LIFE CYCLE & REARING OF LAC INSECTS

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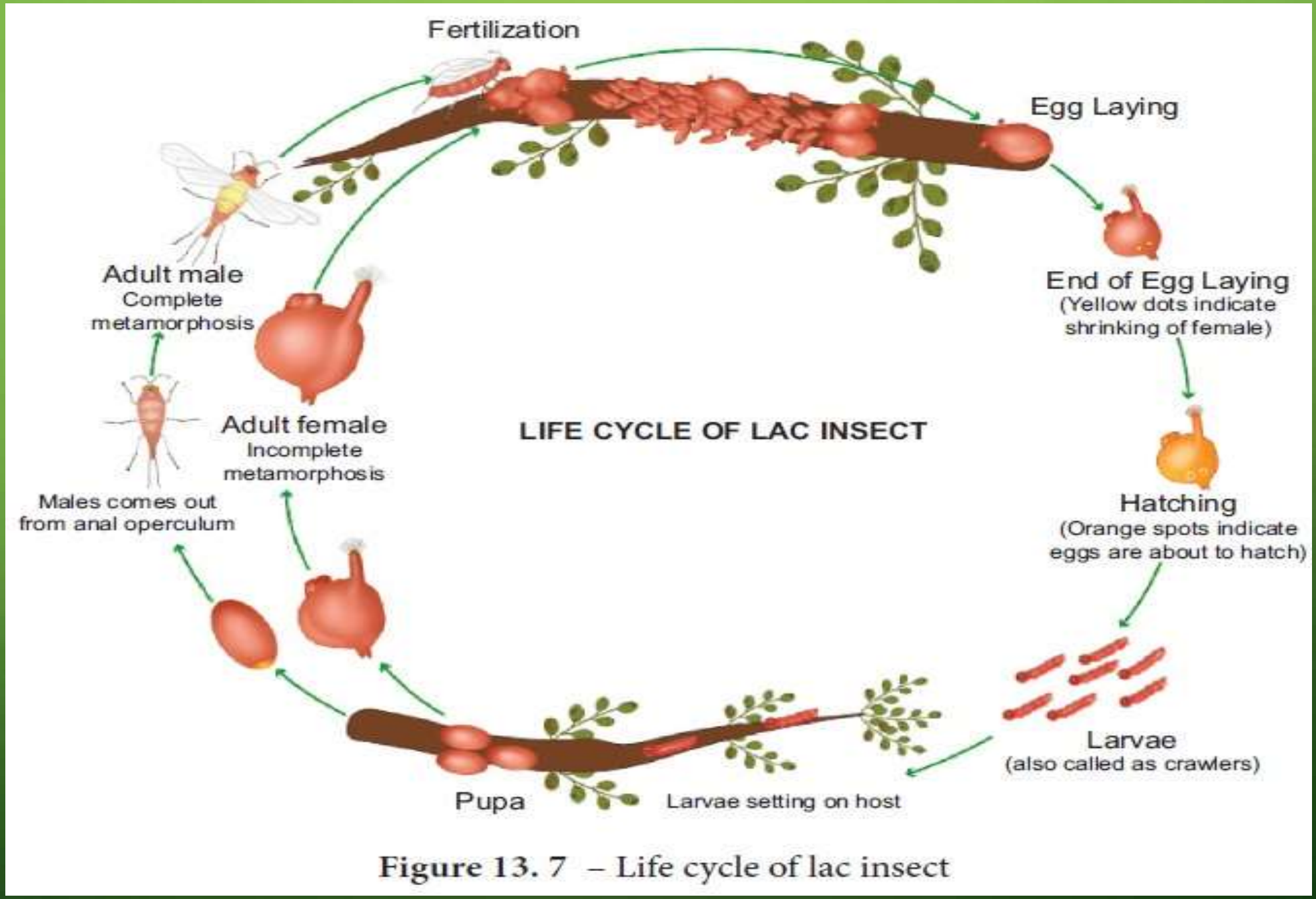


