

high levels of metals such as sulfur, manganese, and aluminium; (4) providing protection from certain plant pathogenic fungi and nematodes that attack roots; (5) inducing hormonal relationships that cause feeder roots to remain physiologically active for longer periods of time than non-mycorrhizal roots. In return for these benefits, the fungus partner receives carbohydrates and vitamins from the plant. Because most mycorrhizal fungi appear to be obligate symbionts with plants, these materials are essential for the growth of these fungi.

There are two types of mycorrhizal relationships, endomycorrhiza and ectomycorrhiza (Gr. endo = internal, ecto = external + tropho = nutrient). Endomycorrhizae are characterized by hyphae that grow in an intracellular fashion, penetrating root hairs and other epidermal cells as well as cortical cells. Usually no dense hyphal growth of any sort is visible on the surface of the root. The hyphae often form swellings (vesicles) and minute branches within (arbuscules) the cells of the host. Because endomycorrhizal fungi form vesicles and arbuscules, there fore, endomycorrhizal relationship is also called as vesicular-arbuscular mycorrhizae (VAM), and the fungi that forms "VAM" are called "VAM fungi."

VAM fungi are in association with agricultural, horticultural and ornamental plants.

Ectomycorrhizae are characterized by hyphae that grow in an intercellular fashion. Typically an infected root tip is covered by a mantle of hyphae varying from a loose web to parenchyma-like layer. From this mantle a hyphal network (the Harting net) extends into the first few layers of the cortex or rarely deeper and then reaching only the endodermis. Streams extending out from the mantle obtain nutrients from the soil and conduct them to the plant through the network of hyphae that penetrates into the cortex. Root hairs do not develop in the infected root, and the root is morphologically distinct, being short and often branched. Ectomycorrhizae are widespread in nature and have been estimated to occur on 10% of the world flora. They occur with different families of the plants and trees i.e. Pinaceae, Betulaceae, Fagaceae, Juglandaceae and Myrtaceae. Agrics which form ectomycorrhizae are; Tricholomus, Laccaria, Amanita and Lactarius spp. VAM fungi belongs to mostly Zygomycetes.

Mycorrhizae may be affected by soil pH, aeration, nutrient levels and air temperatures.

The Basidiocarp :-

The typical basidiocarp in most agrics is the well ~~known~~ developed mushroom. The tissues comprising a mushroom consist of closely packed, dikaryotic hyphae that arise from the somatic hyphae growing within the particular substrate that supports the growth of the fungus.

The development of mushroom is a remarkable process. The first gross morphological sign of basidiocarp initiation is the formation of a tiny hyphal aggregation in much-branched region of the dikaryotic mycelium. At this early stage of development, the basidiocarp primordium consists of widely spaced, branched interwoven hyphae. As this aggregation enlarges the outermost hyphae from numerous tapered cystidia that give the primordium a "spiky" appearance. The primordium continues to increase in size and elongates as a rudimentary pileus develops. Further enlargement and differentiation produces a ~~minute~~ miniature mushroom with a stipe, pileus and hymenium covered gills. After this point, a very rapid elongation and expansion results in the formation of a mature basidiocarp. The stipe comes out from hard surface through the force that comes out from larger pressure, and excessive cell division of stipe during stipe elongation.