Commercially important marine fishes of India

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Order: Auguilliformes

- · Pelvic fins and supporting bones absent
- · Pectoral fins absent in some fishes
- · Skeleton lack bony connection to skull
- · Anal fin and dorsal fin join with caudal fin
- · Scales are usually absent
- · Gill rakers absent
- · Large swimbladder present
- · Body slender and elongate
- · Leafy, transparent like leptocephali larvae
- · Myomeres are more than 100 in larva

Anguillidae (Freshwater eels)

Small oval scales present, embedded in skin and arranged in a basket-weave pattern.

- Body elongate; snake like
- Dorsal fin origin aboe anus or very nearly so.
- Dorsal fin begins variously between pectoral fin and anus or over anus.
- No pelvic fin
- Lower jaw longer than upper, projecting; angle of mouth a little behind near margin of eye
- Pectoral fins well developed
- Anus in the anterior half of the body
- · Vertical slit like gill opening
- · Lateral line complete on body and head
- · Vertebrae 100 119
- · Catadromy, migrate from freshwater to marine during spawning
- · Leptocephali metamorphosis into elvers
- Eg. 1. Anguilla bicolar bicolar

2. Anguilla bengalensis bengalensis



Similar Families

Congridae - No scales; lower jaw equal to, or shorter than upper; dorsal fin being above or before pectoral lips.

Muraenesocidae - No scales; mouth very large extending to beyond eye; large gill opening.

Ophichthidae - No scales; in most genera no caudal fin but tail tip a hard, burrowing point; a median supraorbital pore present.

Muraenidae - No scales, no pectoral fin; gill opening a small hole.

Xenocongridae - Gill opening a small hole; reduced lateral line system/pectoral fins present or absent.



Muraenidae (Morays)

- Commonly called as moray eel
- The dorsal profile above and behind the eye is steep
- Each gill opening restricted to a small, roundish, lateral hole or slit
- · Dorsal fin and anal fin continuous around tail
- Pectoral and pelvic fins absent
- No lateral line pores on body, but a reduced complement of lateral line pores on head, including typically 1 or 2 above and before gill opening (branchio lateral line pores)
- No scales
- Gill opening is small round like
- Gill arches reduced
- Posterior nostril high in head
- Most of the fishes bear fang like teeth
- Number of vertebrate usually 110 -200
- Over 200 species are reported under 15 genera

Ex: Echidna, Gymnothorax, Muraena

Eg. Lucodontis meleagris



Family: Ophichthidae: worm eels and snake eels

- Elongate slender and cylindrical body
- · Gill opening small
- No pectoral
- . Dorsal fin originating about a pectoral fin length behind tips of pectoral fins.
- · Vertebrae 171- 173
- Eg. Muraenichthys and Callechelys.

Muraenesocidae (pike congers)

- Body long to very long, more or less cylindrical in front, compressed along tail
- Mouth well developed and extends beyound eye
- Dorsal fin begins more or less above gill opening, snout very pointed. Mouth terminal, extending well beyond eye
- No pelvic fiin
- □No scales
- Teeth well developed and fang like
- Pectorals present
- □Eyes large and covered with skin

- Body very long with only tail compressed
- Snout elongate
- Overtebrae 120-216

Eg. Muraenesox cinerons



Family : Nemichthyidae : Stipe eels

- Extremely long jaws, needle like
- body long and slender
- Pectoral fin present
- Eyes relatively large
- Anus far forward
- Ex. Nemichthys.

Congridae (Conger eels)

- · Dorsal fin and anal fin continuous around tail
- Dorsal fin begins more or less above gill opening and originates before pectoral fin tip
- No pelvic fins
- No scales
- Supratemporal pore in front of dorsal fin
 - Robust body without scales.
 - Lateral line complete
 - Mouth not extending beyond eye
 - Teeth well developed but no canines in jaw
 - Lower jaw equal to or shorter than the upper jaw.
 - Vertebrae 205 to 225.

Eg. Uroconger lepturus



Clupeiformes

Clupeidae (Herrings, Shads, Sardinellas, Sprats, Sardines)

- Scutes present along belly (absent in Dussumieria, Spratelloides)
- Fins lacking spiny rays
- Single dorsal fin
- No lateral line
- Caudal fin deeply forked

Eg. Amblygaster sirm, Dussumieria acuta, Herklotsichthys quadrimaculatus, Hilsa kelee , Nematalosa nasus, Ilisha megaloptera, Sardinella albella, Spratelloides gracilis .



Engraulidae (Anchovies)

- Scutes present along belly
- Snout pig-like and projecting, lower jaw characteristically 'underslung'
- Hind tip of upper jaw (Maxilla) extending far backward, sometimes projecting beyond
 gill cover
- Single dorsal fin. No spiny rays in fins, no lateral line.
- Snout usually pig-like and projecting, lower jaw characteristically under slung.

Eg. Coilia dussumieri, Stolephorus indicus, Thryssa vitirostris



Clupeidae - Short maxilla; lower jaw deep; mostly mouth terminal.

Atherinidae - Terminal mouth; short upper jaw; 2 dorsal fins; no scutes along belly.

Chirocentridae (Wolf-herrings)

- Very elongate, highly compressed fishes resembling the clupeidae but without scutes along belly
- · Large canine teeth in both jaws
- A single dorsal fin set well behind midpoint of body; pectoral fins set low on body
- Pelvic fins about equidistant between pectoral base and anal origin
- Caudal fin deeply forked

Eg. Chirocentrus dorab



Similar Families

- Lack canine teeth.
- May have scutes along belly (Clupeidae).
- Dorsal fin more advanced (Engraulidae) or two dorsal fins and body rounded (Sphyraenidae).

