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THE MALE GENITALIA OF SOME NEOTROPICAL *DROSOPHILA*: NOTES AND ILLUSTRATIONS

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ABSTRACT

Illustrations are given of the male genitalia of Drosophila (Drosophila) belonging to the following species group: bromelliae (one species), cardini (3), guaramunu (4), guarani (2); mesophragmatica (1), and tripunctata (9). Five species not assigned to groups are also illustrated. All specimens dissected belong to the respective type series, with the exception of D. guaraja (represented by the type series of D. pulla) and D. griseolineata (from a series published upon by Dobzhansky & Pavan, 1943). Lectotypes of 21 species are designated. All specimens are in the Museu de Zoologia (MZUSP) collection except for the types of some species of the tripunctata group, in the Museu Nacional, Rio de Janeiro (MNRJ). An appendix includes an annotated list of the other drosophilid types in the MZUSP with a simple listing of the types of the repleta group to be discussed elsewhere by C.R. Vilela.

INTRODUCTION

The identification of many Neotropical drosophilids is at present impossible because the original descriptions were incomplete. Detailed information on the male genitalia, often needed to assure identification, is at present lacking for many of the species described from Brasil. This paper includes illustrations of part of the *Drosophila (Drosophila)* type material in the Museu de Zoologia da Universidade de São Paulo and Museu Nacional do Rio de Janeiro, and a catalogue of all types of Drosophilidae in the MZUSP. Some of the male genitalia figured here have been illustrated before, but not with basis on the actual type series; some were too diagrammatic or incomplete. The male genitalia of types of *Drosophila (Drosophila)* deposited in the MZUSP and not illustrated here have been satisfactorily figured by other authors (references are included in the appendix). Views of the aedeagus and teeth in the claspers are the main aspects focused in this paper. Pilosity has been omitted in the majority of the illustrations and in some figures part of the bristles in the anal plates are also intentionally omitted.

MATERIAL AND METHODS

The following species were dissected: *D. addisoni*, *andina*, *bandeirantorum*, *bifilum*, *bromelioides*, *caponei*, *cardinoides*, *fumosa*, *griseolineata*, *guaraja*, *guaramunu*, *guarani*, *guaru*, *medioimpressa*, *medionotata*, *mediosignata*, *mediovittata*, *mesostigma*, *neocardini* (ssp. *itambacuriensis*, ssp. *mourensis*), *neoguaramunu*, *nigricincta*, *para*, *platitarsus*, *polymorpha* and *tuchaua*.

The postabdomen was removed and dissected by routine methods (Wheeler & Kambysellis, 1966). The preparations are kept in microvials or small slides attached to the pinned specimens.

SPECIES ILLUSTRATED

D. bromelioides Pavan & Cunha, 1947

Six specimens of the typical series (3♀, 3♂) are deposited in the MZUSP, all labelled "D. bromelioides Pavan e Cunha, S. Paulo, 1945". One male is hereby designated the lectotype and the other specimens in the series, paralectotypes. The genitalia was dissected from a male without head (fi. 1).

cardini group

Illustrations of the male genitalia of the *cardini* species group are presented by Streisinger, 1946 (*cardinoides*, *neocardini*, *polymorpha*); Hsu, 1949 (*cardini*, *cardinoides*, *parthenogenetica*); Malogolowkin, 1953 (*cardini*); Stalker, 1953 (*acutilabella*, *cardini*, *cardinoides*, *parthenogenetica*, *polymorpha*, hybrid ♀ *acutilabella* X ♂ *cardini*); Cova Garcia & Suárez, 1962 (*cardinoides*, *polymorpha*); Heed, 1962 (*acutilabella*, *belladunni*, *cardini*, *cardinoides*, *dunni*, *neocardini*, *neomorpha*, *nigrodunni*, *parthenogenetica*, *polymorpha*, *procardinoides*, *similis*), and Heed & Russell, 1971 (*bedicheki*, *cardinoides*).

D. cardinoides Dobzhansky & Pavan, 1943

Two females and three males of the typical series are deposited in the MZUSP, all labelled "Iporanga, São Paulo, VII-1943". One male is also labelled "Type" (see comments). One paratype was used for the illustrations (fig. 2).

D. neocardini Streisinger, 1946

A female labelled "Teffe Amazonas, Th. Dobzhansky col." and "Drosophila neocardini sp. n., G. Streisinger" is deposited in the MZUSP.

subspecies *itambacuriensis* and *mourensis* Cunha, 1955

A large number of specimens of these subspecies, preserved in fixative (Barber's fluid), is deposited in the MZUSP. One male of each subspecies was selected and each is hereby designated as the lectotype. Paralectotypes were dissected for the illustrations (figs. 3, 4).

D. polymorpha Dobzhansky & Pavan, 1943

Two males and three females of the typical series are deposited in the MZUSP. One male is labelled "Type" and all are labelled "Bertioga, São Paulo, V-1943". The male paratype was dissected (fig. 5).

guaramunu and *guarani* groups

The male genitalia of species of these groups were illustrated by King, 1947) (*guaramunu*, *guarani*, *guaru*, *subbadia*); Hsu, 1949 (*subbadia*); Malogolowkin, 1953 (*guarani*), and Brncic, 1957 (*araucana*, *huilliche*).

D. griseolineata, *guaraja*, *guaramunu* and *neoguaramunu*, in the *guaramunu* group (according to Kastritsis, 1969), and *guarani* and *guaru*, in the *guarani* group, are here illustrated.

D. griseolineata Duda, 1927

A male from Jacarepaguá, Rio de Janeiro, VII-1943 from the series mentioned by Dobzhansky & Pavan, 1943, was dissected (fig. 6).

D. guaraja King, 1947 (*D. pulla* Pavan & Cunha, 1947-syn).

Two males, two females and part of a specimen (thorax and wings) labelled "D. pulla Pavan e Cunha, Iporanga, 1944" are deposited in the MZUSP. A male without head was dissected (fig. 7). In the MZUSP collection are also deposited two females from "Campos do Jordão, stock" labelled "D. guaraja, sp.n., J. C. King det."

D. guaramunu Dobzhansky & Pavan, 1943

A male labelled "Drosophila guaramunu, Type" and four paratypes (3♀, 1♂), (fig. 8), all labelled "Amália, São Paulo, VI-1943" are deposited in the MZUSP.

D. neoguaramunu Frydenberg, 1956

One male labelled "Typus ♂, Tingo Maria, Peru, Sept. 1955" and another male and female on the same pin, labelled "Drosophila neoguaramunu Frydenberg, ♂ ♀, Peru, 1955" are deposited in the MZUSP. The holotype was dissected (fig. 9).

D. guarani Dobzhansky & Pavan, 1943

One female and four males, one of them labelled "Drosophila guarani Type", from "Cantareira, São Paulo, VI-1943" are deposited in the MZUSP. Two paratypes were dissected (fig. 10).

D. guaru Dobzhansky & Pavan, 1943

A male labelled "Drosophila guaru, Type" (fig. 11) and four paratypes (2♀, 2♂) from "Amália, São Paulo, VI-1945, G. Schreiber" are deposited in the MZUSP.

mesophragmatica group*D. andina* Dobzhansky & Pavan, 1943

Two males, one labelled "*Drosophila andina*, type", and three females (two without head), collected in "Huancayo, Peru, IV-1953" are deposited in the MZUSP. The male paratype was dissected (fig. 12).

tripunctata group

The male genitalia of species in the *tripunctata* group are illustrated by: Hsu, 1949 (*bandeirantium*, *crocina*, *tripunctata*, *unipunctata*); Malogolowkin, 1953 (*tripunctata*); Frota-Pessoa, 1954 (*albecens*, *albicans*, *angustibucca*, *bandeirantium*, *bifilum*, *campestris*, *curvapex*, *medioimpressa*, *medionotata*, *mediopicta*, *medipunctata*, *mediosignata*, *mediostriata*, *mediovittata*, *mesostigma*, *nigricincta*, *platitarsus*, *trifilum*, *tripunctata*); Pipkin & Heed, 1964 (*blumelae*; *bodemannae*, *fairchildi*, *greerae*, *jonhstonae*, *pellewae*, *suchea*, *whartoniae*); Mourão & Gallo, 1967 (*mirassolensis*) and Breuer & Rocha, 1971 (*crocina*, *mediopunctata*).

D. platitarsus in subgroup I, *medioimpressa*, *medionotata*, and *mediosignata* in subgroup II, *bandeirantium*, *bifilum*, *mesostigma* and *nigricincta* in subgroup III, and *mediovittata* in subgroup IV are here illustrated.

D. platitarsus Frota-Pessoa, 1954

The male holotype (fig. 13), from Rio de Janeiro, and two females (Mogi das Cruzes, S. Paulo, 4-1952 and Rio de Janeiro, 11-1952) are deposited in the MNRJ. A female paratype (Vila Atlântica, S. Paulo, 9-1951) is deposited in the MZUSP.

D. medioimpressa Frota-Pessoa, 1954

The male holotype (fig. 14) and eight paratypes (4♀ IV-53; 2♂ 8-53; 2♂ IV-53, all reared in laboratory) are in the MNRJ. Two paratypes (♀ IV-53; ♂ 8-53; both reared in laboratory) are deposited in the MZUSP. All specimens labelled "col. Cunha, Montes Claros, M.G."

D. medionotata Frota-Pessoa, 1954

The male holotype (Vila Atlântica, S.P., IX-1951, col. Pavan), five male paratypes from Vila Atlântica, one male and a female paratypes from Rio de Janeiro (Distrito Federal, V-1953) are deposited in the MNRJ. A female paratype from Rio (D.F., V-1953) is in the MZUSP. Frota-Pessoa (1954) mentions that the species also occurs in several localities in the State of São Paulo, and in Montes Claros (Minas Gerais). A male labelled "parátipo", Montes Claros, Minas, IV-1953, leg. Cunha" is deposited in the MZUSP. Two specimens (♀, ♂) labelled "parátipo, Gávea, Rio de Janeiro, VI-1953, col. Burla", not mentioned by Frota-Pessoa (1954) are deposited in the MNRJ. The holotype and a paratype from Vila Atlântica are illustrated (fig. 15).

D. mediosignata Dobzhansky & Pavan, 1943

A male labelled "type", two other males and two females from Iporanga, S. Paulo, VII-1943 are deposited in the MZUSP. The holotype was dissected (fig. 16).

D. bandeirantium Dobzhansky & Pavan, 1943

A male labelled "Drosophila bandeirantium, type" and ten paratypes (8♀, 2♂) from "Mogi das Cruzes, S. Paulo, V-1943" are deposited in the MZUSP. A paratype was dissected (fig. 17).

D. bifilum Frota-Pessoa, 1954

Frota-Pessoa (1954) mentions a male holotype and two paratypes (♀, ♂) collected in Vila Atlântica, and that the species also occurs in Montes Claros (Minas) "col. Brito da Cunha, IV-1953". The male paratype from Vila Atlântica is lost, only the pin and the label remaining. In addition to the holotype (fig. 18) there are two (not one) females labelled "Parátipo, Vila Atlântica, S.P., VIII-1951, Frota-Pessoa det." deposited in the MNRJ. Other specimens, not included in the original description, are labelled as paratypes, thus a female labelled "Parátipo, Drosophila bifilum, sp. n., ♀, col. Burla, Gávea, Rio, VI-952, Frota det." and a male labelled "Parátipo, Drosophila bifilum, sp. n., ♂, col. Magalhães e Frota, II-53, Cantareira, SP., Frota-Pessoa det." are deposited in the MZUSP. These specimens obviously do not belong to the type series.

D. mesostigma Frota-Pessoa, 1954

Although Frota-Pessoa mentions only ten paratypes (5♀ 5♂) and the holotype from Belém (Pará) "where the species must be frequent since 40 specimens were collected by Pavan, II-1953", 43 specimens labelled as paratypes are found in the collections. The male holotype (fig. 19) mounted on the same pin with a female paratype, five other female paratypes, a male paratype, and 26 specimens mounted together, also labelled as paratypes by Frota-Pessoa (most of them without the abdomen), all from Belém, Pará, VII-1952 (not II-1953 as in the original description), col. Pavan, are deposited in the MNRJ. In this collection are also deposited four paratypes (2♀, 2♂) from "Floriano, Piauí, III-1953, leg. Pavan", locality mentioned by Frota-Pessoa in the original description (fig. 19f). In the MZUSP collection there are two paratypes (♀, ♂) from Belém Pará, VII-1952, and two paratypes (♀, ♂) from Floriano, Piauí, III- 1953.

D. nigricincta Frota-Pessoa, 1954

The male holotype (fig. 20) and a male paratype (without the abdomen) from Cantareira, S. Paulo, II- 1953 are deposited in the MNRJ. Part of a male paratype (head and thorax) are deposited in the MZUSP.

D. mediovittata Frota-Pessoa, 1954

The male holotype (fig. 21) and two female paratypes from "Gávea, Rio de Janeiro (D.F.), VI-1952, col. Burla", are in the MNRJ. A male paratype with similar specifications and a female labelled as a paratype, also from Gávea but collected in VI-1953, are deposited in the MZUSP.

SPECIES NOT ASSIGNED TO GROUPS

D. addisoni Pavan, 1950

Two males and four females labelled "D. addisoni Pavan, Belém, 1948" are deposited in the MZUSP. One male is hereby designated lectotype (fig. 22), the other specimens of the series, paralectotypes.

D. caponei Pavan & Cunha, 1947

A series of four males and three females labelled "D. caponei Pavan e Cunha. V. Atlântica, 1943" are deposited in the MZUSP. One male is hereby designated lectotype and the other specimens in the series paralectotypes. A paralectotype was dissected (fig. 23).

D. fumosa Pavan & Cunha, 1947

Four males and three females labelled "D. fumosa Pavan e Cunha, Iporanga, 1944" are deposited in the MZUSP. One male (fig. 24) is hereby designated lectotype and the other specimens in the series paralectotypes.

D. para Pavan & Burla, 1950, in Pavan 1950

Four females (one without head) and four males (also one missing the head) labelled "D. para Pavan e Burla, Belém, 1948" are deposited in the MZUSP. Two males were dissected (fig. 25). One of those is hereby designated lectotype and the other specimens in the series paralectotypes.

D. tuchaua Pavan, 1950

Three males, one of them pinned on a cork marked "tipo", and two females, all from "Belém, 1948" are deposited in the MZUSP. The male labelled type is hereby designated lectotype and the other specimens in the series paralectotypes. A paralectotype was dissected (fig. 26).

COMMENTS

Based on the study of the morphology of the male genitalia, I am including *D. andina* in the *mesophragmatica* group. The male genitalia of *andina* are very similar to those of *D. pavani* Brncic, 1957 and *D. viracochi* Brncic & Koref-Santibañez, 1957. However, according to Nacur (1958) the male genitalia of six species in the *mesophragmatica* group show great uniformity and the small differences found are not enough to separate these closely related species.

In *D. neoguaramunu*, the lack of secondary teeth in the claspers, and the absence of small spines in the gonapophysis-conchae of the hypandrium seems to indicate a closer relationship to the *tripunctata* group (subgroup I, transitional to *guarani*, Frota-Pessoa, 1954) than to the *guaramunu* and *guarani* groups. However, Frydenberg (1956) based on the study of other characters assigned "with certainty" the species to the "*guarani* group" (in the old sense, before Kastritsis, 1969).

