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研究论文

七株外生菌根真菌与三种松苗菌根的形成能力

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摘要 松树外生菌根菌资源丰富，但实际应用的种类不多。为筛选出与松苗形成菌根能力较强的菌种，采用播种接菌和芽苗截根移栽接菌两种方法，对7株外生菌根真菌与马尾松、湿地松和黑松3种松苗的菌根合成进行了研究。结果表明：形成的菌根以二叉分枝状为主，棒状菌根相对较少，多叉状菌根以马尾松较多。Pt2形成的菌根表面菌丝厚且紧密，504、EG、Pt1形成的菌根表面菌丝紧密程度中等，而505、ZJ和HX形成的菌根其表面菌丝则比较稀疏；Pt1、Pt2、EG形成的菌根外延菌丝较长，而505、HX形成的菌根外延菌丝极短。截根接菌时的感染率和感染指数要高于播种接菌。504形成菌根的能力最强，在3种松苗上的菌根感染率都达100%，感染指数最高可达90，最低也达70；Pt2和EG与马尾松和黑松形成菌根的能力较强；而505和HX仅与马尾松形成菌根的能力较强；Pt1形成菌根的能力较差，在3种松苗上菌根感染率和感染指数都较低。在3种松苗中，马尾松的菌根化状况最好，其次为黑松，湿地松的菌根化状况较差。

关键词 外生菌根真菌；松苗；菌根化；感染指数

分类号 S763

Mycorrhizal formation between seven ectomycorrhizal fungi and seedlings of three pines species

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Abstract Although plenty of ectomycorrhizae are associated with pines, actually few ectomycorrhizae are developed into application. To obtain the ectomycorrhizal fungi having great abilities of mycorrhizal formation with pine seedlings, in this paper mycorrhizal formation of 7 strains of ectomycorrhizal fungi with seedlings of *Pinus elliottii*, *P. massoniana*, and *P. thunbergii* were tested with two inoculating methods: seeding and transplanting seedlings with root apices cut off, The results showed that the dominant form of ectomycorrhizae was dichotomous branching and unbranched ectomycorrhizae were less. Multiple branches of the ectomycorrhizae were more frequently developed on *P. massoniana*. Surface hyphae of mycorrhizae developed by Pt2 were thick and dense, followed by *Boletus edulis* (504), *Amanita pantherina* (EG) and *Pisolithus tinctorius* (Pt1) and surface hyphae developed by the other fungal strains were sparse. Extraradical hyphae of mycorrhizae developed by *P. tinctorius* (Pt1, Pt2) and *A. pantherina* (EG) were longer, while extraradical hyphae of mycorrhizae developed by *Boletus speciosus* (505) and Rhizipogen luteous (HX) were very short. The method of cutting off root apexes of the young pine seedlings and then inoculating ectomycorrhizal fungi showed higher infection rate and index than inoculating during seeding. The ability of Boletus edulis (504) was the greatest in developing mycorrhizae among all the tested ectomycorrhizal fungi and its infection rates with the seedlings of three pine species were all 100%, its highest infection index reached 90 and the lowest infection index was 70. The abilities of Pt2 and EG were greater in developing mycorrhizae with *P. massoniana* and *P. thunbergii*, but 505 and HX only had greater abilities in developing mycorrhizae with P. massoniana. The ability of Pt1 was the worst, because it had low infection rates and indexes with the seedlings of three pine species. Among the seedlings of three pine species, *P. massoniana* was the best in mycorrhization, followed by *P. thunbergii* and *P. elliottii* in a descending order.

Key words ectomycorrhizal fungi; infection indexes; mycorrhization; pine seedlings

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