



**EBTM**

Encontro de  
Biotecnologia Medicinal



**ICMB**

Iberian Congress on  
Medicinal Biotechnology

BOOK OF  
**ABSTRACTS**



21 OCT  
2022

P. PORTO ESCOLA SUPERIOR DE SAÚDE

# Effect of arbuscular mycorrhizal fungi application in biodiesel producing plants

JOÃO MENDES<sup>1</sup>, PILAR BAYLINA<sup>1</sup>, RÚBEN FERNANDES<sup>2</sup> & RUI S. OLIVEIRA<sup>3</sup>

1. Laboratory of Medical & Industrial Biotechnology (LABMI), School of Health, Polytechnic Institute of Porto, Porto, Portugal; 2. i3S - Instituto de Investigação e Inovação em Saúde, Porto, Portugal; 3. Centre for Functional Ecology, Departamento de Ciências da Vida, Universidade de Coimbra, Coimbra, Portugal.

Fossil fuels combustion is one of the major problems of the 21st century(1). Biodiesel could be one of the responses to this environmental problem. However, the yield and price of production come up as barriers to a global adoption. This study aimed to implement a strategy to improve the performance of biodiesel producing plants, through the application of arbuscular mycorrhizal fungi (AMF). Plants were inoculated with AMF and grown under controlled environmental conditions. Root staining showed the presence of AMF structures in inoculated plants and their absence in non-inoculated plants. No statistically significant seed biomass was observed between inoculated and control plants of *Nicotiana tabacum* (Tobacco) and *Linum usitatissimum* (Flaxseed). Chlorophylls assays showed higher chlorophyll content of non-inoculated *L. usitatissimum* plants in the first assay (before flowering stage) and no statistically significant results in the second assay (after flowering stage). In *N. tabacum*, no statistically significant results were obtained in both chlorophylls assays. Genetic evaluation in *N. tabacum* was performed to assess expression of genes involved in triacylglycerol synthesis (DGAT1, DGAT2 and PDGAT) before and during seed development. Results showed that during seed development inoculated plants overexpressed the studied genes compared to control plants. It was hypothesized that a defense mechanism to assure species survival in inoculated plants was strongly induced resulting in production of seeds with higher reserves, namely triacylglycerols(2).

**Keywords:** Arbuscular mycorrhizal fungi; Biodiesel; Genetic expression.

#### References:

1. Greenwell HC, Lloyd-evans M, Wenner C, Greenwell HC. Biofuels , science and society. 2013;2–5.

2. Konvalinková T, Jansa J. Lights off for arbuscular mycorrhiza: On its symbiotic functioning under light deprivation. Front Plant Sci. 2016;7(June2016):1–11.