

## CHAPTER 13

# Taxonomy of Clupeoid Fishes

### Introduction

Clupeoids are fishes coming under the sub-order Clupeoidei of the order Clupeiformes whereas clupeids are fishes coming under the family Clupeidae. Clupeoids are moderate, small or very small fishes without spines in the fins; dorsal fin is single and short (11-23 fin rays) usually near midpoint of body; pelvic fin with 6-10 rays and anal fin usually short or moderate (10-36 fin rays), caudal fin forked. Body usually fusiform, sometimes almost round in cross section but more often compressed sometimes highly compressed. Mouth small. Small conical teeth typically present in jaws, and on vomer, palatines and endo- and ectopterygoids (roof of mouth). Swim bladder present, sometimes double chambered with pneumatic duct joined to oesophagus or stomach. Almost all species with complete covering of cycloid scales on body, scales frequently deciduous. No lateral line canal with pored scales along sides (occasionally one or two behind gill opening). A branching mainly cutaneous sensory canal system covering top and sides of head, supra occipital, infra orbital pre-opercular and pterotic canals all meet in the recessus lateralis, a special chamber characteristic of clupeiform fishes. They are mostly marine, coastal and schooling fishes which feed on small planktonic animals often form large schools at or near the surface. The clupeoid fishes are of prime importance to the fisheries. In 2018, it formed 17 % of the total capture fisheries landing in the world (FAO,2020). In India, it formed 18 % of the total marine capture fisheries landing in 2019 and among the pelagic finfish landing, its contribution was 42 %. Sardiines alone constituted 21 %. (CMFRI, 2019).

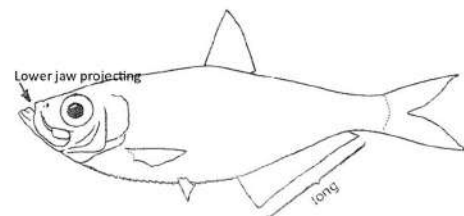
### Classification

The classification is based on FAO Fisheries Synopsis No. 125 Vol.7. The sub-order clupeoidei contains four families namely Pristigasteridae, Chirocentridae, Engraulididae and Clupeidae.

#### Family: Pristigasteridae

Articulation of lower jaw under or just behind eye. Scutes present along belly. Body is oval or round in cross section. Anal fin base is long having more than 30 fin rays. Lower jaw is projecting with mouth directed more or less upward. Pelvic fin rays 7 though it is absent in *Opisthopterus* sp and *Raconda* sp.

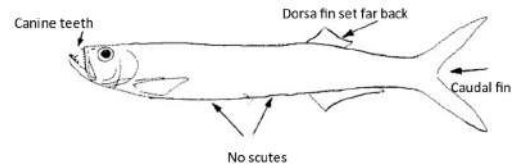
Until recently this family was included under clupeidae. But due to the following reasons, it is separated as a family:



Pre-dorsal bones either upright or inclined forward whereas it is inclined backward in all clupeids. There is no gap between the second and third hypural bones of the tail whereas upper and lower caudal fin rays are separated by a gap in clupeids.

**Family: Chirocentridae**

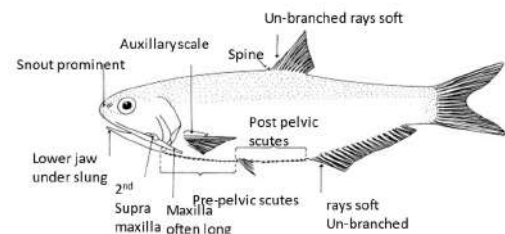
Articulation of lower jaw under or just behind eye. No scutes present all along body. Body is highly compressed and elongate. Canine teeth present. Dorsal fin origin is much nearer to caudal base than to the snout.



**Family: Engraulididae**

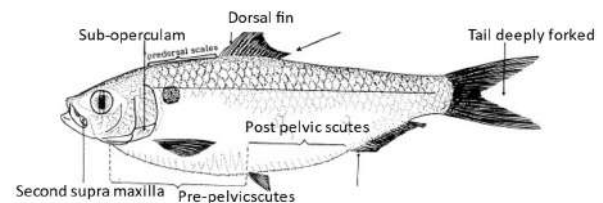
Articulation of lower jaw well behind eye. Scutes are present along the belly. Lower jaw usually slender and under slung. Snout is pig like and projecting. Pelvic fin rays 7.

