Fish of Tam Giang Cau Hai Lagoon I Taxonomic Atlas

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Raining Season

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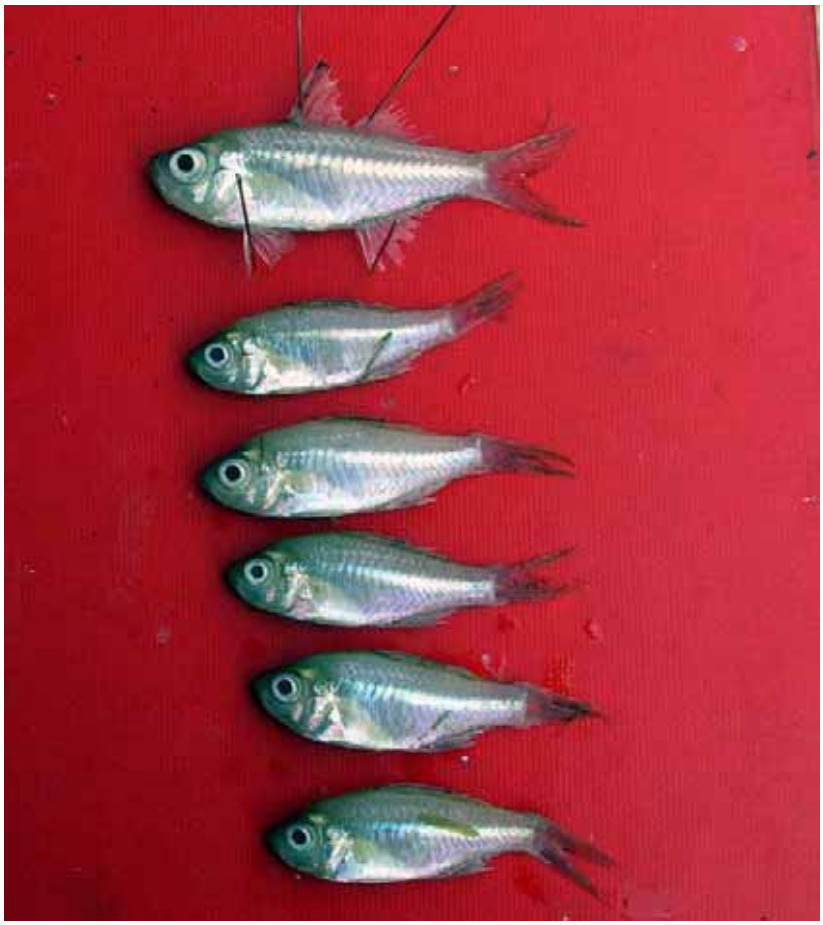
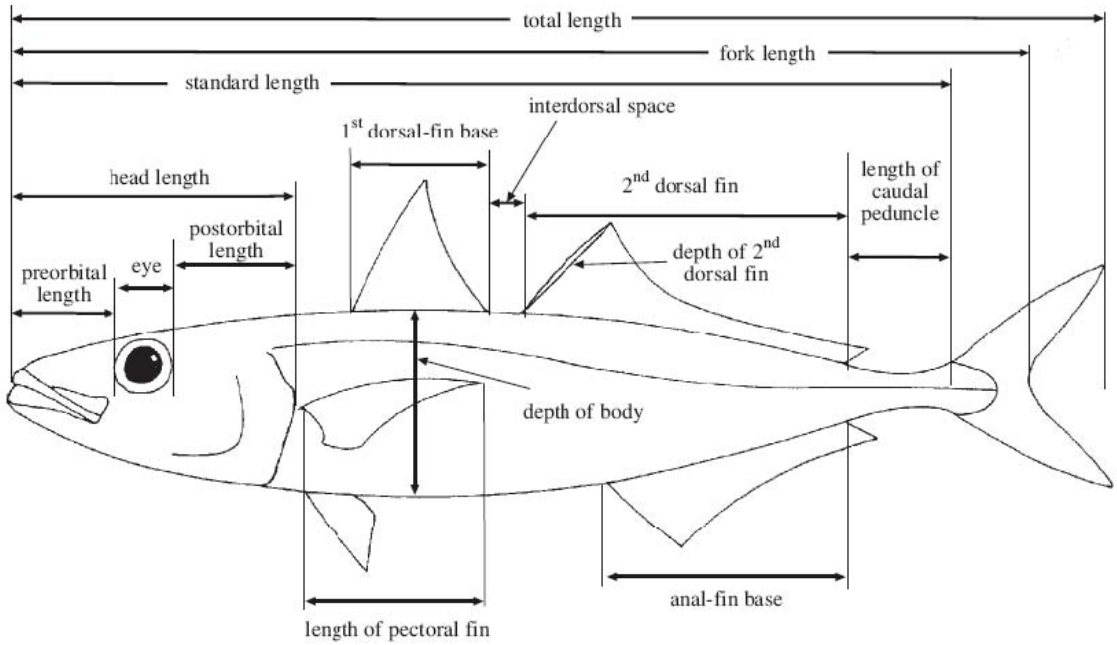
Objectives

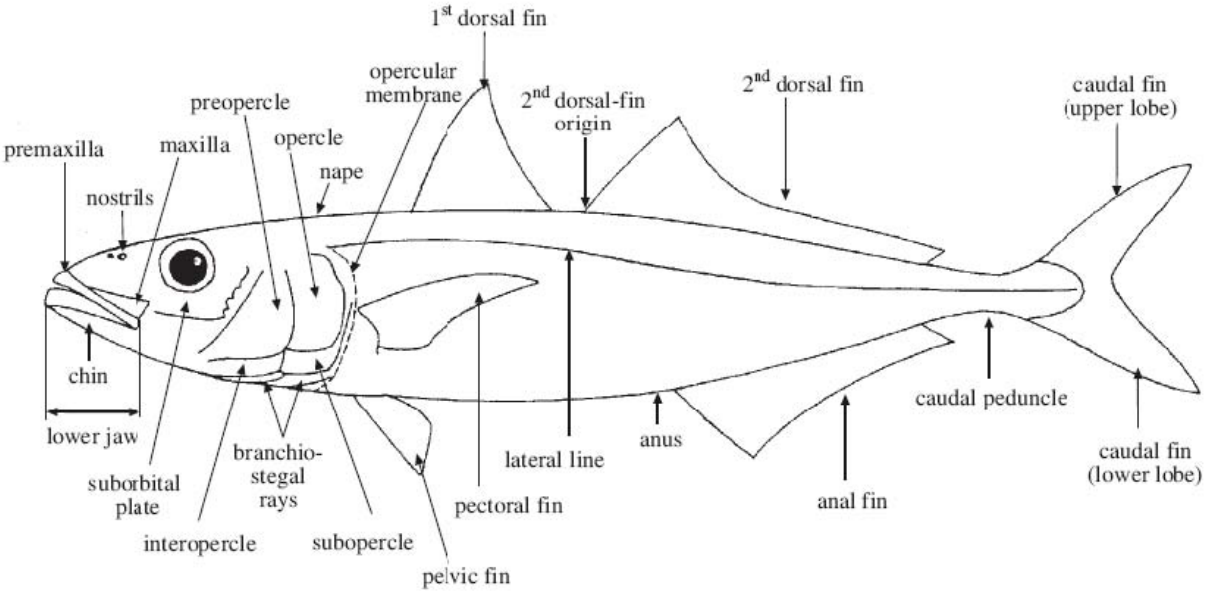
The purpose of this guide is to provide an accurate means to identify to the appropriate taxonomic level those organisms that are of potential use or likely to be captured by fisheries activities in Tam Giang Cau Hai Lagoon, Thau Thien Hue Province, Vietnam. Correct identification is of utmost importance in resource management. The quality of fisheries statistics depends on the ability to correctly assign landing and catch data to taxon-specific categories. The species name is the link to all relevant biological and ecological information in the literature. This information is fundamental in any attempt to manage a fishery. Correct identification is also important for those scientists gathering biological data relevant to marine resource management. The fishery manager cannot confidently use the relevant biological data if the scientist collecting this information did not have an accurate means of identifying the species to begin with. Therefore, this identification tool will benefit fisheries workers gathering catch statistics and resource assessment information, and marine biologists researching information pertinent to resource management. This is particularly important for the West Central Pacific area because it encompasses the highest diversity of marine organisms exploited by fisheries than anywhere in the world. An additional objective of this guide is to document whenever possible the extent of the biodiversity likely to be affected by fisheries within the Lagoon and to give a snap shot of the average size and weight of the fish catch during the raining season (October - January 2006-2007). For the whole classification process, the FAO species identification guide for fishery purposes "The living marine resources of the Western Central Pacific" has been used.



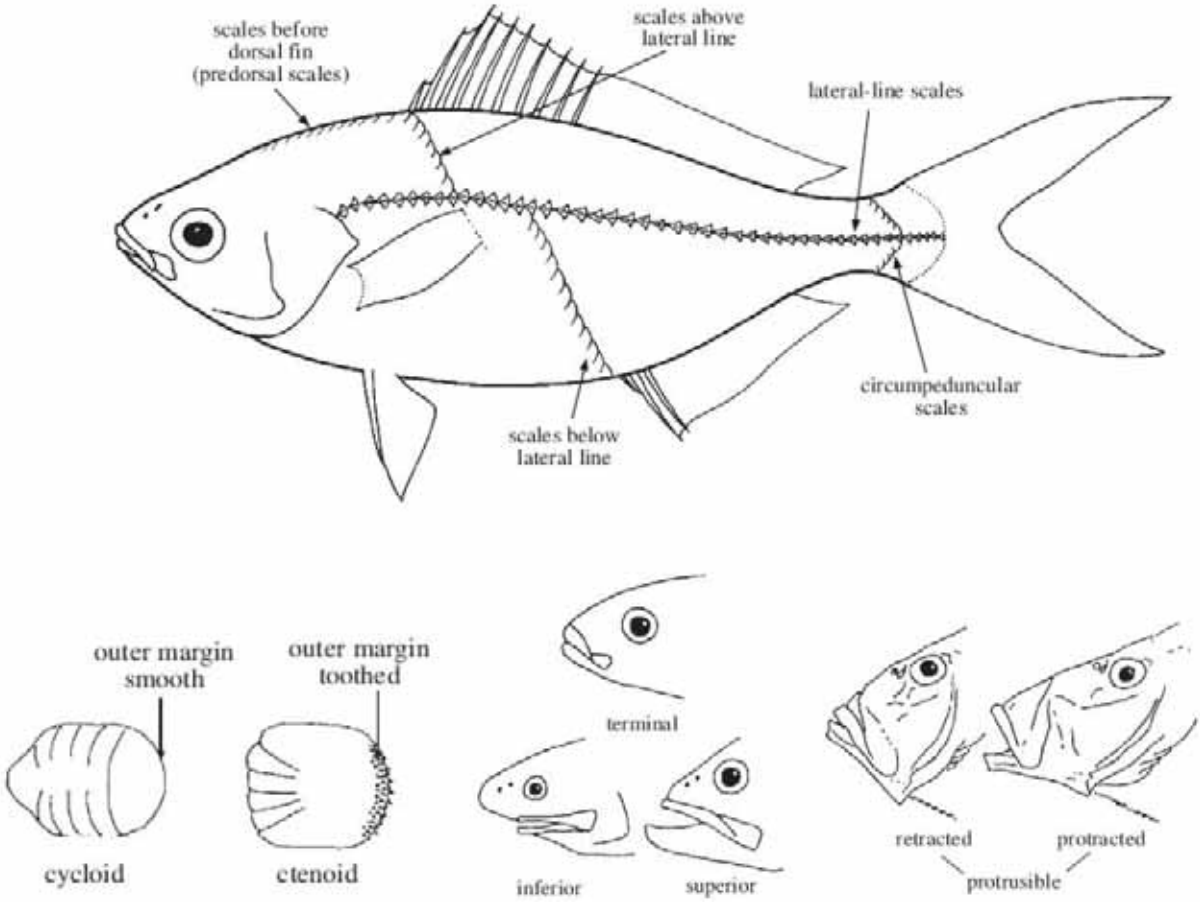
Technical Terms And Measurements



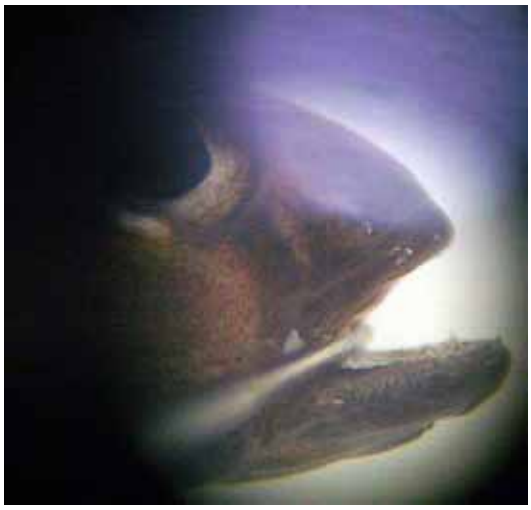
Common External Features



Common Scale Count



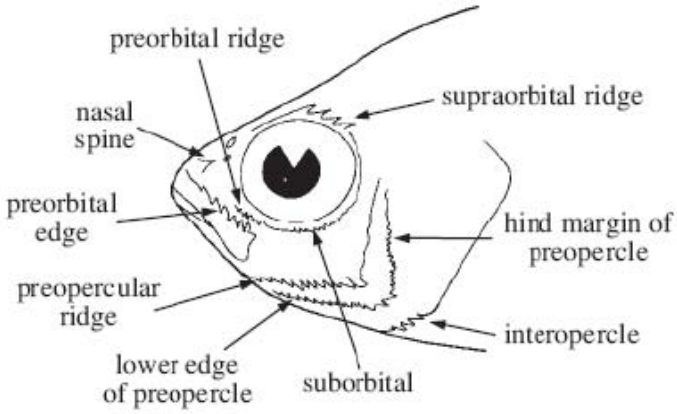
Thematic Exemples Of Typical Scales & Mouth Position And Protrusibility



AMBASSIDAE

(= Chandidae)

Diagnostic characters: Small (to 12 cm) percoid fishes; body oblong to oval-shaped and compressed. Eyes large, much greater than snout length. **Margins and ridges of preorbital, suborbital, supraorbital, preopercle, and interopercle frequently serrate**. Mouth moderately large, only slightly protractile, jaws equal or lower one slightly protruding; angle of jaw oblique, about 40° to horizontal. Bands of villiform teeth on jaws, vomer, and palatines. First gill arch with 16 to 29 gill rakers on lower limb. **A deeply notched dorsal fin**, the front portion of fin with VII spines, the rear portion with I spine and 8 to 11 soft rays. Anal fin with III spines and 8 to 11 soft rays. Caudal fin forked. Pelvic fins with I spine and 5 soft rays. Pectoral fins with 11 to 17 rays. Branchiostegal rays 6. Scales large and cycloid, extending onto head and base of median fins; cheeks and operculum scaly; lateral line continuous or interrupted in middle portion; scales in midlateral series 24 to 34. **Colour:** semitransparent, usually with dark scale outlines and silvery sheen on side of head and belly. The serrated margins and ridges on various head bones are useful features for identifying ambassid fishes



Habitat, biology, and fisheries: Mangrove shores, brackish estuaries, and fresh waters, always in shallow depths. Forms resting aggregations during the day among the roots of mangrove trees, log snags, and aquatic plants. They disperse at night to feed on micro-crustaceans (cladocerans, ostracods, and copepods), aquatic and terrestrial insects, and occasional fishes. Too small to be commercially important, although they are sometimes dried and salted; also used as bait fishes.

Similar families occurring in the area

Apogonidae: dorsal fin consisting of 2 completely separate parts; only II anal-fin spines.

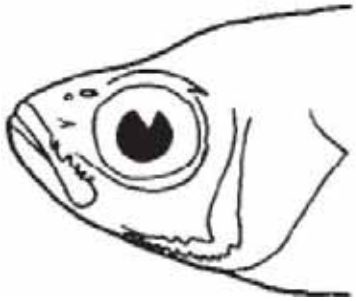
Ambassis kopsi (Bleeker, 1858)

Diagnostic characters: Single suborbital spine; Cheek with 2 or more scale rows; Lateral line continuous from upper edge of gill opening to caudal-fin base; Pectoral-fin rays 13 to 15; nasal spine present, but may be blunt and hidden under skin; Dorsal-fin spines

relatively strong and stiff; soft dorsal-fin rays usually 9 (rarely 10); soft anal-fin rays usually 9 or 10; body deeper, maximum depth
33.4 to 44.7% of standard length; head length 35.5 to 41.4% of standard length; Predorsal scales 8 to 11; second dorsal-fin spine longer than third spine; horizontal scale row from anal-fin origin to base of dorsal fin 11 or 12.

Ambassis Jacksoniensis (Macleay, 1881)

Diagnostic characters: Single suborbital spine; Cheek with 2 or more scale rows ; Lateral line continuous from upper edge of gill opening to caudal-fin base; Pectoral-fin rays 13 to 15; nasal spine present, but may be blunt and hidden under skin; Dorsal-fin spines relatively weak and flexible; soft dorsal-fin rays usually 10 (occasionally 9 or 11); soft anal-fin rays usually 8 or 9; body slender, maximum depth 29.2 to 33.2% of standard length; head length 32 to 34% of standard length.

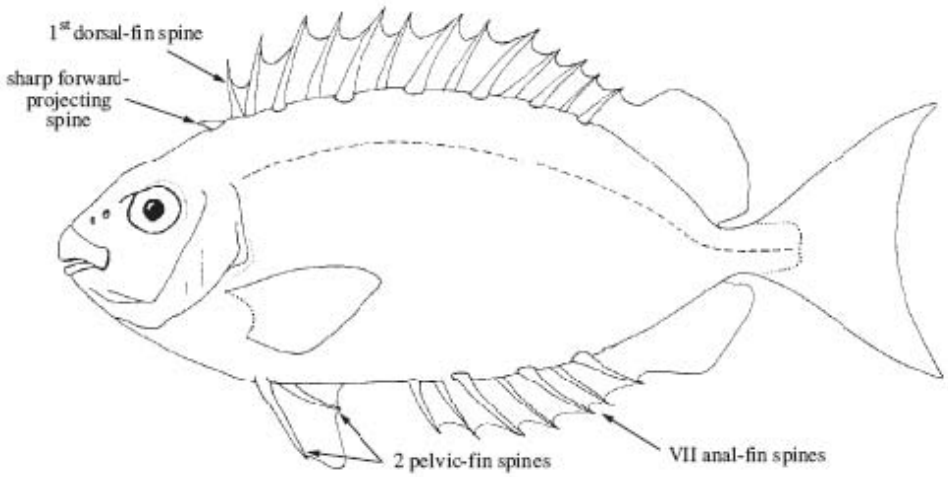


SIGANIDAE

Diagnostic characters: Body laterally compressed, oval, deep, or slender (size to 55 cm). Snout tubulate in a few species. **Mouth terminal, very small; jaws not protrusible**. Single row of compressed, incisiform teeth in both jaws; teeth close-set, overlapping slightly, simulating a denticulated beak. **Dorsal fin with XIII strong spines and 10 soft rays; preceded by a short, sharp, forwardly projecting spine**, usually protruding slightly from its pocket but sometimes completely hidden. **Anal fin with VII strong spines and 9 soft rays** (individual variation in number of dorsal- and anal-fin spines and rays extremely uncommon). **Pelvic fins with II spines (I strong inner and I outer spine, with 3 soft rays in between), a character unique to this family**;

membrane extending from inner spines to belly, the anus lying between these membranes. Fin spines with a pair of lateral grooves containing venom glands. **Scales cycloid and very small**, sometimes absent from isthmus and midthoracic region, and if present on head restricted to suborbital area of cheek. **Colour:** coral-reef species usually brightly coloured and ornately patterned; others often drab and becoming mottled with brown at death.

Habitat, biology, and fisheries: About bottom in shallow coastal waters to a depth of 50 m. Some species live in pairs among corals, others in schools around rock and coral reefs, mangroves, estuaries, and brackish lagoons. Some move with tides to feed in flooding areas of rock and coral reefs. Sleep at night. Primarily herbivorous; progress from feeding on zoo- and phytoplankton as larvae to finer algae as small juveniles and to coarser seaweeds and encrusting algae, and occasionally sea grasses, as adults. However, most will take an animal bait; and 2 species feed extensively on sponges and sessile colonial tunicates. Spawning in schooling species is by pairing from massed congregations at certain phases of the moon. Reproduction in permanently pairing species not recorded. Eggs adhesive. Taken in bottom trawls, traps, and set nets of numerous kinds, and by spearing. From 1990 to 1995, the FAO Yearbook of Fishery Statistics reports a range of yearly catch of around 15 700 to 25 800 t of Siganidae from the Western Central Pacific. Mostly marketed fresh, but juveniles of some schooling species dried or processed into fish paste. Selected schooling species used in aquaculture. A few brightly coloured reef species valued by aquarium trade.



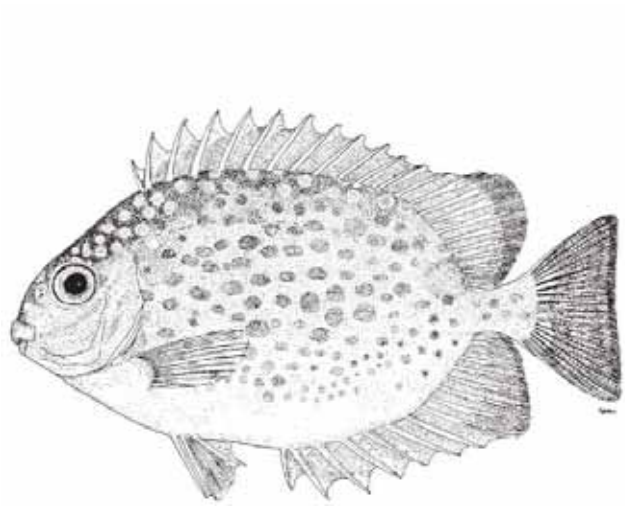
Siganus guttatus (Bloch, 1787)

Order: Perciformes **Suborder:**Acanthuroidei **Family:**Siganidae **Genus:**Siganus

Frequent synonyms / misidentifications: *Siganus concatenatus* (Valenciennes, 1835) / *Siganus lineatus* (Valenciennes, 1835); *S. stellatus* (Forsskål, 1775).

Vietnamese name: *Ca' Dia*

FAO names: En - Orangespotted spinefoot.



Diagnostic characters: Body deep and compressed, its depth 1.8 to 2.3 times in standard length. Dorsal profile of head descending fairly steeply, slightly concave in front of eye; anterior nostril with a low rim, slightly expanded posteriorly. A forward-directed spine in front of dorsal fin, imbedded in nape; **fifth to eighth dorsal-fin spine longest, only a little longer than (1.1 to 1.3 times) last dorsal-fin spine**; last anal-fin spine longest, slightly longer than (1 to 1.3 times) longest dorsal-fin spine; caudal fin emarginate, moderately forked in largest fish. Scales minute; cheeks covered with prominent scales; 20 to 25 scale rows between lateral line and bases of leading dorsal-fin spines. **Colour:** blue above to silver below; **large, roundish, bronze-gold spots over sides (except for thorax and, sometimes, lower belly), largest on midside where same size as pupil and slightly larger than interspaces, slightly smaller on lower sides. A bright yellow spot about size of orbit on sides at base of last few rays of dorsal fin** (also in *Siganus lineatus*). Head golden with sinuous blue lines radiating from mouth to eye and across cheeks, the most constant being **a line from corner of mouth across cheek to behind the eye**, (also in *S. lineatus*). Iris plain yellow, not spotted. Dorsal-fin spines and rays bluish; membrane of spinous portion of fin plain bronze; membrane of soft portion bluish, between each ray a bronze spot at base and a bronze streak extending outward; anal-fin spines dusky and bronze on dark bronze membrane; soft portion of anal fin with same colour pattern as soft portion of dorsal fin. Bronze gold spots on sides extending onto caudal fin, reducing in size towards trailing edge, arranged in columns, appearing as 4 or 5 bars when fin is not expanded (similar to *S. lineatus*); outer spine and ray of pelvic fins silvery, remainder bluish; pectoral fins hyaline. In market specimens, spots rust red to orange, background dusky blue above to grey below and the large yellow spot below the soft dorsal fin often faded to grey.

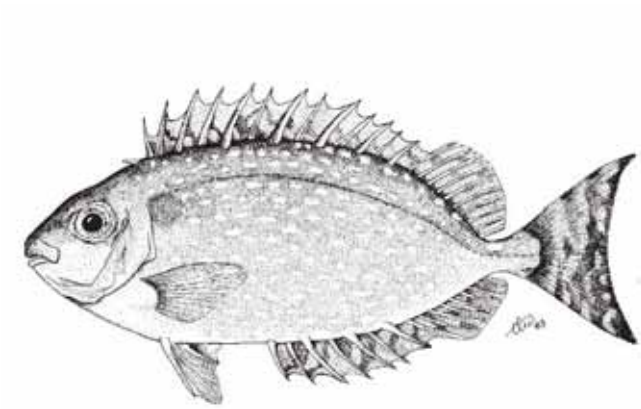
Size: Maximum total length about 45 cm, commonly to 25 cm.

Habitat, biology, and fisheries: Inhabits shallow coastal areas; tolerates or even prefers low salinities; fry settle in seagrass beds around river mouths and adults enter and leave rivers with the tide, but also found on the drop-offs of inshore fringing reefs down to 6 m. Schools throughout life; school size for adults around 10 to 15. Feeds on benthic algae. Caught with set nets and traps and reported to be, unlike other siganids, active at night; common in markets where sold fresh.

Siganus canaliculatus (Park, 1797)

Frequent synonyms / misidentifications: *Siganus oramin* (Schneider, 1801) / None.

FAO names: En - Whitespotted spinefoot; **Fr** - Sigan pintade; **Sp** - Sigano pintado.



Diagnostic characters: Body compressed, moderately slender, its depth 2.3 to 2.8 times in standard length. Head profile slightly to markedly concave above eye; snout pointed rather than blunt; anterior nostril with a long flap in juveniles, shortening with age, absent in old fish; nostril flap reaching less than half-way to posterior nostril in specimens larger than 12 cm standard length. A forward-directed spine in front of dorsal fin; fourth to seventh dorsal-fin spine longest, much longer than (1.7 to 2.2 times) the last; **last anal-fin spine 1.2 to 1.5 times in longest anal-fin spine (usually the third); soft parts of dorsal and anal fins low, longest dorsal-fin ray 0.7 to 1 times in longest dorsal-fin spine; caudal fin almost emarginate in specimens under 10 cm standard length, forked in larger fish** (but median rays never less than 1/2 length of longest rays). Scales minute; cheeks scaleless, or with few to many very fine scales; **16 to 26 (rarely 27) scale rows between lateral line and bases of leading dorsal-fin spines. Colour:** highly variable, especially affected by mood of fish; basic pattern, silvery grey above to silvery below with touch of green on nape and upper surface of head; **numerous (100 to 200) pearly blue to whitish spots on nape and trunk, match-head size on lower sides** but often smaller above lateral line and only pinhead size on nape, round, ovoid or rod-shaped, much smaller than interspaces, arranged more or less in horizontal rows, **2 to 3 rows between first spine of dorsal fin and lateral line (area of eye would cover about 6 spots in this region), and about 10 rows between highest point of lateral line and base of first anal-fin spine**; frequently a dark patch, a little smaller than eye, just below origin of lateral line; **whole of sides of frightened and injured fish mottled light and dark brown and cream, creating 6 or 7 regularly spaced, dark diagonal zones with paler zones of similar width between them,** which pattern may obscure part of the "basic" pattern of spots; brown bar under chin, another across isthmus, and a broader one across thorax (this camouflage pattern not unique to *Siganus canaliculatus*, also present in *S. fuscescens* and *S. argenteus*); caudal fin with 4 to 6 incomplete, irregular pale bars on brown background.

Size: Maximum total length about 25 cm, commonly to 20 cm.

Habitat, biology, and fisheries: In shallow coastal waters to depths of 50 m. Compared

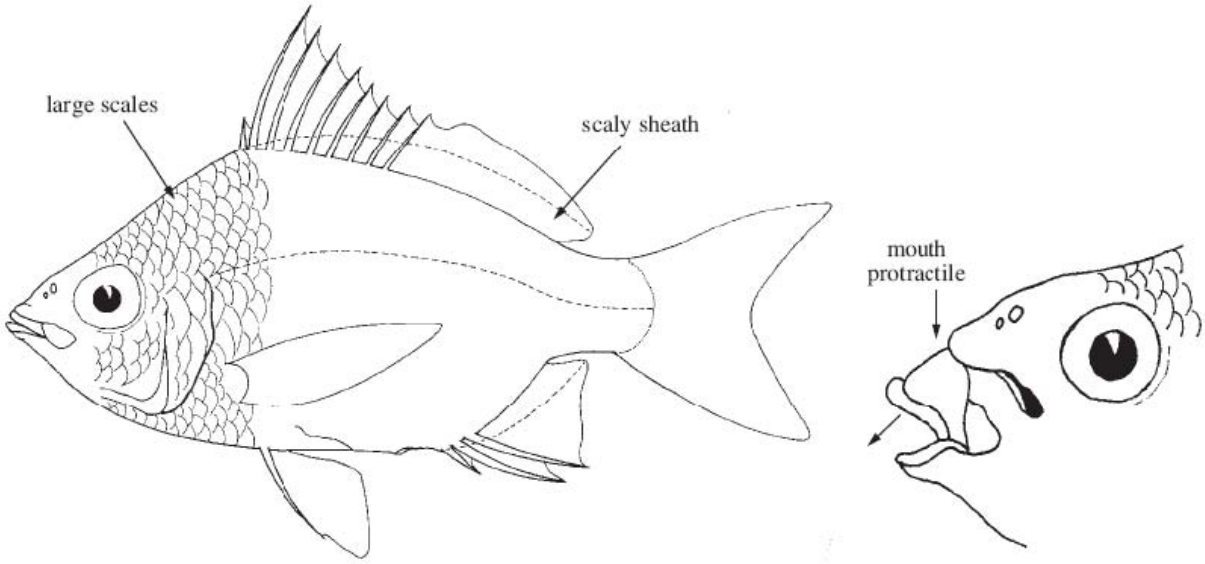
with the very similar *S. fuscescens*, it seems to tolerate more turbid waters, occurring in and about the mouths of rivers especially around seagrass beds but also caught in traps up to several kilometres offshore in deep, clear waters. Juveniles live in very large schools in shallow bays and also on coral reef flats; school size reduces with age, with groups of around 20 adults not uncommon. Much larger aggregations appear to occur around spawning times. Feeds on benthic seaweeds and to a much lesser extent on seagrasses. Fished by trawling and seine netting; bycatch in traps set in deep water. Marketed fresh in very large numbers.

