

NOTES ON THE HOLOTYPES OF FOUR NEOTROPICAL SPECIES OF  
THE GENUS *DROSOPHILA* (DIPTERA, DROSOPHILIDAE) DESCRIBED  
BY A.H. STURTEVANT

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ABSTRACT

*The male genitalia of the holotypes of Drosophila (Drosophila) albirostris, Drosophila (Drosophila) metzii, Drosophila (Phloridosa) alfari, Drosophila (Phloridosa) lutzii are illustrated, described and compared to those of related species. Their distributions and ecological information are summarized and their relationships discussed.*

While working at the American Museum of Natural History (New York City) in 1979, I had the opportunity to study the male holotypes of four *Drosophila* species described by A.H. Sturtevant: *Drosophila albirostris* and *D. metzii*, belonging to the *tripunctata* group of the subgenus *Drosophila*; *D. alfari* and *D. lutzii*, both in the subgenus *Phloridosa*. No attempts were made to locate paratypes.

The genitalia of the analyzed specimens were illustrated, photographed, described and compared to those of related species.

The methods are the same as those previously presented by Vilela (1983) and the terminology is modified after Hsu (1949) and Kaneshiro (1969). Unless otherwise noted, the data on the geographical distribution of the species were collected from the Catalogue of the World's Fauna (Wheeler, 1981).

The purpose of this report is to provide information that will permit a more accurate identification of those four species, one of which is only known from its original description.

✓ *Drosophila (Drosophila) albirostris* Sturtevant  
(Figs. 1; 2; 9a,b)

*Drosophila albirostris* Sturtevant, 1921: 78.

*Drosophila (Drosophila) albirostris*, Sturtevant, 1942: 32.

Holotype male labelled: "Panama, R.P., Feb. March 1915/Type/ac. 5497/*Drosophila albirostris* Sturtevant".

Genitalia ♂. Epandrium with about 10 lower and no upper bristles. Cerci not fused to posterior margin of epandrium. Surstylus with about 7 primary teeth, 5 marginal bristles and 3 bristle-like secondary teeth (Figs. 1a, b).

Hyandrium as long as epandrium; bow of hypandrium posteriorly expanded; concha of hypandrium bearing one anterior bristle (Figs. 1a, c, d).

Aedeagus laterally rough at posterior region, slightly invaginated at tip, with a pair of small, roundish, lateral, serrated expansions; dorsal cleft about 1/3 of length. Aedeagal apodeme straight, laterally flattened, broadly fused to ventral rod. Ventral rod as long as gonopod. Gonopod with one tiny sensillum, fused to concha of hypandrium (Figs. 2a-e; 9a,b). Phallosomal index about 0.9.

Relationship. Belongs to the subgroup IV (Frota-Pessoa, 1954) of the *tripunctata* group of the subgenus *Drosophila*. It is closely related to a sibling set of three species:

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*D. leticiae* Pipkin, *D. metzii* Sturtevant and *D. pellewae* Pipkin & Heed, from which it differs chiefly in the shape of aedeagus and of primary teeth row of surstylus.

According to Heed & Wheeler (1957), *D. albirostris* Sturtevant could be synonymous with *D. albicans* Frota-Pessoa. Comparison of the illustrations of the male genitalia of the former species (this report) with that of the latter as provided by Frota-Pessoa

