



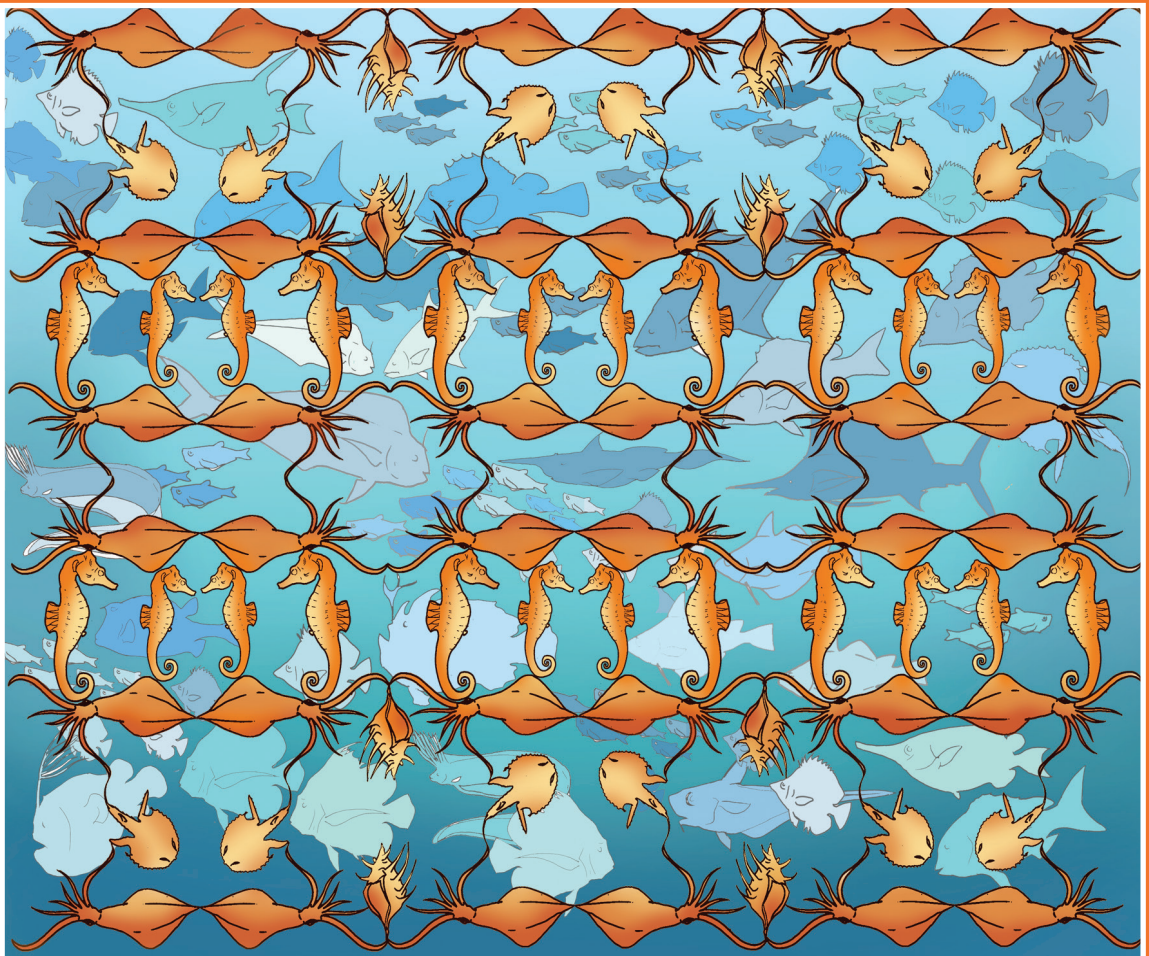
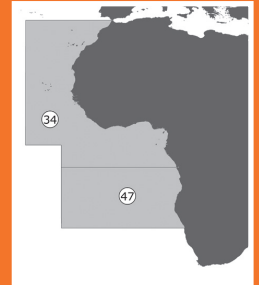
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FAO SPECIES IDENTIFICATION GUIDE FOR FISHERY PURPOSES

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THE LIVING MARINE RESOURCES OF THE
**EASTERN CENTRAL
ATLANTIC**

Volume 4 Bony fishes part 2 (Perciformes to
Tetraodontiformes) and Sea turtles



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THE LIVING MARINE RESOURCES OF THE EASTERN CENTRAL ATLANTIC

VOLUME 4

Bony fishes part 2 (Perciformes to Tetradontiformes) and Sea turtles

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SUMMARY

This multivolume field guide covers the species of interest to fisheries of the major marine resource groups exploited in the Eastern Central Atlantic. The area of coverage includes FAO fishing area 34 and part of 47. The marine resource groups included are bivalves, gastropods, chitons, cephalopods, stomatopods, shrimps, lobsters, crabs, hagfishes, sharks, batoid fishes, chimaeras, bony fishes and sea turtles. The introductory chapter outlines the environmental, ecological, and biogeographical factors influencing the marine biota, and the basic components of the fisheries in the Eastern Central Atlantic. Within the field guide, the sections on the resource groups are arranged phylogenetically according to higher taxonomic levels such as class, order, and family. Each resource group is introduced by general remarks on the group, an illustrated section on technical terms and measurements, and a key or guide to orders or families. Each family generally has an account summarizing family diagnostic characters, biological and fisheries information, notes on similar families occurring in the area, a key to species, a checklist of species, and a short list of relevant literature. Families that are less important to fisheries include an abbreviated family account and no detailed species information. Species in the important families are treated in detail (arranged alphabetically by genus and species) and include the species name, frequent synonyms and names of similar species, an illustration, FAO common name(s), diagnostic characters, biology and fisheries information, notes on geographical distribution, and a distribution map. For less important species, abbreviated accounts are used. Generally, this includes the species name, FAO common name(s), an illustration, a distribution map, and notes on biology, fisheries, and distribution. Each volume concludes with its own index of scientific and common names.

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Editorial Notes

The editorial notes in Volume 1 included descriptions and notes on the geographical limits, institutional affiliations, objectives, history of the project, common and scientific names used, different levels of taxonomic coverage, sizes reported, distribution maps, citations styles, and recognition of scientists and personnel involved in the project. The following editorial notes are intended to supplement information specific to Volumes 2, 3, and 4.

Taxonomy and Systematics of Fishes

This guide has been in production for an unusually long time. This period coincides with many advances in our understanding of the systematics of fishes and subsequent recommendations in the changes in higher taxonomy of fishes (Wiley & Johnson, 2010; Helfman & Collette, 2011; Betancur *et al.*, 2013, Near *et al.*, 2013). These volumes were originally 'typeset' prior to these advances and based primarily on the taxonomy of Nelson (2006). Fortunately, the familial composition of fishes has not changed as dramatically as some of the higher taxonomic levels that have been suggested. We retained Nelson's (2006) taxonomy because of constraints on changing the format of the book and because much of the newer taxonomy still needs to be reconciled more completely in terms of both morphological and molecular evidence. In fact, a recent book on fishes still does not fully incorporate these recommended changes (Hastings *et al.*, 2014). We have attempted to incorporate as many taxonomic updates as possible in the months preceding the publication of these volumes. We have also attempted to contact all of the authors although some original authors are deceased and others have retired or no longer respond to correspondence. We decided to go ahead and print these volumes with the most recent information from authors as possible although some recent taxonomic changes may not have been incorporated. We hope that our decision to print these volumes, together with potential imperfections, is a better alternative than having all the hard work that went into their production go to waste. If questions remain about taxonomy, we recommend consulting Eschmeyer's online Catalog of Fishes (<http://www.calacademy.org/scientists/projects/catalog-of-fishes>) for the most updated pronouncement on familial, genus and species assignments (although in rare cases some authors do not accept these assignments).

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We would also like to reiterate our sincere gratitude to the MAVA Foundation whose grant to the International Union for Conservation of Nature's (IUCN) Global Marine Species Assessment provided much needed support to complete editing of these guides and to convene Red List Assessment workshops for marine fishes of the region. Final desktop publishing and printing of this guide was supported by the EAF-Nansen Project "Strengthening the Knowledge Base for and Implementing an Ecosystem Approach to Marine Fisheries in Developing Countries". We thank the many scientists and facilitators who reviewed distributional and ecological data for marine fishes that improved these guides during these workshops:

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Notes: As several changes in authorship and institutional affiliations have taken place since the printing of the first volume of this book, we have decided to reprint the list of contributing authors so as to present the most updated information. We would like to also take this opportunity to remember our valued contributors who have passed away since the inception of this project, and denote those authors with (†) both here and in their chapters.

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Order PERCIFORMES

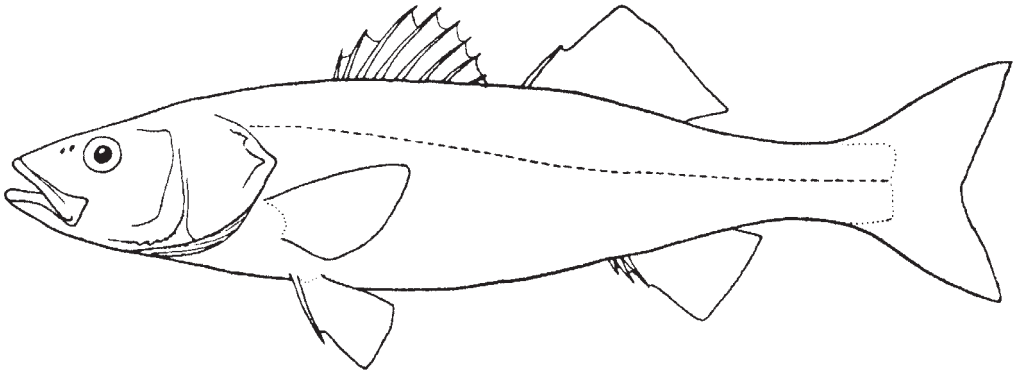
Suborder PERCOIDEI

MORONIDAE

Temperate basses

by P.C. Heemstra, South African Institute for Aquatic Biodiversity, Grahamstown, South Africa

Diagnostic characters: Body elongate, depth subequal to head length; attain 60 to 100 cm. **Rear edge of opercle with 2 flat spines but no horizontal ridge;** preopercle serrate, serrae at angle enlarged, lower edge with 4 to 6 large spines, wide set and pointing anteroventrally; **mouth terminal, slightly protrusile; rear end of maxilla exposed, not slipping under preorbital bone; no supramaxilla;** bands of villiform teeth on jaws, vomer, palatines and tongue. Branchiostegal rays 7, membranes attached at front end of isthmus. Gill rakers lanceolate, slender, 8 or 9 on upper limb, about 15 on lower limb. **Two separate dorsal fins, the first with 8 to 10 slender spines, second dorsal fin with 1 spine, 9 to 14 soft rays;** anal fin with 3 short spines, 10 to 12 soft rays; pectoral fins asymmetric, obtusely pointed, shorter than head; pelvic fins with 1 spine, 5 rays and no scaly axillary process at base; caudal fin emarginate or moderately forked. Scales fairly small, weakly ctenoid; about 55 to 80 in lateral line in eastern Atlantic species; lateral line straight from upper end of gill opening to base of caudal fin. Vertebrae 12 + 13. **Colour: generally silvery;** sometimes with small black spots.

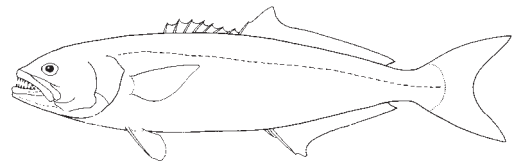


Habitat, biology, and fisheries: Restricted to temperate and subtropical regions; both species in the area are found primarily in coastal and brackish waters; depth range 1 to 30 m. Excellent foodfish. Caught in bottom trawls, beach seines and on hook-and-line. Marketed mostly fresh or frozen. Sometimes used in pond culture.

Remarks: In addition to the 2 eastern Atlantic species of *Dicentrarchus*, this family also includes 4 species of *Morone* of the western North Atlantic and freshwaters of North America, and, formerly, 2 species of *Lateolabrax* from Japan and the northwest Pacific. The family diagnostic characters are based on the 2 species of *Dicentrarchus*. These species have previously been assigned to the Serranidae or Percichthyidae.

Similar families occurring in the area

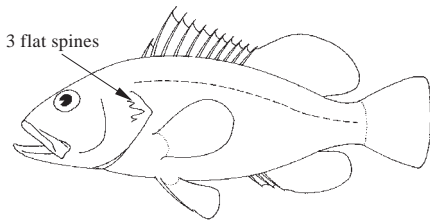
Pomatomidae: dorsal fin with 7 or 8 short spines, soft dorsal and anal-fin rays 23 to 28; anal-fin spines 2.



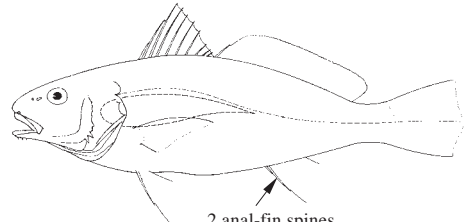
Pomatomidae

Serranidae: single dorsal fin; rear edge of opercle with 3 flat spines; species not silvery.

Sciaenidae: spinous dorsal and soft dorsal fins connected at base of last 2 spines; lateral line extending to rear edge of fin; only 2 spines in anal fin; maxilla partly covered by preorbital bone in most species.



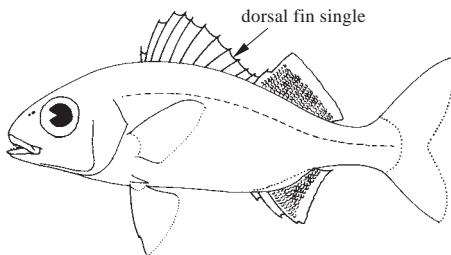
Serranidae



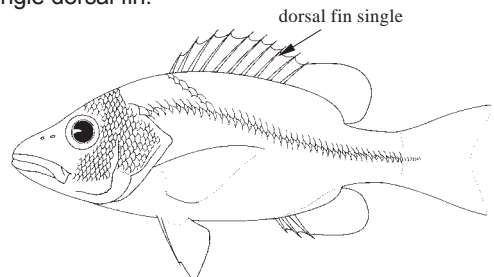
Sciaenidae

Haemulidae: end of maxilla slipping under suborbital bone; single dorsal fin; pelvic-fin base with scaly axillary process.

Lutjanidae: end of maxilla slipping under suborbital bone; single dorsal fin.



Haemulidae




Lutjanidae


Key to species of Moronidae occurring in the area

- 1a. Adults and juveniles with numerous small black spots on body; vomer tooth patch anchor-shaped, with a median band of teeth extending posteriorly . . . ***Dicentrarchus punctatus***
- 1b. Adults uniform silvery; juveniles silvery with several faint dark spots scattered over the body; vomer tooth patch crescentic, no median posterior extension . . . ***Dicentrarchus labrax***

List of species occurring in the area

The symbol  is given when species accounts are included.

 *Dicentrarchus labrax* (Linnaeus, 1758).

 *Dicentrarchus punctatus* (Bloch, 1792).

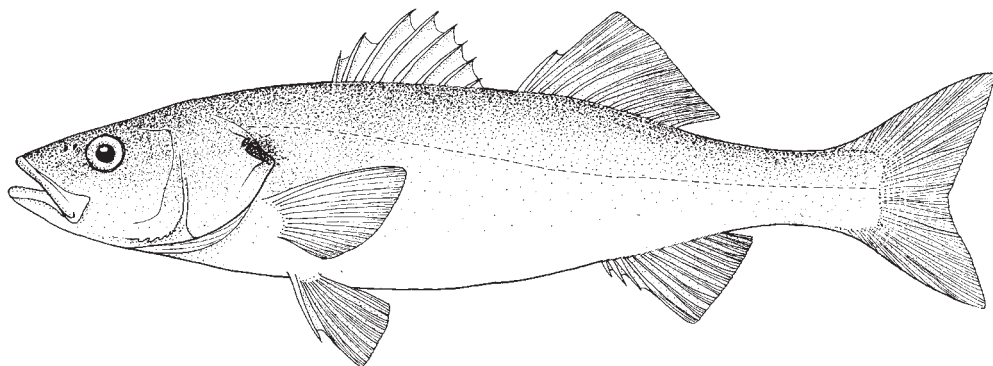
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***Dicentrarchus labrax* (Linnaeus, 1758)**

Frequent synonyms / misidentifications: *Morone labrax* (Linnaeus, 1758) / None.

FAO names: En – European seabass; Fr – Bar européen; Sp – Lubina.



Diagnostic characters: Body elongate, fusiform, body depth less than head length, contained 3.6 to 4.8 times in standard length. Head conical, its length contained 3 to 4 times in standard length; eye diameter about half snout length and about 7 times in head length; maxilla reaches past vertical at front edge of eye. **Bands of villiform teeth on jaws, vomer, palatines and tongue; vomer tooth patch crescentic;** tongue with 3 parallel tooth patches, 1 median, the others submarginal. Preopercle edge serrate, serrae enlarged at angle, lower edge with 4 to 6 large spines, wide set and pointing antero-ventrally. Two separate dorsal fins, first with 8 or 9 slender spines, second dorsal fin with 1 spine, 12 to 14 soft rays; anal fin with 3 spines, 10 to 13 soft rays; caudal fin moderately forked. Gill rakers 7 on upper limb, 16 to 18 on lower limb. Scales in lateral line 62 to 74. **Colour:** silvery grey to bluish dorsally, silvery on the sides, belly and pelvic fins sometimes tinged with yellow. Young may have a few black spots on upper part of body but **adults are unspotted**. Diffuse black spot between spines on upper edge of opercle.

Habitat, biology, and fisheries: Temperate and subtropical coastal waters down to about 200 m, but more common in shallow inshore areas; often in estuaries and sometimes ascending rivers. An active, demersal species found over sandy or rocky substrates. In temperate areas, it moves to deeper water during winter. A voracious predator, feeding mainly on schooling fish and a wide range of invertebrates including shrimps, prawns, crabs, squids, etc. Similar sized fish employ 'pack hunting' techniques to prey on schooling fish. Size at maturity varies by locality. In Tunisian waters, males are mature at 25 cm (age 2 to 3 years) and females mature at 32 cm (age 4 to 5 years). In the United Kingdom males are mature at 34 cm (age 4 to 7), females at 38 cm (age 5 to 8). Separate catch statistics are not reported for this species in Fishing Area 34. Caught in bottom trawls, beach seines and on hook-and-line. Popular game fish. Marketed fresh, smoked or frozen. Commonly used in pond culture.

Size: Maximum 103 cm, 16 kg.

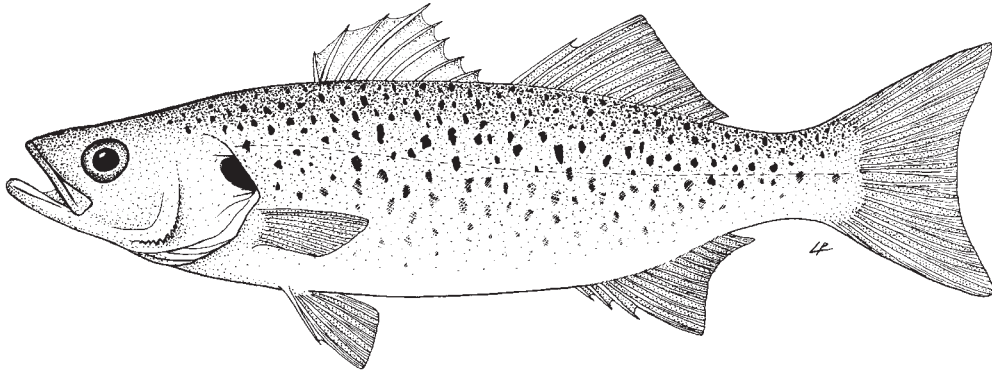
Distribution: From Straits of Gibraltar to Senegal, including Canary and Cape Verde islands; extending into Mediterranean and the Black Sea, northward along Atlantic coast of Europe to Norway.



***Dicentrarchus punctatus* (Bloch, 1792)**

Frequent synonyms / misidentifications: *Morone punctatus* (Bloch, 1792) / None.

FAO names: En – Spotted seabass; Fr – Bar tacheté; Sp – Baila.



Diagnostic characters: Body elongate, body depth contained 3.6 to 4.8 times in standard length. Head conical, its length contained 3 to 4 times in standard length; eye diameter about half snout length and about 7 times in head length; maxilla reaches past vertical at front edge of eye. **Bands of villiform teeth on jaws, vomer, palatines and tongue; vomer tooth patch anchor-shaped, with a median posterior extension.** Preopercle serrate, serrae enlarged at angle, lower edge with 2 or 3 large spines, wide set and pointing anteroventrally. Two separate dorsal fins, first with 8 or 9 slender spines, second dorsal fin with 1 spine, 12 to 14 soft rays; anal fin with 3 spines, 10 to 12 soft rays; caudal fin moderately forked. Gill rakers 6 on upper limb, 15 or 16 on lower limb. Scales in lateral line 57 to 65. **Colour:** silvery grey; bluish dorsally, **adults with small black spots scattered over back and sides;** conspicuous black spot between spines on upper rear edge of opercle.

Size: Maximum total length 70 cm.

Habitat, biology, and fisheries: Inhabits inshore and brackish waters over sand and mixed sand and rocky substrates. Feeds on crustaceans (mainly shrimps), squid, cuttlefish and fish. Caught in bottom trawls, beach seines, trammel nets and on hook-and-line. Separate catch statistics were reported by Senegal, Morocco, and Mauritania. Often used in pond culture. Popular game fish.

Distribution: Straits of Gibraltar to Senegal, including Canary and Cape Verde islands; extending into Mediterranean and along coast of France to Bay of Biscay.



POLYPRIONIDAE

Wreckfish, hapuku (giant sea basses)

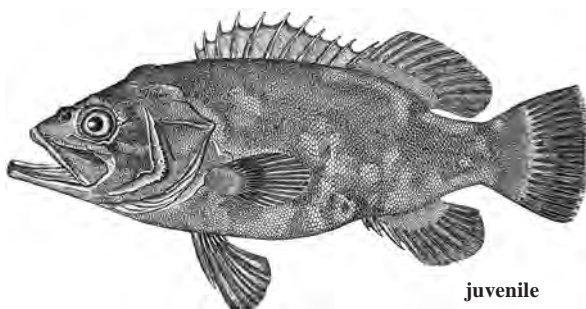
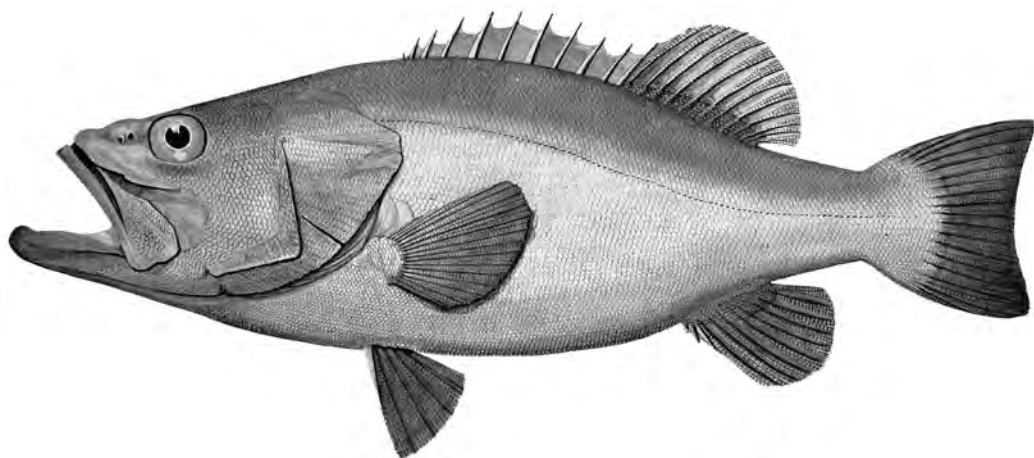
by C.D. Roberts, Museum of New Zealand Te Papa Tongarewa, Wellington, New Zealand

A single species occurring in the area.

Polyprion americanus (Bloch and Schneider, 1801)

Frequent synonyms / misidentifications: *Polyprion cernium* Valenciennes, 1824; *P. moeone* Phillipps, 1927 / *Polyprion oxygeneios* (Schneider and Forster, 1801).

FAO names: En – Wreckfish; Fr – Cernier commun; Sp – Cherna.



juvenile

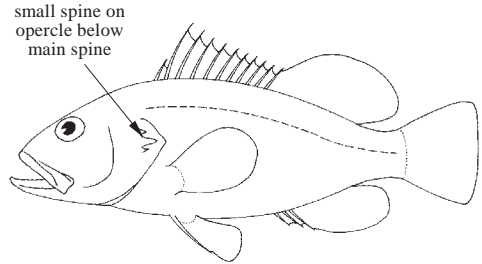
Diagnostic characters: Body robust and deep (2.31 to 2.83 in standard length), with strong striated fin spines. Head large with a **prominent longitudinal bony ridge on the upper part of the gill cover** terminating in a flat spine, a second smaller spine above; serrated bony ridges on nape, above orbits and edges of opercular bones (the serrae becoming reduced in adults). Mouth large, lower jaw projecting; bands of villiform teeth on both jaws, vomer, palatines and tongue. A single continuous dorsal fin with **11 or 12 spines and 11 or 12 soft rays**; anal fin with 3 spines and **9 or 10 soft rays**; caudal fin rounded in juveniles, truncate to slightly emarginate in adults. Substantial allometric variation shown between juveniles and adults, particularly in relative fin sizes. Scales small, ctenoid, covering fleshy fin bases, 70 to 87 tubed scales in lateral line (including 2 or 3 on base of caudal fin). **Colour:** adults uniform dark brown to slate grey on sides of body (sometimes irregular pale markings show temporarily in death); head and back darker dorsally, body lighter ventrally; fins grey black, pelvic streaked with white, caudal with white angles. Pelagic juveniles brownish grey, mottled with irregular pale white to yellow markings, caudal fin with white margin.

Similar families occurring in the area

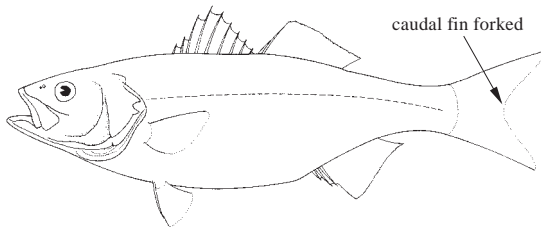
Serranidae (especially subfamily Epinephelinae): distinguished by only a few bony ridges on head, absence of longitudinal ridge on operculum; 3 spines on operculum (upper and lower are small and inconspicuous); irregular-sized teeth, often caniniform, in both jaws.

Moronidae: silvery elongate fishes; with separate dorsal fins; forked caudal fin; no ridge on operculum; found in coastal and estuarine waters.

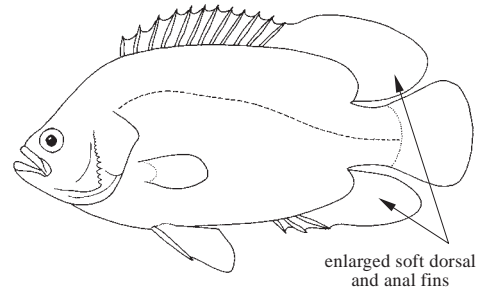
Lobotidae: soft portions of dorsal and anal fins enlarged, forming broadly rounded lobes; no teeth on roof of mouth; no ridge or spines on operculum.



Serranidae



Moronidae



Lobotidae

Size: Maximum 200 cm and 100 kg; commonly to 80 cm and 15 kg.

Habitat, biology, and fisheries: Inhabits rocky and sandy bottoms between 100 and 1 000 m depth, especially around steep cliffs. Continental shelf and upper slope waters throughout its range, also off oceanic islands and on seamounts. Juveniles to 60 cm in length found at the surface associating strongly with floating objects including wreckage (hence its common English name). Sexes separate, not hermaphroditic (Roberts, 1989). Reported to spawn during December to April (but developing gonads often misidentified due to very large size of ripe gonads and eggs). Some continental populations undertake substantial prespawning migrations. Biology poorly known. May be locally common, but easily and quickly overfished to commercial extinction; juveniles form bycatch of oceanic driftnet and purse seine fisheries. Taken on handlines, longlines and in bottom trawls. Marketed fresh locally (often to hotels), also reduced to fishmeal and oil (offshore fleets).

Distribution: In area, from the Straits of Gibraltar to Mauritania, including the Madeira and the Canary Islands. Northwards, extending into the Mediterranean and along the Atlantic coast of Europe, juveniles occurring north to Ireland and Norway in late summer months (Roberts, 1977). Also in the northwestern Atlantic and on the mid-Atlantic Ridge. Elsewhere, recorded from South Africa (Walvis Bay to Natal), the Atlantic seaboard of South America (Brazil to Argentina), St Paul and Amsterdam Islands in the southern Indian Ocean (but possibly confused with *P. oxygeneios*), Australia (WA to NSW) and New Zealand. Not recorded from Pacific coast of South America or in the North Pacific (Roberts, 1986).



Remarks: A large and valuable foodfish that is rarely collected scientifically with relatively few specimens held in museum collections. Hence vouchers are scarce and accurate distributions are uncertain, particularly its southern limit in the present area. Cadenat (1935) recorded wreckfish off Mauritania, but reports of its occurrence south of Senegal including the Cape Verde Islands require verification. The distribution for the area given by Smith (1981) as Straits of Gibraltar to southern Angola is probably in error, and conflicts with the general observation that wreckfish are absent from the tropics. Fortunately identification in the field (particularly where there is known to be only 1 species present) is rapid and reliable if based on the single, longitudinal bony ridge crossing the operculum, a character unique to the genus *Polyprion*. Historically classified in catchall basal percoid families, including Epinephelidae, Serranidae and Percichthyidae; shown to be most closely related to *Stereolepis* and together placed in the Polyprionidae (Roberts, 1986).

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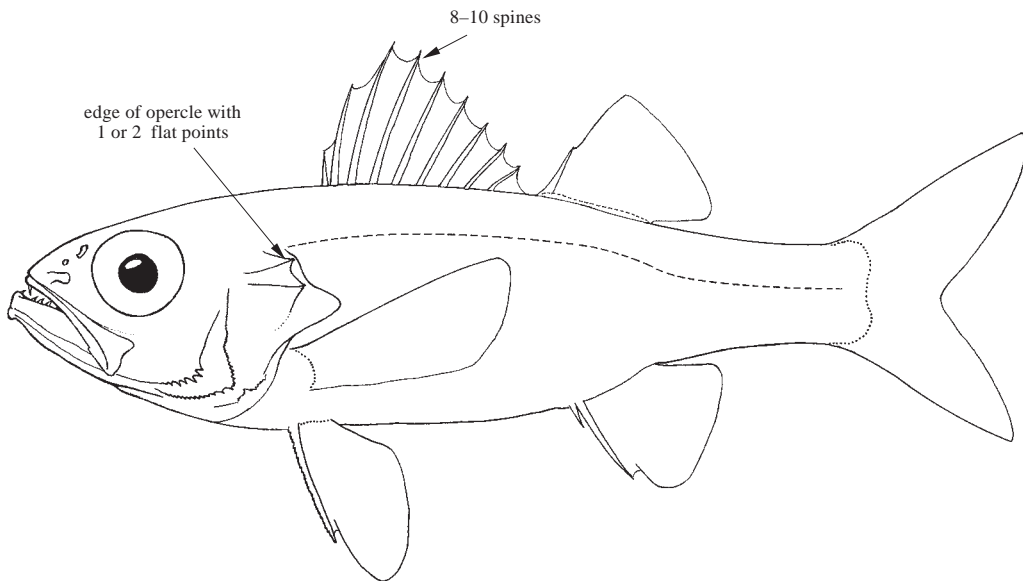
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ACROPOMATIDAE

Acropomatids

by P.C. Heemstra, South African Institute for Aquatic Biodiversity, Grahamstown, South Africa

D **Diagnostic characters:** Body oblong to fusiform, depth less than head length, 3.1 to 4.1 times in standard length; head length 2.5 to 3.3 times in standard length; largest species attains 38 cm. Eye diameter subequal to or more than snout length; snout conical, mouth terminal and slightly protrusile; maxilla naked, expanded posteriorly, mostly exposed when mouth is closed and reaching below middle of eye; supramaxilla present; upper jaw length greater than eye diameter; pair of large canines at front of both jaws; upper jaw with bands of villiform teeth separated at symphysis by a wide toothless gap; lower jaw with bands of villiform teeth anteriorly, a distinct concavity and 1 or 2 pairs of small canines on each side of symphysis; each side of lower jaw with 3 to 6 curved canines; a patch of villiform teeth on vomer and a band of similar teeth on palatines; some minute teeth between and posterior to lateral canines. Eye diameter contained 2.7 to 4.3 times in head length; preorbital narrow, its width 5 to 7 times in eye diameter; inter-orbital area flat; nostrils close together and near front edge of eye; preopercle ridge smooth or serrate; ventral edge of preopercle with strong serrae; **rear edge of opercle with 1 or 2 flat points**. Branchiostegal rays 7, membranes narrowly joined at anterior end of isthmus; gill rakers slender, 12 to 17 on lower limb of first gill arch. **Two dorsal fins, first with 8 to 10 slender spines, second dorsal fin with 1 spine, 9 or 10 rays; anal fin with 2 slender spines, 7 to 10 rays;** pectoral fins more than half head length; pelvic fins with 1 spine and 5 branched rays; inserted below or slightly in front of pectoral-fin base; all fin spines smooth; caudal fin emarginate or slightly forked, with 15 branched rays. Body covered with cycloid, deciduous scales; lateral line continuous. Vertebrae 10 + 15. **Colour:** usually silvery grey, dark brown or blackish.



Habitat, biology, and fisheries: Acropomatids occur in loose aggregations usually near the bottom in depths of 74 to 2 200 m; but some species migrate to near the surface at night. Caught mainly with bottom trawls. Common in some areas, but too small and usually not abundant enough to be of commercial importance.

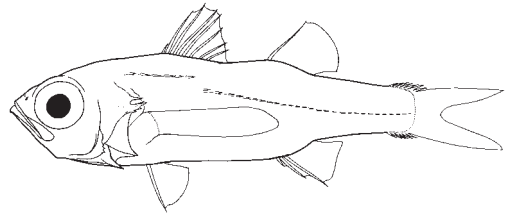
Remarks: The composition and definition of the Acropomatidae are problematic. The species here assigned to this ill-defined 'family' are placed by some recent authors in the Moronidae or Percichthyidae; the genus *Percichthys* comprises 2 species of freshwater fishes in Chile and Argentina; they have 31 to 36 vertebrae and are not closely related to the 'acropomatids'. The family currently comprises 3 or 4 genera with a total of about 12 species. Two species occur in the eastern central Atlantic area.

Similar families occurring in the area

Howellidae: rear edge of opercle with 3 to 7 sharp, slender spines; subopercle and interopercle with large spines; no supramaxilla; first dorsal fin of 7 or 8 spines, second dorsal fin with 1 spine, 8 or 9 soft rays; gap between dorsal fins subequal to spinous dorsal-fin base; anal fin with 3 spines, 6 to 8 soft rays; scales spinoid, adherent.

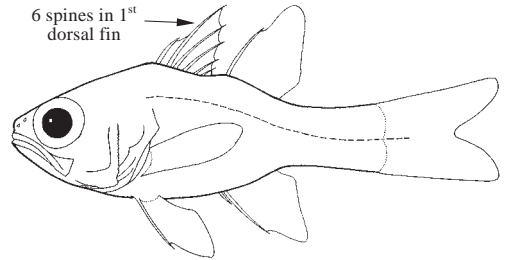
Epigonidae: maxilla slender, greatest width less than one-fifth eye diameter; first dorsal fin with 6 to 8 spines.

Apogonidae: first dorsal fin with 6 or 7 spines; pelvic fins reach anus.

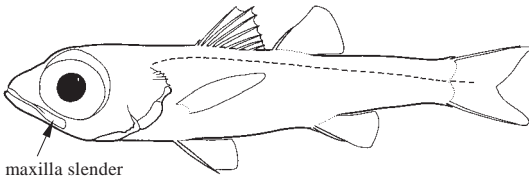


Howellidae

6 spines in 1st dorsal fin



Apogonidae

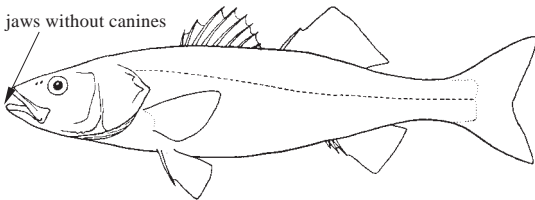


maxilla slender

Epigonidae

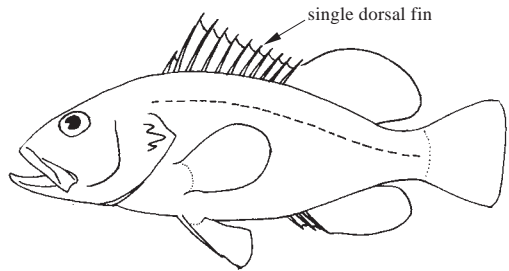
Moronidae: opercle ends in 2 flat points; dorsal fin notched to the base in front of soft-rayed part, with 8 or 9 spines in first part, 1 spine and 10 to 13 rays in second fin; anal fin with 3 spines, 10 to 12 rays.

Serranidae: single dorsal fin; 3 spines on opercle; most species with 3 anal-fin spines.



jaws without canines

Moronidae



single dorsal fin

Serranidae

Key to species of Acropomatidae occurring in the area

- 1a. Dorsal fins separated by a gap about equal to eye diameter; pectoral fins not reaching vertical at anus; lateral-line scales 29 or 30; distinct longitudinal ridge on lateral surface of maxilla; preopercle ridge smooth (Fig. 1) ***Synagrops japonicus***
- 1b. Dorsal fins contiguous; pectoral fins reach well past anal-fin origin; lateral-line scales about 40; no longitudinal ridge on maxilla; ventral limb of preopercle ridge serrate (Fig. 2) ***Synagrops microlepis***

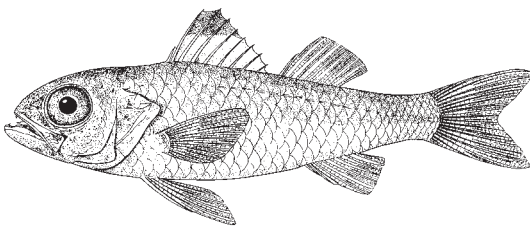


Fig. 1 *Synagrops japonicus*

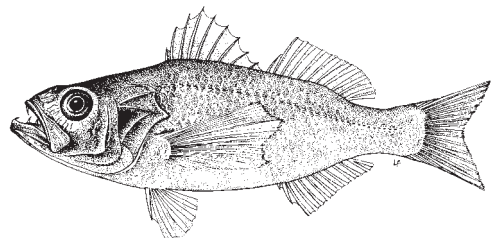




Fig. 2 *Synagrops microlepis*

List of species occurring in the area

The symbol  is given when species accounts are included.

 *Synagrops japonicus* (Döderlein, 1883).

 *Synagrops microlepis* Norman, 1935.

References

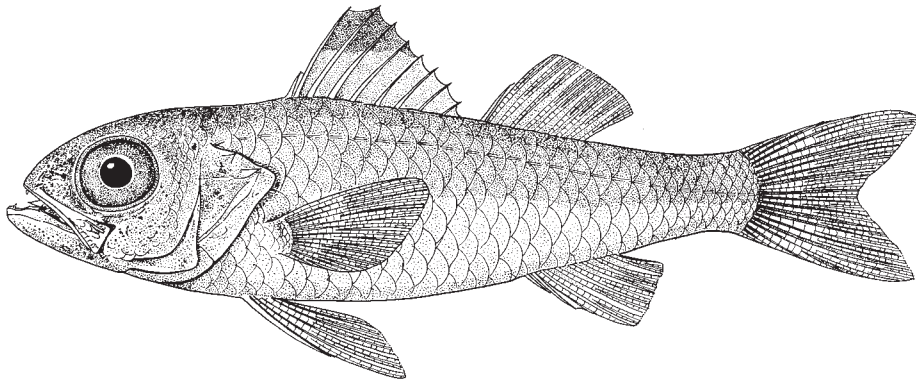
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Synagrops japonicus (Döderlein, 1883)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Blackmouth splitfin; Fr – Maconde bouche; Sp – Maconda boquinegra.



Diagnostic characters: Body depth contained 3.3 to 4.1 times in standard length; head length 3.0 to 3.3 times in standard length. Eye diameter more than snout length. Preopercle edge finely serrate, the serrae at angle enlarged; **preopercle ridge smooth**; **opercle rear edge with 2 flat spines**; **subopercle and interopercle distinctly serrate**; **distinct longitudinal ridge along middle of proximal two-thirds of maxilla**; **supramaxilla present**; lower jaw with distinct concavity on each side of symphysis and 4 to 6 strong canines along front two-thirds of jaw; some minute teeth between and posterior to lateral canines; triangular patch of villiform teeth on vomer and a band of similar teeth on each palatine. Gill rakers stout, 12 to 15 on lower limb of first arch. **First dorsal fin with 8 or 9 spines, second dorsal fin with 1 spine, 9 or 10 soft rays**; **dorsal fins separated by a gap subequal to eye diameter**; **anal fin with 2 spines, 7 or 8 rays**; pectoral-fin rays 15 to 17, fin not reaching vertical at anus; pelvic fins shorter than pectorals. **Lateral line scales 28 to 30**. Swimbladder bifurcate anteriorly, connected to cranium. **Colour:** adult dark brown or black, head paler; dorsal-fin margin, inside of mouth and gill cavity black.

Size: Maximum total length 38 cm.

Habitat, biology, and fisheries: Found near bottom in depths of 50 to 1 000 m. Feeds on crustaceans, fish and cephalopods. Separate statistics are not reported for this species. Caught with trawls.

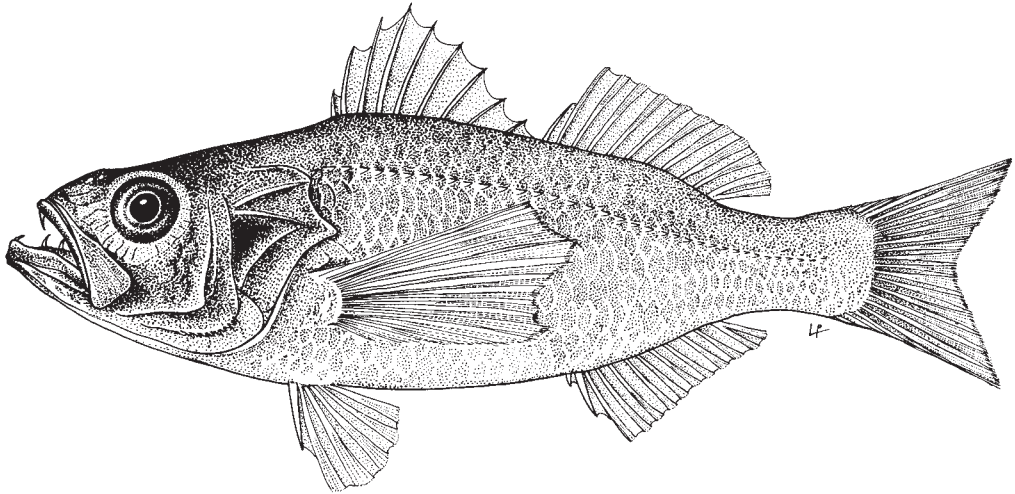
Distribution: Eastern Atlantic from Guinea to Angola; western Atlantic from Canada and Bermuda to southern Brazil, including Gulf of Mexico and Caribbean. Indo-central Pacific from South Africa to Hawaii.



Synagrops microlepis Norman, 1935

Frequent synonyms / misidentifications: None / None.

FAO names: En – Smallscale splitfin.



Diagnostic characters: Body depth contained 3.1 to 4.1 times in standard length; head length 2.5 to 2.9 times in standard length. Ventral limb of preopercle edge coarsely serrate, the vertical (rear) edge paper-thin and smooth; 4 to 7 serrae on ventral limb of preopercle ridge, vertical limb of ridge smooth; opercle rear edge with 2 flat spines; subopercle and interopercle distinctly serrate; no longitudinal ridge on maxilla, supramaxilla long and slender; pair of close-set fixed canines at front of lower jaw, fitting in between 2 larger, fixed canines at symphyseal notch on front of upper jaw; lower jaw with bands of villiform teeth anteriorly, shallow concavity and 1 or 2 pairs of small canines on each side of symphysis; each side of lower jaw with 3 or 4 curved canines; V-shaped band of minute, sharp teeth on vomer and band of similar teeth on palatines. Gill rakers 14 to 17 on lower limb of first arch. **Dorsal fin divided to base before last spine; first part with 9 or 10 spines, second part with 1 spine, 10 soft rays; anal fin with 2 slender spines, first very short, and 9 or 10 rays; pectoral-fin rays 18 or 19; pelvic fins a little shorter than pectorals. Lateral-line scales about 40 including 2 or 3 on caudal fin.** Swimbladder not connected to cranium and not bifurcate anteriorly. Pyloric caeca 4. **Colour:** adults brown; dorsal part of head and body covered with small melanophores; peritoneum and inside of operculum black.

Size: Maximum total length 18 cm.

Habitat, biology, and fisheries: Found near bottom in depths of 70 to 1 000 m. Feeds on crustaceans, fish and cephalopods. Mature at 10 cm. Separate statistics are not reported for this species. Caught with trawls.

Distribution: Eastern Atlantic from Gambia and Guinea to Walvis Bay, Namibia.



SYMPHYSANODONTIDAE

Bunquelovelies (wampeejawed fishes, shelf beauties, slopefishes)

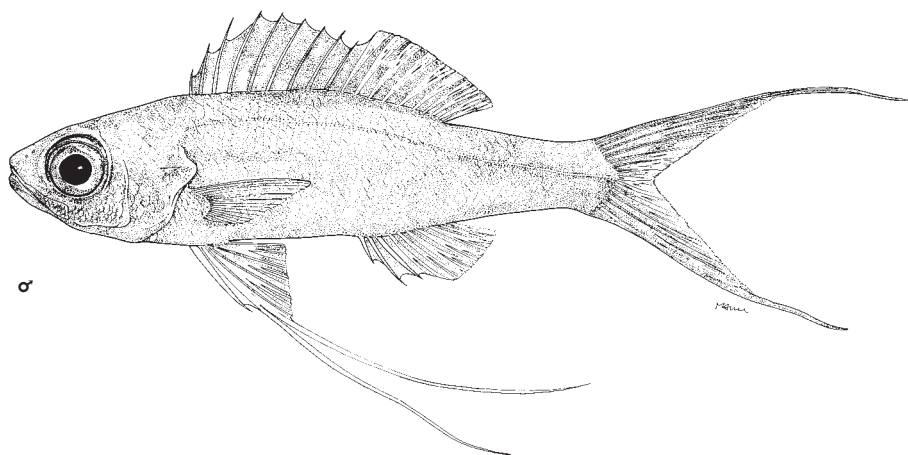
by W.D. Anderson, Jr., Grice Marine Biological Laboratory, Charleston, SC, USA

A single species occurring in the area.

Symphysanodon berryi Anderson, 1970

Frequent synonyms / misidentifications: None / None.

FAO names: En – Slope bass.

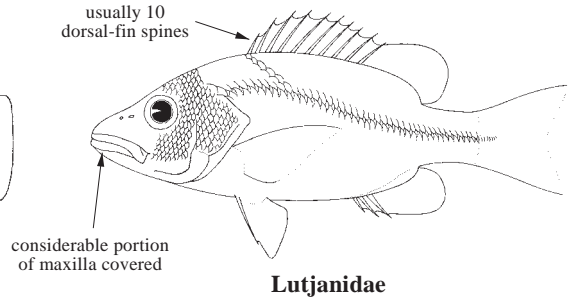
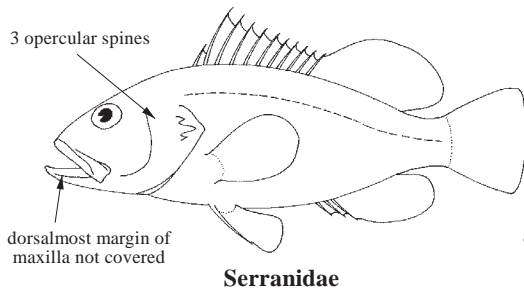


Diagnostic characters: Body slender, depth 20 to 28% standard length, somewhat compressed. Head moderate. Eye rather large, its diameter longer than snout. Snout relatively blunt. **Anterior ends of premaxillae incised, forming conspicuous symphyisial notch that receives anterior ends of dentaries.** Mouth terminal and oblique; jaws about equal. **Extreme dorsalmost margin of maxilla covered by very narrow suborbital with mouth closed.** Premaxilla with small teeth—usually larger anteriorly; symphyisial notch toothless. Dentary with small teeth usually extending from posterior elevation of the bone almost to symphysis; teeth on and near posterior elevation usually larger; **usually a number of relatively large exerted teeth at anterior ends of dentaries—these teeth fitting into symphyisial notch in premaxillae with mouth closed.** No teeth on vomer, palatines, pterygoids, or tongue. **Most of head, including maxillae and dentaries, covered with scales. Suborbital extremely narrow, its height (width) about 1% standard length.** Opercular spines 2. Branchiostegal rays 7. Gill rakers on first arch 9 to 12 on upper limb and 24 to 28 on lower limb, total 34 to 39. Dorsal fin continuous, not incised at junction of spinous and soft rays. Dorsal and anal fins without scales, but with scaly sheaths at their bases. Pelvic axillary scales and scaly interpelvic process well developed. Caudal fin deeply forked; **both lobes of fin produced into filaments in large males, increasing in length with increase in standard length. Length of upper caudal-fin lobe 29 to more than 128% standard length, varying from 30 to more than 35% standard length in females more than about 80 mm standard length and from 34 to more than 128% standard length in males more than about 85 mm standard length. Length of lower caudal-fin lobe 28 to more than 111% standard length, varying from 30 to more than 34% standard length in females more than about 80 mm standard length and from 32 to more than 111% standard length in males more than about 85 mm standard length.** Pelvic fin usually not extending to vent in females; first pelvic-fin soft ray noticeably elongated in males more than about 85 mm standard length, increasing in length with increase in standard length, extremely filamentous in large individuals; medial branch of first pelvic-fin soft ray reaching past fork of caudal fin in some large males. Length of pelvic fin 20 to more than 87% standard length, varying in females from 21 to 25% standard length and in males from 30 to more than 87% standard length in specimens more than about 85 mm standard length. Dorsal fin with 9, very rarely 8, spines and 10, very rarely 9 or 11, soft rays. Anal fin with 3 spines and 7 soft rays. Principal caudal-fin rays 17 (9 in upper lobe + 8 in lower lobe); branched caudal-fin rays 15 (8 in upper lobe + 7 in lower lobe). Pectoral fin with 16 to 18, usually 17, rays. Pelvic fin thoracic, inserted beneath pectoral fin, with 1 spine and 5 soft rays. Scales moderate in size, ctenoid. Tubed scales in lateral line 48 to 52. Vertebrae 25 (10 precaudal + 15 caudal). **Colour:** head and body mostly bright orange; iris of eye with considerable orange.

Similar families occurring in the area

Serranidae: 3 opercular spines; dorsalmost margin of maxilla not covered by suborbital when mouth closed; vertebrae usually 24 or 26.

Lutjanidae: maxilla covered to considerable degree by suborbital when mouth closed; anterior ends of premaxillae not incised to form conspicuous symphyseal notch that receives anterior ends of dentaries when mouth closed; 10, 11, or 12 dorsal spines; vertebrae 24.



Size: Maximum standard length to about 16 cm, commonly to 12 cm.

Habitat, biology, and fisheries: Bottom-associated, collected from depths of 101 (101 to 256) to 476 m over the lower continental shelf and upper continental slope and around islands. Probably planktivorous. Due to its small size of no interest to fisheries, but most likely important as food for larger species of fishes.

Distribution: Adults are widely distributed in the western Atlantic from Bermuda and North Carolina to northern South America, including the West Indies, Gulf of Mexico, and Caribbean Sea; in the central Atlantic off Ascension Island; and in the eastern South Atlantic from localities well north of the Island of St Helena and west of the Island of Pagalu (Annobón). There are a number of collections of larval and postlarval *Symphysanodon* from the western Atlantic north of North Carolina, 1 record being from Lat. 41.6°N (well to the southeast of Sable Island, Nova Scotia); some of those specimens may be representatives of *S. berryi*.

Remarks: *Symphysanodon* has been considered variously as a member of the Acropomatidae, Serranidae, or Lutjanidae, but it lacks traits that would support assigning it to one of those families. *Symphysanodon rhax*, closely related to *S. berryi*, occurs in the western Indian Ocean. Counts of gill rakers are of those on the first arch, including rudiments, when present. Counts of lateral-line scales are of tubed scales.



References

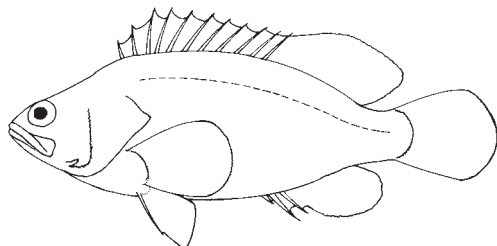
- Anderson, W.D., Jr.** 1970. Revision of the genus *Symphysanodon* (Pisces: Lutjanidae) with descriptions of four new species. *Fisheries Bulletin*, 68: 325–346.
- Anderson, W.D., Jr.** 2003. Symphysanodontidae. In K. E. Carpenter, ed. The living marine resources of the western central Atlantic. Vol. 2. Bony fishes part 1 (Acipenseridae to Grammatidae). *FAO Species Identification Guide for Fishery Purposes and American Society of Ichthyologists and Herpetologists Special Publication No. 5*. Rome, FAO. pp. 1304–1307.
- Anderson, W.D., Jr. & Springer, V.G.** 2005. Review of the perciform fish genus *Symphysanodon* Bleeker (Symphysanodontidae), with descriptions of three new species, *S. mona*, *S. parini*, and *S. rhax*. *Zootaxa*, 996: 1–44.

SERRANIDAE

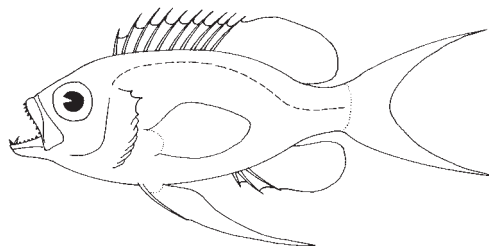
Groupers (seabass, hinds, creolefish, combers, anthiines, soapfish)

by P.C. Heemstra, South African Institute for Aquatic Biodiversity, Grahamstown, South Africa and
W.D. Anderson Jr. (Anthiinae) Grice Marine Biological Laboratory, Charleston, SC, USA

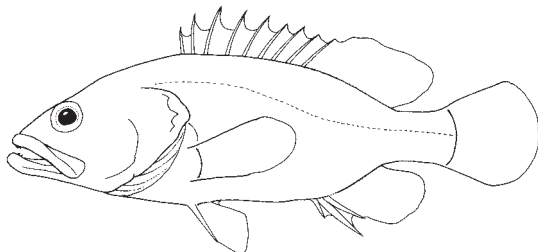
Diagnostic characters: Body oblong, robust or compressed and deep-bodied to moderately slender, small to enormous fishes: the largest grouper (*Epinephelus itajara*) attains 2.5 m and a weight of 400 kg, and the smallest serranid in the area may be *Pseudogramma guineensis*, which is known from a single 23 mm standard length specimen. Mouth moderate to large, horizontal (terminal), or moderately oblique with lower jaw slightly projecting; upper jaw slightly protrusile; **maxilla broad, its rear end not covered by preorbital bone when mouth is closed; teeth slender, conical or villiform, some enlarged as canines; no molars or incisiform teeth; vomer and palatine bones usually with patches of villiform teeth; tongue edentate in most species. Rear edge of opercle with 3 flat spines, the lower (ventral) and upper (dorsal) spines often inconspicuous (merely acute projections of opercle edge) and more or less hidden by skin and scales; preopercle without lateral ridge, its vertical limb serrate, the lower (horizontal) limb serrate or undulate, sometimes with strong antrorse (forward-directed) spines; some species with a pronounced lobe at preopercle angle. Branchiostegal rays 7, the membranes separate, connected to anterior end of isthmus;** pseudobranch (on inner side of gill cover) well developed; gill rakers long or short, often bearing minute teeth. Dorsal fin single, with 9 to 11 spines (2 or 3 dorsal spines in *Rypticus*, 7 or 8 in *Pseudogramma*) and 10 to 19 rays; anal fin with 3 spines (no anal-fin spines in *Rypticus*), 6 to 17 rays; pectoral fins rounded to somewhat pointed, with 13 to 22 rays; pelvic fins slightly ahead or behind pectoral-fin base, with 1 spine and 5 branched soft rays, the innermost often connected to the body by a membrane for one-fourth of its length or more; **scaly axillary process of pelvic fin rudimentary or absent,** caudal fin forked, lunate or rounded, with 13 or 15 branched rays. Scales small to moderately large, sometimes deeply embedded, usually ctenoid, but nearly smooth in some species. Head at least partly scaled, snout and preorbital region usually naked; post-temporal bone sometimes serrate. Vertebrae usually 10 plus 14, occasionally 1 or 2 more. **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 helpful for identification of species, but one needs to be aware of variations within species.



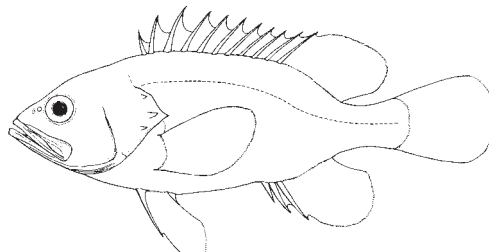
Alphestes



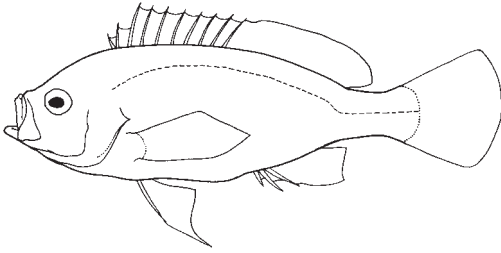
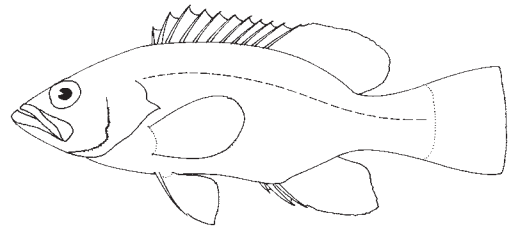
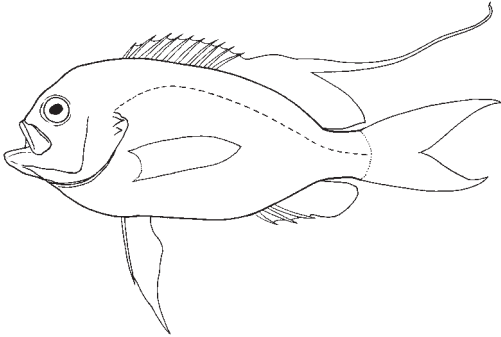
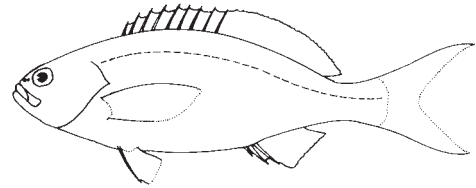
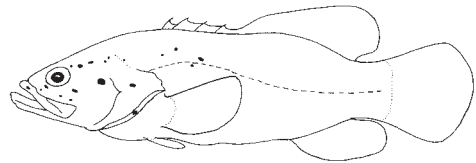
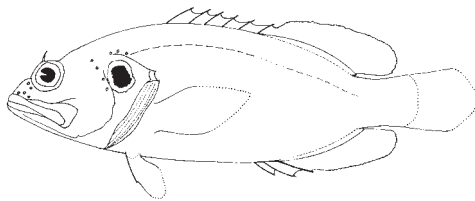
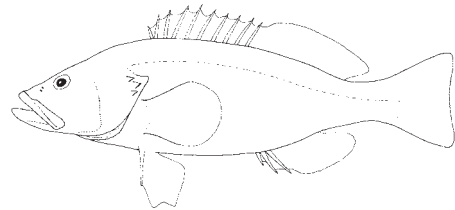
Anthias



Cephalopholis



Epinephelus

*Holanthias**Mycteroperca**Meganthias**Paranthias**Rypiticus**Pseudogramma**Serranus*

Habitat, biology, and fisheries: Seabass and groupers are mostly demersal (benthic or bottom-oriented) fishes of tropical and warm temperate areas, ranging from shallow coastal waters to depths of 600 m; the great majority of species occur on continental or insular shelves in less than 200 m. Although some serranids prefer seagrass beds and mud or sandy bottoms, most species are found on coral reefs and rocky (high relief) substrate. Juveniles of a few species are common in lower reaches of estuaries. Except for breeding aggregations, most groupers are solitary, but most anthiines (subfamily Anthiinae) occur in groups apparently feeding on zooplankton a few metres above the bottom or further up in the water column. Seabass seem more gregarious than groupers (perhaps because they are usually smaller); but, like groupers, most serranines are sedentary and often seen sitting on the bottom. All serranids are predators, feeding on invertebrates (mainly crustaceans and cephalopods) and fishes; most anthiines and a few other serranids have numerous long gill rakers and are thus adapted for feeding on zooplankton.

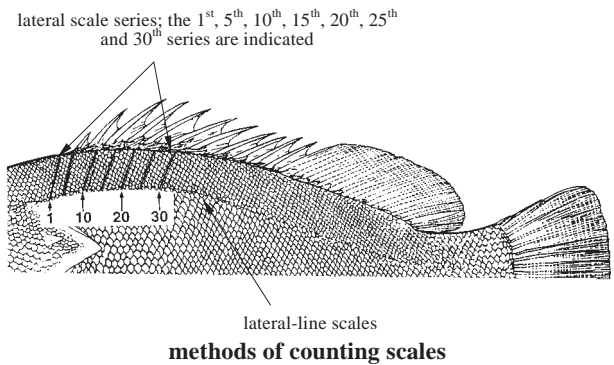
Although the reproduction of many species has yet to be studied, it appears that the vast majority of serranids are hermaphroditic. Anthiines and most groupers (Tribe Epinephelini) represented in the area are probably protogynous hermaphrodites, i.e. they mature first as females and, after spawning 1 or more times as females, they change sex, spawning thereafter as males. Synchronous (simultaneous) hermaphroditism, with both sexes functional at the same time in a single individual, is characteristic of most species in the subfamily Serraninae. Although *Serranus subligarius* of the western central Atlantic can fertilize its own eggs, it usually spawns in pairs; and the fish alternately coordinate release of eggs or sperm. Consequently, their eggs are fertilized by their partner's sperm rather than their own.

Some groupers form large aggregations at specific sites for spawning, making them more vulnerable to overfishing. These spawning aggregations should be protected from fishing, as they are essential to the replenishment of grouper populations. 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 (large species may not be mature until an age of 8 to 10 years) also contribute to the vulnerability of grouper populations.

Groupers are among the most highly-priced foodfishes and are avidly sought by commercial, artisanal and sport fishermen. Serranids are caught with hook-and-line, gillnets, trammel nets, bottom set longlines, spears, traps and trawls. Some groupers are important in aquaculture, and a few species have been spawned in captivity. The smaller serranids, particularly the colourful Anthiinae and Serraninae are valuable aquarium fish.

Remarks: The composition of the family used here follows Johnson (1983, 1984) and Baldwin and Johnson (1993). In the 1981 edition of the FAO Species Identification Sheets for the eastern central Atlantic, the serranid tribe Grammistini and subfamily Anthiinae were recognized as separate families; and the Atlantic cavebass, *Centrarchops chapini* Fowler 1923, was included in the Serranidae. *Centrarchops chapini* is a synonym of *Centrarchops atlanticus* (Reichenow, 1877) and is now assigned to the family Dinopercidae. The wreckfish or cherna, *Polyprion americanus* (Bloch and Schneider, 1801) was also included in the Serranidae, but this species is now placed in the family Polyprionidae.

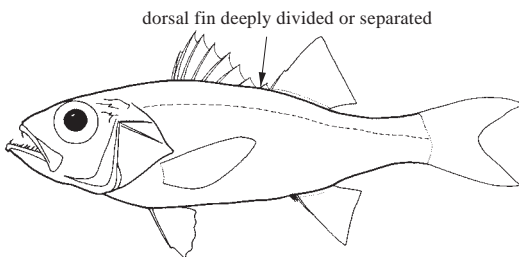
The lateral-scale series of groupers are the oblique series of scales running dorso-posteriorly above the lateral line; these scales are counted from the first lateral-line scale (at the upper end of gill opening) to the base of the caudal fin; the circum-peduncular scale counts are the least number of scale rows around the narrowest part of the caudal peduncle. The last dorsal and anal-fin rays are usually double (split to the base) but counted as a single ray. Total gill raker counts include rudimentary rakers, which are wider than high and spaced at the same intervals as the gill rakers. The inter-nostril distance is from the rear edge of the front nostril to the front edge of the rear nostril; snout length is measured with the mouth closed and the upper jaw retracted, from the front of the premaxillary symphysis to the front edge of the bony orbit. The anal-fin length is from the origin of the anal fin to the tip of the longest fin ray, with fin depressed.



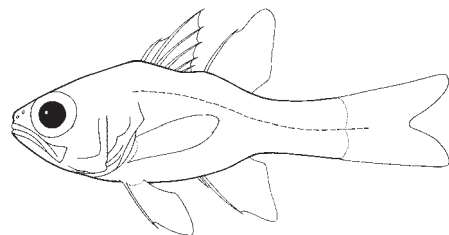
Similar families occurring in the area

Acropomatidae: rear edge of opercle with 2 flat points; dorsal fin deeply divided into a spinous fin with 9 or 10 spines separated by a distinct gap or deep notch from a soft-rayed fin with 1 spine and 9 or 10 rays; anal fin with 2 slender spines and 7 to 10 rays; scales cycloid, deciduous.

Apogonidae: 2 dorsal fins, first with 6 or 7 spines; anal-fin spines 2; pelvic fins reach anus.



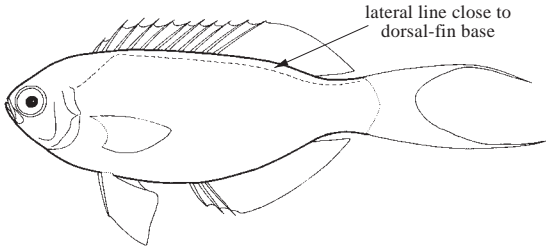
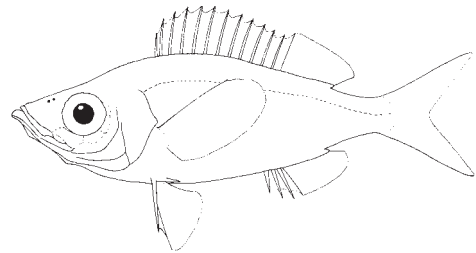
Acropomatidae



Apogonidae

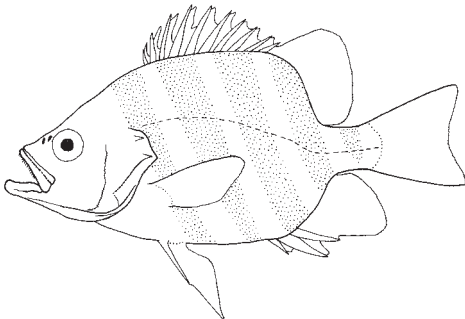
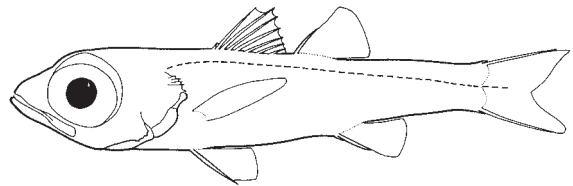
Callanthiidae: lateral line running 1 or 2 scale rows below dorsal-fin base and ending just behind last ray or continuing on dorsolateral surface of caudal peduncle; rear edge of opercle with 1 or 2 spines; preopercle edge smooth; branchiostegal rays 6; olfactory organ devoid of lamellae.

Centracanthidae: upper jaw extremely protrusible; well-developed joint between distal ends of premaxilla and maxilla; teeth minute, no canines; maxilla covered by preorbital bone when mouth is closed; preopercle smooth; no spines on opercle; well-developed scaly axillary process at base of pelvic fins.

**Callanthiidae****Centracanthidae**

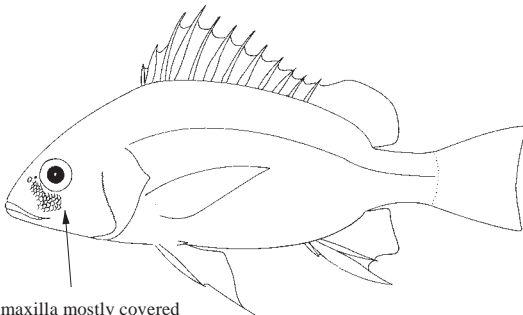
Dinopercidae: body depth much greater than head length and about half standard length; rear edge of opercle with 2 flat points; lips and jaws covered with minute fleshy villi.

Epigonidae: dorsal fins separate, first with 6 to 8 spines, second with 1 spine and 8 to 11 rays; anal fin with 1 to 3 spines and 7 to 10 rays; eye diameter about one-third or more of head length.

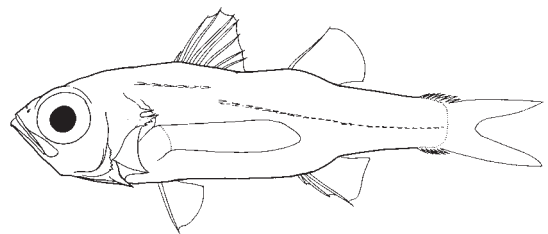
**Dinopercidae****Epigonidae**

Haemulidae: maxilla mostly covered by preorbital bone when mouth is closed; no teeth on vomer or palatines; no spines on opercle.

Howellidae: rear edge of opercle with 3 to 6 sharp, slender spines; subopercle and interopercle with a large spine; spinous dorsal fin of 7 or 8 spines, soft dorsal fin of 1 spine, 8 or 9 rays; gap between dorsal fins is subequal to or longer than spinous dorsal-fin base; scales spinoid, adherent.

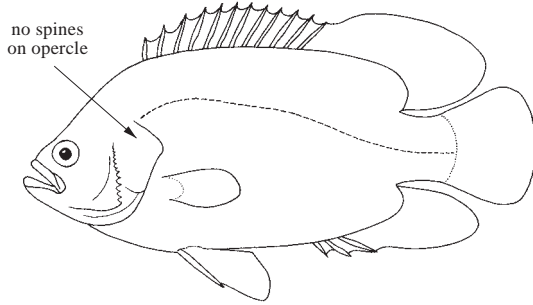
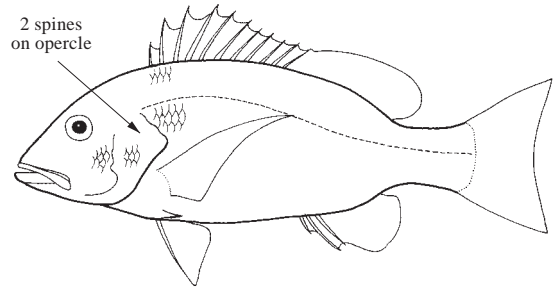


maxilla mostly covered
by preorbital bone

Haemulidae**Howellidae**

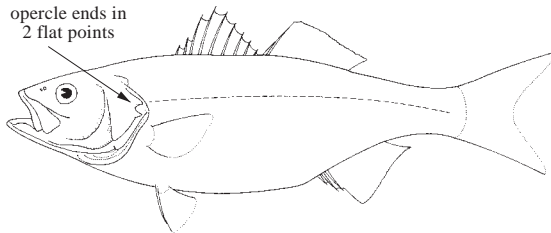
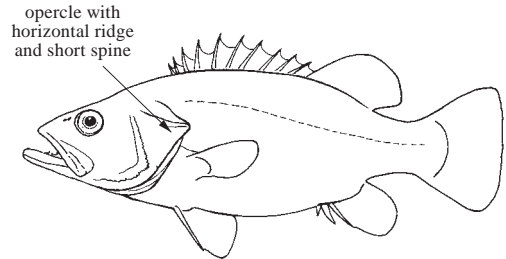
Lobotidae: no spines on opercle; preopercle coarsely serrate; no teeth on vomer or palatines; soft dorsal and anal fins enlarged, projecting well past caudal-fin base.

Lutjanidae: maxilla mostly covered by preorbital bone when mouth is closed; 2 spines on opercle; scaly axillary process at base of pelvic fins usually well developed.

**Lobotidae****Lutjanidae**

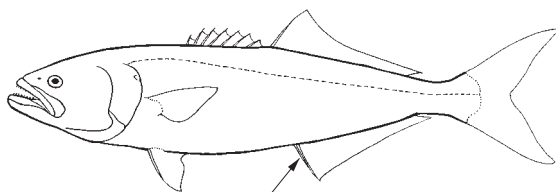
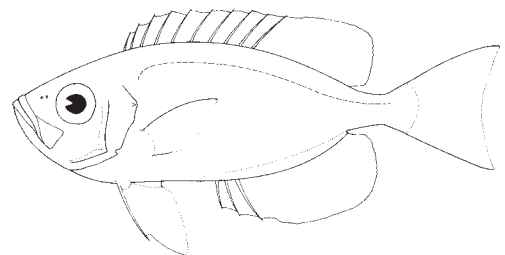
Moronidae: opercle ends in 2 flat points; dorsal fin notched to the base in front of soft-rayed part, with 8 or 9 spines in first part, 1 spine and 10 to 13 rays in second fin.

