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**DEPARTMENT OF ZOOLOGY**

**SEMESTER: - IX**

**ZOOLOGY (H)**



**PROJECT NAME - PROJECT WORK ON  
CRUSTACEA LARVA**

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Certificate of Completion

DEPARTMENT OF ZOOLOGY

This is to certify that Dibyendu Geeni Roll. 1122129 No. 220213.....a UG student of SEM-II, Department of Zoology has successfully completed a project on Crustacean Larva, their Evolution and Phylogenetic Analysis for the paper CC-3 (Non-Chordates-II) in the year 2023.

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# CONTENTS

<u>SUB</u>	Page no-
1. Introduction	
2. About Larva	1
1. General characteristics of crustacean larva	2
2. Distribution	3
3. Habit and Habitat	4
3. Larval forms of phylum Arthropoda and class crustaceans	
* Zoea Larva	5
* Mysid Larva	6
* Megalopoda Larva	7
* Nauplius Larva	8
* Alima Larva	9
* Cypris Larva	10
* Phyllosoma Larva	11
* Decapoda Larva	12
* Cyclops Larva	13
* Daphnia Larva	14
4. Economic importance of different crustacean larva	15
5. Crustacean metamorphosis	16
6. Evolutionary significance	17
7. Conclusion	18
8. Reference	19

# INTRODUCTION

Crustaceans are arthropods whose body is covered with chitinous exoskeleton for protection. But the same exoskeleton does not allow body growth and hence must be shed in order to allow growth. The larvae stage feed and grow in order to become adults and must undergo moulting or ecdysis to grow. After each moulting they change their structure and size and hence are different from the previous stage.

Crustacea was created by CUVIER or LAMARCK. Crustacea show both direct or indirect development. The offspring that hatching from eggs resemble to their parent in general structure, such development is called direct or epimorphic development. When newly hatched young one is different from their adult, it require adult hood after 20 of changes, such development called indirect or metamorphic development.



## What is Larva of About Larva?

Larva is an important stage in the development of many animals, occurring after birth or hatching. These immature active forms are structurally different from the adults and are adapted to a different environment.

### General characters of crustacean Larva:

- crustaceans show both direct and indirect development.
- In direct development, the adult has progressive growth and differentiation of the embryo, so newly hatched young resembles the parents.
- mostly of the crustaceans undergo indirect development involving a wide variety of Larva forms.
- among all the different Larva forms three major Larva forms are nauplius, zoea, and megalopae Larva and others are metanauplius, cypris and protozoea Larva.
- modified and distinct forms of zoea Larva given special designation, such as mysis of Coelostoma.

Distribution :-

They are commonly found at tropical soft bottom habitats, they are also distributed at vegetated habitats and tropical shallow soft bottom habitats.

They live in water, but some are found at land also crustaceans are commonly found in the oceans but some are also found in fresh water.



## Habit and Habitat :-

crustaceans are commonly found in rivers, ponds and other fresh water areas.

They are nocturnal bottom dwellers and live within under water crevices and aquatic vegetation. It takes all kinds of food specially specially decaying leaves. They are good swimmers but they are also capable of crawling on the surface they have a length of seventy five centimeters.



# ZOEALARVA

Systematic position :-

- Kingdom - Animalia
- Subkingdom - metazoa
- Phylum - Arthropoda
- Class - crustacea
- Subclass - malacostraca
- Order - zoea.

## About larva

- a) unsegmented cephalothorax and long abdomen.
- b) the first two pairs of maxillipedes are well developed.
- c) 6 pairs of thoracic appendages are in the form of buds.
- d) one pair of compound eyes.
- e) antennule and antenna are short and sensory in function.

Example - zoea (larva form) comb (adult form)

