Biological Forum – An International Journal **15(9): 897-901(2023)**

ISSN No. (Print): 0975-1130
ISSN No. (Online): 2249-3239

Bio-efficacy of Newer Acaricides and Botanical against Red Spider Mite, *Tetranychus urticae* Koch. in Brinjal

Rahul Patidar[1], G.S. Chundawat[2], Sanju Singh[3], Swarna Kurmi[4*] and Neelesh Raipuriya[1]
[1]Teaching Faculty, Department of Entomology,
R.V.S.K.V.V, College of Agriculture, Indore (Madhya Pradesh), India.
[2]Senior Scientist & Head, Krishi Vigyan Kendra, Mandsaur (Madhya Pradesh), India.
[3]Department of Entomology, College of agriculture, JNKVV Jabalpur (Madhya Pradesh), India.
[4]Department of Plant Pathology, College of agriculture, JNKVV Jabalpur (Madhya Pradesh), India.

(Corresponding author: Swarna Kurmi)*
(Received: 07 July 2023; Revised: 04 August 2023; Accepted: 06 September 2023; Published: 15 September 2023)
(Published by Research Trend)

ABSTRACT: Field studies were undertaken at K.V.K Research Farm, Mandsaur, M.P. to study the Bio-efficacy of newer Acaricides and Botanical against red spider mite during 2020-2021. During the course of investigation Spiromesifen 22.90 % SC @ 400 ml/ha found most effective treatment and it recorded the lowest (2.74) adults followed by Fenazaquin 10 % SC @ 400 ml/ha (3.16) and Fenpropathrin 30 % EC @ 250 ml/ha (3.56) but superior to control (12.25) during both years. The data of percentage increase in yield over untreated control obtained with application of Spiromesifen 22.90 % SC @ 400 ml/ha recorded the highest 34.42 % increase over untreated control. Selection of specific acaricides for the control of red spider mites is difficulties, so that these studies are helpful for the selection of acaricides in Malwa region for the control of red spider mites.

Keywords: Red Spider Mite, Brinjal, Bio-efficacy and Acaricides.

INTRODUCTION

Brinjal, scientifically known as *Solanum melongena* (L.), holds immense importance as a vegetable in South-East Asia, where hot and humid climates are prevalent. It falls under the Solanaceae family and is highly valued for its rich nutritional content, including vitamins, proteins, minerals, and carbohydrates. Eggplant is the fifth most economically important solanaceous crop after potato, tomato, pepper, and tobacco (Taheri *et. al*. 2017). Brinjal is renowned in Ayurveda for its medicinal properties, making it beneficial for diabetic patients and those suffering from liver complaints. India, being the world's second-largest vegetable producer after China, cultivates brinjal across 7,27,000 hectares, yielding a production of 12,680 MT and a productivity rate of 17.5 tons per hectare. In Madhya Pradesh alone, brinjal cultivation spans 51,350 hectares, resulting in a production of 1,073.63 MT and a productivity rate of 20.91 tons per hectare (as per Horticulture statistics at a glance 2019).

However, the successful cultivation of brinjal faces significant threats from various pests and diseases. One of the primary arthropod pests affecting brinjal is the red spider mite, scientifically known as *Tetranychus urticae* Koch, (Ghosh and Hasan 2021) posing a major threat alongside the fruit and shoot borer. These mites, belonging to the sub-class Acari and the class Arachnida, are minute organisms found in diverse biotic and abiotic habitats. They are associated with field crops, vegetables, fruits, ornamental and forest plants, as well as different stored grain products (Pritchard and Baker 1955). In terms of their feeding behaviour, mites are categorized into phytophagous, parasitic, and predatory types. Phytophagous mites, especially *T. urticae*, can destroy 18-22 cells per minute during the feeding process. Continuous feeding results in a stippled, bleached effect on leaves, which later turn yellow, grey, or bronze. In the case of sever infestation the death of plants occurs (Jeppson *et. al*. 1975). If left uncontrolled, these mites can cause complete defoliation. When their population densities are high, they are found on both sides of leaves, producing abundant webbing where eggs, larvae, nymphs, and adults are attached. Given their significance as a major threat to agri-horticulture, understanding their bio-ecology and exploring host plant resistance in available brinjal germplasms is crucial.

