

# DROSOPHILID SURVEY OF INDIA

## IV. THE DROSOPHILIDAE OF SOUTH ANDAMANS

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### ABSTRACT

The present investigations are based on the nine species of the family Drosophilidae collected from South Andamans during February-April, 1964. Of these, one each belongs to subgenera *Pholadoris* and *Tanygastrella*, six to the subgenus *Sophophora* and the remaining one to the subgenus *Drosophila*. Three species, one belonging to the subgenus *Pholadoris* and two belonging to the subgenus *Sophophora*, are novo. The relationship of these novo species has been discussed in details.

### INTRODUCTION

The present investigations, fourth of the series on the Indian Drosophilidae, are based on nine species of the genus *Drosophila* collected from South Andamans. The South Andamans constitutes the major island among the group situated in the Bay of Bengal between 92° 30' to 93° 20' longitude and 11° 20' to 12° 60' latitude. The collections were made during 29 February, 1964 to 16 April, 1964 when one of us (Ram Parshad) accompanied the survey party of the Zoological Survey of India. During this period 2,506 flies were collected which belonged to nine species—one each to the subgenera *Pholadoris* and *Tanygastrella*, six to the subgenus *Sophophora* and the remaining one to the subgenus *Drosophila*. Three out of these, *D. (Pholadoris) setaria*, *D. (Sophophora) andamanensis* and *D. (Sophophora) brevis*, are novo while *D. gracilis*, *D. bipectinata*, *D. ananassae*, *D. malerkotliana*, *D. truncata* and *D. nasuta* are being reported for the first time from South Andamans.

### MATERIAL AND METHODS

The various species were collected from the baits which were charged with over ripe banana and tomato. The collection was made mainly from five stations, i.e. Baratang, Wright Myo, Port Blair, Humphry Ganj and Cowria Ghat (Fig. 1). The frequency distribution of the various species is given in Table I.

The flies for the various studies were treated in the same way as described in the earlier communication (Parshad and Paika, 1964). The holotypes and paratypes of the novo species, as indicated in the text, are with the senior author.

### DESCRIPTION OF THE SPECIES

Genus *DROSOPHILA* Fallen, 1823

Subgenus *PHOLADORIS* Sturtevant, 1942

I. *Drosophila (Pholadoris) setaria* sp. novoA. *Male imago*

1. *External characters*—Arista with 4 branches above and 2 below, in addition to the terminal fork; antenna yellowish brown, 3rd segment light yellow, apically black. Front over  $1/4$  the width of head, wider, yellowish brown.  $Orb_1$  and  $Orb_3$  equal,  $Orb_2$   $1/2$  of either. Vibrissa present,  $Or_2$  minute. Carina light yellow, flat. Face yellow; clypeus light brown, palpus club-shaped with two prominent and few small bristles. Cheeks light yellow, their greatest width about  $1/7$  the greatest diameter of eye. Eyes reddish brown. Ocelli shining brown.

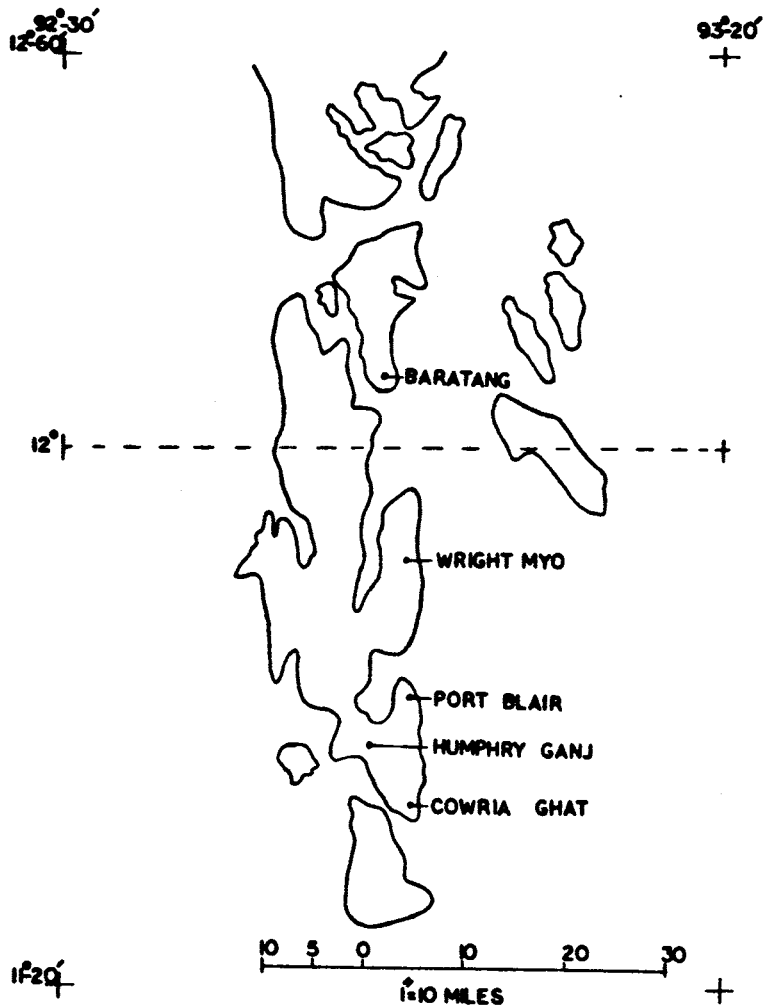


FIG. 1. Map of South Andamans showing sites of collections.

Acrostichal hairs in six slightly irregular rows; prescutellars present, both anterior and posterior scutellars convergent, posterior crossed at the distal end. Mesonotum and scutellum yellowish brown. Humerals equal. Pleura yellow with a light black longitudinal stripe. Sterno-index 0.66.

