

DESCRIPTION OF FOUR NEW SPECIES OF THE "SALTANS" GROUP OF "DROSOPHILA" (Diptera)¹

LUIZ EDMUNDO DE MAGALHÃES

Faculdade de Filosofia, Ciências e Letras, Universidade de São Paulo

(With 8 text-figures)

The "Saltans" group belongs to the subgenus *Sophophora* of the genus *Drosophila*. The following species are included in this group: *D. earlei* Sturtevant, 1916 *D. saltans* Sturtevant, 1916 (STURTEVANT, 1921); *D. prosaltans* Duda, 1925, *D. sturtevanti* Duda, 1925 (DOBZHANSKY & PAVAN, 1943); *D. cordata* Sturtevant, 1942, *D. elliptica* Sturtevant, 1942, *D. emarginata* Sturtevant, 1942, *D. retangularis* Sturtevant, 1942, (STURTEVANT, 1942) *D. neosaltans* Pavan & Magalhães, 1950, and *D. neoelliptica* Pavan & Magalhães, 1950 (PAVAN, 1950). Four new species are described in the present work: *D. pseudosaltans*, *D. parasaltans*, *D. subsaltans* and *D. neocordata*. STURTEVANT (1942) defines the group as follows: "Dark species; long fine ventral receptacle; long spiral testes; one or two opaque heavily chitinized areas on the fifth abdominal tergite of female; skipping larvae; no sex-combs; filaments of eggs much expanded apically; sterno-index .3 to .4; anterior scutellars divergent; tropical America". When the Brazilian new species are included in the group, the following corrections have to be made of the above definition:

- a) Not all species are dark, since *D. parasaltans* and *D. subsaltans* have a light body color.
- b) The opaque mark on the sixth tergite (the fifth tergite of STURTEVANT) is not externally visible in *D. neocordata* and is very weak in *D. parasaltans* and *D. subsaltans*.
- c) The larvae of *D. pseudosaltans*, *D. parasaltans*, *D. subsaltans*, and *D. neocordata* do not skip.

D. pseudosaltans sp. n.

(Figs. 1 and 5)

♂. Arista with 8 to 9 branches. Antennae blackish brown. Front velvety reddish brown, anterior margin with half moon formations, anterior angles

¹ Received for publication June 26, 1956.

Paper n.º 133 from the Departamento de Biologia Geral.

with a silvery reflex. Orbits and ocellar triangle shining with a silvery reflex. Anterior orbital bristles nearly as long as posterior ones. Middle orbital bristle about $1/3$ of the other two. Two prominent oral bristles; the second nearly as long as the first. Carina narrow with hairs at its base. Face darkish gray. Cheeks gray; their greatest width about $1/5$ the greatest diameter of the eyes. Eyes dark red with short black pile.

Acrostichal hairs in 6 regular rows. No prescutellars. Anterior scutellars divergent. Mesonotum pollinose dark grayish brown, with longitudinal black stripes as follows: a long pair just within the dorsocentral rows; sometimes these stripes show anteriorly an inner transversal expansion which may be fused or not medially at the median line; another, just outside the dorso central rows, interrupted at suture. Anteriorly this stripe may be branched. In old specimens, the mesonotum sometimes shows a very strong pollinosity hindering the visibility of the pattern. Scutellum darkened. Pleurae black. Sterno-index 0.5. Legs black, first tibia and the joint femur-tibia brown. Apical bristles on first and second tibia, preapicals on all three. Halteres whitish.

Abdomen black shining. The 2nd, 3rd, 4th, and 5th tergite have near the anterior margin a silvery yellow pollinose half moon area on each side of the median line. 6th tergite all black.

Wings brownish. Tip of first costal section slightly darkened, with two well-developed bristles: third costal section with heavy bristles on its basal $1/3$.

costal index (δ 2.0 – 2.5) mean – 2.15 (φ mean – 2.23 (2.12 – 2.33))

4th vein index (δ 2.09 – 2.5) mean – 2.31 (φ mean 2.19 (2.07 – 2.33))

5x index (δ 1.8 – 2.0) mean – 1.9 (φ mean – 1.43 (1.3 – 1.5))

Body length – δ 2.2 mm, φ 2.5 mm; wings – δ φ 2.5 mm.

