

RELATIVE FIELD SUSCEPTIBILITY OF RICE VARIETIES TO INFESTATION BY THE RICE LEAF ROLLER

CNAPHALOCROCIS MEDINALIS GUENEE

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The importance of pest resistant or tolerant varieties of crops in integrated systems of pest management is fully recognised. Rice leaf roller *Cnaphalocrocis medinalis* is a major pest of rice in India. The information available on the relative susceptibility of different rice varieties to infestation by *C. medinalis* is very meagre. (Veluswamy *et al.*, 1973) The present paper reports results of field experiments undertaken to assess the relative susceptibility of different varieties of rice to infestation by *C. medinalis*

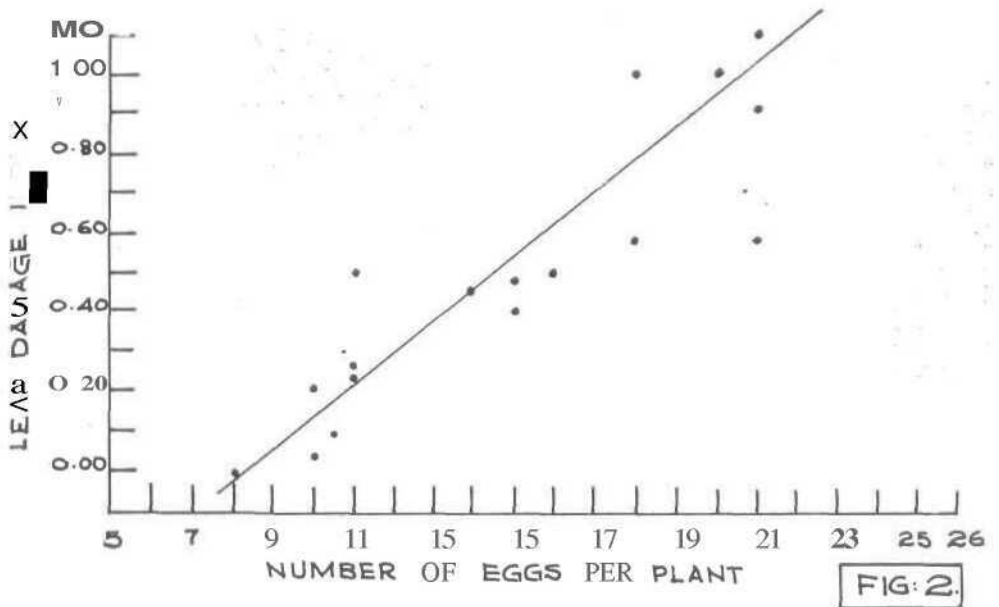
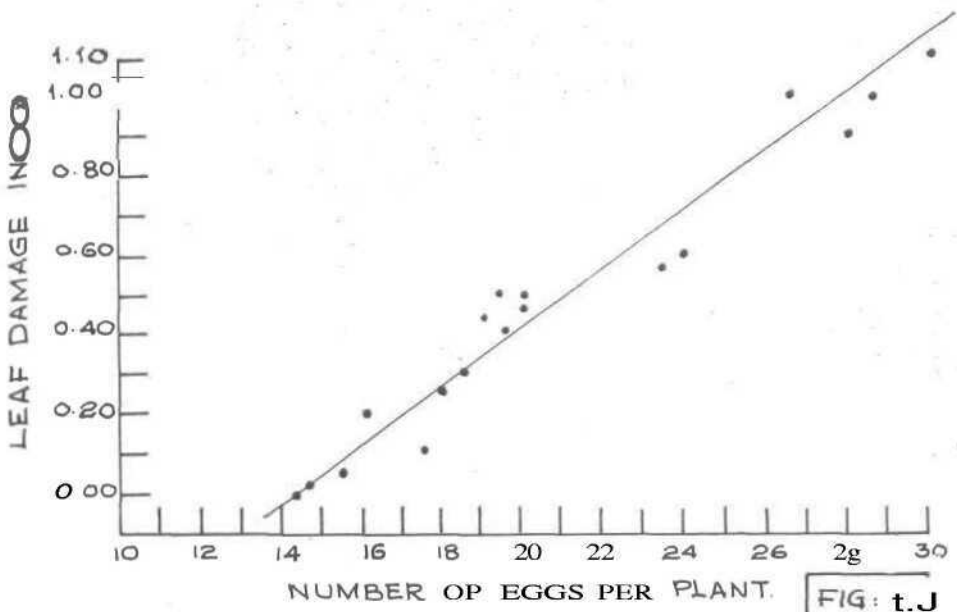
Materials and Methods

Eighteen varieties of rice (vide Table 1) were used in these experiments. Relative susceptibility of these varieties to leaf roller infestation was determined in terms of the number of eggs laid on them and the leaf damage caused by the larvae.