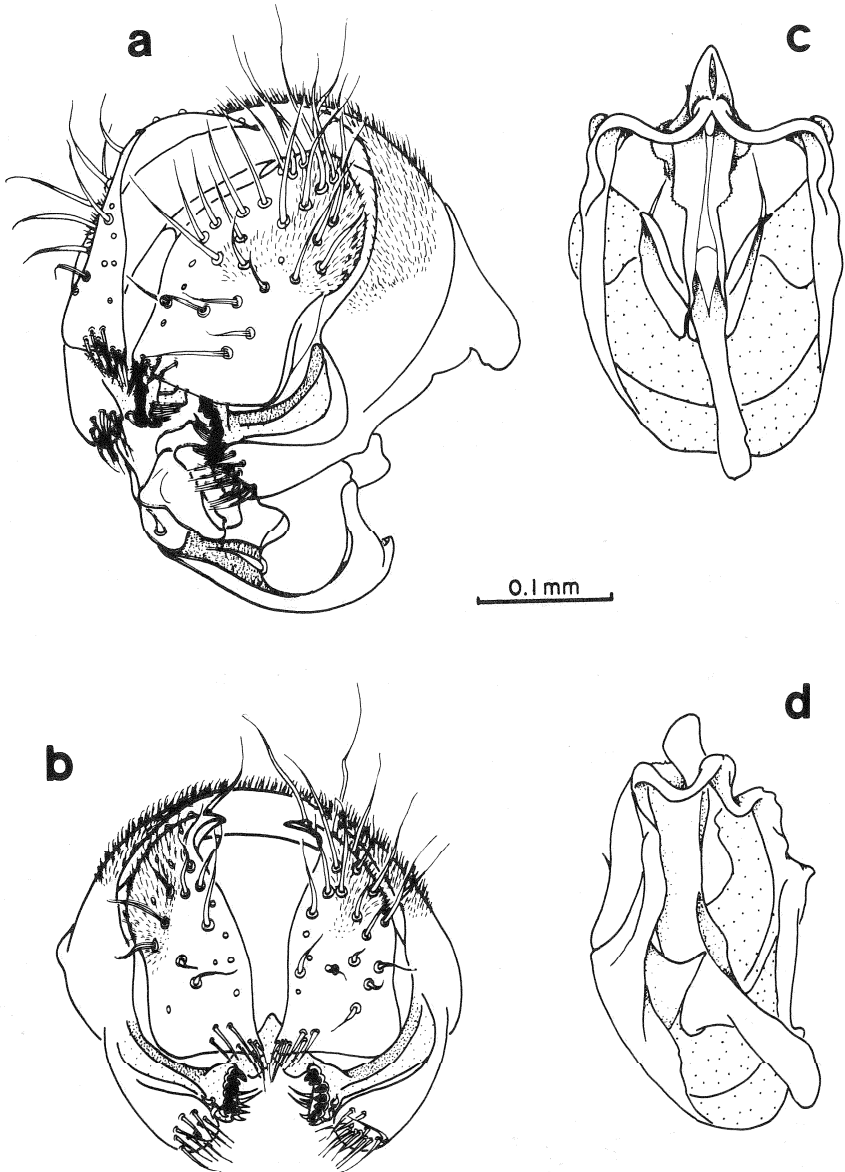


Figure 1. *Drosophila (Drosophila) albirostris* Sturtevant (holotype): a, male genitalia, lateroblique aspect; b, external male genitalia, posterior aspect; c,d, internal male genitalia, two aspects.

(1954) corroborates the surmise. However, I am of the opinion that a final decision should be preceded by the analysis of male topotypes since the holotype of *D. albicans* is a female and no intact male paratype is available (Val, 1982).

Comparing the aedeagus of *D. albirostris* with those of *D. mediosignata* Dobzhansky & Pavan and *D. medionotata* Frota-Pessoa (as illustrated by Val, 1982) one can notice

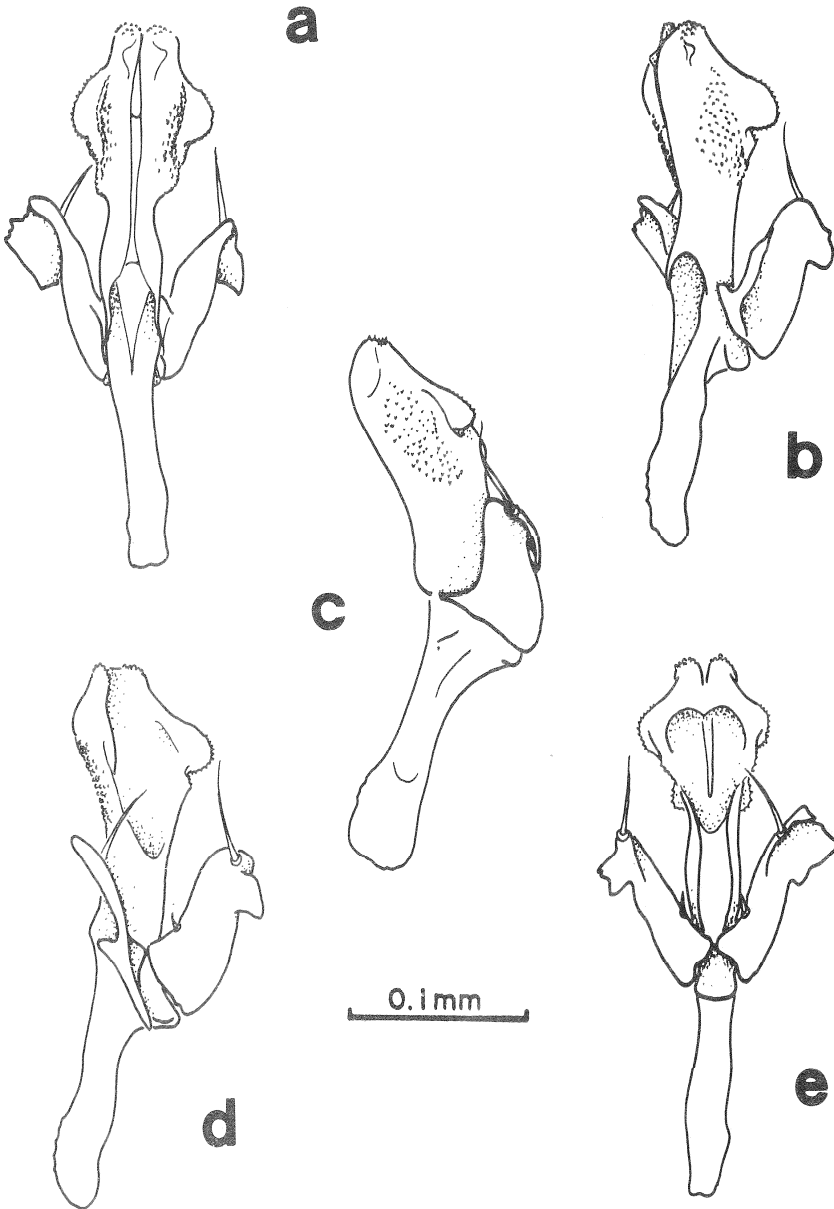


Figure 2. *Drosophila (Drosophila) albirostris* Sturtevant (holotype): a-e, aedeagus, several aspects.

some similarities, although the first belongs to the subgroup IV and the last two to the subgroup II.

Distribution. Panama.