φ . On the posterior margin of the sixth tergite a median opaque rough elliptical area, narrowed in the middle. This mark occupy $2/3$ of the tergite width and $1/2$ of its length.

Malpighian tubes two anterior and two posterior arms all with free ends.

Testes yellow with about $4\frac{1}{2}$ outer coils.

Ventral receptacle: long and slender, resembling a skein of wool that is folded, as a whole, into the shape of an M. Spermathecae spherical with apical indentation (fig. 1).

Eggs: two filaments expanded distally.

Larvae: do not skip, but when crawling they curve their body as do those larvae which skip.

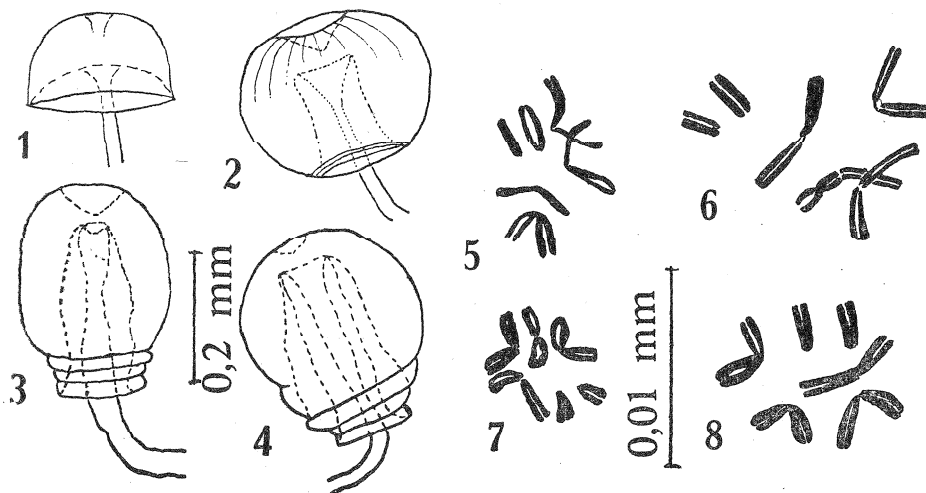
Puparia: anterior spiracles with about 9 branches.

Chromosomes: the metaphasic plates show two pairs of V's and a pair of rods (fig. 5).

Distribution – Cantareira, near São Paulo city, Brazil. Collected by Dr. A. B. da Cunha.

Relationships — Closest to *D. prosaltans* and *D. saltans*. Differs from *D. saltans* by mesonotum pattern and by vein indices; from *D. prosaltans* by the absence of the median dark spot on mesonotum.

The best distinction between these species is made by the male genitalia.



Spermathecae of — Fig. 1: *Drosophila pseudosaltans* sp. n.; fig. 2: *D. neocordata* sp. n.; fig. 3: *D. parasaltans* sp. n.; fig. 4: *D. subsaltans* sp. n. — Metaphase chromosome plates in the cells of the larval brains of — Fig. 5: *D. pseudosaltans*; fig. 6: *D. neocordata*; fig. 7: *D. parasaltans*; fig. 8: *D. subsaltans*.

D. neocordata sp. n.

(Figs. 2 and 6)

♂. Arista with 8 to 9 branches. Antennae anteriorly dark grayish brown. Front very dark brown, orbits and ocellar triangle shining. Anterior orbital bristle slightly shorter than the posterior. Middle orbital about 1/3 of the anterior. Two prominent oral bristles. Face brown, carina narrow and long, not sulcated. No hairs below carina or on its base. Cheeks slightly darker than the face, darkest near the oral bristles; their greatest width about 1/5 the greatest diameter of the eyes. Eyes dark red with black pile.

Acrostichal hairs in 6 rows. Anterior scutellars only slightly divergent, nearly parallel. Mesonotum very dark brown, pollinose, without pattern. Pleurae darkened, sterno index 0.3. Legs dark brown, a little lighter than the pleurae. Apical bristles on first and second pair of legs, preapicals on all three. Halteres whitish.

Abdomen dark brown to black, shining, with a thin lighter basal band, which does not reach the lateral margin.

Wings brownish, first costal section with two prominent bristles. Third costal section with heavy bristles on the basal half. Costal index: ♀ 2.03 — 2.40; mean 2.18. ♂ 1.8 — 2.14; mean 1.9. 4th vein index ♀ 2.29 — 2.03; mean

2.14; ♂ 2.09 — 2.19; mean 2.1; 5x index ♀ 1.77 — 2.0; mean 1.18; ♂ 1.87 — 2.14; mean 1.95.

