LECTURE 14. Pupa and types of pupae

PUPA :

It is the resting and inactive stage in all holometabolous insects. During this stage, the insect is incapable of feeding and is quiescent. During the transitional stage, the larval characters are destroyed and new adult characters are created. There are three main types of pupae.

1. OBTECT : Various appendages of the pupa viz., antennae, legs and wing pads are glued to the body by a secretion produced during the last larval moult. Exposed surfaces of the appendages are more heavily sclerotised than those adjacent to body. e.g. moth pupa.

a. Chrysalis : It is the naked obtect pupa of butterfly. It is angular and attractively coloured. The pupa is attached to the substratum by hooks present at the terminal end of the abdomen called cremaster. The middle part of the chrysalis is attached to the substratum by two strong silken threads called gridle.

b. Tumbler : Pupa of mosquito is called tumbler. It is an obtect type of pupa. It is comma shaped with rudimentary appendages. Breathing trumpets are present in the cephalic end and anal paddles are present at the end of the abdomen. Abdomen is capable of jerky movements which are produced by the anal paddles. The pupa is very active.

2. EXARATE : Various appendages viz., antennae, legs and wing pads are not glued to the body. They are free. All oligopod larvae will turn into exarate pupae. The pupa is soft and pale e.g. Pupa of rhinoceros beetle.

3.COARCTATE : The pupal case is barrel shaped, smooth with no

apparent appendages.
The last larval skin is changed into case containing the exarate pupa. The hardened dark
brown pupal case is called puparium. e.g. Fly pupa.

PUPAL PROTECTION

In general pupal stage lacks mobility. Hence it is the most vulnerable stage. To get
protection against adverse conditions and natural enemies, the pupa is enclosed in a
protective cover called cocoon. Based on the nature and materials used for preparation of
cocoons, there are several types.

Types of cocoon	Materials used	Example
silken cocoon	Silk	Silk worm
Earthen cocoon	Soil + saliva	Gram pod borer
Hairy cocoon	Body hairs	Woolly bear
Frassy cocoon	Frass + saliva	Coconut black headed caterpillar
Fibrous cocoon	Fibres	Red plam weevil
Puparium	Hardened last larval skin	House fly

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