Siluriformes

- Order: Siluriformes
- Mesopterygoid very reduced
- · Pre opercle and inter opercle relatively small
- Adipose fin usually present
- Spine like (=spinous) rays present at the front of the dorsal and pectoral fins
- Dorsal fin of most cat fishes has two spines; The first being very short and forming a locking mechanism for the second spine.
- Body either naked or covered with bony plates.
- Usually up to barbells present on head
- The nasal and chin barbels may be variously absent.
- Maxilla toothless and rudimentary (except in Diplomystidae and the extinct Hypsidoridae)
- Caudal fin rays 18 or fewer (most with 17)
- Caudal skeleton varying between having six separate hypural plates to complete fusion of caudal elements.
- Eye usually small
- Air breathing organs present in Claridae and Heteropreustidae
- Many cat fishes have a maximum length of below 12 cm. The largest cat fish is Silurus glanis (commonly reaches 3m in length)
- Pangasiid and Pimelodid are also known to reach exceptionally large sizes.
- Siluriformes consists of
- Families : 34
- Genera : 412

- Species : 2,405
- Of which, about 1,440 species are presently available.
- Ariidae and Plotosidae consist largely of marine species but also representatives that are frequently found in brackish, coastal waters and sometimes only in fresh water.
- Other families are freshwater, although some have species that can invade brackish water.

Ariidae (Marine catfishes)

- Snout and head rounded to depressed
- 1-3 pairs of barbels present
- Head covered with a bony shield
- A short adipose dorsal fin present
- First dorsal fin short with a short spine or buckler.
- Two pairs of adjacent nostrils on each side of snout.

Eg. Osteogeneiosus militaris, Batrachocephalus mino, Arius dussumieri



All other catfish - Either have widely separated nostrils, a barbel on posterior nostril or dorsal fin and anal fin continuous with caudal fin.

Plotosidae - Pelvic fin with 12 to 14 rays; A dendric apparatus present.

Plotosidae (Stinging catfishes/coral reef catfishes/eel catfishes/barbel eels)

- Elongate body, compressed, tapering to a point posteriorly
- 4 pairs of barbels present with 1 pair nasal, 1 pair maxillary and 2 pairs mental;
- First dorsal fin short-based with a serrated spine and 4-6 soft rays; second dorsal fin (or dorsal procurrent caudal fin), caudal fin and anal fin confluent
- Absence of adipose fin
- Pectoral fins with 1 serrated spine and 9 to 16 soft rays
- A dendritic organ consisting of many vascularised epithelial folds present directly
 posterior to anus
- Caudal fin rounded or pointed

Eg. Plotosus lineatus

Similar Families

All other catfish families- Dendritic organ absent.

Ariidae / marine catfishes- Forked caudal fin; adipose fin present; anal and caudal fins not confluent; 3 pairs of barbels present.

Clariidae and Heteropneustidae- Spines in dorsal fin absent.

Bagridae - Adipose fin present; caudal fin forked; anal and caudal fin not confluent.

Charcidae - Anal and caudal fins not confluent; origin of 2 nd dorsal fin not opposite to pelvic fin origin.



BELONIFORMES

Either snout beak like with upper jaw or lower jaw greatly prolonged or enlarged Wing like pectoral fin, sometime pectoral or pelvic fin present Lateral line near ventral profile of the body.

A single dorsal fin consists of soft rays located in the posterior part of body Pelvic fin is in abdomen

Belonidae (Needle fishes)

- Elongate fishes with both upper and lower jaws extended into long beak
- Dorsal and anal fins posterior in position
- Pelvic fins located in abdominal position

Eg. Strongylura leiura, Tylosurus crocodilus crocodilus



Hemiramphidae - Only lower jaw prolonged or none of the jaw prolonged.

- Lacking needle-sharp teeth.

Sphyraenidae - Jaws pointed but not prolonged into a beak; 2 dorsal fins; the first spiny; pelvic fins thoracic in position.

Exocoetidae (Flyingfishes)

- Pectoral fins high on sides, strikingly long, always extending beyond dorsal fin origin.
- Pelvic fins abdominal in position and greatly enlarged in many.
- Caudal fin deeply forked with lower lobe longer than the upper.

Eg. Cheilopogon furcatus



Hemiramphidae - Pectoral fins short to medium never reaching dorsal fin origin; lower jaw much longer than upper jaw.

Hemiramphidae (Halfbeaks)

- Elongate fishes with a prolonged lower jaw (except *Oxyporhampus*) and a short triangular upper jaw.
- Dorsal and anal fins posterior in position; pelvic fins in abdominal position.
- Lateral line running down from pectoral fin origin and then backward along ventral margin of body.

Eg. Hemiramphus fur



Similar Families

Belonidae (needle fishes) - Both upper and lower jaws elongated and armed with needle sharp teeth.

Exocoetidae (flying fishes) - Lack the prolonged lower jaw characteristic of most half beaks; pectoral fins or both pectoral and pelvic fins enlarged and used for aerial gliding.

Pleuronectiforms

Pleuronectiforms

Psettodidae (Spiny Turbots)

- Body oval to flat; thicker than other flatfishes.
- Large mouth with strong teeth.
- Both eyes present on left or right side.
- Dorsal fin originates beyond posterior to eyes.
- Spinous anterior fin rays.

Eg. Psettodes erumei



Similar Families

All other flat fishes - Dorsal fin origin above or in front of upper eye; Anterior rays of dorsal fin soft and flexible.

Bothidae (Lefteye flounders)

- Flat fishes with eyes on left side of body
- Dorsal fin origin above or in front of eyes
- Caudal fin free from dorsal and anal fins
- Preopercle exposed, its hind margin free and visible
- No spiny rays in fins

Eg. Pseudorhombus arcius



Similar Families

Psettodidae - Dorsal fin with spinous rays; dorsal fin origin behind upper eye; eyes on left or right side of body.

Pleuronectidae/Soleidae - Both eyes on right side of body.

Citharidae - Pelvic fins with one spine/anus placed on eyed side.

Cynoglossidae - Margin of preopercle not free; caudal fin joined to dorsal fin and anal fin.

Citharidae (Flounders)

- Eyes on left side or right side
- · Pelvic fins with one spine
- Dorsal fin origin in front of upper eye
- Anus placed on eyed side

Eg. Paracitharus macrolepis



Psettodidae; Bothidae/Pleuronectidae/Soleidae/Cynoglossidae.

