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✓ TWO NEW SPECIES OF THE MONTIUM SUBGROUP OF  
GENUS *DROSOPHILA* (DIPTERA : DROSOPHILIDAE)

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**ABSTRACT.** Maiden collection trips made to Nilgiri Hills have yielded two new species of *Drosophila* viz., *D. anomelani* and *D. coonorensis* in addition to certain known species. The morphology and internal features of the imagines of both the sexes are described and their relationships are discussed.

Recently collection trips undertaken to explore the various species of *Drosophila* from the Nilgiri Hills, yielded two new species. One of these named *D. anomelani*, was trapped in Merupalyam at an altitude of 1200m and the other new species named *D. coonorensis*, was found in Coonor at an altitude of 1800 m.

✓ 1. *Drosophila anomelani*, sp. nov. (Figs. 1-7)

*Male and female* : Bright yellow; mean body length of the male 1.96 mm, ranging from 1.7 to 2.1 mm, and that of the female 2.36 mm, ranging from 2.33 to 2.43 mm.

*Head* : Arista with nine branches (5/4) including forked. Terminal segment of the antenna tan brown and the basal segment light yellow with fifteen to sixteen bristles. Vibrissae with three stiff medium sized bristles along with a number of smaller ones. Palpi yellow and slender with a single stiff bristle. Face light brown. Carina narrow and shiny white. Ocellar triangle small and light brown. Ocellar bristles long and proclinate. Anterior verticals longer and proclinate. Posterior verticals three-fourths the anterior and reclinate. Anterior orbitals proclinate. Posterior and middle ones are reclinate. Posterior is the longest and about one and a half the anterior.

*Thorax* : Brownish-yellow. Acrostichal hairs in 8 rows, regularly placed. Anterior sternopleurals three-fourths the posterior. Middle sternopleurals absent. Anterior dorsocentrals are smaller than the posterior. Scutellum light yellowish-brown. Posterior scutellars convergent and crossed. Anterior scutellars convergent and not crossed. Prescutellars absent. Postalars as long as the anterior. Wings smoky and hyaline. Mean length of the wing in males 1.83 mm, ranging from 1.60 to 2.06 mm and that of the females 1.93 mm ranging from 1.83 to 2.00 mm. Halteres pale yellow.

*Wing indices :*

	<i>Costal index</i>	<i>4 V index</i>	<i>4 C index</i>	<i>5 X index</i>
<i>Male</i>	2.13 1.6-3.0	2.66 2.00-3.22	3.12 2.50-5.00	2.71 2.25-3.33
<i>Female</i>	2.29 1.85-2.50	2.40 2.18-2.63	3.39 3.00-4.67	2.53 2.00-3.33

*Legs :* The first and second tarsal segments of the fore legs in male carry each a sex comb consisting of 18 to 19 teeth in the first and 14 to 17 teeth in the second set (Fig. 1). Preapicals on all tibiae.

*Abdomen :* Light yellowish. Abdominal banding pattern is more or less similar to *D. melanogaster* though not in intensity. However, the dark bands are more prominent in females than males. Banding pattern is continuous without any median interruption. The tergites of the last three segments in males and two segments in females are devoid of such dark bands.

*Periphallic organs :* Genital arch yellow, narrow above and broad in the middle and continue below as club-shaped structure ending in a roundish heel, which is rather indistinguishable from the toe (Fig. 2). The genital arch carries 16 long slender bristles on the heel, under margin and anterior margin. Primary clasper rhomboidal with ten stout teeth-like bristles, of which 4 are arranged in a row and 6 are irregular in disposition. In addition there are six slender pointed bristles bent inwards. The outer angle of the primary clasper shows the presence of an exceedingly long pointed bristle projecting inwards. Secondary clasper is more or less triangular and is independent of the anal plate. On the outer margin of the secondary clasper there are eight dark slender bristles arranged in a row. There are two stout chitinous pointed teeth originating from the inner angle of the inner margin. The anal plate is independent of the genital arch and characteristically dark with a single stout chitinised tooth-like bristle originating from the inner angle of the under margin. There are 14 to 15 slender bristles which are unevenly distributed.

*Phallic organs :* Pale yellow. Aedeagus is rod-like, non-serrate, without prominent basal vertical rod on its ventral surface. Anterior paramere small, oval structures, inserted on novasternum and bear a number of sensilla subapically. Posterior parameres unbranched, laterally compressed and basally attached to aedeagus and novasternum. Novasternum with lateral blunt processes and a median conical process. On the lateral corners of this median process are found two stout black submedian spines. Ventral fragma distally broadened and caudally rounded. Basal apodeme longer than the aedeagus (Fig. 3).