Spider mites reproduce rapidly and can quickly become harmful in favorable conditions. Many experiments have aimed to control them, but they've developed resistance to pesticides, making control challenging. Chemical methods leave residues, pollute the environment, and harm humans and non-target organisms. Research now focuses on finding non-chemical alternatives (Kirisik *et. al.* 2020).

MATERIALS AND METHODS

A field experiment was conducted in the research farm of Krishi Vigyan Kendra, Mandsur M.P under the aegis

of RVSKVV Agricultural University, Gwalior during 2020-21 to evaluate Bio-efficacy of newer Acaricides and Botanical against red spider mite. The acaricidal treatments will be applied with the help of Knapsack sprayer. The first spray of respective acaricides will be applied on the appearance of mite and second spray after 15 days of first spray. For recording observations on mites, three leaves (upper, middle and lower) will be selected from 5 randomly selected plants. The mite population will record in leaf bit 4.0 cm_2 (2.0 × 2.0 cm). The observations on mite will be made before first spray as well as at 3, 7, 10 and 14 after each spray.

Treatment code	Name of Acaricides/ Insecticides	a.i. (gm)	Formulation (ml)
T1	Fenazaquin10 % EC	40	400
T2	Dicofol 18.5 % EC	250	1350
T3	Fenpropathrin 30 % EC	75	250
T4	Flufenzine 20 % SC	80	400
T5	Spiromesifen 22.90 % SC	96	400
T6	Propargite 57 % EC	570	1000
T7	Azadirachtin 0.15 % EC	1.87	1250
T8	Control (water spray)	-	-

RESULTS AND DISCUSSION

***Kharif*, 2020**: The pre-treatment population of red spider mite T. urticae was ranging between 7.22 to 9.81 mites per 2×2 cm^2 leaf bit. Three days after application of different treatments, the red spider mite population was lowest in Spiromesifen 22.90 % SC (3.31 mites/2×2 cm^2 leaf bit) (Table 1). This was statistically significant and at par with Fenazaquin10 % EC, Fenpropathrin 30 % EC and Flufenzine 20 % SC (3.91, 3.88 and 4.72 mites/2×2 cm^2 leaf bit, respectively), while the maximum spider mite population was recorded in Control (7.58 mites/2×2 cm^2 leaf bit). Further, seven days after application of first spray the maximum reduction in spider mite was recorded in the treatment Spiromesifen 22.90 % SC (1.92 mites/2×2 cm^2 leaf bit), it was found statistically significant and at par with Fenazaquin10 % EC, Fenpropathrin 30 % EC and Flufenzine 20 % SC, however the maximum red spider mite population was recorded in Control plot (9.14 mites/2×2 cm^2 leaf bit). The data was same trends follow in Ten and Fourteen DAS the highest reduction in red spider mite population was recorded in Spiromesifen 22.90 % SC (2.18 and 2.68 mites/2×2 cm^2 leaf bit, respectively) and it was found statistically superior over the rest of the treatments. The highest red spider mite population was however recorded in control (9.40 and 9.96 mites/2×2 cm^2 leaf bit, respectively). Likewise, three days after second spray, the spider mite was lowest in the treatment Spiromesifen 22.90 % SC (2.21 mites/2×2 cm^2 leaf bit) and it was found statistically superior over rest of the treatments accept Fenazaquin10 % EC, Fenpropathrin 30 % EC, however, the highest spider mite population was noticed in Control plot (10.08 mites/2×2 cm^2 leaf bit). Seven Days after the application of second spray, the red spider mite population was lowest in Spiromesifen 22.90 % SC (2.05 mites/2×2 cm^2 leaf bit). Further, ten and fourteen DAS of second spray the lowest red spider mite population was noticed in case of treatment Spiromesifen 22.90 % SC (2.30 and 2.56 mites/2×2 cm^2 leaf bit, respectively), while the highest red spider mite population was however recorded in control (11.65 and 11.45 mites/2×2 cm^2 leaf bit) in both data.

