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Biochemical changes in chrysanthemum infected with leaf blight (*Alternaria chalmydospora)*

R. RENUKA*[1], V, PRAKASAM[2] AND V. RAVICHANDRAN[1]
[1]Department of Plant Pathology, Adhiparasakthi Agricultural College, G.B. Nagar, KALAVAI (T.N.) INDIA
[2] Department of Plant Pathology, Tamil Nadu Agricultural University, COIMBATORE (T.N.) INDIA

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SUMMARY

Chrysanthemum, an important flower crop grown in India next to rose and jasmine, suffers due to incidence of several diseases. *Alternaria chalmydospora* causes leaf blight disease and causes severe losses. Biochemical analysis of the infected plant revealed that the quantity of total sugars, reducing sugars, non reducing sugars and phenols were less in top, middle and bottom healthy leaves than in the diseased leaves. Higher content of sugars and phenols were recorded only in bottom infected leaves when compared to top and middle leaves.

Key words: Chrysanthemum, *Alternaria chalmydospora*, Phenols, Reducing sugars, Non reducing sugars.

Chrysanthemum (*Dendranthema grandiflorum* Tzelvev) (Chryos, golden; Anthos, flower) is one of the important commercial flowers of the world and ranks third next to rose and Jasmine in India (Kher, 1986). It has originated from China and it is known as "Queen of the East". Japan is the leading producer today where Chrysanthemum is regarded as "Symbol of Royalty". Chrysanthemum cultivation is facing several constraints, of which the diseases caused by the pathogens are the major problems. Three different species of *Alternaria viz., A. chrysanthemi, A. tenuissima* and *A. alternata* have been reported to cause leaf blight and blossom blight of chrysanthemum but leaf blight incited by *Alternaria chalmydospora* has not been reported so far**,** but the disease was found to be severe and cause extensive losses. Hence, an attempt was made to study the biochemical changes in chrysanthemeum due to infection of this disease.

MATERIALS AND METHODS

Sample collection for the analysis :

Healthy and infected leaves were collected from bottom, middle and top portions of the plants for the analysis of phenols, total sugars, reducing sugars and non reducing sugars.

Estimation of phenols :

The phenolic content of chrysanthemum leaves was estimated as per the procedure given by (Swain and Hills, 1959). Chrysanthemum leaves (1g) were homogenized in 10 ml of 80 per cent methanol and agitated for 15 min at 70°C. One ml of the methanolic extract was added to 5 ml of distilled water and 250 µl of Folin-ciocalteau reagent (1 N) was added and the solution was kept at 25°C. After 3 min, 1 ml of saturated solution of Na_2SO_3 and 1 ml of distilled water were added and the reaction mixture was incubated for 1 h at 25°C. The absorption of the developed blue colour was measured using a spectrophotometer at 725 nm. The amount of total soluble phenols was then calculated according to the standard curve obtained using the Folin-ciocalteau as standard reaction with total phenol and expressed as phenol equivalents in mg g^{-1} fresh weight.

Estimation of sugars :

Leaf bits (100 mg) were chopped into small bits and immersed in a beaker containing 80 per cent ethanol kept in boiling water both for 10 min and was cooled in running tap water. The tissues were crushed well using pestle and mortar. The macerate was squeezed through two layers of cheesecloth and the filtrate was collected in a beaker. The residue was again extracted with 80 per cent hot ethanol and squeezed through cheese cloth. Both the extracts were pooled together. Then this extract was centrifuged and the supernatant was collected, allowed to dry completely at room temperature, the residue obtained was dissolved in 10 ml of distilled water and used for the estimation of total, reducing and non-reducing sugars.

Total sugars (Hegde and Hofrieter, 1962) :

Ethanol extract (1.0 ml) was taken and kept in water

* Author for correspondence.