Chapter 5

ECTOMYCORRHIZAS IN PLANT COMMUNITIES

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1. Introduction

1.1. Associations

Ectomycorrhizal associations (abbreviated as ECM) are sometimes called ectotrophic associations or sheathing mycorrhizas. They are mutualistic associations between higher fungi and Gymnosperm or Angiosperm plants belonging to the families listed in Table 1. These associations consist of mycorrhizal roots and fungal storage or reproductive structures that are interconnected by soil-borne mycelia (Figure 1).

Ectomycorrhizal associations are formed predominantly on the fine root tips of the host. These ECM roots are defined by the presence of a mantle, consisting of interwoven hyphae on the root surface, and a Hartig net, which is a labyrinth of highly branched hyphae between cells of the root epidermis or cortex. These structures are not always both well developed in the same association. These roots and their associated fungal hyphae typically are most abundant in topsoil layers containing humus and are thought to make a substantial contribution to soil biomass and nutrient cycling in many ecosystems (Section 3.1). Detailed descriptions of the structure and development of ECM are available elsewhere (e.g. Kottke and Oberwinkler 1986; Massicotte et al. 1987).
Trees with ECM associations typically are dominant in coniferous forests in boreal or alpine regions, but are also important in some temperate deciduous forest, tropical forest, as well as savannah and mediterranean plant communities (Meyer 1973; Högberg 1986; Brundrett 1991). Plant families reported to have ECM are listed in Table 1. This table excludes