

Control of Wheat Rust by Leaves Extract of Poisonous Phanerogamic Plants

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Abstract: Wheat rust caused by *Puccinia recondita* was controlled by leaf extract of poisonous phanerogamic plants. Leaf extract of 4 poisonous phanerogamic plants, *Narium odorum*, *Calotropis gigantea*, *Azadirachta indica* and *Datura stramonium* have 40.60, 45.45, 56.96 and 81.81% decrease of disease over control respectively. Whereas fungicide Baytan decrease the disease 84.84% which is at par with *Datura stramonium*.

Keywords: Poisonous phanerogamic plants, *Puccinia recondita*, control, leaf rust of wheat, Baytan

Introduction

Wheat is grown on an area of 8821.4 thousand hectares with an annual production of 16696.61 thousand tonnes (Anonymous, 1994). Antifungal activity of neem oil has been reported against *Fusarium moniliformae* and *Rhizoctonia Solani* (Kazmi *et al.*, 1991).

Baytan has been proved as an effective rusticide (Bhowmick and Chaudhary, 1992). Antifungal activity of leaf extract of *A. indica* against *Alternaria radicina*, *Helminthosporium turcicum* and *Ascochyta rabiei* was demonstrated by Khan, 1989. Bhowmick and Chaudhary (1982) found leaf extract of *A. indica* completely inhibited the growth of *Alternaria alternata*. Muthusamy and coworkers (1988) reported the effect of neem seed extract and neem oil against rust of groundnut. Severe rust epiphytotic of 1948 and 1954 results in 30 to 50% reduction in yield. About 2400 plants species are known to possess biologically active compounds that control various pests and pathogen (Saleem *et al.*, 1988). Control of wheat rust by poisonous phanerogamic extract is safe, economical, with least residual effects as compared to fungicides.

Materials and Methods

Dhurum variety (WL-711) of wheat was cultivated which is highly susceptible to leaf rust of wheat. The experiment was laid out in plant pathology section of Ayub Agricultural Research Institute, Faisalabad. The wheat variety WL-711 susceptible to leaf rust was cultivated in each of the 24 sub plots (5' x 10'). Randomized complete Block Design (RCBD) was used for data analysis. In first year of the experiment, leaf rust of wheat was appeared in natural way. While in next year's season wheat crop, the experiment was artificially inoculated with wheat rust inoculum. Here the rust effected leaves from the other fields of wheat were collected and grinded. Then extract was passed through 4 ply muslim cloth and this extract includes spores of *P. recondita* were sprayed over the experiment for artificial inoculation. The leaf rust symptoms were appeared after 7 days interval. Then extract of *D. stramonium*, *A. indica*, *C. gigantea*, *N. odorum* were obtained. Here fresh leaves of all these 4 poisonous phanerogamic plants were taken. Aqueous extract was

prepared by macerating 50 gm of leaves in 100 ml of distilled water (1:2 ratio). The extract of each individual poisonous phanerogamic plant's leaves was passed through 4 ply muslim cloth and then sprayed over the respective treatment by Knapsack sprayer. Thoroughly washed knapsack sprayer should be used for each treatment. Three consecutive sprays with the interval of 7 days were done alongwith Benlate @ 2 gm/lit of water while last treatment did not sprayed which considered as control. Disease incidence data were recorded after seven days of each spray. The data recorded were analysed statistically and significant results were found. *Datura*, *Neem*, *Akk* and *Knair* have 81.67, 60.64, 48.38, 38.32% decrease of disease incidence respectively in the first year and 81.81, 56.96, 45.45 and 40.60% decrease of disease incidence respectively, in the second year of the experiment.

Results

Poisonous phanerogamic plants have toxins in their extracts by nature. When these extract are sprayed over the diseased crop inhibit the productivity of the fungus spores of *P. recondita*, and fungus do not reproduced and multiplied and ultimately reduce disease incidence. *Datura*, *Neem* and *Akk* have more or less equal control over wheat rust. In first year the experiment's results, maximum control was achieved by Baytan has 0.98% disease incidence which is followed by *Datura*, *Neem*, *Akk* and *Knair* having 2.84, 6.10, 8.56 and 9.56% disease incidence respectively as compared to control which has 15.5% disease incidence. Similarly Baytan has 93.67% decrease of disease incidence over control and is followed by *Datura*, *Neem*, *Akk* and *Knair* having 81.67, 60.64, 48.38 and 38.32% decrease of disease incidence over control. In the next year of the experiment again Baytan a fungicide gave maximum control over the leaf rust of wheat which is 2.5% and it is followed by *Datura*, *Neem*, *Akk* and *Knair* having 3.0, 7.10, 9.0 and 9.80% disease incidence respectively. Whereas in control 16.5% disease incidence were recorded. Similarly Baytan has 84.84% decrease over control which is followed by *Datura*, *Neem*, *Akk* and *Knair* having 81.81, 56.96, 45.45 and 40.60% decrease of disease

Table 1: Effect of Baytan and poisonous phanerogamic plants extract on the wheat rust

Sr. No.	Treatments	1st year of experiment		2nd year of experiment	
		Disease incidence in %age	%age decrease of disease over control	Disease incidence in %age	%age decrease of disease over control
T1	Baytan	0.98a	93.67	2.5a	84.84
T2	<i>Datura (Datura stramonium)</i>	2.84b	81.67	3.0ab	81.81
T3	<i>Neem (Azadirachta indica)</i>	6.10c	60.64	7.1c	56.96
T4	<i>Akk (Calotropis gigantea)</i>	8.56c	48.38	9.0c	45.45
T5	<i>Knair (Narium odorum)</i>	9.56c	38.32	9.8c	40.60
T6	Control	15.50d	-	16.5d	-

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incidence over control respectively.

Discussion

Leaf extract of poisonous phanerogamic plants effectively controlled the wheat rust of fungi. Percentage decrease of disease incidence over control by *Datura stramonium* is 81.81% while decrease of disease incidence by Baytan is 84.84% the most effective fungicide against the wheat rust disease. So far the control of *Puccinia reconditais* concerned the poisonous phanerogamic plants, leaves extract can be used instead of fungicide which will not only save the foreign exchange but cheapest way to control the leaf rust of wheat.

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