Occurrence of Metarhizium rileyi (Farlow) Kepler, S. A. Rehner & Humber in Anticarsia gemmatalis Hübner (Lepidoptera: Erebidae) and Trichoplusia ni Hübner (Lepidoptera: Noctuidae) Larvae in Tamaulipas and Veracruz, Mexico

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Occurrence of *Metarhizium rileyi* (Farlow) Kepler, S. A. Rehner & Humber in *Anticarsia gemmatalis* Hübner (Lepidoptera: Erebidae) and *Trichoplusia ni* Hübner (Lepidoptera: Noctuidae) larvae in Tamaulipas and Veracruz, Mexico

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In Mexico, *Anticarsia gemmatalis* Hübner (Lepidoptera: Erebidae) and *Trichoplusia ni* Hübner (Lepidoptera: Noctuidae) feed on soybean crops (Ávila et al. 2006), but *A. gemmatalis* is considered the principal pest because of the damage it causes (Gamundi et al. 2010). In several parts of the world, both defoliating insects are affected by *Metarhizium rileyi* (Farl.) Kepler, S. A. Rehner & Humber (Hypocreales: Clavicipitaceae) (Palma & Del Valle 2015). This fungus is pathogenic and virulent to 30 species of Lepidoptera (Iqtiat et al. 2009). In this study, we report the natural occurrence of *M. rileyi* in the larvae of *A. gemmatalis* and *T. ni* in the states of Tamaulipas and Veracruz, Mexico.

From Aug to Dec 2017, *A. gemmatalis* and *T. ni* larvae were collected from soybean crops in the municipalities of Altamira, Tamaulipas (22.573211°N, 98.178025°W), and Pánuco, Veracruz (21.974477°N, 98.441155°W). Larvae were collected using a simple random sampling design where they were collected manually at each sampling point. Samples were transported to the biological control laboratory of "Las Huastecas" Experimental Field of the National Institute of Forestry, Agriculture, and Livestock Research (INIFAP) in Villa Cuauhtémoc, Tamaulipas, Mexico. In the laboratory, larvae were incubated at 25 ± 2 °C for 15 d. At the end of this period, fungus present in the larvae was used to inoculate dextrose and potato agar medium, then incubated at 25 ± 2 °C until sporulation. A total of 371 *A. gemmatalis* larvae were collected from Altamira, Tamaulipas, and 9 from Pánuco, Veracruz; all were infected by *M. rileyi* (Fig. 1A). In each municipality, only 1 collected larva of *T. ni* was infected with the fungus (Fig. 1B). *Metarhizium rileyi* was identified using the taxonomic keys of Samson (1981) as shown in Figures 1C and D.

It has been reported that *M. rileyi* causes mortality in larval *A. gemmatalis*, *T. ni*, *Helicoverpa armigera* Hübner, *H. punctigera* Wallengren, *Spodoptera litura* Fab., and *S. frugiperda* Smith & Abbot (Lepidoptera: Noctuidae) in Australia, China, India, Thailand, Cuba, Palestine, Brazil, Argentina, and the United States, respectively (Glare 1987; Tang & Hou 1998; Vimala Devi et al. 2003; Srisukchayakul et al. 2005; Céspedes et al. 2008; Iqtiat et al. 2009; Bortolotto et al. 2015; Duarte da Costa et al. 2015; Namasivayam & Bharani 2015; Palma & del Valle 2015).

In Mexico, the fungus has been reported in larval *S. frugiperda*, *Spodoptera exigua* Hübner, *Helicoverpa zea* Boddie, and *Heliothis virescens* Fab. (Lepidoptera: Noctuidae) (Vega-Aquino et al. 2010), as well as *A. gemmatalis* in soybean crops from Tamaulipas (Ávila et al. 2006). For the first time, we report the natural occurrence of *M. rileyi* in the larvae of *A. gemmatalis* and *T. ni* collected from the soybean producing areas of Pánuco, Veracruz, as well as *T. ni* from Altamira, Tamaulipas. In both municipalities, the greatest number of larvae infected by the fungus was recorded in Oct 2017.

Summary

We report the natural occurrence of *M. rileyi* in larval *A. gemmatalis* and *T. ni* in soybean producing regions of Altamira, Tamaulipas, and Pánuco, Veracruz, Mexico, during Aug through Dec 2017. A total of 380 *M. rileyi*-infected *A. gemmatalis* larvae were collected from Altamira and Pánuco. In each municipality, only 1 larval *T. ni* was found infected with the fungus. In Oct, the greatest number of *A. gemmatalis* larvae infected by *M. rileyi* was recorded from both municipalities.