Distribution: Persian Gulf to the Indo-Malayan area, north to Ryukyu Islands and south to northern half of Australia.

GERREIDAE

Diagnostic characters: Body laterally compressed, oblong, oval, or with markedly elevated back (size to about 35 cm). **Mouth terminal, strongly protractile, pointing downward when extended.** Bands of minute, acute teeth in both jaws; no incisors, canines, or molars. **Dorsal fin long, single, with IX (occasionally X) spines, the first very short (except in *Parequula*, not known from the area), and a similar number (9 to 11 in *Gerres*) or larger number (12 to 15 in *Pentaprion* and 17 in *Parequula*) of soft rays;** base of dorsal fin sheathed in a row of deciduous scales. **Anal fin usually with III (less commonly II) spines,but V or VI in *Pentaprion***, the first spine very short in all species except *Parequula*; 6 to 8 anal-fin rays, but 12 to 14 in *Pentaprion* and 16 to 18 in *Parequula*. **Pectoral fins long and pointed.** Caudal fin markedly to very deeply forked. **Scales large, obvious but deciduous**, cycloid or finely ctenoid, extending over sides of head. **Colour:** predominantly brilliant silver, faint olive to brown dorsally, with dusky markings on sides in some species; dusky bars on sides occur only in juveniles in some species; margin and/or tip of spinous part of dorsal fin often black.

Habitat, biology, and fisheries: Near the bottom in coastal waters of all warm seas, down to 70 m; a few temperate species; especially abundant in very shallow bays, estuaries, and coastal lagoons. Tolerant of hyper-and hyposaline conditions, a few entering fresh water; some species characteristically found in clear water over bottoms of clean sand, others in turbid waters on muddy bottoms; a couple of species inhabit open areas of sand on coral reefs where they forage singly or in small schools, but most live in large schools. Feed on small invertebrates gleaned from the bottom by taking up mouthfuls of substrate and expelling sand and debris. Temperate species have a single spawning season in the warmer months; some species spawn biannually; larvae from a mixture of species abundant throughout the whole year in tropical coastal lagoons in some localities. Caught with set, lift, cast, and seine nets, and as by catch with bottom trawls; flesh of good quality, but softens very quickly unless chilled; marketed fresh or as processed frozen products.



Gerres filamentosus (Cuvier, 1829)

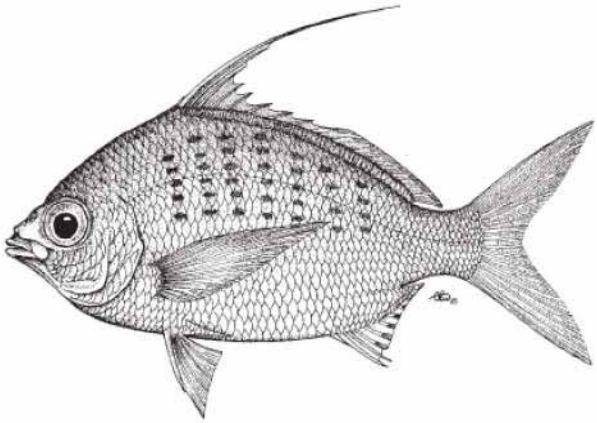
Order: Perciformes **Suborder:** Percoidei

Family: Gerreidae **Genus:** Gerres

Frequent synonyms / misidentifications: *Gerres punctatus* Cuvier, 1830; ? *G. macracanthus* Bleeker, 1854 / None.

Vietnamese Name: *Ca' Mom'*

FAO names: En - Whipfin silverbiddy; **Fr** - Blanche fil; **Sp** - Mojarra de hebra.



Diagnostic characters: Body compressed, elevated back, deep, its depth 2 to 2.5 times in standard length in larger specimens, up to 3 times in smaller ones.
Anterodorsal profile ascending steeply in a gentle curve at an angle of about 40° to horizontal axis.
Second dorsal-fin spine laterally compressed, produced into a filament whose tip extends to at least level of first anal-fin spine, except in very smallest of specimens, only

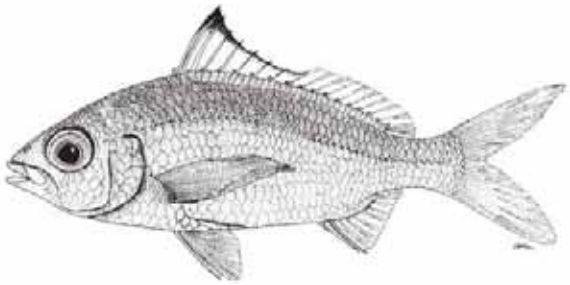
equal to head length in specimens less than 6 cm standard length (filament often lost, but compressed condition of spine indicates original condition); third dorsal-fin spine also laterally compressed, as long as distance from tip of snout to preopercular margin; second anal-fin spine much shorter than length of base of anal fin; pectoral fins long, tip of depressed fins reaching to level of first anal-fin spine; caudal fin deeply forked, its longest rays 3 times length of median rays and slightly longer than length of head. Scales on lateral line 43 to 46 to base of caudal fin, and 2 to 5 more pored scales in scaly sheath on base of fin. Colour: silvery, with a touch of lightest brown dorsally; 7 to 10 columns of pale brown ovoid spots on upper half of sides, coalesced as bars in smaller specimens; iris silvery with a dark ovoid patch in anterodorsal quarter; dorsal fin hyaline except for end of filamentous spine, which is black; anal, caudal, pectoral, and pelvic fins dusky hyaline, tips of anal fin, lower lobe of caudal and pelvic fins white.

Size: Maximum total length about 30 cm, commonly to 15 cm.
Habitat, biology, and fisheries: Lives in shallow coastal waters to depths of at least 50 m, on sandy bottoms, including around coralline areas, also entering lower fresh-water reaches of rivers. Schooling; feeds on small organisms such as crustaceans, polychaetes, and foraminiferans living on sand or muddy-sand bottoms. The commonest gerreid species in markets in many tropical areas. Caught mainly with beach seines and bottom trawls. Flesh excellent, but spoils rapidly.

Gerres oyena (Forsskål, 1775)

Frequent synonyms / misidentifications: None / *Gerres argyreus* (Schneider, 1801).

FAO names: En - Common silverbiddy; **Fr** - Blanche commune; **Sp** - Mojarra común.



Diagnostic characters: Body compressed, oblong, slender, its depth 3 to 3.3 times in standard length; anterodorsal profile gently convex. Dorsal fin distinctly notched, last spine 2/3 length of first soft ray; second dorsal-fin spine neither elongate nor exceptionally short, contained about 0.6 to 0.7 times in length of head (excluding jaws); **second and third anal-fin spines slender and short, e.g. second slightly less than 1/2 length of second or third dorsal-fin spines**; caudal fin very deeply forked, but lobes relatively short, length of longest ray subequal with head length; pectoral fins short, tip of depressed fins only reaching level between bases of first and second dorsal-fin ray. **Scales on lateral line 35 to 39 to base of caudal fin**, and 2 to 4 more

pored scales in scaly sheath on base of caudal fin; **3.25 to 3.5 scales between lateral line and base of fifth dorsal-fin spine. Colour:** silvery, with a trace of pale olive above lateral line; 7 or 8 faint dusky bars on sides of body in young, absent in older fish; prominent black tip to spinous part of dorsal fin, usually confined to distal part of membrane between second and fifth spines but sometimes continuing as a black margin along whole of dorsal fin.

Size: Maximum total length 25 cm, commonly to 15 cm.

Habitat, biology, and fisheries: Inhabits inshore areas on silty-sand bottoms down to at least 30 m; found along sandy beaches but commonly in estuaries and brackish lagoons. Schools; feeds by sifting small invertebrates from mouthfuls of substrate. Fished mainly with seines and bottom trawls. Marketed fresh; also used as fishmeal.

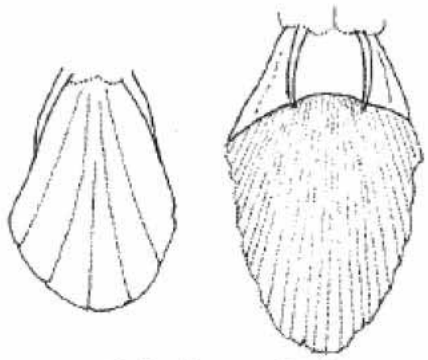
Distribution: Widespread in the tropical Indo-West Pacific Region from the east coast of Africa and the Red Sea westward to Samoa in the south Pacific and the Caroline Islands in the north Pacific; extends northward to southern Japan and southward to tropical Australia and to New Caledonia

GOBIIDAE

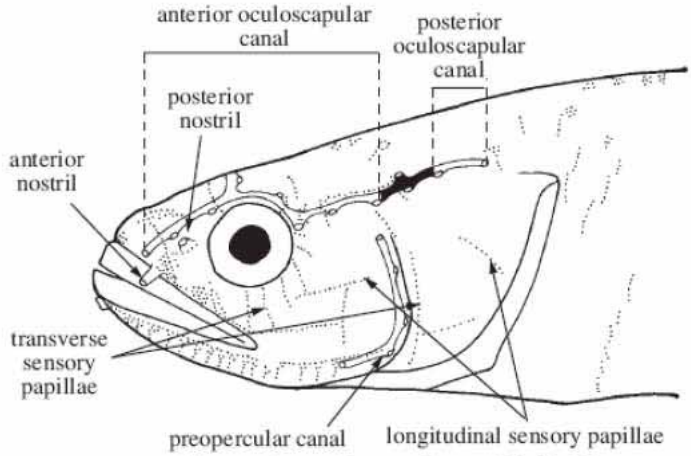
Diagnostic characters: Small gobioid fishes (to 30 cm, usually less than 10 cm); body typically stout (but with many exceptions). **Head** short and broad, often scaly, **typically with a series of sensory canals and pores, and cutaneous papillae**. Snout rounded. Teeth usually small, sharp, and conical, in 1 to several rows in jaws. Gill membranes broadly joined to isthmus**. Two separate dorsal fins**, the first with V to X weak spines, the second with I weak spine and 5 to 37 soft rays; anal fin with I weak spine and 5 to 36 soft rays (typically terminal ray of second dorsal and anal fins divided to its base, but only counted as a single element); pectoral fins broad with 12 to 25 rays; pelvic fins long with I spine and 5 soft rays, pelvic-fin spines usually joined by fleshy membrane (frenum), and **innermost pelvic-fin rays usually joined by membrane, forming a disk** (gobies with pelvic fins not united typically found in coral-reef areas); caudal fin broad and rounded, with 16 or 17 segmented rays. Scales large, either cycloid or ctenoid. **Lateral line absent on body. Colour:** variable.

Habitat, biology, and fisheries: The Gobiidae is the largest family of marine fishes and comprises more than 220 genera and 1 500 species. In the Western Central Pacific, gobies are represented by about 100 genera and approximately 500 species. They are usually secretive in their habits and typically very small (*Trimmatom nanus*, one of the smallest known vertebrates, matures at 8mm). This highly successful family primarily inhabits shallow tropical and subtropical waters but has invaded nearly all benthic habitats from fresh water to the shoreline to depths exceeding 500 m. Gobiid fishes dwell on a variety of substrata from mud to rubble, and coral reefs are particularly rich in goby species. Some gobies spend their entire lives in fresh waters, others migrate back and forth between fresh water and brackish water environments, or between marine and brackish waters. Members of the subfamily Sicydiinae inhabit the upper reaches of rivers, often at great altitudes, and migrate downstream to spawn; when spawning is complete, the fertilized eggs drift out

with currents to develop at sea, and the adults return to their upstream habitat, often overcoming torrential stream flows. Some gobies associate with other organisms such as shrimps, sponges, soft corals, and other fishes. For a few species, symbiotic relationships with other organisms are a necessary part of the goby's lifestyle. For instance, the cleaner gobies of the Caribbean (*Elacatinus*) feed on ectoparasites of other fishes whereas the Indo-Pacific gobies of the genera *Amblyeleotris* and *Cryptocentrus* share a burrow with a snapping shrimp (*Alpheus*). Typically, female gobies lay a small mass of eggs, each attached by an adhesive stalk to the underside of dead shells or other firm overhanging substrate. The eggs are guarded and tended by the male. Most gobiids are of no commercial or recreational importance other than as food for larger fishes. However, postlarval fry of *Awaous* and species of Sicydiinae are popular food items to native peoples throughout the area. Fry are collected in nets as they enter river and stream mouths during migrations from the sea to fresh water, usually during a full moon.



pelvic fins united



sensory papillae and canal pores in a gobioid fish
(after Masuda et al., 1984)

Glossogobius giuris (Hamilton) 1822

Order: Perciformes **Suborder:** Gobioidei **Family:**Gobiidae **Subfamily:** Gobiinae **Genus:**Glossogobius

Vietnamese Name: *Ca' Bong*

Diagnostic characters: Dorsal spines: 7 -7; Dorsal soft rays: 8 - 9; Anal spines: 1; Anal soft rays: 8 –
9. Head flattened, lower jaw projecting; body pale without lateral lines. Dorsal fins with small spots forming longitudinal stripes. Pelvic fins jointed but attached to the body only from their anterior part. The body is brownish yellow with 5 to 6 dark and rounded spots on its sides. Some specimens living on dark substrates can be very dark also. Some living on very light substrates show an ivory coloration. Dorsal fins are light with brownish spots. Pelvic fins are hyaline. Pectorals and caudal are grey or often hyaline.

Habitat, biology, and fisheries: Demersal; amphidromous, found mainly in freshwater and estuaries, but also enters the sea. Also occurs in canals, ditches and ponds. Found in clear to turbid streams with rock, gravel or sand bottoms.
Encountered in medium to large-sized rivers of the lower Mekong. Feeds on small insects, crustaceans and small fish. Grows to a much larger size in brackish water than in fresh water. Marketed fresh.
Cannibalism is relatively common for this species.
In Tam Giang-Cau Hai lagoon (Vietnam) often present in Fish Corral catch.

Acentrogobius caninus (Valenciennes, 1837)

Order: Perciformes **Suborder:** Gobioidei **Family:**Gobiidae **Subfamily:** Gobiinae **Genus:**Acentrogobius

Vietnamese Name: *Ca' Bong*

Distribution: Indo-West Pacific.

Max. size: 13.0 cm TL

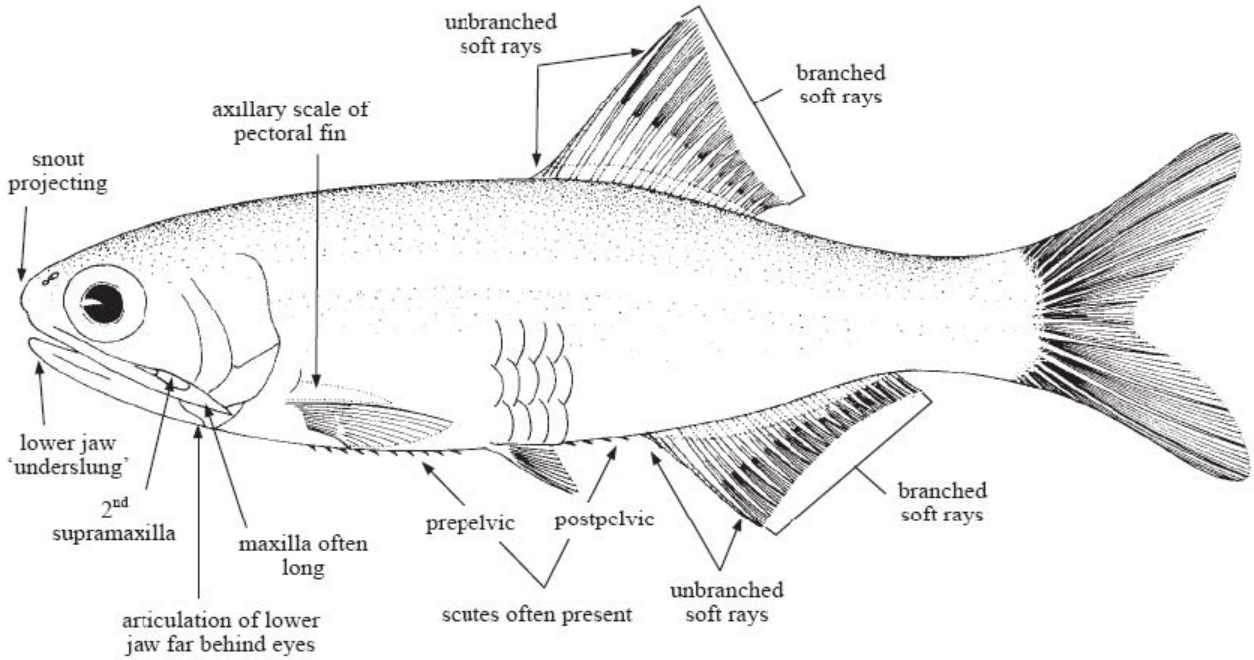
Morphology: Eyes large. Caudal fin rounded. 4, 5 large mid-lateral spots.

Habitat, Biology, and fisheries: Occurs along coastlines and in estuaries and harbours. Usually found in brackish tidal waters. Feeds on invertebrates. Found to contain tetrodotoxin (TTX) and anhydrotetrodotoxin (anh-TTX) this causes paralytic food poisoning (Lin., S.-J., D.-F. Hwang, K.-T. Shao and S.-S. Jeng, 2000. "Toxicity of Taiwanese Gobies" Fish. Sci. 66:547-552 (Name used: Radigobius caninus). Marketed fresh in Mekong delta.

ENGRAULIDAE

Diagnostic characters: Small or moderate-sized clupeoid fishes (10 to 20 cm standard length, sometimes larger) characterized by a usually prominent pig-like snout projecting beyond tip of lower jaw; lower jaw almost always long, slender and underslung, its articulation posterior to vertical through posterior margin of eye, and usually to a point well beyond posterior margin of eye. Typically, with 2 supramaxillae. Jaw teeth usually small or minute (canine-like in *Lycothrissa*). Eyes large, with adipose eyelid completely covering eyes. Gill rakers usually short and not numerous in Indo-Pacific genera. Pelvic scute with ascending lateral arms always present; most Indo-Pacific species with pre- and often postpelvic scutes, and with a small spine-like scute immediately anterior to dorsal-fin origin (*Engraulis* and *Encrasicholina* lack such scutes). Dorsal fin single, short, and usually near midpoint of body (far forward in *Coilia*); no adipose fin; pectoral fins set low on body (with 5 to 19 free, unbranched upper fin rays in *Coilia*); pelvic fins anterior to, equal with, or posterior to the vertical through dorsal-fin base; pelvic fins with i unbranched and 6 branched soft fin rays (except *Coilia ramcarati* with i unbranched and 8 or 9 branched soft fin rays); anal fin usually moderate (about 15 to 25 soft fin rays), but long in *Thryssa* (to 50 fin rays), *Setipinna* (to 80 fin rays), and *Coilia* (to over 100 fin rays). Scales cycloid, moderate, about 30 to 60 in lateral series, with posterior striae or striations, very often shed upon capture. Colour: typically, dorsum blue-green and flanks silvery (sometimes with distinct silver stripe or with diffuse dark saddle on nape); fins hyaline or faint yellow, sometimes chrome or orange, as also the mouth and/or gill cavity; sometimes with black markings on fin tips or margins, or on body just posterior to gill opening, but apparently no species with black spots on flanks (as in clupeids).

Habitat, biology, and fisheries: Anchovies are typically marine coastal and schooling fishes, occurring in all seas from about 60°N to 50°S, but some species enter brackish or fresh water to feed or spawn and some live permanently there. Most species feed on small planktonic animals (especially crustaceans), either by locating individual prey or by more indiscriminant filter-feeding. Most, perhaps all, scatter quite large numbers of eggs from which planktonic larvae hatch. Anchovies are very important commercially, with catches sometimes contributing about 25% of the total clupeoid catch. Regionally, unidentified species of *Stolephorus* and *Encrasicholina* have contributed as much as 6% of the total yearly catch of anchovies. Individual statistics are not reported for the majority of species, but individual statistics seem warranted for species (or groups of species) of *Thryssa* in the Indo-Pacific region. For 1995, FAO's Yearbook of Fishery Statistics reports a total catch of anchovies of around 365 500 t from the Western Central Pacific.



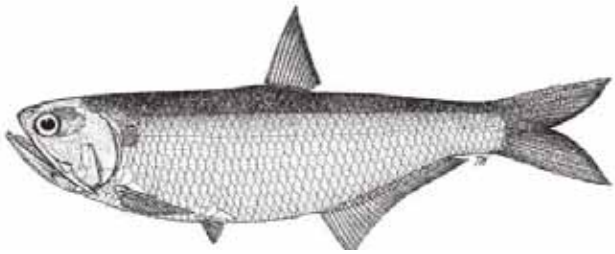
Thryssa hamiltonii (Gray, 1830)

Order: Clupeiformes **Suborder:** Clupeoidei **Family:** Engraulidae **Subfamily:** Coilinae **Genus:** Thryssa

Vietnamese Name: *Ca' Lep*

Frequent synonyms / misidentifications: *Scutengraulis hamiltonii* (Gray, 1830); *Thrissocles hamiltonii* (Gray, 1830) / *Thryssa mystax* (Bloch and Schneider, 1801); *T. spinidens* (Jordan and Seale, 1925).

FAO names: En - Hamilton's thryssa; **Fr** - Anchois-moustache mamata; **Sp** - Bocarte bolinado.



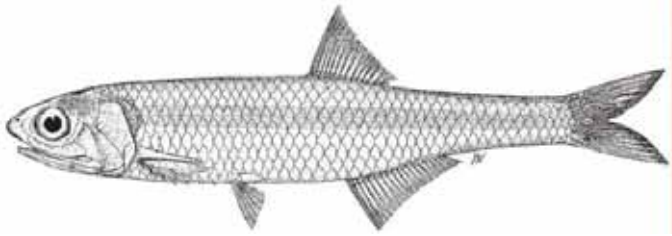
Diagnostic characters: Body compressed, **abdomen with 16 to 19 (rarely 15 or 20) prepelvic and 10 or 11 (rarely 9 or 12) postpelvic scutes; total number of scutes 26 to 31 (mostly 27 to 29). A small, spine-like scute present just anterior to dorsal-fin origin. Tip of snout above level of eye centre, usually about at level of upper rim of eye. Maxilla short to moderate, extending posteriorly to or projecting slightly beyond border of gill cover; first supramaxilla small, oval.**
Teeth small or minute, not canine-like. Lower gill rakers 12 to 14 (less often 11 or 15).
Pseudobranch hidden under skin. Dorsal-fin origin about at midpoint of body. **Anal fin relatively long, with iii (rarely iv) unbranched and 32 to 39 (mostly 35 to 37)**

branched fin rays, its origin just posterior to vertical through posteriormost dorsal-fin ray. Scales moderate, about 41 to 46 (rarely 41 or 46) in lateral series; vertical striae just interrupted at midpoint.
Colour: head with gold tints, especially on maxilla and opercle; body silvery white, olive-grey above, **with pigment lines along dorsum, a dark blotch of horizontal wavy black lines on shoulder just posterior to upper part of gill opening;** dorsal fin dusky yellow, first dorsal-fin ray and posterior border of fin charcoal; anal fin white; pectoral and pelvic fins pale yellow; caudal fin yellow, its upper and lower borders charcoal.
Size: Maximum standard length 20 cm, commonly to 17 cm.

Habitat, biology, and fisheries: Marine, pelagic, and presumably schooling; inshore and entering estuaries. One of the larger species of *Thryssa* for which more precise data are needed based on correct identifications. Principle prey items may be prawns and copepods, supplemented by polychaetes and amphipods. Maximum longevity estimated at 4 years. Recruitment begins in October and continues to February. Females at an age of 4 years (about 25 cm total length) grow faster and attain larger sizes than males (21 to 22 cm total length). Contributes to artisanal catches of clupeoids and appears to be a common species of *Thryssa*. Caught mainly with purse seines, beach seines, and bamboo-stake traps.
Marketed fresh, dried, dried-salted or made into fish meal, fish sauce, or fish balls.

Stolephorus indicus (van Hasselt, 1823)

Frequent synonyms / misidentifications: *Engraulis indicus* van Hasselt, 1823 / None. **FAO names: En** - Indian anchovy; **Fr** - Anchois indien; **Sp** - Boquerón indio.



Diagnostic characters: Body slender, elongate, nearly round in cross-section; abdomen rounded, with 2 to 6 (usually 3 to 5, mostly 4) small needle-like prepelvic scutes; no postpelvic scutes. No predorsal spine-like scute and pelvic scute without spine. Posterior frontal fontanelles remaining open in adults. Maxilla tip pointed, reaching posteriorly to or slightly beyond anterior border of preopercle; maxilla extending beyond second supramaxilla. Posterior border of preopercle convex, rounded. Isthmus muscle tapering evenly anteriorly to posterior border of branchial membrane. Branches of preopercular canal extending onto opercle. Gill rakers slender; lower gill rakers 20 to 28. Anal fin short, with usually iii unbranched and 16 to 18 branched fin rays, its origin at vertical through middle of dorsal-fin base. Pelvic-fin tips not reaching posteriorly to vertical through dorsal-fin origin. Scales moderate, about 38 to 42 in lateral series. Colour: body translucent, pale yellow above, silver below; with a broad, bright silver stripe down entire flank; opercle gold, upper head stippled dark brown; no dark pigment lines on dorsum between head and dorsal fin, dorsal and caudal fins dense

yellow, densely stippled dark brown; bases of dorsal and anal fins with faintly pigmented melanophores; other fins pale yellow.

Size: Maximum standard length 15.3 cm, usually between 10 and 12 cm.

Habitat, biology, and fisheries: Coastal, pelagic, schooling (but probably less so than other *Stolephorus* species); appears to enter at least estuarine parts of rivers and perhaps tolerates brackish water. Feeds most likely on zooplankton, but more data needed. In Manila Bay, migrates out into deeper and more saline water to breed (at about 9 cm standard length and larger), returning inshore immediately after spawning. Eggs oval, with a small knob at one pole. Appears not to form very large schools, thus of minor interest, although the largest *Stolephorus* species. Caught mainly with purse seines, lift nets, beach seines, and fish traps; also incidentally with bottom trawls. Marketed fresh, dried, dried-salted or made into fish meal, fish sauce, or fish balls. Fragile and unsuitable as a tuna baitfish.

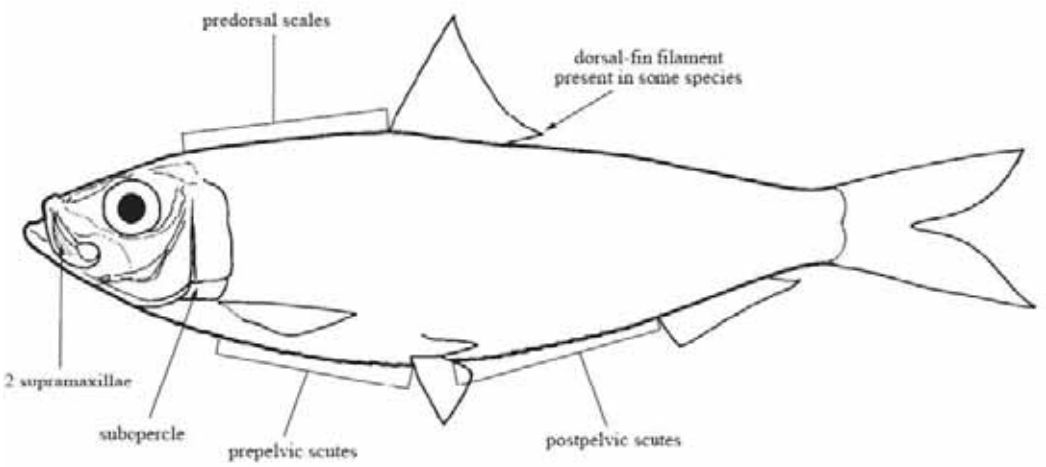
Distribution: Very widespread in western Pacific (Gulf of Thailand eastward to Hong Kong, northern and northeastern coasts of Australia south to Mackenzie Island, Queensland; north to Caroline Islands and Mariana Islands, south to New Caledonia, and further east to Samoa and Tahiti), and widespread in Indian Ocean (northwestern Australia, Sumatra, Java, Lesser Sunda Islands; entire eastern coast of Africa from the Persian Gulf and Red Sea south to Natal, Madagascar, and Mauritius).