The family name Engraulidae has been used in almost all previous literature and is still in use. But this is an incorrect derivation from Engraulis. The correct (but less euphonic) derivation is Engraulididae (Whitehead et al., 1985).



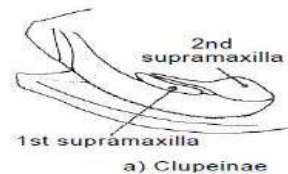
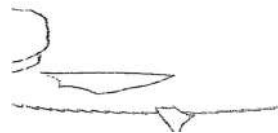
**Family: Clupeidae**

Articulation of lower jaw under or just behind eye. Mostly two supramaxillae present. Scutes present all along body in most of the genera. Body oval or round in cross section. Anal fin moderate and pelvic fin rays range from 7 to 9.



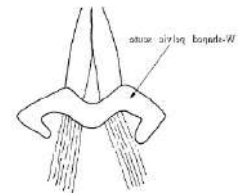
The family is divided into 5 sub-families as Clupeinae, Dussumieriinae, Pellonulinae, Dorosomatinae and Alosinae.

1. Clupeinae : Two supra maxillae. Abdominal scutes present

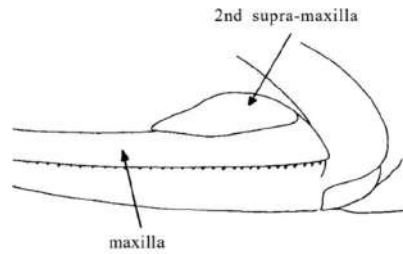
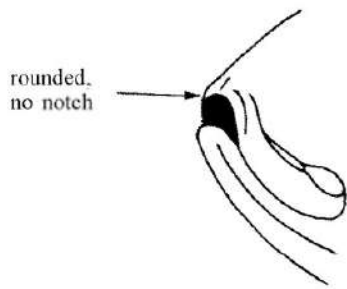


2. Dussumieriinae: Branchiostegal rays (B.S) 6 to 18. Pelvic scute W shaped. No other scutes on belly. Belly is smooth. Premaxilla is rectangular or triangular. This is further divided into 2 tribes:

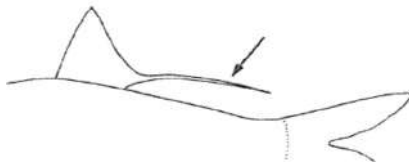
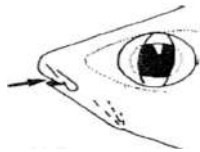
- a. Dussumieriini: B.S rays numerous (11-18). Premaxilla rectangular
- b. Spratelloidini: B.S rays few (6-7). Premaxilla is triangular



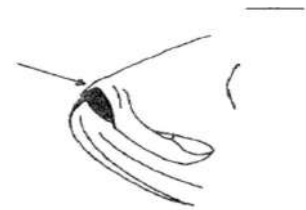
3. Pellonulinae: Mouth is terminal. Upper jaw without a median notch. Lower jaw not flared at corners. Only a single supra maxilla present. Last dorsal ray not filamentous.



4. **Dorosomatinae**: B.S rays 4 to 8. Scutes present. Anal fin is short with less than 30 rays. Lower jaw not prominent. Mouth is inferior and lower jaw is flared at corners. Last dorsal fin ray often filamentous.



5. **Alosinae**: Mouth is terminal. Lower jaw not flared at corners. Upper jaw with a distinct notch at centre. Last dorsal ray not filamentous.



