

✓ *DROSOPHILA AGUMBENSIS*, SP. NOV.
FROM KARNATAKA, SOUTH INDIA
(DIPTERA : DROSOPHILIDAE)

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ABSTRACT. *Drosophila agumbensis*, sp. nov., a member of the *montium* subgroup of the *melanogaster* species group collected from Agumbe (a part of Western Ghats) is described. The systematic position and the affinities of this new species are discussed.

Agumbe, a part of the second phytogeographical region of Western Ghats, is situated at an altitude of 826m with an average rainfall of 8275.7 mm annually. It supports a thick evergreen timber forest and offers a congenial environment for colonization by *Drosophila* species. Recent *Drosophila* collection from this area yielded a new species belonging to the *montium* subgroup of the *melanogaster* species group which is named *Drosophila agumbensis* and is herein described.

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✓ *Drosophila agumbensis*, sp. nov. (Figs. 1-8)

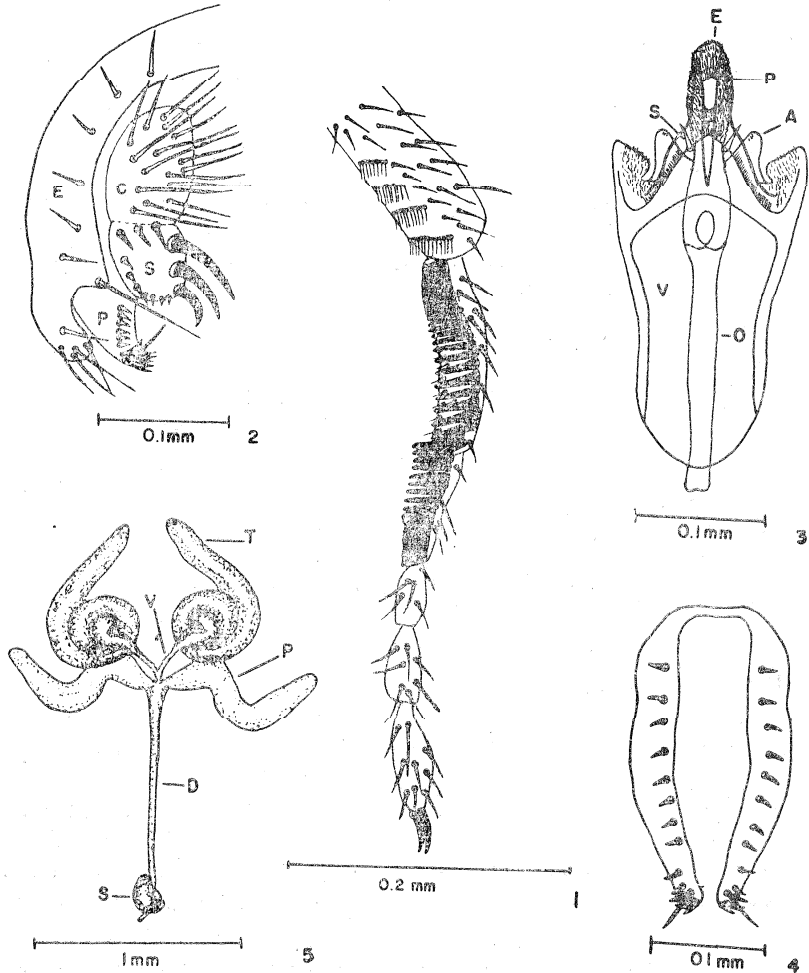
montium subgr.

Male and female : Males bright yellow; females light yellow. Mean body length, males 2.18 mm (range 2.13-2.27 mm), females 2.44 mm (range 2.33-2.53 mm).

Head, ♂ and ♀ : Arista with 9 branches (5/4) including terminal fork. Front light brown. Antenna dark brown. Cheek with several vibrissae, of which one is straight. Palpi light yellow with single straight bristle. Carina narrow. Anterior orbitals same size as posterior orbitals, middle one half the size of anterior. Inner verticals longer, outer verticals small and three-fourths length of inner. Ocellar triangle dark brown and shiny with two long ocellar bristles.