Polyprionidae: opercle with distinct horizontal ridge ending in a short spine; preopercle with large spines in juveniles, serrate in adults; dorsal fin with 11 or 12 spines and 11 or 12 soft-rays; pectoral fins shorter than pelvic fins.

**Moronidae****Polyprionidae**

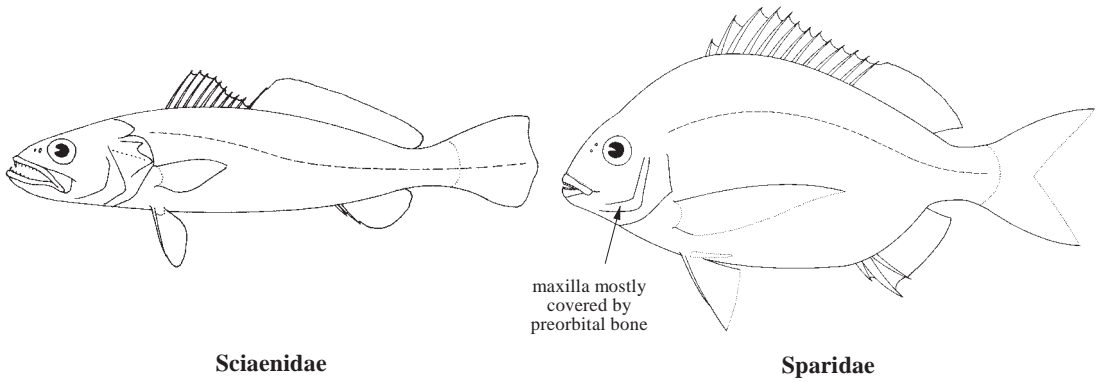
Pomatomidae: silvery fish; dorsal fin with 7 or 8 low spines and long second dorsal fin with 1 spine and 23 to 28 rays; 2 spines in anal fin (3 or none in Serranidae).

Priacanthidae: eyes huge, diameter greater than snout length and more than a third of head length; opercle with a single small spine; pectoral fins much smaller than head or pelvic fins.

**Pomatomidae****Priacanthidae**

Sciaenidae: only 1 or 2 anal-fin spines; lateral line continuing to end of tail; dorsal-fin margin deeply notched before soft-rayed part; soft dorsal-fin base almost twice length of spinous dorsal-fin base; rear edge of opercle forming 2 flat points.

Sparidae: jaws with incisiform and/or molariform teeth; distal (posterior) end of maxilla and premaxilla connected, forming a movable joint; maxilla mostly covered by preorbital bone when mouth is closed; no scales on cheek; no spines on opercle; edge of preopercle smooth.



Key to the species of Serranidae occurring in the area

- 1a. Dorsal fin with 9 to 11 spines and 10 to 20 rays; anal fin with 3 spines and 6 to 13 rays; most of upper edge of operculum free, not connected by skin to body (Fig. 1a) → **2**
- 1b. Dorsal fin with 3 or 7 spines and 20 or 25 rays; anal-fin rays 14 to 17; most of upper edge of operculum joined by skin to body (Fig. 1b) → **30**

- 2a. A thin, movable supramaxilla bone along upper rear edge of maxilla (Fig. 2a); (the supramaxilla is covered by skin and not obvious, but it can be discerned by pushing the upper edge of the maxilla with a fingernail or dissecting needle; the supramaxilla is more apparent if the skin is cut and peeled off the free rear part of the maxilla); most teeth depressible (hinged); scaly flap of skin joining upper part of inner (medial) side of pectoral-fin base to body; soft dorsal and anal fins mostly covered with skin and scales; scales on body small, lateral-scale series (69 to 146) more numerous than lateral-line scales; dorsal fin with 9 to 11 spines and 13 to 20 rays → **3**
- 2b. Supramaxilla absent (Fig. 2b) teeth fixed (not depressible); no scaly flap of skin joining upper part of pectoral-fin base to body; soft dorsal and anal fins mostly naked (except in *Meganthias carpenteri*), hence the rays are easy to count; scales larger, lateral-scale series about equal to number of lateral-line scales (37 to 55); dorsal fin with 10 spines and 10 to 18 soft rays → **16**

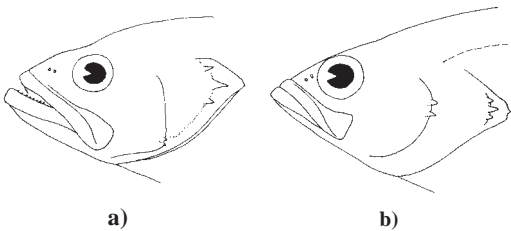


Fig. 1 operculum

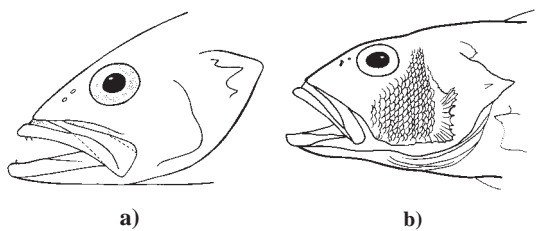


Fig. 2

3a. Tail fin deeply forked (Fig. 3) the middle rays less than half length of upper and lower fin lobes; dorsal fin with 9 spines and 17 to 19 rays; head length less than body depth, contained 3.4 to 3.9 times in standard length; gill rakers 12 to 14 on upper limb, 24 to 26 on lower limb; pectoral fin longer than head

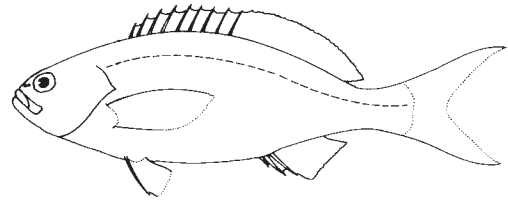


Fig. 3

..... ***Paranthias furcifer***

3b. Tail fin rear margin truncate, convex, rounded, emarginate or distinctly concave, middle rays more than half length of uppermost or lowermost rays; dorsal fin not with 9 spines and 17 to 19 rays; head length less than body depth, 2.3 to 3.3 times in standard length → 4

4a. Dorsal-fin spines 9; tail fin rounded or convex; a knob or protuberance on lower rear corner of maxilla → 5

4b. Dorsal-fin spines 11; tail fin truncate, rounded or emarginate; no knob on rear end of maxilla → 6

5a. Anal-fin rays 8; body dark brownish, with 3 or 4 indistinct dark bars extending onto dorsal fin and 2 more on peduncle; belly reddish; head with close-set reddish spots forming a reticulated pattern of dark lines; juveniles may have red spots all over head and body ***Cephalopholis nigri***

5b. Anal-fin rays 9 or 10; head, body and fins reddish orange, covered with small blue spots; fins blackish distally, the soft dorsal, caudal and anal fins with narrow bluish edge; horizontal blue line under eye; a black variety with blue spots is uncommon ***Cephalopholis taeniops***

6a. Large antrorse spine at corner of preopercle (covered by skin); snout less than or equal to eye diameter; colour uniform brownish, or brown with numerous small dark spots ***Alphestes afer***

6b. No large anteriorly-directed spine on preopercle; snout longer than eye diameter → 7

7a. Anal-fin rays 10 to 12; gill rakers on lower limb of first gill arch 20 to 31. → 8

7b. Anal-fin rays 7 to 9; lower gill rakers 13 to 18 → 9

8a. Lower-limb gill rakers 20 to 24 (including rudiments); adults brownish or dark grey, with irregular pale blotches and spots; juveniles without black saddle blotch on peduncle ***Mycteroperca fusca***
(Azores, Madeira, Canaries and Cape Verde Islands)


8b. Lower-limb gill rakers 28 to 31; adults generally uniform reddish brown; some adults mottled with irregular dark or pale grey spots; juveniles with black saddle blotch on peduncle, irregular black stripes on body and head, body stripes horizontal and interrupted; 4 irregular and interrupted, vertical, dark bars separated below dorsal fin by irregular white patches ***Mycteroperca rubra***
(Mediterranean and eastern Atlantic from Portugal to Morocco and along coast of Africa to Angola)

- 9a.** Juveniles with 3 to 6 dark horizontal stripes on body dorsally; live adults often with diffuse golden blotch on side of body which disappears quickly after death; no dark spots or dark bars on body; tail fin rear margin convex to truncate in fish less than 15 cm standard length, concave to lunate in adults and fish >30 cm standard length; dorsal-fin rays 15 to 17; interspinous dorsal-fin membranes deeply incised; body depth contained 2.8 to 3.4 times in standard length ***Epinephelus costae***
- 9b.** Body often with dark spots or bars; tail fin rounded to truncate; dorsal-fin rays 13 to 18; body depth 2.4 to 3.6 times in standard length → **10**
- 10a.** Dorsal-fin rays 13 or 14; interspinous dorsal fin membranes deeply incised; anal-fin soft rays 8; body dark reddish brown to greyish violet; rear part of median fins with white edge; juveniles with 2 dark stripes down and backwards from eye ***Epinephelus caninus***
- 10b.** Dorsal-fin rays 14 to 18; interspinous dorsal-fin membranes not deeply incised; anal-fin rays 7 to 9 → **11**
- 11a.** Head, body and median fins covered with reddish brown or orange spots; usually 3 to 5 dark blotches at dorsal-fin base and black saddle blotch on peduncle; third to fifth dorsal-fin spines longer than last spine or first soft ray; dorsal-fin rays 16 to 18 ***Epinephelus adscensionis***
- 11b.** Colour pattern not as above; third to eleventh dorsal-fin spines subequal; dorsal-fin rays 14 to 16 → **12**
- 12a.** Body depth 2.4 to 2.8 times in standard length; anal-fin rays 9; pectoral-fin rays 18 to 21; pelvic fins subequal to pectoral fins, reaching to or beyond anus in fish of 13 to 30 cm standard length; pelvic-fin origin in front of vertical at lower end of pectoral-fin base ***Hyporthodus haifensis***
- 12b.** Body depth 2.6 to 3.6 times in standard length; anal-fin rays 7 to 9; pectoral-fin rays 17 to 19; pelvic fins distinctly shorter than pectoral fins; pelvic-fin origin below or behind pectoral-fin base → **13**
- 13a.** Body robust, greatest width more than half body depth; interorbital flat, width equals eye diameter in fish 9 to 15 cm standard length, greater than eye in fish 18 to 25 cm and 1.5 to 3.4 times eye diameter in fish over 30 cm; dorsal-fin spines short, third to eleventh spines subequal, about half length of longest dorsal ray; head and body with numerous small black spots ***Epinephelus itajara***
- 13b.** Body width less than half body depth; interorbital, width subequal to eye diameter in fish 18 to 25 cm standard length; third dorsal-fin spine subequal to dorsal-fin ray; no dark spots on head → **14**
- 14a.** Two or 3 oblique black-edged pale blue or white stripes across cheek and operculum; juveniles with faint dark spots forming 5 indistinct dark bars on body; body depth 3.0 to 3.6 times in standard length ***Epinephelus aeneus***
- 14b.** No pale blue stripes across head; body depth 2.6 to 3.2 times in standard length → **15**
- 15a.** Body brownish, paler ventrally, with 5 wide oblique, dark bars dorsally, first below front of dorsal fin, last at front of peduncle; 2 dark stripes radiating from lower rear edge of eye, and another in groove above maxilla; subopercle and interopercle serrate ***Epinephelus goreensis***
- 15b.** Body dark brown or greyish dorsally, often golden yellow ventrally; irregular white or pale grey blotches usually visible on head and body; median fins dark brown, the lower margin of anal fin and rear margin of tail fin with a narrow white edge; margin of spinous dorsal fin and base of paired fins often golden yellow; subopercle and interopercle smooth ***Epinephelus marginatus***

- 16a.** Maxilla scaly; body depth greater than or equal to head length; total gill rakers 32 to 46 (subfamily Anthiinae; key and species accounts by W.D. Anderson Jr) → **17**
- 16b.** Maxilla naked; body depth usually less than head length; total gill rakers 9 to 22 → **23**
- 17a.** Vomerine tooth patch with well-developed posterior prolongation; large oval patch of teeth on tongue; small accessory scales present at bases of larger scales → **18**
- 17b.** Vomerine tooth patch without posterior prolongation (patch rarely diamond-shaped); tongue with or without teeth; accessory scales present (in *Meganthias carpenteri*) or absent (in other species) → **19**
- 18a.** Lateral-line scales 50 to 55; posterior margin of caudal fin convex to almost truncate, middle rays of caudal fin elongated in larger individuals *Holanthias fronticinctus*
- 18b.** Lateral-line scales 46 or 47; second and third dorsalmost rays of lower caudal-fin lobe greatly elongated *Holanthias caudalis*
- 19a.** Small accessory scales present at bases of head and body scales; some anterior soft rays in dorsal fin greatly elongated, longest dorsal soft ray 33 to 62% standard length; depth of body 45 to 48% standard length; dorsal fin with 10 spines and 17 or 18 soft rays; anal fin with 3 spines and 8 soft rays *Meganthias carpenteri*
- 19b.** No accessory scales at bases of head and body scales; anterior soft rays in dorsal fin not greatly elongated; depth of body 29 to 39% standard length; dorsal fin with 10 spines and 13 to 16 (usually 15) soft rays; anal fin with 3 spines and 7 soft rays → **20**
- 20a.** Gill rakers 9 to 11 + 23 to 25 (total 32 to 35); lateral-line scales 46 to 51; posterior border of anterior nostril produced into slender filament; anterior and posterior nostrils fairly well separated, internarial distances 3 to 6 times in snout length *Choranthias salmopunctatus*
- 20b.** Gill rakers 11 to 14 + 26 to 33 (total 38 to 46); lateral-line scales 37 to 44; posterior border of anterior nostril produced into short flap, but never produced into long slender filament; anterior and posterior nostrils close together, internarial distance 6 to 14 times in snout length → **21**
- 21a.** Longest dorsal spine (usually the third) 13 to 30% standard length, 18 to 30% standard length in specimens greater than about 10 cm standard length; third dorsal spine typically with well-developed filament which may be up to 19% standard length; pelvic-fin length 53 to 74% standard length in specimens greater than about 10 cm standard length *Anthias anthias*
- 21b.** Longest dorsal spine 10 to 15% standard length; fin membrane extending as a short filament posterior to distal end of each dorsal spine, but never produced to the extent seen in *Anthias anthias*; pelvic-fin length 33 to 44% standard length → **22**
- 22a.** Circum-caudal-peduncular scales 18 or 19; lower caudal-fin lobe 37 to 50% standard length; upper caudal-fin lobe 37 to 45% standard length; length of anal-fin base 17 to 19% standard length; no teeth on endopterygoids or tongue; posterior margin of anal fin usually rounded (occasionally more or less angulate) *Anthias helenensis*
- 22b.** Circum-caudal-peduncular scales 20 to 24; lower caudal-fin lobe 31 to 35% standard length; upper caudal-fin lobe 32 to 37% standard length; length of anal-fin base 15 to 17% standard length; endopterygoids occasionally with teeth; tongue with or without teeth; posterior margin of anal fin angulate *Anthias cyprinoides*

- 23a.** Dorsal-fin soft rays 10 or 11, posterior rays longest; pelvic-fin origins well in front of vertical at pectoral-fin base; tail fin convex *Serranus africana*
- 23b.** Dorsal-fin soft rays 11 to 16, middle rays longest; pelvic-fin origins below pectoral-fin base; tail fin convex, truncate, emarginate or shallowly forked → 24
- 24a.** Body pale, with 4 or 5 dark double bars; dark vermiculations below eye; lateral-line scales 60 to 73; total gill rakers 15 to 19; dorsal-fin soft rays 14 to 16 *Serranus scriba*
- 24b.** Colour not as above; lateral-line scales 45 to 90; total gill rakers usually 12 to 15 or 19 to 22; dorsal-fin rays 11 to 16 → 25
- 25a.** Lateral-line scales 80 to 90; dorsal-fin soft rays 15 or 16; body brown, with 4 or 5 large, square, blackish blotches and a black vertical line between each pair of blotches; 2 or 3 wavy, dark, oblique streaks on cheek *Serranus atricauda*
- 25b.** Lateral-line scales 45 to 77; dorsal-fin rays 11 to 15; colour pattern not as above → 26
- 26a.** Lateral-line scales 70 to 77; dorsal-fin rays 13 to 15; body with 8 or 9 dark red or brown bars and 2 white horizontal bands; head with 2 or 3 wavy blue lines *Serranus cabrilla*
- 26b.** Lateral-line scales 44 to 52; dorsal-fin rays 11 to 14; colour pattern not as above → 27
- 27a.** Anal-fin soft rays 7 or 8; interorbital area convex; longest dorsal-fin spine equal to caudal peduncle depth; body with 4 faint dark blotches below lateral line . . *Serranus accraensis*
- 27b.** Anal-fin soft rays 6 or 7; interorbital area flat; longest dorsal-fin spine distinctly longer than peduncle depth → 28
- 28a.** Body depth 2.5 to 3.0 times in standard length; no notch between spinous and soft dorsal fins; lower limb gill rakers 13 to 16; body pale, with 3 or 4 pale dark bars *Serranus hepatus*
- 28b.** Body depth 2.9 to 4.0 times in standard length; lower limb gill rakers 9 to 15; colour pattern not as above → 29
- 29a.** Dorsal-fin margin notched before soft-rayed parts, fourth or fifth spines longer than tenth spine or longest rays; lower limb gill rakers 14 or 15; body buff or pale greenish yellow, with 6 dark bars dorsally, first on nape, last on peduncle, first 3 bars below dorsal fin oblique *Serranus sanctaehelenae*
- 29b.** Dorsal-fin margin entire; fourth to tenth spines subequal and not longer than rays; lower gill rakers 9; body reddish, with 5 more or less distinct, dark, vertical bars dorsally *Serranus heterurus*
- 30a.** Dorsal fin with 3 or 4 spines, 21 to 25 rays; no anal-fin spines → 31
- 30b.** Dorsal fin with 7 spines, 18 to 20 rays; anal-fin spines 3 → 32
- 31a.** Head and body dark brownish with pale blotches or mottling; upper jaw length 13 to 17% standard length and less than peduncle depth *Rypticus saponaceus*
- 31b.** Head and body pale, the head and front of body with a few distinct dark spots; upper jaw length 16 to 20% standard length and more than peduncle depth . . . *Rypticus subbifrenatus*
- 32a.** Pectoral-fin rays 18; anal fin with 3 spines, 17 rays; no skin flap on eye; lateral line extends to below last dorsal-fin spine *Pseudogramma guineensis*
- 32b.** Pectoral-fin rays 14 or 15; anal fin with 3 spines, 14 to 16 rays; adult with triangular skin flap on top of eye; lateral line extends to below middle dorsal-fin rays . . *Pseudogramma gregoryi*

List of species occurring in the area

The symbol  is given when species accounts are included.

-  *Alphestes afer* (Bloch, 1793).
-  *Anthias anthias* (Linnaeus, 1758).
-  *Anthias cyprinoides* (Katayama and Amaoka, 1986).
-  *Anthias helenensis* Katayama and Amaoka, 1986.
-  *Cephalopholis nigri* (Günther, 1859).
-  *Cephalopholis taeniops* (Valenciennes, 1828).
-  *Choranthias salmopunctatus* (Lubbock and Edwards, 1981).
-  *Epinephelus adscensionis* (Osbeck, 1765).
-  *Epinephelus aeneus* (Geoffroy St Hilaire, 1817).
-  *Epinephelus caninus* (Valenciennes, 1843).
-  *Epinephelus costae* (Steindachner, 1878).
-  *Epinephelus goreensis* (Valenciennes, 1830).
-  *Epinephelus itajara* (Lichtenstein, 1822).
-  *Epinephelus marginatus* (Lowe, 1834).
-  *Holanthias caudalis* Trunov, 1976.
-  *Holanthias fronticinctus* (Günther, 1868).
-  *Hyporthodus haifensis* (Ben-Tuvia, 1953).
-  *Meganthias carpenteri* Anderson, 2006.
-  *Mycteroperca fusca* (Lowe, 1838).
-  *Mycteroperca rubra* (Bloch, 1793).
-  *Paranthias furcifer* (Valenciennes, 1828).
-  *Pseudogramma gregoryi* (Breder, 1927).
-  *Pseudogramma guineensis* (Norman, 1935).
-  *Rypticus saponaceus* (Bloch and Schneider, 1801).
-  *Rypticus subbifrenatus* Gill, 1861.
-  *Serranus accraensis* (Norman, 1931).
-  *Serranus africanus* (Cadenat, 1960).
-  *Serranus atricauda* Günther, 1874.
-  *Serranus cabrilla* (Linnaeus, 1758).
-  *Serranus hepatus* (Linnaeus, 1758).
-  *Serranus heterurus* (Cadenat, 1937).
-  *Serranus sanctaehelenae* Boulenger, 1895.
-  *Serranus scriba* (Linnaeus, 1758).

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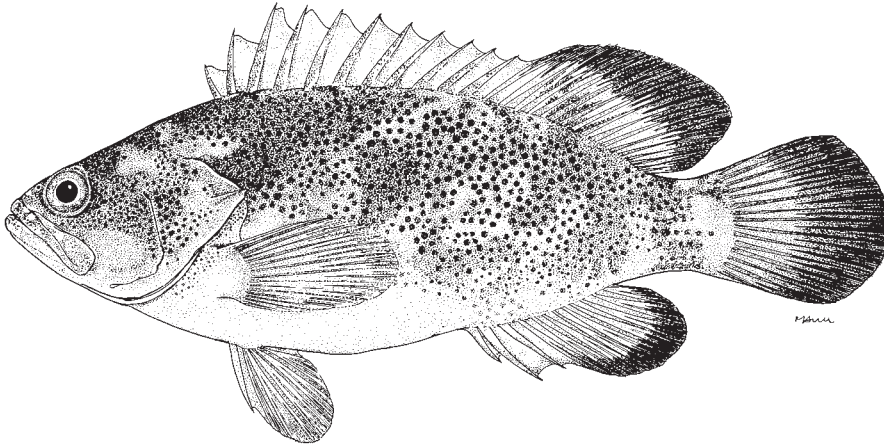
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***Alphestes afer* (Bloch 1793)**

Frequent synonyms / misidentifications: *Epinephelus afer* Bloch, 1793; *Serranus armatus* Osorio, 1894 / None.

FAO names: En – Mutton hamlet; Fr – Varech; Sp – Guaseta.



Diagnostic characters: Body depth slightly less than head length, 2.4 to 3.1 in standard length (for fish 13 to 22 cm standard length); snout short, eye diameter greater than snout length, 4.1 to 5.3 in head length. Preopercle rounded, distinctly serrate, lower edge with a large, curved spine (usually hidden by skin) directed down and forward. Gill rakers 6 to 8 on upper limb, 16 or 17 on lower limb, 22 to 25 total. Dorsal fin with 11 spines and 17 to 19 rays; anal fin with 3 spines and 9 rays; tail fin rounded, with 15 branched rays; pectoral fins with 16 or 17 rays. Scales smooth; lateral-line scales 55 to 61; lateral-scale series 68 to 77. **Colour:** head, body and median fins olivaceous or pale brown; some fish irregularly blotched and barred with dark brown and/or densely covered in small orange or dark brown spots; head, body and all fins often with scattered, small white spots.

Size: Maximum about 33 cm.

Habitat, biology, and fisheries: A shallow-water (from shore to at least 35 m depth), cryptically coloured, secretive species; sedentary during the day, lying among seaweed or hiding in crevices and next to sponges or rocks in the preferred seagrass habitat. This fish relies on its effective camouflage to escape detection, and will sometimes even lie on its side and partly cover itself with sand. With its cryptic coloration, short snout and sedentary habits, mutton hamlet resembles scorpaenid fishes, and can easily be approached or even touched. A nocturnal predator, feeding mainly on benthic crustaceans. Although abundant in the Caribbean, the species has only recently been 'rediscovered' in the eastern Atlantic. Separate statistics are not reported for the mutton hamlet. The distribution and relative abundance in the eastern central Atlantic is uncertain, as the species has apparently been overlooked here for 200 years. Probably caught on handlines and in traps.

Distribution: In the eastern central Atlantic, *Alphestes afer* is known from the type locality ('Guinea') and São Tomé, the type locality of *Serranus armatus*. It seems likely that mutton hamlet also occur between these 2 type localities. In the western Atlantic, the species is reported from Bermuda, south Florida, Bahamas, Cuba (and probably most other West Indian islands), Panama, Colombia and Venezuela to the state of São Paulo, Brazil.

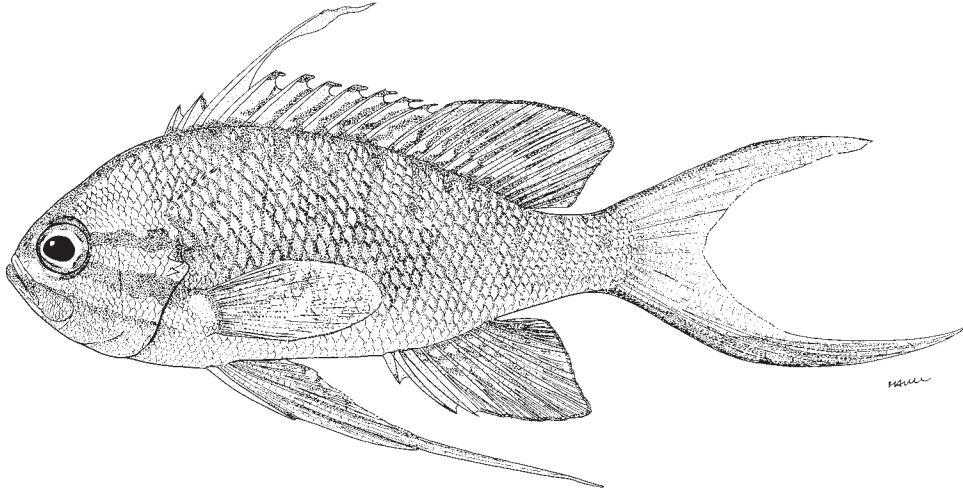


Remarks: In 1865, W. Peters identified Bloch's holotype as conspecific with 2 Caribbean species: *Plectropoma chloroperterum* Valenciennes, 1828 (from Martinique and Santo Domingo) and *P. monacatus* Müller and Troschel, in Schomburgk, 1848 (from Barbados). Subsequent authors recognised *Alphehestes afer* as western Atlantic species and queried the provenance of Bloch's holotype. Boulenger (1895) doubtfully assigned *Serranus armatus* Orsorio, 1894 (from São Tomé) to the synonymy of *Alphestes afer*; and continued to question the Guinea locality for Bloch's holotype. In 2003, a fresh specimen of *A. afer* was photographed at a market in São Tomé.

Anthias anthias (Linnaeus 1758)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Swallowtail seaperch.



Diagnostic characters: Body moderately deep; depth of body at first dorsal spine 29 to 39% standard length. Head moderate, its length 30 to 37% standard length. Orbit longer than snout, horizontal diameter of bony orbit 8 to 12% standard length. Upper and lower jaws each with a series of conical teeth; canines or canine-like teeth present anteriorly in both jaws; vomer and palatines with teeth; vomerine tooth patch roughly triangular, without posterior prolongation; endopterygoids toothless; tongue rarely with teeth. The 2 nostrils on each side of head fairly close together; internarial distance 8 to 17 times in snout length; posterior border of anterior nostril produced into short flap, but never produced into a long slender filament. Most of head, including maxilla, covered with scales. Branchiostegals 7. Gill rakers on first arch 11 to 14 on upper limb and 27 to 33 on lower limb, total 38 to 46. Third dorsal spine, rays in middle of soft dorsal and middle of soft anal fins, caudal-fin lobes, and pelvic fins usually well elongated. Longest dorsal spine (usually the third) 18 to 30% standard length in specimens more than about 10 cm standard length; filament of third dorsal spine up to 19% standard length. Dorsal fin single, not incised at junction of spinous and soft portions. Anal-fin length 32 to 51% standard length, tending to increase in length with increase in standard length. Caudal fin lunate to deeply forked. Lower caudal-fin lobe usually longer than upper caudal-fin lobe. Upper caudal-fin lobe 41 to more than 73% standard length in specimens greater than about 10 cm standard length. Lower caudal-fin lobe 38 to 75% standard length in specimens greater than about 12 cm standard length. Pelvic fin 53 to 74% standard length in specimens greater than about 10 cm standard length. Dorsal fin with 10 spines and 13 to 16 (usually 15) soft rays. Anal fin with 3 spines and 7 soft rays. Pectoral fin with 18 to 22 (usually 18 to 20) rays. Scales ctenoid. Lateral line continuous, not interrupted; tubed scales in lateral line 37 to 44 (usually 37 to 41). Circum-caudal-peduncular scales 18 to 23 (usually 21 or 22). Vertebrae 26 (10 precaudal +16 caudal). **Colour:** body mainly red or pink with yellow and silver marbeling (or yellow dorsally, midbody mostly purplish pink), lighter ventrally; 1 to 3 bright yellow stripes on side of head.

Size: Reported to reach 27 cm; commonly reaches 16 cm standard length.

Habitat, biology, and fisheries: Occurs in depths of 15 to 300 m over rock and gravel and in submarine caves. Nocturnal; feeds on crustaceans and small fishes. A protogynous hermaphrodite that reproduces in spring and summer (July through September on the coast of Maghreb). Part of the bycatch in commercial and sports fishing and is regularly seen in the markets of Morocco – but only occasionally to rarely elsewhere.

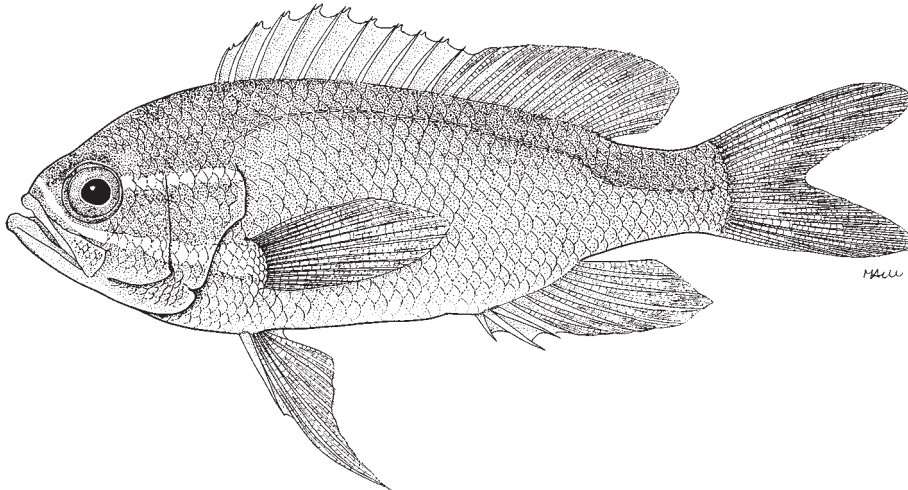
Distribution: Adriatic, Mediterranean, and eastern Atlantic from Portugal and the Azores southward to northern Namibia, including off-lying islands.



Anthias cyprinoides (Katayama and Amaoka, 1986)

Frequent synonyms / misidentifications: *Holanthias cyprinoides* Katayama and Amaoka, 1986 / None.

FAO names: En – Gemmed jewelfish.



Diagnostic characters: Body moderately deep, depth of body 34 to 39% standard length. Head moderate, its length 33 to 37% standard length. Orbit longer than snout, horizontal diameter of bony orbit 8 to 11% standard length. Upper and lower jaws each with a series of conical teeth; canine or canine-like teeth present anteriorly in both jaws; vomer and palatines with small teeth; **vomerine tooth patch triangular or diamond-shaped**; endopterygoids usually without teeth; tongue with or without teeth. The 2 nostrils on each side of head fairly close together; internarial distance 6 to 14 times in snout length; posterior border of anterior nostril produced into short flap, but never produced into a long slender filament. Most of head, including maxilla, covered with scales. Branchiostegals 7. Gill rakers on first arch 11 to 14 on upper limb and 26 to 29 on lower limb, total 38 to 43. Fin membrane extending into a short filament posterior to tip of each dorsal spine, but filaments never greatly produced. Longest dorsal spine (third, fourth, fifth, or sixth) 11 to 15% standard length. Dorsal fin single, not incised at junction of spinous and soft portions. Anal fin angulate posteriorly, its length 31 to 36% standard length. Caudal fin deeply forked. Upper caudal-fin lobe usually longer than lower caudal-fin lobe. Upper caudal-fin lobe 32 to 37% standard length. Lower caudal-fin lobe 31 to 35% standard length. Pelvic fin 33 to 44% standard length. Dorsal fin with 10 spines and 15 soft rays. Anal fin with 3 spines and 7 or 8 (usually 7) soft rays. Pectoral fin with 19 to 21 rays. Scales ctenoid. Lateral line continuous, not interrupted; tubed scales in lateral line 38 to 43. Circum-caudal-peduncular scales 20 to 24. Vertebrae 26 (10 precaudal + 16 caudal). **Colour:** body yellowish brown; yellow band from tip of snout running below eye to base of pectoral fin; yellow band extending from posterior border of orbit to opercular margin; fins yellowish grey.

Size: Maximum standard length 23 cm.

Habitat, biology, and fisheries: Known from depths of 260 to 589 m. No other information available.

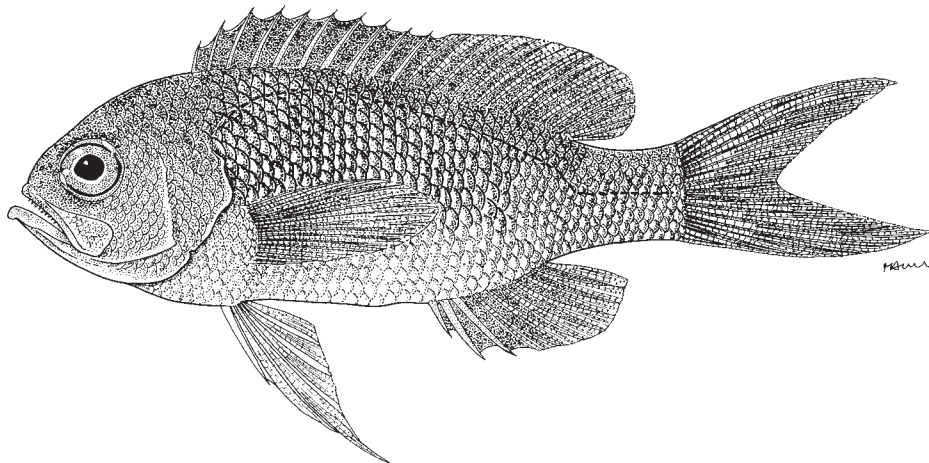
Distribution: Eastern South Atlantic: known only from southwest of the Island of Pagalu (Annobón) at or near 03°01'S, 00°46'E.



***Anthias helenensis* Katayama and Amaoka, 1986**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Rosy gemfish.



Diagnostic characters: Body moderately deep, depth of body 34 to 37% standard length. Head moderate, its length 33 to 37% standard length. Orbit longer than snout, horizontal diameter of bony orbit 10 to 11% standard length. Upper and lower jaws each with a series of conical teeth; canine teeth present anteriorly in both jaws; vomer and palatines with small teeth; vomerine tooth patch approximately triangular; endopterygoids and tongue without teeth. The 2 nostrils on each side of head fairly close together; internarial distance 6 to 11 times in snout length; posterior border of anterior nostril produced into short flap, but never produced into a long slender filament. Most of head, including maxilla, covered with scales. Branchiostegals 7. Gill rakers on first arch 11 or 12 on upper limb and 29 to 31 on lower limb, total 40 to 43. Fin membrane extending into a short filament posterior to tip of each dorsal spine, but filaments never greatly produced. Longest dorsal spine (fourth or fifth) 11 to 13% standard length. Dorsal fin single, not incised at junction of spinous and soft portions. Anal fin usually rounded posteriorly (occasionally more or less angulate), its length 29 to 35% standard length. Caudal fin deeply forked. Upper caudal-fin lobe 37 to 45% standard length. Lower caudal-fin lobe 37 to 50% standard length. Pelvic fin 34 to 39% standard length. Dorsal fin with 10 spines and 15 soft rays. Anal fin with 3 spines and 7 soft rays. Pectoral fin with 19 to 21 rays. Scales ctenoid. Lateral line continuous, not interrupted; tubed scales in lateral line 37 to 42. Circum-caudal-peduncular scales 18 or 19. Vertebrae 26 (10 precaudal + 16 caudal). **Colour:** body chocolate coloured; each scale on side of body with a vertically elongate white spot; all fins except for pelvic fin chocolate coloured; pelvic fin pale pink (according to original description). Two Ektachrome transparencies show body and fins to be mostly rose coloured.

Size: Maximum standard length 18 cm.

Habitat, biology, and fisheries: Known from depths of 156 to 460 m. No other information available.

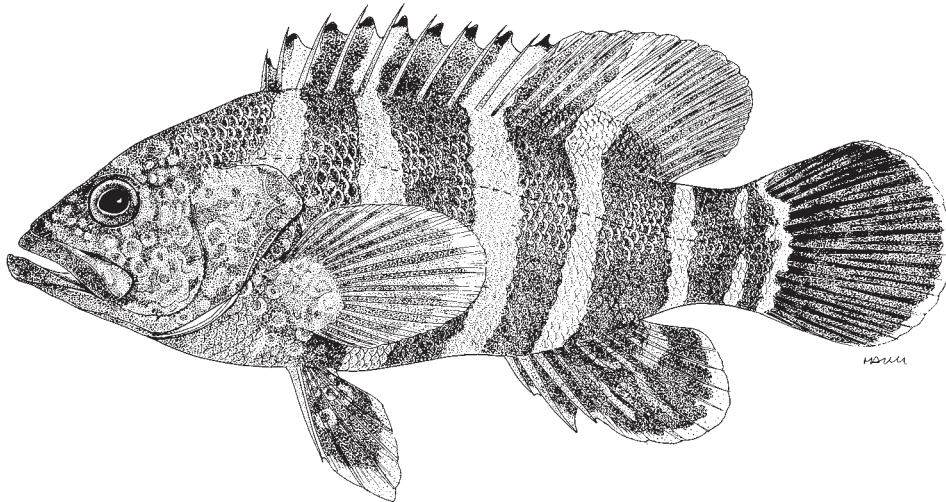
Distribution: Known from only 2 localities well north of the Island of St Helena.



***Cephalopholis nigri* (Günther, 1859)**

Frequent synonyms / misidentifications: *Petrometopon nigri* (Günther, 1859) / None.

FAO names: En – Niger hind; Fr – Mèrou du Niger; Sp – Cherna del Niger.



Diagnostic characters: Body depth less than head length, 2.6 to 3.0 times in standard length (for fish 12 to 25 cm standard length); head length 2.5 to 2.7 times in standard length. Eye diameter less than snout length, 4.3 to 5.3 times in head length. Preopercle rounded, the rear edge finely serrate. Gill rakers 8 or 9 on upper limb, 15 to 17 on lower limb, 22 to 25 total, including rudiments. Midlateral body scales ctenoid; lateral-line scales 45 to 53; lateral-scale series 73 to 86. Dorsal fin with 9 spines and 14 or 15 rays; anal fin with 3 spines and 8 rays; tail fin rounded, branched rays 15; pectoral fins with 16 to 18 rays; pelvic fins reach anus, which is well in front of anal fin. **Colour:** dark brown, usually with 4 to 7 dark bars on body, becoming indistinct anteriorly; belly reddish; **sides of head with a reticulated pattern of hexagonal reddish spots separated by dark lines;** tail fin with pale margin; interspinous dorsal fin membranes with tiny black spot behind tip of each spine; red spots on head become pale in alcohol.

Size: Maximum to 30 cm.

Habitat, biology, and fisheries: Inhabits sandy and rocky bottoms in coastal waters (usually less than 100 m depth). Carnivorous. Some fish mature as males at 14 cm standard length without ever being female; other males appear to have transformed from a previous female stage; females mature at about 16 cm standard length. Caught throughout its range, but too small and apparently not abundant enough to be of significant commercial interest. Separate statistics are not reported for this species. Caught on hook-and-line, in traps, gillnets and in bottom trawls.

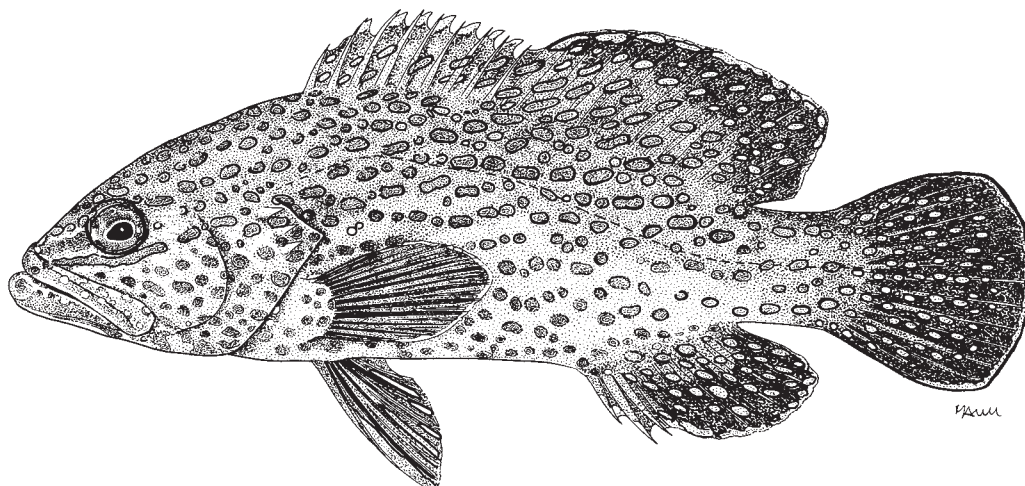
Distribution: From Senegal to Lobito, Angola; also at Canary Islands, São Tomé and Príncipe.



***Cephalopholis taeniops* (Valenciennes, 1828)**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Bluespotted seabass; Fr – Mérrou à points bleus; Sp – Cherna colorada.



Diagnostic characters: Body depth less than head length, contained 2.8 to 3.3 times in standard length (for fish 12 to 25 cm standard length); head length 2.6 to 2.8 times in standard length. Eye diameter less than snout length, 4.9 to 5.8 times in head length. Preopercle rounded, the rear edge finely serrate. Prominent knob on lower rear corner of maxilla. Gill rakers 8 or 9 on upper limb, 15 to 17 on lower limb, 22 to 25 total, including rudiments. Dorsal fin with 9 spines and 14 to 16 rays; anal fin with 3 spines and 9 or 10 rays; tail fin rounded, branched rays 15; pectoral fins with 16 to 19 rays; pelvic fins not reaching anus. Midlateral body scales ctenoid; lateral-line scales 68 to 75; lateral-scale series 114 to 122. **Colour:** reddish orange, head, body and median fins covered with distinct small blue spots with dark edges; base colour of young individuals brown or olive.

Size: Maximum to 70 cm.

Habitat, biology, and fisheries: Inhabits sandy and rocky bottoms between 20 and 200 m, but is essentially a coastal species. Demersal, feeds on crustaceans and fish. Caught throughout its range, but common off Senegal and Mauritania. Separate statistics are not reported for this species. Caught on lines, in traps and in bottom trawls. Marketed fresh, frozen and smoked.

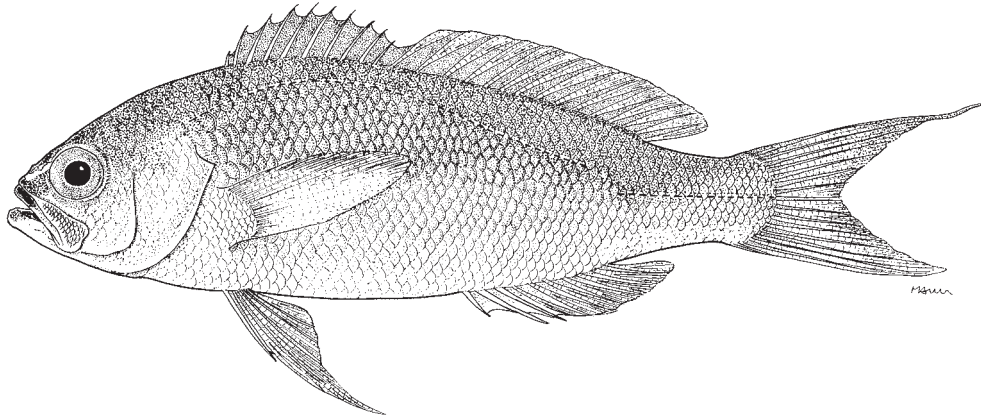
Distribution: Morocco to Angola, including the Canary and Cape Verde Islands, São Tomé and Príncipe.



***Choranthias salmopunctatus* (Lubbock and Edwards, 1981)**

Frequent synonyms / misidentifications: *Anthias salmopunctatus* Lubbock and Edwards, 1981 / None.

FAO names: En – Salmon-spotted jewelfish.



Diagnostic characters: Body rather slender, depth of body at first dorsal spine about 29% standard length. Head relatively short, its length 30 to 32% standard length. Orbit longer than snout, horizontal diameter of bony orbit 7 to 10% standard length. Upper and lower jaws each with a series of conical teeth; canine or canine-like teeth present anteriorly in both jaws; vomer and palatines with villiform to small conical teeth; vomerine tooth patch chevron-shaped; endopterygoids and tongue without teeth. The 2 nostrils on each side of head rather well separated; internarial distance 3 to 6 times in snout length; filament on posterior border of anterior nostril reaching posterior nostril or slightly beyond when reflected. Most of head, including maxilla, covered with scales. Branchiostegals 7. Gill rakers on first arch 9 to 11 on upper limb and 23 to 25 on lower limb, total 32 to 35. Longest dorsal spine (fourth to seventh about equal in length) 10 to 13% standard length. Dorsal fin single. Anal-fin length 29 to 32% standard length. Caudal fin lunate to well forked. Upper caudal-fin lobe 29 to 30% standard length. Lower caudal-fin lobe 27 to 31% standard length. Pelvic fin 24 to 30% standard length. Dorsal fin with 10 spines and 15 soft rays. Anal fin with 3 spines and 7 soft rays. Pectoral fin with 20 to 22 rays. Scales ctenoid. Lateral line usually interrupted for short distance ventral to posterior part of soft dorsal fin; tubed scales in lateral line 46 to 51. Circum-caudal-peduncular scales 26 to 28. Vertebrae 26 (10 precaudal + 16 caudal). **Colour:** head and body mostly light orange; salmon pink spots scattered on body; 3 pink stripes on side of head; iris of eye yellowish olive, with lavender dorsally and ventrally; fins mainly pink, salmon pink, and yellow.

Size: Maximum standard length 6 cm.

Habitat, biology, and fisheries: Known from depths of 30 to 55 m; in 1981 reported to be common on rock faces in depths greater than 30 m; usually seen in small shoals about a metre from the substrate; hides in crevices when alarmed.

Distribution: Known only from St Paul's Rocks, a group of islets on the mid-Atlantic Ridge just north of the equator (approximately 970 km northeast of Natal, Brazil).

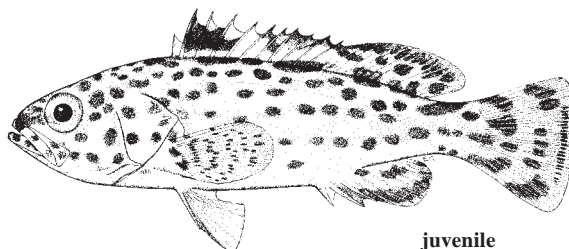
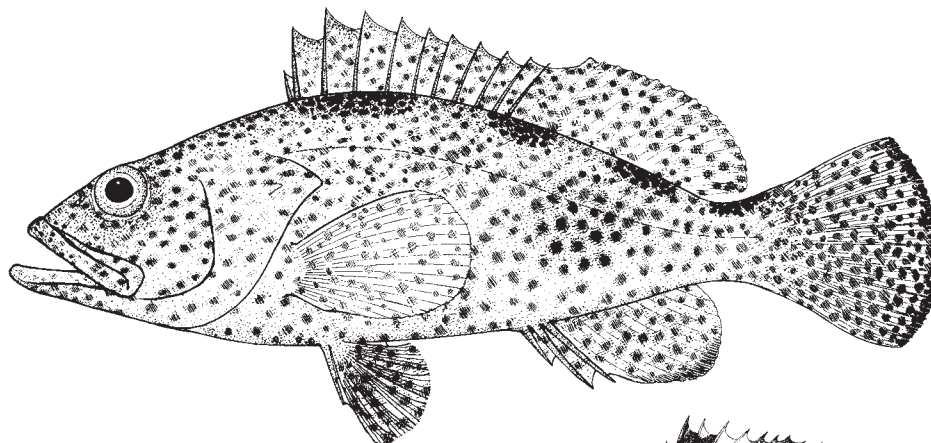
Remarks: In the 2015 IUCN Red List of Threatened Species, *Choranthias salmopunctatus* is considered Vulnerable. On 4 expeditions (in 1999, 2000 and 2001) to St Paul's Rocks, Brazilian ichthyologists surveyed the fishes in tide pools and over reefs down to a depth of 62 m, but they did not find this species. However, in early 2006, a group of Brazilian workers collected several specimens of *C. salmopunctatus* and observed it schooling with *Chromis multilineata* (Pomacentridae).



***Epinephelus adscensionis* (Osbeck, 1765)**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Rock hind; Fr – Mérrou oualioua; Sp – Mero cabrilla.



Diagnostic characters: Body depth less than head length, contained 2.6 to 3.2 times in standard length (for fish 13 to 31 cm standard length); head length 2.1 to 2.5 times in standard length. Eye diameter less than snout length, 4.9 to 5.8 in head length. Preopercle angular, the rear edge finely serrate. Gill rakers 7 to 9 on upper limb, 16 to 19 on lower limb, 23 to 28 total, including rudiments. **Dorsal fin with 11 spines and 16 to 18 rays, the fourth or fifth spines longest, the interspinous membranes distinctly incised; anal fin with 3 spines and 8 rays; tail fin rounded**, branched rays 15; pectoral fins with 18 to 20 rays; pelvic fins not reaching anus. Midlateral body scales distinctly ctenoid; lateral-line scales 48 to 53; lateral scale series 92 to 108. **Colour:** head, body and fins generally buff or pale greenish, covered with reddish brown spots and scattered pale blotches; usually 3 to 5 dark brown blotches (groups of dark spots) at base of dorsal fin and a blackish brown saddle blotch on peduncle; on some fish only the dark blotch at the base of the rear dorsal-fin spines is apparent; rear edge of tail fin with a row of dark brown spots forming a dark margin; small juveniles with fewer but larger dark spots on the head, body and fins, black blotch from second to fifth dorsal-fin spines.

Size: Maximum about 1 m.

Habitat, biology, and fisheries: Inhabits rocky reefs in 2 to about 100 m, essentially a coastal species. Demersal, solitary, feeds mainly on crabs (67%) and fish (20%). At Ascension, rock hind include juvenile triggerfish (*Melichthys niger*) and young sea turtles in their diet. At St Helena, rock hind are common in 2 to 35 m and represent 90% of 'groundfish' landings; large adults (over 50 cm) are taken regularly in 50 to 100 m, but are rare in shallow water. Females mature at 25 cm standard length. This species is of major importance in the fisheries of Ascension Island and St Helena. Caught on lines, in traps and with spears. Marketed fresh.

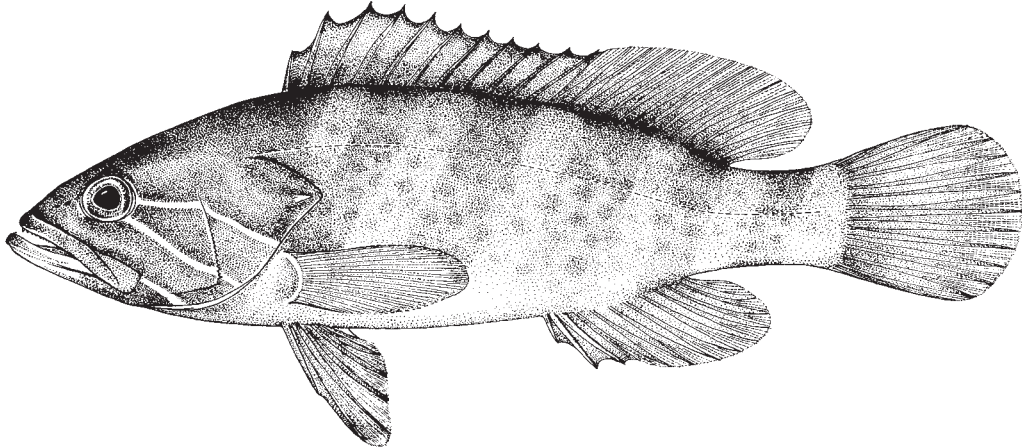
Distribution: Ascension Island, Bonaparte Seamount, St Helena, São Tomé and Príncipe. Widely distributed in western central Atlantic from Bermuda to the state of São Paulo, Brazil.



***Epinephelus aeneus* (Geoffrey St Hilaire, 1817)**

Frequent synonyms / misidentifications: *Serranus aeneus* Geoffroy St Hilaire, 1817 / None.

FAO names: En – White grouper; Fr – Mérrou blanc; Sp – Cherna de ley.



Diagnostic characters: Body depth less than head length, 3.0 to 3.6 times in standard length; head length 2.5 to 2.9 times in standard length. Eye diameter less than snout length, 4.9 to 5.8 in head length. Preopercle angular, with 3 to 6 large spines at angle, lowermost spine directed ventrally. Gill rakers 8 to 10 on upper limb, 15 to 17 on lower limb, 23 to 26 total, including rudiments. **Dorsal fin with 11 spines and 14 to 16 rays, the third and fourth spines longest, the interspinous membranes slightly incised; anal fin with 3 spines and 8 rays; tail fin rounded;** branched rays 15; pectoral fins with 18 to 20 rays; pelvic fins not reaching anus. Midlateral body scales distinctly ctenoid; lateral-line scales 67 to 72; lateral-scale series 98 to 102. **Colour:** generally dark reddish brown or greyish green sometimes with more or less distinct pale cross-bars. **Two or 3 prominent oblique white stripes on head behind eye;** white stripes may be indistinct on large adults. Juveniles with faint dark spots forming 5 indistinct oblique dark bars.

Size: Maximum to at least 120 cm, weight 25 kg.

Habitat, biology, and fisheries: Adults found on rocky or soft bottoms in 20 to about 200 m, but more common in the upper part of this range (to 100 m); juveniles occur in coastal lagoons and estuaries. Demersal and usually solitary. Feeds chiefly on fish (58%), stomatopods (21%), crabs (10%) and cephalopods (10%). Protogynous hermaphrodite that matures first as female at 50 to 60 cm total length, about 3 kg, age 5 to 7 years; changes sex at 10 to 13 years (6 to 15 kg, 80 to 110 cm total length) but smaller males (3 to 5 kg) are occasionally found. Along the Tunisian coast white grouper attain 115 cm total length, 25 kg and are estimated to be 17 years old. The white grouper is of considerable economic importance in fisheries of the Mediterranean and west coast of Africa. Taken on handlines, in bottom trawls and trammel nets, mainly caught by Mauritania and Senegal. Has spawned in captivity in Israel. Marketed chiefly fresh and smoked.

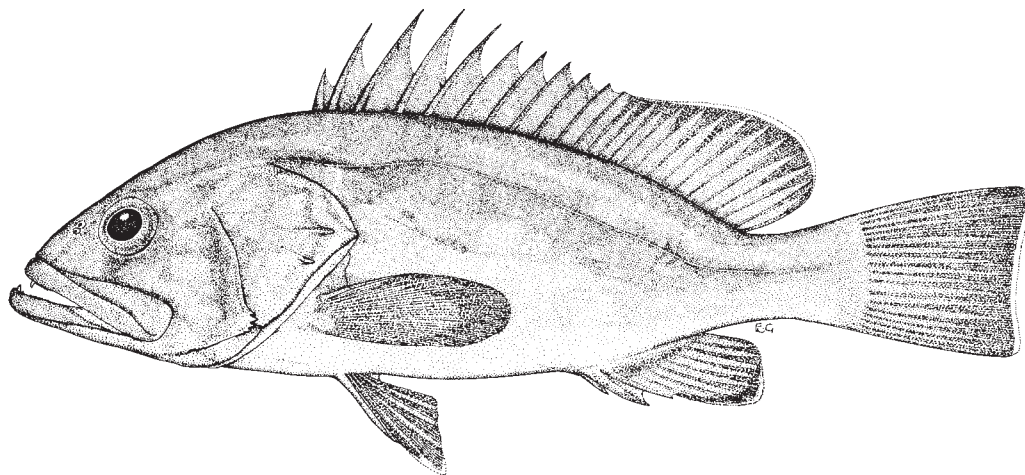
Distribution: Morocco to Angola, Cape Verde Islands, São Tomé and Príncipe, southern Mediterranean and coast of Portugal. The absence of *Epinephelus aeneus* at the Canary Islands is puzzling.



Epinephelus caninus (Valenciennes, 1843)

Frequent synonyms / misidentifications: None / *Epinephelus alexandrinus* (Valenciennes, 1628).

FAO names: En – Dogtooth grouper; Fr – M  rou gris; Sp – Mero dent  n.



Diagnostic characters: Body depth less than head length, contained 2.7 to 3.0 times in standard length; head length contained 2.3 to 2.5 times in standard length. Preopercle angular, serrate, with 3 to 5 distinctly enlarged serrae at the angle; upper edge of operculum distinctly convex. Gill rakers 8 to 10 on upper limb, 15 to 17 on lower limb, 23 to 27 total, including rudiments. Dorsal fin with 11 spines and 13 to 15 rays, the third and fourth spines longest, the interspinous membranes deeply incised; anal fin with 3 spines and 8 rays; tail fin truncate or emarginate; branched rays 15; pectoral fins with 17 or 18 rays; pelvic fins not reaching anus. Midlateral body scales distinctly ctenoid; lateral-line scales 70 to 79; lateral-scale series 120 to 135. **Colour:** body uniform dark reddish brown to greyish violet, **without prominent markings**; belly slightly paler; head with 2 oblique dark stripes running downward and backward from eye across the cheek and gill covers, stripes tend to disappear in old individuals.

Size: Attains at least 1.8 m and 75 kg.

Habitat, biology, and fisheries: Demersal fish, over bottom of mud or sand in about 30 to 400 m. Solitary, feeds on fish, crustaceans and cephalopods. Separate statistics are not reported for this species. Taken on lines and in bottom trawls. Marketed fresh and smoked.

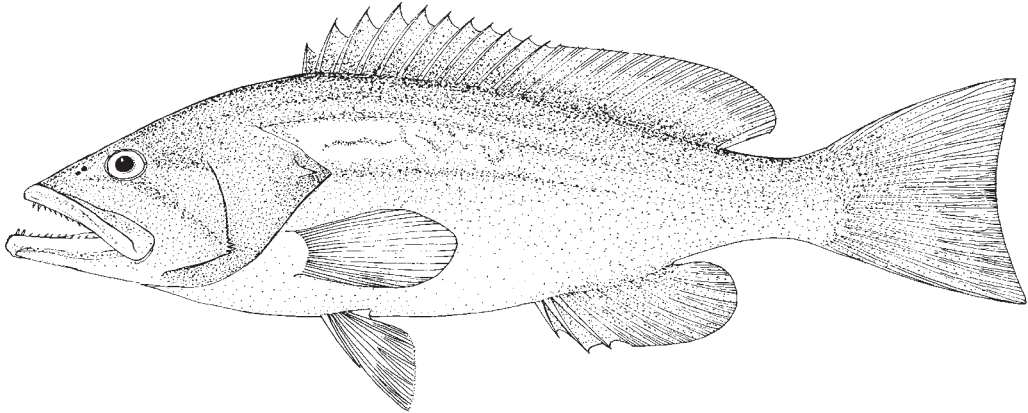
Distribution: Morocco to Angola, Portugal and Mediterranean; Canary Islands. Not known from the Cape Verde Islands.



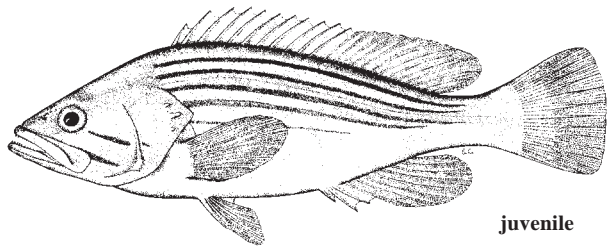
***Epinephelus costae* (Steindachner, 1878)**

Frequent synonyms / misidentifications: *Epinephelus zaslavskii* Poll, 1949 / *Epinephelus alexandrinus* (Valenciennes, 1628).

FAO names: En – Goldblotch grouper; Fr – Mérou badèche (= Abadèche, Area 37); Sp – Falso abadejo.



Diagnostic characters: Body depth less than head length, contained 2.8 to 3.4 times in standard length; head length contained 2.5 to 2.7 times in standard length. Preopercle angular, serrate, with 2 or 3 enlarged serrae at angle; in fish larger than 40 cm standard length, the preopercle angle forms a rounded lobe, with an indentation immediately above the lobe; middle and lower opercular spines flat but distinct; upper spine not apparent in adults; upper edge of operculum straight or slightly convex. Gill rakers on upper limb 8 to 10, on lower limb 16 to 18; total 24 to 27. Dorsal fin with 11 spines and 15 to 17 rays, the interspinous membranes distinctly incised; anal fin with 3 spines and 8 soft rays; pectoral-fin rays 18 or 19; tail fin convex to emarginate, branched rays 15. Lateral body scales ctenoid; lateral-line scales 70 to 73; lateral scale series 113 to 130. **Colour:** yellowish brown to sepia brown; juveniles with 5 or 6 horizontal dark lines on body dorsally and 2 oblique, dark lines on cheek; dark lines indistinct in adults. Large specimens often have a diffuse golden blotch on sides which disappears quickly after death.



juvenile

Size: Maximum to 140 cm, about 11 years.

Habitat, biology, and fisheries: Demersal on sand, mud and rocky bottom from shore to 300 m, but most abundant in shallow water. Feeds on fish, crustaceans and molluscs. Separate statistics are not reported for this species. Taken on lines, in bottom trawls and trammel nets. Marketed fresh, frozen and smoked. Appears to be of some importance to the fisheries of the area and the Mediterranean.

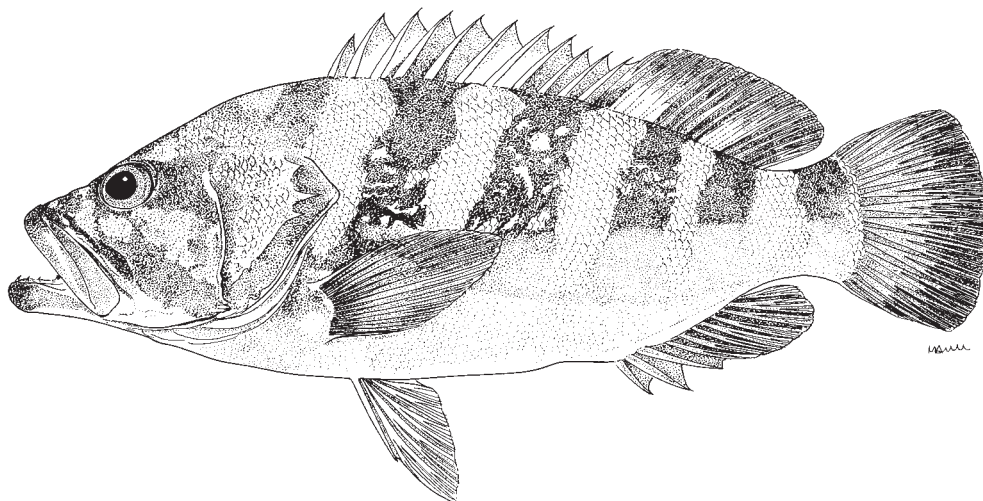
Distribution: Morocco to Angola, also Cape Verde and Canary islands, São Tomé and Príncipe; Mediterranean and coast of Portugal. References to *Epinephelus alexandrinus* at the Azores, Madeira or Canary islands are apparently misidentifications of *Mycteroperca fusca*.



Epinephelus goreensis (Valenciennes, 1830)

Frequent synonyms / misidentifications: None / *Epinephelus alexandrinus* (non Valenciennes, 1828).

FAO names: En – Dungat grouper; Fr – Mérrou de Gorée; Sp – Mero de Gorea.



Diagnostic characters: Body depth less than head length, contained 2.9 to 3.2 times in standard length; head length contained 2.5 to 2.7 times in standard length. Preopercle angular, serrate, with 3 or 4 enlarged serrae at angle, the lowermost directed ventrally. Upper edge of operculum straight or slightly convex. Gill rakers on upper limb 8 or 9, on lower limb 16 or 17; total 24 to 26. Dorsal fin with 11 spines and 16 rays, the interspinous membranes incised; anal fin with 3 spines and 8 soft rays; tail fin convex (juveniles) to emarginate (adults); branched rays 15; pectoral-fin rays 17 to 19. Lateral body scales ctenoid; lateral-line scales 68 to 74; lateral-scale series 120 to 129. **Colour:** head and body brownish; 3 or 4 broad, oblique dark bars on dorsal part of body and another on dorsal half of peduncle; 2 faint dark stripes extend posteriorly from lower half of eye; dark moustache streak in groove above maxilla.

Size: Maximum to at least 55 cm.

Habitat, biology, and fisheries: Demersal on sand, mud and rock at depths of 80 to 100 m. Feeds on fish, crustaceans and molluscs. Taken on lines, in bottom trawls and trammel nets. Appears to be of minor importance to the fisheries of the area.

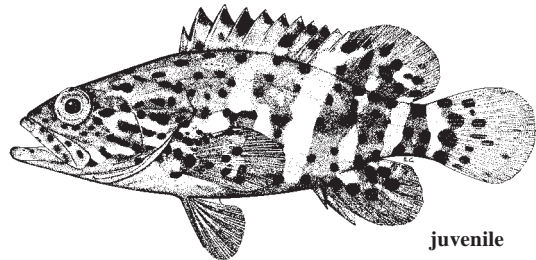
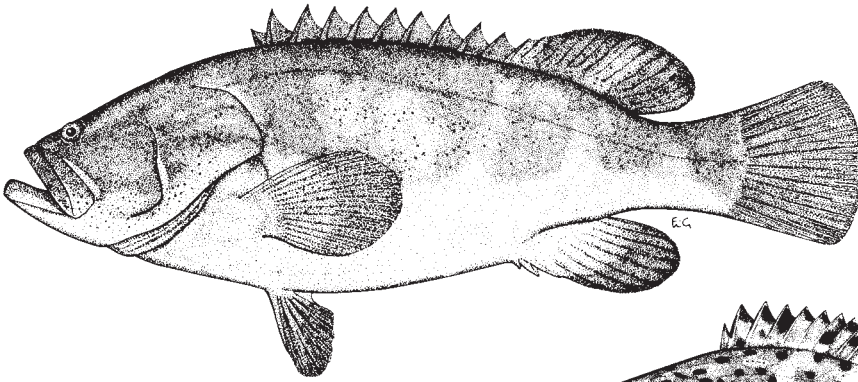
Distribution: Senegal to Angola, including Cape Verde Islands, São Tomé and Príncipe.



Epinephelus itajara (Lichtenstein, 1822)

Frequent synonyms / misidentifications: *Epinephelus esonue* (Ehrenbaum, 1915); *Promicrops ditobo* Roux and Collignon, 1954 / None.

FAO names: En – Jewfish; Fr – Mérou géant; Sp – Mero guasa.



Diagnostic characters: Body robust, the greatest width more than half body depth; depth greater than head length, contained 2.7 to 3.4 times in standard length; head length contained 2.3 to 2.9 times in standard length. Head extremely broad, interorbital width equals eye diameter for 10 to 15 cm standard length, distinctly greater than eye diameter in fish 18 to 25 cm, and 1.5 to 3.4 times greater than eye diameter in fish 30 to 160 cm; eye diameter contained 8 to 13 times in head length for fish 35 to 160 cm. Preopercle finely serrate. Gill rakers on upper limb 8 or 9, on lower limb 13 or 15; total 21 to 24. **Dorsal fin with 11 spines and 14 or 15 rays, the spines short, the third to eleventh spines subequal, and about half length of longest dorsal-fin ray;** interspinous dorsal-fin membranes distinctly incised; anal fin with 3 spines and 8 rays; tail fin rounded, branched rays 15; pectoral-fin rays 18 or 19; origin of pelvic fins below pectoral-fin base. Lateral body scales ctenoid; lateral-line scales 61 to 64; lateral-scale series 89 to 112. **Colour: generally brownish yellow, grey, or greenish; head, dorsal part of body and fins with small black spots, becoming smaller with growth.** Fish less than 1 m show 3 or 4 faint, irregular, subvertical dark bars posteriorly on body and another covering rear half of peduncle; large adults darker and more uniformly coloured than juveniles.

Size: Maximum about 2.5 m and at least 320 kg.

Habitat, biology, and fisheries: Usually over rocky reefs or sunken wrecks; often found in harbours and under piers; juveniles common in mangroves. A demersal, sedentary fish; occupies limited home ranges with little inter-reef movements. Grows about 10 cm / year for the first 6 years of life. Matures at 110 to 115 cm (age about 12) for males, and 120 to 135 cm (age about 14) for females; growth then declines to about 3 cm / year at age 15; 182 to 191 cm total length. A 197 cm fish was estimated to be 37 years old. There is no published evidence for hermaphroditism in this species. Adults and juveniles eat mainly crustaceans, and they also consume cephalopods and fish and young sea turtles. Apparently rare everywhere. Vulnerable to spearfishing as it is easy to approach underwater. Because of their slow growth, longevity, and vulnerability during spawning aggregations, *Epinephelus itajara* is listed globally as Critically Endangered on the IUCN Red List.

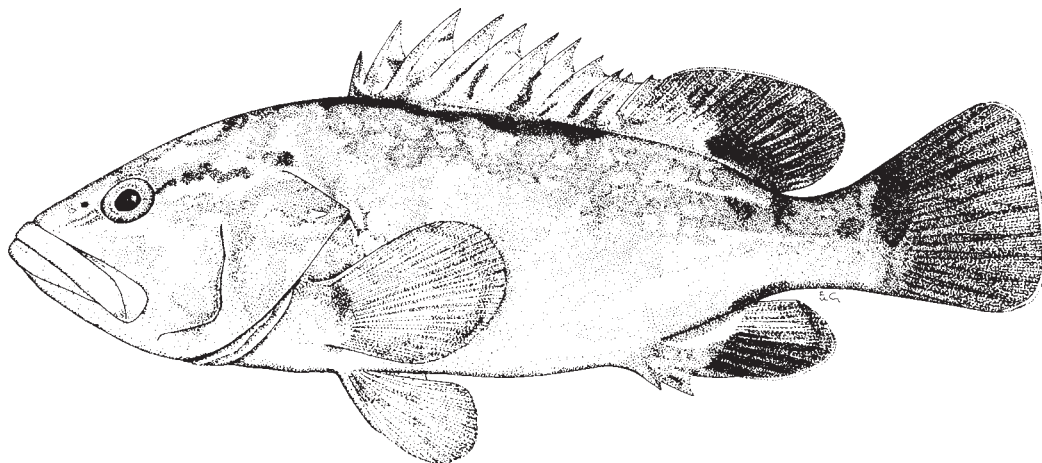
Distribution: Senegal to Angola; rare in Canary Islands. Western central Atlantic from Florida to southern Brazil; also in eastern Pacific from Gulf of California to Peru.



***Epinephelus marginatus* (Lowe, 1834)**

Frequent synonyms / misidentifications: *Epinephelus guaza* (non Linnaeus, 1758) / *Epinephelus gigas* (Brünnich, 1768).

FAO names: En – Dusky grouper; Fr – Mérou noir (= Mérou sombre, Area 37); Sp – Mero moreno.



Diagnostic characters: Body depth less than head length, contained 2.6 to 3.1 times in standard length; head length contained 2.3 to 2.5 times in standard length. Preopercle rounded, finely serrate, the serrae at angle slightly enlarged. Gill rakers on upper limb 7 to 10, on lower limb 14 to 16; total 22 to 25. Dorsal fin with 11 spines and 14 to 16 rays, the third or fourth spines longest, and about equal to longest dorsal-fin ray; interspinous dorsal-fin membranes distinctly incised; anal fin with 3 spines and 8 rays; tail fin rounded, branched rays 15; pectoral-fin rays 17 to 19; origin of pelvic fins below pectoral-fin base. Lateral body scales ctenoid; lateral-line scales 62 to 73; lateral-scale series 98 to 116. **Colour:** head and body dark reddish brown or greyish dorsally, usually yellowish gold ventrally, irregular white, pale greenish yellow or silvery grey spots and blotches usually visible on body and head, and mostly arranged in vertical series; black maxillary streak more or less distinct; median fins dark brown; margin of anal, caudal and often pectoral fins narrowly white; pelvic fins blackish distally; pectoral fins dark reddish brown or grey; margin of spinous dorsal fin often golden yellow.

Size: Maximum to 120 cm, 35 kg.

Habitat, biology, and fisheries: Demersal but not sedentary; inhabits mostly rocky bottoms at depths between 10 and 200 m or more. Juveniles common in tidepools. Feeds chiefly on fish, cephalopods and crustaceans. A large, inquisitive fish, not easily frightened. In Tunisian waters, females mature at 44 to 53 cm total length (6 to 8 years) and change sex at about 80 cm (age 16 years). Estimated maximum age of 35 years for a 118 cm fish. Although this species is of considerable economic importance, catch statistics are uncertain due to previous confusion with *E. haifensis*. Taken on lines in traps and trammel nets, mainly caught by Senegal. Marketed fresh and smoked.

