

LEMON BUTTERFLY (*PAPILIO DEMOLEUS* LINNAEUS) AS A PEST OF CURRY LEAF PLANT (*MURRAYA KOENIGII* LINN. SPRENGEL)

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Abstract

The curry leaf plant (*Murraya koenigii* Linn. Sprengel) (*Narasingha* in Assamese) is cultivated for its aromatic leaves. The leaves, bark and root of the plant are used in the indigenous medicine as a tonic, stimulant, carminative and stomachic. In spite of the fact that their strong smell deters most pests, some insects is a problem for curry leaves. A total of 12 insect-pests of curry leaf plant belonging to 10 families of 5 insect orders were recorded in India. Lemon butterfly is one of the important pests of curry leaves. The lemon butterfly, *Papilio demoleus* Linnaeus, ranges widely and is an extremely successful invader. The adult butterflies feed on the nectar of a variety of flowering plants and shrubs such as the ubiquitous Lantana with its plentiful blooms. In India it is mostly found in the

plains but can be found on the hills of peninsular India and up to 7000 feet in the Himalayas. The number of generations of *Papilio demoleus* is dependent upon temperature and in warm temperate, five generations have been recorded.

Lemon butterfly was found to be a serious pest of curry leaves in some areas of Nagaon district of Assam. The pest defoliated the entire plants of the localities damaging a flash of the leaves. Only one generation of the pest was found infesting the curry leaves causing 50.61% of crop damage during 2012. After that the larvae underwent pupation. Grayish yellow eggs are laid singly on the leaf surface, IP- 4-5 days, LP- 13-23 days and PP- 8-13 days. Early instars larvae resemble bird droppings. Late instars dark green, stout with a pair of hidden red osmetorium which emits

defensive secretion when disturbed. The pupa, chrysalis, is dimorphic with regards to colour, with the colour developing according to the prevalent colour and texture in the background. The colour of pupae in the leaves was pale green while the colour of the pupa in the dead plants or walls was like dry leaves. This valued plant can be protected from lemon butterfly through hand picking of larvae.

Keyword: Curry leaf plant, lemon butterfly, larva, dimorphic, hand picking

Introduction

The curry leaf plant (*Murraya koenigii* Linn. Sprengel) is a tropical to sub-tropical tree in the family Rutaceae, which is native to India. The *P. demoleus* is known to feed on virtually all species and varieties of native or introduced citrus and other members of Rutaceae family including *Aegle marmelos* (Bael fruit) and *Murraya koenigii* (Indian curry-leaf tree). The New World arrival of this pest is a potential threat to the citrus industries in the region. The larvae are a serious pest of citrus nursery stock (trees 1-2 ft. in height) and other young citrus trees in Asia and the Middle East. Larvae may utilize young leaf flush on more mature trees. Potential threat to other members of Rutaceae family including curry leaf plant. The curry leaf plant is named differently in different languages. In Assamese it is called *Narsingha*; *Kathnim*, *Mitha neem*, *Curry patta*, *Gandhela*, *Bareanga* in Hindi; *Barsanga*, *Kariphulli* in Bengali; *Goranimb*,

