CONCLUSION
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1. Himachal Pradesh with diverse habitats with varied ecological conditions, harbors wide varieties of mushrooms. But still extensive communication and cooperation among the public required is essential. Scientific community is beginning to develop an appreciation for the biological and economic value of this special resource. Research and monitoring are important factors in developing strategies that will both protect and promote the edible macrofungi of the region in particular and in general in whole of the western Himalaya. Knowledge about the edibility of wild edible macro-fungi is diminishing especially among young generation; therefore, they have to be made aware about it. Also, more attention need be paid towards the conservation of these important species to cater the need of nutritional requirements of the future generation. Therefore our motive was to collect the large variety of wild mushrooms from different regions of Himachal Pradesh. To discovered the new variety of mushroom which had never been discovered before.

2. Screening of the isolated sample was done on the basis of antimicrobial activity. Out of 40 samples 11 samples showed good results against the pathogenic fungus and bacteria. In this way 11 samples that could enhance the activity of pathogenic microorganisms and have proved to be good in treatment of disease caused by these bacteria and pathogen. Because most of the reports available had been observed lesser efficacy and more side effects of synthetic drugs. Therefore, the use of herbal drugs have proven promising in treating many genetic, biochemical or physiological alterations of human body with least or no side effects.

3. Further samples were screened by microscopic study of hyphae and spores. 10 screened samples showed similarity in hyphae structure and spores. Out of five only 5 samples were selected for further studies of optimization. In present study, the aim was to investigate the effect of physical factors such as Temperature, pH, agitation speed, chemical compounds such as carbon and nitrogen. Mycelial growth into a solid substrate is affected by various factors, including temperature, pH, nutrient ingredients and environmental factors (Imtiaz et al., 2008).
Conclusion

It has been observed that the mushrooms grow very well at between 25°C, 30°C and 35°C temperature and as well Similarly it was also observed that they grow well in extreme basic (9 pH) and neutral pH (7pH). Samples grow well at maximum carbon, nitrogen ratio and minimum carbon nitrogen ratio. One of the most important aspects for a good mycelial growth was he substratum source, which directly affects the bioconversion ability of raw material and consequently the productivity. The different isolates showed significant variation with respect to the differing preference for the nutrient sources. Carbon is required as the skeletal element of all organic molecules, and molecules serving as carbon sources normally also contribute both oxygen and hydrogen. The C:N Exogenous supply of carbon or nitrogen source significantly enhanced the growth of the fungus.

4. Then primary investigation of constituents was done by phytochemical tests showed the presence of constituents in the aqueous and methanolic samples. Then samples were extracted with methanol and ethyl acetate, led to TLC to make sure the compound are getting separated or not then at last final investigation was subjected to screening of bioactive compounds by Gas Chromatography-Mass Spectrum technique, according to the results various active compounds were presented. From the above study, it is concluded that all five samples shown a broad spectrum of bioactivity. Anti-inflammatory, Hypcholesterolemic, Cancer preventive, Hepatoprotective, Nematicide Insectifuge, Antihistaminic etc. Moreover help to identify the natural compounds from wild mushrooms. Additionally, this is the first time that these compounds have been identified from wild mushroom. As the growth rate was very fast except 8/12 therefore, if commercialized can prove to be a very convenient source of bioactive compounds. Also, in the above method samples have been cultured from Mycelia, which is a very reliable source of growing the sample in abundance.

5. Mushroom not only important role in as a dietary supplement for proteins, vitamins and minerals but also cheap and easily accessible source for natural antioxidants. Through DPPH radical scavenging assay was performed. According to the results of this study, it is clearly indicated that the methanolic extract of mushroom species has significant antioxidant activity. They
exhibited better results about 80.5% to 90.1% scavenging activity at 40mg/ml and IC$_{50}$ value ranges from 3.3 to 3.1mg/ml. I can conclude the mushroom species can be used as an easily accessible source of natural antioxidants investigated.

6. Phenotypical characters could not be only reliable source for the identification. In conclusion, five samples were identified on the basis of molecular characterization. DNA isolation and PCR product were subjected for DNA sequencing. In this way an accurate and practical Phylogenetic analysis established with classified status of new macrofungi. Moreover, molecular characterization is an authentication of wild mushrooms. In addition, their evolutionary relationships could provide an important clue for further exploration of the active compounds.