

## **Abstract**

The nematode species *Meloidogyne incognita* is an important plant endoparasite. The infectious developmental stage infects plant roots in the soil to form pathological morphological formations - galls. The most widely used means of protecting crops from nematode infestation are chemical agents, nematocides. However, in order to reduce the negative impact on the environment, emphasis is being placed on finding new, sustainable solutions to combat the parasites. One of these could be to exploit the benefits of arbuscular mycorrhizae (AM), which include increased protection of plants against biotic stresses. This may be due, in addition to improved nutrient availability (especially phosphorus), to the induction of a systemic defence response, or to the interaction of AM fungi with other organisms in the rhizosphere.

The main objective of this study was to describe the effect of AM on the resistance of tomato (*Solanum lycopersicum*) to root parasite, the nematode *Meloidogyne incognita*. In three containerized greenhouse experiment the following was tested 1) the nutrient conditions for tomato cultivation with mycorrhiza, then 2) the effect of nematodes on growth and nutrient uptake by experimental plants, the interaction between nematodes and AM fungi in the root system, and 3) the effect of root colonization by AM fungi on root penetration by infective nematode larvae. In all experiments, the effect of different isolates of AM fungi was compared.

In the second main experiment, the effect of AM was evident when tomato plants were infected by nematodes simultaneously with planting, which significantly reduced their biomass. The benefit of mycorrhiza was improving growth and P uptake of infected plants. Individual AM fungal isolates differed significantly in their ability to colonize the roots of experimental plants, but not in their ability to alleviate the stress caused by nematode infection. Mycorrhiza did not reduce nematode reproduction in the plant root system, and conversely, the presence of nematodes did not affect the development of AM fungi in the root system. In the third experiment, there was no effect of root colonization by AM fungi on root penetration by infective nematode larvae. Thus, the main result of this work is that mycorrhiza mitigates nematode infection stress mainly by increasing the ability of plants to take up nutrients from the soil, but not by suppressing root penetration by nematodes from the soil or their development in the root system.

## **Key words:**

Arbuscular mycorrhiza, nematodes, *Meloidogyne incognita*, biotic stress, biological control