Dried specimens of *D. addisoni* resemble very much the species in the *cardini* group. However, the genitalia show more affinities to some species of the *tripunctata* group, such as *nigricincta* (subgroup III, transitional to *cardini*, Frota-Pessoa, 1954). Pavan (1950) considered *addisoni* as related to *albirostris* and *metzii* (*tripunctata*, subgroup IV).

Frota-Pessoa (1954, p. 257) mentions that within the *tripunctata* group subgroup I seems transitional to the *guarani* group, and that some species belonging to subgroup III seem transitional to the *cardini* group. Kastritsis (1970), after comparing polytene chromosomes of *D. mediotriata* (*tripunctata* group) and *D. griseolineata* (*guaramunu* group) conclude that "the grouping of the species in this section of the phylogenetic tree of *Drosophila* must be reviewed and possibly revised". It seems to me then, that it would be premature to try to place *neoguaramunu* and *addisoni* in species group based only on studies of the male genitalia. These observations should be complemented by further data; the study of isolated species probably will not add much or clarify the relationships in this section of the *Drosophila*.

LECTOTYPE DESIGNATION AND DOUBTFUL PARATYPES

Types of the species described by Dobzhansky & Pavan (1943) although designated collectively (p. 9) are here considered as "holotypes" because: 1. the authors mention the type locality, when the species was collected in more than one place; 2. for many species the data and the name of the collector are also given; 3. the males found in the MZUSP collection (former Departamento de Zoologia, erroneously referred by Pavan and Dobzhansky as Instituto de Zoologia, Museu Paulista are unambiguously labelled "type". The type of *D. pallidipennis* Dobzhansky & Pavan, 1943 was not found and I am not designating a lectotype because it is not clear whether the authors forgot to label the specimen or it was loaned to some other institution.

I am designating lectotypes of the species described by Pavan & Breuer (1954) because although the authors mention that "the type and paratypes of the two species are preserved in the Departamento de Zoologia da Secretaria de Agricultura de São Paulo" specimens labelled "type" are not to be found in the collection.

I consider as paratypes specimens mentioned by Frota-Pessoa (1954) in the description of several species of the *tripunctata* group based on article 72 (b) of the International Code of Zoological Nomenclature which says that "The type series of a species consists of all the specimens on which the author bases the species, except any that he refers to as variants, or doubtfully associates with the nominal species, or expressly excludes from it". These specimens are labelled as paratypes by Frota-Pessoa. Specimens not mentioned in the original description although labelled as paratypes are not considered as such.

APPENDIX

Other types of Drosophilidae in the MZUSP

Clastopterymyia carrerai Frota-Pessoa, 1947: Holotype ♂, Cantareira, S. Paulo, VII-945. M. Carreira col.

Clastopterymyia montei Frota-Pessoa, 1947: Holotype, Petrópolis, M. Vogel, 1930 (genitalia missing, sex not mentioned in the description).

Drosophila (Scaptodrosophila) mirim Dobzhansky & Pavan, 1943: Holotype ♂, paratypes (♀, ♂), Bertioga, São Paulo, 30-IV-1943.

Drosophila (Hirtodrosophila) mendeli Mourão, Gallo & Bicudo, 1965: Holotype, allotype, and paratypes (2♀, 2♂, all preserved in fixative). No locality label.

Observation: All of Mourão's types were originally preserved in medicine empty bottles with rubber stoppers which were subsequently dissolved by the fixative (Barber) and impregnated the specimens.

Drosophila (Hirtodrosophila) morgani Mourão, Gallo & Bicudo, 1967: Holotype, allotype and paratypes (2♀, 2♂, all in fixative).

Drosophila (Hirtodrosophila) prognatha Sturtevant, 1916: Two paratypes, Adjuntas, P.R., June 8-13, 1915.

Drosophila (Drosophila) albecens Frota-Pessoa, 1954: Paratypes (♀, ♂), col. Burla, Gávea, Rio de Janeiro, VI-1952, Frota-Pessoa det. Although Frota-Pessoa mentions only two paratypes in the original description, in addition to these two in the MZUSP there are eight other specimens labelled paratypes in the MNRJ collection. Additional illustrations of the aedeagus (figure in Frota-Pessoa, 1954) are needed but all males found are missing the abdomen.

Drosophila albicans Frota-Pessoa, 1954: Paratypes (♀, ♂) born from the ♀ holotype from Pirassununga, S. Paulo, II-1952, col. Breuer & Pavan. Unfortunately the male lacks the genitalia and I wasn't able to find Frota-Pessoa's preparations on slides. Incomplete genitalia illustrations are given in Frota-Pessoa, 1954.

Drosophila araicas Pavan & Nacur, 1950: Four males and four females labelled "D. araicas, Pavan e Pereira, Belém, 1948". The type locality is not given in the description. One male is hereby designated lectotype and other species in the series paralectotypes. Fine genitalia illustrations are given in Breuer & Pavan, 1950.

Drosophila arapuan Cunha & Pavan in Pavan & Cunha, 1947: Four males, three females and a specimen lacking the abdomen, labelled "D. arapuan Cunha e I. Pavan, Itatiaia, 1944". One male is hereby designated lectotype and the other specimens in the series paralectotypes. Fine genitalia illustrations are given in Breuer & Pavan, 1950.

Drosophila ararama Pavan & Cunha, 1947: Four females and three males, one of those labelled "tipo", all labelled "D. ararama Pavan, B. da Cunha, Bertioga". The male labelled "tipo" is hereby designated as lectotype and the other specimens in the series paralectotypes. Fine genitalia illustrations are given in Breuer & Pavan, 1950.

Drosophila arassari Cunha & Frota-Pessoa in Pavan & Cunha, 1947: Two males, two females and a specimen without abdomen, all labelled "D. arassari B. da Cunha & F. Pessoa, C. Jordão, set. 1944". One male was selected and is hereby designated lectotype while the other specimens in the series are paralectotypes. Fine genitalia illustrations are given in Breuer & Pavan, 1950.

Drosophila arauna Pavan & Nacur, 1950: A male marked "tipo" on the cork which holds the minuten pin and seven other specimens (4♂, 3♀), all labelled "D. arauna, Pavan & Pereira, Pirassununga". The male marked "type" is hereby designated lectotype. The other specimens, paralectotypes. Fine genitalia illustrations are given in Breuer & Pavan, 1950.

Drosophila atrata Burla & Pavan, 1953: Holotype ♂, and paratypes (4♀, 2♂), *D. atrata* n. sp., Pirassununga, VI-51. Genitalia illustrations are given in the description.

Drosophila betari Dobzhansky & Pavan, 1943 (*repleta* gr.).

Drosophila borborema Vilela & Sene, 1978 (*repleta* gr.).

Drosophila breuerae Rocha, 1971: Holotype ♂, and paratypes (2♂, 1♀) from Palmira, Colombia, H. B. Heed, Nov. 1955. Fine genitalia illustrations are presented in the description.

Drosophila brieri Pavan & Breuer, 1954: Eight specimens labelled "D. brieri, V. Atlântica, Maio-1950". A male is hereby designated lectotype and the other specimens in the series paralectotypes. Fine genitalia illustrations are given in the description.

Drosophila brunneipalpa Dobzhansky & Pavan, 1943 (*repleta* gr.).

Drosophila camargoi Dobzhansky & Pavan, in Pavan, 1950: A male labelled "tipo" and six other specimens (3♀, 3♂, 2 missing the genitalia) all from Belém, Pará. The male marked "type" is hereby designated lectotype and the other specimens paralectotypes. The lectotype was collected in July-1948, two paralectotypes in 26-V-1948, two other in 25-VI-1948, one in 26-VI-1948 and one has no date. Fine genitalia illustrations are given in Pavan & Breuer, 1954.

Drosophila cestri Brncic, 1878: Thirteen males and seven females from Sapucaia, Rio Grande do Sul, 13-9-77, Brncic col. One male was selected and is hereby designated lectotype, the other specimens in the series, paralectotypes. The genitalia is well illustrated in the description.

Drosophila corderoi Brncic, 1978: Two males and two females, Morro da Polícia, Porto Alegre, RS, Br., 20-9-77. A male is hereby designated lectotype and the other specimens paralectotypes. The genitalia is well illustrated in the description.

Drosophila curvapex Frota-Pessoa, 1954: Paratype (♀, abdomen, one wing, four legs missing), Feliz, R.G. do Sul, VII-1951, Cordeiro col. The genitalia is well illustrated in the description.

Drosophila dreyfusi Dobzhansky & Pavan, 1943: A female labelled type and three paratypes (♀), all from Mogi das Cruzes, São Paulo, V-1943. Fine genitalia illustrations are given in Pavan & Breuer, 1954.

Drosophila fascioloides Dobzhansky & Pavan, 1943 (*repleta* gr.).

Drosophila inca Dobzhansky & Pavan, 1943 (*repleta* gr.).

Drosophila krugi Pavan & Breuer, 1954: Three males, one labelled "Tipo" and five females, from Cantareira, S. Paulo. The type was collected in August-1951, while the other males in November and December-1954 respectively, the females are all labelled XII-54. Fine genitalia illustrations are included in the description.

Drosophila limensis Pavan & Patterson in Pavan & Cunha, 1947 (*repleta* gr.).

Drosophila mediopicta Frota-Pessoa, 1954: Paratype ♂, Cantareira, S. Paulo, II-1953, col. Frota & Magalhães and a female reared from *Datura* flower on the ground. The genitalia is well illustrated in the description.

Drosophila mediopunctata Dobzhansky & Pavan, 1943: A male labelled type, three females and another male, all from Itanhaem, S. Paulo, VI-1943. Fine genitalia illustrations are given in Frota-Pessoa, 1954 and in Breuer & Rocha, 1971.

Drosophila mercatorum pararepleta Dobzhansky & Pavan, 1943 (*repleta* gr.).

Drosophila mirassolensis Mourão & Gallo, 1967: Holotype ♂, allotype, and ten paratypes (5♀, 5♂) all preserved in fixative) (see obs. in *D. Hirtodrosophila mendeli*). The genitalia is well illustrated in the description.

Drosophila moju Pavan, 1950 (*repleta* gr.)

Drosophila pallidipennis Dobzhansky & Pavan, 1943: Three males and two females, Iporanga, São Paulo, VII-1953. The genitalia is well illustrated in Malogolowkin, 1953.

Drosophila paramercatorum Magalhães & Malogolowkin-Cohen, 1974 (*repleta* gr.).

Drosophila paranaensis Dreyfus & Barros, 1948 (*repleta* gr.).

Drosophila procardionoides Frydenberg, 1956: Holotype ♀ Huadquiña, Peru, Sept. 1955.

Drosophila pseudomercatorum Magalhães & Malogolowkin-Cohen, 1974 (*repleta* gr.).

Drosophila setosa Dobzhansky & Pavan, 1943 (*repleta* gr.).

Drosophila serido Vilela & Sene, 1978 (*repleta* gr.).

Drosophila trifilum Frota-Pessoa, 1954: Paratypes (♀, ♂), Mogi das Cruzes, S. Paulo, VIII-1951, col. Pavan. The genitalia is well illustrated in the description.

Drosophila (Sophophora) bocainoides Carson, 1954: Five males and two females, Vila Atlântica, S. Paulo, VII-1951, H. Carson. A male was selected and is hereby designated lectotype, the other specimens in the series, paralectotypes.

Drosophila bocainensis Pavan & Cunha, 1947: Five males and two females, from "Vila Atlântica", S. Paulo, VII-1951, H. Carson", referred by Carson (1954) as "paratype material". As the types of Pavan & Cunha were lost, Carson probably meant "neotype material".

- Drosophila capricorni* Dobzhansky & Pavan, 1943: A male labelled type and four paratypes (2♀, 2♂), Praia Grande, São Paulo 9-V-1943.
- Drosophila dacunhai* Mourão & Bicudo, 1967: Holotype ♂, allotype and ten paratypes (5♀, 5♂), no locality label.
- Drosophila equinoxialis* Dobzhansky, 1946: A male labelled "Teffé, Amazonas, Th. Dobzhansky" and "*Drosophila equinoxialis* sp. n. Th. Dobzhansky".
- Drosophila magalhaesi* Mourão & Bicudo, 1967: Holotype ♂, allotype and ten paratypes (5♀, 5♂), no locality label.
- Drosophila neocordata* Magalhães, 1956: Five males and three females mounted together, labelled "D. neocordata, Montes Claros". A male (now mounted separately) is hereby designated lectotype, the other specimens paralectotypes.
- Drosophila neoelliptica* Pavan & Magalhães, 1950 in Pavan, 1950: Four females, a male and a specimen lacking the abdomen, all labelled "D. neoelliptica Pavan & Magalhães, Anápolis, Goyaz, 1949". The male is hereby designated lectotype and the other specimens in the series paralectotypes.
- Drosophila neosaltans* Pavan & Magalhães, 1950, in Pavan, 1950: Five males and two females labelled "D. neosaltans Pavan e Magalhães, Mogi das Cruzes, 1949". One male has no date and the label is larger than the others. The male (dated) is hereby designated lectotype, the other specimens in the series paralectotypes.
- Drosophila parabocainensis* Carson, 1954: Five males and three females, Feliz, Rio Grande do Sul, VII-1951, H. Carson. A male is hereby designated lectotype and the other specimens in the series, paralectotypes.
- Drosophila pavlovskiana* Kastritsis & Dobzhansky, 1967: Two female paratypes, Apoteri, British Guiana.
- Drosophila pseudobocainensis* Wheeler & Magalhães, 1962: Two paratypes (♀, ♂), Boquete, Chiriqui, Panama.

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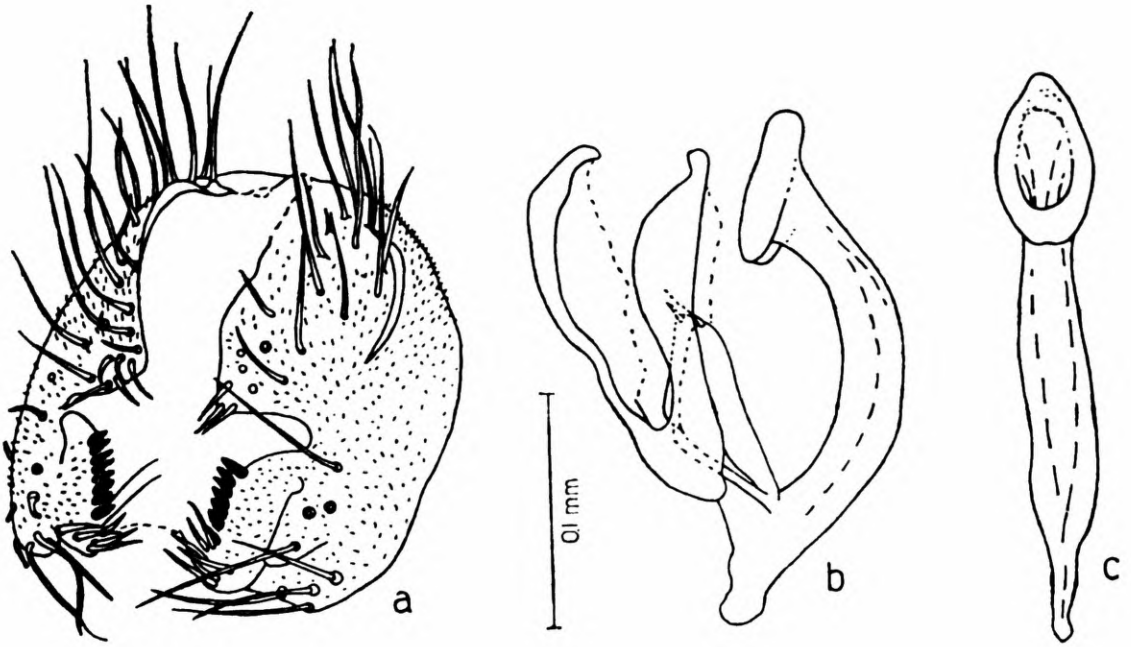


Fig. 1. *Drosophila bromelioides*, paralectotype, a. genital arch, semi-ventral view; b. aedeagus and hypandrium, side view; c. aedeagus, ventral view.

