PROPUESTA DE TRABAJO FIN DE MÁSTER

*__Título del TFM__ (propuesta inicial, podrá modificarse en la versión final)**:**

Microbe-induced systemic plant resistance to root-knot nematodes in tomato

*__Línea de investigación__ (consultar líneas disponibles en https://masteres.ugr.es/microbiologia/investigacion/lineas)**:**

Microbiologia del suelo

*__Resumen de la propuesta__ (máximo 250 palabras)**:**

Project description: Plants roots interact with numerous organisms, including damaging herbivores and beneficial microbes. Among the damaging herbivores are root-knot nematodes (RKN) that infect many economically important crops and cause severe loses worldwide. Conversely, beneficial soil microbes can improve the plant growth and enhance the plant's resistance capacity against broad spectrum of plant pathogens and herbivores. Although progress has been made to understand microbe-induced-resistance in plants to shoot herbivores, comparatively less is known about how beneficial microbial inoculation can protect plants against root damaging herbivores, such as RKN. This project aims to investigate whether root inoculation with the beneficial fungus *Trichorderma* spp. can induce changes in polyamines as plant-mediated systemic resistance to the RKN *Melodigoyne* spp. in tomato plants.

Experimental approach: The study will use tomato (*Solanum lycopersicum*) as the model plant, beneficial fungus *Trichoderma* spp. as root microbe and the RKN are root herbivores. A split-root system will be used to examine direct plant microbe or RKN interactions from systemic interactions mediated via the plant. Experiment include planned treatments will be conducted in greenhouse (EEZ-CSIC-installations). Assessment of RKN growth and development will be done using microscopy. *Trichoderma* spp inoculation, and induced plant responses will be investigated using our well established molecular biology approach, including RNA extraction and gene-expression (qPCR).

Student training: Successful student will gain practical experience in designing and conducting multifactorial experiment, plant growing and establishing split-root system, microbial innocula and infecting plant roots with root-knot nematodes, molecular biology methods. Training will also include data analyses, writing and presentation of research findings.

Key words: Microbe-Induced-Resistance, root-knot nematodes, tomato, beneficial microbes, systemic signalling, split-root system.

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Cotutor/a: Dr. Crispus Mbaluto

***Criterios de selección de los estudiantes:**

In person interview: 70%

Good English skills (writing and speaking): 20%

Previous experience working in laboratory: 5%

Bachelor degree related to plant biology: 5%

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*Campo obligatorio