

AMYLASE AND INVERTASE ACTIVITY IN HEALTHY AND 'GREEN-EAR' INFECTED BAJRA TISSUES

'Pearl millet' or 'Bajra' or 'Bajri' (*Pennisetum typhoides* Stapf & Hubb.) is an important food plant of India. While seeds are used as food by human beings, green leaves and stem pieces are used as fodder for animals. 'Green-ear' disease due to *Sclerospora graminicola* (Sacc.) Schroet. causes heavy loss to the Bajra Crop. Studies on certain biochemical changes in Bajra tissues as a result of 'Green ear' disease have been reported elsewhere (SINHA, 1965; RAI & SINHA, 1967, 1968, 1969; RAI, SINHA & TEWARI, 1968). This paper deals with the activity of two enzymes (amylase and invertase) in healthy Bajra tissues and those infected with 'Green-ear' disease.

Malformed green ears (spikes) and diseased leaves bearing conidia and oospores and their healthy counterparts were selected for the study of the enzyme activity. Activity of the enzymes was studied in acetone dried powders of these tissues prepared according to the procedure of NASON (1955). The activity of amylase and invertase was assayed by a slight modification of the procedure described by NOELTING AND BERNFELD (1948). In case of amylase, starch was used as substrate while sucrose was used in assaying the activity of invertase. Intensity of the colour developed was read on Klett-Summerson colorimeter at 540 μ m. Klett-readings, thus obtained were then compared with a standard curve prepared by using different concentrations of maltose and glucose—the end products. Amylase activity has been represented as mg. maltose liberated and that of invertase as mg. glucose liberated.

(A) Amylase

Amylase activity as mg. maltose liberated in one hour by extracts from healthy and diseased Bajra tissues have been given below:

Enzyme Source	Amylase activity as mg. maltose liberated	Invertase activity as mg. glucose liberated
Healthy leaves	0.25	0.18
Diseased leaved	0.5	0.38
Healthy spikes	0.17	0.32
Malformed spikes	0.38	0.76

It would be clear from the Table that amylase activity increased in the diseased tissues. Amylase activity was about two-times higher in diseased tissues (both in leaves and spikes) than that in healthy counterparts.

(B) Invertase

Mg. glucose liberated in one hour as a result of invertase activity of extracts from healthy and diseased Bajra tissues have been recorded in Table

The above mentioned data clearly showed increased liberation of glucose as a result

of increased activity of invertase in diseased tissues. Activity of the enzyme invertase in diseased leaves and spikes was roughly two times higher than that in healthy tissues.

DISCUSSION

Increased amylase activity in tissues infected with fungal parasites have been reported by YARKINA (1941). The results of the present studies also revealed that 'Green ear' infection of Bajra tissues caused an increase in the activities of enzymes amylase and invertase. Increased phosphorylase activity has also been reported by SINHA (1965). Such a change would obviously result in an increase in the carbohydrate metabolism of the diseased tissues, and increase in respiration (RAI, SINHA & TIWARI, 1968) and phosphate contents (RAI & SINHA, 1967) have also been reported. Thus, in the light of these observations, increased amylase and invertase activities may partly be attributed to the change in the metabolism of the Bajra tissues as a result of 'Green-ear' infection.

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