# Fins and Their functions

The fins are the highly specialized organs of locomotion, adapted for swimming in water. Variations in their structure and arrangement are due to the swimming habits, such as the control of movement and swimming efficiency of the fish.

Broadly the fins are classified into two main types as the median fins or single fins or unpaired fins and associate with the axial skeleton of the fish. and the paired fins or doubble fins or lateral fins and associated with the appendicular skeleton of fish.

Typically the median fins are found in dorsal, Ventral and the caudal positions on the body of a fish and named accordingly as dorsal, Ventral or anal and the caudal fins.

In some fishes these three fins as dorsal, caudal and anal are continuous and form a single fold. In some fishes all these three fins interrupted and separate fins formed.

These fins are supported by skeletal structures called as fin rays. These fin rays are covered by skin and muscles.

During swimming the dorsal and Ventral fins are used as stabilizers to prevent the body from rolling. The caudal fin help drive the animal by back and forth sculling action.

The paired fins include a pair of pectoral and a pelvic fins. These are considered homologous to the paired limbs of higher Vertebrates. The paired fins control the movement of fish during swimming.

Both the median and paired fins are supported by skeletal rods called as radials and dermal fin rays.

## I) Median fins :-

Those fins are single or unpaired these are called as median fins. median fins are Dorsal fin, caudal fin and Anal fins.

### 1) Dorsal fin :-

The fin develop or arrises on the mid dorsal side of the body of fish that fin is called as dorsal fin. In some fishes only one dorsal fin, whereas in some fishes possess two dorsal fins and are called as first dorsal fin and second dorsal fin.

When spines are present prior to dorsal fin then it is called as spinous dorsal fins. These spines are simple thorn like or serrated saw like it is used for offensive and defensive.

In some fishes second dorsal fin lacks any skeletal support and becomes a fleshy, without fin rays, thick skin is covered on the fin that fin is known as the adipose fin. i.e. it is soft, flexible without fin rays.

This fin is also used in locomotion and balancing organs in fishes.

2) **Anal fin** :-

The fins which is close to behind the vent or anal opening that fin is called as anal fin, OR

The fin originate and developed behind to the anal opening or anus that fin is called anal fin.

It consists of the usual myotomic and the skeletal componen The anal fin is also a medin fin or single fin or unpaired fins. In some fishes anal fin is short and simple. Few fishes forms long anx fins. and some fishes forms spines or thorns prior to anal fin. That spine are soft or hard. but it is also used as offensive and defensive purposses. In some fishes anal fin is attached to caudal fin and calle as confluent caudal fin.

It is also used for swimming and locomotion in water.

3) **Caudal fin** :-

It is also a median fins or single fins or unpaired fins. The caudal fin of the fish is a vertically expanded structure lying at the caudal end of the body. The fin develop on the poster most part of body of fish behind to the end of vertebral column of fish is called caudal fin. Caudal fin never possesses the spine It can be differentiated into a dorsal epichordal lobe and the ventral hypochordal lobe. In fishes various types of caudal fin is present, as protocercal caudal fin, Diphycercal caudal fin Heterocercal caudal fin, homocercal caudal fin and Isocercal caudal fin.

The caudal fin is used for swimming, locomotion, balancing the body as well as turning the body in water medium The caudal fin is used in forward movement with the help of caudal fin. This fin is also used for directing the body in any direction.

Modifications in caudal fin in fishes.

In fishes various types of modifications in caudal fin occurs which are as,

① Protocercal caudal fin :-

This type of caudal fin is firstly found in fishes, it is regarded as the most primitive type.

The tail fin fold continues with the dorsal, anal and caudal fin to form a continuous fold unsupported by the fin rays called protocereal caudal fin.

Ex- Cyclostomes, Living Lung fishes.

It is also used in swimming locomotion as well as balancing organs.

② Diphycercal caudal fin :-

When both lobes are equally developed and a continuous median fin is formed by the union of dorsal, anal and caudal fin is called Diphycercal tail.

