

SCIENTIFIC NOTE

First Host Record for *Winthemia analis* (Macquart) (Diptera: Tachinidae: Exoristinae) in Brazil: *Brassolis sophorae laurentii* Stichel (Lepidoptera: Nymphalidae: Brassolinae)

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Primeiro Registro de Hospedeiro para *Winthemia analis* (Macquart) (Tachinidae: Exoristinae: Winthemiini) no Brasil: *Brassolis sophorae laurentii* Stichel (Lepidoptera: Nymphalidae: Brassolinae)

RESUMO - Representantes de Hymenoptera e Diptera têm sido registrados como endoparasitoides de pupas de *Brassolis sophorae* (L.). Diante da importância científica e econômica desse tipo de relação interespecífica, visando à ampliação de conhecimentos relacionados ao controle biológico natural e conservativo, este trabalho registra no Estado de Alagoas, a ocorrência de parasitismo por *Winthemia analis* (Macquart) como parasitóide larva-pupa em *Brassolis sophorae laurentii* Stichel. Esse primeiro registro de hospedeiro para o taquinídeo apresenta aspectos bioecológicos do parasitóide e amplia sua área de distribuição geográfica no Brasil.

PALAVRAS-CHAVE: Inimigo natural, *Cocos nucifera*, distribuição geográfica, Alagoas, controle biológico

ABSTRACT - Hymenopteran and dipteran endoparasitoids are reported acting as pupae endoparasitoids of *Brassolis sophorae* (L.). Concerning the scientific and economic importance of these interspecific relationship, and aiming to increase the knowledge related to natural and conservative biological control, the present study records *Winthemia analis* (Macquart) as larval-pupal parasitoid of *Brassolis sophorae laurentii* Stichel in the State of Alagoas, Brazil. This report presents some data on the bioecology of this parasitoid, on its distributional range in Brazil and a host species for the first time.

KEY WORDS: Natural enemy, *Cocos nucifera*, distribution, Alagoas, biocontrol

Species of Hymenoptera (especially members of Chalcididae) and Diptera (Tachinidae and Sarcophagidae) (Ferreira & Lins 2002, Ruzsczyk & Ribeiro 1998) have been recorded as pupal or larvipupal endoparasitoids, acting therefore as biocontrol agents of *Brassolis sophorae* (L.), a pest in coconut crops (Ferreira *et al* 1998). The present study records *Winthemia analis* (Macquart) (Fig 1A, B) parasitizing pupae of *B. sophorae laurentii* Stichel, in the State of Alagoas, Brazil.

In October 2005, a nest of *B. sophorae* was collected on leaves of a coconut tree in a residential quarter of Maceió Municipality (Serraria, 9° 34' 50" S; 35° 44' 17" W). It was removed from the tree and placed into a 22 x 25 x 35 cm plastic box covered with organdy cloth for aeration, and last instars were isolated into glass recipients (14 cm height x 6

cm diameter), and kept under laboratory conditions (26.5 ± 0.2°C; 53.3 ± 1.6% RH). The pupae were sexed according to Ruzsczyk (1990), and then kept suspended by fixing them on the cloth that covered the recipient with a pin throughout the silk of the cremaster (resembling the way it is in nature).

The examined parasitoid material was deposited at the Museu de Zoologia (Universidade de São Paulo, São Paulo – MZSP) and Coleção Entomológica (Museu de História Natural, Universidade Federal de Alagoas, Maceió); while the host material was deposited at the Coleção Entomológica Padre Jesus S. Moure (Universidade Federal do Paraná, Curitiba – DZUP).

The parasitoid flies obtained were identified as *Winthemia analis* (Macquart). The previous records of Tachinidae on *B. sophorae* were *Xanthozona melanopyga* (Wiedemann)

