

CHANGES IN THE MINERAL CONTENTS OF RICE INFECTED WITH *CORTICIUM SASAKII* (SH1RAI) MATSUMOTO

G. PADMAKUMARI and M. R. MENON

College of Agriculture, Vellayani-695582, Trivandrum

Infection and spread of the pathogen in the host are accompanied by certain biochemical changes which are manifested as the external symptoms of the disease. Alteration in the metabolism and mobility of certain minerals are also often observed subsequent to fungal infections of plants. The present investigations were undertaken to determine the changes in the contents of certain minerals in rice plants infected with *Corticium sasakii*.

Materials and Methods

The pathogen *C. sasakii* isolated from sheath blight affected rice plants was maintained on potato dextrose agar medium after purification* by hyphal tip method. A highly susceptible variety of rice, culture-28 (*Annapoorna*) was used for the studies. The seedlings were grown in 25 cm pots filled with clay-sand loam mixture and well decomposed organic manure, in the proportion of 1:1 and fertilised with paddy fertilizer mixture (8:8:16). At the tillering phase, the plants were inoculated with sclerotia from 15 day old culture of the fungus and kept under humid condition for 41 hours. Control plants were kept without inoculation. Four samples of plant materials were collected for analysis of the mineral contents at intervals of two days after inoculation from infected and control plants. Calcium, magnesium, phosphorus and potassium were estimated by methods described by Jackson (1967) and expressed as percentages on dry weight basis.

Results and Discussion

From the data presented in Table 1 it was evident that there was significant difference in calcium content of healthy and infected plants. In the infected plants the calcium content increased with the development of the disease and it was significantly higher than in healthy plants, at all stages of sampling except at the initial stage. Similar increase in calcium contents of infected plants was reported by Sivaprakasam *et al.* (1974) and Patil and Kulkarni, (1977). Hegde and Munjal (1971) recorded a decrease in calcium in bean pods infected by *Colletotrichum lindimuthianum*. Mogle and Mayee (1978) also reported a lower concentration of calcium in susceptible pearl millet infected with downy mildew.

The infected plants showed a steady significant increase of magnesium content at all periods of sampling which was more evident as the infection advanced, Hegde and Munjal (1971) found that magnesium content of bean pods was reduced as a result of infection by *C. lindimuthianum* while Mogle and Mayee

(1978) found there was an accumulation of magnesium in susceptible varieties of pearl millet in the initial stages of infection. In the inoculated plants potassium content was significantly lower than in the healthy ones. In healthy plants there was a steady increase from 1.26 to 1.45% whereas in diseased plants it ranged from 1.21 to 1.40%. There was significant reduction in the phosphorus content also during all periods of disease development in comparison to healthy plants.

Table 1
Changes in the mineral content of rice infected with
Corticium sasakii, %

Period after inoculation (days)	Calcium		Magnesium		Potassium		Phosphorus	
	Healthy	Inoculated	Healthy	Inoculated	Healthy	inoculated	Healthy	Inoculated
2	0.43	0.43	0.253	0.573	1.260	1.210	0.876	0.356
4	0.44	0.47	0.371	0.796	1.348	1.260	0.430	0.381
6	0.47	0.62	0.371	0.911	1.410	1.340	0.460	0.445
8	0.53	0.76	0.491	1.040	1.450	1.400	0.530	0.480
Mean	0.47	0.57	0.371	0.840	1.367	1.305	0.449	0.415
CD for marginal means	0.003		0.015		0.00002		0.0028	
CD for combination	0.004		0.030		0.00004		0.0056	

The findings on lower potassium and phosphorus contents of infected rice plants agree with the earlier reports (Sadasivan and Kalyanasundaram, 1956; Hedge and Munjal, 1971; Sivaprakasam *et al.*, 1974; Patil and Kulkarni, 1977; Mogle and Mayee, 1978).

It is well known that infection by fungi alters the metabolic activities of the host plants and may even affect the absorption and mobility of certain minerals. Padhi and Chakrabarthi (1977) proposed that the Co-13 cultivar which was susceptible to *Pyricularia oryzae* had higher concentration of all nutrients. Sadasivan and Kalyanasundaram (1956) suggested that the reduction of potassium in wilted cotton plants may be due to the derangement in the absorption of plants due to

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