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Comparative efficacy of botanicals against shoot and fruit borers, (*Earias vittella* Fabricius) on okra

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Abstract
The present investigation was conducted during Kharif Season 2020 at Jalgaon, Maharashtra. Two applications of seven treatments *viz*. chlorantraniliprole 18.5% SC, Neem oil 3%, Karanj oil 2%, NSKE 5%, Garlic bulb extract 3%, Dhatura leaf extract 5%,Calotropics leaf extract 5% were evaluated against shoot and fruit borer, *Earias vittella.* Minimum per cent of shoot infestation, fruit infestation and B:C ratio were recorded in chlorantraniliprole (As check) (6.21%, 9.89% and 1:3.25) Comparatively followed by Neem oil (8.18%, 11.31% and 1:3.05) < Karanj oil (8.88%, 11.93% and 1:2.90) < NSKE (9.66%, 13.08% and 1:2.86) < Garlic bulb extract (10.67%, 13.76% and 1:2.66)< Dhatura leaf extract (12.46%, 15.42% and 1:2.61) < Calotropics leaf extract (14.17%, 16.51% and 1:2.54) < untreated (water spray) (19.46%, 27.77% and 1:1.60) respectively.

Keywords: *Earias vittella*, efficacy, Botanicals, Benefit cost ratio, okra

Introduction
Okra (*Abelmoschus esculentus* (L.) Moench), frequently known as lady's finger or bhendi belonging to family Malvaceae, is an important warm season vegetable crop cultivated comprehensively in tropical and sub-tropical regions of the world. It can be successfully grown in hot humid areas. Okra is native to Ethiopia. It is a short duration crop propagated through seeds, cherished for its tender and scrumptious green fruits used in curries, soups or in canned, dehydrated or frozen forms for off-season consumption Okra is more remunerative than the leafy vegetables. The roots and stems are useful for clearing cane juice from which gur or jaggery is prepared. (Singh *et al.*, 2014) [18] World production of okra as fresh fruit-vegetable is estimated at 6 million tones/year. In India, it is widely cultivated as a summer crop in the North and also as a winter crop in Gujarat, Andhra Pradesh, Karnataka and Tamil Nadu. Globally India ranks first in okra production (72% of the total world production) having area of 533 hectares with an annual production of 6346 million tons and productivity of 11.9 million tons/ha. (Gautam *et al*., 2015) [2]. Among this okra shoot and fruit borer (OSFB), *Earias vittella* is the most serious pest, which cause direct damage to tender shoots and fruits. It is reported that about 69% losses in marketable yield due to attack of this insect pest. The damage due to fruit borer accounts for nearly 22.5% in Uttar Pradesh, 25.93% to 40.91%in Madhya Pradesh 45% in Karnataka which affects the nutritional quality and makes it unsuitable for human consumption. (Pachole *et al.,* 2017). The affected fruits are rendered unfit for human consumption, as well as for procurement of seed (Shrivastava *et al.*, 2017) [17].
The biologically active natural plant products may play a significant role in this regard. Botanical insecticides are broad spectrum in pest management and many are safe to apply, unique in action and can easily be processed and used Among the recognized pesticidal plants, the neem tree, *Azadirachta indica* proved its unique source for numerous active ingredients of insecticidal properties. Neem ingredients affect insects in various ways including repellent, antifeedant, toxic, growth regulatory effects and effect on fecundity. (Rahman *et al.*, 2016) [15]. However, neem-based products were proved as medium to broad spectrum insecticides against various field and store pests. Besides microbes as alternatives to the hazardous chemical insecticides, suggested that the use of indigenous available plants as botanical insecticides play an important role in being an ideal source of low cost or safe and effective insecticide for sustainable pest management. Several studies have been carried out on neem products (*Azadirachta indica* A. Juss.), due to its well known insecticidal properties. Evaluations revealed varying effects on insects, which included repellency, deterrence against feeding and oviposition, insect growth regulatory, physiological, sterilant, ovicidal activity, besides systemic action.

