

Field reaction of some Jute (*Corchorus* spp.) varieties to yellow mite, *Polyphagotarsonemus latus* Banks

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Abstract

Field reaction of eight popular jute varieties of West Bengal, India viz. JRO-524, JRO-632, JRO-878, JRO-7835, JRC-212, JRC-321, JRC-4444 and JRC-7447 was observed against yellow mite, *Polyphagotarsonemus latus* Banks. Among the olitorius varieties, JRO-7835 was found to be tolerant to yellow mite with minimum 7.82 % leaf infestation. Minimum number of mites per leaf was also recorded to be 13.22 in this variety. The variety JRO-632 was found to be the moderately susceptible with 10.90 % leaf infestation and 18.99 numbers of mites per leaf. On the other hand, the capsularis varieties were found resistant to yellow mite with incidence range from 4.96% leaf infestation with 6.90 numbers of mites per leaf in var. JRC-4444 to 6.91% leaf infestation with 10.91 numbers of mites per leaf in the var. JRC-212. Correlation studies of the plant characteristics of different jute varieties with the incidence of yellow mite revealed that plant height, number of leaves per plant, leaf area and moisture content of leaves had positive significant effect on the incidence of the pest. However, leaf thickness and chlorophyll content of leaves had no effect on the incidence of yellow mite.

INTRODUCTION

Jute is the most important fibre crop next to cotton. Two species of jute viz. *Corchorus olitorius* and *Corchorus capsularis* are cultivated widely in one million hectares of land in India. The crop mainly grown in Eastern India during the summer season. Both the species are attacked by number of insect and mite pests throughout their growing season. Among the pest complex of jute, yellow mite, *Polyphagotarsonemus latus* Banks. (*P. latus*) is considered as one of the major pest of the crop^[1]. Though a good number of varieties under both the species are developed but very few are gaining popularity among the farmers. The cultivated varieties are not equally attacked by various pests. The inherent varietal characteristics renders resistance/tolerant or susceptibility against a particular pest. Several works have been conducted to evaluate jute germplasms against some major pests. However, in the changing scenario of pests management programme, there is need to evaluate the resistant/tolerant varieties against the prevailing pests. Considering the fact, eight popular jute varieties from both *Olitorius* and *Capsularis* spp. were taken to screen out for their resistance/tolerance against yellow mite and to observe any relation of mite incidence with the plant characteristics of the varieties.

MATERIALS AND METHODS

Experiment was conducted in a RBD during *Pre-kharif* to *kharif* (March to August) season, 2005 and 2006 at Block "C" farm of Bidhan Chandra Krishi Viswavidyalaya, West Bengal, India. Four popular *olitorius* jute varieties such as JRO 524, JRO 632, JRO 878, JRO 7835 and four of *capsularis* jute varieties viz. JRC-212, JRC 321, JRC 4444 and JRC 7447 were grown in 2m X 2m plot size replicating thrice each. The crop was allowed for natural incidence of mite. Insect pests like *Anomis sabulifera*, *Spilarectia obliqua* and *Mylokerus discolor* were controlled by mechanical destruction as and when appeared. Mite incidence was recorded in terms of per cent plant and leaf infestation and number of mites per leaf at weekly intervals starting from ten days after germination till harvest of the crop. Observations on the

number of plants and leaves infested by mite were recorded from randomly selected ten plants in each plot. Then based on the total number of plants per plot percent plant infestation was calculated. Similarly, based on top ten leaves of the selected plants (total 100 leaves) percent leaf infestation was worked out. After harvesting and retting in normal procedure fiber yield was recorded in q/ha. Plant characteristics such as plant height, number of leaves per plant, leaf area, leaf thickness and moisture and chlorophyll content of leaves of all the varieties were recorded at three different growth stages i.e. 50, 80 and 110 days after sowing.

Data obtained on the pest incidence and fiber yield were statistically analysed. Correlation of mite incidence with the plant characteristics was worked out to see the relative tolerance/susceptibility of the respective variety.

