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Short Communication

OVICIDAL PERFORMANCE OF CERTAIN ACARICIDES AGAINST SPIDER MITES, *TETRANYCHUS URTICAE* KOCH ON OKRA

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Mite menace on various vegetable crops has been reported by many workers (Singh, 1992, 1994 & 1995; Patel *et al*., 1993). The two spotted mite (TSM), *Tetranychus urticae* Koch attacks wide range of agricultural and horticultural crops including several vegetable crops in India (Singh, 1994 & 1995). The losses reported in vegetable production vary from 2 to 35% in eastern part of the India due to mites (Singh, 1995). The indiscriminate, large-scale and non-selective uses of pesticides produce adverse effects like resistance and resurgence of mite pests. Specific acaricide/acaro-insecticides are available in the market and being used for the control of mite pests on several crops. Some commonly used acaricides including propargite of recent origin alongwith and without sticker were evaluated under laboratory condition for their ovicidal action against which can be taken advantage in the management of spider mite in okra under agroclimatic condition of Varanasi region.

The acaricides tested under laboratory condition for their ovicidal action were propargite 57 EC, ethion 50 EC, propargite 57 EC + sticker (Dhanuvit) and sulphur 80% WP each at three different concentrations including untreated control (Table 1).

T. urticae adult mites initially collected from the vegetable grower field from summer sown okra crop were mass reared in laboratory (25 to 28°C temperature and 65% RH) on the fresh detached leaf kept on moist, cotton-pad in petri dishes. Old leaves were replaced with fresh okra leaves every alternate day. Ten adult female mites were placed on okra leaves for laying of eggs and as such 12 sets were prepared. After 24 hours, leaves were examined for the egg counts under stereo bionocular microscope for present study.

The acaricidal solutions of respective acaricides at test concentrations were prepared separately just before the application and replicated three times. Water was as control was also maintained in the experiment. Twenty five eggs were maintained on each detached leaves of okra. The leaf with eggs were sprayed with acaricides each at three different concentrations with the help of automizer to ensure complete wetting and allowed to shade dry. The treated leaves were placed up side down on moist cotton swab. The eggs on treated leaves were examined under stereo bionocular microscope. The unhatched eggs were considered unviable due to treatment effects. The data was recorded after every 8 hours interval i.e. 48, 56, 64 and 72 hours of treatments and corrected per cent egg mortality and hatchability was calculated.

T. urticae eggs were treated with propargite, propargite + (wetting agent) dhanuvit, ethion and sulphur at three different concentrations are presented in Table 1.

At 48 hours, the treatment of propargite showed 16.33, 14.67 and 14.00% ovicidal action and was comparable with the treatment of propargite + dhanuvit 17.33, 14.67 and 13.33% ovicidal action and significantly superior to eithion 14.67, 13.33 and 12.00% and sulphur 13.33, 12.00 and 10.67%. Among all acaricides, propargite with sticker (dhanuvit) showed maximum ovicidal action. Ovicidal action of propargite was comparable with ethion and sulphur is significantly superior to rest of the acaricides tested. The ovicidal action of different acaricide in descending order were propargite + dhanuvit > propargite > ehtion > sulphur.

At 56 hours, the treatment of propargite maintained its superiority giving best acaricide and it provide 53.33, 48.67 and 48.00% egg mortality and was comparable to that of sulphur and ethion. These acaricides showing their effectiveness in following order propargite > ethion > sulphur.

At 64 hours, propargite were highly effective giving 80.00, 77.33 and 77.33% mortality in three different concentrations, while the use of sticker enhanced ovicidal activity of propargite 85.33, 84.00 and 81.33%. The nest order of effectiveness was ethion and sulphur. All three acaricide were found statistically superior over control after 64 hours. The acaricides showed their effectiveness in fallowing descending

Table 1. Performance of acaricides on eggs and their hatchability of spider mites, *T. urticae*