CLUPEIDAE

Herrings (also, sardines, shads, sprats, pilchards, and menhadens)

Diagnostic characters: Typically fusiform fishes, oval in cross-section, and sometimes strongly compressed; **with a complete series of scutes along the abdomen (pelvic scute always present); with terminal mouth, usually 2 supramaxillae, and small or minute jaw teeth**. **No spiny rays in dorsal fin; a single dorsal fin**, which is short and near midpoint of body. Pectoral fins set low on body; pelvic fins just anterior to, below, or just posterior to dorsal-fin base; **anal fin short (usually less than 28 soft rays) with origin well posterior to vertical through base of posteriormost dorsal-fin ray**; caudal fin always deeply forked. **Scales cycloid**, adherent and of moderate size (about 35 to 68 in lateral series). Eyelids with vertical opening in middle (but completely covering eyes only in *Etrumeus*). **No lateral line**. **Scales without posterior striations.** There is great variation in body shape and depth (round bodied to strongly compressed and deep), scutes (some or all absent along abdomen, but a few or a complete series of predorsal scutes occasionally present), mouth shape (lower jaw prominent to mouth fully inferior in the gizzard shads), supramaxillae (one or both absent), teeth (absent in some, canines in others), scales (deciduous in some, minute in others). **Colour:** typically blue-green on back and silvery on flanks; with variable darker markings including spot behind gill cover, spots along flanks, spot at dorsal-fin origin, and dark pigmentation on part of dorsal, pectoral, anal, and caudal fins. **Habitat, biology, and fisheries:** Clupeids are typically marine coastal and schooling fishes that feed on small planktonic animals (mainly crustaceans). They form large schools and scatter large numbers of pelagic eggs that hatch planktonic larvae. There is great range in the biology and ecology of clupeids. Some enter fresh water to feed, some are anadromous, and some live permanently in fresh water, some are partial or full-time filter-feeders, some are predators on fishes (and probably form only loose and small schools

as adults), and some produce only 200 eggs or less (pygmy species) or attach their eggs to the substrate. It is mainly the cool water genera that dominate the clupeid catches. Individually, few warm-water species dominate clupeid catches (exceptions are *Sardinella lemuru* and
S. longiceps), but multispecies clupeid fisheries may account for as much as 1/3 of the total fish catch in some areas. Found in all seas from 70°N to about 60°S. Usually adults range in size from 10 to 20 cm in standard length. However, great variation is found in size, from the shad *Tenualosa ilisha* (to about 60 cm) to riverine pygmy species (*Sierrathrissa leonensis* and *Thrattidion noctivagus*), which may be mature at less than 2 cm.

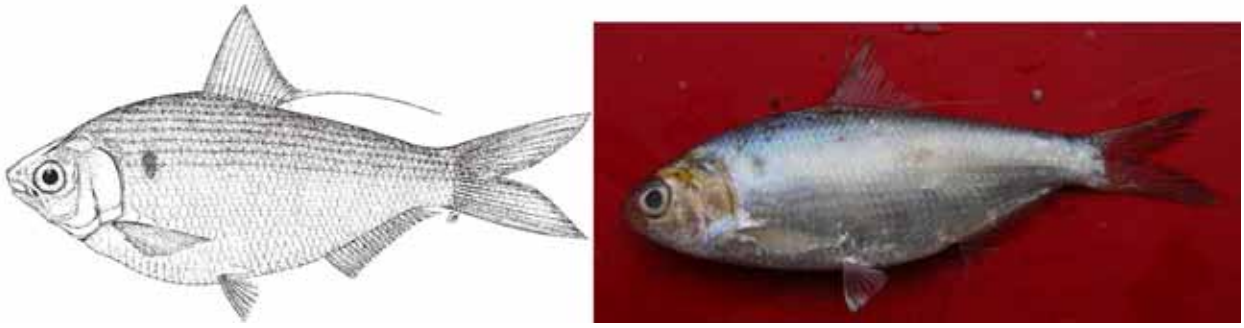


by T.A. Munroe, T. Wongratana, and M.S. Nizinski

Nematalosa nasus (Bloch, 1795)

Frequent synonyms / misidentifications: *Chatoessus chrysopterus* Richardson, 1846; *Clupanodon nasica* Lacepède, 1803; *Dorosoma nasus* (Bloch, 1795) / None.

FAO names: En - Bloch's gizzard shad; **Fr** - Chardin gros nez; **Sp** - Machuelo narigón.



Diagnostic characters: A medium-sized marine gizzard shad; body oval, becoming deeper in larger fish, depth about 34 to 41% of standard length; abdomen fully scuted with 17 to 19 (usually 18) prepelvic and 11 to 13 (usually 12) postpelvic scutes; total number of scutes 28 to 31 (usually 30); pelvic scute with ascending arms. Frontoparietal striae 6 to 11. Mouth inferior, lower jaw strongly flared outward. Premaxillae short, maxilla expanded at tip and actually or apparently turned downward. Upper jaw with distinct median notch when seen from in front; with a single small supramaxilla. Maxilla reaching posteriorly to vertical through anterior margin of eye. No

fleshy outgrowths on posterior margin of gill opening. Opercle smooth without bony striae. Anterior arm of preopercle with third infraorbital bone immediately above it, no fleshy gap between. Gill rakers fine, numerous. Gill filaments fairly short at angle of first arch. Branchiostegal rays 6. Dorsal-fin origin moderately anterior to midpoint of body; last dorsal-fin ray filamentous. Anal fin shorter than head; lying well posterior to vertical through base of posteriormost dorsal-fin ray; with 19 to 22 fin rays. Pelvic-fin insertion at vertical through base of anterior dorsal-fin rays; pelvic fins with i unbranched and 7 branched soft rays. Predorsal scales paired and overlapping in midline. Posterior margin of scales distinctly denticulated. Axillary scale of pectoral fin present, 1 or 2 in number. Lateral-line scales 46 to 49. Colour: blue-brown on back, flanks silvery, without spots; a dark spot behind gill opening.

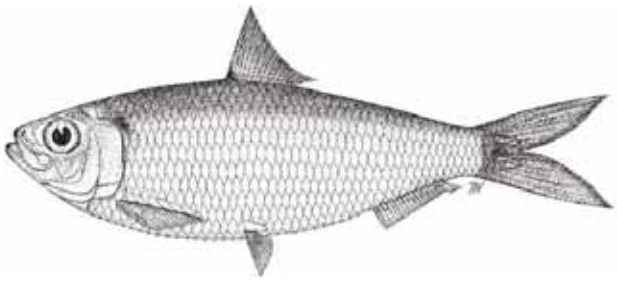
Size: Maximum standard length 21 cm, commonly between 13 and 15 cm.

Habitat, biology, and fisheries: Marine, pelagic, probably entering estuaries. Feeds on detritus. Records of spawning in Chilka Lake, east coast of India, in August. No special fishery, but contributes to clupeid catches; in Saudi Arabia it is caught in set nets and traps, but commands only low to medium prices in markets. Other gears include purse seines. Marketed fresh, dried, dried-salted, boiled, or made into fish balls.

Distribution: Indo-West Pacific from the Persian Gulf, to India and Andaman Sea, Gulf of Thailand, South China Sea to the Philippines; north to Hong Kong and southern Japan or southern tip of Korea. It seems possible that the wide geographic range for *Nematalosa nasus* may indicate that more that one species is actually represented among specimens presently identified as this species

Sardinella albella (Valenciennes, 1847)

Frequent synonyms / misidentifications: *Clupalosa bulan* Bleeker, 1849; *Clupeonia perforata* Cantor, 1849; *Harengula dollfusi* Chabanaud, 1933 / *Sardinella perforata* (Cantor, 1850); *S. bulan* (Bleeker, 1849). **FAO names: En** - White sardinella; **Fr** - Sardinella blanche; **Sp** - Sardinela blanca.



Diagnostic characters: Body somewhat compressed but variable, discontinuous from slender to moderately deep, depth 25 to 40% of standard length; abdomen keeled with prepelvic and postpelvic scutes; total number of scutes 29 to 33 (usually 30 to 32); pelvic scute with ascending arms. Upper jaw rounded without distinct median notch or cleft. Two supramaxillae present; second symmetrical, paddle-shaped. Maxilla reaching vertical through anterior margin of eye. Teeth on palatines and pterygoids weakly developed or apparently absent. With 7 to 11 frontoparietal striae on top of head. Two fleshy outgrowths on posterior margin of gill opening. Opercle smooth without bony striae. Lower gill rakers 41 to 68 (at 4 to 15 cm standard length, increasing a little with

size of fish). Branchiostegal rays usually 6. Dorsal-fin origin moderately anterior to midpoint of body. Anal-fin base short and lying well posterior to vertical through base of posteriormost dorsal-fin ray; 2 posteriormost anal-fin rays distinctly enlarged. Pelvic-fin insertion at vertical through bases of anterior dorsal-fin rays; pelvic fins with i unbranched and 7 branched soft rays. Vertical striae on scales discontinuous not meeting at centre; posterior part of scale with a few perforations and somewhat produced posteriorly. Lateral-line scales usually 41 to 43. Predorsal scales paired. Colour: dorsum and head blue-green above shading to silvery white below; flanks silvery; no spots on body; a dark spot at dorsal-fin origin, otherwise fins pale yellow.

Size: Maximum standard length 14 cm, commonly to 10 cm.

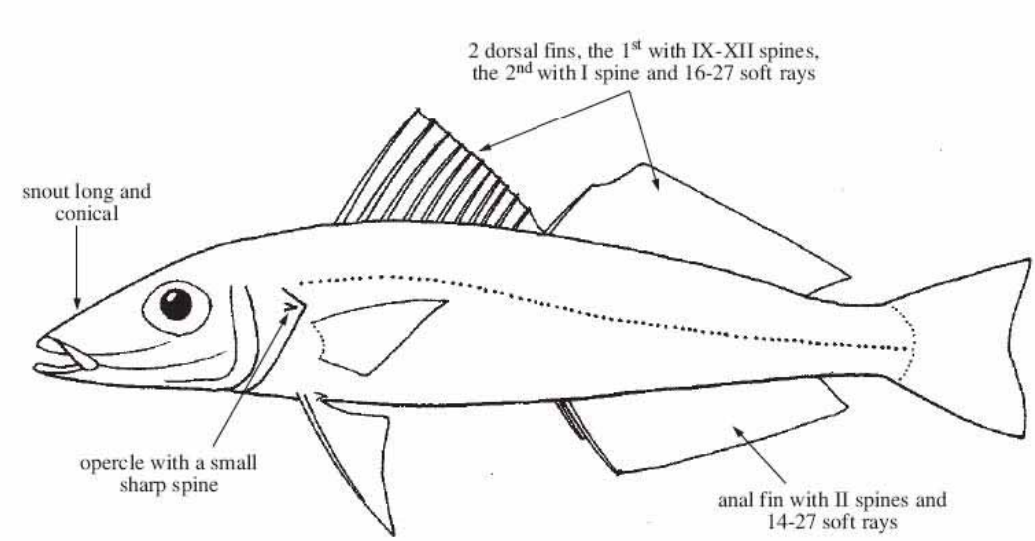
Habitat, biology, and fisheries: Coastal, pelagic, schooling. Misidentifications make published biological data potentially unreliable. Included in general statistics for *Sardinella*, but of some importance along western coasts of India (although fishery statistics probably include *S. fimbriata* and
S. gibbosa). Caught mainly with purse seines, lift nets, and set nets. Marketed fresh, dried, dried-salted, and made into fish balls.

Distribution: Indo-West Pacific from Red Sea, the Persian Gulf, East African coasts, Madagascar eastward to Indonesia, Gulf of Thailand, the Philippines, north to Taiwan Province of China, and south to Papua New Guinea and northernAustralia.

SILLAGINIDAE

Diagnostic characters: Moderate-sized (to 51 cm), elongate perciform fishes. Opercle with small sharp spine; **lower part of preopercle horizontal**. Snout long and conical. Mouth small, terminal; end of upper jaw sliding below preorbital bone. Teeth villiform, in broad bands; small teeth on roof of mouth restricted to anterior part of vomer, none on palatines. Two separate dorsal fins, the first with 9 to 12 slender spines; the second with I spine and 16 to 27 soft rays; **anal fin long, with II weak spines** and 14 to 27 soft rays. Scales small, ctenoid; lateral line slightly arched. Swimbladder frequently complex. **Colour:** silvery to sandy grey or green, sometimes with black spots on body and pectoral-fin base.

Habitat, biology, and fisheries: The family is widespread throughout the Indian Ocean and the western Pacific Ocean. All species are inshore, bottom-dwelling, schooling fishes with a few species found in deeper water to about 180 m. They are commonly taken by beach seine net and line in shallow sandy bays and frequently enter estuaries, penetrating into fresh water for brief periods. Their flesh is very white, tender, and of exceedingly delicate flavour. It contains very little oil and is easily digested. Steamed sillago fillets are highly esteemed as food for invalids and infants. From 1990 to 1995, the FAO Yearbook of Fishery Statistics reports a range of yearly catch of around 12 100 to 16 600 t from the Western Central Pacific.

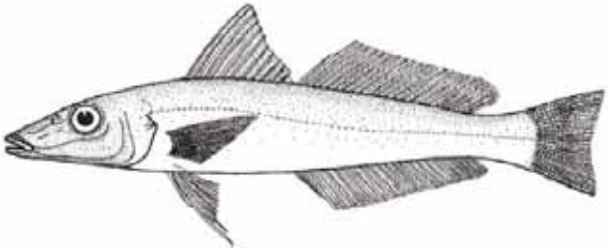


Sillago sihama (Forsskål, 1775)

Order: Perciformes **Suborder:** Percoidei **Family:** Sillaginidae **Genus:** Sillago

Vietnamese Name: *Ca' Duc*

FAO names: En - Silver sillago; **Fr** - Pêche-madame argenté; **Sp** - Silago plateado.



Diagnostic characters: First dorsal fin with XI spines; second dorsal fin with I spine and 20 to 23 soft rays; anal fin with II slender spines and 21 to 23 soft rays. Lateral line with 66 to 72 scales. Vertebrae 14 + 2-8 + 12-18 (total 34). **Swimbladder with 2 anterior extensions extending forward and diverging to terminate on each side of the basioccipital above the auditory capsule; 2 lateral extensions commence anteriorly, each sending a blind tubule anterolaterally and then extending along the abdominal wall below the investing peritoneum to just posterior of the duct-like process; 2 posterior tapering extensions of the swimbladder project into caudal region**, one usually longer than the other. The lateral extensions are normally convoluted and have blind tubules arising along their length. **Colour:** body light tan, silvery yellow-brown, sandy-brown, or honey coloured; paler brown to silvery white below; a midlateral, silvery, longitudinal band normally present; dorsal fins dusky terminally with or without rows of dark brown spots on the second dorsal-fin

membrane; caudal fin dusky terminally; **no dark blotch at base of pectoral fins**; other fins hyaline, the anal fin frequently with a whitish margin; after long preservation coloration may become a uniform light brown. **Size:** Maximum standard length 30 cm; commonly to 20 cm.

Habitat, biology, and fisheries: A nearshore species inhabiting shallow water along beaches, sandbars, mangrove creeks, and estuaries; very rarely captured by prawn trawling vessels. Captured by line, seine net, cast-net, and traps operated from beaches. Marketed fresh and salted.

TERAPONTIDAE

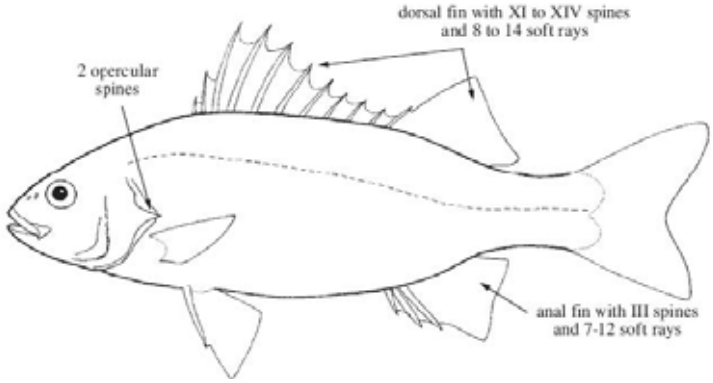
Terapon-perches (terapon-grunters)

Diagnostic characters: Small to medium-sized (to 35 cm) perch-like fishes; body oblong to oblongovate,slightly to moderately compressed laterally. Mouth moderate, protractile, with gape often oblique, sometimes horizontal; jaws typically equal, sometimes upper jaw longer, the upper jaw not extending beyond centre of orbit; jaw teeth usually in villiform bands (reduced to 2 or 3 distinct rows in some species), with teeth of outer row distinctly larger than those in remainder of band; shape of jaw teeth conical, flattened, or tricuspidate; teeth also present on roof of mouth (vomer and palatines) in juveniles of many species, lacking in adults of most species. Posterior and ventral margins of preopercle variably serrate, serrations more prominent in juveniles, usually more developed on vertical margin; first infraorbital (lacrimal) with serrations along ventral margin, serrations less developed with age in some species; opercle with 2 spines posteriorly, the lower one larger and stronger, extending beyond margin of opercular lobe in some species. Posttemporal bone exposed and expanded posteriorly in some species with posterior margin serrate. Dorsal fin single, arched, with XI to XIV spines and 8 to 14 soft rays, fourth to seventh dorsal-fin spines longest, those following decreasing in length to penultimate spine which is much shorter than ultimate spine in some species, this resulting in a notched spinous dorsal fin; anal fin with III variably strong spines and 7 to 12 soft rays; pelvic-fin base located behind vertical line through base of pectoral fins; caudal fin usually emarginate (truncate or rounded in some entirely fresh-water species). Lateral line single and complete. Scales adherent, finely ctenoid (rough to touch). Colour: body tan or light grey, often silvery in life with various dark markings; most marine species with 3 or more dark, straight or downwardly curved longitudinal stripes on body; many marine species with dark transverse bands on lobes of caudal fin.

Habitat, biology, and fisheries: Marine terapontids inhabit inshore marine and brackish waters, with some species also entering hypersaline and fresh waters. Many terapontid species limited to fresh waters of Australia and New Guinea. Marine members of family are good food fishes entering catches largely by artisanal and other inshore fisheries. Noneof the species is important enough to support a special fishery.

Similar families occurring in the area:
Serranidae: mouth large, with upper jaw typically reaching to below vertical through posterior margin of eye (not extendingbeyond vertical though centre of eye in Terapontidae); cauda fin typically rounded (usually emarginate in marine Terapontidae); 3 strong spines on opercle (2 spines in Terapontidae). Kuhliidae: dorsal fin with X spines (XI

to XIV in Terapontidae).

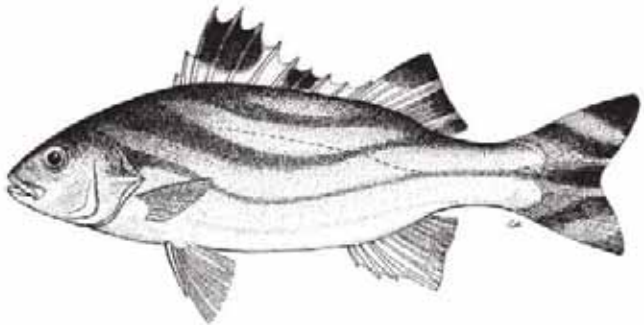


Terapon jarbua (Forsskål, 1775)

Order: Perciformes **Suborder:** Percoidei **Family:** Terapontidae **Genus:** Terapon

Frequent synonyms / misidentifications: *Therapon servus* Bloch, 1790 / None.

FAO names: En - Jarbus terapon; **Fr** - Violon jarbua; **Sp** - Baraonga jarbua.



Diagnostic characters: A moderate-sized species. Body oblong moderately compressed laterally. Jaws equal, gape oblique; rear end of upper jaw reaching to vertical through anterior margin of eye in juveniles, reaching to vertical through centre of orbit in adults; teeth conical, slightly recurved, in villiform bands, the outer row much enlarged; vomer and palatines (on roof of mouth) with teeth in juveniles, often toothless in adults. Preopercle strongly serrate, particularly at angle; **lower opercular spine very long and strong, extending distinctly beyond margin of opercular lobe. Posttemporal bone expanded, exposed and serrate posteriorly**; cleithrum serrate posteriorly. **First gill arch with 6 to 8 rakers on upper limb, 12 to 15 on lower limb.** Dorsal fin with XI or XII spines and 9 to 11 rays, spinous part of fin strongly arched and deeply notched, fourth to sixth spines longest, and **penultimate spine about 1/2 length of ultimate spine**; margin of soft part of dorsal fin straight or emarginate; anal fin with III spines and 7 to 10 soft rays, **second anal-fin spine subequal to third spine and shorter than longest anal-fin rays**, margin of soft part of anal fin concave; caudal fin emarginate. **Pored scales in lateral line 75 to 100**; 13 to 17 rows of scales above lateral line and 19 to 34 rows below it. **Colour:** body silvery greyish or dorsally and silvery white ventrally; **3 or 4 dark brown or black downwardly curved**

longitudinal stripes on body; spinous portion of dorsal fin with a blackish blotch dorsally on membranes between third and sixth spines; soft portion of dorsal fin with membranes of first 3 rays tipped with black and membranes between fifth and seventh rays entirely black; caudal fin with medial rays pigmented; **both caudal-fin lobes with dark tips and a transverse band. Size:** Maximum total length about 35 cm, commonly between 20 and 27 cm.

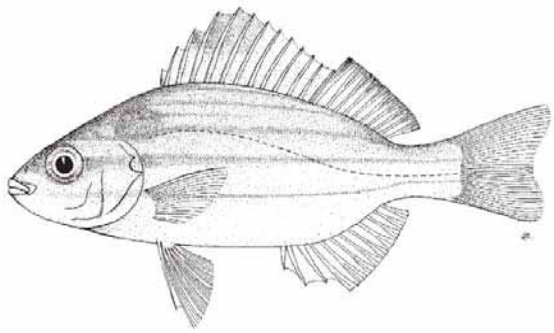
Habitat, biology, and fisheries: Inhabits coastal, brackish, and fresh waters, but apparently reproduces solely in marine waters. Feeds on smaller fishes, invertebrates, and also selectively on scales of various groups of fishes. Caught on all types of inshore fishing gear including gill nets, traps, handlines, and bottom trawls. Marketed fresh and dried-salted.

Pelates quadrilineatus (Bloch, 1790)

Order: Perciformes **Suborder:** Percoidei **Family:** Terapontidae **Genus:** Pelates

Frequent synonyms / misidentifications: None / None.

FAO names: En - Fourlined terapon; **Fr** - Violon crépuscule; **Sp** - Baraonga aurora.



Diagnostic characters: A moderately small species; body oblong, compressed laterally. Jaws equal, gape oblique; posterior margin of upper jaw extending to vertical line through posterior nostril; teeth browntipped, 2 rows in lower jaw and 3 rows or a villiform band with outer row of upper jaw enlarged in upper jaw; vomer and palatines (on roof of mouth) toothless. Preopercle serrate, serrations larger along vertical border, particularly in adults; **lower opercular spine stronger and longer, but not extending beyond margin of opercular lobe. Posttemporal bone not expanded or exposed posteriorly**, covered with skin and scales. **First gill arch with 16 to 18 gill rakers on upper limb, 22 to 27 on lower limb**. Dorsal fin with XII or XIII spines and 9 to 11 soft rays, spinous part of fin arched, fifth to seventh spines longest, and **last 2 spines of approximately same length**; anal fin with III spines and 9 or 10 soft rays, **second anal-fin spine subequal to third spine** and shorter than longest anal-fin rays. **Pored scales in lateral line 66 to 75**; 9 to 11 rows of scales above lateral line and 19 to 23 below it. **Colour:** dorsal portions of body silvery grey, ventral part of body silvery white; **4 to 6 narrow, dark brown or black horizontal stripes on body**, the middle stripe extending onto caudal-fin base; juveniles in addition have 6 or 7 greyish vertical bars; **spinous portion of dorsal fin with a black blotch dorsally on membranes between third to seventh dorsal-fin spines**; a blotch of variable intensity on side of body posterior to nape; **lobes of caudal fin without prominent transverse black stripes**;

mouth and gill cavity red in life.

Size: Maximum total length about 30 cm, commonly to 20 cm.

Habitat, biology, and fisheries: Found in inshore waters, sometimes in brackish waters. Feeds on small fishes and invertebrates. Caught with all types of inshore fishing gear, including gill nets, traps, handlines, and bottom trawls. Marketed fresh and dried-salted.

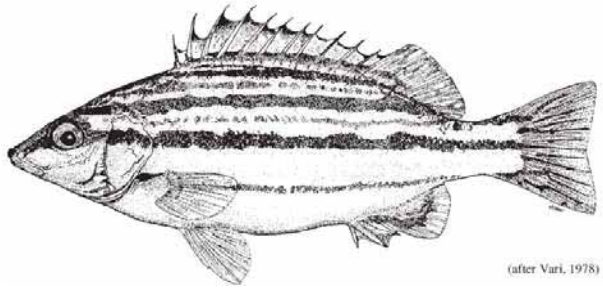
Distribution: Widespread in the Indo-Pacific from East Africa, including the Red Sea and Persian Gulf, eastwards to the Philippines, Japan, and China to New South Wales and the Solomon Islands.

Rhyncopelates oxyrhynchus (Temminck and Schlegel, 1842)

Order: Perciformes **Suborder:** Percoidei **Family:** Terapontidae **Genus:** Rhyncopelates

Frequent synonyms / misidentifications: *Pelates oxyrhynchus* (Temminck and Schlegel, 1842); *Terapon oxyrhynchus* (Temminck and Schlegel, 1842) / None.

FAO names: En - Blotched terapon.



Diagnostic characters: A moderate-sized species; body oblong, moderately deep, compressed laterally, more so in juveniles. Jaws equal, gape slightly oblique; posterior margin of upper jaw extending to vertical line through posterior nostril. Teeth villiform, in bands in each jaw, outer row of teeth much enlarged; vomer and palatines (on roof ofmouth) toothless. Preopercle serrate, serrations larger along vertical border; **lower opercular spine stronger and longer, not extending beyond margin of opercular lobe. Posttemporal bone expanded and exposed posteriorly, with serrate posterior margin.** First gill arch with 7 or 8 gill rakers on upper limb, 14 to 16 on lower limb. Dorsal fin with XII spines and 9 to 11 soft rays, spinous part of fin arched, third to sixth spines longest, and **penultimate and ultimate spines subequal**; anal fin with III spines and 7 to 9 soft rays, **second anal-fin spine longest** and shorter than longest anal-fin rays. **Pored scales in lateral line 60 to 75**; 10 or 11 rows of scales above lateral line and 20 to 24 below it.

Colour: dorsal portions of body grey, ventral part of body silvery to silvery white; 4 somewhat blotchy dark brown or black horizontal stripes on body; some individuals with irregular stripes between 2 dorsal and 2 ventral primary stripes; spinous part of

dorsal fin dusky basally and distally; soft portion of dorsal fin with a basal band anteriorly and pigmentation across posterior rays. Spinous portion of anal fin unpigmented; caudal fin clear in juveniles, **with several narrow, irregular, parallel stripes on each lobe in adults.**

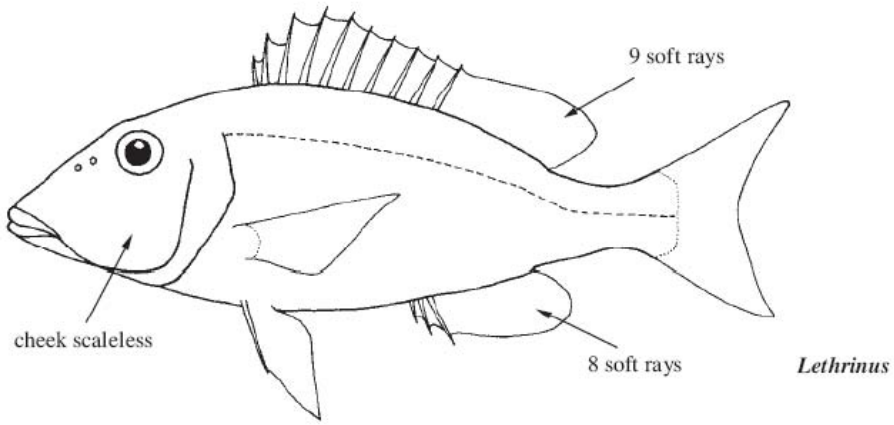
Size: Maximum total length about 33 cm, commonly between 18 and 23 cm.

Habitat, biology, and fisheries: Juveniles entering into fresh waters. Adults found in inshore marine and brackish waters. Feeds on small fishes and invertebrates. Caught with traps, handlines, and other inshore fishing gear.

LETHRINIDAE

Emperors (emperor snappers)

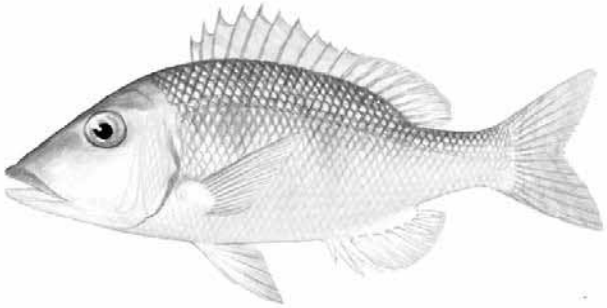
Diagnostic characters: Perch-like sparoid fishes (size to 100 cm). **Dorsal fin continuous, with X spines and 9 or 10 soft rays; anal fin with III spines and 8 to 10 soft rays**; pectoral fins with 13 to 15 soft rays; pelvic fins thoracic, with I spine and 5 soft rays; caudal fin emarginate or forked, with 7 to 9 procurrent caudal-fin rays. Scales finely ctenoid and moderate in size; **cheek naked in *Lethrinus* and scaly in remaining genera**. Mouth small to moderate, terminal; lips often soft and fleshy; upper jaw protrusible, ascending process of premaxilla confluent with articular process, usually longer than or almost equal to alveolar ramus; postmaxillary process absent; palato-premaxillary ligament very well developed; **maxilla mostly concealed below infraorbital bones, not articulating broadly with distal tip of premaxilla**, without a supplementary bone; ethmo-maxillary ligament absent; an outer row of canine teeth in front of both jaws, teeth on sides conical or molar-like; an inner row of villiform teeth anteriorly; **vomer and palatines toothless**. Gill membranes broadly united to one another but separated from isthmus; gills 4, slit behind the fourth present; pseudobranchs present; gill rakers short and knob-like; 4 branchiostegal rays inserting on ceratohyal, the fifth at interspace between ceratohyal and epihyal, the sixth on epihyal; second epibranchial tooth plate present, the third absent. Two openings in pars jugularis; subocular shelf reduced or absent. Three predorsal bones present in the following configuration: first predorsal, first neural spine, second and third predorsal, second neural spine, first pterygiophore supporting the first 2 dorsal-fin spines and second pterygiophore supporting third dorsal-fin spine, third neural spine, third pterygiophore supporting fourth dorsal-fin spine, fourth neural spine; 2 or 3 trisegmental pterygiophores in dorsal and anal fins; 11 epipleural ribs; accessory subpelvic keel absent; postpelvic process well developed. Pyloric caeca few, usually 3. **Colour:** body and head colour silvery, grey, olive, greenish, bluish, tan, brown, or reddish, often with dark blotches or bars; head sometimes with bluish streaks and spots; sometimes bright red markings on or near base of pectoral fins, on pelvic-, anal-, and dorsal-fin membranes near base of fins, on opercular and preopercular margins, and on head, these markings often variable within species; fins clear, pale, bluish, yellowish, or reddish, often blotched, the edge of fins often reddish.



by K.E. Carpenter

Lethrinus lentjan (Lacepède, 1802)

Frequent synonyms / misidentifications: *Lethrinus opercularis* Valenciennes, 1830 / None.
FAO names: En - Redspot emperor; Fr - Empereur lentilles; Sp - Emperador de lentejuelas.