The relative susceptibility of different varieties of rice to oviposition by moths of *C. medinalis* was assessed by exposing the plants to the moths at two stages viz one month after sowing and at boot-leaf stage. The plants required for oviposition were planted in soil in 90 x 80 mm specimen tubes retaining 12 leaves in each. The tubes with the plants were arranged at random in a cage, $< 1 \times 1.5$, m, made of angle iron frames and covered with mosquito net clothing and fifty 3 day old moths released in the cage. Cotton swabs soaked in diluted honey were provided in the cage as feed for the moths. At the end of 48 hours the tillers were removed from the cage and the number of eggs present on each variety counted. Separate experiments were undertaken for the two stages of plants.

To assess the leaf damage in field the different varieties were grown in 5 x 3 m plots adopting a Randomised Block Design. The time of planting was so adjusted that all the varieties came to the boot-leaf stage simultaneously. At the late boot-leaf stage, when leaf injury caused by the caterpillars is at its peak, the plants were cut and brought to the laboratory. The total number of leaves in each plot were then counted and rated under 5 categories based on the extent of leaf damage noted. These categories were N_0, N_1, N_2, N_3 and N_4 , corresponding to 0, 0 to 25, 25 to 50, 50 to 75 and 75 to 100 percent leaf damage respectively. From these data indices were calculated for various plots using the formula I (index) = $N_0 \times 0 + N_1 \times 1 + N_2 \times 2 + N_3 \times 3 + N_4 \times 4 / N_0 + N_1 + N_2 + N_3 + N_4$. These indices were then statistically analysed for assessing the variations in the extent of leaf injury in different varieties.

FIELD SUSCEPTIBILITY OF RICE VARIETIES TO LEAF ROLLER



Scatter diagram showing correlation between the mean number of eggs laid by moths of *C. medinalis* on different rice varieties and the leaf damage caused by the caterpillars to those varieties in field.

Fig. 1- At one month old stage of the crop

Fig. 2. At boot leaf stage

Results and Discussion

The results are presented in Table 1. There was considerable variations in the mean number of eggs laid on different rice varieties. The number varied from 4.33 to 30.66 on one-month old plants and from 8 to 21 on plants at boot-leaf stage. The relative preference for oviposition was more or less identical in both the stages of the crop. At one month old stage the minimum number of eggs were seen on Kochuvithu. It was followed in the ascending order by TKM6, TKM1, Adt27, Ptb9, Pankaj, Triveni, H4, Cavery, TR20 and Aswathi, there being no significant difference among these varieties. Karuna, Jagannath, Annapoorna, Rohini, Mashoori, Jaya and IR8 may be considered as the preferred varieties.

The variety Kochuvithu, TKM6, TKM1, Ptb9, Adt27, Pankaj, Triveni, IR20, H4, Cavery, Aswathi, Karuna, Annapoorna and Jagannath showed the least leaf damage and they did not differ significantly among themselves. IR8 suffered the maximum leaf damage and it was closely followed by Jaya, Rohini and Mashoori with reference to their susceptibility and these did not differ significantly among themselves.

Figures 1 and 2 represent correlation between leaf damage indices and egg load of different varieties of rice. It is seen that in general these two were closely related. The varieties which suffered greater leaf damage in field were those preferred for oviposition and vice-versa. Thus preference shown by the moths to some varieties for oviposition appears to render them more susceptible than others. Non-preference has however.

Table 1
Mean indices of leaf damage caused by *C. medinalis* to different rice varieties and the number of eggs laid on them by the moths

Ricevarieties	Indices of leaf damage	Mean number of eggs per plant	
		At one month old stage	At boot-leaf stage
TKM	1.1363	30.66	21.00
Karuna	0.5038	20.33	16.00
IR20	0.3996	19.66	15.00
Pankaj	0.2649	18.33	11.00
H4	0.4535	19.00	14.00
Rohini	0.9977	26.66	20.00
Aswalhi	0.4885	20.00	15.00
Triveni	0.2772	18.66	11.00
Jaya	0.9955	98.66	18.00
Annapoorna	0.5717	24.33	21.00
Cavery	0.4883	19.66	11.00
Mashuri	0.8910	98.33	21.00
Adt27	0.2203	16.33	10.00
TKM6	0.0154	14.66	8.00
Jagannath	0.5760	23.66	18.00
PTB9	0.1118	17.66	10.66
TKM1	0.0552	15.66	10.00
Kochuvithu	0.0127	14.33	8.00
C. D.	0.78	5.88	8.79

been recognised as an important factor of resistance by some Workers (Pathak, 1971) since such non-preferred varieties usually escape infestation or develop less infestation in field.