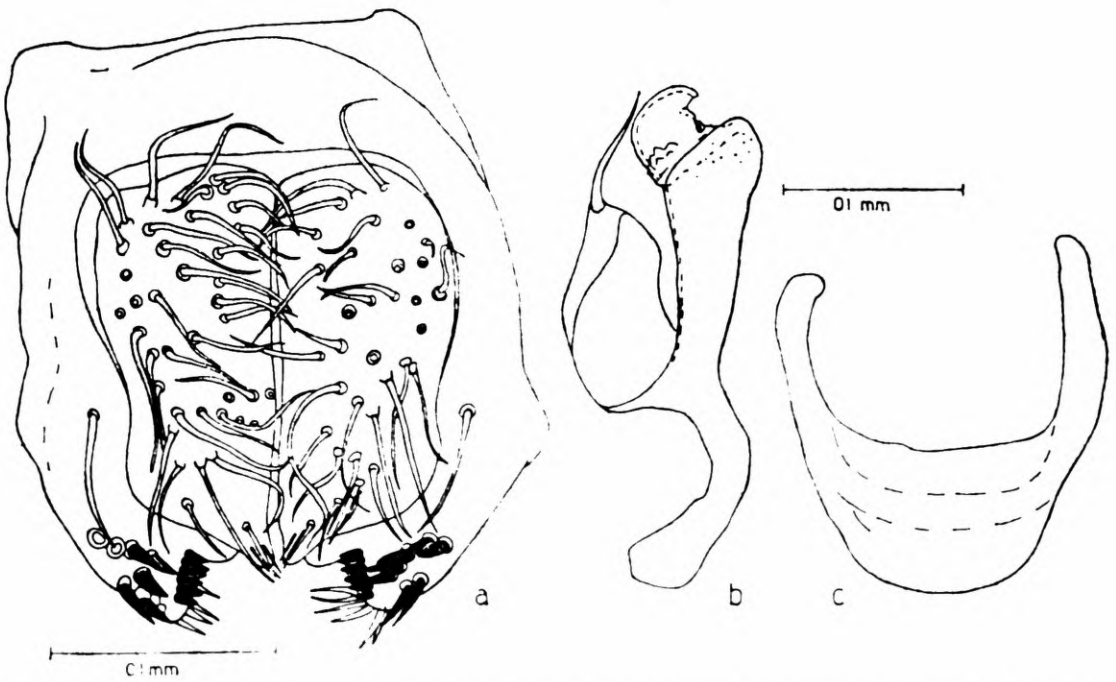


Fig. 3. *Drosophila neocardini itambacuriensis*, paralectotype: a. genital arch, upper view; b. aedeagus and gonapophysis, lateral view; c. hypandrium, ventral view.

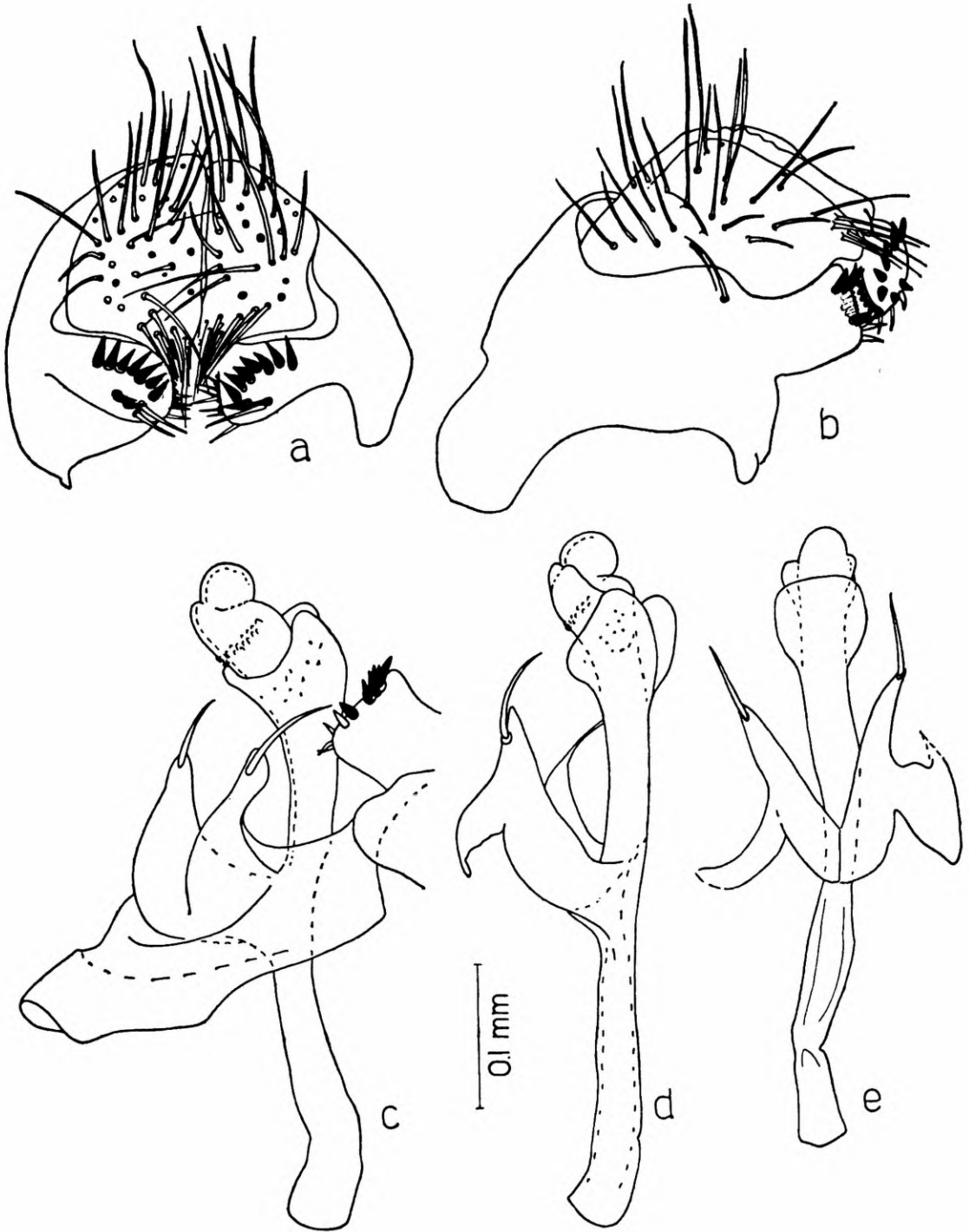


Fig. 2. *Drosophila cardinoides*, paratype; a. genital arch, ventral view; b. genital arch, semi-lateral view; c. aedeagus, hypandrium and left forceps, semi-lateral view; d. aedeagus and gonapophysis, semi-dorsal view; e. aedeagus and gonapophysis, ventral view.

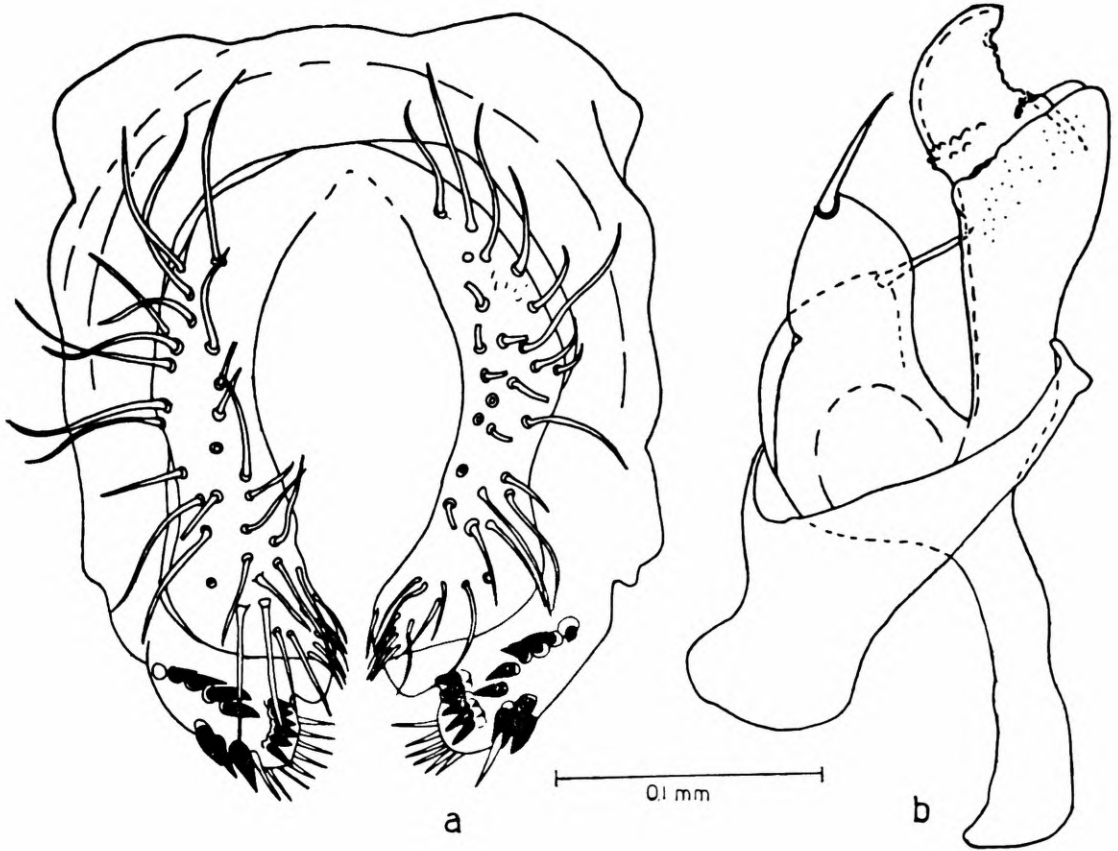


Fig. 4. *Drosophila neocardini mourensis*, paralectotype: a. genital arch, upper view; b. aedeagus and hypandrium, lateral view.

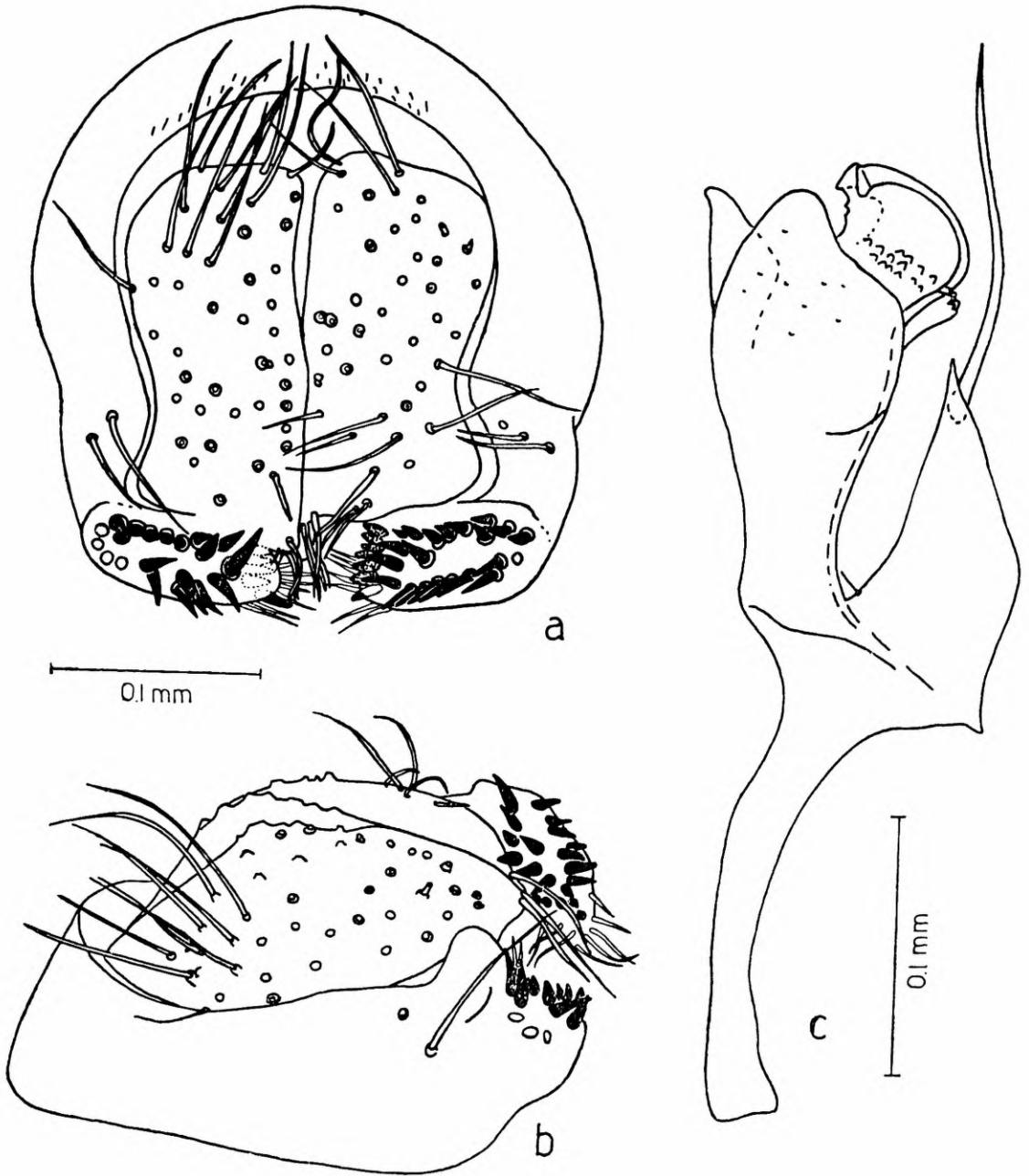


Fig. 5. *Drosophila polymorpha*, paratype: a. genital arch, upper view; b. genital arch, semi-lateral view; c. aedeagus and gonapophysis, lateral view.

