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EVALUATION OF SOME INSECTICIDES AND NEEM OIL AGAINST JASMINE BLOSSOM MIDGE

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ABSTRACT

A field experiment was conducted in Rameswaram island to study the effectiveness of certain insecticides and neem oil against blossom midge, **Contarinia** sp. which caused purple discolouration and drying of flower buds in **Jasminum sambac.** The results indicated that monocrotophos 0.1% was superior to other insecticides and neem oil in reducing the discolouration. Cypermethrin 0.012%, fenpropathrin 0.05%, fenvalerate 0.02%, chlorpyriphos, 0.05%, dimethoate 0.06% and neem oil 2% were moderately effective.

KEY WORDS : Blossom midge, Jasmine, Neem oil, Insecticides.

Gundumalli (*Jasminum sambac* Ait.) is an important commercial flower crop of Tamil Nadu. Flower production in Rameswaram island, around Mandapam and elsehwere in the State has for some years now been hit by the problem of purple discolouration and premature drying of flower buds. Field observations made at Notchiyurani and in Rameswaram island and laboratory studies conducted at the Agricultural Research Station, Paramakudi proved that the scourage was caused by the maggots of a midge later identified as the blossom midge *Contarinia* sp. (Diptera : Cecidomyiidae).

This seems to be the first record of *Contarinia* sp. occurring on *J. sambac* cv. Gundumalli in Tamil Nadu causing purple discolouration and drying of flower buds. In Andhra Pradesh, however, Thirumala Rao *et al.,* (1954) had earlier recorded the cecidomyiid on *J. sambac* as to have caused violet discolouration of petals and later identified the species as *Contarinia maculipennis* Felt (Thirumala Rao, 1955 ; Mani, 1973)probably on the idea that the cecidomyiid, which was reared on *J. sambac* (Fullaway, 1934) and described on *J. sambac,* tomato, egg plant, bitter melon, *Hibiscus, Brassica* and other in Hawaii (Jensen, 1946; Barnes, 1948), should have been the same species on *J. sambac* in India. Nevertheless, the present species could not be confirmed as *C. maculipenn* until adequate taxonomic studies are mad However it is more likely that this specie would probably be the same as th occurred in Andhra Pradesh, becau David (1958) had also recorded *maculipennis* Felt not on *J. sambac* but *J. auriculatus* Vahl. at Coimbatore in Tar Nadu where it produced no purp discolouration of petals but caus swelling at the base of corolla.

This paper reports on a field experime conducted to find out the effect of certa insecticides and neem oil on the midge.

MATERIALS AND METHODS

The trial was conducted in a farmer garden at Thangachimadam Rameswaram island during summer 198 Twelve treatments were included in tl randomized block design with thr replications. Each replication had fi bushes in each treatment. The me damage in the five bushes was taken as replication mean of a particular treatme All the flower buds were removed bef treatment. The granules were appli around the bush before irrigation. T chemicals were sprayed to a level of run- with hand-operated knapsack spray upon the formation of green flower b using a spray fluid enough to s

ants. Neem oil was mixed with teepol efore diluting in water. The percentage of iscolouration was recorded before eatment, one and two weeks after spray by ounting the total number of flower buds id discoloured buds in each bush. As the ccurrence of red spider mite *Tetranychus innabarinus* Boisduval was noticed two eeks after the spray, the mite population as recorded by counting the total number f mites on three leaves, (top, middle and ottom) from the five plants in each eatment. The data on per cent iscolouration were transformed into ngular values, while $\sqrt{x + 0.5}$ transforma-on was adopted for red spider mite opulation for statistical analysis.

ESULTS AND DISCUSSION

The pretreatment occurrence of purple iscolouration was statistically uniform in all eatments and the treatments showed gnificant differences after the spray(Table 1). ne mean percentage of discolouration was gnificantly the lowest on bushes treated ith monocrotophos 0.1% with only 2.62 er cent discoloured buds as against 18.33 er cent on the control bushes. The next best in effectiveness were synthetic pyrethroids, namely, cypemethrin 0.012% fenpropathrin 0.05% and fenvalerate 0.02% followed by chlorpyriphos 0.05% dimethoate 0.06% and neem oil 2%. Neem oil and chlorpyriphos were as effective as monocrotophos one week after the spray, while cypermethrin and fenpropathrin were on par with monocrotophos two weeks after the spray. Neem oil might have acted as an ovipositional repellant for it had significantly reduced the oviposition by brown planthopper *Nilaparvata lugens* (Stal) in rice (Velusamy *et al.*, 1987). However, since it was observed in the present trial as having caused general paleness of the leaves two weeks after the treatment, it could not be recommended on *J. sambac*. Earlier Thirumala Rao *et al.*, (1954) reported that parathion 0.025% was better than BHC, lindane and aldrin in controlling the midge. Methyl parathion, endosulfan, BPMC and carbofuran granules were also moderately effective in reducing the discolouration.

