

***DROSOPHILA WATANABEI*, A NEW SPECIES OF THE *MONTIUM*
SUBGROUP OF THE *MELANOGASTER* SPECIES GROUP OF THE
SUBGENUS *SOPHOPHORA* (DIPTERA: DROSOPHILIDAE)**

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ABSTRACT. *Drosophila watanabei*, sp. nov. is described and its relationship with other species within the *montium* subgroup is discussed.

The *Drosophila melanogaster* species group, established by Sturtevant (1942), has been further divided into several subgroups (Hsu, 1949; Okada, 1954; Bock & Wheeler, 1972; Bock, 1980). The distribution of species amongst these subgroups is not uniform: the *montium* subgroup is by far the largest and it now contains over half of all the species described within the *melanogaster* species group.

In literature, Watanabe et al. (1982) noticed two types of karyotypes in *D. jambulina* Parshad & Paika, 1964 (one of the species of the *montium* subgroup): one for the Indian strain reported by Singh & Gupta (1980), and the other for the Cambodian strain reported by Baimai (1980). The two karyotypes varied in the 4th and Y chromosomes. This situation prompted Dr. Watanabe to look into the systematics of *D. jambulina*. Based on the results of these studies he concluded that the Indian strain represented true *jambulina*, while the strains supplied as *jambulina* from Texas University (Cambodia, Texas Stock No. 3120.5; Thailand, Texas Stock No. 3116.11) constituted a different species which was tentatively called *punjabiensis*-like because it was found genetically much closer to *D. punjabiensis* Parshad & Paika, 1964 than to *D. jambulina*.

In order to get some further insight into the problem of phylogenetic relationships between *D. punjabiensis* and *punjabiensis*-like species, a detailed cytogenetic analysis was undertaken by the present authors. The outcome of these studies (to be published elsewhere) also led us to conclude that *punjabiensis*-like species is both taxonomically and cytogenetically a distinct species. It is described here as *Drosophila watanabei*, in honour of Dr. T. K. Watanabe of the National Institute of Genetics, Japan.

***Drosophila watanabei*, sp. nov.** (Figs. A-F)

Male and female: Arista with about 4 dorsal and 3 ventral branches in addition to small terminal fork. Antennae with second segment pale brownish; third segment lighter. Frons including ocellar triangle pale brown. Orbitals in ratio of 6 : 2 : 7; anterior reclinate much closer to proclinate than to posterior reclinate. Face and cheek

Table - I
 't Test' for D.watanabei and D.punjabiensis with respect to quantitatively varied characters.

Sl. No.	Characters	<u>D.watanabei</u>			<u>D.punjabiensis</u>			d.f t cal.
		No. of Individuals	Range	Mean±S.D.	No. of individuals	Range	Mean±S.D.	
1.	Cheek-eye Ratio	6	0.21-0.25	0.23±0.06	6	0.13-0.17	0.16±0.02	10 2.33*
2.	Sterno-index	6	0.55-0.66	0.61±0.04	6	0.50-0.62	0.55±0.03	10 4.76**
3.	Sex Comb Ratio (Proximal:Distal)	6	1.33-1.50	1.38±0.15	6	1.40-1.72	1.53±0.17	10 1.68
4.	Wing-Vein indices							
	i) C-index	6	1.93-2.31	2.10±0.10	6	1.94-2.16	2.03±2.10	10 0.73***
	ii) 4V-index	6	3.00-3.50	3.27±0.31	6	2.14-2.81	2.50±0.00	10 6.11***
	iii) 5X-index	6	2.20-3.50	2.86±0.24	6	2.50-2.75	2.70±0.06	10 1.79
	iv) 4C-index	6	1.60-2.01	1.72±0.00	6	1.21-1.45	1.40±0.06	10 12.8***
	v) C ₃ fringe	8	0.47-0.56	0.53±0.00	7	0.26-0.37	0.33±0.12	13 0.03
5.	Male Wing length(mm)	6	1.51-1.56	1.53±0.04	6	1.74-1.92	1.82±0.04	10 11.40***
6.	Male Body-length(mm)	6	1.72-1.97	1.81±0.14	6	1.87-1.97	1.92±0.00	10 2.82**

* P < 0.05; ** P < 0.02; *** P < 0.001.

yellowish brown; greatest width of cheek 0.2x greatest diameter of eye. Palpus yellowish, with one apical seta. Vibrissa strong; second oral thin and subequal. Carina yellow, narrow and high. Clypeus brownish. Eyes bright red.

Thorax: Acrostichal hairs regular, in 6 rows. Anterior scutellars convergent; posterior scutellars crossed each other. Distance between anterior and posterior dorsocentrals 0.5x the distance between two anterior dorsocentrals. Mesonotum and scutellum unicolorous, pale yellow. Humeral two, subequal, Thoracic pleura pale yellow. Sterno-index 0.6. Legs pale yellow, preapicals on all three tibiae; apicals on first and second tibiae. Sex-combs on male fore legs along entire lengths of metatarsus and second tarsal segment; metatarsal comb consisting of about 26 (24-28) teeth, lowermost two teeth slightly displaced from axis of remaining teeth; second tarsal comb consisting of about 19 (18-20) teeth (Fig. F). Wings (Fig. E) clear. Approximate wing-vein indices: C-index 2.1; 4V-index 3.27; 4C-index 1.7; 5X-index 2.86. Heavy bristles on basal about 0.53x of third costal section. Halteres light yellow.

Abdomen: Pale yellow; tergites with narrow and uninterrupted black bands; terminal tergites in male black.

