# PRACTICAL HANDBOOK ON ICHTHYOLOGY

## Fin fishes - Identification of common food species

### BIOLOGICAL OCEANOGRAPHY AND FISHERY SCIENCE PRACTICAL (22MSLC03)

**Maximum Marks (CIA=40+UE=60) = 100; Credits=3)**

III Semester

**Prepared By**


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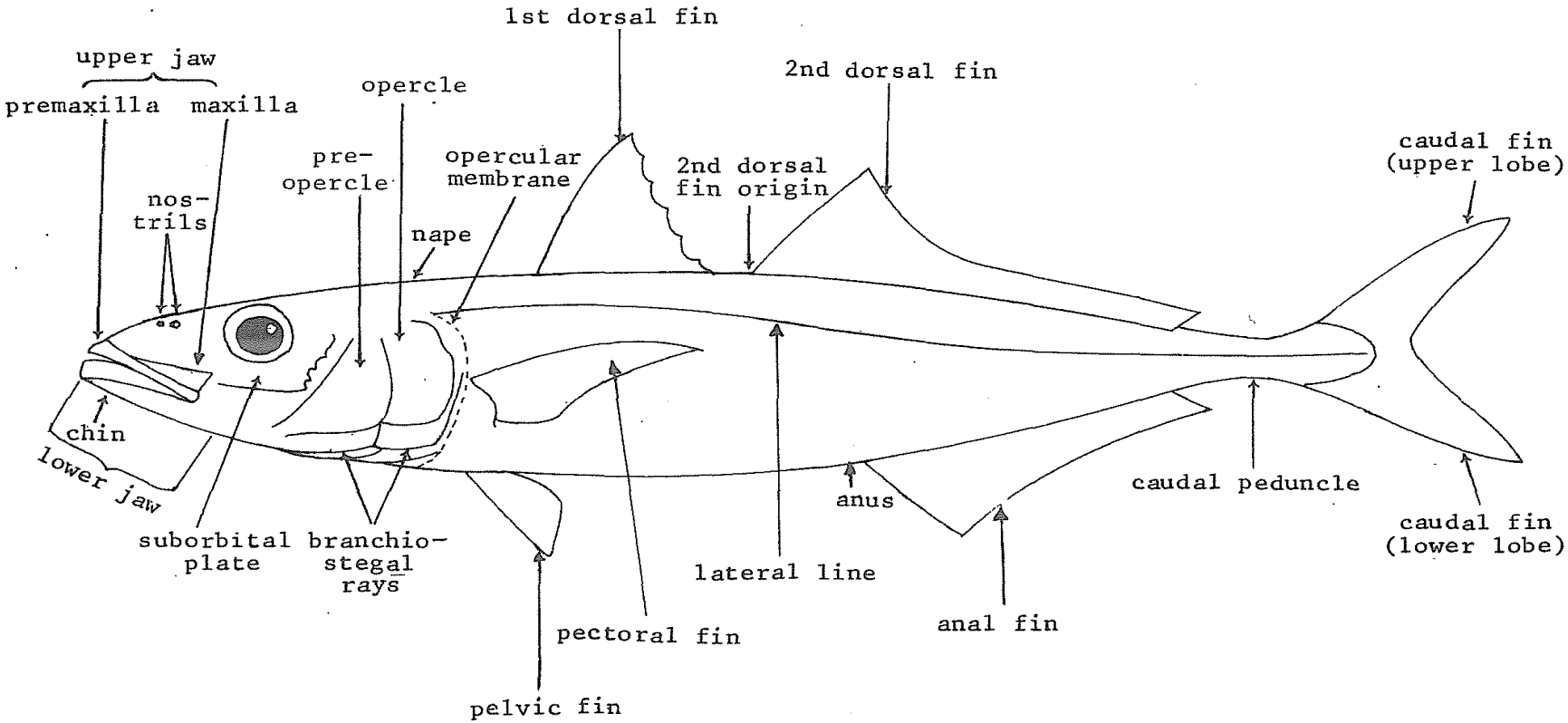
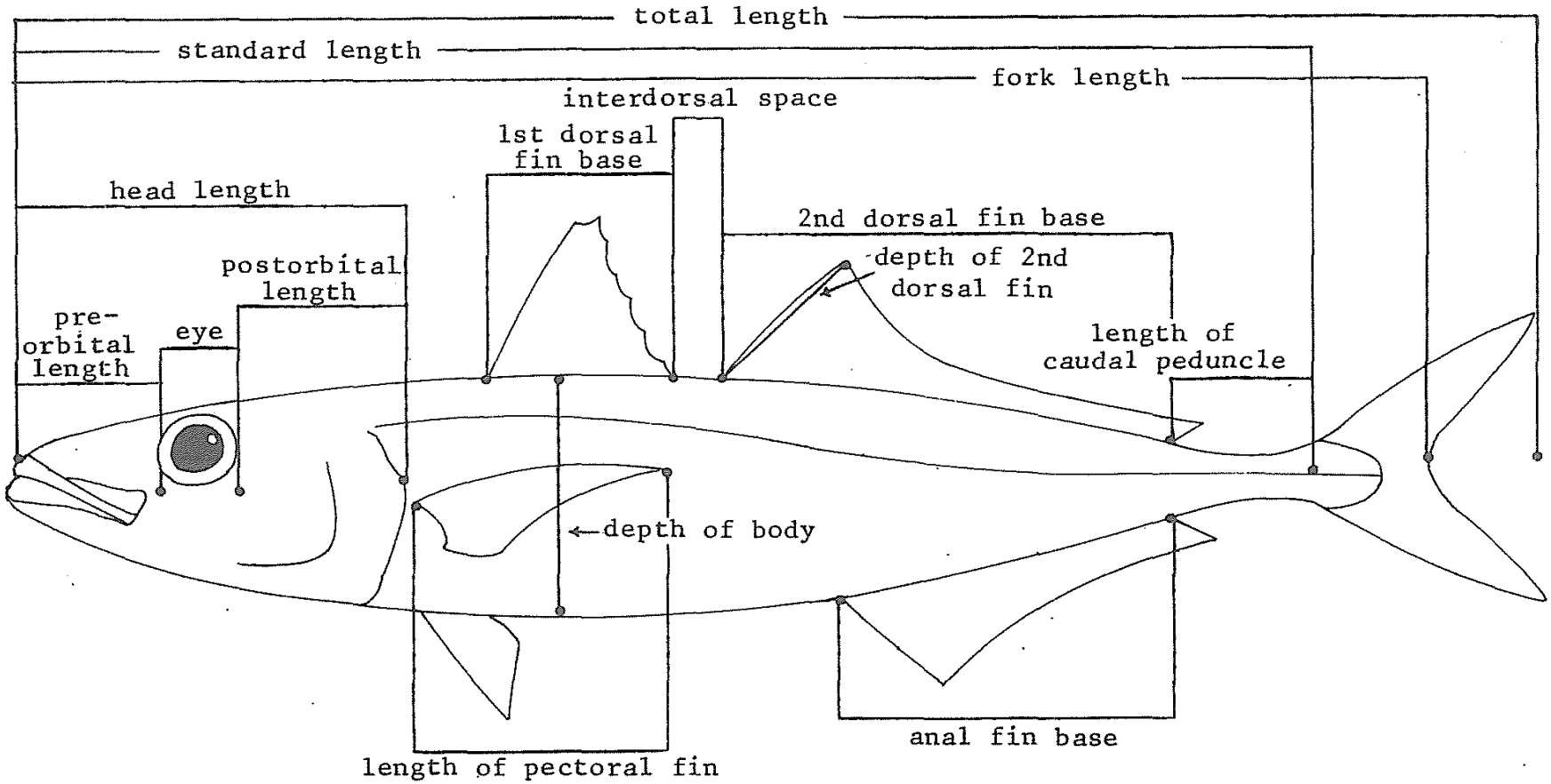
## Morphometric Measurements of a Fish - I