Wing (Fig. 2): Clear; C-1 bristles 2, equal, C-3 bristles on basal  $3/4$  of the 3rd costal section, C-index about 1.41, 4V-index about 2.8, 4C-index about 1.7, 5X-index about 2.5.

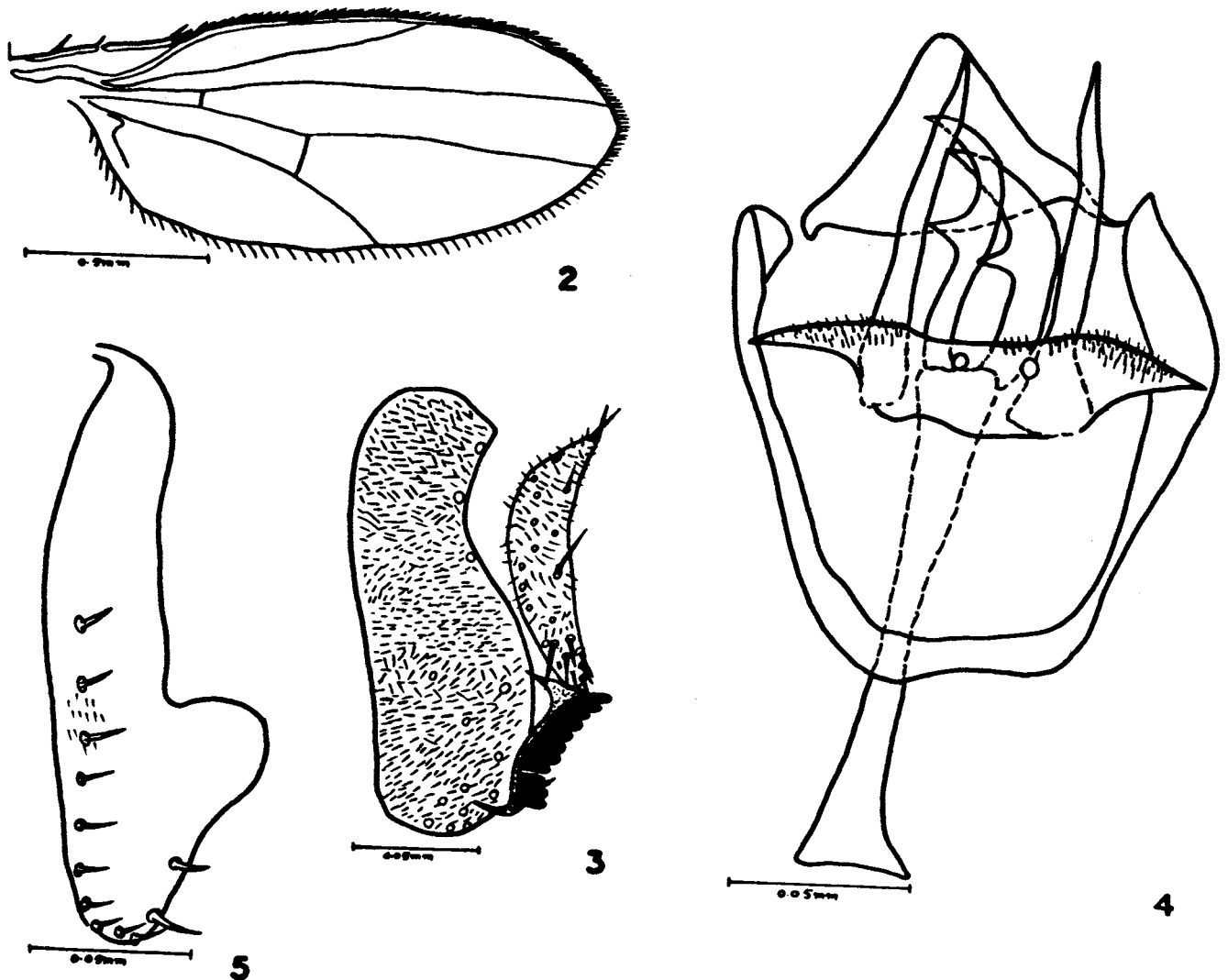
Length of the wing (preserved specimen) 1.44 mm.

Length of the body (preserved specimen) 1.56 mm.

TABLE I  
Frequency distribution of the various species of the *Drosophilidae* in the South Andamans

Sl. No.	Name of the species	Frequency distribution at												Total number of flies	
		Port Blair		Baratang		Wright Myo		Humphry Ganj		Cowris Ghat		Male	Female		
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female			Male	Female
1.	<i>D. (Pholadoris) setaria</i> sp. novo ..	2	5	9	6	5	—	2	—	—	—	18	11		
2.	<i>D. (Tanygastrella) gracilis</i> ..	25	18	90	115	118	192	5	—	3	—	241	325		
3.	<i>D. (Sophophora) bipectinata</i> ..	93	179	262	442	207	256	65	—	52	—	679	877		
4.	<i>D. (Sophophora) malerkotitana</i> ..	4	23	13	16	6	34	1	—	1	—	25	73		
5.	<i>D. (Sophophora) ananasae</i> ..	3	—	—	—	36	—	56	—	15	—	110	—		
6.	<i>D. (Sophophora) andamanensis</i> sp. novo ..	14	2	—	—	40	12	6	—	6	—	66	14		
7.	<i>D. (Sophophora) truncata</i> ..	3	—	25	1	—	—	11	—	—	—	39	1		
8.	<i>D. (Sophophora) brevis</i> sp. novo ..	—	1	—	2	8	3	—	—	—	—	8	6		
9.	<i>D. (Drosophila) nasuta</i> ..	4	3	4	1	—	—	1	—	—	—	9	4		
	Grand Total ..	148	231	403	583	420	497	147	—	77	—	1,195	1,311		
	Period of collection ..	29-2-64 to 3-3-64	12-3-64 to 22-3-64	25-3-64 to 3-4-64	4-3-64 to 8-3-64	8-4-64 to 16-4-64									
	Temperature Maximum ..	31.1°C-32.4°C	32.7°C-33.5°C	32.2°C-33.9°C	31.4°C-34.9°C	33.4°C-34.6°C									
	Minimum ..	24.5°C-20.5°C	25.7°C -21°C	26.5°C-21.2°C	23.2°C-21.1°C	25.3°C-23.2°C									
	Relative humidity ..	63%-74%	67%-75%	59%-69%	40%-72%	60%-67%									
	Rainfall ..	Nil	Nil	Trace	Nil	Nil									