Body length — ♀ 2.8 mm, ♂ 2.3 mm; wings — ♀ 2.3 mm, ♂ 1.7 mm.

♀. Abdomen shining dark brown. Tergites are lighter anteriorly. The sixth tergite does not show an opaque mark in old specimens, as it does in other species of the *Saltans* group. However, the young females shows, under this tergite, a brown formation that is shaped as a conventionalized heart.

The two arms of the anterior and posterior Malpighian tubes with free ends.

Testes yellow with about 9 coils ($3\frac{1}{2}$ inner and $5\frac{1}{2}$ outer).

Ventral receptacle long and slender, resembling a skein of wool that is folded, as a whole, into the shape of a M.

Spermatheca spherical, in form of a tangerine with an apical indentation, from where radiating lines go which end at the base after aturning around (fig. 2).

Eggs with two filaments distally expanded.

Puparia with very short horns. Anterior spiracles with 9 branches.

Chromosomes: two pairs of V's and a pair of rods (fig. 6).

Distribution — Montes Claros, State of Minas Gerais, Brazil.

Relationships — Closest to *D. cordata*, from which it differs by the aspect of the opaque mark on the 6th tergite of the female, as well as by other smaller characteristics.

D. parasaltans sp. n.

(Figs. 3 and 7)

♂. Arista with 10 branches. Antennae brownish yellow. Third segment slightly darker. Front yellowish brown; orbits and the area around the ocellar triangle more shining. Ocellar triangle slightly darkened. Anterior orbital bristle generally slightly shorter than the posterior; middle orbital $\frac{1}{2}$ of the posterior. Two prominent oral bristles of the same length. Face yellow brown, carina narrow, with long hairs on the lower part. Cheeks yellowish gray, its greatest width about $\frac{1}{8}$ the greater diameter of the eyes. Eyes red with very short pile.

Acrostichal hairs in 6 rows. No prescutellar bristles. Anterior scutellars divergent. Thorax olive brown without a pattern, pollinose and slightly shining. Pleurae of the same color as the thorax with traces of 3 dark bands: the first on the margin of the mesonotum, the second from the base of the first coxa to the base of the halter, the third at the base of the sternopleurae. Anterior sternopleural bristles 0.4 the length of the posterior and more slender. Legs generally slightly brighter than the pleurae, on some specimens the coxa femur joint is darkened. Apical bristles little evident on the first, obvious on the

second, and absent on the third tibiae. Preapicals on all the three. Halteres of the same color as the pleurae.

Abdomen bright yellow. Every tergite shows on the posterior margin a dark brown band which is expanded medially and turned anteriorly on the sides. On the second, third, and fourth tergite the posterior band reaches the anterior margin at the tergite. A narrow dark band turns round the lateral parts of the posterior margin and all of the lateral margin of the tergite, enclosing a yellowish area. On the fifth tergite the lateral expansion of the posterior band is little pronounced reaching only half of the width of the tergite. On the sixth tergite the dark band is reduced to the median expansion only, the rest of the tergite is light. The narrow band that turns around the posterior and lateral margins of the tergites is hardly visible or absent on the fifth and sixth tergites.

Wing brownish. First costal section with two prominent bristles. Third costal section with heavy bristles on its basal $2/5$. Costal index 1.8 — 2.4 (δ 1.8 — 2.2), (φ 2.1 — 2.4); 4th index 1.7 — 2.0; 5x index 1.3 — 1.6.

Body length — φ 2.8 mm, δ 2.4 mm; wing length — φ 2.5 mm, δ 2.15 mm.

φ . From the second to the fifth tergite similar to the male. On the sixth tergite the band on the posterior margin, is like that on the fifth tergite and covers an opaque mark that occurs only in this tergite.

The two arms of the anterior and posterior Malpighian tubes with free ends. Teste pale yellow, with 12 coils (4 inner and 8 outer).

Ventral receptacle of the type common to the species of *saltans* group.

Spermatheca little chitinized in form of a pear with a collar that is more chitinized than the rest (fig. 3).

Eggs with filaments distally expanded.