Diagnostic characters: Body moderately deep, its depth 2.5 to 2.8 times in standard length. Head length 0.9 to 1 times in body depth, 2.6 to 3 times in standard length, dorsal profile near eye nearly straight; snout moderately short, its length about 1.9 to 2.4 times in head length, measured without the lip the snout is 0.8 to 1 times in cheek height, its dorsal profile nearly straight, snout angle relative to upper jaw between 60° and 70°; interorbital space convex; posterior nostril an oblong longitudinal opening, closer to orbit than anterior nostril; eye situated close to or far removed from dorsal profile, its length 3.3 to 4.8 times in head length; cheek not high, its height 2.4 to 3.1 times in head length; **lateral teeth in jaws rounded often with conical tips, or molars often with tubercles**; **outer surface of maxilla with a longitudinal ridge**. Dorsal fin with X spines and 9 soft rays, the fourth dorsal-fin spine usually the longest, its length 2.4 to 3.4 times in body depth; anal fin with III spines and 8 soft rays, the first soft ray usually the longest, its length almost equal to or shorter than length of base of soft-rayed portion of anal fin and 1 to 1.2 times in length of entire anal-fin base; pectoral-fin rays 13; pelvic-fin membranes between rays closest to body without dense melanophores. Lateral-line scales usually 46 or 47; **cheek without scales; 5 ½ scale rows between lateral line and base of middle dorsal-fin spines; 15 or 16 scale rows in transverse series between origin of anal fin and lateral line**; usually 15

rows in lower series of scales around caudal peduncle; 4 to 9 scales in supratemporal patch; **inner surface of pectoral-fin base densely covered with scales, with a few scales, or naked**; posterior angle of operculum fully scaly. **Colour:** body greenish or grey, shading to white below, centres of scales on upper sides often white; posterior margin of opercle and sometimes base of pectoral fins red; pectoral fins white, yellow, or pinkish; pelvic and anal fins white to orange; dorsal fin white and orange mottled with a reddish margin; caudal fin mottled orange or reddish.

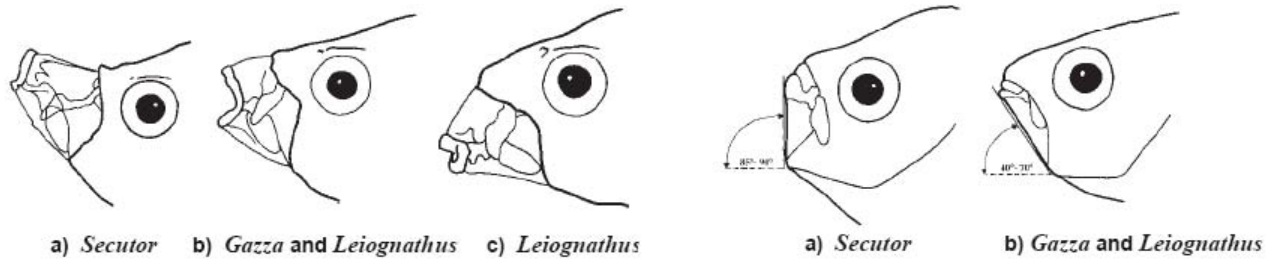
Size: Maximum size about 50 cm total length; commonly to around 30 cm.

Habitat, biology, and fisheries: Over sandy bottom in coastal areas, deep lagoons, and near coral reefs, to depths of about 50 m. Juveniles and small adults often in aggregations over seagrass beds, mangrove swamps and shallow sandy areas; adults are generally solitary and found in deeper waters. Feeds mostly on crustaceans and molluscs, but echinoderms, polychaetes, and fishes are also consumed. Caught primarily by handline, traps, trawls, beach seines, and gill nets. Marketed mostly fresh.

LEIOGNATHIDAE

Slipmouths (ponyfishes)

Diagnostic characters: Small to medium-sized fishes (rarely exceeding 16 cm); body oblong or rounded, **moderately to markedly compressed laterally**. Eyes moderate to large, preceded by a short, snubnosed snout. **Maxilla concealed under the preorbital, except for the widened posterior end which curves downward and is tucked into a groove beneath the eye** (giving these fishes the appearance of being "down in the mouth"). **Mouth highly protrusible**, when extended forming a tube directed either upwards (*Secutor* spp.), forward (*Gazza* spp.), or forward or downward (*Leiognathus* spp.). Teeth small, punctate, arranged in 1 or several rows (*Gazza* spp. additionally with a pair of curved canines at front of upper jaw and several in lower jaw). A pair of lateral elevated bony ridges on top of head between eyes, each preceded by a single spine or a pair of small spines, and, medially, another ridge terminating posteriorly in a bony crest, often referred to as the "nuchal spine". All fin spines and soft rays fragile; **a single dorsal fin with VIII (rarely VII or IX) spines**, the first one very small, and 16 or 17 soft rays; anal fin with III spines and 14 soft rays; caudal fin deeply emarginate to forked; pectoral fins short; pelvic fins very short. **Trunk covered with small cycloid scales, except for breast and, less frequently, an area just behind head in some species; head without scales in all but a few species which have a patch of small scales below eye. Colour:** silvery, with characteristic markings on the upper half of sides which are useful for identification.



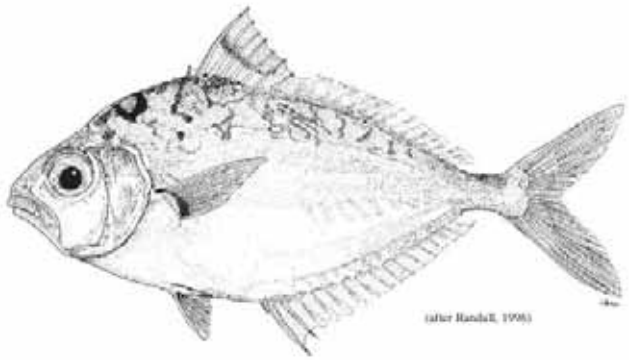
Habitat, biology, and fisheries: Bottom-living fishes in shallow coastal waters, with several species entering brackish waters, especially river estuaries, a few ranging up into fresh water. They occur at depths as shallow as 0.5 m and down to around 160 m; deeper

dwelling species have been reported to move away from the bottom to midwater at night. All species so far examined possess a light producing organ containing symbiotic luminescent bacteria; the transparent patch of skin associated with the organ is usually more elaborately developed in males, indicating perhaps a reproductive as well as schooling role for the signal - for these fishes live, by and large, in immense schools, often in poorly lit waters. They feed on copepods and phytoplankton, with large fish feeding predominantly on benthic invertebrates. Members of the genus *Gazza*, with their canine teeth, feed on small fishes and shrimps, while *Secutor* spp., with their upwardly projecting mouths, feed only on organisms living in the water column. They appear to be short lived, 1 to 2 years, with a protracted breeding season. Leiognathids constituted an important part of the commercial trawl catches of several Asian countries in the past, but in several areas catches have declined - declining from 20 to 30% of the total demersal catch to as little as 4 or 5% in the last 20 years. Fishing restrictions have been imposed in some countries. For 1995, the FAO Yearbook of Fishery Statistics reports a total catch of 120 268 t of Leiognathidae from the Western Central Pacific. Commonly marketed fresh or dried-salted, but surplus catches, especially of small fish, are often converted to fishmeal pellets, used fresh to feed ducks or farmed fish, or used as manure. Often they are dumped as "nuisance" catch, e.g. by prawn trawlers. (by D.J. Woodland, S. Premcharoen, and A.S. Cabanban)

Leiognathus decorus (de Vis, 1884)

Frequent synonyms / misidentifications: None / *Leiognathus brevirostris* (Valenciennes, 1835); *Equula nuchalis* Temminck and Schlegel, 1845.

FAO names: En - Yellowfinned ponyfish.



Diagnostic characters: Body moderately deep and compressed, **its depth 1.8 to 2.3 times in standard length; dorsal profile more convex than ventral profile.** Mouth pointing downward when protracted. Gill rakers slightly less than 1/2 length of corresponding gill lamellae, total gill rakers on first gill arch 21 to 24.

Dorsal- and anal-fin spines strong, only slightly elongate, second dorsal-fin spine between 1/3 and 1/2 body depth. Head and breast scaleless. Colour: silvery, upper half with irregular dark brown wavy to zig-zag vertical lines; brown blotch astride nape (fading in preserved specimens); axil of pectoral fins with a yellow spot and another yellow spot about size of eye on abdomen half-way between bases of pectoral fins and

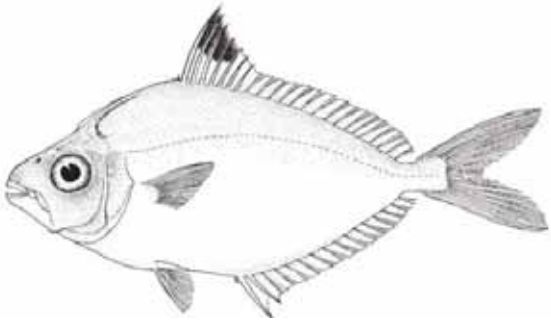
spinous anal fin (both spots absent in Australian specimens); outer half of spinous dorsal and anal fins yellow, yellow margins to soft parts of both fins, caudal fin with dusky yellow margin, other fins colourless.

Size: Maximum total length 15 cm, commonly to 10 cm.

Habitat, biology, and fisheries: Inhabits very shallow (to about 30 m), coastal inshore waters on silty-sand bottoms near mangroves; enters large estuaries; juveniles in mangrove-lined creeks. Feeds on polychaetes, small crustaceans (mysids, copepods, amphipods, ostracods, and cladocerans), large crustaceans (macruran larvae), euphausids, molluscs, and detritus. Schooling; very abundant during spawning season (September to December in northern Australia). Caught mainly in bottom trawls, but also by beach seines, push nets, bamboo stake traps, and dip nets. In Southeast Asia this species may be marketed fresh or driedsalted, but it is more often used as food for ducks or converted to fishmeal, while discarded in Australia.

Leiognathus daura (Cuvier, 1829)

Frequent synonyms / misidentifications: *Leiognathus gerroides* (Bleeker, 1851) / None.
FAO names: En - Goldstripe ponyfish; **Fr** - Sapsap doré; **Sp** - Motambo dorado.



Diagnostic characters: Body rhomboid and compressed, its depth 2 to 2.5 times in standard length; **dorsal and ventral profiles about equally convex**. Snout somewhat blunt; mouth pointing downward when protracted. Gill rakers a little more than 1/2 length of corresponding gill lamellae, total gill rakers 18 to 22 on first gill arch. **Head and breast scaleless.** Lateral line much less convex than dorsal profile, and terminating below end of dorsal fin; tubed scales on lateral 59 to 65. **Colour:** back grey greenish, belly silvery; **very faint vertical lines above lateral line which disappear completely with increasing age**; black dots all over ventral half of body; a golden hue on dorsal half of body and on head; tip of snout black; **distal half of fin membrane between second and sixth dorsal-fin spines jet-black, lined above by creamy white; a broad yellow band over the lateral line, which disappears gradually on preservation**; outer half of anal fin golden yellow; outer margin of lower caudal-fin lobe also yellow.

Size: Maximum total length 14 cm, commonly to 9 cm.

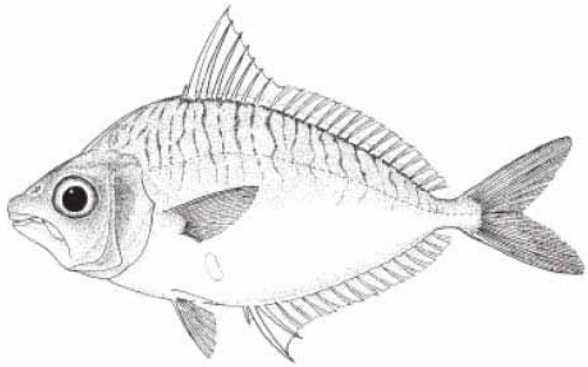
Habitat, biology, and fisheries: Inhabits very shallow coastal inshore waters on

bottoms of muddy sand, mostly around depths of 10 to 15 m. Schooling. Caught mainly in bottom trawls. May be marketed dried-salted, but mostly treated as trash fish and either dumped or used as food for ducks or converted to fishmeal.

Distribution: From the Gulf of Aden along the coasts of India and Sri Lanka to the western Central Pacific.

Leiognathus equlus (Forsskål, 1775).

Frequent synonyms / misidentifications: None / *Leiognathus dussumieri* (Valencienne, 1835). **FAO names: En** - Dussumier's ponyfish; **Fr** - Sapsap vaguelette; **Sp** - Motambo de onda.



Diagnostic characters: Body moderately slender and compressed, its depth 2 to 2.3 times in standard length; anterior part of dorsal profile more strongly arched than anterior part of ventral profile. Snout pointed, slightly longer than eye diameter; mouth pointing downward when protracted. Pelvic fins comparatively long, reaching first anal-fin spine. Head scaleless, but conspicuous scales present on breast. About 60 tubed scales on lateral line. Colour: back greenish to brownish, belly silvery, fins yellowish (often blue-green due to settlement of algae, and this colour becomes more prominent on preservation in formalin); sides of body with grey, wavy, vertical lines descending from back to a little below lateral line; an elongate yellow spot on abdomen half-way between bases of pectoral fins and spinous anal fin.

Size: Maximum total length 14 cm, commonly to 11 cm.

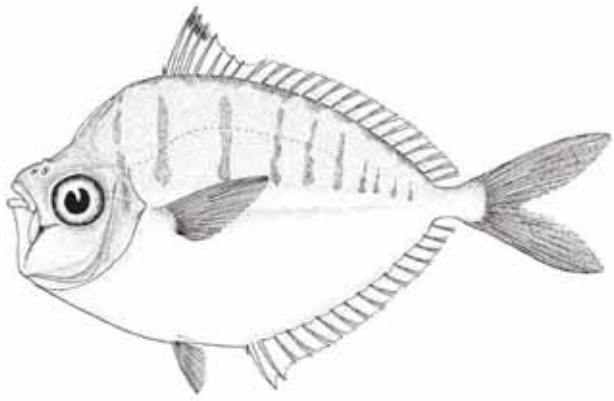
Habitat, biology, and fisheries: Inhabits coastal waters demersally between depths of around 10 to 40m. Reported to favour bottoms of coral sand, but also to enter estuaries. Feeds on small crustaceans, polychaetes, foraminiferans, bivalves, gastropods, and nematodes. Schooling. It is the dominant species in catches from certain parts of southern India, but separate statistics not available for it. Caught mainly with bottom trawls. As one of the larger species, large individuals probably marketed fresh, with surplus fish being converted to fishmeal, used to feed ducks, or discarded.

Distribution: Recorded from Madagascar, Réunion, the coasts of India and Sri Lanka, through Indonesia and the Philippines. Possibly more widely distributed but has been confused with *Leiognathus equulus* by some authors.

Secutor ruconius (Hamilton-Buchanan, 1822)

Frequent synonyms / misidentifications: *Secutor interruptus* (Valenciennes, 1835) / None.

FAO names: En - Deep pugnose ponyfish; **Fr** - Sapsap bouledogue; **Sp** - Motambo buldog.



Diagnostic characters: Body oval, compressed and very deep, **its depth 1.4 to 1.7 times in standard length**. Head strongly concave above eye. **Mouth pointing upward when protracted**. Gill rakers long and slender, approximately equal in length to corresponding gill lamellae, total gill rakers on first gill arch 18 to 28.
Body scales comparatively large, 10 to 16 rows between bases of pectoral and pelvic fins; scales on cheek; breast fully scaly, including isthmus. Lateral line terminating below about middle of soft portion of dorsal fin; tubed scales on lateral line up to this point 28 to 32, but if scale-row count were continued to end of caudal peduncle total count would be 54 to 60 scale rows. Colour: silvery, with about 10 bluish vertical bars on back extending to a little below lateral line; a prominent curved black band running from lower margin of eye to beyond posterior angle of lower jaw; membrane between second and fifth dorsal-fin spines black on upper third portion; soft part of dorsal and anal fins colourless; caudal fin partly yellow; underside of pectoral-fin base black.

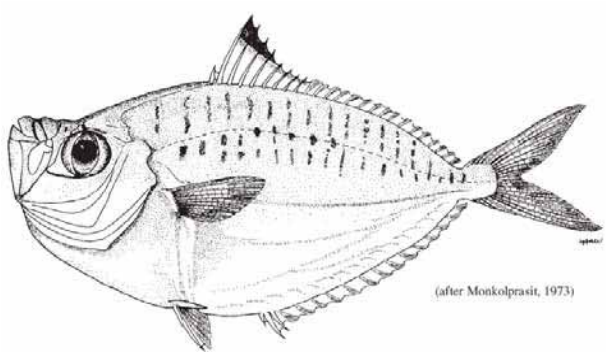
Size: Maximum total length almost 10 cm, commonly to 6 cm.

Habitat, biology, and fisheries: Inhabits inshore coastal waters over bottoms of muddy sand to depths of 60 m; both young and adults enter estuaries. Feeds on copepods, mysids, and plant detritus. Found to spawn in March in northern Australia, but spawning may be serial. Caught mainly in bottom trawls, but also in beach seines. In Southeast Asia, marketed fresh or dried-salted, but mostly treated as trash fish and converted to fishmeal or used as food for ducks or for farmed fish. In Australia, discarded as bycatch.

Secutor indicius (Monkolprasit, 1973)

Frequent synonyms / misidentifications: None / *Secutor insidiator* (Bloch, 1787). **FAO**

names: En - Dots-and-dashes ponyfish.



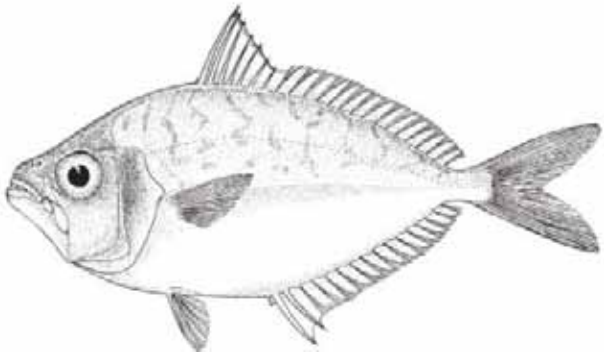
Diagnostic characters: Body oval, deep and very compressed, **its depth 2.2 to 2.6 times in standard length**. Head strongly concave above eye. **Mouth pointing upward when protracted.** Gill rakers long and slender, approximately equal in length to corresponding gill lamellae, total gill rakers on first gill arch 24 to 30. Body scales very small; cheeks scaleless; breast without scales ventrally, including isthmus. **Lateral line reported as terminating below middle to last third of dorsal fin; tubed scales on lateral line up to this point 80 to 92, but if scale-row count were continued to end of caudal peduncle total count would be 87 to 111 scale rows. Colour:** belly silvery, **back light blue, with 17 to 22 dark, vertical markings on upper half, these terminating above lateral line and resuming below it, with row of dots along lateral line corresponding to points where vertical markings cross it, vertical markings as dashes or string of small dots**; narrow black line from lower margin of eye to posterior angle of lower jaw; dorsal-fin membrane between second and fifth spines black at upper third reducing in width posteriorly with a narrow yellow band immediately below it; soft parts of dorsal and anal fins colourless; caudal fin pale yellow with a dusky trailing edge; underside of pectoral-fin base black, membrane pale yellow.

Size: Maximum total length 10 cm, commonly to almost 10 cm.

Habitat, biology, and fisheries: Inhabits coastal waters over bottoms of muddy sand at depths of 20 to 70 m; also enters estuaries. Feeds mostly on copepods, mysids, and plant detritus. Schooling. Caught mainly in bottom trawls. Marketed dried-salted or fresh; in Southeast Asia mostly treated as trash fish and used as food for domestic animals, e.g. ducks, or as food in fish farms.

Gazza minuta (Bloch, 1797)

Frequent synonyms / misidentifications: None / None. **FAO names: En** - Toothpony; **Fr** - Sapsap dentu; **Sp** - Motambo dentudo.



Diagnostic characters: Body oval and somewhat compressed, its depth 1.9 to 2.7 times in standard length; dorsal and ventral profiles equally convex, moderately deep. Mouth pointing forward when protracted, with distinct caniniform teeth in both jaws. Gill rakers approximately equal in length to corresponding gill lamellae, 17 to 20 on first gill arch. Head scaleless, but scales covering all of body except for breast ahead of a line from base of pectoral fins to origin of anal fin. Tubed scales on lateral line 45 to 51. Colour: silvery; back greyish, with dark yellow irregular marks extending to below lateral line. Spinous dorsal-fin membrane black-edged; soft part of dorsal fin and anal fin edged with grey; anterior part of anal fin yellow; caudal fin yellowish, its hind margin dusky; pectoral and pelvic fins colourless; underside of pectoral-fin base with black dots.

Size: Maximum total length 14 cm, commonly to 10 cm.

Habitat, biology, and fisheries: Inhabits coastal inshore waters over silty bottoms to depths of 75 m, juveniles in shallower water around mangroves to 10 m; enters estuaries. Feeds on small fishes, prawns, polychaetes, and crustacean larvae; juveniles feed on plankton and insects as well. Schooling. Caught mainly with bottom trawls, but also in shore seines. Larger fish may be marketed fresh or dried-salted; but mostly sold for consumption by domestic animals (e.g. ducks) or dumped at sea.

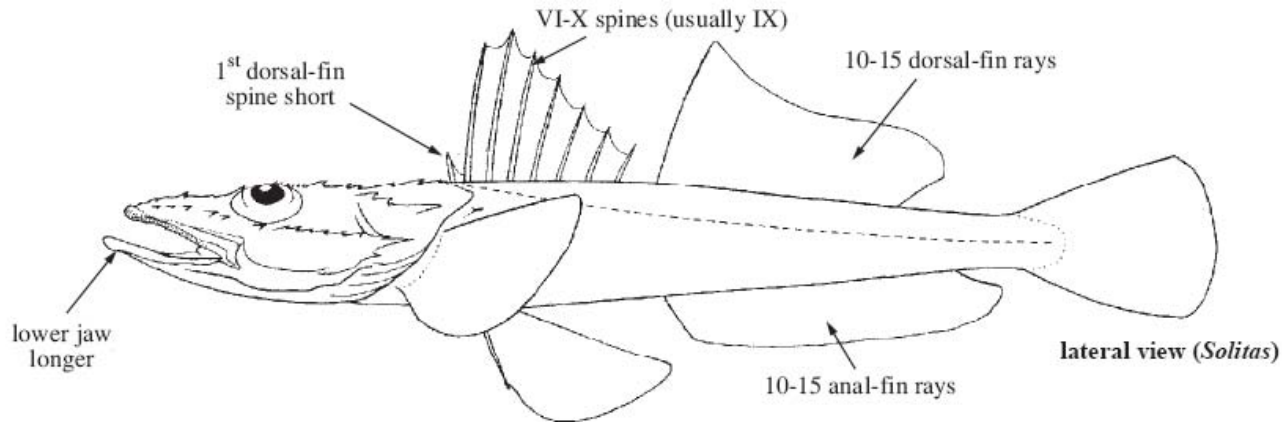
Distribution: Reported from the east coast of Africa and the Red Sea throughout the tropical coasts of the Indian Ocean to the Indo-Malayan Archipelago and beyond; in the Pacific found in parts of Micronesia, northward to Taiwan Province of China and Okinawa, southward to northern Australia, eastward, at least as far as Vanuatu, with unconfirmed records for Cook Islands and Tahiti. (This distribution may include a closely related, undescribed species.)

PLATYCEPHALIDAE

Diagnostic characters: Body elongate, headmoderately to strongly depressed.Mouth large, lowerv jaw longer than upper. Eye partly directed upward; orbit diameter subequal to or less than snout length. Small villiform or caniniform teeth on jaws, vomer, and palatines in most; stout canines present in a few species. Bony ridges of head usually bearing spines or serrations. Branchiostegal rays 7. Gill rakers few,

relatively short or mere stubs; gill membranes free from isthmus. Two dorsal fins, well separated; spinous dorsal fin with VI to X spines, first spine short, isolated or scarcely connected to second spine; second dorsal fin with 10 to 15 soft rays; anal fin with 10 to 15 soft rays (no spines). Pelvic fins thoracic in position, behind pectoral-fin base, set far apart towards sides of body, with I spine and 5 soft rays. Vertebrae 27, usually 11+16 or 12+15. Lateral line complete, number of pored scales varying from as few as 28 in *Onigocia* to more than 100 in *Elates*; most species with a small spine or ridge on first few anterior lateral-line scales, and in a few species all or most lateral-line scales bear a spine.

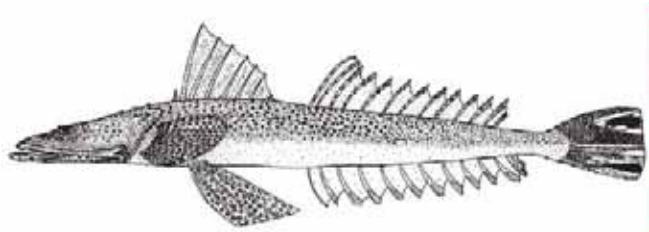
Colour: usually dark above and pale below, the dark colours with various shades of brown, grey, or black; brighter hues of reddish, purplish, or greenish in some species.



by L.W. Knapp

Platycephalus indicus (Linnaeus, 1758)

FAO names: En - Bartail flathead; **Fr** - Platycéphale indian; **Sp** - Chato índico.



Diagnostic characters: Body elongate, **head strongly depressed**. Rear edge of maxilla reaches to about belowmiddle of eye. **Preopercular spines 2, lower usually longest**; a trace of an accessory spine usually present on base of upper spine. Supraorbital ridge smooth. Preorbital spine lacking; a single preocular spine, obscure in large adults. Suborbital ridge smooth in adults, bearing a spine below rear of eye in juveniles. **Teeth on vomer in a single transverse band.** Lower side of head bicarinate. **Iris lappet a simple elongated lobe.** Interopercular flap present, finger-like in shape. **Total gill rakers on first gill arch 7 to 10 (usually 8 or 9). Dorsal-fin spines I,VII,I, I,I,VII,I or I,VIII**; **dorsal-fin rays 13; anal-fin rays usually 13**; pectoral-fin rays 17 to 20 (usually 18 or 19). **Diagonal scale rows slanting backward above lateral line 83 to 107. Lateral-line scales 65 to 81, anteriormost scale usually with a small spine or ridge.** Scale pores of lateral line with a single opening to the outside. **Colour:** head and body covered with small brown flecks, whitish below, several indistinct dark bands crossing back in some; dorsal, pectoral, and pelvic fins with small brown spots on rays; **caudal fin with 2 or 3 horizontal dark bars, a prominent yellow blotch near middle of fin, whitish areas in upper lobe and along lower margin.**

Size: Maximum total length about 50 cm, commonly to 35 cm.

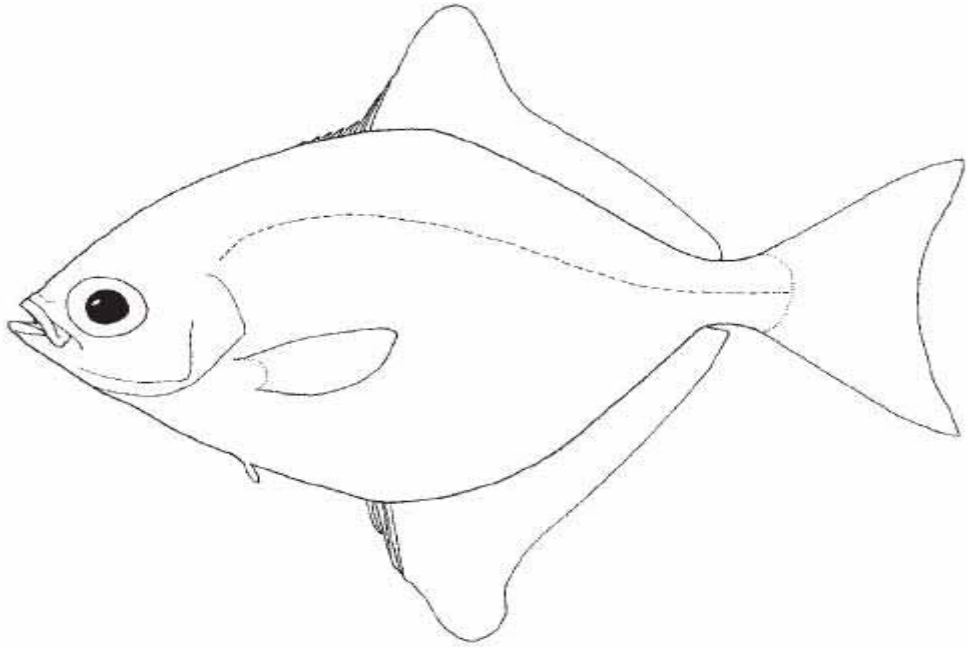
Habitat, biology, and fisheries: Taken by handlining and seining in shallow coastal waters; taken by trawls over mud and sand at depths to 30 m, usually less. Frequently found in estuaries, small juveniles have been taken in fresh water.

