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FUNGI ASSOCIATED WITH CONIFER SEEDLINGS GROWN IN FOREST NURSERIES UNDER DIFFERENT SYSTEMS

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Abstract

The diversity of fungi colonizing pine and spruce seedlings was analyzed in container and field (bare-root) nurseries in the Region of Warmia and Mazury, Poland. The presence of pathogenic fungi and *Oomycetes* belonging to the genera *Botrytis*, *Cylindrocarpon*, *Fusarium*, *Pestalotia*, *Phoma*, *Phytophthora*, *Pythium* and *Rhizoctonia* was noted in the sampled seedlings. The presence of the pathogenic species *C. destructans* and species belonging to the genera *Fusarium* and *Phytophthora* on the roots and stems of coniferous tree seedlings was also determined with the use of SCAR PCR molecular markers. This method proved to be more accurate than the conventional cultivation method. Conventional mycological analyses revealed that pine and spruce roots were significantly colonized by pathogenic fungi which accounted for 55.5% and 50.14% of all fungi, respectively. Pine stems were more severely infected with pathogenic fungi at 61.5%, whereas spruce stems were colonized by pathogenic fungi in 53.83%. Pathogenic fungi were more abundant on pine and spruce seedlings from the container nursery, whereas a comparison of the species richness index with the Shannon diversity index revealed greater species diversity of fungal communities in samples from field nurseries than in seedlings from container nurseries. The studies showed also the association of fungal communities with a specific nursery, which was probably influenced by the way of cultivation. Based on the research high efficiency of fungal identification by SCAR PCR method was found, this method should be recommended as part of integrated plant protection for wide use, especially in container nursery.

Key words: forest nurseries, fungal diversity, *Fusarium*, pine, root pathogens, SCAR PCR, spruce

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