2. *Periphalic organs* (Fig. 3)—Genital arch wheatish brown, pubescent, narrow above, broader below, upper posterior margin with 3 bristles, lower posterior with 11. Heel as well as toe rounded. Anal plate separate from genital arch, boat-shaped, pubescent with 20 large and 8 short bristles at the tip. Clasper single, small; primary teeth 11 arranged along the concave margin of the clasper; marginal bristles 3.



FIGS. 2-5. *Drosophila (Pholadoris) setaria*. 2, wing; 3, genital arch; 4, phallic organs; 5, egg guide.

3. *Phallic organs* (Fig. 4)—Pale brown in general; aedagus pale, bifid, slender, apically narrow and curved with a pointed process arising mid-ventrally. Anterior paramere broad, bare, fused to form V. Posterior paramere pale, longer than aedagus, slender having six sensillae arranged in a row. Novasternum broad, posteriorly concave, pubescent, with a pair of sub-median spines. Ventral fragma almost quadrangular, narrow anteriorly. Basal apodeme longer than aedagus, expanded distally. Phallosomal index about 0.46.

#### B. *Female imago*

1. Resembles male in all its morphological characters except the body length and the wing length.

Length of the wing (preserved specimen) 1.92 mm.

Length of the body (preserved specimen) 1.98 mm.

2. *Egg guides* (Fig. 5)—Lobe pale brown, narrow, rounded apically and with a lateral lobe-like expansion. Marginal teeth dark brown, 11 in number and a single discal tooth. The ultimate tooth comparatively long and slightly isolated from the penultimate one. Basal isthmus short and cylindrical.

C. *Holotype*—One male, Port Blair, February, 1964.

D. *Paratype*—Two males and one female, collected along with the holotype.

E. *Other specimens examined*—15 males and 11 females from Baratang, Humphry Ganj, Port Blair and Wright Myo.

F. *Status and relationship*—The present species belongs to the species group *levis* of the subgenus *Pholadoris* which was established by Mather (1955) to include *Drosophila* (*Paradrosophila*) *levis* because of the following features:

1. Body colour brown.
2. Anterior scutellars convergent.
3. Acrostichal hairs in 6 rows.
4. Genital arch lightly bristled below, anal plate without rear angle and without especially dense bristles at lower tip; clasper without numerous fine hairs and not extending beyond primary teeth.

In addition to these features which are diagnostic of this species group, the present species further resembles *Drosophila levis* in the following aspects:

1. Arista with 8 branches.
2. Carina flat.
3. C-3 bristles on basal 3/4.
4. Wing indices—  
C-index: 1.4, 4C-index: 1.7, 5X-index: 2.5.
5. Genital arch narrow above, broader below, primary teeth 11 arranged in a concave row.

It, however, differs from *Drosophila levis* as follows:

	<i>D. setaria</i> sp. novo.	<i>D. levis</i>
1. Or <sub>2</sub>	Minute	2/5 of Or <sub>1</sub>
2. Orb <sub>2</sub>	1/2 of either	1/3 of either
3. Cheek	1/7 the greatest diameter of the eye	1/10 the greatest diameter of the eye
4. Pleura	With a black stripe	Without such stripe
5. Abdomen	Yellow, each tergite with black caudal band, last tergite completely black	First segment black, 2-4 segments with black bands indented with yellow dorsally and laterally, 5 and 6 segments completely black
6. 4V-index	2.8	2.3
7. Genital arch	With ten bristles at lower half	With 8 bristles at lower half
8. Heel	Rounded	Squarish
9. Toe	Rounded and at the level of heel	Squarish and below the level of heel

- |                                    |  |  |
|------------------------------------|--|--|
| 10. Genital arch<br>and anal plate | Pubescent  | Not pubescent  |
| 11. Egg guides                     | Narrow, laterally with a lobe-like projection with about 12 bristles | Broad, no lobe-like projection, with about 18 bristles |

Subgenus *TANYGASTRELLA* Duda, 1924

II. *Drosophila (Tanygastrella) gracilis* Duda, 1924

*Tanygastrella gracilis* Duda, 1924. Arch. Naturg., 90, A (2), 192, 215; 90, A (3), 253.

*Drosophila (Tanygastrella) gracilis* Duda, 1926. Suppl. Ent., 14, 99.

*Drosophila (Tanygastrella) gracilis* Duda, 1929. Treubia, 7, 420.

*Drosophila (Tanygastrella) gracilis* Okada, 1964. Nature and Life in South-East Asia, 3, 447.

*Male and female imagines*—Orb<sub>2</sub> 1/2 the either, sterno index 0.6, 4V-index about 2.14. Other structures as reported by Duda (1924, 1926) and as described by Okada (1964).

*Periphallalic and phallic organs*—As described and figured by Okada (1964).

*Specimens examined*—Large number of individuals both male and female collected from Port Blair, Baratang, Wright Myo, Cowria Ghat and Humphry Ganj.

Subgenus *SOPHOPHORA* Sturtevant, 1939

*melanogaster* species group Sturtevant, 1942

*ananassae* species subgroup Hsu, 1949

III. *Drosophila (Sophophora) bipectinata* Duda, 1923

*Drosophila bipectinata* Duda, 1923. Ann. Mus. Nat. Hung., 20, 52; Duda, 1926. Suppl. Ent., 14, 98; Kikkawa and Peng, 1938. Japan Journ. Zool., 7, 527.