Thorax, ♂ and ♀ : Brownish yellow. Acrostichal hairs in 8 rows, regularly placed. Anterior dorsocentrals smaller than posteriors. Scutellum light yellowish brown. Anterior scutellars convergent, posterior scutellars crossed. Anterior sternopleurals three-fourths length of posterior, middle sternopleurals small and less chitinized. Prescutellars absent.

Wings, ♂ and ♀ : Transparent. Mean wing length, males 2.02 mm (range 1.97-2.10 mm), females 2.19 mm (range 2.10-2.23 mm). Halteres small yellowish.



Figs. 1-5. *Drosophila agumbensis*, sp. nov. : 1, Fore leg of male showing sex-combs; 2, Peripheral organs : C=Cerci, E=Epandrium, P=Primary surstylus, S=Secondary surstylus; 3, Phallic organs : A=Anterior gonopophyses, E=Aedeagus, O=Ejaculatory apodeme, P=Posterior gonopophyses, S=Submedian spine of novasternum, V=Ventral fragma; 4, Egg guide; 5, Male Reproductive organs : D=Anterior ejaculatory duct, P=Paragonia, S=Sperm pump, T=Testis, V=Vas deferens.

Wing indices calculated as per the formulae of Okada (1956)

	<i>Costal index</i>	<i>4V index</i>	<i>4C index</i>	<i>5X index</i>
	<i>2nd Costal Section/3rd Costal Section</i>	<i>4th Section of IV Vein/3rd Section of IV Vein</i>	<i>3rd Costal Section/3rd Section of IV Vein</i>	<i>Last Section of V Vein/ Posterior Cross Vein</i>
Male	2.00	2.78	1.55	2.86
Female	2.15	2.60	1.40	2.68

Legs : Preapical bristles on all tibiae; apicals only on first and second tibiae. Sex-comb of male (Fig. 1) longitudinal along entire lengths of metatarsus and second tarsal segment. Metatarsal comb consisting of about 31 teeth, 18 of which on upper portion are small, densely packed, contiguous; the remaining 13 teeth on lower portion are large, stout and distinct; the lowermost 2 displaced from axis. Comb on second tarsal segment consisting of about 21 teeth, 9 of which on upper portion are large, stout and distinct; the remaining 12 teeth on lower portion are small, densely packed and contiguous.

Abdomen, ♂ and ♀ : Tergites of male shiny yellow, first 4 with narrow dark apical bands, remaining tergites yellow. Tergites of female light yellow with broad apical bands, 6th tergite becoming darker in older specimens.

Periphallic organs (Fig. 2) : Epandrium (genital arch) broad dorsally and laterally; toe with 4 to 5 bristles. Primary and secondary surstyli present. Primary surstylus (primary clasper) with a lateral row of about 6 teeth and a ventromedial cluster of teeth, of which one is elongated. Secondary surstylus partially separated from cerci (anal plate), with 3 very large curved black medial teeth and smaller bristles along ventral and lateral borders. and 3 large bristles dorsally. Cerci roughly oval, with about 12 bristles.

Phallic organs (Fig. 3) : Yellow. Aedeagus hirsute, subapically narrowed; basal apodeme long, straight. Anterior gonopophyses (anterior parameres) large, triangular, with minute sensilla. Posterior gonopophyses (posterior parameres) long, slender, reaching tip of aedeagus, with finely serrate margins. Caudal margin of novasternum with median convexity, laterally with fine hairs and apically with a pair of submedian spines.

Egg guide (Fig. 4) : Brown, with about 13 teeth and a subterminal hair.

Internal structures : Testes yellow with 3 coils, of which inner is swollen. Accessory glands transparent and large. Ejaculatory bulb globular (Fig. 5). Spermathecae small; paraovaria ovoid and large. Ventral receptacle long, tightly coiled (Fig. 6). Malpighian tubules two pairs, free.

Egg filaments (Fig. 7) : 2 long slender filaments, not flattened apically.

Pupae : Anterior spiracle with about 7 branches.

Chromosomes (Fig. 8) : Somatic metaphase of female larval neuroblast cells reveal 2 pairs of V-shaped chromosomes, a pair of rods and a pair of dots, while in male one of the rods is replaced by a J-shaped Y-chromosome. The polytene

chromosome complement consist of 5 long arms and a short arm radiating from the chromocenter.

