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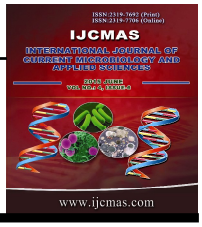

Original Research Article

Biomass Production in *Auricularia* spp.(Jew's ear) collected from Manipur, India

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Keywords

Auricularia delicata, *A. polytricha*, *A. auricula*, Edible mushroom, Biomass production

A B S T R A C T

Auricularia spp. an edible jelly fungus which grows ubiquitously on any decayed logs or on dead branches of trees in different forest areas of Manipur. The sporophores of this edible mushroom were tissue cultured and biomass production was assessed. In liquid media, Potato dextrose was found to support the maximum biomass production of three *Auricularia* species followed by Yeast potato dextrose in both *A. delicata* and *A. polytricha* and Malt extract in *A. auricula*. Likewise, very good biomass was produced at pH 6.5 for the three species after 10 days of incubation. Both *A. delicata* and *A. polytricha* attained their maximum biomass production at 28^0C whereas 30^0C for *A. auricula* after 10 days. The biomass production by the test fungus over a period of 40 days of incubation exhibited differential response with the maximum mycelial growth of *A. delicata* in 25 days of incubation whereas 20 days for both *A. polytricha* and *A. auricula* respectively.

Introduction

Auricularia spp.(Jew's ear) are widely distributed throughout the tropical and sub-tropical regions of the world (Zoberi, 1972 and Well, K., 1984). It belongs to the phylum Basidiomycota, order Auriculariales and family Auriculariaceae. It is an edible jelly fungus which grows ubiquitously on any decayed logs or on dead branches of trees during the rainy season and is very popular wild edible fleshy fungi of Manipur.

Three species of *Auricularia* viz., *Auricularia delicata*, *A. polytricha* and *A. auricula* were identified from Manipur state. These three species, has a very peculiar consistency so that the indigenous people of the state are very fond of taking this fungus (locally known as Uchina) as a culinary items since olden days.

In order to understand the biology of the *Auricularia*, a local strain of these three species were selected for this study on biomass production by using different liquid media, pH, incubation temperature and incubation period so that attempts might be made to explore the possibility of cultivating this mushroom on different substrates.

Materials and Methods

The sporophores of *Auricularia* spp. were tissue cultured and the mycelia culture thus obtained were maintained throughout the study period on PDA medium.

Effect of liquid media on biomass production

Eleven natural and synthetic liquid media were taken for this study. Twenty five (25)ml of each of the eleven media were dispensed into 150ml conical flasks, sterilized and inoculated with 7mm mycelial disc cut out aseptically by a sterile cork borer from the periphery of actively growing culture of the test fungus and incubated at 25 ± 1^0 C for 10 days. After the incubation, the mycelial biomass were harvested on Whatman's filter paper No. 42 which were already dried in a hot air oven to a constant weight at 60^0C for 48 hrs and cooled down in dessicator to obtain their constant dry weight.. The final pH of the culture filtrates were also determined with the help of pH meter. The average of four replicates were calculated.

Effect of pH on biomass production

The effect of pH on mycelial growth was studied in potato dextrose broth. The pH of the broth was adjusted with appropriate volume of 0.1N HCl and 0.1N NaOH solutions at eleven different values of pH (3.0, 3.5, 4.0, 4.5, 5.0, 5.5, 6.0, 6.5, 7.0, 7.5 and 8.0) before autoclaving at 121^0C for 15 minutes. 25ml of the medium was taken in 150ml conical flasks. Each sterilized flask was inoculated separately with 7mm diameter mycelium disc of three species and incubated at 25 ± 1^0 C for 10 days. Mycelial biomass were harvested on weighed Whatman's filter paper No. 42 and dried at 60^0C for 48 hrs .Final pH of the medium was recorded with the help of pH meter. The average of four replicates were calculated.

Effect of incubation temperature on biomass production

Effect of different incubation temperature on mycelial growth was studied in potato dextrose broth adjusted at pH 6.5. Flasks with 25ml of the broth were sterilized and inoculated with mycelial disc of the respective fungus and incubated at seven different temperatures (10^0, 15^0, 20^0, 25^0, 28^0, 30^0 and 35^0 C) for 10 days. After incubation, the mycelial mats were harvested and dried to a constant weight at 60^0C to record their dry weight. The average of four replicates were taken.