Distribution: Widespread, from the eastern Mediterranean, Red Sea, to South Africa, northern Indian Ocean to Indonesia, Korea, southern Japan, Philippines, and northern and eastern Australia.

MONODACTYLIDAE

Moonfishes

Diagnostic characters: Body oval, deep, strongly compressed (size to about 25 cm). Eye moderately large, its diameter longer than snout length. Mouth small and oblique. Jaws with bands of small conical teeth; vomer, palatines, and tongue with granular teeth. Gill membranes free from isthmus, separate. Branchiostegals 6. Dorsal fin with V to VIII spines and 26 to 31 soft rays; **anterior soft dorsal-fin rays elongated**, situated over midlength of body or somewhat in front, in a single species at least as long as 1/2 body depth. Anal fin with III spines and 26 to 31 soft rays; **anterior soft analfin rays elongated**, situated below midlength of body or somewhat in front, longer than elongated soft dorsal-fin rays. Caudal fin truncate to forked. Body, head, and unpaired fins covered by small, deciduous scales. **Colour:** body and head silvery, in most species with 1 or more black vertical bar through eye, in front of pectoral-fin base (usually continuous with black margin along anterior edge of anal fin) and on body; tip of dorsal and anal fins



Habitat, biology, and fisheries: Occur in shoals in estuaries, lagoons, and over shallow coral reefs, in brackish and sea water, sometimes in fresh water. Minor commercial importance, occasionally sold fresh in local markets. Some are caught for the aquarium-fish trade.

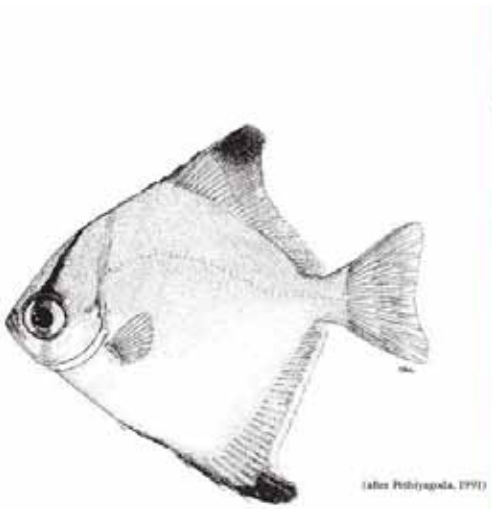
Remarks: Some authors place *Schuetta* in the Monodactylidae, but Tominaga (1968) considered it a separate family. A single species has classically been recognized in the area, *Monodactylus argenteus*.
M. kottelati has recently been discovered in Sri Lanka and Laccadive Archipelago (India); this species appears to be much rarer. In Sri Lanka, both species occur in sympatry, with *M. kottelati* occupying deeper areas with higher tidal flow. More than 1 species apparently occur around Sumatra and one of them has been identified as *M. kottelati* on the basis of juveniles; this should be confirmed with examination of adult specimens.

by M. Kottelat

Monodactylus argenteus (Linnaeus, 1758)

Frequent synonyms / misidentifications: None / None.

FAO names: En - Silver moony; **Fr** - Lune d'argent; **Sp** - Ramball plateado.



Diagnostic characters: Body oval, deep, strongly compressed. Body depth 1.2 to 1.6 times in standard length; distance between tips of dorsal and anal fins 0.8 to 0.9 times in standard length.
Eye moderately large, its diameter longer than snout length. Mouth small and oblique. Jaws with bands of small conical teeth. Gill membranes free from isthmus, separate. Dorsal fin with VII or VIII spines and 26 to 31 soft rays; **anterior soft dorsal-fin rays elongated,** situated over midlength of body. Anal fin with III spines and 26 to 31 soft rays; **anterior soft anal-fin rays elongated**, situated below midlength of body, longer than elongated soft dorsal-fin rays. **Posterior edge of dorsal and anal fins distinctly concave. Caudal fin slightly emarginate. Pelvic fins rudimentary or absent in adults**. Body, head, and unpaired fins covered by small, deciduous scales. **Colour:** adults silvery, tip of dorsal and anal fins dusky; juveniles silvery, with a curved black vertical bar through eye and 1 in front of pectoral-fin base; tip of dorsal and anal fins black; anterior edge of anal fin with broad black margin.

Size: Maximum total length about 25 cm.

Habitat, biology, and fisheries: Inhabits estuaries and lagoons, usually in shallow water, often in schools, with a preference for around and under floating or sunken logs and branches. Juveniles occasionally enter rivers but are rarely recorded from fresh waters. Sold fresh in local markets. Juveniles are caught for the aquarium-fish trade.

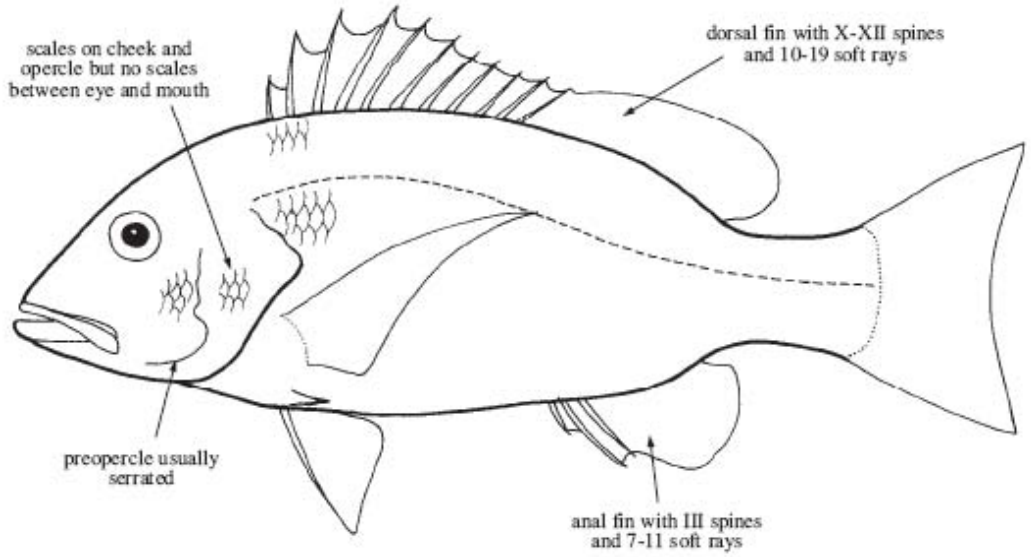
Distribution: Widespread in the tropical Indo-West Pacific, from South Africa and Red Sea to Australia, Samoa, and southern Ryukyu Islands.

LUTJANIDAE

Snappers (jobfishes)

Diagnostic characters: Typical perch-like fishes, oblong in shape, moderately compressed (size to 160 cm). Eye usually moderate. Premaxillae usually moderately protrusible (fixed in

Aphareus and *Randallichthys*). Two nostrils on each side of snout. Mouth terminal and fairly large. **Maxilla slipping for most or all of its length under lacrimal when mouth closed.** Supramaxilla absent. Jaws usually with more or less distinct canines (canines absent in *Aphareus, Parapristipomoides*, and *Pinjalo*). Vomer and palatines usually with teeth. Pterygoids usually toothless. Cheek and operculum scaly; maxilla with or without scales; snout, lacrimal, and lower jaw naked. Opercular spines 2. Branchiostegal rays 7. Dorsal fin single, spinous portion sometimes deeply incised posteriorly where it joins soft portion. Caudal fin truncate to deeply forked. Dorsal fin with X to XII spines and 10 to 19 soft rays. Anal fin with III spines and 7 to 11 soft rays. Principal caudal-fin rays 17 (9 in upper lobe, 8 in lower lobe of fin). Pectoral-fin rays 14 to 19. Pelvic fins with I spine and 5 soft rays. Scalesmoderate to rather small, ctenoid. Lateral line complete. Pelvic axillary process usually well developed. Vertebrae 24 (10+14). **Colour:** highly variable; mainly from red through yellow to blue; often with blotches, lines, or other patterns.



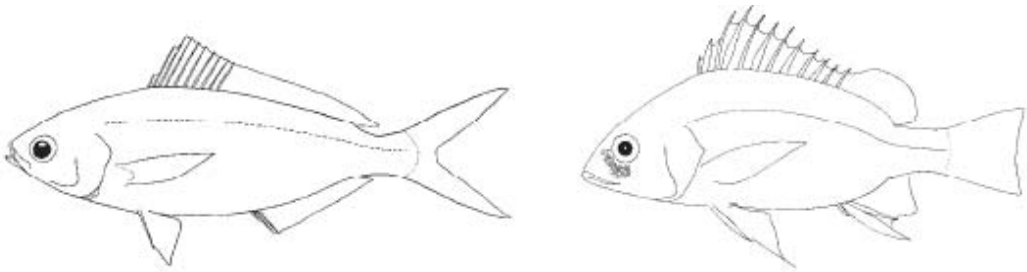
Habitat, biology, and fisheries: Found worldwide in warm seas; juveniles of several species of *Lutjanus* enter estuaries and the lower reaches of fresh-water streams; a few Indo-Pacific species of *Lutjanus* are inhabitants of fresh waters. Mostly bottom-associated fishes, occurring from shallow inshore areas to depths of about 500 m, mainly over reefs or rocky outcrops. Active predators, mostly nocturnal, feeding on fishes, crustaceans (especially crabs, shrimps, stomatopods, lobsters), molluscs (gastropods, cephalopods), and pelagic urochordates; plankton is particularly important in the diets of those species with reduced dentition and numerous well-developed gill rakers. Gonochoristic (sexes separate), reaching sexual maturity at about 40 to 50% of maximum length, with big females producing large numbers of eggs. Populations in continental waters have extended spawning throughout the summer, whereas those occurring around islands spawn throughout the year with peaks in spring and fall; lutjanids are batch spawners, with individual females usually spawning several times in a reproductive season. Spawning is apparently at night, on some occasions coinciding with spring tides. Courtship terminates in a spiral swim upward, with gametes released just below the surface. Eggs and larvae identified as lutjanid are pelagic; the larvae avoid surface waters during the day, but display a more even vertical distribution at night. Long-lived, slow-growing fishes with relatively low rates of natural mortality and with considerable vulnerability to overfishing. Snappers are important to artisanal fisheries, but seldom the prime interest of major commercial fishing activities; many are fine food fishes, frequently found in markets, although some

species are ciguatoxic in certain areas. They are caught with handlines, traps, a variety of nets, and trawls. The species that reach large sizes are important recreational fishes in some areas, including the waters off the eastern coast of Australia. For 1995, the FAO Yearbook of Fishery Statistics reports a total catch of around 93 200 t of Lutjanidae from the Western Central Pacific.

Similar families occurring in the area:

Caesionidae: mouth small (fairly large in Lutjanidae); premaxillae extremely protrusible (premaxillae moderately protrusible or fixed in Lutjanidae); teeth small or minute (jaws usually with distinct canines in Lutjanidae); teeth absent on premaxilla, vomer, and palatines in some species (teeth typically well developed on those bones in Lutjanidae); caudal fin deeply forked, with pointed lobes (caudal-fin shape variable in Lutjanidae -frequently truncate, emarginate, or lunate).

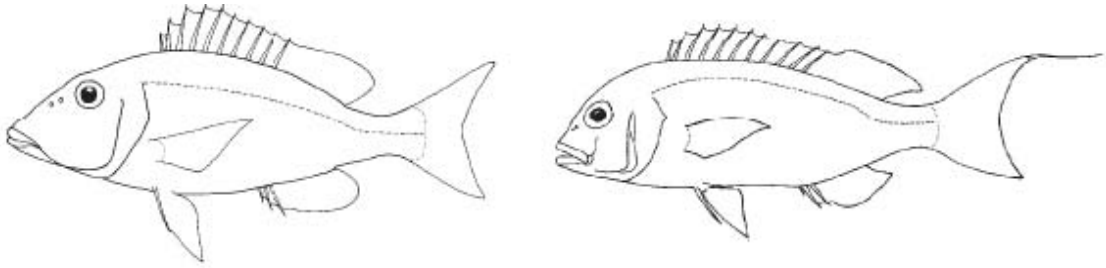
Haemulidae: scales present on snout and lacrimal, those on lacrimal often embedded (snout and lacrimal naked in Lutjanidae); preoperculomandibular canal of lateralis system opening under chin through median longitudinal groove or enlarged pores or both (no chin pores in Lutjanidae); usually no teeth on vomer, no teeth on palatines (teeth usually present on those bones in Lutjanidae); vertebrae 26 or 27 (24 in Lutjanidae).



Caesionidae Haemulidae

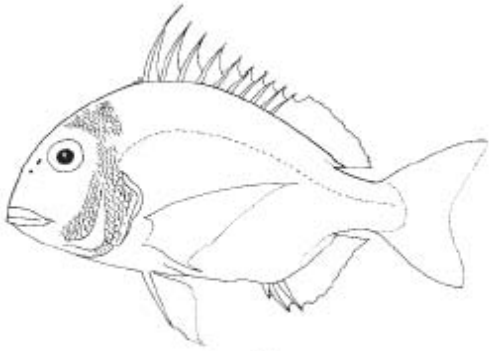
Lethrinidae: gill membranes broadly united to each other (not united in Lutjanidae); preopercular margin typically smooth (usually serrate in Lutjanidae); branchiostegal rays 6 (7 in Lutjanidae); soft rays in dorsal fin 9 or 10 (usually 11 or more in Lutjanidae); no teeth on vomer or palatines (teeth usually present on those bones in Lutjanidae); most species lack scales on cheek (cheek scales present in Lutjanidae); lips frequently fleshy (usually not fleshy in Lutjanidae).

Nemipteridae: preopercular margin typically smooth (usually serrate in Lutjanidae); soft rays in dorsal fin 9 (almost always 10 or more in Lutjanidae); soft rays in anal fin usually 7, rarely 8 (almost always 8 or more in Lutjanidae); branchiostegal rays 6 (7 in Lutjanidae); no teeth on vomer or palatines (teeth usually present on those bones in Lutjanidae).



Lethrinidae Nemipteridae

Sparidae: preopercular margin typically smooth (usually serrate in Lutjanidae); branchiostegal rays 6 (7 in Lutjanidae); teeth in jaws variable-conical, incisiform, or molariform (no incisiform teeth in Lutjanidae, molariform teeth found in jaws of only a single eastern Pacific species of Lutjanidae, submolariform teeth in jaws of the western Pacific lutjanid *Symphorichthys spilurus*).



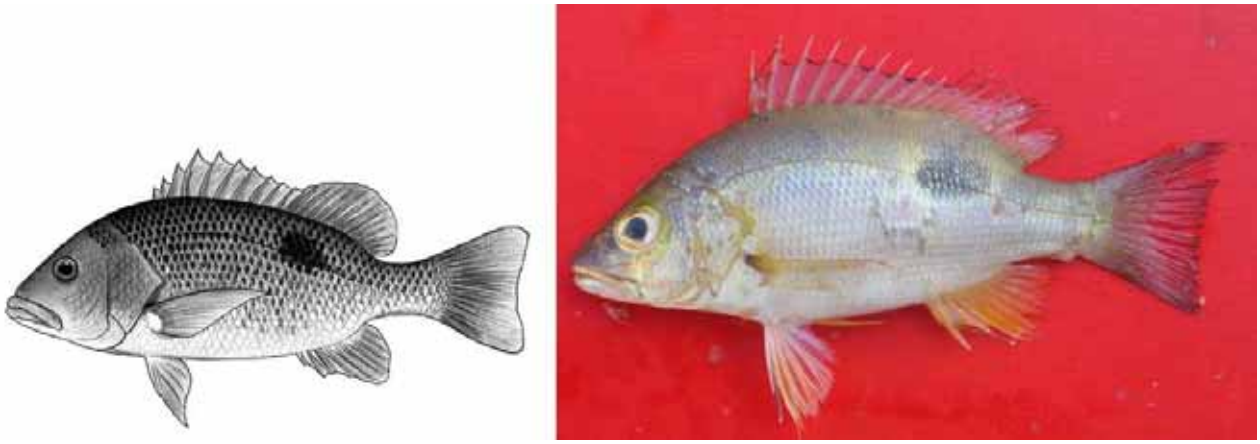
Sparidae

by W.D. Anderson, Jr. and G.R. Allen

Lutjanus johnii (Bloch, 1792)

Frequent synonyms / misidentifications: None / None.

FAO names: En - John's snapper; **Fr** - Vivaneau ziebelo; **Sp** - Pargo jaspeado.



Diagnostic characters: Body moderately deep, its depth 2.4 to 2.9 times in standard length. Dorsal profile of head steeply sloped; preorbital width equal to eye diameter or larger (4.9 to 6 times in head length); **preopercular notch and knob poorly developed**; vomerine tooth patch crescentic, without a medial posterior extension; tongue with a patch of granular teeth. First gill arch with 17 or 18 gill rakers, of which 11 (including rudiments) on lower limb. **Dorsal fin with X spines and 13 or 14 soft rays**; anal fin with III spines and 8 soft rays; posterior part of dorsal and anal fins rounded. Caudal fin truncate or slightly emarginate. Pectoral fins with 16 or 17 rays. **Scale rows on back parallel to lateral line. Colour:** generally yellow with a bronze to silvery sheen, grading to silvery white on belly and underside of head; **centre of each scale often with a reddish brown spot**, giving an overall appearance of series of horizontal lines on side of body; a round black spot, larger than eye, on back, mainly above lateral line, below anterior soft dorsal-fin rays (sometimes absent in large adults).

Size: Maximum total length about 70 cm, commonly to 50 cm.

Habitat, biology, and fisheries: Little information on habitat of adults, although they probably frequent coral reef areas. Juveniles in brackish mangrove estuaries. Large adults trawled to depths of 80
m. Feeds on fishes and benthic invertebrates including shrimps, crabs, and cephalopods. Spawning has been reported during September in the Andaman Sea. Frequently found in markets. Caught mainly with handlines, bottom longlines, traps, and bottom trawls. Excellent quality flesh, usually marketed fresh or sometimes dried-salted.

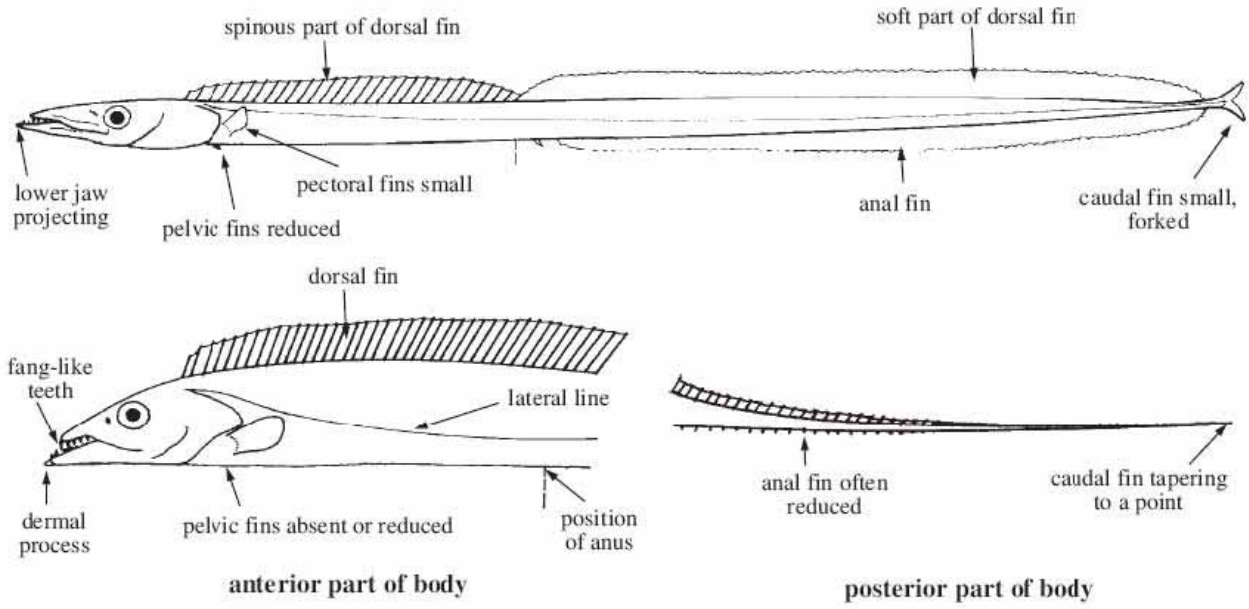
Distribution: Widespread in the Indo-West Pacific from the Fiji Islands to East Africa and from Australia to the Ryukyu Islands.

TRICHIURIDAE

Cutlassfishes

Diagnostic characters: Body remarkably elongate and compressed, ribbon-like, with a tapered tail or small forked caudal fin (size to 225 cm). **A single nasal opening on each side of head**. Mouth large, jaws not protractile, lower jaw extends anterior to upper jaw. Teeth extremely strong, fang-like in anterior part of upper jaw and sometimes in anterior part of lower jaw. Dorsal fin low and long, beginning shortly behind eye, its anterior spinous part shorter than posterior soft part, 2 parts continous mostly or interrupted by a shallow notch sometimes. Anal fin low or reduced to short spinules.

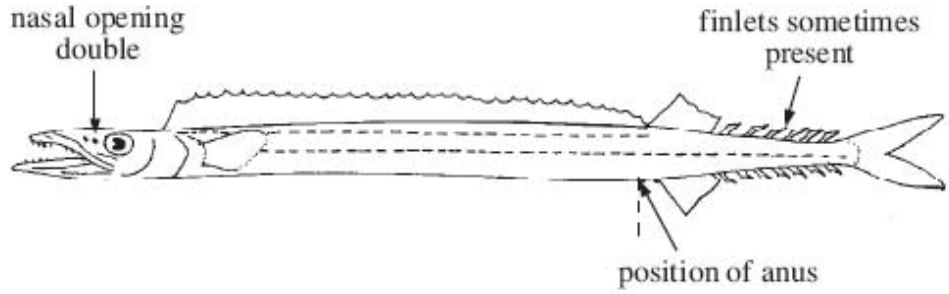
Caudal fin either small and forked or absent. Pectoral fins short and low in position. **Pelvic fins reduced to a scale-like spine** (plus a rudimentary ray in *Benthodesmus*) **or completely absent** (in *Trichiurus* and *Lepturacanthus*). Preanal length less than 1/2 standard length. Lateral line single. Scales absent. **Colour:** body generally silvery or more or less brown in *Aphanopus* and *Lepidopus*.



Habitat, biology, and fisheries: Benthopelagic on continental shelves and slopes and underwater rises, from the surface to a depth of about 2 000 m, found in tropical to warm-temperate waters. Voracious predators feeding on fishes, squids, and crustaceans. Spawning throughout the year in warm waters. Eggs and larvae pelagic. Hairtails (*Trichiurus*) are important in fisheries and species of the other genera are locally exploited commercially. Excellent eating, although the flesh is scanty. Marketed mostly fresh or salted, sometimes also frozen. For 1995, the FAO Yearbook of Fishery Statistics reports a total catch of around 40 800 t of Trichiuridae from the Western Central Pacific.

Similar families occurring in the area

Gempylidae: nasal openings double, soft (second) dorsal fin always distinct from, and shorter than spinous (first) dorsal fin, anal fin always well defined, soft rays of second dorsal and anal fins decreasing in height posteriorly and followed by 2 to 7 finlets in most genera, preanal length 1/2 or more than 1/2 of standard length (less than 1/2 of standard length in Trichiuridae), minute or deformed scales usually present. anal fin often reduced caudal fin tapering to a point **posterior part of body.**



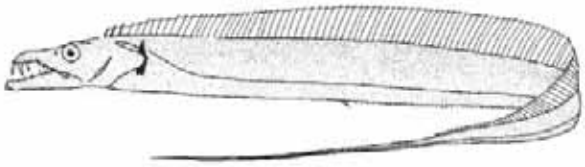
Gempylidae

by I. Nakamura and N.V. Parin

Lepturacanthus savala (Cuvier, 1829)

En - Savalani hairtail; **Fr** - Poisson sabre cimeterre; **Sp** - Pez sable savalai.

Maximum total length 100 cm, commonly to 70 cm. Benthopelagic, in coastal waters down to about 100 m, often comes close to the surface at night. Feeds on a wide variety of small fishes and crustaceans. Distributed in the Indo-West Pacific from India and Sri Lanka to Malaysia, Singapore, Indonesia, Philippines, Thailand, China, New Guinea, and northern Australia. Caught mainly with shore seines, bag nets, and coastal bottom trawls in Asian countries. Marketed fresh, iced, and dried-salted.

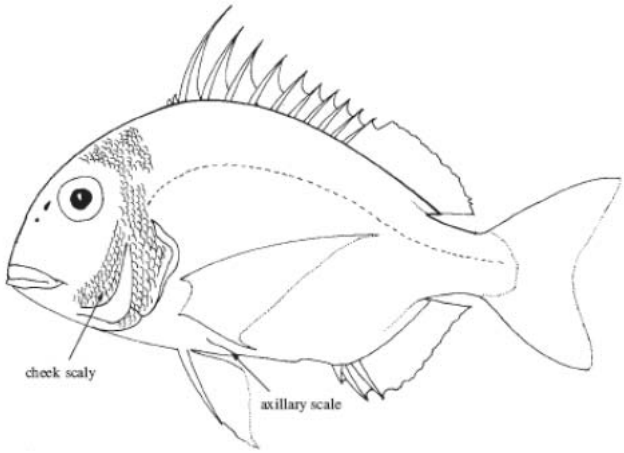


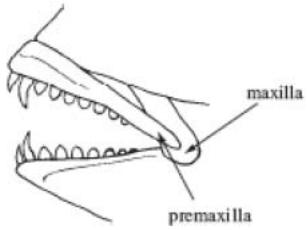
SPARIDAE Porgies (seabreams)

Diagnostic characters: Body oblong, moderately deep and compressed (size to 75 cm). Head large, often with a steep upper profile; snout scaleless, cheeks scaly, preopercle

with or without scales, without spines or serrations on margin; opercle scaly, without spines. Mouth subhorizontal and slightly protrusible, **upper jaw never reaching backward beyond a vertical line through middle of eye; hind tip of premaxilla overlapping maxilla; maxilla in sheath formed by first 2 circumorbital bones when mouth closed; jaw teeth well developed, differentiated into either conical (caninelike), or flattened (incisor-like), and often rounded (molar-like)**; roof of mouth (vomer and palatines) toothless. Gill rakers variable, 7 to 20 on lower limb of first gill arch. **Dorsal fin single, with X to XIII spines and 9 to 17 soft rays** (last ray double, counted as 1), the spiny and soft portions not separated by a notch, anterior spines sometimes elongate or filamentous; **anal fin with III spines and 7 to 15 soft rays** (last ray double, counted as 1), the spines, especially the second, often stout; caudal fin moderately deeply emarginate or forked; pectoral fins usually long and pointed; **pelvic fins** below or just behind pectoral-fin bases, with I spine and 5 soft rays, and **with an axillary scale at their base** (axillary pelvic process). Scales cycloid (smooth) or weakly ctenoid (rough to touch); a single continuous lateral line extending backward to base of caudal fin.

Colour: overall colour highly variable, from pinkish or reddish to yellowish or greyish, often with silvery or golden reflections, often with dark or coloured spots, stripes, or bars.





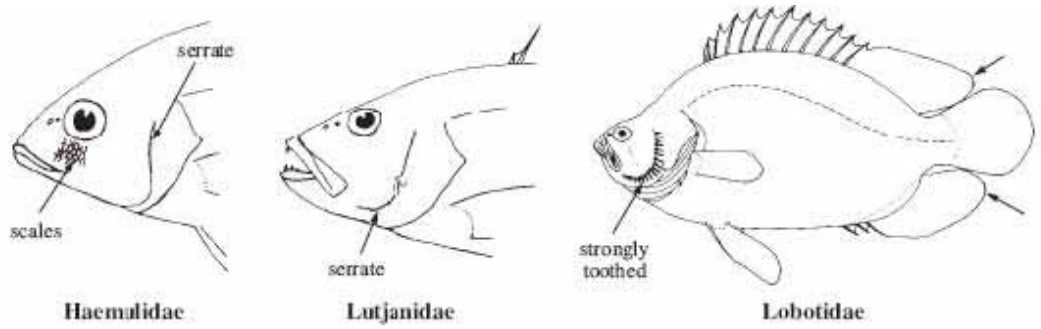
Habitat, biology, and fisheries: Seabreams inhabit tropical and temperate coastal waters. They are demersal inhabitants of the continental shelf and the slope. The smaller species, as well as the young of large species, usually form aggregations, while large adults are less gregarious or solitary and occur in deeper waters. Occasionally they are found in estuaries which are used as nurseries. Hermaphroditism is widespread in this family. Most seabreams are excellent food fish and are of notable commercial importance. From 1990 to 1995, the FAO Yearbook of Fishery Statistics reports a range of yearly catch of around 2 170 to 4 020 t of Sparidae from the Western Central Pacific.

Similar families occurring in the area

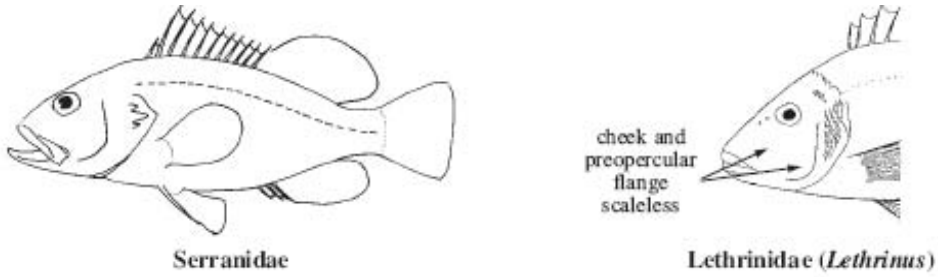
Haemulidae: edge of preopercle serrate; suborbital space scaly; at least 2 conspicuous pores beneath chin; never with molar teeth.