*Egg guide :* Egg guide with lobe well sclerotized and carries 11 to 13 teeth. The ultimate tooth of these is evidently isolated from the others (Fig. 4).

*Eggs* : With two filaments.

*Internal characters* : Testis light yellow with three coils (Fig. 5). Vasa deferentia are peculiarly wide tubes, showing constrictions a little in front of the common duct. This common duct again widens, then shows a mild constriction and finally continues as the anterior ejaculatory duct. Paragonia are club shaped and transparent as in *D. melanogaster*. Spermathecae round, ventral receptacle coiled (fig. 6). Malpighian tubules two pairs, stalked, forked and free.

*Cytology* : Somatic metaphase of the female neuroblast cells reveal two pairs of V-shaped chromosomes, a pair of rods and a pair of dots. In males one of the rods is replaced by a V-shaped metacentric chromosome representing the Y-chromosome. The salivary gland nuclei reveal five long arms and a short arm (Fig. 7) radiating from the chromocenter. A paracentric heterozygous inversion in the left arm of the second chromosome (Fig. 7) is observed in a high frequency.

*Holotype* ♂, INDIA : Madras : Nilgiris : Merupalyam, 1200m, 26. xii. 1970, Coll. G. Sreerama Reddy and N. B. Krishnamurthy; deposited in the Museum of Department of Zoology, Manasa Gangotri, University of Mysore, Mysore. *Allotype* ♀, data as above. *Paratypes* 8 ♂♂ and 8 ♀♀. INDIA : Madras; Nilgiris : Merupalyam, Coll. Sreerama Reddy and Krishnamurthy. 2 ♂♂ and 2 ♀♀ deposited in Z.S.I, Calcutta; 2 ♂♂ and 2 ♀♀ in I.A.R.I, New Delhi; 2 ♂♂ and 2 ♀♀ in Department of Biology, Tokyo Metropolitan University Setagaya-Ku, Tokyo, Japan and 2 ♂♂ and 2 ♀♀ in the University of Texas reference collections.

*Distribution* : India : Madras and Mysore.

*Relationships and remarks* : The presence of two egg filaments, the nature of puparia, the banding pattern of abdominal tergites warrant its inclusion in the subgenus *Sophophora*. The characters like the presence of long ventral receptacle, coiled testis, convergent scutellars and two pairs of malpighian tubules qualify its inclusion in the *melanogaster* group (Patterson and Stone 1952). Further, the prominent sex comb extending beyond the tips of the tarsal joints, presence of two claspers in the male with the primary clasper having single group of teeth, large anterior paramere, which is not continuous with aedeagus, the egg guide with sclerotized lobe, with an isolated ultimate tooth permits its inclusion in the *montium* subgroup (Okada 1956, and Gupta and Ray-Chaudhuri 1970).

Okada (Personal communication 1971) has pointed out that the new species *D. anomelani* is nearer to *D. truncata*, but different from it in having a dark anal plate. This new species shows the general features of *montium* subgroup along with the other members like *D. truncata*, *D. montium*, *D. mysorensis* and *D. kikkawai* (Okada 1964, Sreerama Reddy and Krishnamurthy 1970 and Gupta & Ray-Chaudhuri 1970), but there are some note-worthy

differences between them and the new species. To mention some, the number of teeth in sex comb of this species differs from all others except *D. montium*. The shape and size of the primary clasper and the number, shape and arrangement of teeth in this species show marked differences from the other species. The relationship of secondary clasper with the anal plate and the number and nature of teeth in it, also differs from others. Further, *D. anomelani* described here differs from *D. truncata* in the number of arisal branches, rows of acrostichals, pattern and intensity of abdominal pigmentation in females, shape of the genital arch and in having dark pigmented anal plate. It also differs from *D. mysorensis* in the number of arista and in the nature of abdominal pigmentation. Therefore the new species herein described deserves the status of a species in the montium subgroup.

The specific name of *D. anomelani* is coined to denote the characteristic dark colour of the anal plate.

2. *Drosophila coonorensis*, sp. nov. (Figs. 8-9)

*parvula*  
Syn. of *thepalea* Book of Wheeler  
1972

cf. *Wata*  
1977  
Catalog  
Orient.  
: 370

*Male and female* : Yellow; mean body length of male 2 mm, ranging from 1.90 to 2.50 mm and that of the female 2.5 mm, ranging from 2.2 to 2.8 mm.

*Head* : Arista with 8 branches (5/3) including forked. Antenna tan brown. Anterior orbitals proclinate. Posterior reclinate and longest. Middle three-fourths the posterior and reclinate. Ocellar triangle narrow and brownish. Ocellar bristles long and proclinate. Anterior verticals longest and proclinate. Post-verticals reclinate. Posterior verticals small and reclinate.

