Indian J. mycol. Res., 24(2), 155-157 (1986)
Printed in India

EFFECT OF TEMPERATURE AND HYDROGEN—ION CONCENTRATION ON THE MYCELIAL GROWTH OF *TRICHOLOMA CRASSUM* (BERK.) SACC. IN SUBMERGED CULTURE

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As far as the environmental factors are concerned temperature and hydrogen-ion concentration seem to play a vital role in the growth of the mushrooms. Literature can be dated back for these works as early as the 19th century and it has been found that 25-30°C are the most favourable temperatures (Styer, 1928) while a *p*H range of 4.0-6.0 to be optimum for different mushrooms.

Experiments were earried out to find out the optimal temperature and hydrogen-ion concentration for the mycelial growth of *Tricholoma crassum*. The pileus culture was maintained in PDA slants. Glucose-casein hydrolysate liquid basal medium of Lilly and Barnett (1951) was used in which only 1% carbon source was added.

Erlenmeyer flasks (250 ml) containing of the above acid basal medium were plugged and sterilised at 15 psi for 15 minutes. Each flasks was inoculated with one ml of the cell suspension (obtained by fragmeting 7 days old mycelium grown in the same medium) and incubated in a shaking incubator (120 rpm) for 14 days. For the temperature experiment, the inoculated flasks were incubated at 20°, 25°, 30°, 35°, 40°C (±0.5°C). For the *p*H experiment, the basal medium was adjusted to different *p*H sets with the help of 0.2 M sodium phosphate buffer. The different pH maintained were 4.0-7.6 at 0.5 unit intervals.

After 14 days the mycelia were harvested by filtration through a tarred filter paper and washed several times with distilled water to remove any trace of the medium and dried at 60°C. The dried mycelia were kept in a vaccum desiccator and weighed. The dry weight of the mycelium thus obtained are presented in Tables 1 and 2.

The effect of temperature on the growth of the test-fungus shows that the fungus could grow between 25°-35°C. The optimum temperature has been found to be 30°C. At lower and higher temperatures there was no growth (Table-1). The results coincide with the findings of Hong *et al* (1981) who reported that for

Table 1. *Data (mean)* showing the effect of different temperatures on the growth (g/1) of the mycellia of* T. crassum *under submerged conditions*

Temperature (°C)	Dry weight of mycelium (g/1)	S. E.
20	NG	—
25	0.900±0.021	±0.014
30	1.080±0.028	±0.018
35	0.720±0.024	±0.016
40	NG	—

*Values are averages of 3 replicates.
NG = Negligible growth

Table 2. *Data (mean)* showing the effect of different hydrogen-ion concentrations on the growth (g/1) of the mycelia of* T. crassum *under submerged conditions at 30°C*

*p*H	Dry weight of mycelium (g/1)	S. E.
4.0	0.746±0.026	±0.017
4.5	0.863±0.024	±0.016
5.0	1.026±0.026	±0.017
5.5	1.080±0.030	±0.019
6.0	1.173±0 029	±0.019
6.5	1.146±0.027	±0.018
7 0	1.000±0.021	±0.014
7.5	0.880±0.028	±0 018

* Values are average of 3 replicates.

Agaricus bitorquis the optimum temperature for growrh to be 25°-30°C. According to Brodziak (1980), the maximum growth is found at 35°C in case of *Lentinus edodes*.

The data on the effect of different *p*H on the growth of the mushroom indicate that the test-fungus could grow within a wide range of *p*H 4.0-7.5 (Table-2). But the optimum *p*H is 6.0. For *Agaricus bitorouis* and *Pleurotus ostreatus* the optimum growth was at pH 6.0-6.5 and 5.0 to 6.5 respectively (Hong *et al* 1981). According to Martin (1983) the submerged production of *Agaricus campestris* in peat extracts was best at *p*H 6.0. However, for *Volvariella volvacea* *p*H 4.0 was best for maximum yield in submerged conditions (Ghosh and Sengupta, 1977).

The authors are grateful to Prof. S. C. Dutta, Head of the Deparment of Botany, University of Calcutta, 35, Ballygunge Circular Road, Calcutta for his interest and one of us(P.D.)also to the Council of Scientific and Industrial Research for providing the financial assistance during the course of this investigation

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