



BIOLOGY, BEHAVIOUR AND MANAGEMENT OF LOCUST

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ABSTRACT

There are several species of locust, of which the desert locust *Schistocerca gregaria* (Acrididae: Orthoptera) is the most destructive in India and surrounding countries. The life cycle consists of three stages, i.e. egg, nymph and adult. Adults form swarms during a favourable breeding season and move from one place to another, causing severe damage to almost all vegetation types. Various control measures are taken to save the crops from this havoc. The optimum use of cultural, biological, and chemical methods may effectively control the locust problem.

INTRODUCTION

Locusts are grasshopper species that multiply in large numbers under favourable conditions; locust migrate in swarms of millions from one country to another country or from place to place.

LOCUST SPECIES

Italian Locust (*Calliptamus italicus*) – Italy, France, Northern Africa, Iran, and Southern Russia

Moroccan Locust (*Dociostaurus moroccanus*) – Southern Europe, Northern Africa, Iraq, Iran, and Afghanistan

Red Locust (*Nomadacris septemfasciata*) – Tanganyika, Southern Africa

Brown Locust (*Locustana pardalina*) – Southern Africa

South American Locust (*Schistocerca paranensis*) – Argentina to Mexico

Australian Locust (*Chortoicetes terminifera*) – Australia

Bombay Locust (*Patanga succinata*) – India, Sri Lanka, Malaysia

Taxonomic Position	
Kingdom	Animalia
Phylum	Arthropoda
Class	Insecta
Order	Orthoptera
Family	Acrididae
Genus	<i>Schistocerca</i>
Species	<i>gregaria</i>

Migratory Locust (*Locusta migratoria*) – India, Europe, Africa, Pakistan, East and South Asia

Desert Locust (*Schistocerca gregaria*) – India, Pakistan, Arabia, North Africa

LIFE CYCLE OF DESERT LOCUST

Eggs are laid in soil by probing the abdomen into soil for optimum soil texture, temperature and moisture. Egg-laying takes place in batches 5 cm long egg pod below 5-7 cm soil surface. Number of eggs ranges from 80/pod (gregarious) to 95-158/pod (solitarious). Egg-laying is done three times in life at an interval of 6-11 days. Initially eggs are yellow but turn to brown in contact to soil and absorb water for 1st five days for complete development. The extent of breeding ground can be more than a mile. Eggs hatch in 14 days or in Indian conditions where eggs are laid in September-October, they hatch during next season on the onset of monsoon. They feed on vegetation and become adults by passing through five instars in the life cycle.



Locust attack on the crop

SWARMING IN LOCUST

Adults of the locust form swarm and travel from one place to another. The first swarm usually travel from tens or hundreds of kilometres downward from the main laying area. Swarm structure can occur as either Stratiform or Cumuliform. Swarm densities vary considerably up to 50 million locusts/km² (average) or 20-150 million locusts/km² (range).

Table 1. Distinguish features of solitary and gregarious phases of locust

Features	Solitaria	Gregaria
Nymphs		
Colour	Green as of vegetation	Black with pink markings when young black with yellow - adult
Behaviour	Scattered on vegetation	form group and march long distance
Adults		
Colour	Greenish or grey	Pink – immature, Yellow – mature
Behaviour	Fly during nights – isolated individuals	Fly – day in swarms
Pronotum	Short, convex	Longer, concave (saddle – shaped)
Antennae	27 –30 segmented	26 segmented
Eye stripes	6-7	6
Femoral spines	Both strong and weak	Only weak

MANAGEMENT OF LOCUST

There are several methods to manage locusts, i.e., prevention, biological control, chemical control and other alternative approaches.

PREVENTIVE MEASURES FOR AGAINST BUILDING OF SWARM POPULATION AT SWARM BUILDING AREAS

Surveillance of the breeding sites may play a crucial role in controlling the locust population. Constant surveillance of the breeding sites and quick preventive measures is required when a large-scale swarm building is notified.

Cultural Methods

The locust population may be controlled at the egg stage by utilizing cultural methods such as digging, ploughing, flooding, and chemical soil treatment. During the hopper stage, locust may be controlled by using flame-throwers, vacuuming, aerial spraying in the breeding areas.

Biological control

PAN, Phenylacetonitrile governs swarming behaviour in adult males. PAN causes insects to resume solitary behaviour, appetite loss, and cannibalism in hoppers. The use of Insect Growth Regulators may also influence the ability of hoppers to moult and grow properly and used in barrier treatments. Predatory spiders, wasps, birds and reptiles are important locust enemies.

Chemical control

Dieldrin was the first insecticide to be used. Organophosphates, carbamates and pyrethroids are used now a day. At the adult stage, the control measures are similar to the nymph stage but can be controlled easily by spraying the chemicals during nights while locusts resting on the vegetation.

CONCLUSION

Locust swarms are a serious threat to crop production, and timely vigilance is imperative to adopt a holistic approach to tackle this havoc. The life cycle consists of locust consist of three stages, *i.e.* egg, nymph and adult. Adults form a swarm during a favourable breeding season and move from one place to another, causing severe damage to almost all vegetation types. Various control measures are taken to save the crops from this havoc. The optimum use of cultural, biological, and chemical methods may effectively control the locust problem.

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