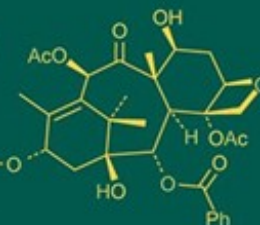
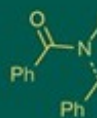
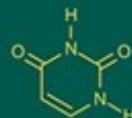
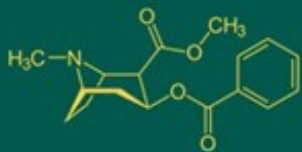


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Khating AP

M.Sc. (Agri.) Research Scholar,
Department of Entomology,
College of Agriculture,
Badnapur, VNMKV, Parbhani,
Maharashtra, India.

Mutkule DS

Professor (CAS), Department
of Entomology, NARP, Chh.
Sambhajinagar, Maharashtra,
India.

Suradkar AL

Assistant Professor,
Department of Entomology,
College of Agriculture,
Badnapur, Maharashtra, India.

Sontakke PL

Assistant Professor,
Department of Plant
Pathology, ARS, Badnapur,
Maharashtra, India.

Thorat DK

M.Sc. Research Scholar,
Department of Entomology,
College of Agriculture,
Badnapur, Maharashtra, India.

Chaudhari AR

M.Sc Research Scholar,
Department of Entomology,
College of Agriculture,
Badnapur, Maharashtra, India.

Corresponding Author:**Khating AP**

M.Sc. (Agri.) Research
Scholar, Department of
Entomology, College of
Agriculture, Badnapur,
VNMKV, Parbhani,
Maharashtra, India.

Efficacy of different botanicals and insecticide against leaf eating caterpillar (*Carea Subtilis*) on jamun (*Syzygium Cuminii* L.)

Khating AP¹, Mutkule DS², Suradkar AL³, Sontakke PL⁴, Thorat DK⁵, Chaudhari AR⁶

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ABSTRACT

A field experiment was conducted to evaluate the efficacy of different botanicals and insecticides against the leaf eating caterpillar infesting jamun (*Syzygium cuminii* L.). Seven treatments comprising neem oil, karanj oil, mahua oil, *Bacillus thuringiensis*, NSKE 5 per cent, lambda-cyhalothrin 5% EC and an untreated control were evaluated through three consecutive sprays. The pooled efficacy of the treatments revealed that lambda-cyhalothrin 5% EC @ 1.0 ml/litre was the most effective treatment, recording the lowest pooled leaf infestation of 6.51 per cent (14.78). It was followed by NSKE 5 per cent @ 50 g/litre with 8.13 per cent (16.57) and neem oil @ 2.0 ml/litre with 9.25 per cent (17.71). *Bacillus thuringiensis* @ 2.0 g/litre recorded a pooled infestation of 10.12 per cent (18.55), followed by karanj oil @ 2.0 ml/litre (10.87 per cent) and mahua oil @ 2.0 ml/litre (12.02 per cent). The untreated control recorded the highest pooled infestation of 17.09 per cent (24.42). The results indicated that lambda-cyhalothrin 5% EC was the most effective treatment against leaf eating caterpillar on jamun, followed by NSKE 5 per cent and neem oil.

Keywords: Jamun, *Syzygium cuminii*, *Carea subtilis*, Leaf eating caterpillar, Botanicals, NSKE, *Bacillus thuringiensis*, Lambda-cyhalothrin, Pest management

Introduction

Jamun (*Syzygium cuminii* L.) is an important fruit crop belonging to the family Myrtaceae and is valued for its edible fruits and medicinal and nutritional properties. The crop is cultivated in different parts of India and has considerable importance in fruit production as well as traditional health uses. Several insect pests are associated with jamun and may affect foliage, flowers and fruits. Among the foliage-feeding insects, the leaf eating caterpillar (*Carea subtilis*) is an important pest because larval feeding damages the leaf lamina and reduces the effective photosynthetic area. Severe infestation can adversely affect plant growth and fruit production. Management of foliage-feeding insect pests in perennial fruit crops requires effective and timely suppression while considering the use of botanicals and microbial biopesticides. Neem oil, karanj oil, mahua oil, neem seed kernel extract (NSKE) and *Bacillus thuringiensis* are potential alternatives for pest management, whereas insecticides such as lambda-cyhalothrin may provide rapid suppression. Therefore, the present investigation was undertaken to evaluate the efficacy of selected botanicals, biopesticide and insecticide against leaf eating caterpillar on jamun under field conditions.