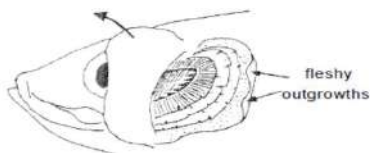
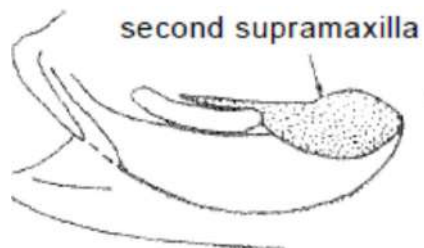
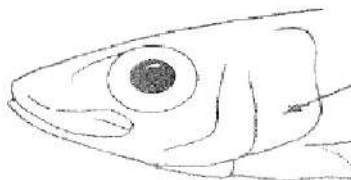
### Key to genera

Family: Clupeidae

Sub-family: Clupeinae

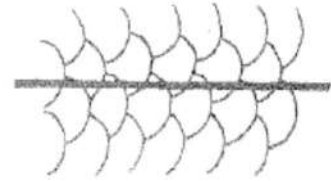
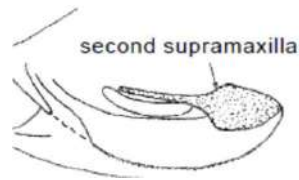
#### 1. **Herklotsichthys**

Opercle is smooth. Gill opening with two fleshy outgrowths. Fronto parietal striae on top of head is 3 to 8. Lower portion of paddle shaped, second supra maxilla is longer than upper. Pelvic fin rays 8 or 9. Back is blue or green



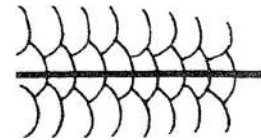
2. *Sardinella*

Opercle is smooth. Gill opening with two fleshy outgrowths. Fronto parietal striae on top of head is 3 to 8. Lower portion of paddle shaped second supra maxilla is equal to upper. Pelvic fin rays 8 or 9. Pre dorsal scales paired and overlapping in midline. Gill rakers more than 40. Back is blue or green



3. *Amblygaster*

Opercle is smooth. Gill opening with two fleshy outgrowths. Fronto - parietal striae on top of head is 3 to 8. Pelvic fin rays 8 or 9. Gill rakers 26-43. Pre dorsal scales forming a well-defined single median row.



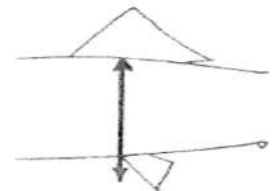
4. *Escualosa*

Gill opening smoothly rounded. Pelvic fin rays 7. Body creamy white.

**Sub-family : Dussumieriinae**

1. *Dussumieria*

Pelvic fins under dorsal fin base. Pre maxilla is rectangular. B.S rays 11-18.



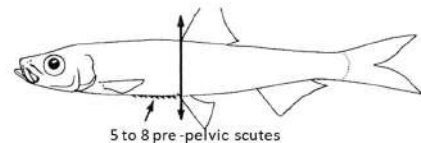
2. *Spratelloides*

Pelvic fins behind dorsal fin base. Premaxilla is triangular. B.S rays few (6 or 7).

**Sub-family: Pellonulinae**

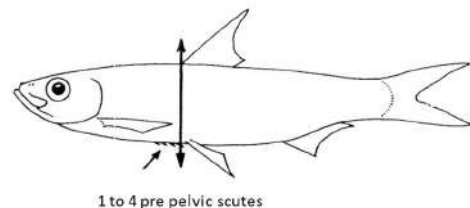
1. *Ehirava*

One to 9 unkeeled pre pelvic scutes present. Pelvic fin base just before dorsal fin origin. Pre-pelvic scutes 5 to 8.



2. *Dayella*

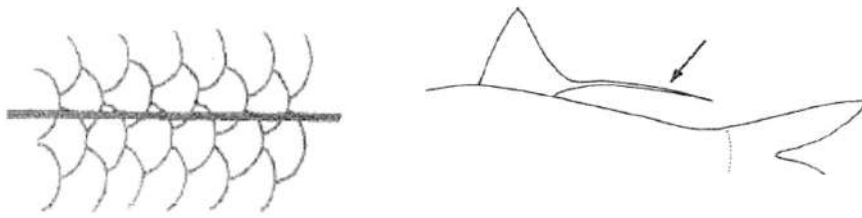
One to 9 unkeeled pre pelvic scutes present. Pelvic fin base just behind dorsal fin origin. Pre-pelvic scutes 1 to 4.