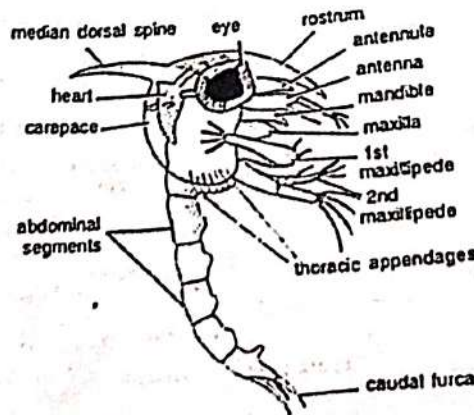


Fig: - zoea larva

# MYSIS LARVA :-

## Systematic position :-

Kingdom - Animalia

Sub Kingdom - metazoa

Phylum - Arthropoda

Class - crustacea

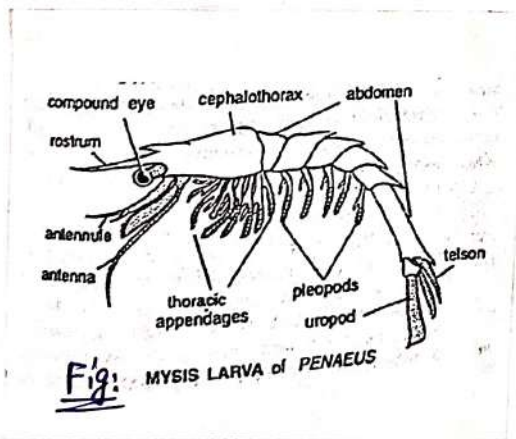
Subclass - malacostraca

speciment - mysis

## About larva :-

- a) Look like a miniature prawn.
- b) Head and thorax heavily compressed.
- c) All thoracic appendages are a like and biramous with endopodites.
- d) Head bears antennules antenna and pair of eyes.

Example → mysis (larva form) prawn (adult form)





# MEGALOPODA LARVA

## Systematic position

- Kingdom - Animalia
- Sub Kingdom - metazoa
- Phylum - Arthropoda
- Class - crustacea
- subclass - megalopoda

## About Larva :-

- a) Body is divisible into cephalothorax and 8 segmented abdomen.
- b) The carapace, large and idrawn into a spire in front this body.
- c) Thoracic appendages pairs well developed.

Example → megalopoda (larva from) crab (adult from)

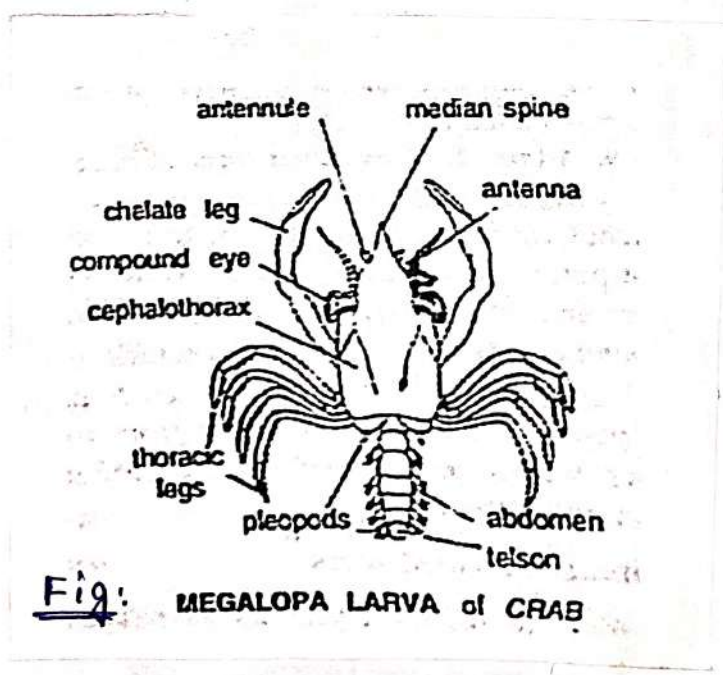


Fig: MEGALOPA LARVA of CRAB

# NAUPLIUS LARVA

## Systematic position →

Kingdom - Animalia  
 Sub Kingdom - metazoa  
 phylum - Arthropoda  
 class - crustacea  
 specimen = nauplius

## About Larva :-

- a) unsegmented larva, somewhat oval in shape with a broad anterior and narrow posterior end.
- b) Body divisible into head, trunk and bilobed anal region.
- c) A median eye and a mouth at the anterior region.
- d) Three pairs of unjointed appendages.

Example - Nauplius (larva form), Cyclops (adult form)

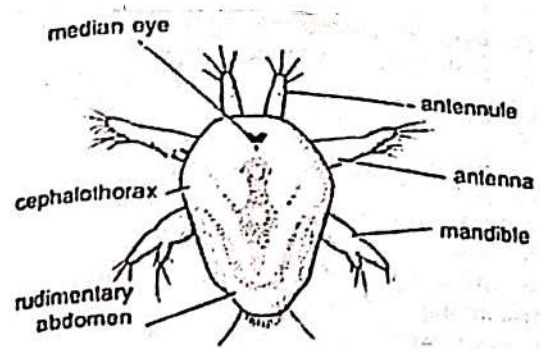


Fig. NAUPLIUS LARVA of CYCLOPS



# ALIMA LARVA

## Systematic position

Kingdom - animalia

Sub Kingdom - metazoa

phylum - arthropoda

class - crustacea

speciment → Alima

## About Larva

of The Alima Larva of *Squilla*, which attached out to modified zoea larva. of Anterior cephalothorax produced into rostrum.

of The abdomen is segmented and has four pair of appendages and in telson.

