

EXISTENCE OF PHYSIOLOGICAL RACES IN *USTILAGO SCITAMENEA* SYDOW IN WEST BENGAL

Disease surveys carried out in the Sugarcane Research Station, Bethuadahari, and its adjoining sugar mill areas during 1979-81, showed the incidence of 'Smut' disease of Sugarcane in the cultivars namely Co. 740, Co. 1158, Co. 62033, Co. 6311 and B.O. 91. The ratoon crop was more susceptible to the disease. A preliminary screening trial revealed that the cultures (teliospores) collected from various cane cultivars from different locations caused differential infection in field in the test cultivars and this indicated possible existence of physiologic races in the smut fungus, *Ustilago scitaminea*. As no systemic study about the pathogenicity of various cultures of the smut fungus was reported either from the locality or from the State, of West Bengal it was, decided to study the existence of physiological races in *Ustilago scitaminea* by cross inoculation method for two successive years (1982-'83) in the Sugarcane Research Station, Bethuadahari, Nadia.

The smut cultures (teliospores) were collected aseptically before emergence of whip from the four cane cultivars, viz., Co. 1158, Co. 62033, Co. 6311 and B.O. 91 separately from different locations. Six cultivars, viz., Co. 1158, Co. 62033, Co. 6311, Co. 7218, Co. 7801 and B. O. 91 were selected as differential hosts. The cultures were designated as A (host—Co. 1158), B, (host Co. 62033), C (host—Co. 6311) and D (host—B.O. 91) were inoculated on differential hosts. Healthy two bud setts were dipped in spore suspension (1 g spores with 95% viability/1 litre sterile distilled water) for 30 minutes. Before inoculation, the bud scales of the setts were removed with arrow needle without making any injury to eye bud. Two setts of each cultivar inoculated with each type of smut culture were planted in 30 cm. earthen pots, duly filled with sterilised soil. The experiment was replicated four times. Planting was done during the month of March every year and the smut infection was recorded from the first appearance of the disease in treatments at fortnightly intervals and continued till harvest in the month of December every year. The cumulative disease incidence was expressed as percentage of the number of canes infected by smut over the total number of germinated canes.

Data based on average for the two years of study showing the percentage of smut infection on differential host cultivars presented in Table 1 indicated that none of the culture could infect the cultivar Co. 7218. The cultures A, C and D could infect the cultivars Co. 1158, Co. 62093, Co. 6311, Co. 7801 and B.O. 91

TABLE 1. Percentage of smut infection on six differential host cultivars of sugarcane under conditions at Bethuadahri.

Differed smut cultures with host cultivars	Differential host cultivars						Mean
	Co.1158	Co.62033	Co.6311	Co.7218	Co.7801	B.O.91	
A (Co.1158)	100.00	75.00	100.00	0.0	87.50	100.00	77.08
B (Co.62033)	75.00	62.50	31.25	0.0	0.0	31.25	33.33
C (Co.6311)	100.03	37.50	100.00	0.0	43.75	68.75	58.33
D (B.O.91)	87.50	62.50	56.25	0.0	75.00	100.00	63.54

* Average of two years (1982,—'83)

whereas culture B could infect the cultivars Co. 1158, Co. 62033, Co. 6311 and B.O. 91. The culture A was found more virulent as it could infect all the cultivars except Co. 7218 to a great extent. The culture B appeared to be comparatively less virulent. It was very interesting to note that culture B collected from the cultivar Co. 62033 could not infect extensively the original host cultivar Co. 62033. Amongst the four smut cultures tried there was variation in reaction, suggesting thereby the possible presence of physiological races in *Ustilago scitaminea* for the six cultivars tested. However, detailed cytogenetic studies of these races need to be done.

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