**Sub-family: Dorosomatinae**

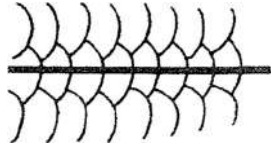
1. *Nematolosa*

Last dorsal fin ray is filamentous. Pre-dorsal scales paired and overlapping.



2. *Anodontostoma*

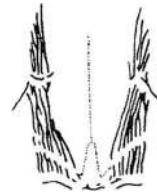
Last dorsal fin ray is normal. Pre-dorsal scales forming a single median row.



Sub-family: *Alosinae*

1. *Hilsa*

Fronto-parietal striae on top of head many (8 to 14). Gill rakers on inner arches distinctly curved outward. Scales perforated.



2. *Tenuulosa*

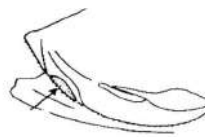
Fronto-parietal striae on top of head weakly developed usually hidden by skin. Gill rakers on inner arches straight. Scales unperforated.



Family: *Pristigasteridae*

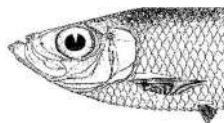
1. *Pellona*

Toothed hypomaxilla. Pelvic fin present.



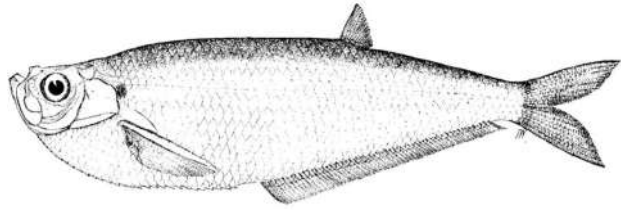
2. *Ilisha*

Hypomaxilla is not toothed. Pelvic fin is present. Anal fin rays 34-53.



3. *Opisthopterus*

Hypomaxilla not toothed. Pelvic fin absent. Anal fin base long with 51 to 65 fin rays. Scutes well developed.



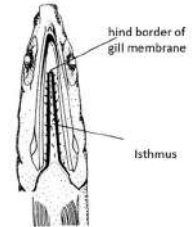
**Family: *Chirocentrus***

A single genus *Chirocentrus*

**Family: *Engraulididae***

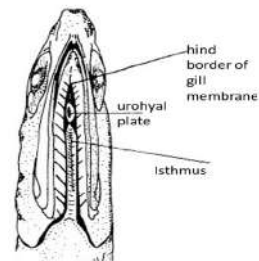
1. *Stolephorus*

Isthmus muscle touch the hind border of gill membrane.



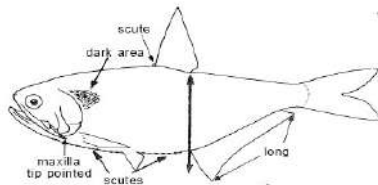
2. *Encrasicholina*

Isthmus muscle is not touching the hind border of gill membrane. Urohyal is exposed



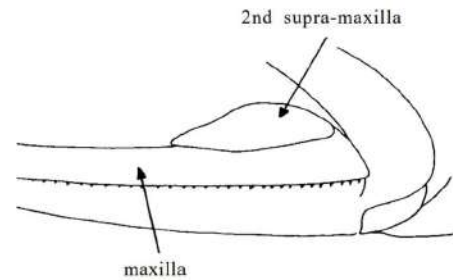
3. *Thryssa*

Post pelvic scutes are strong and sharply keeled.



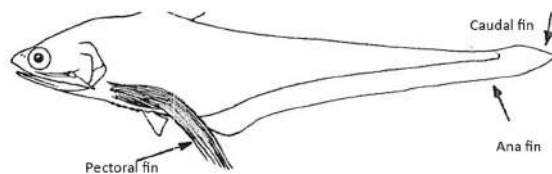
4. *Setipinna*

Upper fin ray a filament. Single supra maxilla



5. *Coilia*

Body tapering rat tailed caudal fin is small. Pectoral fin is filamentous.