Lutjanidae: edge of preopercle usually serrate, and often excavated to accommodate a bony knob; never molar or incisor-like teeth; roof of mouth usually toothed (except in *Aphareus*).

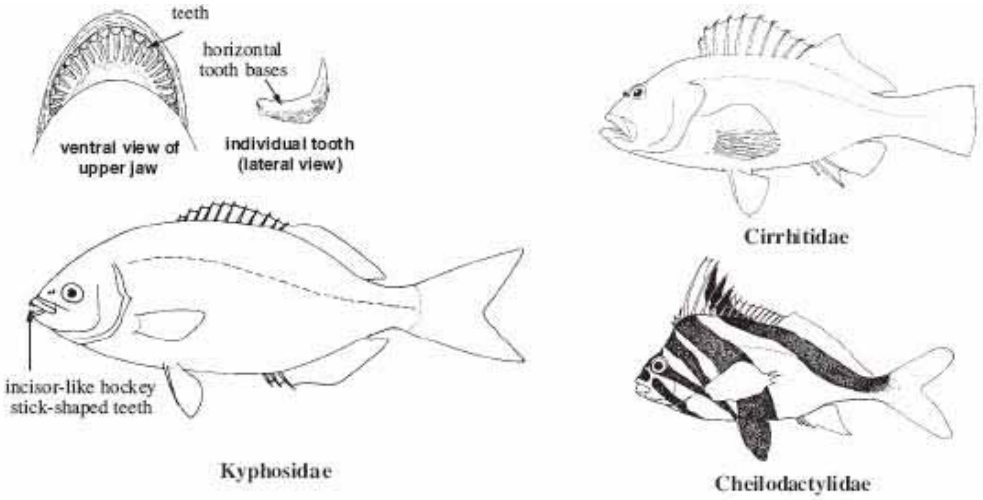
Lobotidae: edge of preopercle strongly toothed; never molar teeth; dorsal, anal, and caudal fins rounded, appearing as a single tri-lobed fin ('triple-tails').



Serranidae: edge of preopercle serrate; suborbital space scaly; similar species lack axillary scale of pelvic fins; caudal fin generally rounded, never forked; also never molar teeth.
Lethrinidae: posterior tip of maxilla overlapping premaxilla (posterior tip of premaxilla overlapping maxilla in Sparidae); cheek and preopercular flange scaleless (but scales present on cheek in *Wattsia*,
Monotaxis, *Gymnocranius*, and *Gnathodentex*); 8 to 11 soft dorsal-fin rays (9 to 17 in Sparidae); incisor-like teeth never present.



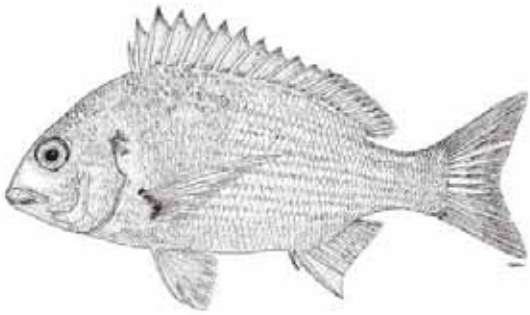
Kyphosidae: head entirely scaly, except for snout; teeth in jaw incisor-like, close-set, and of a peculiar hockey-stick shape, with their base set horizontally, resembling a radially striated bone inside mouth. Cirrhitidae and Cheilodactylidae: lower pectoral-fin rays simple and thickened.



by K.E. Carpenter

Acanthopagrus latus (Houttuyn, 1782)

Frequent synonyms / misidentifications: *Sparus latus* Houttuyn, 1782; *Mylio latus* (Houttuyn, 1782) / None. **FAO names: En** - Yellowfin seabream; **Fr** - Pagre à nageoires jaunes; **Sp** - Sargo aleta amarilla.



Diagnostic characters: Body fairly deep and compressed, its depth about 2 times in standard length. **Head** 3 times in standard length, its **upper profile notably convex** and angular due to a bulge at eye;
eye moderate in size. **In both jaws, 4 to 6 large, moderately compressed teeth in front, followed by 3 to 5 rows of molar-like teeth**; upper lateral teeth of outer row conical and blunt. Dorsal fin with XI spines and 11 or 12 soft rays, fourth to sixth spines longest (spines appear alternately broad and narrow on either side). **Anal fin** with III spines and 8 or 9 soft rays, the first spine shorter than eye diameter, **second spine flattened laterally, much longer and stronger than third; margin of soft-rayed part of anal fin nearly straight**. Pelvic fins with I strong spine. Caudal fin slightly forked, with tips sharp. Scales large, about 48 to 50 in lateral line (to base of caudal fin); **3 ½ (rarely 4 ½) rows between lateral line and fourth dorsal-fin spine**; a scaly sheath at base of dorsal and anal fins; a long axillary pelvic process. **Colour:** pale grey to whitish, darker above, belly usually yellowish; golden streaks along longitudinal rows of scales; **a diffuse dark blotch at origin of lateral line**; a dark interorbital band and a dark edge along opercle; dorsal fin greyish to hyaline, **pelvic and anal fins yellowish and whitish, sometimes with blackish areas on inter-ray membranes; caudal fin greyish with dark blackish margin, lower part of fin with yellowish tinge; caudal fin with a black margin,** lower portion of fin with yellowish tinge.

Size: Maximum total length 45 cm, commonly to 30 cm.

Habitat, biology, and fisheries: Inhabits shallow coastal waters to depths of about 50 m; enters estuaries. Carnivorous, feeds on invertebrates, mainly echinoderms, worms, crustaceans, and molluscs. Caught with bottom trawls and lines. Mainly exploited by artisanal fisheries. Marketed fresh, whole.

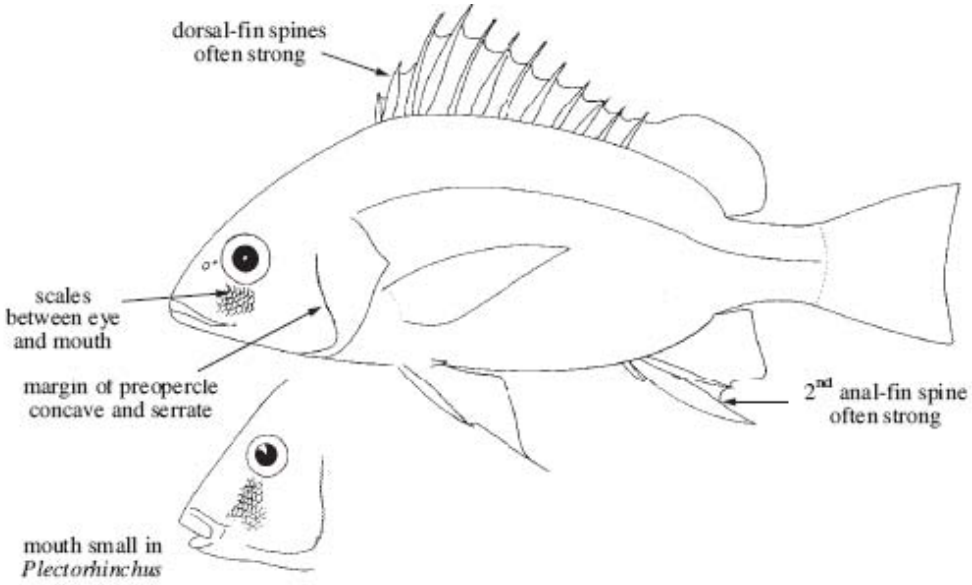
Distribution: Indo-West Pacific from the Persian Gulf and along the coasts of India;

eastward extending to the Philippines, Japan, and northern Australia.

HAEMULIDAE

Grunts (also sweetlips, rubberlips, hotlips, and velvetchins)
by R.J. McKay

Diagnostic characters: Oblong, compressed, perch-like fishes (size to 120 cm). Head profile strongly convex; **scales present on entire head except tip of snout, lips, and chin.**Mouth small or moderate, lips thick in *Plectorhinchus*, **tip of upper jaw hidden when mouth closed; chin with 2 pores anteriorly and a median pit (*Pomadasys*), or 6 pores and no pit (*Plectorhinchus*)**. Teeth conical, in a narrow band in each jaw, the outer series enlarged, but no canines; **palate toothless**. Preopercle with a slightly concave and serrated posterior margin; opercle with 1 distinct spine. Dorsal fin single, with IX to XV strong spines and 12 to 26 soft rays; anal fin with III spines (the second often very strong) and 7 to 9 soft rays; caudal fin truncate or emarginate (rounded in juveniles); pelvic fins below base of pectoral fins, with I spine and 5 soft rays; pectoral fins long. Scales ctenoid (rough to touch), small or moderate. **Colour:** highly variable, ranging from uniformly coloured to banded, blotched, and spotted; juvenilesmay differmarkedly from adults in shape, development of lips, and coloration.

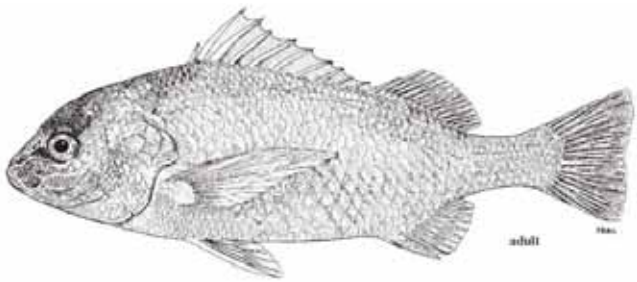


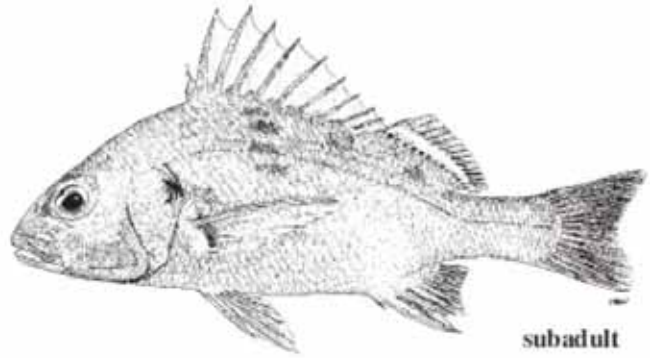
Habitat, biology, and fisheries: Generally frequenting coastal reefs (Plectorhinchus), inshore bays, and estuaries (Pomadasys). Feed mostly at dawn or dusk, moving out from the reef to feed on open sandy bottoms, but may be taken throughout the day by line, spear, or net. All are good table fishes with white flesh, the larger grunts are considered fine sport fishes. For 1995, the FAO Yearbook of Fishery Statistics reports a total catch of around 12 000 t of Haemulidae from the area (Indonesia, Malaysia, Singapore). **Remarks:** The genus Hapalogenys has been removed from the family Haemulidae. It is very close to the 2 species of the family Dinopercidae, but lacks intrinsic muscles on the posterior part of the swimbladder. Two species of Hapalogenys occur in the area and are placed here for convenience until better accommodated.

Pomadasys kaakan (Cuvier in Cuvier and Valenciennes, 1830) (Plate XV, 113)

Frequent synonyms / misidentifications: None / *Pomadasys hasta*

(Bloch, 1790). **FAO names: En** - Javelin grunt; **Fr** - Grondeur javelot; **Sp** - Corocoro jabalina.





Diagnostic characters: Body depth 2.5 to 3 times in standard length. Head blunt, its upper profile convex; mouth small; maxilla reaching to eye; teeth in jaws arranged in villiform (brushlike) bands; **2 pores and a median pit on chin. Dorsal fin with XII spines and 13 to 15 (usually 14 ½) soft rays; anal fin with III spines and 7 soft rays.** Scales ctenoid (rough to touch); lateral line with 43 to 50 scales; **7 scales between lateral line and dorsal-fin origin; 20 scales around caudal peduncle, 9 above lateral line, 9 below.** Swimbladder without anteriolateral horn-like extensions. **Colour:** juveniles brilliant silvery green above to golden silver on sides and silvery white on belly with 12 or more faint vertical bars comprised of small dark brown spots or irregular blotches; dorsal fin spotted with black-brown spots on lower half of spinous dorsal fin and in 3 rows on rayed dorsal fin; margin of soft dorsal fin darker and lower tip of caudal fin milk white. Adults uniform golden green above, silvery below with traces of the vertical bars present only when alive and spots on dorsal fins indistinct or absent.

Size: Maximum total length about 80 cm, commonly to 45 cm.

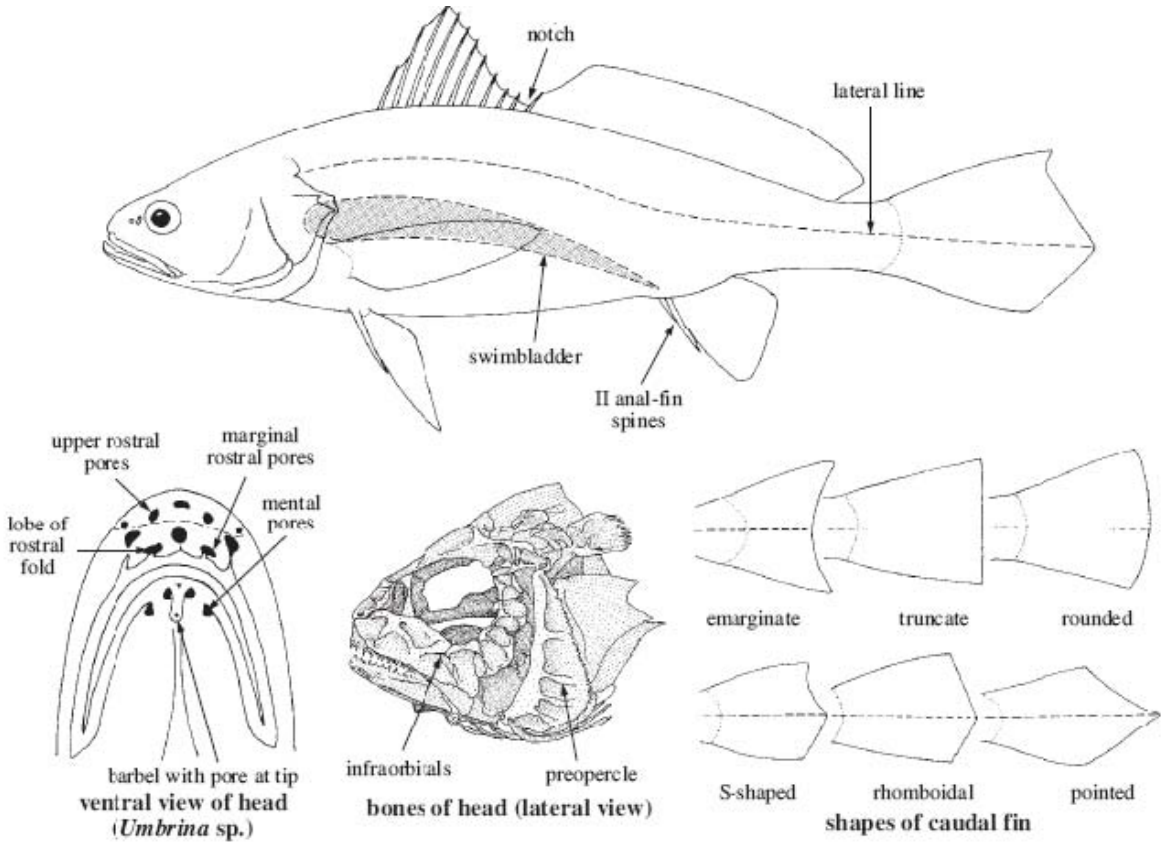
Habitat, biology, and fisheries: Coastal inshore waters in open bays and estuaries, penetrating rivers to the upper limit of brackish water. Taken by handline, set net, trap, and spear. Marketed fresh, a small quantity is salted or smoked. **Distribution:** Indo-West Pacific from Transkei to Red Sea, Persian Gulf, India, Indonesia to China (including Taiwan Province), including northern Australia from Exmouth Gulf to Moreton Bay

SCIAENIDAE

Croakers (drums)

by K. Sasaki

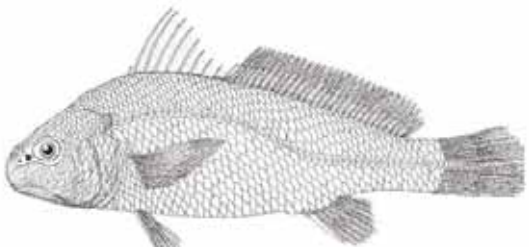
Diagnostic characters: Moderately elongate, moderately compressed, small to large (to 200 cm standard length) perciform fishes. Head and body (occasionally also fins) completely scaly, except tip of snout. Sensory pores often conspicuous on tip of snout (upper rostral pores), on lower edge of snout (marginal rostral pores), and on chin (mental pores), usually 3 or 5 upper rostral pores, 5 marginal rostral pores, and 3 pairs of mental pores; these pores usually distinct in bottom feeders with inferior to subterminal mouth, whereas indistinct in midwater feeders with terminal to oblique mouth. A barbell sometimes present on chin. Position and size of mouth variable from strongly inferior to oblique, larger in species with oblique mouth, smaller in species with inferior mouth. Teeth differentiated into large and small in both jaws or in upper jaw only; **enlarged teeth always form outer series in upper jaw, inner series in lower jaw**; well-developed canines (more than twice as large as other teeth) may be present at front of one or both jaws; **vomer and palatine without teeth**. Dorsal fin continuous, with deep notch between anterior (spinous) and posterior (soft) portions; anterior portion with VIII to X slender spines (usually X), and posterior portion with I spine and 21 to 44 soft rays; **base of posterior portion elongate, much longer than anal-fin base; anal fin with II spines and 6 to 12 (usually 7) soft rays;** caudal fin emarginate to pointed, never deeply forked, usually pointed in juveniles, rhomboidal in adults; pelvic fins with I spine and 5 soft rays, the first soft ray occasionally with a short filament. Scales cycloid (smooth) or ctenoid (rough); **lateral-line scales extending to hind margin of caudal fin. Dorsal side of head (skull) cavernous with a series of bridge-like bony struts; infraorbitals and preopercle with variously developed ridges which fold over canals of cephalic lateral-line system**. Branchiostegal rays 7, of which 6 on ceratohyal and 1 on epihyal. **Swimbladder well developed with thick wall; carrot-shaped, or hammer-shaped, with horn-like, tube-like, or arborescent appendages. Appendages may spread behind transverse septum or entering head beyond the septum.** Drumming muscles (sound-producing muscles on body wall) usually developed in males, less so or absent in females. Sagitta (large earstone) thick, housed in well-inflated auditory bulla (ear capsule), with a tadpole-shaped impression (or sulcus) on its inner surface. **Colour:** highly variable from silvery to dark brown or black, either uniform or some species with spots and dark bands; juveniles of many species have bands and/or spots on body.



Habitat, biology, and fisheries: Primarily inhabit coastal waters on continental shelves, but also occur in estuaries and rivers, especially in breeding seasons and when juvenile and young. Never found in oceanic island groups distantly separated from a continental shelf (such as Mariana Islands and Solomon Islands in the area). A large majority of them are found over muddy or sandy bottoms. Some occur in large shoals and are the object of sizable fisheries. From 1990 to 1995, the FAO Yearbook of Fishery Statistics reports a range of yearly catch of around 36 800 to 50 900 t of Sciaenidae from the Western Central Pacific. Actual yearly catch is probably still higher, since available statistics do not cover small-scale fisheries. Most croakers feed on small crustaceans, fishes, and benthic organisms. They are usually taken in bottom trawls and bottom set gill nets.

Johnius (Johnius) carouna (Cuvier, 1830)

Frequent synonyms / misidentifications: None / *Johnius australis* (Günther, 1880); *J. belangerii*
(Cuvier, 1830); *J. weberi* Hardenberg, 1936.
FAO names: En - Caroun croaker; **Fr** - Courbine caroune; **Sp** - Corvina caruna.



Diagnostic characters: A small to medium-sized species with a moderately deep body; body depth 26 to 33% of standard length. Eye large, 21 to 28% of head length. Interorbital width 22 to 28% of head length**. Snout bluntly rounded, slightly projecting in front of upper jaw**; mouth small, inferior; upper jaw extending backward below middle to hind margin of eye; **no barbel on chin**; upper rostral pores 5, marginal rostral pores 5; mental pores in 3 pairs, the first open close behind symphysis in a common pit; **teeth differentiated into large and small in upper jaw only**, the large ones close-set, not canine-like, forming outer series; **lower jaw with a band of villiform teeth. Gill rakers short, stiff, about 1/2 length of gill filaments at angle of arch, 10 to 12 on lower limb of first gill arch.**
Dorsal fin with X spines, followed by a deep notch, second part of fin with I spine and 26 to 30 soft rays; **anal fin with II spines** and 7 soft rays, **second spine long, stiff, 41 to 58% of head length**; caudal fin rhomboidal.
Scales moderately large, 6 to 9 scale rows above lateral line to origin of dorsal fin, 10 to 14 scale rows below lateral line to origin of anal fin; scales cycloid (smooth) on snout, cheek, and throat, but ctenoid (rough to touch) on other parts of head and body; small scales present on soft parts of dorsal and anal fins; lateral-line scales reaching to tip of caudal fin. Swimbladder hammer-shaped, with 14 or 15 pairs of arborescent appendages along its sides, the first pair entering head beyond transverse septum and sending a palmate branch to the front of pectoral arch. Sagitta (large earstone) with a tadpole-shaped impression, the head of which has its long axis lying obliquely to that of sagitta and the tail expanded and deepened as a hollow cone connected with the head by a narrow groove. Vertebrae 25. Colour: upper 2/3 of body light grey or with a white sheen, lower 1/3 yellowish; pectoral, pelvic, and anal fins and lower part of caudal fin with yellow tinge.

Size: Maximum standard length 25 cm, commonly to 16 cm.

Habitat, biology, and fisheries: Inhabits shallow coastal waters, entering estuaries and mangrove swamps.

Distribution: Gulf of Thailand, Sumatra, and Borneo; north to southern China, west to India.

SCATOPHAGIDAE

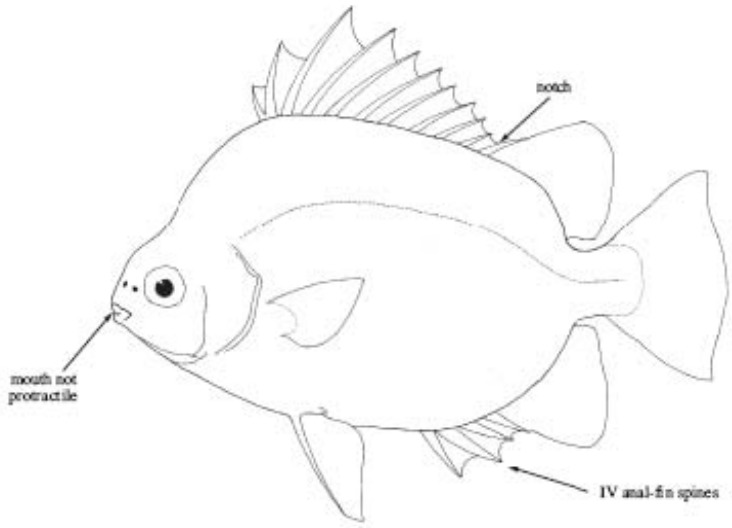
Diagnostic characters: Body quadrangular, strongly compressed (size to about 32 cm). Dorsal head profile steep. Eye moderately large, its diameter somewhat smaller than snout length. Snout rounded. **Mouth small, horizontal, not protractile**. Teeth villiform, in several rows on jaws. Dorsal fin with XI or XII spines and 16 to 18 soft rays; **first dorsal-fin spine procumbent; a deep notch between spinous and soft parts of dorsal fin**. **Anal fin with IV spines** and 13 to 16 soft rays. Caudal fin from rounded (in juveniles) to truncate or slightly emarginate. Pectoral fins with 16 or 17 rays. Pelvic fins with I spine and 5 soft rays. Head, body, caudal fin, and soft parts of anal and dorsal fins covered with small ctenoid scales.

Colour: body greenish or silvery with black spots or bars; juveniles and adults of the same species may have very different colour patterns.

Habitat, biology, and fisheries: Occur in estuaries, harbours, and lower reaches of fresh-water streams, especially those with high mineral concentrations. Juveniles go

through a pelagic “tholichthys” larval stage. Minor commercial importance, occasionally sold fresh in local markets. Considered of poor taste in some areas, esteemed in others. From 1990 to 1995, the FAO Yearbook of Fishery Statistics reports a range of yearly catch of around 1 290 to 4 610 t of *Scatophagus* spp. from the area (Philippines only).

Remarks: A single species of the genus *Scatophagus* is presently recognized in the area, *S. argus*. However, possibly more than a single species are involved: juvenile specimens (about 1 to 3 cm standard length) from the Philippines, Sabah, Malukku, and Australia have 5 or 6 broad vertical bars, and larger individuals show small spots more or less arranged in vertical rows and still with faint indications of the bars. On the other hand, juveniles from Java, Singapore, Viet Nam, and possibly Sri Lanka have few large blotches, these become proportionally smaller and more numerous with age, but at similar size are always larger than those of the previous form. At this stage, both the systematic and nomenclatural problems remain unsolved.



by M. Kottelat

Similar families occurring in the area

Chaetodontidae: no deep notch between spinous and soft-rayed parts of dorsal fin; mouth protractile.

Pomacanthidae: preopercle with a long, backward pointed spine; no deep notch between spinous and
soft-rayed parts of dorsal fin; mouth protractile; anal fin with III spines.

Drepanidae: anal fin with III spines; mouth protractile; pectoral fins elongate.

Scatophagus argus (Bloch, 1788)

Frequent synonyms / misidentifications: None / None.
FAO names: En - Spotted scat; **Fr** - Scatophage tacheté; **Sp** - Pingo manchado.

Diagnostic characters: Body quadrangular, strongly compressed. Dorsal head profile steep. Eye moderately large, its diameter somewhat smaller than snout length. Snout rounded. **Mouth small, horizontal, not protractile**. Teeth villiform, in several rows on jaws. **Dorsal fin with XI spines** and 16 to 18 soft rays; **first dorsal-fin spine procumbent; a deep notch between spinous and soft parts of dorsal fin. Anal fin with IV spines** and 14 or 15 soft rays. Caudal fin from rounded (in juveniles) to truncate or slightly emarginate. Pectoral fins with 16 rays. Pelvic fins with I spine and 5 soft rays. Head, body, caudal fin, and soft parts of anal and dorsal fins covered with small ctenoid scales. **Colour:** ground colour greenish; juveniles with a few large roundish blotches, about size of eye, or with about 5 or 6 broad, dark, vertical bars; **specimens above about 4 cm standard length with black spots, usually smaller than eye, more or less arranged in vertical rows**; in large adults, spots may be faint and restricted to dorsal part of flanks.
Size: Maximum standard length about 30 cm; total length to about 35 cm.

Habitat, biology, and fisheries: Occur in estuaries, harbours, and lower reaches of fresh-water streams, especially those with high mineral concentrations. Juveniles go through a pelagic "tholichthys" larval stage. Minor commercial importance, occasionally sold fresh in local markets. Considered of poor taste in some areas, esteemed in others. Juveniles are collected for the aquarium fish trade.

Distribution: Indo-West Pacific, from southern India and Sri Lanka to southern Japan and Tahiti.

DREPANIDAE

Sicklefishes

by P.C. Heemstra

Diagnostic characters: Body oval and strongly compressed (size to about 50 cm). Interorbital, preorbital, and broad preopercular flange naked; opercle scaly dorsally; ventral edge of preopercle serrate in juveniles. **Mouth highly protrusible, forming a**

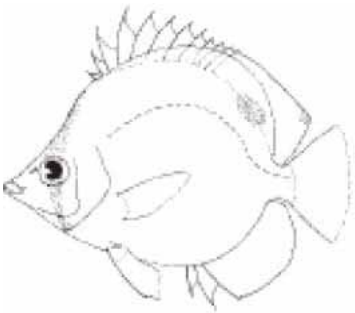
downward-pointing tube when protruded; jaws with bands of setiform teeth; no teeth on roof of mouth; maxilla exposed posteriorly, no supramaxilla. Branchiostegal membranes joined to isthmus; branchiostegal rays 6. **A single dorsal fin, with VIII to X spines (third or fourth spines longest) and 19 to 22 soft rays; anal fin with III spines and 16 to 19 soft rays**; caudal fin rounded or bluntly wedge-shaped (almost truncate in large adults); **pectoral fins elongate, falciform, reaching caudal peduncle**, with 16 to 18 rays; pelvic fins with I spine, 5 soft rays, and a fleshy axillary process; first pelvic-fin ray elongate. Scales small, finely ctenoid, extending onto top of head and base of median fins; lateral line complete, strongly curved over pectoral fins; lateral-line scales 48 to 55. Vertebrae 10+14. Swimbladder large. Pyloric caeca 2 or 3. Large adults with a bump or bony knob on interorbital region, a result of hyperostosis of the frontal bones. **Colour:** head and body silvery; sides of body with vertical rows of dark spots or lines.

Habitat, biology, and fisheries: Frequents a variety of habitats (sand or mud bottoms and coral reefs) in shallow water, including estuaries and harbours. Feeds on benthic invertebrates (mainly crustaceans and worms). Mostly caught with trawls.

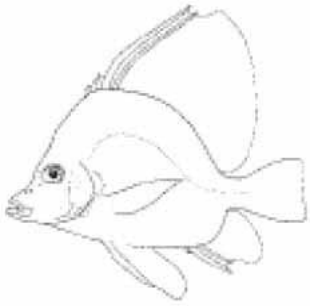
Remarks: Three species are known for this family; 2 species occur in the area.