Summary

Eighteen varieties of paddy were screened for their relative susceptibility to infestation by *Cnaphalocrocismedinalis*. The cviposition response of the different varieties varied significantly. The varieties could be ranked in the following ascending order with reference to the extent of preference: Kochuvithu, TKM6, TKM1, Adt27, Ptb9, Pankaj, Triveni, H4, Cavery, IR20, Aswathi, Karuna, Jagannath, Annapoorna, Rohini, Mashoori Jaya and IR8. Based on the extent of leaf damage caused by the larvae, Kochuvithu ranked as the least susceptible variety followed by TKM6, TKM1, Ptb9, Adt 27, Pankaj, Triveni, IR20, Cavery, Aswathi, Karuna, Annapoorna and Jagannath there being no significant difference among themselves. IR8, Jaya, Rohini and Mashoori were most susceptible. Based on the extent of leaf damage caused by the larvae Kochuvithu ranked as the least susceptible variety followed by TKM6, TKM1, Ptb9, Adt 27, Pankaj, Triveni, IR20, H4, Cavery, Aswathi, Karuna, Annapoorna and Jagannath, there be ing no significant difference among themselves. Susceptibility of the riec varieties to damage by leaf roller in the field was positively correlated with the number of eggs laid on them.

സംഗ്രഹം

പതിനെട്ട് ഇനം നെൽചെടികൾക്ക് ഓലച്ചുട്ടിപ്പുഴുവിന്റെ ബാധയ്ക്കു എത്ര വിധേയത്വം (ശീലത) എന്നെ പാടത്തു നടത്തിയ ചില പരീക്ഷണങ്ങൾകൊണ്ടു നിർണ്ണയിച്ചു. വിവിധ ഇനം ചെടികളിൽ ഓലച്ചുട്ടി പുഴുക്കൾ വിവിധ തോതിലാണു മുട്ടകൾ നിക്ഷേപിച്ചതു്. ഏറ്റവും കുറവു മുട്ടകൾ കണ്ടതു് കൊച്ചുവിത്തിലാണു്. ആരോഹണ ക്രമത്തിൽ മുട്ടകൾ നിക്ഷേപിക്കപ്പെട്ട *fnOOICT* *SBCo അനുക്രമം: റി. കെ. എം. 6, റി. കെ. എം. 1, എ. ഡി. റി. 27, പി. റി. ബി. 9, പങ്കജ്, ത്രിവേണി, എച്ച് 4, കാവേരി, ഐ. ആർ. 20, അശ്വതി, കരുണ, ജഗ്നാഥ്, അന്നപൂർണ്ണ, രോഹിണി, മധുരി, ജയ, ഐ. ആർ. 8, എന്നിവയാണു്. പുഴുക്കൾ മുലമുള്ള ഇലനാശം ഏറ്റവും കുറവു കണ്ടതു് കൊച്ചുവിത്തിലാണു്. റി. കെ. എം. 6, റി. കെ. എം. 1, പി. റി. ബി. 9, എ. ഡി. റി. 27, പങ്കജ്, ത്രിവേണി, ഐ. ആർ. 20, എച്ച് 4, കാവേരി, അശ്വതി, കരുണ, അന്നപൂർണ്ണ, ജഗ്നാഥ് എന്നീ ഇനങ്ങളും ശീലതയുടെ കാര്യത്തിൽ കൊച്ചുവിത്തിനോടുത്തായിരുന്നു. ജയ, ഐ. ആർ. 8 എന്നിവയ്ക്കു പുഴുക്കൾ മുലം ഗണ്യമായ ഇലനാശം സംഭവിച്ചു. വിവിധ ഇനം ചെടികൾക്കു പാടത്തു ഓലച്ചുട്ടി പുഴുക്കൾ ഉണ്ടാക്കിയ ഇലനാശവും മുട്ടകളുടെ എണ്ണവും തമ്മിൽ ഗണനീയമായ ധനസഹസംബന്ധമുണ്ടു്.

ശീലത = susceptibility ധനസഹസംബന്ധം — positive correlation

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(M.S received: 1-4-1974)