Effect of incubation period on biomass production

Effect of incubation period on biomass production was studied in potato dextrose broth and initial pH was adjusted at 6.5. Flasks with 25ml of the broth were sterilized and inoculated with mycelial disc of the respective fungus and incubated at 25 ± 1^0 C. The mycelial mats were harvested at 5, 10, 15, 20, 25, 30, 35 and 40 days of incubation. In each case four replicates were taken and calculated.

Results and Discussion

Potato dextrose was found to support the maximum biomass production of three *Auricularia* species followed by Yeast potato dextrose in both *A. delicata* and *A. polytricha* and Malt extract in *A. auricula* (Fig.1). In general, natural media are more favourable for the growth of *Auricularia* spp. than semi-synthetic and synthetic media because the natural media are known to supply many growth promoting substances.

Fig.1 Effect of different liquid media on the biomass production of *Auricularia* species found in Manipur

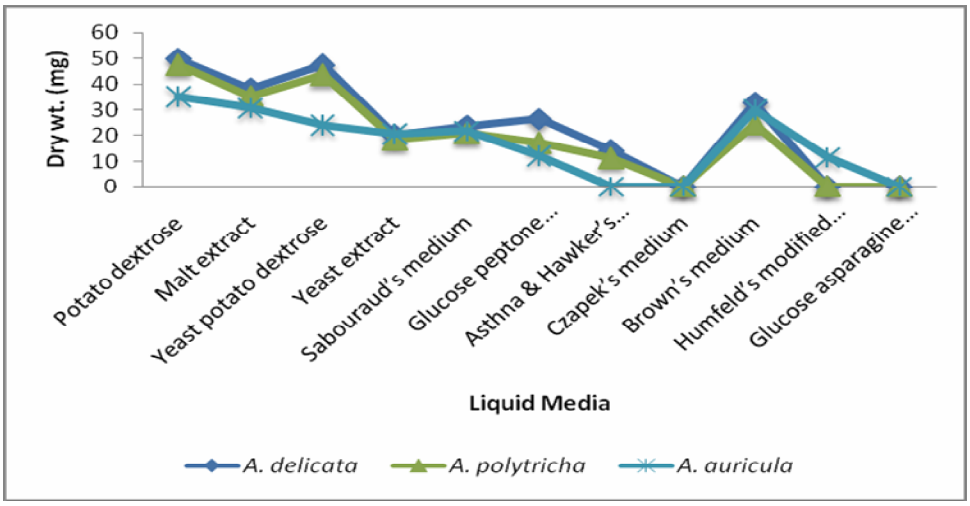


Fig.2 Effect of different Hydrogen-ion (pH) concentrations on the biomass production of *Auricularia* species found in Manipur

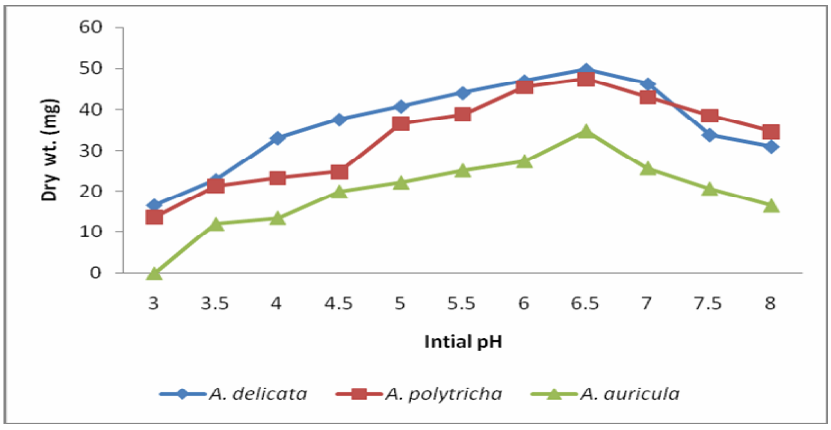


Fig.3 Effect of temperature on biomass production of *Auricularia* species found in Manipur