# Morphometric Measurements of a Fish - II



# Shapes of the Mouth

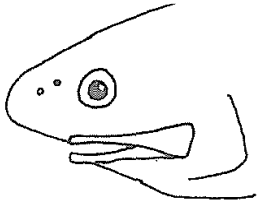
Fish feed on many different types of plants and animals. Generally, the type of food eaten relates to the shape of the fish's mouth

**Superior Mouth:**

Mouth of fish is said to be superior if it is positioned above the snout or situated directly upward. Such fish species like *Epiplatys sexfasciatus* and *Cyprinodonts spp*. feeds on insect that fall onto water or other surface water organisms such as mosquito larvae and pupae. They are said to be insectivorous or larvivorous. **Eg. Groupers**

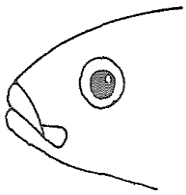
**Inferior Mouth:**

The mouth of fish is inferior if it is positioned below the tip of the snout or situated underneath. Fish species with this type of mouthpart are usually bottom dwellers and therefore, feed on detritus, worms and algae attached to the bottom platforms. *Clarias gariepinus*, *Synodontis spp*. and *Petrocephalus bane ansorgei* posses inferior mouth and are known to be omnivorous. **Eg. Sharks**



**Terminal Mouth:**

A terminal mouth in fish is the one located at the tip or at the extreme end of the snout. This type is seen present in *Hydrocynus brevis*, *Hepsetus odoe* and *Tilapia spp*. The feeding habits of species with terminal mouth type may be carnivorous (predatory) or planktivorous. **Eg. Tuna**

