Food and Feeding Habits of Finfish

FRM-122 "Anatomy & Biology of Finfish"

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The food of the fishes

- Fishes feed on wide range of food materials and obtain their nourishment from plants as well as animals. Depending upon the number of different type of food items consumed by them, fishes has been divided into two groups

1. **Stenophagic:** Feeding on few type of food.

2. **Euryphagic:** Feeding on variety of food.

Fish Food: consist of various material

- **Zoo-planktons** (Protozoans, rotifers, cladocera, crustacean larvae etc.)
- **Phyto-planktons** (unicellular algae, filamentous algae, diatoms etc.)
- **Annelids worms**
- **Snails, mussels**
- **Insects**
- **Smaller fishes, tadpoles, frog**
- **Aquatic plants**

Food eaten by various species of fishes has been divided into **four category**

1. **Main Food or Basic Food**: The natural food taken and preferred by fishes in their natural habitat under the favorable condition.

2. **Secondary food:** Consumed by the fish when available in plenty.

3. Incidental food: Food enters the gut by chance along with other food items.

4. Emergency or Obligatory Food: Taken by the fish in order to survive under unfavorable condition when basic food is not available.

Major feeding types

1) Predators

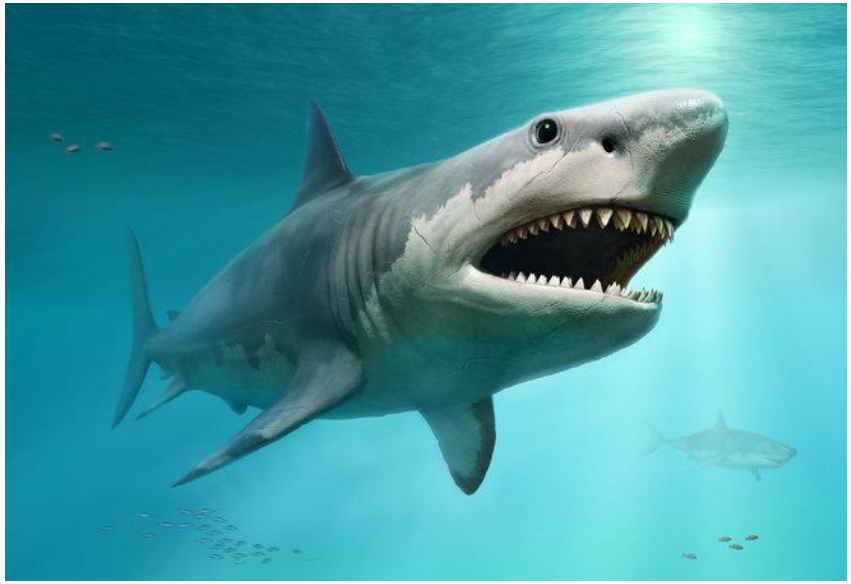
2) Grazers

3) Strainers (Filter feeders)

4) Suckers

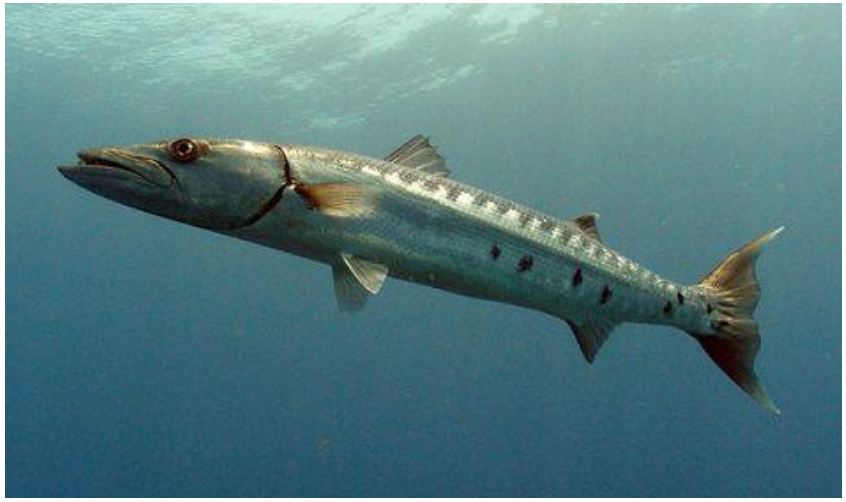
5) Parasites

Fishes that feed on macroscopic animals. They usually have well developed grasping and holding teeth