The results also indicated that most of the chemicals, except monocrotophos, dimethoate and carbofuran, were prone to

ıblo 1. Effect of insecticides and neem oil on Contarinia sp. (percentage of discoloured flower-Mean of three replications)

ıteatments	Before spray	Weeks after spray		Mean
		One Week	two Weeks	
lethyl parathion 0.1%	20.06 (26.39) a	6.97 (15.30) bc	6.53 (14.88) cd	6.75 (15.09) cd
imethoate 0.06%	18.70 (25.56) a	6.22 (14.41) bc	5.41 (13.43) c	5.82 (13.92) bcd
ndosulfan 0.1%	18.52 (25.43) a	8.25 (16.61) c	7.89 (16.28) d	8.02 (16.45) d
lonocrotophos 0.1%	19.83 (26.30) a	3.54 (10.53) a	1.70 (7.38) a	2.62 (8.95) a
hlorpyriphos 0.05%	20.69 (26.98) a	5.21 (13.45)abc	5.58 (13.60) c	5.39 (13.52) bc
ypermethrin 0.012%	21.25 (27.10) a	6.07 (14.25) bc	2.55 (9.12) ab	4.31 (11.69) b
envalerate 0.02%	20.45 (26.75) a	6.12 (14.21) bc	3.48 (10.76) b	4.80 (12.48) bc
enpropaphrin 0.05%	18.45 (25.34) a	7.38 (15.74) bc	1.61 (7.33) ad	4.50 (11.54) b
PMC 0.1%	18.88 (25.66) a	6.69 (14.94) bc	8.35 (16.77)	7.52 (15.86) d
arbofuran 3 G 40g/bush	19.79 (26.20) a	7.44 (15.78) bc	6.53 (14.81) cd	6.99 (15.30) cd
eem oil 2% + Tepol 0.05%	21.33 (27.27) a	4.76 (12.60) ab	5.67 (13.73) c	5.22 (13.16) bc
ıtreated check	19.55 (26.19) a	18.28 (25.32) d	18.37 (25.37) e	18.33 (25.35) e

Figures in parentheses are angular transformed values. In a column, figures followed by the same letter are not significant di fer nt

Table 2. Effect of Insecticides and neem oil on Tetranychus cinnabarinus population.

Treatments	Number of mites on three leaves (Mean of 15 observations)
Methyl parathion 0.1%	6.0 (2.55) b
Dimethoate 0.06%	1.67 (1.39) a
Endosulfan 0.1%	7.0 (2.72) b
Monocrotophos 0.1%	0.0 (0.71) a
Chlorpyriphos 0.05%	17.0 (4.17) d
Cypermethrin 0.12 %	13.67 (3.75) cd
Fenvalerate 0.02%	15.0 (3.92) cd
Fenpropathrin 0.05%	11.33 (3.42) bcd
BPMC 0.1%	10.33 (3.25) bc
Carbofuran 3 G 40g/bush	0.0 (0.71) a
Neem oil 2% + Teepol 0.05%	7.0 (2.72) b
Untreated check	1.0 (1.09) a

(Fifures in parenthes are $\sqrt{X}+0.5$ transformed values. In a column, figures followed by the same letter are not significantly different at the 5% level by DMRT.)

invite secondary infestation of the red spider mite, *T. cinnabarinus* following their spray (Table 2). The mite population was nil on bushes treated with monocrotophos and carbofuran and negligible on untreated and dimethoate - sprayed plants. The population was moderate in methyl parathion, endosulfan and neem oil treatments. Chlorpyriphos and pyrethroids with the maximum number of population proved that they were more prone to cause secondary mite infestation. Resurgence of *Tetranychus* spp. following application of synthetic pyrethroids has become a common phenomenon (Hoyt *et al.,* 1978; Hall, 1979).

Analysing the results it may b recommended that monocrotophos 0.1% was the ideal treatment in effectivel reducing the purple discolouration i *J. sambac* without inviting the secondar outbreak of the red spider mite.

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