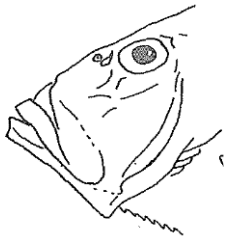


**Terminal Mouth**

**Sub-Terminal Mouth**

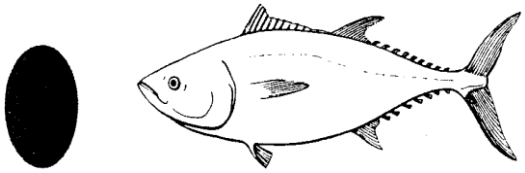
**Protrusible Mouth:**

This is a structural characteristic of any particular mouth type of a fish. It is such that it can be extended or pushed forward and outward or fold backward and inward especially during feeding apart from opening and closing the mouth during ingestion. Fish species with such trait are *Lates niloticus* and *Tilapia spp.*



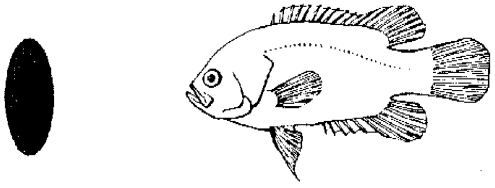
**Shapes of the Body:** Fish tend to have body shapes that are most suited for where they Live and feed. Each shape is advantageous for a different lifestyle.

1. **Fusiform Body:** The fusiform body shape is rounded or torpedo shaped and streamlined, which is an ideal shape for fast, continual swimming. Fish with this body shape are well adapted for feeding and survival in open water because the fusiform shape creates minimal drag as the fish swims through the water.



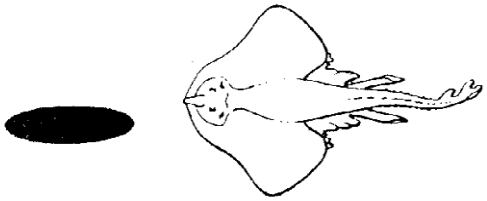
**Example:** Tuna, Jack, Salmon

2. **Compressed Body:** The compressed body is flattened from side to side, allowing the fish to turn easily and move quickly. Fish with a compressed body shape rely on quickness and agility rather than speed or camouflage to capture prey and avoid predators. This body shape is well suited for schooling, maneuvering around obstacles and coral reefs, and living around wrecks, rocks, or pilings.



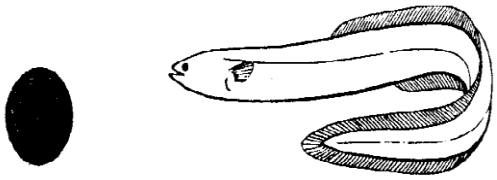
**Example:** Sunfishes, Angle fishes, Pile fishes

3. **Depressed Body:** Fish with a depressed body shape are flattened from top to bottom. This body shape is good for living on the bottom.



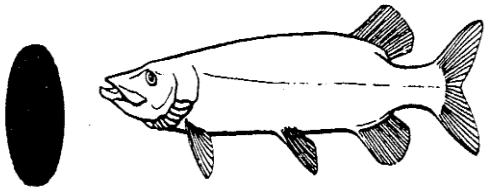
**Example:** Ray, Skates, Angle sharks, Flounders

4. **Elongated Body:** Fish that have an elongate or attenuated body shape are long and thin. This body shape allows fish to hide in holes and burrows, in plants and crevasses. Fish with elongate bodies are often quick-action, lie-in-wait predators.



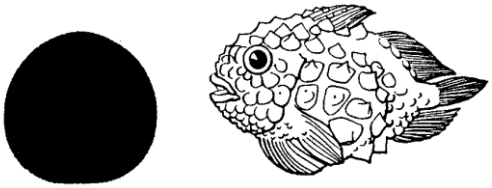
**Example:** Eel Fishes

5. **Truncated Body:** Fish with a square or truncate body shape are slow swimmers. They rely on camouflage and other special adaptations to capture prey and avoid predators.



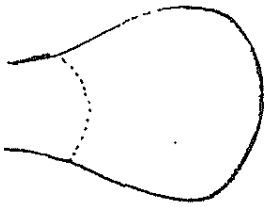
**Examples:** Pike

6. **Globiform Body:** Fish with round bodies have a globiform body shape. These fish are also slow swimmers, relying on camouflage and other special adaptations to capture prey and avoid predators.

