Tolerance to UV-B radiation of the entomopathogenic fungus *Metarhizium rileyi* for development as a microbial agent for management of main lepidopteran species in soybean and cotton crops

Eliezer P. de Andrade[1], Alcides P. de Brito[1], Daniel R. Sosa-Gómez[2], and Drauzio E.N. Rangel[1]

[1]Universidade Brasil, São Paulo, SP 08230-030, Brazil,

[2]Embrapa Soybean, Londrina, PR 86001-970 Brazil

Corresponding author: email: drauzio@live.com

Abstract

Soybean, corn and cotton crops are afflicted by several noctuid pests. Therefore, the development of bioinsecticides, based on entomopathogenic fungi, can provide the control of these pests with the sustainability of the system. The fungi *Metarhizium rileyi* has the greatest potential, since its epizootics decimate caterpillar populations in the absence of fungicide applications. The low survival of insect-pathogenic fungi when used for insect control in agriculture, however, is mainly due to the deleterious effects of ultraviolet radiation and heat from solar irradiation. In this study, fourteen isolates of *M. rileyi* were studied and compared with isolate ARSEF 2575 of *Metarhizium robertsii* and isolate ARSEF 324 of *Metarhizium acridum*, which sensitivity to UV-B radiation had been previously studied. Conidial suspensions were exposed at room temperature (ca. 26 °C) to 847.90mWm^2 of Quaite-weighted UV-B using two fluorescent lamps TL 20W12 RS

(Philips, Eindhoven, Holland). The plates containing the conidial suspensions were irradiated for 1, 2, and 3 h, providing doses of 3.05, 6.10, 9.16, and 12.21 kJ m^2, respectively. Remarkable variability in conidial UV-B tolerance was found among 14 isolates of *M. rileyi*. Isolate CNPSo-Mr 150 was the most tolerant isolate (germination above 80% after 2 h exposure), which was comparable ARSEF 324 (germination above 90% after 2 h exposure), the most tolerant Metarhizium isolate. The least tolerant isolate was CNPSo-Mr 597 (germination below 5% after 2 h exposure). Nine isolates were similar with ARSEF 2575 (germination above 50% after 2 h exposure). Concluding, the majority of *M. rileyi* isolates can endure 1 or 2 h of UV-B radiation exposure. However, after 3 h exposure caused great reduction of germination below 40% for all isolates, except for CNPSo-Mr 150 and ARSEF 324.

Key Words: Entomopathogenic fungi; solar radiation; agricultural microbiology; stress tolerance