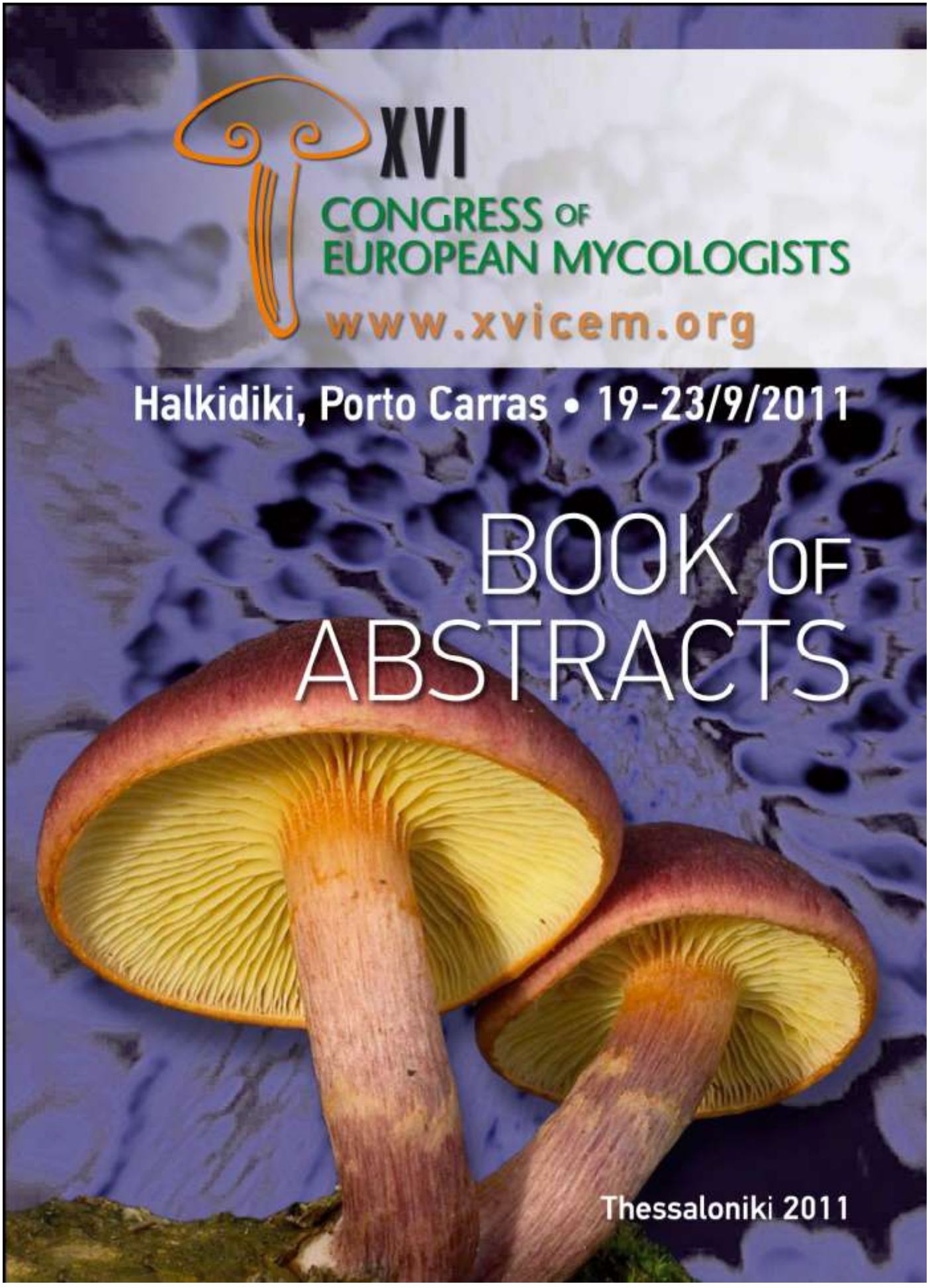
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ABSTRACTS
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pathogenic fungi in one of mountainous regions in Poland. The investigations were conducted in pure and mixed stands at the altitudes: 500, 700, 900 and 1100 m a.s.l., in Radziejowa Massif (Beskid Sądecki, Carpathians). Specimens of the fungi were collected in the experimental plots (No. 11-14 – 500 m a.s.l., No. 21-24 – 700 m a.s.l., No. 31-34 – 900 m a.s.l., No. 41-41 - 1100 m a.s.l.). At the last altitude no mycorrhizal samples were taken.