*Drosophila (Sophophora) bipectinata* Sturtevant, 1942. Univ. Texas Publ., 4213, 29; Hsu, 1949. Univ. Texas Publ., 4920, 120; Wheeler, 1949. Univ. Texas Publ., 4920, 174; Patterson and Stone, 1952. Evol. gen. Dros., 16; Okada, 1955. Sci. Result Japan exped. Nipal Himalaya, 1, 387; Okada, 1956. Syst. St. Drosophilidae allied Fam. Japan, 117.

*Male and female imagines*—Arista with 5 branches above and 3 below excluding the terminal fork. Orb<sub>2</sub> 1/2 of either. Humerals equal. Sterno-index 0.72. 4V-index 2.5; 4C-index 2.0. Other structures as described and figured by Kikkawa and Peng (1938) and Okada (1956).

*Periphallalic organs*—Genital arch with toe tubular and slightly tapering and with about 20 bristles. Other characters same as described and figured by Hsu (1949).

*Phallic organs*—Same as described and figured by Okada (1954, 1956).

*Egg guides*—Narrow, and rounded distally, ultimate tooth neither isolated nor stout. Otherwise same as described and figured by Okada (1956).

*Internal structures*—RI = 1.87. Testis with 2.5 outer and one inner coil. Other structures as described and figured by Okada (1956).

*Specimens examined*—Stock raised from a single female from Port Blair and a large number of males and females from Port Blair, Cowria Ghat, Wright Myo, Baratang and Humphry Ganj.

IV. *Drosophila (Sophophora) annanassae* Doleschell, 1858

*Drosophila annanassae* Doleschell, 1858. Duda, 1923. Ann. Mus. Nat. Hung., 20, 53; Sturtevant, 1927. Phil. Journ. Sci., 32, 371; Kikkawa and Peng, 1938. Jap. Journ. Zool., 7, 526.

*Drosophila (Sophophora) annanassae* Sturtevant, 1942. Univ. Texas Publ., 4213, 29; Patterson, 1943. Univ. Texas Publ., 4313, 14; Hsu, 1949. Univ. Texas Publ., 4920, 96; Wheeler, 1949. Univ. Texas Publ., 4920, 175; Tan, Hsu and Sheng, 1949. Univ. Texas Publ., 4920, 197; Patterson and Stone, 1952. Evol. gen. Dros., 16; Okada, 1956. Syst. St. Drosophilidae Allied Fam. Japan, 116; Mather, 1960. Univ. Queensland Papers, I, 9, 233; Parshad and Paika, 1964. Res. Bull. Panjab Univ., 15, 225; Parshad and Duggal, 1966. Res. Bull. Panjab Univ., 17, 277.

*Male and female imagines*—Arista with 4 branches above and 3 below excluding the terminal fork. Carina narrow above and wider below. Sterno-index 0.8. C-index 1.46. RI = 1.8. Other characters same as described by Kikkawa and Peng (1938), Patterson (1943), Okada (1956), Parshad and Paika (1964) and Parshad and Duggal (1966).

*Specimens examined*—Large number of males and females from Cowria Ghat, Wright Myo, Port Blair and Humphry Ganj.

V. *Drosophila (Sophophora) malerkotliana* Parshad and Paika, 1964

*Drosophila (Sophophora) species*. Okada, 1964. Nature and Life in South-East Asia, 3, 449–452.

*Drosophila (Sophophora) malerkotliana*, Parshad and Paika, 1964. Res. Bull. Panjab Univ., 15, 235–238.

*Male and female imagines*—Or<sub>2</sub> equal to vibrissa. Sex comb in 2 sets; small, proximal set comprising of 2 transverse rows of 1–3 teeth and distal one of single row of 1–2 teeth. Other structures as described by Parshad and Paika (1964) and Okada (1964).

*Periphallalic organs*—Genital arch bears a notch in the middle of anterior margin, posterior margin does not cover the clasper. Primary teeth in 2 sets, anterior set of 2 teeth and the posterior set of single tooth. Other features as described and figured by Parshad and Paika (1964) and Okada (1964).