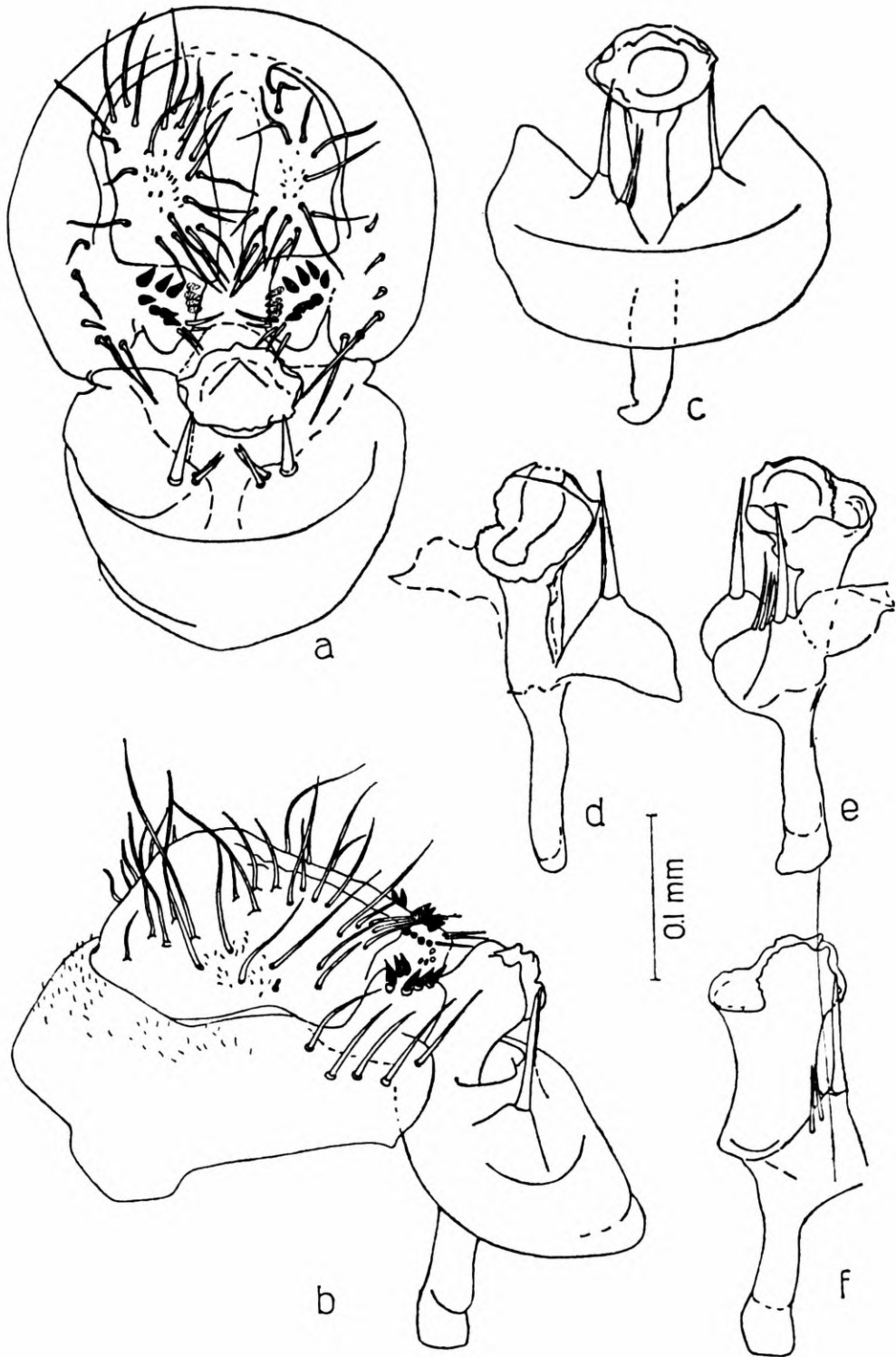


Fig. 6. *Drosophila griseolineata*, specimen from Jacarepaguá, RJ: a. male genitalia, upper ventral view; b. male genitalia, semi-lateral view; c. aedeagus and hypandrium, ventral view; d. aedeagus and gonapophysis, semi-dorsal view; e. aedeagus and gonapophysis, semi-lateral view; f. aedeagus and gonapophysis, lateral view.

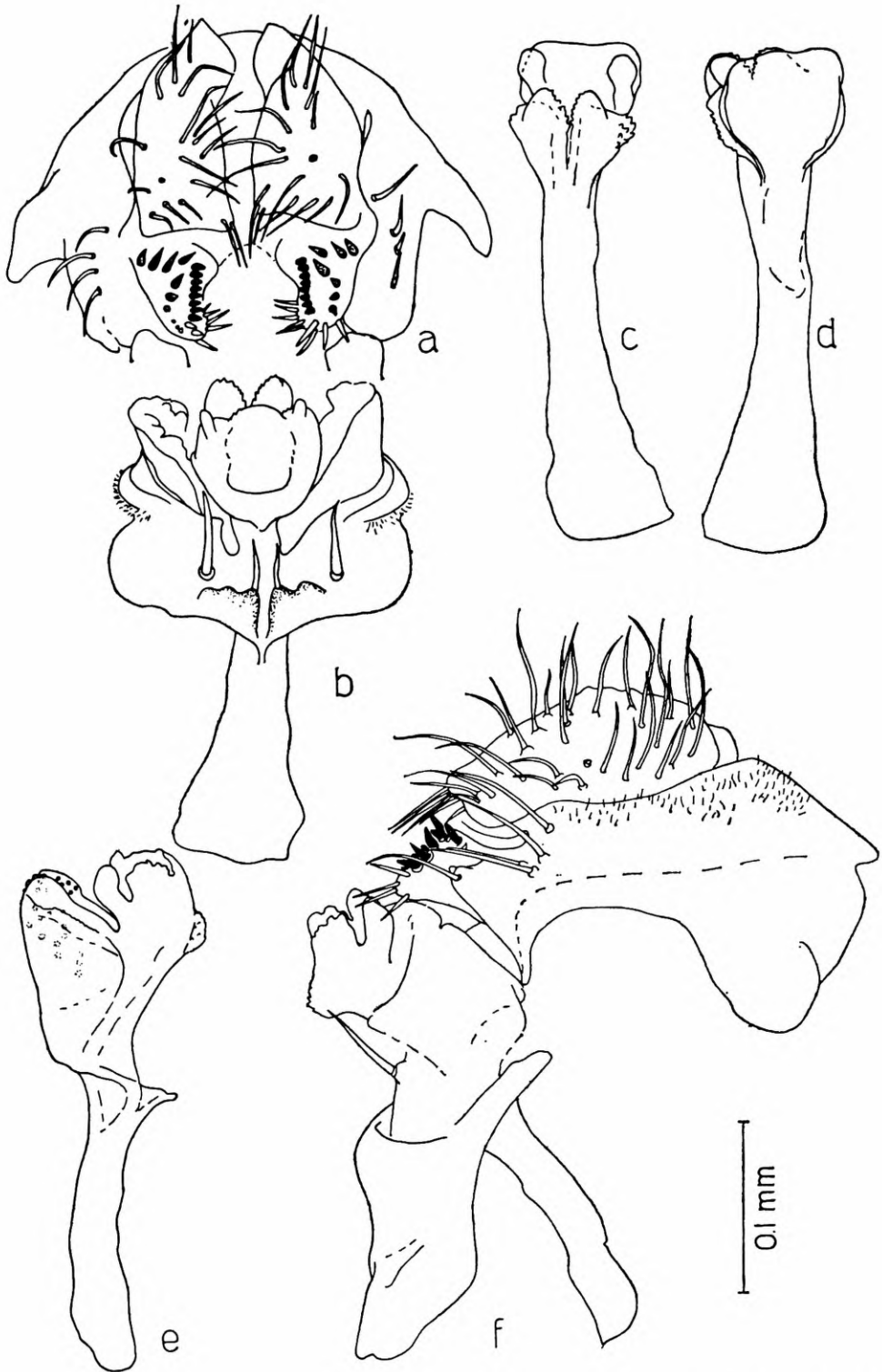


Fig. 7. *Drosophila guaraja*, paratype of *D. pulla*: a. genital arch, ventral view; b. aedeagus and hypandrium, ventral view; c. aedeagus, dorsal view; d. aedeagus, ventral view; e. aedeagus, lateral view; f. male genitalia, lateral view.

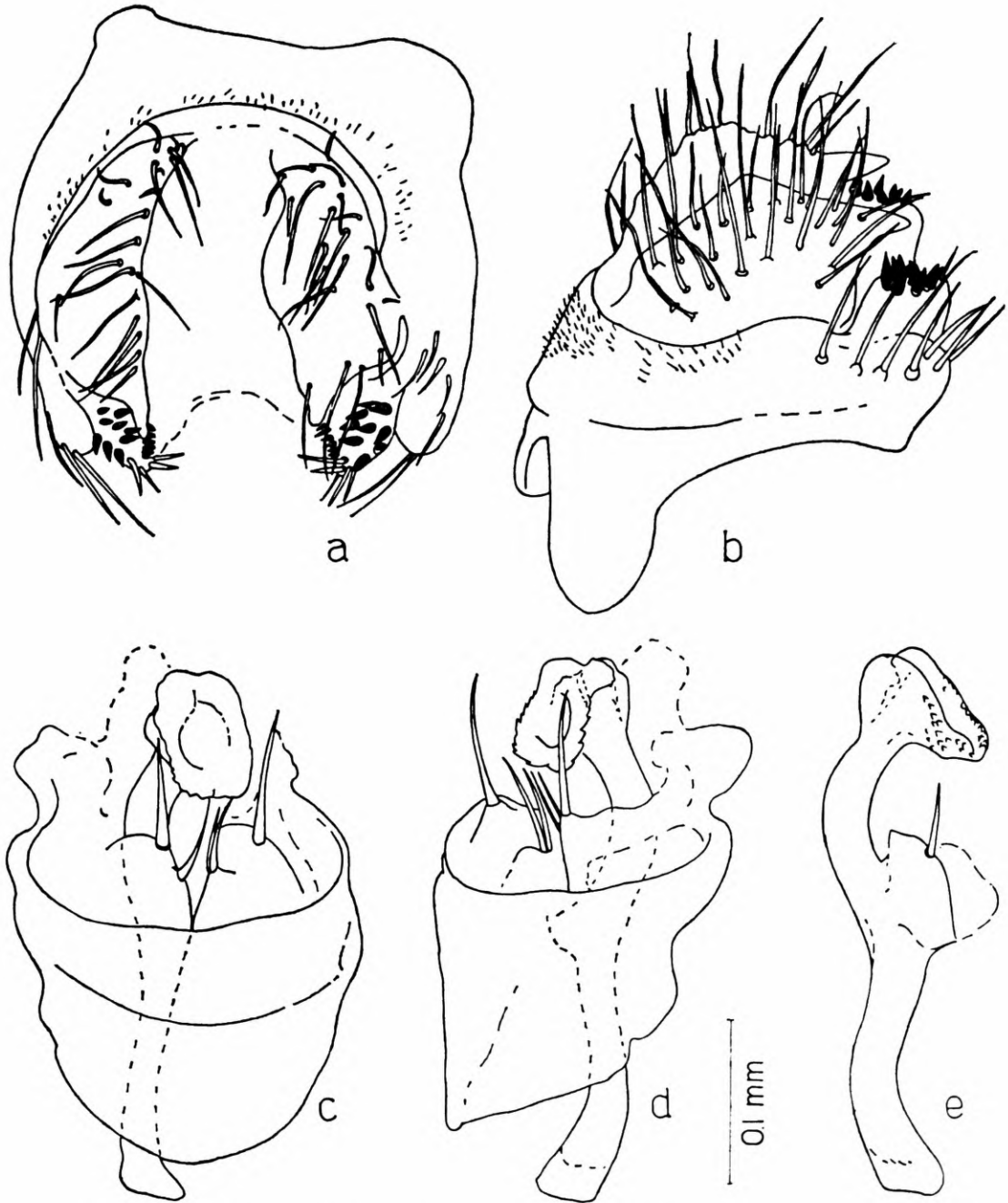


Fig. 8. *Drosophila guaramunu*, paratype: a. genital arch, upper view; b. genital arch, semi-lateral view; c. aedeagus and hypandrium, semi-ventral view; d. aedeagus and hypandrium, semi-lateral view; e. aedeagus, semi-lateral view.

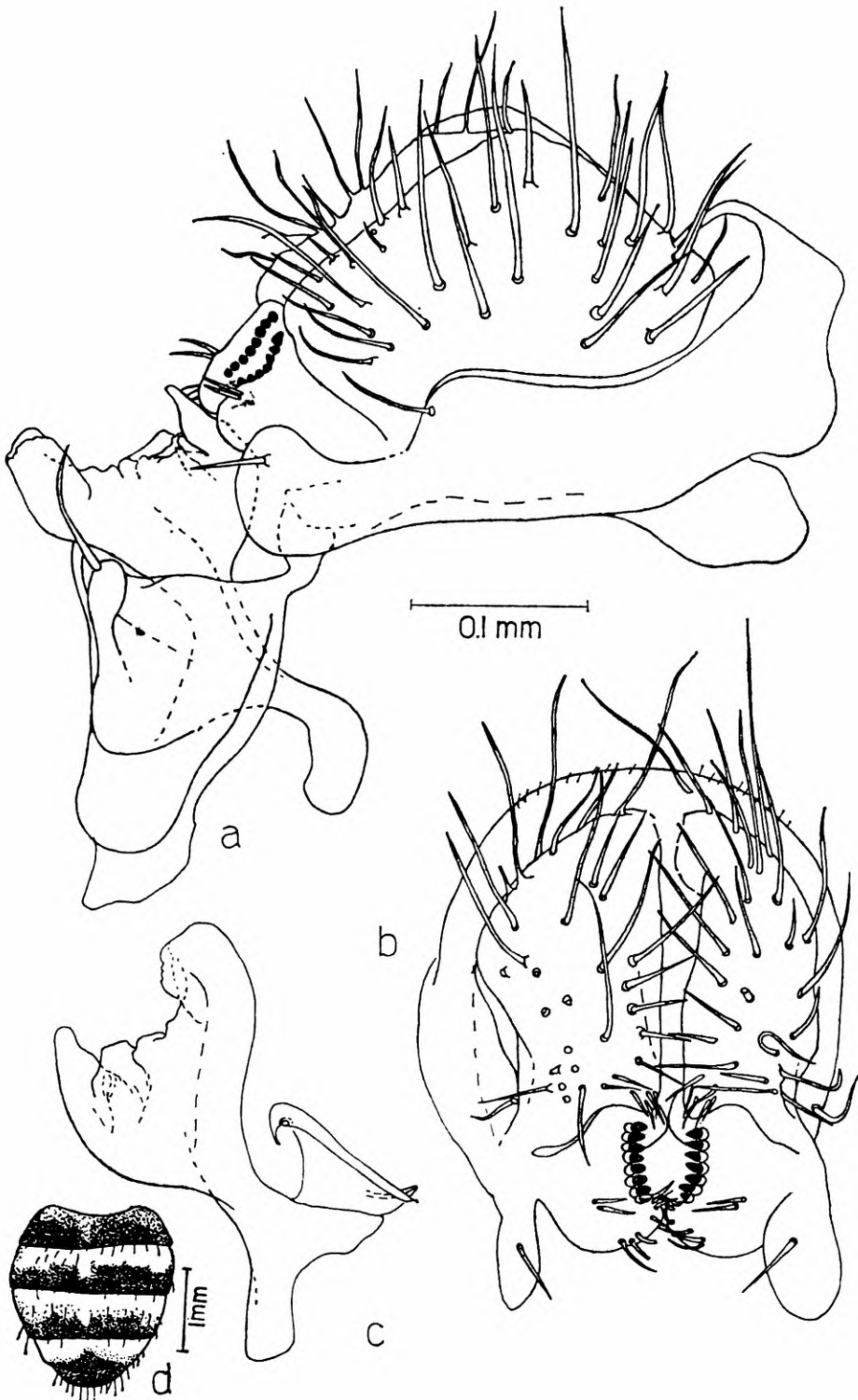


Fig. 9. *Drosophila neoguaramunu*, holotype: a. male genitalia, semi-lateral view; b. genital arch upper view; c. aedeagus, lateral view; d. abdomen, dorsal view.