Pleuronectidae (Righteye Flounders)

- Flat fishes with eyes on right side
- Preopercle exposed, its hind margin free and visible
- Dorsal fin origin above or in front of eye
- Dorsal and anal fins free from caudal fin
- Anus placed midventral or blind side

• Spiny rays absent in fins

Eg. Paralichthodes algoensis



Similar Families

Psettodidae - Dorsal fin with spinous rays, its origin well posterior to upper eye; eyes on right or left side.

Bothidae and Cynoglossidae - Both eyes on left side.

Citharidae - Pelvic fins with one spine; anus placed on eyed side.

Soleidae - Preopercle not exposed.

Soleidae (Soles)

- Flat fishes with eyes on right side of body
- Preopercle without a free margin
- No spines in fins
- Dorsal fin extending far forward on head; dorsal fin and anal fin completely separate from, adherent to or fused with caudal fin
- Pectoral fin sometimes absent; right always longer than left if present
- Lateral line single and straight on body, sometimes branched on head

Eg. Zebrias quagga



Similar Families

Cynoglossidae - Dorsal fin origin far forward on head; dorsal fin and anal fin always joined to caudal fin, eyes on left side of body.

Psettodidae - Dorsal fin and anal fin always separated from caudal fin; dorsal fin not extending forward onto head and spiny rays present on dorsal and pelvic fins.

Pleuronectidae/ Bothidae - Margin of preopercle free and distinct.

Cynoglossidae (Tonguesoles)

- Tongue-shaped flat fishes with eyes on left side of body
- A rostral hook present below mouth
- Dorsal fin reaching forward onto head; both dorsal and anal fins joined to caudal fin
- Pectoral fins absent
- Only left pelvic fin present
- Lateral lines variable

Eg. Cynoglossus arel



Soleidae; Psettodidae; Pleuronectidae/Bothidae.

Gonorhynchiformes

Orbitosphenoid absent.

Parietal is small.

Teeth absent in fifth ceratobranchial.

First three vertebrae is specialised and associated with one or more cephalic ribs.

Suprabrachcial organ is present.

Teeth absent.

Five to seven hypural plates.

This order has close affinity with clupeiformes.

There are four families seven genera and nearly 35 species are present in this order.

Chanidae (Milkfishes)

- No gular plate between arms of lower jaw; branchiostegal rays only four
- Mouth small, without teeth
- Dorsal fin at about midpoint of body
- Anal fin short and far behind dorsal fin base
- Scales small, lateral line present

Eg. Chanos chanos



Similar Families

Clupeidae - Smaller; scutes present along belly; no lateral line/6 or 7 branchiostegal rays (only 4 in *C. chanos*).

Elopiformes

Elopidae (Ladyfishes, Tenpounders)

- A gular plate present between arms of lower jaw.
- Single dorsal fin; origin a little behind midpoint of body

Eg. Elops machnata



Similar Families

Clupeidae - Scutes along belly; no lateral line or gular plate.

Megalopidae - Large scale; last dorsal fin ray filamentous (Megalops cyprinoides).

Chanos chanos - Small sub-terminal mouth and no gular plate.

Megalopidae (Tarpons)
- Eye large
- A gular plate located between arms of lower jaw
- Dorsal fin single present at midpoint of body; last dorsal fin ray filamentous

Eg. Megalops cyprinoides



Similar Families

Clupeidae - Absence of lateral line and gular plate; scutes seen along belly region.

Elopidae (*Elops machnata*)

(Chanos chanos)

Chanidae - Dorsal fin ray not filamentous, Gular plate absent.

Harpadontidae (Bombay-duck)

- Dorsal fin followed by a conspicuous adipose fin
- Pelvic fins very long
- Laterals line extending into pointed median lobe of caudal fin

Eg. Harpadon nehereus



Similar Families

Species of Synodontidae (Lizard fishes) have the lateral line confined to the body and not extending as a median lobe of caudal fin.

Berciformes

Orbitosphenoid present.

Two supramaxillae present.

suboccular shelf present.

Holocentridae (Squirrelfishes, Soldierfishes)

- Dorsal fin with 11 or 12 stout spines and 12 to 17 soft fin rays, deeply notched between spinous and soft portions.
- Eyes large
- Anal fin with 4 spines, the third the stoutest and often the longest

Eg. Myristipis kuntee



Perciformes

Percoiidei

Percoidei

1. Perch like Fishers

- 2. Here, Animals have 2 or single df with first with sharp spines followed by rays
- 3. Pelvic fin with single spine by rays placed, posterior part of body profile.

4. Maxillary bones are not included in gape of mouth. But dorsal to the tooth bearing premaxilla.

Serranidae (Groupers, Seabasses, Rockcods, Hinds, Combers, Coral trouts, Lyretails)

- Superior mouth
- Maxilla exposed, with or without supramaxilla
- A single dorsal fin with 7 to 12 strong spines and 10 to 19 soft rays
- Anal fin with 3 spines
- Edge of preopercle serrate
- Opercle with 2 or 3 flat points or spines (mostly 3)
- Caudal fin rounded or truncate in most species/emarginated to lunate in a few

Eg. Cephalopholis sonnerati



Similar Families

Lutjanidae - Maxilla mostly covered by preorbital bone when mouth is closed (maxilla exposed in serranidae), no spines on opercle.

Haemulidae - 2 or more distinct pores on chin; maxilla mostly covered by preorbital bone when mouth is closed; no spines on opercle.

Sparidae - Maxilla mostly covered by preorbital bone when mouth is closed; no spines on opercle; edge of preopercle not serrated.

Sillaginidae (Sillagos)

- Body elongate, slightly compressed
- One opercular spine

- Two separate dorsal fin, first with 9 to 12 slender spines; second with 1 spine; base of 2 nd dorsal fin twice of first
- Anal fin with 2 weak spines

Eg. Sillago sihama



Lactariidae (False Trevallies, Milk Trevallies)

- Mouth large and oblique, with a prominent lower jaw
- Anal fin base is longer than that of second dorsal fin
- Caudal fin forked

Eg. Lactarius lactarius



Carangidae (Trevallies).

