

COMPARATIVE DECAY OF TOTAL CARBOHYDRATE
PRESENT IN SOUND AND DECAYED WOOD OF *SWIETENIA MAHOGANI*, *CASUARINA EQUISETIFOLIA* AND
MIMUSOPS ELENGI BY *FOMES DURISSIMUS* LLOYD.

In wood, carbohydrates are present mainly in the form of cellulose and hemicellulose and form the structural material of cell walls. These major polysaccharides are aggregated into linear strands and form interpenetrating complex system with lignin around the central core of highly crystalline cellulose. Small amount of starch and soluble sugars also occur as reserve food almost exclusively in the cytoplasm of parenchyma cells of the sapwood. One of the most intriguing aspects of the disintegration of the woody plant tissues is the capacity of wood-destroying fungi to metabolize the carbohydrates and other carbon rich constituents of wood (Merrill *et al*, 1965, 1966). The literatures on the utilization of carbohydrates by wood-destroying basidiomycetes are infrequent, thus leaving enough scope to the present investigation to undertake the present work of comparative study on the basis of quantitative estimation of total carbohydrate contents in sound and partially decayed wood of *Swietenia mahogani*, *Casuarina equisetifolia* and *Mimusops elengi* subjected to the attack of *Fomes durissimus* Lloyd isolated from the three hosts.

The mycelium of *F. durissimus* was isolated from basidiocarps growing luxuriantly on standing trees of the three hosts in the Burdwan University campus, Burdwan, West Bengal. Pure cultures of the test-fungus was grown on *malt-agar* in Kolle flasks and sap and heart-wood blocks of the three host-species were subjected to decay by the mycelia of *F. durissimus* for a period of eight months under controlled laboratory conditions (Banerjee, 1955). After the experimental period the blocks were freed from superficial thick mycelial growth and used for quantitative estimation.

The wood-blocks were cut into small chips, ground into a fine powder of 40-mesh. The total carbohydrates of the wood were dissolved by hydrolysis in sulphuric acid while the lignin remained as an insoluble residue (Saman *et al*, 1954). The acid solution was used for quantitative determination of total carbohydrates.

Total carbohydrate was estimated quantitatively by colorimetric method (Viles, *et al*, 1949). About 1 ml of above aliquot and 4 ml of 0.2% anthrone in conc. H_2SO_4 (4 hours to 9 days old) mixed immediately by stirring with a glass rod and allowed to cool. After 10 - 15 minutes the tube is placed in a bath of

cold water. The colour developed was stable from 5 minutes to 3 hours. The intensity of colour developed was measured colorimetrically in 615 m μ and the total carbohydrate content was expressed in mg/100 mg dry weight of wood.

The results are given in the following Table 1.

Table No 1. *Percentage of total carbohydrate in sound and decayed wood of S. mahogani, C. equisetifolia and M. elengi after 8 months of decay by Fomes durissimus Lloyd.*

Nature of wood	Percentage of total carbohydrate*		Loss (%)
	Sound wood	Decayed wood	
<i>S. mahogani</i>			
Sapwood	71.0	66.0	6.9
Heartwood	65.5	62.5	4.6
<i>C. equisetifolia</i>			
Sapwood	69.0	65.0	5.7
Heartwood	63.5	61.5	3.1
<i>M. elengi</i>			
Sapwood	67.0	63.0	5.9
Heartwood	60.5	58.5	3.3

* Average of three replicates.

From the table, it is evident that total carbohydrate contents in the three host-species are considerably high being maximum in *S. mahogani* and minimum in *M. elengi*. In each host-species, heart-wood ranks next to sapwood in its carbohydrate content. Some amount of loss in total carbohydrate content after eight months, becomes evident in all the woods due to decay by *F. durissimus*. The decomposition is comparatively less in the heart-wood of all the host-species than the respective sapwood probably because of lesser amount of total carbohydrates available for decay in normal heart-wood thus rendering the wood to be less susceptible against the organism causing decay.

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REFERENCES

- Banerjee, S. N. (1955). A disease of Norway Spruce (*Picea excelsa*) associated with *St reum sanguinolentum* and *Pleurotus mites*. *Indian J. Mycol. Res.*, 1: 1-30.
- Merrill, W. and Cowling, E. B. (1965). Effect of variation in nitrogen content of wood on rate of decay. *Phytopathology* 55: 1067-1068.
- _____ and _____ (1966). Role of nitrogen in wood deterioration. IV. Relationship of natural variation in nitrogen content of wood to its susceptibility to decay. *Phytopathology* 56: 1324-1325.
- Sæman, J. F., Moore, W. E., Mitchell, R. L. and Millett, M. A. (1954). Techniques for the Determination of Pulp Constituents by Quantitative Paper Chromatography. *Tappi*, 37: 336-343.
- Viles, F. J. and Silverman, L. (1949). *Modern Method of Plant Analysis*, 2: 159-162.

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