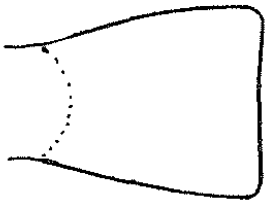


**Examples:** Puffer fishes, Porcupine fishes.

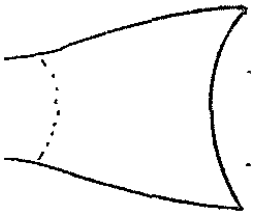
## Shapes of the Caudal Fin



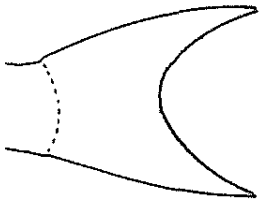
**Round**



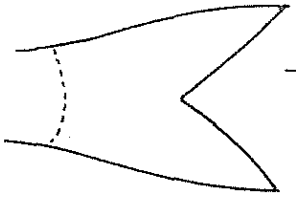
**Truncate (or) Straight**



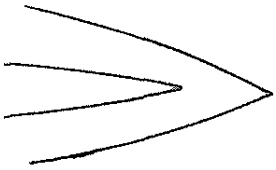
**Emarginate (or) Concave**



**Lunate**



**Forked**



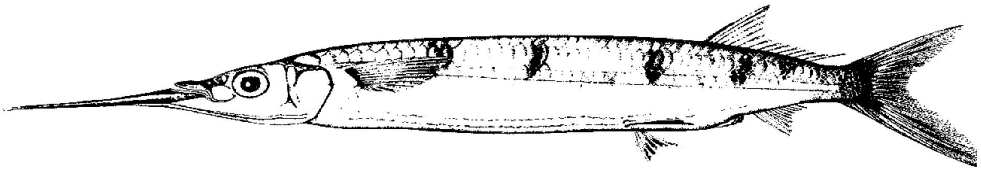
**Pointed**

## Identification of Common Food Fishes

### *1. Hemiramphus far*

**Taxonomic Classification**

| | | |
|---|---|---|
| Kingdom | : | Animalia |
| Phylum: | : | chordata |
| Class | : | Actinopterygii |
| Order | : | Beloniformes |
| Family | : | Exocoetidae |
| Genus | : | Hemiramphus |
| Species: | : | *Hemiramphus far* |



**Diagnostic Features for identification**

**Vernacular Name:** Black-barred half beak, Black-barred gar fish.

**External Features:**

- An elongate fish with a greatly prolonged body
- Lower jaw looks Beak-like; and the upper jaw is short, triangular and scales less.
- No spines in the fins;
- Dorsal fin rays are 12 to 14 anal fin rays are 10 to 12.
- Pectoral fins are short.
- Caudal fin deeply forked, lower lobe much longer than upper

**Diet:** Adults feed mainly on sea grasses, to a lesser extent on green algae and diatoms.

**Colour:** Dark bluish above, silvery white below, with 3 to 9 (usually 4 to 6) vertical bars on the sides. Beak dark, with a bright red fleshy tip.

**Geographical Distribution:**

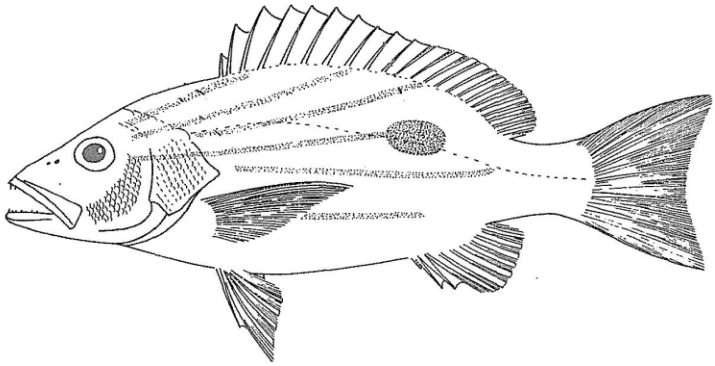
- Found from South Africa, East African coast including Madagascar, Mauritius, Zanzibar, Pakistan, India and Sri Lanka, Eastern Indian Ocean and Western Central Pacific ocean.

- Found in the proximity of continental coasts and islands, chiefly in areas of rich submerged vegetation.

**2. *Lutjanus* sp.,**

**Taxonomic Classification**

| | | |
|---|---|---|
| Kingdom | : | Animalia |
| Phylum | : | Chordata |
| Class | : | Actinopterygii |
| Order | : | Perciformes |
| Family | : | Lutjanidae |
| Genus | : | Lutjanus |
| Species | : | *Lutjanus* sp., |



**Diagnostic Features for Identification**

**Vernacular Name:** Lunartail snapper, Perch

**External Features:**

- A small, robust snapper body with a shallow or indistinct notch present in the edge of preopercle
- Snout profile straight or convex; Vomerine teeths are present.
- Dorsal fin with 10 spines and 13 or 14 soft rays.
- Anal fin with 3 spines and 8 soft rays;
- Emarginated caudal fins are present. Lateral line scales 47 to 48

**Diet:** It feeds mainly on the fishes and crustaceans

**Colour:** Ground colour grey-brown, yellow along ventral surface, Dorsal fin greyish or dusky; Caudal fin with a prominent black lunate marking**,** Anal, pelvic and pectoral fins Yellow.

**Size:** Maximum size of the fish - 25 cm; Common Size of the fish - 18 cm.

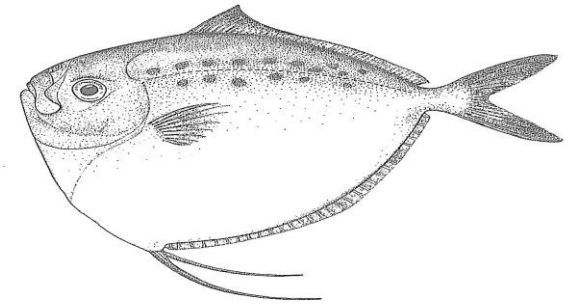
**Geographical Distribution:**

- Known from relatively few localities in the area including Kenya and Sri Lanka. Andaman Sea and northern New Guinea.
- Inhabits coral reefs to depths of about 50 m.