Species richness differed between the altitudes: 24 species were found at 500 m a.s.l., 22 – at 700 m a.s.l. and 19 – at 900 m a.s.l. The most frequent mycorrhizae were created by Tomentelloid, *Thelephora, Inocybe, Cortinarius, Cenoccocum and Paxillus* fungi.

Heterobasidion sp. was found at 500, 700 and 900 m a.s.l., while *Armillaria* sp. was present at all altitudes. The lack of root pathogens on one of the plots (No. 31 at 900 m a.s.l.) corresponds with the high number of mycorrhiza at this altitude. The lack of pathogens at the same altitude, on plots No. 33 and 34, can be an effect of the species composition of the stands, mainly a high percentage (regarding the DBH area) of tree species other than spruce,such as larch (over 30% in plot No. 33) and beech (over 50% in plot No. 34). *Armillaria* gap at 1100 m a.s.l. (plot No. 42) is characterized by a high abundance of bark beetles infesting standing trees, as well as those collected from sentinel bolts (*Polygraphus poligraphus, Hylastes* sp. and *Ips amitinus*). The above preliminary findings need to be confirmed by further investigation.

MYCORRHIZA-LIKE STRUCTURES DURING *IN VITRO* CULTURE OF STONE PINE (*PINUS PINEA* L.). A MATTER OF STRESS?

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Keywords: fungus-plant interactions, mycorrhizal systems, genotype, micropropagation, *Pinus pinea*, osmotic potential

Pinus pinea is one of the most important species grown in the Iberian Peninsula and it is Portugal's largest edible seeds producer. The induction and improvement of *in vitro* rhizogenesis of microshoots of *Pinus pinea* L. was developed in our laboratory using *in vitro* co-culture system of pine micro-shoots with ECM fungi. Unexpectedly, extensive dichotomous and coralloid branching of lateral roots occurred during *in vitro* rooting at the expression phase in our control plants. On the other hand, non inoculated plants that remained in the culture medium for longer than a month, in

increasingly dry medium, developed more numerous mycorrhizal-like structures. This would suggest a correlation between osmotic and/or nutritional stress and the abundance of these mimicing structures. Results of changes in the osmotic potential of the culture medium (water content) and their influence on the number of dichotomous branching as well as the genotype dependence on the production of such structures will be presented.

Analysis of dichotomous and coralloid roots (derived from *in vitro* co-cultures) with and without fungus inoculation, were analyzed during the acclimation phase through histological observation. The cryostat sections revealed anatomical differences, both internal and external. The dichotomous branching of short lateral roots and the formation of coralloid organs are diagnostic of ectomycorrhizas in many pine species, but the micorrhyzae-like structures found in the control plants show a striking similarity to those of ectomycorrhizas. This phenomenon has been observed previously in other pine species and might be indicative of the long co-evolution of these two kingdoms for millions of years. Therefore, it is possible that in the past mycorrhiza-like structures might have been erroneously assumed as plant-fungi associations.

SELECTION OF *AMANITA CAESAREA* (Scop.: Fr.) PERS. STRAINS FOR MYCELIAL INOCULANT PRODUCTION

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Keywords: fungus-plant interactions, mycorrhizal systems, *Amanita caesarea*, mycorrhizosphere, inoculant production

In the southwest of Spain, *Castanea sativa* Mill. is a host of *Amanita caesarea* but only a small percentage of roots formed mycorrhizas on inoculated seedlings in forest nursery conditions.

In order to select the most effective *A. caesarea* strain, a total of seventeen isolates were obtained from sporocarps collected in three different chestnut groves located in the Natural Park of Sierra de Aracena y Picos de Aroche (Huelva) and checked to determine its growth in synthetic media. Since the establishment of ectomycorrhizal symbiosis can be improved by mycorrhizosphere bacteria some of the fungal isolates were firstly selected for compatibility with mycorrhizosphere phosphate solubilizing and siderophore-producing bacteria able to increase lateral root formation in chestnut seedlings. Two of those *A. caesarea* isolates were selected on the basis of their growth rate for inoculant production. Fungal inocula remained viable after twelve months. Dual inoculation with *A. caesarea* CT19 in combination with several mycorrhizosphere bacteria was efficient in