Great White Shark

Predators



Barracuds (Sphyraena)

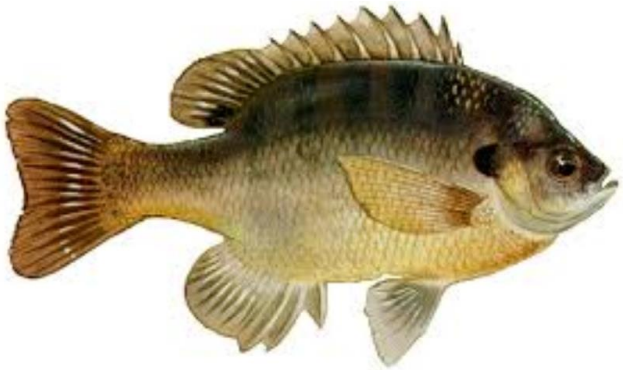
Pike (Esox)

Predators

Gar (Lepisosteus)

Grazers

In Grazing, the food is taken by bites or continual browsing (they mainly feed on planktons or on bottom organisms) and feed in bottom or column



Bluegill (*Lepomis macrochirus*)

Parrot fishes (scaridae)

Butterfly fishes (chaetodontidae)

Other examples: *Cirrhinus mrigala, Cyprinus carpio, Labeo rohita*

Strainers (Filter feeders)

Filter the water for plankton. Foods are selected by size and not by kind. Example: Herring (clupidae), Gizard, Shads (Dorosoma), Paddle fish, Hilsa, Catla have efficient food straining or filtering adaptation. The principal adaptation for filter feeding or strainers is the development of numerous, closely – set and elongated gill rackers.

Shads (Clupidae)

Gizzard

Hilsa

Other Examples:

Calta catla, Gudusia chapra, Hypopthalmicthys molitrix

Suckers

Sucking food or food containing material by bottom feeding fishes such as the sturgeons (Acipenseridae), suckers (catostomidae) and some loaches.

Sturgeons (Acipenseridae)

loach

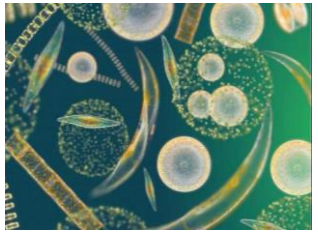
Parasites

Parasitism is perhaps the most unusual and highly evolved feeding habits among animals. They suck body fluid after rasping a hole in the sides of the body.

Examples: **Lambreys (Petromyzonidae), Sea lampreys (Petromyzon marinus) Pacific lampreys (Lamptra tridentata**

On the basis of their **gut content and preference for certain food items** in their natural habitat, the fishes are broadly divided into three groups

1. Herbivores



2. Omnivores

3. Carnivores

Specialized food habit: some fishes take only one type of food and are referred to as