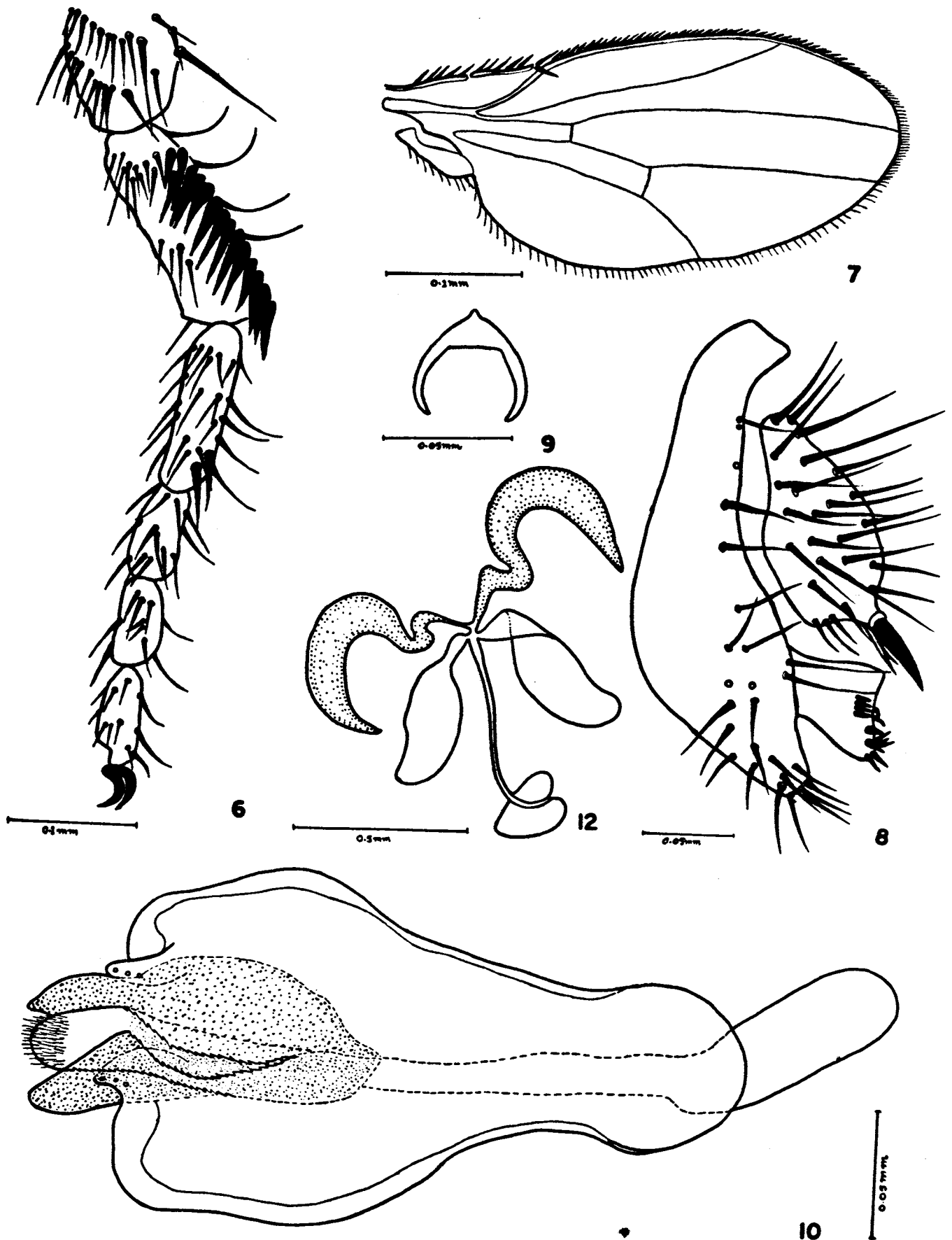
*Phallic organs*—As described and figured by Parshad and Paika (1964).

*Specimens examined*—22 males from Port Blair, Cowria Ghat, Wright Myo, Baratang and Humphry Ganj.

*montium* species subgroup, Hsu, 1949

VI. *Drosophila (Sophophora) andamanensis* sp. novoA. *Male imago*

1. *External characters*—Arista with 4 branches above and 2 below, in addition to the terminal fork; antenna light yellow, 3rd segment apically black. Front over  $\frac{2}{7}$  the width of the head, wider above, light yellow. Orb<sub>1</sub> equal to Orb<sub>3</sub>, Orb<sub>2</sub> nearly  $\frac{1}{2}$  of either. Or<sub>2</sub> equal to vibrissa. Carina raised, narrow above broader below. Face light yellow, clypeus dark brown, palpus club-shaped, yellow with a single prominent bristle at the tip. Cheeks pale, their greatest width about  $\frac{1}{6}$  the greatest diameter of eye. Eyes brick red. Ocelli shining yellow.



FIGS. 6-10 and 12. *Drosophila (Sophophora) andamanensis*. 6, sex comb; 7, wing; 8, genital arch; 9, decasternum; 10, phallic organs; 12, male reproductive organs.



Acrostichal hairs in 8 regular rows; prescutellars absent, anterior scutellars convergent, posterior crossed in the middle. Mesonotum and scutellum greyish yellow. Humeralis 2, equal. Pleura greyish yellow. Sterno-index 0.71.

Legs pale. Preapicals on all the 3 tibiae, apicals on the first two. Sex comb (Fig. 6) in two sets; proximal comb of 14–16 stout bristles arranged in a straight row on the first metatarsus and distal set of 1–2 setae-like bristles on the first tarsal joint. Abdomen yellow, each tergite with black uninterrupted caudal band, last 2 tergites completely black. Halteres light yellow.

Wing (Fig. 7): Clear, C-1 bristles 2, equal; C-3 bristles on basal  $3/5$  the 3rd costal section, C-index about 1.45, 4V-index about 2.55, 4C-index about 1.82, 5X-index about 2.5.

Length of the wing 1.51 mm.

Length of the body 1.7 mm.

2. *Periphallic organs* (Fig. 8)—Genital arch light wheatish brown, narrow above with about 27 bristles, 8 arranged along the upper posterior margin and 10 congregated at the toe. Heel distinct. Toe pointed downwards and inwards. Anal plate pear-shaped, separate from the genital arch and with about 20 long bristles. Clasper in two sets; primary clasper large, primary teeth 4 in the upper half, marginal bristles 9 of various sizes; secondary clasper fused with the anal plate and with a single large tooth and 5 setae, distal tip produced into a small finger-like projection having 2 minute setae.

*Decasternum* (Fig. 9)—Median piece triangular, with a pair of anterior lateral arms pointed slightly inward and outward.

3. *Phallic organs* (Fig. 10)—Wheatish brown in general. Aedagus plumose and serrated, large and slender, and expanded distally. Anterior paramere small, with 3 sensillae at the tip. Posterior paramere large, compact and contiguous at the base. Ventral fragma almost quadrangular but projecting and narrowing anteriorly till it ends in a small expansion. Basal apodeme expands gradually from the middle to the distal end and about double the size of aedagus. Novasternum not much prominent and spines not observable or very minute. Phallosomal index 0.5.

4. *Internal structures*—Proximal intestine: Coiling index about 3. Malpighian tubules with short common stalks and long branches, posterior branches ending free (Fig. 11). Rectal papillae: RI about 1.86.