***Kharif*, 2021**: The pre-treatment population of red spider mite T. urticae was ranging between 6.30 to 7.21 mites per 2×2 cm^2 leaf bit. Three days after application of different treatments, the red spider mite population was lowest in Spiromesifen 22.90 % SC (2.25 mites/2×2 cm^2 leaf bit) (Table 2). This was statistically significant and at par with Fenazaquin10 % EC, Fenpropathrin 30 % EC and Flufenzine 20 % SC (2.44, 2.64 and 3.34 mites/2×2 cm^2 leaf bit, respectively), while the maximum spider mite population was recorded in Control (6.48 mites/2×2 cm^2 leaf bit). Further, seven days after application of first spray the maximum reduction in spider mite was recorded in the treatment Spiromesifen 22.90 % SC (1.42 mites/2×2 cm^2 leaf bit), it was found statistically significant and at par with Fenazaquin10 % EC, Fenpropathrin 30 % EC and Flufenzine 20 % SC, however the maximum red spider mite population was recorded in Control plot (7.08 mites/2×2 cm^2 leaf bit). The data was same trends follow in Ten and Fourteen DAS the highest reduction in red spider mite population was recorded in Spiromesifen 22.90 % SC (1.60 and 2.19 mites/2×2 cm^2 leaf bit, respectively) and it was found statistically superior over the rest of the treatments. The highest red spider mite population was however recorded in control (7.12 and 7.89 mites/2×2 cm^2 leaf bit, respectively). Likewise, three days after second spray, the spider mite was lowest in the treatment Spiromesifen 22.90 % SC (1.82 mites/2×2 cm^2 leaf bit) and it was found statistically superior over rest of the treatments accept Fenazaquin10 % EC, Fenpropathrin 30 % EC, however, the highest spider mite population was noticed in Control plot (9.27 mites/2×2 cm^2 leaf bit). Seven Days after the application of second spray, the red spider mite population was lowest in Spiromesifen 22.90 % SC (1.78 mites/2×2 cm^2 leaf bit). Further, ten and fourteen DAS of second spray the lowest red spider mite population was noticed in case of treatment Spiromesifen 22.90 % SC (1.92 and 2.18 mites/2×2 cm^2 leaf bit, respectively), while the highest red spider mite population was however recorded in control (10.32 and 10.01 mites/2×2 cm^2 leaf bit) in both data.

Table 1: Bio-efficacy of newer acaricides on adults of red spider mites infesting brinjal during *Kharif*, 2020.