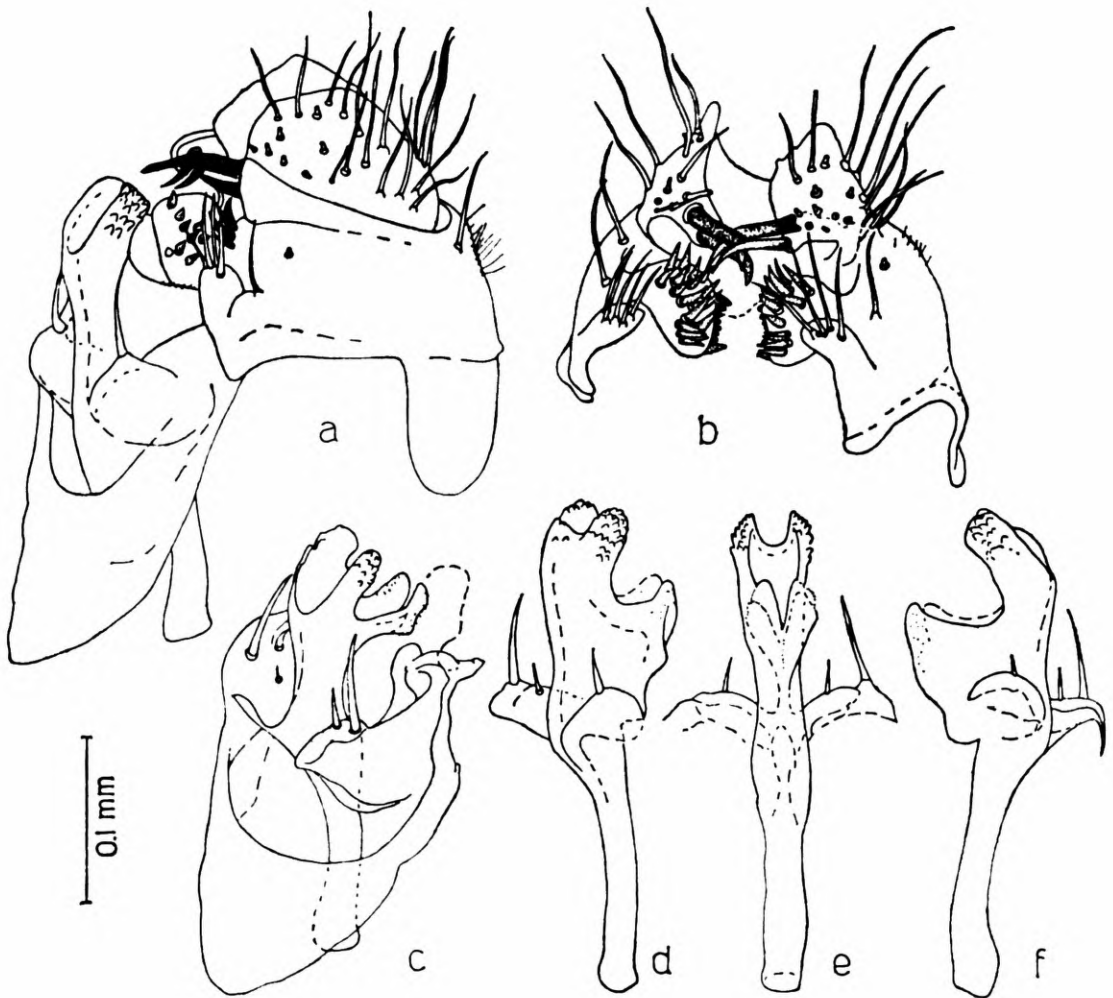


Fig. 10. *Drosophila guarani*, two paratypes: a. male genitalia, semi-lateral view; b. genital arch, ventral view; c. aedeagus and hypandrium, semi-ventral view; d. aedeagus and gonapophysis, semi-lateral view; e. aedeagus, dorsal view; f. aedeagus, lateral view.

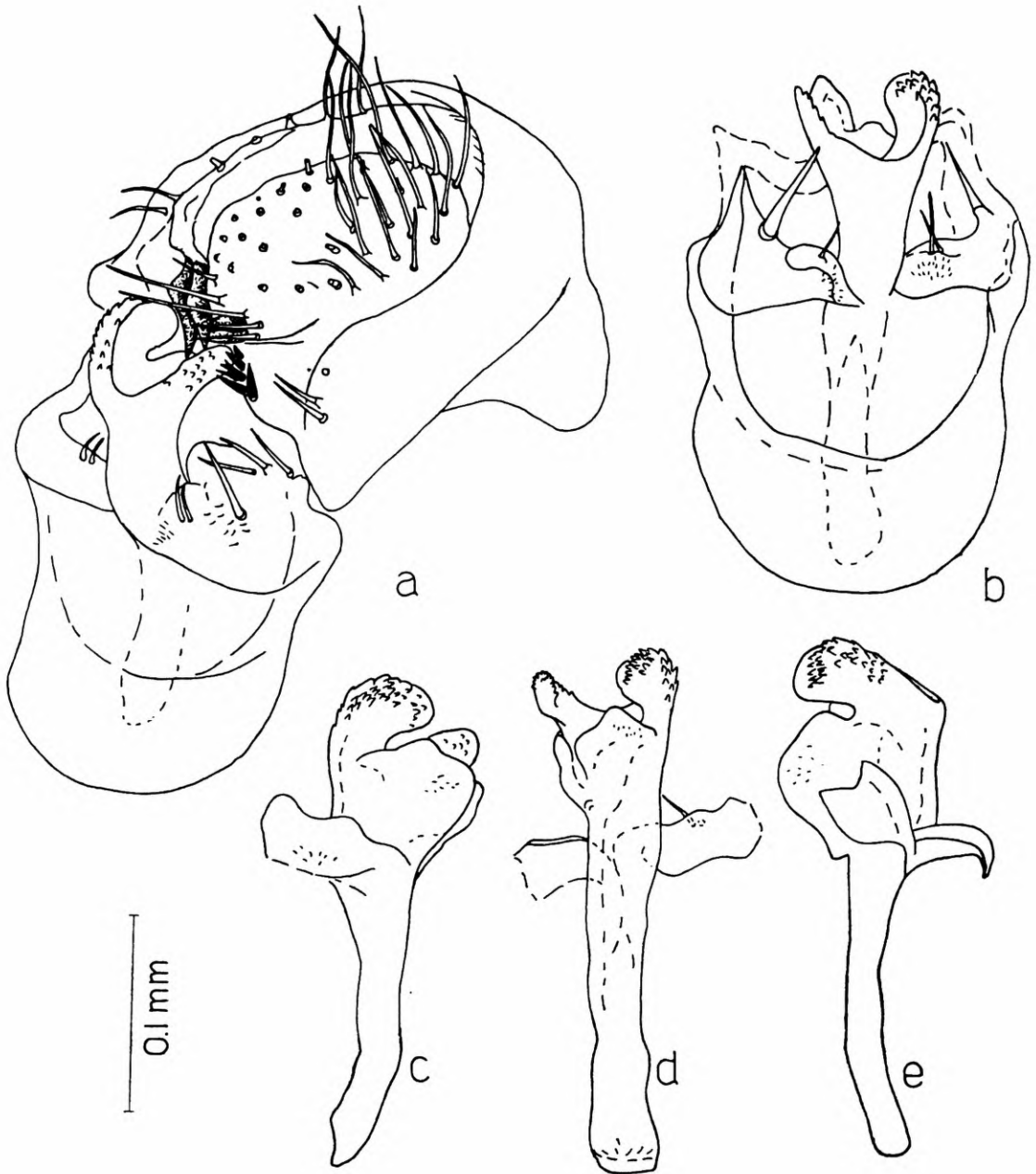


Fig. 11. *Drosophila guaru*, holotype: a. male genitalia, semi-lateral view; b. hypandrium and aedeagus, ventral view; c. and d. aedeagus semi-dorsal views; e. aedeagus, lateral view.

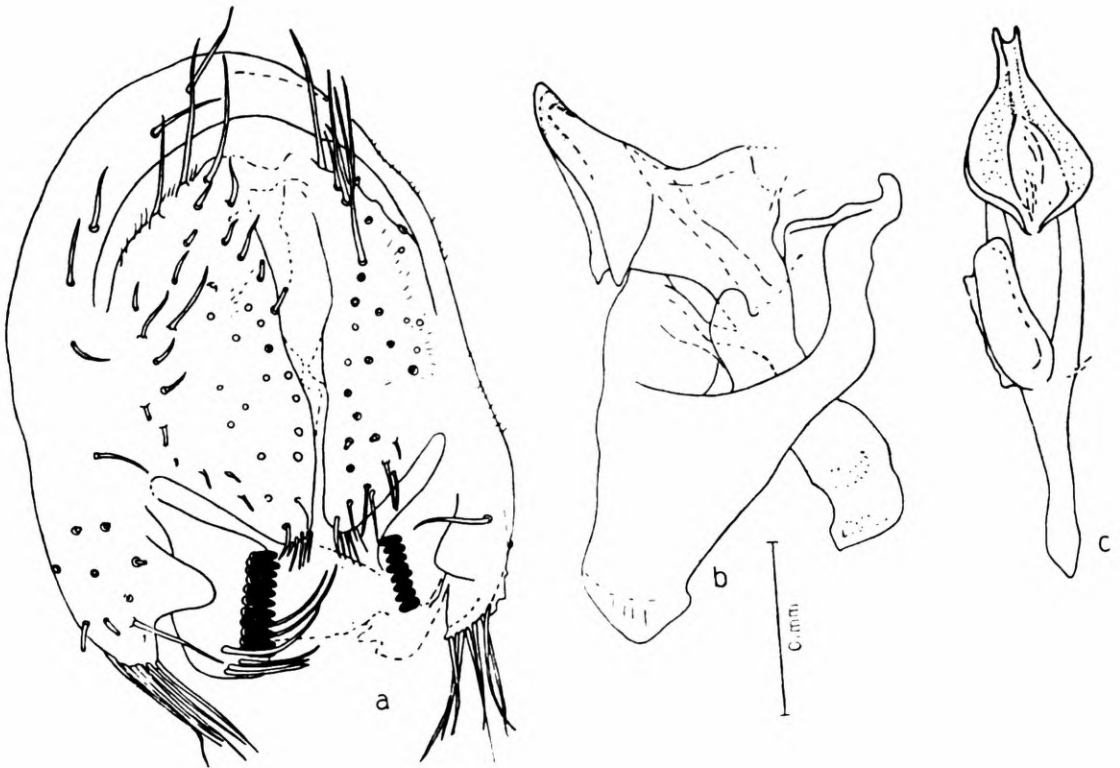


Fig. 12. *Drosophila andina*, paratype: a. genital arch, upper view; b. aedeagus and hypandrium, semi-lateral view; c. aedeagus, ventral view.

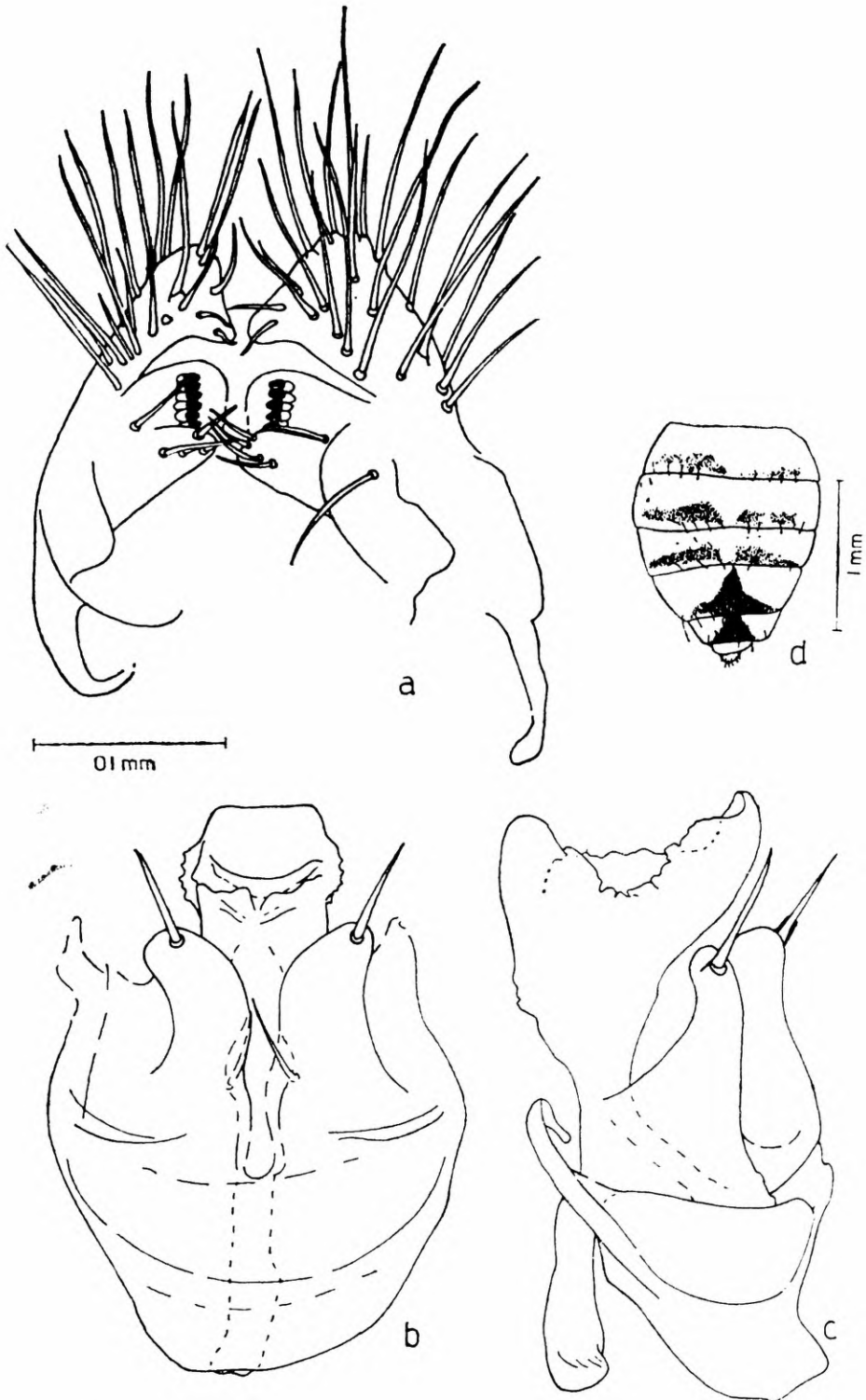


Fig. 13. *Drosophila platitarsus* holotype: a. genital arch, ventral view; b. hypandrium and aedeagus, ventral view; c. aedeagus and hypandrium, semi-lateral view; d. abdomen, dorsal view.