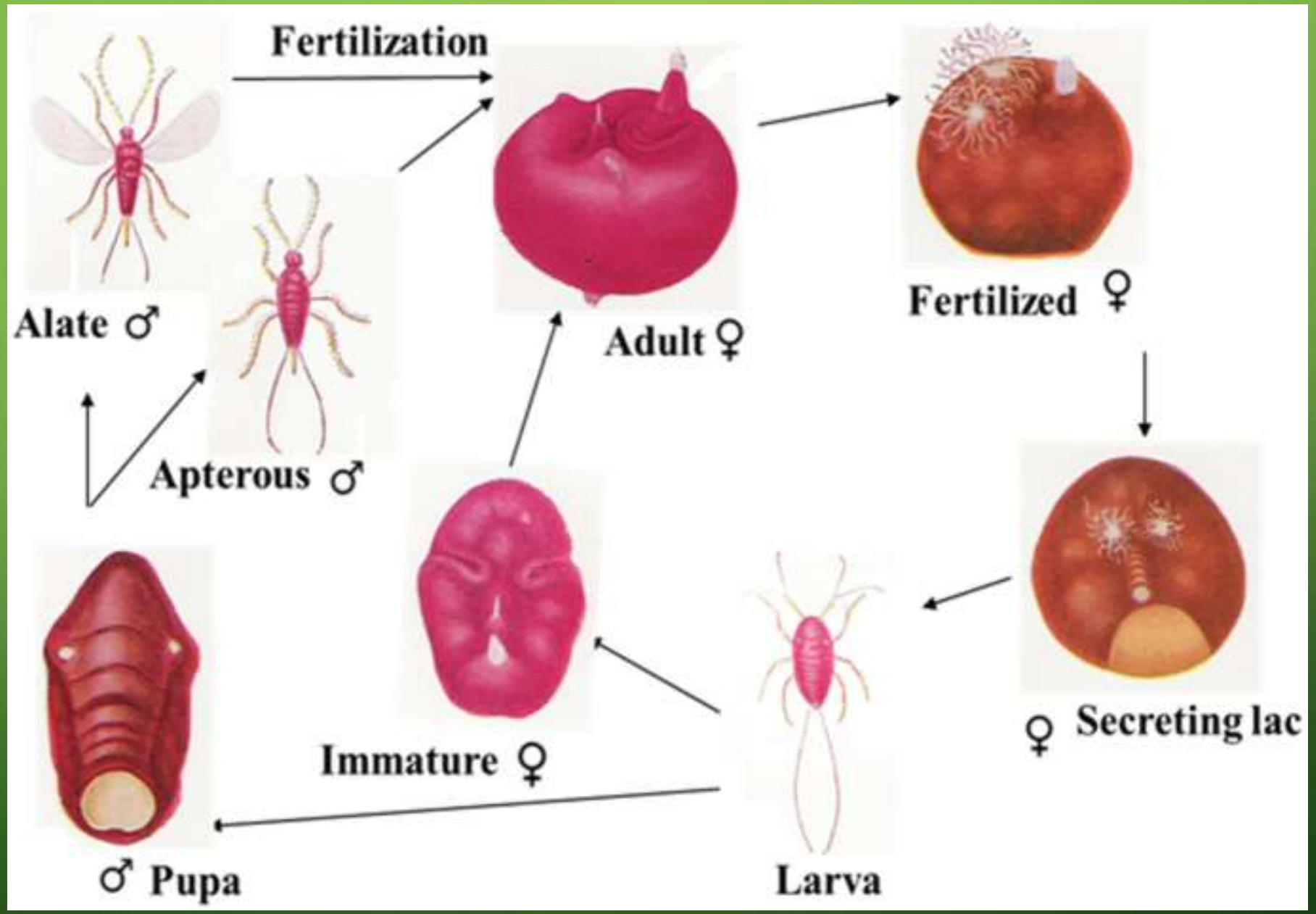
Figure 13. 7 – Life cycle of lac insect

Lac insect is a soft-bodied, round tiny creature, resin-secreting hemipteran scale insects which completes its life cycle in four stages viz., egg, larva, pupa and adult on host plants within six months.

Laccifer lacca, (Tachardia lacca) is the commercially cultured lac insect.

Lac insects exhibit extreme sexual dimorphism, where females are larger, immobile, and sac-like, while males are smaller, mobile, and winged or wingless. The adult male lac insect lives for a very short duration, such as 3-4 days, while the female lac insect lives longer.

