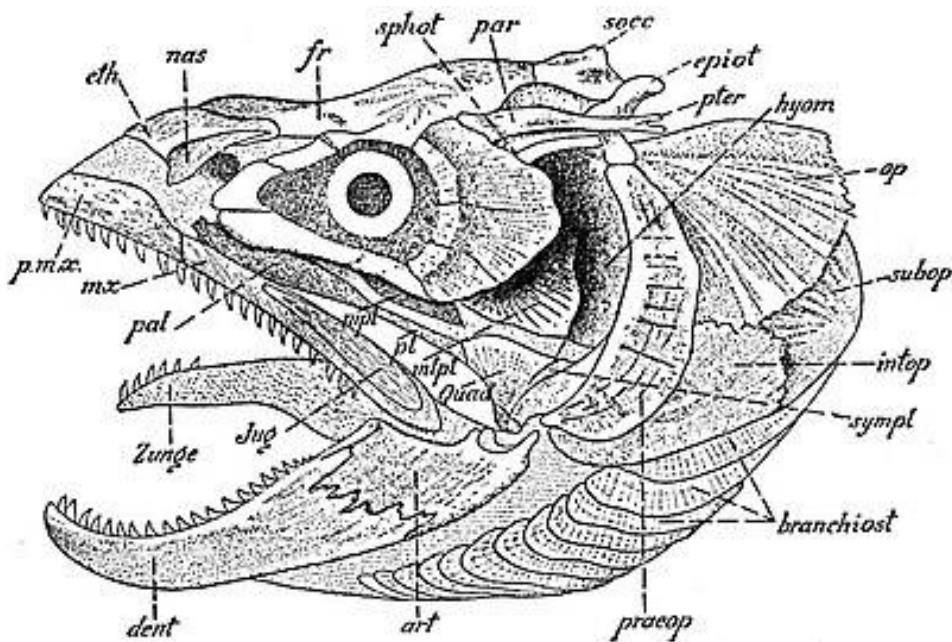




# ARM 105 1.0

## ICHTHYOLOGY

### PRACTICAL SCHEDULE



Lecturer In-charge

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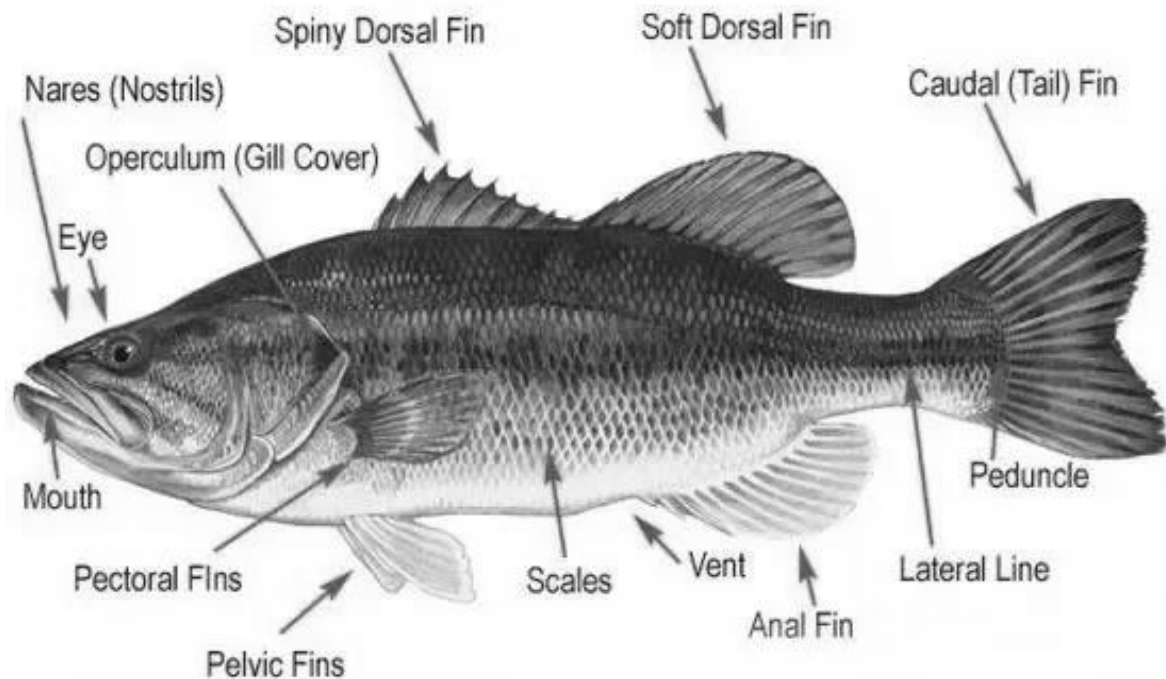
University of Sri Jayewardenepura