Testis chrome yellow with 1.5 outer and 0.5 inner coils narrowing posteriorly. Paragonia rounded distally and folded once. Ejaculatory bulb flattened, triangular with a deep notch (Fig. 12).

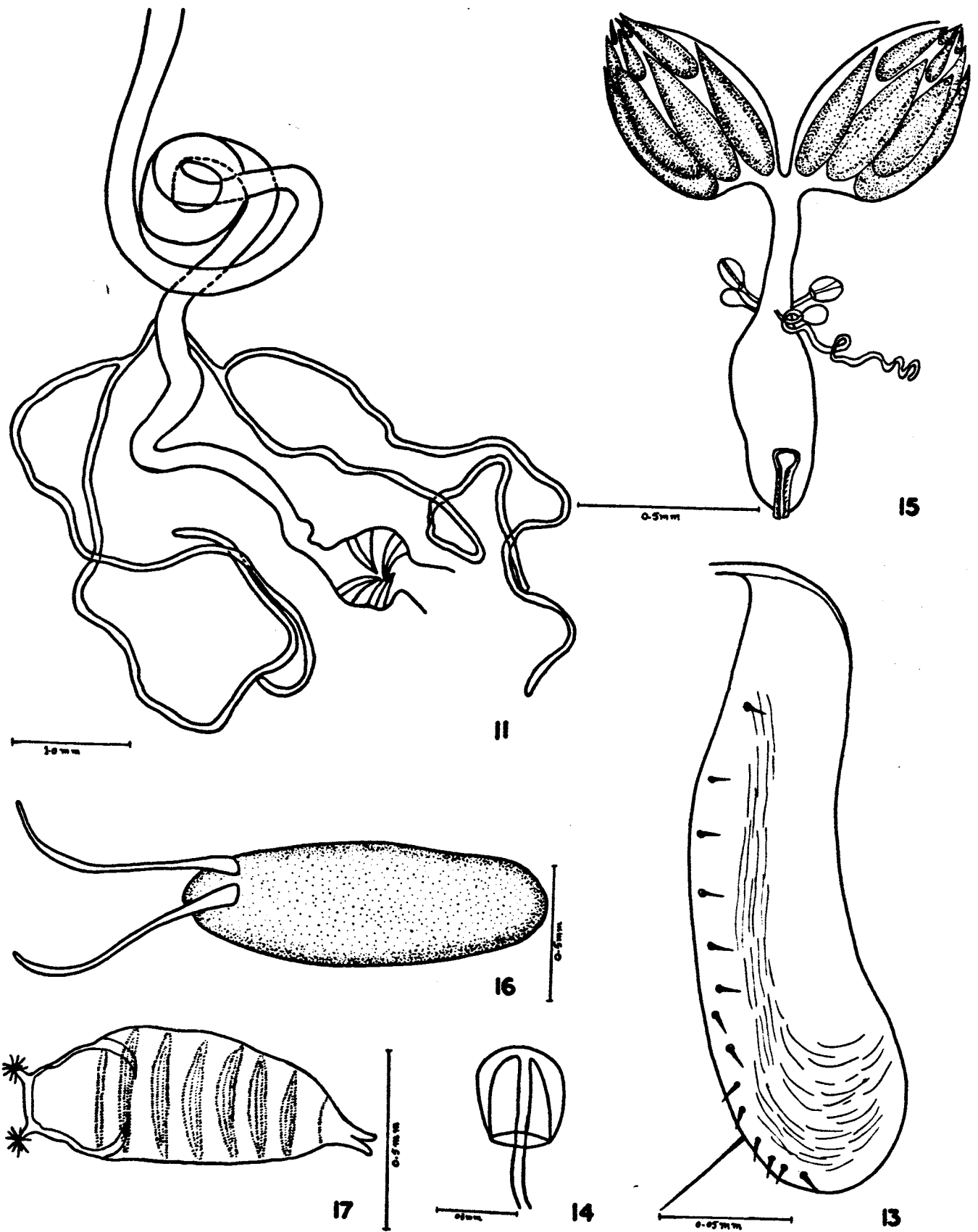
## B. *Female imago*

1. *External characters*—Resembles male except in the absence of sex comb, last 2 tergites not black and slightly larger body size.

Length of the wing 1.92 mm.

Length of the body 2.16 mm.

2. *Egg guides* (Fig. 13)—Lobe pale yellow, apically rounded, tip narrow and rounded; marginal teeth 14, black sub-median hair between 4th and 5th teeth. Basal isthmus cylindrical and short.



Figs. 11 and 13-17. *Drosophila (Sophophora) andamanensis*. 11, ♂ proximal intestine; 13, egg guide; 14, spermathecae; 15, parovaria; 16, egg; 17, puparium.

3. *Internal structures*—Spermathecae (Fig. 14) globular, hyaline, chitinized and swollen distally. Ventral receptacle with about 8 semicircular folds, placed against the ventral wall of the uterus; parovaria rounded and small (Fig. 15).

C. *Egg* (Fig. 16)—Provided with 2 long slender filaments.

D. *Larvae*—Third larva with black hooklet.

E. *Puparium* (Fig. 17)—Amber coloured. Posterior spiracles divergent. S.B. 1/22; NA 11 including a small one.

F. *Holotype*—One male and one female from the stock raised of a single female from Port Blair.

G. *Paratype*—One male and one female from the stock maintained in the laboratory.

H. *Other specimens examined*—A large number of males and females collected along with the holotype and paratypes from Port Blair, Wright Myo and Humphry Ganj.

I. *Status and relationship*—It belongs to the *montium* series (Okada, 1956) of the species group *melanogaster* (Sturtevant, 1942) because of the following characters:

C-3 bristles on the basal  $3/5$  the 3rd costal section, 5X-index about 2.5 and large sex comb.

Periphallalic organs: Claspers 2, secondary clasper fused with the anal plate, caudal flap of the genital arch lowely convex.