During the life cycle, this insect sucked the sap juices of tree branches through its mouth, and the female lac insect secretes lac around the branches of host plants by which sticklac obtained; thus, it plays a major role in the production of lac (Ogle, 2006).


Fertilization
Alate ♂
Apterous ♂
Adult ♀
Fertilized ♀
♀ Secreting lac
Immature ♀
♂ Pupa
Larva

Lac is a type of natural resin that is formed as a result of secretion by the female Indian lac insect, K. lacca (Kerr). It belongs to the Kerridae family, consists of nine genera, while the number of species reported vary from 87 to 100 species (Sharma and Ramani, 2011; Ben-Dov and Lit,).

Two generas are found in India, while genus Kerria is the most important and widely exploited insect for lac cultivation in India.

Types of Raw Lac It is represented by two strains, i) Rangeeni strain and ii) Kusmi strain. Rangeeni strain thrives on hosts other than Kusum, while the Kusmi strain is grown on Kusum (Sharma, 2006; Mohanta, 2012). In the case of Rangeeni, two crops are such as-Katki and Baishakhi

Lac Insect

Structure of Male Lac-insect:

- It is larger in size and red in colour.
- The body is typically divided into head, thorax and abdomen.
- The head bears a pair of antennae and a pair of eyes.
- Mouth parts are absent so a male adult insect is unable to feed.

- Thorax bears three pairs of legs. Wings may or may not be found.
- Abdomen is the largest part of the body bearing a pair of caudal setae and sheath containing penis at the posterior end.

Structure of Female lac-insect:

- It is smaller in size, pyriform (pear-shaped) or globular, and red, without distinct head, thorax, or abdomen segmentation
- The head bears a pair of antennae and a single proboscis.
- Eyes are absent.

Thorax is devoid of wings and legs.

Mouthparts: Possess a delicate proboscis for piercing and sucking the phloem sap of host plants.

Antennae: Vestigial, small, and segmented.

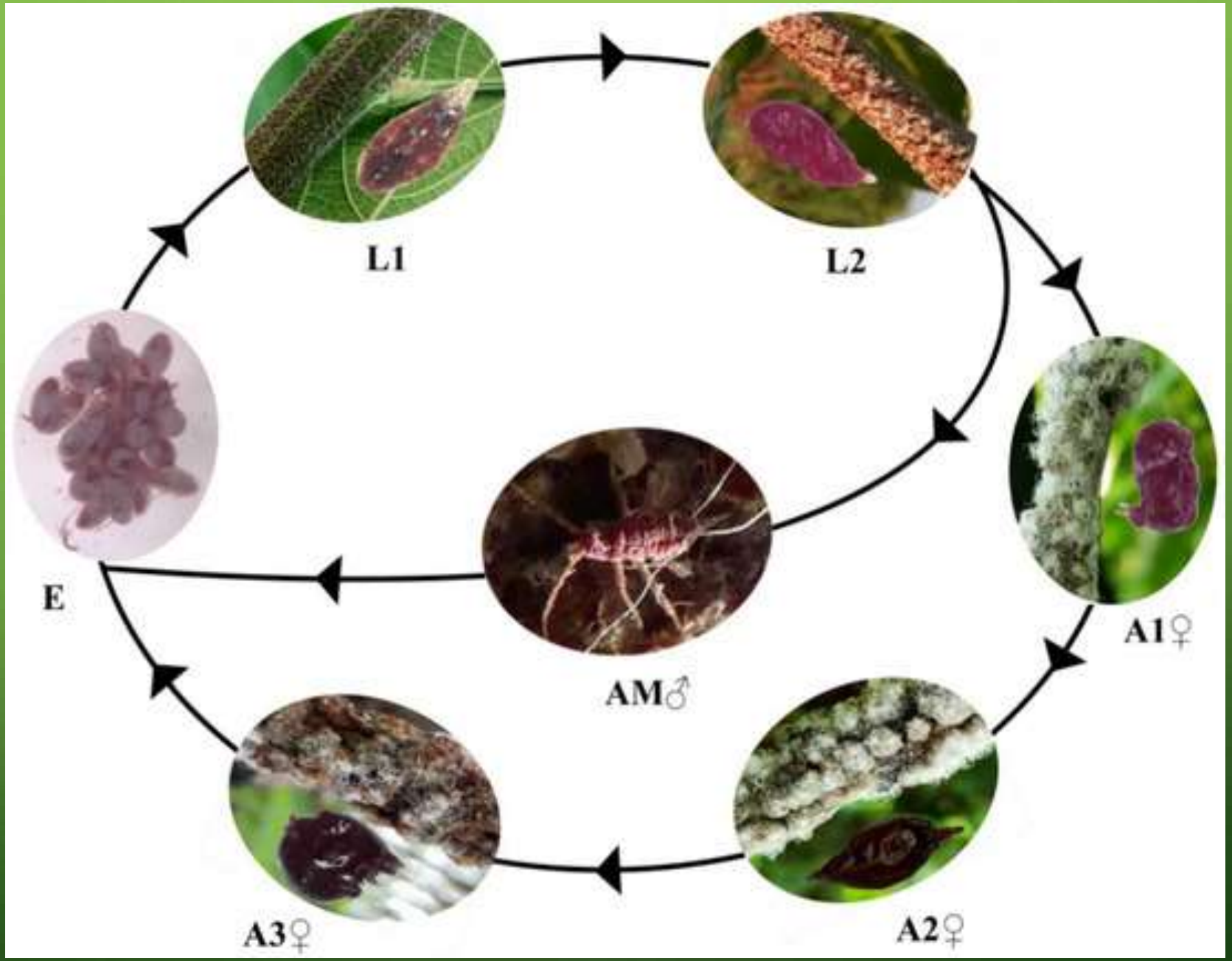
Degeneration: Adult females are sessile, having lost eyes, wings, and legs, as they remain in one spot for their entire life after settlement.

