INFLUENCE OF MYCORRHIZAL SYMBIOSIS IN ANTIOXIDANT POTENTIAL OF FUNGI AND SEEDLINGS

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Ectomycorrhizal (ECM) symbiosis plays a major role in nutrient cycling and the functioning of forest ecosystems. Trees with well developed ectomycorrhizas are more resistant to environmental stresses such as drought and to biotic stresses such as root pathogens (Smith and Reid 2008). The establishment of ECM symbiosis is triggered by signals produced by both partners. These signals lead to morphological changes and a complex development of specific structures in both the plant root and the fungus (Martin et al. 2001).

In the present work, the development of the ECM fungi, Paxillus involutus and Pisolithus arhizus, in presence and absence of the symbiont – Pinus pinaster- was evaluated, as well as their antioxidant properties and phenolic compounds composition in response to the symbiotic association. Phenolic compounds were analyzed by reversed phase HPLC-DAD and the antioxidant properties were evaluated by three in vitro assays: 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging activity, reducing power and lipid peroxidation inhibition through β-carotene bleaching inhibition (Reis et al. 2011).

ECM fungi grew less in the presence of P. pinaster, with P. arhizus being less affected in growth and thus being more adapted to this association. Protocatechuic acid was found only in P. involutus, while P. pinaster roots, both in association and isolated, proved to have other phenolic acids, such as p-hydroxybenzoic and p-coumaric acids. The symbiosis between P. involutus and P. pinaster had no major effects on the symbionts. Otherwise, the association between P. arhizus and P. pinaster seems to generally decrease the antioxidant effects of both symbionts, despite the increase in p-coumaric and cinnamic acids in the ECM fungi, accounting for the hypothesised reduced oxidative stress of the mycorrhizal association induction for both partners.

Literature
Diego, CA, USA.

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CAN ECTOMYCORRHIZAL FUNGI BE CHEATERS?

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Fungi are commonly regarded as ectomycorrhizal when they are able to form ectomycorrhizae (ECM) with roots, irrespective of whether they can cause in addition arbutoid, ericoid, orchidoid or jungennannioid classes of mycorrhizae, indicating a decisive influence of the plant upon the anatomical relation between root cells and hyphae. Whereas the latter three classes present exclusively intracellular hyphae and lack a hyphal mantle, ECM develop apart from a hyphal mantle also intercellular hyphae, the Hartig net. Arbutoid mycorrhizae discern in addition to intracellular hyphae a Hartig net and a hyphal mantle. The latter mycorrhizal classes, are—as indicated by their designation-mostly restricted to special plant relationships whereas ECM plants are widely distributed over angiosperm and gymnosperm families. For all classes there seems to be no possibility to grow beyond the endodermis and to colonize the root meristem.

Although it is known that the Hartig net of ECM can differently deeply protrude into the root cortex, all ECM that form any kind of Hartig net are regarded as typical ECM. As also the mantle can differ in thickness from very wide and compact to a mantle consisting of almost only a single hyphal layer, a high variability of root fungus relations is evident. Extreme issues are examples where hyphae form only a mantle and no Hartig net (Agerer & Beenken 1998). The relation between hyphae and roots is even more diversified, when ECM fungi use foreign ECM as their nutritive basis (Agerer 1990, Beenken 2004), or grow into the meristem and hamper cell
Monday, September 19

Congress Opening Ceremony

Plenary Session

Moderators: Dr. Stephanos Diamandis & Organizing Committee

08:00-09:00  Registration

09:00-09:30 Meliton Hall (middle floor)  Congress Opening Ceremony

Speakers:
- Dr. S. Diamandis
- Mr. I. Tzitzios Mayor
- Dr. K. Mallidis NAGREF
- Dr. T. Papachristou director FRI
- Dr. D. Minter president EMA, ISFC

09:30-10:00 Meliton Hall (middle floor)  Keynote speaker: Professor John Taylor

Fungal evolution: divergence and adaptation

10:00-10:30 Meliton Hall (middle floor)  Keynote speaker: Dr Paul Cannon

Fungal families: morphology, phylogeny and conflict resolution

10:30-11:00 Meliton Hall (middle floor)  Discussion

11:00-11:20 Coffee break

11:30-13:00 Parallel Thematic Sessions in 3 Rooms

Thematic Area: Developmental Mycology

Moderator: Prof. R. Poeder

11:30-11:45 CHLOE (Room I)  Fungal interactions of Hypholoma fasciculare
- E. Pereira, D. Baptista, P. Baptista, Teresa Lino-Neto

11:45-12:00 CHLOE (Room I)  Measurement of mycelium growth rate of homokaryotic mycelium obtained from single spore isolates of Hericium erinaceus in different culture media and their compatibility.
- Ilgaz Akata, E. Kalmis, F. Kalyoncu, M. Atmaca

12:00-12:15 CHLOE (Room I)  Lipid metabolism in Aspergillus niger under heat shock.
- Vera M. Tereshina, A.S. Memorskaya, E.R. Kotlova

12:15-13:00 CHLOE (Room I)  Discussion

13:00-14:00 Lunch

14:00-15:00 CHLOE (Room I)  Poster Session

Thematic Area: Edible and medicinal fungi

Moderator: Prof. Joao Baptista-Ferreira

15.00-15.15 CHLOE (Room II)  Saprotrophic and mycorrhizal wild edible mushrooms from Portuguese mycoflora as a source of nutrients and nutraceuticals
- C. Grangeia, S.A. Heleno, L. Barros, Anabela Marting, I.C.F.R. Ferreira

15.15-15.30 CHLOE (Room II)  Localization of the phenolic compounds on the surface of micelle cells of Lentinula edodes (Berk) Pegler cultivated without or with 20 ppm of Na_2SeO_3 added to the...