

EFFECTS OF pH ON THE CULTURAL BEHAVIOUR OF
ISOLATED STRAINS OF *IRPEX FLAVUS* KL.

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In connection with the studies on *Irpex flavus* Kl. in relation to timber-decay, three different strains of the fungus were obtained from Sal (*Shorea robusta* Gaertn. f.), Mahogany (*Swietenia mahagoni* Linn.) and Kokko (*Albizia lebbek* Benth.) collected from timber-yards of Calcutta and suburbs. Both monosporous and polysporous cultures were prepared from fruit-bodies growing on the respective timber species and compared with the different isolates already made available for the purpose of identification. The three isolates exhibited variable growth characteristics when they were grown on malt agar medium and kept under identical conditions of light, temperature and humidity although the fruit-bodies growing on their respective timbers were more or less morphologically identical. This indicates that there is a possibility of the existence of different strains of *I. flavus*. With a view to confirm this, a number of experiments were performed as reported in the earlier papers (Banerjee and Purkayastha, 1957, 1966). The present note deals with the effects of pH on the cultural behaviour of the available strains of the fungus concerned. In order to investigate this issue the following experiment was carried out in the laboratory.

Potato-dextrose-agar was prepared as stated by Fritz (1923) and the medium was found to be slightly acidic. To neutralize the acidity, 10 ml. of it was titrated with N/10 NaOH solution using phenolphthalein as an indicator. The total quantity of the medium was then neutralized with the requisite quantity of N/10 NaOH. After sterilization of the neutral medium, five pH grades were prepared by adding known volumes of N/10 NaOH or N/10 HCl with the help of sterile pipettes. Before plating, the medium was thoroughly mixed up with the acid or alkali and different values of pH were determined by the colorometric method. Petri-dishes containing media were then separately inoculated with the monosporous mycelia of the three strains of *I. flavus*. In this case inocula of the same size were punched out by means of a sterile cork-borer from the advancing zone of the mycelial mats and were placed individually over the medium. Four replicates were employed for each treatment and one replicate of each was kept as a control but without the fungus. After inoculation, Petri-dishes were incubated under ordinary conditions of temperature ($30 \pm 2^\circ\text{C}$.) and diffused light of the laboratory. The cultures were examined four days after inoculation and growth characteristics of the three strains were noted. The change in pH value in each of the five different grades was, however, recorded after thirty days of growth of the fungus with

a view to ascertain the maximum acidity and alkalinity of the media during this prolonged period of incubation. The results are summarised in Tables 1 and 2.

Table 1. *Effect of pH on the growth characteristics of isolated strains of Irpex flavus*

pH value	FUNGAL STRAINS ISOLATED		
	Sal	Mahogany	Kokko
4.2	Fungal mat mostly downy with faint radiating lines; faintly zoned around the inoculum; margin raised; colour white; diameter 60 mm.	Mat more or less appressed but felty around the inoculum; margin even; colour white throughout; diameter 60 mm.	Growth floccose but condensed; appressed around the inoculum; margin raised; colour white; diameter 67 mm.
6.0	Mat subfelty throughout; margin raised; colour white; diameter 70 mm.	Mat appressed to felty; peripheral portion appressed but felty around the inoculum; margin even; colour white throughout; diameter 58 mm.	Mat floccose at the periphery but uniform around the inoculum; margin raised; colour white; diameter 60 mm.
7.0	Mat subfelty; margin raised; colour white; diameter 68 mm.	Mat appressed to felty; other characters same as above; diameter 55 mm.	Floccose growth throughout but appressed around the inoculum; diameter 60 mm.
8.0	*Growth in diameter 65 mm.	*Growth in diameter 45 mm.	*Growth in diameter 58 mm.
9.2	*Diameter of the fungal mat—50 mm.	*Diameter of the fungal mat—10 mm.	*Diameter of the fungal mat—27 mm.

* Other growth characteristics are same as for pH 7.

Table 2. *Variation in pH of the media after 30 days' growth of the three strains of Irpex flavus*

Initial pH	pH of the media after 30 days' growth			
	Control (without fungus)	Sal	Mahogany	Kokko
4.2	4.2	5.4	5.7	5.4
6.0	6.0	5.6	5.9	5.7
7.0	6.8	5.8	6.0	5.9
8.0	8.0	6.0	6.2	6.0
9.2	9.1	6.2	6.4	6.4

It appears from the results that all the three strains of *I. flavus* grow well in acidic media but their degree of tolerance is dependent upon the variation in the amount of acidity. Mycelia obtained from the fruit-bodies on Kokko and Mahogany grow better at pH 4.2 while the remaining one shows maximum growth of pH 6.0. It has been found that the growth rate of the tested strains decreases with a gradual increase in alkalinity of the medium. Another feature of interest is that, of the three strains, the one

isolated from Sal shows the maximum tolerance to acidity. Since no buffer had been used, it was not possible to maintain the media at their respective pH values during incubation period. It can be assumed from the results that *I. flavus* has the capacity to regulate the pH of the media to some extent according to its necessity and makes it favourable for growth.

REFERENCES

- Banerjee, S. N. and Purkayastha, R. P. (1957). Studies on *Irpea flavus* Kl.—I. Antagonism between different strains and their host-relations. *Indian J. mycol. Res.*, 3 (1 & 2), 40-50.
- Banerjee, S. N. and Purkayastha, R. P. (1966). *Irpea flavus* Kl. in relation to timber decay. *Proc. nat. Inst. Sci. Ind.*, 32, B, 21-33.
- Fritz, C. W. (1923). Cultural Criteria for the Distinction of wood-rotting Fungi. *Trans. Roy. Soc. Can.*, V, 17, (3), 191-288..

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