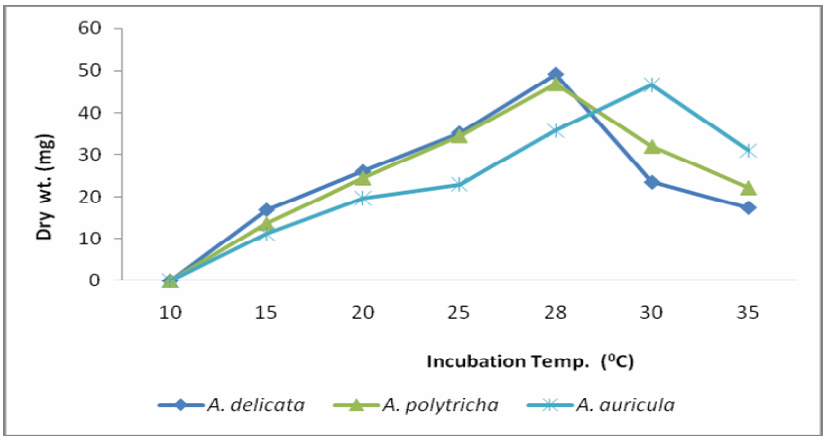
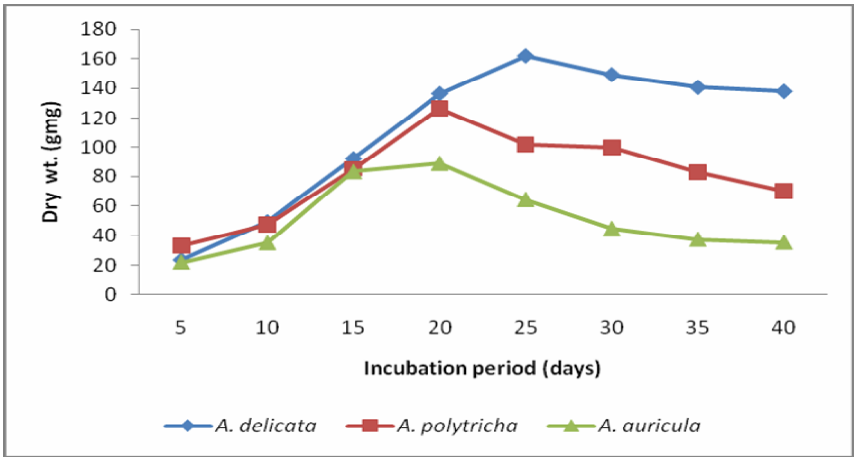


Fig.4 Biomass production of *Auricularia* species found in Manipur at different incubation period



The findings are more or less in conformity with the findings of other workers (Cheng and Hou, 1978; Quimio, 1982; Khan *et al*., 1991 and Upadhyay, 1999) in respect of *Auricularia* spp. which attained the maximum mycelial growth in liquid media.

It was observed that the pH 6.5 supported the maximum biomass production for the three species after 10 days of incubation and their optimum pH ranges from 6.0 to 7.0 which was found to be similar with *A. polytricha* reported earlier (Borromeo, 1967, 1968; De Guzman, 1978 and Khan *et al*., 1991). In the present findings, all the three *Auricularia* spp. could grow mostly in slightly acidic to neutral condition (Fig.2).

The growth response of three *Auricularia* species at seven different incubation temperature indicated that both *A. delicata* and *A. polytricha* attained their maximum biomass production at 28^0C. The optimum temperature for *A. auricula* was found to be 30^0C after 10 days (Fig.3) (Borromeo, 1967, 1968; Cheng and Tu, 1975; De Guzman, 1978; Quimio, 1962; Khan *et al.*, 1991 and Thakur and Bhandal, 1993) also made similar observation in case of *A. polytricha*.

The data on the mycelial growth of the test fungus after eight different incubation periods (Fig.4) indicate that 25 days of incubation period yield the maximum biomass of *A. delicata* whereas 20 days for both *A. polytricha* and *A. auricula.* However, there is no result comparable with the present findings since there is no previous study on the incubation period of *Auricularia* species.

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