

# *Laetilia coccidivora* (Comstock, 1879) preying on *Coccus pseudomagnoliarum* (Kuwana, 1914) in Mexico, first record of Association prey-predator host plant (Lepidoptera: Pyraloidea)

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## Abstract

The association between the entomophagous Lepidoptera *Laetilia coccidivora* (Comstock, 1879) is recorded for the first time with the species of Coccoidea *Coccus pseudomagnoliarum* (Kuwana, 1914). This phytophagous insect also represents the first record for Mexico. The material was obtained from the municipality of Cortazar, Guanajuato, Mexico. The host plant, *Acacia farnesiana* (L.) Willd. & Arn., is a new record as a host for the scale insect. The voracity of the larvae of this lepidopteran considerably reduced the individuals collected.

KEY WORDS: Lepidoptera, Pyraloidea, *Laetilia coccidivora*, entomophagous, Fabaceae, Coccoidea, *Coccus pseudomagnoliarum*, Mexico.

*Laetilia coccidivora* (Comstock, 1879) alimentándose sobre *Coccus pseudomagnoliarum* (Kuwana, 1914) en México, primer registro de asociación presa-depredador planta alimenticia (Lepidoptera: Pyraloidea)

## Resumen

La asociación entre el Lepidoptera entomófago *Laetilia coccidivora* (Comstock, 1879) se registra por primera vez con la especie de Coccoidea *Coccus pseudomagnoliarum* (Kuwana, 1914). Dicho insecto fitófago representa también el primer registro para México. El material se obtuvo del municipio de Cortazar, Guanajuato, México. La planta alimenticia, *Acacia farnesiana* (L.) Willd. & Arn., es un registro nuevo como hospedante del Coccoidea. La voracidad de las larvas de este Lepidoptera redujo considerablemente los individuos recolectados.

PALABRAS CLAVE: Lepidoptera Pyraloidea, *Laetilia coccidivora*, entomófago, Fabaceae, Coccoidea, *Coccus pseudomagnoliarum*, México.

## Introduction

The entomophagous dietary is a quality of some species of subfamily Phycitinae (SOLIS, 2008). Among these organisms, *Laetilia coccidivora* (Comstock, 1879), a predator located from the south of the USA to Central America, is reported (MANN, 1969). Studies on this moth refer mainly to its association with *Opuntia ficus-indica* (L.) Miller, where it feeds on prickly pear cochineal and occasionally on other sessile insects (PORTILLO & VIGUERAS, 2006; SOLIS, 2008; VANEGAS-RICO *et al.*, 2010). The ability of this lepidopteran to tolerate the deterrent substance known as

carminic acid has contributed to being considered a potential agent of classic biological control on *Dactylopius coccus* Costa, 1829 in Africa (BARRETO-GARCÍA *et al.*, 2020).

One of the relevant aspects in the development of biological control programs is to know the possible non-target of the released species. Therefore, the present work had the objective of determining the species of scale insects' prey of *L. coccidivora* in a locality of the Guanajuato state, Mexico.

## Materials and Methods

In October 2018, sampling of Fabaceae (branch of 40 cm) infested with scale insects, was done at the municipality of Cortazar, Guanajuato (20°29'31.02"N, 100°55'23.59"O, 1744 m). A few coccids showed dorsal damage from bites of predatory larvae and silk tunnels. The branches were cut and placed in 20 cm tricot-nylon fabric bags for review in a personal laboratory at room temperature. Preserving some specimens of coccids in ethanol 70%, and the rest in the fabric cage with predaceous larvae. Emerged adult of moth were cold sacrificed in a domestic refrigerator, mounted and compared with *L. coccidivora* collection in 2018. The scale insect specimens were processed in 2019 with the technique of HAMON & KOSZTARAB (1979). Determination was made in 2020, by the first author, with the keys of GILL (1988). It would be deposited some Voucher specimens in the authors' personal collections and in the Coccoidea collection of the Faculty of Higher Studies Iztacala (UNAM). The Fabaceae were determinate with a visual guide of native Flora and de keys of RICO (2001).