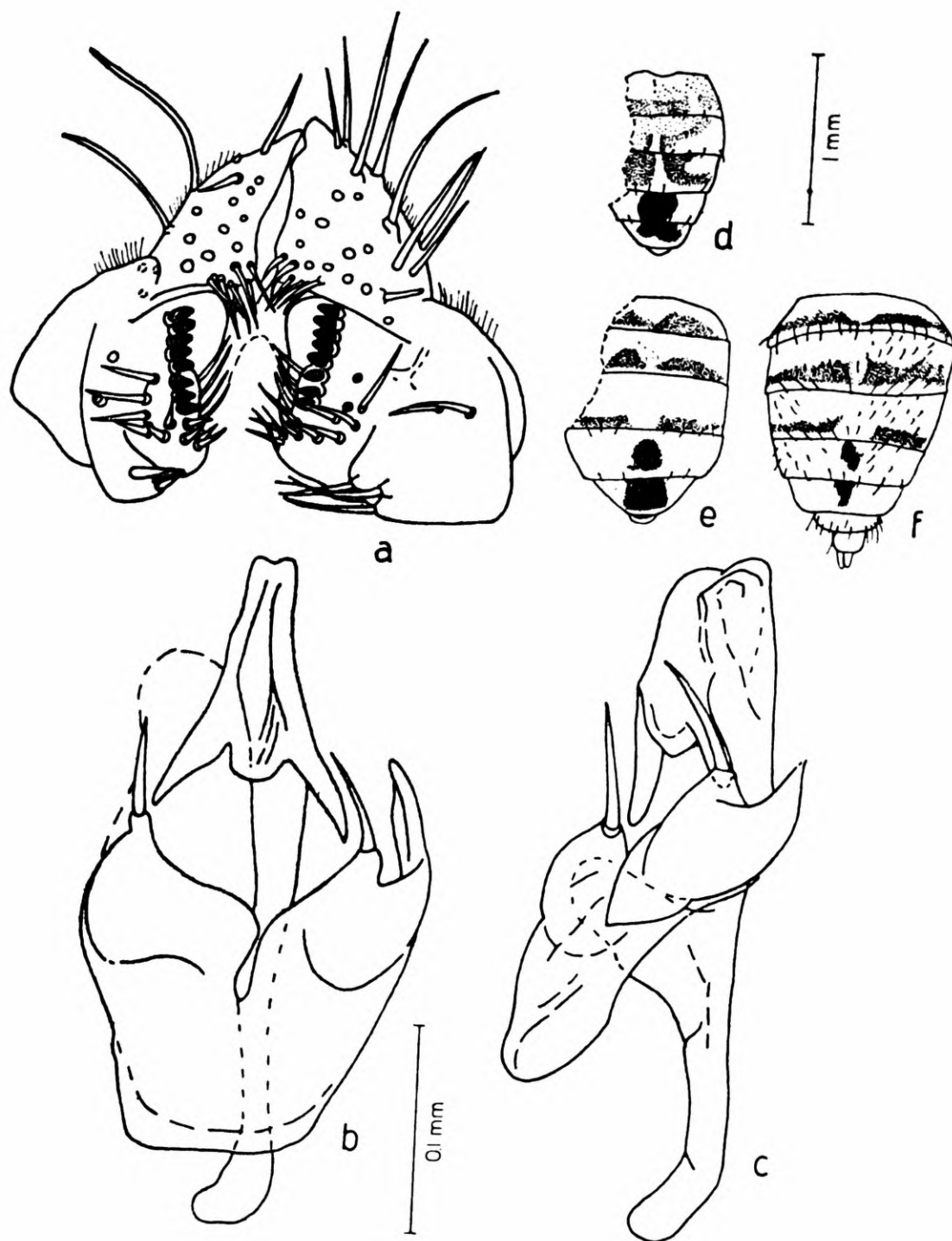


Fig. 14. *Drosophila medioimpressa*, holotype: a. genital arch, ventral view; b. aedeagus and hypandrium, ventral view; c. aedeagus and hypandrium, semi-lateral view; d. abdomen, dorsal view. Paratypes: e. and f. abdomens, dorsal view, male and female.

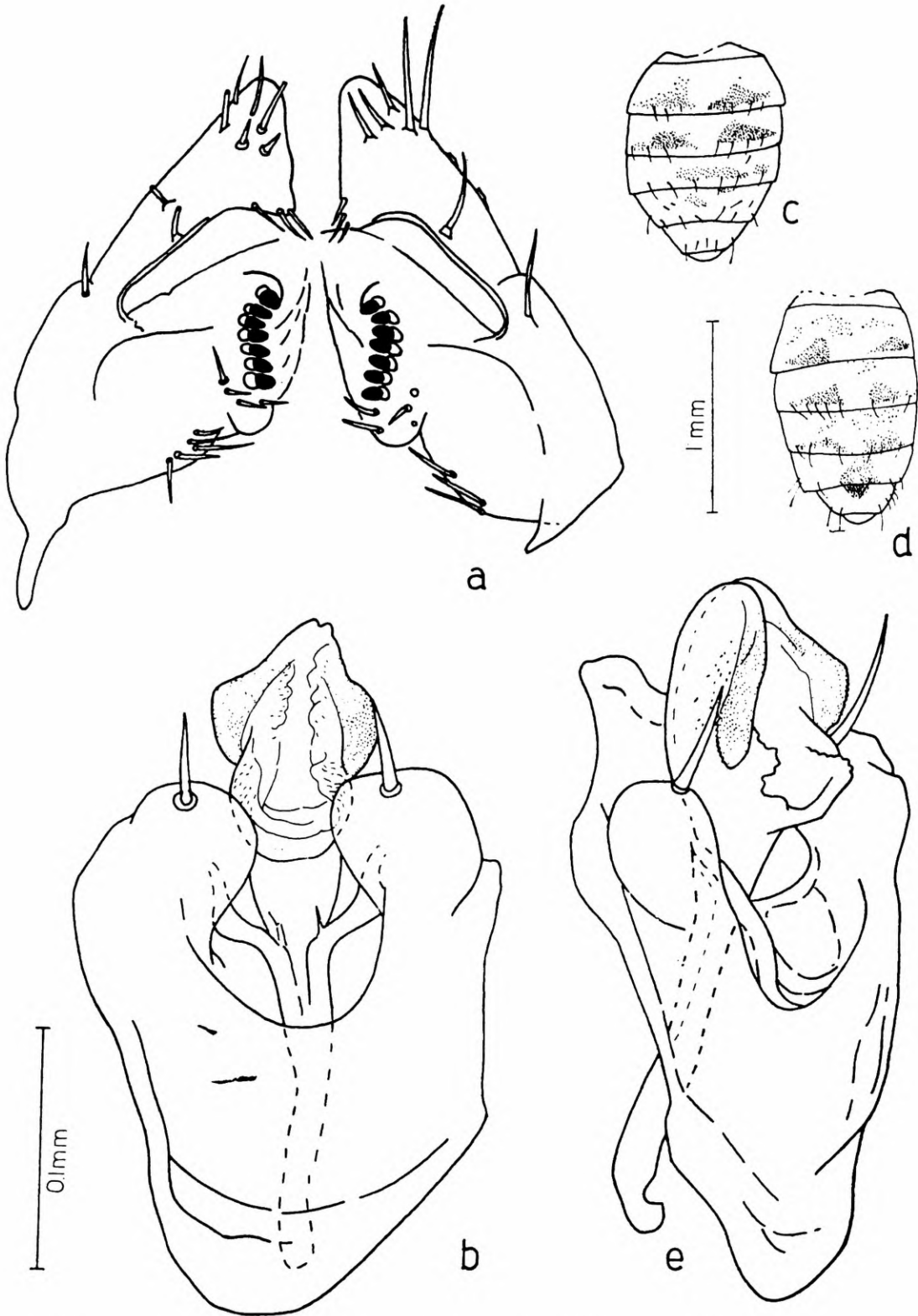


Fig. 15. *Drosophila medionotata*, holotype: a. genital arch, ventral view; b. aedeagus and hypandrium, ventral view; c. abdomen, dorsal view. Paratype: d. abdomen, dorsal view; e. aedeagus and hypandrium semi-ventral view.



Fig. 16. *Drosophila mediosignata*, holotype: a. genital arch, ventral view; b. aedeagus and hypandrium, ventral view; c. aedeagus, semi-lateral view.

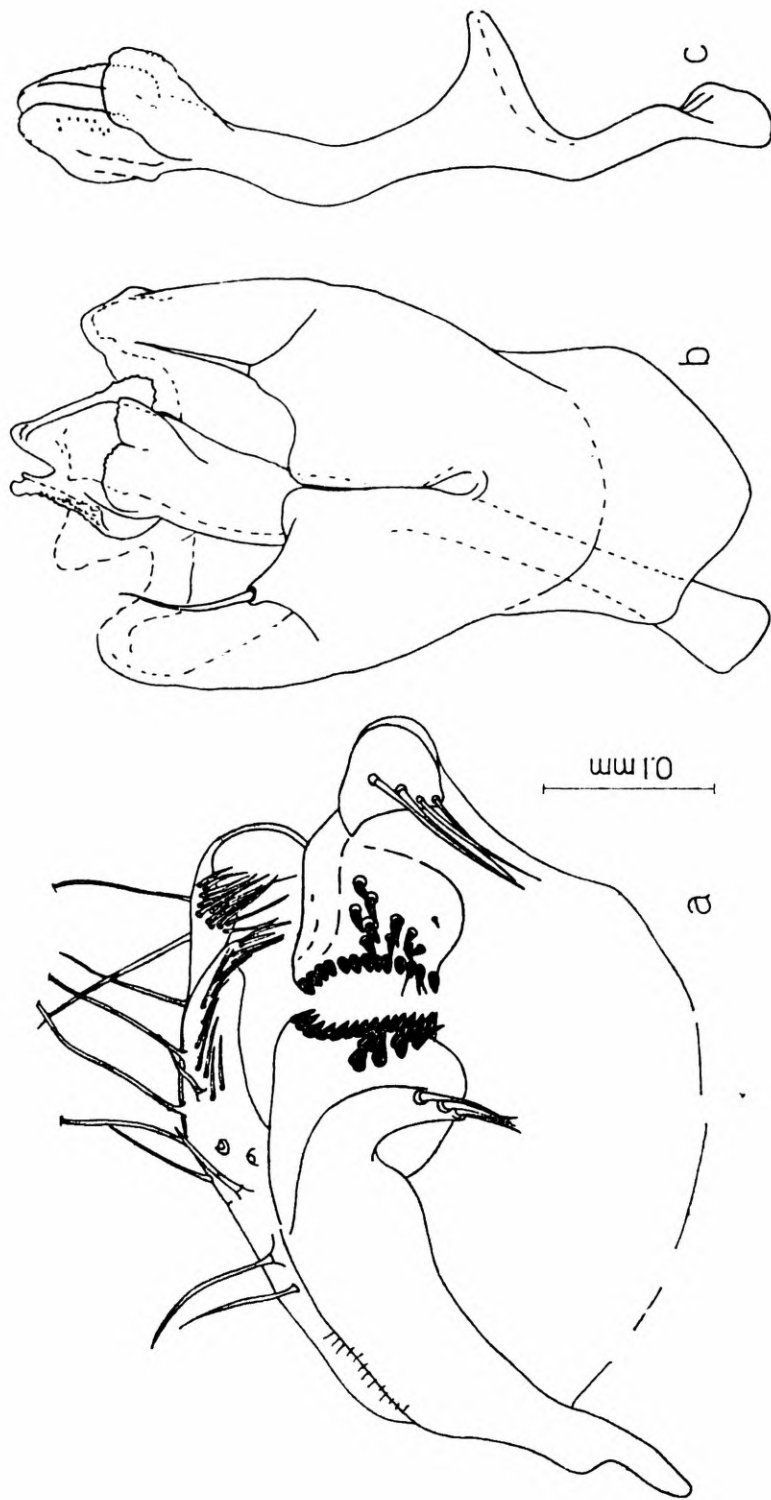


Fig. 17. *Drosophila bandeiratorum*, paratype: a. genital arch, semi-ventral view; b. aedeagus and hypandrium, ventral view; c. aedeagus semi-lateral view.

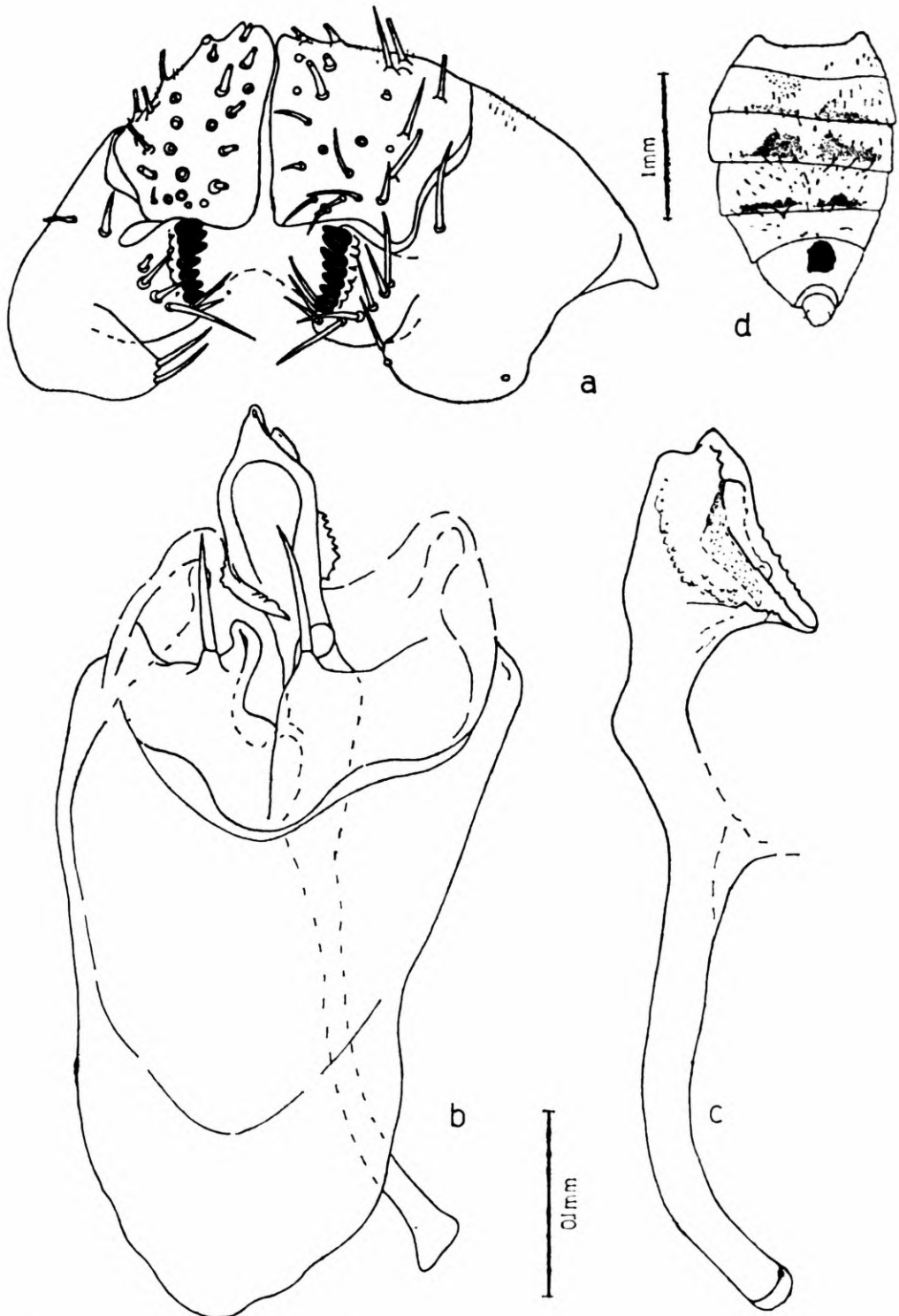


Fig. 18. *Drosophila bifilum*, holotype: a. genital arch, semi-ventral view; b. aedeagus and hypandrium, ventral view; c. aedeagus, semi-lateral view; d. abdomen, dorsal view.