T. c.	Name of Acaricides/ Insecticides	Dosage (ml/ha)	Before	No. of Adults stages /2x2 cm² leaf bit (Days after spray)										Fruit yield T/ha
				First Spray					Second Spray					
				3	7	10	14	Pooled	3	7	10	14	Pooled	
T_1	Fenazaquin 10 % EC	400	8.47 (2.98)	3.91 (2.07)	2.21 (1.61)	2.38 (1.66)	3.02 (1.84)	2.88 (1.82)	2.34 (1.67)	2.32 (1.66)	2.85 (1.81)	2.73 (1.78)	2.56 (1.73)	22.93
T_2	Dicofol 18.5 % EC	1350	8.41 (2.97)	4.90 (2.32)	3.63 (2.03)	4.02 (2.12)	4.65 (2.26)	4.30 (2.19)	4.08 (2.13)	4.01 (2.12)	4.38 (2.20)	4.82 (2.30)	4.32 (2.19)	19.00
T_3	Fenpropathrin 30 % EC	250	8.89 (3.06)	3.88 (2.09)	2.84 (1.82)	3.05 (1.88)	3.40 (1.96)	3.29 (1.94)	2.67 (1.75)	2.56 (1.72)	3.26 (1.92)	3.12 (1.89)	2.90 (1.82)	22.43
T_4	Flufenzine 20 % SC	400	9.13 (3.10)	4.72 (2.28)	3.51 (2.00)	3.74 (2.06)	4.27 (2.18)	4.06 (2.13)	3.61 (2.02)	3.49 (1.99)	3.84 (2.08)	4.43 (2.22)	3.84 (2.08)	21.23
T_5	Spiromesifen 22.90 % SC	400	9.81 (3.20)	3.31 (1.95)	1.92 (1.54)	2.18 (1.62)	2.69 (1.78)	2.53 (1.73)	2.21 (1.64)	2.05 (1.59)	2.30 (1.66)	2.56 (1.74)	2.28 (1.66)	23.70
T_6	Propargite 57% EC	1000	8.85 (3.03)	4.92 (2.33)	3.60 (2.01)	3.90 (2.08)	4.51 (2.23)	4.23 (2.17)	3.93 (2.10)	3.80 (2.07)	4.07 (2.13)	4.64 (2.26)	4.11 (2.14)	19.83
T_7	Azadirachtin 0.15 % EC	1250	7.22 (2.76)	5.48 (2.44)	4.08 (2.13)	4.44 (2.21)	5.12 (2.36)	4.78 (2.30)	4.65 (2.26)	4.17 (2.16)	4.80 (2.29)	5.66 (2.47)	4.82 (2.30)	18.50
T_8	Control	-	7.58 (2.83)	8.58 (3.01)	9.14 (3.1)	9.40 (3.15)	9.96 (3.23)	9.27 (3.12)	10.08 (3.25)	10.90 (3.38)	11.65 (3.49)	11.45 (3.46)	11.02 (3.39)	15.50
S.Em (±)			**0.18**	**0.12**	**0.13**	**0.14**	**0.13**	**0.10**	**0.13**	**0.13**	**0.14**	**0.13**	**0.13**	**1.44**
C.D. at 5%			**NS**	**0.36**	**0.40**	**0.42**	**0.40**	**0.29**	**0.40**	**0.41**	**0.41**	**0.41**	**0.38**	**4.37**

Table 2:Bio-efficacy of newer acaricides on adults of red spider mites infesting brinjal during *Kharif*, 2021.

