

First record of the sweet potato pest *Bedellia somnulentella* (Lepidoptera: Bedelliidae) in Brazil

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The sweet potato, *Ipomoea batatas* (L.) (Solanales: Convolvulaceae), is native to South and Central America and distributed worldwide, especially in underdeveloped countries (França & Ritschel 2002; Reddy 2015). Young leaves and shoots, as well as the tuberous roots of this species, are edible and have additional uses such as animal feed and biofuel production (Ziska et al. 2009). The sweet potato leafminer, *Bedellia somnulentella* (Zeller) (Lepidoptera: Bedelliidae) is a major pest of sweet potato in United States, including Puerto Rico, Africa, Asia, Europe, and Oceania where temperatures ≤ 29.4 °C occur (Clemens 1862; Tawfik et al. 1976; Parrella & Kok 1977; Seven 2006; Fatah et al. 2014). This species is considered a specialist pest of Convolvulaceae (Solanales) and has been reported to infest *Convolvulus arvensis* (L.) and *Calystegia sepium* (L.) R. Br. (both Solanales: Convolvulaceae).

Individuals of *B. somnulentella* were observed and collected on *I. batatas* specimens in Sep 2013 at the germplasm bank of the Olericultura sector of the Universidade Federal dos Vales do Jequitinhonha e Mucuri (UFVJM) in Diamantina, Minas Gerais State, Brazil (18.1666°S, 43.5000°W and 1,387 masl) but it was not identified at that time. In Mar 2017, a new infestation of this species was found in *I. batatas* fields which represents a regular occurrence of this pest in Brazil. This is the first report of *B. somnulentella* damaging *I. batatas* in the municipality of Diamantina (average temperature of 19 °C) shows that this pest has now required its integration into sweet potato pest monitoring programs.

Bedellia somnulentella has 5 larval instars. The first and second instars are yellow-green with a characteristic greenish-white line evident in the intestines. The remaining instars are characteristically dark green with dorsal pinkish spots on the thoracic and abdominal segments (Fig. 1A). Larvae have retractable prognathic heads and the prothorax is highly projected during feeding (Shorey & Anderson 1960). Recently formed pupae are green to red but gradually change to dark brown when nearing adult emergence (Shorey & Anderson 1960). The anterior and posterior extremities of pre-pupae and pupae feature a network of crossed horizontal silk strands (Figs. 1B, 1C). Adults possess filiform antennae and are yellow-bronze moths with an approximate wingspan of 4.0 mm with fringed posterior wings. The anterior wings cover the posterior ones when resting (Fig. 1D). Adults usually remain perched at the end of the abaxial leaves of the plant (Fig. 2A).

Generally, damage of *I. batatas* by *B. somnulentella* occurs when larvae mine young and mature leaves. Initially, mines are serpentine then later become translucent with yellowish-brown spots (Fig. 2B). Mined leaves also exhibit a brown, wrinkled appearance that become

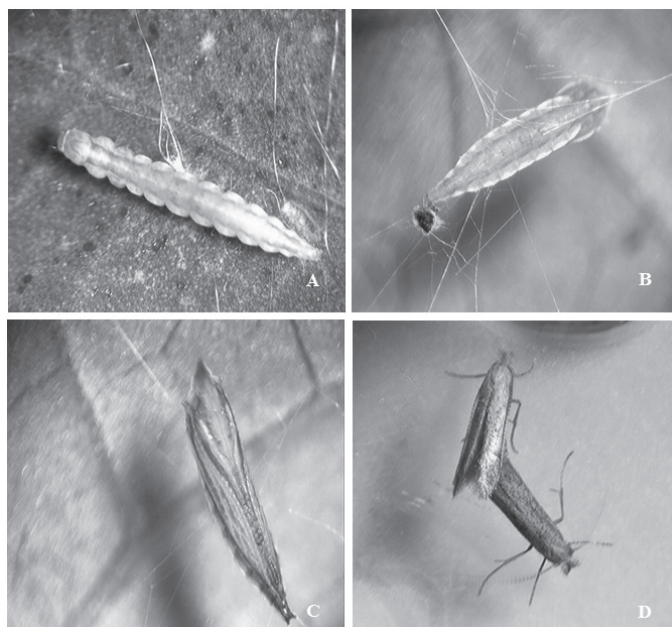


Fig. 1. Larvae (A); pre-pupae (B); pupae (C); and adults (male and female) (D) of *Bedellia somnulentella* (Lepidoptera: Bedelliidae).