Materials and Methods

Field trail were conducted to study the "comparative efficacy of botanicals against shoot and fruit borers, (*Earias vittella* Fabricius*)* on okra [*Abelmoschus esculentus* (L.) Moench]''**.** at Jalgaon, Maharashtra *Kharif* season Botanicals were used with seven treatments and three replications. Experiment was carried out in Randomized Block Design. with the plot size 2 x 2m. The experiment was carried out on okra Variety Radhika. Two rounds of spray were given at fifteen days interval using a hand operated sprayer during morning hours to avoid photo oxidation of Botanicals. The treatments details are: T1 NSKE 5%, T2 *Neem* oil 3%, T3 Garlic bulb extract 3%, T4 *Dhatura* Leaf Extract 5%, T5 *Karanj* oil 2%, T6 Calotropis Leaf Extract 5%, T7 Chlorantraniliprole 18.5% SC, T0 Untreated control.

Table 1: Particulars of treatments

Sr. No	Treatment	Chemicals name and formulations	Chemical Name	DOSAGE * (gm/ml)/lit
1.	T_0	Untreated	-	-
2.	T_1	NSKE 5%	Crude Azadirachtin	50 ml
3.	T_2	*Neem* oil 3%	Crude Azadirachtin	30 ml
4.	T_3	Garlic bulb extract 3%	Alliin (S-allyl cystein sulfoxide	30 ml
5.	T_4	*Dhatura* Leaf Extract 5%	Flavanoids Saponin	50 ml
6.	T_5	*Karanj* oil 2%	Furano-flavonol	20 ml
7.	T_6	Calotropis Leaf Extract 5%	tannin, saponins	50 ml
8.	T_7	Chlorantraniliprole 18.5% SC	2-amino-5-chloro-N,3-dimethylbenzamide.	0.5 ml

Data collection

Five plants were randomly selected from each plot and tagged. The total number of infested shoots and total number of shoots were recorded one day before application and 3rd, 7th and 14th days after application in each treatment. The results thus, obtained were converted into per cent shoot infestation with the following formula. Similar observation was taken for fruit infestation with the following formula (Yadav *et al.*, 2015) [21].

Statistical analysis

Data were analyzed by using MSTAT software for analysis of variance. Percentage of shoot and fruit damaged by ESFB was transformed before analysis. ANOVA was made by F variance test and the pair comparisons were performed by Duncan's Multiple Range Test. (Gomez and Gomez 1984) [3].

Result and Discussion

The results (Table: 1) after 1st and 2nd spray revealed that all the treatments were significantly superior to control in managing the pest infestation of *Earias vittella* on okra. The data on the percent infestation of shoot and fruit borer on Okra third, seventh fourteenth day after first spray revealed that all the botanicals treatments were significantly superior over control. Among all the treatments lowest per cent shoot, infestation was recorded in T_7 chlorantraniliprole (6.21), follo wed by T_2 *Neem* oil (8.18), T_5 *Karanj* oil (8.88), T_1 NSKE (9. 66), T_3 Garlic bulb extract (10.67), T_4 Dhatura leaf extract (12 .46) and T_6 Calotropics leaf extract (14.17). The treatments T_6 Calotropics leaf extract (14.17) was least effective among all the treatments. Control plot T_0 (19.46) infestation.

The data on the percent infestation of fruit borer on Okra mea n third, seventh, fourteen days after second spray revealed tha t all the botanicals treatments were significantly superior over control. Among all the treatments lowest per cent shoot, infest ation was recorded in T_7 chlorantraniliprole (9.89), followed by T_2 *Neem* oil (11.31), T_5 *Karanj* oil (11.93), T_1 NSKE (13.08), T_3 Garlic bulb extract (13.76), T_4 *Dhatura* leaf extract (15.42) and T_6 Calotropics leaf extract (16.51). The treatments T_6 Calotropics leaf extract (16.51) was least effective among all the treatments. Control plot T_0 (27.77) infestation.