T. C.	Name of Acaricides/ Insecticides	Dosage (ml/ha)	Before	No. of adults /2×2 cm² leaf bit (Days after spray)										Fruit yield T/ha
				First Spray					Second Spray					
				3	7	10	14	Pooled	3	7	10	14	Pooled	
T_1	Fenazaquin 10 % EC	400	6.90 (2.70)	2.44 (1.71)	1.60 (1.44)	2.02 (1.58)	2.60 (1.75)	2.16 (1.63)	2.11 (1.61)	2.07 (1.60)	2.22 (1.65)	2.38 (1.67)	2.19 (1.64)	23.80
T_2	Dicofol 18.5 % EC	1350	6.88 (2.70)	3.53 (2.00)	2.49 (1.72)	2.90 (1.84)	3.47 (1.99)	3.10 (1.89)	3.25 (1.93)	3.16 (1.91)	3.42 (1.98)	4.29 (2.18)	3.53 (2.01)	19.43
T_3	Fenpropathrin 30 % EC	250	7.21 (2.77)	2.64 (1.77)	1.80 (1.51)	1.99 (1.58)	2.69 (1.79)	2.28 (1.67)	2.31 (1.67)	2.22 (1.64)	2.41 (1.70)	2.74 (1.79)	2.40 (1.70)	23.17
T_4	Flufenzine 20 % SC	400	7.08 (2.75)	3.34 (1.96)	2.29 (1.67)	2.60 (1.76)	3.37 (1.95)	2.90 (1.84)	2.98 (1.85)	2.90 (1.83)	3.13 (1.89)	3.79 (2.06)	3.20 (1.92)	22.00
T_5	Spiromesifen 22.90 % SC	400	7.08 (2.73)	2.25 (1.61)	1.42 (1.36)	1.60 (1.43)	2.19 (1.61)	1.86 (1.51)	1.82 (1.50)	1.78 (1.49)	1.92 (1.54)	2.18 (1.63)	1.93 (1.54)	24.53
T_6	Propargite 57% EC	1000	6.92 (2.72)	3.44 (1.98)	2.35 (1.68)	2.74 (1.78)	3.38 (1.96)	2.98 (1.86)	3.19 (1.9)	3.01 (1.87)	3.36 (1.94)	3.92 (2.10)	3.37 (1.97)	20.07
T_7	Azadirachtin 0.15 % EC	1250	6.50 (2.63)	3.89 (2.09)	3.22 (1.93)	3.46 (1.99)	3.94 (2.11)	3.63 (2.03)	3.74 (2.06)	3.67 (2.04)	3.95 (2.11)	4.65 (2.27)	4.00 (2.12)	19.07
T_8	Control	-	6.30 (2.59)	6.48 (2.64)	7.08 (2.75)	7.12 (2.76)	7.89 (2.90)	7.14 (2.76)	9.27 (3.12)	10.42 (3.3)	10.32 (3.29)	10.01 (3.24)	10.01 (3.24)	16.13
S.Em (±)			**0.20**	**0.12**	**0.10**	**0.10**	**0.11**	**0.09**	**0.11**	**0.10**	**0.11**	**0.13**	**0.07**	**1.45**
C.D. at 5%			**NS**	**0.36**	**0.31**	**0.32**	**0.34**	**0.29**	**0.35**	**0.31**	**0.35**	**0.39**	**0.22**	**4.39**

Table 3: Bio-efficacy of newer acaricides on adults of red spider mites infesting brinjal (Pooled over years).

T. c.	Name of Acaricides/ Insecticides	Dosage (ml/ha)	No. of adults /2x2 cm² leaf bit				Yield (Tonnes/Ha)	
			2020	2021	Pooled	% reduction over control	Pooled data	% increase over UTC
T_1	Fenazaquin 10 % EC	400	2.72 (1.78)	2.18 (1.63)	2.45 (1.71)	73.83	23.37	32.31
T_2	Dicofol 18.5 % EC	1350	4.31 (2.19)	3.31 (1.95)	3.81 (2.08)	59.27	19.22	17.69
T_3	Fenpropathrin 30 % EC	250	3.10 (1.89)	2.35 (1.68)	2.72 (1.79)	70.90	22.80	30.63
T_4	Flufenzine 20 % SC	400	3.95 (2.11)	3.05 (1.88)	3.50 (2.00)	62.59	21.62	26.83
T_5	Spiromesifen 22.90 % SC	400	2.40 (1.70)	1.89 (1.53)	2.15 (1.62)	77.04	24.12	34.42
T_6	Propargite 57% EC	1000	4.17 (2.16)	3.17 (1.91)	3.67 (2.04)	60.77	19.95	20.72
T_7	Azadirachtin 0.15 % EC	1250	4.80 (2.3)	3.81 (2.08)	4.31 (2.19)	53.98	18.78	15.79
T_8	Control	-	10.14 (3.26)	8.58 (3.01)	9.36 (3.14)	—	15.82	—
S.Em (±)			**0.11**	**0.08**	**0.06**		**1.42**	
C.D. at 5%			**0.33**	**0.24**	**0.19**		**4.30**	