Materials and Method

The field experiment was conducted in a nine-year-old jamun orchard of the variety 'Kokan Bahadoli' at the Research Farm, College of Agriculture, Badnapur, during 2025–26. The orchard was maintained without application of insecticides during the seasonal incidence observations and recommended agronomical practices were followed. For the management experiment, the treatments were evaluated in a Randomized Block Design (RBD) with seven treatments and three replications.

Table 1. Experimental details

Sr. No.	Particulars	Details
1	Design	RBD
2	Crop	Jamun (<i>Syzygium cumini</i> L.)
3	Variety	Kokan Bahadoli
4	Age of orchard	9 years
5	Treatments	07
6	Replications	03
7	Spacing	6 m × 6 m
8	Experimental year	2025–26
9	Number of sprays	03
10	Spray interval	15 days

Table 2. Treatment details

Tr. No.	Biopesticide / Chemical	Dose per litre of water
T ₁	Neem oil	2.0 ml
T ₂	Karanj oil	2.0 ml
T ₃	Mahua oil	2.0 ml
T ₄	<i>Bacillus thuringiensis</i>	2.0 g
T ₅	NSKE 5%	50 g
T ₆	Lambda cyhalothrin 5% EC	1.0 ml
T ₇	Untreated control	—

Imposition of treatments

Three sprays were applied at an interval of 15 days. The selected treatments were applied at their respective recommended experimental doses, while T₇ was maintained as an untreated control. Observations were recorded before and after each spray.

Method of observations

Observations on leaf eating caterpillar (*Carea subtilis*) were recorded from four randomly selected branches of uniform length (1.5 ft each) representing the top, middle and bottom canopy of each experimental tree. Observations were recorded one day before spraying (1 DBS) and after each spray. The total number of healthy and damaged leaves was counted and the percentage of leaf damage was calculated as follows:

Number of damaged leaves

Per cent damage = $X \times 100$

Total number of observed leaves

The treatment data were subjected to analysis of variance (ANOVA) appropriate for a Randomized Block Design (RBD) following Gomez *et al.* (1984) [1]. Treatment means were compared using the Critical Difference (CD) at the 5 per cent level of significance. The values in parentheses in the efficacy table are arcsine transformed values.

Results and Discussion

The pooled efficacy of three consecutive sprays of the evaluated treatments against leaf eating caterpillar on jamun is presented in Table 3. The treatments differed in their efficacy and a progressive reduction in leaf infestation was observed across the successive spray means in most treatments.

Figures in parentheses are arcsine transformed values.

Table 3. Pooled efficacy of three consecutive sprays of different botanicals and insecticide against leaf eating caterpillar on jamun

Tr. No.	Botanical / Pesticide	Dose / litre	1 DBS (First spray)	First spray Mean	Second spray Mean	Third spray Mean	Pooled mean of all sprays
T1	Neem oil	2.0 ml	18.53 (25.50)	11.53 (19.85)	8.93 (17.39)	7.29 (15.66)	9.25 (17.71)
T2	Karanj oil	2.0 ml	19.13 (25.94)	13.14 (21.25)	10.66 (19.06)	8.81 (17.27)	10.87 (19.25)
T3	Mahua oil	2.0 ml	18.60 (25.55)	14.23 (22.16)	11.69 (19.99)	10.13 (18.56)	12.02 (20.29)
T4	<i>Bacillus thuringiensis</i>	2.0 g	17.60 (24.80)	12.40 (20.62)	9.80 (18.24)	8.15 (16.59)	10.12 (18.55)
T5	NSKE 5%	50 g	16.33 (23.83)	10.06 (18.49)	7.62 (16.02)	6.72 (15.02)	8.13 (16.57)
T6	Lambda cyhalothrin 5% EC	1.0 ml	17.23 (24.53)	7.11 (15.46)	6.49 (14.76)	5.94 (14.11)	6.51 (14.78)
T7	Untreated control	—	19.06 (25.89)	18.31 (25.33)	16.91 (24.28)	16.04 (23.61)	17.09 (24.42)
	S.E. ±		1.15	0.80	0.78	0.67	0.75
	C.D. at 5%		NS	2.47	2.39	2.06	2.31
	C.V. (%)		11.05	11.18	13.11	12.85	12.38

