

Short Communication

Pak. j. sci. ind. res., vol. 34, nos. 7-8, July-August 1991

In Vitro Screening of Sorghum Commercial Varieties against Grain Smut of Sorghum (*Sphacelotheca sorghii* Link)

RIZWAN Y. HASHMI, A.K. KHANZADA AND M. ASLAM
CDRI, Pakistan Agriculture Research Council, University
Campus, Karachi - 75270, Pakistan

(Received April 2, 1991; revised September 4, 1991)

Sorghum is an important cereal of kharif season and in Pakistan grown for fodder and silage purposes. Grain smut of sorghum (*Sphacelotheca sorghii* Link) is an important seed borne pathogen recorded every year in different intensities. Most of the sorghum varieties have been found susceptible to this pathogen under field condition [1, 6 and 7].

Gupta *et al.* [4] evolved a technique for the germination of the spores of loose smut (*Ustilago nuda*) on seed extract of different wheat varieties under laboratory conditions. In the present studies, efforts were made to evolve a suitable technique for the germination of *Sphacelotheca sorghii* Link., spores for identification of resistance potential in sorghum cultivars.

Nine commercial varieties of sorghum received from different Agricultural Research Institutes of the country were studied for their reaction to grain smut. 1.5 Gram seeds of each test variety were powdered and soaked in 5 ml of sterile distilled water and left at room temperature for 15-20 mins and then centrifuged at 4000 rpm for 25 mins. Supernatant was taken out. Freshly collected spores of pathogen taken from infected spikes were placed in drops of the seed extract on glass slides, enclosed in petridishes, over moistened filter paper and incubated for 24 hrs at 25° ($\pm 1^\circ$) to allow the spores to germinate. Each test was replicated three times. Maximum number of spores encountered and maximum number of germinated spore were counted using an ordinary microscope. Duncan's multiple range test was applied to find out the significance.

It is apparent from Table 1 that higher mean spore germination was observed on seed extracts of varieties Mr. 839, Local white, Pak SS 11 and Bhawalpur were as compared to that on other varieties, Least spore germination occurred on extracts from the seeds of varieties of Kaghan, Sweat Jowar, and Ds- 75, while germination on extracts of G13 a-3 and Pu-7 was in the intermediate range. These differences in percentage spore germination on seed extract of each variety were significant at $p \leq 0.001$. The level of susceptibility of a

variety thus appeared directly correlated to its ability to support spore germination on seed extracts. It appears that resistant varieties have some factors present in their seed extract which inhibit the germination of the fungal spores or restrict the mycelial growth.

Gupta *et al.* [4], applied spore germination technique described by Anonym [2], and found satisfactory results when they tested 9 wheat genetic stocks of known field reaction to loose smut. Two varieties which gave resistant reaction to loose smut in the field for three to four years gave lower percentage of spore germination.

According to Batts and Jeater [3] and Khanzada *et al.* [5] the presence of mycelium could be detected by embryo count test, but this would not be a sure test, because it could not be predicted whether disease would appear in plants grown from such infected seeds, because smut does not appear if the growing mycelium fails to catch up with plumule. This failure of the mycelium to grow at the same rate as the plumule can be explained on the basis of the observations made during the course of the present study, where seed extracts from some varieties either inhibited spore germination altogether or else retarded the growth of mycelium.

TABLE 1. SPORE GERMINATION OF GRAIN SMUT (*SPHACELOTHECA SORGHII* LINK) IN SEED EXTRACTS OF DIFFERENT SORGHUM VARIETIES.

Varieties	No. of spore	Mean spore germination
Local white	457.67 c	102.33 b
Kaghan	417.33 d	20.00 f
Sweat jowar	544.33 a	23.67 f
Bhawalpur	459.33 c	90.33 c
G 13A-3	451.00 c	73.33 d
DS-75	398.00 e	24.33 f
Pu - 7	424.67 d	58.33 e
Mr-839	459.00 c	125.33 a
Pak SS II	515.33 b	98.33 bc

Average of 3 replications. Mean followed by the same letter are not significantly different at 5% level by Duncan's multiple range test.

Key words: Rapid technique, Screening, Sorghums, Grain smut, Spore germination.

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