Pooled over years (2020 & 2021). The data on pooled over years (Table 3) revealed that all the treatments were superior to control. Spiromesifen 22.90 % SC @ 400 ml/ha found most effective treatment and it recorded the lowest no. of adults (2.74 adults/2×2 cm^2 leaf bit) followed by Fenazaquin 10 % SC @ 400 ml/ha (3.16) and Fenpropathrin 30 % EC @ 250 ml/ha (3.56). Rest of treatments were at par to each other and secondary superior to control plot (12.25 adults/2×2 cm^2 leaf bit). The per cent reduction in adults of red spider mite over control was also calculated and presented in Table 3. The higher population reduction in Spiromesifen 22.90 % SC @ 400 ml/ha was (77.66 %) followed by Fenazaquin 10 % SC @ 400 ml/ha (74.20 %) and Fenpropathrin 30 % EC @ 250 ml/ha (70.95 %). The lowest percent reduction was Azadirachtin 0.15 % EC (53.78 %) over control. These finding aggregate with Singh *et al.* (2020); Meghana (2018); Baladhiya *et al.* (2018); Randhawa *et al.* (2020). Sultan and Kanditas (2019), Bretschneider *et al.* (2003); Kavitha *et al.* (2006); Varghese and Mathew (2013) reported spiromesifen was highly effective to eggs, immature stages and adults of red spider mite. Wale *et al.* (2010) revealed that fenazaquin 10 EC (150g a.i./ha) was found most effective for the control of mites on okra. Singh (2021) reported that the maximum efficacy was obtained from fenazaquin @ 0.20 ml/ l (0.50 mites/ leaf). Amjad *et al.* (2012) found that chlorfenapyr 36 SC was the most effective followed by fenazaquin 10 EC and propergite 57 EC while dicofol 18.5 EC was least effective. Fenazaquin 10 EC at 125 and 150 g/ha a.i. caused the highest reduction in numbers of mites in pot culture and field experiments, Sangeetha and Ramaraju (2013). Kavya *et al*. (2015) also observed spiromesifen (1.05 mites/leaf) reduced the overall mite population more significantly than other acaricide. Fenpropathrin 30 % EC was effective control of red spider mite, Sumedha *et al.* (2019). Vasanthakumar *et al.* (2013) provided with Azter (azadirachtin 0.15% EC) treated leaves for egg-laying, the numbers of eggs laid were significantly lower than that on untreated control leaves.

Fruit yield of brinjal. The data on the pooled fruit yield and percentage increase in yield over untreated control of brinjal are presented in the Table no.3. The yield of brinjal in all insecticide treatment recorded higher yield as campare to untreated check. Among all the treatment, Spiromesifen 22.90 % SC @ 400 ml/ha recorded maximum yield (24.12 q/ha) and significantly superior treatment followed by Fenazaquin 10 % SC @ 400 ml/ha (23.37 q/ha) and Fenpropathrin 30 % EC @ 250 ml/ha (23.37 q/ha). The treatment with Flufenzine 20 % EC @ 400 ml/ha, Propargite 57% EC @ 1000 ml/ha, Dicofol 18.5 % EC @ 1350 ml/ha and Azadirachtin 0.15 % EC @ 1250 ml/ha were the order of yield and noted 21.62, 19.95, 19.22 and 18.78 q/ha yield respectively. Untreated check recorded minimum yield 15.82 q/ha.