Key Words: Soybean; velvetbean caterpillar; cabbage looper; fungus

Sumario

En el presente estudio reportamos, de ago a dic del 2017, la ocurrencia natural de *M. rileyi* en larvas de *A. gemmatalis* y *T. ni* en la región productora de soya de Altamira, Tamaulipas, y Pánuco, Veracruz, México. En total se recolectaron 380 larvas de *A. gemmatalis* infectadas por *M. rileyi* en Altamira y Pánuco. En cada municipio, solo 1 larva de *T. ni* fue recolectada infectada con *M. rileyi*. En oct, el número mayor de larvas de *A. gemmatalis* infectadas por *M. rileyi* fue recolectado en ambos municipios.

Palabras Clave: Soya; gusano terciopelo; gusano falso medidor; hongo

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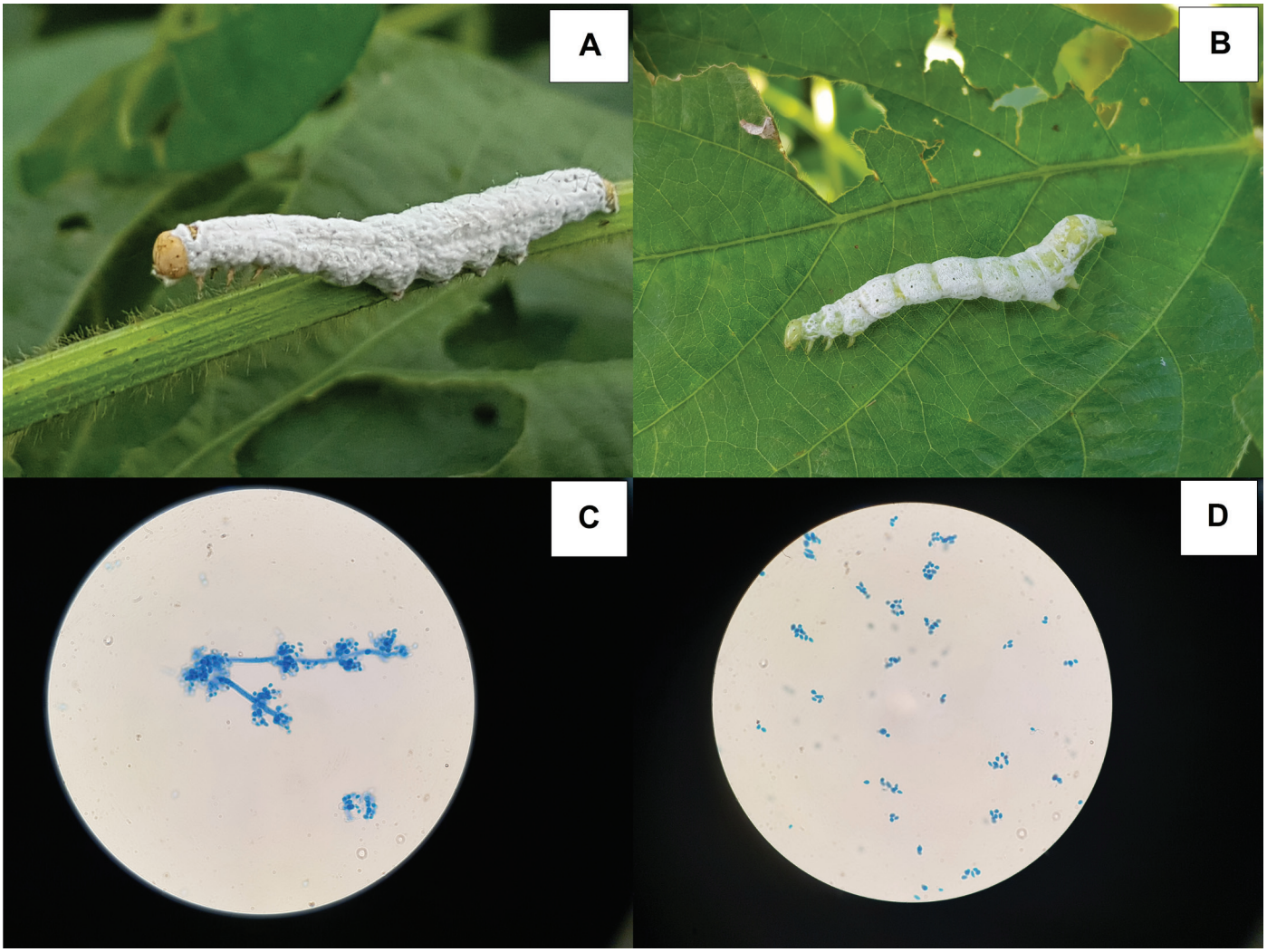

Fig. 1. Larvae of (A) *Anticarsia gemmatalis* and (B) *Trichoplusia ni* infected by *Metarhizium rileyi*, collected from soybean plants in the states of Tamaulipas and Veracruz, Mexico; (C) Conidiophores of *M. rileyi* at 100× magnification and dyed with cotton blue; (D) Spores of *M. rileyi* at 100× magnification and dyed with cotton blue.

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