chlorotic and may result in subsequent reduction of the photosynthetic condition of the affected area, especially when 1 or more larvae are present per leaf. Damage is produced when caterpillars consume the foliar mesophyll (including the associated palisade and lacunic parenchyma as well as conducting vessels), thereby reducing the production and conduction of photoassimilates. Reduced vessel flow leads to pronounced release of ethylene causing premature leaf fall that reduces nutrient translocation to roots reducing yield and productivity (Souza et al. 1998; Lenis et al. 2006). Also, larvae usually deposit droppings outside the entry hole of the mine during feeding (Fig. 2C) where accumulation of excreta may result in fungal growth (Tawfik et al. 1976).

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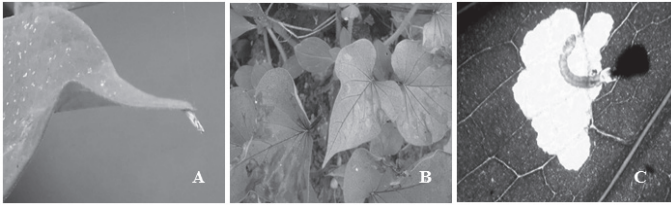


Fig. 2. *Bedellia somnulentella* (Lepidoptera: Bedelliidae) adult perched on the abaxial end of an *Ipomoea batatas* leaf (A); larval damage on *I. batatas* leaves (B); caterpillar with excreta deposited outside a mine (C).

tion of *B. somnulentella* collected on *I. batatas* plants in the germplasm bank of the Olericultura sector of the Universidade Federal dos Vales do Jequitinhonha e Mucuri. Dr. Phillip John Villani (The University of Melbourne, Australia) revised and corrected the English language used in this manuscript.

Summary

Bedellia somnulentella (Zeller) (Lepidoptera: Bedelliidae) is a specialist Convolvulaceae pest. Its larvae damage host plants by mining young and mature leaves. This is the first report of *B. somnulentella* in the Brazilian territory. This pest was observed on young and mature *Ipomoea batatas* (L.) (Solanales: Convolvulaceae) leaves in Diamantina, Minas Gerais State, Brazil. This insect alters the leaf appearance due to its mines, changing the leaf color to yellowish-brown, which reduces the photosynthetic area. The presence of *B. somnulentella* in Brazil makes it necessary to include this insect in pest monitoring programs in sweet potato plantations.

Key Words: Bedelliidae; damage; Convolvulaceae; Lepidoptera; sweet potato

Sumario

Bedellia somnulentella (Zeller) (Lepidoptera: Bedelliidae) es una plaga especialista de Convolvulaceae. Los daños a las plantas hospede-

ras ocurren durante la fase larval, minando hojas jóvenes y maduras. Este artículo, es el primer reporte de *B. somnulentella* en territorio brasileño. Esta plaga fue observada en hojas jóvenes y maduras de *Ipomoea batatas* (L.) (Solanales: Convolvulaceae) en Diamantina, Minas Gerais, Brasil. El insecto transforma las hojas con la presencia de minas que mudan el color de la hoja a marrón amarillenta, reduciendo el área fotosintética. La presencia de *B. somnulentella* en Brasil hace necesaria su inclusión en programas de monitoreo de plagas en cultivos de papa dulce.

Palabras Clave: Bedelliidae; Daños; Convolvulaceae; Lepidoptera; patata dulce

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