The loss of eyes, wings, and legs are due to the fact that the female larvae after settling down once never move again and thus these parts become useless and ultimately atrophy.

- Abdomen bears a pair of caudal setae.
- It is female lac insect which secretes the bulk of lac for commerce.

LIFE CYCLE

- Female insect is viviparous, producing about 1000 nymphs, deep red in colour with black eyes.
- The larvae settle down on a suitable place of the host plant gregariously.
- A day or two after settlement, the larvae start secreting lac all around the body except on the rostrum, spiracles and on the tip of abdomen.


L1
L2
A1♀
AM♂
E
A3♀
A2♀

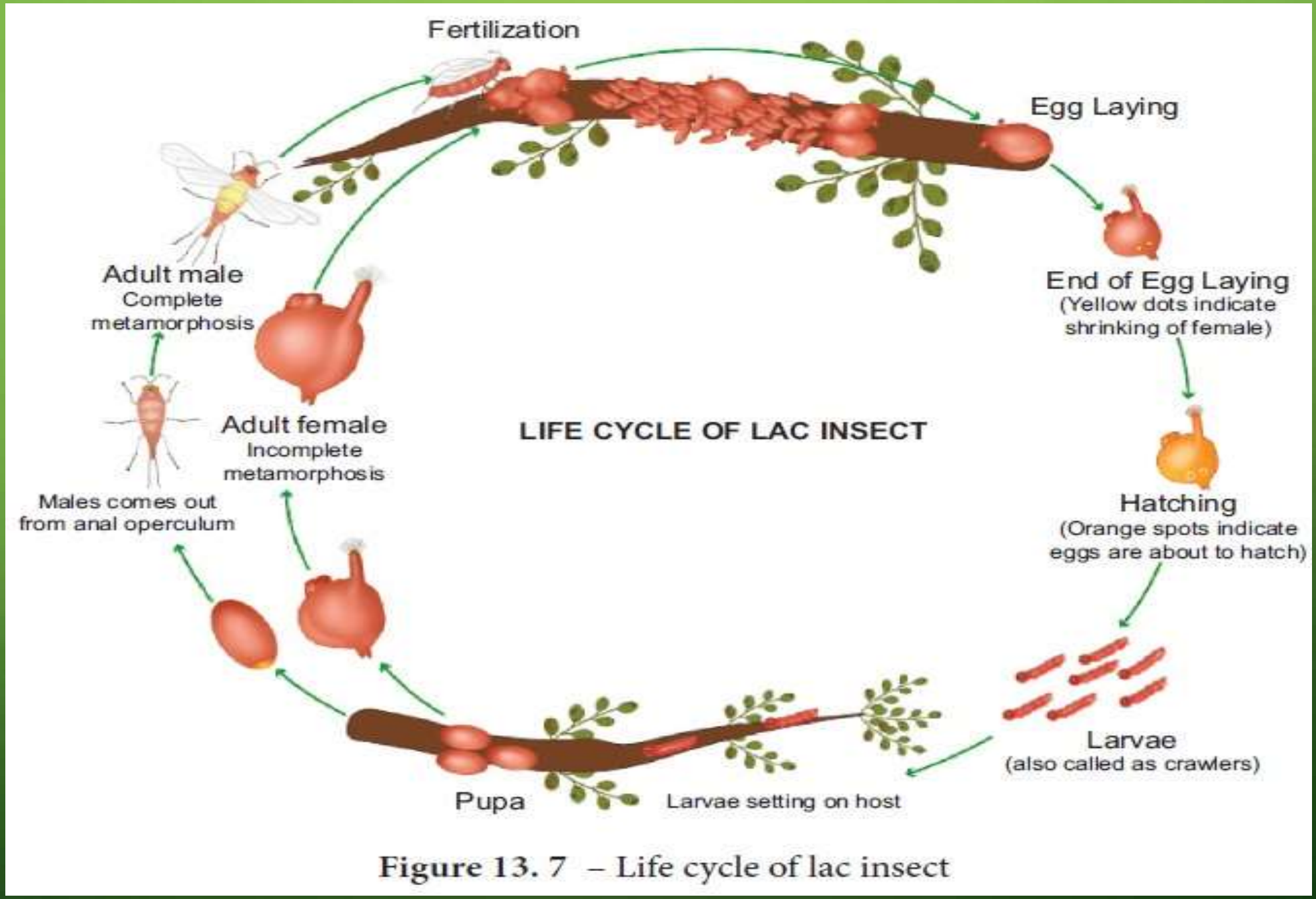


Figure 13. 7 – Life cycle of lac insect

- Thus, it gets encased in a cell of lac, which gradually increases in size along with the increase in size of the insect.
- The insect moults twice before reaching maturity.
- The male larvae produce elongated lac cells while the females produce oval cells.
- After the first moult, larvae lose their legs, antennae and eyes and become bag-like.

 After the 3rd moult the larvae pass on to a pseudo-pupal stage. Males emerge and copulate with the females and die. The female larvae never regain appendages and continue to remain under the lac cell, become adults and reproduce.

