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A new species of viviparous moth fly (Diptera, Psychodidae, Psychodinae) from the Brazilian Amazon

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Abstract: A new species of Psychoda Latreille from Brazil is described and illustrated, and represents the first record of viviparous species in the genus Psychoda.

Keywords: Diptera, Psychodidae, Psychoda, new species, Amazonian, Brazil.


Resumo: Uma nova espécie de Psychoda Latreille do Brasil é descrita. Este trabalho apresenta o primeiro registro de uma espécie vivípara no gênero Psychoda.

Palavras-chave: Diptera, Psychodidae, Psychoda, espécie nova, Amazônia, Brasil.
Introduction

The genus Psychoda Latreille, a globally distributed genus, is represented by fifty-five recent species from the Neotropics, five of which are known from Brazil (Bravo et al. 2006): P. divaricata Duckhouse from the state of Santa Catarina, P. dantilanensis Bravo, Cordeiro & Chagas and P. serraoabonensis Bravo, Cordeiro & Chagas, both from the state of Bahia, P. alternata Say, a cosmopolitan species recorded from the state of Bahia, and P. zetoscuta Quate, known from Panama, Trinidad and the state of Bahia, Brazil.

Viviparity, a form of reproduction in which the larvae hatch inside the female before deposition, is a widely distributed phenomenon in Diptera and has been recorded in 22 families (Meier et al. 1999). Viviparity is presently known for only one species of the family Psychodidae - Philosepedon humeralis Meigen (Laurence 1997) where thirty-three larvae were discovered in the genital ducts of a female of this species (Meier et al. 1999).

In this paper we describe a new species of Psychoda from the Brazilian Amazon, and also report viviparity for the first time in this genus.

Materials and Methods

All specimens examined were treated with 10% KOH, dehydrated and mounted in Canada balsam. Morphological terminology follows that of McAlpine (1981). The specific morphological terminology for Psychodidae follows that of Duckhouse (1990) and Bravo (2006). The wide diagnosis of Bravo et al. (2006) was accepted as the definition of the genus Psychoda. The specimens were deposited in the Coleção Entomológica do Museu de Zoolôgica da Universidade Estadual de Feira de Santana, Feira de Santana, Bahia, Brazil (MZUEFS) and Coleção de Invertebrados do Instituto Nacional de Pesquisas da Amazônia (INPA).

Results

1. Psychoda amazonensis Cordeiro & Bravo, sp. nov. (Figures 1-14)

Type material: Holotype male, BRAZIL, Amazonas, Silvis, Saracá, 30.VI.1997, without name of collector (INPA); 1 paratype male, same locality and date as holotype, without name of collector (INPA); 1 paratype male, same locality and date as holotype, without name of collector (INPA); 1 paratype female, same locality and date as holotype, without name of collector (INPA); 3 paratype female, same locality and date as holotype, without name of collector (MZUEFS).

Diagnosis: This species can be recognized by the following combination of characters: eye bridge with 4 facet rows, separated by 0.3 facet diameters; ascoids 4-branched, 3 superior and 1 inferior; labellum with 4 teeth; gonostylus with a long setae near the base; gonocoxal bridge posteriorly expanded, longer than the aedeagus; subgenital plate of female reduced, subquadrate, not reaching lateral margins of the eighth tergite (T8); lobes reduced, widely separated; genital digit absent; spermatheca as shown in the figure 12.

Comments on Viviparity and the Larvae

Eight females of Psychoda amazonensis sp. nov. were prepared and mounted in Canada balsam; only after this procedure was completed was the presence of larvae in the abdominal cavity noted. All larvae in the abdomen had their head capsules oriented towards the anterior end of the female. The number of larvae in the abdomens of the females varies from 2 to 46: 2 larvae (1 specimen), 4 (1), 15 (1), 20 (2), 22 (1), 33 (1), and 46 (1). Some characters of the larva were not visible in the preparation. The head capsule was evident and long (Figure 13). A pair of ocelli was observed on the head capsule (Figure 13). The posterior spiracle is present in a terminal, short, siphon (Figure 14).

Discussion

Psychoda amazonensis sp. nov. can be distinguished from other species of Psychoda by the absence of parameres in male terminalia, females with ascoids with 4 branches, reduced subgenital plate, and absence of a digit in the subgenital plate.

Species of the subgenus Falsologima Ježek & Van Harten of the genus Psychoda have males with ascoids with 4 branches in the flagellomeres, while females have ascoids with 3 branches (Ježek & Van Harten, 2005). The new species described here cannot be assigned to this subgenus because the ascoids of females have 4 branches, similar to males of Falsologima. The ascoids of P. amazonensis sp. nov. males are unknown.

Psychoda amazonensis sp. nov. is morphologically similar to Psychoda. quiniversa Quate from Costa Rica. Six characteristics are similar in the two species: 1) hair patch of frons extend to facet row 2; 2) females with 11th, 13th and 14th flagellomeres with spines, 12th without spine; 3) ascoids of females with 4 branches; 4) paramere of male terminalia absent; 5) posterior expansion of gonocoxal bridge with basal ventral pilosity (small setose lobe under center of aedeagus of Quate 1996); 6) gonostylus with a long setae in the ventral surface, near the base. These morphological similarities suggest a common
ancestry between these two species that can be tested with future phylogenetic studies.

*Psychoda amazonensis* sp. nov. can be distinguished from *P. quinivesta*, by three principal characters: 1) eye bridge of *P. quinivesta* wider than *P. amazonensis* sp. nov. (5 facet rows vs. 4 facet rows); 2) posterior expansion of the gonocoxal apodeme long in the new species (Fig. 6); and (3) subgenital plate reduced in the new species and large (normal sized) in *P. quinivesta*.

The observation of larvae in eight females of *P. amazonensis* sp. nov. represents the first record of viviparity for the genus *Psychoda*, and the second record for the family Psychodidae. The only other species of Psychodidae demonstrating viviparity is *Philosepedon kinabaluensis* (Hedden, 1997) from Borneo.

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approximately 37 larvae. The position of the larvae in the abdomen of the new species is identical to that observed in Ph. humeralis, with the head capsule oriented towards the anterior end of the female. According to Laurence (1997), the general position of the larvae of Ph. humeralis in the abdomen of the female is the same as that expected for the eggs in a normal gravid fly, and suggests that the eggs were fertilized in situ in the ovary.

The number of larvae in the females of P. amazonensis sp. nov. varied from 2 to 46, and thus classified it as a multilarviparous species. According to Meier et al. (1999), shortended female terminalia (as observed in P. amazonensis sp. nov.) represents one of the morphological adaptations of species of Diptera to viviparity. This characteristic suggests that this is, in fact, an obligatorily viviparous species.

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References


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