Similar families occurring in the area:

Chaetodontidae and Pentacerotidae: mouth not highly protrusible; pectoral fins not much longer than head and well short of caudal peduncle; no notch between spinous and soft-rayed parts of dorsal fin.



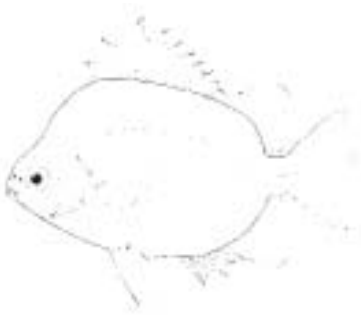
Chaetodontidae



Pentacerotidae

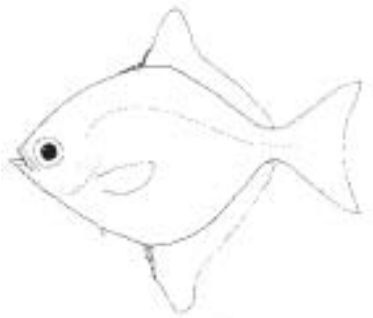
Ephippidae and Scatophagidae: mouth not highly protrusible; pectoral fins not reaching past anal-fin base.

Ephippidae



Scatophagidae

Monodactylidae: mouth not highly protrusible; pectoral fins shorter than head; eye centred on horizontal axis through mouth.

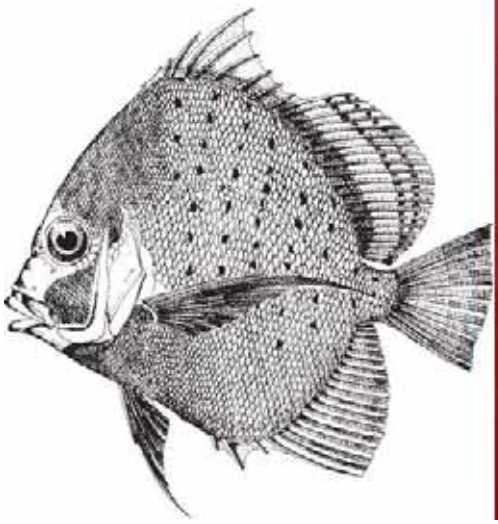


Monodactylidae

Drepane punctata (Linnaeus, 1758)

Frequent synonyms / misidentifications: None / *Drepane longimana* (non Bloch and Schneider,
1801) .

FAO names: En - Spotted sicklefish; **Fr** - Forgeron tacheté; **Sp** - Catemo manchado.



Diagnostic characters: Body oval and strongly compressed, its depth 1.2 to 1.3 times in standard length and 2 to 3 times in head length. Snout profile straight or concave; preorbital deep, the eye well above horizontal line through upper jaw symphysis. Interorbital, preorbital, and broad preopercular flange naked; opercle scaly dorsally; ventral edge of preopercle serrate in juveniles; a fringe of cirri just behind chin. **Mouth highly protrusible, forming a downward-pointing tube when protruded**; jaws with bands of setiform teeth; no teeth on roof of mouth; maxilla exposed posteriorly, no supramaxilla. First gill arch with 5 gill rakers on upper limb, 10 or 11 on lower limb. **A single dorsal fin, with VIII to X (usually IX) spines (third or fourth spines longest) and 20 to 22 soft rays; anal fin with III spines and 16 to 19 soft rays**; caudal fin rounded or bluntly wedgeshaped (almost truncate in large adults);

pectoral fins elongate, falciform, reaching caudal peduncle, with 16 to 18 rays. Lateral-line scales 46 to 50. Large adults with a bump or bony knob on interorbital region, a result of hyperostosis of frontal bones. **Colour:** head and body silvery; **dorsal part of body from below dorsal fin to caudal peduncle with 5 to 10 series of black spots arranged in vertical lines**; fins dusky yellow; dorsal and caudal fins darker distally; 2 or 3 longitudinal rows of small dark spots (1 on each interradial membrane) on soft dorsal fin.

Size: Maximum total length about 40 cm.

Habitat, biology, and fisheries: Occurs in a variety of inshore habitats, such as sand or mud bottoms, reefs, estuaries, and harbours. Biology little known. Mostly caught with trawls, occasionally with hookandline. From 1990 to 1995, the FAO Yearbook of Fishery Statistics reports a range of yearly catch of around 580 to 950 t of *Drepane punctata* from the Western Central Paci fic (Malaysia, Philippines).

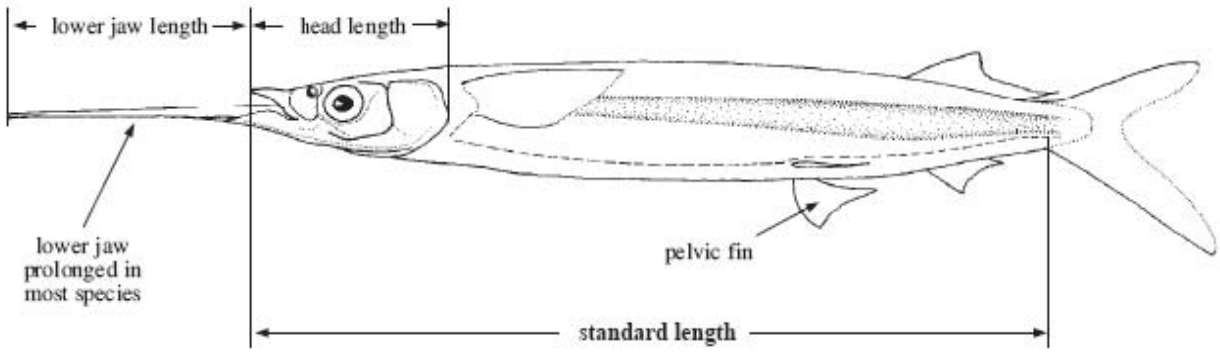
Distribution: Temperate and tropical waters from India to northern Australia, Indonesia, New Guinea, Philippines, Taiwan Province of China, and Japan.

HEMIRAMPHIDAE

Halfbeaks

by B.B. Collette

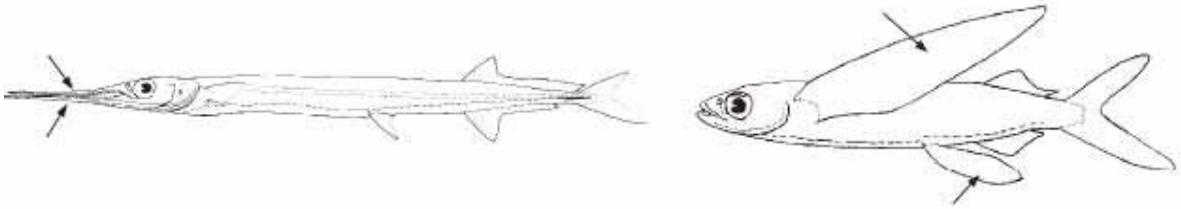
Diagnostic characters: Elongate fishes with **prolonged lower jaw** (except in *Oxyporhamphus, Arrhamphus,* and *Melapedalion*) **and short triangular upper jaw** (except in *Oxyporhamphus*). Nostrils in pit anterior to eyes. No spines in fins; dorsal and anal fins posterior in position; pelvic fins abdominal in position, with 6 soft rays; pectoral fins usually short. Lateral line running down from pectoral-fin origin and then backwards along ventral margin of body. Scales moderately large, cycloid (smooth), easily detached. **Colour:** these fishes live near the surface and are protectively coloured for this mode of life by being green or blue on the back and silvery white on the sides and ventrally; tip of lower jaw bright red or orange in most species.



Habitat, biology, and fisheries: Most species are marine, but some inhabit fresh waters. Omnivorous, feeding on floating sea grass, crustaceans, and small fishes. They are prone to leap and skitter at the surface and 3 offshore species, *Euleptorhamphus viridis* and *Oxyporhamphus* spp. leap out of the water and glide like a flyingfish. Although at present these fishes are not of great commercial importance, many species are regularly found in local markets. The flesh is excellent and halfbeaks are utilized as food in many parts of the

world. From 1990 to 1995, FAO's Yearbook of Fishery Statistics reports a range of yearly catch of Hemiramphidae (and Exocoetidae) of around 25 900 to 67 200 t from the Western Central Pacific. They are mainly caught with seines and pelagic trawls, and dipnetted under lights at night. They are utilized fresh, dried salted, or smoked.

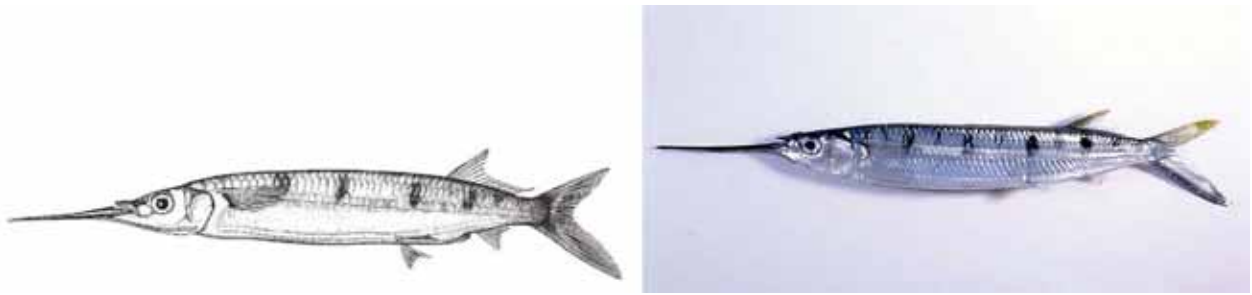
Similar families occurring in the area
Belonidae (needlefishes): both upper and lower jaws elongate and armed with needle-sharp teeth. Exocoetidae (flyingfishes): lack the prolonged lower jaw characteristic of most halfbeaks; pectoral fin or both pectoral and pelvic fins enlarged and used for aerial gliding.



Belonidae Exocoetidae

Hemiramphus far (Forsskål, 1775)

Frequent synonyms / misidentifications: *Hemiramphus commersonii* Cuvier, 1829 / None. **FAO names: En** - Black-barred halfbeak; **Fr** - Demi-bec bagnard; **Sp** - Agujete manchada.



Diagnostic characters: An elongate fish with **greatly prolonged, beak-like lower jaw; upper jaw short, triangular and scaleless; preorbital ridge** (bony ridge behind nostril) **absent. Total number of gill rakers on first gill arch 25 to 36** (usually 29 to 33); 6 to 10 on upper and 19 to 26 on lower limb of arch. Dorsal fin with well-developed anterior lobe; dorsal-fin rays 12 to 14; **anal-fin rays 10 to 12** (usually 11)**; pectoral fins short, not reaching past nasal pit when folded forward** and with 11 to 13 rays (usually 12); caudal fin deeply forked, lower lobe much longer than upper. Predorsal scales 32 to 39 (usually 34 to 37). **Colour:** dark bluish above, silvery white below, with **3 to 9 (usually 4 to 6) vertical bars on sides**; beak dark, with a bright red fleshy tip.

Size: Maximum total length about 44 cm; maximum standard length 33 cm (from tip of upper jaw to base of caudal fin), commonly to 27 cm.

Habitat, biology, and fisheries: Found in proximity of continental coasts and islands, chiefly in areas of rich submerged vegetation. Adults feed mainly on sea grasses, to a lesser

extent on green algae and diatoms. Taken with gill nets, shore seines, drag nets, or by drifting a fine line with tiny hooks baited with shrimp. Marketed mostly fresh and dried salted.

Distribution: An Indo-West Pacific species found in tropical waters of the Indian and western parts of the Pacific oceans. In the area, extends eastward to the Philippines, Palau, Fiji , Samoa, and Tonga south to New Guinea, New Caledonia, and northern Australia; north to the Izu Peninsula of Japan.

Hyporhamphus (Hyporhamphus) limbatus (Valenciennes, 1846)

Frequent synonyms / misidentifications: None / *Hemiramphus gaimardi* Valenciennes, 1846;
Hyporhamphus unifasciatus (Ranzani, 1847).
FAO names: En - Congaturi halfbeak; **Fr** - Demi-bec congaturi; **Sp** - Agujeta congaturí.

Diagnostic characters: An elongate fish with greatly prolonged, beak-like lower jaw, equal to, or longer than head length; upper jaw short, triangular and scaly, its width 0.6 to 0.8 times in its length. Preorbital distance 1.3 to 2.1 times in diameter of orbit and 0.75 to 1.2 times in length of upper jaw; preorbital ridge (bony ridge between nasal opening and eye) present; posterior branch to preorbita lateral-line canal absent. Total number of gill rakers on first gill arch 23 to 37 (usually 25 to 31), 6 to 11 on upper and 19 to 23 on lower limb of arch. Dorsal-fin rays 13 to 16, usually 13 or 14; anal-fin rays 13 to 16 (usually 14 or 15); pectoral fins short, with 10 to 12 rays; caudal fin emarginate, not strongly forked. Anterior part of dorsal and anal fins covered with scales; predorsal scales (in front of dorsal fin) 30 to 38 (usually 32 to 35).

Colour: greenish above, the silvery lateral stripe widening posteriorly, white ventrally; fleshy tip of beak reddish.

Size: Maximum total length 22 cm; maximum standard length 17 cm (tip of upper jaw to base of caudal fin), commonly to 13 cm.

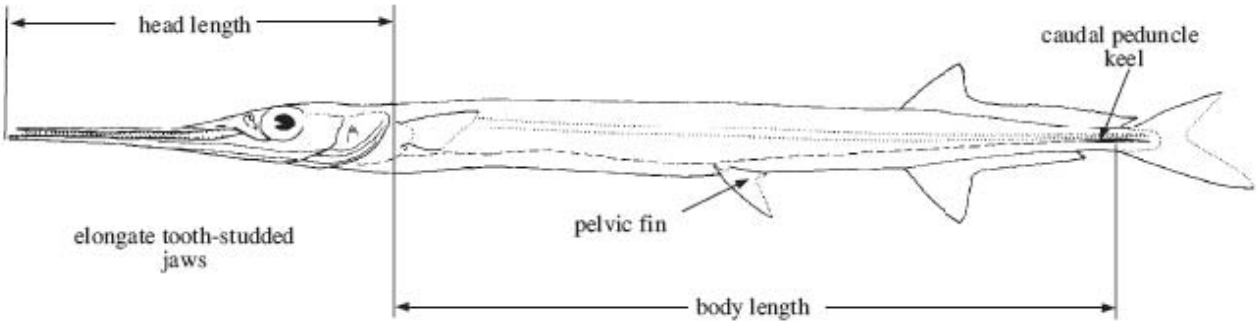
Habitat, biology, and fisheries: A coastal species, frequently enters estuaries and even strictly freshwater. Taken with cast nets on coasts of India. Marketed fresh and dried salted.

Distribution: Extends from the Persian Gulf to China along the mainland coast of Asia. Within the area, found from Thailand northward to China. Replaced in Indonesia, Borneo, and the Philippines by the closely related *Hyporhamphus neglectus*, and around southern New Guinea and northern Australia

BELONIDAE

by B.B. Collette

Diagnostic characters: Elongate fishes with **both upper and lower jaws extended into long beaks filled with sharp teeth**; nostrils in a pit anterior to eyes. No spines in fins; dorsal and anal fins posterior in position; pelvic fins located in abdominal position and with 6 soft rays; pectoral fins short. Lateral line running down from pectoral-fin origin and then along ventralmargin of body. Scales small, cycloid (smooth), easily detached. **Colour:** these fishes live at the surface and are protectively coloured for this mode of life by being green or blue on back and silvery white on lower sides and belly; usually, a dusky or dark blue stripe along sides; tip of lower jaw frequently red or orange.

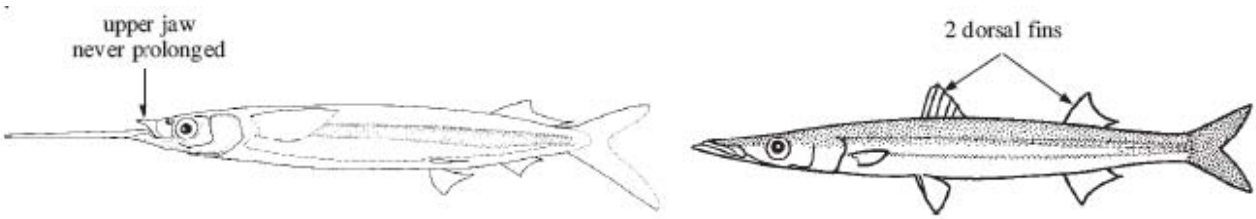


Habitat, biology, and fisheries: Most species are marine, but some occur in fresh water. Carnivorous, feeding largely on small fishes which they catch sideways in their beaks. Needlefishes tend to leap and skitter at the surface and some people have been injured when accidentally struck by them, particularly at night when the fishes are attracted by lights. Caught by casting or trolling surface or near-surface lures. Flesh excellent in flavour although some people have misgivings about eating it due to the green colour of the bones. From 1990 to 1995, FAO's Yearbook of Fishery Statistics reports a range of yearly catch of needlefishes of around 32 900 to 39 400 t from the Western Central Pacific (Philippines, Indonesia). Some fresh-water needlefishes reach only 6 to 7 cm in total length while some marine species may attain 2 m.

Similar families occurring in the area:

Hemiramphidae (halfbeaks): only the lower jaw prolonged or neither jaw prolonged and lacking the needle-sharp teeth that stud the upper and lower jaws of needlefishes.

Sphyraenidae (barracudas): jaws pointed but not prolonged into a beak; 2 dorsal fins, the first spiny; pelvic fins in thoracic position.



Hemiramphidae Sphyraenidae

Strongylura strongylura (van Hasselt, 1823)

Frequent synonyms / misidentifications: *Tylosurus strongylura* van Hasselt, 1823 / None.

FAO names: En - Spottail needlefish; **Fr** - Aiguillette ocelée; **Sp** - Agujón ocelado.

Diagnostic characters: Body elongate, **rounded in cross-section**. Upper and lower jaws greatly elongate and studded with sharp teeth; gill rakers absent. No spines in fins; anterior parts of dorsal and anal fins forming moderate lobes; **dorsal-fin rays 12 to 15; anal-fin rays 15 to 18**; pectoral fins not falcate; pectoral-fin rays 10 to 12 (usually 11). **Caudal peduncle without lateral keels; caudal fin rounded or truncate**, not emarginate or forked. **Predorsal scales** (in front of dorsal fin) **few and relatively large, 100 to 130**; bases of dorsal and anal fins covered with scales. Total number of vertebrae 59 to 65. **Colour:** greenish above, silvery laterally, white ventrally; pectoral, pelvic, and anal fins light; dorsal and anal fins with some pigmentation along middle of the rays; **caudal fin light with a prominent round black spot near its base;** dorsal-fin lobe and distal margin of caudal fin yellow in live adults, anterior margin of anal fin orange. **Size:** Maximum standard length (without caudal fin) 40 cm, commonly to 22 cm; maximum body length 26 cm (without head and caudal fin).

Habitat, biology, and fisheries: Inhabits coastal areas and mangrove-lined lagoons, where it is common (especially small specimens) and also enters fresh water. Carnivorous, feeding mainly on small fishes, especially clupeoids. Caught by casting or trolling surface or near-surface lures; also with seines, often using lights and with cast nets in mangrove-lined lagoons. Marketed fresh.

Distribution: Indo-West Pacific from the Persian Gulf along the coasts of Pakistan, India, and Sri Lanka to the western Central Pacific. Within the area, north to the Philippines and southern China, south to northern Australia

SCORPAENIDAE

Scorpionfishes (also, lionfishes, rockfishes, stingfishes, stonefishes, and waspfishes)
by S.G. Poss

Diagnostic characters: Body usually weakly, rather than strongly, compressed; body depth 21 to 50% standard length. **Head moderate to large, 37 to 50% standard length**, often notably depressed with cirri, particularly above eye. Eye small to relatively large, 4 to 14% of standard length. Snout short to long, often prominent, 6 to 20% of standard length. Mouth often large and upturned, upper jaw 9 to 23% standard length. Numerous small conical teeth present on upper and lower jaws, with those on vomer and palatine present or absent. Branchiostegal rays typically 7 (rarely 6). Gill rakers usually small or moderate, 1 to 9 in upper arch and 4 to 20 in lower arch. **All species with suborbital stay (or ridge), an extension of the third infraorbital bone (second suborbital) extending backward across the cheek and usually firmly bound to preopercle. Most species with numerous head spines**, with those on lacrimal bone (or first infraorbital bone), those above orbital margin and those behind occiput most prominent. **Dorsal fin with strong venomous spinous part bearing VIII to XVIII spines** connected to soft-rayed part posteriorly, with 3 ½ to 14 soft rays, the

last typically split to its base and counted as 1 ½. **Anal fin with II to IV**, **but usually III strong, sharp spines**, the second usually longest, followed by 3 ½ to 15 soft rays, the last usually split to its base and counted as 1 ½. Caudal fin typically rounded or truncate, never forked, 15 to 40% standard length, usually about 27 to 35% standard length. Pectoral fins usually large, with 11 to 24 rays; with rays of larger individuals of most species branched. Pelvic fins with I strong spine and 5, or less often, 4 branched rays. Scales in most species relatively small and either ctenoid or pseudocycloid, entirely absent in others, or present only as deeply embedded scale rudiments. Lateral-line scales present, with 4 to 54 pored or tubed scales (lateral-line scales trough-like in the subfamily Setarchinae). When present, scales above lateral line 4 to 8; scales below lateral line 10 to 19. **All species possess striated swimbladder musculature that is extrinsic in nearly all species**, withmusculature present even in those without swimbladders. Pyloric caecae 1 to 16. Vertebrae 24 to 29. **Colour:** most species strongly camouflaged and red, reddish brown, or brown in colour, and usually have barred or mottled colour patterns that are typically darker dorsally than ventrally.

Habitat, biology, and fisheries: Scorpionfishes and their near relatives are typically found on or near the bottom, which they often strongly resemble. Most species in the area are found on relatively nearshore hard bottoms and reefs or associated with coral rubble, from the surface to a depth of 150 m. Some species in the area range, into deeper waters (to 800 m), although outside the area captures to 1 113 m have been reported. A few species, such as those of the genera *Setarches, Lioscorpius*, and *Ectreposebastes*, are pelagic or semipelagic occurring offshore in depths of 200 to 800 m. Many species are relatively small, typically under 20 cm standard length, and their biology poorly studied. Nonetheless, most are known to lead solitary lives, and evidently aggregate only for reproduction. The young of most species are planktonic, with many VIII-XVIII dorsal-fin spines preopercle spiny suborbital stay (or ridge) III (II-IV) anal-fin Spines caudal fin usually rounded supraocular cirrus (some species) dorsal fin continuous, notched **detail of head** lacrimal bone (shape and spines often used as specific diagnostic characters) Scorpaeniformes: Scorpaenidae 2291 settling out of the plankton relatively quickly. Most feed primarily on arthropods and many feed on small fishes as they attain larger sizes. Most species are extremely well camouflaged and excellent ambush predators. The vividly (aposematically) coloured lionfishes or turkeyfishes are notable exceptions, cornering their prey with their elongate pectoral fins. Most scorpionfishes are ovoviviparous, producing between a few hundred and a few thousand eggs, although some are viviparous. Nearly all possess well-developed venom glands and should be handled with extreme caution, lest painful and potentially fatal wounds be inflicted by their sharp fin and head spines. Although all are edible, most species in the Western Central Pacific are small and dangerous to handle and thus do not form the basis of large fisheries. However, a few species in the area are relatively large, occur in considerable number, and are marketed fresh. Numerous species outside the area for important fisheries.

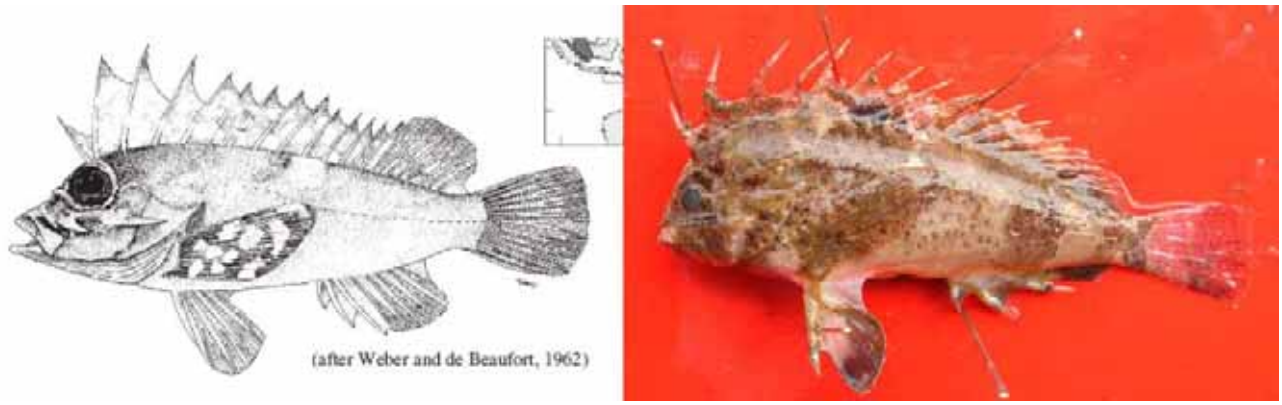
Remarks: Scorpaenoid fishes form a large (approximately 500 species) and heterogenous assemblage of fishes. The limits of the Scorpaenidae, included subfamilies, and associated families are not well established nor is there agreement on what family or subfamily names should be used. Some phylogenetically derived taxa, such as the Synanceiinae and Tetraroginae, are often treated as distinct families by many authors, whereas such authors usually regard more phylogenetically distant relatives as

belonging to the Scorpaenidae. Other derived taxa, such as Caracanthidae and Aploactinidae, are almost universally regarded as separate families, although they too are more closely related than are some genera invariably included in the Scorpaenidae. For purposes of this general treatment a broad definition of the Scorpaenidae is adopted. With a few commonly accepted exceptions, this avoids use of an unfamiliar and highly split classification.

Paracentropogon longispinis (Cuvier, 1829)

En - Whiteface waspfish.

Maximum standard length 8 cm. A venomous species that should be handled with caution, found inshore down to nearly 70 m, on and around corals and hard bottoms. Of little importance to fisheries, but often taken in nets and by hand lines. Some colour patterns are characteristic of a given region. For example, specimens from the Gulf of Thailand almost always have large blotches over the body, while those from Indonesia and Australia generally have less solid markings. Although these various colour patterns may suggest that specimens identified here as *Paracentropogon longispinis* belong to a species complex, limited information on live coloration exists and some intermediate colour patterns are observed. Further study may show *P. vespa* Ogilby, 1910 to be a synonym. This species has been seen to alter its colour from light to dark in captivity. Known throughout the western Pacific from Taiwan Province of China and southern China southward through Indonesia, the Philippines, to New Caledonia; occurs west of the area to southern India.