Ecology. *D. albirostris* has been found feeding on fallen fruits of *Andira inermis* and

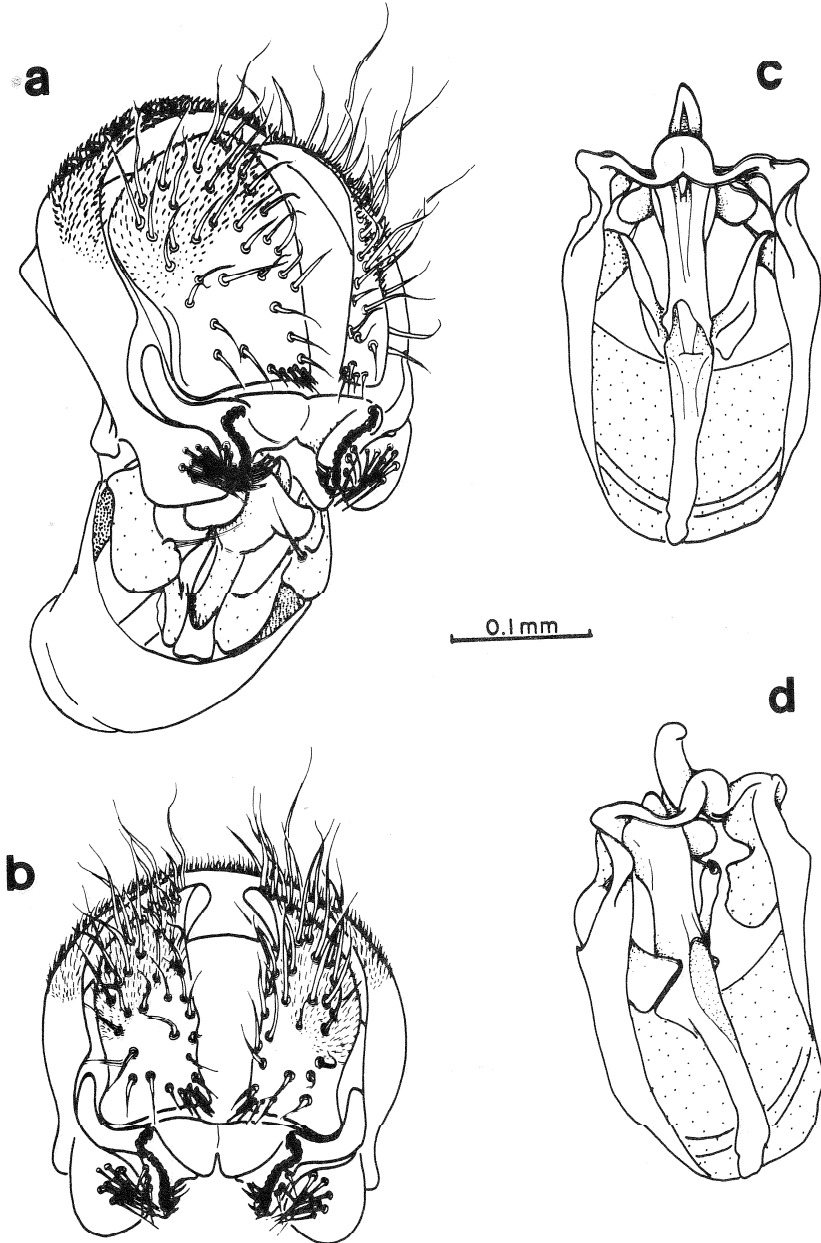


Figure 3. *Drosophila (Drosophila) metzii* Sturtevant (holotype): a, male genitalia, lateroblique aspect; b, external male genitalia, posterior aspect; c, d, internal male genitalia, two aspects.

fallen pea family vine blossoms; it has been bred from the latter as well as from fruits of *Clusia* sp. (Pipkin, 1965).