Echeneidae (Remoras, Sharksuckers, Discfishes)

- An oral-shaped cephalic disc on head to get attached with the host
- Skull wide, depressed to support disc

Eg. Echeneis naucrates

No other family has a cephalic sucking disc.

Rachycentridae (Cobias)

- Elongate body; lower jaw projected
- First dorsal fin with 7 to 9 short but strong isolated spines, not connected by a membrane
- Lunate caudal fin in adults with upper lobe longer than lower
- Anterior part of lateral line wavy

Eg. Rachycentron canadum



Coryphaenidae (Dolphin fishes, Dolphins)

- Elongate compressed fishes
- Adult males develop a bony crest on front of head
- Lateral line curved upward above pectoral fin
- Dorsal and anal fins very long, continuing almost to caudal fin from dorsal fin
- Origin on nape

Eg. Coryphaena hippurus



No other fishes have a combination of characters – dorsal fin from nape to caudal fin / anal fin from mid-point of body to caudal fin / no sharp spines in dorsal fin and anal fin / caudal fin deeply forked.

Carangidae (Jacks/ Trevallies/ Bludgers/ Scads/Queenfishes/ Runners/Amberjacks/ Pilotfishes/ Pampanos/ Leerfish)

- Two dorsal fins separate in small juveniles, the first of moderate height or very low, anterior lobe of the second dorsal fin scarcely produced to extremely long;
- Anal fin with two anterior spines (detached spines) and with the anterior lobe low to elongate.
- Scutes present in most of the genera, absent in some genera.

Eg. Alectis indicus, Atul mate, Atropus atropos, Caranx ignobilis, Carangoides malabaricus, Decapterus killachi, Elegatis bipinnulata, Gnathonodon speciosus, Megalaspis cordyla, Parastromateus niger, Scomberoides Iysan, Selar crumenophthalmus, Selaroides leptolepis, Trachinotus baillonii, Uraspis uraspis.



Scombridae - Dorsal fin spines 9 to 27; no scutes on posterior part of lateral line/ finlets present.

Stromateidae - 5 blade-like anal-fin spines not detached from fin/pelvic fins minute or absent in adults.

Rachycentridae - Broad and depressed head/lower projecting/first dorsal fin with 8 or a short free spines/a single week spine in anal fin.

Gempylidae - Base of first dorsal fin longer than that of second excluding finlets (equal or shorter than second in Carangidae).



Leiognathidae (Ponyfishes, Slipmouths, Toothponies)

- Mouth strongly protrusible
- Top of head scaleless

• Top of head with bony ridges and a well developed nuchal crust or spine

Eg. Leiognathus : Mouth horizontal, pointing forward or downward when protracted, canniform teeth absent.

Eg. Leiognathus bindus, L. equilus

Secutor : Mouth oblique, pointing upward when protracted; canniform teeth absent

Eg. Secutor ruconius

Gazza : Mouth pointing forward when protracted; canniform teeth present.

Eg. Gazza achlamys



Lutjanidae (Snappers/Jobfishes)

- Serrated preopercle
- Single dorsal fins, continuous with 10 to 12 spines and 10 to 17 soft rays
- Scales absent at anterior part of head (snout and preorbital area) scales present on cheek, preopercle and on gill cover in rows

Eg. Lutjanus argentimaculatus.



Similar Families

Caesionidae, Lethrinidae, Nemipteridae, Sparidae, Haemulidae

Caesionidae (Fusiliers)

• Eyes moderately large.

- Dorsal fin with 10 to 15 slender, weak spines and 9 to 13 soft rays.
- Separate ossification of the ascending premaxillary process and the presence of 1 or

2 finger like premaxillary lateral processes.

Eg. Caesio caerulaureus



Gerreidae (Silver-biddies, Mojarras)

- Mouth strongly protractile, pointing downwards when extended
- A single long dorsal fin
- Bases of dorsal and anal fins with an elevated scaly sheath
- Pectoral fins long and pointed
- Scales large and obvious

Eg. Gerres filamentosus

Similar Families

Leiognathidae - Bony nuchal "crest" or "spine" on nape; scales minute, barely visible.

Sparidae - Mouth not strongly protrusible.

Haemulidae (Grunts, Sweetlips, Rubberlips, Hotlips)

- Scales present on entire head (except front of snout, tips and chin)
- Chin with 2 pores anteriorly and a median pit or 6 pores and no pit in *Ptectorhincus*
- Preopercle with a slightly concave and serrated posterior margin
- Opercle with 1 indistinct spine
- Tips thick, tip of upper jaw hidden when mouth closed
- Anal fin with 3 spines, the second often very strong

Eg. Plectorhinchus gibbosus



Lutjanidae, Lethrinidae, Nemipteridae and Sparidae.

Sparidae (Porgies, Seabreams, Stumpnoses)

- Head large, often with a steep upper profile, cheeks scaly, preopercle with or without scales, without spines or serrations on margin
- Dorsal fin single, with 10 to 13 spines and 9 to 17 soft rays; no notch between spiny and soft portions
- Anal fin with 3 spines and 7 to 15 soft rays
- An axillary scale at the base of pelvic fins

Eg. Cheimerius nufar



Similar Families

Haemulidae, Lutjanidae, Serranidae, Lethrinidae.

Lethrinidae (Emperors, Pig-face breams, Large eye-breams)

- Head large, with deep suborbital space
- Short gill rakers, knoblike
- Dorsal fin single continuous with 10 spines and 9 or 10 branched (soft) rays

- Cheeks, upper surface of head and preorbital area scaleless in the genus *Lethrinus*, scales present on cheek in other genera of Lethrinidae
- Maxilla overlapping premaxilla

Eg. Lethrinus harak



Similar Families

Lutjanidae - Cheek always scaled; edge of preopercle serrated, a preopercular notch and an interopercular knob often present.