RESULTS AND DISCUSSION

Field screening of eight popular jute varieties was conducted against the yellow mite, *Polyphagotarsonemus latus* Banks. in the year 2005 and 2006. Among the olitorius varieties, the highest plant damage was recorded in var. JRO-632 with 21.35 per cent plant infestation followed by the varieties JRO-878, JRO-7835 and JRO-524 with 19.47, 19.21 and 18.21 per cent, respectively (Table1). The maximum number of mite/leaf was also found to be 18.99 in the var. JRO-632 and considered as susceptible to yellow mite. Being tolerant to mite infestation the var. JRO-524 gave maximum fibre yield of 28.42 q/ha. On the other hand all the capsularis varieties showed less than 10 per cent plant infestation with lesser number of mites per leaf and therefore considered as resistant to the pest. Considering the per cent plant infestation, the varietal preference to yellow mite can be ranked as JRO-632 > JRO-878 > JRO-524 > JRO-7835 > JRC-212 > JRC-7447 > JRC-321 > JRC-4444. Hath^[2] ranked the varieties tested as JRO-7835 > JRO-632 > JRO-524 > JRC-7447 > JRC-212 > JRC-321 with regard to yellow mite preference. The variety JRO-7835 was found to be moderately resistant while JRO-878 and JRO-524 were moderately susceptible but JRO-632 was highly susceptible to yellow mite. The response of a variety to a

Table 1. Field reaction of different jute varieties against yellow mite, *Polyphagotarsonemus latus*

Variety	Per cent infestation		Mean no. of mites leaf ⁻¹	Fibre yield (q ha ⁻¹)
	Plant	Leaf		
JRO-524	18.21	9.29	14.80	28.42
JRO-632	21.35	10.90	18.99	26.00
JRO-878	19.47	9.11	15.32	24.24
JRO-7835	17.21	7.82	13.22	24.56
JRC-212	9.80	6.91	10.91	21.11
JRC-321	9.16	5.41	8.23	18.39
JRC-4444	7.93	4.96	6.90	17.88
JRC-7447	9.40	6.22	8.80	18.19
SEm ±	0.84	0.49	1.03	2.58
CD(p=0.05)	2.53	1.47	3.09	7.72

Data are pooled mean of two years experiment

Table 2. Correlation of mite (*P. latus*) incidence with the plant characteristics of different jute varieties Banks.

Variety	Plant infestation (%)	Plant characteristics					
		Plant height (cm)	No. of leaves/plant	Leaf area (cm ²)	Leaf thickness (µm)	Moisture content (%)	Chlorophyll content (mg/g)
JRO-524	18.21	170.38	20.78	70.44	140.05	81.99	1.508
JRO-632	21.35	171.47	21.00	68.16	126.57	80.56	1.312
JRO-878	19.47	165.62	20.60	63.94	143.65	81.80	1.216
JRO-7835	17.21	166.99	20.71	73.10	130.11	79.45	1.640
JRC-212	9.80	158.65	19.05	67.67	131.05	76.52	1.214
JRC-321	9.16	162.69	18.68	53.85	135.92	76.48	1.358
JRC-4444	7.93	163.73	19.12	56.60	123.45	76.42	1.306
JRC-7447	9.40	159.66	19.87	63.72	131.39	76.85	1.250
SEm ±	0.84	2.57	0.86	1.23	2.14	1.58	0.06
Correlation coefficient (r)		0.758*	0.819*	0.708*	0.204 NS	0.809*	0.229 NS

* = Significant, NS= Non-significant, Plant characteristics are pooled mean of two years observations at three different growth stages

particular pest greatly vary depending on local situation, surrounding crop scenario, season, date of sowing, soil and climatic factors. Das and Pathak^[3] reported that JRO-524 was least susceptible to yellow mite amongst the ten olitorius varieties tested. Mahapatra^[4] categorized 52 olitorius germplasms as moderately resistant (9.36-19.73 %), susceptible (20.07-29.07 %) and highly susceptible (30.04-45.08 %) against *P. latus* based on the percent plant infestation as shown in parenthesis followed

by the category name. Das and Choudhury^[5] reported that out of 14 olitorius germplasms JRO-524 and CO-32 were least susceptible while CO-14 was highly susceptible to yellow mite.

The correlation of the mite incidence with the plant characteristics showed that plant height, number of leaves/plant, leaf area and moisture content of leaves had significant positive relationship (table2). While leaf thickness and chlorophyll

content of leaves did not show any significant role on the incidence of yellow mite.

CONCLUSION

Among the olitorius jute varieties JRO-524 was found tolerant against *P. latus* and also producing highest fibre yield. Hence this variety may be grown in mite endemic areas. As all the capsularis varieties tested are found resistant against *P. latus*, they can also be grown for white jute cultivation.

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