Puparia with anterior spiracles with 10 to 11 branches.

Chromosomes: the metaphasic plate shows two pairs of V's and one pair of rods (fig. 7).

Distribution — Alto Rio Negro near the mouth of the Uaupés river, tributary of the Rio Negro, state of Amazonas, Brazil.

Relationships — Related to *D. subsaltans* sp. n. from which it differs by the pattern of the bands on the posterior margin of the tergite and by other small differences. Hybridization tests between these two species have given negative results.

***D. subsaltans* sp. n.**

(Figs. 4 and 8)

δ . Arista with 11 to 12 branches, usually 12. Antennae brownish yellow, third segment darker. Front brownish yellow; orbits and area around the ocellar triangle brighter. Ocellar triangle slightly darkened internally. Anterior orbital bristle slightly shorter than the posterior, middle 0.4 of the posterior.

Two prominent and equally long oral bristles. Face grayish yellow. Carina narrow, long and prominent. Few short hairs below carina, not present in all specimens. Cheeks narrow, grayish yellow, their greatest width about 1/10 to 1/8 the greatest diameter of the eyes. Red eyes with very short pile.

Acrostichals hairs in 6 to 8 (usually 8) irregular rows. Anterior scutellars slightly divergent. Thorax olive brown, darkened in the posterior region where a median bright streak is visible. Pleurae of the same color as the thorax, darkened near the wing insertion and with traces of a dark streak between the base of the first coxa and the base of the halter. Sternopleural area darkened. Anterior sternopleural bristles $2/5-1/2$ the posterior ones and more slender. Legs slightly brighter than thorax and pleurae, sometimes pale yellow. Apical bristles little evident on the first, present on the second and absent on the third tibiae. Preapicals on all three. Halteres of the same color as the legs.

Abdomen pale yellow, shining. All the tergites with dark and broad bands on the posterior margin. These bands are expanded in the middle line region and laterally, covering nearly all the second, third, fourth, and fifth tergites. On the second tergite there is sometimes a median interruption of the band on the posterior margin. Sometimes pale spots are found in the lateral expansion of the band on the posterior margin. On the 6th tergite the band on the posterior margin does not reach the lateral margin of the tergite.

Wings brownish. First costal section with two prominent bristles, third costal section with heavy bristles on its basal $2/5$. Costal index: 1.4 2.0 (♀ 1.6-2.0 ♂ 1.4-1.9); 4th vein index 2.0-2.6; 5x index 1.8-2.6.

Body length — ♀ 2.7 mm, ♂ 2.0 mm; wings — ♀ 1.95 mm, ♂ 1.68 mm.

♀. 6th tergite shows on the dark band a dense pilosity responsible for the opaque aspect.

The two arms of the anterior and posterior Malpighian tubes with free ends.

Testes pale yellow, with 13 coils (7 inner and 6 outer).

Ventral receptacle of the type common to the species of *saltans* group.

Spermatheca little chitinized, pear shaped with a little apical indentation (fig. 4).

Eggs with two filaments expanded distally.

Puparia: anterior spiracle with 8 to 10 branches.

Chromosomes: a metaphasic plate shows two pairs of V's and one pair of rods (fig. 8).

Distribution — Belém, state of Pará, Brazil.

KEY TO THE SPECIES OF THE *SALTANS* GROUP

1. Mesonotum with stripes or spots or with stripes and spots; minute hairs below carina 2
- Mesonotum without pattern or with only an indistinct vestigial pattern behind the posterior dorsocentral bristles; with or without minute hairs below carina 7