Table 1: Percent infestation of shoot and fruit borer (*Earias vittella* Fab) on Okra at different days of interval (I[st] and II[nd] spray)

Treatments		Percent shoots and fruit infestation of *Earias vittella*							
		First spray				Second spray			
		3rd DAS	7th DAS	14th DAS	Mean	3rd DAS	7th DAS	14th DAS	Mean
T_1	NSKE 5%	8.80	9.46	10.72	9.66	14.05	12.39	12.28	13.08
T_2	*Neem* oil 3%	7.30	8.24	9.02	8.18	12.63	11.21	10.11	11.31
T_3	Garlic bulb extract 3%	9.58	10.43	11.73	10. 67	14.67	13.82	12.79	13.76
T_4	*Dhatura* Leaf Extract 5%	11.60	12.33	13.46	12.46	16.61	15.27	14.38	15.42
T_5	*Karanj* oil 2%	7.95	9.00	9.71	8.88	13.03	11.27	10.38	11.93
T_6	Calotropis Leaf Extract 5%	13.45	14.06	15.02	14.17	17.70	16.30	15.54	16.51
T_7	Chlorantraniliprole 18.5% SC	6.69	5.37	6.58	6.21	11.47	9.57	8.63	9.89
T_0	Control	17.76	19.24	21.39	19.46	27.04	27.59	28.70	27.77
Overall Mean		10.39	11.01	12.20	11.21	15.09	14.74	14.15	14.95
F- test		S	S	S	S	S	S	S	S
S. Ed. (±)		0.48	0.74	0.74	0.31	1.09	0.79	0.77	0.51
C. D. (P = 0.05)		1.22	1.50	1.51	0.98	1.83	1.55	1.53	1.25

Conclusion

It could be concluded that for the management of *Earias vittella* on Okra crop, recommended botanicals insecticide *Neem* oil 3%@ 30 ml/lit. proved to be most effective and economical. Similarly, the use of *Karanj* oil 2%, NSKE 5%, Garlic bulb extract 3%, Dhatura leaf extract 5% can also be thought of for the management of OSFB. However, the application of Calotropis leaf extract 5% @ 50ml /lit. could not exert encouraging role for Okra Shoot and Fruit Borer management. This plant product also helps in reducing

pollution in the environments. Hence it can be suitably incorporated as treatments in IPM programme.