Nemipteridae - Scaled cheek; preopercle margin serrated preorbital spines present in the genera, *Scolopsis*, *Pentapodus* and *Parascolopsis*.

Sparidae - Posterior tip of premaxilla overlap maxilla at hind end of mouth; more than 10 dorsal spines.

Haemulidae - Scales always present between eye and mouth; 2 or more pores present on chin; second anal fin spine very strong.

Nemipteridae (Thread fin breams/Monocle breams/Dwarf monocle breams)

- A backward pointing spine below eye in *Scolopsis* and in some *Parascolopsis* species
- Front of head scaleless, scales on top of head (predorsal scales) beginning above or just in front of eye
- Cheeks with 3 rows of scales in *Nemipterus*, 4 to 7 rows in *Scolopsis* and *Parascolopsis*
- Single dorsal fin originating above pectoral fin bases, the first spine sometimes prolonged into a filament
- Just above pelvic fin, medium sized axillary scale present
- Caudal fin forked or emarginated, upper lobe sometimes with a filament

Eg. Nemipterus japonicus



Lethrinidae, Sparidae, Lutjanidae, Caesionidae, Haemulidae.



Polynemidae (Thread fins/Tassel fishes)

- Head scaly; conical snout, projecting beyond the mouth, mouth large.
- Spinous part of dorsal fin well separated from rays part; first with 7 or 8 feeble spines.
- Pectoral fins in two parts, the upper normal, the lower with 3 or more free filamentous rays.
- Lateral line extending upto caudal fin.

Eg. Polynemus sextarius



Sciaenidae (Croakers, Drums, Meagres)

- Head and body scaled except at extreme part of snout
- Sensory pores present on tip of snout (rostral pores), on lower edge of snout (marginal pores) and on chin (mental pores); usually 3 to 5 rostral pores on top of snout, 5 nearer anterior margin of mouth and 3 pairs on lower jaw.

Bottom feeders (Johnius sp.) - well developed rostral and mental pores.

Mid water feeders (Otolithes, Argyrosomus) - the pores are indistinct.

One or more mental barbels present on chin (*Dendrophysa nusselli, Jhonius dussumieri*) or with a pore at tip of barbel (*Umbrina*)

- Mouth terminal (*Otolithes, Pennalia*), subterminal (*Protonibea*), inferior (*Jhonius, Umbrina*) or lower jaw projecting (*Atractoscion*)
- Dorsal fin long continuous with a deep notch between the anterior (spinous) and posterior (soft) portions.
- Anal fin with 2 spines of which the 2 nd is enlarged.
- Lateral line extends to hind margin of caudal fin.
- Scales cycloid on head/ctenoid on body or only cycloid (Jhonius dussumieri).

Eg. Johnieops vogleri



Note

Internal character such as shape and size of Otoliths and Swimbladder are helpful in identification of genera/species.

Similar Families

All other perch like fishes - Lateral line not extending to hind margin of caudal fin; anal fin with 3 spines.

Mullidae (Goatfishes)

- Presence of two long unbranched barbels on chin.
- Two well separate dorsal fin; the first dorsal fin with 7 or 8 slender spines; the second fin with 9 rays.

Eg. Mulloides flavolineatus



Similar Family

Polymixiidae - 2 barbels; but single dorsal fin.

Monodactylidae (Moonies)

- Oval shaped, strongly compressed body
- Free from isthmus
- Juveniles with pelvic fin rudimentary (very small) or absent in adults
- Dorsal fin with 7 or 8 spines and 25 to 30 soft rays.

Eg. Monodactylus argenteus



Similar Families

Scatophagidae and - Dorsal fin with 10 to 17 spines/well separated from soft Chaetodontidae rayed part of fin, well developed pelvic fins.

Drepanidae/ Platacidae/Ephippidae - Pelvic fin well developed.

Menidae - Scaleless body, dorsal fin spines absent in adults; Two pelvic fin rays much elongated.

Carangidae - Anal fins with two spines; caudal fin forked.



Chaetodontidae (Butterflyfishes)

- Body deep and strongly compressed
- Snout slightly produced to greatly elongated
- An axillary scaly process present at base of pelvic fin spine
- Dorsal fin continuous, sometimes with a slight notch between spinous and soft portions
- Ctenoid scales

Eg. Chaetodon collare



Pomacanthidae - A strong spine at angle of preopercle/larger and more colourful.

Scatophagidae - Dorsal fin with a deep notch/mouth not protractile/anal fin with 4 spines.



Drepanidae (Sicklefishes)

- Body very deep and strongly compressed
- Scales absent in front of eye and on opercle
- Mouth strongly protrusible
- Pectoral fins long and falcate
- Anal fin with 3 spines
- Hind margin of caudal fin rounded

• Lateral line strongly arched; no scutes

Eg. Drepane punctata



Similar Families

Ephippidae - Short pectoral fins and not falcate; mouth not protrusible.

Platacidae - Pectoral fins short and not falcate; 5 to 9 spines in dorsal fin, increasing in length posteriorly and not separated from soft part of fin by a notch.

Scatophagidae - 4 anal fin spines/small pectoral fins/head profile concave.

Pomacanthidae (Angelfishes)

- Elongate body oval to orbicular in shape/strongly compressed
- Mouth protrusible
- Dorsal fin single, continuous without a notch
- A strong spine at an angle in preopercle

Eg. Pomacanthus semicirculatus



Similar Families

Chaetodontidae - No strong spine at angle in preopercle region; in axillary scaly process at base of pelvic fin; more compressed body.

Ephippidae - Axillary scaly process at base of pelvic fin absent, strong preopercle spine, more compressed, dorsal and anal fins very elongate.

Scatophagidae - Dorsal fin with a deep notch; mouth not protrusible; no strong peropercle spine; 4 spines present in anal fin; axillary scaly process. wanting at base of pelvic fin.



Teraponidae (Terapon-perches / Terapons)

- Preopercle serrate/serrations more prominent in juveniles
- Two opercular spines; lower one larger and stronger; post temporal bone exposed in some species, its posterior margin serrate
- Single dorsal fin; with 11 to 14 spines
- Anal fin with 3 strong spines

Eg. Terapon puta



Note

Terapons inhabit inshore marine and brackish waters and some species enter freshwaters; most marine species with 3 or more longitudinal body stripes.