Example → Alima (larva from) *Squilla* (adult from)

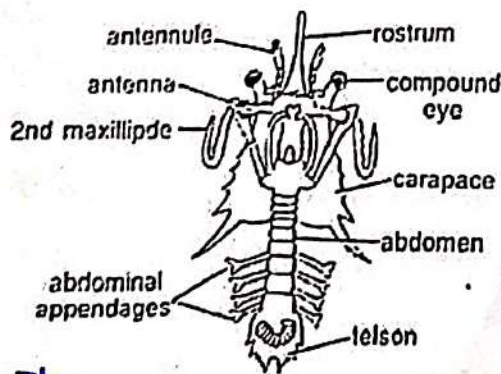


Fig:- ALIMA LARVA of SQUILLA

# CYPRIS LARVA :-

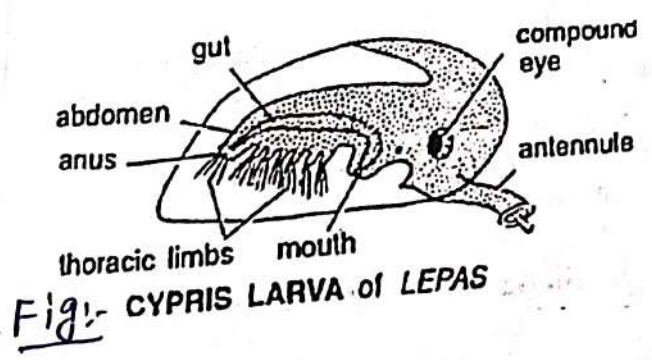
## Systematic position :-

- Kingdom - Animalia
- Sub Kingdom - metazoa
- phylum - Arthropoda
- class - crustacea
- subclass - ostracod
- specimen - cypris

## About Larva :-

- a) Body of cypris is enclosed into bivalve shell which is secured by an adductor muscles.
- b) There are 6 pairs of binomous thoracic appendages for swimming.
- c) There is one pair of compound eye the antennule is long and specially modified for attachment to substratum with cement gland, the second antennule is

Example - cypris (comatrom) cypris (adult from)





# PHYLLOSOMA LARVA

## Systematic position

Kingdom - animalia

Subkingdom - metazoa

Phylum - arthropoda

class - crustacea

subclass - malacostraca

speciment - <sup>ca</sup> phyllosoma

## About Larva

a) There is a pair of stalked compound eyes and a pair each of antennules and antennae as sense-organs.

b) Body is dorsoventrally flattened and transparent.

c) The abdomen is small segmented and does not bear appendages.

d) Body is divided head, thorax and abdomen.

Example → phyllosoma (larva form) palinurus (adult form)

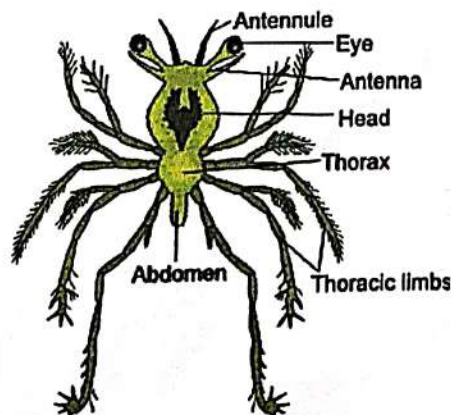


Fig: PHYLLOSOMA LARVA OF PALINURUS  
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# DECAPODA LARVA

Systematic position :-

Kingdom - Animalia  
 Sub Kingdom - metazoa  
 class - crustacea  
 sub class - malacostraca  
 specimen - Decapoda.

## About Larva

- a) 8 pairs of thoracic appendages.
- b) 5 pairs of appendages are considered.
- c) Front - 3 pairs of appendages function as mouth parts

Example - Decapoda (larva form) Decapoda (adult form)

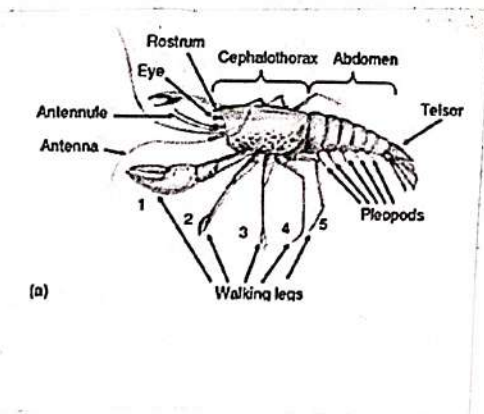


Fig: Decapoda larva



# Cyclops (Larva)

## Systematic position :-

Kingdom - Animalia  
 Subkingdom - Metazoa  
 Phylum - Arthropoda  
 Class - Crustacea  
 Subclass - Copepoda  
 Specimen - Cyclops

## About Comma

a) The cyclops has a pair of long and divided tail-like appendages called a furca.

b) The cyclops is very small about 2-3 mm long with one black or red eye in the middle of its head.

c) Cephalothorax covered with comas.

d) Body elongated with a broad cephalothorax and narrow abdomen.