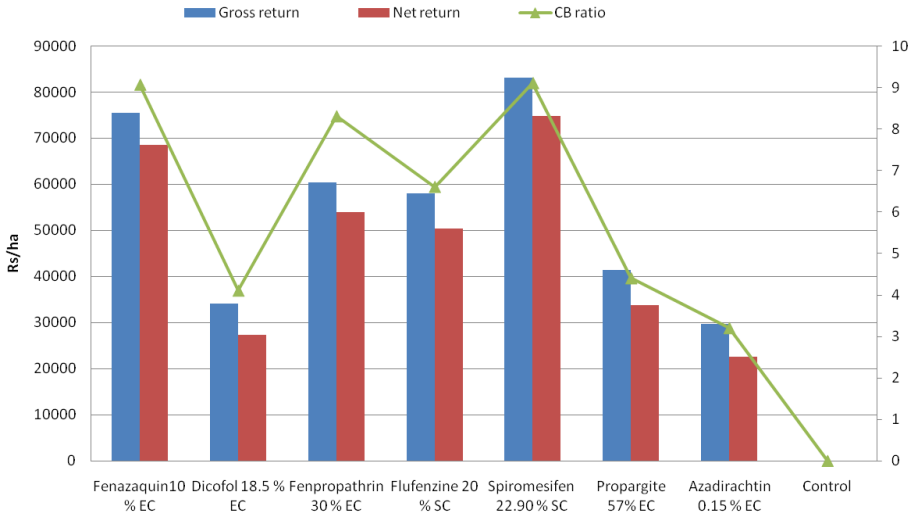

Fig. 1 GR, NR and CB ratio of increase yield over control.

The data of percentage increase in yield over untreated control obtained with respect to fruit yield revealed that, application of Spiromesifen 22.90 % SC @ 400 ml/ha recorded the highest 34.42 % increase over untreated control. This was followed by Fenazaquin 10 % SC @ 400 ml/ha, Fenpropathrin 30 % EC @ 250 ml/ha, Flufenzine 20 % EC @ 400 ml/ha, Propargite 57% EC @ 1000 ml/ha, Dicofol 18.5 % EC @ 1350 ml/ha and Azadirachtin 0.15 % EC @ 1250 ml/ha were recorded (32.31, 30.63, 26.83, 20.72, 17.69 and 15.79 %) yield increase over untreated control. These finding more or less similar, Shukla *et al.* (2017); Kavya *et al.* (2015).

CONCLUSIONS

The efficacy of different acaricides was tested against red spider mite, T. urticae infesting brinjal under the field conditions. Among all the available acaricides, the treatment comprise with Spiromesifen 22.90 % SC @ 400 ml/ha was found most superior and higher marketable fruit yield of brinjal and it was followed by Fenazaquin 10 % SC @ 400 ml/ha and Fenpropathrin 30 % EC @ 250 ml/ha.

FUTURE SCOPE

Further scope for experiment can be carried the farmer must be used effective acaricides with appropriate dose for the control of red spider mites specially in Malwa region of M.P.

Acknowledgements. Authors are highly grateful to the Senior Scientist & Head, Krishi Vigyan Kendra, Mandsaur (M.P.) for providing necessary technical and financial support.
Conflict of Interest. None.

REFERENCES

Amjad, M. Bashir, M. H., Gogi, M. D., Aslam, M., Zia, K., Khan, M. A. and Ali, L. (2012). Evaluation of some acaricides against two spotted spider mite, *Tetranychus urticae* Koch (Acari: Tetranychidae) on cotton crop under laboratory and field conditions. *Pakistan Entomologist, 34*(2), 125-129.

Baladhiya, H. C., Patel, N. B., Joshi, V. I. and Acharya, R. R. (2018). Bio-efficacy of Spiromesifen 22.9 SC against Brinjal Mite, *Tetranychus urticae* Koch. *Int.J.Curr.Microbiol.App.Sci., 7*(7), 1650-1656.

Bretschneider, T., Buchhol, B.J., Fischer, R. and Nauen, R. (2003). Spirodiclofen and Spiromesifen – novel acaricidal and insecticidal tetronic acid derivatives with a new mode of action. *Crop Prot. Res*., *57*, 697–701.

Ghosh, S.K. and Hasan, W. (2021) Red Spider Mite (*Tetranychus urticae* Koch) Infestation on Brinjal/Eggplant (*Solanum melongena* L.) and Environmental Sustainability. Researchgate, 299-320.

Jeppson, L. R., Keifer, H. H. and Baker, E. W. (1975) Mites Injurious to Economic Plants. University of California Press. 614 p.

Kavitha, J., Kuttalam, S. and Chandrasekaran, S. (2006). Evaluation of Spiromesifen 240 SC against chilli mite, *Polyphagotarsonemus latus* (Banks). *Ann. Pl. Protec. Sci., 14*(1), 52-55.

