PART I - GENERAL

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GENERAL INTRODUCTION

It is now well established that the species of the genus Synchytrium DeBary and Woronin, Chlorochytrium Cohn as well as certain members of the family Endogonaceae are known to grow endophytically in number of the plants, especially within the tissues of Algae, Mosses, Pteridophytes, Gymnosperms and Angiosperms. However, the Synchytrium is endoparasitic fungus which may infect stem, leaves, flowers of various plants; while Chlorochytrium Cohn is most contraversial genus which is the endophytic green alga. Certain members of Endogonaceae formed either ecto or endomycorrhiza in the roots of majority of higher as well as lower plants.

The genus Synchytrium DeBary and Woronin, Chlorochytrium Cohn and family Endogonaceae have certain common features like, formation of thick-walled spores, may be resting spores, Chlamydospores, azygospores and zygospores with or without pyrenoids and chloroplast. These thick-walled spores may be formed in the host tissues, freed in soil or in sporocarps and remain viable for longer time.

However, the resting spores of Synchytrium DeBary and Woronin and Chlorochytrium Cohn apparently resemble with each other at maturity. Because Chlorochytrium spores looses its chloroplast and form homogenous oily mass of reddish-brown to

violet-brown colour; with thickness. So difficulty arises in identification of these spores. Due to above fact, those mycologists who had studied the genus Synchytrium had described Chlorochytrium under various species of Synchytrium (Karling, 1964). Karling (1964) had excluded certain species of Synchytrium like S. borreriae Lacy, S. uliginicola Spegazzini, S. montanum Zopf and S. khandalensis Payak and Thirumalachar (1956). Only after confirming that these are nothing but resting spores of endophytic alga; may be Chlorocytrium. This is the only reason to include the Chlorochytrium along with Synchytrium even though it is endophytic green alga in the present study.

However, the family Endogonaceae which shows complexity in occurrence, morphology, taxanomy and it includes eight valid genera. Out of these eight genera, four genera namely Acaulospora, Gigaspora, Glomus and Sclerocystis are known to be responsible for the formation of Vesicular-Arbuscular Mycorrhizas (VAM) amongst roots of various phanerogamous plants. But genera like Modicella, Glaziella and Enterophospora are not known to form mycorrhizal association (Trappe, 1982). These fungi ultimately produces thick-walled stalked or sessiles chlamydospores, zygospores, azygospores or sporangiospores, with various shades of yellow, brown, orange, black, colours. These spores are either produced in sporocarps or as ectocarpic free spores in soil or in roots as VAM.

But free spores which are found in soil were considered by some (Treub, 1885; Jeffrey, 1898) as resting spores of either Synchytrium, Phytium or Peronospora which may or may not form VAM.

However, Beniamino Peyronel (1923) was the first to recognize that the VAM fungi were members of the Endogonales, rather than chytrids, Phytium spp. or other fungi.

In the present investigation, an attempt has been made to study these three groups of diverse organisms taxanomically. More emphasis has been given to the family Endogonaceae.