**3. *Mene maculata***

**Taxonomic Classification**

| | | |
|---|---|---|
| Kingdom | : | Animalia |
| Phylum | : | Chordata |
| Class | : | Actinopterygii |
| Order | : | Perciformes |
| Family | : | Menidae |
| Genus | : | Mene |
| Species | : | *Mene maculata* |



**Diagnostic Features for Identification**

**Vernacular Name:** Moon fish

**External Features:**

- Extremely compressed Body is present.
- The Upper jaw is protrusile; bands of villiform teeth in jaws, Gillrakers are well developed.
- Dorsal fin and anal fins are long and low, the anterior rays slightly elevated, the rays very short and overgrown with skin in adults.
- Pectoral fins are shorter than head, with 15 rays.
- The caudal fin is forked

**Diet:** It feeds on the small invertebrates.

**Colour:** Dark blue dorsally and silvery white present in below. Several small round black spots are present on the dorsal part of body.

**Size:** Maximum size - 24 cm; common size - 18 cm.

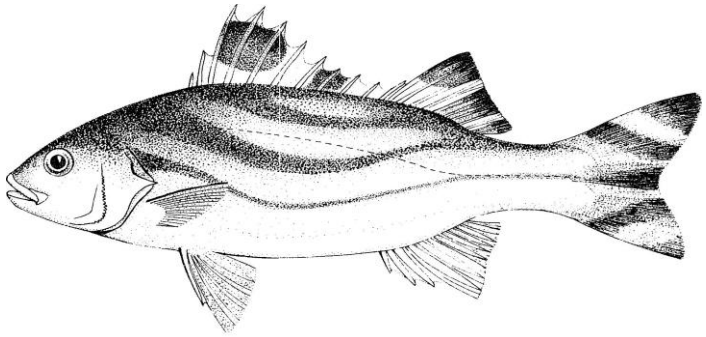
**Geographical Distribution:**

- Found along continental coasts in the Eastern Indian Ocean, Western Central Pacific.
- Inhabits deeper coastal waters, especially around coral reefs. Sometimes enters estuaries. A solitary fish, living near the bottom.

**4. *Terapon jarbua***

**Taxonomic Classification**

| | | |
|---|---|---|
| Kingdom | : | Animalia |
| Phylum | : | Chordata |
| Class | : | Actinopterygii |
| Order | : | Perciformes |
| Family | : | Terapontidae |
| Genus | : | Terapon |
| Species | : | *Terapon jarbua* |



**Diagnostic Features for Identification**

**Vernacular Name:** Jarbua terapon, Crescent Squeeking Perch

**External Features:**

- A moderate-sized species. Oblong compressed body is present.
- Jaws are equal, gape slightly oblique; conical shaped teeths are present.
- Slightly recurved in villiform bands.
- Dorsal fin with 11 or 12 spines and 9 to 11 soft rays.
- The first spine very short, the 4th to 6th spines are longer. Anal fin with 3 spines and 7 t 10 soft rays

**Diet:** Feeds on fishes and invertebrates; commonly a scale-eater.

**Colour:** Body silvery-greyish on the dorsally and silvery white in ventrally; 3 or 4 dark brown or black, downwardly curved longitudinal stripes on body

**Size:** Maximum size - 30 cm; common size - 25 cm.

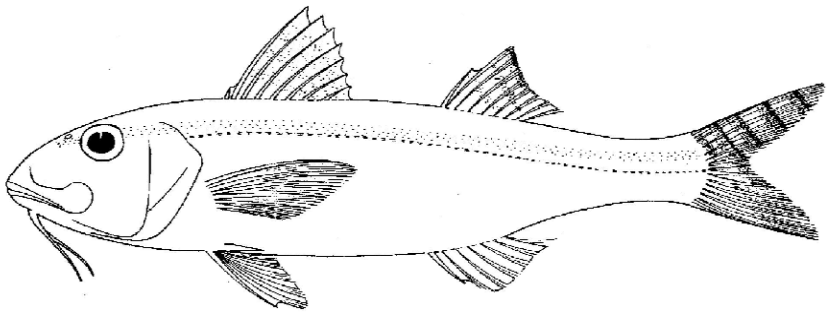
**Geographical Distribution:**

- Along the coast of East Africa, Madagascar, Red Sea, Arabian Peninsula, the "Gulf" India, Eastern Indian Ocean, and Western Pacific.
- Found in inshore waters, often occurring in brackish and freshwaters

**5. *Upeneus* sp.,**

**Taxonomic Classification**

| | | |
|---|---|---|
| Kingdom | : | Animalia |
| Phylum | : | Chordata |
| Class | : | Actinopterygii |
| Order | : | Perciformes |
| Family | : | Mullidae |
| Genus | : | Upeneus |
| Species | : | *Upeneus* sp., |



**Diagnostic Features for Identification**

**Vernacular Name:** Goldband goatfish, Goat fish.

**External Features:**

- Body elongated. Chin with 2 short and thin barbells. No spine on the operculum.
- Teeth in both jaws and on vomer and palatines (roof of mouth).
- Caudal peduncle moderately deep.
- 5 vertical rows of scales along the space between dorsal fins.
- 12 vertical rows of scales along upper part of caudal peduncle.
- Pectoral fins are much longer than pelvic fins.