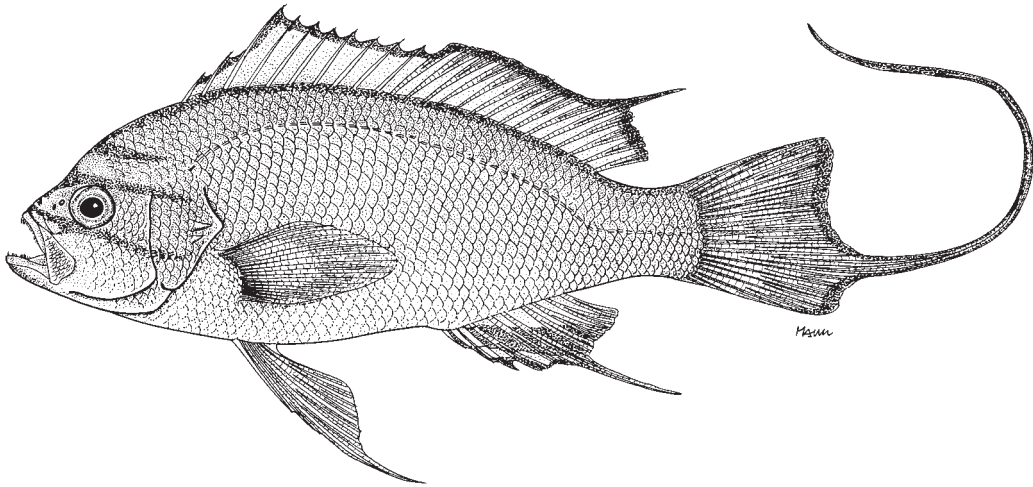
Distribution: Eastern Atlantic from Mediterranean, Azores, coasts of United Kingdom, France, Spain and Portugal, Madeira, Canary and Cape Verde Islands to Angola, São Tomé and Príncipe; records from Namibia are unsubstantiated. Also occurs in the western Atlantic from southern Brazil to Argentina; and in the western Indian Ocean from South Africa to southern Madagascar, including one record from Oman.



Holanthias caudalis Trunov, 1976

Frequent synonyms / misidentifications: None / None.

FAO names: En – Whiptail seaperch.



Diagnostic characters: Body moderately deep, depth of body 37 to 39% standard length. Head relatively short, its length 28 to 29% standard length. Eye shorter than snout, horizontal diameter of eye 6 to 7% standard length. Vomer, palatines, and tongue with small teeth; vomerine tooth patch with well-developed posterior prolongation. Most of head, including maxilla, covered with scales. Gill rakers on first arch, 12 on upper limb and 29 or 30 on lower limb, total 41 or 42. Dorsal fin single, not incised at junction of spinous and soft portions. Eleventh dorsal soft ray, third anal soft ray, and second pelvic soft ray elongated. Caudal fin with second and third dorsalmost rays of lower lobe greatly elongate. Dorsal fin with 10 spines and 15 soft rays. Anal fin with 3 spines and 7 soft rays. Pectoral fin with 21 rays. Small accessory scales present at bases of larger scales. Lateral line complete, not interrupted; tubed scales in lateral line 46 or 47. Colour: overall body colour pinkish yellow with small reddish spots; 3 rose-coloured stripes on head (1 below eye, 1 above eye, and 1 on occiput); rest of head rosy; dorsal fin yellow with rose-coloured border along base and at distal ends of fin rays; anterior border of anal fin and margins of caudal fin edged with rose; anal fin partly rosy with wide yellow band anteriorly; pelvic fin rosy.

Size: Maximum standard length 22 cm.

Habitat, biology, and fisheries: Collected in 120 to 170 m. No other information available.

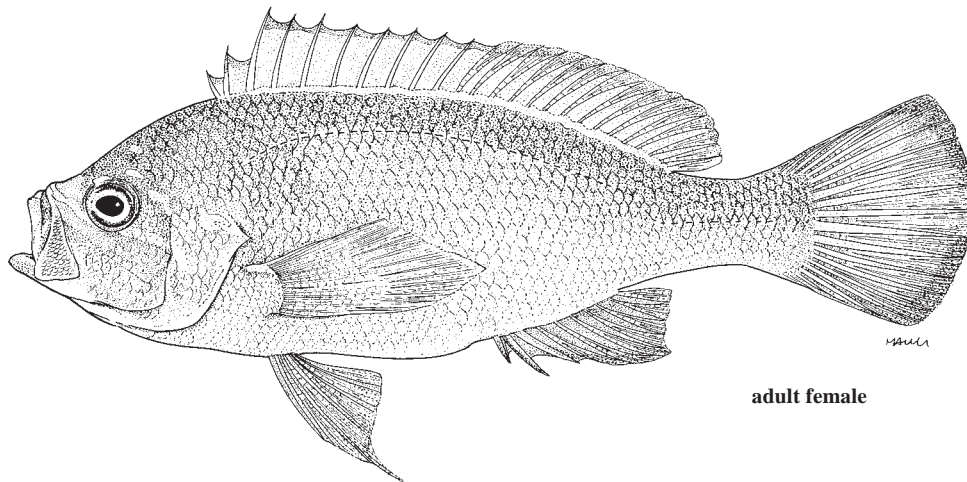
Distribution: Known from a single locality southeast of Ascension Island.



***Holanthias fronticinctus* (Günther, 1868)**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Deepwater greenfish.



adult female

Diagnostic characters: Body moderately deep, depth of body 34 to 39% standard length. Head relatively short, its length 28 to 30% standard length. Orbit usually longer than snout, horizontal diameter of bony orbit 7 to 8% standard length. Outer teeth in jaws mostly conical, some enlarged into canines anteriorly (a few of these exerted); inner jaw teeth villiform to small conical, anteriorly a few enlarged into recurved canines. Vomer, palatines, and tongue with patches of teeth; endopterygoids usually with teeth; vomerine tooth patch with well-developed posterior prolongation. The 2 nostrils on each side of head close together; internarial distance 8 to 12 times in snout length. Most of head, including maxilla, covered with scales. Branchiostegals 7. Gill rakers on first arch 10 to 14 on upper limb and 26 to 30 on lower limb, total 38 to 43. Dorsal fin single, not incised at junction of spinous and soft portions. Longest dorsal spine (third) 11 to 14% standard length. Anal-fin length 25 to more than 39% standard length, third anal soft ray longest in fin, becoming relatively longer in large males than in females. Posterior margin of caudal fin convex to almost truncate, middle rays of caudal fin elongated in larger individuals; midcaudal-fin rays 27 to 44% standard length, becoming relatively longer in large males than in females. Pelvic fin 28 to 55% standard length; second pelvic soft ray longest in fin, becoming relatively longer in large males than in females. Dorsal fin with 10 spines and 15 or 16, usually 15, soft rays. Anal fin with 3 spines and 7 soft rays. Pectoral fin with 19 to 21, usually 20, rays. Scales ctenoid; small accessory scales present at bases of larger scales. Lateral line complete, not interrupted; tubed scales in lateral line 50 to 55. Circum-caudal-peduncular scales 24 to 26. **Colour:** brilliant yellow-orange in life; head with purple band running obliquely from snout through lower edge of orbit to preoperculum; intermittent purple band passing from forehead through upper edge of orbit to preoperculum; short purple band present on nape; dorsal fin with purple edging and purple band along base; axil of pectoral fin purple.

Size: Maximum standard length to at least 22 cm.

Habitat, biology, and fisheries: Known from depths of 73 to 110 m. This species appears to be a protogynous heremaphrodite. No other information available.

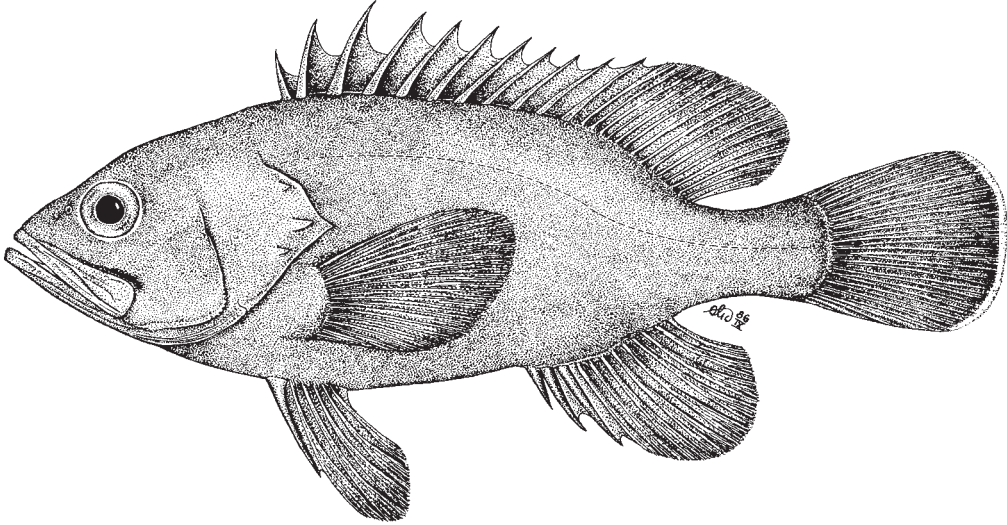
Distribution: Known from waters off St Helena Island. Also reported from the stomach contents of *Thunnus albacares* (yellowfin tuna) collected over Bonaparte Seamount, about 130 km west of St Helena, but no specimens are available to verify this record.



***Hyporthodus haifensis* (Ben-Tuvia, 1953)**

Frequent synonyms / misidentifications: *Epinephelus haifensis* Ben-Tuvia, 1953; *Epinephelus gigas* Brunnich, 1768 / *Epinephelus marginatus* (Lowe, 1834).

FAO names: En – Haifa grouper; Fr – Mérou d'Haifa; Sp – Mero de Haifa.



Diagnostic characters: Body depth slightly less than head length, contained 2.4 to 2.8 times in standard length; head length contained 2.2 to 2.4 times in standard length. Preopercle serrate, with enlarged serrae at angle, the lower edge of preopercle with 1 to 6 small serrae usually covered by skin. Gill rakers on upper limb 7 to 10, on lower limb 13 or 15; total 20 to 25. Dorsal fin with 11 spines and 14 or 15 rays, the interspinous membranes deeply incised; anal fin with 3 spines and 9 rays; tail fin rounded; branched rays 15; pectoral-fin rays 18 to 21; origin of pelvic fins in front of vertical at lower end of pectoral-fin base. Lateral body scales ctenoid; lateral-line scales 64 to 75; lateral-scale series 104 to 112. **Colour:** head and body dark brown; soft dorsal, caudal, and anal fins blackish distally (where there are no scales), the basal (scaly) part of these fins are not so dark; caudal and pectoral fins with white edge; pelvic fins blackish; prominent black streak on cheek at upper edge of maxilla.

Size: Maximum size uncertain, to at least 110 cm, 25 kg.

Habitat, biology, and fisheries: Bottom-living on sand, mud and rock at depths of 90 to 220 m. Feeds on fish, crustaceans and molluscs. Taken on lines, in bottom trawls and trammel nets. Appears to be of minor importance to the fisheries of the area, but the catch statistics for *E. haifensis* are uncertain because of its previous confusion with *E. marginatus*.

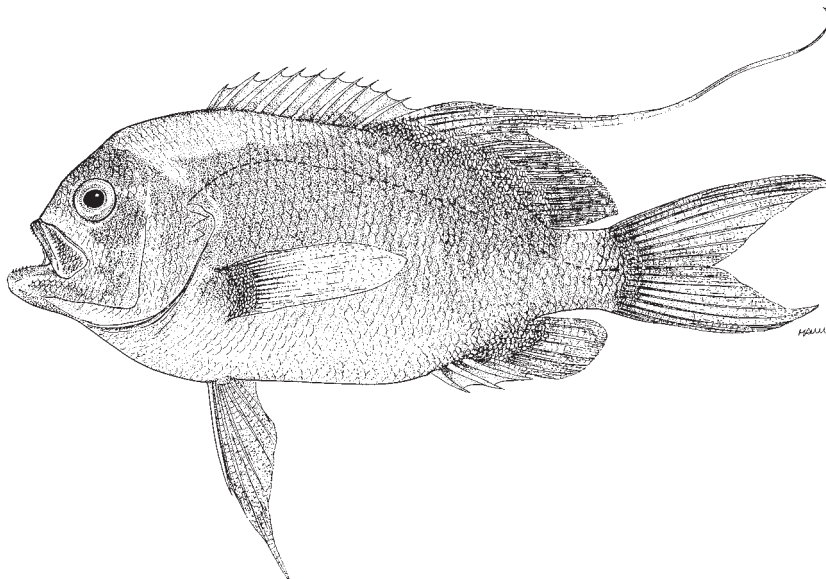
Distribution: Morocco to Angola; Mediterranean to coast of Israel; also reported from São Tomé and Príncipe.



***Meganthias carpenteri* Anderson, 2006**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Yellowtop jewelfish.



Diagnostic characters: Body deep, depth of body at first dorsal spine 45 to 48% standard length. Head moderate, its length 35 to 36% standard length. Orbit and snout lengths about equal, horizontal diameter of bony orbit 7 to 9% standard length. Lips mostly covered with very small scales; upper lip without rugosities; lower lip mostly without rugosities. Upper and lower jaws each with a series of small conical teeth, a few of these enlarged anteriorly, and an inner band of villiform teeth; vomer and palatines with teeth; vomerine tooth patch roughly triangular, without posterior prolongation; endopterygoids toothless; tongue with a patch of teeth (patch ranging from small and rectangular in shape to a large elongated oval). The 2 nostrils on each side of head close together; internarial distance 14 to 17 times in snout length; posterior border of anterior nostril produced into short flap. Most of head, including maxilla and dentary, covered with scales. Branchiostegals 7. Gill rakers on first arch 11 or 12 on upper limb and 24 or 25 on lower limb, total 35 to 37. Anterior dorsal soft rays elongate, longest of these (third or fourth) 33 to 62% standard length. Longest dorsal spine (fourth or fifth) 14 to 16% standard length. Dorsal fin single, not incised at junction of spinous and soft portions. Anal-fin length 32 to 34% standard length. Upper caudal-fin lobe damaged on available specimens. Lower caudal-fin lobe about 45% standard length (slightly damaged on specimen with essentially intact lower lobe). Pelvic fin 30 to 35% standard length. Dorsal fin with 10 spines and 17 or 18 soft rays. Anal fin with 3 spines and 8 soft rays. Pectoral fin with 16 or 17 rays. Scales ctenoid. Small accessory scales present at bases of larger scales. Tubed scales in lateral line 38 to 46 (specimen with 38, on both sides, has a few missing scales in lateral-line series and a number of scales without tubes on each side). Circum-caudal-peduncular scales (difficult to count) about 25 or 26. Vertebrae 26 (10 precaudal + 16 caudal). Colour: head mostly rosy, but with bright yellow on much of snout, suborbital region, and anterior part of preopercle and bordering maxilla and dentary; bright yellow oblong area on dorsum extending from level of posterior part of orbit to at least middle of spinous dorsal fin; iris of eye mostly yellow, with some rose peripherally; body mostly rosy dorsally, paler ventrally; numerous yellow blotches present, particularly on caudal peduncle; fins mostly yellow, except soft dorsal fin with much rose overlain with numerous yellow streaks and spots and base of anal fin rosy.

Size: Reaches 30 cm standard length.

Habitat, biology, and fisheries: No information available.

Distribution: Known from 2 specimens collected off Nigeria.

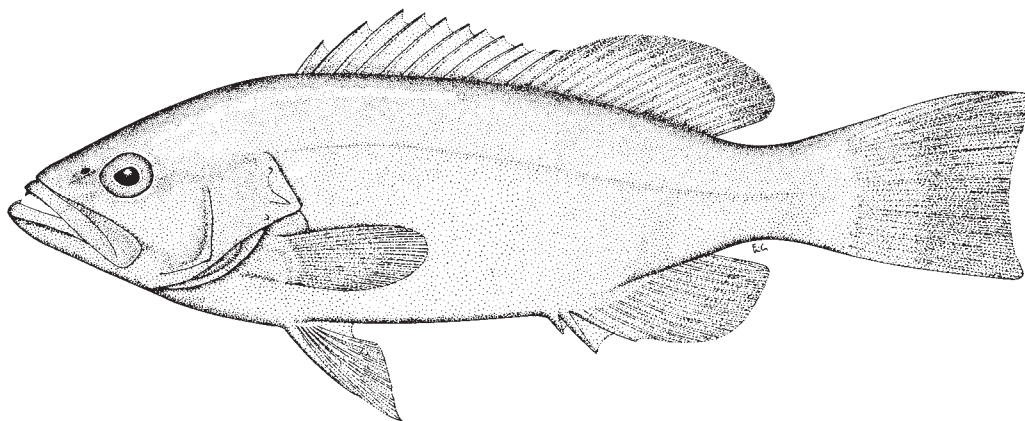
Remarks: *Meganthias carpenteri* resembles very closely the western Indian Ocean species *M. natalensis*.



***Mycteroperca fusca* (Lowe, 1838)**

Frequent synonyms / misidentifications: *Epinephelus emarginatus* (Valenciennes, 1843); *Serranus simonyi* Steindachner, 1891 / *Mycteroperca rubra* (Bloch, 1793); *M. acutirostris* (Valenciennes, 1828); *Epinephelus alexandrinus* (Valenciennes, 1628).

FAO names: En – Island grouper; Fr – Mérou d'île; Sp – Mero abadejo.



Diagnostic characters: Body depth less than head length, contained 3.0 to 3.3 times in standard length (for fish 15 to 51 cm standard length); head length contained 2.6 to 2.9 times in standard length; maxilla width 3.8 to 5.0% standard length. Interorbital convex; preopercle finely serrate, the serrae at angle slightly enlarged, forming a rounded lobe below a shallow indentation on vertical edge. Gill rakers on upper limb 11 to 14, on lower limb 20 to 24; total 32 to 36. Dorsal fin with 11 spines and 14 to 16 rays, the third or fourth spines longest, and slightly shorter than longest dorsal-fin ray; rear margin of dorsal and anal fins rounded; interspinous dorsal-fin membranes slightly incised; **anal fin with 3 spines and 10 to 12 rays**; tail fin emarginate, branched rays 15; pectoral-fin rays 15 to 17; origin of pelvic fins below pectoral-fin base. Lateral-body scales ctenoid; lateral-line scales 72 to 78; lateral-scale series 96 to 106. **Colour:** at Madeira, most adults are brownish or dark grey, with irregular pale blotches and spots and a prominent black streak on cheek above maxilla; a live fish under stress or chasing prey may reverse this pattern so that the head and body are pale, with irregular dark markings. A 14 cm standard length juvenile caught in a tide pool was mottled greenish brown, with prominent white spots on the head and body, white streaks on the median fins and hyaline golden pectoral fins. Xanthic (golden) fish are occasionally seen at Madeira, and 1 xanthic fish was put in an aquarium at the Municipal Museum of Funchal. Within a few weeks this yellow fish had changed to the normal brown colour.

Size: Maximum to at least 80 cm, 3 kg.

Habitat, biology, and fisheries: Inhabits mostly rocky bottoms at depths between 10 and 100 m. An active, solitary, demersal fish; feeds chiefly on fish, cephalopods and crustaceans. Information on the biology and fishery statistics of the island grouper is not available. Taken on lines, in traps and trammel nets. Common in markets at Madeira; sold fresh or frozen. Listed as Endangered in 2008 on the IUCN Red List due to limited range.

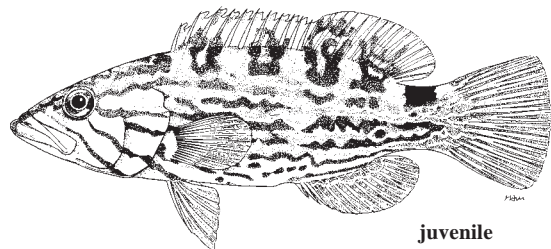
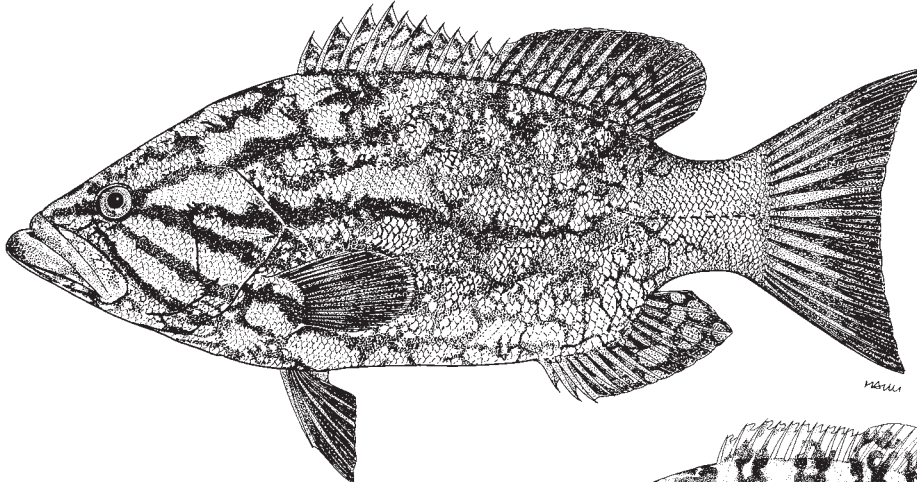
Distribution: Endemic to northeastern Atlantic islands: Azores, Madeira, Canaries and Cape Verde.



***Mycteroperca rubra* (Bloch, 1793)**

Frequent synonyms / misidentifications: *Epinephelus ruber* Bloch, 1793 / *Mycteroperca fusca* (Lowe, 1838).

FAO names: En – Mottled grouper; Fr – Badèche rouge; Sp – Gitano.



Diagnostic characters: Body depth less than head length, contained 2.8 to 3.2 times in standard length (for fish 17 to 59 cm standard length); head length contained 2.5 to 2.7 times in standard length; maxilla width 3.8 to 4.5% standard length for fish of 17 to 37 cm, 4.8% for a 59 cm fish. Interorbital convex; preopercle finely serrate, the serrae at angle slightly enlarged, forming a rounded lobe below a shallow indentation on vertical edge. **Gill rakers on upper limb 16 to 18, on lower limb 28 to 31; total 44 to 49 (including 1 to 3 rudiments on each limb).** Dorsal fin with 11 spines and 15 to 17 rays, the third or fourth spines longest, and slightly shorter than longest dorsal-fin ray; rear margin of dorsal fin rounded; interspinous dorsal-fin membranes slightly incised; **anal fin with 3 spines and 11 or 12 rays, the rear margin angular in adults;** tail fin of juveniles convex, distinctly concave in adults, branched rays 15; pectoral-fin rays 16 or 17; origin of pelvic fins below pectoral-fin base. Lateral-body scales ctenoid; lateral-line scales 69 to 76; lateral-scale series 94 to 108. **Colour:** generally uniform reddish brown; sometimes mottled with irregular, blackish or pale grey spots; black streak above maxilla. Juveniles with a small black saddle spot on peduncle; some adults mottled with irregular dark or pale grey spots; juveniles with black saddle blotch on peduncle, preceded by white blotch below last dorsal-fin rays; irregular black stripes on body and head, body stripes horizontal and interrupted; 4 irregular, interrupted, vertical, dark bars separated below dorsal fin by irregular white patches.

Size: Maximum at least 82 cm, 7 kg.

Habitat, biology, and fisheries: Inhabits sandy and rocky bottoms from 10 to 150 m. An active, solitary, demersal fish. Occurs near the bottom over upper continental shelf waters throughout its range. Feeds on fish and cephalopods. Taken in upper shelf waters throughout its range. Separate statistics are not reported for this species. Caught in bottom trawls and on hook-and-line. Marketed fresh and frozen.

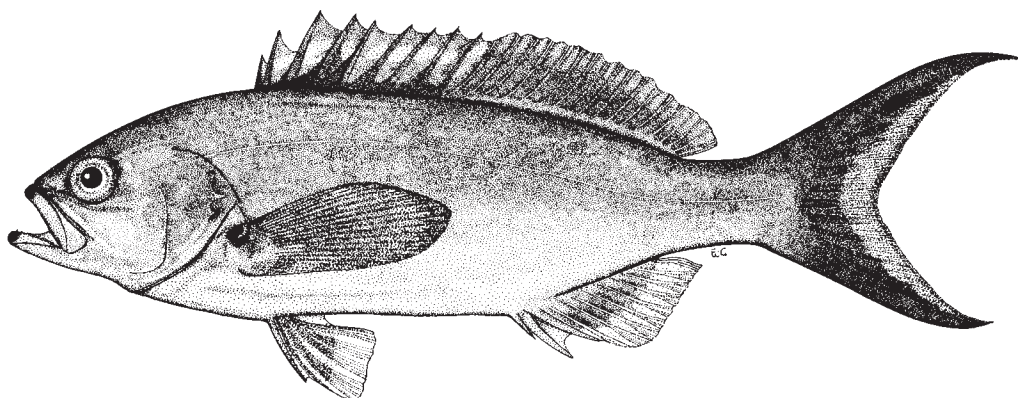
Distribution: Straits of Gibraltar along west African coast to Angola; Mediterranean and along coasts of Portugal and Spain to Bay of Biscay. Reports of *Mycteroperca rubra* from the Canaries and Cape Verde islands are unsubstantiated and probably based on misidentifications of *M. fusca*, which is very similar.



***Paranthias furcifer* (Valenciennes, 1828)**

Frequent synonyms / misidentifications: None / *Apsilus fuscus* Valenciennes, 1830.

FAO names: En – Creole-fish; Fr – Badèche créole; Sp – Cuna lucero.



Diagnostic characters: Body slender, moderately compressed, body depth slightly greater than head length; dorsal and ventral profiles of body nearly equally curved. Head short, less than 35% of standard length. Preopercle finely serrate. Gill rakers on upper limb 12 to 14, on lower limb 22 to 25, total 36 to 38. Dorsal fin with 9 spines and 16 to 19 rays; anal fin with 3 spines and 8 to 10 rays; tail fin deeply forked, branched rays 15; pectoral fins with 19 or 20 rays, fin length subequal to head length. Scales ctenoid small; lateral-line scales 69 to 77; lateral-scale series 124 to 129. **Colour:** head and body red or reddish brown, slightly paler ventrally; bright orange-red spot at upper end of pectoral-fin base; often with 3 or 4 widely spaced, contrasting spots between base of dorsal fin and lateral line.

Size: Maximum to 35 cm fork length.

Habitat, biology, and fisheries: Coral and rocky reefs in 10 to 64 m. Feeds primarily on zooplankton (copepods, salps, shrimps and shrimp larvae). Usually seen in feeding aggregations swimming well above the reef. Probably protogynous.

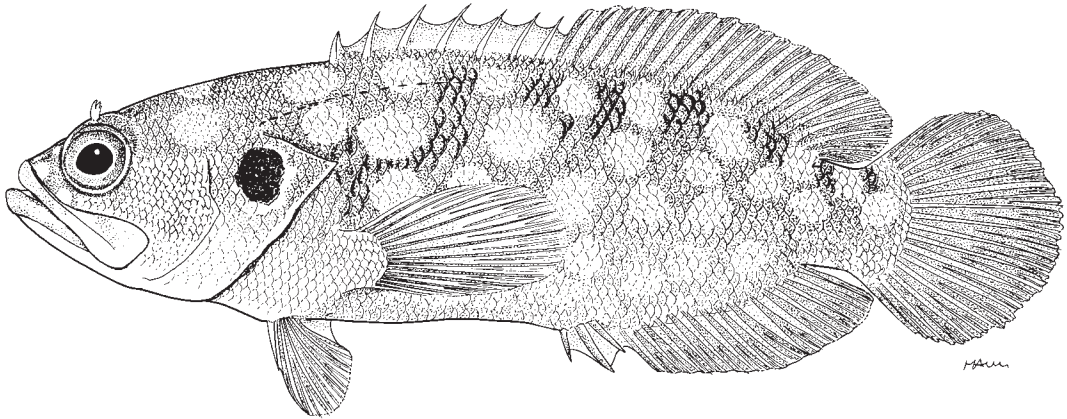
Distribution: Eastern central Atlantic: Ascension Island, Príncipe, São Tomé and Annobon. Western central Atlantic: Bermuda and Gulf of Mexico to southern Brazil.



***Pseudogramma gregoryi* (Breder, 1927)**

Frequent synonyms / misidentifications: *Rhegma bermudensis* Kanazawa, 1952 / None.

FAO names: En – Reef bass.



Diagnostic characters: Body depth contained 2.9 to 3.7 times in standard length; head length contained 2.4 to 2.7 times in standard length. **Preopercle serrate, with a short spine projecting obliquely downward on lower edge. Adult with broad-based, slender, triangular skin flap on top of eye.** Villiform teeth on jaws, vomer and palatines; no canines. Gill rakers on upper limb 5 or 6, on lower limb 9 to 11. **Dorsal fin with 7 spines and 18 or 19 rays; anal fin with 3 spines and 14 to 16 rays;** tail fin rounded, with 15 branched rays; **pectoral fins with 14 or 15 rays;** fin shorter than head; pelvic fins with 1 spine and 5 rays, fin origin well in front of pectoral-fin base. Scales ctenoid, small; single lateral line extending from upper end of operculum to below middle dorsal-fin rays. **Colour: dark reddish brown with about 5 rows of pale reddish brown blotches; oval black spot on opercle;** spinous dorsal and anal fins brown; soft dorsal and tail fin brownish red, the rays bright red; paired fins pale dusky red.

Size: Maximum 45 mm standard length.

Habitat, biology, and fisheries: Coral reefs and rocky bottom from shore to 21 m. *Pseudogramma* species are sedentary, extremely cryptic, small reef species that have yet to be photographed alive; commonly collected with rotenone. Probably nocturnal. This secretive, tiny fish is of no commercial importance.

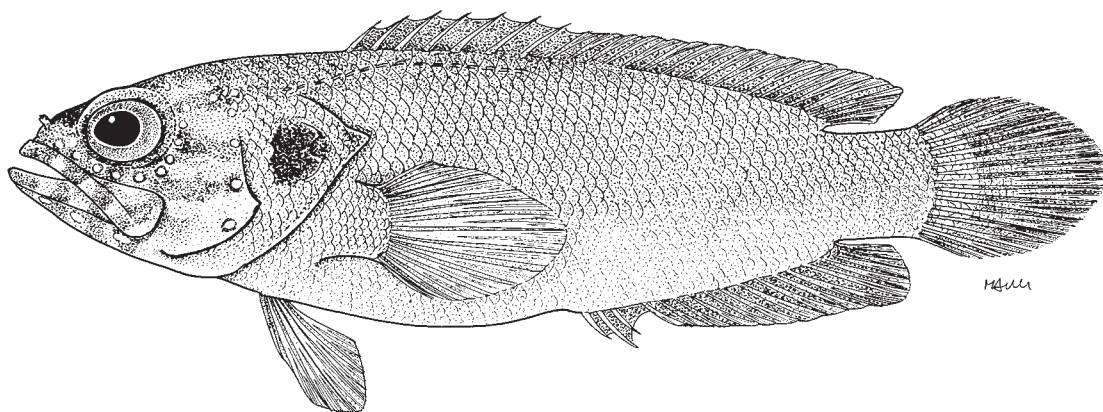
Distribution: Western central Atlantic from Bermuda to the Florida Keys, Bahamas and throughout the Caribbean. One specimen reported from Ascension Island.



Pseudogramma guineensis (Norman, 1935)

Frequent synonyms / misidentifications: *Rhegma guineensis* Norman, 1935 / Unknown.

FAO names: None.

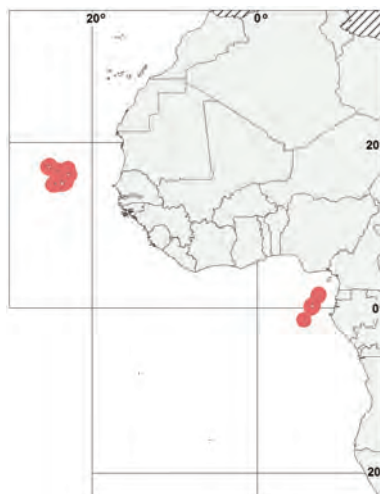


Diagnostic characters: Body depth slightly shorter than head, contained 3.7 times in standard length (about 3.3 times on figure); head length contained 2.5 times in standard length. Preopercle serrate, with a short spine projecting slightly downward at the angle. Villiform teeth on jaws, vomer and palatines; no canines. Gill rakers on upper limb 6, on lower limb 11. **Dorsal fin with 7 spines and 20 rays; anal fin with 3 spines and 17 rays;** tail fin bluntly pointed, the middle rays longest, branched rays 15; **pectoral-fin rays 8**, most branched; fin shorter than head; pelvic fins with 1 spine and 5 rays, fin origin well in front of pectoral-fin base. Scales ctenoid small; a single lateral line extending from upper end of operculum to below last dorsal-fin spine. **Colour:** (In alcohol) head and body pale yellowish brown, with dark brown spot on upper part of opercle; front nostril with dark stripe; median fins darker than body except scaly part of tail fin which is pale. Norman's original figure shows dark bands in a grid pattern on the head.

Size: The single known specimen is 23 mm standard length.

Habitat, biology, and fisheries: The holotype was collected in a dredge from a depth of 18 to 20 m. *Pseudogramma* species are sedentary, extremely cryptic small-reef species that have yet to be photographed alive. Commonly collected with rotenone.

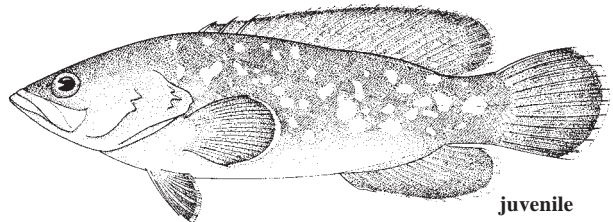
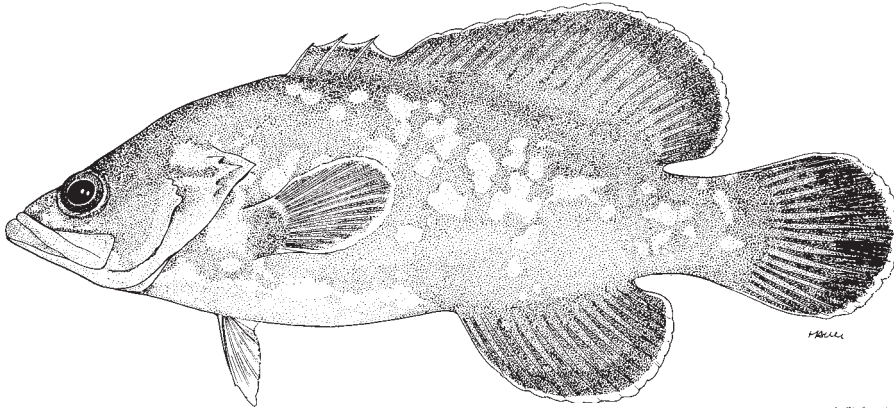
Distribution: The holotype was collected at the island of Annobon in the Gulf of Guinea. It has also been recorded in the Cape Verde and Gulf of Guinea Islands.



***Rypticus saponaceus* (Bloch and Schneider, 1801)**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Greater soapfish.



Diagnostic characters: Body compressed, its depth contained 3.0 to 3.3 times in standard length. Head shorter than body depth; mouth large, with thick lips; lower jaw projecting; maxilla broad posteriorly, its width (including supramaxilla) distinctly greater than suborbital distance (from lower edge of eye to maxilla); villiform teeth on jaws, vomer and palatines; entire upper edge of operculum joined by skin to body; 3 well-developed spines on opercle and 1 to 3 on upper edge of preopercle.

Gill rakers on first gill arch 6 to 9 not counting rudiments. Base of median fins fleshy, covered by skin and scales; dorsal fin single, low anteriorly, increasing in height posteriorly, with 3 spines and 23 to 25 rays; anal fin with 15 rays and no spine; caudal fin rounded; branched rays 15; pectoral fins shorter than head, with 14 to 17 rays; pelvic fins rudimentary, inserted in advance of pectorals, their inner rays attached to body by membrane; median fins rounded posteriorly. Lateral line complete; lateralis pores conspicuous on preopercle margin and underside of lower jaw. Scales small, embedded, with concentric rings. **Colour:** adults dark grey or brownish grey, paler below; often with a pattern of fine dark lines which becomes reticulate on fins; body with irregular pale spots about pupil size or smaller, less numerous on dorsal fin and anal fins, many of the spots merging; pale mid-dorsal stripe often present on head, particularly in juveniles. Small juveniles with numerous irregular dark spots and streaks on a pale background.

Size: Maximum to about 32 cm.

Habitat, biology, and fisheries: Inhabits shallow water (to about 50 m depth) on bottoms of eroded limestone or mixed sand and rocks as well as around reefs. When disturbed, the soapfish secretes copious mucus that contains a toxin called 'grammistin'. This toxin gives the fish a bitter taste that deters predators. Caught mainly in traps and by hook-and-line. Consumed locally fresh and smoked, but not highly esteemed as a foodfish, because of its slime.

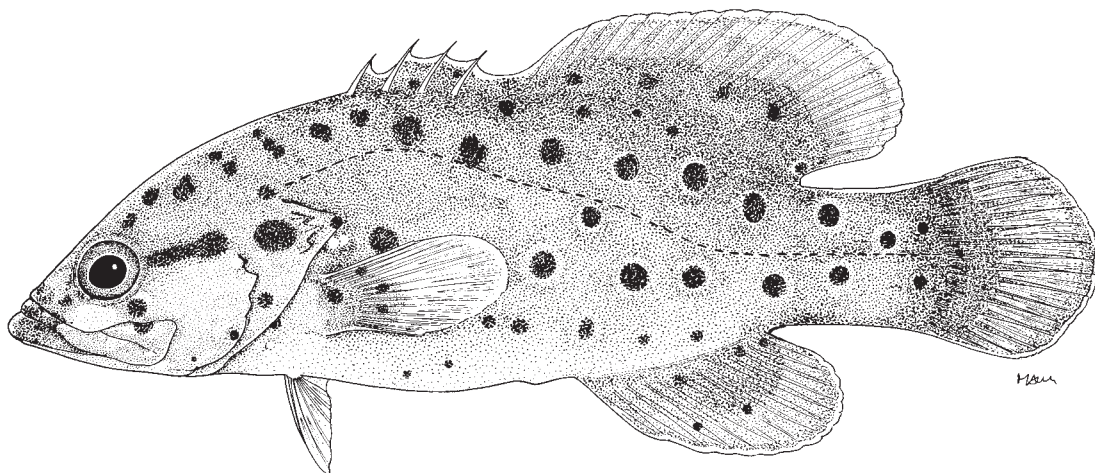
Distribution: Eastern central Atlantic: St Helena, Ascension, St Paul's Rocks, Cape Verde Islands, Senegal to Angola, São Tomé and Príncipe. Western central Atlantic: Bermuda, south Florida and Gulf of Mexico, throughout Caribbean to southern Brazil.



***Rypticus subbifrenatus* Gill, 1861**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Spotted soapfish; Fr – Savon tacheté; Sp – Jabonero colorada.



Diagnostic characters: Body compressed, its depth contained 3.2 to 3.5 times in standard length. Head shorter than body depth; mouth with thick lips; lower jaw projecting; maxilla broad posteriorly, its width (including supramaxilla) greater than suborbital distance (from lower edge of eye to maxilla); villiform teeth on jaws, vomer and palatines; entire upper edge of operculum joined by skin to body; 3 well-developed spines on opercle and 1 to 3 on upper edge of preopercle. Base of median fins fleshy, covered by skin and scales; dorsal fin single, low anteriorly, increasing in height posteriorly, with 3 or 4 spines and 21 to 24 rays; anal fin with 14 to 16 rays and no spine; caudal fin rounded, branched rays 15; pectoral fins shorter than head, with 14 to 16 rays; pelvic fins rudimentary, inserted in advance of the pectorals, their inner rays attached to body by a membrane; median fins rounded posteriorly Lateral line single and complete; lateralis pores conspicuous on preopercle margin and underside of lower jaw. Scales small, with concentric rings, embedded in the skin. **Colour:** head and body usually olive green to pale reddish brown, with several widely scattered small dark reddish brown to black spots; in fish larger than 10 cm standard length, the spots are confined to the head and front part of the body. Some large fish have no dark spots.

Size: Maximum 16 cm.

Habitat, biology, and fisheries: Inhabits shallow water (to about 50 m depth) on bottoms of eroded limestone or mixed sand and rocks as well as around reefs. Solitary and sedentary. When disturbed, the soapfish secretes copious mucus that contains a toxin called 'grammistin'. This toxin gives the fish a bitter taste that deters predators. Caught mainly in traps and by hook-and-line. Consumed locally fresh and smoked, but not highly esteemed as a foodfish, because of its slime.

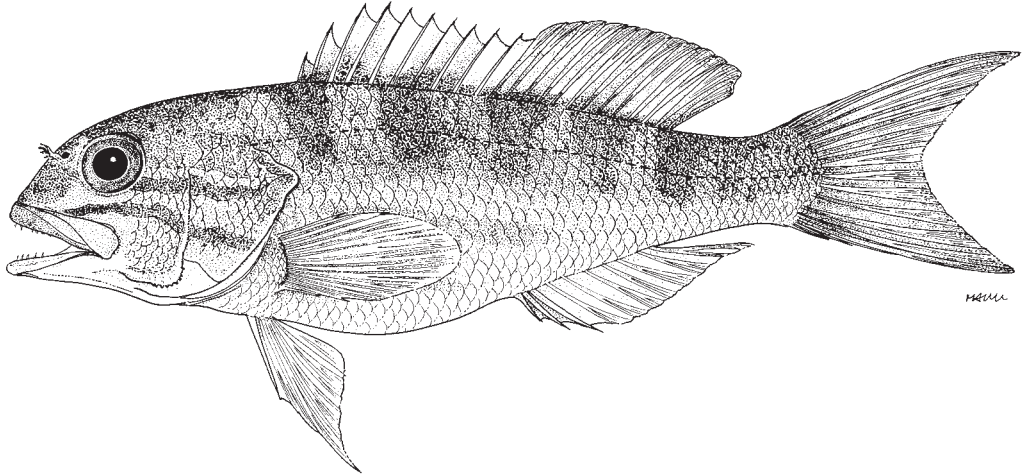
Distribution: Reported from Senegal, Guinea-Bissau, Democratic Republic of the Congo, Angola, São Tomé, Príncipe and Annobon. Western central Atlantic: Bermuda, Florida Keys, Bahamas, West Indies, Panama to Venezuela.



***Serranus accraensis* (Norman, 1931)**

Frequent synonyms / misidentifications: *Neanthias accraensis* Norman, 1931; *Novanthias accraensis* (Norman, 1931) / None.

FAO names: **En** – Ghanian comber; **Fr** – Serran ganéen; **Sp** – Serrano ganés.



Diagnostic characters: Body depth less than or subequal to head length, contained 2.6 to 3.0 times in standard length; head length contained 2.5 to 2.7 times in standard length. Eye diameter subequal to snout; interorbital convex; dorsal head profile convex; preopercle finely serrate; upper part of head naked well behind eyes. Rear border of front nostrils produced, forming a broad flap fringed with 6 long cirri; rear nostrils a circular hole. Maxilla naked, with a low longitudinal ridge along lateral side of exposed portion of bone. Side of upper jaw with outer series of 13 small, curved, fixed canines and inner minute depressible teeth; side of lower jaw with 12 small canines mixed with smaller teeth; vomer with minute sharp teeth in a chevron, teeth mostly hidden by bulbous papillae; palatines with 1 or 2 series of minute teeth. **Gill rakers on lower limb 2 + 5 rudiments, lower limb rakers 11 to 14, no rudiments.** Dorsal fin with 10 spines and 12 or 13 rays; anal fin with 3 spines and 7 or 8 rays, the last ray longest; tail fin emarginate, branched rays 15; pectoral fins with 17 rays, fin shorter than head; pelvic-fin origin slightly in front of pectoral-fin base. Scales ctenoid; **lateral-line scales 45 to 48**; circum-peduncular scales 22. **Colour:** live colour: body below lateral line pale bluish silver, with longitudinal yellow stripes; body above lateral line dusky bluish purple. Head dull yellow with 2 blue stripes: 1 from front of snout below eye to upper end of pectoral-fin base; second stripe from lower edge of eye to rear edge of opercle. Dorsal fin yellowish; soft-rayed part with pale blue spots and orange margin; tail fin dusky yellow; anal fin hyaline yellow. Underside of head white. In preservative: body pale brown with 5 or 6 faint dark bars dorsally, ending in dark blotches below lateral line; faint dark stripe from snout, below eye to upper end of pectoral-fin base and another from lower rear edge of eye to middle opercle spine; faint spots on dorsal and caudal fin.

Size: Maximum to at least 20 cm.

Habitat, biology, and fisheries: Inhabits mud and sand bottom between 25 and 150 m depth. Feeds on fish. Occurs in aggregations near the bottom. A 12 cm total length female had a large ovary filled with ripe eggs. Caught in trawl fisheries throughout its range; reported to be taken regularly off Ghana. Separate statistics are not reported for this species. Caught in bottom trawls. Marketed fresh and smoked.

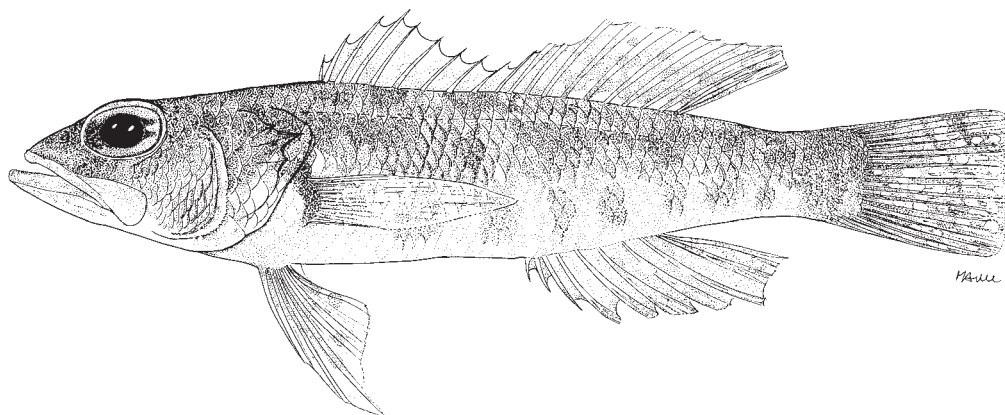
Distribution: Guinea-Bissau to Angola.



***Serranus africanus* (Cadenat, 1960)**

Frequent synonyms / misidentifications: *Chelidoperca africanus* Cadenat, 1960 / *Chelidoperca investigatoris* (non Alcock, 1890).

FAO names: None.



Diagnostic characters: Body slender, slightly compressed, depth less than head length, contained 3.9 to 4.4 times in standard length (for fish 6 to 14 cm standard length); head length 2.8 to 3.0 times in standard length. Eye diameter greater than snout length, 3.0 to 3.3 times in head length. Preopercle rounded, rear edge finely serrate; 3 spines on rear edge of opercle, upper spine small and hidden by skin and scales. Maxilla naked, no supramaxilla; upper jaw with band of minute, slender, inwardly depressible teeth, band about 7 or 8 teeth wide at front of jaw, narrowing to about 3 teeth at rear end of premaxilla; a cluster of about 7 enlarged, slender, depressible canines on each side of symphysis; lower jaw with band of small, sharp, curved, canines (depressible inwards), band of 3 or 4 teeth wide at front of jaw, narrowing to 1 row at rear of jaw; 2 rows of small teeth in chevron on vomer and 2 or 3 rows on palatines. **Dorsal fin with 10 slender spines and 10 or 11 rays, the fourth spine longest, but distinctly less than longest ray; anal fin with 3 spines and 6 rays, the last ray double, but counted as a single ray; tail fin rounded, with 15 branched rays;** pectoral fins with 15 or 16 rays, fin distinctly shorter than head; pelvic-fin origin below opercle, well in front of pectoral-fin base; pelvic fins reach anal-fin origin. Scales distinctly ctenoid, adherent; covering body and head except for the snout and jaws; tail fin scaly, dorsal and anal fins naked; lateral-line scales 44 to 46. Gill rakers on upper limb 6 or 7 (including 4 or 5 rudiments); lower limb rakers 13, including 4 rudiments, total 19 or 20. **Colour:** in alcohol, pale with faint spots on the flanks and tail fin; anal-fin margin and pelvic fins black; brownish vermiculations on the snout.

Size: Specimens of 13 cm are still immature. Maximum size unknown.

Habitat, biology, and fisheries: Inhabits sandy and mud bottoms between 75 and 200 m. Biology unknown. Caught in bottom trawls. Apparently rare; of no commercial importance.

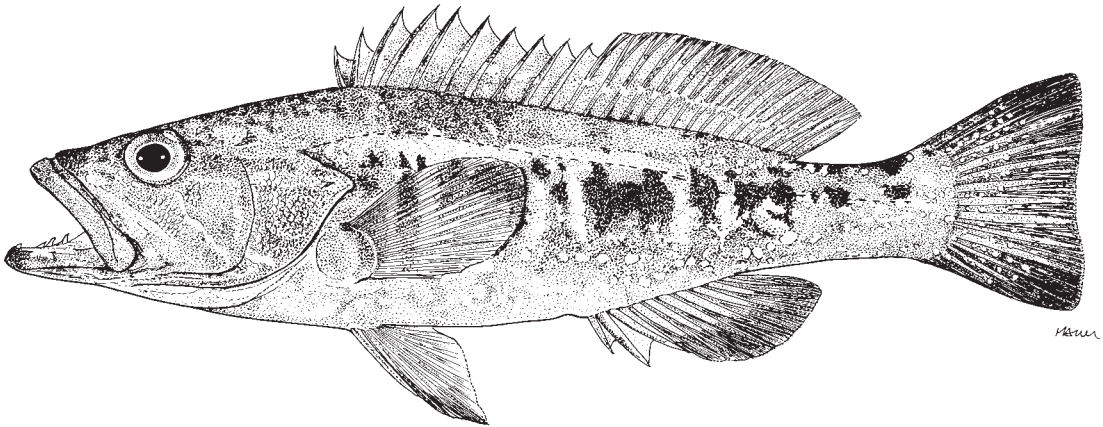
Distribution: From Mauritania to Angola.



***Serranus atricauda* Günther, 1874**

Frequent synonyms / misidentifications: *Paracentropistis atricauda* (Günther, 1874) / None.

FAO names: En – Blacktail comber; Fr – Serran à queue noire; Sp – Serrano imperial.



Diagnostic characters: Body depth less than head length, contained 3.3 to 3.5 times in standard length; head length 2.7 to 3.0 times in standard length. Snout longer than eye diameter, which is contained 4 to 6 times in head length. Preopercle finely serrate. Snout and interorbital area naked. Gill rakers on lower limb 14 or 15. **Dorsal fin with 10 spines and 15 or 16 rays;** anal fin with 3 spines and 7 or 8 rays; tail fin truncate or slightly emarginate, branched rays 15; pectoral fins with 17 rays, fin shorter than head. **Scales ctenoid; lateral-line scales 80 to 90. Colour: brownish, with a series of 4 or 5 larger squarish dark blotches alternating with narrow vertical dark bars;** 2 or 3 dark oblique stripes on cheeks; median fins dark with pale blue dots; pelvic fins dark, distal half of anal fin and corners of tail fin black. Some fish with a white stripe along lateral line.

Size: Maximum to 35 cm; common to 25 cm.

Habitat, biology, and fisheries: Demersal on rocky bottom, from shore to about 90 m depth. Feeds on fish and invertebrates. Separate statistics are not reported for this species. Caught on handlines and in trammel nets and bottom trawls. Marketed mostly fresh.

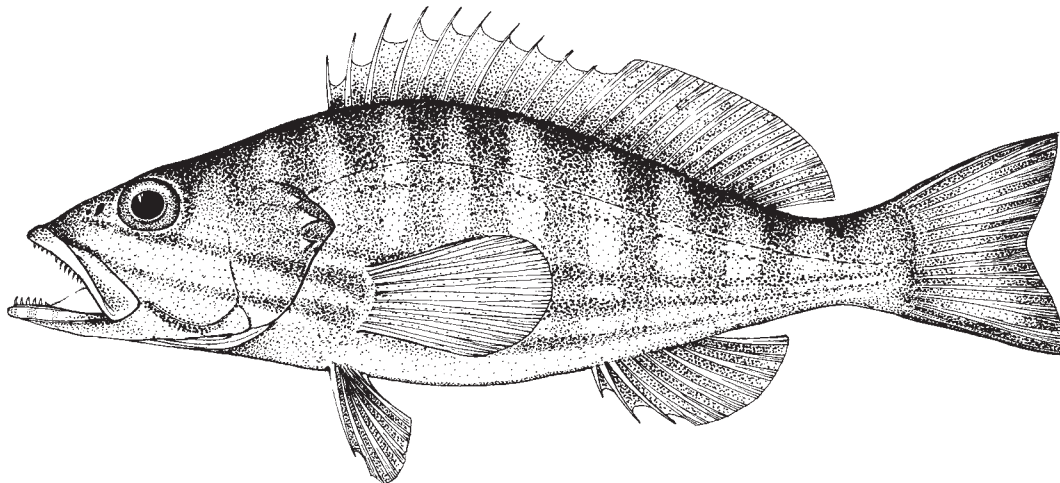
Distribution: Straits of Gibraltar to Guinea-Bissau, Madeira, Canary Islands, Mediterranean, off Portugal and common in the Azores.



***Serranus cabrilla* (Linnaeus, 1758)**

Frequent synonyms / misidentifications: *Paracentropristis cabrilla* (Linnaeus, 1758) / None.

FAO names: En – Comber (= Cabrilla seabass, Area 37); Fr – Serran-chèvre (= Serran cabrille, Area 37); Sp – Cabrilla.



Diagnostic characters: Body depth less than head length, contained 3.2 to 3.7 times in standard length; head length 2.7 to 3.0 times in standard length. Snout longer than eye diameter, which is contained 4 to 6 times in head length. Preopercle finely serrate. Snout and interorbital area naked. Gill rakers on lower limb 13 to 16, including rudiments, total gill rakers 19 to 21. **Dorsal fin with 10 spines and 13 to 15 rays, the fin margin notched between spinous and soft-rayed parts of fin;** anal fin with 3 spines and 7 or 8 rays; tail fin slightly emarginate, branched rays 15; pectoral fins with 15 or 16 rays, fin distinctly shorter than head. Scales ctenoid; lateral-line scales 70 to 77. **Colour:** quite variable; ground colour reddish yellow; **body with 2 or 3 white or bluish, horizontal stripes from head to tail; usually 8 or 9 dark reddish brown or dark brown bars on dorsolateral part of body; head with oblique red or orange stripes below and behind eye;** lower jaw and ventral part of body white; vertical fins with bright pale violet dots. This colour pattern is reported as varying more or less with sex, age and habitat, individuals from deeper waters being less colourful.

Size: Maximum to at least 40 cm; common to 25 cm.

Habitat, biology, and fisheries: Rocky as well as soft bottoms from shore to about 450 m. Feeds on fish, cephalopods and crustaceans. Caught on handlines and in bottom trawls and trammel nets. Marketed fresh, dried-salted, smoked. Also reduced to fishmeal (offshore fleets).

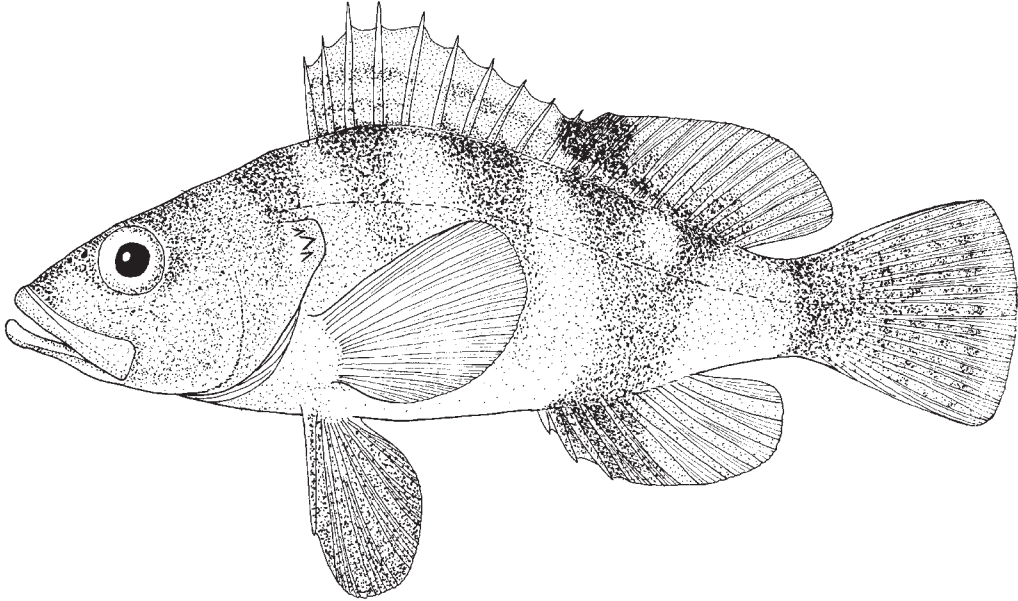
Distribution: Straits of Gibraltar to Angola, Madeira, and Canary and Cape Verde islands, São Tomé and Príncipe, Mediterranean, Black Sea, eastern Atlantic to British Isles and Azores; also in the Red Sea. South African records of this species appear to be misidentifications of *Serranus knysnaensis* Gilchrist, 1904 which is endemic to southern Africa.



Serranus hepatus (Linnaeus, 1766)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Brown comber.



Diagnostic characters: Body depth subequal to head length, contained 2.5 to 3.0 times in standard length. Snout equal to or shorter than eye diameter, which is contained 3.5 to 4.0 times in head length. Preopercle finely serrate; head scaly except for snout and front part of interorbital area. Gill rakers on lower limb 13 to 16, including rudiments, total gill rakers 19 to 22. **Dorsal fin with 10 spines and 11 to 13 rays;** no notch between spinous and soft-rayed parts of fin; anal fin with 3 spines and 6 or 7 rays; tail fin slightly emarginate, branched rays 15; pectoral fins with 15 rays, fin distinctly shorter than head. Scales ctenoid; lateral-line scales 44 to 50. **Colour:** brownish yellow or silver with 4 or 5 more or less distinct vertical bars, last bar at base of tail fin, the bar below the soft dorsal fin is broadest, darkest and bifurcates dorsally, where it joins a black ocellus in the fin; pelvics and base of anal fin blackish.

Size: Maximum to 25 cm; common to 12 cm.

Habitat, biology, and fisheries: Occurs from 5 to 100 m depth over seagrass, sand, mud and rocks. A sedentary species, usually seen sitting on the bottom. Feeds on fish and invertebrates. Taken by artisanal fisheries throughout its range. Separate statistics are not reported for this species. Caught on handlines, and in bottom trawls and trammel nets. Marketed fresh and smoked.

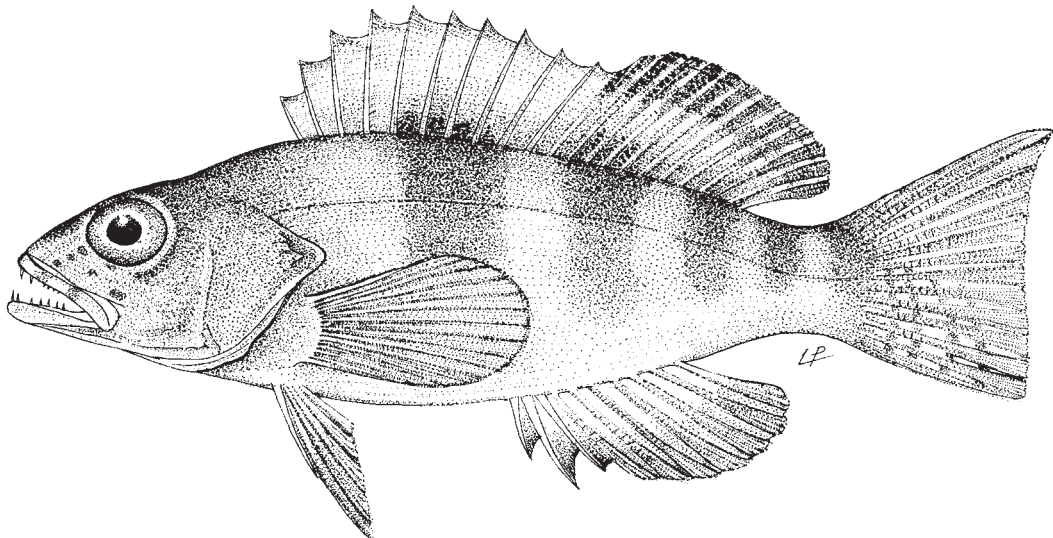
Distribution: Straits of Gibraltar to Senegal, also in western Mediterranean and along coast of Portugal. Reports of *Serranus hepatus* from the Canaries (Dooley *et al.*, 1985) are unsubstantiated.



Serranus heterurus (Cadenat, 1937)

Frequent synonyms / misidentifications: *Paracentropristis heterurus* Cadenat, 1937/ *Serranus sanctaehelenae* Boulenger, 1895.

FAO names: None.



Diagnostic characters: Body depth subequal to head length, contained 3.2 times in standard length. Snout equal to or shorter than eye diameter, which is contained 3.5 times in head length. Preopercle angular, finely serrate; cheeks and operculum scaly, the snout and top of head naked to well behind the eyes. Gill rakers on lower limb 9, including rudiments. **Dorsal fin with 10 spines and 12 rays;** no notch between spinous and soft-rayed parts of fin; anal fin with 3 spines and 7 rays, the middle ray longest, the first and last rays subequal; tail fin truncate, branched rays 15; the uppermost 2 or 3 rays slightly produced; pectoral fins with 17 rays, fin distinctly shorter than head. Scales ctenoid; lateral-line scales 46. **Colour:** reddish, with 5 more or less distinct, dark vertical bars, last bar at base of upper caudal-fin rays, penultimate bar on dorsal half of peduncle, first bar below rear half of spinous dorsal fin; body and tail fin with small blue spots.

Size: Maximum to 8 cm.

Habitat, biology, and fisheries: Known from rocky bottom in 25 to 30 m. Caught in bottom trawls. Rare. Nothing known of the biology of this species.

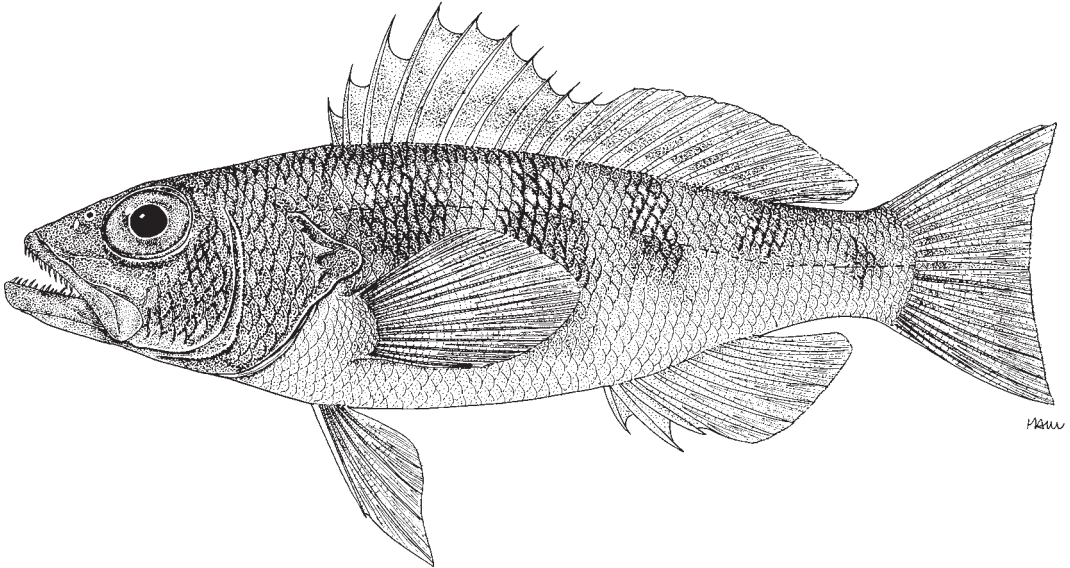
Distribution: Cape Verde Islands, coast of Guinea to the Congo.



Serranus sanctaehelena Boulenger, 1895

Frequent synonyms / misidentifications: None / None.

FAO names: None.



Diagnostic characters: Body depth less than head length, contained 3.5 to 4.0 times in standard length. Snout equal to or shorter than eye diameter, which is contained 3.3 to 3.5 times in head length. Preopercle rounded, finely serrate; cheeks and operculum scaly, the snout and interorbital naked up to the level of the rear edge of the eyes. Gill rakers on lower limb 14 or 15, including rudiments. **Dorsal fin with 10 spines and 12 rays**; a slight notch between spinous and soft-rayed parts of fin; anal fin with 3 spines and 7 rays, the first ray longest; tail fin emarginate, branched rays 15; pectoral fins with 17 rays, fin distinctly shorter than head. Scales ctenoid; lateral-line scales 47 to 52. **Colour:** body pale, with 4 broad, oblique, brown bars below dorsal fin; large brown saddle blotch extending below lateral line on peduncle and another brown blotch on nape; head brown.

Size: Maximum 24 cm.

Habitat, biology, and fisheries: Occurs in 100 to 110 m. Biology unknown. Although small, this fish is moderately common at St Helena and Ascension Island and is regularly caught by fishermen with hook-and-line or in trawls.

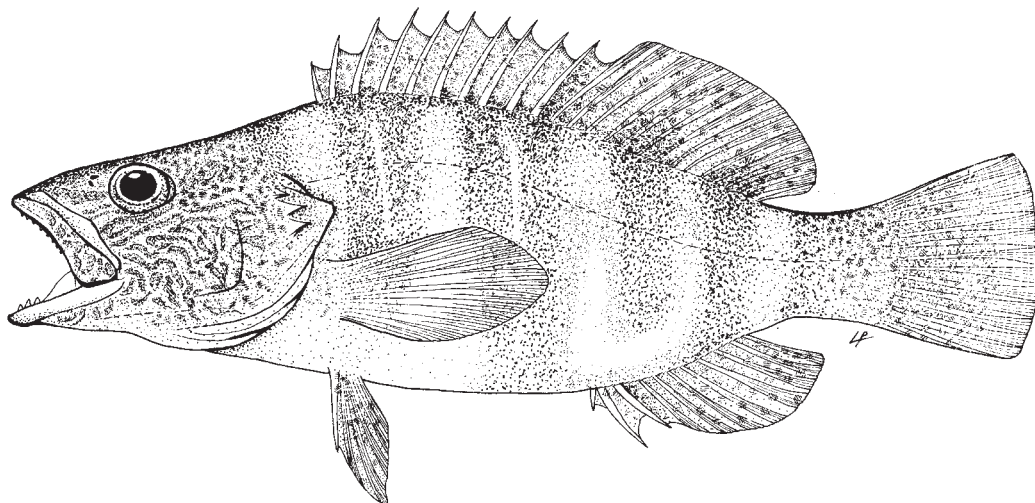
Distribution: Known only from St Helena and Ascension Island.



Serranus scriba (Linnaeus, 1758)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Painted comber.



Diagnostic characters: Body depth subequal to head length, contained 2.7 to 3.3 times in standard length; dorsal head profile of large adults concave, the back distinctly arched. Snout length 1.3 to 1.8 times longer than eye diameter, which is contained 5 to 6 times in head length. Preopercle finely serrate; cheeks and operculum scaly, snout and top of head naked. Gill rakers on lower limb 12 to 14, including rudiments, total gill rakers 15 to 19. **Dorsal fin high, with 10 spines and 14 to 16 rays**; no notch between spinous and soft-rayed parts of fin; anal fin with 3 spines and 7 or 8 rays; tail fin slightly convex or emarginate, branched rays 15; pectoral fins with 13 to 16 rays, fin distinctly shorter than head. Scales ctenoid; lateral-line scales 60 to 73. **Colour:** body and head brownish with 4 to 6 narrow dark brown vertical bars which extend into dorsal fin, and some bars bifurcate below lateral line; on some fish the bars may fuse to form 2 broad bars, 1 below soft dorsal and 1 below spiny dorsal fins; head sometimes red, or dorsal half brown and lower half pale with dark longitudinal stripe running through eye; or mostly covered with dark brown vermiculations; median fins hyaline with yellow rays or with red dots; fish at the Canary Islands have reddish fins, the tips of dorsal-fin spines with scarlet tips. Large pale bluish violet blotch on abdomen of live or very fresh specimens.

Size: Maximum 36 cm.

Habitat, biology, and fisheries: A shallow-water sedentary species inhabiting rocky bottoms from shore to 150 m. Feeds on fish and crustaceans. Taken by artisanal fisheries throughout its range. Caught on hook-and-line, occasionally in bottom trawls. Marketed fresh or frozen.

Distribution: Straits of Gibraltar to Senegal including the Canary Islands, also in Mediterranean and Black Seas, and along coasts of Portugal and Spain to the Bay of Biscay.



CALLANTHIIDAE

Groppos (goldies, splendid perches)

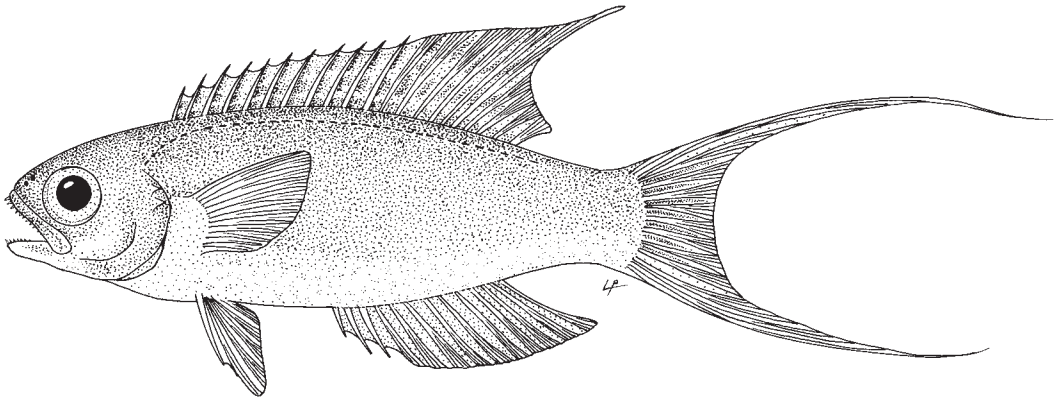
by W.D. Anderson, Jr., Grice Marine Biological Laboratory, Charleston, SC, USA

A single species occurring in the area.

Callanthias ruber (Rafinesque, 1810)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Parrot seaperch, Splendid groppo; Fr – Barbier perroquet; Sp – Tres colas papagayo.

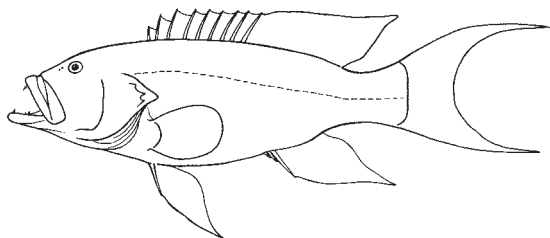
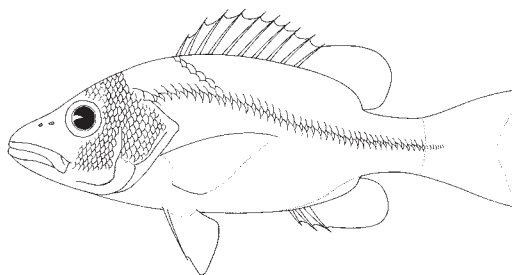


Diagnostic characters: Body oblong, compressed, rather slender. Eye fairly large, its diameter appreciably longer than length of snout. Mouth terminal and oblique; jaws almost equal. Jaws with caniniform, conical, and villiform teeth; vomer and palatines usually with small teeth; pterygoids and tongue without teeth. **Nasal organ without lamellae.** Opercular spines 2. Most of head, including maxillae and dentaries, covered with scales. **Branchiostegal rays 6.** Gill rakers on first arch 8 to 11 on upper limb and 23 to 26 on lower limb – total 32 to 37. Dorsal fin not incised at junction of spinous and soft rays. Soft rays in posterior halves of dorsal and anal fins sometimes noticeably produced. Caudal fin lunate; dorsal and ventral lobes frequently produced in larger individuals. **Dorsal fin with 11 spines and 10, rarely 11, soft rays. Anal fin with 3 spines and 10, rarely 11, soft rays.** Principal caudal-fin rays 17 (9 in upper lobe + 8 in lower lobe); branched caudal-fin rays 15 (8 in upper lobe + 7 in lower lobe). Pectoral fin with 19 to 22, usually 20 or 21, rays. Pelvic fin thoracic, inserted beneath pectoral fin, with 1 spine and 5 soft rays. Membranes of dorsal and anal fins without scales. Pelvic axillary scales and scaly interpelvic process well developed. Scales moderate, ctenoid, without ctenial bases in the posterior field. **Series of modified scales with unique ornamentation along body midlaterally. Lateral line running along base of dorsal fin and terminating near base of ultimate dorsal soft ray.** Tubed scales in lateral line 21 to 26. Vertebrae 24 (10 precaudal + 14 caudal). **Colour:** generally red or rosy; dorsal fin, anal fin, lobes of caudal fin, and pelvic fins yellow; base and middle of caudal fin and pectoral fins rosy.

Similar families occurring in the area

Serranidae: 3 opercular spines; nasal organ with lamellae; 6 or 7 branchiostegal rays; midlateral body scales without ornamentation; lateral line running a number of scale rows below dorsal fin, usually uninterrupted and usually extending to at least base of caudal fin.