*Thorax* : Acrostichals in 8 rows. Anterior dorsocentrals smaller than the posterior. Scutellum light yellowish-brown. Anterior scutellars convergent. Posterior scutellars convergent and crossed. Wings hyaline. Mean length of the wing in male 1.94 mm, ranging from 1.90 mm to 1.98 mm and in females 2.23 mm, ranging from 1.93 mm to 2.34 mm.

*Wing indices* :

	<i>Costal index</i>	<i>4V index</i>	<i>4C index</i>	<i>5X index</i>
<i>Males</i>	2.65	2.24	3.42	2.29
	2.13-2.72	2.16-2.25	2.62-5.00	2.12-2.60
<i>Females</i>	2.78	2.00	3.50	2.00
	2.25-2.82	1.96-2.52	3.30-4.52	1.98-2.30

*Legs* : Preapicals on all tibiae. The first and second tarsal segments of the fore legs in males carry each a sex comb. The first one contains 10 to 12 teeth and second has 7 to 9 teeth (Fig. 8).

*Abdomen* : The abdominal pigmentation in male is similar to that of *D. melanogaster*. But in females the caudal region of each tergite has a

pigmented band which is broader in the first three segments and narrow in the 4th segment.

*Periphallic organs* : Yellowish, narrow above and continue below as a club-shaped structure with heavily crowded slender bristles. The primary clasper is hook-like bearing 7 teeth at the tip projecting inwards, out of which 2 are long and pointed. The presence of 4 to 5 comb like teeth with a common origin found at the base of the primary clasper is peculiar to this species. The secondary clasper is continuous with the anal plate. It is slender, narrow and bears a stout blunt chitinized tooth and is characteristic of this species. Anal plate is roughly triangular with 27 to 30 bristles (Fig. 9).

*Phallic organs* : More or less similar to *D. anomelani*. *Internal characters* : Testis with  $5\frac{1}{2}$  coils. Paragonia transparent club-shaped and similar to *D. melanogaster*. Spermathecae round and chitinized. Ventral receptacle coiled. Malpighian tubules 2 pairs, stalked, forked and free.

*Eggs* : With two filaments.

*Cytology* : The cytology of this species could not be analysed as they could not be bred in the laboratory.

*Holotype* ♂, INDIA : Madras : Nilgiris : Coonor, 1800 m, 28. xii. 1970, Coll. G. Sreerama Reddy and N.B. Krishnamurthy, deposited in the Museum of Department of Zoology, Manasa Gangotri, University of Mysore, Mysore. *Allotype* ♀, data as above. *Paratypes* 8 ♂♂ and 8 ♀♀. INDIA : Madras : Nilgiris : Coonor, Coll. Sreerama Reddy and Krishnamurthy; deposited in Department of Biology, Tokyo Metropolitan University, Setagaya-Ku, Tokyo, Japan, and also in Z.S.I, Calcutta, I.A.R.I, New Delhi, and in the University of Texas reference collections.

*Distribution* : India : Madras.

*Relationships and remarks* : Okada (personal communication 1971) has pointed out that the species *D. coonorensis* was probably a new species belonging to the *montium* subgroup. The validity of its inclusion in the subgenus *Sophophora, melanogaster* group and *montium* subgroup is based on the same parameters listed earlier for *D. anomelani*. It differs from the other members of the *montium* subgroup in the number of teeth in sex comb, in the features of the primary and secondary claspers and in the nature of abdominal banding pattern. Hence it deserves the status of a new species in the *montium* subgroup.

*D. coonorensis* is named after the locality, Coonor, where these were collected for the first time.

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Figs. 1-7. *Drosophila anomelani*, sp. nov. : 1, Fore leg of male showing sex combs; 2, periphallallic organs—A. Anal plate, G. Genital arch, P. Primary clasper, S. Secondary clasper; 3. Phallic organs—A. Anterior paramere, E. Aedeagus, N. Novasternum, O. Basal apodeme of the aedeagus, P. Posterior paramere, S. Submedian spine of the 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; 6, Female reproductive organs—D. Oviduct, O. Ovary, P. Paraovaria, S. Spermatheca, V. Vagina, Vr. Ventral receptacle; 7, Salivary gland chromosomes showing six arms and a paracentric heterozygous inversion in the left arm of the second chromosome.

Fig. 8-9. *D. coonorensis*, sp. nov. : 8, Fore leg of male carrying sex combs; 9 Periphallallic organs—A. anal plate, G. genital arch, P. primary clasper, S. secondary clasper.