As the lac insects remain close together, lac secretion from adjacent cells coalesces with each other and forms a continuous encrustation on the tree branch.

Fig.- Pruning of Kusum tree

Fig.- Kusum tree with new leaves

Fig.- Inoculation of Brood lac

Fig.- Removed Phunki stick

Status of Raw Lac Production India is the leading lac producer in the world in terms of the production of raw lac, with an annual production of over 20,000 tons (Ogle, 2006). About 80 per cent of the world's total production is in India, and 75 per cent of it is exported to over a hundred countries, mainly in processed and semi-processed forms.

Scientific method of lac cultivation:

To start lac cultivation, two things are mainly to be taken into consideration, such as the suitable host plant on which the lac insect thrives and the availability of healthy brood lac in time.

Major lac cultivation operations/practices consist of six stages such as

i) Selection of suitable host plants,
ii) Inoculation of brood lac,
iii) Removal of brood lac sticks,
iv) Natural enemies of lac insect,
v) Harvesting of lac sticks and
vi) Scraping of raw lac from twigs.

Composition and Their Properties:

The surmised level of various constituents of lac is: resin 68 to 90%, dye 2 to 10%, wax 5 to 6%, mineral substances 3 to 7%, albuminous substances 5 to 10%, and water 2 to 3%. Lac called as multipurpose resin due to possess so many desirable properties.