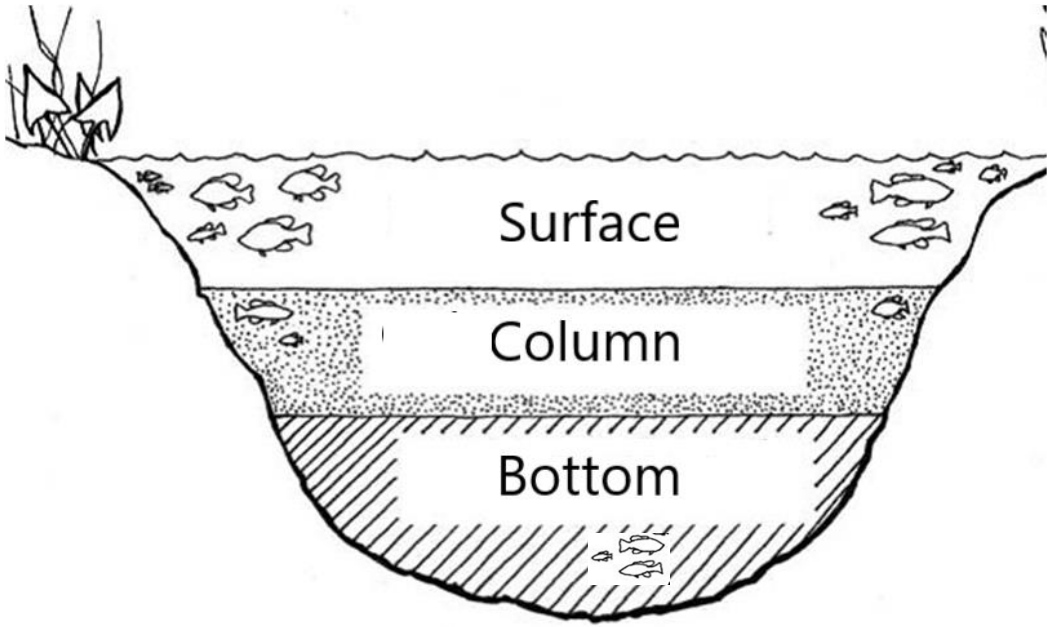
- Insectivorous
- Larvivorus
- Mollusc feeder
- Crustacean feeder
- Piscivorous

Freshwater fishes can also be divided into **three groups** on the basis of **ecological zone (niche) they occupy for feeding**

1. Surface Feeder

2. Column Feeder

3. Bottom Feeder



Specialized feeding Behavior

- **Plankton Feeder:** Some fishes feed entirely on plankton and form a separate group called the plankton feeder. For this they develop efficient filter feeding mechanism.

- These fishes may be **herbivorous** (feed on phytoplankton), **omnivorous** (feed on phyto and zoo planktons) or **carnivorous** (feed on zooplankton only)
- Example: ***Catla caatla, Hilsa hilsa, Gudusia chapra, Hypophthalmichthys molitrix.***

Herbivorous Fishes

- *Labeo rohita*
- *L. fimbriatus*
- *L. calbasu*
- *L. bata*
- *L. gonius*
- *Cirrhinus mrigala*
- *C. reba*
- *Ctenopharyngodon idella*
- *Liza tade*
- *Mugil cephalus*

Omnivorous Fishes

- *Catla catla*
- *Puntius sarana*
- *P. saphore*
- *P. javanicus*
- *Cyprinus carpio*
- *Colisa fasciatus*
- *Hypopthalmicthys molitrix*
- *Neolissochilus hexagonolepis*
- *Tor putiotra*
- *T. khudree*
- *T. mosal*
- *T. tor*
- *Osteobrama cotia*
- *Hilsa ilisha*

Carnivorous Fishes

- *Notopterus chitla*
- *Mystus seenghala*
- *M. vittatus*
- *Wallago attu*
- *Rita rita*
- *Pagasius pangasius*

- *Clarius batrachus*
- *Heteropneustes fossilis*
- *Channa marulius*
- *Channa striatus*
- *Anabas testudineus*
- *Lates calcariferd*

Detection of Food

For detection of food following organs are involve

- **Photo-sensory organ** like Eye used for visual cues for locating and capturing food.
- **Gustatory organs** are used for searching of food
- **Mechano-sensory organ**
- **Electro-receptor organs**

