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DROSOPHILIDAE (DIPTERA) FROM THE *PANTANAL* OF MATO GROSSO (BRAZIL), WITH THE DESCRIPTION OF A NEW SPECIES BELONGING TO THE *BROMELIAE* GROUP OF THE GENUS *DROSOPHILA*

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ABSTRACT

A brief discussion is presented on two samples of Drosophilidae collected in the Pantanal of Mato Grosso, Brazil, including the description of Drosophila aguape, sp. n., a larviparous species associated with flowers of the water hyacinth Eichhornia azurea (Pontederiaceae).

Keywords: Diptera, Drosophilidae, *Drosophila, bromeliae* group, larviparity, *Eichhornia*.

INTRODUCTION

The *Pantanal* of the Brazilian States of Mato Grosso and Mato Grosso do Sul is a large depression (mean altitude ca. 100 m) extending on the eastern side of the Paraguay valley for about 500 km south of Cuiabá, capital of the state of Mato Grosso, with a width (east to west) of 200-250 km. The area is flat, covered with poorly consolidated sediments. In consequence, river channels are ill defined and changeable, and the yearly flood covers large continuous areas. When the waters recede, many ponds and swamps are left behind (Ab'Saber, 1988).

The vertebrate fauna of the *Pantanal* is both diversified and abundant, in fact, it supports a thriving tourist industry and has been the subject of several publications. The invertebrates, and especially the insects, however, are

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poorly known. In the present paper we report the collection of a small sample of Drosophilidae collected on flowers and on baits of fermented bananas and oranges, including a new species of *Drosophila*, larviparous and associated with the flowers of the water hyacinth *Eichhornia azurea* (Pontederiaceae).

Localities and samples

Collections were made in two localities (Taiamã 16°50'S, 57°38'W and Limoeiro about 15 km SE of Taiamã) in the *Pantanal*, both on the Rio Paraguay, August 7-9, 1980 (Table 1).

The collecting area in the Estação Ecológica da Ilha de Taiamã, was limited to land around the houses, including a landing strip. The Station, owned and operated by the Secretaria Especial do Meio Ambiente, is on a low alluvial island, formed by an arm of the Paraguay River. It is entirely covered by open formation: bushes and grasses with sparse trees are the dominant vegetation. The other locality, Limoeiro, some 15 km up river on another island, is a small area of forest (about 600 m²) close to a house.

In both localities, baits of fermented bananas and oranges were set in cans suspended at 1.5 m above the ground, at four different sites. In Taiamã, a sample of flies was collected with an aspirator and by sweeping of a net around the flowers of the water hyacinth *Eichhornia azurea* by the river shores. In Limoeiro, sweeping was done in the woods, as well as in an orchard where there were rotting limes on the ground.

Unless otherwise noted, samples of all species are deposited in the Museu de Zoologia da Universidade de São Paulo (MZUSP).

Rhinoleucophenga sp.

The specimens probably represent an undescribed species but since our sample does not contain males, we are postponing a description.

The species keys out as *Gitona*, according to Wheeler's 1954 key for the North American genera of Drosophilidae. It has short plumose arista, bands on the legs and pleurae with a longitudinal stripe as in *G. bivisualis*, species of uncertain affinities (Wheeler, 1981); however, the patterns of mesonotum and scutellum are different from that species.

Drosophila aguape, sp. n.

(Figs. 1-5)

Type Material: Holotype (wild-caught male, dissected), Ilha de Taiamã,

R. Paraguay, 9/VIII/1980, F. Val col. Paratypes: 11 females collected in nature plus 28 reared in the laboratory (15 males, 13 females) from *E. azurea* flowers. Two male and two female paratypes are deposited in the National Museum of Natural History (Washington, D.C.), the remaining specimens in the Museu de Zoologia da Universidade de São Paulo.

Small dark brown to black flies, characterized by male terminalia structure. Male body length 1.6-1.7 mm. Females 1.7-2.0 mm.

Adults: antennae brown; arista black to brown, usually with 3 dorsal and 2 ventral branches in addition to the distal fork (fork sometimes not well defined). Frons reddish brown anteriorly; area by the eyes and ocellar triangle with ochre pollinosity; area between ocellar triangle and the stripes by the eyes, dark brown, forming a V-shaped spot on the frons. Second orbital shorter than others, approximately intermediate to first and third orbitals, in some specimens slightly closer to the second than to inner vertical. Face light brown, with prominent carina. One prominent oral bristle. Eyes with very short dark hairs.

Mesonotum, scutellum and upper pleurae with an ochre pollinosity. Acrostichal hairs in six-eight regular rows; two prescutellars present. Anterior scutellars bristles convergent. Sternopleura lighter than the upper portion of pleura, in most specimens; sterno-pleural index about 0.8. Legs light brown, 4th and 5th segments of tarsi darker. Apical and preapical bristles on 1st and 2nd tibiae; preapicals on third.

Wings clear; costal-index about 1.9 in males and 2.1 in females.

Abdomen light brown, tergites with darker stripes posteriorly.