Ex- Diphois chimaera etc.

③ Epiheterocercal caudal fin :-

Unequal development of caudal fin lobe is called as heterocereal caudal fin. One lobe is well developed whereas another lobe is not developed, called as heterocercal caudal fin.

When upper lobe is long and lower lobe is small, notochord bends upwards as its posterior end and continues almost upto the tip of the caudal fin is unequal or assemetrical externally and internally that fin is called as epichordal caudal fin.

Ex- Elasmobranch.

④ Hypocercal heterocercal caudal fin :-

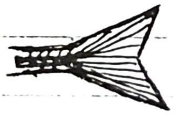
When in caudal fin notochord or vertebral column is bend downwards at its posterior end and continues almost upto the tip of caudal fin, one lobe is shorter and another lobe is longer and forms assemetrical caudal fin it is called as hypocercal heterocercal caudal fin.

Ex - Anaspida.

⑤ Homocercal caudal fins :-

It is characteristic of most higher bony fishes. It is symmetrical externally consisting of equal sized upper or epichordal and lower or hypochordal lobes. In this caudal fin both lobes is similar size and shape externally and look like symmetrical lobes but internally assymemmetrical called as homocercal caudal fin.

Ex- Catla, Labeo, Mrigala etc (Bony fishes).



⑥ Isocercal caudal fin :-

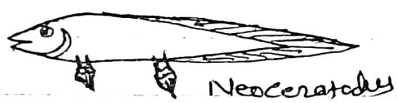
Upper dorsal lobe and ventral lower lobe is run parallel to the spine which is backward direction it is run posteriorly. All these three lobes are equal in size

## 4) Paired fins or Lateral fins :-

The paired fins of fish include a pair of pectoral fin and a pair of pelvic fins, both of which are supported by their respective girdles. The pectoral fins being used for a more active role in steering and stabilizing during forward locomotion while the pelvic fins are play a more passive role in stabalizing the body.
The form and functions of pectoral fin undergo a rapid and tremendous adaptive radiations.

### Pectoral fins:-

The pectoral fin articulate with the pectoral girdle by their basals, or by radials directly. In some fishes pectoral fin modified into various ways as, it acts as a adhesive organ in few bony fishes, in some fishes it is acts as spine like structure which is offensive and defensive found in Pteois russel. In some fishes it is modified into lobate paired fins which is used for creeping on mud found in lung fishes. In this fishes pectoral fin modified into paddle like structure for walking on mud. In flying fishes pectoral fin is modified into wing like structure used in water.
In some deep sea fishes this pectoral fin is absent it is the adaptive radiations. In hill stream fishes pectoral fin is small and short in size.
In some fishes pectoral fin possess a spine which is internally serrated which is used defensive purpose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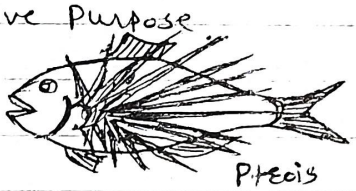
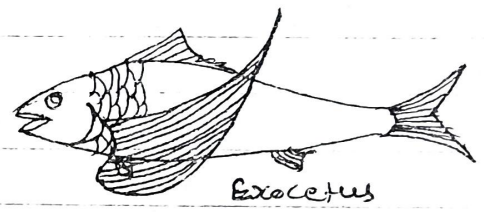

Pteois


Exocetus

### Pelvic fins:-

The pelvic fins articulate with the pelvic girdle. It is primitively situated infront of anus but during course of evolution it is situated in ventral side just behind to the pectoral fin.
In cartilagenous fishes it is lie posterior to the pectoral fins.
In few fishes pelvic fins are modified into lobate paired fins used for creeping on ground found in lung fishes. In this lung fishes pelvic fins modified into paddle like structures. In number of hill stream fishes pelvic fins are modified into adhesive sucker like structure which is used for attachment of rocks and stones.
Spines are also present in pelvic fins and used for offensive and defensive. These are also used in locomotion balancing the body & swimming in water.



Lungfish