**Diet:** It feeds on the bottom-living organisms.

**Colour:** Head and back Parts are brown/red or bright red, sides and the belly parts white. A distinct bright yellow band runs from anterior profile of head through eye above lateral line to caudal fin both dorsal fins yellow/golden, with 3 red horizontal Stripes

**Size:** Maximum size - 25 cm; common size about - 15 cm.

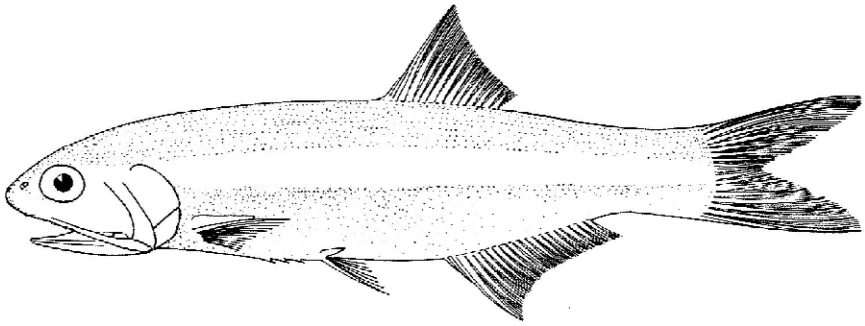
**Geographical Distribution:**

- Throughout northern part of area, northern coasts of Australia.westward to East Africa.
- Inhabits predominantly coastal waters at depths of 10 to 80 m; usually found in large schools.

**6. *Stolephorus commersoni***

**Taxonomic Classification**

| | | |
|---|---|---|
| Kingdom | : | Animalia |
| Phylum | : | Chordata |
| Class | : | Actinopterygii |
| Order | : | Clupeiformes |
| Family | : | Engraullidae |
| Genus | : | Stolephorus |
| Species | : | *Stolephorus commersoni* |



**Diagnostic Features for Identification**

**Vernacular Names:** Commerson's Anchovy, Anchovy

**External Features:**

- Fusiform body, nearly cylindrical; belly rounded, with 3 to 4 (rarely 5).
- Needle-Like scutes between pectoral and pelvic fin bases.
- Maxilla long, Anal fin origin below dorsal fin base.
- Lower gill rakers more than 21.

**Diet:** Feeds on plankton organisms.

**Colour:** Pale cream when scales lost; bright silver stripe along flank

**Size:** Maximum size - 15 cm; common size about - 12 cm.

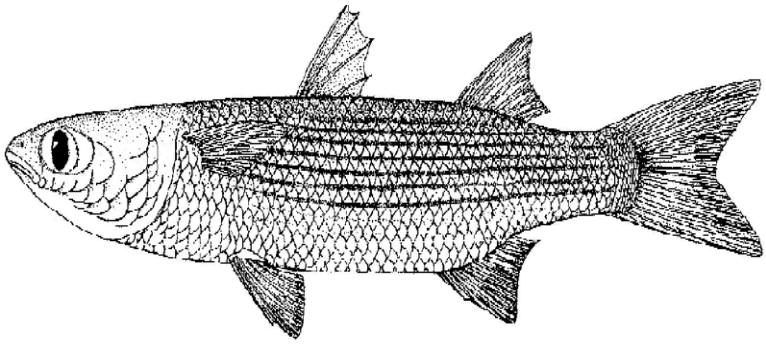
**Geographical Distribution:**

- Throughout most of northern part of area, also, westward to East Africa.
- A coastal pelagic species.

**7. *Mugil cephalus***

**Taxonomic Classification**

| | | |
|---|---|---|
| Kingdom | : | Animalia |
| Phylum | : | Chordata |
| Class | : | Actinopterygii |
| Order | : | Mugiliformes |
| Family | : | Mugilidae |
| Genus | : | Mugil |
| Species | : | *Mugil cephalus* |



**Diagnostic Features for Identification**

**Vernacular Name:** Flathead mullet, Grey mullet

**External Features:**

- Body robust, head much flattened dorsally.
- Fatty (adipose) tissue covering most of eye; lips thin, lower lip with a high symphysial knob; Labial teeths are present.
- First dorsal fin origin nearer to snout tip than to caudal fin base; second dorsal fin origin in front of vertical through midpoint of anal fin base.
- anal fin with 3 spines and 8 soft rays; second dorsal and anal fins lightly scaled anteriorly.