Lutjanidae: nasal organ with lamellae; 7 branchiostegal rays; midlateral body scales without ornamentation; lateral line running a number of scale rows below dorsal fin to at least base of caudal fin.

**Serranidae****Lutjanidae**

Size: Maximum standard length about 18 cm, commonly to 15 cm.

Habitat, biology, and fisheries: Found over rocky and muddy bottoms and in submarine caves at depths of 50 to 500 m. Carnivorous. Probably a protogynous hermaphrodite. In the Mediterranean, ripe in December and January. Caught by artisanal and sport fishermen and occurs in the bycatch of offshore trawlers.

Distribution: In the eastern Atlantic from the English Channel (occasionally) to Mauritania, including certain offshore islands – Azores, Madeira, and Canaries, and throughout the Mediterranean Sea.

Remarks: *Callanthias* has been considered as a member of the family Serranidae, but species of Callanthiidae share derived characters that are not found in the Serranidae. Counts of gill rakers are of those on the first arch, including rudiments, when present. Counts of lateral-line scales are of tubed scales.

**References**

- Anderson, W.D., Jr. & Johnson, G.D.** 1984. A new species of *Callanthias* (Pisces: Perciformes: Percoidei: Callanthiidae) from the southeastern Pacific Ocean. *Proceedings of the Biological Society of Washington*, 97(4): 942–950.
- Anderson, W.D., Jr., Johnson, G.D & Baldwin, C.C.** In press. Review of the splendid perches *Callanthias* (Percoidei: Callanthiidae). *Transactions of the American Philosophical Society, Philadelphia*.

GIRELLIDAE

Nibblers

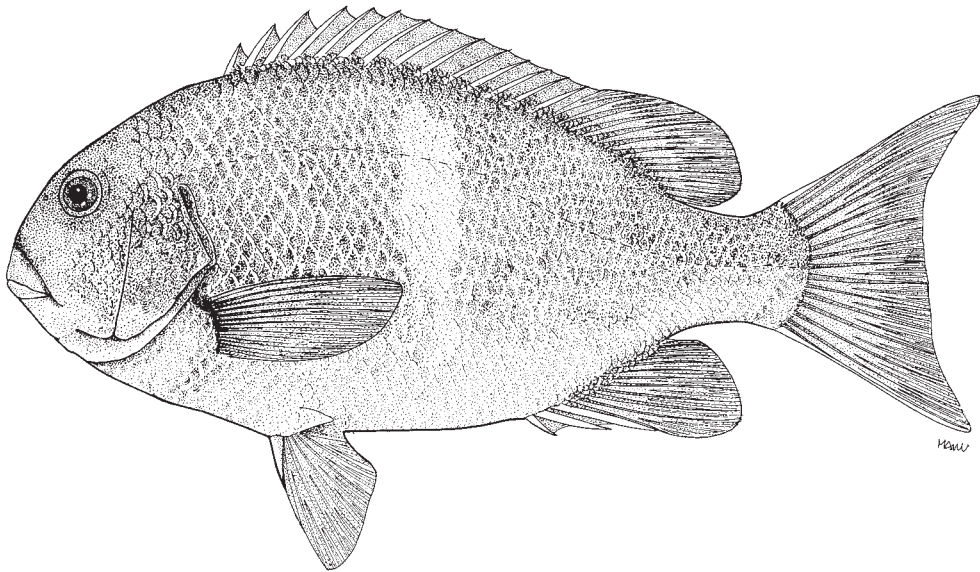
by N. Yagishita, Graduate School of Fisheries and Environmental Sciences, Nagasaki University, Japan

A single species occurring in the area.

Girella zonata Günther, 1859

Frequent synonyms / misidentifications: *Girella stuebeli* Troschel, 1866 / None.

FAO names: En – Verdean nibbler.



Diagnostic characters: Body oblong or ovate, compressed, its depth about 46% of standard length; caudal peduncle deep. Head length 28 to 30% of standard length; dorsal profile of head abruptly slanting in front of eyes. Snout profile round. Mouth wide, upper lip thick; **rear tip of maxilla covered by suborbital; teeth tricuspid** (partly incisor-like in some), arranged in 3 or 4 rows along outer jaw margins in adults. **Dorsal fin continuous, with 14 or 15 spines** and 13 or 14 soft rays; soft-rayed portion round, higher than spinous portion. Anal fin with 3 spines and 11 or 12 soft rays; soft-rayed portion round, higher than spinous portion, greatly protruding posteriorly. Caudal fin emarginate; upper lobe a little longer than lower lobe. Pectoral fins round, with 19 or 20 soft rays. Pelvic fins slightly shorter than pectoral fins. Scales ctenoid, extending onto cheeks and upper third of opercles, and on bases of dorsal and anal fins. Pored scales on lateral line 47 to 52; transverse scales between lateral line and median spinous portion of dorsal fin 7. **Colour:** body greenish brown, paler brown ventrally; opercular flap black; a transverse light green band on sides; all fins greenish brown; pectoral fins with a black bar on base.

Similar families occurring in the area

Kyphosidae: rear tip of maxilla exposed (Fig. 1a) (covered by suborbital in Girellidae, Fig. 1b); teeth of outer series in both jaws lanceolate incisor-like (Fig. 2a) (mostly tricuspid in Girellidae, Fig. 2b); dorsal fin with 11 spines (Fig. 3a) (14 or 15 in Girellidae, Fig. 3b).

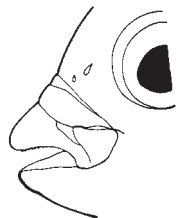


Fig. 1a maxilla

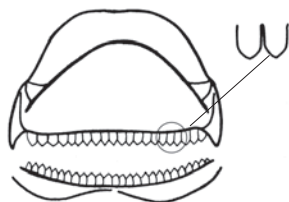


Fig. 2a teeth

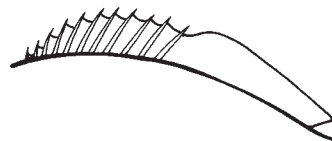


Fig. 3a dorsal fin

Kyphosidae



Fig. 1b maxilla

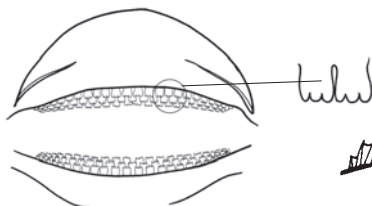


Fig. 2b teeth

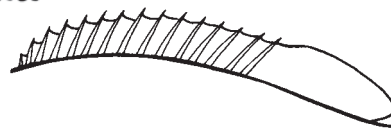


Fig. 3b dorsal fin

Girellidae

Size: Maximum total length 24 cm; commonly to 20 cm.

Habitat, biology, and fisheries: Inhabits coastal areas of subtropical and temperate waters, primarily on rocky reefs to a depth of about 18 m. Feed mainly on algae and occasionally small invertebrates. Caught mostly by anglers.

Distribution: Cape Verde.

Remarks: *Girella stuebeli* Troschel, 1866 was described as a different species from *G. zonata*, mainly based on some differences between their dentition, and they have been often treated as different species. However, those differences in dentition almost correspond to the ontogenetic or intraspecific variations shown in several species of *Girella*, and substantial differences are not recognized between their morphological characters. Therefore, *Girella stuebeli* is regarded as a junior synonym of *Girella zonata*. The nibblers are currently considered as a subfamily (Girellinae) of Kyphosidae by Eschmeyer's Catalog of Fishes. Family designations made by the author at the time of writing have been retained for the sake of organization.



Reference

Reiner, F. 1996. *Catálogo dos peixes do arquipélago de Cabo Verde*. Lisbon, Publ. Avulsas do IPIMAR No. 2: 339 p.

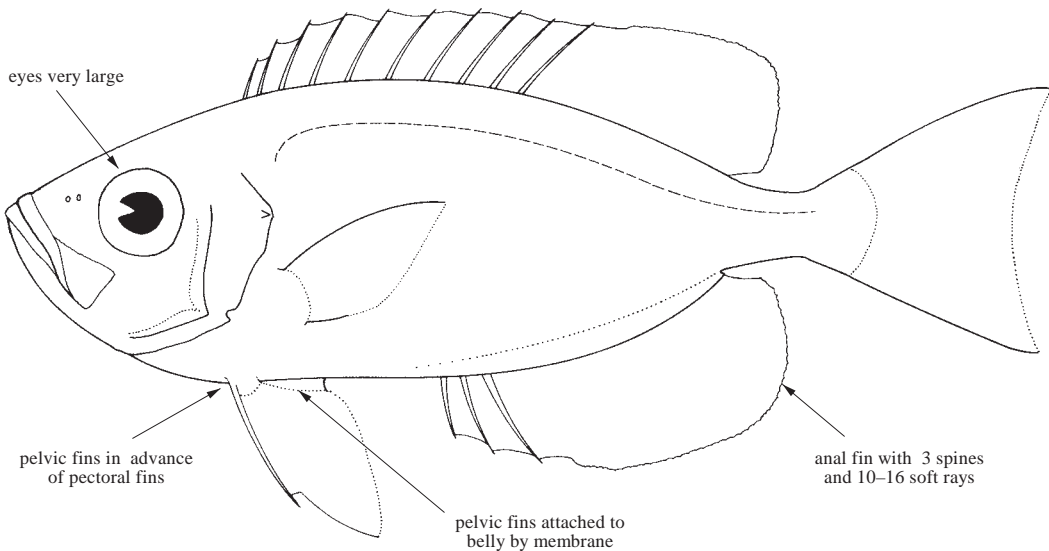
Wirtz, P., Brito, A., Falcón, J.M., Freitas, R., Fricke, R., Monteiro, V., Reiner, F. & O. Tariche. 2013. The coastal fishes of the Cape Verde Islands – new records and an annotated check-list (Pisces). *Spixiana*, 36: 113–142.

PRIACANTHIDAE

Bigeyes

by W.C. Starnes, North Carolina Museum of Natural Sciences, Raleigh, NC, USA

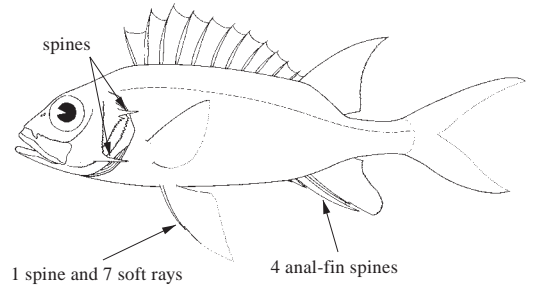
Diagnostic characters: Medium-sized fishes with maximum total lengths of 25 to 65 cm. Deep-bodied, laterally compressed fishes with **extremely large eyes** (up to 1/2 of head length); **mouth oblique**. A weak spine on posterior opercle and **prominent to remnant spine at angle of preopercle**. Branchiostegals 6; gill rakers 17 to 32. Dorsal fin continuous with 10 spines and 11 to 15 soft rays, soft portion relatively short to long, broadly rounded to slightly pointed. Anal-fin rays relatively short to long and broadly rounded to slightly pointed with 3 spines and 10 to 16 soft rays. Caudal fin rounded, emarginate, or lunate, with 16 principal rays. Pectoral fins relatively short with 17 to 21 rays. **Pelvic fins** short to very long and **broadly attached to belly by membrane** and positioned in advance of pectorals with 1 spine and 5 rays. Head and body mostly covered with extremely adherent, rough, spiny scales (bearing true spines, which are integral part of scale rather than cteni on individual detachable bases). Scales much modified, varying among genera and species. **Scales on branchiostegal rays. Spinules present on fin spines.** Lateral-line scales, including pored scales on caudal-fin base, 38 to 115. Vertebrae 23. Some species with modifications of skull and swimbladder, including connections between these components. **Colour:** head, iris of eye, and body generally reddish, sometimes with silvery blotches or, in some species, occasionally a pattern of red and silver/white barring. These colours are highly changeable. Fins reddish to dusky or black, occasionally yellowish in some species; some species with dark spots or speckling on fin membranes.



Habitat, biology, and fisheries: Generally epibenthic fishes occurring near coral reefs or rock formations but occasionally in more open areas; occur at depths from 5 to 400 m or more. Probably most active nocturnally but known to feed diurnally as well. Feed primarily on crustaceans, small cephalopods, polychaetes, and small fishes. Eggs, larvae, and early juvenile stages pelagic, transforming on settling to suitable habitats. Occur solitarily or in small aggregations, but some Indo-Pacific species may form sizeable aggregations at times as indicated from trawl catches. Of minor importance in most fishery areas but some species occasionally common in trawl catches of southeast Asian waters. Generally incidental in trawls or hook-and-line fisheries elsewhere. Flesh is said to be of excellent quality.

Similar families occurring in the area

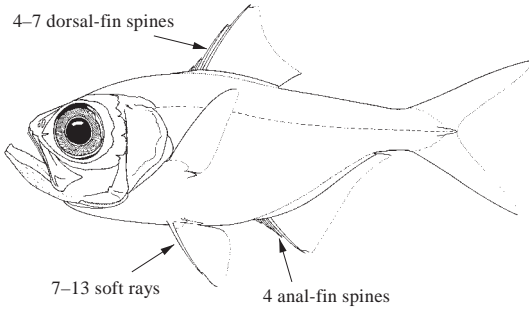
Holocentridae: readily distinguishable from bigeyes by spines on opercular margin, by having spinous and soft-rayed portions of dorsal fin nearly separate, and deeply forked caudal fin with 18 or 19 rays. Pelvic-fin origin is behind pectoral-fin origin, having 1 spine and usually 7 (versus 5) soft rays, and not attached to belly by membrane; anal fin with 4 (versus 3) spines.



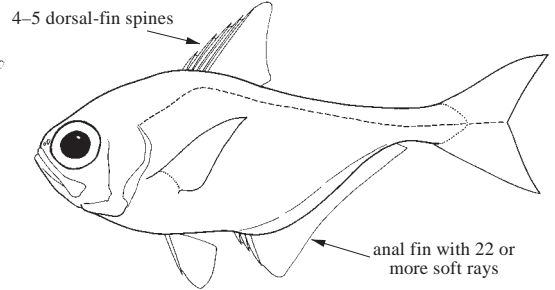
Holocentridae

Berycidae: readily distinguishable from bigeyes by short dorsal-fin base with only 4 to 7 spines, anal fin with 4 spines, caudal fin deeply forked, and pelvic fin having origin behind pectorals and 7 to 13 soft rays.

Pempheridae: dorsal-fin base short, 4 or 5 spines and 8 or 9 soft rays, and anal fin with very long base, 3 spines and 22 or more soft rays. Attains small maximum size.



Berycidae



Pempheridae

Key to the species of Priacanthidae occurring in the area

- 1a. Scale rows between dorsal-fin origin and lateral line 16 to 20; pelvic fins very long except in large adults (300+ mm) exceeding head length (Fig. 1); soft dorsal and anal fins long and slightly pointed except in very large specimens ***Cookeolus japonicus***
- 1b. Scale rows between dorsal-fin origin and lateral line fewer than 16; pelvic fins short, less than or equal to head length; soft dorsal and anal fins moderately long, broadly rounded (Fig. 2) → **3**

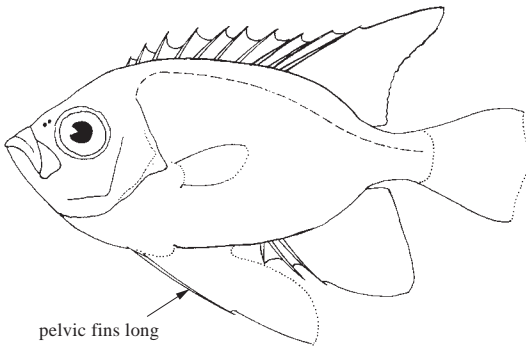


Fig. 1 *Cookeolus japonicus*

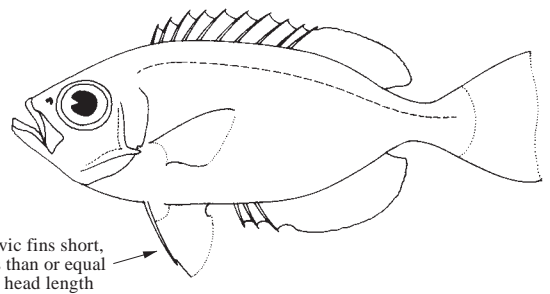


Fig. 2 *Priacanthus*

2a. Posterior portion of preopercle lacking scales (Fig. 3a) and notably striate; anterior profile of head nearly symmetrical, extremity of lower jaw when mouth tightly closed about level with midline of body (Fig. 3a); soft dorsal, anal, and caudal fins usually with small, elliptical dark specks in membranes; pelvic fins lacking well-developed black basal blotch . . . ***Heteropriacanthus cruentatus*** (Fig. 4)

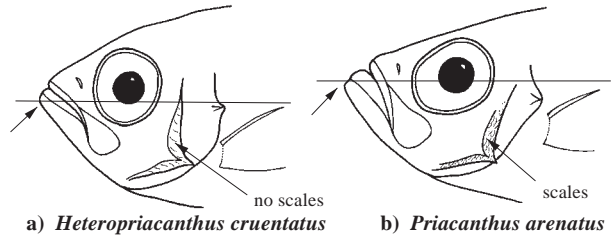


Fig. 3 lateral view of head

2b. Posterior portion of preopercle with scales (Fig. 3b); anterior profile of head more asymmetrical, extremity of lower jaw usually above level of midline of body (Fig. 3b); median fins lacking well-defined specks; pelvic fins usually with well-developed black area at base ***Priacanthus arenatus*** (Fig. 5)

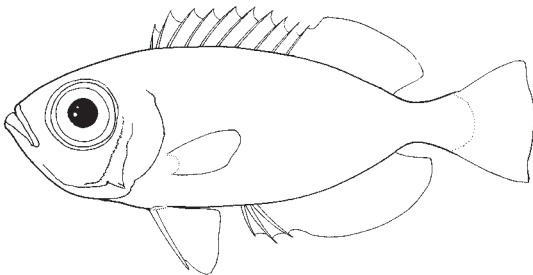


Fig. 4 *Heteropriacanthus cruentatus*

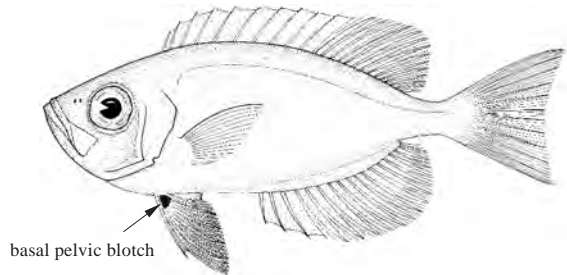






Fig. 5 *Priacanthus arenatus*

List of species occurring in the area

The symbol  is given when species accounts are included.

-  *Cookeolus japonicus* (Cuvier, 1829).
-  *Heteropriacanthus cruentatus* (Lacépède, 1801).
-  *Priacanthus arenatus* Cuvier, 1829.

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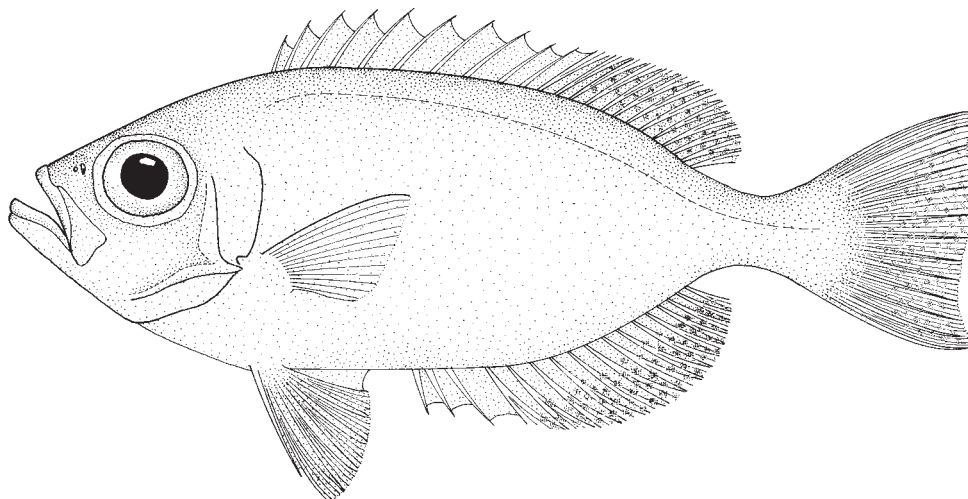
Starnes, W.C. 1988. Revision, phylogeny, and biogeographic comments on the circumtropical marine percoid fish family Priacanthidae. *Bulletin of Marine Science*, 43(2): 117–203.

Starnes, W.C. 2002. Priacanthidae. In K. Carpenter, ed. *The living marine resources of the Western Central Atlantic, Volume 3: Bony fishes part 2 (Opistognathidae to Molidae), sea turtles and marine mammals. FAO species identification guide for fishery purposes and American Society of Ichthyologists and Herpetologists Special Publication No. 5*. Rome, FAO, p. 1379–1385.

***Heteropriacanthus cruentatus* (Lacépède, 1801)**

Frequent synonyms / misidentifications: *Cookeolus boops* (Forster, 1801); *Priacanthus cruentatus* (Lacépède, 1801) / *Priacanthus arenatus*.

FAO names: En – Glasseye; Fr – Beau claire de roche; Sp – Catalufa de roca.



Diagnostic characters: Body deep, ovate, laterally compressed. **Anterior profile symmetrical, tip of protruding lower jaw about on level with midline of body** when mouth tightly closed. **Well-developed spine at angle of preopercle.** Small teeth on dentaries, vomer, palatines, and premaxillaries. Total gill rakers on first arch 21 to 25. Dorsal fin with 10 spines and 11 to 13 soft rays; anal fin with 3 spines and 13 or 14 soft rays. **Caudal fin truncate to slightly convex.** Pectoral fin with 18 or 19 rays. Scales covering most of head and body but **scales lacking on posterior portion of preopercle. Scales modified, those of midlateral area with posterior field elevated above a separate flange, broadly pointed, with spinules confined to posterior margin.** Scales in lateral series, counted in straight line at midbody from behind opercle posteriorly onto caudal fin, joining lateral line on caudal peduncle and counting all pored scales on caudal-fin base, 78 to 96; 63 to 81 pored lateral-line scales; vertical scale rows (dorsal-fin origin to anus) 56 to 68. **Swimbladder with pair of posterior extensions only.** **Colour:** entire body and head pinkish red or blotched with red and silver. Iris of eye red. Fins reddish; membranes of spinous dorsal fin and margin of caudal fin sometimes dusky; caudal and soft dorsal and anal fins with elliptical dark specks.

Size: Maximum total length to about 35 cm.

Habitat, biology, and fisheries: Inhabits shallow reef areas, particularly in insular areas, where may be common in both lagoons and seaward areas, usually at depths of 20 m or less. Not common in continental shelf areas. Secretive by day and foraging at night. Feeds on octopi, shrimp, stomatopods, crabs, small fish, and polychaetes. Caught primarily on hook and line, spearing, and in traps. Marketed mostly fresh.

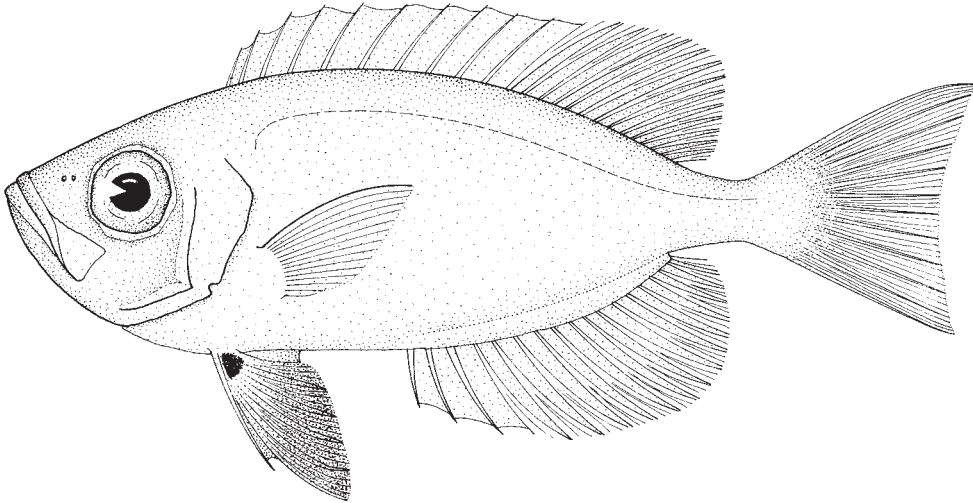
Distribution: Circumtropical in all major oceans into subtropical waters. Young occasionally in temperate waters due to postlarval transport. In eastern Atlantic, in insular habitats from Madeira to St Helena; though listed from Angola, there are no vouchered records from African continental waters.



***Priacanthus arenatus* Cuvier, 1829**

Frequent synonyms / misidentifications: None / *Heteropriacanthus cruentatus*.

FAO names: **En** – Atlantic bigeye; **Fr** – Beauclaire soleil; **Sp** – Catalufa toro.



Diagnostic characters: Body deep, ovate, and laterally compressed. The body depth 2.5 to 3.1 in standard length. **Anterior profile of head slightly asymmetrical, the tip of protruding lower jaw usually above midline of body.** Small teeth on dentaries, vomer, palatines, and premaxillaries. **Spine at angle of preoperculum reduced or nonexistent in specimens over 125 mm total length.** Total gill rakers on first arch 28 to 32. Dorsal-fin spines 10, soft rays 13 to 15; anal-fin spines 3, soft rays 14 to 16. **Caudal fin slightly emarginate to lunate.** Pectoral-fin rays 17 to 19. Scales covering most of head and body onto base of caudal fin. **Scales modified, the posterior field elevated as a separate flange with spinules both on the surface and posterior margin.** Scales in lateral series, counted in straight line at midbody from behind opercle posteriorly onto caudal fin, joining lateral line on caudal peduncle and counting all pored scales on caudal-fin base, 83 to 91; pored lateral-line scales 71 to 84. Vertical scale rows (dorsal-fin origin to anus) 49 to 59. **Swimbladder with pair of anterior and posterior protrusions**, the former associated with specialized recesses in posterior of skull. **Colour:** red on body, head, and iris of eye. May change to silvery white with pattern of broad reddish bars on head and body. Row of small dark spots sometimes evident along lateral line. Fins red to light pink, with dusky pigment in dorsal, anal, and caudal fin membranes. A black blotch usually present at base of pelvic fins.

Size: Maximum total length to about 45 cm.

Habitat, biology, and fisheries: Occurs near reefs and rocky areas at depths ranging from less than 20 to 250 m or more, but probably most common at 30 to 50 m. Shows some evidence of territorial behaviour. Prefers outer reef slopes to more sheltered environments. Moderately common about rock outcrops on continental shelf habitats of 30 m depth or more. Biological information generally lacking in eastern Atlantic and Southern Hemisphere. In western Atlantic, pelagic juveniles are abundant in February to April. Gravid females have been taken in September. Probably feeds on crustaceans, polychaetes, and small fishes. Occasionally taken in low numbers in trawls, by hook-and-line, and spearing. Marketed mostly fresh.

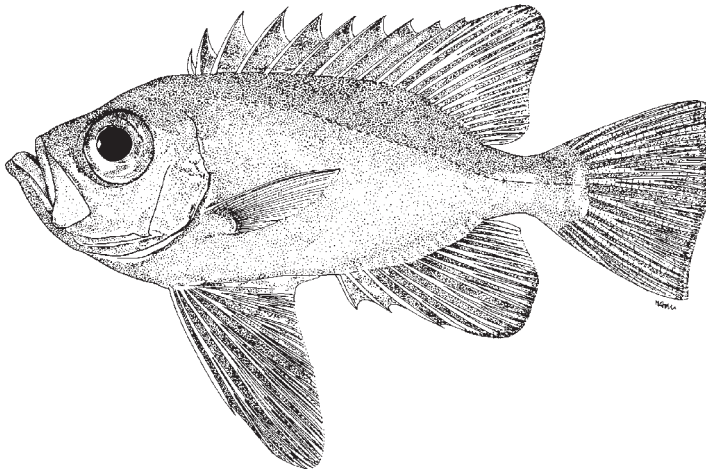
Distribution: Occurs in tropical and tropically influenced waters of both western and eastern Atlantic. In eastern Atlantic, occurs from Madeira southward to Angola.



Cookeolus japonicus (Cuvier, 1829)

En – Longfinned bulleye; **Fr** – Beauclaire longue aile; **Sp** – Catalufa aleta larga.

Maximum total length to about 65 cm (largest member of family). In deeper waters off rocky coasts or insular areas in association with holes and ledges at depths of 60 to 400 m. Feeds on crustaceans and small fishes. Life span is 9 or more years. Caught incidentally on deep handlines or other rigs; probably rare in markets. Circumtropical and extending into subtropical regions; young occasionally in temperate waters as result of postlarval transport. In eastern Atlantic at St Helena Island; perhaps occurs elsewhere, especially in insular habitats. *Cookeolus boops* Forster, 1801 is frequent applied to this species in the literature but that name is properly a synonym of *Heteropriacanthus cruentatus*.

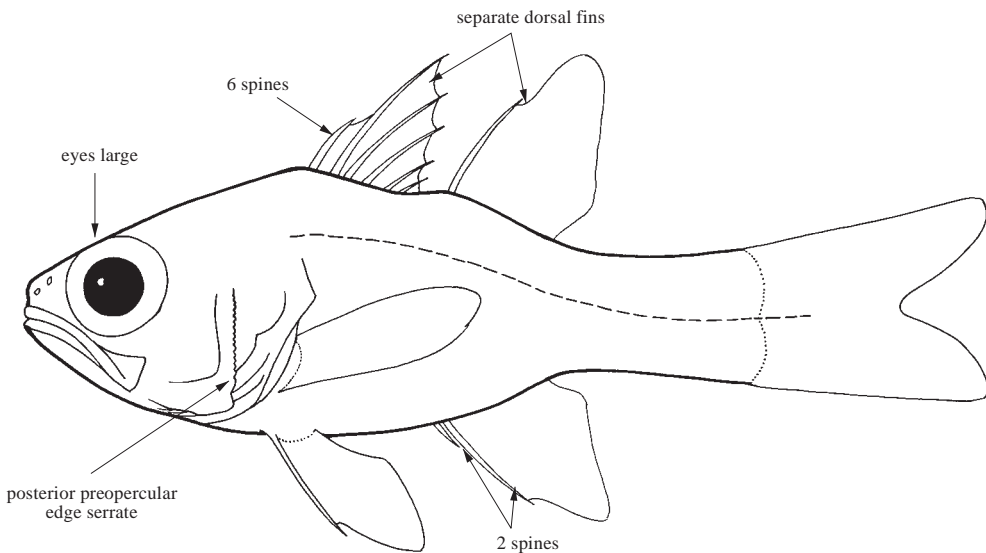


APOGONIDAE

Cardinalfishes

by O. Gon, South African Institute for Aquatic Biodiversity, Grahamstown, South Africa

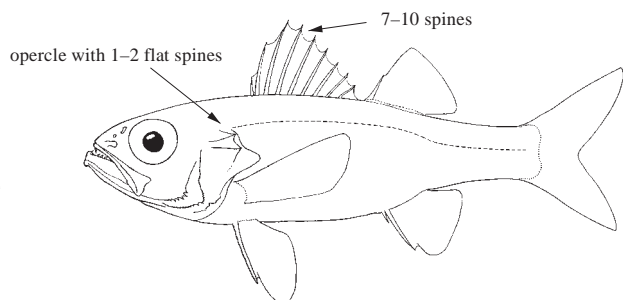
Diagnostic characters: Small fishes attaining 150 mm (twice as large in Indo-Pacific region), but commonly 50 to 100 mm. Body short, oblong and compressed; head and **eyes large**; 2 nostrils; **mouth terminal, large and oblique**; **maxilla naked, its upper part concealed when mouth closed**; **supramaxilla absent**; jaws, vomer and palatines with small villiform teeth (*Apogon affinis* has several caniniform teeth); 7 branchiostegal rays. **Two separate dorsal fins**; **first dorsal-fin spines 6**; second dorsal fin with 1 spine and 9 segmented rays; **anal fin with 2 spines and 8 segmented rays** (9 in *Apogon affinis*); pectoral-fins rays 11 to 14; caudal fin emarginate. Scales large, ctenoid; lateral line complete and extending onto caudal-fin base, with 23 to 25 tubular scales (counted to end of hypural plate). Preopercle double-edged; **posterior preopercular edge serrate, ventral edge membranous, smooth and sometimes crenulate**; **preopercular ridge smooth**; opercular spine poorly developed. **Colour:** translucent reddish pink to bright red, usually with dark marks (spots and/or bars) at posterior end of or below second dorsal-fin base and on caudal peduncle; sometimes a dark stripe on head (genus *Apogon*); alternatively, translucent pale brown with varying amount of dark spots on head and body; large, diffuse dark spot may be present posteriorly on caudal peduncle (genus *Phaeoptyx*).



Habitat, biology and fisheries: Primarily coral and rocky reef species found from shore to about 100 m depth; mostly nocturnal, feeding on small invertebrates and zooplankton; most if not all species are oral brooders with the male incubating a ball of eggs in its mouth; cardinalfishes are not commercially exploited, but some species occasionally appear on the marine aquarium trade.

Similar families occurring in the area

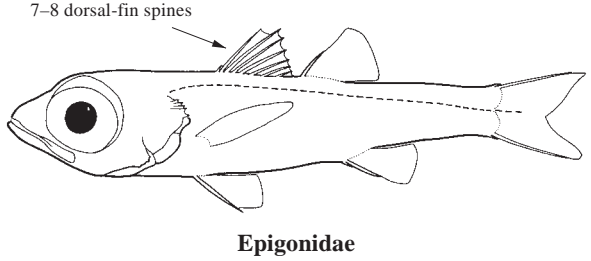
Acropomatidae: first dorsal-fin spines 7 to 10; anal-fin spines 3 (2 in most *Synagrops*); lateral line not extending onto caudal fin; caniniform teeth usually present; opercle with 2 spines.



Acropomatidae

Epigonidae: first dorsal-fin spines 7 or 8; lateral-line scales 33 to 56; maxilla narrow.

Identification note: The last anal-fin ray is usually split to base and counted as 1 ray. A ventral preopercular flap is a membranous expansion of the angle and ventral part of the preopercle; flap sometimes extending posteriorly beyond edge of opercle; pectoral-fin rays count includes upper rudimentary ray.



Key to the species of Apogonidae occurring in the area

- 1a. Membranous ventral preopercular flap not extending beyond posterior preopercle edge (Fig. 1a); inner pelvic ray mostly free from body (Fig. 2a); body colour scarlet to pinkish red (*Apogon*) → 2
- 1b. Membranous ventral preopercular flap extending beyond posterior preopercle edge (Fig. 1b); inner pelvic ray connected by membrane to body along most or all its length (Fig. 2b); body colour brown with a dark spot at centre of most scales . . . *Phaeoptyx pigmentaria*

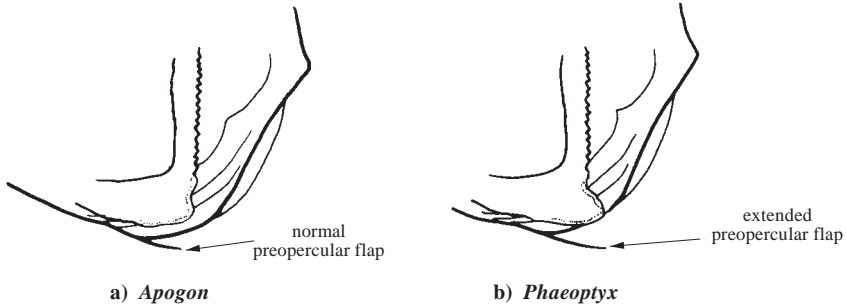


Fig. 1

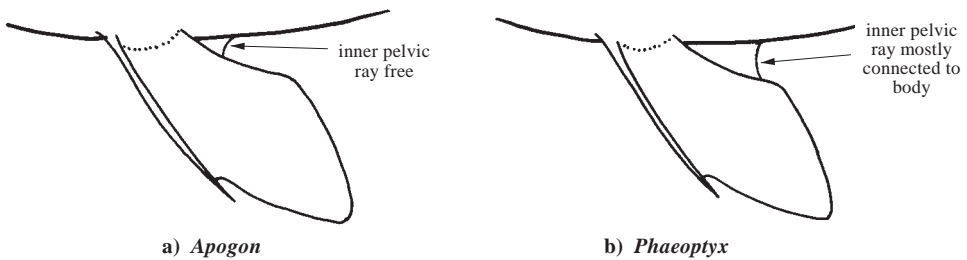







Fig. 2

- 2a. Segmented anal-fin rays 8; no large caniniform teeth; teeth in both jaws villiform, in a polyserial band of varying width → **3**
- 2b. Segmented anal-fin rays 9; both jaws with a single series of small conical teeth interspersed with several enlarged caniniform teeth ***Apogon affinis***
- 3a. Pectoral-fin rays 13; large dark spot at pectoral-fin base ***Apogon axillaris***
- 3b. Pectoral-fin rays 12; no dark spot at pectoral-fin base ***Apogon imberbis***

List of species occurring in the area

The symbol  is given when species accounts are included.

-  *Apogon affinis* (Poey, 1875).
-  *Apogon axillaris* Valenciennes, 1832.
-  *Apogon imberbis* (Linnaeus, 1758).
-  *Phaeoptyx pigmentaria* (Poey, 1860).

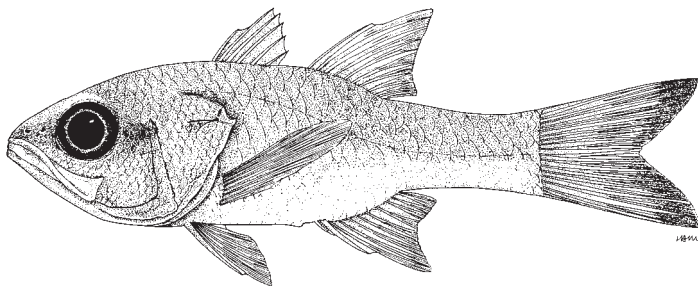
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- Maugé, L.A. & Mayer, G.F. 1990. Apogonidae. In J.-C. Quéro, J.-C. Hureau, C. Karrer, A. Post & L. Saldanha, eds. *Check-list of the Fishes of the Eastern Tropical Atlantic*. Paris, UNESCO, Vol. 2, pp. 714–718.

***Apogon affinis* (Poey, 1875)**

En – Bigtooth cardinalfish.

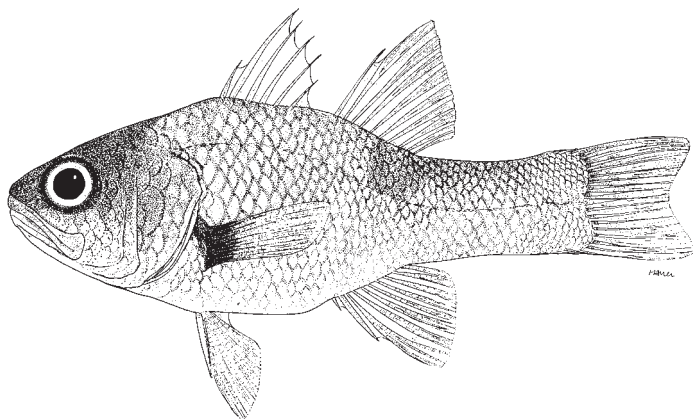
Maximum standard length 76 mm. Occurs from shore to 50 m. Nocturnal, hiding in caves and in dark holes during the day. Gulf of Guinea and associated islands; in the western Atlantic, Florida and the Bahamas to Venezuela and Brazil (Isla de Itaparica).



***Apogon axillaris* Valenciennes, 1832)**

En – Axillary cardinalfish.

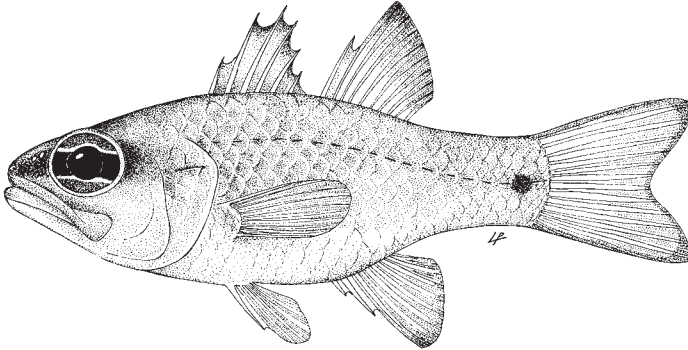
Maximum standard length 150 mm. Collected and observed at 4 to 35 m. Nocturnal, feeding on zooplankton, hiding during the day in caves. Ascension and St Helena Islands.



***Apogon imberbis* (Linnaeus, 1758)**

En – Cardinal fish; **Sp** – Salmonete real.

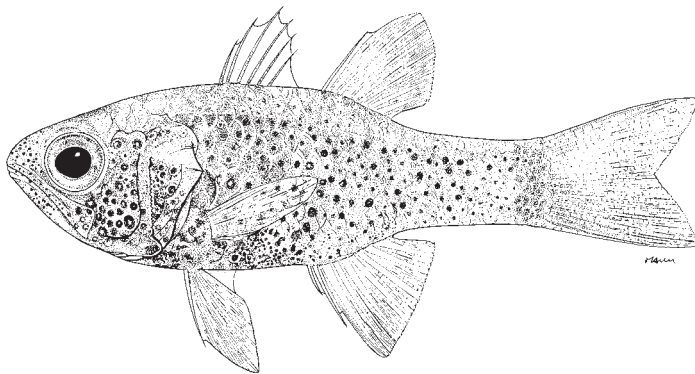
Maximum standard length 150 mm. Found from shore to 200 m. Nocturnal, feeding on zooplankton, small invertebrates and small fishes, hiding in groups or solitary under rocky ledges and in caves during the day. Morocco to northern Angola, Madeira Islands, Cape Verde Islands, São Tomé and Príncipe Islands, Annobon Island; also in the Mediterranean.



***Phaeoptyx pigmentaria* (Poey, 1860)**

En – Dusky cardinalfish.

Maximum standard length 76 mm. Occurs from shore to 50 m. Nocturnal, hiding in caves and in dark holes during the day. Gulf of Guinea and associated islands, Ascension Island; in the western Atlantic, Florida and Bahamas to Venezuela and Brazil (Isla de Itaparica).

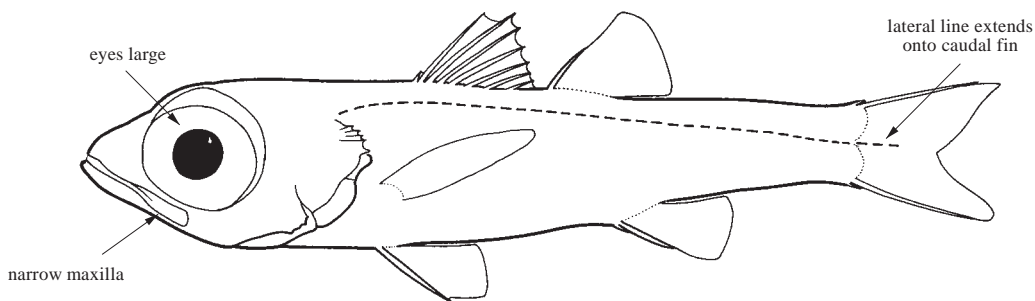


EPIGONIDAE

Deepwater cardinalfishes

by O. Gon, South African Institute for Aquatic Biodiversity, Grahamstown, South Africa

Diagnostic characters: Small to medium-sized fishes (to about 50 cm). Body varies from elongate and subcylindrical or compressed, to short and stocky. **Eyes large** (moderate in *Microichthys*), round to oval; margin of infraorbital bones smooth. **Opercle usually with 1 spine**, weak (rarely absent) to stout; posterior edge of opercular bones smooth (*Microichthys* with several minute serrae around angle of preopercular edge and ridge), rarely poorly ossified. **Mouth large, oblique; maxilla narrow, not reaching beyond vertical at middle of eye.** Teeth in jaws, vomer, and palatines usually small, conical, in 1 to several series (palatines of *Microichthys* toothless); in some species enlarged caniniform teeth protruding forward at tip of lower jaw (*Epigonus glossodontus*) or both jaws (*Florenciella* and *Rosenblattia*). **Two separate dorsal fins, the first usually with 7 or 8 spines, the second with a single spine and 8 to 11 soft rays; anal fin usually with 2 spines and 8 or 9 soft rays** (1 anal spine and 10 anal soft rays in *Brinkmanella*; 6 first dorsal spines, and 3 anal spines and 7 anal soft rays in *Sphyraenops*); caudal fin emarginate to forked; pectoral-fin rays 14 to 23. Branchiostegal rays usually 7 (6 in *Sphyraenops*). Scales cycloid or weakly to strongly ctenoid, and deciduous to firmly attached; **lateral line complete and extending onto caudal fin**, with 33 to 56 tubular scales (counted to end of hypural plate). Vertebrae: precaudal 10 or 11 and 14 or 15 caudal. **Colour:** reddish brown to blackish.



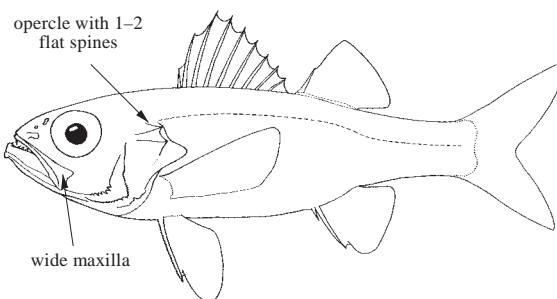
Habitat, biology, and fisheries: Contains 5 or 6 genera with about 30 species. *Epigonus*, with 25 species, is the largest genus. Epibenthic to pelagic fishes, found around the world on continental and insular slopes, seamounts, and oceanic rises, from northern cold-temperate to sub-Antarctic waters, at depths from 75 to 3 700 m. Schools of juveniles of some species may be found in caves as shallow as 15 m. Carnivorous, feeding on zooplankton, including copepods, euphausiids, shrimps, and small fishes like myctophids and pelagic juveniles. Bycatch of trawl fisheries.

Similar families and genera in the area

Acropomatidae: 2 or 3 anal-fin spines; maxilla wide; canine teeth usually present; opercle usually with 2 spines.

Bathysphyraenops simplex (Howellidae): always 3 anal-fin spines; long pectoral fins, reaching beyond anal-fin origin; 6 branchiostegal rays; 5 pyloric caeca; maxilla wide; opercle with 2 spines; other opercular bones each with a small spine; angle of preopercle serrate.

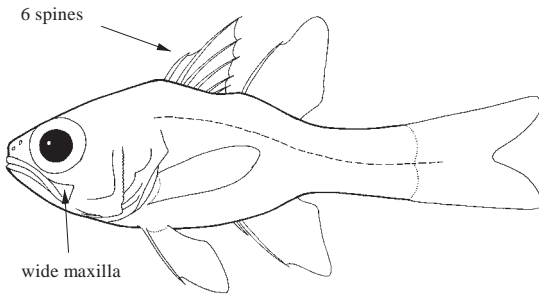
Howella sherborni (Howellidae): always 3 anal-fin spines; long pectoral fins, reaching beyond anal-fin origin; maxilla wide; lateral line interrupted; opercular bones armed with spines and/or serrae; scales large, ctenoid and adherent; no caniniform teeth.



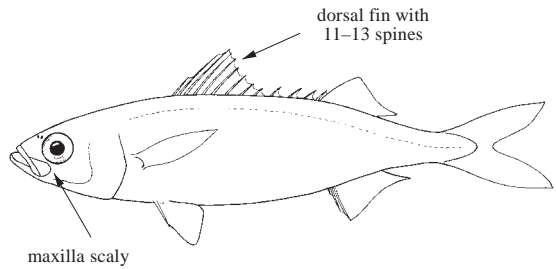
Acropomatidae

Apogonidae: first dorsal-fin spines 6; lateral-line scales 23 to 25; maxilla wide.

Emmelichthyidae: head covered with scales; mouth extremely protrusile; maxilla wide and scaled; dorsal-fin spines 11 to 13 (posterior spines sometimes hidden under skin).



Apogonidae



Emmelichthyidae

Key to the species of Epigonidae occurring in the area

- 1a. Upper jaw ending posteriorly at front edge of eye; posterior bony edge of eye with 2 or 3 spinules; origin of first dorsal fin at about middle of body length (standard length); scales cycloid; palatine teeth absent ***Microichthys coccoi***
- 1b. Upper jaw ending posteriorly below middle of eye; posterior bony edge of eye smooth; origin of first dorsal fin distinctly in front of middle of body length (standard length); scales ctenoid; palatine teeth usually present (***Epigonus***) → 2


- 2a. First dorsal-fin spines 8; pyloric caeca 21 to 34; gill rakers 23 to 26 ***Epigonus telescopus***
- 2b. First dorsal-fin spines 7; pyloric caeca 5 to 14; gill rakers 26 to 35. → 3







- 3a. Second dorsal-fin rays 9 → 4
- 3b. Second dorsal-fin rays 10 → 5

- 4a. Body depth 17.0 to 20.5% standard length; pectoral-fin rays 18 or 19; pyloric caeca 7 to 10 ***Epigonus affinis***
- 4b. Body depth 27.5 to 30.5% standard length; pectoral-fin rays 16 to 18; pyloric caeca 5 to 8 ***Epigonus constanciae***

- 5a. Body depth 22.0 to 30.0% and length of caudal peduncle 22.0 to 27.0% standard length; first dorsal-fin spine long, 5.0 to 8.5% standard length ***Epigonus pandionis***
- 5b. Body depth 16.0 to 24.0% and length of caudal peduncle 26.0 to 32.0% standard length; first dorsal-fin spine short, 2.5 to 4.0% standard length ***Epigonus denticulatus***

List of species occurring in the area

The symbol  is given when species accounts are included.

-  *Epigonus affinis* Parin and Abramov, 1986.
-  *Epigonus constanciae* (Giglioli, 1880).
-  *Epigonus denticulatus* Dieuzeide, 1950.
-  *Epigonus pandionis* (Goode and Bean, 1881).
-  *Epigonus telescopus* (Risso, 1810).
-  *Microichthys coccoi* Rüppell, 1852.

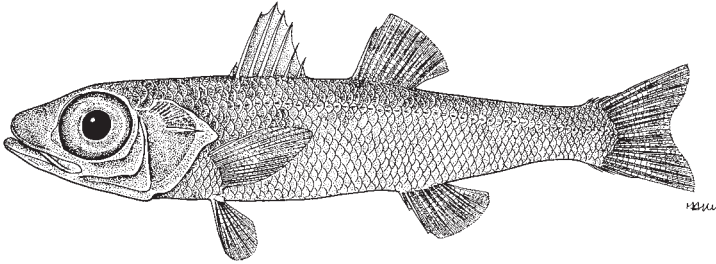
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***Epigonus affinis* Parin and Abramov, 1986**

En – Slim deepwater cardinalfish.

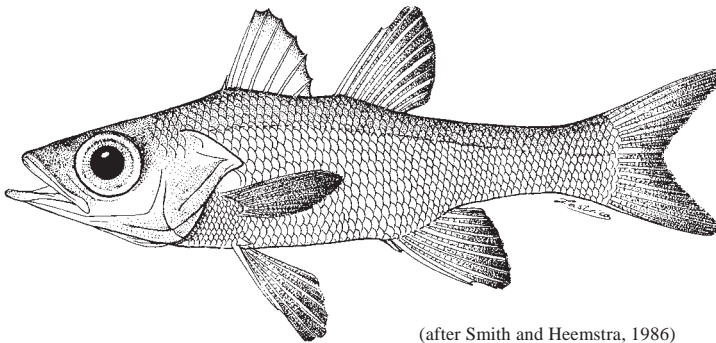
Maximum standard length to 14.5 cm. Vavilov Ridge, Guinea Basin, at 300 m over 2 000 m, and Sierra Leone Rise, near bottom at top of seamount, about 730 m (observation made from submersible). Rarely collected, biology unknown.



***Epigonus constanciae* (Giglioli, 1880)**

En – Constance deepwater cardinalfish.

Maximum standard length to 19.7 cm. Epibenthic, adults taken by bottom trawls at depths from 200 to 600 m. Juveniles probably pelagic. Morocco to Guinea-Bissau and Madeira Islands, and Angola to northern Namibia; western Mediterranean.



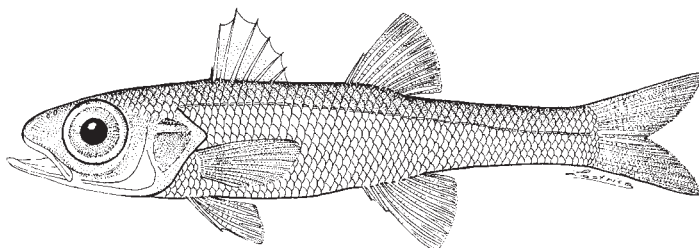
(after Smith and Heemstra, 1986)



***Epigonus denticulatus* Dieuzeide, 1950**

En – Pencil cardinal.

Maximum standard length to 18.7 cm. Epibenthic, adults taken by bottom trawls at depths of 200 to 830 m and are of some commercial interest. Juveniles pelagic, collected at 130 to 145 m and 350 to 425 m. Diet includes pelagic crustaceans, mainly euphausiids, hyperiid amphipods and mysids, and pelagic juveniles of fish. Atlantic coast of Africa from Morocco to South Africa; Gulf of Mexico and Caribbean, western Mediterranean, off southeastern Japan and temperate Southern Hemisphere from southwestern Atlantic to southwestern Pacific.



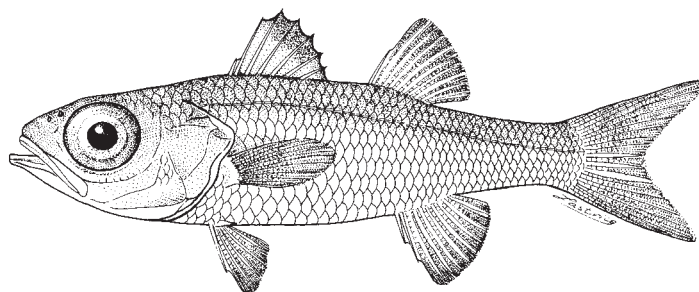
(after Smith and Heemstra, 1986)



***Epigonus pandionis* (Goode and Bean, 1881)**

En – Bigeye deepwater cardinalfish.

Maximum standard length to 19.4 cm. Epibenthic, adults taken by bottom trawls at depths from 210 to 600 m. Juveniles pelagic, collected at 275 to 300 m. Guinea-Bissau to Namibia and St Helena Island; Gulf of Mexico, Caribbean, off Guyana, off Suriname and off New Jersey.



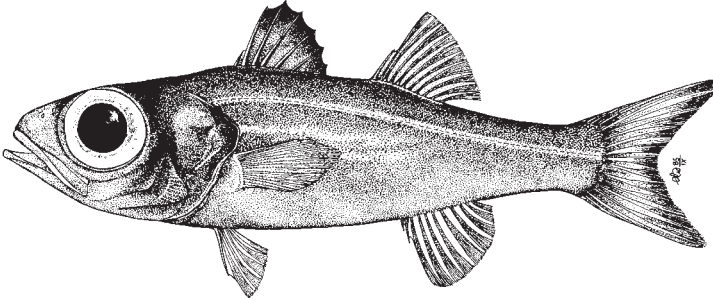
(after Smith and Heemstra, 1986)



***Epigonus telescopus* (Risso, 1810)**

En – Black cardinal fish.

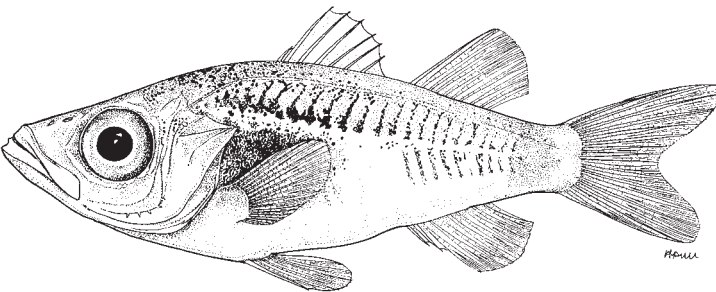
Maximum standard length 55.3 cm. Epibenthic, adults taken by bottom trawls at depths from 75 to 1 200 m and are of limited commercial interest. Juveniles pelagic. Diet consists of mostly pelagic crustaceans, including euphausiids, mysids and decapods. Antitropical, Morocco, Madeira and Canary Islands, southern Angola, Namibia and Walvis Ridge; eastern north Atlantic, western Mediterranean, west coast of South Africa, Walter's Shoal, New Zealand's South Island.



***Microichtys coccoi* Rüppell, 1852**

En – Dwarf deepwater cardinalfish.

Maximum standard length to 3 cm. Pelagic, at depths from 145 to 350 m over slopes of oceanic islands and seamounts. Known from the EEZ of the Azores, but may occur on the northwestern fringe of Fishing Area 34. Rarely collected, biology unknown.

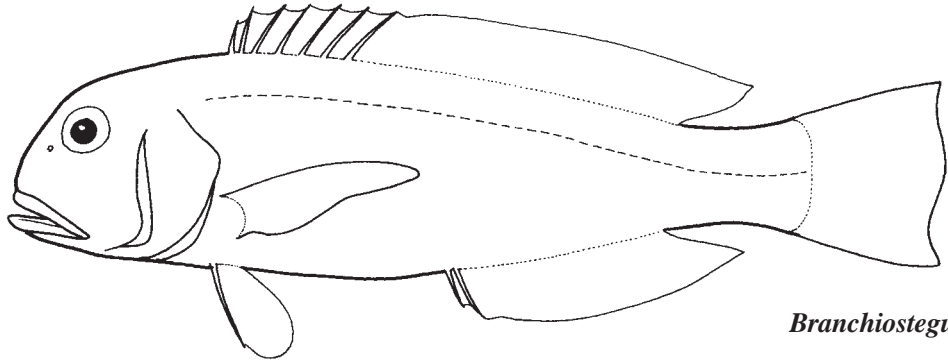


BRANCHIOSTEGIDAE

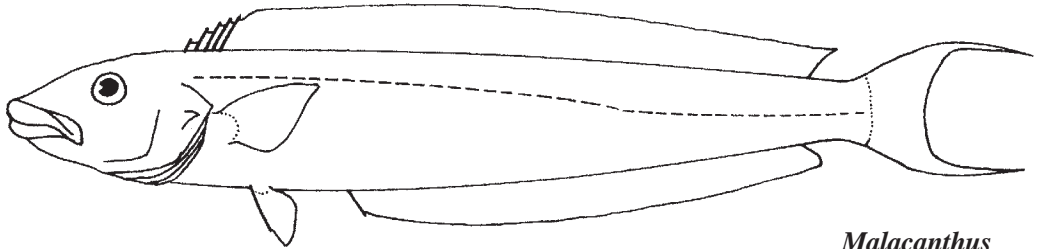
Tilefishes

by J.K. Dooley, Department of Biology, Adelphi University, Long Island, NY, USA

Diagnostic characters: Dorsal and anal fins long and continuous, bases sum to 80 to 135% standard length; single opercular spine (blunt in *Branchiostegus*, sharp and pointed in *Malacanthus*); vertebrae 10-11+14 in *Branchiostegus*, *Malacanthus* and *Hoplolatilus* (not found in the eastern central Atlantic) or 11+16 in *Caulolatilus* (also not found in the eastern central Atlantic); body slender, 11 to 20% standard length (*Malacanthus*), or relatively deep, 15 to 36% standard length (*Branchiostegus*); head with prominent predorsal ridge (*Branchiostegus*) or absent (*Malacanthus*).



Branchiostegus



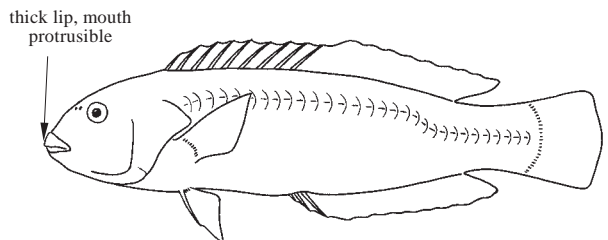
Malacanthus

Habitat, biology, and fisheries: Benthic, caught on hook-and-line, trap, longline or bottom trawl; may inhabit burrows or mounds; unusual, pelagic spinous larvae; in the eastern central Atlantic area, *Branchiostegus semifasciatus* caught at 50 to 200 m depths over soft bottom; most abundant June-October off of Senegal, caught in trawls up to 25 kg/hr; *Malacanthus plumieri* live in self-constructed rubble mounds (10 to 40 m depths) and are not generally caught for food. In other areas of the world, tilefishes (*Branchiostegus*, *Caulolatilus* and *Lopholatilus*) comprise a significant food fishery.

Remarks: The tilefishes are currently considered to belong to two subfamilies (Malacanthinae and Latilinae) of Malacanthidae by Eschmerer's Catalog of Fishes. Family designations made by the author at the time of writing have been retained for the sake of organization.

Similar families occurring in the area

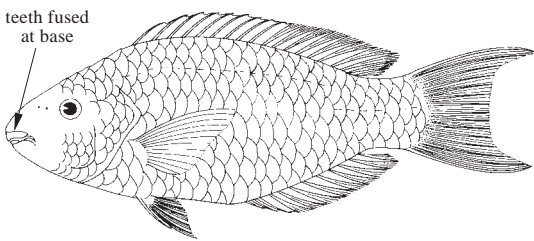
Labridae: prominent nipping canine teeth.



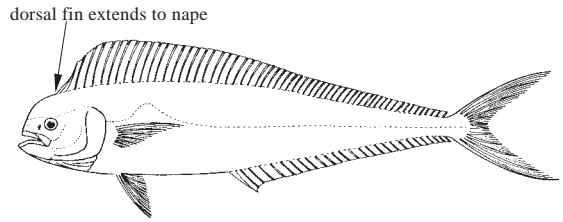
Labridae

Scaridae: teeth fused or united at bases; discontinuous lateral line; large scales.

Coryphaenidae: dorsal fin extends forward to nape.



Scaridae




Coryphaenidae

Key to the species of Branchiostegidae occurring in the area

- 1a. Body quadriform, body depth 27 to 36% (usually 29%) standard length; snout blunt; jaws extending to well under eye anterior margin; head with elevated predorsal ridge (raised seam in front of dorsal fin); relatively large eye (22 to 35% head length); first arch gill rakers 18 to 23; preoperculum with fine serrae on upper limb only; single blunt opercular spine or tab; dorsal fin with 6 spines, 15 or 16 soft rays ***Branchiostegus semifasciatus***
- 1b. Body elongate and fusiform, body depth 12 to 20% (usually 16%) standard length; snout pointed; jaws extending to only under posterior nostril well in front of eye margin; head without elevated predorsal ridge; relatively small eye (11 to 25% head length); first arch gill rakers short and blunt, numbering 8 to 13; preoperculum edge smooth; single pronounced opercular spine; dorsal fin with 4 or 5 spines, 54 to 60 soft rays ***Malacanthus plumieri***

List of species occurring in the area

The symbol  is given when species accounts are included.

 *Branchiostegus semifasciatus* (Norman, 1931).

 *Malacanthus plumieri* (Bloch, 1786).

References

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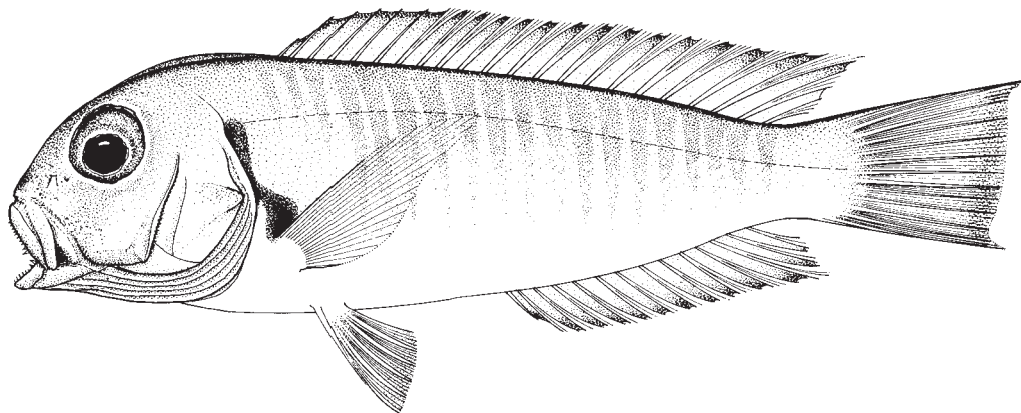
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***Branchiostegus semifasciatus* (Norman, 1931)**

Frequent synonyms/ misidentifications: None / None.

FAO names: En – Zebra tilefish; Fr – Tile zebre; Sp – Blanquillo cebra.



Diagnostic characters: Head with an elevated black predorsal ridge (raised seam in front of dorsal fin); relatively large eye, 22 to 35% (usually 28%) of head length; first arch gill rakers 18 to 23; preoperculum finely serrated on upper limb only; single blunt opercular spine; dorsal fin 6 spines, 15 or 16 (usually 16) soft rays; anal fin with 1 spine (rarely 2) and 13 soft rays; caudal-fin margin truncate with dorsal and ventral tips slightly elongate. **Colour:** live fish golden yellow on sides; large dark area between axil of pectoral fin and dorsal margin of operculum; body with series of 16 to 20 grey-violet (dark) tapering vertical bars to below midbody along side of body from anterior of dorsal fin base to posterior dorsal-fin base.

Size: Maximum 60 cm standard length; common from 20 to 40 cm.

Habitat, biology, and fisheries: A bottom-dwelling species, found over sand to mud bottom near the edge of the continental shelf. Perhaps living in burrows as found in many other species in this family. Seasonal availability, being most abundant between June and October in depths of 50 to 100 m; depth range from 61 to 200 m. Caught by longlines, trawls or traps; marketed fresh or smoked; excellent food quality. Ripe females found in September and January. Catches per hour by trawl range from 1 to 25 kg off Grand-Bassam, west Africa.

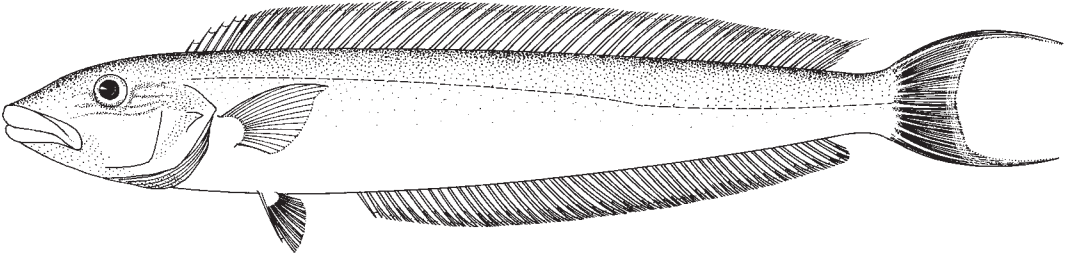
Distribution: Found from about 34° N latitude near Casablanca, Morocco south to Baia dos Tigres, Angola at about 16° S latitude where the cold Benguela Current turns westward; rarely found north of Dakar, Senegal, but found more or less continuously south of there; not found outside of the eastern central Atlantic region.



***Malacanthus plumieri* (Bloch, 1786)**

Frequent synonyms/ misidentifications: None / None.

FAO names: **En** – Sand tilefish; **Fr** – Matajuel blanc; **Sp** – Matajuelo blanco.



Diagnostic characters: Body elongate and fusiform; head without an elevated predorsal ridge (raised seam in front of dorsal fin); snout pointed; jaws extending to under posterior nostril, well in front of eye margin; jaws with well developed recurved canines; fleshy upper lip; very small eye, 11 to 25% (usually 13%; dependent upon size) of head length; first arch gill rakers 8 to 13; preoperculum edge smooth; a single pronounced sharp opercular spine; dorsal fin 4 or 5 (usually 5) spines, 54 to 60 soft rays (usually 56); anal fin with 1 spine, and 48 to 55 (usually 52) soft rays; pored lateral-line scales 135 to 152.

Colour: in life light metallic blue-green on sides (may have light yellow bars on side), belly blue-white; head with a series of yellow and blue stripes under and around eyes; dorsal fin with thin bright yellow stripe along dorsal margin, with an underlying clear area and another yellow band; remainder of dorsal with 3 or 4 rows of light yellow spots; anal fin is coloured as dorsal except yellow spots are lighter with most of the rest of the anal-fin membrane milky white; caudal fin with areas of orange-yellow on dorsal and ventral bases, dorsal lobe may have a dark area, remainder of caudal milky-white with some grey; margin slightly falcate with dorsal and ventral tips slightly to very elongate (in males larger than 30 cm).

Size: Maximum 60 cm standard length; common from 20 to 45 cm, males usually larger than females.

Habitat, biology, and fisheries: A bottom dwelling shallow water species, found over sand to coral rubble bottom near reefs and seagrass beds; living in self-constructed coral-shell rubble mounds (often as large as 3 m) with a tunnel entrance. Mound occupied by a male and several females; at night mound entrance filled with sand; males enter mound head first. Males have territories up to 1 000 m², which is aggressively defended; females with territories up to about 250 m². Most abundant in depths of 10 to 50 m (found to depths of 153 m off South Carolina, USA). Caught by hook-and-line, occasionally in trawls or traps; may bite when handled. A protogynous hemaphrodite; (all males have undergone a sex change from females); spawn 1 to 5 m above bottom at dusk. Unusual pelagic larvae with numerous head spines and keeled scales (were described as a new genus *Dikellorhyncous* when first discovered), larvae metamorphose at a length of about 6 cm. Adults feed mainly on fish and invertebrates. Not a species with a high commercial value, marketed fresh; not found in great abundance, as they are territorial, they are prone to being overfished. Marketed fresh; good food quality.

Distribution: Presently known in the eastern central Atlantic area only from Ascension Island; unverified records from St Helena Island and Sierra Leone. In the western Atlantic from Cape Lookout, North Carolina, USA, and Bermuda, to Florida and the Bahamas, throughout the Gulf of Mexico and most of the Caribbean and West Indies to Venezuela. A gap in distribution occurs between the Orinoco River to south of the Amazon (perhaps due to the soft bottom sediment not conducive to mound building). Southward, in the western South Atlantic the species extends to Santos, Brazil ca. 24° 15' S, 46° 10' W, and possibly to Uruguay; also found in the central South Atlantic off the oceanic island of Trinidad, 1 160 km east of Brazil about 28° 15' S, 20° 30' S, 29° W.



POMATOMIDAE

Bluefish

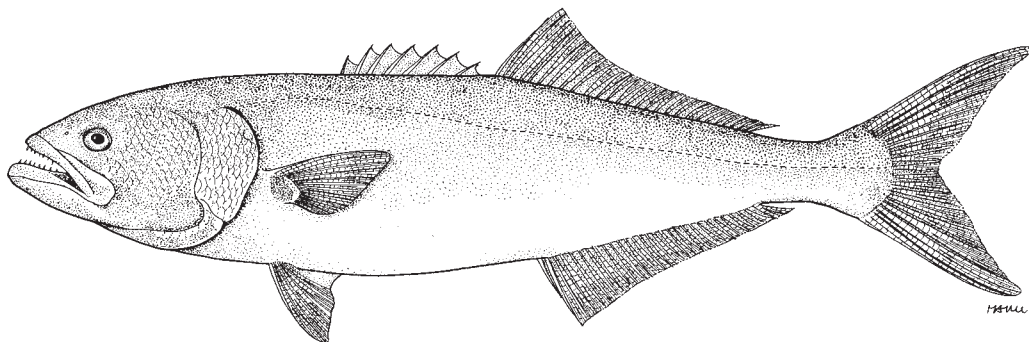
by B.B. Collette, National Marine Fisheries Service, National Systematics Laboratory, National Museum of Natural History, Washington, DC, USA

A single species in this family.

Pomatomus saltatrix (Linnaeus, 1766)

Frequent synonyms / misidentifications: *Pomatomus saltator* (Linnaeus, 1766); *Temnodon saltator* (Valenciennes, 1833) / None.

FAO names: En – Bluefish; Fr – Tassergal; Sp – Anjova.

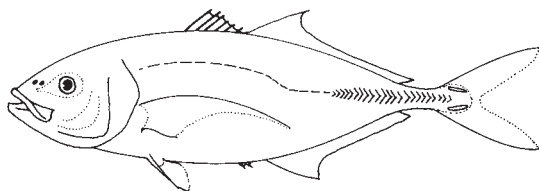


Diagnostic characters: A large species reaching 110 cm with a sturdy compressed body and large head. Mouth large, terminal, lower jaw sometimes slightly projecting; **jaw teeth prominent, sharp, compressed**, in a single series. **Two dorsal fins, the first short and low, with 7 or 8 feeble spines connected by membranes**, the second long with 1 spine and 23 to 28 soft rays; anal fin a little shorter than soft dorsal fin, with 2 spines and 23 to 27 soft fin rays; pectoral fins short, not reaching to origin of soft dorsal fin; pelvic fins under pectoral fins with 1 spine and 5 soft rays; caudal fin moderately forked. **Scales small**, covering head, body, and bases of vertical fins; lateral line almost straight. **Colour:** **back greenish blue, sides and belly silvery**; dorsal and anal fins pale green tinged with yellow; pectoral fins bluish at base; caudal fin dull greenish tinged with yellow.