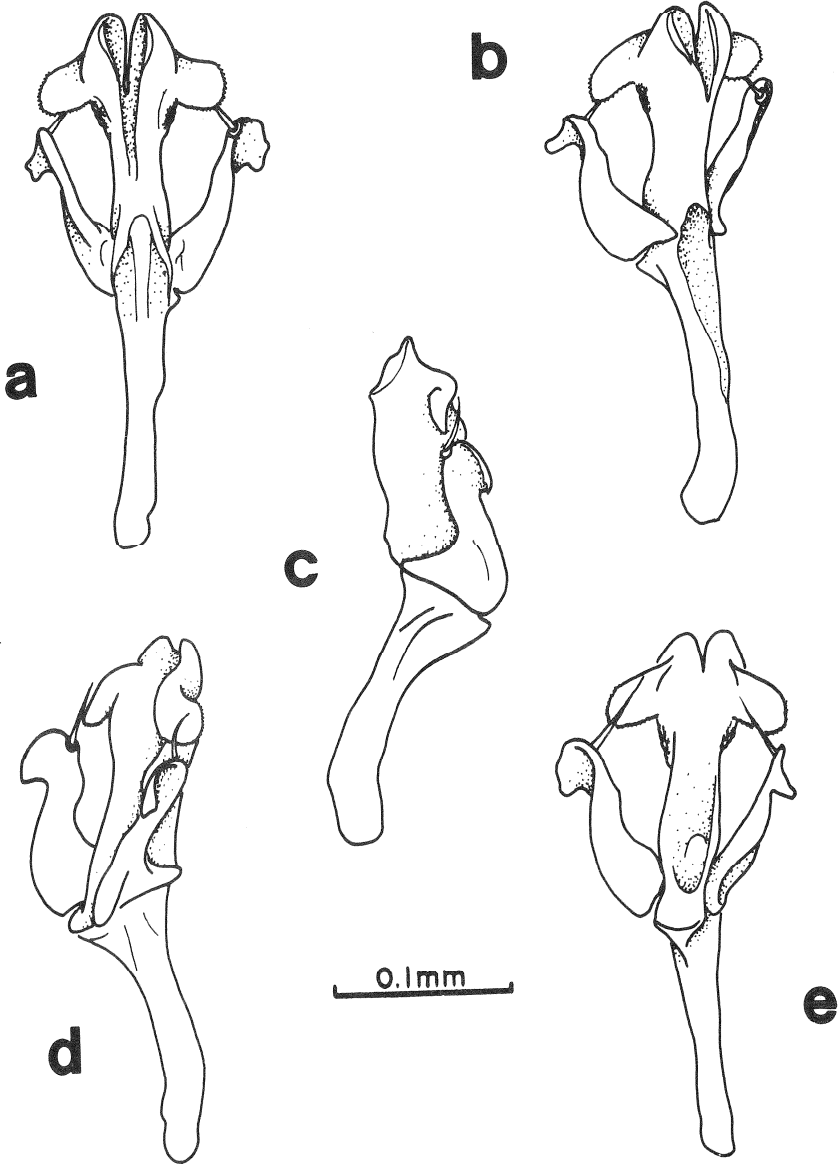


Figure 4. *Drosophila (Drosophila) metzii* Sturtevant (holotype): a-e, aedeagus, several aspects.

✓ ***Drosophila (Drosophila) metzii* Sturtevant**  
(Figs. 3; 4; 9c,d)

*Drosophila metzii* Sturtevant, 1921: 78.

*Drosophila (Drosophila) metzii*, Sturtevant, 1942: 32.

Holotype male labelled: "Herradura, Cuba / ♂ , 2/16 / Type / ac. 5497 / *Drosophila metzii* Sturtevant".

Genitalia ♂. Epandrium with about 9 lower and no upper bristles. Cerci not fused to posterior margin of epandrium. Surstylus with about 14 primary teeth, 5 marginal bristles and 3 bristle-like secondary teeth (Figs. 3a, b).

Hypandrium as long as epandrium; bow of hypandrium posteriorly expanded; concha of hypandrium bearing one anterior bristle (Figs. 3a,c,d).

Aedeagus laterally rough at middle region, invaginated at tip, with a pair of roundish, lateral, serrated expansions; dorsal cleft about 4/5 of length. Aedeagal apodeme rod-shaped; broadly fused to ventral rod. Ventral rod as long as gonopod. Gonopod with no sensillum, fused to concha of hypandrium (Figs. 3a-e; 9c,d). Phallosomal index about 0.9.

Relationship. Belongs to the subgroup IV (Frota-Pessoa, 1954) of the *tripunctata* group of the subgenus *Drosophila*. It is closely related to a sibling set of three species: *D. albirostris* Sturtevant, *D. leticiae* Pipkin and *D. pellewae* Pipkin & Heed, differing from the first chiefly in the shape of aedeagus and of primary teeth row of surstylus.

The characters used to distinguish between *D. metzii* and the last two species have been presented by Pipkin & Heed (1964) and Pipkin (1967a,b).

Distribution. West Indies, Mexico to Colombia and Trinidad. Galapagos Is. (Carson, Val & Wheeler, 1983).

Ecology. This species has been found feeding and breeding on the drier type of fallen fruits such as those of *Clusia* sp. and *Bactris* sp. and on fallen blossoms of *Bombax barrigon* (Pipkin, 1965, 1967a).

✓ ***Drosophila (Phloridosa) alfari* Sturtevant**  
(Figs. 5; 6; 9e,f)

*Drosophila alfari* Sturtevant, 1921: 75.

*Drosophila (Phloridosa) alfari*, Sturtevant, 1942: 28.

Holotype male labelled: "*Datura* flower/San Jose, Costa Rica, March 1915/Type/ac. 5497/ *Drosophila alfari* Sturtevant".

Genitalia ♂. Epandrium with about 3 lower and no upper bristles. Cerci not fused to posterior margin of epandrium. Surstylus with about 6 primary teeth, 8 marginal bristles and 4 bristle-like secondary teeth (Figs. 5a,b).

Hypandrium as long as epandrium; bow of hypandrium posteriorly expanded; concha of hypandrium micropubescent, bearing one anterior bristle (Figs. 5a,c,d).

Aedeagus ventrally expanded at anterior region, with a pair of lateral, serrated expansions; dorsal cleft as long as aedeagus. Aedeagal apodeme straight, laterally flattened, broadly fused to ventral rod. Ventral rod as long as gonopod. Gonopod micropubescent with no sensillum, fused to concha of hypandrium (Figs. 6a-e; 9e,f). Phallosomal index about 2.1.

Relationship. Belongs to the subgenus *Phloridosa*. It is related to *D. lutzii* Sturtevant, from which it differs chiefly in the shape of aedeagus and the type of connection between epandrium and surstylus.

Distribution. Known from the type-locality (San Jose, Costa Rica) only.

Ecology. Collected in the corollae of a large species of *Datura* (Sturtevant, 1921).

*Drosophila (Phloridosa) lutzii* Sturtevant  
(Figs. 7; 8; 9g,h)

*Drosophila lutzii* Sturtevant, 1916: 340.