Kavya, M.K., Srinivasa, N., Vidyashree, A. S. and Ravi, G.B. (2015). Bioefficacy of newer acaricides against two spotted Spider mite, *tetranychus urticae* and phytoseiid Predator, *neoseiulus longispinosus* on brinjal under Field condition. *Plant Archives,* (15)*1*, 493-497.

Kirisik. M., Erler, F., Boyaci, F. and Bayram, Y. (2020) Evaluation of resistance in 16 eggplant genotypes to the two-spotted spider mite, Tetranychus urticae Koch (Acari: Tetranychidae). Phytoparasitica, *49*(2), 275-285.

Pritchard, A. E. and Baker, E. W. (1955) A Revision of the Spider Mite Family Tetranychidae. San Francisco Pacific Coast Entomological Society, *2*, 1955. 472 p

Randhawa, H. S., Kau, P. and Damanpreet (2020). Bioefficacy of oberon 22.9% (spiromesifen) against red spider mite, *Tetranychus urticae* koch in okra and effect on its natural enemies. *Journal of Entomology and Zoology Studies*, *8*(2), 1740-1743.

Sangeetha, S. and Ramaraju, K. (2013). Relative toxicity of fenazaquin against two spotted spider mites on okra, *International Journal of Vegetable Science, 19*(3), 282-293.

Shukla, A., Radadia, G. G. and Hadiya, G. D. (2017). Estimation if loss due to two spotted Spider mite, *Tetranychus urticae* Koch (Acari: Tetranychidae) infesting brinjal. *Int. J. Curr. Microbiol. App. Sci*., *6*(9), 2145-2150.

Singh, J. (2021). Efficacy of acaricides against phytophagous mites in apple. *Indian Journal of Entomology Online published Ref. No*. e20339.

Singh, R. H., Paramjit, K. and Damanpreet (2020). Bioefficacy of oberon 22.9% (spiromesifen) against red spider mite, *Tetranychus urticae* koch in okra and effect on its natural enemies. *Journal of entomology and zoology studies. semanticscholar*. Corpus ID: 221130264.

Sultan, C. and Kandiltas, B. G. (2019). Toxicity of spiromesifen on different developmental stages of two-spotted spider mite, *Tetranychus urticae* Koch (Acari: Tetranychidae). *Persian J. Acarol*., *8*(1), 57–68.

Sumedha, J.S., Kakad M.N. and Lande, G.K. (2019). Effect of biopesticides with new generation insecticides against red spider mites on brinjal. Journal of Entomology and Zoology Studies, *7*(4), 525-528.

Taher, D., Solberg, S., Prohens, J., Chou. Y. Y., Rakha, M. and Wu, T. H. (2017) World Vegetable Center Eggplant Collection: Origin, Composition, Seed Dissemination and Utilization in Breeding. Front. Plant Sci., REVIEW article. 8.

Varghese, T. S. and Mathew, T. B. (2013). Bioefficacy and safety evaluation of newer insecticides and acaricides against chilli thrips and mites. *J. of Tropical Agric., 51*(1-2), 111-115.

Vasanthakumar, D., Babu, A., Shanmugapriyan, Rajagopalan and Subramaniam, S. R. (2013). Impact of Azter (azadirachtin 0.15% EC), a neem-based pesticide, against tea red spider mite, Oligonychus coffeae Neitner (Acarina: Tetranychidae), and its natural enemies. *International Journal of Acarology*, *39*(2), 140-145.

Wale, S. D., Kadu, R. V., Landge, S. A. and Handele, A. G. (2010). Evaluation of magister (fenazaquin 10 EC) against mites on okra. *Bioinfolet., 7*(4), 230-234.

How to cite this article: Rahul Patidar, G.S. Chundawat, Sanju Singh, Swarna Kurmi and Neelesh Raipuriya (2023). Bio-efficacy of Newer Acaricides and Botanical against Red Spider Mite, *Tetranychus urticae* Koch. in Brinjal. *Biological Forum – An International Journal, 15*(9): 897-901.