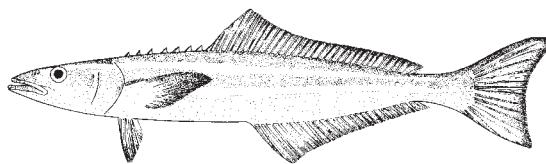
Similar families occurring in the area

Carangidae: usually have 2 detached spines in front of anal fin; also, scutes on caudal peduncle in many species, and detached finlets behind dorsal and anal fins in *Elagatis*, *Decapterus* and *Oligoplites*. The most superficially similar carangids are: *Campogramma* (differs in having breast and head mostly naked) and *Seriola* (differs in having bands of villiform teeth in jaws).

Rachycentridae: spines of dorsal fin shorter, isolated, not connected by a membrane; teeth much smaller and not in a single row; 2 silvery stripes on body.



Carangidae



Rachycentridae

Size: Maximum to 110 cm; commonly to 60 cm. The IGFA all-tackle gamefish record is 14.4 kg for a fish caught in North Carolina in 1972.

Habitat, biology, and fisheries: Coastal waters throughout its range. A powerful, swift fish, the young hunting in schools, the adults in loose groups. A voracious visual predator often attacking shoals of mullet or other fishes and destroying numbers apparently far in excess of feeding requirements. Median length at first maturity is 33.9 cm fork length for males, 33.4 cm for females, at between 1 and 2 years of age. Bluefish reach an age of 12 years. Caught mainly with gillnets, lines and purse seines. Marketed mostly fresh.

Distribution: In the eastern Atlantic found from the Azores, Madeira, Canary Islands, and Morocco south throughout the Gulf of Guinea to South Africa. Also found in the western Atlantic, in the Mediterranean and in the Indo-West Pacific but absent from the eastern Pacific.



References

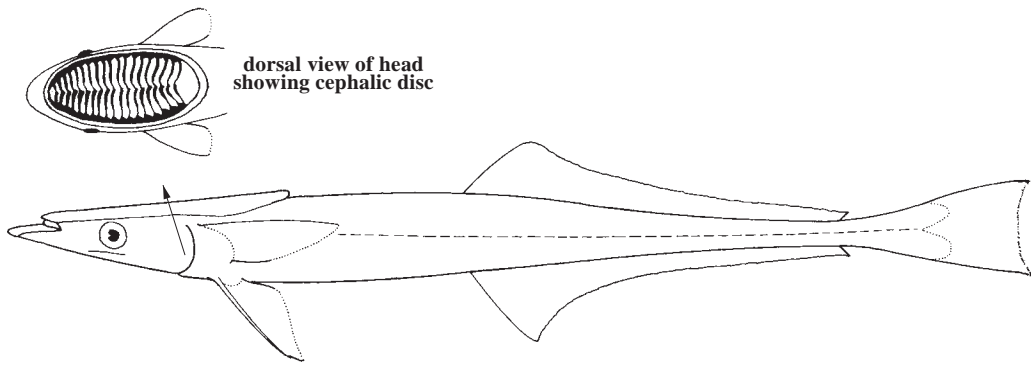
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ECHENEIDAE

Remoras, sharksuckers, discfishes

by B.B. Collette, National Marine Fisheries Service, National Systematics Laboratory, National Museum of Natural History, Washington, DC, USA

Diagnostic characters: Perciform fishes with fusiform, elongate body reaching 90 cm standard length. **Head with a transversely laminated, oval-shaped cephalic disc**, homologous with spinous dorsal fin; **skull wide, depressed to support disc**; opercle without spines, premaxillae not protractile, gill membranes free from isthmus. Jaws broad, the lower projecting beyond the upper; villiform teeth present in jaws and vomer (centrally on roof of mouth), usually on tongue and in certain species on palatines (laterally on roof of mouth). **Dorsal and anal fins long, lacking spines**, dorsal rays range from 18 to 45, anal rays from 18 to 41; pectoral fins set high on body, pointed or rounded, with 18 to 32 rays; pelvic fins far forward, close together, narrowly or broadly attached to underside of body, with 1 spine and 5 soft rays; caudal fin slightly forked, emarginate, or slightly rounded (in large specimens of some species), juveniles of some species with an elongate median caudal filament. Scales small, cycloid (smooth), usually embedded in the skin. No swimbladder. **Colour:** life colours subdued, pale brown, greyish to black, sometimes light to whitish or with conspicuous light and dark horizontal stripes on trunk.



Habitat, biology, and fisheries: The Echeneidae is divisible into 2 subfamilies, 4 genera, and 8 species, 7 of which occur in the eastern central Atlantic. Remoras attach themselves to many different marine vertebrates including sharks, rays, tarpons, barracudas, sailfishes, marlins, swordfishes, jacks, basses, groupers, ocean sunfish, sea turtles, whales, and dolphins; they may also attach to ships, floats, and other floating objects. Some remoras have a great preference or specificity toward certain hosts. *Remora australis*, the whalesucker, is only known from marine mammals. *Remora osteochir*, the marlinsucker, is usually found in the gill cavities of spearfishes, particularly sailfish and white marlin. The preferred host of *Remora albescens*, the white sucker, is the manta ray. Species of the genus *Echeneis* are often free-swimming and occur in shallow, inshore waters. *Remora* and *Remorina* are almost always captured on their host where they may be found attached to the body, in the mouth, or in the gill cavity. Discfishes have relatively little commercial importance. *Echeneis naucrates* is readily taken on hook-and-line and is occasionally seen in markets. In the eastern central Atlantic, the species most often consumed for food appear to be *Echeneis naucrates* and *Remora remora*. They are reported to be marketed dried-salted and smoked, especially in Ghana and Senegal.

Similar families occurring in the area

No other family of fishes has a cephalic sucking disc. The cobia (family Rachycentridae) bears some resemblance to the remoras. It has been hypothesized that a cobia-like ancestor may have given rise to the echeneid fishes.

Key to the species of Echeneidae occurring in the area

- 1a. Body very elongate, depth contained 8 to 14 times in standard length; pectoral fins pointed; usually a dark longitudinal band on sides, bordered with white; anal-fin base long, anal rays 29 to 41; disc small, 18 to 31% standard length; caudal fin lanceolate in young, the middle rays filamentous, almost truncate in adults, the lobes produced (subfamily Echeneinae) (Fig. 1) → 2
- 1b. Body less elongate, depth contained 5 to 8 times in standard length; pectoral fins rounded; colour nearly uniform, without bands; anal-fin base short, anal rays 18 to 28; disc large, 28 to 58% standard length; caudal fin forked in young becoming emarginate or truncate in adults (subfamily Remora) (Fig. 2) → 3

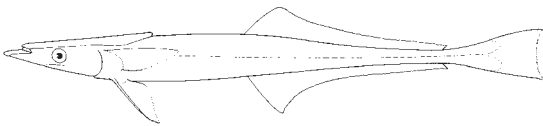


Fig. 1 *Echeneis*

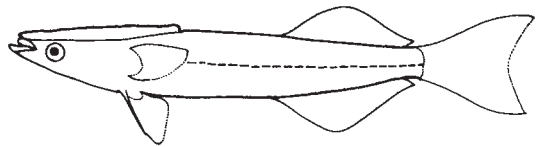










Fig. 2 *Remora*

- 2a. Sucking disc large, with 18 to 28 laminae; body moderately elongate; vertebrae 30 ***Echeneis naucrates***
- 2b. Sucking disc small, with 9 to 11 laminae; body very slender, elongate; vertebrae 39 to 41 ***Phtheirichthys lineatus***
- 3a. Pelvic fins narrowly attached to abdomen; disc laminae 13 or 14; colour whitish; vertebrae 26; usual host manta rays ***Remora albescens***
- 3b. Pelvic fins broadly attached to abdomen; disc laminae 15 or more; colour light to dark brown; vertebrae 27; hosts include sharks, billfishes or cetaceans, depending on species → 4
- 4a. Gill rakers, including rudiments, more than 27. ***Remora remora***
- 4b. Gill rakers, including rudiments, less than 21. → 5
- 5a. Disc laminae 25 to 28; gill rakers 17 to 20; preferred hosts, cetaceans ***Remora australis***
- 5b. Disc laminae 15 to 20; gill rakers 11 to 17; preferred hosts, billfishes → 6
- 6a. Dorsal-fin rays 26 to 34; disc length 27 to 40% standard length, disc does not extend posteriorly past tip of adpressed pectoral fin; outer two-thirds of pectoral-fin rays flexible; pectoral-fin rays 23 to 27; disc spinules pointed, arranged in 2 or 3 irregular rows in larger specimens ***Remora brachyptera***
- 6b. Dorsal-fin rays 20 to 26; disc length 37 to 50% standard length, disc extends posteriorly past tip of adpressed pectoral fin; pectoral-fin rays stiff to tips in specimens larger than 150 mm standard length; pectoral-fin rays 20 to 24; disc spinules blunt, arranged in about 4 irregular rows in specimens larger than 150 mm standard length ***Remora osteochir***

List of species occurring in the area

The symbol  is given when species accounts are included.

-  *Echeneis naucrates* Linnaeus, 1758.
-  *Phtheirichthys lineatus* (Menziés, 1791).
-  *Remora albescens* (Temminck and Schlegel, 1850).
-  *Remora australis* (Bennett, 1840).
-  *Remora brachyptera* (Lowe, 1839).
-  *Remora osteochir* (Cuvier, 1829).
-  *Remora remora* (Linnaeus, 1758).

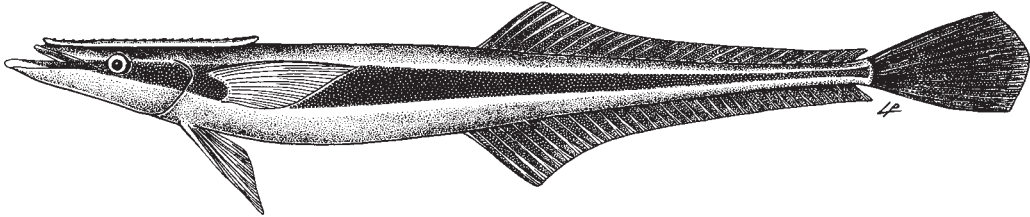
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***Echeneis naucrates* Linnaeus, 1758**

Frequent synonyms / misidentifications: None / *Echeneis neucratoides* Zuiew, 1789.

FAO names: En – Live sharksucker; Fr – Rémora commun; Sp – Pegatimón.

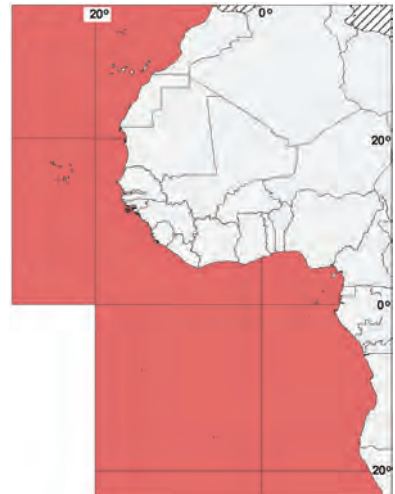


Diagnostic characters: An elongate fish (to 900 mm standard length), **depth of body contained 8 to 14 times in standard length**. Jaws broad, the lower projecting beyond the upper. First dorsal fin replaced by a transverse laminated oval cephalic disc with **21 to 28 laminae**; second dorsal and anal fins long, without spines, **the anal fin with 31 to 41 rays**; pectoral fins short, high on body, pointed; caudal fin lanceolate in young, the middle rays elongate and filamentous; almost truncate in adults with upper and lower lobes longer than the middle rays. **Colour:** **dark longitudinal stripe on sides bordered by narrow white stripes above and below**. Tips of dorsal, anal, and caudal fins white; white edging becomes narrower with increasing size.

Size: Maximum to 900 mm standard length. The IGFA all-tackle gamefish record is 5.38 kg for a fish caught in Molasses Reef, Florida in 2001.

Habitat, biology, and fisheries: Unlike most other remoras, the sharksucker is often found free-swimming in shallow inshore waters. It will attach temporarily to a wide variety of hosts particularly sharks, but also including rays, jacks, parrotfishes, sea turtles and also ships, buoys, and even bathers. Live sharksuckers are used in artisanal fisheries as an aid to line-fishing. A line is tied around the caudal peduncle of the sharksucker and then it is released in the water. Upon attaching to a host, the remora and its host are pulled in by the fisherman. Taken with drift nets and trawls. Occasionally marketed fresh.

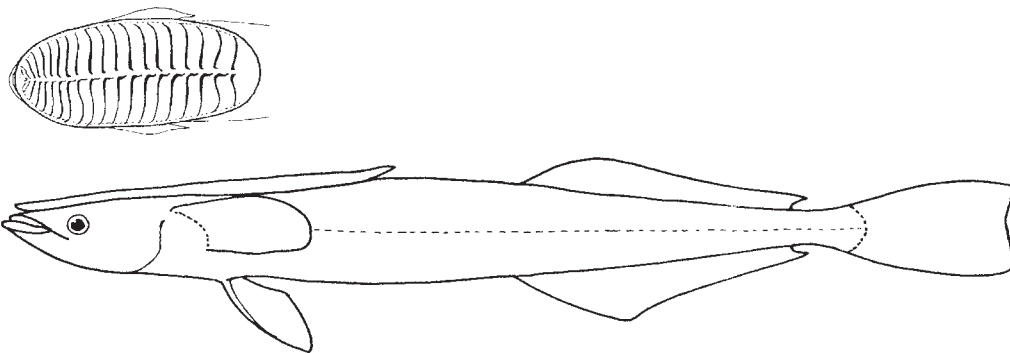
Distribution: Worldwide in tropical and temperate seas except for the eastern Pacific. In the eastern central Atlantic from the Azores south to St Helena and along the coast of west Africa.



***Remora osteochir* (Cuvier, 1829)**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Marlinsucker; Fr – Rémora des marlins; Sp – Agarrador.



Diagnostic characters: A moderately elongate fish (to 386 mm standard length), **depth of body contained 5 to 8 times in standard length**. Jaws broad, lower projecting beyond the upper. First dorsal fin replaced by a transverse laminated oval cephalic disc with **15 to 19 laminae**; **disc length 37 to 50% standard length**; **disc extends posteriorly past tip of adpressed pectoral fin**; second dorsal and anal fins short, without spines, pointed, **pectoral-fin rays stiff to tips in specimens longer than 150 mm standard length**; pelvic fins broadly attached to the abdomen. **Gill rakers 11 to 15, including rudiments**. Vertebrae 13 + 14 = 27. **Colour:** overall brown.

Size: Maximum to 386 mm standard length.

Habitat, biology, and fisheries: Oceanic. Occurs on the body and in the gill cavity of billfishes, particularly the white marlin and the sailfish. Parasitic copepods form an important part of diet, 70% of stomachs with food contained parasitic copepods.

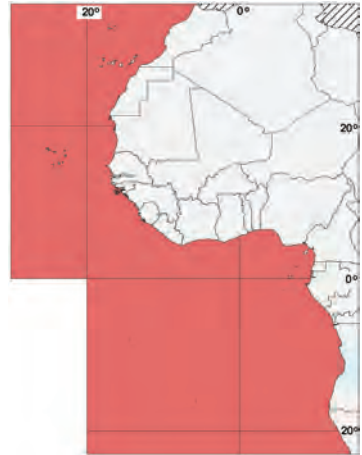
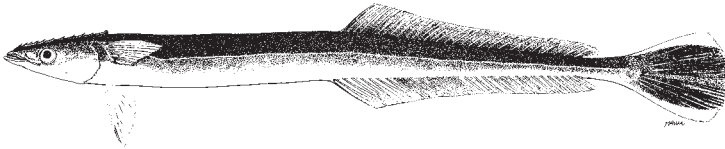
Distribution: Worldwide in all warm seas.



***Phtheichthys lineatus* (Menzies, 1791)**

En – Slender suckerfish.

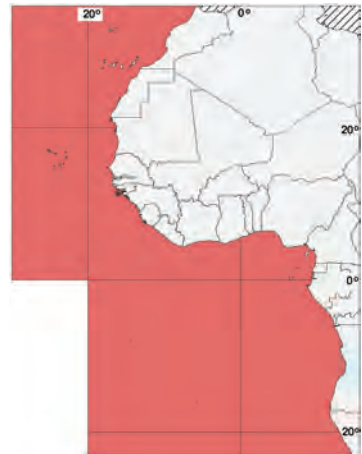
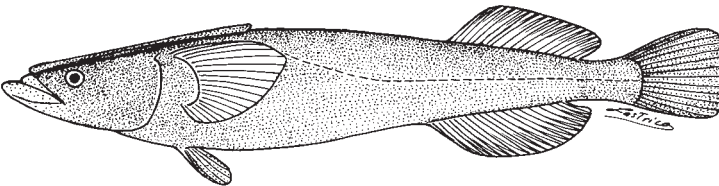
Maximum size to 490 mm standard length. Oceanic. Attaches to body or enters gill chambers of other fishes, most frequently barracuda. Worldwide in tropical and subtropical waters but rare in the Atlantic Ocean. Known from the Azores and Ghana in the eastern central Atlantic.



***Remora albescens* (Temminck and Schlegel, 1850)**

En – White suckerfish.

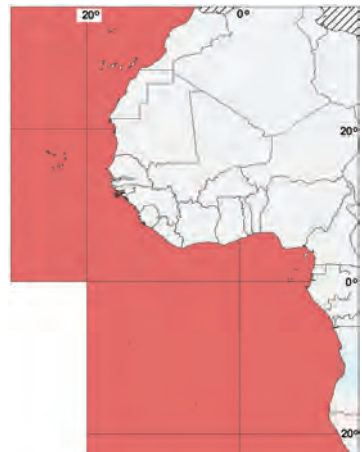
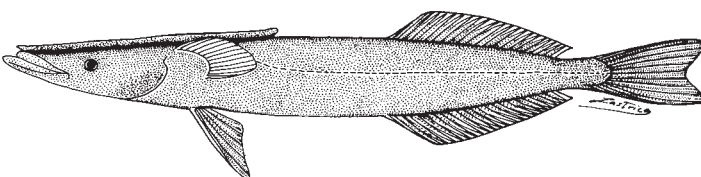
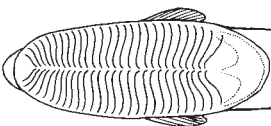
Maximum size to 225 mm standard length. Oceanic. The preferred hosts are manta rays, but there are also a few records from sharks. Found in warm parts of all oceans.



***Remora australis* (Bennett, 1840)**

En – Whalesucker; **Fr** – Rémora des baleines; **Sp** – Pegaballena.

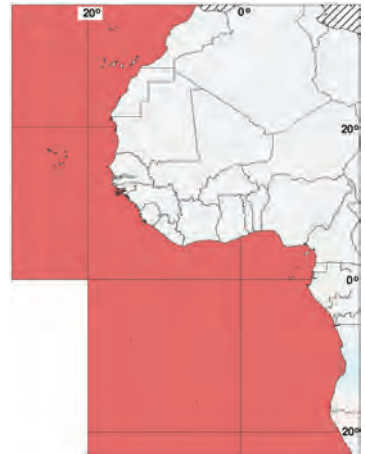
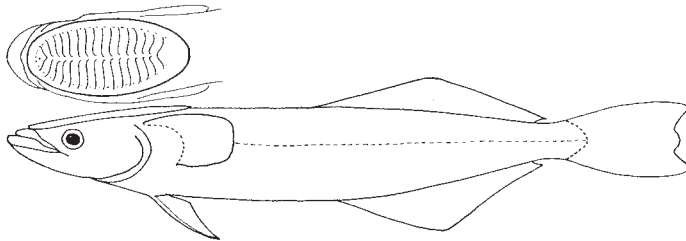
Maximum size to 403 mm standard length. Oceanic. Hosts: cetaceans. Probably widely distributed in all warm seas; the rarest member of the family.



Remora brachyptera (Lowe, 1839)

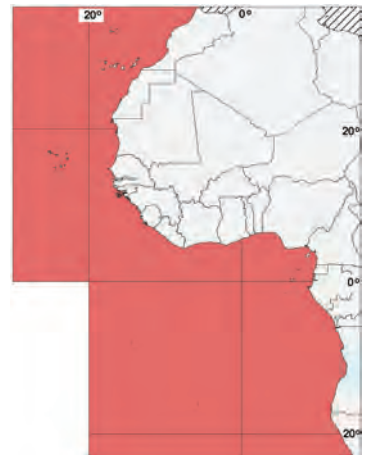
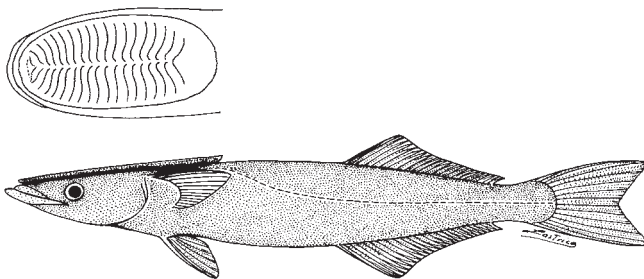
En – Spearfish remora; **Fr** – Rémora des espadons; **Sp** – Tardanaves.

Maximum size to 260 mm standard length. Oceanic. Billfishes are preferred hosts. Worldwide in all warm seas.

***Remora remora*** (Linnaeus, 1758)

En – Sharksucker (AFS: Remora); **Fr** – Rémora des requins; **Sp** – Rémora tiburonera.

Maximum size to 618 mm standard length. Offshore waters. Found on at least 12 species of sharks, especially blue and whitetip sharks, attached to body or in gill chamber. Parasitic copepods form an important part of diet. Common in warm parts of all oceans.



RACHYCENTRIDAE

Cobia

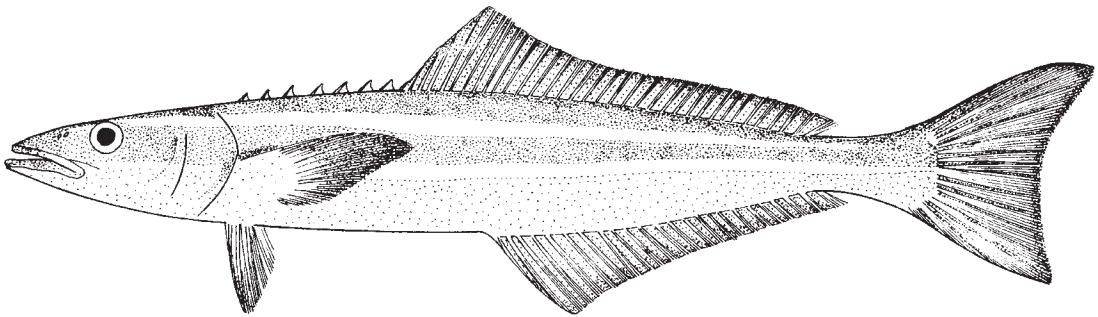
by B.B. Collette, National Marine Fisheries Service, National Systematics Laboratory,
National Museum of Natural History, Washington, DC, USA

A single species in this family.

Rachycentron canadum (Linnaeus, 1766)

Frequent synonyms / misidentifications: None / None.

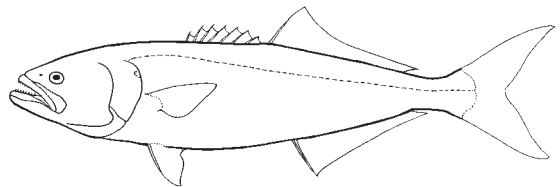
FAO names: En – Cobia; Fr – Mafou; Sp – Cobia.



Diagnostic characters: A large fish reaching 2 m in length. Body elongate, subcylindrical; **head broad and depressed. Mouth large**, terminal, with projecting lower jaw; villiform teeth in jaws and on roof of mouth and tongue. **First dorsal fin with 7 to 9 (usually 8) short but strong isolated spines, not connected by membranes**; second dorsal fin long, 34 or 35 rays, anterior rays somewhat elevated in adults; anal fin similar to dorsal, but shorter, 24 to 26 rays; **caudal fin lunate in adults, upper lobe longer than lower (caudal fin rounded in young, the central rays much prolonged)**. Pectoral fins pointed, becoming more falcate with age. Scales small, embedded in thick skin; lateral line slightly wavy anteriorly. **Colour:** back and sides dark brown, with 2 sharply defined narrow light bands; belly yellowish.

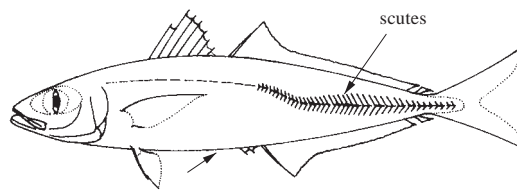
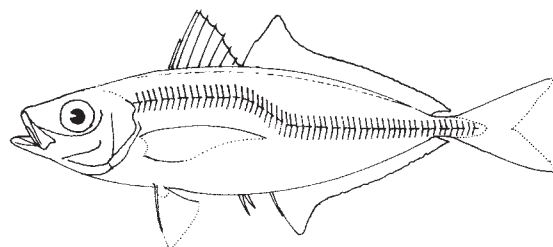
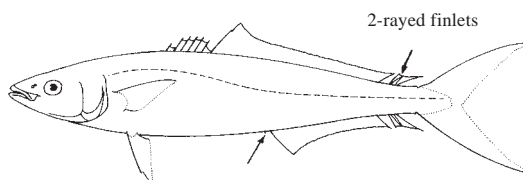
Similar families occurring in the area

Pomatomidae: spines of dorsal fin connected by membranes; also, body and head deeper and no stripes on sides; teeth large and very sharp.



Pomatomus

Carangidae: none have a broad depressed head, and most species usually have 2 detached spines visible in front of anal fin; also distinctly elongate carangid species have either scutes on lateral line (*Decapterus*, *Trachurus*) or detached finlets behind dorsal and anal fins (*Decapterus*, *Elagatis*).

*Decapterus**Trachurus**Elagatis*

Size: Maximum to 200 cm; commonly to 110 cm. The IGFA all-tackle game fish record is 61.5 kg for a fish caught in Shark Bay, Western Australia in 1985.

Habitat, biology, and fisheries: Pelagic, but also found over shallow coral reefs and off rocky shores, occasionally in estuaries. Primarily a demersal feeder, preying on crabs, squids, teleosts and elasmobranchs. Grows rapidly and reaches at least 8 years of age. Both sexes mature at age 2, males at 60 to 65 cm fork length, females at 80 cm fork length. Caught mainly with handlines and bottom trawls. Large size and strong fighting qualities make cobia a favourite of coastal recreational fishermen adjacent to buoys, fishing piers, and over artificial reefs. Marketed mostly fresh, but holds up well as a frozen product, and also makes a fine smoked product. Due to its extraordinary growth rate, overall aquaculture performance and market demand and price, cobia is one of the species identified as having the greatest potential for commercial aquaculture throughout its distribution range in tropical regions.

Distribution: Throughout the area. Nearly worldwide in warm seas except absent from the eastern Pacific Ocean and the Pacific Plate.



References

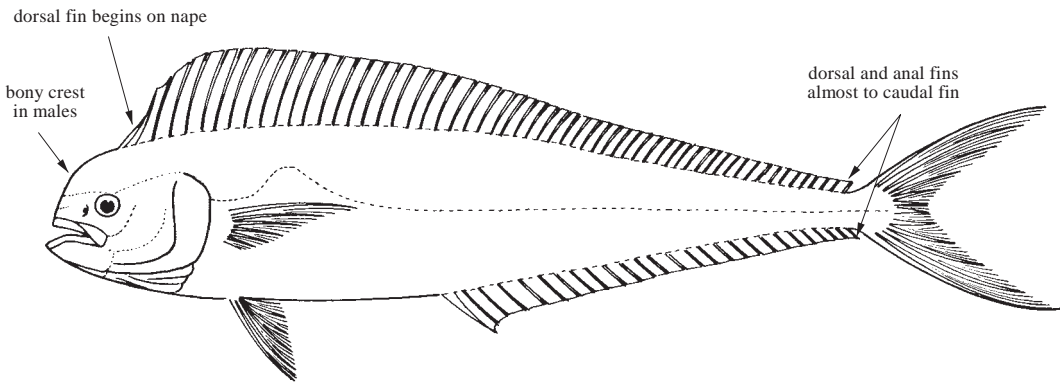
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CORYPHAENIDAE

Dolphinfishes, "dolphins"

by B.B. Collette, National Marine Fisheries Service, National Systematics Laboratory, National Museum of Natural History, Washington, DC, USA

Diagnostic characters: Elongate compressed fishes reaching 2 m fork length. Mouth large, with many fine teeth in bands. **Adult males develop a bony crest on front of head.** Lateral line curved upward above pectoral fin. **Dorsal and anal fins very long, continuing almost to caudal fin, without sharp spines, or finlets, with 52 to 66 soft rays; dorsal-fin origin on nape;** anal-fin origin at or before midpoint of body, with 23 to 30 soft rays; pelvic fins beneath the pectoral fins and fitting into a groove on body; caudal fin deeply forked, without any keels on fin or caudal peduncle. Scales small and cycloid (smooth). Total vertebrae 31 or 33. **Colour:** in life very variable, **sides with golden hues** and back brilliant metallic greens and blues; many small, black spots on head and body. Specimens less than 15 cm have dark vertical bars.



Similar families occurring in the area

No other fishes have a combination of characters such as dorsal fin from nape almost to caudal fin; anal fin from about midpoint of body almost to caudal fin; no sharp spines in dorsal and anal fins; caudal fin deeply forked; and pelvic fins well developed.

Key to species of Coryphaenidae occurring in the area

- 1a. Greatest body depth in adults less than 25% of standard length; pectoral fin of adults more than half length of head; dorsal-fin rays 58 to 66; tooth patch on tongue small and oval (Fig. 1a); 17 or 18 caudal vertebrae ***Coryphaena hippurus***
- 1b. Greatest body depth in adults more than 25% of standard length; pectoral fin of adults about half length of head; dorsal-fin rays 52 to 59; tooth patch on tongue broad and trapezoidal (Fig. 1b); 19 or 20 caudal vertebrae ***Coryphaena equiselis***

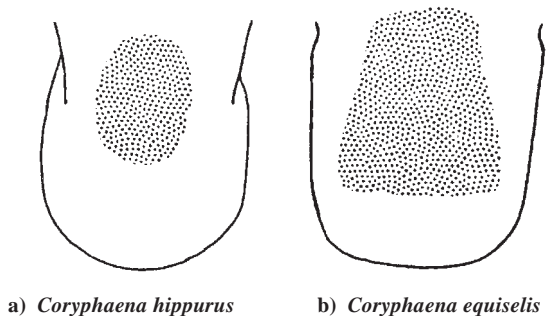





Fig 1 tooth patch on tongue

List of species occurring in the area

The symbol  is given when species accounts are included.

 *Coryphaena equiselis* Linnaeus, 1758.

 *Coryphaena hippurus* Linnaeus, 1758.

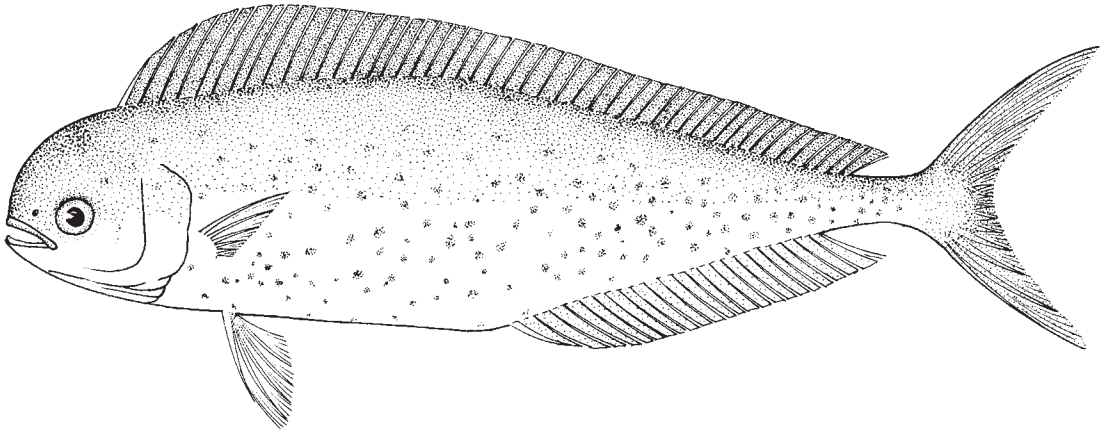
References

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***Coryphaena equiselis* Linnaeus, 1758**

Frequent synonyms / misidentifications: *Coryphaena equisetis* Linnaeus, 1758 / *Coryphaena hippurus* Linnaeus, 1758.

FAO names: En – Pompano dolphinfish; Fr – Coryphène dauphin; Sp – Dorado.

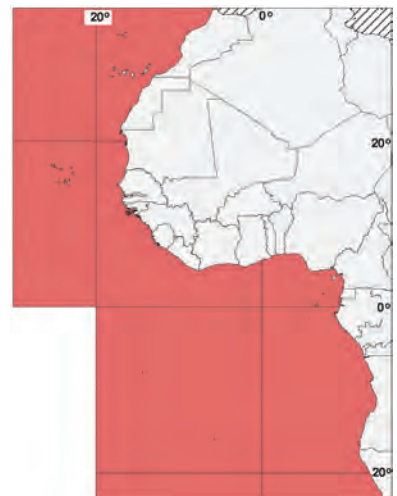


Diagnostic characters: Body elongate and compressed, **greatest body depth in adults more than 25% of standard length**; young fish (up to 30 cm) have head profile slightly convex. **Tooth patch on tongue broad and trapezoidal**; bands of teeth on jaws, vomer and palatines. **A single dorsal fin extending from just behind eye almost to caudal fin, with 52 to 59 rays; a convex anal fin extending from anus almost to caudal fin, with 23 to 29 soft rays; pectoral fin about half of head length**; caudal fin deeply forked; lateral-line scales 200 or fewer; caudal vertebrae 19 or 20, total vertebrae 33. **Colour:** back brilliant metallic blue/green in life, fading rapidly after death to grey with a green tinge; sides silvery with a golden sheen and numerous black spots; dorsal fin dark. In juveniles, entire margin of caudal fin white; pelvic fins not pigmented.

Size: Maximum to 75 cm; common to 50 cm. The IGFA all-tackle game fish record is 3.86 kg for a fish caught off Maryland, USA in 2008.

Habitat, biology, and fisheries: Epipelagic, inhabiting open waters, but also approaching the coast. Probably resembles *C. hippurus* in following ships and concentrating below floating objects. Feeds on small fishes and squids. Caught mainly by trolling and with floating lines. Marketed fresh. Infrequently caught and usually not distinguished from *C. hippurus* so no separate landing statistics are available.

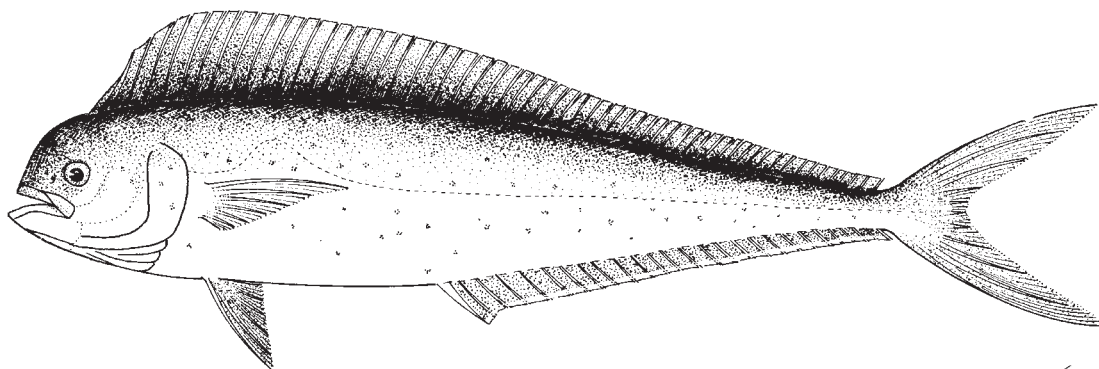
Distribution: Probably throughout the area, but not always distinguished from *C. hippurus*. In the eastern Atlantic recorded from the Azores, Madeira, the Canaries, and Senegal. Worldwide in tropical and subtropical seas, except for the Mediterranean Sea.



Coryphaena hippurus Linnaeus, 1758

Frequent synonyms / misidentifications: None / None.

FAO names: **En** – Common dolphinfish (AFS: Dolphinfish); **Fr** – Coryphène commune; **Sp** – Lampuga.



Diagnostic characters: Body elongate and compressed, **greatest body depth in adults less than 25% of standard length**; young fish (up to 30 cm) have a slender, elongate body with head profile slightly convex; in larger males (30 to 200 cm) the head profile becomes vertical with development of a bony crest; **tooth patch on tongue small and oval**; bands of teeth on jaws, vomer and palatines. **A single dorsal fin extending from above eye almost to caudal fin**, with 58 to 66 rays; **a concave anal fin** extending from anus almost to caudal fin, with 25 to 31 soft rays; **pectoral fin more than half of head length**; caudal fin deeply forked; lateral-line scales 200 or more; caudal vertebrae 17 or 18, total vertebrae 31. **Colour:** back brilliant metallic blue/green in life, after death fading to grey with a green tinge; sides silvery with a golden sheen, and 1 row of dark spots or golden blotches running below dorsal fin and 1, 2 or more rows on and below lateral line, some scattered irregularly; dorsal and anal fins black, the latter with a white edge; pectoral fins pale; caudal fin silvery with a golden sheen. In juveniles, only tips of caudal-fin lobes white; pelvic fins black.



head showing
increase in
steepness of profile

Size: Maximum to 200 cm; common to 100 cm. The IGFA all-tackle game fish record is 39.9 kg for a fish caught in the Bahama Islands in 1998.

Habitat, biology, and fisheries: Pelagic, inhabiting open waters, but also approaching the coast; follows ships and forms small concentrations below floating objects. Mainly found in waters warmer than 20°C. Feed mainly on fishes, but also on crustaceans and squids. Dolphinfish grow rapidly and reach maturity in their first year, females at about 350 mm fork length, males at about 427 mm. Maximum age about 4 years. Breed in the open sea, probably approaching the coast as water temperatures rise. Batch fecundity estimates range from 58 000 to 1.5 million eggs and are strongly influenced by fish size. Caught by trolling and on tuna longlines; also occasionally with purse seines. Marketed fresh, frequently under the Hawaiian name “mahī-mahī”; a very highly appreciated food and sports fish.

Distribution: Throughout the whole area between 30°N and 30°S, worldwide in tropical and subtropical seas.

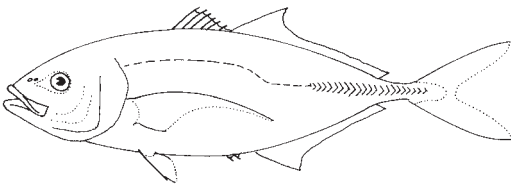


CARANGIDAE

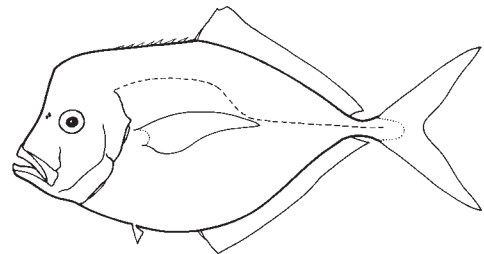
**Jacks, crevalles, scads, bumpers, runners, pompanos, leerfish,
vadigo, amberjacks, pilot fishes**

by W.F. Smith-Vaniz, Florida Museum of Natural History, University of Florida, Gainesville, FL, USA

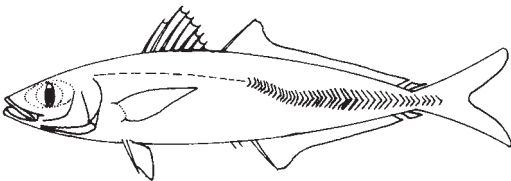
D **Diagnostic characters:** Moderate to large fishes (20 to 180 cm fork length). **Body extremely variable in shape, ranging from elongate and fusiform to deep and strongly compressed;** caudal peduncle of medium width to notably slender, in some species with a moderate lateral keel, bilateral paired keels or dorsal and ventral grooves. Head varying from moderately long and rounded to short, deep and very compressed; snout pointed to blunt; lower jaw protruding to subtended (included); eye small to large, with adipose eyelid negligible to strongly developed; teeth in jaws in rows or bands, either small to minute or an enlarged row of recurved canines present; teeth on roof of mouth (vomer, palatines) or tongue present or absent depending on species or developmental stage; gill openings large, gill membranes not united, free from isthmus; branchiostegal rays 7 or 8 (usually 7); gill rakers moderate in length and number to long and numerous, their number decreasing with growth in some species; opercular bones smooth (but with spines in larvae and small juveniles). **Two dorsal fins that are separated in small juveniles, the first of moderate height or very low, with 4 to 8 spines** (the spines embedded in adults of some species), **the second dorsal fin with 1 spine and 18 to 37 soft rays** and the anterior lobe scarcely produced to extremely long; **anal fin with 2 anterior spines** (except 1 spine in *Elagatis*) **that are separate from rest of fin by a gap** (becoming embedded in adults of some species) **followed by 1 spine and 15 to 31 soft rays**, with the anterior lobe low to elongate; pectoral fins with 1 spine and about 14 to 24 soft rays, either long and falcate or short and pointed or rounded; pelvic fins with 1 spine and 5 soft rays, moderately long in some species to becoming rudimentary in others; **caudal fin forked, with the lobes equal in most species**. Scales small, sometimes difficult to see, and cycloid (smooth to touch), but ctenoid (rough) in 2 species and strongly lanceolate on breast in *Lichia*, usually absent from some areas of head and usually covering whole body (but absent on certain body areas in some species) and sometimes extending onto fins; **scutes** (enlarged, thickened, and often pointed scales in lateral line) **present and prominent, or reduced in some species and absent in some genera**. Lateral line arched (curved) or elevated anteriorly and straight posteriorly, extending onto caudal fin. Vertebrae 10 or 11 precaudal and 14 to 16 caudal, 24 to 26 total (usually 10 + 14 in most species). **Colour:** darker above (green or blue to blackish) and paler below (silvery to white or yellow golden), some species almost entirely silvery when alive, others with dark or coloured bars or stripes on head, body or fins, and some able to change patterns; the young of many species with bars or spots.



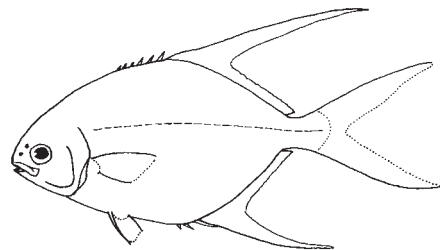
Caranx



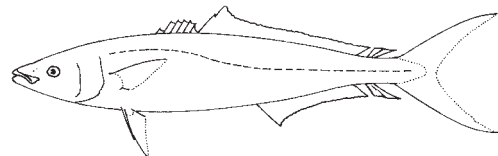
Selene



Decapterus



Trachinotus



Elagatis

examples of body shape

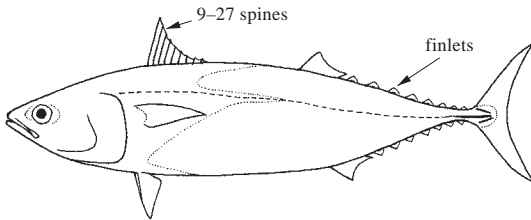
Habitat, biology, and fisheries: Mostly schooling species (but *Alectis* generally solitary); some species have largely continental distributions and occur primarily in brackish environments (especially young), others such as *Elagatis* and *Naucrates* are pelagic, usually found at or near the surface, mostly in oceanic waters, often far offshore. Caught commercially with trawls, also with purse seines, traps and on line gear. The larger species of *Trachinotus*, *Seriola* and *Caranx* are highly regarded as sportfish.

Similar families occurring in the area

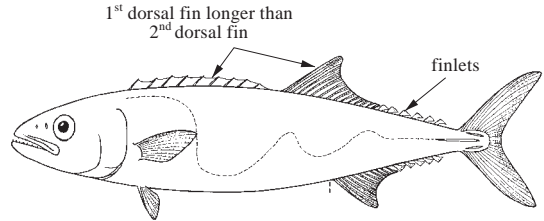
Distinguished from all similar families in having the first 2 anal-fin spines detached from rest of fin (caution: these spines sometimes are partially or completely embedded in large carangids, especially *Seriola*). The presence of enlarged, thickened scutes in the straight part of lateral line in some genera easily distinguishes them from other families. Additional distinguishing characters of similar families (especially to those carangid genera lacking scutes on the lateral line), are the following:

Scombridae: dorsal-fin spines 9 to 27 (4 to 9 in Carangidae); posterior rays of dorsal and anal fins forming a series of free finlets (at most only a terminal double-rayed finlet in carangids occurring in Fishing Area 34); also, dorsal fins widely separated in *Auxis* and *Scomber* species.

Gempylidae (especially *Lepidocybium* and *Ruvettus*): first dorsal-fin base longer than that of second excluding finlets (shorter than second in Carangidae); a series of dorsal and anal finlets present in *Lepidocybium* and *Ruvettus*.



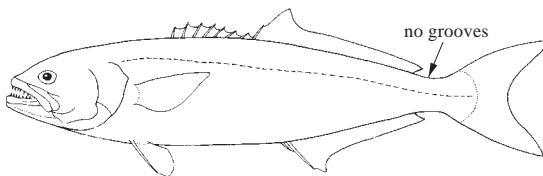
Scombridae



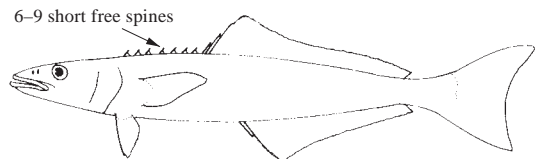
Gempylidae

Pomatomidae: both jaws with a series of strong compressed teeth (teeth similar in the carangid *Campogramma glycos* which differs in having naked cheeks); no grooves on caudal peduncle (present in the carangid genus *Seriola* which is superficially similar).

Rachycentridae: head broad and depressed, lower jaw projecting; first dorsal fin with 8 or 9 short, free spines, each depressible in a groove; a single weak spine in anal fin.

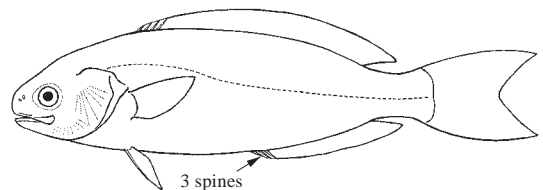


Pomatomidae



Rachycentridae

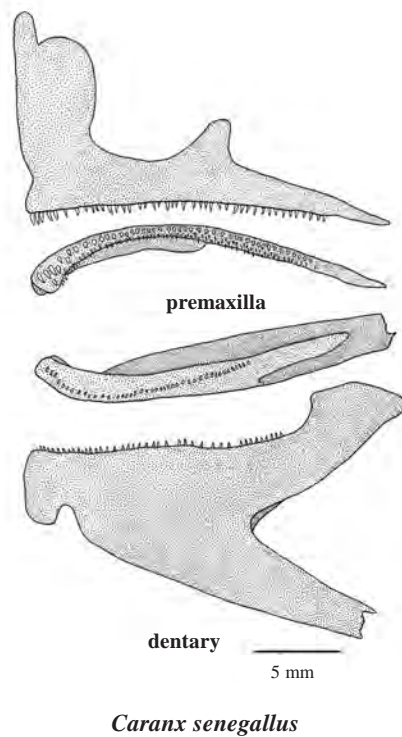
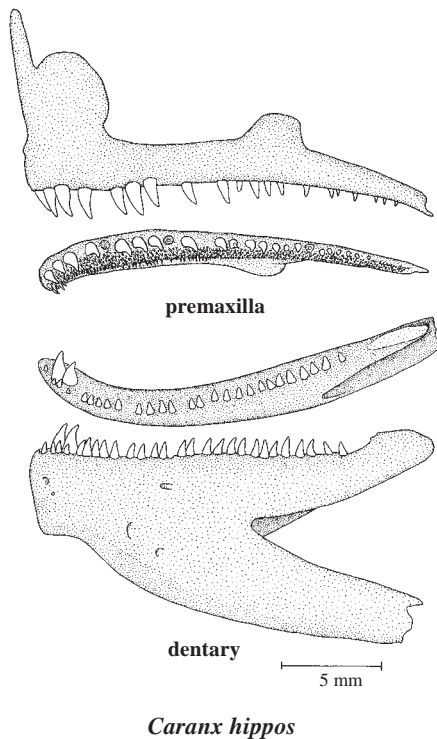
Centrolophidae, particularly the genus *Hyperoglyphe*: 3 anal-fin spines not detached from fin; preopercle margin usually moderately denticulate (smooth in Carangidae); jaw teeth all conical, simple caudal fin not deeply forked.



Centrolophidae

Identification Note

Dentition: Dentition has been used solely by past workers to recognize a number of species groups related to *Caranx* under different generic or subgeneric designations. One such group is the “catch-basket” genus *Carangoides*. Although this generic name has been widely used for a number of Indo-Pacific species, *Carangoides* (*sensu lato*) exhibits a wide range of dentition types and has not been defined by any shared derived characters. Without discussion, Randall (1983, Caribbean reef fishes, 3rd ed.) assigned that generic name to *Caranx bartholomaei*, *C. crysos* and *C. ruber*, and some recent authors have followed him in adopting that nomenclature. Such a change in generic classification may ultimately prove to be justified (but probably not for *C. crysos*), but in the interest of nomenclatural stability traditional usage should be maintained until carangid generic limits and phylogenetic relationships are better resolved. Dentition must be used with caution as an exclusive generic character because it is a highly variable character in carangids and usually is very different even in juveniles and adults of the same species. As examples of this variation, the dentition of adults of *Caranx hippos* (type species of *Caranx* Lacépède) and *C. senegallus* (type species of *Vexillicaranx* Fowler) are illustrated below. Even enlarged symphyseal dentary canines (see *C. hippos*), almost certainly a derived character state, do not define a monophyletic *Caranx* (*sensu stricto*).



Fin-spines: The detached anterior anal-fin spines and the spines of the first dorsal fin (especially the first 1 or 2) frequently become completely embedded in large individuals of many carangids (all spines of the first dorsal fin become embedded in *Alectis* at a relatively small size). Even in those genera with a relatively high spinous dorsal fin, the first spine is usually very small and closely appressed to the second spine and can easily be overlooked.

Gill raker counts: Counts are of rakers on the first (outermost) gill arch. In species with relatively numerous gill rakers (e.g. *Decapterus* and *Trachurus*) great care must be taken not to overlook rakers at either end of the gill arch. It is suggested that a small knife be used to free the upper limb of the first gill arch where it joins the skull. With a little practice this can be done without leaving any stub with rakers attached. Once this has been accomplished, the gill rakers are much easier to see. In some genera (e.g. *Caranx* and *Seriola*) the number of developed rakers decreases with growth with a concomitant increase in the number of rudiments (tubercles or short rakers with the diameter of their bases greater than their height). When rudimentary rakers are included in the gill raker counts, and large specimens are being examined, it is very important that all of the tubercles are counted. In all cases the raker in the angle of the gill arch is included in the count of lower limb rakers.

Lateral-line scutes: In many carangids, size and configuration of the scales and scutes on the lateral line is variable and there may be a gradual transition from one type to another. Scutes are here defined as modified scales that either have their posterior margin with a small to moderate projecting spine or the scale has a raised horizontal ridge and ends in an apex not exceeding a 90° angle. All scutes should be counted, including those extending onto the caudal-fin base. In order to observe and accurately count the lateral-line scales and scutes, good lighting and some magnification is recommended. In some species it may also be necessary to remove small body scales that tend to overgrow or otherwise obscure the lateral line.

Breast squamation: Several species of *Caranx* have the breast only partially scaly, and the pattern of breast squamation is sometimes difficult to observe in fresh specimens; observation is facilitated by gently scraping the breast with a knife to remove mucous and allowing the breast to partially dry, hastened by blowing air on the area.

Measurements: The curved part of the lateral line is measured as a chord (straight-line distance) of the arch extending from the upper edge of the opercle to its junction with the straight part. The straight part of the lateral line is measured from its junction with the curved part to its termination on the caudal-fin base (end of the last scute). In cases where the junction of the curved and straight parts is very gradual, **the curved part is considered to begin with the scale or scute that has three-fourths of its height above the central axis of the straight part.** Fork length, measured from the tip of the snout to the end of the middle caudal-fin rays, is the standard body length measurement used for carangids because the caudal-fin lobes are frequently broken off, especially in trawled specimens.

Skeleton: Some carangid species have certain bones that become progressively expansive or swollen in adults. In fishes this condition is generally called hyperostosis. Although the ontogenetic onset of hyperostosis is variable in some species, the pattern of hyperostotic bones is remarkably consistent in large adults and is a useful identification aid. Smith-Vaniz *et al.* (1995) gives an overview of hyperostosis in marine teleosts with emphasis on the Carangidae. See also Smith-Vaniz and Carpenter (2007).

Adipose eyelid: A thick, mostly transparent tissue that partly or wholly covers the eye. The relative development of the adipose eyelid in adults is a useful distinguishing character of some species.

Key to the species of Carangidae occurring in the area

Note: "*Decapterus*" *rhonchus*, originally described as a species of *Caranx*, is here assigned to *Decapterus* for convenience; studies in progress will result in description of a new monotypic genus for the species (see "Remarks" in species account).

- 1a. Posterior straight part of lateral line with enlarged hardened scutes (Fig. 1) (scutes very small in *Chloroscombrus* and *Selene*); adults of most species with pectoral fins long and falcate, in most genera longer than head (but about equal to head length in *Selar* and *Trachurus* (Fig. 2), and shorter than head length in all *Decapterus* (Fig. 3) except "*D.*" *rhonchus* where they are equal to head) → 2
- 1b. Posterior straight part of lateral line without scutes (Figs 4 and 5); pectoral fins relatively short, always shorter than head (about 50 to 90% of head length) → 27

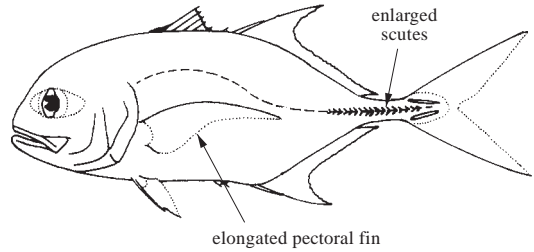


Fig. 1 *Caranx*

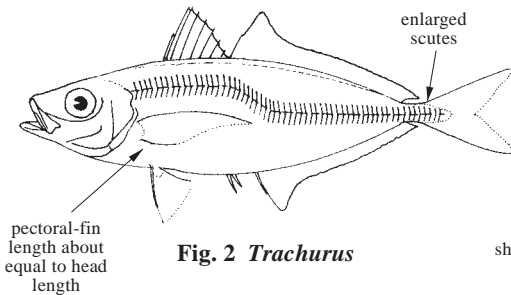


Fig. 2 *Trachurus*

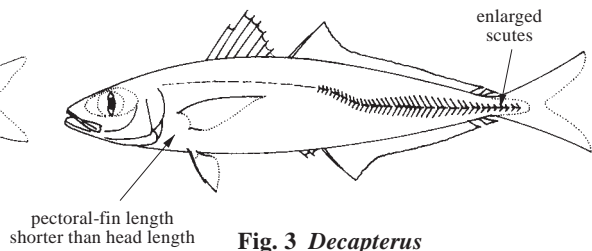


Fig. 3 *Decapterus*

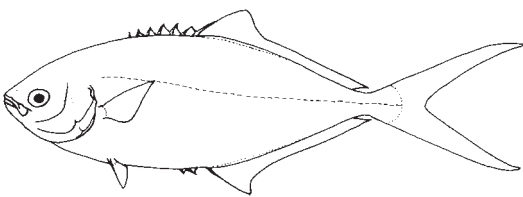


Fig. 4 *Trachinotus*

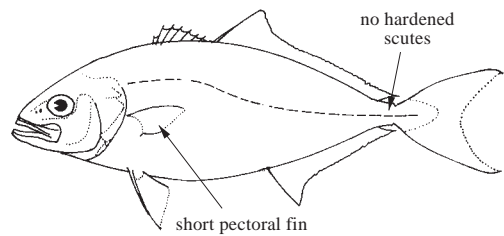


Fig. 5 *Seriola*

- 2a. Body superficially naked, scales minute and embedded where present (except some scales in straight part of lateral line consisting of weak to moderate scutes). → 3
- 2b. Scales obvious over most or all of body → 5

- 3a. Adults with pelvic fins very short, about one-fourth to one-third of upper jaw length (Fig. 6); juveniles with soft rays of dorsal and anal fins never filamentous, but anterior dorsal-fin spines distinctly elongate in juveniles less than 5 cm fork length ***Selene dorsalis***
- 3b. Adults with pelvic fins relatively long, longer than upper jaw length (Fig. 7); juveniles and occasionally adults with soft rays of dorsal and anal fins filamentous, and anterior dorsal-fin spines always short → 4

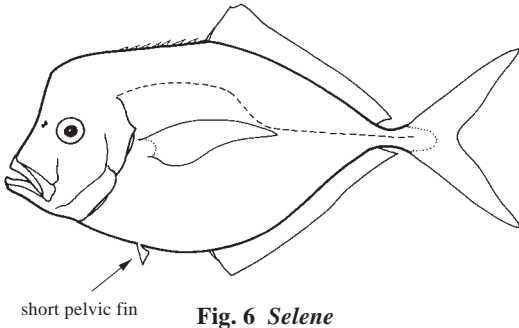


Fig. 6 *Selene*

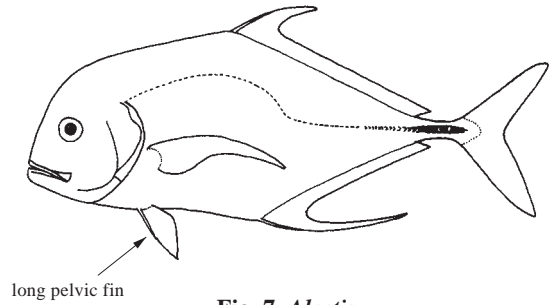
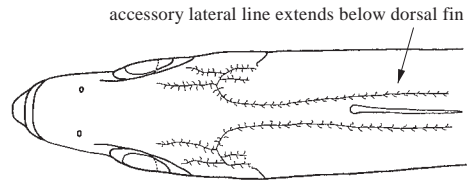


Fig. 7 *Alectis*

- 4a. Dorsal-fin rays 20 to 22; anal-fin rays 18 to 20; lower limb gill rakers 25 to 28; vertebrae 10+16 ***Alectis alexandrina***
- 4b. Dorsal-fin rays 18 or 19; anal-fin rays 15 to 17; lower limb gill rakers 12 to 17; vertebrae 10+14 ***Alectis ciliaris***
- 5a. Adults with pectoral fins relatively short, equal to or shorter than head length (Figs 2 and 3), except 1.0 to 1.2 times head length in "*Decapterus*" *ronchus*). → 6
- 5b. Adults with pectoral fins relatively long and falcate, distinctly longer than head length (Fig. 1) → 16

- 6a. Pored scales in curved lateral line scute-like, expanded dorsoventrally (Fig. 2), (caution: in large fish may be obscured by overgrowth of smaller scales); dorsal accessory lateral line normally extends posteriorly at least to below first dorsal-fin spine, usually much farther posteriorly (Fig. 8a) → 7



- 6b. No enlarged scute-like scales in curved lateral line; dorsal accessory lateral line terminating before origin of first dorsal fin (Fig. 8b) (except beneath origin of dorsal fin in *Selar*). → 10

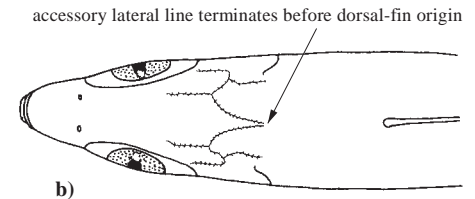


Fig. 8 dorsal view of head

- 7a. Dorsal accessory lateral line terminates below dorsal-fin spines 1 to 6; scales in curved part of lateral line only slightly enlarged (Fig. 9a), maximum height of scales 2.0 to 2.9% of standard length ***Trachurus trecae***
- 7b. Dorsal accessory lateral line terminatus below dorsal-fin soft rays 6 to 31 (except terminating below eighth spine to third soft ray in *T. mediterraneus*); scales in curved part of lateral line moderately to strongly enlarged (Fig. 9b-d), maximum height of scales 3.3 to 8.2% of standard length → **8**

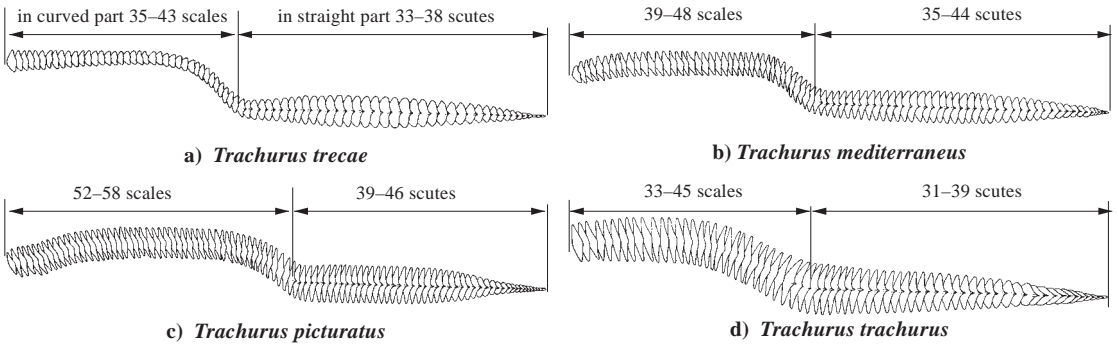


Fig. 9 lateral line of *Trachurus* spp.

- 8a. Dorsal accessory lateral line terminates below eighth spine to third soft ray of dorsal fin; lower limb gill rakers 36 to 44; scales in curved part of lateral line 39 to 48 (Fig. 9b) ***Trachurus mediterraneus***
- 8b. Dorsal accessory lateral line terminates below dorsal-fin soft rays 6 to 31; lower limb gill rakers 41 to 56; scales in curved part of lateral line 33 to 58 → **9**
- 9a. Dorsal accessory lateral line terminates below dorsal-fin soft rays 6 to 10; scales in curved part of lateral line 52 to 58 (Fig. 9c); total scales and scutes in lateral line 93 to 100 ***Trachurus picturatus***
- 9b. Dorsal accessory lateral line terminates below dorsal-fin soft rays 19 to 31; scales in curved part of lateral line 33 to 45; (Fig. 9d) total scales and scutes in lateral line 66 to 78 ***Trachurus trachurus***

- 10a. Terminal ray of dorsal and anal fins close to penultimate ray and usually completely attached by interradiial membrane; shoulder girdle (cleithrum) margin with a deep groove ventrally, a large papilla immediately above it and a smaller papilla near upper edge (Fig. 10a); dorsal-fin rays 23 to 27 . . . → **11**
- 10b. Terminal ray of dorsal and anal fins noticeably separated from penultimate ray and either joined only basally by interradiial membrane or terminal ray consisting of a widely detached finlet; shoulder girdle (cleithrum) margin either completely smooth or with a shallow groove ventrally, a low moderate papilla above it, and a smaller papilla near upper edge (Fig. 10b); dorsal-fin rays (including finlet) 28 to 37. → **12**

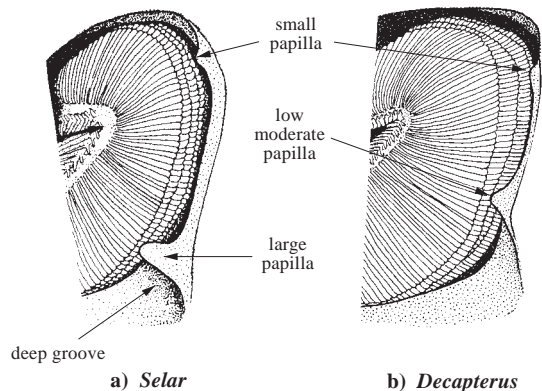


Fig. 10 gill chamber

- 11a. Curved part of lateral line with 48 to 56 scales; curved part of lateral line moderate, with chord of curved part contained 0.7 to 1.2 times in straight part; scutes smaller (Fig. 11a) ***Selar crumenophthalmus***
- 11b. Curved part of lateral line with 21 to 24 scales; curved part of lateral line short, with chord of curved part contained 2.1 to 3 times in straight part; scutes larger (Fig. 11b) . . . ***Selar boops***

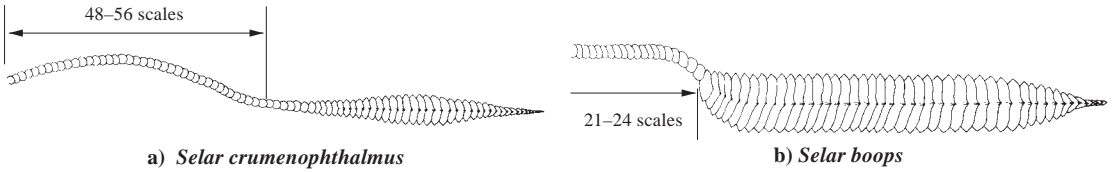


Fig 11 lateral line of *Selar* spp.

- 12a. Shoulder girdle (cleithrum) margin smooth; terminal ray of dorsal and anal fins basally joined to penultimate ray by interradiation membrane; fleshy adipose eyelid unevenly covering eye usually with at least anterior half of eye unprotected (Fig. 12) ***“Decapterus” rhonchus***

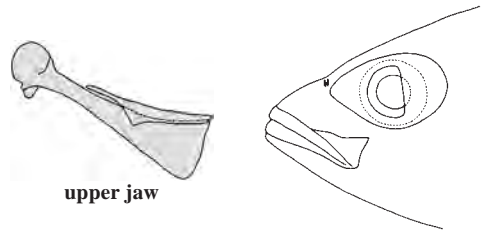


Fig. 12 *“Decapterus” rhonchus*

- 12b. Shoulder girdle (cleithrum) margin with a shallow groove ventrally, a low moderate papilla above it, and a smaller papilla near upper edge (Fig. 10b); terminal ray of dorsal and anal fins each consisting of a widely detached finlet; fleshy adipose eyelid evenly covering eye except for a vertical slit centred on pupil (Fig. 13) → 13

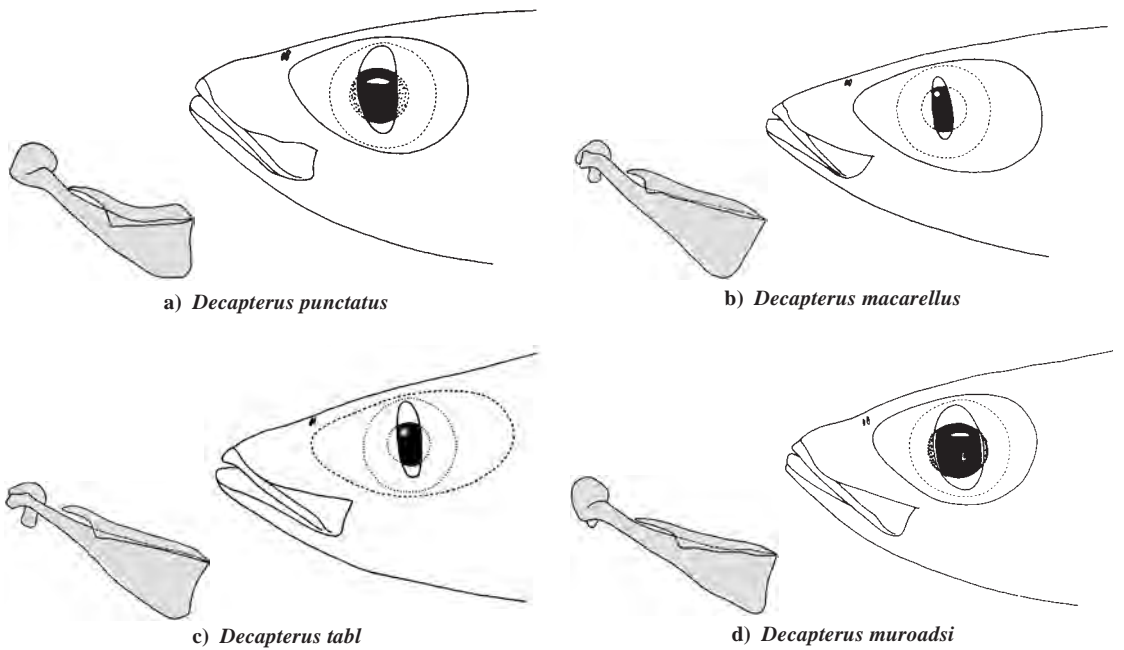


Fig. 13 *Decapterus* spp.

- 13a. In individuals larger than 10 cm fork length, row of dark spots (centred on scales) along curved lateral line; posterior end of maxilla concave above, noticeably rounded and produced below (Fig. 13a); straight part of lateral line usually with 0 (rarely 1 or 2) scales anteriorly (Fig. 14a); curved lateral line with 46 to 62 scales ***Decapterus punctatus***
- 13b. No row of dark spots along curved lateral line; posterior end of maxilla straight above, moderately rounded only at lower corner, otherwise posterior margin straight (Fig. 13b-c); straight part of lateral line with 0 to 33 scales anteriorly (Fig. 14b-d); curved lateral line with 54 to 79 scales → 14

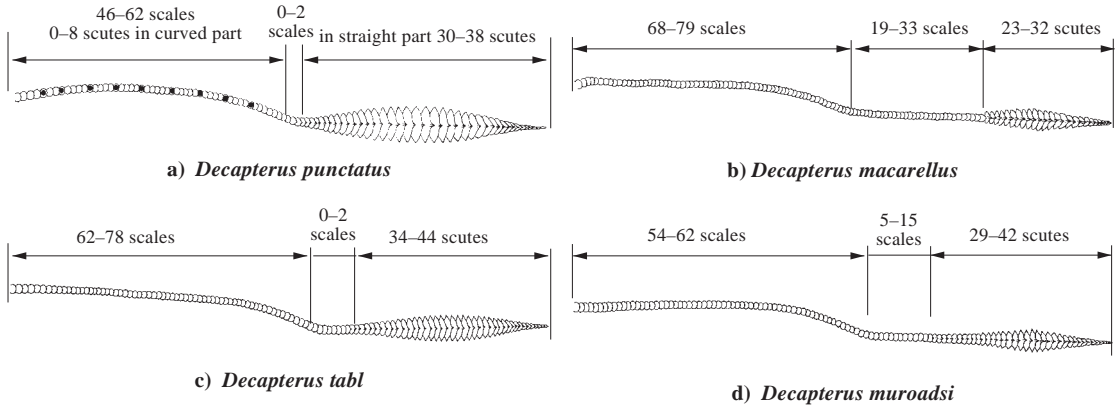


Fig. 14 lateral line of *Decapterus* spp.

