Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; 7(5): 365-367
Received: 07-07-2018
Accepted: 09-08-2018

NE Jayewar
Ph.D. Scholar and Assistant Professor Department of Agril.Entomology, VNMKV, Parbhani, Maharashtra, India

BB Bhosle
Associate Dean,College of Agriculture, Latur, VNMKV, Parbhani, Maharashtra, India

PR Zanwar
Head Department of Agril. Entomology, VNMKV, Parbhani, Maharashtra, India

Correspondence
NE Jayewar
Ph.D. Scholar and Assistant Professor Department of Agril.Entomology, VNMKV, Parbhani, Maharashtra, India

Chilli hybrids reaction to biotic stress with special reference to thrips

NE Jayewar, BB Bhosle and PR Zanwar

Abstract
A field experiment to screen eleven commonly grown hybrids was conducted during *Kharif* season of the year 2016 and 2017 agaist thrips to identify source of resistance at the Research Farm of Department of Agricultural Entomology, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani. The experiment was laid out using two sets of same eleven hybrids each one under protected condition and another in unprotected condition in Randomized Block Design with spacing of 6.75 X 45 cm^2. Results obtained in the present investigation shows that chilli hybrids, Arka Khyati and Sitara recorded low population of thrips. Whereas Green gold recorded highest densities of thrips in both the seasons.

Keywords: Chilli, hybrids and thrips

Introduction
Chilli, (*Capsicum annuum* L) is one of the most popular and highly remunerative vegetable crops grown in most parts of the world, *viz.*, China, Spain, Mexico, Romania, Yugoslavia, Bulgaria, USA, India, Europe and Central & South America and are the major countries of capsicum production. In India, it is intensively cultivated in Karnataka, Maharashtra, Tamil Nadu, Himachal Pradesh and hilly areas of Uttar Pradesh. (Anon., 2011 and Anon., 2012a) [2, 3]. In Maharashtra State, major green chilli growing districts in the order of decreasing area and production are Nagpur, Jalgaon, Nashik, Nanded, Nandurbar, Palghar, Pune, Jalana, Aurangabad and Amaravati with an area of 99.50 thousand ha, annual production of 45.60 thousand tonnes and the productivity was 0.46 t/ha, which is quite low when compared with national (1.93 t/ha) and global (1.86 t/ha) average. (Geetha and Selvarani, 2017) [6].

The major reason which attributes to low productivity of chilli is infestation of insect pests and diseases. Among the different insect pests of chilli, thrips is the dominant one which can cause 50 to 90 per cent yield loss (Borah, 1987, Varadharajan, 1994 and Patel and Gupta 1998) [5, 15, 11]. The symptoms of chilli leaf curl caused by feeding injury of thrips was described by Amin (1979), which is locally known as "*Kokada*" or "*Churda murda*" in Maharashtra State. It multiplies appreciably at a faster rate during dry weather periods and causes a yield loss. Because of high pest pressure on chilli, farmers resort to frequent applications of insecticides of different group which leads to resistance development in insects and increase cost of cultivation enormously, making cultivation of chilli crop highly risky. It is therefore imperative to resort to alternative pest management strategies such as use of resistant varieties (Babu *et al*., 2002) [4].

In this context, to minimise pesticide uses; present experiment was planned to screen commonly grown hybrids of chilli against thrips to identify resistant sources.

Materials and Methods
The field experiments were conducted during *Kharif* season of the year 2016 and 2017 to screen eleven different hybrids for thrips resistance at the Research Farm of Department of Agricultural Entomology, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani on well drained deep black cotton soil with medium fertility and uniform in level. The depth of soil varied from 2 to 3 meters**.** The experiment was laid out using two sets i.e. smilar eleven hybrids but one under protected condition and another in unprotected condition in Randomized Block Design with spacing of 6.75 X 45 cm^2, with all other recommended crop mangment practices.

The details of hybrids of chilli used for study are given in Table 1.

Table 1: Hybrids used for screening studies

S. No.	Hybrids
1	Arch-930
2	Garima
3	Green gold
4	KSP-1194
5	Sitara
6	Teja-4
7	Amulya
8	Arka Khyati(H)
9	Arka Meghana(H)
10	Tokita
11	Pragati

Five randomly selected plants have been tagged in each hybrid. Incidence of thrips have been recorded from five terminal leaves in both protected and unprotected plot (Pathipati *et al.* 2012) [12]. The yield data was recorded from both unprotected and protected condition to know the percent yield losses due to pest.

