Field Application of the Generalist Entomopathogenic Fungus *Metarhizium brunneum* Did Not Affect Beneficial *Orius cf. insidiosus* on Maize

Oscar E. Rosales-Escobar, Antonio P. Terán-Vargas, Livier Guizar-Guzmán, Ausencio Azuara-Domínguez, and Sergio R. Sánchez-Peña*

Departamento de Parasitología, Universidad Autónoma Agraria Antonio Narro (UAAAN), Saltillo, Coahuila 25315 Mexico

By necessity, implementation of integrated pest management (IPM) requires that management tools are compatible. In biological control there is sometimes concern about the interactions of polyphagous natural enemies in the field. Generalist entomopathogens like the fungus *Metarhizium brunneum* Petch (=*Metarhizium anisopliae* var. *brunneum*, in part) (Ascomycota: Clavicipitaceae) can, in theory, infect and negatively impact beneficial insects, especially when applied in inundative mode for pest control. Exposure tests in a laboratory sometimes result in infection of beneficial insects like pirate bugs (Hemiptera: Anthocoridae), by generalist entomopathogenic fungi. Pirate bugs, particularly *Orius* spp., are important natural enemies of pests worldwide (Luna et al. 2012). These predatory true bugs feed on pests such as thrips, mites, aphids, and whiteflies (Chyzik et al. 1995, Lara et al., 2002) and on eggs and first instars of Lepidoptera (Luna et al. 2012). Meyling and Pell (2006) described laboratory infection of the generalist pirate bug *Anthocoris nemorum* L. by the polyphagous fungus *Beauveria bassiana* (Bals.) Vuill. *Orius sauteri* (Poppius) was not susceptible to *B. bassiana* even after immersion in high concentrations of infective spores (1 x 10^8 conidia/ml) in a laboratory (Gao et al. 2012). Likewise, in laboratory exposure, *Orius albidipennis* (Reuter) was much less susceptible than onion thrips, *Thrips tabaci* (Lindeman), to infection by *Metarhizium anisopliae* (Metch.) Sorokin (Ascomycota: Clavicipitaceae) (Pourian et al. 2011). However, there are few empirical data from field tests on possible direct negative impacts of generalist entomopathogenic fungi upon beneficial organisms.

This study aimed to evaluate the impact (under field conditions) of one heavy application of *M. brunneum* strain M11 on a population of *Orius cf. insidiosus* in a field of maize, *Zea mays* L., at southern Tamaulipas, Mexico. The strain was observed to kill sugarcane borers, *Diatrea saccharalis* (Fabricius), after application in another maize field (O.R.E and S.S.P., unpublished observations). It also attacks

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1Ascomycota: Hypocreales
2Hemiptera: Anthocoridae
3Campo Exp. Las Huastecas, Instituto Nacional de Investigaciones Agrícolas, Forestales y Ganaderas, Carr. Tampico-Mante km. 55, CP 86910, Mexico.
4Instituto Tecnológico de Ciudad Victoria, Blvd. Emilio Portes Gil 301, Ciudad Victoria, Tamaulipas, 87010, Mexico.
*Corresponding author