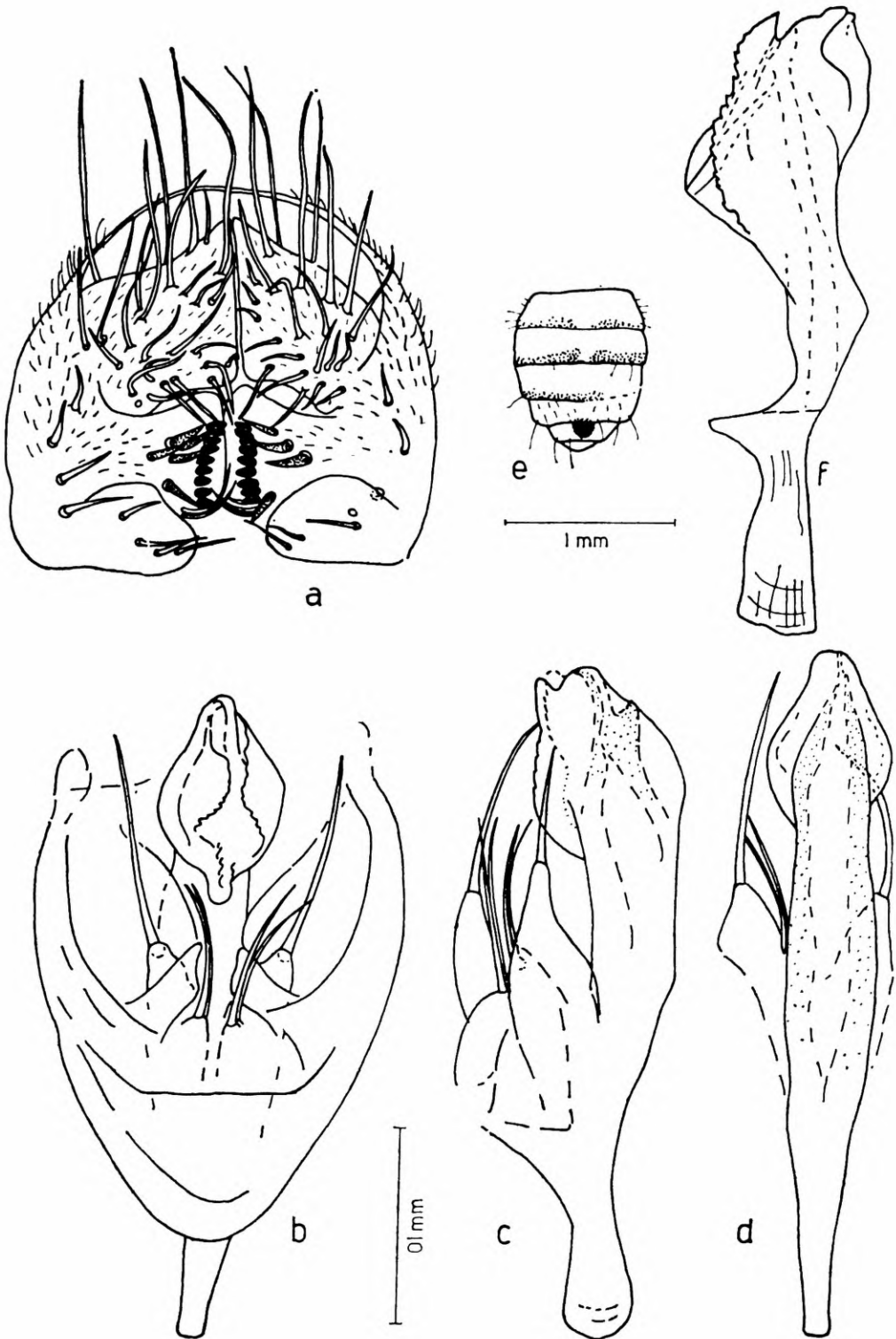


Fig. 19. *Drosophila mesostigma*, holotype: a. genital arch, ventral view; b. hypandrium and aedeagus, ventral view; c. aedeagus and gonapophysis, semi-lateral view; d. aedeagus, dorsal view; e. abdomen, dorsal view. Paratype from Plauí: f. aedeagus, lateral view.



Fig. 20. *Drosophila nigricincta*, holotype: a. genital arch, semi-ventral view; b. hypandrium and aedeagus, ventral view; c. aedeagus and gonapophysis lateral view; d. abdomen, dorsal view.

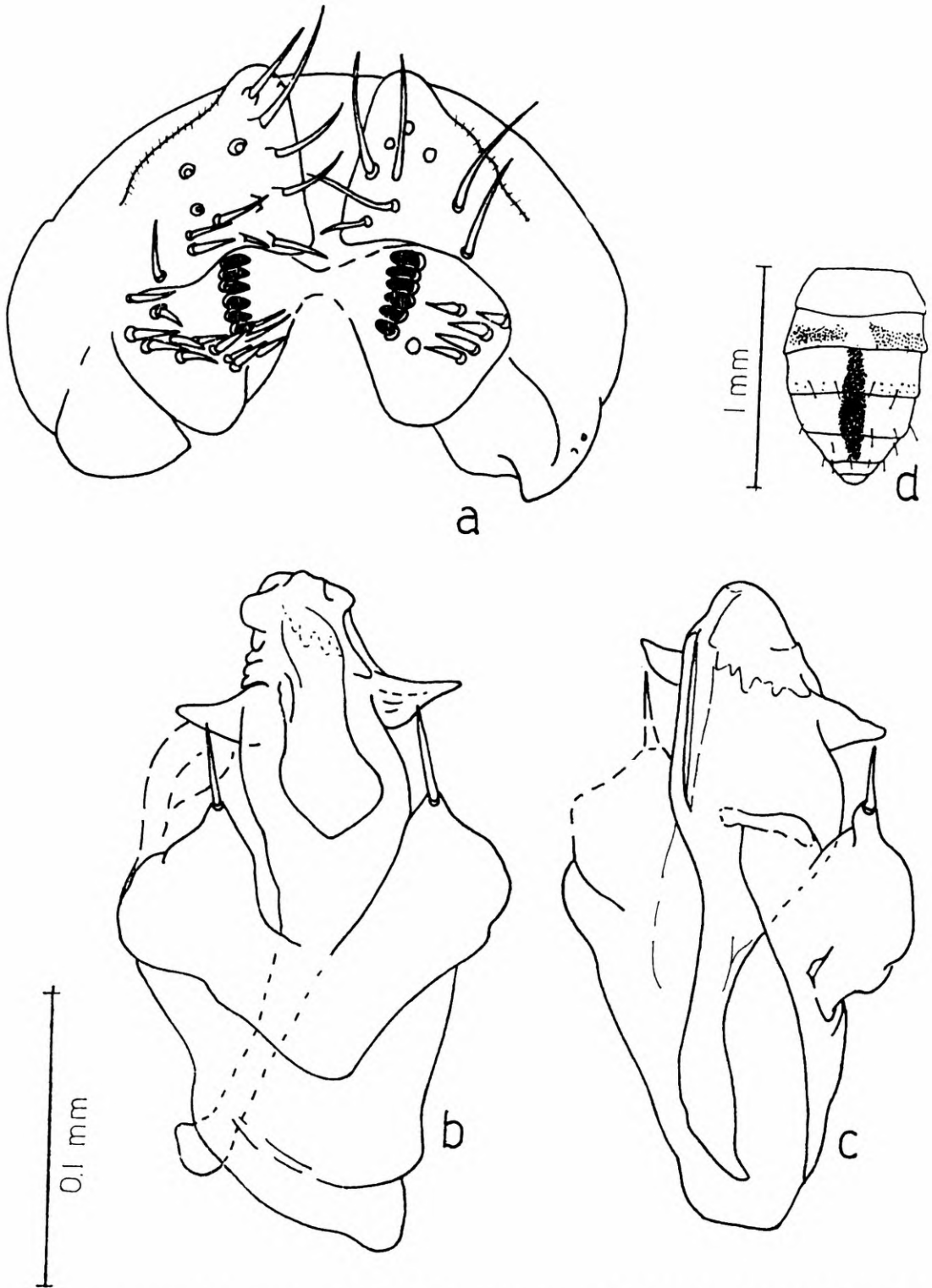


Fig. 21. *Drosophila mediovittata*, holotype: a. genital arch, ventral view; b. aedeagus and hypandrium, ventral view; c. aedeagus and hypandrium, dorso-lateral view; d. abdomen, dorsal view.

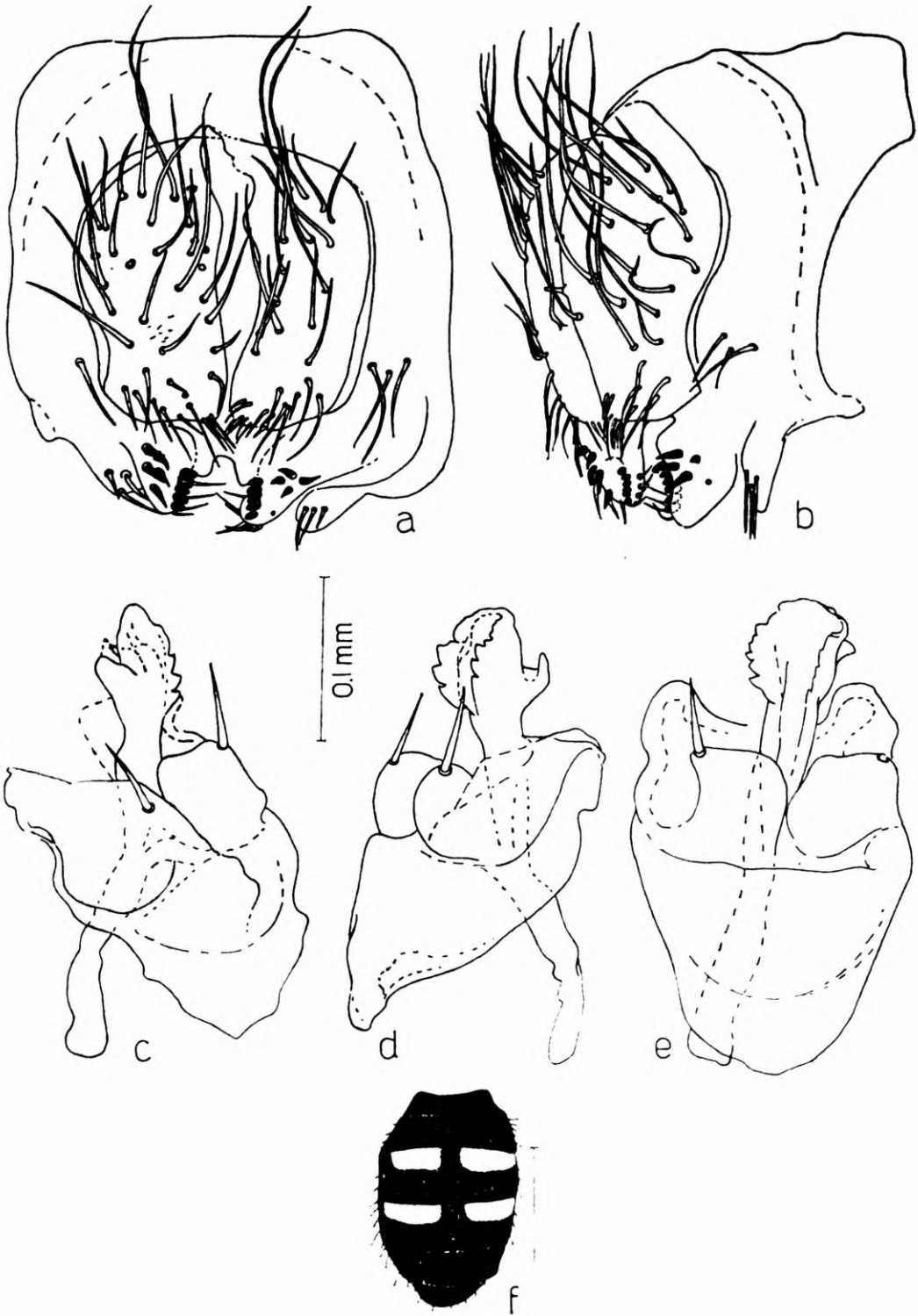


Fig. 22. *Drosophila addisoni*, lectotype: a. genital arch, upper view; b. genital arch, semi-lateral view; c. and d. aedeagus and hypandrium, semi-lateral view; e. aedeagus and hypandrium, ventral view; f. abdomen, dorsal view.

