

## EFFECT OF GLUCOSE CONCENTRATION ON GROWTH OF CERTAIN BASIDIOMYCETES

Of all the carbohydrates, glucose is more utilized by the fungi than any other sugar and it is nearly a universal source of carbon. Hawker (1939) described the effects of a range of concentrations of glucose and some other sugars on growth and fruiting of *Melanospora destruens* Shear. He showed that mycelial growth increased with increase in the concentration of glucose up to a point above which a gradual decline in growth was noticed. Similar results were also obtained by Brown (1925) with *Fusarium fructigenum* and by Hawker and Chaudhuri (1946) with several species of Ascomycetes. This paper presents the results obtained from a study on the effect of different concentrations of glucose on the amount of growth of three species of Polyporaceae, viz., *Polystictus xanthopus* Fr., *Polystictus sanguineus* (L.) Mey., and *Trametes persoonii* Fr., all of which are responsible for the decay of wood.

The cultures used for this investigation were obtained by tissue-culture method from fresh sporophores. *Glucose-asparagine solution* was selected as the basal medium for this investigation. Its composition per litre of distilled water was  $\text{KH}_2\text{PO}_4$ , 1.5 gm.;  $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$ , 0.5 gm.; Asparagine, 2 gm.; and trace elements in p.p.m.—Boron, 0.005; Copper, 0.02; Iron, 0.1 and Manganese, 0.01. Glucose was added in varying amounts to this medium to obtain 1.0, 2.0, 3.0, 4.0 and 5.0 per cent concentrations.

The pH of the medium was adjusted to 6.0 before autoclaving. 15 m.l. of the medium was distributed in each of the Erlenmeyer flasks of 100 m.l. capacity. Sterilization of the medium was done at 15 lb. pressure for 15 minutes.

Replicates of three flasks were employed and results, reported here, were based on the average of three cultures. The inoculum was taken from the advancing region of the actively growing colonies on *potato-dextrose-agar*. Thin and uniform discs (5 mm. in diameter) cut out from the plate were used as inocula. The cultures were incubated at 25°C. for a period of 14 days during which they were aerated daily by shaking for  $\frac{1}{2}$  minute. Growth was determined after harvesting. The mycelium was obtained after filtering the medium through a finely woven cloth and any trace of the medium was removed by washing it several times with hot water. The mycelium was then carefully transferred to a weighing bottle and dried to a constant weight at 90°C. The pH of the medium at the time of harvest was about 5.0 in all cases. The results are recorded in Table 1.

From Table 1, it will be evident that the three test fungi are essentially similar in nature in their reactions to different concentrations of glucose. Growth, in all the three species, increased with the use of more glucose up to a certain concentration, varying with species, above which it declined rapidly in case of *P. xanthopus* and *T. persoonii* and gradually in case of *P. sanguineus*. In *P. sanguineus* and *T. persoonii* optimum growth was

obtained at the same concentration (3%). Of these two species, *T. personii* had a well defined, narrow, optimum value at about 3% but *P. sanguineus* showed a broad range of tolerance, with nearly maximum growth all the

Table 1. *Mycelium (in mg.) of three fungi produced on glucose-asparagine medium.*

Fungus	Concentrations of glucose in the medium				
	1%	2%	3%	4%	5%
<i>Polystictus xanthopus</i>	55	74	76	83	40
<i>Polystictus sanguineus</i>	40	94	102	92	69
<i>Trametes personii</i>	59	83	129	80	48

way from a concentration of 2% to 4%. With *P. xanthopus* optimum was at a slightly higher concentration (4%). In the latter species a near-maximum growth was also recorded throughout the concentration range from 2% to 4%. From the results it will appear that the two species of the genus *Polystictus* viz., *P. xanthopus* and *P. sanguineus* have the same range of tolerance (2% to 4%) but they differ somewhat in their optimal concentration of glucose. Thus, it will be seen that earlier observations by Brown (1925) Hawker (1939) and Hawker and Chaudhuri (1946) are in agreement with the results of the present investigation.

This investigation has only attempted to give an approximate idea of the optimum concentration of glucose necessary for the rapid growth of three species of Basidiomycetes. An accurate determination of the optimum concentration, however, requires the use of a larger number nutrient solutions differing in their glucose concentration by much smaller values, but that has not been possible in the present case.

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