HOST-PARASITE INTERACTION OF *PUCCINIA PURPUREA*

S. T. NAIK, K. H. ANAHOSUR and R. K. HEGDE
Department of Plant Pathology, College of Agriculture, Dharwad 580005, India.

PUCCINIA PURPUREA Cooke is the causal organism of sorghum rust, which is one of the destructive diseases which has taken a heavy toll in recent years in the hybrid seed production. The uredial stage is the most potential source to start and spread the disease to the epidemic form during some years. It is also made use of in artificial inoculation to screen the genotypes to find out the resistant sources.

The external factors such as temperature required for germination, nutrient media and host-penetration are not investigated for this organism. Hence an attempt was made to study these.

The various media tried were tap water, distilled water, ½%, 1% and 2% glucose solutions (table 1). Uredospore suspension was prepared in different media and was sprinkled on the agar film on the glass slides which were kept in petriplates lined with moist blotting paper. The slides were incubated at 27 ±1°C. for three intervals *viz* 24, 36 and 48 hr. Spores with the germ tubes longer than their diameter were considered as germinated. The per cent germination was based on a count of 400 spores for each treatment. The data are presented in the table. Results revealed that the germination started after 1½ hr of incubation and reached maximum after 48 hr in all the media tested. The maximum spore germination (92.4%) was recorded in 2% glucose solution and the least was in distilled water (51.5%).

The maximum germination in 2% glucose solution after 48 hr is in agreement with the work done by few workers [1,2] for different species of rust, explained on the basis that the uredospores require some nutrients for their germination. The poor germination in distilled water is therefore due to lack of nutrients or salts.

The host parasite relation was studied by finding out the penetration by following the collodion stripping method[3]. Mature uredospores obtained from 36-B host were made use of for the study. Uredospore suspension was prepared in 2% glucose solution. The material was incubated at (25 ±1°C) for 48 hr. The leaf pieces were then taken out and air dried. A thin layer of collodion was smeared on the leaf surface and dried for 20 sec. Afterwards, collodion layer was stripped off gently, stained with cotton-blue in lactophenol; they were then observed under the microscope. The results revealed that uredospores germinated on the host leaf (36-B) surface in 2 or 3 hr, generally one germ tube was produced from each spore. The tips of germ tube were thickly stained with cotton-blue than the remaining portion indicating accumulation of cytoplasm at the tips of germ tube. Occasional branching of germ tube was also seen. The tips of germ tube showed tendency to move towards the stomata and ultimately terminate into a bulbous like structure, appressorium. The appressorium was found to fit into the stomata indicating the entry of this fungus through the stomata. This finding is in agreement with the work of Dalmacio[4].

Table 1 *Effect of different media on germination of uredospores.*

Medium	Percentage of spore germination 24 hr.	36 hr.	48 hr.
2 % glucose	92.40	92.4	92.4
1 % glucose	82.0	83.15	83.15
0.5 % glucose	75.0	75.3	75.3
Tap water	66.8	66.94	66.94
Sterile water	59.77	61.45	61.45
Distilled water	50.73	51.5	51.5

26 March 1984; Revised 16 August 1984

1. Duggar, B. M., *Bot. Gaz.*, 1901, **31**, 38.
2. Simons, M. D., *Phytopathology*, 1955, **45**, 410.
3. Delp, J., *Phytopathology*, 1954, **44**, 615.
4. Dalmacio, S. C., *Philipp. Agric.*, 1969, **53**, 53.

THE POSSIBLE EXISTENCE OF VARIABILITY IN *HELMINTHOSPORIUM TURCICUM* INCITANT OF LEAF BLIGHT OF MAIZE IN INDIA

S. SHANKERLINGAM and
K. A. BALASUBRAMANIAN*
Maize Research Station, Amberpet, Hyderabad 500013, India.
**Department of Plant Pathology, College of Agriculture, A. P. Agricultural University, Rajendranagar, Hyderabad 500030, India.*

THIS paper deals with an attempt to study the possibility of variation occurring in *Helminthosporium turcicum* incitant of leaf blight of maize in a field experiment.