Terminalia ♂ (Figs. 1-3). Epandrium with 6 ventral bristles: 3(4) lower, 2 (1) median and 1 in an upper position. Cerci fused to epandrium. Surstylus with 8-9 primary teeth. Hypandrium slightly shorter than epandrium.

Terminalia ♀ (Figs. 4,5). Ovipositor plates yellow, slightly pointed apically, with 15-16 marginal and 4-3 discal short spines. Spermathecae light-brown, mushroom-shaped with a flat-top, slightly sclerotized, duct half-way telescoped.

Notes. Measurements were taken from dried specimens, five males and five females, in the Museu de Zoologia collection. Twelve specimens flying around the corollae of *E. azurea* flowers were aspirated or netted. Other adults were reared from the flowers, in the laboratory. Chromosomes were not studied. Eggs were not observed. Very young larvae were found inside the abdomen of females. The general shape of these larvae was pointed anteriorly and rounded posteriorly, showing rudiments of oral hooks. The larvae were apparently connected with the main abdominal tracheal trunk of the mother. Further observations of these larvae should be done in fresh material in order to

clarify the interaction larva-mother. However, efforts to collect more flies from *Eichhornia* around the city of São Paulo were not successful.

Relationships: it belongs to the *bromeliae* group (Patterson & Stone, 1952), currently included in the subgenus *Drosophila*. The general shape of the male terminalia, especially the aedeagus of *D. aguape*, indicates a close relationship to *D. bromelioides* (illustrations in Val, 1982). *D. aguape* differs from *D. bromeliae* Sturtevant, by the general coloration, yellow in the latter. The male terminalia of *D. aguape* also shows similarities to those of *D. othoni* (Pipkin, 1964).

Ecology. Eleven females and one male were obtained by sweeping on flowers of *E. azurea*, and 13 males and 15 females were reared from these same flowers brought to the Museu de Zoologia.

DISCUSSION

Seven species of Drosophilidae were obtained during three periods of collecting in Taiamã (Table 1). Considering the faunistic diversity usually found in the *Pantanal*, even for short times of collecting, this sample is surprisingly poor. A possible explanation might be the placement of the baits too close to the houses. Two species (*D. simulans* and *D. latifasciaeformis*) are introduced to the Neotropics. *D. repleta* and *D. mercatorum* although originally from the Neotropical region are widespread and perianthropic. *D. nebulosa* is a common species in open formations.

It was interesting to collect *Rhinoleucophenga* sp., usually not attracted to baits of fermented fruits and *D. aguape* on flowers of *E. azurea*. The specimens of *Rhinoleucophenga* probably belong to an undescribed species.

In a seasonally swampy area like the *Pantanal*, flowers of aquatic plants, which are among the dominant features of vegetation, seem to be an alternative appropriate habitat for *D. aguape*. Other anthophilic Neotropical species of *Drosophila* had been previously studied by Sturtevant (1942), Heed *et al.* (1960), Brncic (1966, 1978), Pipkin (1964, 1966) and Hunter (1979, 1988, 1992) among others. Four larviparous species were described: *D. leoni*, Pipkin, 1964; *D. arboloco* and *D. desbaratabaile* Hunter, 1979; and *D. bifurcata* Hunter, 1992. Pipkin (1964) described the eggs of *D. leoni* "with a short shield-shaped white plate replacing filaments; larvae seen moving within several fresh laid eggs; hence flies are presumed to be viviparous". Hunter (1979) mentioned that in *D. desbaratabaile* "eggs terminate in a sharp point anteriorly, but lack filaments. They are thin and white and larvae can be seen moving inside the eggs within the female". A similar description of eggs is pre-

sented for *D. arboloco* where "the larvae were seen developing inside eggs within the female". Brncic (1983), in a chapter reviewing the ecology of the flower breeding *Drosophila*, mentions that well developed first instar larvae were found in the reproductive tracts of dried specimens of *D. nesiotia* and *D. crossoptera* both in the *flavopilosa* group, indicating some degree of viviparity. The same author also comments that in the flower niche, where food supply is limited, a reduction on the number of ovarioles is observed and egg development is altered so that at most one mature egg can be deposited per day. An extended retention of the eggs in the vagina is also observed and eggs are deposited in an advanced stage of embryonic development in flower-breeding species. A case of probable larviparity in the genus *Diathoneura* is reported by Vilela & Bächli (1990) who found a completely developed larva in the "uterus" of the dried lectotype of *D. cruciata*.

We were only able to observe larvae apparently connected to the main abdominal tracheal trunk of the mother; eggs were not observed. Efforts to obtain more specimens of *D. aguape* for further observations, were not successful.

