

Aquatic Respiration in Prawn

Q.Name two aquatic respiratory structures of arthropods and cite examples.

Respiratory organ used in Aquatic respiration	Examples
Gills	<i>Palaemon</i>
Branchial baskets	Insect

Q.Account briefly the adaptive modification of the respiratory structures in aquatic and terrestrial arthropods.

Q.Describe the structure of a typical gill of prawn. Add a note on the mechanism of respiration in prawn.

GILLS: The gills are the respiratory organs of aquatic arthropods. These are developed in crustaceans.

(In this new syllabus we have aquatic respiration in prawn only)

Q.What is branchiostegite?

Gill chamber in prawn is covered by the lateral extension of carapace, which is called as branchiostegite.

Prawn respire in the aquatic medium and it carries 3 sets of organs for the purpose—lining of the **branchiostegite**, **epipodites** and **gills**. All these organs are enclosed within a special chamber on each side of the cephalothorax which is called gill chamber. Each gill chamber is open ventrally, anteriorly and posteriorly. Prawns perform their aquatic respiration by using the following structures—

A)Lining of the branchiostegite—

- i) Richly vascularised membrane of the branchiostegite serves as respiratory surface.
- ii) This surface ensures gaseous exchange.

B)Epipodites—

- i) These are small highly vascularised leaf-like membranous structures, one on the coxal segment of each maxilliped.
- ii) These epipodites being present in the anterior part of the gill-chamber.
- iii) These structures carry out respiratory functions.

C)Gills—

- i) Considered as the primary respiratory organs.
- ii) Located on each lateral side of the cephalothorax and beneath the branchiostegites.
- iii) They are crescent shaped and their sizes increase gradually from the anterior to posterior direction.
- iv) There are 8 gills., each attached with thoracic wall by a gill-root.
- v) 7 of these 8 gills are serially arranged, while the 8th gill remains concealed under the second gill.

STRUCTURE OF GILL:

1. Each gill consists of a slender axis or base on which double rows of rhomboidal leaf-like gill-plates are arranged like the pages of a book.

2. Type of gills (on the basis of position)— According to their position and mode of attachment, the gills are 3 types,

Type of gills	Features
Podobranch	i) Attached with the coxa of the second maxilliped ii) First gill is podobranch
Arthrobranch	i) Attached with the arthroidal membrane of third maxilliped ii) 8 th gill is arthrobranch
Pleurobranch	i) Attached with the outer border of the thorax and over the articulating surface of the walking legs. ii) Remaining 5 gills are pleurobranch

3. Histology:

Gill base has following layers, the outer cuticle, inner epidermis and innermost connective tissue mass.

4. Blood supply:

- i) 2 lateral and 1 median longitudinal blood channels pass throughout the length of gill-base.