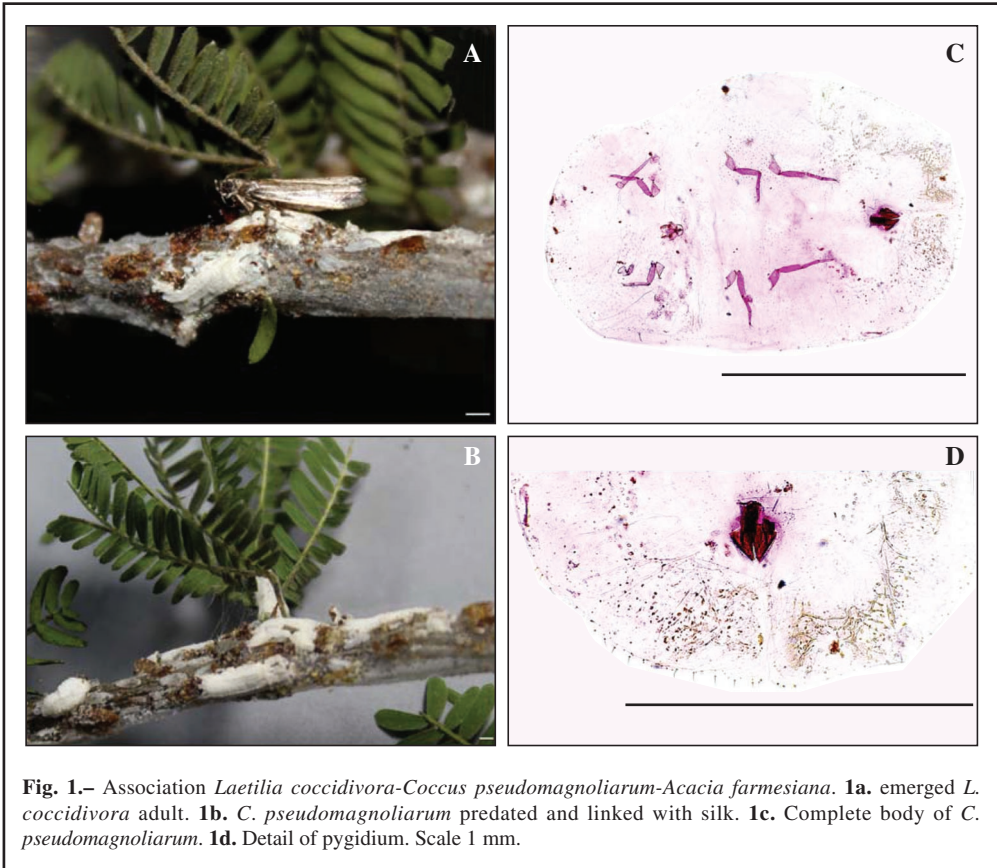
## Results and Discussion

The Lepidoptera *L. coccidivora* is a widely distributed entomophagous in the prickly pear areas of Mexico. Among these places, there are some municipalities of Guanajuato, where it occurs in wild *Opuntia* infested with *Dactylopius opuntiae* (Cockerell, 1896) and *Dactylopius confusus* (Cockerell, 1893) (unpublished data). Two adults of *L. coccidivora* were got, also observed three larvae and one pupa with evidence of cannibalism, a phenomenon recorded in other populations of *L. coccidivora* (VANEGAS-RICO *et al.*, 2018).

The closest specimens of these Pyraloidea larvae, were in *Opuntia*, almost 2 km on the same road. It is probable that its adults moved through the air currents and reached the Fabaceae *Acacia farnesiana* (L.) Willd. & Arn., a common plant in the state, rather tolerated in the marginal areas of crops and on the roadside, site where it was collected.

The soft scale corresponds to *Coccus pseudomagnoliarum* (Kuwana, 1914) (Fig. 1), parthenogenetic species (GARCÍA-MORALES *et al.*, 2016) that presents one generation per year, individuals of the same stage of development are generally found in the population, nymphs and adult females are mainly found on twigs (GILL, 1988); mainly attacks citrus species, although it also others plants (GILL *et al.*, 1977) such as pomegranate, walnut, laurel rose, feijoa, and others; depending on the country, it can be a pest of economic and minor importance in citrus crops (GARCÍA-MORALES *et al.*, 2016); in these, it causes tree decline and low fruit production due high removal of sap, in addition to the production of honeydew that causes the appearance of sooty mold on fruits (GILL, 1988); insecticides have been used to manage this Coccoidea, and several species of entomophagous have been registered as natural enemies, mainly parasitoids, as possible biological agents control (GARCÍA-MORALES *et al.*, 2016).

Voracity of *L. coccidivora* on the adult populations of this scale was high, registering that over 95% of them had the ventral part total consumed, leaving only the dorsal cover adhered to each other with other scales by silk tunnels. *C. pseudomagnoliarum* is recorded from 22 countries. In the American continent USA were recorded (GARCÍA-MORALES *et al.*, 2016), although GILL *et al.* (1977) and GILL (1988) report the presence of the species in Mexico but without indicating hosts and collection sites. So, this is the first record for Mexico. In Guanajuato, there are native species of the genera *Berberis*, *Celtis*, *Juglans* and *Rhamnus*, as well as other urbanized ones such as *Nerium oleander* L. and *Citrus* sp. which are mentioned as hosts of this insect (GARCÍA-MORALES *et al.*, 2016) and could be



**Fig. 1.**– Association *Laetilia coccidivora*-*Coccus pseudomagnoliarum*-*Acacia farnesiana*. **1a.** emerged *L. coccidivora* adult. **1b.** *C. pseudomagnoliarum* preyed and linked with silk. **1c.** Complete body of *C. pseudomagnoliarum*. **1d.** Detail of pygidium. Scale 1 mm.

the sources of dispersal, but it is probable that due to the action of this predator, the populations of the scale are regulated and do not cause significant damage.

Presence of *L. coccidivora* on the Coccoidea *C. pseudomagnoliarum* is a fortuitous event probably caused by the ability to feed on more than 24 prey species, some of this related to *Opuntia* sp. (PORTILLO & VIGUERAS, 2006; SOLIS, 2008; VANEGAS-RICO *et al.*, 2010; VANEGAS-RICO *et al.*, 2018; BARRETO-GARCÍA *et al.*, 2020), which suggests a high capacity for adaptation to other food resources. Mexico is the second country in America with the presence of *C. pseudomagnoliarum*, its development on *A. farnesiana* represents a new record of the association between predator-phytophagous-plant.

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