Treatments	Conc. (%)	Mean per cent corrected mortality of eggs (hrs.)				Mean per cent corrected hatchability of eggs (hrs.)			
		48	56	64	72	48	56	64	72
Propargite (57 EC)	0.180	16.33*	53.33	80.00	93.33	0.00*	2.67	5.33	6.67
		(23.81)**	(46.89)	(63.44)	(75.00)	(0.00)**	(9.28)	(13.31)	(14.89)
	0.178	14.67	48.67	77.33	90.67	1.33	5.33	6.67	9.33
		(22.26)	(44.20)	(61.55)	(72.15)	(6.55)	(13.31)	(14.89)	(17.76)
	0.176	14.00	48.00	77.33	86.67	4.00	6.67	9.33	12.00
		(21.97)	(43.85)	(61.55)	(68.53)	(11.54)	(14.89)	(17.76)	(20.27)
Propargite + Dhanuvit (57 EC + 1 ml)	0.180	17.33	49.33	85.33	97.33	0.00	1.33	2.67	2.67
		(24.58)	(44.03)	(67.45)	(80.64)	(0.00)	(6.55)	(9.28)	(9.28)
	0.178	14.67	48.00	84.00	93.33	1.33	2.67	4.00	5.33
		(22.46)	(43.83)	(66.43)	(75.00)	(6.55)	(9.28)	(11.54)	(13.31)
	0.176	13.33	46.67	81.33	92.00	2.67	2.67	5.33	11.33
		(21.39)	(43.05)	(64.38)	(73.57)	(9.28)	(9.28)	(13.31)	(19.64)
Ethion (50 EC)	0.050	14.67	38.67	66.67	92.00	1.33	2.67	5.33	9.33
		(22.46)	(38.41)	(54.70)	(73.57)	(6.55)	(9.28)	(13.31)	(17.76)
	0.048	13.33	37.33	56.00	86.67	4.00	6.67	9.33	13.33
		(21.39)	(37.64)	(48.45)	(68.53)	(11.54)	(14.89)	(17.76)	(21.39)
	0.046	12.00	34.67	53.33	84.00	4.00	8.00	10.67	16.00
		(20.27)	(36.03)	(46.89)	(66.42)	(11.54)	(16.43)	(19.00)	(23.58)
Sulphur (80 WP)	0.25	13.33	41.33	76.00	90.67	2.67	5.33	5.33	9.33
		(21.39)	(39.99)	(60.67)	(72.15)	(9.28)	(13.31)	(13.31)	(17.76)
	0.248	12.00	36.00	72.00	86.67	4.00	6.67	9.33	13.33
		(20.27)	(36.87)	(58.05)	(68.53)	(11.54)	(14.89)	(17.76)	(21.39)
	0.246	10.67	32.00	65.33	80.00	5.33	8.00	14.67	18.67
		(19.00)	(34.43)	(53.91)	(63.44)	(13.31)	(16.43)	(22.46)	(25.55)
CD at 1%		7.97	12.27	1349	10.52	3.76	5.53	6.33	4.65

*Mean of three replication; 8**Figure in parentheses Arc Sine vPercentage transformation

order: propargite + dhanuvit > propargite > ethion > sulphur.

After 72 hours of treatment propargite proved to be highly effective exhibiting 93.33, 90.67 and 86.67% eggs mortality in three different concentrations. While the use of wetting agent, (dhanuvit) ovicidal efficacy of propargite in these concentrations increased cauding 97.33, 93.33 and 92.00% eggs mortality. The treatment of ethion caused 92.00, 86.67 and 84.00% eggs mortality and was comparable to that of sulphur treatment. Thus, propargite maintained its supremacy with rest of the acaricidal treatments. While when dhanuvit used as a spreader-sticker, it gives best results. Next order of effectiveness was ethion and sulphur. These acricides showed their effectiveness as ovicide in fallowing descending order : propargite + dhanuvit > propargite > ethion > sulphur and consequent low egg hatchability in these treatments (Table 1).

It is evident from the foregoing observation that propargite 57 EC + sticker (Dhanuvit) performed best as ovicide and consequent lest hatchability followed by propargite alone. Similarly Oliveira *et al*. (1997) also reported that propargite + spreader-sticker caused 95.6% mortality of spider mite, *T. urticae*. El-enany (1990) reported that propargite + juvenile hormone caused 90% eggs mortality of *T. urticae*. Ethiion has also been found effective against the eggs of T. macfarlanei (Kumar and Singh, 2005). In contrast to ethion, sulphur was found to be less effective as ovicide against.

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