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Management of yellow mite [*Polyphagotarsonemus latus* (Banks)] on Chilli (*Capsicum annum* Linn.)

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Abstract
The experiment was conducted during *rabi* 2020-2021 at agricultural land, Taluk: Kottarakara, dist.: Kollam, Kerala, India to observe the efficacy of certain chemicals and botanicals against yellow mite *Polyphagotarsonemus latus* (Banks) on Chilli. The results on reduction population show that Propargite 57% EC (68.32% and 82.47%) Hexythiazox 5.45% EC (59.22% and78.72%) was found effective against chilli mite during first and second spray respectively. Pongamia oil (50.61% and 68.38%) Neem oil (44.10% and 62.03%) was recorded as least effective but significant and superior over treatment control.

Keywords: *Capsicum annum*, chilli, management, *Polyphagotarsonemus latus*, spiromesifen, yellow mites

Introduction
Chilli is an important spice crop belonging to the genus Capsicum under the Solanaceae family is considered one of the commercial spice crops. Named a wonder spice, it is the most widely used universal spice. Different varieties of Chilli are cultivated for varied uses like vegetables, pickles, sauces and condiments. In daily life, chilliesare an integral ingredient in many different cuisines worldwide, adding spice, taste, flavor and colour to the dishes. It is an important vegetable and condiment crop grown throughout India. India is the largest consumer and exporter of Chilli globally, with a production of 13,76,000 tons from an area of 792,000 ha, and productivity is about 1.74 tonnes per ha. Andhra Pradesh is the largest producer of Chilli in India, contributing to about 44% of the total production, and West Bengal contributes about 7.26% (Sen *et al*., 2020) [10]. Capsaicin is an antioxidant having medicinal properties. It is grown in almost all the country, covering an area of 1.9 million hectares with a production of 29.9 million tons averaging productivity of 15.8 tonnes per ha. India is the foremost and highly erratic producer, consumer and exporter of Chilli, covering an area of 0.77 million hectares with a production of 0.659 million tons averaging productivity of 0.86 tons per ha. India is the largest exporter of Chilli globally and contributes one-fourth of the total quantity of Chilli exported globally. (Veena *et al*., 2017) [13]. A complex of more than 293 insect's pests associated with Chilli has been reported, among which sucking pests like thrips, mites and whiteflies are important ones. Leaf curl caused by mites and thrips is serious, and yield losses due to these two pests are estimated to be 50 per cent. Under favourable weather situations, the yield loss due to yellow mite alone may go up to 96.39 per cent, sometimes leading to complete crop failure. The study was conducted to evaluate both chemical and botanicals, and the results are presented herein.

Materials and Method
The investigation was carried out on the agricultural field, Kottarakara Taluk at Kollam district for 2020-21. The chemicals and botanicals *viz*. Nimbicidine, Neem oil, Pongamia oil, Hexythiazox 5.45% EC, Propargite 57% EC, Spiromesifen 22.9 SC, Fenzaquin 10%EC were used in the experiment against Yellow mite, *Polyphagotarsonemus latus*. The chilli variety "Ujjwala" was raised 45 x 45 cm spacing in a randomized block design (RBD) with eight treatments including control, each replicates thrice. The size of each plot was 2 m x 2m. Six weeks old seedlings were transplanted on 15.10.2020. All the recommended agronomic practices, i.e., fertilizer application, intercultural operation, proper irrigation and weeding operations, were practised thoroughly. Totally two rounds of foliar spray were applied at 15 days intervals. Mites were examined and recorded on the leaves of five selected and tagged plants, observations made on 3rd, 7th, 14th day after each spraying apart from pre-treatment count.

Results and Discussion

The results given in Table 1 shows that mean data on the percentage reduction on first and second spray revealed that all the treatments were significantly superior over control. Among all the treatments, higher efficiency, as well as the percentage reduction, was recorded in Propargite 57% EC (68.32% and 82.47%); these findings are in agreement with Varghese *et al.* (2013) [12], Prasad *et al.* (2017) [6], who reported the treatment was found more effective in reducing the mite population in Chilli which was followed by Hexythiazox 5.45% EC (59.22% and 78.72%) these findings are also supported by Mehta *et al.,* (2017) Bathani *et al.,* (2019) [1] along with it Fenzaquin 10% EC (53.01% and 73.15%) these findings are agreement with Sarkar *et al.,* (2013) [7], Sangle *et al.,* (2017) [9]. Spiromesifen 22.9SC (52.13% and 70.45%) these results held up by Samanta *et al.* (2017) [8], Gupta *et al.* (2020) and compared with each other treatment was statistically at par with each other. The treatments Pongamia oil (50.61% and 68.38%) these findings are held up by Krishnan *et al.* (2021) [4] similarly Neem oil (44.10% and 62.03%) these findings are agreement with Hossain *et al.* (2013) [3] Krishnan *et al.* (2021) [4] and Nimbicidine (41.86% and 60.65%) these findings supported by Siddesha *et al.,* (2021) [11].

Table 1: To evaluate the field efficacy of selected botanicals and chemicals against yellow mite *Polyphagotarsonemus latus* (Banks) on Chilli and their two consecutive sprays

Treatment symbols	Treatments	No. of mites/ five leaves 1DBS	% Population reduction of yellow mites – 1st Spray (After Spray)				No. of mites / five leaves 1DBS	% Population reduction of yellow mites – 2nd spray (After Spray)			
			3rd day	7th day	14th day	Mean (M1)		3rd day	7th day	14th day	Mean (M2)
T1	Nimbicidine	8.69	39.64	40.50	45.43	41.86	4.13	53.22	66.03	62.69	60.65
T2	Neem oil	8.73	40.43	43.42	48.46	44.10	4.22	55.33	66.47	64.29	62.03
T3	Pongamia oil	7.75	46.72	49.24	55.86	50.61	3.25	62.85	68.74	73.55	68.38
T4	Hexythiazox 5.45% EC	6.45	54.47	58.29	64.90	59.22	2.11	73.07	82.20	80.88	78.72
T5	Propargite 57% EC	5.64	62.39	69.30	73.26	68.32	2.01	77.13	83.46	86.82	82.47
T6	Spiromesife n 22.9SC	7.26	47.83	51.92	56.65	52.13	3.22	66.03	69.35	75.97	70.45
T7	Fenzaquin 10% EC	7.56	47.93	53.64	57.48	53.01	3.14	69.34	73.35	76.75	73.15
T0	Control	13.71	0.00	0.00	0.00	0.00	8.14	0.00	0.00	0.00	0.00
	Overall mean	8.22	42.42	45.78	50.25	46.15	3.77	57.12	63.7	65.11	61.98
	F-Test	NS	S	S	S	S	NS	S	S	S	S
	C. D. at 0.5%	4.61	4.04	2.89	4.33	3.36	4.007	3.96	4.77	4.83	4.68
	S.Ed (+)	1.91	1.88	1.35	2.01	1.568	1.868	1.84	2.22	2.25	2.18

Conclusion

The present findings' analysis showed that specific treatment like Propargite 57%EC followed by Hexythiazox 5.45% EC, Fenzaquin 10% EC Spiromesifen 22.9 SC promise good results along with botanicals against *Polyphagotarsomenus* latus Banks. Therefore, acaricides of short residual effect like Propargite, Hexythiazox may help devise proper integrated pest management strategy against yellow mites and investigation could be a part of integrated pest management in order to suppressed the pest emergence and balancing use of pesticide for ecofriendly management to balance flora and fauna from the eco system.

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