CHAPTER -5
DISCUSSION
Mushrooms are recognized as important food items since ancient times. Their usage is being increased day by day for their significant role in human health, nutrition and disease. Fungi are ideal food because they have a fairly high content of protein (typically 20-30% dry matter as crude protein) which contains all of the essential amino acids (Moore and Chiu, 2001).

For carrying out our study, we first selected three species two wild that is Morchella sp. and Helvella sp. and one commercially cultivated Auricularia polytricha. These were grown on Malt Extract Agar Media and broth. The mycelium of Auricularia polytricha grew optimally at a temperature of 20°C and pH of 6.5 for 8 days. Glucose is the best source of mycelia biomass production (Jonathan, 2002). Mycelium of Morchella sp. grew optimally at a temperature 20-30°C and pH 6.5 Maltose was found to be a good source of carbon followed by glucose and sucrose (Kaul, 1993).

The effect of temperature, pH and carbon nitrogen on mycelial growth in commercially cultivated and wild type mushrooms were studied. Present results indicate that the optimal mycelial growth of Auricularia polytricha, Helvella sp. and Morchella sp. was recorded at pH 5-6, temperature was between 25-30°C and required both carbon and nitrogen for growth. Helvella sp. was grow at best optimum temperature that is 28-30°C and pH-6.0 Glucose was the best source of carbon (Ozcan and Johnston, 1999). The mycelial mass can also be enriched by growing in a medium containing glucose and ammonium tartrate as carbon and nitrogen source respectively. The extracellular enzyme laccase, Aryl alcohl oxidase (AAO), Ligninperoxidase (LiP) and Manganese peroxidases (MnP) are thought to be involved in lignin degradation by WRF, which produce different combination of these extracellular enzymes. Ligninolytic enzyme activity was detected in three of species (Tien and Kirk 1983). Proteins, Laccase and MnP production was maximum in Helvella sp. AAO production was maximum in Auricularia polytricha and Morchella sp. showed high LiP activity. In WRF laccase beside functioning as lignin degrading enzyme, it was also important in pigment production, polyphenol detoxification, fruiting body formation, sporulation and antimicrobial agent (Eggert et al., 1997). In general Laccase and MnP are more widely distributed among WRF than LiP (Rothschild et al., 2002).
*Auricularia polytricha* showed low laccase, LiP and MnP activity as compare to AAO. Laccase activity was less in *Auricularia polytricha* as compared two wild species. Laccase activity expression level was found to be higher during early stage of harvest and decline in the activity was observed during 3rd harvest. MnP activity was more in *Helvella* sp. and *Morchella* sp. as compare to commercially cultivated *Auricularia polytricha*. The results of present study allow us to conclude that wild *Morchella* sp. and *Helvella* sp. showed good for production of ligninolytic enzyme as compared to commercially cultivated *Auricularia polytricha*.

**Future prospective:**

- In various industries like dye industries, paper industries, textile biofinishing. In paper industries treating the wood with selectively lignin degrading fungi decreased the energy input required for mechanical pulping and also improved the bonding ability of fiber, leading to strong paper.
- In bioremediation, removal of pollutants like DDT, synthetic dye pollutants etc. The low specificity and strong oxidative abilities of fungal lignin degradation systems allow them to be applied to the degradation of many organic pollutants.