

Short Communication

Occurrence of Two Physiologic Races of *Tilletia foetida* in Pakistan

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ABSTRACT

Seven samples of *Tilletia foetida* were analysed for physiologic races. The two samples collected from Quetta and Pishin region resembled with race L-8 and five samples from Swat, Murree, Rawalpindi, Chitral and Gilgit resembled with race L-9. According to data and proposed formula the two physiologic races were identified.

Key Words: *Tilletia foetida*; Physiologic races; Location; Scale

INTRODUCTION

Wheat is important staple food crop in Pakistan. It is cultivated on about eight million hectares. Different diseases hit this crop but the attack of complete bunt (*Tilletia foetida*) is recorded very high in some wheat growing areas of the country in uplands. The incidence as high as 28% was recorded by Haq and Attauddin (1992) in the swat area in NWFP during 1992 on variety Pak 81. Choudhry (1953) tested two collections of *T. foetida* from Quetta against many varieties including the 11 standard differentials but did not give any race number. However his results indicate that the two collections used by him were much different from races reported earlier. The pathogenic specialization of *T. foetida* has not been studied thoroughly in Pakistan. Information on the virulence potential of the pathogen prevalent in the country is essential for evolving bunt resistant varieties. Therefore, survey of the physiologic races of bunt was carried and preliminary results obtained during 1993-94 and 1994-95 are reported.

MATERIALS AND METHODS

During survey in 1992-93, seven samples of complete bunt of wheat were collected each from Quetta, Pishin, Murree, Rawalpindi, Swat, Chitral, and Gilgit where the average incidence was estimated to be 40, 12.5, 33.5, 1.25, 50.0, 30.0, 25.0%, respectively. The samples of Quetta and Pishin were collected from a semi- winter type wheat variety "Local white". The samples of Murree, Rawalpindi, Swat, Gilgit and Chitral were from spring type varieties Kenya Gipsy, C591, Dirk, Pirsabak 85 and touf, respectively. The seed of standard differential varieties were disinfected with 0.1% Mercuric chloride, washed in running water to remove toxicity and were infested artificially with the chlamydospores of the above mentioned seven samples individually in the ratio of 3 gm of powdered bunt to 100 gm of seed as given by Heald (1921). The soil was

sterilized with 2% formalin solution before planting as recommended by Hafiz (1955). The sowing was done in 9" pots at Rawalpindi on January 10, 1994 and observations were recorded at maturity of the crop on May 29, 1994. In 1994-95, the same seven bunt samples were again used for field tests, using the same method as given above and 30 bunt infested seeds were sown in 6 feet rows of each differential variety at Rawalpindi. The sowing was done on 6 December, 1994 when the mean daily temperature was 15°C. The observations were recorded in accordance with Rodenhiser and Holton (1945) at maturity of the crop. The bunt percentages are based on at least 30 culms in pots and 100 culms in 6" feet rows in the field. Fractional percentages of 0.5 or more were recorded as 1.

RESULTS AND DISCUSSION

The reactions of standard differential varieties against the seven individual samples in pots and in field during 1993-94 and 1994-95, respectively at Rawalpindi have been presented in Table I. The above results of pots and field experiments during 1993-94, respectively are comparatively matching each other. Accordingly, the seven bunt samples can be divided in two groups on the basis of their reactions on Redit, Oro, Hussar, White Odessa and Marquis. The samples from Quetta and Pishin resemble race L-9 and two samples from Chitral and Gilgit resemble race L-9 of *T. foetida* as described by Rodenhiser and Holton (1945). The reactions of differential varieties of pot experiments in 1993-94 and field experiments 1994-95 are comparatively matching each other and confirm the results. The minimum number of culms in pot experiment was in three replications and that in the field it was 100, although in some cases the number of culms was much more. Thus the results can be considered fairly reliable. The results further indicate that race L-8 of *T. foetida* is very common in Quetta region while race L-9 in the northern foot hills areas of Gilgit to Rawalpindi. The number of samples analysed is

Table I. Reaction of differentials to seven different samples of *Tilletia foetida* collected during 1993-94 (percentage of heads infected, differential lines)

Place of collection	Period of experiment	Hybrid 128	Ridit	Oro	Hussar	Allint	Martin	White odessa	Ulka	Marquis	Cannu	Mindum
Quetta	1993-94	100	10	67	0	7	0	10	50	50	60	0
	(pots)	S	R	S	R	R	R	R	S	S	S	R
	1994-95	75	7	60	0	0	0	0	50	45	43	0
Pishin	(Field)	S	R	S	R	R	R	R	S	S	S	R
	1993-94	100	10	70	0	0	0	10	60	60	67	0
	(Pots)	S	R	S	R	R	R	R	S	S	S	R
Sawat	1994-95	67	10	60	0	0	0	5	50	50	60	0
	(Field)	S	R	S	R	R	R	R	S	S	S	R
	1993-94	100	100	7	11	0	0	44	100	29	67	0
Murree	(Pots)	S	S	R	I	R	R	S	S	I	S	R
	1994-95	80	66	0	20	0	0	60	100	25	75	0
	(Field)	S	S	R	I	R	R	S	S	I	S	R
Rawalpindi	1993-94	100	75	0	12	0	0	45	100	11	71	0
	(Pots)	S	S	R	I	R	R	S	S	I	S	R
	1994-95	77	60	0	21	0	0	50	100	13	75	0
Chitral	(Field)	S	S	R	I	R	R	S	S	I	S	R
	1993-94	100	100	0	14	0	0	67	100	25	100	0
	(Pots)	S	S	R	I	R	R	S	S	I	S	R
Gilgit	1994-95	67	100	0	25	0	0	75	100	20	100	0
	(Field)	S	S	R	I	R	R	S	S	I	S	R
	1993-94	65	100	0	21	0	0	75	100	11	71	0
	(Pots)	S	S	R	I	R	R	S	S	I	S	R
	1994-95	100	86	0	22	0	0	67	100	20	76	0
	(Field)	S	S	R	I	R	R	S	S	I	S	R

inadequate to draw any conclusion regarding the distribution of races in Pakistan, since no work has been done on the physiologic specialization of bunt of wheat in Pakistan subcontinent.

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