Ectomycorrhizal

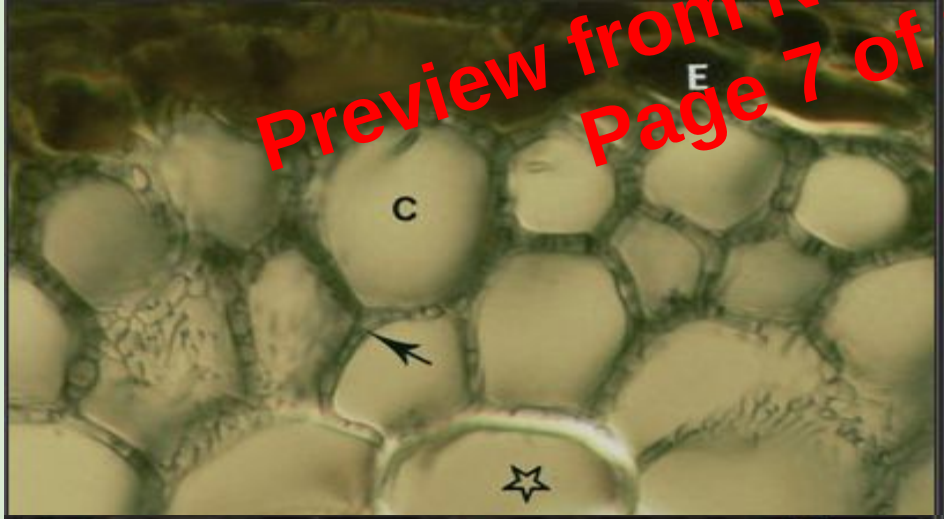
Ectomycorrhizas, characterized by an intercellular network of hyphae—Hartig net—surrounding but **not penetrating** the cortex cells of plant roots.

Mainly seen in the family Basidiomycota and occur in temperate and semi-arid zones.

An important visible feature-Y-shaped rootlets.

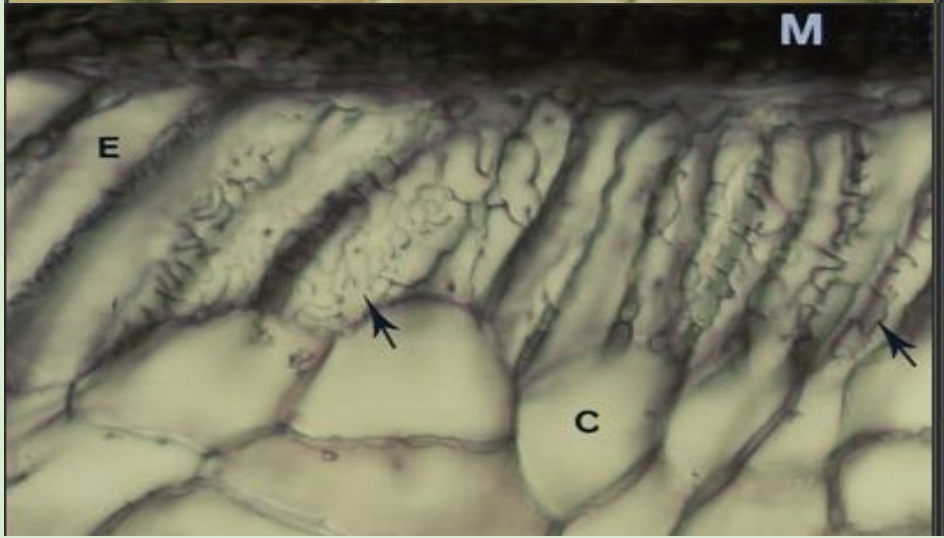
e.g.- *Amanita muscaria, Boletus* and *Scleroderma citrinum*
Plant type- *Pinus*, Poplar, Oak and Eucalyptus.

Hartig net-
Labyrinthine network of specialised fungus hyphae, with frequent branching (or wall ingrowths) that forms a layer between the walls of adjacent root epidermal or cortex cells. This is considered to be the major site of nutrient exchange between the fungus and host plant.



Cross section of a *Tsuga canadensis* ECM with labyrinthine Hartig net hyphae (arrows). Note tannin-filled epidermal cells in the inner mantle.

Magnification = 540x
C = cortex cell
E = epidermal cell



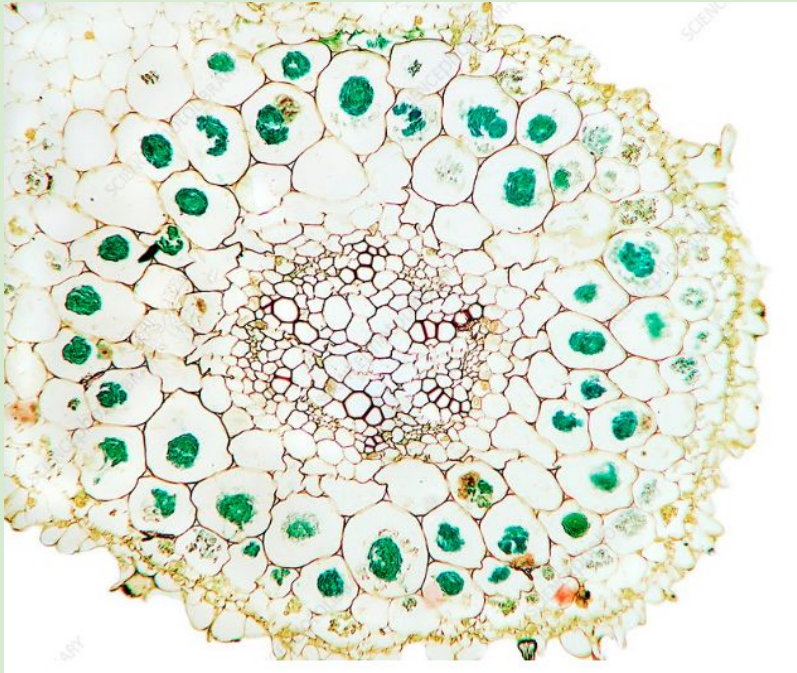
Longitudinal section of an *Betula papyrifera* ECM root showing how epidermal cells have become radially elongated to increase the area available for the Hartig net (arrows).

Magnification = 540x.
C = cortex cell, **E** = epidermal cell, **M** = mantle

Orchid Mycorrhiza

This type of fungus is imperative for the survival of the orchid seedling as it is achlorophyllous. It is completely dependent on the mycorrhiza for its nutrition for a few months or upto years.
Both the plant and fungus are living, but the fungus degrades over a period of time.

The fungus belongs to Basidiomycetes-
Rhizocotonia solani, Sesbania, Russula.



Orchid mycorrhiza. Light micrograph of a section through the root of a bird's nest orchid (Neottia nidus-avis), showing cells of endotrophic mycorrhiza. Here, the roots of the plant have been invaded with the filamentous hyphae (green) the fungus, through the epidermis and outer cortex. The hyphae coil up in the outer layer of the cortex of the root.