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References

1. Deepak S, Reddy N, Gaikwad S, Shashibhushan S. Bio-efficacy and dissipation of flubendiamide against shoot and fruit borer (*Earias vittella* Fab.) of okra. Journal of Entomology and Zoology Studies. 2017;5(4):1825-1829.
2. Gautam HK, Singh NN, Rai AB. Effect of some plant extract and an insecticide on the incidence of *Earias vittella* in okra. Indian Journal of Agricultural Research. 2015;49(2):175-179.
3. Gomez KA, Gomez AA. Statistical procedures for agricultural research. John Wiley and Sons. 1984.
4. Ghuge DK, Gosalwad SS, Patil SK. Bio-efficacy of newer insecticides against fruit borers of okra. International Journal of Chemical Studies. 2020;8(1):2606-2611.
5. Murugesan N, Murugesh T. Bioefficacy of some plant products against brinjal fruit borer, *Leucinodes orbonalis* Guenee (Lepidoptera: Pyrallidae). *Journal of Biopesticides*. 2009;2(1):60-63.
6. Naidu G, Kumar A. Field efficacy of certain insecticides against shoot and fruit borer (*Earias vittella* Fab.) on rainy season okra in Prayagraj (U.P.). Journal of Entomology and Zoology Studies. 2019;7(6):1211-1213.
7. Nalini C, Kumar A. Population dynamics and comparative efficacy of certain chemicals and biopesticides against okra shoot and fruit borer shoot and fruit borer (*Earias vitella*). International Quarterly Journal of Life Sciences. 2016;11(3):1589-1592.
8. Narasa RG, Sivappa Thara KT, Deepak. Field efficacy of selected bio-agent and insecticide against shoot and fruit borer, *Earias vittella* (Noctuidae: Lepidoptera) on okra. Journal of Entomology and Zoology Studies. 2019;7(3):380-383.
9. Naidu G, Kumar A. Field efficacy of certain insecticides against shoot and fruit borer (*Earias vittella* Fab.) on rainy season okra in Prayagraj (U.P.). Journal of Entomology and Zoology Studies. 2019;7(6):1211-1213.
10. Nalini C, Kumar A. Population dynamics and comparative efficacy of certain chemicals and biopesticides against okra shoot and fruit borer shoot and fruit borer (*Earias vitella*). International Quarterly Journal of Life Sciences. 2016;11(3):1589-1592.
11. Narasa RG, Sivappa, Thara KT, Deepak. Field efficacy of selected bio-agent and insecticide against shoot and fruit borer, *Earias vittella* (Noctuidae: Lepidoptera) on okra. Journal of Entomology and Zoology Studies. 2019;7(3):380-383.
12. Padwal KG, Kumar A. Efficacy of plant products and co mbination with cypermethrin in management of *Earias vittella* of Okra. Annals of Plant Protection Science. 2013;22(1):73-75.
13. Panbude CU, Neharkar PS, Peddu H. Seasonal incidence and biorational management of fruit and shoot borer (*Earias vitella* Fab.) on okra. Journal of Pharmacognosy and Phytochemistry. 2019;8(5):1574-1576.
14. Pratibha Singh R. Effect of neem and garlic based biopesticides on the reproductive parameters of *Earias vittella* (fab.) (Lepidoptera: noctuidae). Life science informatics publications. 2018;4(4):219-224.
15. Rahman MA, Uddin MM, Haque MA, Rahman MM. Co mparative efficacy of different tactics for the management of okra shoots and fruit borer, *Earias vittella* (fab.) Under field Condition. International journal of applied science biotechnology. 2016;4(1):74-78.
16. Rajput GS, Tayde AR. Population dynamics and comparative efficacy of certain novel insecticides, botanicals and bioagents, against shoot and fruit borer (*Earias vitella* Fabricius) of okra crop [*Abelmoschus esculentus* (L.) Moench]. 2017.
17. Shrivastava PK, Kumar A, Dhingra MR. Evaluation of insecticides for the management of shoot and fruit borer *Earias vittella* (Fab.) infesting okra. Journal of Entomology and Zoology Studies. 2017;5(5):1052-1056.
18. Singh P, Chauhana V, Kumar B, Tiwaria Chauhan S, Simon S, Bilalc Abidia A. An overview on okra (*Abelmoschus esculentus*) and it's importance as a nutritive vegetable in the world. Journal of Biological Sciences. 2014;4(2):227-233.
19. Subbireddy KB, Patel HP, Patel NB, Bharpoda TM. Utili zation of Plant Extracts for Managing Fruit Borers in Okra, [*Abelmoschus esculentus* (L.) Moench]. International Journal of Current Microbiology and Applied Sciences. 2018;7(5):2786-2793.
20. Thara KT, Sharanabasappa Narasa Reddy G, Kalleshwara. Bio-efficacy of newer insecticide molecules against okra fruit borer, *Helicoverpa armigera.* Journal of Pharmacognosy and Phytochemistry. 2019;8(1):2564-2567.
21. Yadav R, Lyall H, Kumar S, Kumar R. Efficacy of certain botanical insecticides against shoot and fruit borer, *Leucinodes orbonalis* (Guenee) on brinjal (*Solanum melongena* L.). International Quarterly Journal of Environmental Sciences. 2015;10(3):987-99.