**Table 1. List of common species of clupeoid recorded from Indian coasts.**

Family	Ser.No.	Species name	Common name
<b>Clupeidae</b>	1	<i>Sardinella gibbosa</i> (Bleeker,1849)	Golden stripe sardinella
	2	<i>Sardinella albella</i> (Valenciennes,1847)	White sardinella
	3	<i>Sardinella brachysoma</i> Bleeker,1852	Deep body sardinella
	4	<i>Sardinella fimbriata</i> (Valenciennes,1847)	Fringe scale sardinella
	5	<i>Sardinella melamura</i> (Cuvier,1829)	Blacktip sardinella
	6	<i>Sardinella jessieui</i> (Valenciennes,1847)	Mauritian sardinella
	7	<i>Sardinella longiceps</i> Valenciennes,1847	Indian oil sardine
	8	<i>Amblygaster clupeioides</i> Bleeker, 1849	Bleekersmooth belly sardinella
	9	<i>Amblygaster leiogaster</i> (Valenciennes,1847)	Smooth belly sardinella
	10	<i>Amblygaster sirm</i> (Walbaum, 1792)	Spotted sardinella
	11	<i>Escualosa thoracata</i> ( Valenciennes, 1847)	White sardine
	12	<i>Dussumiera acuta</i> Valenciennes, 1847	Rainbow sardine
	13	<i>Spratellides delicatulus</i> (Bennett, 1831)	Delicate round herring
	14	<i>Spratelloides gracilis</i> (Schlegel, 1846)	Silver stripe round herring
	15	<i>Ehirava fluviatilis</i> Deraniyagala, 1929.	Malabar sprat
	16	<i>Dayella malabarica</i> (Day, 1873)	Day's round herring
	17	<i>Nematalosa nasus</i> (Bloch, 1795)	Bloch's gizzard shad
	18	<i>Anodontostoma chacunda</i> (Ham.Buch., 1822)	Chacunda gizzard shad
	19	<i>Hilsa kelee</i> (Cuvier, 1829)	Kelee shad
	20	<i>Tenualosa ilisha</i> (Ham. Buch. , 1822)	Hilsa shad
	21	<i>Tenualosa toli</i> (Valenciennes, 1847)	Toli shad
<b>Pristigasteridae</b>	1	<i>Pellona ditchela</i> Valenciennes, 1847	Indian pellona
	2	<i>Ilisha megaloptera</i> (Swainson, 1839)	Bigeye ilisha
	3	<i>Opisthopterus tardoore</i> (Cuvier, 1829)	Tardoore
<b>Chirocentridae</b>	1	<i>Chirocentrus dorab</i> (Forsskal, 1775)	Dorab wolf herring
	2	<i>Chirocentrus nudus</i> (Swainson,1839)	Whitefin wolf herring
<b>Engraulididae</b>	1	<i>Thryssa balaema</i> (Forsskal,1775)	Baelema anchovy
	2	<i>Thryssa dussumieri</i> (Valenciennes, 1848)	Dussumier"s thryssa
	3	<i>Thryssa mystax</i> (Schneider,1801)	Moustached thryssa
	4	<i>Thryssa setirostri</i> (Broussonet,1782)	Longjaw thryssa
	5	<i>Thryssa vitriostris</i> (Gilchrist & Thompson,1906)	Orangemouth anchovy
	6	<i>Thryssa malabarica</i> (Bloch,1795)	Malabar thryssa
	7	<i>Coilia dussumieri</i> Valenciennes, 1848	Gold spotted granadier anchovy
	8	<i>Encrasicholina devisi</i> (Whitley,1940)	Devi's anchovy
	9	<i>Encrasicholina heteroloba</i> (Ruppel,1837)	Shorthead anchovy
	10	<i>Stolephorus commersonii</i> Lacepede,1803	Commerson's anchovy
	11	<i>Stolephorus waitei</i> Jordan & Seale,1926)	Spottyface anchovy
	12	<i>Stolephorus indicus</i> (van Hassell,1823)	Indian anchovy

## Reference

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Line drawings-Courtesy to FAO Fish Synop. (125).