Statistical analysis

Categorisation of entries as per AICRP Method

The live population count data of pest was transformed to √x +0.5 values The values thus obtained were analyzed for testing the significance of difference between two means by "Analysis of variance" and finally following formulae were used for various estimations

1. Standard error for treatment mean: S. Em. ± = EMsr
2. Critical difference: C. D. = S. Em. X √2 x t

Where,

Ems = Error means sum of square

r = Number of replication

t ='t' value at 5% probability level

The entries were categorized as:

HR = values < mean – CD at 1%.

R = values between mean – CD at 1% & mean – CD at 5%.

MR = values between mean – CD at 5% & mean

LR = values between mean & mean + CD at 5%

S = values between mean + CD at 5% and mean + CD at 1%

HS = values > mean + CD at 1%.

Results and Discussion

Screening of commonly grown varieties and hybrids of chilli

In the present studies an attempt was made to screen 11 chilli hybrids for their reaction to thrips under field conditions during 2016 and 2017. The performance of the hybrids was assessed based on pest population counts recorded by them using as AICRP to obtain precise and reliable results. The results obtained from the studies are presented in Tables 2.

Categorisation of varieties and hybrids of chilli using AICRP method

Eleven chilli hybrids were screened against chilli thrips during 2016 and 2017. Data indicated that chilli hybrid Arka Khyati recorded low population of all pests followed by Sitara which were at par with each other. Whereas, Greengold recorded highest densities of all pests. Hybrids Arch-930 and Sitara showed moderately resistant reaction against thrips. Hybrids Garima and Pragati also recorded moderately resistant reaction against all thrips. Chilli hybrids Arka Meghana and Tokita were moderately resistant to thrips. Hybrids *viz.*, Green gold, KSP-1194, Amulya and Teja -4 were low resistant to thrips.

Table 2: Screening of chilli hybrids against pests during 2016 and 2017

Hybrids	Thrips/leaf			
	2016	2017	Mean	C
T_1-Arch-930	3.18(1.92)	3.86(2.09)	3.52(2.00)	MR
T_2-Garima	3.28(1.94)	3.92(2.10)	3.60(2.02)	MR
T_3-Green Gold	5.54(2.46)	6.67(2.68)	6.11(2.57)	LR
T_4-KSP-1194	5.84(2.52)	7.11(2.76)	6.48(2.64)	LR
T_5-Sitara	2.72(1.79)	3.43(1.98)	3.07(1.89)	MR
T_6-Teja-4	3.86(2.09)	4.98(2.34)	4.42(2.22)	LR
T_7-Amulya	3.92(2.10)	5.02(2.35)	4.47(2.23)	LR
T_8-Arka Khyati	2.28(1.67)	3.02(1.88)	2.65(1.77)	MR
T_9-Arka Meghana	3.42(1.98)	4.42(2.22)	3.92(2.10)	MR
T_{10} -Tokita	3.58(2.02)	4.68(2.28)	4.13(2.15)	MR
T_{11} -Pragati	3.38(1.97)	4.02(2.13)	3.70(2.05)	MR
S.Em.±	0.13	0.15	0.13	
C.D. at 5%	0.39	0.45	0.39	
C.V. (%)	10.61	11.01	10.57	

Resistant (R), Moderately resistant (MR), Low resistant (LR), Susceptible (S). Figures in parenthesis are √ X + 0.5 transformed values

The present results are in partial agreement with earlier researchers like Kaur *et al.* (2010) reported that, three entries (EC-391082, PBC-613 and NIC-23906) were found resistant, four entries (EC-305593, EC-378633, EC-391090 and IC-214992) were moderately resistant and three entries (EC-378634, IC-214990 and NIC-23897) were tolerant to thrips leaf curl. They also reported that to mites leaf curl, it was observed that five accessions (EC-378630, EC-378633, EC-391082, IC-214991 and NIC-23897) were found as resistant with less than 1% disease while the incidence ranged from 2.1 to 5.2% in rest of the entries. However, one exotic entry, EC-391082, a paprika type was found to be resistant to the leaf curl caused by both thrips and mites. Borah (1987) [5] reported that out of 58 genotypes of chilli, Musalwadi selection, K-3435 and IC- 24343 were found promising against thrips, whereas, 20-6, 434-10, 530, Sindhur, BR-Red, Perinal, Manajawan, Nerli, K-3430 and Byadagi were severely damaged. The genotype Musalwadi selection was also observed to be least susceptible to mites. Lingeri *et al*. (1998) indicated that lowest population of thrips was observed in resistant variety GPC-80, while it was highest in Byadagi. Rai *et al*. (2009) reported the lowest thrips population on PDC-24 (0.2/plant) and highest in LCA-235 (6.6/plant) on chilli crop. Singh *et al*. (1998) stated that among seven varieties of chilli screened against aphids, whitefly, thrips and leaf curl virus, Pusa Sadabahar, Pant C-2 and Jawahar Mirch–218 were

