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The nitrogen assimilation of pine mycorrhizal fungi

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Mycorrhizal fungi can be involved in different stages of nitrogen metabolism in ectomycorrhizae, including ammonium and nitrate assimilation. Glutamine synthetase (GS), glutamate synthase and glutamate dehydrogenase (GDH) are the ammonium assimilation enzymes in fungi and ectomycorrhizae (Plassard et al 1985, Martin et al. 1986). Nitrate reductase (NR) is the nitrate-assimilating enzyme, which catalyses the reduction of nitrate to nitrite. This enzyme has been found in several ectomycorrhizal fungi (Plassard et al. 1985).

In this study, ammonium and nitrate assimilation enzymes were assayed in pure cultures of mycorrhizal fungi, at the Finnish Forest Research Institute in Parkano. Fungi were isolated from sporocarps (*Paxillus involutus, Suillus variegatus*) or sclerotia (*Cenococcum graniforme*) by the author. An ectendomycorrhizal fungus and *Piloderma croceum* were old cultures isolated from Scots pine (*Pinus sylvestris*) roots by Mikola and Laiho. All these fungi were able to infect the roots of Scots pine seedlings.

The fluctuation of the GS activity during five weeks' growth in modified Melin-Norkrans medium differed between *Cenococcum graniforme* and the ectendomycorrhizal fungus. In the same conditions, the GDH activity did not reach a detectable level, except in samples of three-week-old cultures, in which the activity was higher in the ectendomycorrhizal fungus than in *Cenococcum graniforme*.

Cenococcum graniforme, Paxillus involutus, Piloderma croceum, Suillus variegatus and the ectendomycorrhizal fungus were able to assimilate nitrate in pure culture. There were differences in the NR activity between fungus species and fungal strains and the activity depended to some extent on the nitrate concentration of the medium.

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