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RESEARCH NOTES

SOME PHYSIOLOGICAL STUDIES ON *COLLETOTRICHUM FALCATUM* WENT, THE CAUSAL ORGANISM OF RED ROT OF SUGARCANE

Faiz-ur-Rehman*, Masoud A. Nasir and K. B. Malik

Red rot is one of the most important and widely distributed diseases of sugarcane that causes substantial loss to the sugar industry (Hughes, 1953). Rafay and Padmanabhan (1941) reported three variants of the causal fungus differing from each other in their morphological and physiological characters. Although some studies on nutritional requirements of *C. falcatum* have been carried out in some foreign countries (Ahmed, 1973 and Ghouse, 1975) but such information on local strain of *C. falcatum* was lacking.

Diseased stems showing red rot symptoms were collected and isolations from the diseased material were made by applying usual isolation techniques. For physiological studies the fungus was grown on different culture media at different temperatures, pH, radiation doses and light conditions.

All the Lab. experiments were run in 90 mm petri plates in quardruplicate. Except otherwise mentioned, the petri plates were incubated at 28°C. Linear colony diameter was measured after eight days of incubation. Spore density was estimated with the help of haemocytometer (Ahmed, 1973).

The fungus grew well on all the culture media. However, maximum growth and sporulation was obtained on modified Richard's agar (Table 1). Our local isolate had better growth and sporulation on modified Richard's agar. This increase in growth and sporulation may be attributed to the addition of cane juice which might have stimulatory effect on its growth and sporulation. The fungus did not grow at temperature below 10°C and above 40°. However, it was maximum at 28°C (Table 2). The findings are in conformity with Ahmed and Divinagracia (1974).

Maximum growth and sporulation was obtained at pH 5.5 (Table 3) as

* Pakistan Agricultural Research Council, Islamabad.

Table 1. *Effect of different culture media on growth and sporulation of C. falcatum*

Culture medium	Average Colony diameter (mm)	Number of spores per cm^2 (1×10^7)
Potato-dextrose agar	27.8	2.6
Basal medium	38.3	3.5
Nutrient Agar	52.6	4.0
Corn meal agar	64.5	12.0
Malt extract	62.0	11.9
Oat meal agar	56.0	8.5
Modified oat meal agar	61.0	10.6
Richard's agar	60 0	11 7
Modified Richard's agar	76.0	14.0

Table 2. *Effect of different temperatures on growth and sporulation*

Temperature (°C)	Average colony diameter (mm)	Number of spores per cm^2 (1×10^7)
5	0.0	0.0
10	5.0	0.0
15	20.0	1.9
20	33.2	4.0
22	47.8	6.2
24	51.1	8.9
26	70.0	13.2
28	76.1	13.7
30	72.0	13.2
40	5.0	0.8
45	0.0	0.1

Table 3. *Effect of hydrogenion concentration on growth and sporulation*

Temperature (°C)	Average colony diameter (mm)	Number of spores per cm^2 (1×10^7)
3 0	20.0	2.2
4.0	45.0	5.7
5.0	60.0	10.9
5.5	62.2	11.2
6.0	61.7	10.8
6.5	49.0	6.5
7.0	41.0	4.2
7.5	21.0	1.9
8.0	18.0	0.8
9.0	8.0	0.1

also reported by Ahmed and Divinagracia (1974). Continuous flourescent light favoured maximum growth and sporulation. It was adversely affected by alternate light and darkness and was minimum in complete darnkness (Table 4). According to Ahmed and Divinagracia (1974) and Ghouse (1975) growth and sporulation was maximum under continuous light and was the least in darkness. Exposure of the fungus to higher doses of gamma radiation gradually inhibited both the growth and sporulation of the fungus. The effect on sporulation was, however, more pronounced than on growth (Table 5). These observations are in conformity with those of Iqbal (1977) who also reported retardative effect on growth of *Alternaria solani* after exposure to higher doses of gamma irradiation.

Table 4. *Effect of continuous light, alternate light and darkness and complete darkness on growth and sporulation*

Light condition	Average colony diameter (mm)	Number of spores per cm^2 (1×10^7)
Continuous light	70.5	14.3
Alternate light and darkness	65 0	10.0
Complete darkness	50.0	9.0

Table 5. *Effect of gamma radiation on growth and sporulation of C. falcatum*

Radiation dose	Average colony diameter (mm)	Number of spores per cm^2 (1×10^7)
25	76.0	12.1
50	56.0	10.2
75	56.0	5.2
100	54.0	4.7
125	53.0	4.4
150	52.0	3.6
175	42.0	2.6
200	40.0	2.1
Check	81.0	13.8

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