Similar Families

Serranidae - Large mouth; upper jaw reaching posteriorly to vertical through rear margin of orbit; 3 spines on opercle.

Labroidei

- 1. Identification is based on Teeth well developed
- 2. Parrot like same speices
- 3. Scales are large and smooth

4. Body compressed usally colourful

Pomacentridae (Damselfishes)

- Eye moderate in size; Body moderately elongate to orbiculate, laterally compressed
- Dorsal fin single, with 9 to 17 spines and 10 to 20 soft rays
- Anal fin with 2 spines

Eg. Amphiprion sebae



Cichlidae - Anal fin spines 3 or more; freshwater forms.

Serranidae - 3 anal fin spines; enlarged canine teeth seen on the jaws.

Labridae (Wrasses, Hogfishes, Razor fishes, Coris, Tuskfishes)

- Mouth terminal, with prominent lips
- Single long based dorsal fin
- Lateral lines smoothly curved or with an abrupt curve below soft portion of dorsal fin either continuous or interrupted below posterior part of dorsal fin

Eg. Coris formosa



Similar Families

Scaridae (Parrotfishes).

Scaridae (Parrotfishes)

- Head bluntly rounded anteriorly
- Teeth usually fused to form a pair of beak-like plates in each jaw; few species have incisor/canine teeth
- Dorsal fin single, continous with 9 slender flexible spines and 10 soft rays
- Anal fin with 3 flexible spines and 9 soft rays
- Caudal fin rounded to lunate with produced caudal lobes
- 1-4 rows of scales on cheek; 2-8 median predorsal scales

Eg. Scarus frenatus



Note:

• Many species exhibit striking sexual dimorphism.
- Many species are protogynous hermaphrodites individuals maturing first as females, then sexually transforming into males
- For field identification of parrotfish species, reliance must usually be placed on colour patterns and few meristic characters.

Genus, *Calotomus* sp. (teeth not fused) is confused with some wrasses (Labridae). In Labridae - teeth well separated; protrusible mouth.

Gobiodei

- 1. Very small fishes
- 2. Pelvic fins usually united to a cup like structure
- 3. Gill Membranes are joined to isthmus
- 4. Dorsal spinous

Gobiidae-gobies

The pelvic fins are united and forming an adhersive or sucking dics. First dorsal spinous and seperated from second. Five branchiostegal rays. They live in close association with other animals like sponges and sea urchins This family contains world smallest fishes. The marine goby *Trimmatom nanus* female measures 8-10 mm. The freshwater counter part *Pandaka pygmaea* and *Mistichthys luzonensis* measure upto 10-11mm. It is most species rich family of vetebrates.

Mugilidae (Mullets)

- Two short dorsal fin; the first fin with 4 slender spines
- Pectoral fins located rather high on body
- Pelvic fin base about equal distant between pectoral fin base and origin of first dorsal fin
- Lateral line absent
- Auxillary scale below first dorsal fin, above pectoral and pelvic fins

Eg. Mugil cephalus



Similar Family

Atherinidae - Anal fin rays more than 10 (less than 10 in Mugilidae).

Acanthuroidei

- 1. Small scales one or two strong movable garwardly projecting spine
- 2. Pre. Maxilla protorsible
- 3. Caudal peduncle one spine or two bony plates

Ephippidae (Spadefishes)

- Head short, its profile either steep or fairly convex
- Pectoral fins rounded, small; pelvic fins thoracic, pointed with an axillary process
- Anal fin with 3 spines

Eg. Ephipus orbis



Drepanidae; Platacidae; Scatophagidae.

Drepanidae - Long and falcate pectoral fin; mouth protrusible strongly; dorsal fin spines shorter.

Platacidae, Scatophagidae - Refer Drepanidae.



Platacidae (Batfishes)

- Deep body, rhomboid and strongly compressed
- A single unnotched dorsal fin decreasing in size with age; spinous part not well differentiated, with 3 to 9 spines increasing in size posteriorly and nearly concealed by the scaly covering of the fin
- Short rounded, pectoral fins, pelvic fin, greatly produced

Eg. Platax orbicularis



Ephippidae - Dorsal fin with a deep notch; dorsal fin spines produced.

Drepanidae - Long and falcate pectoral fin; protrusible mouth; dorsal fin spines shorter and stouter.

Scatophagidae - 4 anal spines; snout profile concave.

Acanthuridae (Surgeonfishes, Tangs and Unicorn fishes)

- High bodied compressed fishes with a single folding lancet-like spine or one or two bony plates usually bearing sharp keels on either side of caudal peduncle.
- Single dorsal fin.
- Caudal fin truncate to lunate.

Eg. Acanthurus leucosternon, Naso unicornis, Zebrasoma veliferum



No family is to be confused with the Acanthuridae because of their distinctive caudal spines. However, this family resembles the families, Siganidae and Zandidae.



Scatophagidae (Scats)

- Highly compressed body, quadrangular shaped fishes
- Head profile rising steeply to nape, mouth not protrusible
- Dorsal fin with 11 or 12 strong spines and 16 to 18 soft rays, the first spine procumbent; a deep notch between spinous and soft portions of fin
- Anal fin with 4 strong spines

Eg. Scatophagus argus



Chaetodontidae - Dorsal fin not deeply notched; protrusible mouth; 3 to 5 anal fin spines (usually 3).

Pomacanthidae - Dorsal fin not deeply notched; protrusible mouth; 3 anal fin spines; preopercle with a long spine.

Drepanidae - Mouth protrusible; 3 anal spines; pectoral fins elongate.

Siganidae (Spine foots, Rabbit fishes)

- Body laterally compressed
- Mouth small with a single row of fine, close-set teeth in each jaw

- Dorsal fin with 13 strong spines and 10 soft rays, preceded by a forward projecting spine
- Pelvic fins with 2 strong spines separated by 3 soft rays, character unique to the family
- Anal fin with 7 strong spine and 9 soft rays
- The spines are venomous

Eg. Siganus javus



Similar Families

All other families - Mostly 1 pelvic fin spine (2 in siganidae).

