

***Phytophthora* Species in Forest Stands in Hungary**

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Abstract – Occurrence of *Phytophthora* species and their phytopathological role have been investigated in forest stands since 1999. Trees with specific stem lesions and unspecific top drying symptoms were surveyed in forest stands of different tree species in order to find the causal agents and especially to clarify the role of the *Phytophthora* species in decline.

The isolation of *Phytophthora* was carried out from soil taken from around the diseased trees by baiting with *Prunus laurocerasus* leaves on selective medium PARPNH. The isolates were identified by morphological and molecular way. The morphological characters were observed in the cultures growing on carrot agar medium. The formation of sporangia was induced by flooding of the cultures with soil extract. The molecular identification was performed by sequencing the ITS regions of the rDNA and comparing with the known *Phytophthora* sequences accessible in GenBank database. The pathogenicity of the isolates was tested by wound inoculation in the stem of seedlings and by root infection as well.

Phytophthora species were found in *Alnus glutinosa* with bleeding stem lesions and crown drying symptoms, in *Juglans nigra*, *Quercus petraea* and *Q. cerris* with crown drying symptoms. The morphological and molecular identification resulted in 8 *Phytophthora* species in *Alnus* (*P. alni*, *P. citricola*, *P. gonapodyides*, *P. inundata*, *P. megasperma*, *P. sp.1*, *P. sp. 2.*, *P. sp. 3.*), 4 in *Juglans* (*P. cactorum*, *P. citricola*, *P. hedraiaandra*, *P. sp.1*) and 2 in *Quercus* (*P. citricola*, *P. gonapodyides*). The inoculations caused well-delimited bark necrosis in the stem of seedlings, the largest by *P. alni* in alder and *P. citricola* in black walnut, but generally not exceeding 3-4 cm length. Root infections caused lesion and reduction of fine roots, most pronounced by *P. citricola* in black walnut.

The impact of *Phytophthora* species on the healthy condition of the forest trees in Hungary is most important in *Alnus glutinosa* and *Juglans nigra* stands situated in wet sites and flood areas respectively. A community of *Phytophthora* species occurs in the rhizosphere of these trees causing root and collar rot symptoms in alder and fine root reduction manifesting by crown drying in walnut.

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