**Diet:** Feeds on small algae (diatoms and foraminifera) and other organic matter, both living and detrital, taken in with sand or mud.

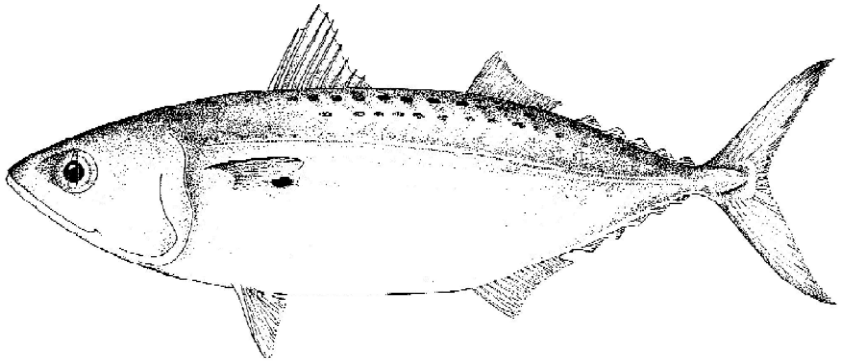
**Colour:** olive-green on back part, silvery on the sides, and shading to white below.6 or 7 indistinct brown bands down flanks, a dark purple blotch at base of pectoral fin. Margins of dorsal and caudal fins dusky

**Size:** Maximum: 90 cm; common to 35 cm.

**8. *Rastrelliger kanagurta***

**Taxonomic Classification**

| | | |
|---|---|---|
| Kingdom | : | Animalia |
| Phylum | : | Chordata |
| Class | : | Actinopterygii |
| Order | : | Perciformes |
| Family | : | Scombridae |
| Genus | : | Rastrelliger |
| Species | : | *Rastrelliger kanagurta* |



**Diagnostic Features for Identification**

**Vernacular Names:** Indian Mackerel

**External Features:**

- Body moderately deep.
- Its depth at margin of gill cover 4.3 to 5.2 times in fork length; head longer than body depth.
- Two widely separated dorsal fins; second dorsal and anal fins each followed by 5 or 6 finlets.

**Diet:** Feeds primarily on plankton, mainly larval crustaceans.

**Colour:** Back blue/green, flanks silver with a golden tint and a black spot on body near lower margin of pectoral fin. Dorsal fins yellowish with black tips, caudal and pectoral fins Yellowish; other fins dusky.

**Size:** Maximum size - 35 cm; common size - 25 cm.

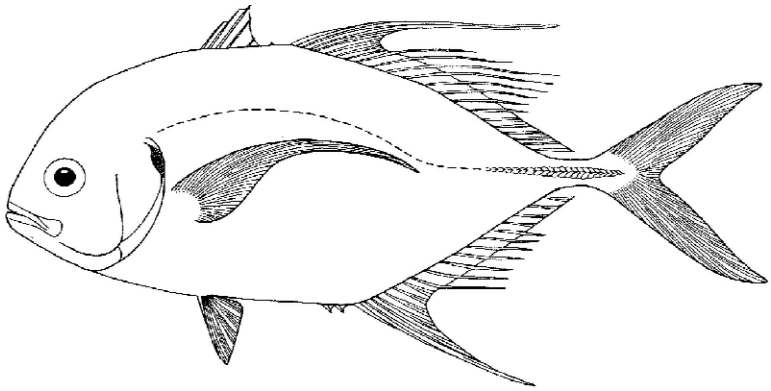
**Geographical Distribution:**

- Found from Natal northward along the coast of East Africa, Madagascar, Réunion, Red Sea, western India, and Sri Lanka.
- A common, coastal pelagic species, often found in large schools. Off India, batch spawning extends from March through September

**9. *Carangoides armatus***

**Taxonomic Classification**

| | | |
|---|---|---|
| Kingdom | : | Animalia |
| Phylum | : | Choardata |
| Class | : | Actinopterygii |
| Order | : | Perciformes |
| Family | : | Carangidae |
| Genus | : | Carangoides |
| Species | : | *Carangoides armatus* |



**Diagnostic Features for Identification**

**Vernacular Name:** Trevalley

**External Features:**

- Body strongly compressed, almost ovate Body strongly compressed and deep.
- Eye diameter slightly larger than snout length; upper jaw with a narrow band of small teeth.
- Two separate dorsal fins, the first with 8 spines, the second with 1 spine and 19 to 22 soft rays.
- Pelvic fins conspicuously long, tip of appressed fin extending almost to anal fin origin.

**Diet:** Feeds primarily on shrimps, copepods, decapod crustaceans and small fish.

**Colour:** Bluish-grey above, silvery below; blackish blotch on upper margin of opercle. Spinous dorsal fins are blackish; second dorsal and anal fins pale to dusky.

**Size:** Maximum: Largest specimen examined 23 cm fork length and 26.5 cm total length; probably does not exceed 30 cm total length.

