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Changes in phenolic contents of sheshum leaf exudates in response to infection with Phyllactinia dalbergiae

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An increase in phenolic contents of leaf exudates was found after infection with *Phyllactinia dalbergiae*, but phenolic content decreased as the disease progressed. Healthy leaf exudates show a gradually decline in phenolic contents as the leaves mature.

INTRODUCTION

The leaf include a great diversity of materials viz. amino acids, carbohydrates, organic acids, growth regulators, phenols, minerals and antimicrobial substances (Godfrey 1976). Leaf exudates are further known to influence germination of spores of pathogenic fungi (Dix 1974). The present study was made to examine the changes in phenolic contents of leaf exudates of sheshum (*Dalbergia sissoo* Roxb.) in response to infection by *Phyllactinia dalbergiae*.

MATERIALS AND METHODS

Phyllactinia dalbergiae, a powdery mildew pathogen of *Dalbergia sissoo* infects at the end of October. The disease gradually proliferates and leaf fall takes place in March next year. The fluctuations in phenolic content of leaf exudates of diseased leves was studied from October to March next year healthy leaf exudates as control.

Leaf exudates were collected as described by Godfrey (1978). Compounds within the exudates were separated by paper chromatography according to Smith (1969). Total phenolic contents in exudates were analysed according to the A.O.A.C. method (1965 a).

RESULTS AND DISCUSSION

Quantitatively phenolic contents (Tables 1, 2) are high in diseased samples in October and November: 6.54 mg/g and 7.14 mg/g respectively. Then there is a gradual decrease with the amount being lowest in March i.e. 3.52 mg/g. Healthy leaf exudates show the highest phenolic content in October i.e. 10.2 mg/g. The phenolic content declined, and at maturity it reached 4.40 mg/g (in March) (Table 1). Qualitatively six phenolic compounds were detected. Phenol content declines in the samples as the leaves arrive at the senescence stage both in healthy and diseased cases. A phenol with Rf value .098 was recorded in October only in the healthy sample. A phenol with value .23 appeared at time of senescence in the healthy sample, in January and February. A phenol with Rf value .46 appeared in November and was recorded till senescence in the healthy sample. Similarly, a phenol with Rf value .52 was recorded in the healthy sample in November and in the diseased sample in October and November. A phenol with Rf value .64 was recorded in almost all samples except in February and March in the healthy sample. A phenol with Rf value .70 was recorded in October and November in the healthy sample and in October, November, December and January in the diseased sample (Table 2).

Increase in phenolic content in response to infection has been reported earlier (Hare 1966). The decline in phenolic content as the

Table 1

Total phenolic contents estimated at monthly intervals in healthy and diseased leaf exudates

Month	Healthy leaves exudates	Diseased leaves exudates
October	10.2*	6.52
November	8.7	7.14
December	5.4	4.58
January	5.4	4.54
February	4.9	3.56
March	4.9	3.52

* mg/g wet wt. expressed in terms of Resorcinol used as standard.

Table 2

Qualitative changes in phenolic contents of leaf exudates

Rf value	Healthy leaf exudates						Diseased leaf exudates					
	Months											
	X	XI	XII	I	II	III	X	XI	XII	I	II	III
0.098	+	—	—	—	—	—	—	—	—	—	—	—
0.23	—	—	—	+	+	—	—	—	—	—	—	—
0.46	—	+	+	+	+	+	—	—	—	—	—	—
.52	—	+	—	—	—	—	+	+	—	—	—	—
.64	+	+	+	+	—	—	+	+	+	+	+	+
.70	+	+	—	—	—	—	+	+	+	+	—	—

disease progresses has been advocated by Hulme and Rhodes (1971). Besides the influence of the pathogen, environmental factors also influence leaf exudation quantitatively and qualitatively.

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REFERENCES

A. O. A. C., 1965a, (ed.) W. Horowitz. Official 3 methods of Analysis. A. O. A. C. Washington, D. C. — P 219.

Dix N. J., 1974, Ann. Bot. 38: 504-514.

Godfrey B. E. S., 1974, Phylloplane mycoflora of Bracken *Pteridium aquilium*. Trans. Brit. Mycol. Soc. 62: 305-311.

Godfrey B. E. S., 1976, In Microbiology of aerial plant surfaces (Ed. C. H. Dickinson and T. F. Preece), New York, London, Acad. Press.

Hare R. C., 1956, Bot. Rev. 32: 95-137.

Hulme A. C., Rhodes M. J. C., 1971, On Pome fruits in Biochemistry of fruits and other products (ed., A. C. Hulme) p. 333-375, New York — London.

Smith I., ed., 1969, Chromatographic and electrophoretic techniques, I. London, W. Heinemann.