CHAPTER-I
INTRODUCTION
India is a subcontinent spreading over an area of 3 million sq Km. It's 80 per cent population depends on agriculture and live in villages. Removal of poverty in these areas is one of the priorities before planners which can be achieved by scientific utilization of human and physical resources. Because of large population, the problem of malnutrition is quite acute and the country has almost the lowest per capita consumption of protein among the developing ones.

Protein deficiency is a world wide problem which can be met out by looking forward for alternative sources of food rich in protein. Among such food sources, mushrooms, yeasts and several algal foods may frequently be mentioned. Of these, yeasts and algae are not much preferred by man for their unpalatability. Mushrooms, on the other hand are more palatable, rich in protein, minerals and vitamins and constitute a balanced human diet. These have been rightly recommended by Food and Agriculture Organisation (FAO) as food contributing to protein nutrition in developing countries depending largely on cereals. This is the main dietary defect with our country also which under prevailing circumstances can be overcome by exploitation of all possible methods of production of protein including mushrooms. The protein contents of mushroom is about twice as high as that in most vegetables except green peas, pulses and brussels sprouts but is much lower to meats, eggs, fish, cheese and bread. The digestibility of the mushroom protein ranges between 71-90 per cent. Mushroom not only constitute a valuable source of nutritive food for man but also contains a number of medicinal properties. They are ideally suited for diabetics and also for different other diseased persons. These have also been reported to possess
antiviral and anticancer properties. Among several conventionally grown mushroom species three viz., button, oyster and paddy straw mushrooms are generally grown in India at commercial scale. The climatic conditions of our country is predominantly tropical which is suitable for cultivation of oyster and paddy straw mushrooms. The button mushroom on the other hand is common mushroom corp of temperate region but due to vast demand in market and good liking among the people of this country cultivation has been encouraged on hills and also in plains during winter.

India, primarily being an agricultural country produces million tonnes of wheat and paddy straws and others lignocellulosic agro wastes each year. These were traditionally being used as cattle feed but now a days due to mechanization of agricultural operations cattle taming is quite meagre and in such condition the consumption of straw in form of cattle feed has much reduced. A major portion of this straw is either burnt or used as landfill while remaining unutilized ones may pose a serious environmental problem. Under such circumstances the biological processes using microorganisms that convert ligno-celluloses into products useful to man is continually being sought (Wood, 1985). One of such economically viable processes of bioconversion of lignocellulosic wastes is the cultivation of edible fungi, the mushrooms.

Mushroom production also represents an attractive method of improving the nutritional quality of ligno-cellulosic wastes which are used as an animal feed stock. The feed value of these lingo-cellulosics is limited by low polysaccharide degradation achieved during digestion within rumen. This restricted digestibility is due to presence of lignin which acts as a barrier depriving the cellulolytic and hemicellulolytic enzymes access to the polysaccharide components. Among various
physical, chemical and biological methods used for upgrading the digestibility and nutritive value of agricultural wastes, bio-degradation by using white rot fungi including mushrooms have been found promising. The use of straw and other ligno-cellulosic agrowastes in production of mushroom not only solves the dietary problem of man but also generates avenues of employment for youths and provides extra source of income to them. There is good potential for mushroom cultivation in our country for its varied climatic condition. Also, raw materials for use as substrates are available in plenty. Labour is cheap and other infrastructural facilities require lesser inputs than other industries. It can profitably be started by land less farmers, unemployed youths and other entrepreneurs. It does not make demand upon land space like other crops and can be cultivated under shade, in unused space of courtyards, or even in an space around the house. It is basically an indoor crop which can be managed even by house wives.

Present status of mushroom production in our country is very encouraging which is largely contributed by button mushroom. Now button contributes about 85% of total mushroom production followed by oyster and paddy straw mushrooms. According to recent estimate India is producing about 25000 tonnes of button mushroom each year a major fraction of which is contributed by Himachal Pradesh alone. The contribution of U.P. to the total production of Agaricus bisporus is relatively the minimum, inspite of the fact that straw is available in plenty. The reason for such a low production can be attributed to lack of awareness among the people in respect of mushroom production technology, un availability of good quality spawn, lack of favourable climatic conditions around the year and inadequate post harvest disposal
facilities. However, now button mushroom is being cultivated by seasonal growers in this regions of the country under natural climatic conditions on unpasteurized compost prepared by long methods of composting, harvesting an average of 10-20 kg of mushroom per quintal of the substrate. Eastern part of Uttar Pradesh, similarly, spares straw in huge amounts as this is famous for bumper production of wheat and rice crops. The climatic conditions prevailing in this region is also suitable for cultivation of mushroom. But the knowledge of people in this respect is quite scanty and this has poorly been exploited. Looking around above, it has been proposed to undertake the studies on cultivation of *Agaricus bisporus*, a most promising mushroom species, on wheat straw based compost in following heads:

1- Cultivation of button mushroom (*Agaricus bisporus* (Lange) sing. On wheat straw based compost in the climatic conditions prevailing at Faizabad.

2- Studies on the use of different pre-composting supplemented organic amendments to the substrate in relation to mushroom production.

3- Isolation of microorganism involved during compost preparation.

4- Investigations on the effect of different chemical amendments at post composting stage, prior to spawning and its relation to fruit body formation.

5- Studies on the effects of use of different type of casing soils, their sterilization and method of casing on fruit body formation of mushroom.

6- Determination of ratio of substrate utilization and production of mushroom crop.
7- Observation on the effects of temperature and humidity on frute body formation of mushroom.

8- Food value determination of this mushroom species in respects of:
   1- Soluble sugar
   2- Crude protein
   3- Crude fat
   4- Total Ash content
   5- Crude fibres
   6- Minerals like Ca, Mn, Cu, Fe and Zn
   7- Assay of different amino acids

9- Study of competitor fungi occuring on bed during mushroom cultivation.

10- Economics of mushroom production and its market potential.