Example → Cyclops (comma form) Cyclops (adult form)

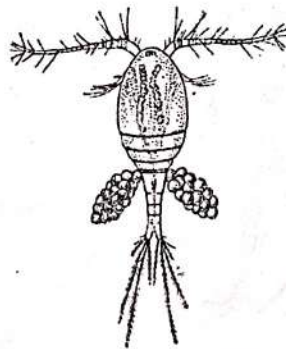


FIG. 14—*Cyclops albidus*, A SPECIES OF COPEPOD FOUND IN FRESH WATER. (After Schmeil.)  
 Female specimen carrying a pair of egg-packets. The actual length is about one tenth of an inch.

Fig:- Cyclops larva

# DAPHNIA LARVA

## Systematic position

- Kingdom - Animalia
- Subkingdom - Metazoa
- Phylum - Arthropoda
- Class - Crustacea
- Subclass - Branchiopoda
- Specimen - Daphnia

## About Larva :-

- of Body bilaterally compressed
- of Abvalve compress enclosed body and appendages
- of Eyes long sessile.
- of Second antennae long and biramous

Example - Daphnia (larva form) Daphnia (adult form)

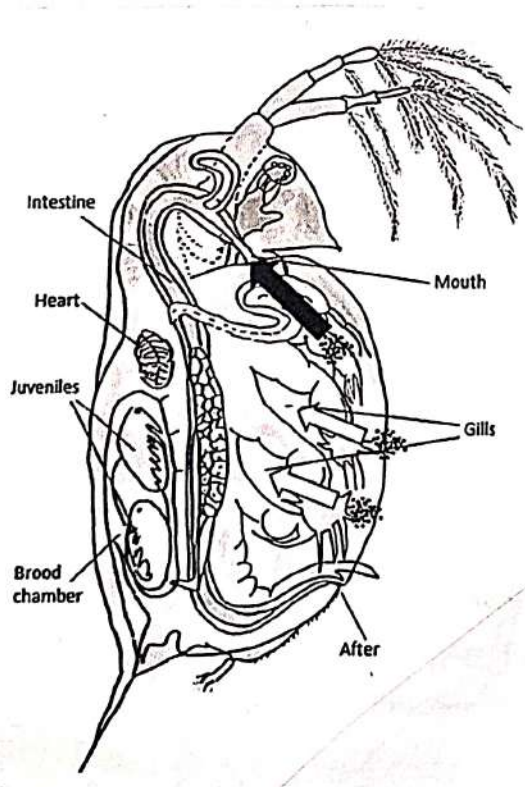


Fig:- Daphnia larva



## Economic importance of different crustacean larvae.

1) Human food :- The larvae decapod crustacean their larvae provided delicious crustacean food many small crustacean, however can be caught is such vast numbers and bulk that they become of considerable value. Several crustacean are often made into pastes.

2) public health :- Various crustacean in both larva and adult forms in some definite hosts of certain parasitic worms whose final host is man. The lung fluke *Paragonimus* ringens, of Asia and South America has as its second hosts a fresh water common crayfish. man becomes the final host by eating a raw or undercooked second host. Infection leads to a chronic bronchitis.

3) Industrial damage :- one of the most serious crustacean pests is the barnacle, which often attaches itself to ship hulls, a heavy layer of barnacles and other fouling organisms can in creases by 50% the amount of fuel needed to maintain a given speed. Fouling by barnacles, is greatest in the tropics. The copepod larva free swimming stage on a ship only, when the vessel is in front it can't attach it self to a moving ship.

## Evolutionary Significance :-

- a) They help in dispersal of species.
- b) They help to study the different groups of crustacea.
- c) The larval stage are useful in finding the homologous species and in keeping the food reserves of eggs to a minimum.
- e) The larval stages are useful for finding out the homologies and affinities among various groups of the animal which as through similar stage are closely related.
- f) It is evident that primitive crustacea do not pass only through nauplius stage.



# CONCLUSION

of crustacea is their development undergo various larva stages with increasing complexity.

As the nauplius larva present in majority of crustacean life cycle hence. It's believed that all crustacean weight have evolved from the common ancestor which is resembles to nauplius larva.

The other larva (zoea, mysis; metamorphosis etc) shows the stage of evolution of higher crustacean from the nauplius like ancestor.

Janata  
24/09/23

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