- 14a. Caudal fin red in life; oral valve (membranous flap) at symphysis of upper jaw dusky or hyaline; posterodorsal margin of opercular membrane minutely serrated in large adults (Fig. 15) lower gill rakers 30 to 33 ***Decapterus tabl***
- 14b. Caudal fin mostly yellow greenish in life; oral valve (membranous flap) at symphysis of upper jaw conspicuously white in adults (Fig. 16); posterodorsal margin of opercular membrane smooth in large adults; lower gill rakers 31 to 44. → 15

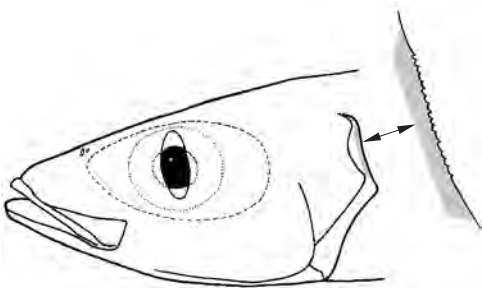


Fig. 15 *Decapterus tabl*

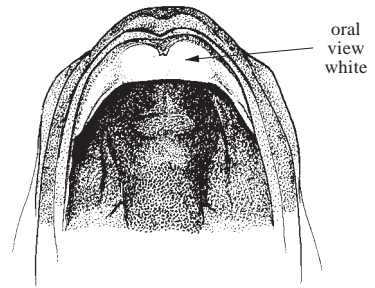


Fig. 16 ventral view of upper jaw and roof of mouth

- 15a. Straight part of lateral line with 19 to 33 anterior scales followed by 23 to 32 scutes (Fig. 14b); lower gill rakers 31 to 39; posterior end of upper jaw strongly oblique (Fig. 13b) ***Decapterus macarellus***
- 15b. Straight part of lateral line with 5 to 15 anterior scales followed by 29 to 42 scutes (Fig. 14d); lower gill rakers 41 to 44; posterior end of upper jaw only slightly oblique (Fig. 13d) ***Decapterus muroadsi***

16a. Black saddle on upper part of caudal peduncle; body very compressed and ventral profile more convex than dorsal profile (Fig. 17); scutes in straight lateral line 5 to 15, and relatively small (maximum height about half pupil diameter) *Chloroscombrus chrysurus*

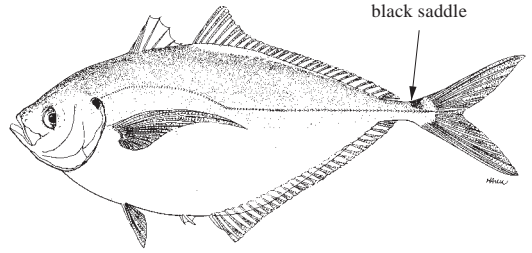


Fig. 17 *Chloroscombrus chrysurus*

16b. No black saddle on upper part of caudal peduncle; body slightly to moderately compressed and ventral profile not more convex than dorsal profile; scutes in straight lateral line 23 to 56, and relatively large (maximum height at least equal to pupil diameter) . . . → 17

17a. Tongue, roof and floor of mouth white, the rest very dark (Fig. 18); anal-fin spines reduced or absent *Uraspis secunda/helvola*

17b. Lining of mouth not distinctly white and dark as above; anal-fin spines distinct and movable → 18

18a. Upper jaw with a single row of minute teeth; upper caudal-fin lobe of adults typically longer than lower lobe (Fig. 19a); base of caudal fin without a pair of low fleshy keels *Hemicaranx bicolor*

18b. Upper jaw with several rows or a band of teeth; both caudal-fin lobes of adults about equal in length; base of caudal fin with a pair of low fleshy keels (Fig. 19b) → 19

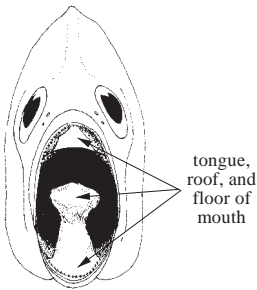


Fig. 18 *Uraspis*

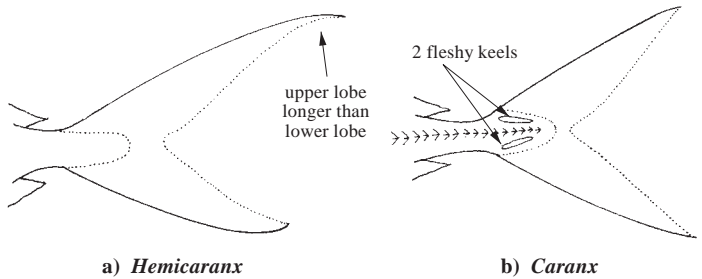


Fig. 19 caudal fin

19a. Lobe of second dorsal fin lower than height of longest dorsal-fin spine (Fig. 20); upper jaw teeth mostly blunt conical; lips of adults often strongly papillose *Pseudocaranx dentex*

19b. Lobe of second dorsal fin distinctly higher than height of longest dorsal-fin spine (Fig. 21); upper jaw with small to large canines; lips of adults not papillose (weakly papillose in *Caranx bartholomaei*) → 20

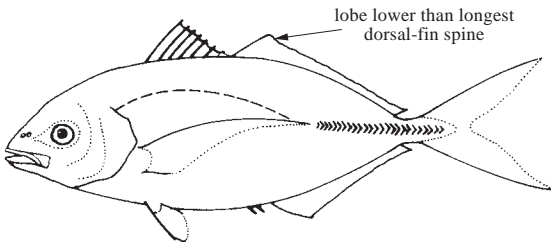


Fig. 20 *Pseudocaranx*

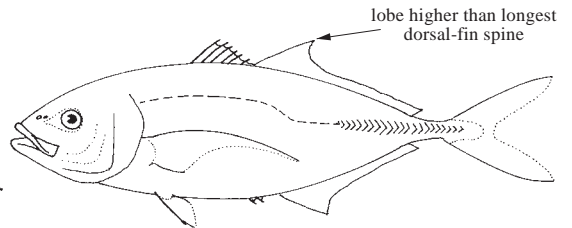


Fig. 21 *Caranx*

- 20a. Breast entirely naked ventrally or with only a small patch of prepelvic scales (Figs 22 and 23). → 21
- 20b. Breast entirely scaly → 23

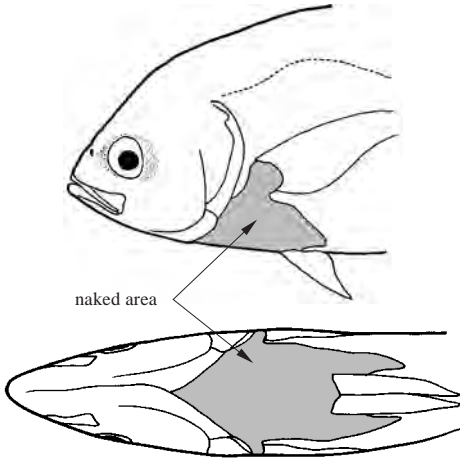


Fig. 22 *Caranx senegallus*

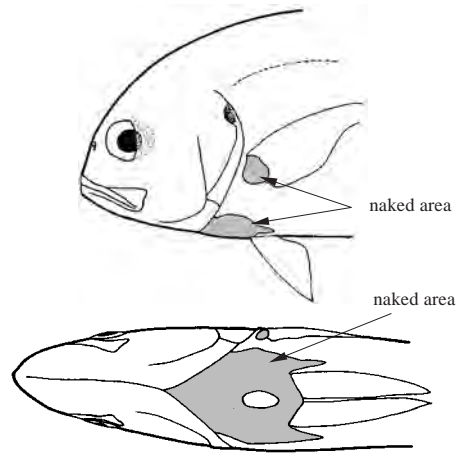


Fig. 23 *Caranx hippos*

- 21a. Breast entirely naked ventrally and with naked area extending well behind pelvic-fin origin and uninterrupted to pectoral-fin base (Fig. 22); no oval black spot on pectoral fin of adults; lower jaws without 1 or 2 pairs of noticeably enlarged canines anteriorly; lower gill rakers (including rudiments) 27 to 30. ***Caranx senegallus***
- 21b. Breast naked ventrally except for a small patch of prepelvic scales and with naked area usually separated from naked pectoral-fin base by a broad band of scales (Fig. 23) adults with oval black spot on lower half of pectoral fin; lower jaws with 1 or 2 pairs of noticeably enlarged canines anteriorly; lower limb gill rakers (including rudiments) 16 to 19 → 22
- 22a. Adults with anterior margin of anal-fin lobe mostly white; dorsal-fin soft rays 21 to 24; anal-fin soft rays 17 to 19, usually 18; adults with post-temporal bones greatly enlarged (hyperostosis), expansion noticeable at about 20 cm fork length ***Caranx fischeri***
- 22b. Adults with anal-fin lobe uniformly bright yellow (orange-yellow in postmortem fish); dorsal-fin soft rays 19 or 20; anal-fin soft rays 16 or 17; post-temporal bones never becoming noticeably enlarged ***Caranx hippos***
- 23a. Lower gill rakers 31 to 38; adults with dark stripe (blue in life) extending along back and through lower caudal-fin lobe ***Caranx ruber***
- 23b. Lower limb gill rakers 18 to 21; no dark stripe extending along back and through lower caudal-fin lobe → 24
- 24a. Lower gill rakers 25 to 28; lateral-line scutes 46 to 56; vertebrae 10+15 ***Caranx crysos***
- 24b. Lower gill rakers 16 to 21; lateral-line scutes 22 to 39; vertebrae 10+14. → 25

- 25a. Dorsal- and anal-fin soft rays 25 to 28 and 21 to 24, respectively; upper jaw not extending to anterior margin of eye ***Caranx bartholomaei***
- 25b. Dorsal- and anal-fin soft rays 19 to 23 and 16 to 19, respectively; upper jaw extending at least to below about middle of eye → 26

26a. In life, body dark blue to bluish grey above, silvery white to golden below; adults with upper jaw extending to vertical at rear of margin of eye and profile of head not noticeably steep and angular; dorsal-fin lobe shorter than head, about 5.6 to 6.0 times in fork length ***Caranx latus***

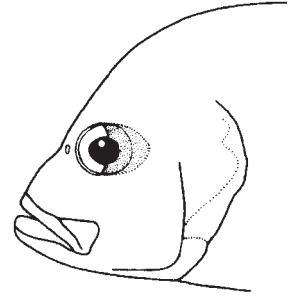


Fig. 24 *Caranx lugubris*

26b. In life, head, body, and fins grey to dark brown; adults with upper jaw extending to below vertical from anterior half to middle of eye and profile of head relatively steep and angular (Fig. 24); dorsal-fin lobe longer than head, about 2.3 to 5.3 times in fork length ***Caranx lugubris***

- 27a. A single row of large widely spaced canines in each jaw; cheeks naked and breast partially naked ***Campogramma glaycos***
- 27b. Teeth in both jaws, if present, minute and closely set in a dense band; cheeks and breast completely scaly → 28

28a. Bases of soft dorsal and anal fins unequal in length, anal-fin base shorter and only about 45 to 70% of dorsal-fin base length (Fig. 25); caudal peduncle grooves present, dorsally and ventrally (Fig. 26) → 29

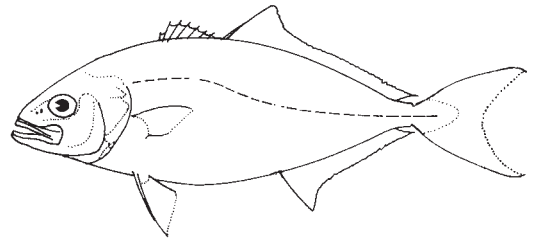


Fig. 25 *Seriola*

28b. Bases of soft dorsal and anal fins about equal in length (Fig. 27); no caudal peduncle grooves → 35

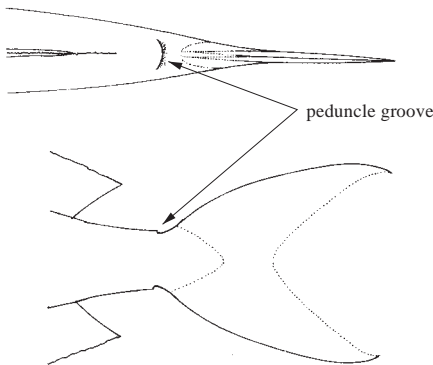


Fig. 26 caudal fin

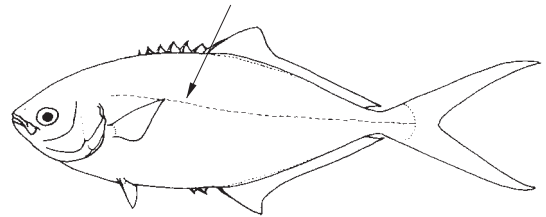


Fig. 27 *Trachinotus*

- 29a. Terminal 2-rayed finlet present in dorsal and anal fins (Fig. 28)
 ***Elagatis bipinnulata***
- 29b. No finlets in dorsal and anal fins → **30**

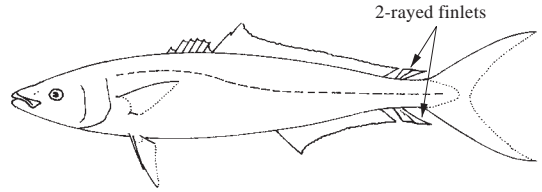


Fig. 28 *Elagatis*

- 30a. First dorsal-fin spines 4 or 5; caudal-fin lobes with conspicuous white tips; soft rays in anal fin 15 to 17; well-developed cutaneous keel laterally on caudal peduncle (Fig. 29) ***Naucrates ductor***
- 30b. First dorsal-fin spines 7 or 8 (anterior spines may become completely embedded in large specimens); caudal-fin lobes without conspicuous white tips; soft rays in anal fin 18 to 22; cutaneous keel on caudal peduncle absent or only slightly developed → **31**

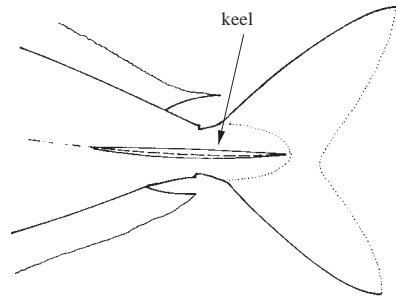


Fig. 29 lateral view of tail

- 31a. Caudal fin yellowish; upper jaw and supramaxilla of adults slender (Fig. 30a); vertebrae 11+14 (temperate species occurring only at St Helena in the area) . . . ***Seriola lalandi***
- 31b. Caudal fin dark to dusky sometimes with a lighter posterior margin; upper jaw and supramaxilla moderate to broad (Fig. 30 c-d), except slender in *S. fasciata* (Fig. 30b); vertebrae 10+14; (tropical or subtropical species not reported from St Helena) → **32**

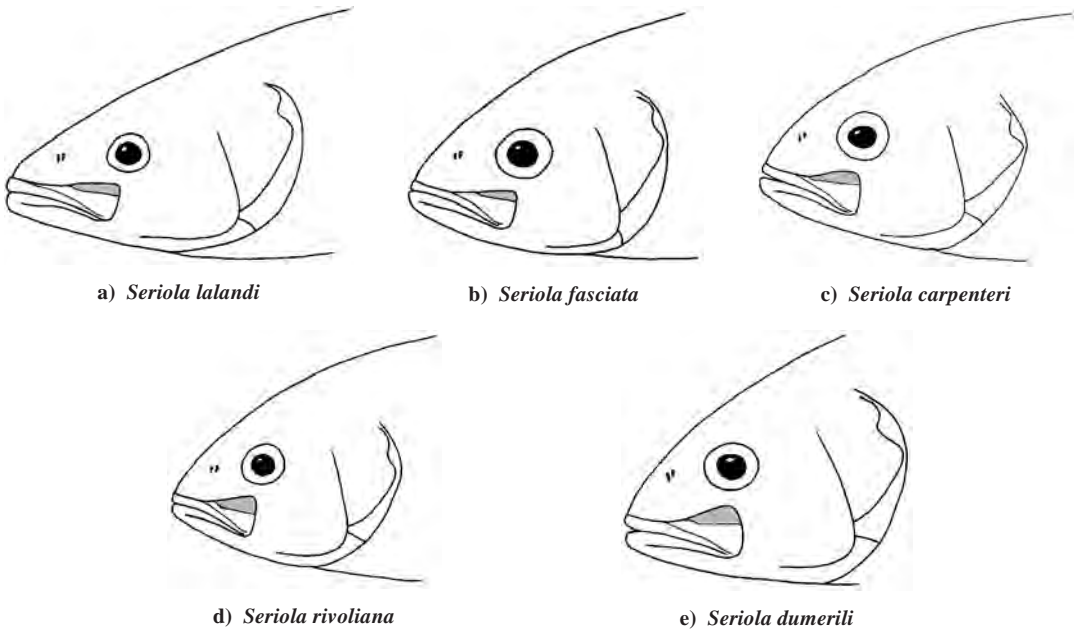


Fig. 30 lateral view of head (supramaxilla shaded)

32a. Dorsal-fin lobe of adults relatively long, 4.3 to 6.3 times in fork length and 1.3 to 1.6 times longer than pectoral-fin length; upper jaw and supramaxilla of adults very broad, with posterodorsal angle often relatively acute (Fig. 30d); first pterygiophore of anal fin with anterolateral profile straight in specimens larger than about 10 cm fork length (Fig. 31a) . . . ***Seriola rivoliana***

32b. Dorsal-fin lobe of adults about 6.0 to 8.6 times in fork length and usually slightly shorter than pectoral-fin length; upper jaw and supramaxilla of adults slender to moderate, except broad in *S. dumerili* (Fig. 30e); first pterygiophore of anal fin with anterolateral profile curved in specimens larger than about 10 cm fork length (Fig. 31b) → **33**

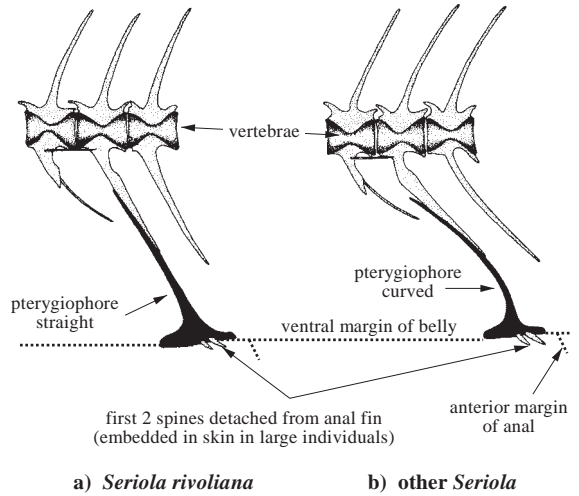


Fig. 31

33a. Upper jaw and supramaxilla of adults slender (Fig. 30b); in specimens larger than about 20 cm fork length, total gill rakers (excluding rudiments) 23 to 27; in young and small juveniles dark body bars, if present, extending onto membranes of second dorsal and anal fins ***Seriola fasciata***

33b. Upper jaw and supramaxilla of adults moderate to broad (Fig. 30c,e); in specimens larger than about 20 cm fork length, total gill rakers (excluding rudiments) 11 to 25; in young and small juveniles dark body bars, if present, not extending onto membranes of second dorsal and anal fins → **34**

34a. In specimens larger than about 20 cm fork length, total gill rakers (excluding rudiments) 20 to 24; dorsal-fin lobe of adults 6.0 to 6.9 times in fork length; young and juveniles (to about 20 cm fork length) with membranes of second dorsal and anal fin very dark . . . ***Seriola carpenteri***

34b. In specimens larger than about 20 cm fork length, total gill rakers (excluding rudiments) 11 to 19; dorsal-fin lobe of adults 6.7 to 8.1 times in fork length; in young and juveniles with membranes of second dorsal and anal fin lightly pigmented ***Seriola dumerili***

35a. Lateral line very irregular and sinuous, describing a convex curve above and a concave curve behind the pectoral fin (Fig. 32); teeth in both jaws in a broad band anteriorly and becoming narrower posteriorly; upper jaw extending beyond posterior margin of eye ***Lichia amia***

35b. Lateral line only slightly irregular, weakly to moderately convex above pectoral fin, becoming straight posteriorly (Fig. 33); teeth, if present, in a narrow band in both jaws; upper jaw not extending to posterior margin of eye → **36**

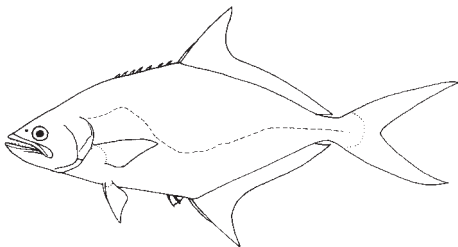


Fig. 32 *Lichia*

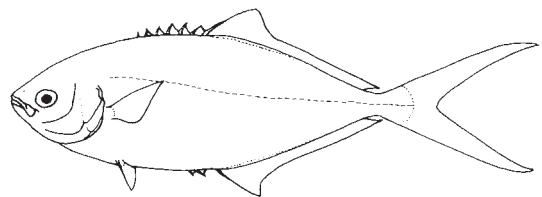



Fig. 33 *Trachinotus*

- 36a.** Dorsal- and anal-fin soft rays 23 to 27 and 22 to 25, respectively; lower limb gill rakers 22 to 32; dorsal-fin lobe much shorter than head, contained 6.5 to 8.3 times in head length ***Trachinotus ovatus***
- 36b.** Dorsal- and anal-fin soft rays 19 to 23 and 16 to 21, respectively; lower limb gill rakers 9 to 13; dorsal-fin lobe slightly shorter to much longer than head in individuals larger than 10 cm fork length, contained 1.8 to 5.6 times in head length → **37**
- 37a.** Sides with 4 to 6 (usually 5) dark blotches (forming at about 7 to 9 cm fork length), the anterior one a vertically elongate bar and the others oval or round; dorsal-fin lobe longer than head length in individuals larger than 10 cm fork length, contained 1.8 to 3.2 times in fork length; teeth never present on tongue of young ***Trachinotus goreensis***
- 37b.** No distinctive markings on body; dorsal-fin lobe length variable (see couplet 38); teeth on tongue present or absent in young → **38**
- 38a.** Dorsal-fin lobe usually longer than head in individuals larger than 10 cm fork length, contained 2.5 to 4.2 times in fork length; anal-fin lobe orange with tip and margin black; tongue with narrow band of teeth in young, resorbing in adults ***Trachinotus maxillosus***
- 38b.** Dorsal-fin lobe shorter than head in individuals larger than 10 cm fork length, contained 4.1 to 5.6 times in fork length; anal fin mostly yellow with distal half of lobe dark; tongue always without teeth ***Trachinotus teraia***

List of species occurring in the area

The symbol  is given when species accounts are included.

-  *Alectis alexandrina* (Geoffroy Saint-Hilaire, 1817).
-  *Alectis ciliaris* (Bloch, 1787).
-  *Campogramma glaycos* (Lacépède, 1801).
-  *Caranx bartholomaei* Cuvier, 1833.
-  *Caranx crysos* (Mitchill, 1815).
-  *Caranx fischeri* Smith-Vaniz and Carpenter, 2007.
-  *Caranx hippos* (Linnaeus, 1766).
-  *Caranx latus* Agassiz, 1831.
-  *Caranx lugubris* Poey, 1860.
-  *Caranx ruber* (Bloch, 1793).
-  *Caranx senegallus* Cuvier, 1833.
-  *Chloroscombrus chrysurus* (Linnaeus, 1776).
-  *Decapterus macarellus* (Cuvier, 1833).
-  *Decapterus muroadsi* (Temminck and Schlegel, 1844).
-  *Decapterus punctatus* (Cuvier, 1829).
-  *Decapterus tabl* Berry, 1968.
-  “*Decapterus*” *rhonchus* (Geoffrey Saint-Hilaire, 1817).
-  *Elagatis bipinnulata* (Quoy and Gaimard, 1825).
-  *Hemicaranx bicolor* (Günther, 1860).
-  *Lichia amia* (Linnaeus, 1758).
-  *Naucrates ductor* (Linnaeus, 1758).
-  *Pseudocaranx dentex* (Bloch and Schneider, 1801).
-  *Selar crumenophthalmus* (Bloch, 1793).

- *Selene dorsalis* (Gill, 1863).
- *Seriola carpenteri* Mather, 1971.
- *Seriola dumerili* (Risso, 1810).
- *Seriola fasciata* (Bloch, 1793).
- *Seriola lalandi* Valenciennes, 1833.
- *Seriola rivoliana* Valenciennes, 1833.
- *Trachinotus goreensis* Cuvier, 1832.
- *Trachinotus maxillosus* Cuvier, 1832.
- *Trachinotus ovatus* (Linnaeus, 1758).
- *Trachinotus teraia* Cuvier, 1832.
- *Trachurus mediterraneus* (Steindachner, 1863).
- *Trachurus picturatus* (Bowdich, 1825).
- *Trachurus trachurus* (Linnaeus, 1758).
- *Trachurus trecae* Cadenat, 1949.
- *Uraspis helvola* (Foster, 1801).
- *Uraspis secunda* (Poey, 1860).

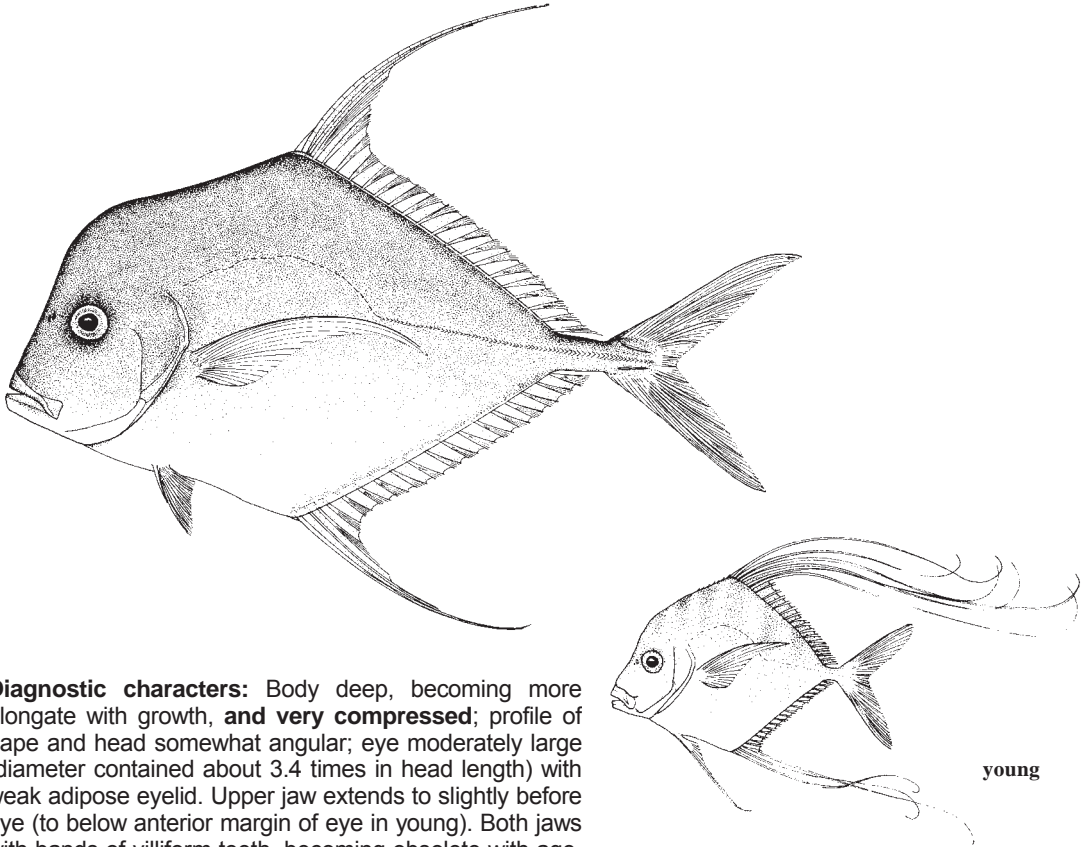
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Alectis alexandrina (Geoffroy Saint-Hilaire, 1817)

Frequent synonyms / misidentifications: *Scyris alexandrina* (Geoffroy Saint-Hilaire, 1817); *Hynnys goreensis* Cuvier, 1833 / None.

FAO names: En – Alexandria pompano; Fr – Cordonnier bossu; Sp – Jurel de Alejandría.



Diagnostic characters: Body deep, becoming more elongate with growth, **and very compressed**; profile of nape and head somewhat angular; eye moderately large (diameter contained about 3.4 times in head length) with weak adipose eyelid. Upper jaw extends to slightly before eye (to below anterior margin of eye in young). Both jaws with bands of villiform teeth, becoming obsolete with age.

Gill rakers on first arch 7 to 11 upper, **25 to 28 lower and 34 to 39 total**. **Dorsal fin with 7 spines (becoming completely embedded at about 15 cm fork length) followed by 1 spine and 20 to 22 soft rays**; anal fin with 2 spines (embedded and not apparent with growth) followed by 1 spine and **18 to 20 soft rays**; **dorsal and anal-fin lobes extremely long and filamentous in young**; pectoral fins falcate, longer than head; pelvic fins elongate in young. Lateral line with a strong and moderately long anterior arch, its posterior (straight) part with 4 to 20 scutes; **body superficially naked, scales minute and embedded where present**. Vertebrae 10 precaudal and 15 or 16 caudal; supraoccipital crest, pterygiophore of first dorsal-fin spine, and pterygiophores of 7 to 10 posterior dorsal- and anal-fin rays hyperostotic (greatly enlarged) in adults. **Colour:** mostly silvery with a light metallic bluish tinge on upper third of body and head; juveniles with 5 chevron-shaped bars on body.

Size: Maximum is unknown, reported to attain at least 70 cm fork length (85 cm total length).

Habitat, biology, and fisheries: Adults generally solitary and near the bottom (to depths of at least 50 m); young usually pelagic and drifting. Caught with bottom and pelagic trawls, boat seines and on line. Utilized fresh, dried-salted, smoked and for fishmeal.

Distribution: African coast from Morocco to southern Angola; warmer areas of the Mediterranean Sea (Israel, Syria, Malta, southern Spain, Morocco).

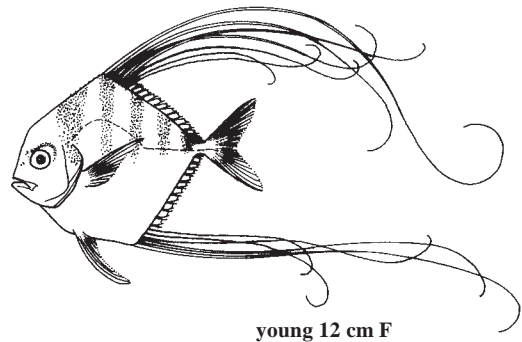
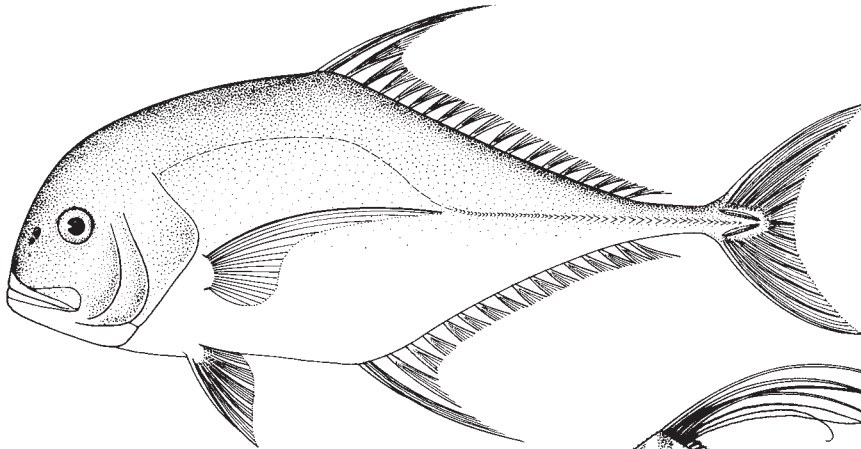
Remarks: *Alectis* is considered to be feminine and rules of scientific nomenclature require that binominal names agree in gender, hence the feminine suffix instead of the more commonly used but incorrect terminal "us" spelling.



Alectis ciliaris (Bloch, 1787)

Frequent synonyms / misidentifications: *Alectis crinitus* (Mitchill, 1826); *Blepharis crinitus* (Mitchill, 1826) / None.

FAO names: **En** – African pompano; **Fr** – Cordonnier fil; **Sp** – Pámpano de hebra.



young 12 cm F

Diagnostic characters: **Body deep**, becoming more elongate with growth, **and compressed**; profile of nape and head broadly rounded; eye moderately large (diameter contained about 4 to 4.7 times in head length) with weak adipose eyelid. Upper jaw extending to under posterior part of eye. Both jaws with bands of villiform teeth, becoming obsolete with age. **Gill rakers** on first arch 4 to 6 upper, **12 to 17 lower, 18 to 22 total**.

Dorsal fin with 7 short spines (becoming completely embedded at about 17 cm fork length) followed by 1 spine and **18 or 19 soft rays**; anal fin with 2 spines (embedded and not apparent with growth) followed by 1 spine and 15 to 17 soft rays; **dorsal- and anal-fin lobes extremely long and filamentous in young**, much less produced in adults (dorsal lobe about 7 times in fork length at 80 cm fork length); pectoral fins falcate, longer than head; pelvic fins elongate in young. Lateral line anteriorly with a strong curved arch, its posterior (straight) part with 12 to 30 scutes; **body superficially naked, scales minute and embedded where present**. Bilateral caudal keels present. Vertebrae 10 precaudal and 14 caudal; no hyperostosis. **Colour:** mostly silvery with a pale bluish tinge on upper one-third of body and head; juveniles with 3 chevron-shaped dark bars on body, and a black blotch at base of third to sixth soft dorsal-fin rays, filaments black distally.

Size: Maximum possibly to 130 or 150 cm fork length; common to 100 cm fork length. All-tackle IGFA world angling record 22.9 kg.

Habitat, biology, and fisheries: Generally solitary. Young usually pelagic and drifting; adults usually near bottom (to at least 100 m) and strong swimmers. Feeds mainly on fish and squid. Adults caught primarily on hook-and-line, especially on light tackle. Juveniles are often taken in beach seines. Edibility good to excellent. Separate statistics are not reported for this species. Utilized fresh and dried-salted.

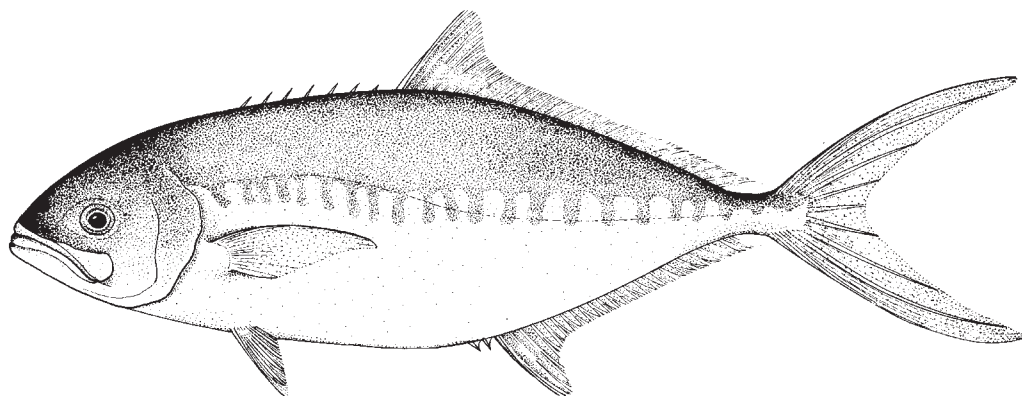
Distribution: Eastern Atlantic distribution not well established, definitely known from the Cape Verde Islands and the Gulf of Guinea to Congo. Circumtropical in marine waters.



***Campogramma glaycos* (Lacépède, 1801)**

Frequent synonyms / misidentifications: *Campogramma lirio* Dollfus, 1955; *C. vadigo* (Risso, 1810); *Solagmedens africana* (Delsman, 1941) / None.

FAO names: En – Vadigo; Fr – Liche lirio; Sp – Lirio.



Diagnostic characters: Body elongate, moderately deep and slightly compressed, with upper profile slightly more convex than lower; eye moderately small, its diameter contained 4.2 to 6.0 times in head length. **Upper jaw broad and rounded at end, extending to below posterior margin of eye or beyond. Single row of large, widely spaced canines in each jaw**, with a series of smaller teeth anteriorly in upper jaw. Gill rakers on first arch 4 to 6 upper and 9 to 12 lower. Dorsal fin with 6 or 7 (typically 7) spines, followed by 1 spine and 26 to 28 soft rays; anal fin with 2 spines separated from rest of fin, followed by 1 spine and 23 to 25 soft rays; **anal-fin base long, contained 1.1 to 1.3 times in second dorsal-fin base**; pectoral fins short, contained 1.2 to 1.5 times in head length. Scales small and cycloid; no scutes; **cheeks and breast naked, except for a small patch of scales immediately in front of pelvic fins**. Only slight indication of caudal peduncle grooves. Vertebrae 10 precaudal and 14 caudal. **Colour:** in fresh adults, greenish grey dorsally, extending on sides to lateral line in a series of prominent zigzag lobes; ventrally white with a rose tint on flanks; fins greyish.

Size: Maximum is unknown, attains at least 60 cm fork length.

Habitat, biology, and fisheries: Adults are pelagic or epibenthic, mostly in shallow waters (15 to 30 m). Feeds primarily on schooling fishes. Coastal waters throughout its range. Separate statistics are not reported for this species. Caught with bottom and pelagic trawls. Utilized fresh, frozen, dried-salted, and for fishmeal and oil.

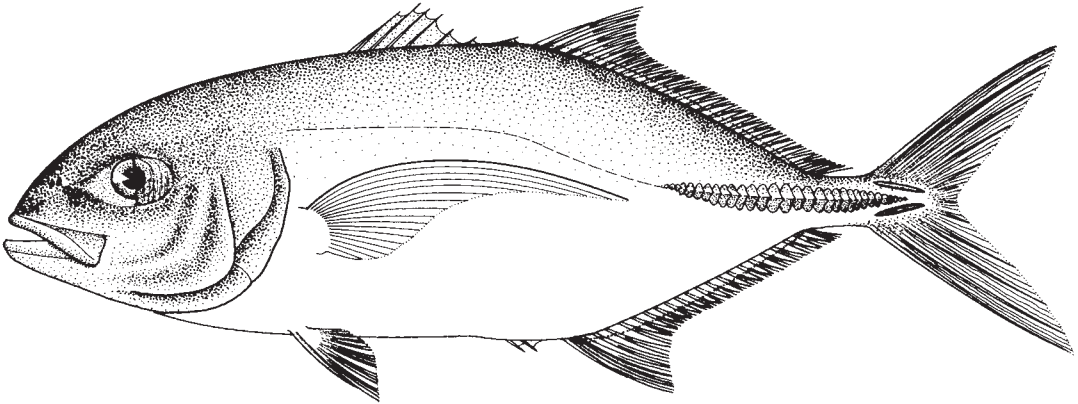
Distribution: Morocco to Senegal including Madeira and the Canary Islands; northward extending to the Mediterranean (common) and rarely to the Bay of Biscay.



***Caranx bartholomaei* Cuvier in Cuvier and Valenciennes., 1833**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Yellow jack; Fr – Carangue grasse; Sp – Cojinua amarilla.



Diagnostic characters: Body elongate, moderately deep, and compressed; eye moderate (diameter contained about 6 to 6.8 times in head length) with moderate adipose eyelid. **Upper jaw not reaching to anterior margin of eye.** Upper jaw anteriorly with 2 or 3 irregular rows of small teeth that are in single row posteriorly, lower jaw anteriorly with 2 irregular rows small teeth that are in single row posteriorly. Gill rakers on first arch 6 to 9 upper and 18 to 21 lower. **Dorsal fin with 7 spines followed by 1 spine and 25 to 28 soft rays; anal fin with 2 spines followed by 1 spine and 21 to 24 soft rays;** dorsal- and anal-fin lobes slightly elongate (dorsal lobe contained about 6.9 to 7.2 times in fork length); pectoral fins falcate, longer than head. Lateral line with a moderate and extended anterior arch, straight part with 22 to 28 scutes; scales small and cycloid; breast completely scaly. Bilateral paired caudal keels present. Vertebrae 10 precaudal and 14 caudal; no hyperostosis. **Colour: pale greenish blue above, silvery below.** Small juveniles with about 5 vertical bands on body; larger juveniles with blotches.

Size: Maximum of 90 cm fork length; common to 45 cm fork length. All-tackle IGFA world angling record 10.65 kg.

Habitat, biology, and fisheries: Usually solitary or in small groups, often around outer reefs (not common inshore). Spawning probably in offshore waters; young often found in association with jellyfishes and sargassum; young may also inhabit mangrove-lined lagoons. Adults feed primarily on bottom-dwelling fishes. Often taken trolling, occasionally while still-fishing; also caught in seines and trawls; marketed fresh or salted; edibility fair to good.

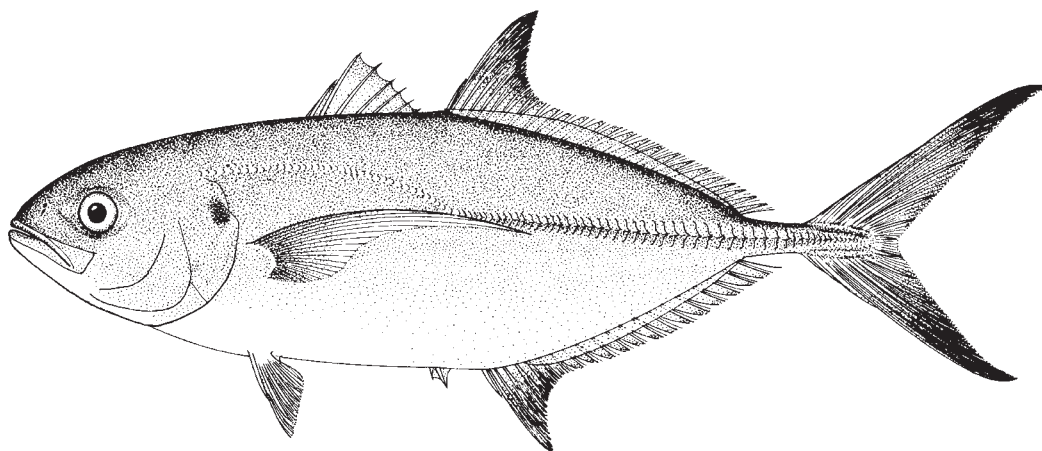
Distribution: Both sides of the Atlantic Ocean; species not previously recorded from the eastern Atlantic Ocean. In the eastern Atlantic Ocean known only from the Gulf of Guinea (São Tomé and Príncipe islands) and Ascension Island. In the western Atlantic known from Bermuda (rare) and Massachusetts to Brazil.



***Caranx crysos* (Mitchill, 1815)**

Frequent synonyms / misidentifications: *Caranx fusus* Geoffroy Saint-Hilaire, 1817 / None.

FAO names: En – Blue runner; Fr – Carangue coubali; Sp – Cojinua negra.



Diagnostic characters: Body elongate, moderately deep, and compressed; eye moderate (diameter contained about 4 to 5 times in head length) with moderate adipose eyelid. **Upper jaw reaching to under mideye.** Upper jaw with an irregular outer row of small canines flanked by an inner row of smaller teeth; lower jaw with a single row of small canines, without any enlarged canines anteriorly. **Gill rakers** on first arch **10 to 14 upper and 25 to 28 lower.** Dorsal fin with 8 spines followed by 1 spine and 22 to 25 soft rays; anal fin with 2 spines followed by 1 spine and 19 to 21 soft rays; dorsal- and anal-fin lobes shorter than head length (dorsal lobe contained about 6.4 to 7.6 times in fork length); pectoral fins falcate, longer than head. **Lateral line with a strong, short anterior arch, straight portion with 46 to 56 scutes;** scales small and cycloid; **breast completely scaly.** Bilateral paired caudal keels present. Vertebrae 10 precaudal and 15 caudal; post-temporal bones hyperostotic (greatly enlarged) in adults. **Colour:** body light olive to dark bluish green above, silvery grey to golden below; juveniles with about 7 dark body bands.

Size: Maximum to about 62 cm fork length reported; common to 35 cm fork length. All-tackle IGFA world angling record 5.05 kg.

Habitat, biology, and fisheries: A schooling species usually close inshore, but also in deeper waters (over 100 m depth); moves rapidly over open bottoms, not common around reefs. Feeds primarily on fish, but also shrimps, crabs, and other invertebrates. Separate statistics are not reported for this species. Caught with pelagic and bottom trawls, gillnets, seines and on line gear. Utilized fresh, dried-salted, smoked and for fishmeal and oil; edibility poor to satisfactory.

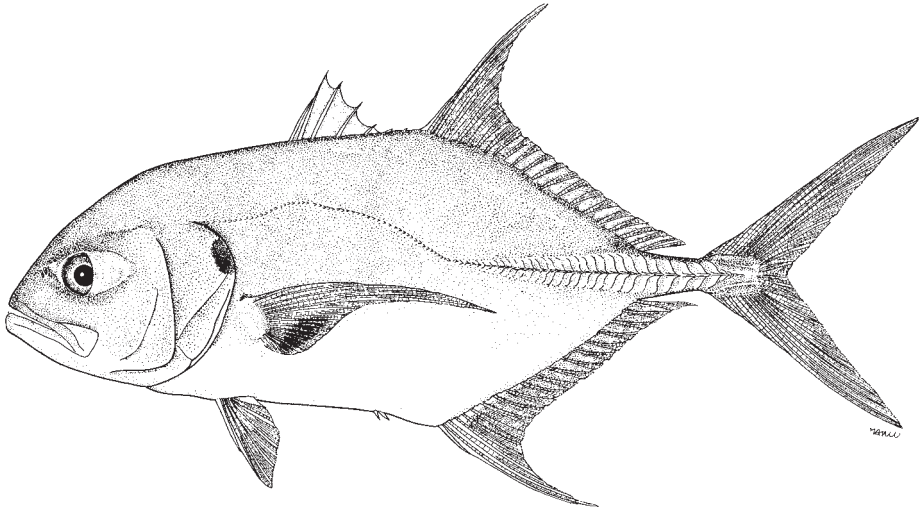
Distribution: Mediterranean (common only in southeastern part) and from Senegal to Angola and Canary, Madeira, Cape Verde, Ascension and St Helena islands. Also occurs in the western Atlantic from Bermuda, and Nova Scotia to Brazil; possibly conspecific with the eastern Pacific *Caranx caballus* Günther.



Caranx fischeri Smith-Vaniz and Carpenter, 2007

Frequent synonyms / misidentifications: None / *Caranx hippos* (Linnaeus, 1766).

FAO names: En – Longfin crevalle jack.



Diagnostic characters: Body elongate, deep, and moderately compressed; eye large (diameter contained about 3.8 to 4.2 times in head length) with strong adipose eyelid. **Upper jaw extending to below or beyond posterior margin of eye.** Upper jaw with an outer row of strong canines flanked by an inner band of fine teeth; lower jaw teeth with a single row of moderate canines, and 1 or 2 pairs of noticeably enlarged canines anteriorly. Gill rakers (including rudiments) on first arch 4 to 8 upper and 16 to 18 lower. **Dorsal fin with 8 spines followed by 1 spine and 21 to 24 soft rays; anal fin with 2 spines followed by 1 spine and 17 to 19 (usually 18) soft rays;** dorsal- and anal-fin lobes elongate (dorsal lobe longer than head in large adults); pectoral fins falcate, longer than head. Lateral line with strong, moderately long anterior arch, straight part with 25 to 40 scutes; scales small and cycloid. **Breast naked ventrally except for a small patch of prepelvic scales and with naked area not extending behind pelvic-fin origin and separated from naked pectoral-fin base by a broad band of scales.** Bilateral paired caudal keels present. Vertebrae 10 precaudal and 14 caudal; **post-temporal bones hyperostotic (greatly enlarged) in adults,** cleithrum, pelvic and first dorsal-fin pterygiophore not hyperostotic. **Colour:** body greenish to bluish or bluish black above and silvery white to yellowish or golden below; an **oval black spot on lower half of pectoral fins; anal-fin lobe mostly white (never yellow);** juveniles with about 5 dark bars on body.

Habitat, biology, and fisheries: Occurs in moderate to large schools in coastal areas; estuaries and lagoons are essential habitat for juveniles and young; reported (unconfirmed) to descend far up coastal rivers to spawn. True freshwater occurrence doubtful but there are verified collections of juveniles from 3 separate coastal river drainages. Feeds primarily on fish, shrimp, and other invertebrates. Most commercial catches made by haul seines and gillnets; also caught with trawls and often caught by anglers. Separate statistics for this species are unavailable because of past confusion with *C. hippos* (see account). Utilized fresh, frozen, smoked, dried-salted and for oil and fishmeal. Edibility reported as poor to good; bleeding upon landing improves taste.

Size: Attains at least 100 cm fork length and approximately 26 kg.

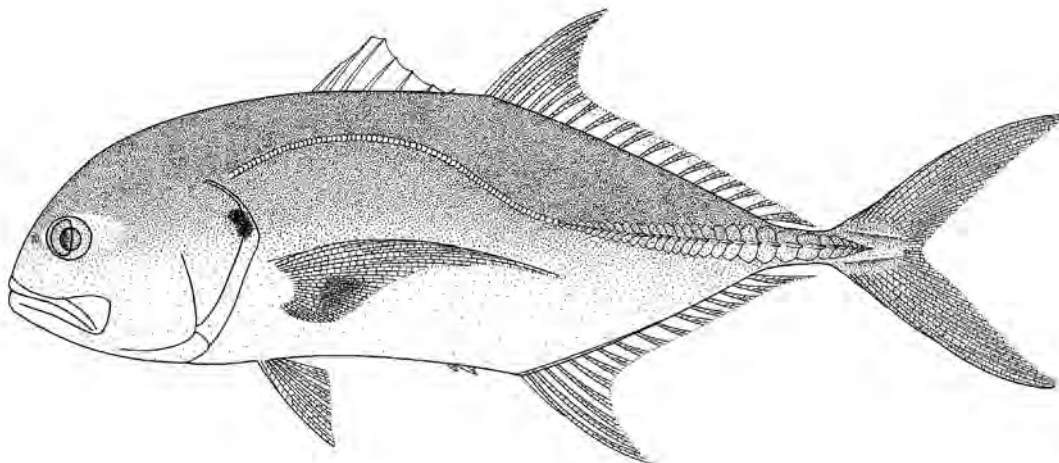
Distribution: African coast at least from Mauritania to southern Angola. Confirmed historical records from the Mediterranean Sea and Ascension Island; unconfirmed records of *Caranx hippos* from St Helena possibly also apply to this species.



***Caranx hippos* (Linnaeus, 1766)**

Frequent synonyms / misidentifications: *Caranx carangus* (Bloch, 1793) / *Caranx fischeri* Smith-Vaniz and Carpenter, 2007.

FAO names: En – Crevalle jack; Fr – Carangue çrevalle; Sp – Jurel común.



Diagnostic characters: Body elongate, deep, and moderately compressed; eye large (diameter contained about 3.8 to 4.2 times in head length) with strong adipose eyelid. **Upper jaw extending to below or past posterior eye margin.** Upper jaw with an outer row of strong canines flanked by an inner band of fine teeth; lower jaw teeth with a single row of moderate canines, and 1 or 2 pairs of noticeably enlarged canines anteriorly. Gill rakers (including rudiments) on first arch 4 to 8 upper and 16 to 18 lower. **Dorsal fin with 8 spines followed by 1 spine and 19 or 20 soft rays; anal fin with 2 spines followed by 1 spine and 16 or 17 soft rays;** dorsal- and anal-fin lobes elongate (**dorsal lobe shorter than head in large adults**); pectoral fins falcate, longer than head. Lateral line with strong, moderately long anterior arch, straight part with 25 to 37 scutes; scales small and cycloid. **Breast naked ventrally except for a small patch of prepelvic scales and with naked area not extending behind pelvic-fin origin and usually separated from naked pectoral-fin base by a broad band of scales.** Bilateral paired caudal keels present. Vertebrae 10 precaudal and 14 caudal. Pelvic bones and ventral end of cleithrum hyperostotic (greatly enlarged) and pterygiophore of first dorsal-fin slightly so in large adults; **post-temporal bones not hyperostotic.** **Colour:** body greenish to bluish or bluish black above and silvery white to yellowish or golden below; an **oval black spot on lower half of pectoral fins; in life anal-fin lobe entirely yellow (yellow-orange in postmortem fish);** juveniles with about 5 dark bars on body.

Size: Maximum size uncertain, common to 60 cm fork length. All-tackle IGFA world angling record 26.5 kg and 114 cm fork length.

Habitat, biology, and fisheries: Occurs in moderate to large schools in coastal areas; estuaries and lagoons are essential habitat for juveniles and young; in Ghanaian lagoons, fish re-enter the sea at approximately 12 cm fork length with large shoals of adults returning to inshore waters from September to December. Spawning occurs offshore and the spawning season is protracted, occurring throughout the year with peak activity in the autumn. Adults feed primarily on fishes, with clupeids (*Sardinella* and *Engraulis* the dominant prey), but invertebrates, especially juvenile shrimps, may contribute to more than half the diet of juvenile *C. hippos* during the dry season. Most commercial catches made by haul seines and gillnets; also caught with trawls and often caught by anglers. Utilized fresh, frozen, smoked, dried-salted and for oil and fishmeal. Edibility reported as poor to good; bleeding upon landing improves taste.

Distribution: African coast from Mauritania to Angola and confirmed records for Cape Verde and Ascension islands; records from the Mediterranean Sea and St Helena are probably based on misidentifications of *C. fischeri*. If *C. hippos* on the other side of the Atlantic Ocean are conspecific (see "Remarks"), the species also occurs in the western Atlantic from Nova Scotia to Uruguay.

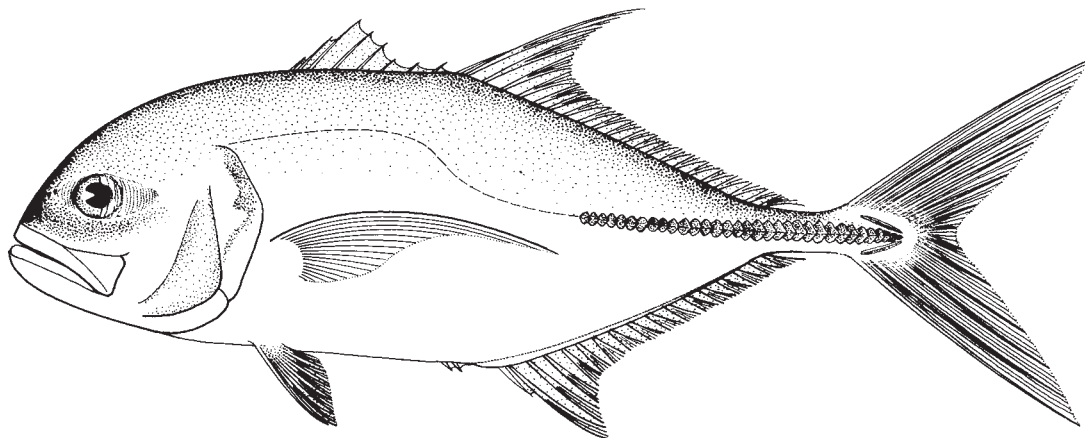
Remarks: Specimens from opposite sides of the Atlantic Ocean differ in some aspects of hyperostosis development (see discussion in Smith-Vaniz and Carpenter, 2007, p. 221), but molecular studies are needed to determine if separate taxonomic recognition is appropriate for the eastern Atlantic population.



Caranx latus Agassiz, 1831

Frequent synonyms / misidentifications: None / *Caranx hippos* (Linnaeus, 1766).

FAO names: En – Horse-eye jack; Fr – Carangue mayole; Sp – Jurel ojón.



Diagnostic characters: Body elongate, deep, and moderately compressed; eye large (diameter contained about 3.8 to 4.2 times in head length) with strong adipose eyelid. **Upper jaw extending to posterior eye margin.** Upper jaw with an outer row of strong canines flanked by an inner band of fine teeth; lower jaw teeth with a single row of moderate canines, and 1 or 2 pairs of moderately enlarged canines anteriorly. Gill rakers on first arch 6 or 7 upper and 16 to 18 lower. Dorsal fin with 8 spines followed by 1 spine and 19 to 22 soft rays; anal fin with 2 spines followed by 1 spine and 16 to 18 soft rays; dorsal- and anal-fin lobes elongate, **dorsal lobe shorter than head** (dorsal lobe contained about 5.2 to 6.0 times in fork length); pectoral fins falcate, longer than head. Lateral line with a strong, moderately long anterior arch; straight part with 32 to 39 scutes; scales small and cycloid; **breast completely scaly.** Bilateral paired caudal keels present. Vertebrae 10 precaudal and 14 caudal. Dorsal and ventral ends of cleithrum hyperostotic (greatly enlarged) in adults. **Colour:** body dark blue to bluish grey above, silvery white or golden below, with dorsal-fin lobe and sometimes posterior scutes black or dark, and **no oval black spot on pectoral fins**; juveniles with about 5 dark bars on body.

Size: Maximum size is uncertain, at least to 80 cm total length, possibly to 16 kg; common to 50 cm fork length. All-tackle IGFA world angling record 13.38 kg.

Habitat, biology, and fisheries: Found mostly in small schools around islands, offshore, and along sandy beaches in the tropics, but may enter brackish waters and rivers. Feeds primarily on fish, but also preys on shrimp and other invertebrates (including pteropods). Caught mainly with hook-and-line by anglers; commercial catches made with purse seines. Separate statistics are not reported for this species, which is probably confused with other *Caranx* representatives. Edibility fair to good, but ciguatera poisoning allegedly linked to eating large individuals of this species.

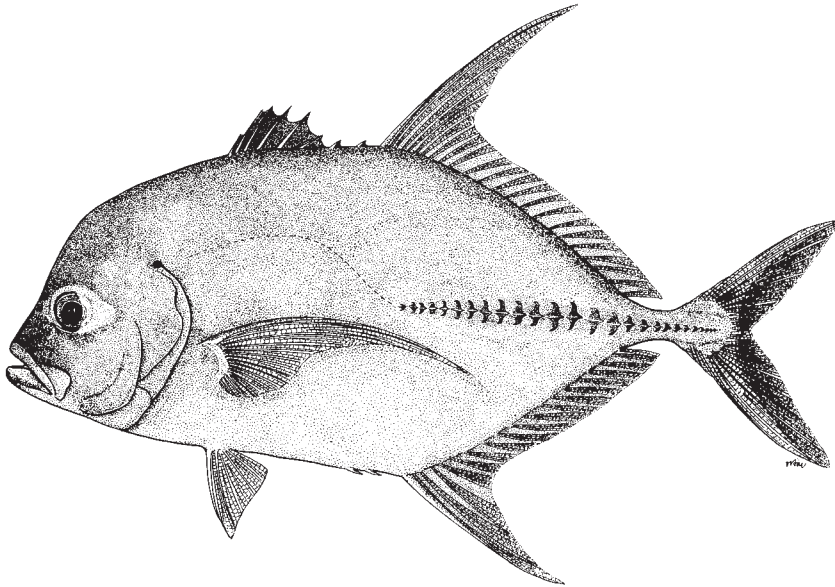
Distribution: Occurs on both sides of Atlantic Ocean. Eastern Atlantic distribution poorly known, definite records from Madeira, Canary, Cape Verde, and Ascension islands and the Gulf of Guinea. In the western Atlantic known from Bermuda, and New Jersey to southern Brazil.



Caranx lugubris Poey, 1860

Frequent synonyms / misidentifications: None / None.

FAO names: En – Black jack; Fr – Carangue noire; Sp – Jurel negro.

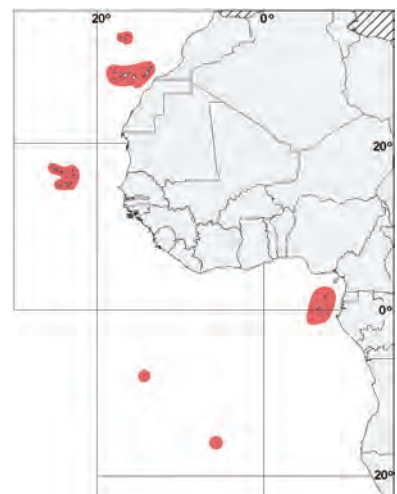


Diagnostic characters: Body oblong, deep, and moderately compressed; dorsal profile strongly convex anteriorly, ventral profile slightly convex; **profile of head relatively steep and angular**; eye large (diameter contained 4.0 to 4.9 times in head length) with strong adipose eyelid. Upper jaw extending to under anterior half or middle of eye. Upper jaw with an outer row of strong canines flanked by an inner band of fine teeth; lower jaw teeth with a single row of moderate canines, and 1 or 2 pairs of moderately enlarged canines anteriorly. Gill rakers on first arch 6 to 8 upper and 18 to 21 lower. Dorsal fin with 8 spines followed by 1 spine and 20 to 23 soft rays; anal fin with 2 spines followed by 1 spine and 17 to 20 soft rays; **dorsal- and anal-fin lobes elongate** (dorsal lobe contained about 2.3 to 5.3 times in fork length in specimens larger than 15 cm fork length); pectoral fins falcate, longer than head. Lateral line with a strong moderately long anterior arch, straight part with 26 to 32 scutes; scales small and cycloid; breast completely scaly. Bilateral paired caudal keels present. Vertebrae 10 precaudal and 14 caudal; no hyperostosis. **Colour: body and head grey to dark brown or black with fins and posterior scutes black; small dark spot at upper end of opercle**; juvenile colour unknown.

Size: Maximum to 90 cm fork length reported; maximum weight of 7 kg reported. Common to 70 cm fork length. All-tackle IGFA world angling record 17.9 kg.

Habitat, biology, and fisheries: Uncommon in shallow waters, usually at depths of 24 to 65 m or deeper; mostly in clear water; early life history uncertain. Primary prey is fish. Caught mainly by hook-and-line. Separate statistics are not reported for this species. Edibility uncertain; linked to ciguatera poisoning in Cuba (also in the Indo-Pacific).

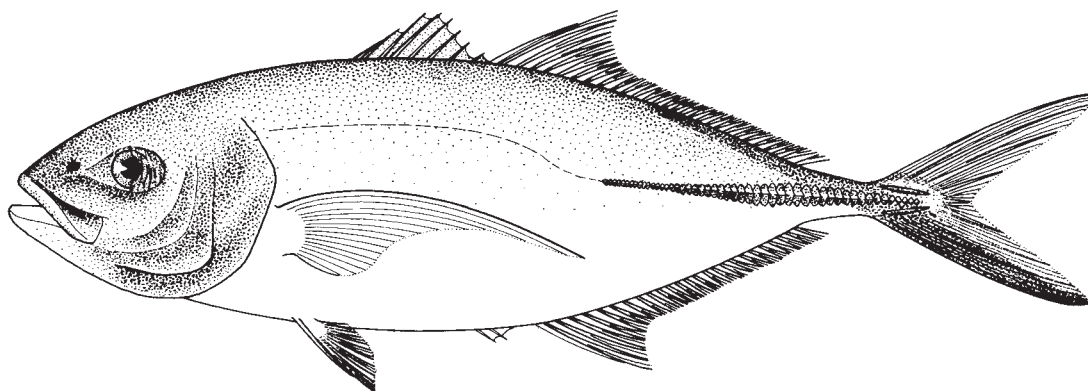
Distribution: A circumtropical species, very widespread but usually restricted to oceanic insular habitats. Eastern Atlantic distribution not well established, definitely known from the Azores, Madeira, Canary, Cape Verde, Ascension, and St Helena islands and the Gulf of Guinea.



Caranx ruber (Bloch, 1793)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Bar jack; Fr – Carangue comade; Sp – Cojinua carbonera.



Diagnostic characters: Body elongate, moderately deep, and moderately compressed; eye moderate (diameter contained about 5.4 to 5.8 times in head length) with moderate adipose eyelid. **Upper jaw barely or not quite reaching anterior eye margin.** Upper jaw with a band of small teeth, which become much smaller posteriorly, lower jaw with very small teeth in a single row except an irregular inner row anteriorly. Gill rakers on first arch 10 to 14 upper and 31 to 38 lower. **Dorsal fin with 8 spines followed by 1 spine and 26 to 30 soft rays; anal fin with 2 spines followed by 1 spine and 23 to 26 soft rays;** dorsal- and anal-fin lobes slightly elongate (dorsal lobe contained about 6.8 to 7.2 times in fork length); pectoral fins falcate, longer than head. Lateral line with moderate and extended anterior arch, straight part with 23 to 29 scutes; scales small and cycloid; breast completely scaly. Bilateral paired caudal keels present. Vertebrae 10 precaudal and 14 caudal. No hyperostosis. **Colour:** body silvery (tinted greyish blue above and white below) with a **dark stripe extending along the back and through the lower lobe of the caudal fin.** Juveniles with about 6 dark bands on body.

Size: Maximum to over 50 cm total length. Individuals weighing 6.8 kg reported from the Bahamas and the Florida Keys. Common to 40 cm fork length.

Habitat, biology, and fisheries: Found mostly in small to large schools in clear, shallow water over reefs; occasionally solitary; young usually associated with *Sargassum*. Diet consists mainly of fish, some shrimp, and other invertebrates. Edibility rated fair to good.

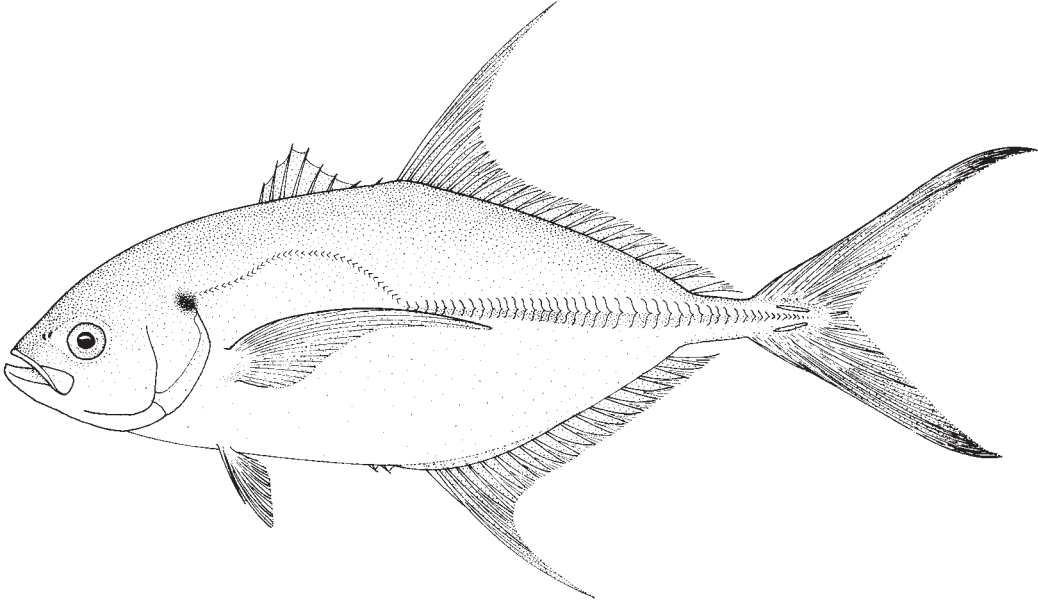
Distribution: Occurs on both sides of Atlantic Ocean. In the eastern Atlantic known only from Ascension and St Helena islands. In the western Atlantic known from Bermuda, and New Jersey to Brazil; the most abundant *Caranx* species in the West Indies.



***Caranx senegallus* Cuvier, 1833**

Frequent synonyms / misidentifications: *Caranx africanus* Steindachner, 1883 / None.

FAO names: En – Senegal jack; Fr – Carangue du Sénégal; Sp – Jurel senegalés.



Diagnostic characters: Body elongate, deep and moderately compressed; snout bluntly pointed; eye large (its diameter contained about 3.0 to 4.1 times in head length) with a weak adipose eyelid. **Upper jaw extending to under middle of eye.** Upper jaw with an outer series of small to moderate canines anteriorly that are much smaller posteriorly, flanked by an irregular inner series of slender canines anteriorly that become obsolete or minute posteriorly; lower jaw teeth in a single row of very small canines, without a pair of enlarged canines anteriorly. Gill rakers on first arch 11 to 13 upper and 27 to 30 lower. Dorsal fin with 8 spines followed by 1 spine and 20 or 21 soft rays; anal fin with 2 spines followed by 1 spine and 17 or 18 soft rays; dorsal- and anal-fin lobes elongate, **dorsal lobe longer than head**, contained about 2.1 to 3.4 times in fork length; pectoral fins falcate, longer than head. Lateral line with a high and moderately short anterior arch, its posterior (straight) portion with 40 to 45 scutes; scales small and cycloid. **Breast entirely naked ventrally and with naked area extending well behind pelvic-fin origin and uninterrupted to pectoral-fin base.** Bilateral caudal keels present. Vertebrae 10 precaudal and 14 caudal; posterodorsal part of supraoccipital crest hyperostotic (greatly enlarged) in adults. **Colour:** body and head light to dark brown above, white or yellowish below; dorsal fin brown, caudal and anal fins yellow in young, brown at larger sizes.

Size: Maximum size unknown, attains at least 50 cm fork length and reported to reach 100 cm total length.

Habitat, biology, and fisheries: An inshore species occurring from the surface to at least 90 m depth (perhaps even to 200 m). Feeds primarily on fish. Continental shelf throughout its range. Separate statistics are not reported for this species.

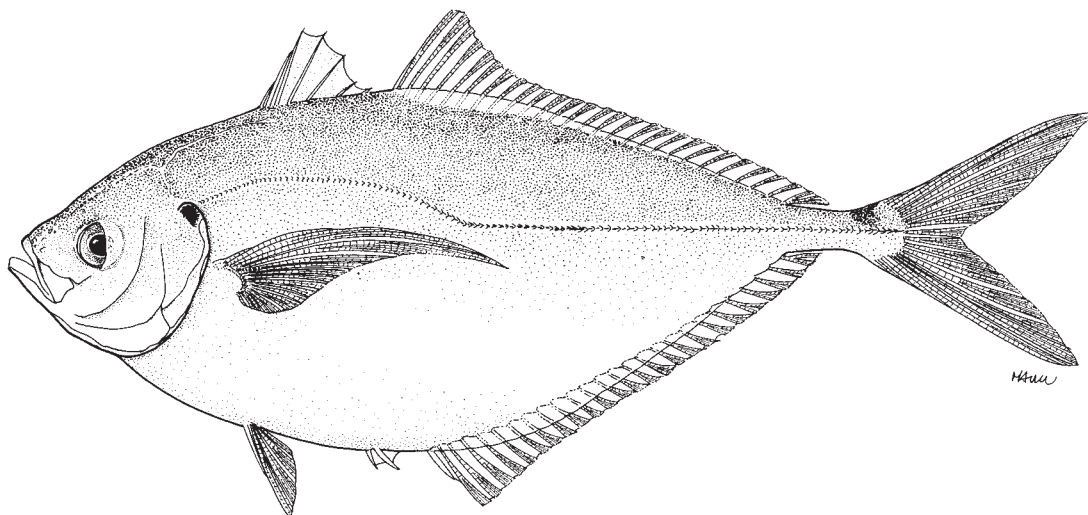
Distribution: African coast from Mauritania to southern Angola.



***Chloroscombrus chrysurus* (Linnaeus, 1776)**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Atlantic bumper; Fr – Sapater; Sp – Casabe.



Diagnostic characters: Body ovate with ventral profile more convex than dorsal, deep, and very compressed; snout short and bluntly pointed; eye small (diameter contained 3.0 to 3.4 times in a short head), with slight adipose eyelid. **Mouth small and oblique;** upper jaw extending nearly to below anterior eye margin. Teeth in narrow bands in jaws (grading into 2 irregular rows on sides of lower jaw). Gill rakers on first arch 9 to 12 upper and 30 to 37 lower. Two scarcely separated dorsal fins, the first with 8 spines, the second with 1 spine and 25 to 28 soft rays; anal fin with 2 spines followed by 1 spine and 25 to 28 soft rays; dorsal- and anal-fin lobes slightly elongate (dorsal lobe contained about 6.9 to 8.7 times in fork length); upper caudal-fin lobe elongate (about 1.2 times longer than lower lobe). Lateral line with strong short anterior arch, posterior (straight) part with **about 6 to 12 weak scutes, mainly over caudal peduncle;** scales small and cycloid; breast completely scaly. Vertebrae 10 precaudal and 14 caudal; no hyperostosis. **Colour:** body and head dark above (metallic blue to iridescent green) and silvery on sides and belly; **a black saddle spot on upper part of caudal peduncle.**

Size: Common to about 25 cm fork length; reported to attain 65 cm total length.

Habitat, biology, and fisheries: A schooling species, usually found in shallow water, both marine and estuarine, including mangrove-lined lagoons. Often gives a grunting sound when caught. The young occur at times far offshore, frequently in association with jellyfish. Coastal waters throughout its range. Caught with trawls, seines and setnets. Utilized fresh, frozen, smoked, dried-salted and for fishmeal and oil.

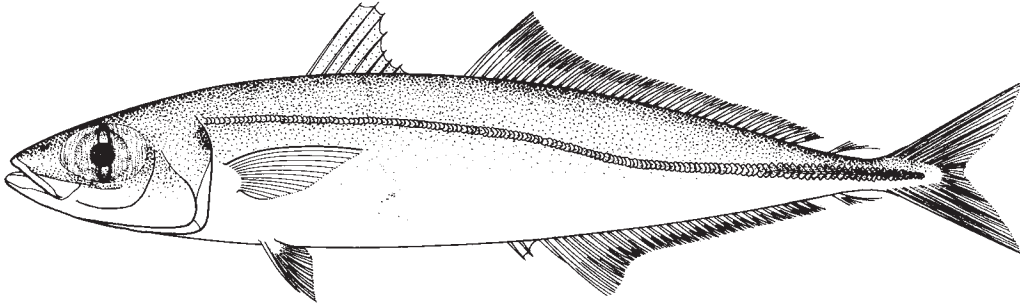
Distribution: Mauritania to Angola and a recent record from Gulf of Cadiz, Spain; also broadly distributed in the western Atlantic from Bermuda (rare) and Massachusetts to Uruguay, and a single record from Gulf of Cadiz, Spain. A geminate species, *Chloroscombrus orqueta* Jordan and Gilbert, occurs in the eastern Pacific Ocean.



Decapterus macarellus (Cuvier in Cuvier and Valenciennes, 1833)

Frequent synonyms / misidentifications: None in the Atlantic; *Decapterus pinnulatus* Eydoux and Souleyet, 1841, in the central Pacific and Indian Ocean / None.

FAO names: En – Mackerel scad; Fr – Comète maquereau; Sp – Macarela caballa.



Diagnostic characters: Body very elongate, slender, and nearly rounded; eye moderate (diameter contained 3.8 to 4.9 times in head length) with adipose eyelid well developed, completely covering eye except for a vertical slit centred on pupil. **Posterior end of upper jaw straight above, moderately rounded and noticeably slanted anteroventrally.** Teeth minute, in a single row in both jaws, decreasing in number and extent with growth. Gill rakers on first arch 9 to 13 upper and 31 to 39 lower; **shoulder girdle with 2 slight papillae and a shallow groove above and below the pair, the lower papilla and groove the larger.** Two well separated dorsal fins, the first with 8 spines, the second with 1 spine and 31 to 37 soft rays (including finlet); anal fin with 2 detached spines followed by 1 spine and 27 to 31 soft rays (including finlet); **terminal dorsal- and anal-fin rays each consisting of a widely detached finlet;** pectoral fins very short (contained 1.5 to 2.0 times in head length). Lateral line arched to beneath ninth to twelfth dorsal-fin rays, the chord of curved part 0.8 to 1.0 times into straight part (to caudal-fin base); **scales in curved part of lateral line 68 to 79; no scutes in curved part; anterior scales in straight part 19 to 33;** scutes in straight part 23 to 32; total scales and scutes in lateral line 119 to 133. Dorsal accessory lateral line short, terminating near end of head. Vertebrae 10 precaudal and 14 caudal. **Colour:** metallic blue to bluish black above, silvery to white below; small black spot on margin of opercle near upper edge; **no small black spots spaced on pored scales of curved lateral line; oral valve (membrane) at symphysis of upper jaw conspicuously white in adults; caudal fin yellow-green to amber.**

Size: Attains at least 30 cm fork length and 32 cm total length; common to about 25 cm fork length.

Habitat, biology, and fisheries: Found mainly in schools in open water, occasionally over outer reefs. Planktonic invertebrates comprise main food. Caught with haul seines, some purse seines, bottom trawls, traps, and hook-and-line; no specific fishery, but may be used as bait or marketed locally as foodfish. Utilized dried-salted, for fishmeal and oil.