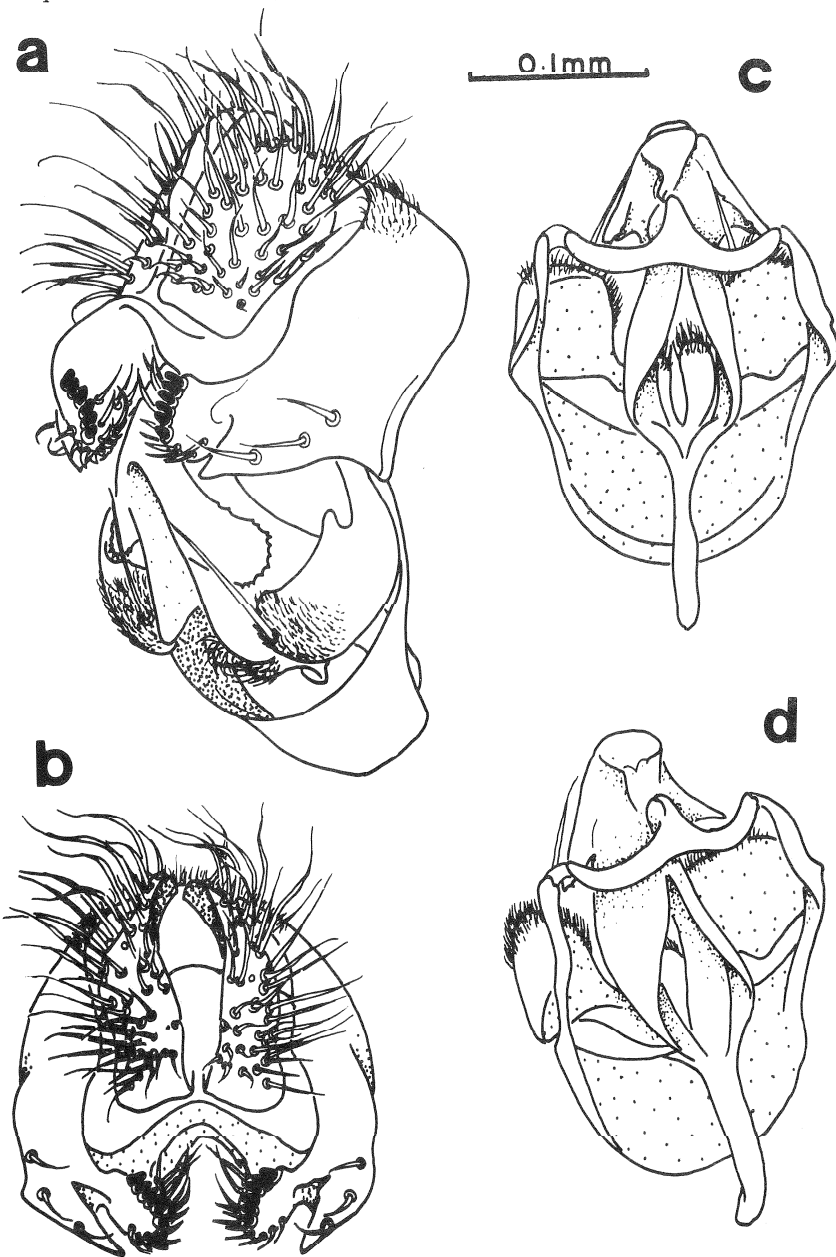


Figure 5. *Drosophila (Phloridosa) alfari* Sturtevant (holotype): a, male genitalia, lateroblique aspect; b, external male genitalia, posterior aspect; c,d, internal male genitalia, two aspects.

*Drosophila (Phloridosa) lutzii*, Sturtevant, 1942: 28.

Holotype male labelled. "Havana, Cuba, Jan. Feb. 1915/ *Datura* flow. /Type, *Dros. lutzii* Stur./Am. Mus. Nat. Hist., Dept. Invert. Zool., N° 24144/ *Drosophila lutzii* Sturtevant".