## ARM 105 1.0

### Ichthyology

#### Practical No: 01

#### Fish morphology and Identification



Ichthyology is the branch of Zoology that deals with fishes. This includes bony fish (Osteichthyes), cartilaginous fish (Chondrichthyes), and jawless fish (Agnatha). Along with classification of fishes, ichthyology also looks at the evolution of fish species, behavior of fishes, and environmental impact on specific species. Ichthyology is a companion to other fields like ecology, marine biology, oceanography and climatology, since information about fish can lead to greater understanding of the environment or other species of plants and animals.

## Lab Exercise -I

◆ You will be given following fish and scale specimens in the Laboratory class

- *Myxine* sp
- *Polypterus* sp
- *Protopterus* sp.
- *Acipenser* sp.
- *Petromyzone* sp.
- *Anguilla* sp.
- Shark
- Hammerhead shark
- *Remora* sp.
- Ray
- Pipe fish
- Sea horse
- Puffer fish
- *Leiognathus* sp.
- *Pseudorhombus* sp.
- *Mystis* sp.
- *Cheilopogon* sp.
- *Scatphagus* sp.
- *Chirocentrus* sp.
- Hair tail fish
- *Euthynnus* sp.
- *Chanos chanos*
- *Hemiramphus* sp.
- Cycloid
- Ctenoid
- Placoid
- Ganoid

◆ Study the different body shapes, different types of mouth patterns, forms of teeth, median and paired fins, gill apertures of the fish species and the characteristic features of different types of scales.

◆ Try to formulate a Dichotomous key to separate fish species.

Class	Order	Morphological Characteristics
Myxini	Myxiniformes	Have elongated, eel-like bodies, and paddle-like tails. They have tooth like structures composed of keratin. Colors depend on the species, ranging from pink to blue-grey, and black or white spots may be present. Eyes are simple eye spots, not compound eyes that can resolve images. Have no true fins and have six or eight barbels around the mouth and a single nostril.  Eg: <i>Myxine</i> sp.
	Petromyzoniformes	Two dorsal fins but lack any paired fins. Single nostril. A set of seven gill openings.  Eg: <i>Petromyzon</i> sp.
Actinopterygii	Acipenceriformes	Elongated bodies, lack of scales, bottom-feeders, Numerous small bony plates are scattered between the rows of scutes.  Eg: <i>Acipenser</i> sp,
	Polypteriformes	Serrated dorsal fin runs along most of the body until it meets the caudal fin. Head is small and lizard-like with a gaping. Mouth and small eyes on either side.  Eg: <i>Polypterus</i> sp.
	Anguilliformes	Olive to dark bluish-brown color dorsally and lighter in ventrally from jaws to anus. Dorsal body colour is uniform. Dorsal fin origin above vent.

		<p>Dorsal fin soft rays number 240-250. Anal fin soft rays 200-220.</p> <p>Eg: <i>Anguilla</i> sp.</p>
	Gonorynchiformes	<p>Long, muscular, silvery body with a forked tail. The forked tail is fairly large and strong. Have large eyes, a pointed snout with a terminal mouth and cycloid scales. Have 13 to 17 rays in their dorsal fin, 6 to 8 anal rays, 15 to 17 pectoral rays and 10 to 11 pelvic rays.</p> <p>Eg: <i>Chanos</i> sp.</p>
	Elopiformes	<p>They have a long fossil record, easily distinguished from other fishes by the presence of an additional set of bones in the throat. They are related to the order of eels, although the adults resemble herrings in appearance.</p> <p>Eg: <i>Elops</i> sp.</p>
	Clupeiformes	<p>Sub-cylindrical, but sometimes a little compressed; belly rather rounded but scutes apparent. Scales numerous, small, usually lost. Silvery; back bright blue. Have slightly shorter pectoral fin and the black marking of the upper part of the dorsal fin.</p> <p>Eg: <i>Sardinella</i> sp.</p>
	Mugiliformes	<p>Body cylindrical, robust. Head broad, its width more than width of mouth cleft: adipose eyelid well</p>

