

ELETROLYTIC CHANGES IN MUSTARD LEAVES INFECTED WITH ALTERNARIA BRASSICAE

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INTRODUCTION

Fungal infection causes profound ionic imbalance in the tissues as a result of its parasitic action. Some workers have indicated that the leakage of electrolytes attributed to the ionic imbalance of the diseased tissues (Wheeler and Luke, 1963, Roy, 1977, Gupta *et. al.*, 1983. This paper deals with the electrolytic changes in mustard leaves during pathogenesis following infection by *Alternaria brassicae*, the incitant of *Alternaria* blight of mustard.

MATERIALS AND METHODS

Six week old plants of two varieties of mustard viz. "Varuna" and "RL-18" grown on earthen pots were used for the study of the electrolytic leakage. Potted plants were inoculated by spraying conidial suspension of *A. brassicae* in sterilized distilled water (10^4 /ml). An equal number of healthy plants inoculated with sterilized distilled water were served as control. Leaves were harvested following inoculation at 1 day interval upto 3 days and the loss of electrolyte from the pathogen and water inoculated leaves was measured with the help of direct reading conductivity meter. One hundred mg of leaves cut into small pieces and suspended in 20 ml of double glass distilled water and placed on a shaker for 5 hours and the conductance of the ambient solution was measured. The equipment was calibrated by adjusting the conductivity of 1/100 KCL solution (7.459 g of dried KCL in 1 liter of distilled water) at the prevailing room temperature before measuring the conductivity of the experimental samples.

RESULTS

It was evident from the results (table 1 and 2) that the permeability of leaves was increased as a result of infection by *A. brassicae* and therefore, the leakage of electrolytes was more in infected leaves as compared to healthy ones. However, the rate of increase of electrolytic leakage was more in case of variety "RL-18" which was more susceptible than variety "Varuna".

The statistical analysis of the data confirmed that all the factors viz. treatments, days, and treatment x days were significant. The rate of increase of electrolytic leakage was found to be maximum after 2 days and then started dropping in both the varieties. The percent increase of

leakage of electrolytes in diseased leaves of "RL-18" after 1, 2 and 3 days were 52.23, 87.07 and 46.59 whereas in case of "Varuna" it was 33.12, 71.48 and 63.67, respectively.

Table 1. Electrolytic conductivity (μ mhos/cm) of "RL-18" leaves infected with *A. brassicae*

Sl No.	Days of observation after inoculation (D)	Tretments (T)		Average	Percent increase over healthy
		Diseased leaves	Healthy leaves		
1.	1 day	*39.93	*26.23	33.08	52.23
2.	2 day	59.73	31.93	45.83	87.07
3.	3 day	57.17	39.00	48.08	46.59
	Average	52.28	32.39	-	-
	C.D. at 5% level		* Av. of 3 replicas		
	Treatments	3.18			
	Days	3.92			
	TreatmentxDays	5.55			

Table 2. Electrolytic conductivity (μ mhos/cm) of "Varuna" leaves infected with *A. brassicae*

Sl No.	Days of observation after inoculation (D)	Tretments (T)		Average	Percent increase over healthy
		Diseased leaves	Healthy leaves		
1.	1 day	34.16	25.66	29.91	33.12
2.	2 day	46.33	27.00	36.66	71.48
3.	3 day	54.83	33.50	44.16	63.67
	Average	45.10	28.72	-	-
	C.D. at 5% level		* Av. of 3 replicas		
	Treatments	3.56			
	Days	4.34			
	TreatmentxDays	6.15			

DISCUSSION

In the present investigation, leakage of electrolytes was found to be more in infected leaves as compared to healthy leaves. The rate of increase was maximum after 2 days and then declined. The leakage of electrolytes during the first days of infection may possibly be on account of increased permeability as a result of metabolic secretion of the pathogen. Similar results were also obtained by Dube *et al.* (1980) who stated that the pathogen produced a factor which increased the permeability of host cells during infection. The high rate of loss of electrolytes in the leaves of "RL-18" might be due to its higher susceptibility to the pathogen.

Addy (1976) observed that along with electrolytes, there was a leakage of phenols. The probable reason of a drop in electrolytic leakage after 2 days may be that phenols may be converted to quinone or other high molecular weight compounds with the help of oxidising enzymes which blocks the pores of cell membranes and decreasing the outward flow of electrolytes.

SUMMARY

The present study revealed that the leakage of electrolytes was more in leaves infected with *A. brassicae* as compared to uninoculated leaves. The loss was more in the susceptible variety "RL 18" than "Varuna". However, the rate of increase was maximum after 2 days of inoculation and then declined in the leaves of both the varieties.

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