

Coffee seedlings inoculated with *Metarhizium* and their response to leaf miner damage.

Mayara Loss Franzin ¹, Leila Nascimento Pereira da Silva ¹, Camila Costa Moreira ², Simon Luke Elliot ¹, Marcos Antonio Matiello Fadini ³, Madelaine Venzon ⁴

¹ Universidade Federal de Viçosa.

² Koppert Brasil.

³ Universidade Federal de São João del-Rei.

⁴ EPAMIG Sudeste.

* Leila Nascimento Pereira da Silva. E-mail: leila.n.silva@ufv.br

Some fungi can cause diseases in insects, being entomopathogenic. They can also associate with plant roots, promoting growth and generating protection against pests. Species of the genus *Metarhizium* can associate with plant roots and are very important for pest control. These fungi are commonly found in soils of agricultural crops, associating themselves with a wide variety of plants, including coffee plants. In previous studies *Metarhizium robertsii* and *Metarhizium brunneum* were found associated with coffee roots cultivated in a diversified system in the Cerrado of Minas Gerais. This study aimed to verify whether these fungi inoculated in coffee seedlings can associate with the roots and indirectly protect the seedlings against the coffee leaf miner *Leucoptera coffeella* (Lepidoptera: Lyonetiidae), which is an important pest for this crop. The experiment with coffee seedlings was carried out in a greenhouse, the seedlings were irrigated with 30 ml of suspension of *M. robertsii* and *M. brunneum*. The suspensions were adjusted to a concentration of 1×10^8 conidia/ml. For controls, 30 ml of 0.05% Tween were used. Each treatment was carried out on 20 coffee seedlings. Eight days after inoculation the seedlings were infested with two pairs of adult leaf miners, which were removed after 48 hours. At the end of the experiment, when the last adult emerged, colonization of the roots by fungi and the mined area of the leaves were evaluated. No *Metarhizium* isolates were recovered from the roots of control coffee seedlings. Both isolates were recovered from roots of coffee seedlings treated with the respective fungi. At 43 days after inoculation, *M. robertsii* was recovered in 90% of the roots of coffee seedlings and *M. Brunneum* in 75%. For statistical evaluation, plants with a positive association were considered. The mined leaf area was measured by images with ImageJ software. Both isolates, *M. robertsii* ($0.08 \pm 0.02\%$; $t = 9.23$, $p < 0.001$) and *M. brunneum* ($0.28 \pm 0.10\%$; $z = 7.16$, $p < 0.001$), promoted protection against *L. coffeella*, reducing the mined leaf area by 70%, when compared to the control ($1.38 \pm 0.17\%$). These results showed that *M. brunneum* and *M. robertsii*, when associated with the roots of coffee seedlings, promote protection against the coffee leaf miner and can be considered for the development of inoculants for coffee seedlings.

Key words: entomopathogenic fungi; biological control; endophytic.

Mudas de café inoculadas com *Metarhizium* e sua resposta aos danos do bicho-mineiro.

Metarhizium pode estabelecer associação com as raízes de mudas de café e promover indiretamente proteção contra o bicho- mineiro. Foram testadas duas espécies, *Metarhizium robertsii* e *Metarhizium brunneum*. As duas espécies são capazes de se associar à mudas de café e diminuir a área foliar minada pelo bicho- mineiro. Os tratamentos diminuíram área de mina em 70%, quando comparada ao controle.

Palavras-chave: Fungos entomopatogênicos; controle biológico; endofíticos.

Acknowledge: Consórcio Café, FAPEMIG, EPAMIG, FUNARBE, CAPES, CNPq.