Phallic organs: Aedagus plumose and without branches, anterior paramere separate and small with 3 sensillae, posterior paramere unbranched.

Egg guide lobe apically broad and rounded, basal isthmus short.

In the external characters it resembles more closely with the members of the *montium* species subgroup rather than with any other in the following respect:

Or<sub>2</sub> more than  $1/3$  the vibrissa, Orb<sub>2</sub> larger, palpus with single prominent bristle, C-3 bristles on basal  $1/2$ , 5X-index more than 2. Sex comb large, do not extend beyond the tip of the tarsal joint, in two sets. It, however, differs from the already known members of the *montium* species subgroup in having the distal tarsal sex comb reduced to only 2 spine-like bristles instead of a large one.

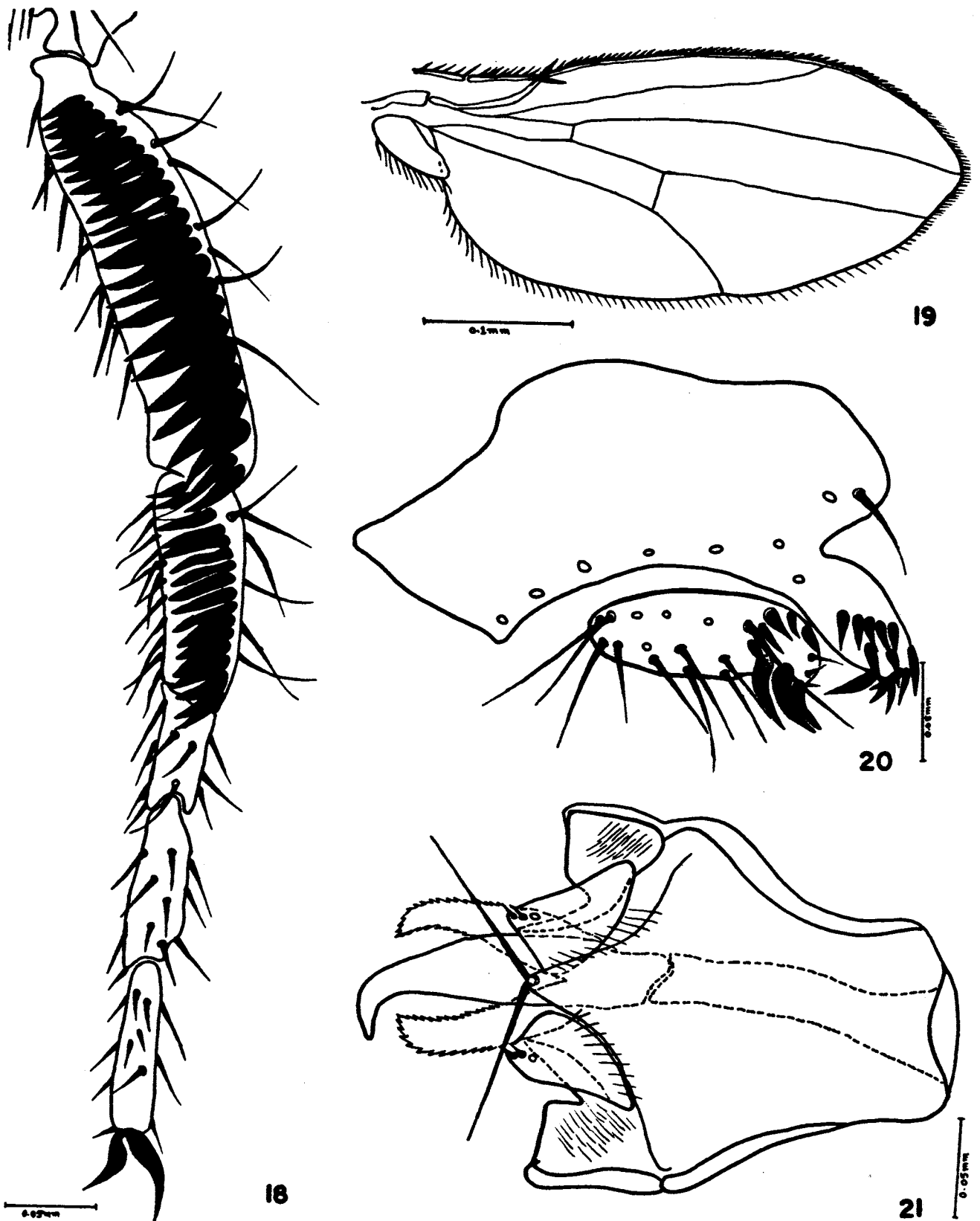
With regard to periphallalic organs, it shows affinity with the *nipponica* species subgroup in the fusion of its secondary clasper, with the lower tip of the anal plate and having a single prominent tooth. In the other features it resembles the members of the *montium* species subgroup, in having the primary teeth in a single row, genital arch long and broad, toe rounded.

As far as the phallic organs are concerned, it resembles the *ananassae* species subgroup, in having small anterior paramere. This species differ from the members of the *montium* species subgroup in having plumose and serrated aedagus, novasternum not much prominent and without any observable spine.

*montium* species subgroup, Hsu, 1949

## VII. *Drosophila (Sophophora) truncata* Okada, 1964

D. (*Sophophora*) *truncata* Okada, 1964. Nature and Life in South-East Asia, 3, 455-457.



Figs. 18-21. *Drosophila (Sophophora) brevis*. 18, sex comb; 19, wing; 20, genital arch; 21, phallic organs.

*Male imago*

Arista with 4 branches above and 3 below, in addition to the terminal fork. Antenna light yellow, 3rd segment whitish yellow. Frontover 1/3 the width of head,  $Orb_2$  nearly

$1/3$  Orb<sub>1</sub> and Orb<sub>3</sub>. Cheeks about  $1/6$  the greatest diameter of eye. 4V-index about 3.22, 4C-index about 2.11. Other characters same as described and figured by Okada (1964).