Acanthuridae - Bony plates or lancet like spines on each side of caudal peduncle and only 2 or 3 anal fin spines (7 in siganidae).

Zanclidae (Moorish idol)

- Body deep and compressed, to oval or discoid body
- Tubular snout with a small mouth containing numerous elongate bristle like teeth
- Dorsal spines elongated into a whip like filament
- Small horn like projection above eye, more prominent in adults
- Yellow in colour with two broad blackish brown cross bands, anterior band broader crosses the eye
- Caudal dark with yellow margin and narrow blue submarginal line

Eg. Zanclas cornatus



Scombroidei

- 1. Finlets are usually present
- 2. Caudal peduncle with keels
- 3. Mouth is large, Fast swimmers

Sphyraenidae (Barracudas)

- Body elongate and slightly compressed; long and pointed snout
- Lower jaw projecting beyond upper jaw; strong canine teeth
- Two short and widely separated dorsal fin, first with 5 fairly strong spines
- Short pectoral fin
- Forked caudal fin

Eg. Sphyraena barracuda



Similar Families

Atherinidae/Mugilidae/Polynemidae

- Two widely spaced dorsal fin, but short snout, no canine teeth.
- Lower pectoral fin rays filamentous in polynemidae.

Trichiuridae/Gempylidae

• Elongate snout with canine teeth, never two short and well spaced dorsal fin.

Gempylidae (Snake mackerels, Barracoutas)

- · Lower jaw projecting beyond tip of upper jaw
- Detached finlets behind dorsal and anal fins
- Pelvic fins usually small, often reduced to a single spine with only a few or no soft rays
- No keels on caudal peduncle (except in *Lepidocybium*)
- Lateral line single or double, ending at caudal fin base

Eg. Gempylus serpens



Trichuridae, Scombridae, Carangidae.

Trichiuridae (Cutlassfishes / Hairtailfishes / Frostfishes / Scabbardfishes)

- Body extremely elongate, compressed and ribbon like
- Maxilla concealed by a preorbital bone
- Dorsal fin low and long, beginning shortly behind eye
- Anal fin low or reduced to short spines
- Pectoral fins short and low on body

- Pelvic fins reduced to a scale like spine (*Benthodesmus* sp.) or completely absent (in *Trichiurus* and *Lepturacanthus*)
- · Caudal fin small, forked or absent
- Scales absent

Eg. Trichiurus lepturus



Xiphidae (Swordfishes)

- · Body elongate and cylindrical
- Upper jaw prolonged into a long bill (but both jaws prolonged into long bills in immature individuals)
- No gill rakers on gill arches
- Two separate dorsal fin in adults (continuous in immature specimens) the first much larger than the second
- Pectoral fins falcate

- Pelvic fins absent
- A large keel on each side of caudal peduncle
- Lateral line indistinct, but recognizable in specimens of 1 m length

Eg. Xiphias gladius



Similar Families

Istiophoridae - Upper jaw prolonged into long spear; Two dorsal fins close together; pelvic fin present; a pair of keels on each side of caudal fin base; lateral line present.

Istiophoridae (Bill fishes, Spearfishes, Marlins and Sailfishes)

- Upper jaw prolonged into a long spear which is round in cross section
- No rakers on gill arches
- Two dorsal fins and two anal fins
- 1 st dorsal fin and anal fin long, can both be folded back into grooves.

- Pectoral fins falcate
- Caudal fin large, strong and forked with a pair of keels on either side at base
- Pelvic fin very long with 1 or 2 rays and a spine

Eg. Istiophorus platypterus



Similar Families

Belonidae

Large representatives of Belonidae may be similar to small spear fishes or Marlins, with the first dorsal fin folded into a groove, but they have both jaws prolonged, the dorsal and anal fins both single and similar in size and shape; pectoral fins not falcate; pelvic fins inserted far behind the pectorals.

Stomatoides

- 1. Shapes are variable
- 2. Snout blunt and thick
- 3. Mouth small
- 4. Pelvic fin sometimes absent
- 5. Toothed saccular outgrowths in gullet behind last gill arch.
- 6. Caudal fin with 15 brached rays.

Stromateidae (Butterfishes, Silverpomfrets)

- Body very deep and compressed
- Snout short and blunt; mouth small and immobile maxilla
- Single dorsal fin and anal fin; long-based and slightly to deeply falcate, preceeded by none or 5 to 10 flat, blade-like spines
- Pectoral fins long and wing-like
- No pelvic fins
- Caudal fin forked; in some species with very extended lobes
- · Gill membranes broadly united to the isthmus

Eg. Pampus argenteus



Apolectus niger with (Carangidae) - Gill membranes not broadly united to isthmus; caudal peduncle lateral keels.

Ariommidae/Nomeidae/Carangidae/ Other silvery compressed fishes - Pelvic fins present; gill openings normal.

Aulopiformes

Second pharyngobranchial elongated.

Synchronous hermaphrodites.

Comes under the super order Cyclosquamata.

3.3.10.1 Synodontidae (Lizardfishes)

- Elongate and cylindrical body with adipose fin.
- Pointed teeth visible even when mouth is closed.

Eg. Saurida tumbil



Similar Families

All other families - Lack the combination of an adipose fin, a robust body/lizard-like head with pointed teeth visible even when mouth is closed.

Tetraodontiformes

Triacanthidae (Trpodfishes/Triplespines)

- Deep compressed body; skin moderately thick having shagreen-like appearance
- Dorsal fin spines 6 (usually only 5 visible, 6 th being rudimentary)
- Caudal fin deeply forked; caudal peduncle distinctly tapered
- Pelvic fin represented by a large spine

Eg. Triacanthus biaculeatus



Balistidae (Trigger fishes and Durgons)

- Deep and moderately compressed body with very thick, tough skin.
- Scales above pectoral fin base form a tympanum.
- Two dorsal fins; first is with 3 spines only. Second dorsal is with fin-rays branched.
- Three dorsal fin spines, the second spine more than one-half the length of the first, the first spine capable of being locked in an upright position of erection by the second.
- Pelvic fins and spines rudimentary or absent, represented by a series of 4 pairs of enlarged scales encasing the end of pelvis.