Kadhilimbdo in Gujarati; *Karibevu* in Kannada; *Karriveppilei* in Malayalam; *Karhinimb*, *Poospala*, *Gandla*, *Jhirang* in Marathi; *Barsan*, *Basango*, *Bhuraunga* in Odisha; *Curry patta* in Punjabi; *Krishna nimbi* in Sanskrit; *Karivempu*, *Karuveppilei* in Tamil and *Karepaku* in Telugu. Curry leaf is found almost throughout India up to an altitude of 1500 metres. It is much cultivated for its aromatic leaves. The plant is a shrub or small tree, growing 4–6 m (13-20 feet) tall, with a trunk up to 40 cm diameter. The leaves are pinnate, with 11-21 leaflets, each leaflet 2–4 cm long and 1–2 cm broad. They are highly aromatic. The leaf is used in South India as a natural flavouring agent in various curries. Volatile oil is used as a fixative for soap perfume. The leaves, bark and root of the plant are used in the indigenous medicine as a tonic, stimulant, carminative and stomachic. They are much valued as an anti-diabetic, antioxidant, anti-hypercholesterolemic, antimicrobial, anti-inflammatory, hepatoprotective, etc (Arulselvan and Subramanian, 2007). In spite of the fact that their strong smell deters most pests, some insects is a problem for curry leaves. A total of 12 insect-pests of curry leaf plant belonging to 10 families of 5 insect orders were recorded in India. Lemon butterfly is one of the important pests of curry leaves. The lemon butterfly, *Papilio demoleus* Linnaeus, ranges widely and is an extremely successful invader. The adult butterflies feed on the nectar of a variety

of flowering plants and shrubs such as the ubiquitous Lantana with its plentiful blooms. In India it is mostly found in the plains but can be found on the hills of peninsular India and up to 7000 feet in the Himalayas. The number of generations of *Papilio demoleus* is dependent upon temperature and in warm temperate, five generations have been recorded.



Fig. 1. Lemon butterfly larva in curry leaf

of Nagaon district during March, 2012. Some places of Haiborgaon areas were surveyed. Data were simply collected from few randomly selected plants by counting the infested and non-infested plant and the intensity of the lemon butterfly attack was worked out. For the biological study of the pest, the larvae were reared in the laboratory on curry leaf plant.



Fig. 2. Pupa in curry leaf plant

The New World arrival of this pest is a potential threat to the citrus industries in the region (Eastwood *et. al.*, 2006). The larvae are a serious pest of citrus nursery stock (trees 1-2 ft. in height) and other young citrus trees in Asia and the Middle East. Larvae may utilize young leaf flush on more mature trees and emerge as potential threat to other members of Rutaceae family including curry leaf plant (Tara and Sharma, 2010).

Materials and Methods

Lemon butterfly was found as most serious pest of curry leaves in some areas

Result and discussion

The pest defoliated the entire plants of the localities damaging a flash of the leaves. Only one generation of the pest was found infesting the curry leaves. Out of 81 plants observed 41 plants were found damaged. Average 50.61% of plant was found damaged. Some of the damaged plants were completely defoliated. The adults range in wingspan from 80-100 mm. The adults range in wingspan from 80-100 mm. The upper portion of the forewing is largely black and the outer wing margin has a series of

irregular yellow spots. Two yellow spots are present at the upper end of the discal cell with several scattered yellow spots in the apical region. The adults fly in every month but are more abundant after monsoons. The eggs are pale yellow, nearly spherical, about 1.5 mm, basally flattened, and smooth. Females lay eggs singly near the edges of the food plant leaves. Incubation period was 4-5 days. Early instars larvae resemble bird droppings (Fig. 1). Late instars dark green, stout with a pair of hidden red osmeterium which emits defensive secretion when disturbed. Larval period was 13-23 days. The pupa, chrysalis, is dimorphic with regards to colour, with the colour developing according to the prevalent colour and texture in the background (Fig. 2). Pupal period was 8-13 days. Adult period was 4-6 days. Total life cycle ranged from 29 to 47 days.

Conclusion

This valued plant can be protected from lemon butterfly through hand picking. Biological control agents also play critical role in protecting the curry leaf plant from this pest. Three larval parasitoids are known to parasitize *P. demoleus* larvae in India. They are *Apanteles papilionis*, *Apanteles* sp. and

Bracon hebetor (Hymenoptera: Braconidae). The biopesticides *Bacillus thuringiensis* (Bacterium) and *Beauveria bassiana* (fungus) were shown to have effects on *P. demoleus* in India and *Bacillus thuringiensis* showed the highest effect. Neem seed kernel extract and azadirachtin are also known to protect the plant from lemon butterfly.

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