



CHANGES IN THE PROTEASES DURING DEVELOPMENT OF LARVAE OF *Aedes aegypti* AFTER EXPOSURE TO THE PHYTOTOXIN FROM *TRIDEX PROCUMBENS*

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ABSTRACT:

In insects proteases are important enzymes that proteolyze different kinds of proteins in a variety of insect species. In this study Activity of enzyme Protease After exposure to phytotoxin *Tridax procumbens* for 12 hrs. in larvae of *Aedes aegypti* is 192, 192 and 110 enzyme activity/mg protein/ 30 min respectively in acidic, alkaline and neutral protease where as in control set 110, 145 and 57 enzyme activity/mg protein/ 30 min. The enzyme activity was found increased in the larvae of all exposed sets, when compared with control set. The protein products are utilized for the metabolic activities which require increased protease activity.

Key words: - Protease, *T. procumbens*, phytotoxin.

INTRODUCTION:

The mosquito *A.aegypti* is an important vector transmitting diseases like malaria, chicken guinea, dengue and yellow fever. Therefore it is selected for the present study. During development as the larval stage is important, it is selected for the present study.

As protein metabolism is important during development it is interesting to study enzyme activity during larval stage.

Proteases in insects are important enzymes existing freely in the lumen or bound to the microvillar membrane that proteolyze different kinds of proteins in a variety of insect species (Applebaum, 1985; Terra, 1988).

As there is mere study on the effect of phytotoxins on the enzyme protease during development of larvae the efforts have been made to study the effect of phytotoxin from *T. procumbens* on protease activity during development of larvae of *A. aegypti*.

MATERIAL AND METHODS:-

Larvae of *Aedes aegypti* with development of 5 days were exposed in a respective LC₅₀ concentration for 12 hrs. of phytotoxin *T. procumbens* were selected for this study. These larvae of *A. aegypti* were exposed for 2, 4, 8, 12, 24 and 48 hrs. respectively to concentrations 221.86 ppm of phytotoxin *T. procumbens*.

The alcoholic extracts of powder of leaves of *Tridax procumbens* had been prepared with the help of Soxhlet's apparatus whereas Biochemical assay of acidic protease was carried out according to the method of Mycek (1970), alkaline protease like enzyme was carried out according to the method of Rick (1965) and Neutral protease was carried out according to the method of Wilkes and Prescott (1976).

RESULTS AND DISCUSSION

The observations on changes in acidic, alkaline and neutral protease enzyme activity in larvae of

A. aegypti after exposure for 12 hrs. to the phytotoxins from *T. procumbens* are recorded in table no. 1 and illustrated graphically in Fig. No.1. In the control set enzyme activity of larvae was observed 110,145 and 57 enzyme activity /mg protein /30 min respectively in acidic, alkaline and neutral proteases where as in the experimental set enzyme activity was observed as 192, 192 and 110 enzyme activity/mg protein/ 30 min in acidic, alkaline and neutral proteases.

The enzyme activity was found increased in the larvae of all exposed sets, when compared with control set.

Increased activity of protease during the stress condition was supported by Chandravathy and Reddy (1994). They are of the opinion that proteolytic activity increases during the toxic conditions. This view of increased proteolysis was also suggested by Sastry *et al.* (1979). He is also of the opinion that due to anaerobic condition the proteolysis get increased. Increased proteolysis is correlated with increased protease activity.

In our study when larvae of *A. aegypti* exposed to the phytotoxins from *T. procumbens* the stress condition is produced in which maximum energy is utilized which increases the metabolic activity. The protein products are utilized for the metabolic activities which requires increased protease activity. It is also further suggested that during phytotoxin toxicity anaerobic condition may be created which caused increased proteolytic activity which may be also another sign of increased protease activity. Hence from above discussion it is concluded that due to toxicity of phytotoxins from *T. procumbens* stress condition and anaerobic condition is produced which may results in the increased protease activity in the larvae of *A. aegypti*.

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Table No. 1

Activity of Acidic, Alkaline and Neutral Protease After Exposure to Phytotoxins for 12 hrs.

Enzyme Protease	Enzyme activity /mg protein/ 30 min.	
	Control	Exposed
<i>Acidic</i>	110	192
<i>Alkaline</i>	145	192
<i>Neutral</i>	57	110

Fig. No. 1

Activity of Acidic, Alkaline and Neutral Protease After Exposure to Phytotoxins for 12 hrs.