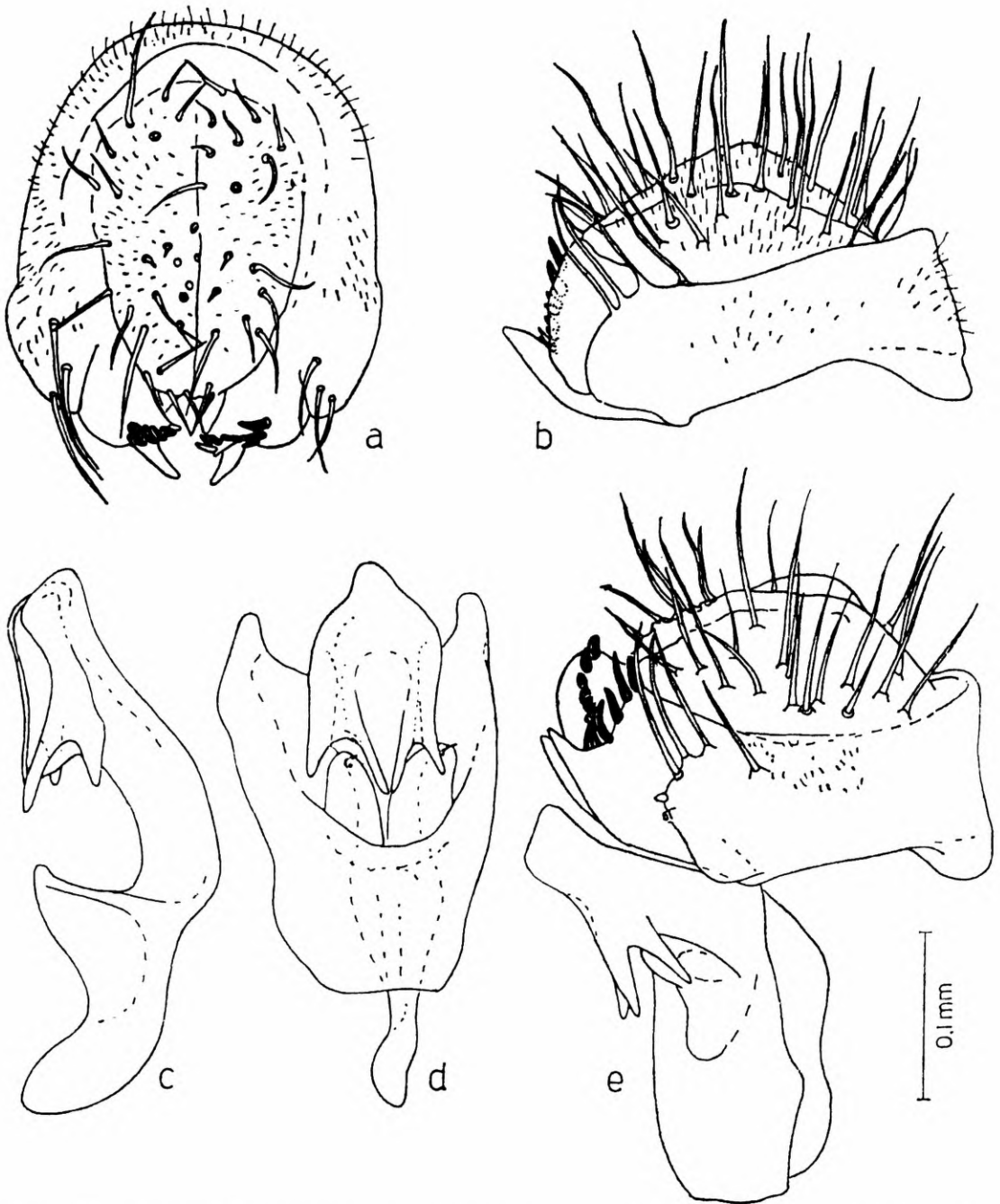


Fig. 23. *Drosophila caponei*, paralectotype: a. genital arch, upper view; b. genital arch, lateral view; c. aedeagus, lateral view; d. aedeagus and hypandrium, ventral view e. male genitalia, semi-lateral view.

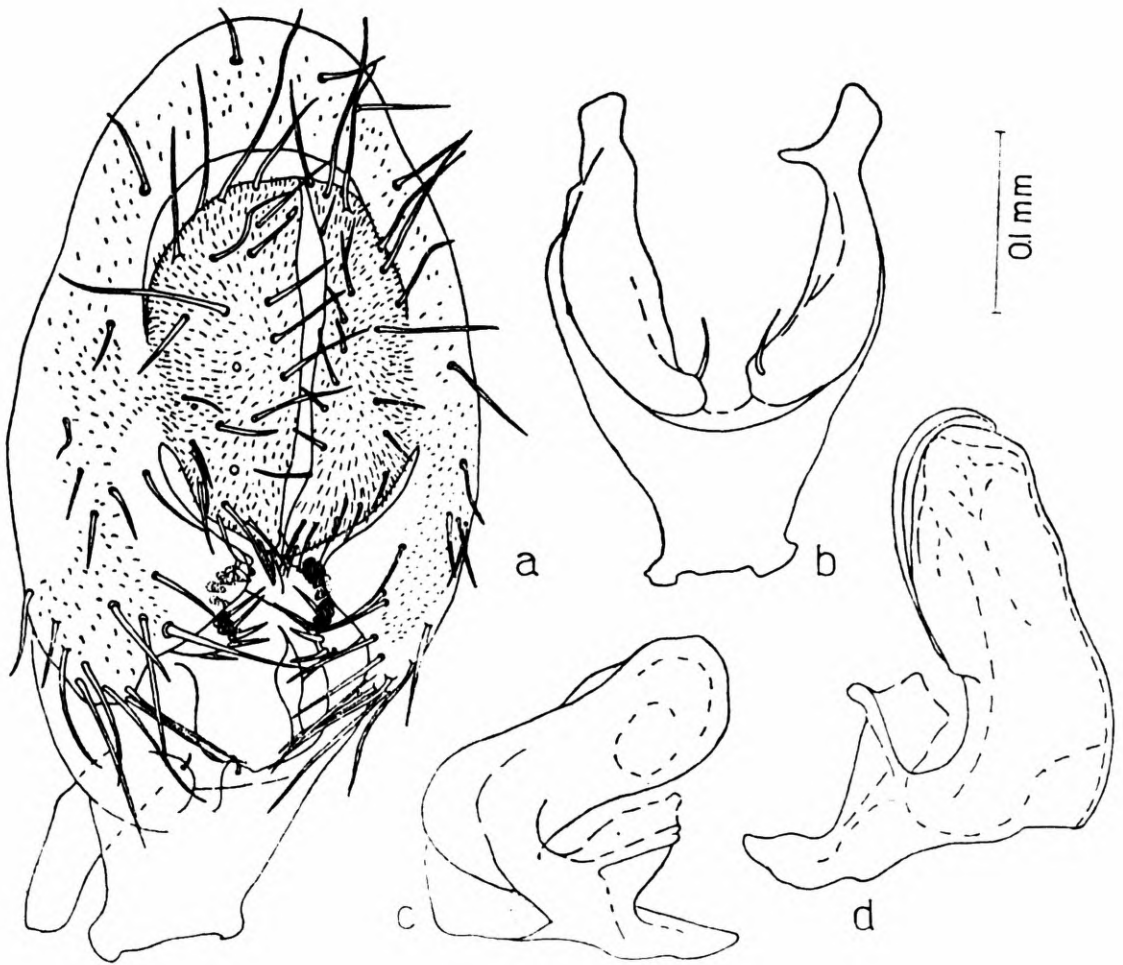


Fig. 24. *Drosophila fumosa* lectotype: a. genital arch, upper view; b. hypandrium, ventral view; c. and d. aedeagus, semi-lateral views.

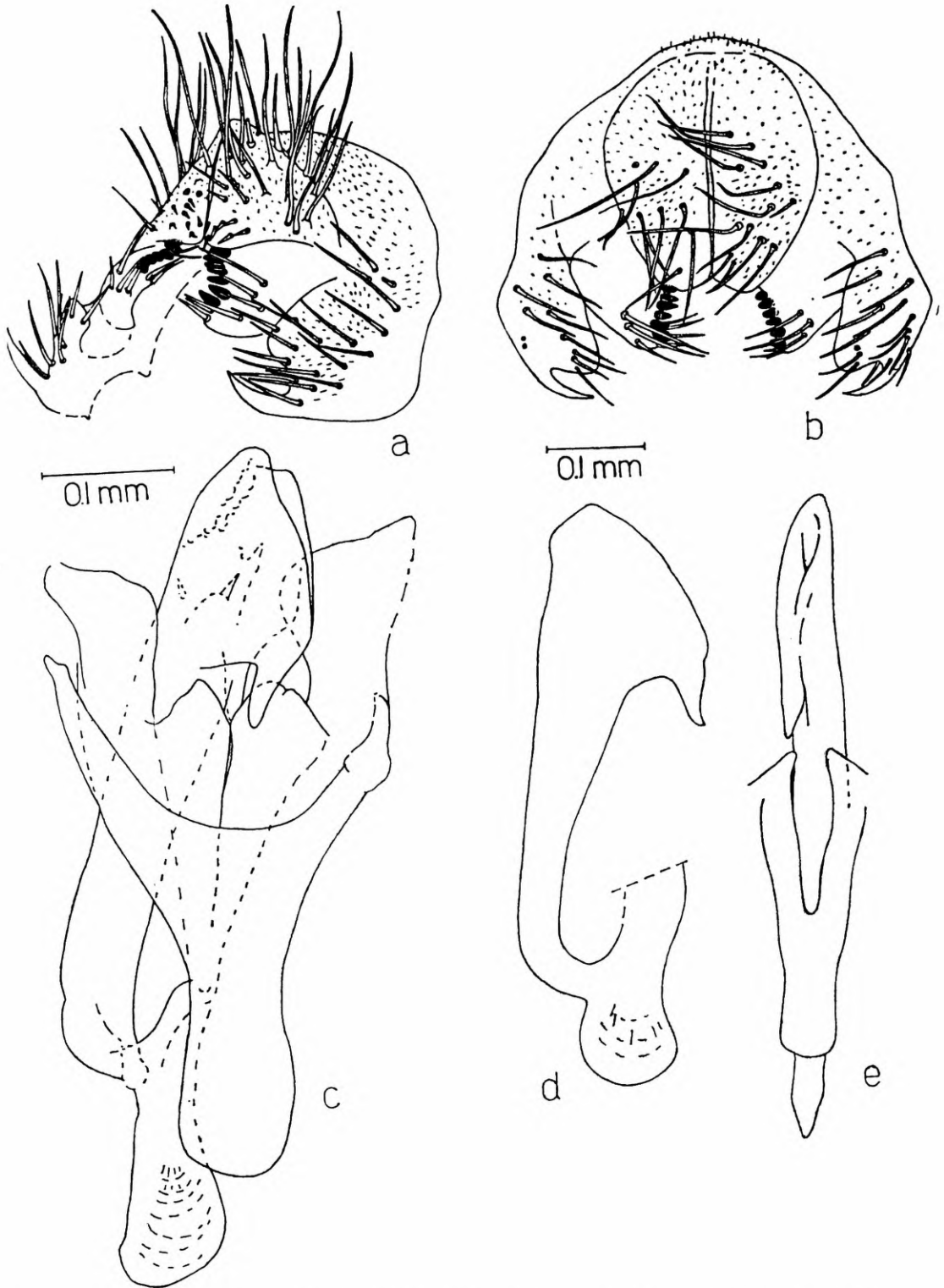


Fig. 25. *Drosophila para*, lectotype: a. genital arch, semi-lateral view; c. aedeagus and hypandrium, semi-ventral view. Paralectotype: b. genital arch, upper view; d. aedeagus, lateral view; e. aedeagus ventral view.

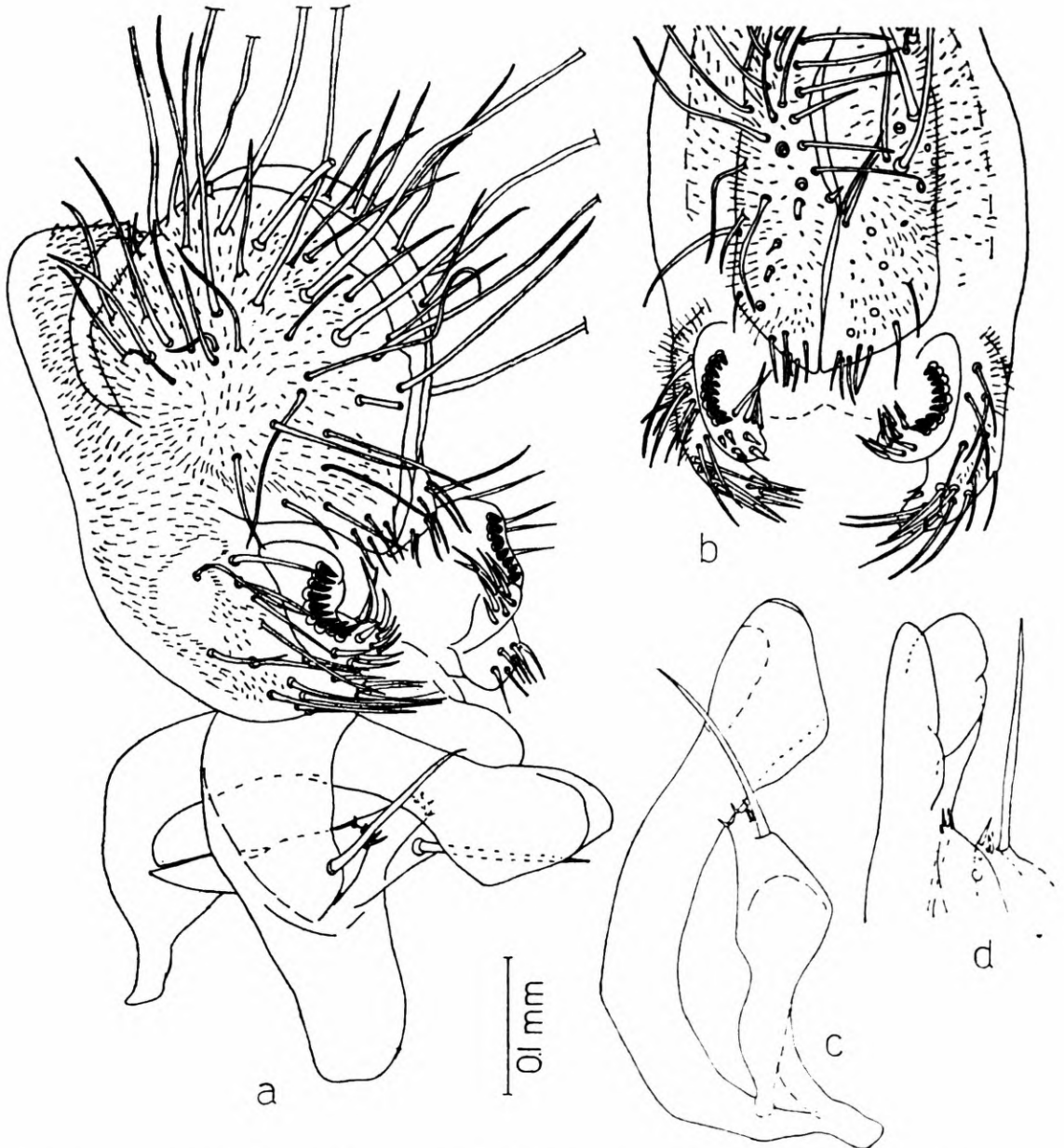


Fig. 26. *Drosophila tuchaua*, paralectotype: a. male genitalia, semi-lateral view; b. genital arch (part), upper view; c. aedeagus and gonapophysis, lateral view; d. apex of aedeagus and gonapophysis, semi-ventral view.