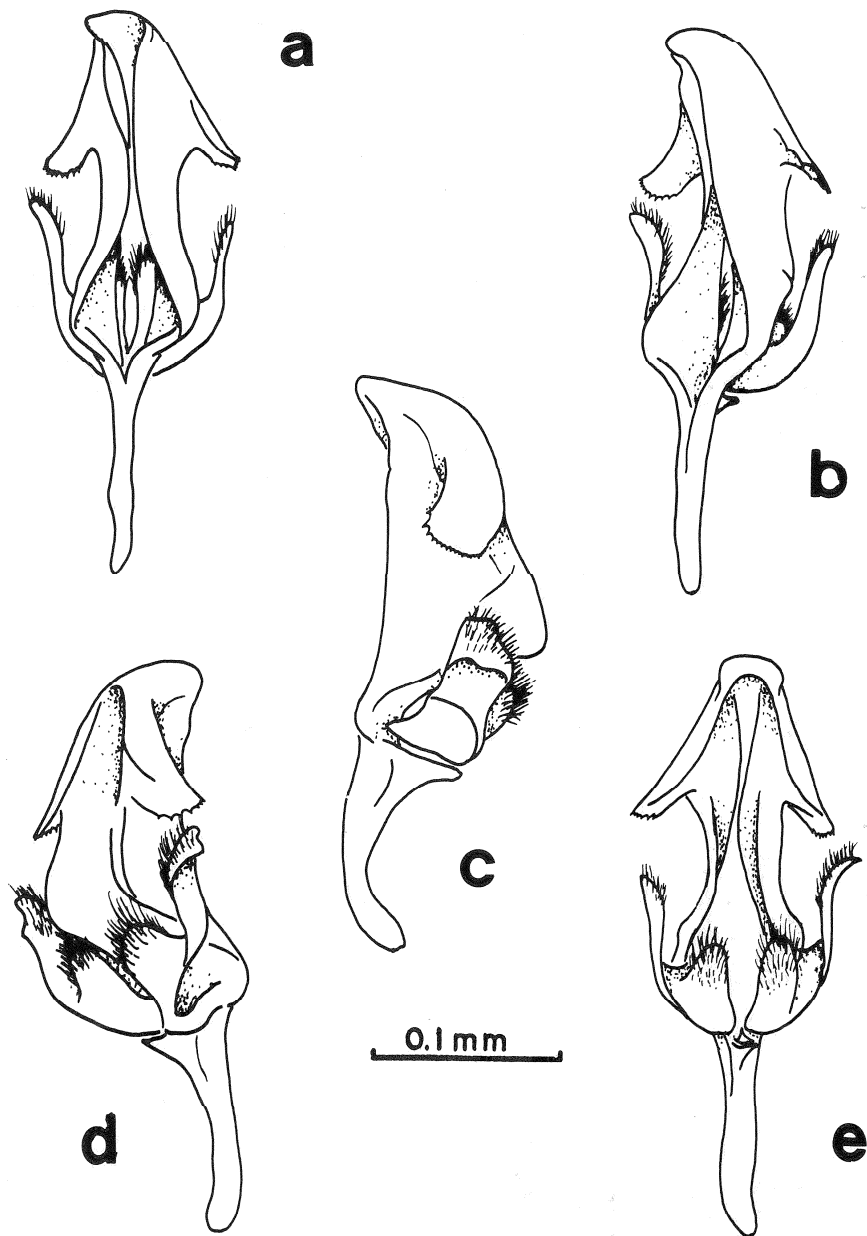


Figure 6. *Drosophila (Phloridosa) alfari* Sturtevant (holotype): a-e, aedeagus, several aspects.



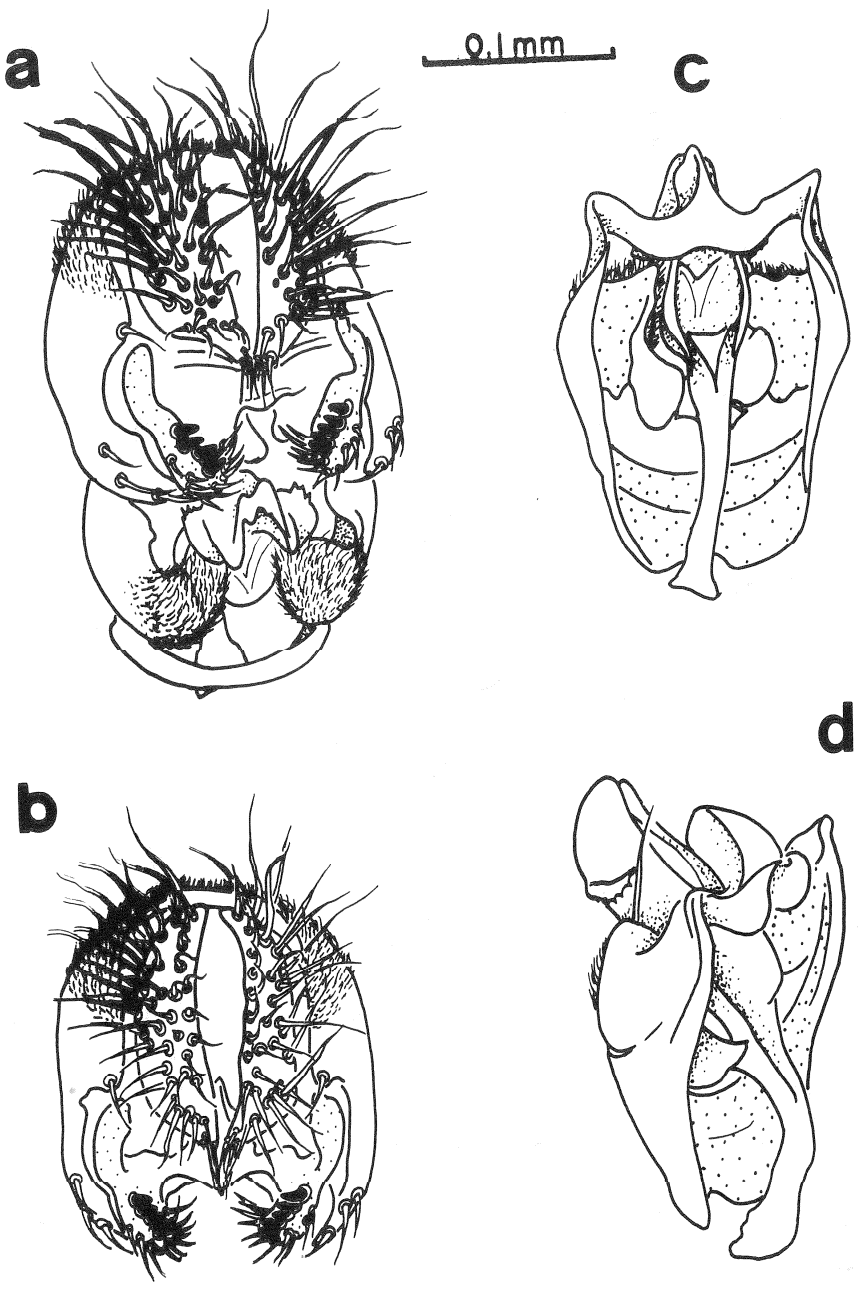


Figure 7. *Drosophila (Phloridosa) lutzii* Sturtevant (holotype): a, male genitalia, lateroblique aspect; b, external male genitalia, posterior aspect; c,d, internal male genitalia, two aspects.