found best. Babu *et al*. (2002) [4] who observed lowest thrips in EC-391090 (4.2/25 buds) and the highest population was recorded in IC-214991 (13.2/25 buds). Kulkarni *et al.* (2011) reported promising genotypes with resistant reaction to thrips were IC 324894, Pant C-1, DCA-7, DCA- 11, DCA-40 and Arka Lohit to both thrips and mites.

Conclusion

On the basis of results obtained in the present investigation the following recommendation / conclusion can be withdrawn. In chilli hybrids, Arka Khyati and Sitara recorded low population of thrips. Green gold recorded highest densities of thrips.

However, these findings are based upon two years studies and for confirmation and validation of results further studies are necessary.

References

1. Amin PW. Leaf curl disease of chilli peppers in Maharashtra, India. PANS. 1979; 25:131-134.
2. Anonymous, 2011. http://www.ikisan.com
3. Anonymous, 2012a. http://www.agricultureinformation.com
4. Babu BS, Pandravada SR, Reddy KJ, Varaprasad KS, Sreekanth M. Field screening of pepper germplasm for sources of resistance against leaf curlcaused by thrips (*Scirtothrips dorsalis* Hood) and mites (*Polyphagotarsonemus latus* Banks). Indian J of Pl. Protec. 2002; 30(1):7-12.
5. Borah DC. Bio ecology of *Polyphagotarsonemus latus* (Banks) (Acari; Tarsonemidae) and *Scirtothrips dorsalis* Hood (*Thysanoptera*: Thripidae) infesting chilli and their natural enemies. Ph.D. Thesis, U.A. S., Dharwad, 1987, 74.
6. Geetha R, Selvarani K. A study of chilli production and export from India, 2017, IJARIIE. 2017; 3(2):205-210.
7. Kaur Sandeep MS, Dhaliwal DS, Cheema, Abhishek Sharma. Screening of chilli germplasm for resistance against chilli thrips and yellow mite. Journal of Research. 2010; 47(3&4):143-144.
8. Kulkarni SK, Gasti VD, Mulge R, Madalageri MB, Kulkarni MS, Shirol AM. Reaction of chilli genotypes against mites, *Polyphagotarsonemus latus* (Banks) and thrips, *Scirtothrips dorsalis* (Hood) under natural conditions. Karnataka J. Agri. Sci. 2011; 24(2):258-259.
9. Lingeri MS. Evaluation of advanced chilli lines for the reaction of *P. latus* (Banks) (Acari: Tarsonemidae) and *S. dorsalis* (Hood) (Thysanoptera: Thripidae). M. Sc. (Agri.) *Thesis*, UAS, Dharwad, Karnataka, 1998.
10. Lingeri MS, Awaknavar JS, Kulkarni KA, Lingappa S, Madalageri BB. Screening of chilli germplasm against *Polyphagotarsonemus latus* (Banks) and *S. dorsalis* Hood. Karnataka J of A. Sci. 1998; 11(1):39-44.
11. Patel VN, Gupta HCL. Investigations into the causes of leaf curl of chillies in Rajasthan. Indian J Appl. Ent. 1992; 6**:**1-3.
12. Pathipati VL, Lakshmi TV, Ramana CV, Kumari SS, Naidu LN. Evaluation of certain new acaricides/insecticides for the management of chilli mite in Andhra Pradesh. Pest Mngt. in Horti. Eco. 2012; 18(1):111-113.
13. Rai AB, Satpathy S, Gracy RG, Swamy TMS. Some approaches in management of sucking pests on chilli with special reference to Tarsonemidmite, *P. latus* Bank. J Vegetable Sci. 2009; 36(3):297-303.
14. Singh UC, Singh R, Wagaich KN. Reaction of some promising chilli varieties against major insect pests and leaf curl disease. Indian J Ent. 1998; 60(2):181-183.
15. Varadharajan S. Studies on host plant resistance and biology of chilli thrips, *Scirtothrips dorsalis* Hood. M. Sc. (Agri.) thesis submitted to A. U.A., Tamil Nadu (India), 1994, 57.