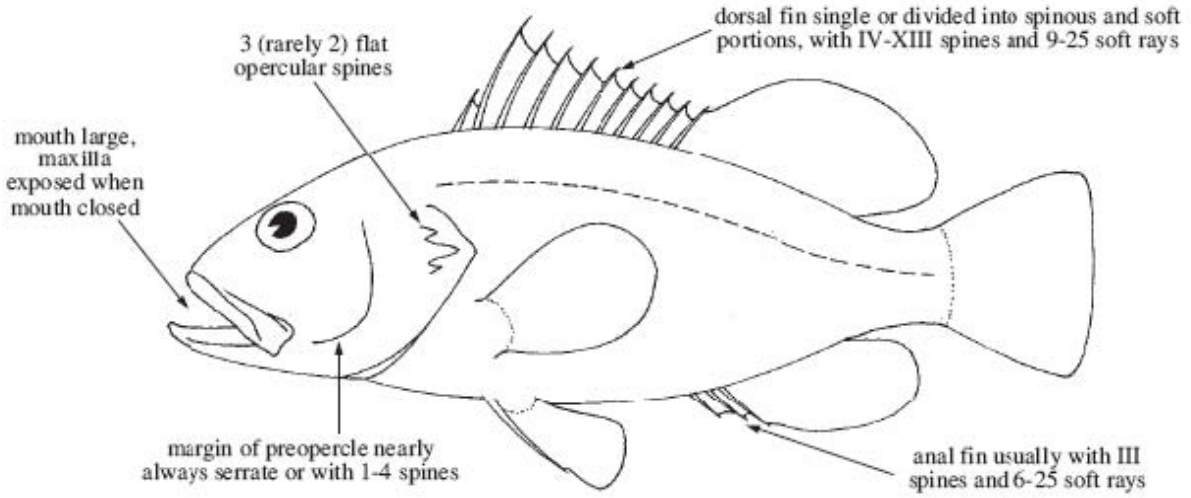
SERRANIDAE

Groupers and seabasses (also, soapfishes, anthiines, etc.)

by P.C. Heemstra and J.E. Randall

Diagnostic characters: Body variable in shape, from deep-bodied to elongate and little compressed (at least anteriorly) to notably compressed (size from a few to 250 cm). **Opercle with 3 (rarely 2) flat spines; margin of preopercle nearly always serrate (but serrae rudimentary in adults of a few species) or with 1 to 4 spines. Mouth large, terminal; maxilla exposed when mouth is closed; lower jaw usually projecting; bands of small, slender teeth in jaws; canines usually present at front of jaws and sometimes at side**; small teeth present on vomer and palatines of most species; no molars or incisiform teeth. Gill membranes separate, with 7 branchiostegal rays. **Dorsal fin single or divided into spinous and soft portions, with IV to XIII spines and 9 to 25 soft rays**; anal fin with III (rarely II) spines and 6 to 24 soft rays; last dorsal and anal-fin rays usually split to their

base but counted as a single ray; caudal fin with 12 to 15 branched rays, the fin varying in shape from rounded to lunate; pelvic fins with I spine and 5 soft rays, inserted below or slightly anterior or posterior to base of pectoral fins; no scaly axillary process at base of pelvic fins. Scales small tomoderate, adherent, ctenoid (or secondarily cycloid). A single complete lateral line (except *Pseudogrammini* and some species of *Plectranthias*), extending on caudal fin less than 1/2 length of middle caudal-fin rays. Vertebrae 24 to 30. **Colour:** variable with patterns of light or dark stripes, spots, vertical or diagonal bars, or nearly plain; many species are capable of rapid colour changes; xanthic (yellow) phases are known in some species and several species have distinctively coloured deep- and shallow-water forms; **colour patterns are generally themost useful field characters as the morphometric and meristic characters often overlap to a considerable degree.**

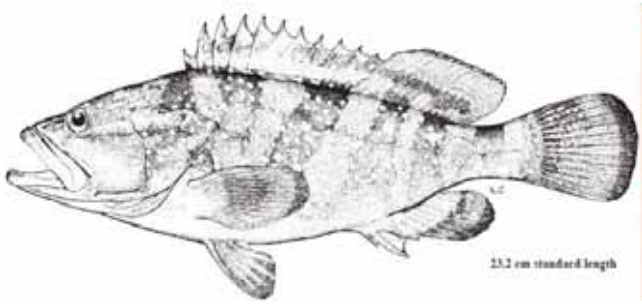


Habitat, biology, and fisheries: Serranids are benthic or bottom-oriented fishes, usually found on coral reefs or rocky substrata; the great majority of species occur on continental or insular shelves in depths less than 200 m. All are predaceous, the larger species feeding mainly on fishes, crustaceans, and cephalopods, while many of the smaller ones feed on zooplankton. Most serranids represented in the area are protogynous hermaphrodites, i.e. they first mature as females and, after spawning one or more times, they will then change sex, spawning thereafter as males. Fishes of the subfamily Serraninae are synchronous hermaphrodites, with both sexes combined (and functional) at the same time in a single individual. Although these synchronous hermaphrodites can fertilize their own eggs, they normally spawn in pairs and alternate the release of eggs or sperm in order to have their eggs fertilized by the other fish. Some groupers (subfamily Epinephelinae) form large aggregations at specific sites at the time of spawning, making them vulnerable to over-fishing. These spawning aggregations should be protected. Except for occasional spawning aggregations, most groupers are solitary fishes, and tagging studies have shown that they are generally resident on a particular reef for a long time (often years). This site specificity and the relatively slow growth rate of groupers make them particularly vulnerable to overfishing. Groupers are among the most highly priced food fishes and are actively sought by commercial and sport fishermen. They are caught with hook-and-line, gill nets, spear, traps, and in trawls. For 1995, FAO's Yearbook of Fishery Statistics reports a total catch of around 45 600 t of Serranidae from the Western Central Pacific. Separate statistics per species are not available from the area. Some groupers are important in aquaculture, and a few species have been spawned in captivity. Several species are used in cage-culture

operations. Some of the smaller serranids, particularly the colourful Anthiinae and Liopropomatini are of value as aquarium fishes.

Epinephelus akaara (Temminck and Schlegel, 1842)

FAO names: En - Redspotted grouper; **Fr** - Mérou rouge tacheté; **Sp** - Mero de pintas rojas.



Diagnostic characters: Body depth less than head length, 2.7 to 3.2 times in standard length (for specimens 11 to 38 cm standard length); head length 2.3 to 2.6 times in standard length. **Preopercle with enlarged serrae at angle; upper edge of operculum straight;** nostrils subequal; maxilla reaching about to vertical at rear edge of eye; midside of lower jaw with 2 rows of teeth. First gill arch with 23 to 25 gill rakers, of which 8 or 9 on upper limb and 15 to 17 on lower limb. Dorsal fin with XI spines and 15 to 17 soft rays, the third to sixth spines longest, 2.4 to 3.8 times in head length, the interspinous membranes incised; anal fin with III spines and 8 soft rays; caudal fin rounded; pectoral-fin rays 17 to 19, the fin length 1.5 to 2.1 times in head length; **pelvic fins not reaching anus, 1.9 to 2.3 times in head length**. Lateral body scales rough, with auxiliary scales in adults; lateral-line scales 50 to 54; lateral scale series 92 to 106. **Colour: head and body pale brownish grey, covered (except ventrally) with small red, orange, or gold spots;** 6 faint oblique dark bars usually visible on body (at least dorsally), the first bar on nape, the third bar confluent with a dark brown or black blotch on body at base of last 3 dorsal-fin spines, and the last bar on caudal peduncle; dark body bars extend only onto base of dorsal fin; **dorsal-fin margin yellow or orange; a row of dusky yellow or orange spots (1 per membrane) along middle of spinous dorsal fin and another row along base of fin;** soft dorsal, caudal, and anal fins with faint red or orange spots basally, the distal parts of these fins dusky with small faint white spots.
Size: Maximum total length 51 cm.

Habitat, biology, and fisheries: In Japanese waters, this species is common in rocky areas. Spawning of pairs in shallow culture ponds has been reported, but the high mortality of larvae has hampered its use in aquaculture. The redspotted grouper is of considerable commercial importance in Hong Kong and Japan where it brings a high price in markets, and live specimens are sold for an even better price.

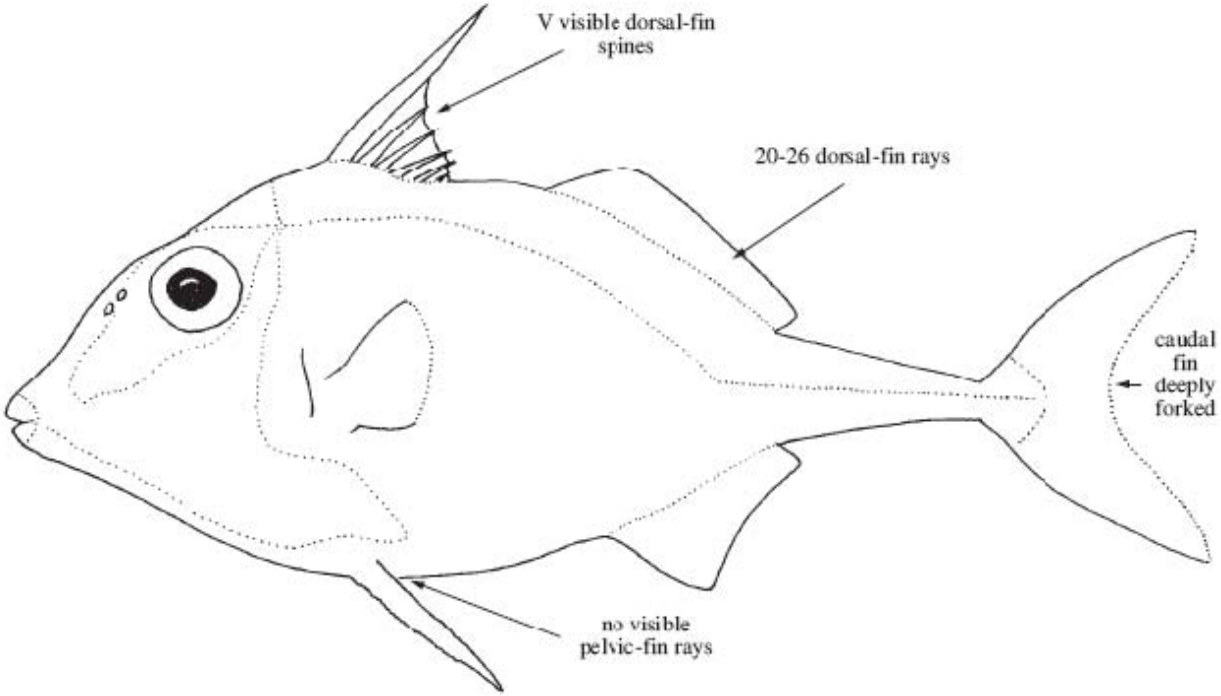
TRIACANTHIDAE

Triplespines

by K. Matsuura

Diagnostic characters: Small fishes (to 30 cm), with moderately elongate, strongly compressed body; skin moderately thick with numerous scales not individually easily

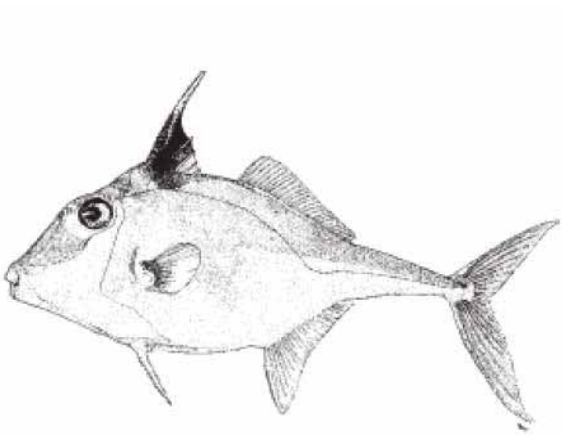
discernible to the unaided eye, each scale bearing upright spinules and having a rough, shagreen-like appearance. Mouth small and usually terminal; teeth in an outer series of about 10 heavy incisors in each jaw, internally to which are several molariform teeth, usually 4 in upper jaw and 2 in lower jaw. Gill opening a moderately short vertical slit in front of pectoral-fin base. Dorsal-fin spines VI (usually only V visible, the sixth rudimentary),
dorsal-fin rays 20 to 26; caudal fin deeply forked; pelvic fins with I large spine and no visible rays; most dorsal-, anal-, and pectoral-fin rays branched. **Caudal peduncle distinctly tapering to a narrow transversely indented region just in front of caudal-fin base, where the peduncle is wider than deep.** Lateral line inconspicuous. **Colour:** generally silvery, with upper half of body dusky, with or without darker blotches.



Habitat, biology, and fisheries: Benthic, occurring usually on flat, sandy or weed-covered bottoms. Feed on bottom invertebrates. Marketed but not commercially important.

Triacanthus nieuhofi Bleeker, 1852

En - Silver tripodfish.
Maximum total length 28 cm. Coastal, over sandy or muddy substrate. Feeds on benthic invertebrates.
Taken by trawl, marketed fresh. Mainly Indonesia to northwestern Australia; recorded also from Bay of Bengal.

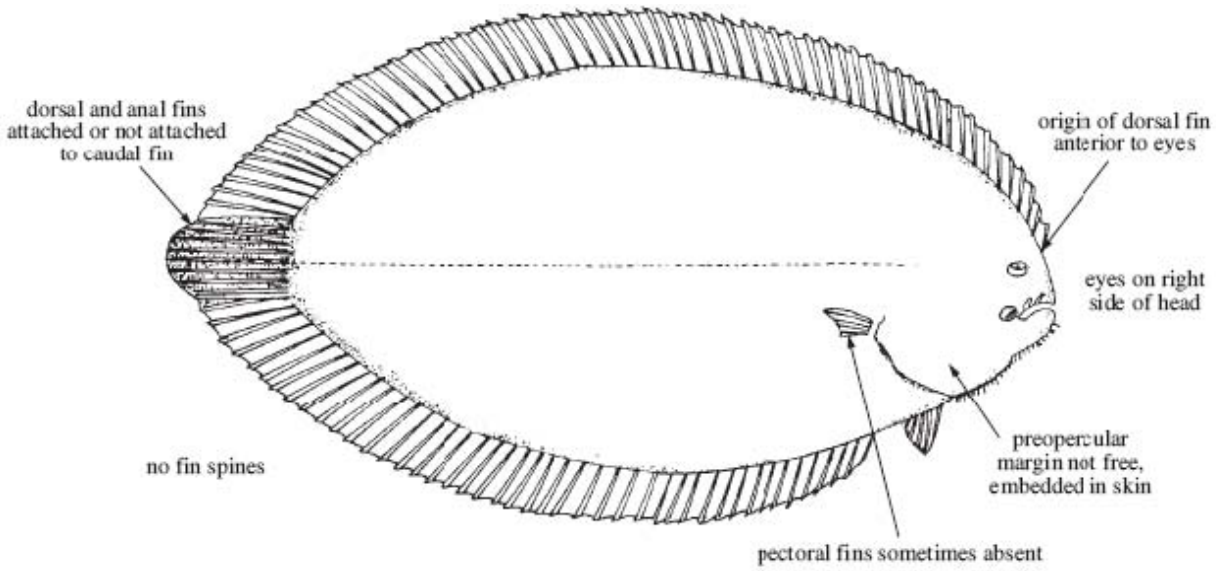


SOLEIDAE

Soles

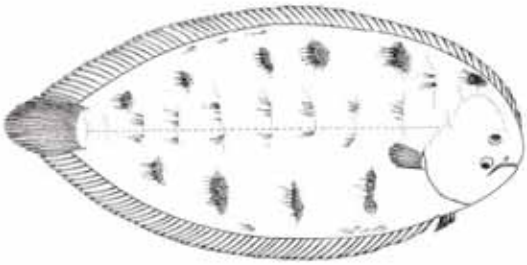
by T.A. Munroe

Diagnostic characters: Oval or somewhat elongate and strongly compressed flatfishes with **eyes on right side of body** (size to about 32 cm). **Preopercle without free margin**, **embedded in skin**. Mouth small and asymmetrical, terminal or slightly inferior; snout sometimes hook-shaped; teeth small, villiform, better developed on blind-side jaws. No spines in fins; **dorsal fin extending far forward on head**; dorsal and anal fins completely separate from, adherent to, or fused with caudal fin; pectoral fins sometimes absent, when present, right usually longer than left; pelvic fins sometimes asymmetrical, either free or joined to anal fin. Scalesmoderately large, cycloid or ctenoid, **sometimes modified into skin flaps fringed with sensory filaments**. Lateral line single and straight on body, sometimes branched on head. **Colour:** highly variable according to substratum; from uniformly dull brown to strikingly coloured with scattered black spots or blotches or dark cross bands on eyed side of body and vertical fins; blind side usually uniformly yellowish or white.



Brachirus orientalis (Bloch and Schneider, 1801)

Frequent synonyms / misidentifications: *Euryglossa orientalis* (Bloch and Schneider, 1801);
Synaptura
orientalis (Günther, 1862) / None.
FAO names: En - Oriental sole; **Fr** - Sole d'orient; **Sp** - Lenguado oriental.



Diagnostic characters: Body oval, both contours equally arched. **Scales strongly ctenoid on eyed side, mostly weakly ctenoid on blind side with some cycloid**. Eyed side with 3 longitudinal rows of small patches of scales with obvious black sensory filaments on scales. **Head scales of blind side modified into cutaneous sensory processes. Eyes on right side**, **separated by small scaly interorbital space**. Mouth small, jaws curved, cleft reaching to vertical through middle of lower eye. **Lateral line with high rounded arch on head not directed posteriorly, ending above upper eye. Dorsal and anal fins joined to caudal fin; pectoral fins well developed**, the left somewhat shorter than the right; pelvic fins moderately symmetrical in size, and symmetrical in position. **Colour:** eyed side grey or brown with numerous, cloudy, and indistinct patches and with 3 longitudinal series of black circular blotches corresponding to regions of filamentous scales; **blind side uniformly light yellow, without sooty blotches**; dorsal, anal, and caudal fins uniformly dark throughout their lengths, except distal tips of fins with white margin; eyed-side pectoral fin darkly pigmented with black blotch near distal tip and with white margin; eyed-side pelvic fin dark with white margin; blind-side pelvic fin white.

Size: Maximum total length about 30 cm, commonly 10 to 12 cm.

Habitat, biology, and fisheries: Inhabits shallow sand or mud bottoms in coastal waters. Feeds predominently on bottom-living invertebrates, especially small crustaceans. Caught mainly with bottom trawls on the inner continental shelf. Marketed fresh, frozen, and dried-salted.

Distribution: Common throughout most tropical coastal waters of Indo-West Pacific area from Gulf of Thailand northward to Taiwan Province of China and southern Japan, southward through the Philippines, New Guinea to north-central Australia (both coasts); westward to India and Persian Gulf.

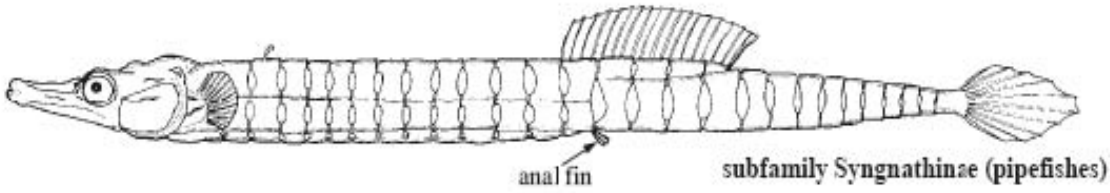
SYNGNATHIDAE

Pipefishes and seahorses

by T. Paulus

Diagnostic characters: Usually small fishes (4 to 55 cm total length).

Body typically slender and elongate, without scales, encased in a series of bony rings; with or without a prehensile tail. Head either more or less along same axis as rest of body (subfamily Syngnathinae), or clearly bent in ventral direction from main axis of body (subfamily Hippocampinae). **Snout generally long and tubular**; mouth small, toothless, located at tip of snout. **Branchiostegal rays 1 to 3**; gill opening reduced to a pore in the opercular membrane. **Spinous dorsal and pelvic fins absent**; other fins variously present or absent; a single dorsal fin, usually with 15 to 60 soft rays; anal fin small, with 2 to 6 soft rays; caudal fin, if present, with 8 to 10 rays; pectoral fins usually with 10 to 23 rays. Some species develop dermal appendages along body, head, and snout. **No lateral line**. **Colour:** variable with the species, generally adapted to the preferred habitat; species living on seagrass, sand, and coral rubble usually have grey, green, brown, or black ground colour with various patterns; coral-reef species sometimes colourful with white, yellow, orange, blue, red, and black stripes and



Habitat, biology, and fisheries: Syngnathidae usually live in coastal marine waters; some are found in estuarine waters, and only a few in fresh water. The marine species live in a wide variety of habitats, such as on sand and rubble substrate, seagrass beds, in caves and crevices of coral reefs and on steep drop-offs of the reef. Juveniles often with a planktonic stage. Some species are associated with floating objects such as *Sargassum* seaweeds. Generally found in shallow waters at depths of 1 to more than 100 m, planktonic juveniles are sometimes caught in trawls from greater depths in the open sea. The majority of the known species feed on minute benthic and planktonic fauna, preferably microcrustaceans. Perhaps the most peculiar behaviour displayed by the seahorses and pipefishes is their habit of male egg incubation. The female deposits the eggs on the ventral surface of the male body, where they are fertilized. The eggs are kept in a pouch or on a specially vascularized surface of the trunk or tail. The brood is carried by the male until the young hatch. Most of the relatively small species are of no or minor commercial importance. However, some colourful species regularly appear in the aquarium trade, e.g. *Corythoichthys* spp., *Doryrhamphus* spp., *Halicampus* spp., and *Hippocampus* spp. In addition, seahorses and pipefishes are sold primarily for use on Asian markets as medicine and aphrodisiacs, but also as curios and food.

Nannocampus sp.

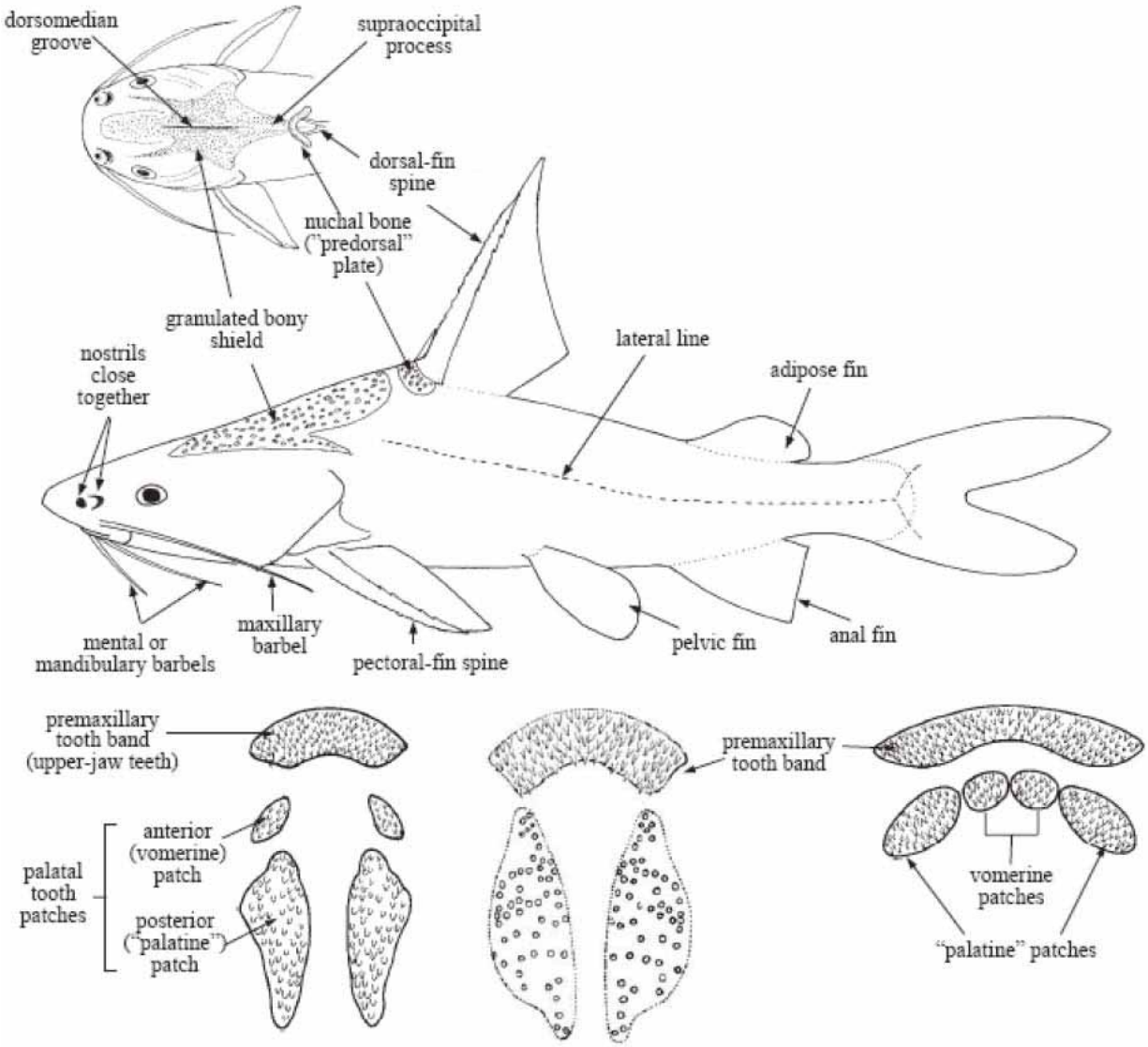
Order SILURIFORMES ARIIDAE

(= TACHYSURIDAE)

Sea catfishes (fork-tailed catfishes)

by P.J. Kailola

Diagnostic characters: Medium to large fishes (to 180 cm); body elongate, robust. Head conical to rounded, depressed.**Abony shield covering part of dorsal surface of head, well visible beneath thin skin in most species, concealed by thick skin and muscle tissue in others; smooth, rugose, striate, or granular; in most species, posterior portion (= supraoccipital process) of bony shield extends backwards to meet the predorsal (nuchal) plate**. A dorsomedian groove or "fontanel" often apparent, extending from nostrils to supraoccipital process. Eye usually free, rarely covered by skin, and not free in its orbit. **Front and rear nostrils close together on each side of snout; rear (posterior) nostril more or less covered by a flap of skin**. Mouth terminal to inferior; teeth fine, wedge-shaped, conical and sharp, or granular. Jaw teeth arranged into narrow and broad bands; teeth on palate (= roof of mouth), when present, grouped into large and small patches (patches may be reduced in brooding male fish); teeth sometimes present on parasphenoid bone. **Mouth surrounded by 2, 4, or 6 barbels**: 1 pair of maxillary barbels (absent in *Batrachocephalus*), 1 pair of mandibulary barbels (absent in *Bagre* and *Osteogeneiosus*), and 1 pair of mental barbels (absent in Batrachocephalus and *Osteogeneiosus*). **Gill membranes joined together, attached to isthmus anteriorly**, and with posterior margin free or attached to isthmus (gill openings therefore variously wide or restricted). **Branchiostegal rays 5 to 7**. Total gill rakers on anterior aspect of first arch ranging from about 9 to more than 50; rakers always present along posterior aspect of third and fourth arches, sometimes on first and second arches. Dorsal fin situated before midlength of body, consisting of **a long, hard, usually serrated spine preceded by a very short, broad spine or buckler, and followed by 7 branched rays**; anal fin with 14 to 33 rays; pectoral fins low-set, with a usually long and hard serrated spine and 9 to 13 branched rays; **pelvic fins with 6 branched rays and no spine**; shape of inner pelvic-fin ray often modified in mature females; **caudal fin deeply forked, with 15 principal rays**, 13 of them branched (i, 6 + 7, i). **Adipose fin always present above anal fin. Body naked**. Lateral line well developed, terminating at tail base by turning upwards or bifurcating over caudal-fin lobes. **Swimbladder usually ovate and sack-like**, but much depressed in some species, and with posterior chamber in others. **Colour:** upper 2/3 of body dark brown to charcoal through dark and pale blue and brown; usually with blue, green, violet, or coppery lustre, rarely blotched dark or with a silvery lateral stripe; lower body paler: yellow, cream, white, or silvery, frequently finely stippled brown; fins dusky yellow, frequently with dark (bluish) margins or proximal patches, especially on dorsal aspect of paired fins; barbels dark brown to white; peritoneum and buccopharyngeal cavity may be dusky or charcoal-coloured.



examples of tooth patches on palate (= roof of mouth) and upper jaw

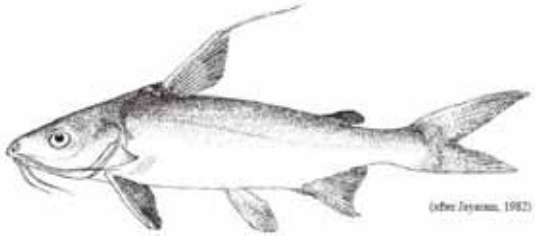
Habitat, biology, and fisheries: Ariids occur in marine, brackish, and fresh waters of warm-temperate and tropical regions of the world. Most are confined to coastal and marine habitats, but some are found also in fresh-water rivers, streams, and lakes. Ariids are locally abundant in mangrove areas, large river estuaries, and turbid waters, as well as in fully marine waters (to 150 m) and clear fresh waters. Some species live in coastal to fresh water (e.g. Sahul Shelf species *Arius leptaspis* and *A. graeffei*) and this preference for a range of habitats may be common. On the other hand, adults of the subgenus *Netuma* (*A. thalassinus*, *A. bilineatus*) inhabit fully marine waters. Other ariids are confined to fresh water (e.g. the genus *Cephalocassis* Bleeker in Southeast Asia; the subgenera *Brustiarius* Herre and *Pachyula* Ogilby in New Guinea; individual Arius species). Their diet varies from omnivorous to specialized, larger individuals often feeding solely on large crustaceans, molluscs, and teleosts. These fishes are renowned for their method of reproduction, the females producing few, large (to 25 mm diameter) eggs which the male incubates in his buccal cavity after fertilisation until the young hatch and the yolk sack is resorbed. Many ariids have high economic value because of their large size, local abundance, hardiness, and flesh quality. They are captured using a variety of gear (mainly demersal trawl, gill nets, and seines), and are sold fresh, smoked, and brined.

From 1990 to 1995, FAO's Yearbook of Statistics reports a range of yearly catch of sea catfishes of around 49 600 to 72 900 t from the Western Central Pacific.

Arius arius (Hamilton, 1822)

Frequent synonyms / misidentifications: *Arius falcarius* Richardson, 1844; *A. cochinchinensis* Günther, 1864; *A. boakeii* Turner, 1866. Synonyms recorded in literature: *Bagrus crinalis* Richardson, 1846; *Pimelodus mong* Richardson, 1846; *Arius buchanani* Day, 1877 / *Arius maculatus* (Thunberg 1792); *A. gagora* (Hamilton, 1822).

FAO names: En - Threadfin sea catfish; **Fr** - Mâchoiron fouet; **Sp** - Bagre filamentoso.



Diagnostic characters: Head shield smoothanteriorly, a series of granules and rugae posteriorly; dorsomedian head groove shallow, narrow, and deeper posteriorly. Eye 4 to 6 (mean 5.1) times in head length. Snout rounded to acute, about twice eye diameter. Mouth gape 36 to 42% (mean 37.4%) of head length. **Teeth on palate in 2 oval-elliptical patches, 1 on each side, placed well forward on palate and usually parallel to each other**, patches extensive in larger fish; **palatal teeth molariform, peg-like**, and blunt or globular and short, **up to about 120, but usually less**; band of upper jaw teeth 4 to 6.5 (mean 5) times longer (across mouth) than broad (width of band). Maxillary barbels usually extending past head, 24 to 37% (mean 28.7%) of standard length. **Total gill rakers on first gill arch 14 to 17; rakers present on hind aspect of all gill arches**. Dorsal-fin spine 3/4 to 4/5 of head length, **a filament at its tip**; pectoral-fin spine subequal to and slightly stronger than dorsal-fin spine; anal-fin rays 17 to 22. Adipose-fin base 2/3 to 4/5 of dorsal-fin base.
Lateral line bifurcates at tail base. Caudal peduncle moderately deep, 1.5 to 2.1 (mean 1.8) in its depth.

Colour: bluish brown above, white below; fins yellow, pectoral- and dorsal-fin margins dark, **adipose fin with large black spot**.

Size: Maximum standard length possibly 40 cm.

Habitat, biology, and fisheries: Estuaries and inshore waters. Diet unknown.

Distribution: India through neighbouring coastal states to Singapore, South China Sea, and possibly Sumatra. 1840 Bony Fishes