

ENZYMES, PROLINE AND PROTEIN CONTENT IN *ERUCA SATIVA* VAR T-23 SEEDLINGS GERMINATED IN PRESENCE OF SODIUM FLUORIDE

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Fluoride is known to act as an enzyme inhibitor. Effect of sodium fluoride was studied on GPT, GOT, protein and proline content of seven day old seedlings of *Eruca sativa*. NaF increased the activity of GOT. As far as proline is concerned there was an increase in accumulation of proline under stressed conditions. However, no significant changes were seen in protein content.

Keywords : *Eruca sativa*; Sodium fluoride; Aminotransferases; Protein and proline content.

Fluoride is said to affect most fundamentally the activities of enzymes essential to plant processes such as respiration, photosynthesis, carbohydrate metabolism, protein synthesis, cell wall formation, energy balance, nucleotide and nucleic acid synthesis (Treshow, 1970).

As there is very little information available regarding the role of sodium fluoride on Indian desert plants, an experiment was designed to evaluate the role of sodium fluoride on the activities of certain enzymes, protein and proline content in *Eruca sativa* var T-23. This is an important oil yielding as well as fodder crop of Indian Desert belonging to family Brassicaceae.

Eruca sativa var T-23 seedlings were grown in 9 cm petriplates at 28°C. These seedlings were treated with different concentrations of NaF (10 ml) in each petriplates. The concentrations of NaF used were 1, 10, 50 and 100 ppm, respectively.

Enzyme activities were assayed in crude enzyme extracts. Activity of GOT (Glutamate Oxaloacetate Transaminase) and GPT (Glutamate Pyruvate Transaminase) were assayed according to Bergmeyer (1970). Proline content was assayed according to Bates *et al.* (1973) and protein by Bradford (1976). Enzymatic activities have been represented as percent increase or decrease over control. The experiments were performed in triplicates and repeated twice.

Results relating to the effect of NaF on GPT and GOT are given in Table 1. It is clear that with an increase in concentration (1, 10 ppm) of NaF there is an increase in activity of GPT. However GPT activity decreases at 50 and 100 ppm respectively. On the other hand NaF completely inhibited the activity of GOT. *Eruca* seedlings treated with NaF showed an increase in the proline content (Table 1). However, no significant changes were found in the protein content of NaF treated seedlings (Table 1).

TABLE 1
EFFECT OF NAF ON GPT, GOT, PROLINE AND PROTEIN CONTENTS

Parameter	ppm	Amount (% increase or decrease over control)
GPT	Control	100
	1	111.42
	10	191.42
	50	82.85
	100	85.71
GOT	Control	100
	1	80
	10	75
	50	65
	100	55
Proline	Control	100
	1	181.81
	10	272.72
	50	63.63
	100	45.45
Protein	Control	100
	1	80.00
	10	76.36
	50	78.18
	100	80.00

The activity of aminotransferases is modified with several factors including plant growth regulators, fluorides (Sankhla *et al.*, 1983; Weinstein, 1977) and salinity (Huber and Sankhla, 1973; Upadhyaya, 1982). In the present investigations NaF increased the activity of GPT while it decreased GOT activity. Since GPT is an important regulatory enzyme (Hedley and Stoddart, 1971) it

is apparent that its activity is more than GOT (Ahmed and Sankhla, 1979; Ahmed, 1983; Huber and Sankhla, 1973).

There was a distinct increase in the proline content under the influence of NaF. In many plants levels of free proline are known to increase during stress conditions (Singh *et al.*, 1972; Eder *et al.*, 1977, Ahmed and Sankhla

1979). The result of the present investigations are in accordance with the findings. However, protein content showed no definite pattern under different concentrations of NaF.

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