Table 1 **Reaction of different isolates and cultivars in leaf blight of maize*

Isolates	Maize cultivars PTR	Ade C	RWF 9	CM 202	CM 600	Mean
Mandya	2.5	1.1	3.0	5.0	5.0	8.82[a]
	(1.58)	(1.05)	(1.73)	(2.23)	(2.23)	(1.764)
Sikkim	2.0	1.1	2.5	4.5	4.0	8.16[b]
	(1.41)	(1.05)	(1.58)	(2.12)	(2.0)	(1.632)
Hyd.-1	1.0	1.0	1.0	2.75	2.5	6.24[c]
	(1.00)	(1.0)	(1.00)	(1.66)	(1.58)	(1.248)
Hyd.-2	1.75	1.0	2.5	4.5	4.5	8.14[b]
	(1.32)	1.0	1.58	2.12	2.12	1.628
Sorghum	1.0	1.0	1.0	2.0	2.0	5.82[c]
	(1.00)	(1.00)	(1.00)	(1.41)	(1.41)	(1.164)
Mean	6.31[a]	5.10[b]	6.89[c]	9.54[d]	9.34[d]	37.18
	(1.262)	(1.02)	(1.378)	(1.908)	(1.868)	

C.D. at 5% = 0.091; C.D. at % = 0.12570; *Score on a 1–5; **Figures in parenthesis are square root transformed data.
Mean values superscribed by common letters do not significantly at $P<0.05$.

Five isolates, three from Hyderabad (Hyd.-1, Hyd.-2 from maize and an isolate from sorghum) one from Mandya (Karnataka) and one from Sikkim were isolated from the infected leaves and purified on maize leaf extract medium. Five maize cultivars (inbred lines), three resistant (PTR, Ade C, RWF 9) and two susceptible (CM 202 and CM 600) were used. Plants (30-day-old) were inoculated with spore suspension of the isolates.

To provide humidity, the plants were covered with polythene bags for 18 hr. The plants were checked everyday for typical symptoms. Characteristic blight symptoms started appearing 13 days after inoculation. Disease ratings were carried out on a 1–5 scale 20 days after inoculaion and the data are presented in table 1. It is seen that the isolate from Mandya is the most virulent one. The table also shows the possible existence with different virulence of the two isolates from Hyderabad. Further, one of the isolates from Hyderabad (Hyd.-2) appears to be closely related to the isolate obtained from Sikkim. It is interesting to observe that the other isolate from Hyderabad (Hyd.-1) isolated from maize and the isolate from sorghum expressed a common type of reaction projecting the capacity of sorghum colonizing *Helminthosporium turcicum* to colonize maize with little effort. This brings out the possible threat of large scale colonization of maize by sorghum isolate.

7 June 1984

USEFUL SPONTANEOUS MUTANTS IN CHICKPEA (*CICER ARIETINUM* L.)

B. S. DAHIYA, V. S. LATHER,
I. S. SOLANKI and RAM KUMAR
Department of Plant Breeding,
Haryana Agricultural University,
Hisar 125 004, India.

SPONTANEOUS mutations, a source of genetic variability are natural phenomenon in crop plants. In chickpea a number of spontaneous mutants for different morphological characters have been reported[1–5]. These mutants can be used directly or indirectly in crop improvement programmes. However, in chickpea except basic studies on the genetics of spontaneous mutants, no information is available when such mutants have been used as a source of agronomically desirable character for use in crop improvement through hybridization.

In the present study three spontaneous mutants, E100Y(m)-compact and erect plant type, resistance to *Ascochyta* blight and Greymould diseases; Bushy-mutant—higher branch number identified during 1979–80 and an open flower mutant of HMS 6-1 identified during 1982–83 have been described (table 1) and their use in improvement of chickpea crop is discussed.

E100Y(m): A spontaneous mutant appeared in a germplasm line named E100Y, an introduction from Greece. The mutant is late germinator and takes 15–16 days for emergence as compared to 7–8 days by the