Genitalia ♂. Epandrium with about 3 lower, one median and no upper bristles. Cerci not fused to posterior margin of epandrium. Surstylus linked to epandrium by membranous tissue, with about 5 primary teeth, 6 marginal bristles and 5 bristle-like secondary teeth (Figs. 7a,b).

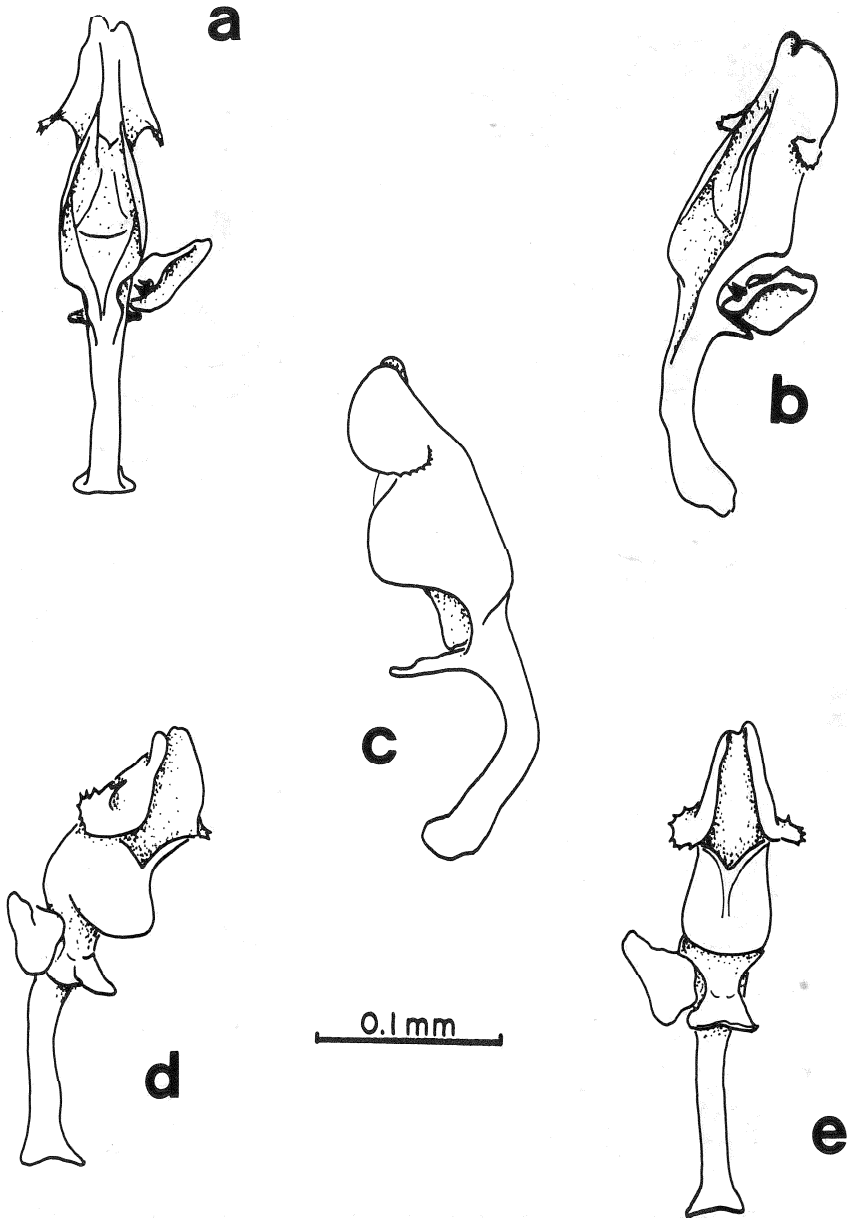


Figure 8. *Drosophila (Phloridosa) lutzii* Sturtevant (holotype): a-e, aedeagus, several aspects.

Hyandrium as long as epandrium; bow of hypandrium posteriorly expanded; concha of hypandrium micropubescent, bearing one anterior bristle (Fig. 7d).