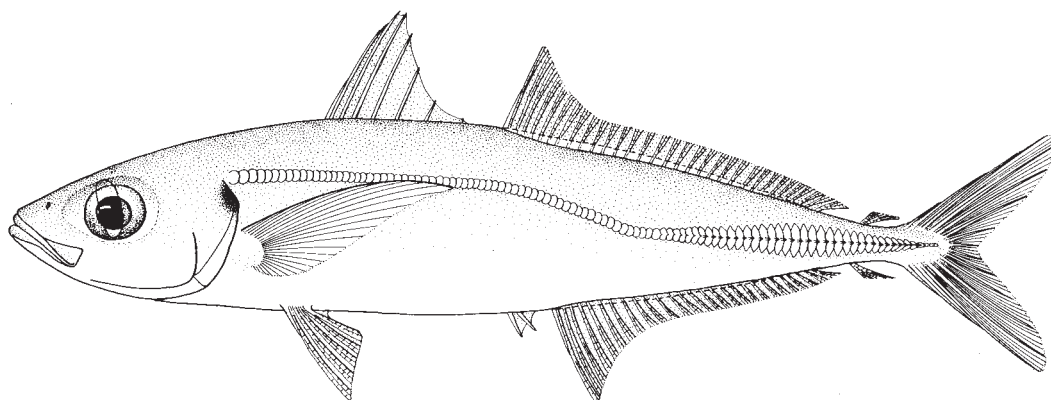
Distribution: A circumtropical species. Eastern Atlantic distribution not well known, but definitely known from the Azores, Madeira, Canary (rare), Cape Verde, Ascension, and St Helena islands, and the Gulf of Guinea.



Decapterus muroadsi (Temminck and Schlegel, 1844)

Frequent synonyms / misidentifications: *Decapterus scombrinus* Valenciennes, 1844 / None.

FAO names: En – Amberstripe scad; Fr – Comète de roche; Sp – Macarela de roca.



Diagnostic characters: Body very elongate and slender and nearly rounded; eye moderate (its diameter contained 3.3 to 3.5 times in head length), with adipose eyelid well developed, completely covering eye except for a vertical slit centred on pupil. **Posterior end of upper jaw straight above, not noticeably slanted anteroventrally.** Teeth minute, in a single row in both jaws, reducing in number and extent with growth. **Gill rakers (including rudiments)** on first arch 14 to 16 upper and **41 to 44 lower**; **shoulder girdle (cleithrum) margin with 2 small papillae, the lower papillae larger.** Two well separated dorsal fins, the first with 8 spines, the second with 1 spine and 33 or 34 soft rays (including finlet); anal fin with 2 detached spines followed by 1 spine and 28 or 29 soft rays (including finlet); **terminal dorsal and anal soft rays each consisting of a widely detached finlet**; pectoral fin moderately short (contained 1.1 or 1.2 times in head length), tip of appressed fins usually falling short of a vertical line from second dorsal-fin origin. Scales small and cycloid; the chord of the curved part of lateral line contained 0.7 or 0.8 times in straight part (to caudal-fin base). **Scales in curved part of lateral line 54 to 62**; no scutes in curved part; straight part with 5 to 15 scales followed by **29 to 42 scutes**; **total scales and scutes in lateral line 94 to 106.** Dorsal accessory lateral line short, terminating near end of head. Vertebrae 10 precaudal and 14 caudal. **Colour:** preserved, dusky above, lighter below; a small black spot on margin of opercle near upper edge; **no small black spots spaced on pored scales of curved lateral line**; **oral valve (membrane) at symphysis of upper jaw conspicuously white.**

Size: Maximum to 43 cm fork length; in the Indo-West Pacific common to about 30 cm fork length.

Habitat, biology, and fisheries: Pelagic schooling species. Feeds primarily on smaller planktonic invertebrates.

Distribution: In the area known only from St Helena, and the adjacent Bonaparte Seamount, where species apparently exists as a relict population. A broadly distributed warm temperate species elsewhere known from southern Australia, Japan, Hawaii, Rapa, Easter Island, Nazca Ridge, and the eastern Pacific Ocean (Gulf of California to Peru).

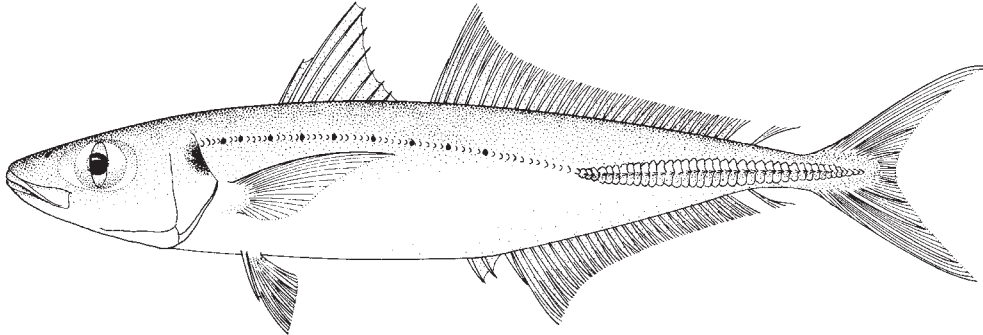
Remarks: The above counts are based on 12 specimens, all from St Helena. Life coloration not recorded for St Helena fish, but elsewhere *D. muroadsi* has an amber stripe on sides, the lower caudal-fin lobe dusky and upper lobe greenish yellow.



***Decapterus punctatus* (Cuvier, 1829)**

Frequent synonyms / misidentifications: *Decapterus sanctaehelenae* (Cuvier, 1833) / None.

FAO names: **En** – Round scad; **Fr** – Comète quiaquia; **Sp** – Macarela chuparaco (= Surela).



Diagnostic characters: Body very elongate and slender and nearly rounded; eye moderate (diameter contained 3.4 to 3.9 times in head length) with adipose eyelid well developed, completely covering eye except for a vertical slit centred on pupil. **Posterior end of upper jaw concave above, noticeably rounded and produced below.** Teeth minute, in a single row in both jaws, becoming reduced in number and extent with growth. Gill rakers on first arch 11 to 13 upper and 32 to 37 lower; **shoulder girdle with 2 slight papillae and a shallow groove above and below the pair, the lower papilla and groove the larger.** Two well separated dorsal fins, the first with 8 spines, the second with 1 spine and 29 to 34 soft rays (including finlet); anal fin with 2 detached spines followed by 1 spine and 26 to 30 soft rays (including finlet); **terminal dorsal- and anal-fin rays each consisting of a widely detached finlet;** pectoral fins short (contained 1.1 to 1.5 times in head length). Lateral line arched to beneath eighth to tenth dorsal-fin rays, the chord of curved part contained 0.7 to 0.9 times in straight part (to caudal-fin base); **scales in curved part of lateral line 46 to 62; scutes in curved part 0 to 8; anterior scales in straight part usually 0, rarely 1 or 2;** scutes in straight part 30 to 38; total scales and scutes in lateral line 87 to 99. Dorsal accessory lateral line short, terminating near end of head. Vertebrae 10 precaudal and 15 caudal. **Colour:** greenish to greenish blue above, dusky through silvery to whitish below; a narrow, bronze, or olive stripe from tip of snout to caudal peduncle along upper part of straight lateral-line scutes; a small blackish spot on margin near upper edge of opercle; **small black spots, 3 to 14, spaced on pored scales of curved lateral line (formed at about 10 cm fork length);** oral valve (membrane) at symphysis of upper jaw dusky or transparent; caudal fin dusky or amber.

Size: Maximum to at least 25 cm total length; common to about 15 cm fork length.

Habitat, biology, and fisheries: Primarily a schooling species in midwater or near the bottom in shallower water to about 90 m; also pelagic and near surface, especially as juveniles. Spawns offshore, apparently year round; feeds on planktonic invertebrates, mainly copepods. Caught primarily with haul seines, also with bottom trawls and hook-and-line; no specific fishery; used mainly as bait by fishers or in traps; possibly consumed locally, but not commercially relevant.

Distribution: Occurs on both sides of the Atlantic Ocean. In the eastern Atlantic from Madeira to Walvis Bay, Namibia, including Madeira, Canary (rare), Cape Verde, Ascension, and St Helena islands. In the western Atlantic recorded from Bermuda, and off Georges Bank to Brazil.

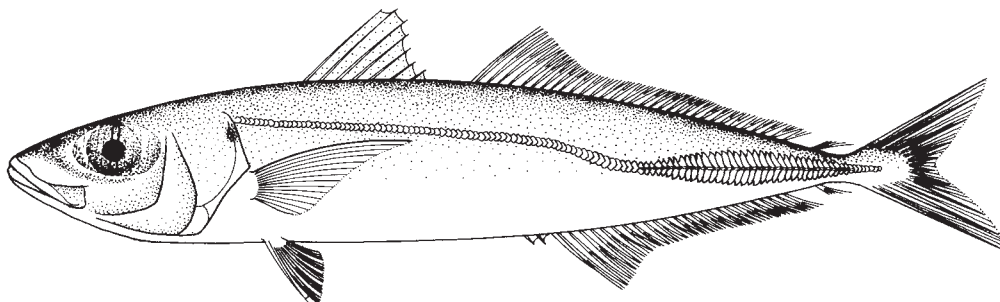
Remarks: Western Atlantic *Decapterus punctatus* have fewer scales in the curved lateral line (37 to 56) and more scutes in the straight lateral line (32 to 46), which is reflected in a concomitant larger lateral-line ratio (0.9 to 1.15), but otherwise agree well with eastern Atlantic fish. If future molecular studies indicate that the 2 amphi-Atlantic populations are strongly differentiated genetically, *D. sanctaehelenae* is an available name for the eastern Atlantic fish.



***Decapterus tabl* Berry, 1968**

Frequent synonyms / misidentifications: None / None.

FAO names: **En** – Roughear scad; **Fr** – Comète queue rouge; **Sp** – Macarela rabo colorado.



Diagnostic characters: Body very elongate and slender and nearly rounded; eye moderate (its diameter contained 3.8 to 4.8 times in head length) with adipose eyelid well developed, completely covering eye except for a vertical slit centred on pupil. **Posterior end of upper jaw straight, slightly slanting upward and backward.** Teeth minute, in a single row in both jaws, decreasing in number and extent with growth. Gill rakers (including rudiments) on first arch 10 to 12 upper and **30 to 33 lower**; **shoulder girdle with 2 slight papillae and a shallow groove above and below the pair, the lower papilla and groove the larger.** Two well-separated dorsal fins, the first with 8 spines, the second with 1 spine and 29 to 34 soft rays (including finlet); anal fin with 2 detached spines followed by 1 spine and 24 to 27 soft rays (including finlet); **terminal dorsal and anal soft rays each consisting of a widely detached finlet**; **pectoral fins short** (contained 1.4 to 1.8 times in head length). Scales small and cycloid; chord of curved part of lateral line contained 0.6 to 0.9 times in straight part (to caudal-fin base); **scales in curved part of lateral line 61 to 78**; no scutes in curved part; anterior scales in straight part 0 to 8; **scutes in straight part 34 to 44**; **total scales and scutes in lateral line 103 to 119.** Dorsal accessory lateral line short, terminating near end of head. Shoulder girdle with 2 slight papillae and a shallow groove above and below the pair, the lower papilla and groove the larger. Vertebrae 10 precaudal and 14 caudal. **Colour:** metallic blue to bluish black above, silvery to white below; a small black spot on margin of opercle near upper edge; no small black spots spaced on pored scales of curved lateral line; oral valve (membrane) at symphysis of upper jaw dusky or transparent; **caudal fin red.**

Size: Maximum to 48 cm fork length, commonly attains 35 cm fork length.

Habitat, biology, and fisheries: A schooling species; in midwater or near bottom; at depths of about 150 to 220 m. Feeds generally on smaller planktonic invertebrates, primarily copepods. Separate statistics are not reported for this species. Caught mainly with bottom trawls.

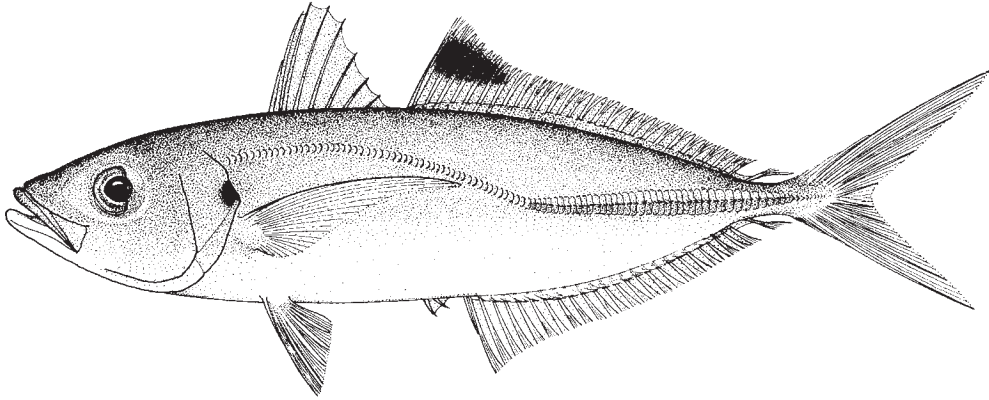
Distribution: In the eastern Atlantic known only from Ascension and St Helena islands. Also occurs in the western Atlantic from Bermuda, and North Carolina to Venezuela, the Indian Ocean, and the Indo-West Pacific to Hawaii.



“*Decapterus*” *rhonchus* (Geoffroy Saint-Hilaire, 1817)

Frequent synonyms / misidentifications: *Caranx rhonchus* Geoffroy Saint-Hilaire, 1817; *C. angolensis* Fowler, 1919 / None.

FAO names: En – False scad; Fr – Comète coussut; Sp – Macarela real (= Jurel real).



Diagnostic characters: Body elongate and slightly compressed with upper and lower profiles about equal; eye moderate (its diameter contained 3.3 to 4.6 times in head length) with a well-developed adipose eyelid, more extensive posteriorly. **Posterior end of upper jaw straight**, slightly slanting upward and backward and **covered with small scales**. Teeth in both jaws in a narrow, irregular band, widest anteriorly; outer teeth slightly enlarged. Gill rakers (including rudiments) on first arch 14 to 18 upper and 36 to 40 lower; **shoulder girdle (cleithrum) margin smooth, without papillae**. Two well separated dorsal fins, the first with 8 spines, the second with 1 spine and 28 to 32 soft rays (including finlet); anal fin with 2 detached spines followed by 1 spine and 25 to 28 soft rays (including finlet); **terminal dorsal and anal soft rays each consisting of a partially detached finlet joined only basally by interradiol membrane**; pectoral fins short (contained 1.0 to 1.2 times in head length). Scales small and cycloid; chord of curved part of lateral line 0.7 to 0.9 times into straight part (to caudal-fin base); scales in curved part of lateral line 45 to 55; scutes in curved part 0 to 3; anterior scales in straight part 0 to 8; scutes in straight part 24 to 32; total scales and scutes in lateral line 75 to 86. Dorsal accessory lateral line short, terminating near end of head. Vertebrae 10 precaudal and 14 caudal. **Colour:** brownish to olive above and light olive to whitish below; narrow yellowish stripe sometimes present from head to base of caudal fin; black spot on margin of opercle near upper edge; **lobe of second dorsal fin with black blotch and narrow pale border distally**.

Size: Maximum to at least 60 cm total length; common to 35 cm fork length.

Habitat, biology, and fisheries: A schooling species, found frequently near the bottom, mostly in depths of 30 to 50 m; but reportedly also occurring in deeper waters (>200 m); also pelagic and near the surface at times. Feeds on small fish and invertebrates. Caught with trawls, purse seines, and gillnets. Utilized fresh, frozen, smoked, dried-salted and for fishmeal and oil.

Distribution: Along African coast from Morocco to southern Angola and the Cape Verde Islands; also occurs northward to Spain and abundant in the eastern Mediterranean Sea.

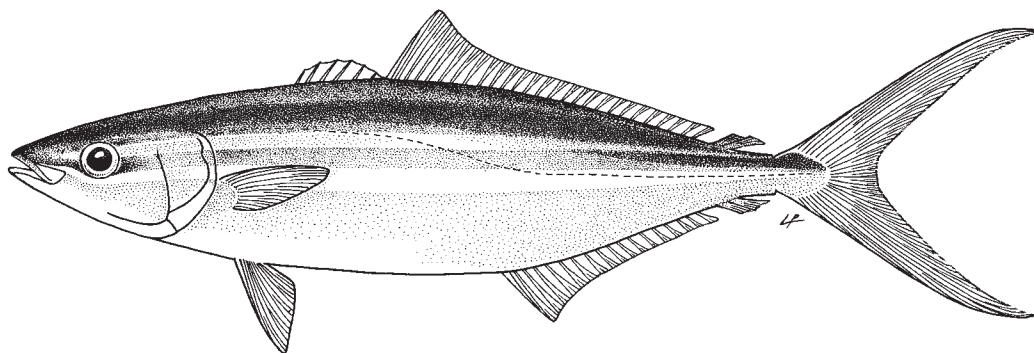
Remarks: “*Decapterus*” *rhonchus* originally described as a species of *Caranx*, is here assigned to *Decapterus* for convenience, but probably should be assigned to a separate monotypic genus.



Elagatis bipinnulata (Quoy and Gaimard, 1825)

Frequent synonyms / misidentifications: None / None.

FAO names: **En** – Rainbow runner; **Fr** – Comète saumon; **Sp** – Macarela salmón.



Diagnostic characters: **Body greatly elongate**, almost fusiform; head and snout pointed. Mouth small, **upper jaw ending distinctly before eye (to anterior margin of eye in young)**. **Teeth in jaws in villiform bands**, minute teeth also on roof of mouth and on tongue. **Dorsal fin with 6 spines**, followed by 1 spine and 25 to 30 soft rays, including **a detached terminal 2-rayed finlet**; anal fin comparatively short (its base about 1.5 times in second dorsal-fin base) **with only 2 spines, the first becoming detached from rest of fin and covered by skin in fish of larger sizes, the second spine continuous with the following 18 to 22 soft rays, including a detached 2-rayed finlet**; pectoral fins short, about 2 times in head length and about as long as pelvic fins; caudal fin deeply forked. Lateral line with a slight anterior arch. Body scales ctenoid, covering breast, parts of opercle, cheek, and pectoral, pelvic, and caudal fins; no scutes. Dorsal and ventral peduncle grooves present. Vertebrae 10 precaudal and 14 caudal. **Colour: dark olive blue or green above and white below; 2 narrow light blue or bluish white stripes along each side, with a broader olive or yellowish stripe between them**; fins dark with an olive or yellow tint.

Size: Maximum to 107 cm (possibly even 120 cm) fork length and 10.5 kg; common to 80 cm fork length. All-tackle IGFA world angling record 17.05 kg.

Habitat, biology, and fisheries: Pelagic species, found mainly near the surface, over reefs, or sometimes offshore; may form large schools when abundant. Feeds on invertebrates and fish. An excellent game fish on light tackle and trolling lines; also taken with purse seines. Usually marketed fresh; flavour reported as excellent.

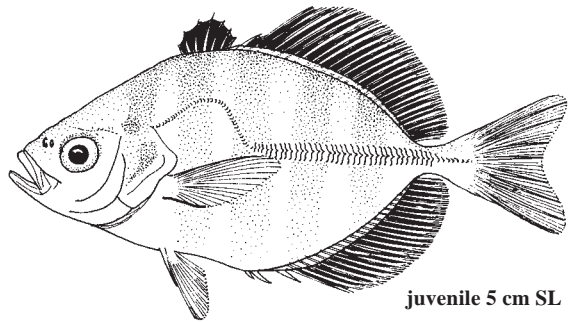
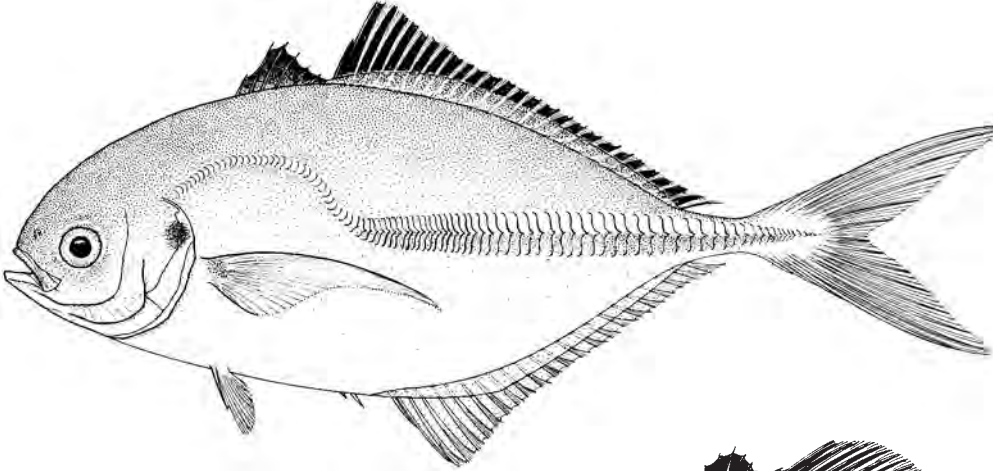
Distribution: Circumtropical in marine waters. Eastern Atlantic distribution not well known, definitely known from the Azores, Canary (very rare), Cape Verde, Ascension and St Helena islands, and Senegal to southern Angola.



Hemicaranx bicolor (Günther, 1860)

Frequent synonyms / misidentifications: None / *Hemicaranx amblyrhynchus* (Cuvier, 1833).

FAO names: En – Two-colour jack; Fr – Carangue bicolore; Sp – Casabe bicolor.



juvenile 5 cm SL

Diagnostic characters: In adults, body moderately elongate, deep, and strongly compressed; **snout bluntly rounded**; eye small (diameter contained 3.3 to 4.3 times in head length) with weak adipose eyelid. **Mouth small; upper jaw extending to under anterior margin of eye. Teeth in both jaws a single narrow row.** Gill rakers on first arch 7 to 10 upper and 18 to 23 lower. Dorsal fin with 7 spines followed by 1 spine and 24 to 28 soft rays; anal fin with 2 spines followed by 1 spine and 21 to 24 soft rays; dorsal- and anal-fin lobes short (dorsal-fin lobe contained about 6.6 to 8.7 times in fork length); pectoral fins moderately falcate, longer than head; **upper caudal-fin lobe elongated in adults (about 1.3 times longer than lower lobe).** **Lateral line with a short strong anterior arch, its posterior (straight) part with 41 to 53 scutes**; scales small and cycloid; chest completely scaly. No bilateral paired caudal keels. Vertebrae 10 precaudal and 16 caudal.

Colour: body dark bluish green above, silvery below; a large black opercular blotch; dorsal-fin margin and upper caudal-fin lobe tips black, other fins clear; juveniles with 4 or 5 dark body bands.

Size: Unconfirmed reports to 70 cm total length, common to 25 cm fork length.

Habitat, biology, and fisheries: An inshore species; enters brackish water; usually midwater or bottom dwelling and solitary or in small schools; young associate with jellyfishes. Separate statistics are not reported for this species. Caught in trawls and seines. Utilized fresh and dried-salted.

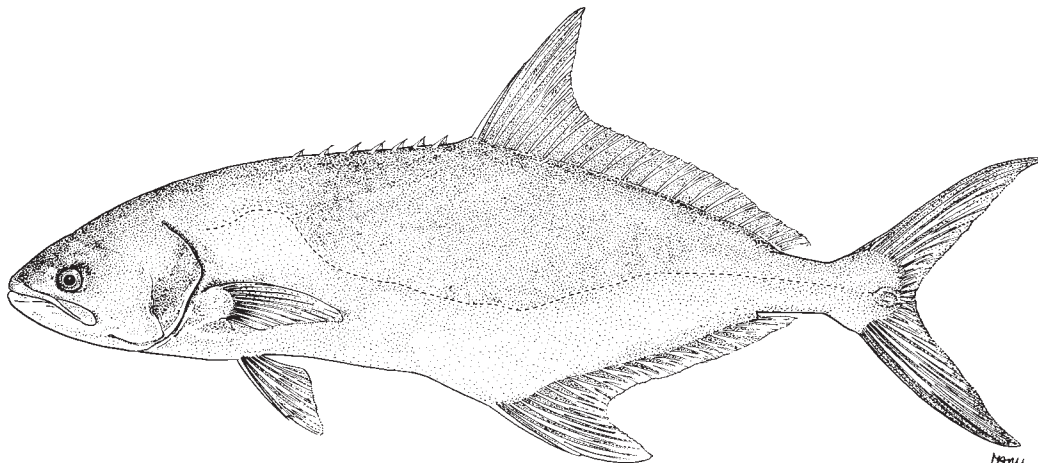
Distribution: Along the African coast at least from Senegal to southern Angola. A geminate species, *Hemicaranx amblyrhynchus* Cuvier, occurs in the western Atlantic Ocean.



Lichia amia (Linnaeus, 1758)

Frequent synonyms / misidentifications: *Hypacanthus amia* (Linnaeus, 1758) / None.

FAO names: En – Leerfish; Fr – Liche; Sp – Palometón.



Diagnostic characters: Body elongate, moderately deep and compressed, with upper and lower profiles similar; head profile nearly straight dorsally ending in an acute snout; eye moderately small, its diameter contained 3.5 to 5.2 times in head length. **Upper jaw narrow and rounded at end, extending to below posterior margin of eye or beyond.** Both jaws with a broad band of teeth, widest anteriorly. Gill rakers (including rudiments) on first arch 2 to 5 upper and 7 to 11 lower. Dorsal fin with 7 short spines, connected by a membrane at their bases only, and followed by 1 spine and 19 to 21 soft rays; anal fin with 2 spines separated from rest of fin, followed by 1 spine and 17 to 21 soft rays; bases of anal and second dorsal fins about equal in length; pectoral fins short, contained 1.5 to 1.8 times in head length. **Lateral line very irregular and sinuous, describing a convex curve above and a concave curve behind the pectoral fin;** scales small, oval-shaped to strongly lanceolate on breast and partially embedded; no scutes. No hyperostosis or caudal peduncle grooves. Vertebrae 10 precaudal and 14 caudal. **Colour:** in life, adults silvery grey dorsally, silvery white below the lateral line and with grey fins; sometimes with a row of 8 to 15 evenly spaced small dark spots above lateral line; fish from estuaries or river mouths may have mostly yellow body and fins. Juveniles, to at least 12 cm fork length, with brownish black bands on sides.

Size: Maximum reported to attain 200 cm total length; common to 100 cm total length. Attains sexual maturity at about 55 cm total length. All-tackle IGFA world angling record 23.7 kg.

Habitat, biology, and fisheries: An inshore or estuarine species, occasionally entering rivers, and found in surface waters to a depth of at least 50 m. Adults feed primarily on other fish; prefers live or moving bait, and may often be seen in pursuit of mullets on the surface. Caught with trawls, purse seines, setnets and on line gear. Utilized fresh, frozen, smoked, dried-salted and for fishmeal and oil.

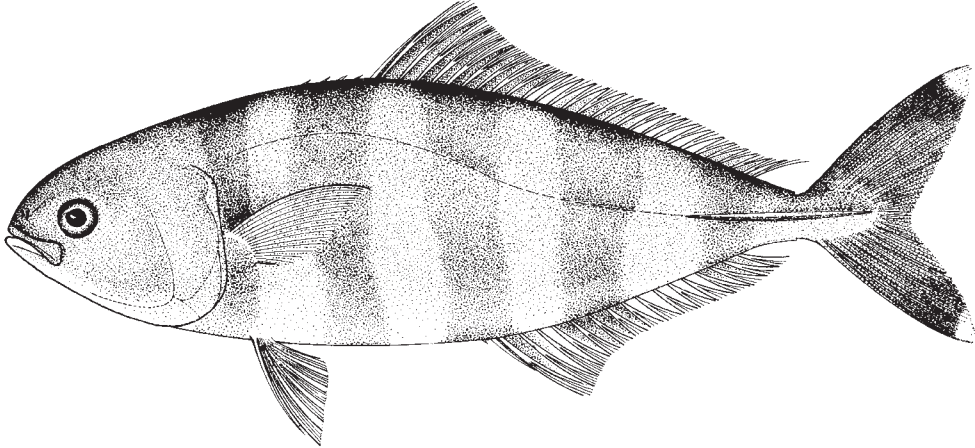
Distribution: Mediterranean Sea (common) and Portugal, and along African coast to Cape Town and northward in the Indian Ocean to Mozambique. Also known from Madeira, Canary and Cape Verde Islands where relatively uncommon.



Naucrates ductor (Linnaeus, 1758)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Pilotfish; Fr – Poisson pilote; Sp – Pez piloto.



Diagnostic characters: Body elongate, shallow, and barely compressed, with nearly equal upper and lower profiles, but head profile tapering sharply above anterior half of upper jaw to produce a nearly blunt snout. **Upper jaw very narrow posteriorly and extending to about anterior margin of eye.** Teeth minute, in a band in upper and lower jaws. Gill rakers on first arch 6 or 7 upper, 15 to 20 lower and 21 to 27 total. **Dorsal fin with 4 or 5 spines (first spine may be minute and/or last spine may be reduced and skin-covered in fish larger than 20 cm fork length),** followed by 1 spine and 25 to 29 soft rays; anal fin with 2 spines separated from rest of fin (first may be reduced and skin-covered) followed by 1 spine and 15 to 17 soft rays; second dorsal-fin lobe short, contained 7.1 to 8.2 times in fork length; anal-fin base short, contained 1.6 to 1.9 times in second dorsal-fin base. Scales very small and ctenoid; no scutes. **Caudal peduncle with a well-developed lateral, fleshy keel on each side and dorsal and ventral peduncle grooves.** Vertebrae 10 precaudal and 15 caudal. **Colour:** in live fish, 5 or 6 black bands against a light silvery background, but there also is a transient coloration (possibly aggressive display) with bands disappearing and most of fish silvery white with 3 broad blue patches in tandem across back. In fresh or preserved fish, head dark, 5 or 6 dark broad body bands and a similar band at end of caudal peduncle, bands 3 to 6 extending through soft dorsal and anal-fin membranes, and the bars persistent at all sizes; rest of body bluish (fresh) or light or dusky; **white tips prominent on upper and lower caudal-fin lobes and smaller white tips on second dorsal- and anal-fin lobes;** most of fins dusky to dark.

Size: Maximum to 63 cm fork length, 70 cm total length, common to 35 cm fork length; weight 0.5 kg at 33 cm fork length.

Habitat, biology, and fisheries: Pelagic in oceanic water. Has semi-obligate commensalisms with large sharks, rays, other fishes, turtles, ships, and driftwood; juveniles often associated with seaweeds and jellyfishes; larvae are epipelagic in ocean waters. Feeds on host's food scraps and small invertebrates. Caught with dipnets, hook-and-line, and gillnets. No real fishery. Separate statistics are not reported for this species.

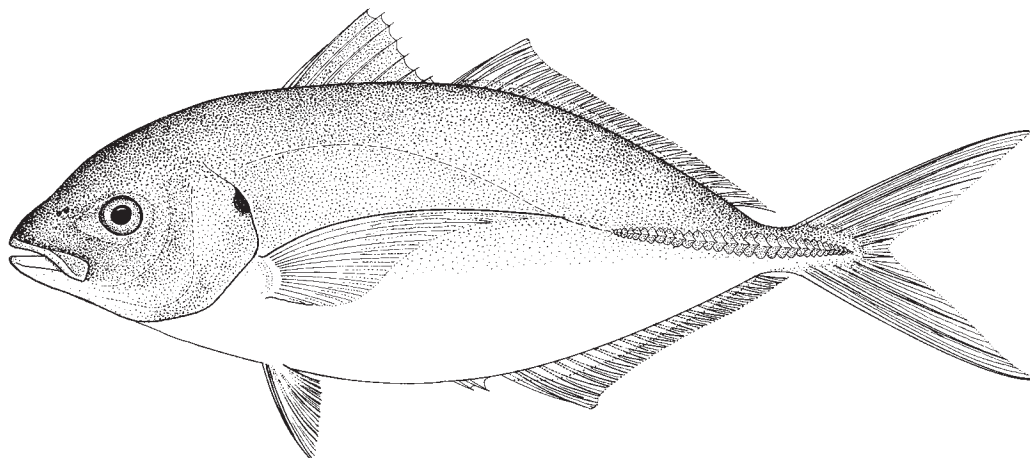
Distribution: Circumtropical in marine waters. In the area, known from the Straits of Gibraltar to southern Angola, including the Azores, Madeira, Canaries, Cape Verde, Ascension, and St Helena islands; also found in the Mediterranean, but rare in northern European waters.



Pseudocaranx dentex (Bloch and Schneider, 1801)

Frequent synonyms / misidentifications: *Caranx adscensionis* (Osbeck, 1771) = invalid name; *C. dentex* (Bloch and Schneider, 1801); *C. guara* (Bonnaterre, 1788) / *Caranx georgianus* Cuvier, 1833.

FAO names: En – White trevally; Fr – Carangue dentue; Sp – Jurel dentón.



Diagnostic characters: Body elongate, moderately deep, and compressed, with dorsal and ventral profiles similar; eye relatively small (diameter contained 4.4 to 5.3 times in head length) with weak adipose eyelid. **Lips noticeably papillose and upper jaw projecting beyond lower in large adults. Upper jaw not reaching anterior margin of eye. Both jaws with a row of blunt conical teeth**, upper jaw with an inner row of smaller conical teeth anteriorly, which become fewer in number in larger fish. Gill rakers on first arch 11 to 14 upper and 23 to 28 lower. Two separate dorsal fins, the first with 8 spines, the second with 1 spine and 25 to 27 soft rays; **anal fin with 2 spines followed by 1 spine and 21 to 26 soft rays; dorsal-fin spines long, longest spine longer than lobe of soft dorsal fin**; pectoral fins falcate, longer than head. Lateral line with a weak and extended anterior arch, with junction of curved and straight parts of lateral line below vertical from twelfth to fourteenth rays of second dorsal fin; chord of curved part of lateral line contained 0.6 to 0.85 times in straight part (to caudal-fin base); curved part of lateral line with 57 to 78 scales; straight part of lateral line 2 to 27 anterior scales and 16 to 31 scutes; scales small and cycloid; breast completely scaly. No bilateral paired caudal keels. Vertebrae 10 precaudal and 15 caudal. **Colour:** pale greenish blue above, silvery below; **yellow stripe along sides (wider posteriorly)** and at base of soft dorsal and anal fins; caudal and soft dorsal fins dusky yellow; **black spot near posterodorsal margin of opercle.**

Size: Attains at least 85 cm fork length; common to 40 cm fork length. All-tackle IGFA world angling record 15.2 kg.

Habitat, biology, and fisheries: A schooling species in depths of 80 to 200 m, feeds on the bottom. Separate statistics are not reported for this species. Caught with pelagic and bottom trawls. Utilized fresh, dried-salted and for fishmeal and oil.

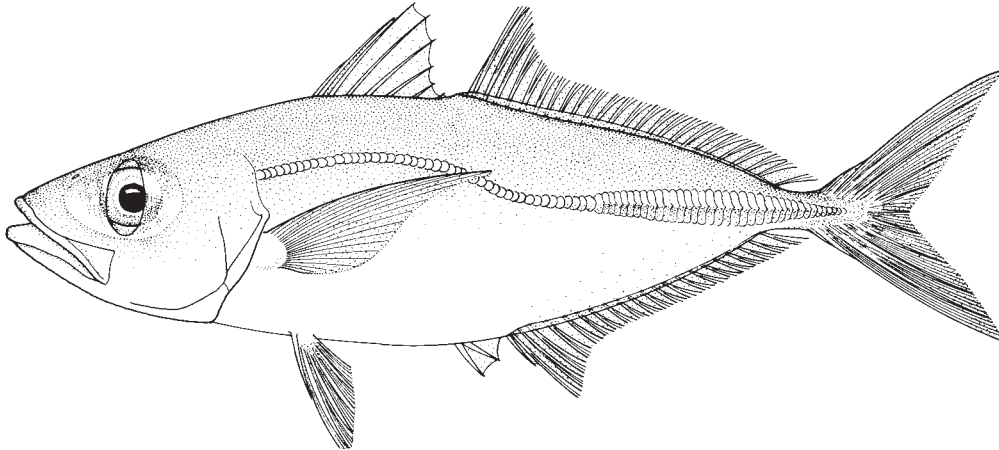
Distribution: In the eastern Atlantic known from the Mediterranean Sea, Azores, Madeira, Canary, Cape Verde, Ascension and St Helena islands, and along the entire African coast. Also occurs in the northwestern Atlantic (Bermuda and North Carolina), southern Brazil, and Indian Ocean (South Africa). Indo-west Pacific records for *Pseudocaranx dentex* are based on an unresolved species complex (see Smith-Vaniz and Jelks, 2006, *Memoirs Museum Victoria*, 62: 97–106).



***Selar crumenophthalmus* (Bloch, 1793)**

Frequent synonyms / misidentifications: *Trachurops crumenophthalmus* (Bloch, 1793) / None.

FAO names: En – Bigeye scad; Fr – Selar coulisou; Sp – Chicharro ojón.



Diagnostic characters: Body elongate and moderately compressed, with lower profile slightly more convex than upper; eye very large (diameter contained 2.7 to 3 times in head length), **with a well-developed adipose eyelid completely covering eye except for a vertical slit centred on pupil**. Upper jaw moderately broad at end and extending to below anterior margin of pupil. Teeth small and recurved; upper jaw with a narrow band, tapering posteriorly; lower jaw with an irregular single row. Gill rakers on first arch 9 to 12 upper, 27 to 31 lower, and 37 to 42 total. **Shoulder girdle margin with a deep (cleithral) furrow, a large papilla immediately above it and a smaller papilla near upper edge**. Dorsal fin with 8 spines, followed by 1 spine and 24 to 27 soft rays; anal fin with 2 spines separated from rest of fin, followed by 1 spine and 21 to 23 soft rays; pectoral fins shorter than head. Lateral line with a weak and extended anterior arch; **chord of curved part of lateral line contained 0.7 to 1.2 times in straight part (to caudal-fin base)**; scales in curved part of lateral line 48 to 56; 0 to 4 scutes in curved part, 48 to 58 total scales and scutes, straight part with 0 to 11 anterior pored scales and 29 to 42 scutes (to caudal-fin base), total 30 to 43 scales and scutes; total number of scales and scutes in lateral line 83 to 94. Dorsal accessory lateral line extending posteriorly to beneath origin of first dorsal fin. Vertebrae 10 precaudal and 14 caudal. **Colour:** in fresh fish, upper third of body and top of head metallic blue or bluish green; tip of snout dusky or blackish; lower two-thirds of body and head silvery or whitish; a **narrow, yellowish stripe may be present from edge of opercle to upper part of caudal peduncle**; blackish areas above and below pupil with a reddish area sometimes present; a small elongated, blackish opercular spot on edge near upper margin. First dorsal fin dusky on margins with rest of fin clear; second dorsal fin dusky over most of fin with dorsal lobe blackish; anal fin clear or slightly dusky along base; caudal fin dusky with tip of upper lobe dark; pectoral fins clear or slightly dusky near base and with a yellowish tint sometimes present; pelvic fins clear.

Size: Maximum documented record of 27 cm standard length; unsubstantiated report of 60 cm standard length; common to about 24 cm fork length at weights of about 0.23 kg.

Habitat, biology, and fisheries: Occurs in small to large schools, usually in inshore or in shallow water, but reported to depths of 170 m, and may occur over shallow reefs or in turbid water. Feeds mostly on planktonic or benthic invertebrates; also feeds on fish. Separate statistics are not reported for this species, they are probably reported together with other species such as *Decapterus* spp. Caught with trawls, purse seines, setnets and on line gear. Utilized fresh, smoked and for fishmeal and oil. Edibility fair to good.

Distribution: Cape Verde, Ascension and St Helena islands, and Senegal to southern Angola. Worldwide in tropical and subtropical marine waters.

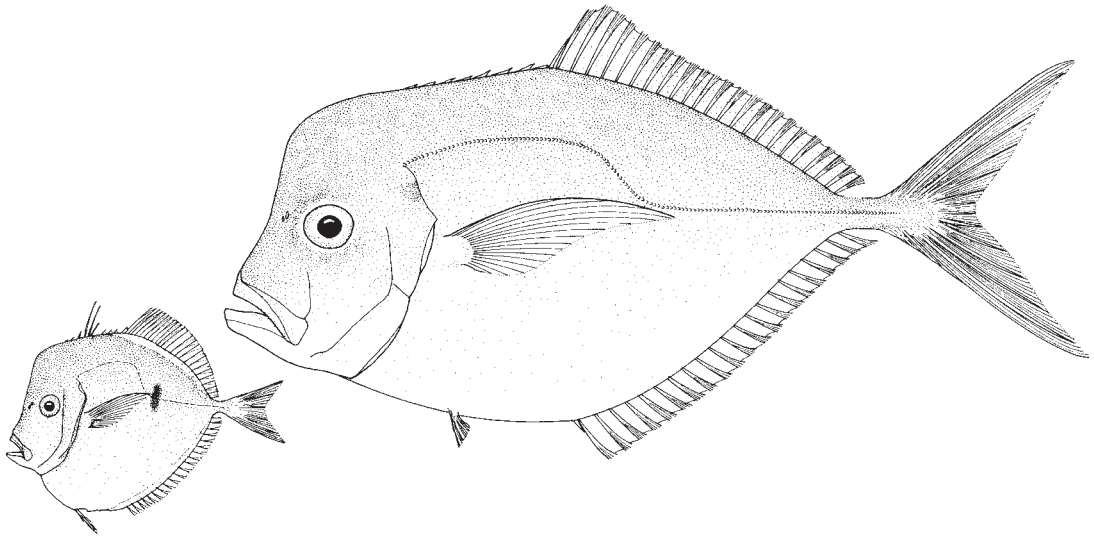
Remarks: There is a single confirmed record of *Selar boops* (Cuvier) trawled in 366 to 458 m off Portugal and thus outside the area of coverage. This species is contrasted with *Selar crumenophthalmus* in the key because it almost certainly has a broader eastern Atlantic range. This record has generally been overlooked because the species was misidentified as *S. crumenophthalmus* in the original publication documenting this unexpected distributional record.



***Selene dorsalis* (Gill, 1862)**

Frequent synonyms / misidentifications: *Vomer gibbiceps* Gilchrist and Thompson, 1914 / *Vomer setapinnis* (Mitchill, 1815); *V. setapinnis dorsalis* Gill, 1862; *Selene vomer* (Linnaeus, 1758).

FAO names: En – African lookdown; Fr – Musso africain; Sp – Jorobado africano.



juvenile 4.5 cm FL

Diagnostic characters: Body short, very deep and extremely compressed, with ventral profile more convex than dorsal; head profile rounded at top and sharply sloping through a slight concavity in front of eye to a blunt snout with lower jaw protruding; eye moderately small, its diameter contained 3.3 to 4.2 times in head length. Upper jaw short, expanded at posterior end, and ending far below and about under anterior margin of eye. Teeth relatively small; upper jaw with a narrow irregular band; lower jaw with a narrow irregular band tapering to an irregular row posteriorly. Gill rakers on first arch 7 to 9 upper, 31 to 34 lower and 38 to 43 total. Dorsal fin with 8 spines, followed by 1 spine and 23 or 24 soft rays; anal fin with 2 spines (resorbed and not apparent at about 13 cm fork length) separated from rest of fin, followed by 1 spine and 18 to 20 soft rays; first 4 dorsal fin spines elongated in fish shorter than 6 cm fork length, with the longest (second) spine about equal in length to body depth, these spines becoming very short and nearly resorbed at 30 cm fork length; second dorsal-fin lobe only slightly elongated, contained 7.2 to 10.1 times in fork length; pelvic fins relatively short at all sizes, becoming nearly rudimentary. Body superficially naked, scales small and embedded, covering most of lower half of body but absent on most of area anterior from pelvic fin to below curved portion of lateral line; scutes in straight part of lateral line weak, scarcely differentiated, numbering from 8 to 17 over caudal peduncle. Vertebrae 10 precaudal and 14 caudal. **Colour:** in life, body and head silvery, sometimes with a metallic bluish cast, more pronounced on upper body, head and snout; a faint dark spot on edge of opercle near upper margin; a narrow black area on top of caudal peduncle; fins clear or hyaline, with dusky or olive yellow tints on second dorsal and caudal-fin lobes in some. **Juveniles (about 5 to 9 cm fork length) generally silvery with an oval black spot over straight part of lateral line.**

Size: Maximum is unknown, largest examined 32.5 cm fork length (36 cm total length), 0.4 kg; common to 24 cm fork length.

Habitat, biology, and fisheries: A schooling species, usually found near the bottom from inshore waters to at least 60 m depth. The young of less than 3 cm fork length occur near the surface, and juveniles may be found in bays and river mouths. Feeds on small fishes and crustaceans. Shelf waters throughout its range. Caught with pelagic and bottom trawls. Utilized fresh and for fishmeal and oil.

Distribution: Eastern Atlantic distribution not well known; definitely known from the Canary (very rare), Cape Verde islands, and Madeira and along the African coast from Senegal to Walvis Bay, Namibia; also unconfirmed records from Portugal and Madeira.

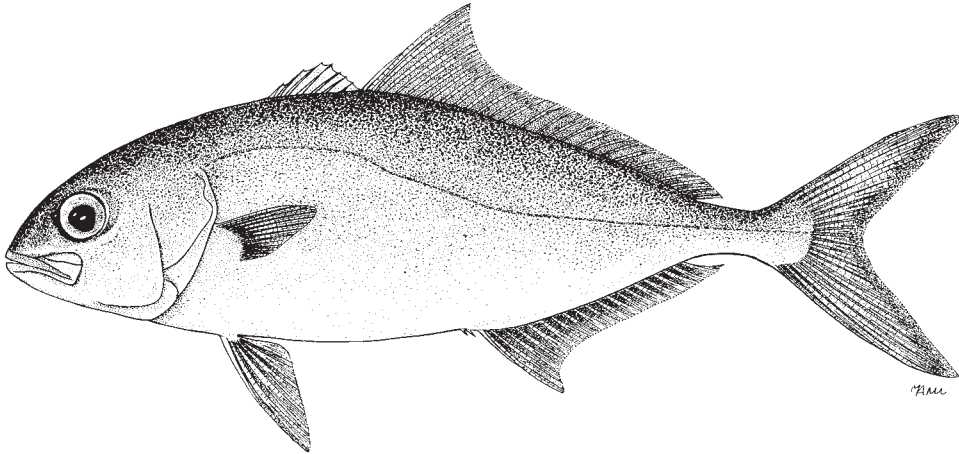
Remarks: Justification for recognition as a separate species is a molecular phylogeny (Reed *et al.*, 2002) indicating that the western Atlantic *Selene setapinnis* (Mitchill) and eastern Pacific *S. peruviana* (Guichenot) are sister taxa with *Selene dorsalis* as the basal member of a short-finned *Selene* triad.



Seriola carpenteri Mather, 1971

Frequent synonyms / misidentifications: None / *Seriola dumerili* (Risso), 1810.

FAO names: **En** – Guinean amberjack; **Fr** – Sériole guinéenne; **Sp** – Medregal de Guinea.



Diagnostic characters: Body elongate, moderately shallow and slightly compressed, with upper profile slightly more convex than lower; eye relatively small, its diameter contained 4.2 to 5.8 times in head length. **Upper jaw moderately broad at end (with a moderately broad supramaxilla)**, extending to below anterior margin of pupil. Teeth minute, in a band in upper and lower jaws. **Gill rakers (excluding rudiments)** on first arch **relatively constant in number with growth; at sizes larger than about 15 cm fork length**, 5 to 7 upper, 14 to 17 lower and **20 to 24 total**. **Dorsal fin with 7 or usually 8 spines** (caution: first and last spine becoming reduced and embedded in large fish), followed by 1 spine and 28 to 33 soft rays; anal fin with 2 spines separated from rest of fin (the spines becoming reduced and skin-covered in some large fish), followed by 1 spine and 19 or 20 soft rays; **second dorsal-fin lobe moderately long, contained 6.0 to 6.9 times in fork length**; anal-fin base moderately short, contained 1.5 to 1.7 times in second dorsal-fin base; pelvic fins longer than pectorals. Scales small and cycloid; no scutes. **Caudal peduncle grooves present**. **First pterygiophore of anal fin with distinctly concave anterior margin**. Vertebrae 10 precaudal and 14 caudal. **Colour:** in fresh adults, not well established, **large fish** reported to be “old rose” coloured. **Juveniles with a dark nuchal bar, variable in position**, extending from the eye to the dorsal-fin origin or curving toward a point nearer the nape; **5 dark body bands**, becoming irregularly split vertically, **which do not extend into the membranes of the second dorsal and anal fins**, a sixth band at end of caudal peduncle; **interradial membranes of second dorsal and anal fins predominantly dark (distinctive to about 25 cm fork length)**.

Size: Maximum is uncertain due to past confusion with *Seriola dumerili*; at least to 75 cm fork length, but possibly attains a larger size.

Habitat, biology, and fisheries: Adults are pelagic or epibenthic; generally restricted to coastal waters over the continental shelf, from the surface to at least 200 m depth. Shelf waters throughout its range. Data on fishing gear and utilization uncertain due to past confusion of this species with other representatives of *Seriola*.

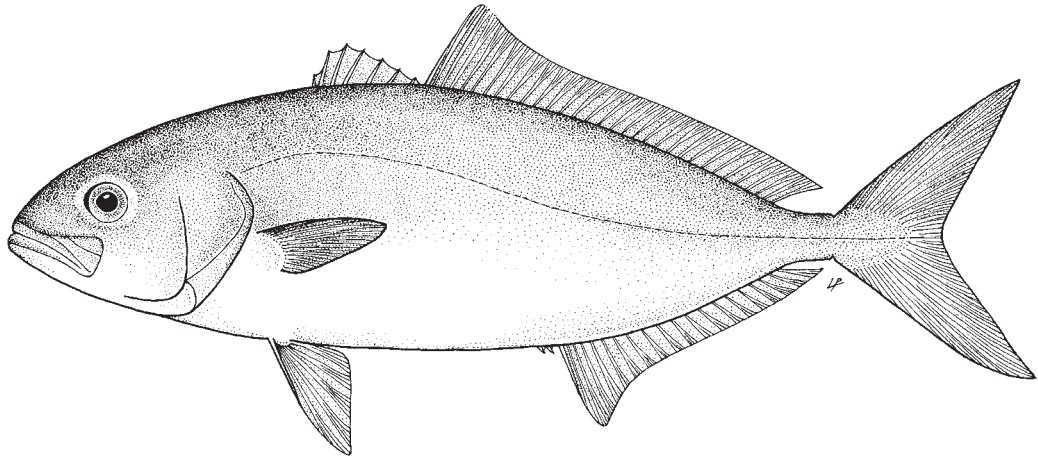
Distribution: Mediterranean Sea, Portugal and (rarely) northward to the English Channel (where records unconfirmed and likely based on misidentifications), Maderia, Cape Verde, Canary Islands (rare) and Morocco to Angola. Generally confined to areas where surface temperatures exceed 25°C. Its distribution may be influenced by seasonal movements of the 18 to 27°C water mass along the African coast.



Seriola dumerili (Risso, 1810)

Frequent synonyms / misidentifications: None / *Seriola carpenteri* Mather, 1971.

FAO names: En – Greater amberjack; Fr – Sériole couronnée; Sp – Pez de limón.



Diagnostic characters: Body elongate, moderately shallow, and slightly compressed, with upper profile slightly more convex than lower. **Upper jaw broad posteriorly** (and broad supramaxilla with posterodorsal angle usually rounded) **and extending to below about middle of eye.** Teeth minute, in a broad band in upper and lower jaws. **Gill rakers (excluding rudiments)** on first arch **decreasing in number with growth;** at sizes less than 20 cm fork length, 5 or 6 upper, 15 or 16 lower, 18 to 24 total, **at sizes larger than 20 cm fork length, about 11 to 19 total.** Dorsal fin with 7 spines (caution; first and last spine reduced or embedded in fish larger than 60 cm fork length), followed by 1 spine and 29 to 34 soft rays; anal fin with 2 detached spines (these spines reduced or completely embedded in large fish), followed by 1 spine and 18 to 22 soft rays; **second dorsal-fin lobe relatively short, contained 6.7 to 8.1 times in fork length;** anal-fin base moderately short, contained 1.4 to 1.7 times in second dorsal-fin base; pelvic fins longer than pectorals. Scales small and cycloid; no scutes. **Caudal peduncle grooves present. First pterygiophore of anal fin curved in specimens larger than about 10 cm fork length.** Vertebrae 10 precaudal and 14 caudal. **Colour:** bluish grey or olivaceous above, sides and belly silvery white, sometimes brownish or with a pinkish tinge; **usually a dark nuchal bar extending through eye to first dorsal-fin origin;** often amber stripe from eye along middle of body; caudal fin dark or dusky with a lighter narrow posterior margin, extreme tip of lower caudal lobe sometimes light or white. **Juveniles (2 to 17 cm fork length) with 5 dark body bands that become irregularly split vertically, which do not extend into the membranes of the second dorsal and anal fins,** a sixth band at end of the caudal peduncle; interradial membranes of second dorsal and anal fins generally clear.

Size: Maximum to 80.6 kg and 188 cm total length (Bermuda); common from about 70 to 110 cm fork length. All-tackle IGFA world angling record 70.6 kg.

Habitat, biology, and fisheries: Epibenthic and pelagic. Smaller fish (less than 3 kg) may be taken in shallow water (less than 10 m). Larger fish usually in 18 to 72 m but taken as deep as 360 m; often found on reefs or at deep offshore holes or drop-offs, usually in small or moderate-sized schools, but may be solitary. Juveniles associate with *Sargassum* or flotsam in oceanic and offshore neritic waters. Feeds primarily on fish and also invertebrates, and also takes live, dead, and artificial bait. Caught with pelagic and bottom trawls as well as on line gear. Utilized fresh, smoked, dried-salted and for fishmeal and oil. Large individuals have been implicated in ciguatera poisoning in some areas of the West Indies and the Pacific Ocean.

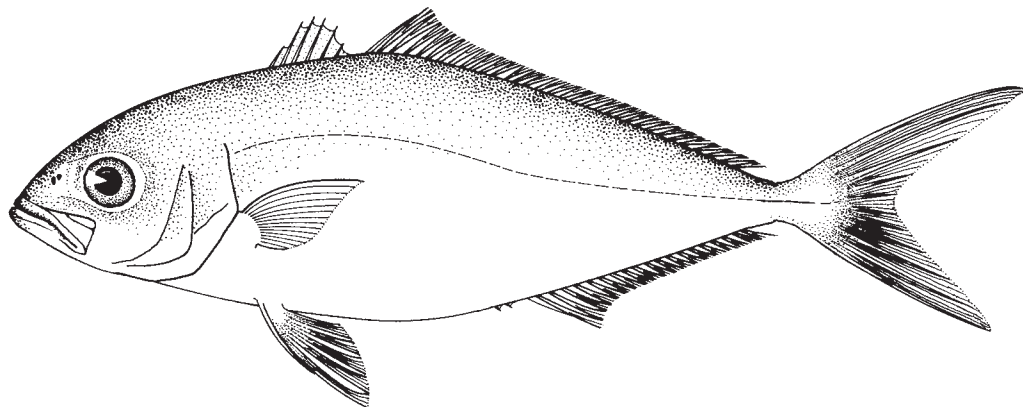
Distribution: Eastern Atlantic distribution not well established due to past confusion with *S. carpenleri* but presumably occurs along the northwestern African coast at least to Ghana (and perhaps to Angola), and definitely known from the Mediterranean Sea, Madeira, Canary and Cape Verde and Ascension Islands, and from southern England where it is exceptionally rare. Elsewhere it is known from Bermuda, Nova Scotia to Brazil, and the Indo-Pacific from South Africa, Australia, Japan and the Hawaiian Islands.



Seriola fasciata (Bloch, 1793)

Frequent synonyms / misidentifications: None / *Seriola carpenteri* Mather, 1971.

FAO names: En – Lesser amberjack; Fr – Sériole babiane; Sp – Medregel listado.



Diagnostic characters: Body elongate, moderately deep, and slightly compressed, with upper profile slightly more convex than lower. Upper jaw moderately broad posteriorly (**with narrow supramaxilla**), and extending to below about anterior margin of pupil. Teeth minute, in a band in upper and lower jaws. **Gill rakers** on first arch **remaining constant in number with growth; 6 to 8 upper, 16 to 18 lower, and 23 to 27 total**. Dorsal fin with 8 spines (caution: first or eighth spine may be minute in large fish), followed by 1 spine and 28 to 33 soft rays; anal fin with 2 detached spines, followed by 1 spine and 17 to 20 soft rays; **second dorsal-fin lobe relatively short contained about 6.5 to 8.6 times in fork length**; anal-fin base moderately short, contained about 1.6 to 1.9 times in second dorsal-fin base; pelvic fins longer than pectorals. Scales small and cycloid; no scutes. Caudal peduncle grooves present. First pterygiophore of anal fin curved in specimens larger than about 10 cm fork length. Vertebrae 10 precaudal and 14 caudal. **Colour:** fresh adults, dorsal surface dark (pinkish or violet), sides lighter, and belly white or silvery; faint, dark nuchal bar, and a faint narrow lateral amber stripe extending backward from eye may be present. Dorsal fin dusky; second dorsal-fin lobe tip clear to whitish; anal-fin lobe with white, rest of fin dusky to dark; pectoral fins clear to dusky; pelvic fins white with most of dorsal surface dark; caudal fin dusky to dark with a lighter, narrow posterior margin; **dark nuchal bar, when present, extending from eye to nape (ending well anterior to first dorsal fin)**. **Juveniles (to about 20 cm fork length) with 7 dark body bands, irregular and broken, third through seventh, which extend into the membranes of the second dorsal and anal fins**, an eighth dark band at end of caudal peduncle; dark, rounded spot on medial caudal-fin rays; caudal fin otherwise clear.

Size: Maximum to 67.5 cm fork length at 4.6 kg.

Habitat, biology, and fisheries: Adults apparently occur near to, or on the bottom in 55 to 130 m depth. Larger juveniles are pelagic or benthic in shelf waters; smaller juveniles epipelagic in oceanic or offshore neritic waters. Known to eat squid and to take dead bait. Caught incidentally, mostly on line gear. Utilized fresh and dried-salted.

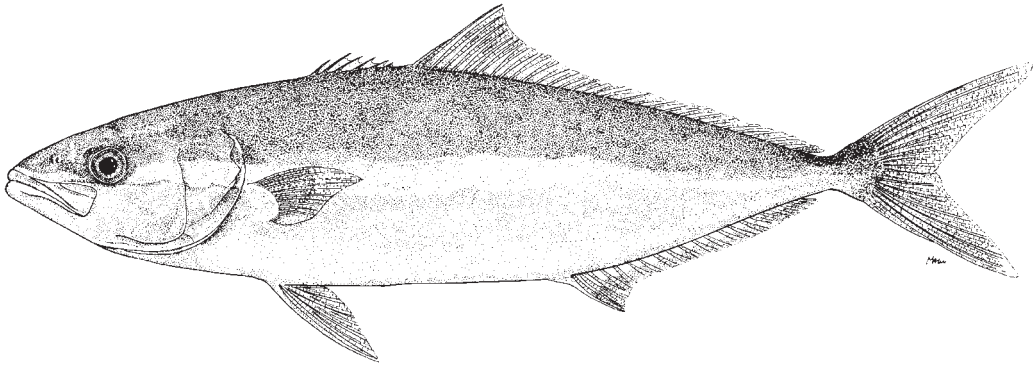
Distribution: Eastern Atlantic distribution uncertain due to past confusion with *Seriola carpenteri*; definitely known from the southeastern Mediterranean Sea, Azores, Madeira, Canary, Cape Verde, and St Helena islands. Also occurs in the western Atlantic from Bermuda and Massachusetts to Brazil.



Seriola lalandi Valenciennes, 1833

Frequent synonyms / misidentifications: South Africa, *Seriola pappei* (Castelnau, 1861) and *S. banisteri* Smith, 1959; Australia, *S. grandis* Castelnau, 1872; Eastern Pacific, *S. dorsalis* (Gill, 1864) / None.

FAO names: En – Yellowtail amberjack; Fr – Sériole chicard; Sp – Medregal rabo amarillo.



Diagnostic characters: Body elongate, moderately slender and slightly compressed, with upper and lower profiles similar; eye relatively small, its diameter contained 5.0 to 7.9 times in head length. **Upper jaw moderately slender at end (with moderately slender supramaxilla), extending to below about middle of eye.** Teeth minute, in a broad band in upper and lower jaws. Gill rakers (including rudiments) on first arch 7 to 10 upper, 15 to 20 lower and 23 to 29 total. Dorsal fin with 7 spines (seventh spine becoming reduced or skin-covered in large fish), followed by 1 spine and 30 to 34 soft rays; anal fin with 2 spines separated from rest of fin (these spines reduced and may be skin-covered in large fish), followed by 1 spine and 19 to 22 soft rays; **second dorsal-fin lobe short, 7.0 to 8.8 times in fork length; anal-fin base moderately short contained 1.6 to 1.8 times in second dorsal-fin base;** pelvic fins longer than pectorals. Scales small and cycloid; no scutes. Caudal peduncle with a slight lateral, fleshy keel on each side and dorsal and ventral grooves present. **Vertebrae 11 precaudal and 14 caudal;** first pterygiophore of anal fin with distinctly concave anterior margin. **Colour:** blue to olivaceous above, sides and belly silver to white, sometimes with a rosy tinge; a narrow bronze stripe from snout extending through eye and along midside of body, darker on head, becoming yellow posteriorly; spinous dorsal fin dusky; second dorsal fin and anal fin dusky olive basally, yellow distally; **caudal fin olivaceous yellow, pectoral and pelvic fins yellowish.** Juveniles (to about 20 cm fork length) with many irregular dusky body bands, slightly wider than paler interspaces, which do not extend into the membranes of the second dorsal and anal fins.

Size: Maximum is not known but attains at least 150 cm fork length and 50 kg. If *Seriola banisteri* is conspecific, as believed, then the maximum verified size is 193 cm total length and 58.4 kg.

Habitat, biology, and fisheries: Congregates in large offshore shoals in depths of 50 m, but occasionally ventures into surf zones in pursuit of prey. Feeds primarily on small fishes and squid. An excellent sport fish. Caught with seines, bottom trawls and on hook- and-line.

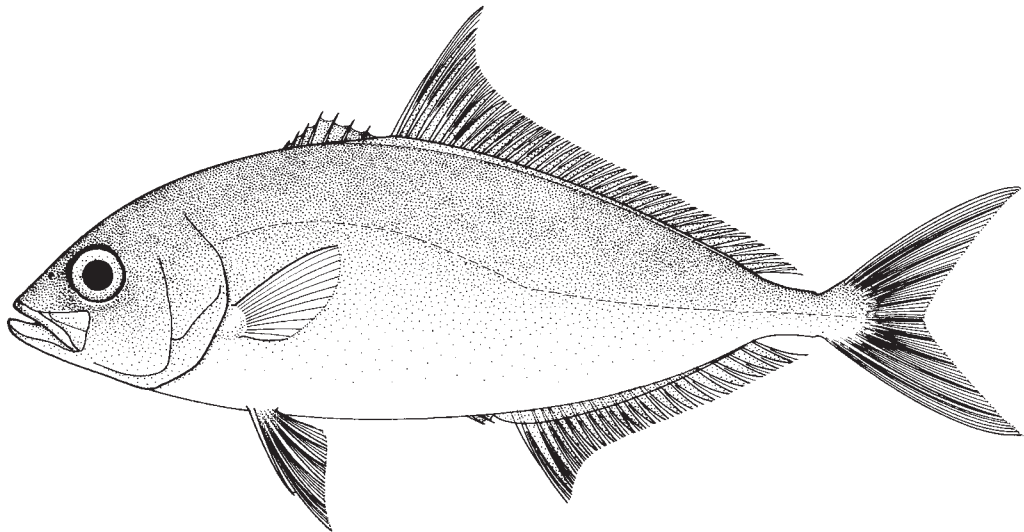
Distribution: In the eastern Atlantic known only from St Helena Island and South Africa. A circumglobal species restricted to subtropical waters, and consisting of a series of disjunct populations, some of which are still considered to represent distinct species. Elsewhere known from Africa, Australia, New Zealand, Rapa, Pitcairn, Easter, Hawaiian islands, southern Brazil and Argentina, Galapagos Islands, and the west coast of the United States.



Seriola rivoliana Valenciennes, 1833

Frequent synonyms / misidentifications: *Seriola falcata* Cuvier, 1833; South Africa, *S. songoro* Smith, 1959; Mozambique, *S. bovinoculata* Smith, 1959; eastern Pacific, *S. colburni* Evermann and Clark, 1928 / None.

FAO names: En – Almaco jack; Fr – Sériole limon; Sp – Medregal limón.



Diagnostic characters: Body elongate, moderately deep, and slightly compressed, with upper profile more convex than lower. **Upper jaw very broad posteriorly** (and broad supramaxilla with posterodorsal angle often acute in adults) and extending to below about anterior margin of pupil. Teeth minute, in a broad band in both jaws. **Gill rakers** on first arch **decreasing slightly in number with growth, 6 to 9 upper, 18 to 20 lower, and 24 to 29 total at sizes less than 10 cm fork length, at larger sizes total gill rakers 18 to 25.** Dorsal fin with 7 spines (caution: first and last spine minute or embedded in large fish), followed by 1 spine and 27 to 33 soft rays; anal fin with 2 detached spines (reduced or completely embedded in large fish), followed by 1 spine and 18 to 22 soft rays; **second dorsal-fin lobe long, contained 4.0 to 6.3 times in fork length;** anal-fin base moderately long, contained 1.5 to 1.6 times in second dorsal-fin base; pelvic fins longer than pectorals. Scales small and cycloid; no scutes. Caudal peduncle grooves present. **First pterygiophore of anal fin straight in specimens larger than about 10 cm fork length.** Vertebrae 10 precaudal and 14 caudal. **Colour:** brown or olivaceous to bluish green above, sides and belly lighter, sometimes with brassy or lavender reflections, **dark nuchal bar often persistent in adults and extending from eye to first dorsal-fin origin,** faint amber lateral stripe extending backward from eye frequently present; anal fin mostly dark, usually with the lobe white, often with a narrow distal white margin along fin, and sometimes with the anterior edge of lobe white; pelvic fins white ventrally and laterally with a dark dorsal surface, or sometimes entirely dark; caudal fin dark with a lighter narrow posterior margin. **Juveniles** (to about 2 to 18 cm fork length) **with dark nuchal bar extending to first dorsal-fin origin; 6 dark body bands, each with a lighter narrow irregular area through their middle vertically,** which do not extend into the membranes of the second dorsal and anal fins, a seventh dark band at end of caudal peduncle; **dorsal and anal fins dark** and anal-fin tip white; pectoral, pelvic, and caudal fins becoming dusky.

Size: Common from about 55 cm fork length and 2.5 kg to 80 cm fork length and 3.4 kg. All-tackle IGFA Atlantic world angling record 35.4 kg.

Habitat, biology, and fisheries: Adults are pelagic and epibenthic, possibly more oceanic than other *Seriola* species, and rarely caught in inshore waters. Juveniles are pelagic and occur offshore, under floating plants and debris. Known to feed on fish, to strike trolled artificial bait and bottom fished dead bait. Caught with pelagic and bottom trawls and on line gear. Utilized fresh, dried-salted and for fishmeal and oil.

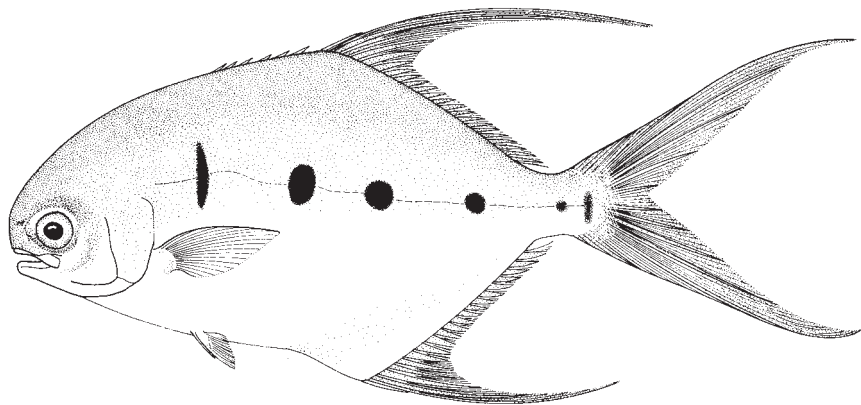
Distribution: Eastern Atlantic distribution not well known, definitely known only from southern England, the Azores, Portugal, Madeira, Cape Verde, Canary, São Tomé and Príncipe islands (Gulf of Guinea), Ascension, and along the African coast from Morocco to at least southern Angola; a recent record from the Mediterranean Sea (off Lampedusa Island). Circumtropical in marine waters, entering temperate waters in some areas.



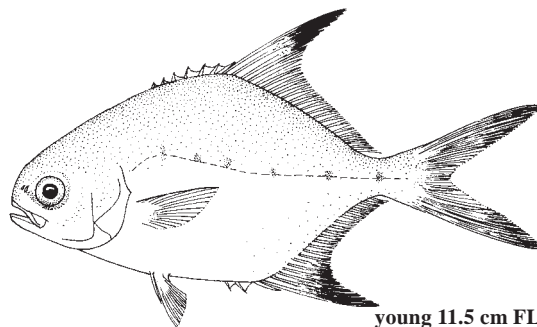
***Trachinotus goreensis* Cuvier, 1832**

Frequent synonyms / misidentifications: *Trachinotus myrias* Cuvier, 1832 / None.

FAO names: En – Longfin pompano; Fr – Pompaneau tacheté; Sp – Pámpano cojonovo.



Diagnostic characters: Body short, deep and compressed with upper and lower profiles similar but slightly asymmetrical and head profile sloping to a blunt snout; eye small, its diameter contained 3.1 to 3.9 times in head length. Upper jaw very narrow at end and extending to below posterior margin of pupil. Teeth in jaws small, conical and recurved, consisting of a broad band anteriorly, tapering posteriorly; **no teeth on tongue** at any size. Gill rakers on first arch 6 to 8 upper and 11 to 13 lower. Dorsal fin with 6 spines, followed by 1 spine and 20 to 23 soft rays; anal fin with 2 short spines



young 11.5 cm FL

separated from rest of fin, followed by 1 spine and 18 to 21 soft rays; bases of anal and soft dorsal fins about equal in length; **second dorsal-fin lobe longer than head at sizes larger than about 10 cm fork length, contained 1.8 to 3.2 times in fork length**; pectoral fins short, contained 1.2 to 1.5 times in head length. Scales small, cycloid and partially embedded; lateral line slightly arched to below middle of second dorsal fin and straight thereafter; no scutes. Vertebrae 10 precaudal and 14 caudal. No hyperostosis or caudal peduncle grooves. **Colour:** 4 to 6, usually 5, dark blotches on sides forming at about 7 to 9 cm fork length; the anterior blotch a vertically elongate bar, the second oval, and the remainder more rounded and progressively smaller; dorsal, anal, and caudal-fin lobes dark with a light distal margin.

Size: Maximum is unknown, largest individual examined by author 26 cm fork length but undoubtedly attains a much larger size (unpublished records of 100 cm total length).

Habitat, biology, and fisheries: Inhabits mostly shallow coastal waters, but may also occur at depths of about 100 m. Separate statistics are not reported for this species. Caught with pelagic and bottom trawls and seines. Utilized fresh, dried-salted and for fishmeal and oil.

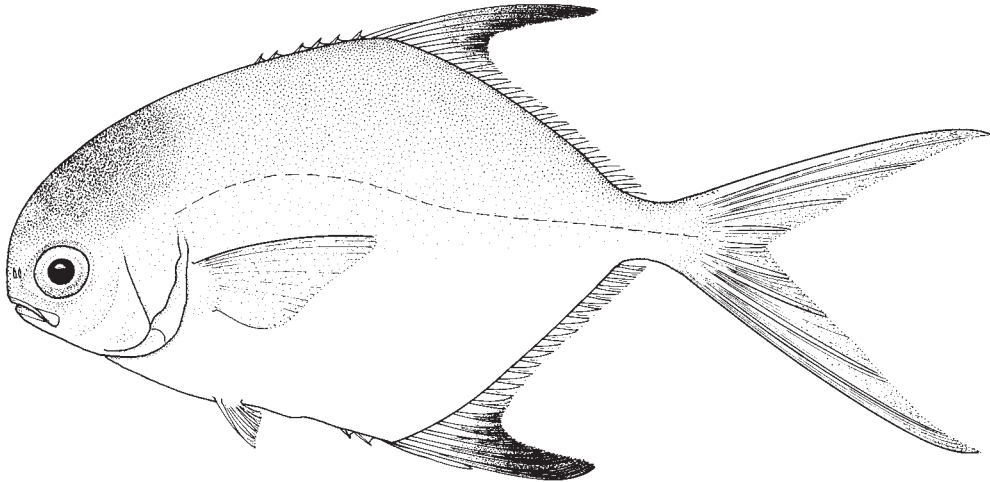
Distribution: Not well known, occurs at least from Mauritania to the Gulf of Guinea, and the Cape Verde Islands.



***Trachinotus maxillosus* Cuvier, 1832**

Frequent synonyms / misidentifications: None / *Trachinotus teraia* Cuvier, 1832.

FAO names: En – Galloon pompano; Fr – Pompaneau chevron; Sp – Pámpano galonero.



