

Notes and Comments

Eacles manuelita (Lepidoptera: Saturniidae: Ceratocampinae): first report as *Eucalyptus urophylla* pest

R. F. Pavani^a , M. F. Ribeiro^{a,b} , D. A. Nascimento^a , F. A. Santos^a , S. Dallacort^a , C. G. C. Mielke^{c,d} , J. C. Zanuncio^e , M. V. Masson^a , G. T. Ribeiro^f  and C. F. Wilcken^a 

^aUniversidade Estadual Paulista - UNESP, Faculdade de Ciências Agrônomicas, Departamento de Proteção Vegetal, Botucatu, SP, Brasil

^bInstituto de Pesquisas e Estudos Florestais - IPEF, Piracicaba, SP, Brasil

^cResearch Associate, Carambeí, PR, Brasil

^dMcGuire Center for Lepidoptera & Biodiversity, Gainesville, FL, USA

^eUniversidade Federal de Viçosa - UFV, Instituto de Biotecnologia Aplicada à Agropecuária - BIOAGRO, Departamento de Entomologia, Viçosa, MG, Brasil

^fUniversidade Federal de Sergipe - UFS, Departamento de Ciências Florestais, São Cristóvão, SE, Brasil

Forest plantations cover 10.2 million hectares in Brazil, mainly with species of the genus *Eucalyptus* (Myrtales: Myrtaceae), with 7.8 million hectares (IBÁ, 2024). The genus *Eucalyptus* originates from Australasia, but insects native to Brazil are continuously adapting to its plantations, reaching pest level status (Zanuncio et al., 1994). Native insect pests have been damaging eucalyptus plantations in Brazil since 1948, including defoliating caterpillars (Zanuncio et al., 1989, Lucchetta et al., 2022).

Species of the genus *Eacles* Hübner, [1819] (Lepidoptera: Saturniidae: Ceratocampinae), with about two dozen valid ones (St Laurent and Mielke, 2015), are generally polyphagous insects feeding mainly on plants of the families Anacardiaceae, Lauraceae, Myrtaceae, Rosaceae, Rubiaceae and others (Ribeiro et al., 2021). *Eacles magnifica* Walker, 1855 and *Eacles ducalis* (Walker, 1855) (Lepidoptera: Saturniidae, Ceratocampinae) have been reported in plantations, defoliating 100% of *Eucalyptus* trees (Zanuncio et al., 1993, 2001, 2014).

Other Saturniidae caterpillars, such as *Hylesia nanus* (Walker, 1855), and *Dirphia moderata* Bouvier, 1919, have been reported feeding on *Eucalyptus* trees in different regions of Brazil (Zanuncio et al., 1993, 2014; Pereira et al., 2008; Masson et al., 2017). We report the first record of *Eacles manuelita* Oiticica, 1941 caterpillars defoliating *Eucalyptus* trees.

Approximately 300 pupae, buried at 10 cm deep in the soil surrounding infested trees, were collected in June 2019 during an outbreak of *Eacles* sp. caterpillars in a 200-ha *Eucalyptus urophylla* S.T. Blake clonal plantation in the municipality of Alagoinhas (12°7'13.08" S 38°24'35.28" W), in the northeast of Bahia State, Brazil.

The collected pupae were washed in clean water, placed in plastic containers with a voile fabric opening, protected by paper towels to minimize damage, and transported to the Laboratory of Biological Control of Forest Pests (LCBPF) at São Paulo State University (UNESP/FCA) in Botucatu, São

Paulo State, Brazil. They were treated with a 5% copper sulfate solution, rewashed, and individualized in plastic containers (150 mm in diameter and 148.5 mm in height) with openings sealed with voile fabric, lined with paper towels, daily sprayed with distilled water, and kept in rooms with controlled temperature of 25 ± 1°C, 50 ± 10% relative humidity (RH), and a 12:12h photoperiod.

Males and females of *Eacles* sp. emerged from 59.0% of the collected pupae and were maintained in the laboratory to establish a colony. Three males and three females were killed with injections of absolute alcohol and sent to Msc. Carlos G. C. Mielke at the Universidade Federal do Paraná (UFPR) for identification. These insects were identified, according to the morphological attributes provided by Lemaire (1988), as *E. manuelita* (Figure 1) and were deposited in the entomological collections of UFPR in Curitiba, Paraná State, Brazil, and UNESP/FCA in Botucatu, São Paulo State, Brazil.

Eacles manuelita is a rare species collected in the states of Alagoas, Bahia, Ceará, Minas Gerais, Pernambuco and Sergipe, Brazil (St Laurent and Mielke, 2015), but it has never been reported as a pest in crops and forestry. The first detection of this species in clonal *Eucalyptus* plantations occurred in 2018 in northeastern Bahia. However, it was initially misidentified as *E. ducalis*. Definitive identification was only achieved in 2019, following a large-scale outbreak that affected 10,000 hectares. In 2020, the species infested an additional 2,500 ha within the same region. A secondary species, *Citheronia laocoon* (Cramer, 1777) (Lepidoptera: Saturniidae), was found in low numbers associated with *E. manuelita*.

Pupae of *E. manuelita* remained alive in the laboratory for up to a year after its collection, indicating possible diapause, as observed by Crocomo (1977) in *E. imperialis magnifica* (now *E. magnifica*), though the factors inducing this behavior are unknown. Outbreaks of *E. manuelita* after periods of rain suggest that this insect depends on soil humidity to emerge, as reported for *E. magnifica* (Crocomo, 1977).

*e-mail: murilo@ipef.br

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Figure 1. Larvae and adults of *Eacles manuelita*. A) Last instar larvae feeding on *Eucalyptus* leaves; B) Habitus of adult male (left) and adult female (right), dorsal view (B). Scale bar = 1 cm.

Population outbreaks during the rainy season of species that go through dry periods in prepupae stage have also been reported for another secondary pest of *Eucalyptus*, *Psoracampa denticulata* Schaus, 1901 (Lepidoptera: Notodontidae). However, it differs from most *Eucalyptus* defoliating caterpillars with higher populations during dry periods (Zanuncio et al., 1993, 2015).

Parasitism of 26.9% of *E. manuelita* pupae by unidentified species of Diptera, Tachinidae, was also observed. Parasitism by *Belvosia bicincta* Robineau & Desduoyoidy, 1830, *Belvosia potens* Wideman, 1830, *Pararrhinactia parva* Townsend, 1935, and *Euphorcera* sp. (Diptera: Tachinidae) were reported for *E. magnifica* pupae (Crocomo, 1977; Trevisan et al., 2004). The parasitoid of *E. manuelita* pupae requires further investigation for biological control of this pest.

The outbreak of *E. manuelita* in *Eucalyptus* plantations highlights the ongoing adaptations of native insects to this crop and the need to develop integrated pest management programs in Brazil. It also demonstrates that even rare species can damage these plantations if environmental conditions are favorable and/or competition with other Lepidoptera species is low (Bernardi et al., 2011).

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Data Availability Statement

Data is available upon request.

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