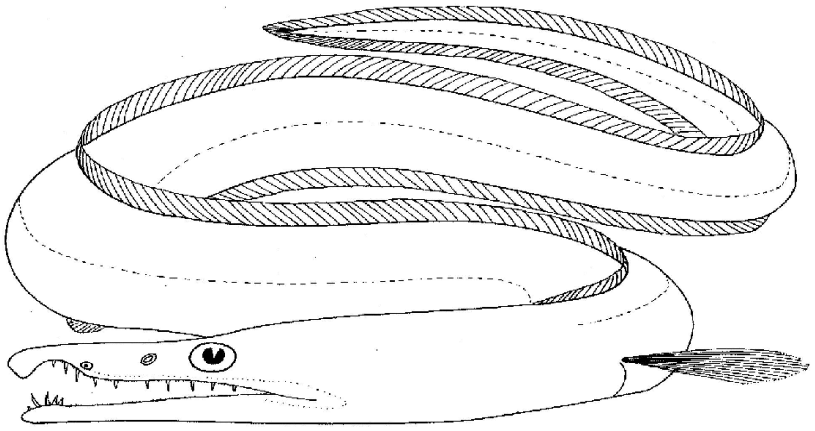
**Geographical Distribution:**

- Elsewhere in the Indo-West Pacific known from the east coast of India, Gulf of Thailand, Taiwan Island, Okinawa arid Indonesia.
- Common in shallow coastal waters where it oftens swims near the surface.

### *10. Congresox talabon*

**Taxonomic Classification**

| | | |
|---|---|---|
| Kingdom | : | Animalia |
| Phylum | : | Chordata |
| Class | : | Actinopterygii |
| Order | : | Angulliformes |
| Family | : | Muraenesoidae |
| Genus | : | Congresox |
| Species | : | *Congresox talabon* |



**Diagnostic Features for Identification**

**External Features:**

- Eel-shaped fish without scales. Mouth large, upper jaw ending well behind eye.
- Outer tooth row in lower jaw leaning outward; middle canines on vomer (roof of mouth) conical (needle-like, not blade-shaped).
- Dorsal and anal fins joined to caudal fin.
- Pectoral fins well developed their length about 3 times in, length of head.

**Diet:** Feeds mainly on bottom-living fishes.

**Colour:** Head and body yellow.

**Size:** Maximum size - 200 cm; Common size about - 150 cm.

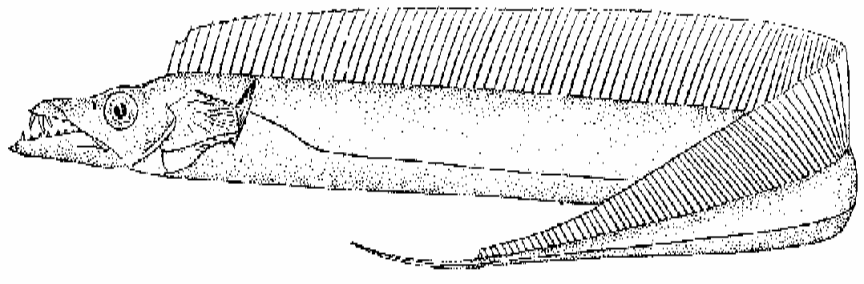
**Geographical Distribution:**

- Coasts of India eastward to Celebes, the Philippines, and South China Sea.
- Lives over soft bottoms down to about 100 m; also in estuaries.

### *11. Trichurus lepterus*

**Taxonomic Classification**

| | | |
|---|---|---|
| Kingdom | : | Aniamlia |
| Phylum | : | Choardata |
| Class | : | Actinopterygii |
| Order | : | Perciformes |
| Family | : | Trichiuridae |
| Genus | : | Trichurus |
| Species | : | *Trichurus lepterus* |



**Diagnostic Features for Identification**

**Vernacular Name:** Longer head hairtail, Ribbon fish

**External Features:**

- Body extremely elongate and strongly compressed, ribbon-like.
- Tapering to a point Mouth large, with a dermal flap at tip of each jaw.
- 2 or 3 pairs of enlarged fangs with barbs near tip of upper jaw and another pair near tip of lower jaw compressed lateral teeth in both jaws.
- Minute teeth on palatines eye large, its diameter contained 5 to 7 times in head length Dorsal fin rather high and long-based pectoral fins medium-sized pelvic and caudal fins absent Body scale less

**Diet:** It feeds on wide verities of small fishes and crustaceans; such as species of Dussumieria, Sardinella, Stelephorus, Excualosa, Hemiramphus, Mugil Leiognathus, Caranx

**Colour:** Fresh specimens are steel blue with silvery reflections, pectoral fins semi-transparent. Other fins sometimes tinged with pale yellow. The colour becomes uniform silvery grey some time after death.

**Size:** Maximum size - 120 cm; common size - 100 cm.

**Geographical Distribution:**

- Known from the east coast of Africa, the Red Sea, the North Arabian Sea, India and Sri Lanka.
- Benthopelagic, living in coastal waters usually to the depth of 100 m; often comes near to surface at night.

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