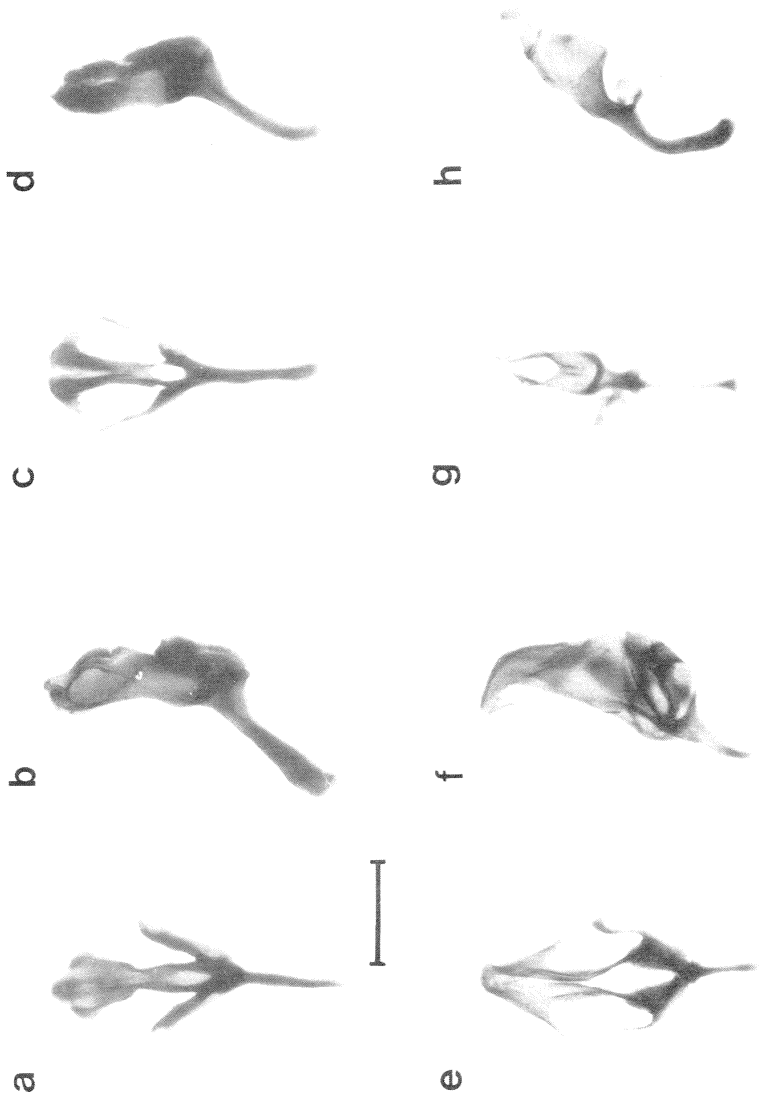


Figure 9. Aedeagi of the holotypes of: *Drosophila (Drosophila) albirostris* Sturtevant (a: ventral aspect, b: lateral aspect); *Drosophila (Drosophila) metzii* Sturtevant (c: ventral aspect, d: lateral aspect); *Drosophila (Phloridosa) alfari* Sturtevant (e: ventral aspect; f: lateral aspect); *Drosophila (Phloridosa) lutzii* Sturtevant (g: ventral aspect, h: lateral aspect). All pictures were taken at the same magnification (bar: 0.2 mm).

Aedeagus invaginated and slightly assymmetric at tip, ventrally expanded at anterior region, with a pair of lateral, serrated expansions; dorsal cleft as long as aedeagus. Aedeagal apodeme curved, rod-shaped. Ventral rod longer than gonopod. Gonopod not micropubescent, with two tiny sensilla; fused to concha of hypandrium (Figs. 8a-e; 9g,h). Phallosomal index about 1.0.

Relationship. Belongs to the subgenus *Phloridosa*. It is related to *D. alfari* Sturtevant, from which it differs chiefly in the shape of aedeagus and the type of connection between epandrium and surstylus.

Distribution. SE USA, West Indies, Mexico to Costa Rica. Brazil (Hsu, 1949).

Ecology. Collected in flowers of *Datura*, melon, cotton and morning glory and reared from decaying petals of such flowers; also bred on tomato fruit (Sturtevant, 1916, 1921).

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#### REFERENCES

- Carson, H.L., F.C. Val & M.R. Wheeler, 1983. Drosophilidae of the Galápagos Islands with descriptions of two new species. *Intern. J. Ent.* 25 (4): 239-248.
- Frota-Pessoa, O. 1954. Revision of the *tripunctata* group of *Drosophila* with description of fifteen new species (Diptera, Drosophilidae). *Arq. Mus. Paranaense*, Curitiba 10(6): 253-304.
- Heed, W.B. & M.R. Wheeler 1957. Thirteen new species in the genus *Drosophila* from the Neotropical Region. *Univ. Tex. Publs.* 5721: 17-38.
- Hsu, T.C. 1949. The external genital apparatus of male Drosophilidae in relation to systematics. *Univ. Tex. Publs.* 4920: 80-142.
- Kaneshiro, K.Y. 1969. A study of the relationships of Hawaiian *Drosophila* species based on external male genitalia. *Univ. Tex. Publs.* 6918: 55-70.
- Pipkin, S.B. 1965. The influence of adult and larval food habits on population size of Neotropical ground-feeding *Drosophila*. *Am. midl. Nat.* 74: 1-27.
- Pipkin, S.B. 1967a. Introgression between closely related species of *Drosophila* in Panama. *Evolution*, Lancaster, 22: 140-156.
- Pipkin, S.B. 1967b. A new member of a sibling set belonging to the *Drosophila tripunctata* group. *Proc. ent. Soc. Wash.* 69(2): 111-114.
- Pipkin, S.B. & W.B. Heed 1964. Nine new members of the *Drosophila tripunctata* species group (Diptera, Drosophilidae). *Pacif. Insects* 6(2): 256-273.
- Sturtevant, A.H. 1916. Notes on North American Drosophilidae with description of twenty-three new species. *Ann. ent. Soc. Am.* 9: 323-343.
- Sturtevant, A.H. 1921. The North American species of *Drosophila*. *Carnegie Inst. Wash. Publ.* 301: 150 pp.
- Sturtevant, A.H. 1942. The classification of the genus *Drosophila*, with descriptions of nine new species. *Univ. Tex. Publs.* 4213: 5-51.
- Val, F.C. 1982. The male genitalia of some Neotropical *Drosophila*: notes and illustrations. *Papéis Avulsos Zool.*, S. Paulo 34(27): 309-347.
- Vilela, C.R. 1983. A revision of the *Drosophila repleta* species group (Diptera, Drosophilidae). *Revta bras. Ent.* 27(1): 1-114.
- Wheeler, M.R. 1981. The Drosophilidae: A taxonomic overview. In *The Genetics and Biology of Drosophila*, vol. 3a, M. Ashburner, H.L. Carson & J.N. Thompson (Eds), pp 1-84, Academic Press, London.