*Specimens examined*—4 males collected from Baratang.

### VIII. *Drosophila* (*Sophophora*) *brevis* sp. novo

#### A. *Male imago*

1. *External characters*—Arista with 4 branches above and 3 below, in addition to the terminal fork; antenna yellowish brown, 3rd segment light yellowish brown. Front-over  $1/3$  the width of head, wider above, brownish yellow. Orb<sub>1</sub> equal to Orb<sub>3</sub>, Orb<sub>2</sub>  $1/2$  the either two. Or<sub>2</sub> equal to vibrissa. Carina yellow, raised, narrow above broader below. Face light yellow; clypeus blackish yellow; palpus light yellow with single prominent bristle. Cheeks light yellow, their greatest width about  $1/6$  the greatest diameter of eye. Eyes dark red (maroon). Ocelli shining yellow.

Acrostichal hairs in 6 regular rows; prescutellars absent, anterior scutellars convergent, posterior crossed in the middle. Mesonotum and scutellum brownish yellow. Pleura yellow. Humerals 2, equal. Sterno-index 0.6.

Legs light yellow. Preapicals on all the 3 tibiae, apicals on the first two. Sex comb (Fig. 18) in two sets; proximal set, on metatarsal joint, of 24 stout black bristles placed transversally; distal set of 18 similar bristles on the first tarsal joint. Abdomen yellow, tergites with complete black caudal bands, last tergite without any band. Halteres light yellow.

Wing (Fig. 19): Clear; C-1 bristles 2, equal; C-3 bristles on basal  $5/8$  the 3rd costal section; C-index about 1.5, 4V-index about 2.78, 4C-index about 1.76, 5X-index about 3.25.

Length of the wing (preserved specimen) 1.92 mm.

Length of the body (preserved specimen) 2.04 mm.

2. *Periphallic organs* (Fig. 20)—Genital arch wheatish brown, almost rectangular, upper posterior margin with 5 bristles, 5th being largest, lower half with 12 bristles, out of which 8 are congregated to form a tuft at the toe. Heel prominent, obtuse. Toe rounded directed downwards and inwards. Anal plate almost oval, separate from the genital arch, with 14 bristles. Clasper in two sets; primary clasper globular, fused with the genital arch, primary teeth 5 arranged in a row, marginal bristles 9 of which one longer directed inwards; secondary clasper fused with the anal plate and with 3 large stout curved black teeth surrounded by 7 setae of which 5 are stout and teeth-like.

3. *Phallic organs* (Fig. 21)—Aedagus yellow, broader at the base, tapering posteriorly, apex pointed and curved. Anterior paramere well developed, almost triangular (pyramid), with 3 sensillae of which one is at the apex. Posterior paramere serrated, light yellow, well developed, broader at the base. Ventral fragma bell-shaped. Novasternum pubescent, posterior margin with a median acute process having 2 very long median spines. Basal apodeme slightly dilated distally and almost of the size of aedagus. Phallosomal index about 0.8.

B. *Holotype*—One male collected from Wright Myo.

C. *Paratype*—One male collected along with the holotype.

D. *Other specimens examined*—7 males collected along with the holotype.

E. *Status and relationship*—In the external characters, the present species closely resembles *D. truncata* (Okada, 1964) in the following features:

Front  $1/3$  the greatest width of head, cheeks  $1/6$  the greatest diameter of eye, C-3 bristles on almost basal  $1/2$  the third costal section, C-index about 1.5, 5X-index about 3.2. Periphallial organs: Primary teeth of the primary clasper 5 and arranged in a row.

It, however, differs from *D. truncata* in the following main features:

Arista with 9 branches including the fork,  $Orb_2$   $1/2$  of either  $Orb_1$  and  $Orb_3$ .  $Or_2$  equal to vibrissa, humerals equal. Metatarsal sex comb with a row of 24 transverse stout and black teeth and first tarsal comb with 18 similar bristles. 4V-index about 2.8. Periphallial organs: Toe broad and round with only 9 bristles; anal plate oblong with about 13 bristles. Phallic organs: Aedagus bare, slightly curved and tapering into a pointed tip at the apex; anterior paramere pyramidal-shaped with base towards caudal end; posterior paramere serrated, novasternum raised into a median cone-like (projection) structure with a pair of long apical median spines; heavily pubescent along its margin; ventral fragma companulate, narrowing towards the anterior side.

In these characters, the present species not only differ from *D. truncata* but also do not resemble with any other species of the *montium* species subgroup described so far, except *D. kikkwai* where this species resembles in having its aedagus bare and curved and novasternum raised into a median conical projection bearing two median long and stout spines.

The serration of posterior paramere has been found exclusively in this species of *montium* species subgroup known so far.

#### Subgenus *Drosophila* Fallen, 1923

#### *Immigrans* species group Sturtevant, 1942

#### IX. *Drosophila (Drosophila) nasuta*

*Drosophila nasuta* Lamb, 1914.

*Drosophila (Spinulophila) nasuta* Sturtevant, 1927. Phil. J. Sci., 32, 369.

*Drosophila nasuta* Harrison, 1954. Trans. Roy. Ent. Soc. London, 105, 107.

*Drosophila (Drosophila) nasuta* Okada, 1964. Nat. Life in South-East Asia, 3, 463.

*Male and female imagines*—Arista with 7 branches above and 2 below, in addition to the terminal fork. Cheeks  $1/6$  the greatest diameter of the eye. C-1 bristles 2; C-index 4.0; 4V-index 1.3; 4C-index 0.6. Phallosomal index 2.25. Other characters same as described and figured by Okada (1964).

*Specimens examined*—11 males and 6 females from Port Blair, Baratang and Humphry Ganj.

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