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BOOK OF ABSTRACTS

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I1. Environmental Microbiology and Biotechnology

P38. Non-invasive monitoring of stress response of urban trees inoculated with EcM

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Urban trees play a key role in urban settings providing ecosystem services not only by improving the environment quality but also by contributing to population welfare and biodiversity. Ectomycorrhizal fungi (EcM) emerge as a helpful biotechnology tool for urban tree management conferring advantages to the host plant by improving its vigor and resilience under stressing conditions such as limited soil water availability.
The major aims of this study were (i) the analysis of the response of *Tilia tomentosa* inoculated with EcM under a water-stress scenario and (ii) the evaluation of bioindicators of water-stress.
A 9 months in-vivo experiment was established and consisted in the induction of water-stress on seedlings in two substrates (acid and alkaline pH) inoculated with 4 EcM. To induce water-stress, the watering system that irrigated the plants daily (before-stress point) was stopped for 2 weeks (stress- point). The plants were analyzed 2 weeks after resuming watering to assess its recovery from drought (recovery-point). SPAD levels and leaf proline content were measured. At the end of the assay specific leaf area (SLA) and leaf water content (LWC) were determined.
Inoculation with EcM significantly increased the SPAD values and proline content at the stress point of plants when compared to non-inoculated (control) plants in both acid and alkaline substrates, revealing the protection/mitigation effect of EcM by conferring the ability to the plants to maintain its normal activity during a drought period. The inoculated plants normalized their SPAD and proline levels during the recovery period. These two parameters can be used as bioindicators to evaluate the water-stress response and water-status of trees. The plants inoculated with EcM revealed a higher SLA and LWC indicating a promotion in the development of the aerial part of the plant and an improvement of tree vigor. These results represent an important contribution for the development and application of EcM- inocula to improve tree resilience and for the establishment of strategies for tree monitoring in urban context.