First spray application

After the first spray, lambda-cyhalothrin 5% EC @ 1.0 ml/litre (T₆) recorded the lowest mean leaf infestation of 7.11 per cent (15.46), indicating the highest efficacy among the treatments. It was followed by

NSKE 5% @ 50 g/litre (T₅) with 10.06 per cent (18.49), neem oil @ 2.0 ml/litre (T₁) with 11.53 per cent (19.85), *Bacillus thuringiensis* @ 2.0 g/litre (T₄) with 12.40 per cent (20.62), karanj oil @ 2.0 ml/litre

(T_2) with 13.14 per cent (21.25), and mahua oil @ 2.0 ml/litre (T_3) with 14.23 per cent (22.16). The untreated control recorded the highest infestation of 18.31 per cent (25.33).

Second spray application

Following the second spray, T_6 continued to be the most effective treatment and recorded the lowest leaf infestation of 6.49 per cent (14.76). T_5 recorded 7.62 per cent (16.02), followed by T_1 (8.93 per cent), T_4 (9.80 per cent), T_2 (10.66 per cent) and T_3 (11.69 per cent). The untreated control recorded the highest infestation of 16.91 per cent (24.28).

Third spray application

After the third spray, the lowest infestation was again recorded in T_6 , lambda-cyhalothrin 5% EC @ 1.0 ml/litre, with 5.94 per cent (14.11). It was followed by T_5 (6.72 per cent), T_1 (7.29 per cent), T_4 (8.15 per cent), T_2 (8.81 per cent) and T_3 (10.13 per cent). The untreated control recorded the highest infestation of 16.04 per cent (23.61).

Pooled mean

The pooled mean of three consecutive sprays clearly demonstrated the superiority of lambda-cyhalothrin 5% EC @ 1.0 ml/litre (T_6), which recorded the lowest pooled leaf infestation of 6.51 per cent (14.78). NSKE 5% @ 50 g/litre (T_5) ranked second with 8.13 per cent (16.57), followed by neem oil @ 2.0 ml/litre (T_1) with 9.25 per cent (17.71). *Bacillus thuringiensis* @ 2.0 g/litre (T_4) recorded 10.12 per cent (18.55), while karanj oil @ 2.0 ml/litre (T_2) and mahua oil @ 2.0 ml/litre (T_3) recorded 10.87 per cent (19.25) and 12.02 per cent (20.29), respectively. The untreated control recorded the highest pooled infestation of 17.09 per cent (24.42). The consistent superiority of T_6 across all three sprays indicates that lambda-cyhalothrin 5% EC provided the most effective suppression of leaf eating caterpillar under the conditions of the present experiment. Among the non-chemical options, NSKE 5% and neem oil showed comparatively better performance than the other evaluated botanicals and biopesticide.

Conclusion

The field evaluation demonstrated that the tested treatments differed in their efficacy against leaf eating caterpillar on jamun. Lambda-cyhalothrin 5% EC @ 1.0 ml/litre recorded the lowest infestation after the first, second and third sprays and also recorded the lowest pooled infestation of 6.51 per cent (14.78). Among the botanicals and biopesticide, NSKE 5% @ 50 g/litre and neem oil @ 2.0 ml/litre were comparatively more effective. Therefore, lambda-cyhalothrin 5% EC @ 1.0 ml/litre was the most effective treatment in the present field evaluation, followed by NSKE 5% and neem oil.

Author details

Khating A. P.
M.Sc. (Agri.) Research Scholar,

Department of Entomology,
College of Agriculture, Badnapur, VNMKV, Parbhani, Maharashtra, India.

Mutkule D. S.
Professor (CAS),
Department of Entomology,
NARP, Chh. Sambhajinagar, Maharashtra, India.
Suradkar A. L.
Assistant Professor,
Department of Entomology,
College of Agriculture, Badnapur, Maharashtra, India.
Sontakke P. L.
Assistant Professor,
Department of Plant Pathology,
ARS, Badnapur, Maharashtra, India.
Thorat D. K.
M.Sc. Research Scholar,
Department of Entomology,
College of Agriculture, Badnapur, Maharashtra, India.
Chaudhari A. R.
MSc Research Scholar,
Department of Entomology,
College of Agriculture, Badnapur, Maharashtra, India.

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