		<p>developed. Two dorsal fins; the first with 4 spines; the second with 8-9 soft rays; origin of first dorsal fin nearer to snout tip than to caudal fin base: origin of second dorsal fin at vertical between a quarter and a half along anal fin base. Anal fin with 8 soft fin rays. Pectoral fins with 16-19 rays.</p> <p>Eg: <i>Mugil</i> sp. (Flat head Mullet)</p>
	Perciformes	<p>Pelvic and caudal fins absent; anal fin reduced to spinules (about 75). Lateral line running nearer the ventral than the dorsal contour of the body. Color is steely blue with metallic reflection</p> <p>Eg: <i>Caranx</i> sp., <i>Scomberomorus</i> sp., <i>Thunnus</i> sp.</p>
	Atheriniformes	<p>Generally elongate and silvery in colour, although exceptions do exist. They are small fish. Members of the order usually have two dorsal fins, the first with flexible spines, and an anal fin with one spine at the front. The lateral line is typically weak or absent.</p> <p>Eg: <i>Allanetta</i> sp.</p>
	Beloniformes	<p>Body elongate, moderately thick, flattened ventrally. Pectoral branch of lateral line absent. Upper jaw not protrusible. Dorsal fin with less or equal (rarely with one more) rays than anal fin; dorsal fin low, anterior rays the longest, pectoral fins strikingly long, reaching to or almost to caudal</p>

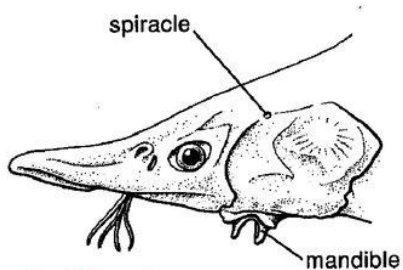
		<p>fin base; pelvic fins long, reaching beyond anal fin origin, their insertion closer to anal fin origin than to pectoral fin insertion.</p> <p>Eg: <i>Exocoetus</i> sp. (Flying fish)</p>
	Lampriformes	<p>Have 84-96 total vertebrae. Their premaxilla completely excludes the maxilla from the gape, but the jaws are highly protrusible. The pelvic fins have up to 17 rays and are placed rather far toward the front of the animal, but they can be missing entirely. The dorsal fin is long, and tend to extend along most of the length of the body. Fin spines are absent in all. They either have tiny scales or naked skin.</p> <p>Eg: <i>Trichiurus</i> sp.</p>
	Syngnathiformes	<p>They do not have scales, but rather a thin skin stretched over a series of bony plates arranged in rings throughout their body. Seahorses have a coronet on their head, no caudal fin. Prehensile tails wound around a stationary object. They have long snouts</p> <p>Eg: <i>Hippocampus</i> sp. (Sea horse)</p>
	Pleuronctiformes	<p>Body is thin, laterally compressed and flat. The side of the body bearing the eyes turned upward. Caudal fin well developed. Dorsal and anal fins</p>

		<p>are long without spines and confluent with the caudal fin</p> <p>Eg: <i>Psettodes</i> sp. (Pathamadiya)</p>
Chondrichthyes	Rajiformes	<p>Have wing like pectoral fins forming a disc that is much wider than it is long. The tail is much longer than the disc, has a filamentous end, and in many species bears one or more serrated stinging spines near its base, close behind the pelvic fins. Their mouths are large and terminal or sub terminal, and they have fiat-crowned teeth. Presence a moderately large dorsal fin over or just behind the pelvic fins and a very small or absent caudal fin. Eyes lateral on the head, and two spiracles (respiratory openings) on top of the head just behind the eyes. There are five pairs of gill openings, ventrally white or pale and dorsally black, olive, gray, or brown. Some have dorsal spots or bands.</p> <p>Eg: Rays, Skates.</p>
Sub Class : Elasmobranchii	Carcharhiniformes	<p>Have slender, streamlined body with a long, rounded snout and large eyes. There is a well-developed flap of skin in front of each nostril, defining the inflow and outflow openings. The teeth are triangular and oblique with serrated edges; the upper teeth are stouter than the lower teeth. The</p>