Periphallid organs (Fig. C): Epandrium pale brown, broad, with about 12 bristles. Primary surstylus quadrate, with row of about 5 black teeth above and cluster of 6-7 strong bristle-like teeth below, one thinner and elongate. Secondary clasper less differentiated, not completely separated from cercus, with two large, unequal black teeth and 6-7 tough bristles proximally. Cercus triangular, separated from epandrium, with about 15 large bristles.

Phallic organs (Fig. A, B): Aedeagus large, not bifid, pubescent apically. Anterior parameres small, broad, with 3 minute apical sensilla. Posterior parameres long, reaching tip of aedeagus. Caudal margin of novasternum medially projected, with 1 pair of small submedian spines. Ventral fragma quadrate.

Egg-guide (Fig. D): Lobe pale yellow, oblong, with about 9 marginal teeth. Discal teeth absent.

Holotype: Male, CAMBODIA: Siem Reap, 1972, Coll. I. R. Bock & M. R. Wheeler. Deposited in the Department of Zoology, Banaras Hindu University, Varanasi, India.

Paratypes: 25 M, 25 F, derived from the culture initially obtained from National *Drosophila* Species Resource Center, Bowling Green, U.S.A. In the Dept. of Zoology, B.H.U., Varanasi, India.

Relationships: This species closely resembles *D. punjabiensis* Parshad & Paika, 1964 in general morphology, but clearly differs from it in having secondary surstylus with two large unequal black teeth (three large unequal black teeth in *punjabiensis*). Additionally, statistical 't' test analysis for six quantitatively varied characters also revealed highly significant differences for some of these important taxonomic characters in two species (Table I).

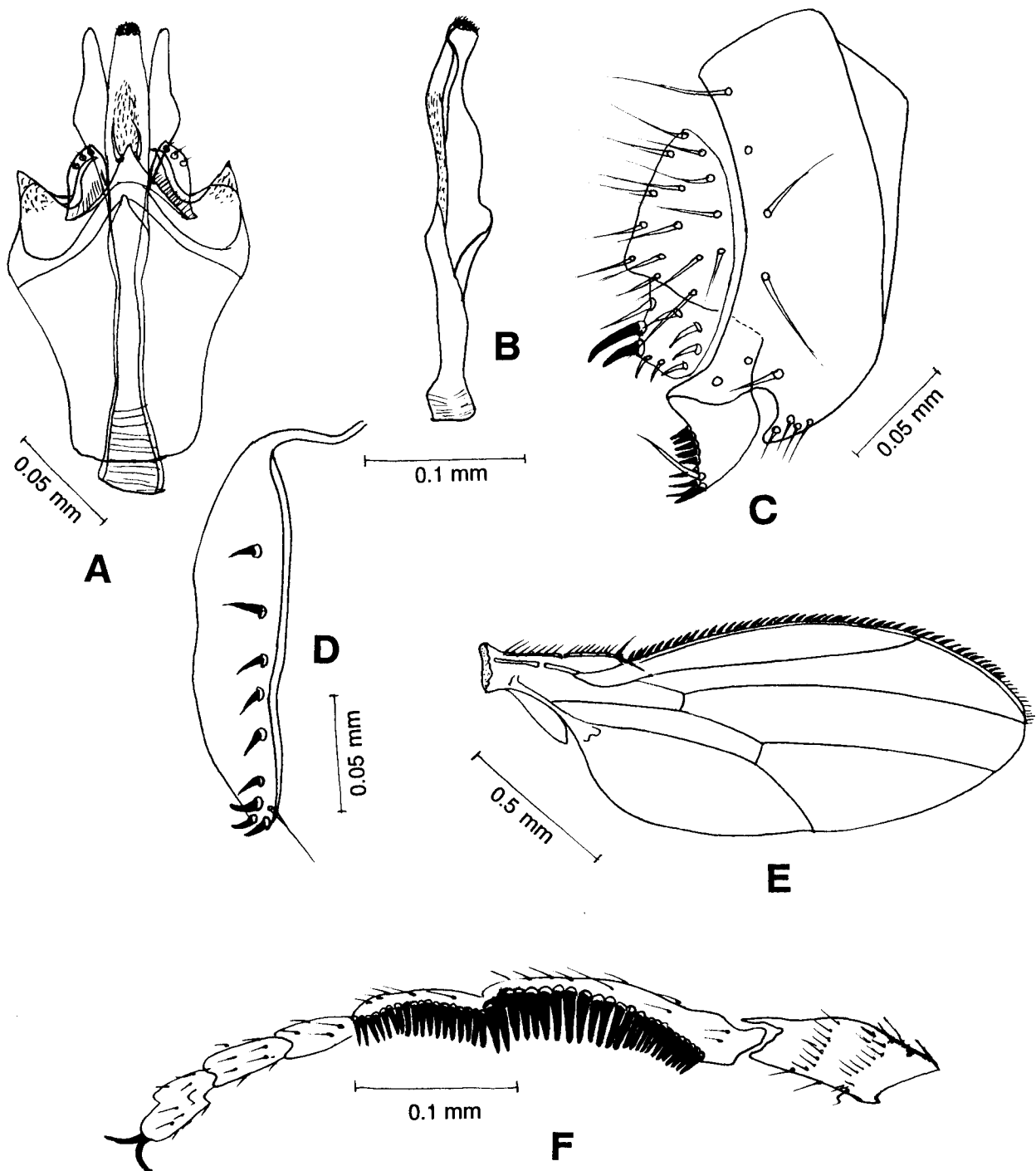
Distribution: Cambodia, Thailand.

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Figs. A-F. *Drosophila watanabei*, sp. nov. : A, phallic organs; B, aedeagus (lateral view); C, periphallic organs; D, egg-guide; E, male wing; F, male fore leg with sex-combs.