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subbaraman.Sriram@icar.gov.in
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B.R., Jayanthi Mala; P.D., Kamala Jayanthi; Subramoniam, Anjana; A, Rekha

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Short Communication

Management of Eulophid Seed Borer, *Anselmella kerrichi* (Narayanan *et al.*) (Hymenoptera : Chalcidoidea : Eulophidae) on Jamun

Jayanthi Mala B.R.[1*], Kamala Jayanthi P.D.[1], Anjana Subramoniam[1] and Rekha A.[2]
Division of Entomology and Nematology[1], Division of Fruit crops[2], ICAR- Indian Institute of Horticultural Research
Hesaraghatta Lake PO, Bengaluru - 560 089.
*Email: entjaya@gmail.com

ABSTRACT

A field experiment was conducted at ICAR-Indian Institute of Horticultural Research, Bengaluru during 2019 to evaluate certain insecticides and botanicals against jamun seed borer, *Anselmella keriichi* (Naryanan*et al.*). The results revealed that the seed borer infestation was significantly low in λ-cyhalothrin (4.20%) and cypermethrin (5.77%) treatments followed by spinosad (6.36%), deltamethrin (6.40%) and imidacloprid (6.71%) (F=7.9; df=11; P<0.0001). Among the organic insecticides *viz.,* spinosad @ 0.2 mL/L showed significant reduction in jamun seed borer infestation.

Keywords: *Syziumcumini,* Chemical insecticides, Botanical insecticides, Hymenoptera and Insect pest

Fruits of Jamun, *Syzium cumini* L. (Family Myrtaceae; commonly known as jambul, black plum, Indian blackberry, jambulan, java plum *etc.*) are known for their economic importance with several medicinal properties (Warrier *et al.*, 1996). Jamun is attacked by number of insect pests and recently a eulophid seed borer, *Anselmella kerrichi* (Narayanan *et al*.,) (Hymenoptera: Chalcidoidea: Eulophidae) causing huge economic losses in jamun cultivation have been reported (Kamala Jayanthi *et al*., 2019; Anjana *et al*., 2019). The adult female wasp lays eggs inside the tender fruits. After completing the life cycle inside the Jamun seeds, fully-grown adults emerge out making a circular hole, in turn causing both quantitative and qualitative losses. The infested fruits bore black, pinprick size oviposition punctures along with circular exit holes on the rind. Heavy infestation of jamun fruits by *A. kerrichi* rendering the fruits unmarketable was observed (Fig.1).

The present study was conducted during March-April 2019 at an experimental block of ICAR-Indian Institute of Horticultural Research, Bengaluru, India located at 13°58' N Latitude and 78° E Longitude at an elevation of 890 m above mean sea level. A total of 12 treatments (as listed in Table 1) were evaluated against jamun seed borer. Each treatment involved three consecutive sprays with 15 days interval and each treatment replicated thrice in three different sets. A total of 1200 fruits were harvested for each treatment. Each set containing 1200 fruits per treatment in which randomly 400 fruits per replication were observed. Keeping the fact in view that jamun fruits are consumed fresh for its high medicinal value, all the experimental sprays were restricted to early stages of fruiting (during G3 to G4 stages; Kamala Jayanthi *et al*., 2019) to avoid pesticide residue issues. The observations were recorded on total number of fruits and number of fruits infested with jamun seed borer. Data were subjected to ANOVA (using F test as criteria at P=0.05 level). Net benefit per acre for each treatment was derived by subtracting the total cost of plant protection from total income. Cost: Benefit ratio of each treatment was derived by subtracting the income of the control treatment from the net income of each sprayed treatment and the products were divided by total cost of plant protection for each treatment (Shabozoi *et al*., 2011).

The results pertaining to the efficacy of various treatments in the management of jamun seed borer were given in Table 1. The mean per cent fruit infestation by *A. kerrichi* varied significantly from 4.20-19.45 among the treatments (F=7.9; df=11; P<0.0001). After administering all the three experimental sprays the per cent fruit infestation by *A.kerrichi* was significantly lower in treatments viz., λ-cyhalothrin, cypermethrin, spinosad, deltamethrin and imidacloprid with a fruit infestation of 4.20, 5.77, 6.36, 6.40 and 6.71% respectively compared to the control. However, all above treatments were found on par with each other with respect to seed borer infestation. The treatments viz., abamectin, pongamia soap, neem soap, neem oil did not reduce the seed borer infestation compared to the control (Table 1).

Relative economic performance of the treatments was compared with the control using the cost:benefit (C:B) ratio. The synthetic pyrethroid viz., λ-cyhalothrin (1:9.67), gave the highest C:B ratio followed by spinosad (1:8.57), cypermethrin (1:8.48), and deltamethrin (1:8.23). The present study revealed that spinosad and other synthetic pyrethroids could be recommended for the management of jamun seed borer at the early stage of fruiting. Anjana *et al.*, (2109) studied the possibility of using color sticky traps as a strategy for management of *A. kerrichi* in jamun. Their results showed that females were attracted to blue sticky trap whereas, male wasps attracted to yellow sticky trap. Considering the need for eco-friendly pest management modules for jamun, integrated management strategies involving colour traps and need based spray interventions have to be standardized to minimize the economic losses caused by jamun seed borer *A. kerrichi.*

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Fig. 1: a. Pricks on immature Jamun fruits, b. adult Jamun seed borer, c & d. galleries

Table 1: Efficacy of different insecticides against jamun seed borer, *A.kerrichi* (Narayanan *et al.*)

	Treatment	Fruit infestation (%)				C: B Ratio
		Set I	Set II	Set III	Overall Mean	
T1	Cypermethrin (1.0 mL/L)	4.83 (12.70)	8.12 (16.55)	4.38 (12.07)	5.77 (13.77)	1:8.48
T2	Deltamethrin (1.0 mL/L)	5.00 (12.92)	7.57 (15.97)	6.62 (14.91)	6.40 (14.60)	1:8.23
T3	Spinosad (0.2 mL/L)	3.57 (10.89)	4.35 (12.04)	11.14 (19.50)	6.36 (14.15)	1:8.57
T4	Quinalphos (2.5 mL/L)	10.00 (18.43)	17.87 (25.01)	13.64 (21.67)	13.84 (21.70)	1:2.14
T5	Chlorantraniliprole (0.3 mL/L)	13.46 (21.52)	10.56 (18.96)	1.74 (7.59)	8.59 (16.02)	1:6.53
T6	λ- cyhalothrin (1.0 mL/L)	5.00 (12.92)	4.32 (11.99)	3.27 (10.42)	4.20 (11.78)	1:9.67
T7	Imidacloprid (0.5 mL/L)	6.67 (14.96)	7.33 (15.71)	6.14 (14.34)	6.71 (15.01)	1:7.57
T8	Abamectin (0.5 mL/L)	24.00 (29.33)	18.13 (25.20)	15.20 (22.95)	19.11 (25.83)	1:1.14
T9	Pongamia soap (10 g/L)	12.08 (20.34)	12.63 (20.82)	16.43 (23.91)	13.71 (21.69)	1:2.15
T10	Neem soap (10 g/L)	24.17 (29.45)	19.57 (26.25)	14.61 (22.47)	19.45 (26.06)	1:1.57
T11	Neem oil (10 mL/L)	13.33 (21.42)	19.40 (26.14)	22.22 (28.13)	18.32 (25.53)	1:0.84
T12	Control	13.68 (21.71)	17.39 (24.65)	20.00 (26.57)	17.03 (24.31)	-
CD @0.05%					5.80	

*Figures in the parenthesis are arcsine transformed values

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