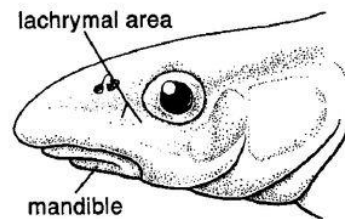


		<p>five pairs of gill slits are short. The first dorsal fin is small and somewhat falcate (sickle-shaped) with a pointed apex and a short free rear tip. The second dorsal fin is relatively large. The body is covered with overlapping dermal denticles. The colouration is yellowish to greenish gray or brown above and white to yellow below.</p> <p>Eg: Sharks</p>
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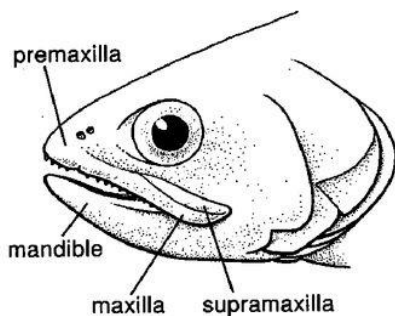
## Mouth Position



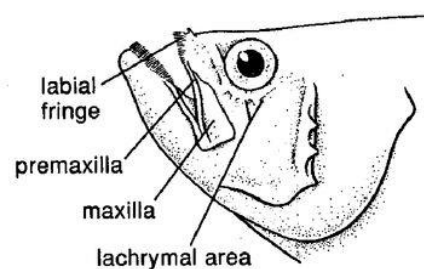
Inferior



Subterminal

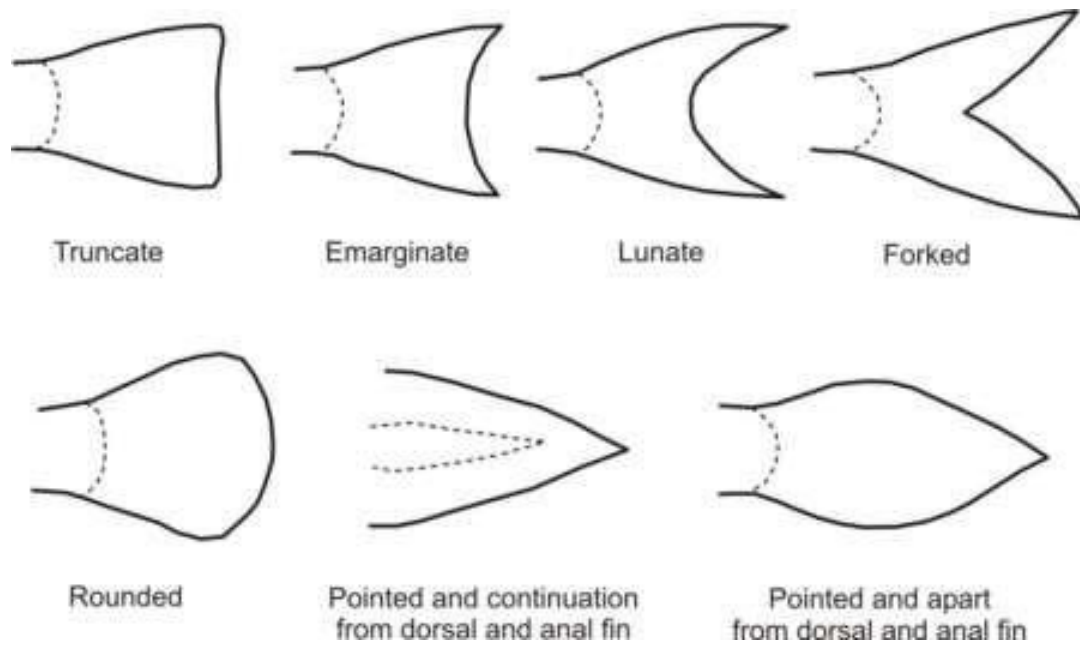


Terminal

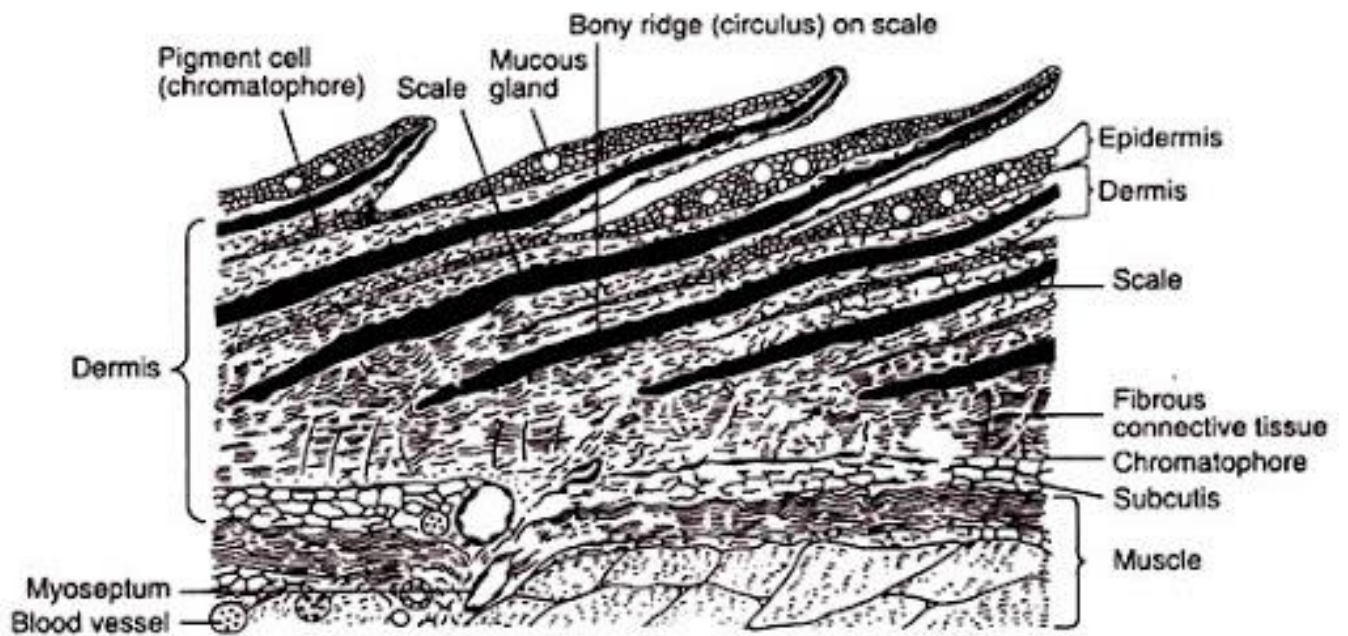


Superior

## Different types of Fish Caudal fins

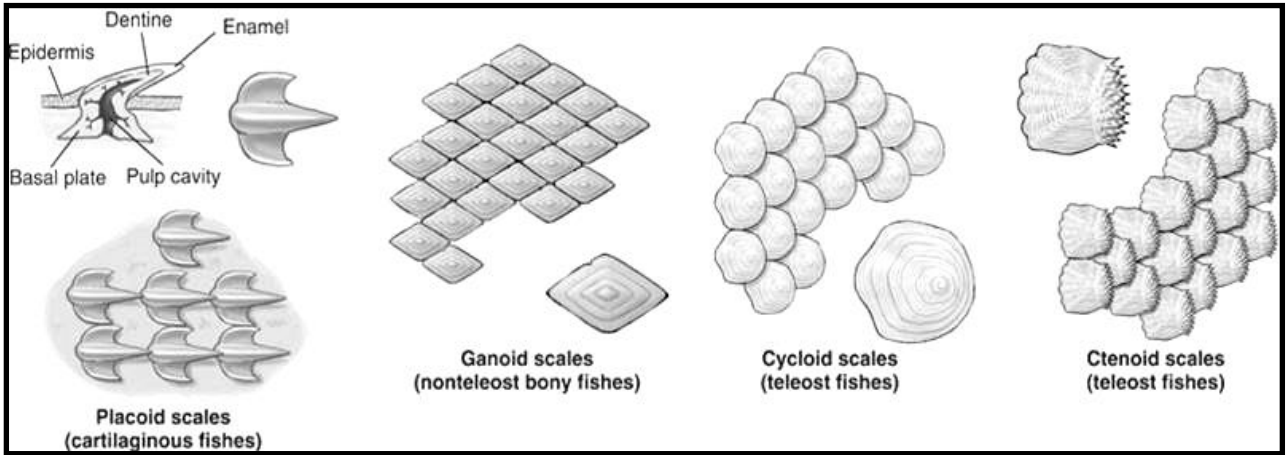