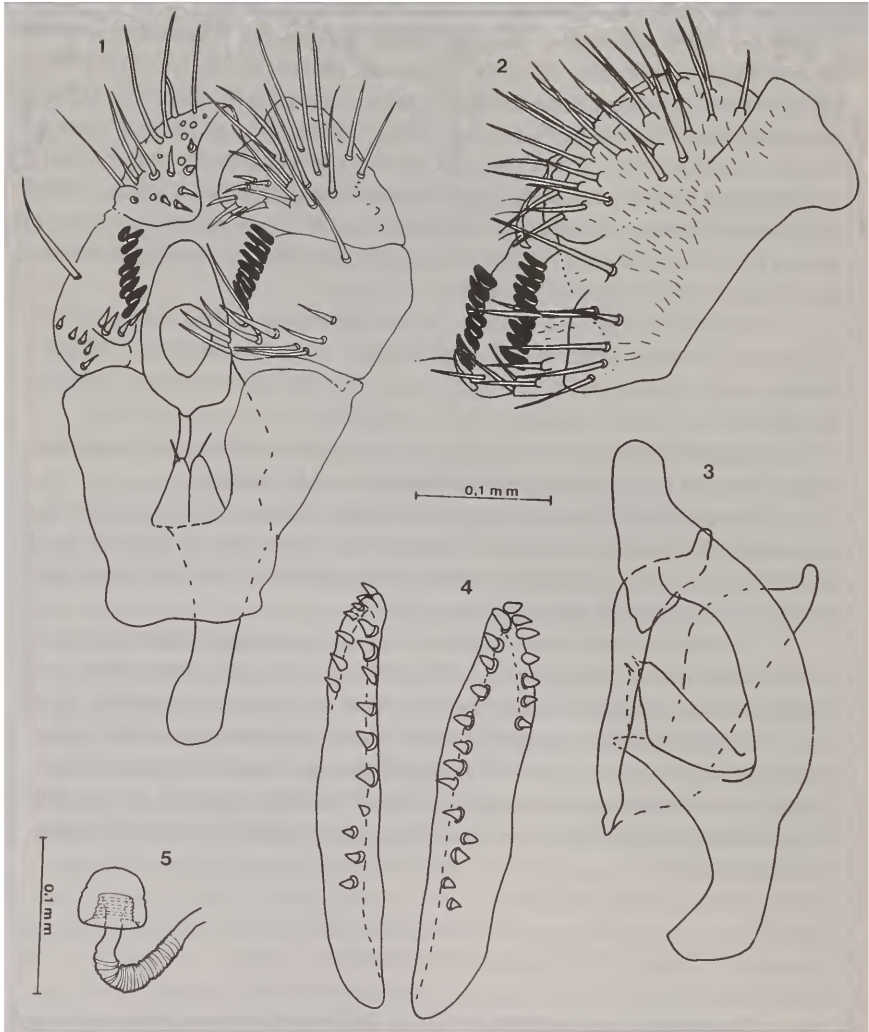
Thus the occurrence of larviparity in species breeding in flowers seems to be related to the ephemerality of the habitat used by the flies.

The sample collected at Limoeiro during a shorter period of time (one morning) was also poor (Table 1) and differed from that of Taiamã by the presence of *D. sturtevanti* of the *saltans* group and of *D. malerkotliana* found on rotting limes on the ground of an orchard.

D. malerkotliana had not been previously reported from the *Pantanal* (Val & Sene, 1980; Sene *et al.*, 1980) or from areas of Chaco close to the Paraguay river, during an intense survey done by Vilela *et al.* (1980). As the main interest of those colleagues was to obtain information on the natural, and not perianthropic, fauna of Drosophilidae, and especially on the *repleta* group, their collecting sites certainly did not include orchards. It is possible therefore to conclude that *D. malerkotliana* was probably recently introduced in Limoeiro.

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Figs. 1-5. *Drosophila aguape*, sp. n., holotype male (1-3) and paratype female (4,5). 1. Entire terminalia, oblique posterior view; 2. epandrium, cerci and surstili, oblique posterior view; 3. aedeagus, parameres, aedeagal apodeme and hypandrium, oblique anterior view; 4. spermatheca and duct; 5. ovipositor plates, ventral view. All the figures to the same scale. Bar 0.1 mm.

Table 1. *Drosophilidae* species collected at two localities in the *Pantanal* of Mato Grosso in August 7-9, 1980

	Taiamã Station		Limoeiro		
	baits*	flowers**	baits**	forest sweeping**	river bank fruits**
<i>Drosophila nebulosa</i>	2	-	2	2	2
<i>Drosophila malkotliana</i>	-	-	-	-	6
<i>Drosophila simulans</i>	540	-	3	-	-
<i>Drosophila sturtevanti</i>	-	-	1	-	-
<i>Drosophila</i> gr. <i>saltans</i>	-	-	1	-	-
<i>Drosophila aguape</i> , sp.n.	-	12	-	-	-
<i>Drosophila repleta</i>	117	-	3	-	-
<i>Drosophila mercatorum</i>	19	-	-	-	-
<i>Drosophila latifasciaeformis</i>	1	-	-	-	-
<i>Drosophila</i> sp (♀)	-	-	-	1	-
<i>Rhinoleucophenga</i> sp.	1	-	6	-	-

* collection made during three periods (morning, evening, morning)

** collection made during one morning

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