2. Mesonotum brownish gray, pollinose, with an unpaired dark brown to black median streak or spot in front of the anterior dorsocentrals *D. prosaltans* Duda
- Mesonotum without an unpaired dark brown or black median streak or spot in front of the anterior dorsocentrals 3
3. Mesonotum with a dark dull brown pair of short longitudinal stripes on the front margin, just within the dorsocentral rows, not reaching the posterior part of mesonotum *D. saltans* Sturtevant
- Mesonotum with a pair of longitudinal stripes within the dorsocentral rows reaching the posterior part of mesonotum 4
4. Scutellum uniformly blackish. Pleurae and legs blackish *D. pseudosaltans* sp. n.
- Scutellum dark brown to black, lateral edges (or margins) slightly yellowish or grayish. Legs yellowish brown 5
5. Arista with 7 branches *D. earlei* Sturtevant
- Arista with 9 branches 6
6. 6th tergite of the female with a median rectangular opaque area *D. rectangularis* Sturtevant
- 6th tergite of the female with two opaque areas, one on each side of tergite *D. sturtevanti* Duda
7. With minute hairs below carina 8
- Without minute hairs below carina 10
8. 7th female tergite (hypopygium) blackish brown. Abdomen of males shining, dark brownish tan, with broad blackish bands *D. neosaltans* Pavan & Magalhães
- 7th tergite of females yellow, abdomen of males yellow, with dark brown bands on posterior margins of the tergites 9
9. The dark brown basal band on the 5th tergite reaching the lateral edges of the tergite *D. subsaltans* sp. n.
- The band mentioned above does not reach the lateral edges of the tergite but leaves a yellow area *D. parasaltans* sp. n.
10. ♂ and ♀: abdominal tergites yellow with blackish brown bands on the posterior margins. The band on the 6th tergite does not reach the lateral margin of the tergite *D. subsaltans* sp. n.
- Not entirely as above 11
11. Acrostichals hairs often in 7 or 8 irregular rows. Thorax tan, sometimes dark, in females often lighter than in males. Abdomen brown, each tergite with a black marginal band which does not reach the lateral areas of the 5th and 6th tergite in female specimens *D. neoelliptica* Pavan & Magalhães
- Not entirely as above 12
12. Mesonotum yellowish brown. Abdomen dull brownish black, each tergite with a rather poorly defined anterior band *D. emarginata* Sturtevant
- Mesonotum and scutellum dark brown to blackish, pollinose 13

09.1.51
13.1.60

- 13. Mesonotum slightly pollinose. Pleurae brown, paler below. Legs yellowish brown, femora darker. Abdomen dark brown, slightly paler toward base of each tergite. Female with a median area on the 6th tergite that is shaped like a conventionalized heart *D. cordata* Sturtevant
- Not entirely as above 14
- 14. Pleurae dark. Legs dark brown, little brighter than the pleurae. Abdomen dark brown to black, shining, with a narrow yellowish grey basal band on the anterior margin. Opaque area included under the 6th tergite of the female, only visible in dissected specimens *D. neocordata* sp. n.
- Thorax dark blackish brown, dull. Coxae and femora black, tibiae and tarsi brown. Abdominal tergites shining black; in female each tergite with yellow anterior band. Sixth tergite in female with an elliptical opaque area *D. elliptica* Sturtevant

Acknowledgements — The author wishes to thank the Rockefeller Foundation and Conselho Nacional de Pesquisas for the grants that made possible the collection of the flies; Dr. C. PAVAN for collection of *D. parasaltans*; Dr. A. B. DA CUNHA for collection of *D. subsaltans*, *D. neocordata* and *D. pseudosaltans*; Dr. J. M. FOKKELMANN for the translation of the text to English; Dr. OVE FRYDENBERG and Prof. THEODOSIUS DOBZHANSKY for the revision of the English text and many suggestions and criticisms; Dr. C. PAVAN for his valuable assistance during the elaboration of this work; and T. M. UNGARETTI for the typewriting.

RESUMO

O presente trabalho apresenta a descrição de 4 novas espécies do gênero *Drosophila* (Diptera) incluídas no grupo *saltans* do sub-gênero *Sophophora*. Com a inclusão dessas novas espécies nesse grupo, sua definição foi mudada.

Uma chave de classificação para tôdas as espécies do grupo é também apresentada.

REFERENCES

DOBZHANSKY, TH. & PAVAN, C., 1943, Studies on Brazilian species of *Drosophila*. *Bol. Fac. Fil. Cien. Letr. Univ. S. Paulo*, XXXVI, Biol. Geral, 4:7-71.

PAVAN, C., 1950, Espécies Brasileiras de *Drosophila* II. *Bol. Fac. Fil., Cien. Letr. Univ. S. Paulo*, Biol. Geral, 8:3-35.

STURTEVANT, A. H., 1921, The North American species of *Drosophila*. *Carneg. Inst. Wash. Publ.*, 301:150 pp.

STURTEVANT, A. H., 1942, The classification of the genus *Drosophila*, with descriptions of nine new species. *Univ. Tex. Publ.*, 4213:5-51.