## Fish skin



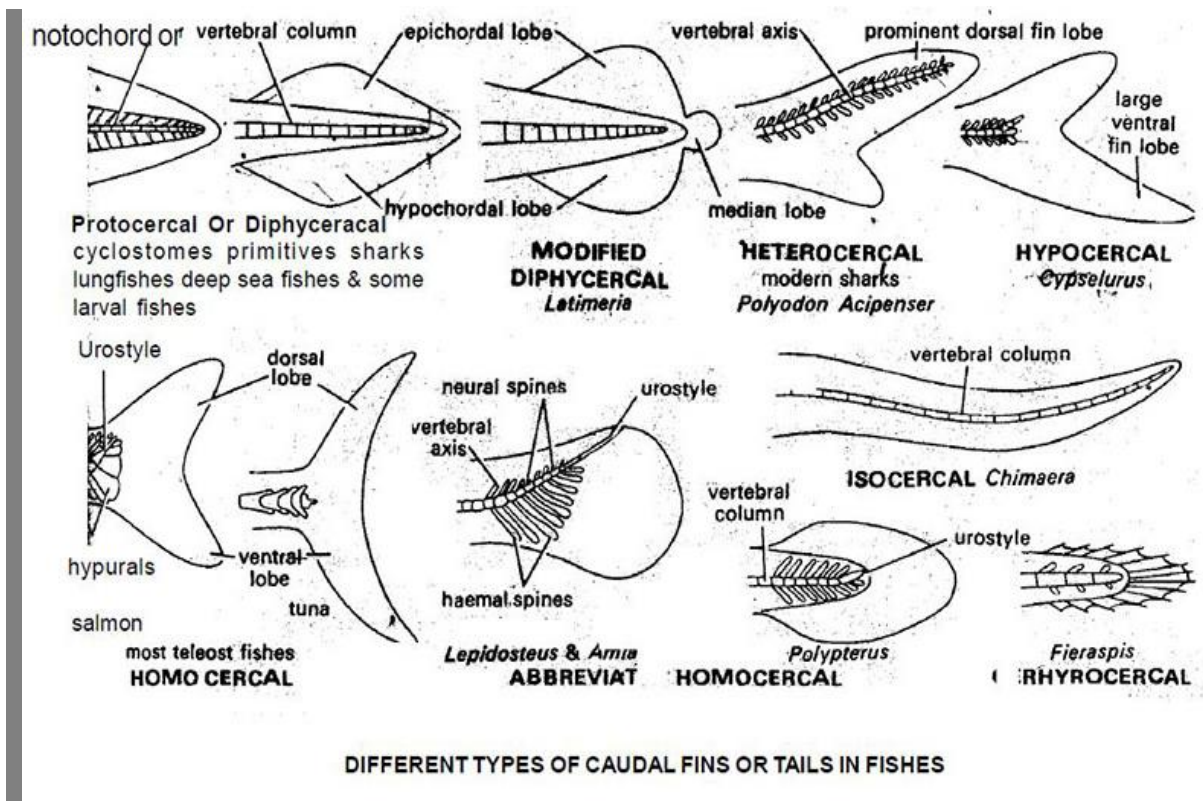
**Fig. 3.1 :** Section of fish skin (Source : General Biological Supply House)

**Schematic diagram of fish skin (left) and Arrangement of scales on skin of a teleost fish (right).**



**Scale types in fish**

**Different types of fish caudal fins**



**DIFFERENT TYPES OF CAUDAL FINS OR TAILS IN FISHES**