

Piricularia Leaf Spot Disease of Bajra

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Piricularia disease of bajra has attained importance since the cultivation of hybrid bajra. Out of 15 graminaceous plants, the fungus infected only bajra but 4 varieties were found resistant. Kasumin was the most effective fungicide in checking the disease.

With the large scale cultivation of hybrid bajra (*Pennisetum typhoides* S. & H.) under conditions of high fertility in the country, the leaf spot disease caused by *Piricularia penniseti* P. & G. has attained much importance as it may be responsible for heavy losses under favourable set of conditions.

MATERIAL AND METHODS

Large scale isolations were made from diseased material collected from different parts of Rajasthan and the culture was multiplied on potato dextrose agar. A heavy spore suspension in sterile distilled water was sprayed on plants of bajra variety, HB₁, which was sown in pots at weekly intervals so as to produce 4 to 11 week old plants. After incubation, the plants were kept in humid chamber for 6, 16, 24, 48, 72 and 96 hrs.

For studying the host range of the pathogen, 15 graminaceous hosts viz., *Sorghum vulgare* P., *Zea mays* L., *Sateria tomentosa* -K. *S. italica*, *Digitaria sanguinalis* S. *Cenchrus biflorus* R., *Perotis indica* O. & K., *Aerchne* sp., *Cyprus compressus* L., *Dactyloctenium aegyptiacum* W., *Eragostris benghalensis* L., and *Pennisetum typhoides* S & H. were sown in 22 cm pots and these

were incubated for 24 hrs in humid chamber after spraying with heavy spore suspension.

For varietal resistance studies, 6 crosses, 4 inbreds and 18 varieties were grown in pots. Six week old plants were inoculated by spraying spore suspension and were kept in humid chamber for 24 hrs. Infected plants were rated as prescribed by Atkin and Goto (1967).

- R - Resistant : No reaction or small brown flecks,
M - Moderate : Small or restricted lesions showing grayish centre and brown margin
S - Susceptible : Well developed necrotic lesions without restricted margin

Twelve fungicides were sprayed on appearance of the disease symptoms on bajra, HB₁. The second spray was repeated after 15 days. The result of disease incidence is summarised on the basis evolved for *Piricularia oryzae* by Anderson *et al.* (1947) and average disease incidence was calculated as per following scale :

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- 0 = no infection
 1 = 1-5 lesions
 2 = 6-10 lesions
 3 = 11-25 lesions
 4 = 26-40 lesions
 5 = above 40 lesions per plant

Half of the does of these fungicides were also incorporated in Ramakrishnan's medium (Ramakrishnan, 1948) in petridishes and colony diameter was measured 10 days after inoculation. A piece of 8 mm diameter was cut from the growing culture with the help of a cork borer for inoculation.

RESULTS AND DISCUSSION

Pathogenicity and host range :

Infection was obtained as small brown flecks after 70 hrs of inoculation and the typical necrotic spots appeared within 4-6 days. The maximum infection was observed on the apical half portion of lower leaves of 6-7 week old plants. On reisolation the same organism was obtained. When the plants were kept in humid chamber for 6, 16, 24, 48, 72 and 96 hrs, the lesions 0.5, 22.5, 32.0, 32.0, 32.2 and 36.0 per plants were counted, respectively. This indicated that 24 hrs humid conditions are essential for good infection.

The pathogen did not infect any other host than bajra showing thereby that the fungus was highly specific. The specificity is similar to observations of Veeraraghavan and Padmanabhan (1955) in case of *Piricularia oryzae* of rice.

Varietal resistance : The reaction on different materials against the pathogen were found as follows :

- Resistant : T55, D174, Malvi, RSJ
 Moderate : Inbred DB3, DB6, DB16, Ghana, Sathi, I.P.367, RSK and local
 Susceptible : Inbred 11, TG23A, N0207, A1/3, S 530, S 350, White Bajra, HB1 HB4, HB3, 23A × DB2, 23A × DB6, 23A × DB9, 23A × DB10, 23A × DB 13, and 23A × DB19.

Effect of fungicides :

Kasumin followed by Aureofungin and Zineb proved to be most efficacious in controlling the disease incidence (Table). The fungus did not grow in the medium when incorporated with Kasumin and Ziram fungicides. The colony diameter measured was 8.75 mm in comparison to 75.5mm in control. There was no spore formation in the medium incorporated with Brestanol, Ferbam, RH539 and Ziram. Metha *et al.* (1952) observed the disease at Kanpur as early as 1948 on leaves of bajra plants and recently Prasada and Goyal (1970) named the causal organism as *Piricularia pennisetii*, a new species on the basis of cross inoculation tests. The diseased bajra leaves and culture of the fungus were sent to C.M.I. for identification (Personal communication) and the organism was identified as *Piricularia grisea*. According to the nomenclature put by Sprague (1950), the species occurring in tropical regions are designated as *P. grisea* while in temperate region it is *P. oryzae*. Therefore identification of *Piricularia* sp. involved in carrying the leaf spot disease of bajra needs further investigations.

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TABLE Effect of fungicides on disease incidence, growth and sporulation of the fungus

Fungicide	Chemical nature	dose	Disease (Index) 1969-70	Disease (Index) 1970-71	Colony Diameter (mm)	Sporulation
Aureofungi	Heptene antibiotics	50 g/hact.	1.4	2.6	11.25	good
Blitox	Copper oxychlorido	0.2%	3.8	3.1	16.25	good
Brestanol	Tri-phenyle tin acetate	0.05%	2.1	3.3	11.50	nil
Ferbam	Ferric di methyle dithio carbamate	0.2%	2.4	—	14.00	nil
Hinosan	O ethyle S, S-diphenylephosphoro dithiicate	0.1%	—	3.2	—	—
Kasumin	Kasugamycin antibiotics	0.2%	1.2	2.0	8.75	traces
Miltox	Copper oxychloride and Zineb	0.2%	2.6	2.7	15.00	good
Morestan	Copper oxychloride	0.2%	2.0	3.1	30.00	good
RH 539		0.2%	2.3	3.2	31.25	nil
Thiovit	Bisdimethyle thio carbomyi disulphide	0.5%	—	3.6	—	—
Zineb	Zinc ethylene bisdithiocarbamate	0.2%	2.0	1.9	38.00	traces
Ziram	Zinc di methyle di thio carbamate	0.2%	3.3	3.4	8.75	nil
Control	(No spraying)		3.8	3.5	75.50	good