The important properties of lac are such as

i) it is soluble in alcohol.
ii) It has adhesive nature.
iii) Resistance to water.

i) Possess high scratches hardness.
ii) It consist capacity of forming a uniform durable film.
iii) it allows quick rubbing with sandpaper without gumming or slicking

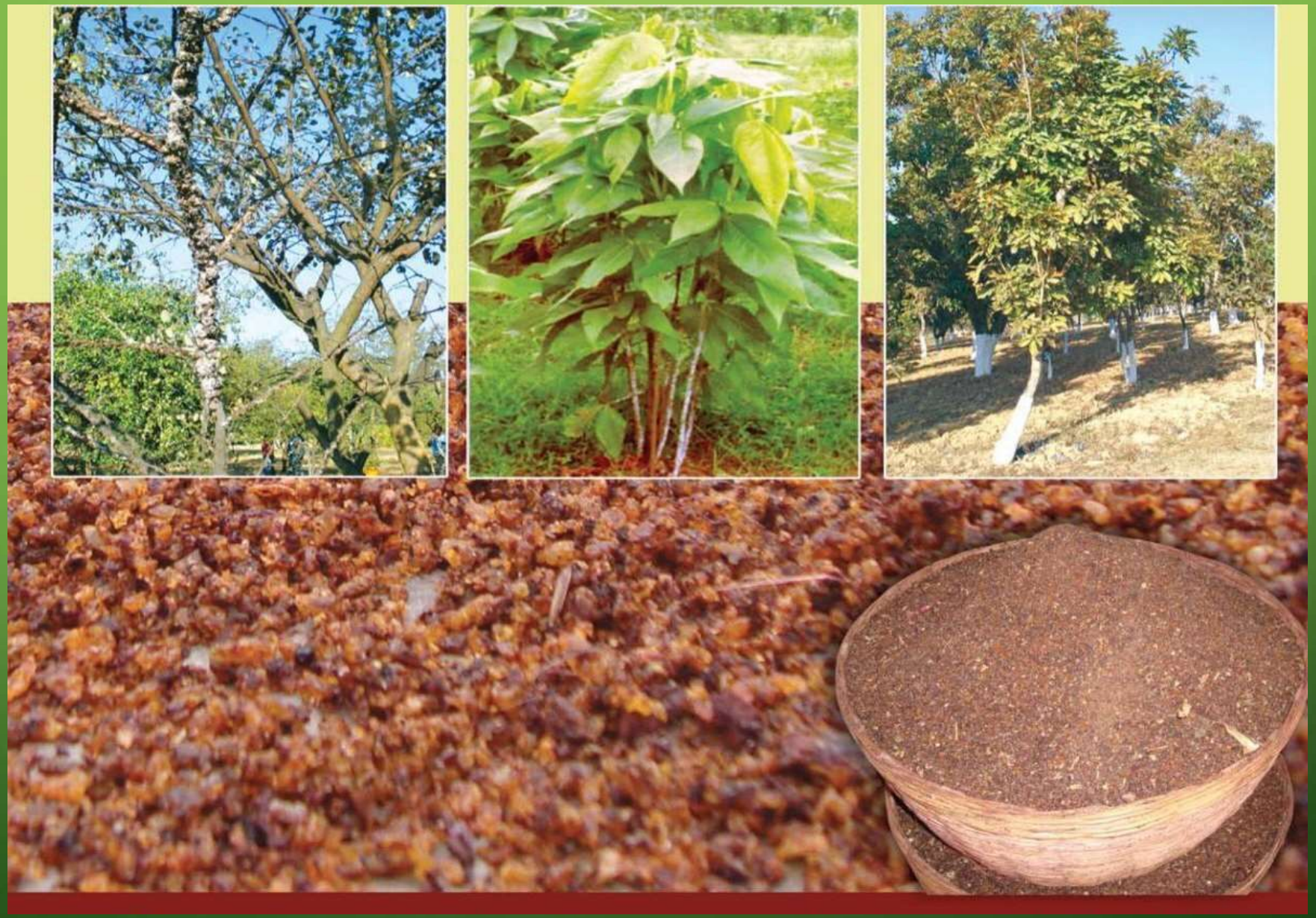
Fig.- Harvesting of lac

Fig.- Scrapping of lac

		
Stick lac	**Seed lac**	**Shellac**
		
Button lac	**Garnet lac**	**Bleached lac**

MANAGEMENT OF BENEFICIAL INSECTS

UNIT - 3



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