Soil Biodiversity and Ecosystem Services

MEETING PROGRAMME and ABSTRACTS

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Fungal endophytes from the common yew tree (Taxus baccata) produce antimicrobial metabolites

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Endophytic fungi are a group of highly diverse microorganisms that reside within plant tissues without causing diseases, moreover, they can even be beneficial to their host and produce a large variety of biologically active secondary metabolites.

In this study, samples of Taxus baccata (the common yew tree) were collected from the Botanical Garden of the University of Szeged, Hungary during the late spring of 2015. Three-three parts of ten individual plants were sampled. Plant pieces were washed and surface-sterilized with 70% aqueous ethanol and sodium hypochlorite solutions to kill epiphytic microorganisms, and placed in 3 replicates onto the surface of plates with Potato Dextrose Agar (PDA) and Rose Bengal Agar (RBA) media supplemented with ampicillin (50 μg/ml). Fungal growth was regularly monitored during the incubation period of 10 days at 25 °C. Finally, 200 isolates were recovered, purified and deposited at the Szeged Microbiology Collection (SZMC). Morphology- and culture-based identification of the isolated strains was confirmed by DNA sequence-based tools. The taxonomic diversity of the isolates was remarkably high: they represented mainly the genera Alternaria, Aspergillus, Fusarium, Cladosporium, Rhizoctonia and Trichoderma.

For the investigation of their biologically active metabolites, endophytic isolates were pre-cultured on the surface of PDA plates. Agar plugs of these cultures were transferred into Erlenmeyer flasks containing potato dextrose broth and incubated in a rotary shaker (150 rpm) at 25 °C for 14 days. Cultures were filtered (0.45 μm) and extracted sequentially with equal volume of hexane, chloroform and ethyl acetate. The organic phases were evaporated to dryness, resolved in 2 ml extraction solvent and tested in microdilution plate and agar diffusion assays against bacterial and fungal strains, respectively.

Results of this study provide a good basis for the discovery of new potential antimicrobial compounds.

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