

Detection of Total Phenols in Relation to Red Rot Resistant and Susceptible Varieties of Sugarcane

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SUMMARY

The total phenols in both resistant and susceptible varieties increased thirty days after inoculation with the three pathotypes of *Colletotrichum falcatum* causing red rot in sugarcane. No perceptible differences were observed between resistant and susceptible varieties of sugarcane at any stage.

Key words :

Red rot,
Colletotrichum falcatum,
Pathotypes,
Phenols

Phenolic compounds have long been considered to play an important role in the biochemical aspects of disease resistance in plants (Mahadevan, 1966). Rao *et al.* (1968) studied the phenolic content of the cane juice in resistant and susceptible varieties after inoculation with red rot pathogen. They observed that it was significantly higher in varieties resistant to *Colletotrichum falcatum* (*Glomerella tucumerensis*) than in susceptible varieties and that the activity of poly phenol oxidase (PPO) was greater. After inoculation, there was marked liberation of phenols in the resistant varieties but none or even a slight decrease in the susceptible ones. A higher level of activity of PPO was also maintained in the resistant varieties. Chlorogenic acid was detected by Wilson and Srivastava (1969) in the nodal tissues of the varieties Co 285 and Co1070 moderately resistant to red rot.

These varieties have high phenolic content compared to the susceptible varieties Co331 and Co 445. Singh *et al.* (1976) reported an increase in the total phenols on fourth day after inoculation of all the varieties tested against red rot pathogen. However, they observed that there was no positive correlation between the amount of total phenols in sugarcane and degree of resistance. The phenolic content differed among cultivars, tissues and growth stages as reported by Sharma *et al.* (1982). These compounds seemed to accumulate more in the apical meristem than in roots and leaves. Healthy stem tissues contained much higher

amounts of endogenous phenols in *Colletotrichum falcatum* resistant varieties than in those of susceptible genotypes at ripening. Phenolic content in the juice of immature tissues was positively correlated with resistance.

Pinon *et al.* (1984) found higher phenol content when the cane was inoculated with *Colletotrichum falcatum*. They reported that the total phenols in plant and first ratoon were higher in My 5514 resistant to *Colletotrichum falcatum* and My 5741 moderately resistant, than in susceptible Pomez-72. Average values were higher in the first ratoon than in plant cane. In a subsequent report, Pinon *et al.* (1985) observed that when resistant, moderately resistant and susceptible cultivars were inoculated with *Colletotrichum falcatum* an increase in total phenols was observed in susceptible Pomez-72, seven days later and in all the three cultivars after 15 and 30 days after inoculation, although there was a general tendency of phenolic compounds to increase in all three cultivars. Based on three observations, attempts were made to compare the total phenolic content in resistant and susceptible cane varieties on infection with three pathotypes of red rot.

MATERIALS AND METHODS

Sugarcane varieties, Co 419, Co 997 and Co 671 (susceptible) and Co 7706, CoA 7602 and Co 8013 (resistant) were used for study.

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