The species can be cultured in the laboratory. The progenies obtained were used for the analysis of wing indices and other morphological characters.

Holotype ♂, INDIA : KARNATAKA : Western Ghats : Agumbe, 13. vii. 1977, Coll. H.S. Prakash and G. Sreerama Reddy. Deposited in the Museum of Department of Zoology, Manasa Gangotri, University of Mysore, Mysore. *Allotype* ♀, data as above. *Paratypes* : 10 ♂♂ and 10 ♀♀, INDIA : KARNATAKA : Western Ghats : Agumbe, Coll. H.S. Prakash and G. Sreerama Reddy. Deposited in the Department of Biology, Tokyo Metropolitan University, Setagaya-Ku, Tokyo, Japan, and some will be deposited in Z.S.I., Calcutta and I.A.R.I., New Delhi.

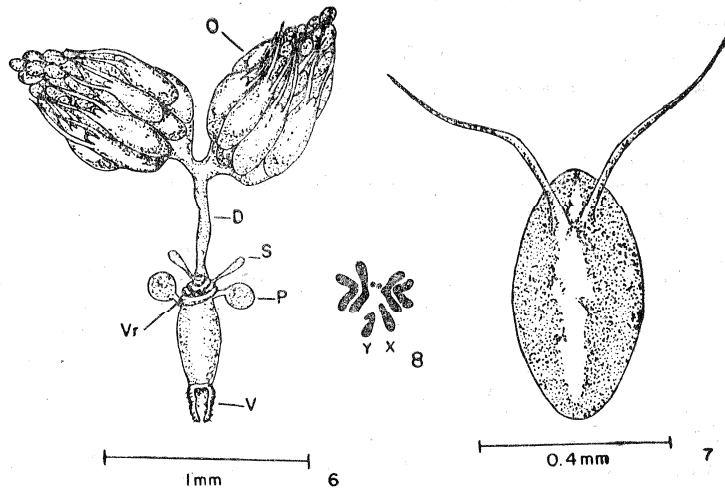
Distribution : India : Western Ghats : Karnataka.

Relationships and remarks : The presence of coiled ventral receptacle, posterior pair of malpighian tubules which are free, eggs with 2 filaments and the banding pattern of the abdomen warrant the inclusion of this species in the subgenus *Sophophora*. Such characters as the presence of sex-combs; periphallic organs with well developed epandrium, cerci and a pair of surstyli with teeth (setigerous claspers); phallic organs with anterior and posterior gonopophyses; long coiled ventral receptacle; spiral testes and non-skipping larvae qualify its inclusion in the *melanogaster* species group (Bock and Wheeler, 1972). Further, the presence of yellowish abdominal tergites with distinct apical bands; sex-combs of male longitudinal along entire lengths of the metatarsus and second tarsal segment; the nature of the secondary surstylus with curved black median teeth and hirsute aedeagus permits its inclusion in the *montium* subgroup (Bock and Wheeler, 1972).

Okada (personal communication, 1977) has pointed out that the new species resembles *D. vulcana* Graber 1957, but differs from it in details. On comparison with other members of the *montium* subgroup, it is also found that the new species resemble *D. punjabiensis* Parshad and Paika 1964 and *D. jambulina* Parshad and Paika 1964, in the structure of periphallic and phallic organs. However, the new species distinctly differ from them in the nature of abdominal banding pattern in males; number and pattern of teeth in the sex-combs; longer and much stouter medial teeth in the secondary surstylus; a fully hirsute aedeagus; and in the wing indices. Further, the combination of characters such as, the number and pattern of teeth in the sex-combs; abdominal banding pattern in males, as well as the structure of periphallic and phallic organs are unique to this species and are not found together in any of the known species of *montium* subgroup. Therefore, it deserves the status of a new species.

The specific name *Drosophila agumbensis* is coined to denote the place, Agumbe, from where it was collected for the first time.

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Figs. 6-8. *Drosophila agumbensis*, sp. nov. : 6, Female Reproductive organs : D=Oviduct, O=Ovary, P=Paraovaria, S=Spermatheca, V=Egg guide, Vr=Ventral receptacle; 7, Egg; 8, Mitotic metaphase chromosomes of male.

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