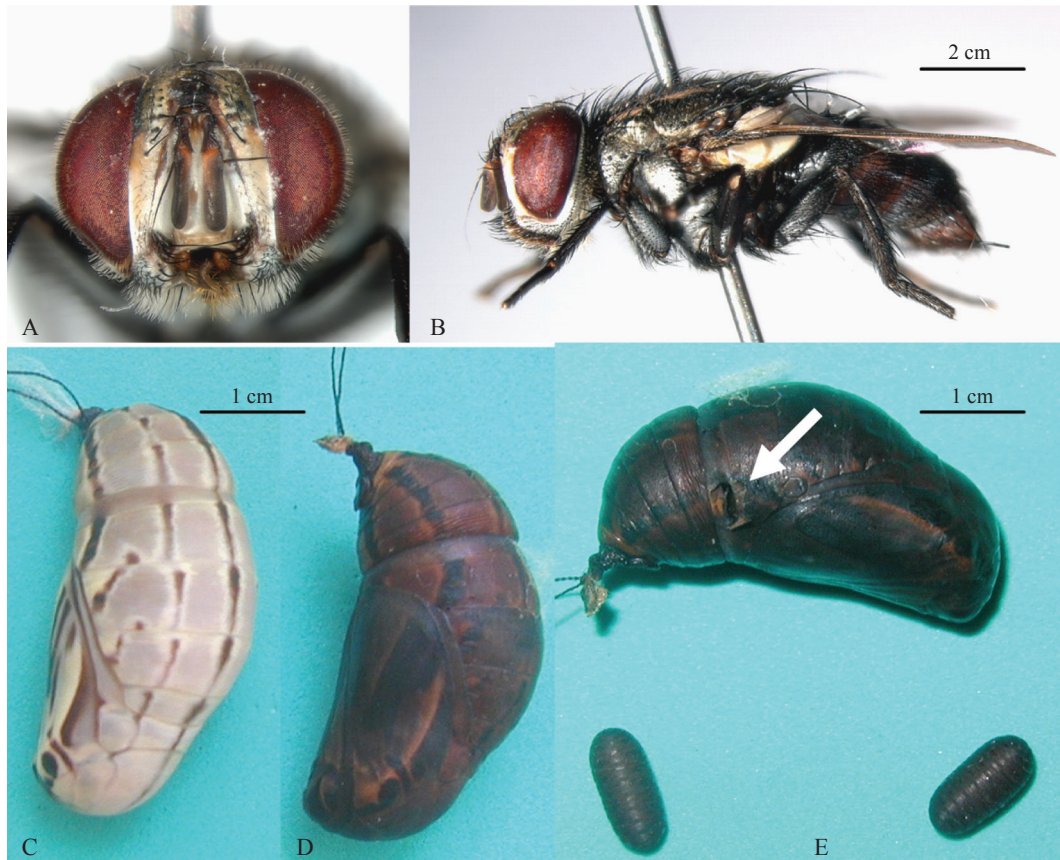


Fig 1 Association of *Winthemia analis* to *Brassolis sophorae laurentii*. A. Frontal view of the head of *W. analis* male, without fronto-orbital setae; B. Lateral view of *W. analis* male; C. Pupae of *B. sophorae* non parasitized; D. Parasitized pupae; E. Pupae with a lateral opening for the exit of *W. analis* larvae, and its two puparia.

(Tachinini) (Piza & Zamith 1944) and *Winthemia pinguis* (Fabricius) (Exoristinae: Winthemiini) (Ruszczuk & Ribeiro 1998).

Only *W. pinguis* was previously recorded and associated to a host species (on *B. sophorae*), among the South American species of *Winthemia* (Guimarães 1977). Specimens were sexed (females with two fronto-orbital setae, males with none as in Fig 1A). The location of the parasitized nest at a residential quarter corroborates Ruszczyk (1990) reports on the parasitization of *B. sophorae* by *W. pinguis* at urban areas.

Within the 56 caterpillars collected, 55 parasitoid pupae (98.2%) were obtained, being one male and the remaining females (sex ratio = 0.98). This high proportion of females indicates prior pupation and emergence of males, as observed by Carvalho *et al* (1998). Color patterns differ healthy pupae (Fig 1C) from parasitized ones which are immobile and completely and evenly dark brown (Fig 1D), both at the same age. In mature viable pupae near eclosion, pharate butterfly could be observed through the transparent pupal cuticle (mainly in ventral surface). Amongst the 12 host pupae the parasitism rate was 21.4%, lower than the value observed by Piza & Zamith (1944) (38.9%) when studying *X. melanopyga* parasitizing *B. sophorae*.

In 10 out of the 12 parasitized pupae the exit of tachinid larvae was observed, representing thus a parasitism efficacy

of 83.3%. A total of 16 larvae of the endoparasitoid were recorded, with an average of 1.6 parasitoid/host, with a maximum of three parasitoids/host. There is a report of up to 36 larvae of *Winthemia* sp. from a single pupa of *Caligo atreus* Kollar (Nymphalidae: Brassolini) (Calvo 2004).

From the 16 pupae of *W. analis*, 12 adults were obtained (total viability 75%). Two failing pupae came from the host that veiled three larvae therefore presenting only 33.3% of survival, which may indicate this host is unsuitable at this parasitoid load. Calvo (2004) obtained only 15 adults of *Winthemia* sp. from the 36 pupae that come out from one pupa of *C. atreus* (41.7% survival).

The exit of *W. analis* larvae occurred predominantly from one single opening on each brassoline pupa, as an elongated ovate slit (Fig 1E) located mainly on the left side of the 6th abdominal segment (10 host pupae or 83% of the cases). Only in two pupae the slit was found on the right side. On the other hand, in cases with more than one larva of *W. analis* per pupa of *B. sophorae*, we observed the occurrence of a single opening (in four host pupae with two larvae) as well as two openings (in one host pupa with three larvae), indicating that in most cases the endoparasitoid larvae use the same opening to leave the host body. The same behavior was observed by Calvo (2004).

Then, pupation was completed in 1h or 2h. Adult emergence occurred 13.5 ± 0.2 days (13 to 15 days) after

pupation. The duration of the pupal stage observed is different from others reported, which is certainly due to differences in the rearing temperature (Piza & Zamith 1944, Calvo 2004).

The geographical distribution of *W. analis* ranges over Trinidad & Tobago, Guyana, Colombia, Ecuador, Peru, Bolivia, Paraguay, Argentina and Brazil. In Brazil, the species is known from the States of Pará, Bahia (southern portion), Mato Grosso, Goiás, Minas Gerais, Espírito Santo, Mato Grosso do Sul, Rio de Janeiro, São Paulo, Paraná, Santa Catarina and Rio Grande do Sul (Coelho *et al* 1989).

The present record for the State of Alagoas extends the geographical distribution of *W. analis* over the Northeast of Brazil, region with high temperatures along the year (mean of 28° along the year, with a minimum of 20° and a maximum of 40° in the hot season from December to March). This study also reports the first host record (*B. sophorae laurentii*) for *W. analis*.

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