophilidae in Poona and neighbouring areas. III. *J. Univ. Poona*, 44, 41—43.
- VAIDYA, V. G. & N. N. GODBOLE (1976) Systematic study of Drosophilidae in Poona and neighbouring areas. IV. *J. Univ. Poona*, 48, 85—92.
- WILSON, F. D., M. R. WHEELER, M. HARGET & M. KAMBYSELLIS (1969) Cytogenetic relations in the *Drosophila nasuta* subgroup of the *immigrans* group of species. *Univ. Texas Publ.*, 6918. 207—254.