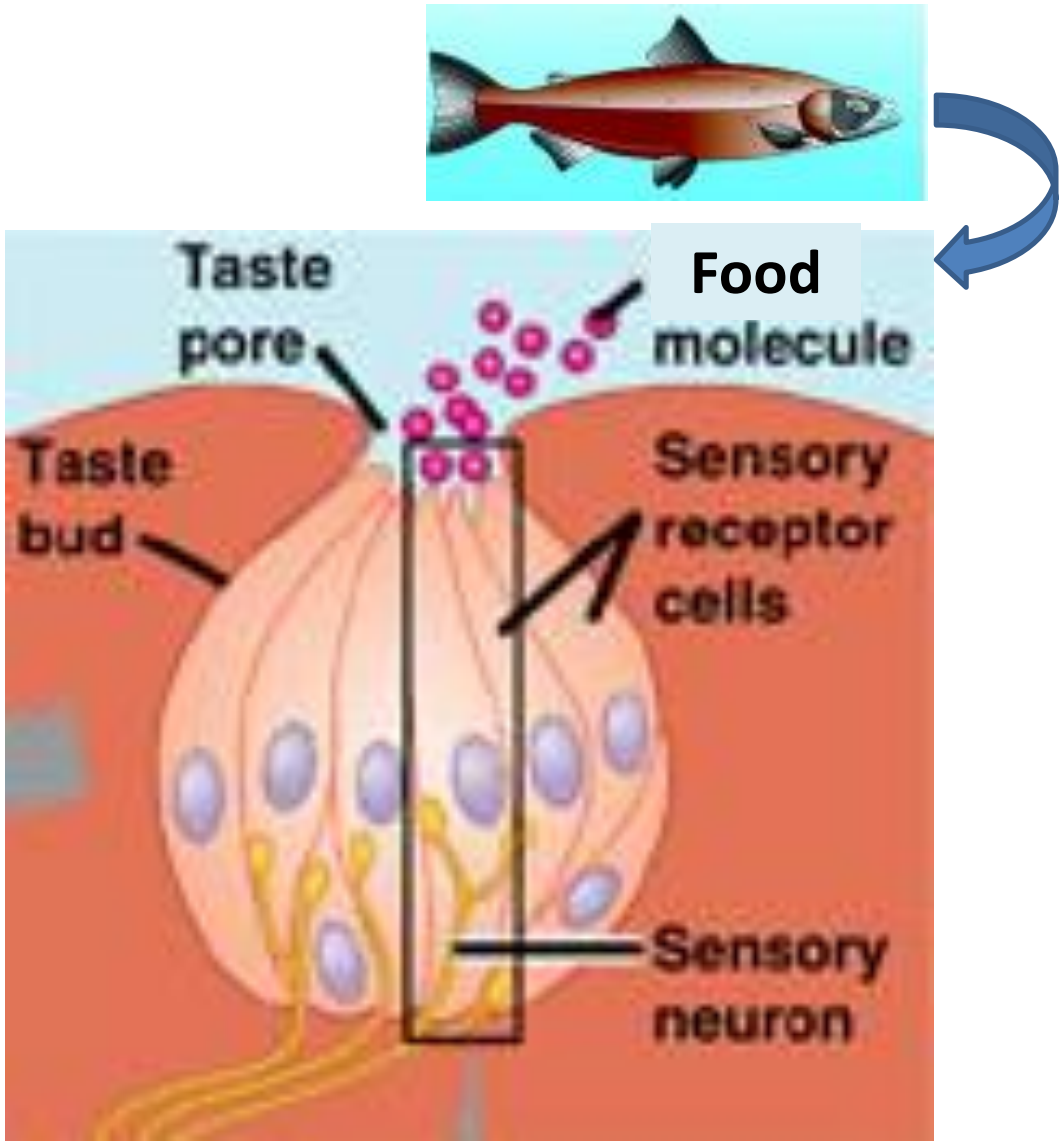
Gustatory organ (taste buds)

Gustatory organ (taste buds) situated on the lips, barbels, pharynx and gill arches help the fish in selecting the suitable food.

The gustatory sense of fishes is associated with distinct cranial nerves (VII, IX, X), all of which are projected to different areas of brain.

Taste buds that synapse with cranial nerve VII are important in appetitive (food search) feeding activity.

Taste buds that synapse with IX and X cranial nerves are important in consummatory (ingestive and swallowing) feeding behavior.



Taste Transduction

- **Mechano-sensory organ like Lateral line system and auditory organ like internal ear or membranous labyrinth are used by the fish in detecting prey due to displacement of water and distortion in water current.**

- **Lateral line sense organ also help in capturing prey at night or in deep dark water.**

- **Electro-receptor organs in fishes belonging to Mormyridae, Gymnarchidae, electrophoridae and some other enable the fish to detect location, size and shape of the prey in its vicinity.**