Eg. Odonus niger, Balistoides viridescens



Monacanthidae - Two dorsal fin spines; first large and prominent.

Ostracidae - No spiny dorsal fin; body covered with a box-like encasement.

Tetraodontidae - No spiny dorsal fin; No pelvic fin; teeth fused with the jaw bones to Diodontidae/ form a parrot like beak.

Triodontidae/Molidae - Skin rough with scales/modified as prickles/absent/smooth.

Triacanthidae/ - Dorsal fin spines 2 to 6.

Triacanthodidae - A strong pair of pelvic fin spines.



Monocanthidae (Filefishes/Leatherjackets)

• Smooth to rough shagreen - like skin, minute scales with fine spicules.

- Two dorsal fin spines; the first being large and armed with downward curving barbs; the second spine very small and capable of locking the first in an upright position.
- Rudimentary pelvic fins, a series of 3 or fewer pairs of enlarged scales encasing the posterior end of the pelvis, projects through the skin, or a single scale seen anterior to the posterior end of the pelvic, disappears with age or entirely absent.

Eg. Alutera monoceros



Similar Families

Triacanthidae - Dorsal fin spines 2 to 6; a strong pair of pelvic fin spines.

Balistidae - 3 dorsal fin spines; pelvic fin with rudimentary spines or absent; scales longer; skin not shagreen like.

Ostracidae - Dorsal fin without spines; pelvic fin absent; thick enlarged scales as hexagonal plates sutured to form a box-like encasement of the body.

Tetraodontidae/ Diodotidae/ Triodontidae/Molidae - No obvious spiny dorsal fin/pelvic fin absent, skin either rough with scales or scales absent with smooth skin.

Ostracidae (Boxfishes, Cowfishes)

- Body almost completely encased in a bony shell, or carapace formed of enlarged, thickened scale plates
- Absence of pelvic fin

Eg. Lactoria cornuta



Teraodontide (Pufferfishes/Blowfishes/Tobies)

• Heavy and blunt body capable of rapid inflation by intake of water (or air)

- Head large and blunt, jaws modified to form a beak and heavy powerful teeth, 2 above and 2 below
- Eyes located high on head
- Pelvic fins absent
- Dorsal fin and anal fin located far posteriorly; no spines
- Typical scales absent, but numerous small spiny prickles often present on back and/or belly, sometimes on sides

Eg. Canthigaster rivulata



Similar Families

Diodontidae - Strong elongate spines cover head and body/a single tooth in each jaw.

Monacanthidae - Spinous dorsal fin/first dorsal fin spine very strong and long; 2nd spine very small.

Diodontidae (porcupine fishes, Spiny puffers, Balloon fishes)

- Body wide and capable of great inflation, covered with spines
- The teeth fused to form a beak-like crushing structure dividing the upper and lower jaws into left and right halves
- No pelvic fins
- Lateral line inconspicuous
- No normal scales

Eg. Chilomycterus reticulatus



Similar Families

No other family has the following combination of characters: Large body spines; no pelvic fins; capability of inflating the body and teeth fused into a single beak-like unit in each jaw, without a median suture dividing upper and lower jaws into right and left halves.

Gasteroseteiformes

- 1. Long extended jaw
- 2. Caudal Fin sometime absent
- 3. Snout tube like
- 4. Elongated, small body having plates
- 5. Pelvic girdle never attached directly to cleithra.
- 6. body often with armor of dermal plates.

It has two suborders;

a. gasterosteoidei

Upper jaw protractile, ascending process of premaxilla well developed.

b. Syngnathoidei:

Mouth small

Tube like mouth

Ribs absent

Most of them comes under scheduled organisms.

Syngnathidae (seahorses and Pipefishes)

- Moderate to very elongate body encased in body rings with small gill openings
- Fins small
- Dorsal fin single
- Pelvic fins lacking
- Some species without caudal fin
- Caudal peduncle more prehensile
- Tube like mouth
- Eggs are attached to the body of male, sometimes enclosed in a pouch
- Coronet may be present with spines
- Anal fin short (2- rays)
- Pelvic fin absent
- Reported from Shallow coastal water
- · Head extended, separated from body
- Body encased in numerous bony plates

Eg. Hippocampus kuda



Solenotomidae (Ghost pipe fish/False pipe fish)

- 1. Long Pelvic fin
- 2. Body relatively short
- 3. Dorsal fin two
- 4. First dorsal 5 spine
- 5. Gill opening is moderately large
- 6. Brood pouch is found in female

(e.g) Solenostomus

Centriseidae (Razor fish)

- 1. Found like thin razor
- 2. Body compressed laterally
- 3. First dorsal single spine
- 4. Body folly covered with thin body plates
- 5. Caudal and second dorsal displaced ventrally.
- 6. Mouth Toothless
- 7. No lateral line and usually swim in vertical position
- 8. Shrimp fishes
- (e.g) Centriseus

Fistolaridae (Cornet fishes)

- 1. Body depressed and naked minute, line as series of suites are present
- 2. Dorsal spine absent

- 3. CF is forked with Elongate filament
- 4. Lateral line present
- 5. Mouth tube like

e.g Fistularia

Pegasidae (Sea moth)

- 1. Body broad and depressed
- 2. Long rostrom is present
- 3. small mouth under the rostrom
- 4. Pec. Fins very large
- 5. CF very small
- (e.g) Pegasus

Aulostomidae (Trumpet fishes)

- 1. Body compressed, Elongate, scaly
- 2. Small fleshy barbel present at tip of the lower jaw

- 3. Small isolated dorsal spines
- 4. Anal and Second dorsal are far posterior
- (e.g) Aulostomus