Diagnostic characters: Body short and deep and compressed with upper and lower profiles similar and head profile sloping to a blunt snout; eye small its diameter contained 2.7 to 3.8 times in head length; upper jaw very narrow at end and extending to below midpoint of eye. Teeth in jaws small, conical and slightly recurved, disappearing completely at about 30 cm fork length; **tongue with narrow, median band of teeth in young, resorbing in large fish** and completely absent at about 35 cm fork length. Gill rakers (including rudiments) on first arch 5 to 8 upper and 9 to 11 lower. Dorsal fin with 6 spines, followed by 1 spine and 20 or 21 soft rays; anal fin with 2 short spines separated from rest of fin, followed by 1 spine and 17 to 20 soft rays; bases of anal fin and soft dorsal fins about equal in length; **second dorsal-fin lobe usually longer than head at sizes larger than about 10 cm fork length, contained 2.5 to 4.2 times in fork length**; pectoral fins short contained 1.1 to 1.2 times in head length. Scales small, cycloid and partially embedded; lateral line slightly arched to below middle of second dorsal fin and straight thereafter; no scutes. Vertebrae 10 precaudal and 14 caudal; in large adults, hyperostosis present in pterygiophores of middle dorsal-fin spines and first 2 anal-fin spines, and ribs 3 and 4. No caudal peduncle grooves. **Colour:** no distinctive markings on body pelvic fins pale, other fins dusky to dark, **anal-fin lobe orange with black tip and anterior margin**; upper third of head and body dark and silvery white to yellowish below.

Size: Maximum: largest individual examined by author 56 cm fork length, but unconfirmed reports of 80 cm total length.

Habitat, biology, and fisheries: Inhabits shallow coastal waters. Separate statistics are not reported for this species. Caught with pelagic and bottom trawls. Utilized fresh and dried-salted.

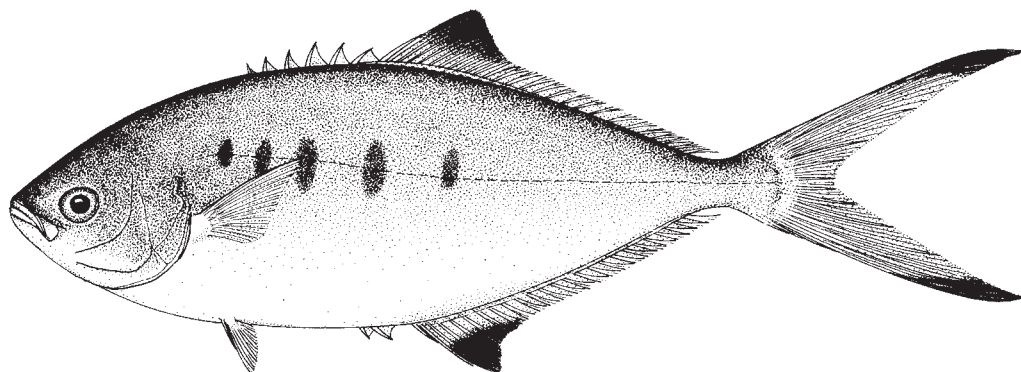
Distribution: Cape Verde Islands and Senegal to Angola.



Trachinotus ovatus (Linnaeus, 1758)

Frequent synonyms / misidentifications: *Lichia glaucus* Cuvier, in Cuvier and Valenciennes, 1832; *Caesimorus glaucus* Fowler, 1936; *Trachinotus glaucus* (Linnaeus, 1758) / None.

FAO names: En – Pompano; Fr – Palomine; Sp – Pámpano blanco.



Diagnostic characters: Body moderately elongate and compressed, with upper and lower profiles similar and head profile sloping to a bluntly pointed snout; eye small, its diameter contained 3.4 to 4.1 times in head length. Upper jaw very narrow at end and extending only to below anterior third of eye. Teeth in jaws small, conical and recurved, consisting of a broad band anteriorly, tapering posteriorly; tongue with a narrow band of teeth, broader posteriorly. **Gill rakers** on first arch **10 to 19 upper and 22 to 32 lower**. Dorsal fin with 6 spines, followed by 1 spine and 23 to 27 soft rays; anal fin with 2 short spines separated from rest of fin, followed by 1 spine and 22 to 25 soft rays; bases of anal and second dorsal fins about equal in length; **second dorsal-fin lobe shorter than head contained 6.5 to 8.3 times in fork length**; pectoral fins short, contained 1.3 to 1.6 times in head length. Scales small, cycloid and partially embedded; lateral line slightly arched above pectoral fins and straight thereafter; no scutes. Vertebrae 10 precaudal and 14 caudal. No hyperostosis or caudal peduncle grooves. **Colour: 3 to 5 dark blotches on sides** the anterior 3 or 4 blotches below the spinous dorsal fin are vertically elongate and extend ventrally for about one-third their length or more below the lateral line; **dorsal- and anal-fin lobes black distally** remainder of dorsal fin clear to slightly dusky and anal fin usually clear; caudal-fin lobes becoming black near tips.

Size: Maximum to about 70 cm total length, common to 35 cm.

Habitat, biology, and fisheries: Adults and juveniles usually occur in schools in the surf zone and clear water along sandy beaches. Known to eat small invertebrates and fishes. Separate statistics are not reported for this species. Caught with pelagic and bottom trawls, purse seines, setnets and on line gear. Utilized fresh, frozen, smoked, dried-salted and for fishmeal and oil.

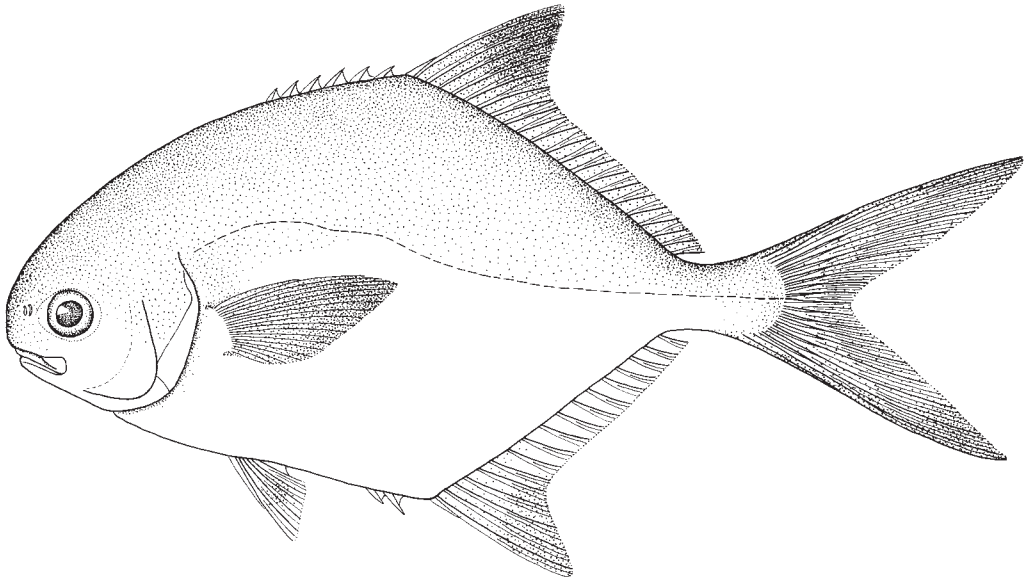
Distribution: African coast from Morocco to southern Angola and all the offshore islands, including Ascension and St Helena islands; also common in the Mediterranean and occasionally taken in northern European waters.



***Trachinotus teraia* Cuvier, 1832**

Frequent synonyms / misidentifications: None / *Trachinotus falcatus* (Linnaeus, 1758); *T. maxillosus* Cuvier, 1832.

FAO names: En – Terai pompano; Fr – Pompaneau né-bé; Sp – Pámpano terayo.



Diagnostic characters: Body short and deep and compressed with upper and lower profiles similar and head profile sloping to a blunt snout; eye small, its diameter contained 2.8 to 4.6 times in head length; upper jaw very narrow at end and extending to below posterior margin of pupil. Teeth in jaws small, conical and recurved, consisting of a band anteriorly, tapering posteriorly; **no teeth on tongue at any size**. Gill rakers on first arch 5 to 7 upper and 9 to 13 lower. Dorsal fin with 6 spines, followed by 1 spine and 19 to 21 soft rays; **anal fin with 2 short spines separated from rest of fin, followed by 1 spine and 16 to 18 soft rays**; bases of anal fin and soft dorsal fin about equal in length; **second dorsal-fin lobe shorter than head, contained 4.1 to 5.6 times in fork length**; pectoral fins short, contained 1.1 to 1.5 times in head length. Scales small, cycloid and partially embedded; lateral line slightly arched to below middle of second dorsal fin and straight thereafter; no scutes. Vertebrae 10 precaudal and 14 caudal. No hyperostosis or caudal peduncle grooves. **Colour:** **no distinctive markings on body**; dark on upper third of head and body (bluish grey through iridescent blue to blue-green) and silvery below; **pelvic and anal fins mostly yellow with distal half of anal-fin lobe dark**; pectoral fin and lobes of dorsal and caudal fins dusky to black.

Size: Maximum to 61 cm fork length (68 cm total length) and 7.9 kg.

Habitat, biology, and fisheries: An inshore species often present in estuaries and occasionally found in rivers well inland. Feeds on molluscs, crustaceans, other invertebrates and small fish. Separate statistics are not reported for this species. Caught with pelagic and bottom trawls and with purse seines. Utilized fresh, dried-salted and for fishmeal and oil.

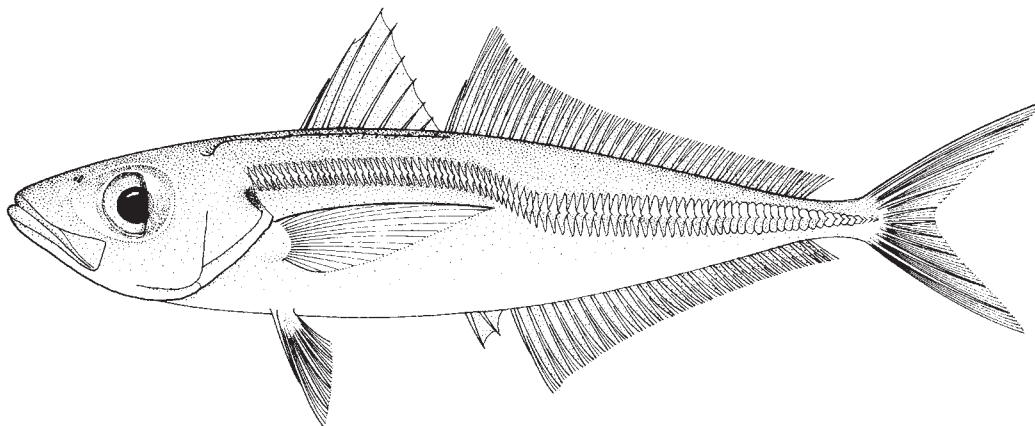
Distribution: Cape Verde Islands and Senegal to Angola.



Trachurus mediterraneus (Steindachner, 1863)

Frequent synonyms / misidentifications: *Trachurus mediterraneus ponticus* Aleev, 1956; *Suareus furnestini* Dardignac and Vincent, 1958 / *Trachurus picturatus* (Bowdich, 1825).

FAO names: **En** – Mediterranean horse mackerel; **Fr** – Chinchard à queue jaune (= Chinchard de la Méditerranée, Area 37); **Sp** – Jurel mediterráneo.



Diagnostic characters: Body elongate and slightly compressed, with upper and lower profiles about equal; eye large (its diameter contained 3.2 to 4.1 times in head length) with a well developed adipose eyelid. Upper jaw moderately broad and extending to below anterior margin of eye. Teeth small, in a single row in upper and lower jaws. **Gill rakers** on first arch 13 to 19 upper and **36 to 44 lower**. **Shoulder girdle (cleithrum) margin with a small furrow at upper end, but no papillae present**. Dorsal fin with 8 spines, followed by 1 spine and 29 to 35 soft rays; anal fin with 2 spines separated from rest of fin, followed by 1 spine and 26 to 31 soft rays; terminal soft ray of dorsal and anal fins connected by a membrane to rest of fin; pectoral fins about equal to head length. Scales moderately small and cycloid covering body except for small area behind pectoral fins; **scales in curved as well as straight part of lateral line enlarged and acute-like**; maximum height of scales in curved lateral line 3.3 to 4.3% of standard length; **scales and scutes in curved part 39 to 48**, in straight part 35 to 44; total scales and scutes in lateral line 75 to 92. **Dorsal accessory lateral line terminating below eighth spine to third soft ray of dorsal fin**. Vertebrae 10 precaudal and 14 caudal. **Colour:** no distinctive markings except for a small, black opercular spot on edge near upper angle. Upper part of body and top of head dusky to nearly black or grey to bluish green; lower two-thirds of body and head usually paler, whitish to silvery.

Size: Maximum to at least 50 cm fork length.

Habitat, biology, and fisheries: Pelagic and migratory, living in large schools from the surface to about 500 m depth. Feeds mainly on small fish and on crustaceans (shrimps and mysids). Continental shelf and upper parts of slope. Separate statistics are not reported for this species. Caught with pelagic and bottom trawls, longlines and purse seines (using light). Utilized fresh, canned and for fishmeal.

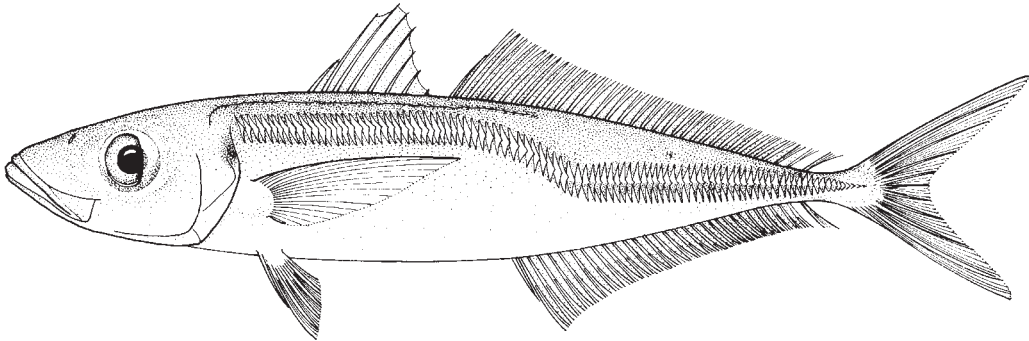
Distribution: Northwest African coast to Senegal and extending northward into the Bay of Biscay. Also occurs in the Mediterranean, Marmara and Black seas, and in the southern and western regions of the Azov Sea.



Trachurus picturatus (Bowdich, 1825)

Frequent synonyms / misidentifications: *Trachurus suareus* (Risso, 1833) / None.

FAO names: En – Blue jack mackerel; Fr – Chinchard du large; Sp – Jurel de altura (= Chicharro).



Diagnostic characters: Body elongate and slightly compressed, with upper and lower profiles about equal; eye large (its diameter contained 3.1 to 3.9 times in head length) with a well developed adipose eyelid. Upper jaw moderately broad and extending to below anterior margin of eye. Teeth small, in a single row in upper and lower jaws. **Gill rakers** on first arch 14 to 17 upper and **41 to 44 lower; shoulder girdle (cleithrum) margin with a small furrow at upper end, but no papillae present.** Dorsal fin with 8 spines, followed by 1 spine and 30 to 35 soft rays; anal fin with 2 spines separated from rest of fin, followed by 1 spine and 27 to 30 soft rays; terminal soft ray of dorsal and anal fins connected by a membrane to rest of fin, but spaced about 50% farther apart than other rays; pectoral fins about equal head length. Scales moderately small and cycloid covering body except for small area behind pectoral fins; **scales in curved as well as straight part of lateral line enlarged and scute-like; maximum height of scales in curved part of lateral line 3.6 to 5.1% of standard length; scales and scutes in curved part 52 to 58, in straight part 39 to 46; total scales and scutes in lateral line 93 to 100; dorsal accessory lateral line terminating below soft rays 6 to 10 of dorsal fin.** Vertebrae 10 precaudal and 14 caudal. **Colour:** no distinctive markings except for a small, black opercular spot on edge near upper angle. Upper part of body and top of head dusky to nearly black or grey to bluish green; lower two-thirds of body and head usually paler, whitish to silvery.

Size: Reliable data unavailable, but said to attain at least 60 cm total length.

Habitat, biology, and fisheries: A pelagic and demersal species ranging in depth to at least 370 m. Continental shelf, upper parts of slope and open waters around islands. Separate statistics are not reported for this species. Caught mostly with pelagic and bottom trawls. Utilized fresh, dried-salted, frozen and for fishmeal.

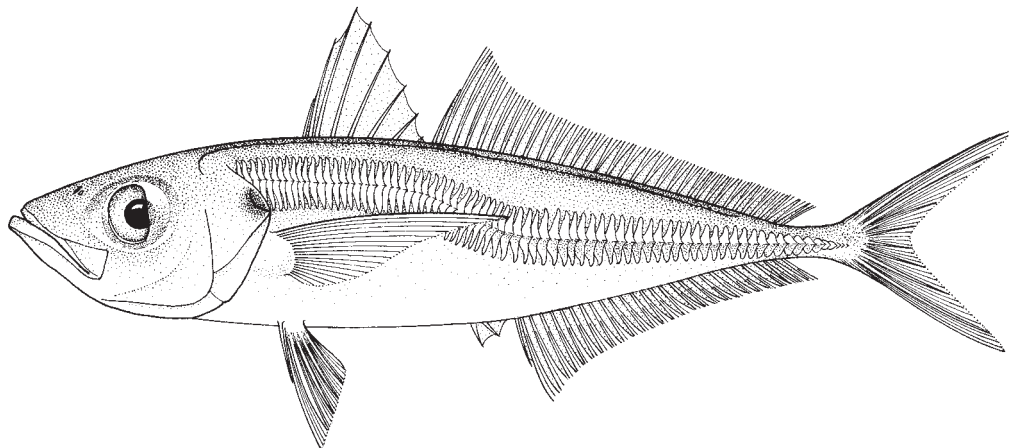
Distribution: Around the Azores, Cape Verde, Madeira, Canary islands, and along the Moroccan coast. Northward extending into the Mediterranean (at least the western part) and to Portugal.



Trachurus trachurus (Linnaeus, 1758)

Frequent synonyms / misidentifications: *Trachurus capensis* Castelnau, 1861 / None.

FAO names: **En** – Atlantic horse mackerel; **Fr** – Chinchard d'Europe; **Sp** – Jurel.



Diagnostic characters: Body elongate and slightly compressed, with upper and lower profiles about equal; eye large (its diameter contained 3.2 to 4.0 times in head length) with a well-developed adipose eyelid. Upper jaw moderately broad and extending to below anterior margin of eye. Teeth small, in a single row in upper and lower jaws. **Gill rakers** on first arch 15 to 20 upper and **41 to 56 lower**; **shoulder girdle (cleithrum) margin with a small furrow at upper end, but no papillae present**. Dorsal fin with 8 spines, followed by 1 spine and 29 to 33 soft rays; anal fin with 2 spines separated from rest of fin, followed by 1 spine and 24 to 29 soft rays; terminal soft ray of dorsal and anal fins connected by a membrane to rest of fin, but spaced about 50% farther apart than other rays; pectoral fins about equal head length. Scales moderately small and cycloid covering body except for small area behind pectoral fins; **scales in curved as well as straight part of lateral line enlarged and acute-like**; maximum height of scales in curved part of lateral line 4.8 to 8.2% of standard length; scales and scutes in curved part 33 to 45, in straight part 31 to 39; total scales and scutes in lateral line 66 to 78; **dorsal accessory lateral line terminating below soft rays 19 to 31 of dorsal fin**. Vertebrae 10 precaudal and 14 caudal. **Colour:** no distinctive markings except for a small, black opercular spot on edge near upper angle. Upper part of body and top of head dusky to nearly black or grey to bluish green; lower two-thirds of body and head usually paler, whitish to silvery.

Size: Maximum to about 60 cm fork length; common to 30 cm fork length.

Habitat, biology, and fisheries: A schooling species, found frequently over sandy bottom localities at 100 to 200 m depth, but may occur in deeper water (to about 500 m); also pelagic and near surface at times. The young sometimes seek shelter under jellyfishes and often occur with shoals of juvenile herrings. Juveniles and adults feed on a wide variety of pelagic and even benthic fishes, crustaceans and squids. Mainly on the continental shelf. No separate statistics were reported for this species. Caught with trawls and purse seines (using light); also with longlines. Utilized fresh, frozen, dried-salted, smoked and canned.

Distribution: In the area from Madeira, the Straits of Gibraltar and Canary and Cape Verde Islands to South Africa; northward extending into the Mediterranean Sea and along the Atlantic coasts of Europe to Norway.

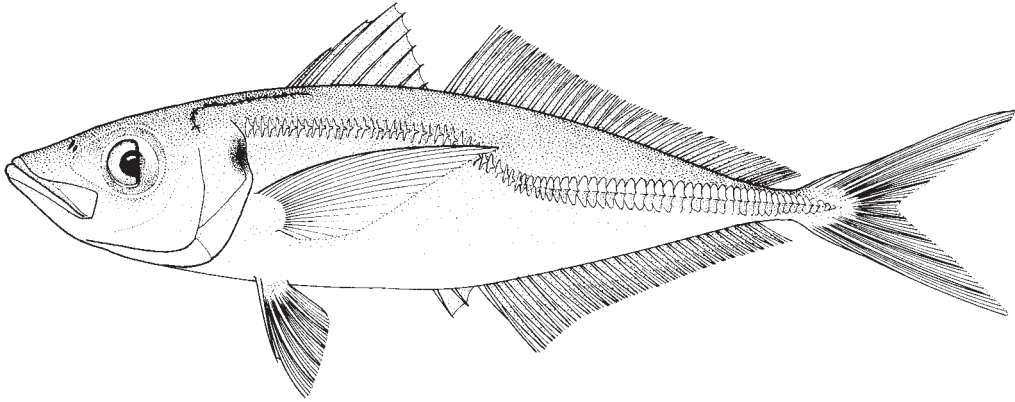
Remarks: Some authors consider the more southern population (Gulf of Guinea to South Africa), for which the name *Trachurus capensis* is available, to be subspecially distinct but differences appear to be only clinal variation.



Trachurus trecae Cadenat, 1949

Frequent synonyms / misidentifications: None / None.

FAO names: En – Cunene horse mackerel; Fr – Chinchard du cunène; Sp – Jurel de cunene.



Diagnostic characters: Body elongate and slightly compressed, with upper and lower profiles about equal; eye large (its diameter contained 3.0 to 3.9 times in head length) with a well-developed adipose eyelid; upper jaw moderately broad and extending to below anterior margin of eye. Teeth small, in a single row in upper and lower jaws. Gill rakers on first arch 13 to 16 upper and 37 to 45 lower; **shoulder girdle (cleithrum) margin with a small furrow at upper end, but no papillae present.** Dorsal fin with 8 spines, followed by 1 spine and 28 to 33 soft rays; anal fin with 2 spines separated from rest of fin, followed by 1 spine and 25 to 29 soft rays; terminal soft ray of dorsal and anal fins connected by a membrane to rest of fin, but spaced 50% farther apart than other rays; pectoral fins about equal to head length. Scales moderately small and cycloid covering body except for a small area behind pectoral fins; **scales in curved as well as straight part of lateral line enlarged and scute-like; maximum height of scales in curved lateral line 2.0 to 2.9% of standard length;** scales and scutes in curved part 35 to 43, in straight part 33 to 38; **total scales and scutes in lateral line 71 to 78; dorsal accessory lateral line terminating below first to sixth dorsal-fin spines.** Vertebrae 10 precaudal and 14 caudal. **Colour:** no distinctive markings except for a small black opercular spot on edge near upper angle. Upper part of body and top of head dusky to nearly black or grey to bluish green; lower two-thirds of body and head usually paler, whitish to silvery.

Size: Attains at least 35 cm fork length; but unconfirmed reports indicate maximum total length up to 80 cm.

Habitat, biology, and fisheries: A schooling species, usually occurring near the bottom in 20 to 300 m with sexually mature fish usually at depths of 100 to 300 m; also sometimes pelagic and near surface at times. Sexually mature fish make seasonal migrations along the coast largely related to water temperature with the largest aggregations usually between the 19 and 21° isotherms. Feeds primarily on crustaceans. Mainly over the continental shelf. Caught with pelagic and bottom trawls and with purse seines. Utilized fresh, frozen, dried-salted, canned and smoked.

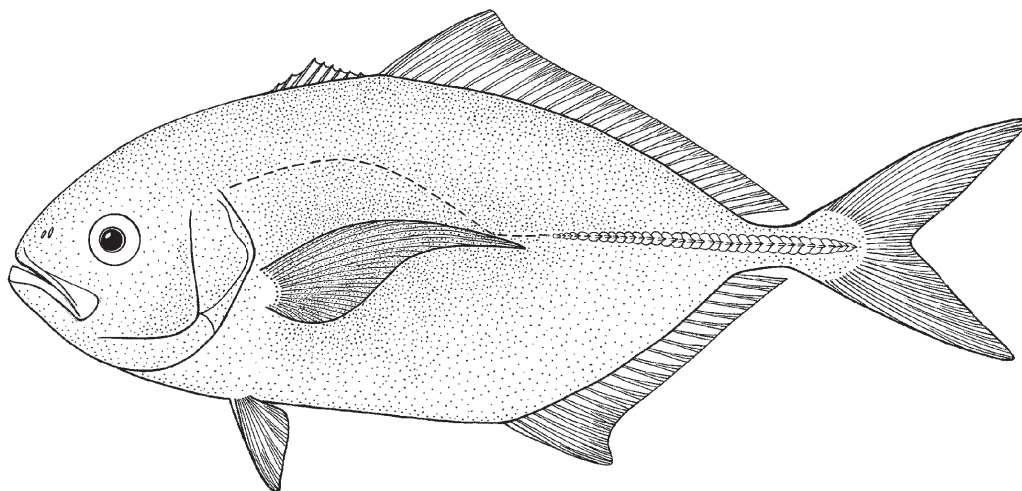
Distribution: In the eastern Atlantic known from the Canary (very rare) and Cape Verde Islands, and along the African coast from Mauritania to southern Angola.



Uraspis helvola (Forster, 1801)

Frequent synonyms / misidentifications: *Caranx helvolus* (Forster, 1801); *C. micropterus* Rüppell, 1836; *Leucoglossa candens* Jordan, Evermann and Wakiya, 1927 / *Uraspis secunda*.

FAO names: **En** – Whitetongue jack; **Fr** – Carangue langue blanche; **Sp** – Jurel lengua blanca.



Diagnostic characters: Meristic and colour pattern characters are essentially identical and broadly overlap those of *Uraspis secunda* (see **Remarks**), and only the following major diagnostic characters (which apply to both species) are repeated here. **In fish smaller than about 20 cm fork length some of the scutes with spines directed anteriorly (antrorse), the number of antrorse spines decreasing with growth. Breast naked ventrally to origin of pelvic fins; laterally naked area of breast separated from naked base of pectoral fin by a broad band of scales. Colour:** tongue, roof and floor of mouth white or cream coloured, the rest blue-black.

Size: Maximum: 46 cm fork length.

Habitat, biology, and fisheries: Apparently an oceanic species; at surface, pelagic, and benthic; solitary or (usually) in small schools.

Distribution: In the area known only from Ascension and St Helena islands. Also widely distributed in the Indo-west Pacific and offshore islands in the northeastern tropical ocean but rarely collected.

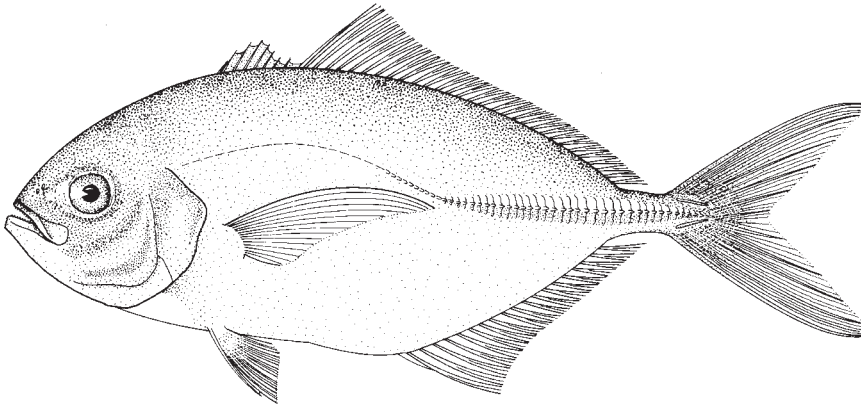
Remarks: Adults of *Uraspis helvola* and *U. secunda* are virtually impossible to distinguish although juvenile characters involving allometric growth patterns suggest that they may be distinct species. If subsequent studies indicate that these 2 nominal species are conspecific, the oldest available name is *Uraspis helvola*. A complete description is given only for *U. secunda* because that name has been widely used for Atlantic *Uraspis*.



Uraspis secunda (Poey, 1860)

Frequent synonyms / misidentifications: *Uraspis heidi* Fowler, 1938; *U. cadenati* Blache and Rossignol, 1962 / *Uraspis helvola*.

FAO names: En – Cottonmouth Jack; Fr – Carangue coton; Sp – Jurel volatín.



Diagnostic characters: Body elongate-ovoid, deep and moderately compressed; snout short and bluntly pointed; eye relatively small (its diameter contained 4.4 to 4.7 times in head length), with a weak adipose eyelid. Upper jaw extending to below anterior margin or to middle of eye. Teeth in jaws in 2 to 4 irregular rows in smaller fish, becoming a single row at about 28 cm fork length. Gill rakers on first arch 3 to 8 upper and 13 to 16 lower. **Dorsal fin with 8 spines followed by 1 spine and 25 to 32 soft rays; anal fin with 2 spines (embedded and apparently absent above 15 cm fork length) followed by 1 spine and 19 to 23 soft rays;** dorsal and anal-fin lobes scarcely produced in larger fish; pectoral fins falcate (longer than head) only in larger fish; pelvic fins elongate in individuals to about 25 cm fork length and relatively short in larger fish. Lateral line with moderate arch, posterior (straight) part with 23 to 40 scutes; **in fish smaller than about 20 cm fork length some scutes with spines directed forward (antrose), the number of antrose spines decreasing with growth. Breast naked ventrally to origin of pelvic fins; laterally naked area of breast separated from naked base of pectoral fin by a broad band of scales.** Bilateral paired caudal keels only moderately developed at larger sizes. Vertebrae 10 precaudal and 14 caudal. No hyperostosis. **Colour:** body and head very dark (leaden, blue-black, or dusky) in fish of 30 cm fork length and larger; juveniles to about 30 cm fork length with 6 or 7 dark bands; **tongue, roof and floor of mouth white or cream coloured, the rest blue-black.**

Size: Maximum to 43.5 cm fork length; common to 35 cm fork length. All-tackle IGFA world angling record 2.0 kg.

Habitat, biology, and fisheries: Throughout water column in oceanic waters; solitary or in small schools; may grunt when caught. Caught in trawls, purse seines, dipnets, and hook-and-line. Taken incidentally. Separate statistics are not reported for this species. Edibility rated as good, but has been implicated in ciguatera poisoning in Cuba.

Distribution: Cape Verde Islands and outer parts of continental shelf and slope from Mauritania to Angola. Also known from scattered localities in the western Atlantic and Indo-Pacific, including Hawaii, and from offshore islands in the northeastern tropical Pacific Ocean. Possibly a junior synonym of *Uraspis helvola*, in which case the species has a circumglobal distribution.

Remarks: Adults of *Uraspis helvola* and *U. secunda* are virtually impossible to distinguish although juvenile characters involving allometric growth patterns suggest that they may be distinct species. If subsequent studies indicate that these 2 nominal species are conspecific, the oldest available name is *Uraspis helvola*.

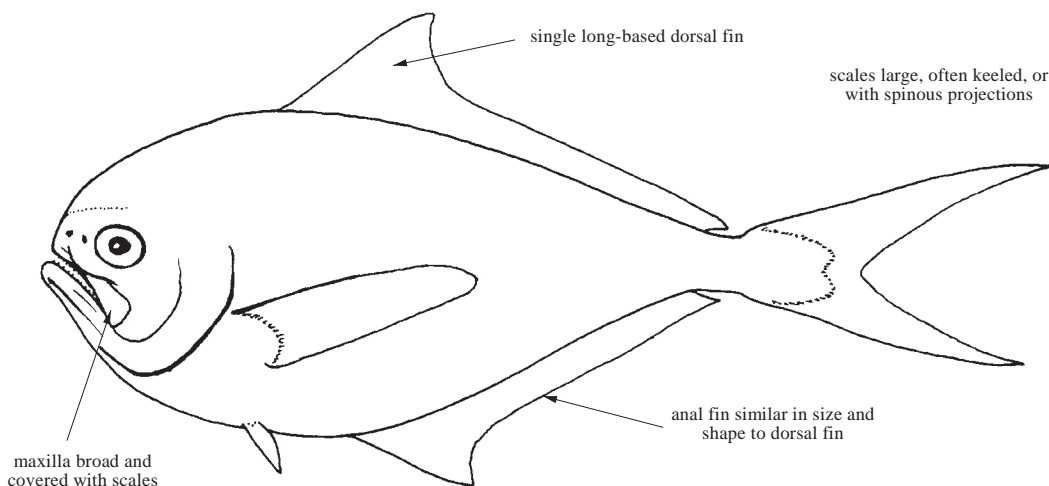


BRAMIDAE

Pomfrets

by R.L. Haedrich, Memorial University, St. John's, Newfoundland, Canada

Diagnostic characters: Medium- to large-sized fishes attaining nearly 1 m total length; **body deep and sometimes very compressed**; head fairly deep, eyes large and located on side of head; mouth large with heavy jaws; **maxilla broad and covered with scales**; **a single long-based dorsal fin, longer or equal in length to anal fin that is very similar to dorsal fin**; both dorsal and anal fin with several spines in anterior part of fin, but not easily distinguished from rays; large caudal fin is often deeply forked; **pectoral fins long and wing-like**; **both pectoral and pelvic fins with scaled axillary processes**; pelvic fins often short, always with 1 spine and 5 rays; lateral line can be poorly formed or absent in some adults; **scales large, adherant, often keeled or modified with spinous projections**; scales cover body and head except for certain species with naked patches at snout and near eyes. **Colour:** **most species are black**, sometimes with flecks of silver; *Brama* can have very silvery scales.

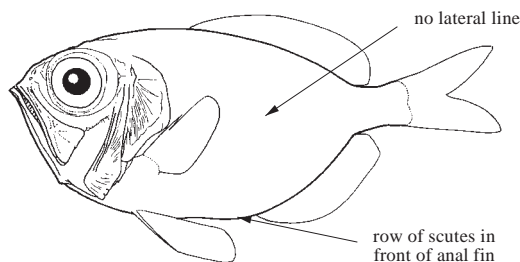


Habitat, biology, and fisheries: Epi- and mesopelagic, except for *Eumegistus* which is more benthic, in all temperate and warm-temperate oceans. Prey on small fishes and macroinvertebrates including squid. Apparently almost year-round batch spawners. Most species undergo a considerable transformation in fin and body shape with growth. Several species are taken by longline and vertical line, but there is no directed fishery in the region even though they are excellent foodfish; a considerable fishery for *Brama* exists to the north off the Iberian Peninsula.

Remarks: Thompson and Russell (1996) recognize 18 to 20 species in 7 genera for the family as a whole, and indicate that the taxonomy and key characteristics in *Brama* remain in need of review.

Similar families occurring in the area

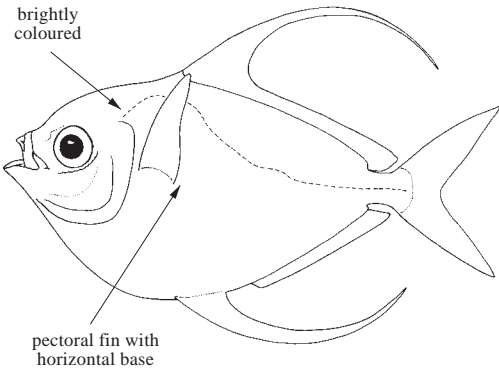
Diretmidae: size small (usually less than 25 cm), abdomen keeled, with a row of scutes in front of anal fin; lateral line absent; pelvic fins with 1 spine and 6 soft rays (5 soft rays in Bramidae).



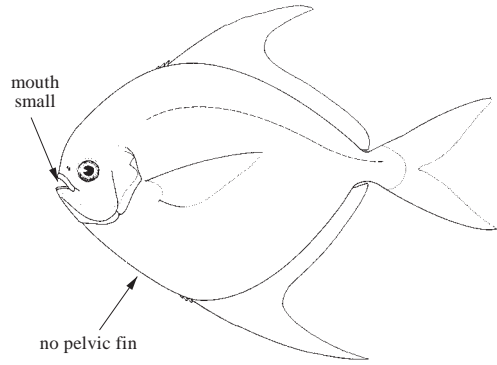
Diretmidae

Lampridae: somewhat similar in shape, but brightly coloured, especially fins and jaws (bright scarlet); also, mouth smaller and pelvic fins about as large as pectoral fins, the latter with a horizontal base.

Stromateidae: somewhat similar in shape, but has a small mouth, lacks pelvic fins and has very thin, small scales which are easily shed.



Lampridae



Stromateidae

Key to the species of Bramidae occurring in the area

- 1a. Dorsal and anal fins broadly expanded, no scales along rays of these fins; median fins can be depressed into sheathed groove formed by modified scales (Fig. 1) . . . → 2
- 1b. Dorsal and anal fins not broadly expanded, scales along at least part of the length of the rays; no modified sheath at base of median fins → 3
- 2a. Anterior dorsal- and anal-fin rays thickened; modified sheath at dorsal-fin base extends forward onto snout (Fig. 2a); branchiostegal rays 8; pectoral-fin rays 18 or 19 ***Pteraclis carolinus***
- 2b. Anterior dorsal- and anal-fin rays all similar, no distinct thickening; modified sheath not extended forward beyond dorsal-fin insertion (Fig. 2b); branchiostegal rays 7; pectoral-fin rays 20 to 23 ***Pterycombis brama***
- 3a. Transverse precaudal grooves well developed (Fig. 3) . . → 4
- 3b. Transverse precaudal grooves absent → 6

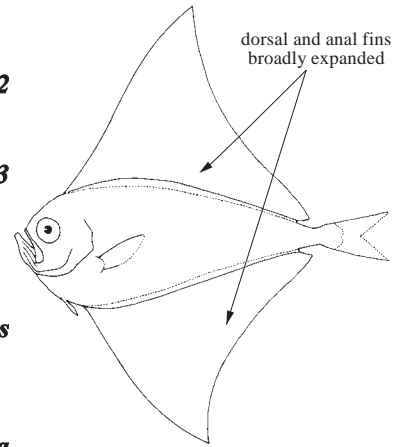


Fig. 1 *Pterycombis*

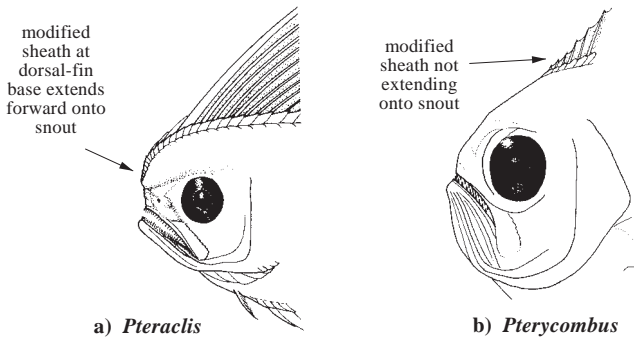


Fig. 2 lateral view of head

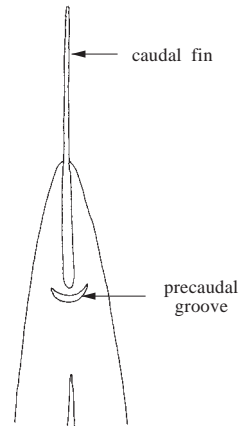


Fig. 3 dorsal view of caudal peduncle

- 4a. Lateral profile of body rounded; body deep, 48 to 58% standard length; snout blunt; pelvic fins short, 7 to 9% standard length; pectoral fin greater than 40% standard length (Fig. 4) ***Taractichthys longipinnis***
- 4b. Body more elongate, body depth 36 to 45% standard length; snout pointed; pelvic fins longer, 13 to 19% standard length; pectoral fin shorter, less than 38% standard length (***Taractes***) → 5

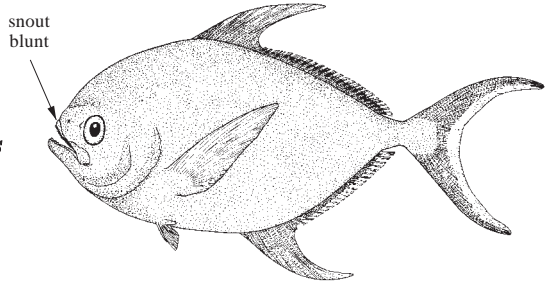


Fig. 4 *Taractichthys longipinnis*

- 5a. Body depth greater than 40% standard length; preanal distance less than 60% standard length; anal-fin base greater than 30% standard length. No keel on the caudal peduncle. Lateral line usually present, with an abrupt bend on the forward part of the body (Fig. 5) ***Taractes asper***
- 5b. Body depth usually less than 40% standard length; preanal distance greater than 60% standard length; anal-fin base less than 30% standard length. A strong keel of enlarged and fused scales on the caudal peduncle. Lateral line usually absent in adults, but when present forming a gentle arch on the forward part of the body (Fig. 6) ***Taractes rubescens***

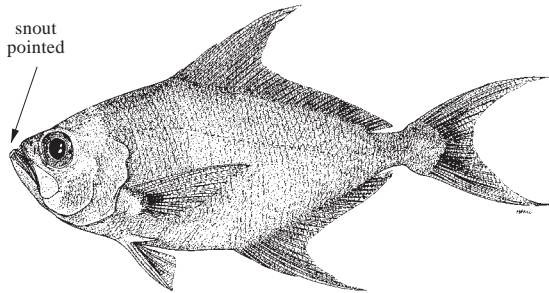


Fig. 5 *Taractes asper*

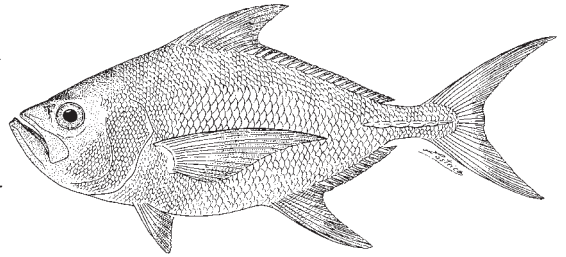


Fig. 6 *Taractes rubescens*

- 6a. Mandibles not touching along entire length (Fig. 7a); scales form keel along ventral midline of belly; posterior edge of caudal fin white (Fig. 8) ***Eumegistus brevorti***
- 6b. Mandibles generally touching along entire length so no exposed area of isthmus (Fig. 7b); scales do not form keel at midline of belly; posterior edge of caudal fin black. (***Brama***) → 7

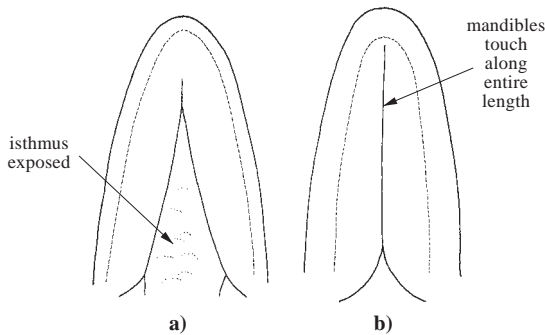


Fig. 7 underside view of head

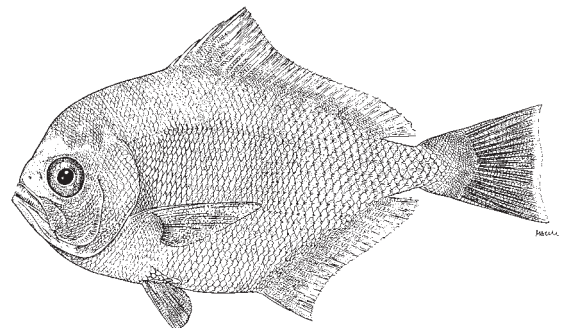


Fig. 8 *Eumegistus brevorti*

- 7a.** Pectoral-fin rays 19 to 21, usually 20; dorsal-fin rays 33 to 35, anal-fin rays 26 to 28, gill rakers on first arch 13 to 15, lateral-line scales 57 to 65 (Fig. 9) ***Brama dussumieri***
- 7b.** Pectoral-fin rays 21 to 23, usually 22; dorsal-fin rays 35 to 38, anal-fin rays 29 to 32, gill rakers on first arch 15 to 18, lateral-line scales 70 to 80 (Fig. 10) ***Brama brama***

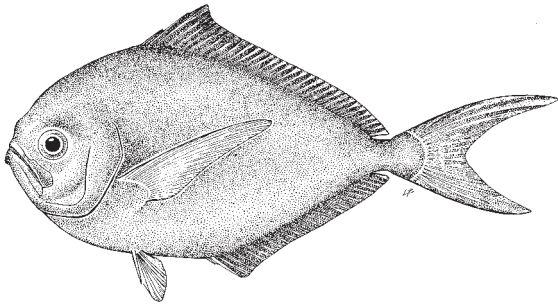


Fig. 9 *Brama dussumieri*

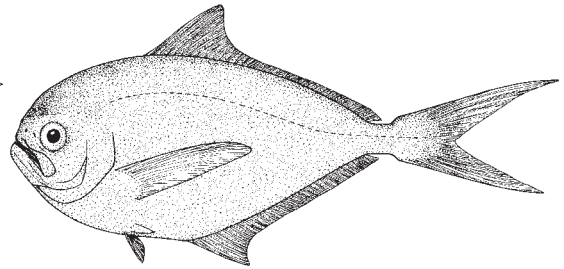


Fig. 10 *Brama brama*

List of species occurring in the area

- Brama brama* (Bonnaterre, 1788). To 70 cm TL. Widespread in N Atlantic, and possibly the Southern Ocean, above 30°N and 30°S.
- Brama dussumieri* Cuvier, 1831. To 19 cm SL, 37 cm. Widespread in tropical and subtropical seas between 35°N and 35°S.
- Eumegistus brevorti* (Poey, 1860). To 52 cm TL. Widespread in tropical Atlantic, rarely seen and probably demersal.
- Pteraclis carolinus* Valenciennes, 1833. To 29 cm TL. Tropical Atlantic, rarely seen.
- Pterycombus brama* Fries, 1837. To 45 cm TL. Widespread in Atlantic Ocean; occasionally taken in the Iberian *Brama* longline fishery.
- Taractes asper* Lowe, 1843. To 50 cm TL. Widespread in temperate N and S Atlantic and Pacific Oceans; not uncommonly taken in the Iberian *Brama* longline fishery.
- Taractes rubescens* (Jordan and Evermann, 1887). To 85 cm TL. Widespread in Atlantic and Pacific Oceans.
- Taractichthys longipinnis* (Lowe, 1843). To 92 cm TL. Widespread in Atlantic Ocean from 60°N to 35°S.

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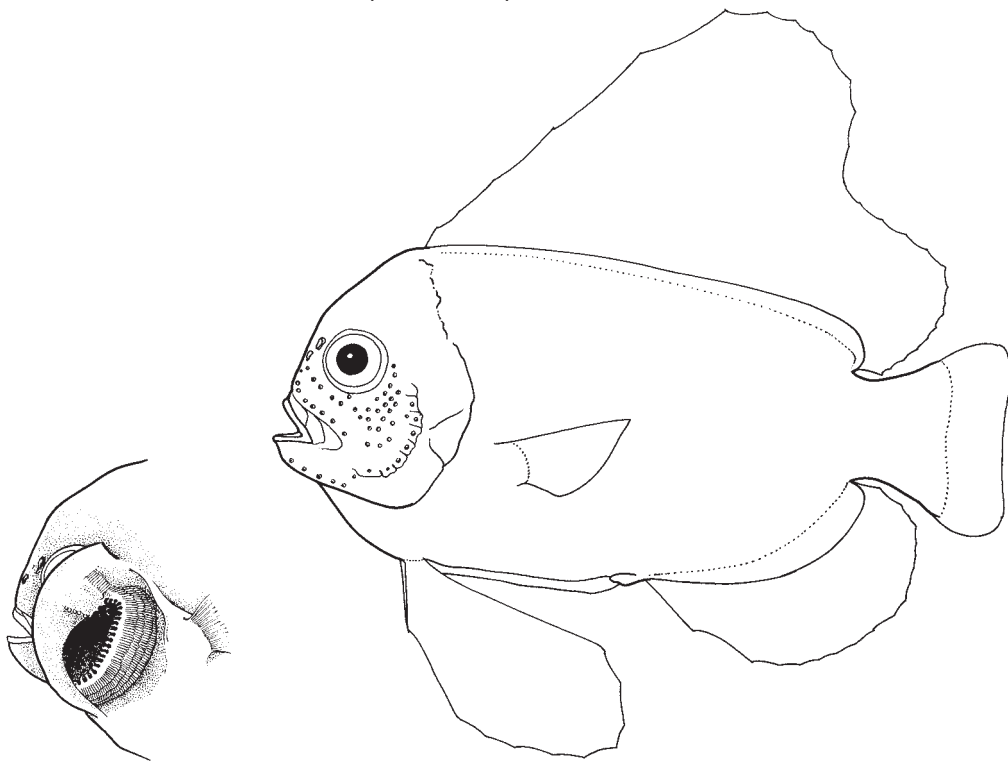
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CARISTIIDAE

Manefishes

by D.E. Stevenson, U.S. National Marine Fisheries Service, Seattle, WA, USA,
C.P. Kenaley, Museum of Comparative Zoology, Harvard University, Cambridge, MA, USA
and R. Britz, Department of Zoology, The Natural History Museum, London, UK

Diagnostic characters: Medium-sized fishes (to at least 40 cm); **body soft, deep, and strongly compressed laterally**, with steep anterior head profile and very short snout; eye large, longer than snout; mouth gape moderate to large; jaw teeth small, simple, often slightly curved; 7 branchiostegal rays; pseudobranch large, with a **variably developed row of small folds or nodules of unknown function below**. **Dorsal fin high, sail-like, with delicate membrane, usually extending onto the head**, with 27 to 39 rays; anal fin also high with delicate membrane, and 15 to 24 rays; bases of dorsal and anal fins can be folded into scaled sheath; caudal fin truncate or slightly emarginate, with 9+8 principal rays and several procurent spines; the ventralmost of which may be flattened or include a hook-like process; pectoral fin delicate, elongate, fan-like, with 16 to 20 rays, the longest extending beyond anal-fin origin; **pelvic fin elongate**, thoracic, with 1 spine and 5 soft rays extending to or beyond anus, flanked by a shallow depression extending along ventral midline between pelvic-fin base and anal-fin origin. **Scales small to moderate in size, cycloid, deciduous**; lateral line, if present, arching over opercle toward dorsal-fin base, and following dorsal contour of body to caudal peduncle. Vertebrae 31 to 41. **Colour:** head and body usually brown to black; all fin membranes black; at least 1 species with opalescent sheen.

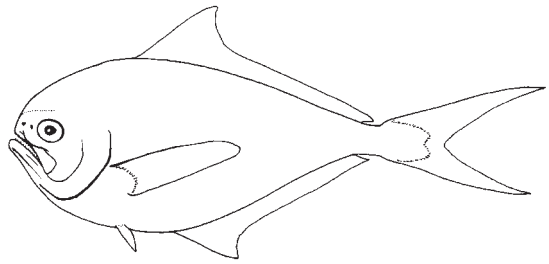


Habitat, biology, and fisheries: Juveniles epi- and mesopelagic, adults meso- and bathypelagic. Juvenile and adult specimens have been observed in close association with siphonophores. Diet includes small fish, crustaceans, and other small pelagic invertebrates (including siphonophore parts). Rare oceanic fishes with no commercial importance.

Remarks: Several recent publications have clarified the taxonomy of this family considerably. Worldwide, a total of 18 species are currently recognized in 4 genera. At least 7 of those species occur in the area, and 3 species are known only from the eastern central Atlantic. Keys to all known species can be found in Stevenson and Kenaley (2011, 2013) and Kukuev *et al.* (2013).

Similar families occurring in the area

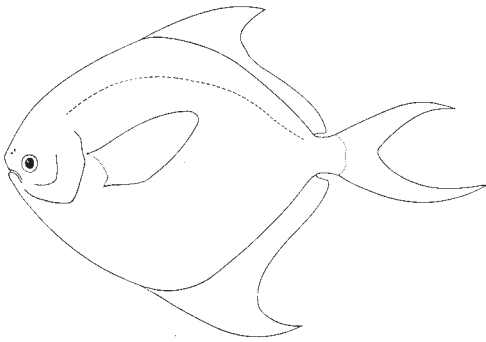
Bramidae: body firm, with thick, heavy scales (rather than thin, deciduous scales), caudal fin deeply forked (rather than truncate), dorsal and anal fins not elongate and delicate; pelvic fins short, not extending to anus, and not retractable into ventral groove.



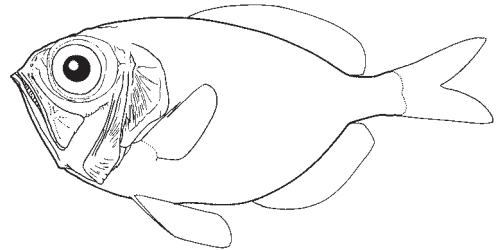
Bramidae

Stromateidae: dorsal fin not extending onto head, not elongate and delicate; caudal fin deeply forked (rather than truncate), pelvic fins absent.

Diretmidae: dorsal and anal fins not elongate and delicate; dorsal fin not extending onto head; pelvic fins not retractable into ventral groove.



Stromateidae



Diretmidae

Key to the species of Caristiidae occurring in the area

- 1a. Suborbital series expanded, overlapping bones of the upper jaw and creating a broad space between orbit and mouth; upper jaw short, extending approximately to midorbit; palatine teeth absent; vomerine teeth absent (***Paracaristius***) → 2
- 1b. Suborbital series not expanded, space between orbit and mouth narrow; upper jaw relatively long, extending to posterior margin of orbit; palatine and vomerine teeth present (***Platyberyx***) → 5

- 2a. Fingerlike papillae absent along dorsal margin of hyoid arch and at articulation of interhyal and posterior ceratohyal; dorsal-fin rays 27 to 31; anal-fin rays 17 to 20 → 3
- 2b. Fingerlike papillae present along dorsal margin of hyoid arch and at articulation of interhyal and posterior ceratohyal; dorsal-fin rays 30 to 33; anal-fin rays 15 to 18 → 4


- 3a. Dorsal-fin origin posterior to orbit; jaw teeth arranged in multiple rows . ***Paracaristius maderensis***
- 3b. Dorsal-fin origin above orbit; jaw teeth arranged in single row, except near symphyses ***Paracaristius nudarcus***








- 4a. Body shape oval; maximum body depth ≥50% SL; caudal peduncle relatively short and deep, its depth greater than its length ***Paracaristius nemorosus***
- 4b. Body shape rectangular; maximum body depth ≤50% SL; caudal peduncle relatively long and shallow, its depth less than its length ***Paracaristius aquilus***

- 5a. Dorsal-fin rays 31 to 35; anal-fin rays 20 to 22; vertebrae 36 to 39 ***Platyberyx andriashevi***
- 5b. Dorsal-fin rays 27 to 31; anal-fin rays 17 to 19; vertebrae 32 to 35 → 6

- 6a. Mouth moderate, posterior margin of upper jaw extending approximately to mid-orbit; prepectoral length 39 to 50% SL; prepelvic length 30 to 53% SL; preanal length 55 to 65% SL *Platyberyx opalescens*
- 6b. Mouth large, posterior margin of upper jaw extending nearly to posterior margin of orbit; prepectoral length 30 to 35% SL; prepelvic length <33% SL; preanal length 50 to 56% SL. *Platyberyx maui*

List of species occurring in the area

The symbol  is given when species accounts are included.

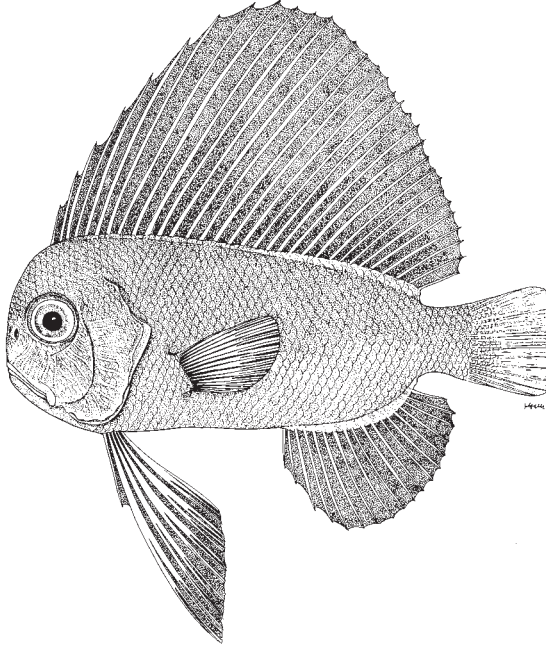
-  *Paracaristius aquilus* Stevenson and Kenaley, 2011.
-  *Paracaristius maderensis* (Maul, 1949).
-  *Paracaristius nemorosus* Stevenson and Kenaley, 2011.
-  *Paracaristius nudarcus* Stevenson and Kenaley, 2011.
-  *Platyberyx andriashevi* (Kukuev, Parin and Trunov, 2012).
-  *Platyberyx maui* Kukuev, Parin and Trunov, 2012.
-  *Platyberyx opalescens* Zugmeyer, 1911.

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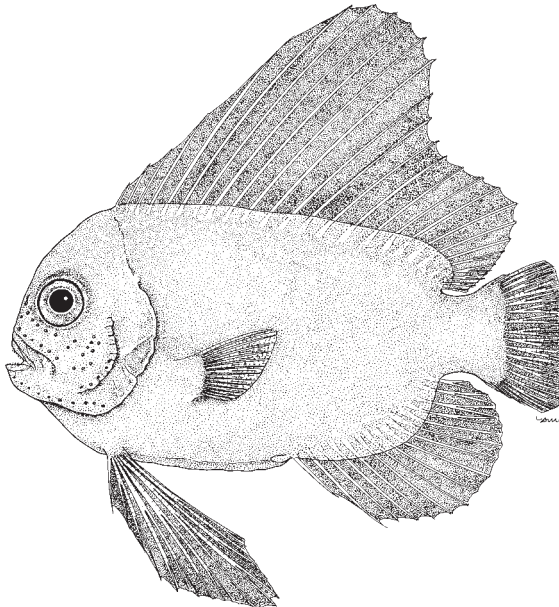
***Paracaristius aquilus* Stevenson and Kenaley, 2011**

At least 25 cm total length. Known only from the eastern tropical Atlantic, from 600 to 1 500 m.



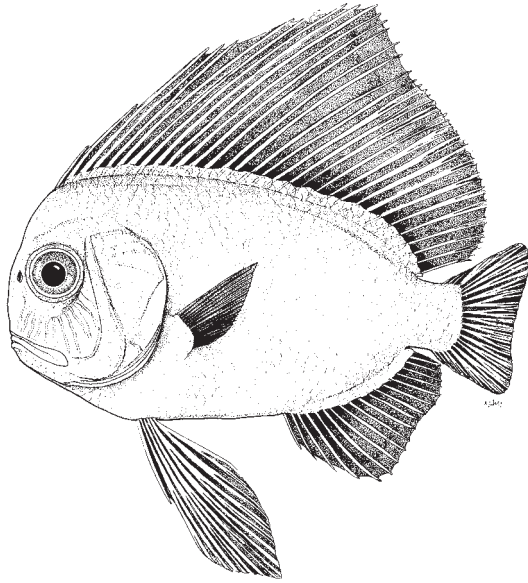
***Paracaristius maderensis* (Maul, 1949)**

At least 30 cm total length. Known from both sides of the tropical North Atlantic, as well as the western tropical Pacific and Indian Ocean, from the epipelagic zone to at least 700 m. Widespread but rarely collected.

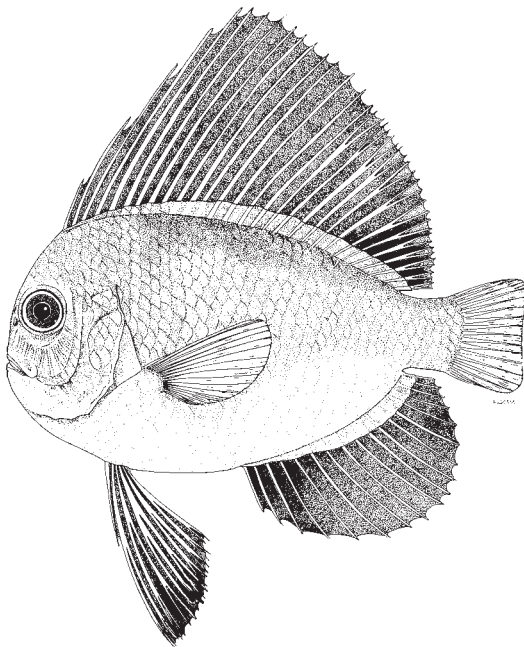


***Paracaristius nemorosus* Stevenson and Kenaley, 2011**

At least 25 cm total length. Known only from the eastern tropical Atlantic, from about 700 m to at least 1 500 m.

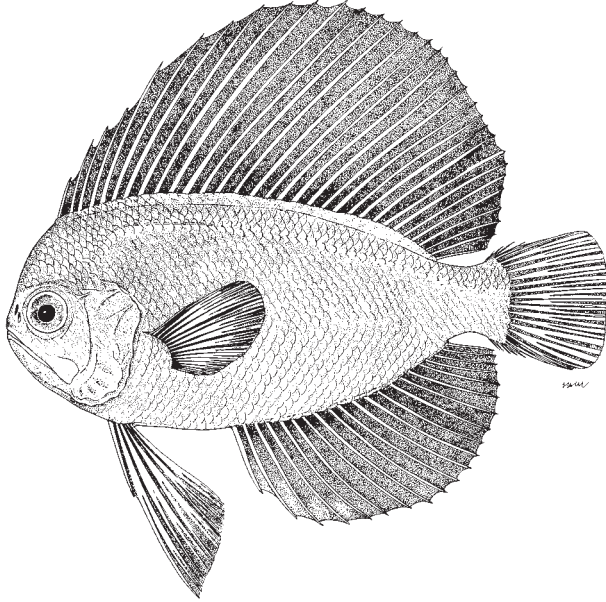
***Paracaristius nudarcus* Stevenson and Kenaley, 2011**

At least 28 cm total length. Known from both sides of the tropical and subtropical Atlantic and Pacific, as well as the Indian Ocean, from the epipelagic zone to at least 1 200 m. Widespread but relatively rare.



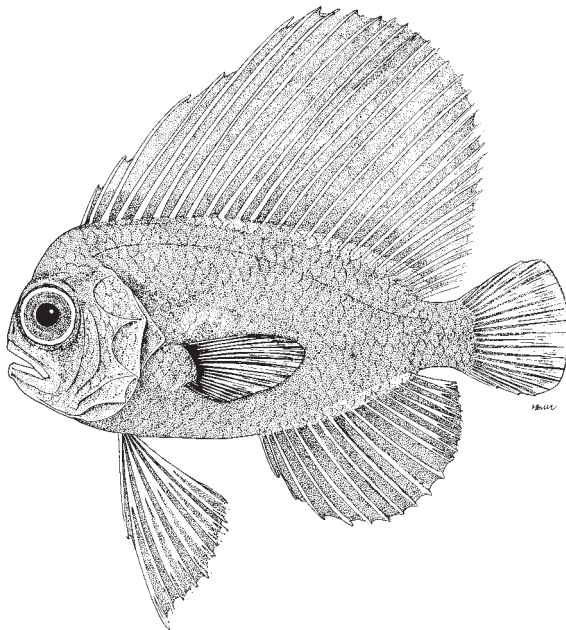
***Platyberyx andriashevi* (Kukuev, Parin and Trunov, 2012)**

At least 25 cm total length. Widespread in the Atlantic, Pacific and Indian Oceans, from the epipelagic zone to nearly 5 000 m.



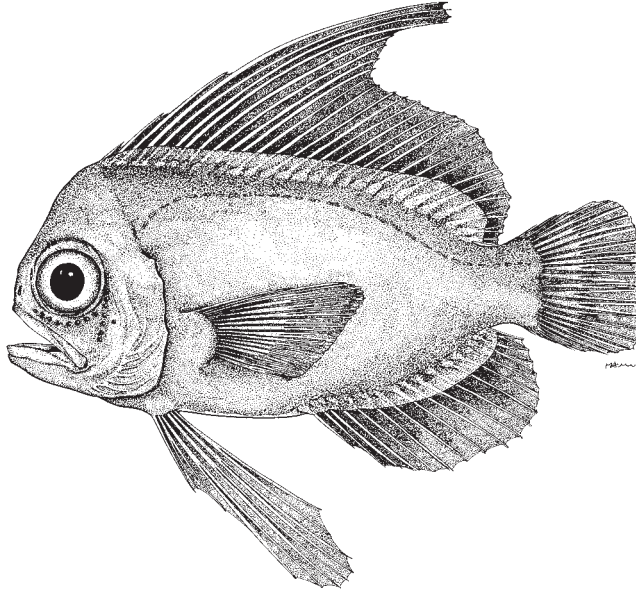
***Platyberyx mauli* Kukuev, Parin and Trunov, 2012**

At least 20 cm total length. Known from only a few specimens, all collected in the eastern central Atlantic.



***Platyberyx opalescens* Zugmeyer, 1911**

At least 20 cm total length. Known only from the eastern Atlantic, from 30°S to 55°N, ranging from the epipelagic zone to at least 2 000 m. Relatively common.

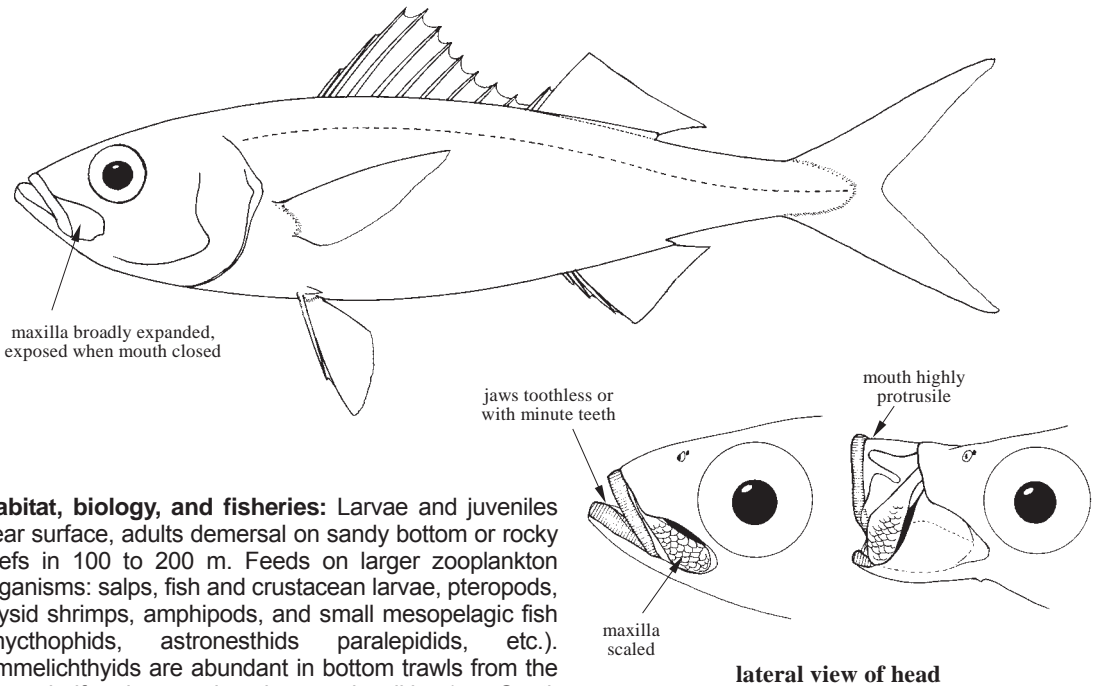


EMMELICHTHYIDAE

Rubyfishes, redbaits, rovers

by P.C. Heemstra, South African Institute for Aquatic Biodiversity, Grahamstown, South Africa

Diagnostic characters: Body elongate, subcylindrical or oblong and somewhat compressed; attains 55 cm. **Upper jaw very protrusile; maxilla broadly expanded, scaly, and not covered by preorbital bone when mouth is closed; supramaxilla bone elongate; jaws toothless or with a series of minute teeth;** nostrils elliptical, close together; rear edge of opercle with 2 inconspicuous, flat spines; preopercle edge weakly serrate, posteroventral edge broadly rounded, projecting slightly posterior to upper edge as a thin lamina which is smooth or crenulate with weak serrae; branchiostegal rays 7, membranes separate, free from isthmus; gill rakers long and numerous, 9 to 12 on upper and 24 to 31 rakers on lower limb of first arch. **Dorsal fin continuous or divided, with 11 to 14 spines and 9 to 12 soft rays; spinous part of fin higher than soft-rayed part; anal fin with 3 spines and 9 or 10 soft rays; soft dorsal and anal fins with a scaly sheath at base that is best developed posteriorly;** pectoral fins pointed, shorter than head, with 19 or 20 rays; pelvic fins with 1 spine and 5 rays, large axillary process of fused scales, and another midventral scaly process between the fins; caudal fin forked, heavily scaled at base; branched rays 15. Lateral line single, continuous, slightly curved. **Body and head covered with finely ctenoid, firm adherent scales.** Vertebrae 10 + 14. Swimbladder elongate, fusiform, not bifurcate at either end. **Colour:** reddish pink or greyish blue dorsally and silvery pink below.

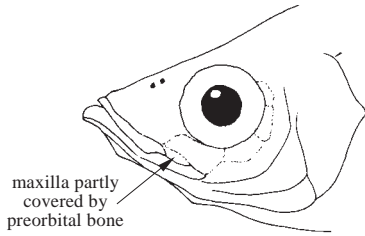
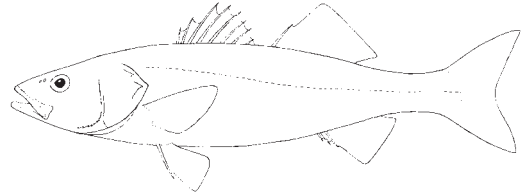


Habitat, biology, and fisheries: Larvae and juveniles near surface, adults demersal on sandy bottom or rocky reefs in 100 to 200 m. Feeds on larger zooplankton organisms: salps, fish and crustacean larvae, pteropods, mysid shrimps, amphipods, and small mesopelagic fish (myctophids, astronethids, paralepidids, etc.). Emmelichthyids are abundant in bottom trawls from the outer shelf and upper slope in some localities (e.g. South China Sea). They are excellent eating fish. *Erythrocles monodi* is large enough to be important as a foodfish, but it does not appear to be abundant in the area.

Similar families occurring in the area

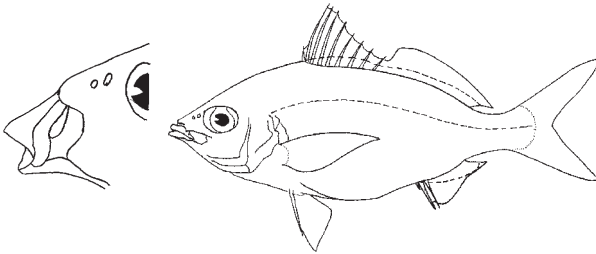
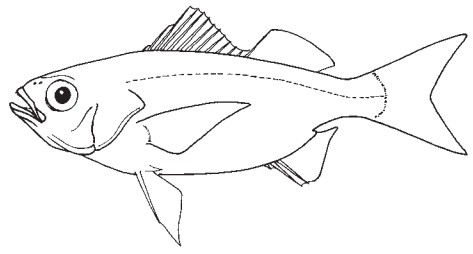
Centracanthidae: no supramaxilla; maxilla without scales and covered by preorbital bone when mouth is closed; distal end of maxilla and premaxilla loosely connected; jaws with cardiform teeth.

Moronidae: upper jaw not protrusile; maxilla not scaly; lower edge of preopercle with large forward-directed spines.

**Centracanthidae****Moronidae**

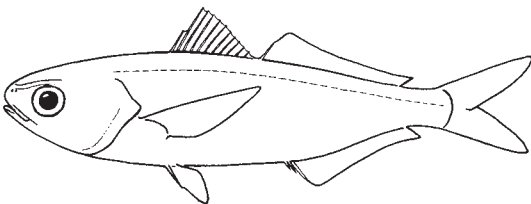
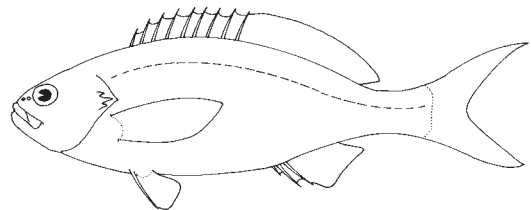
Gerreidae: body deeper; only 9 dorsal-fin spines (11 to 14 in Emmelichthyidae); maxilla naked, no supramaxilla, and mouth pointing downward when protruded.

Haemulidae: maxilla partly covered by preorbital bone when mouth is closed.

**Gerreidae****Haemulidae**

Nomeidae: maxilla naked and mostly covered by preorbital bone when mouth is closed; no supramaxilla; soft dorsal and anal fins with 14 to 27 rays.

Other superficially similar percoid fishes (*Paranthias furcifer* [Serranidae], Pomatomidae): upper jaw not greatly protrusile; maxilla not scaly, no scaly axillary process at base of pelvic fins.

**Nomeidae****Serranidae**

Key to species of Emmelichthyidae occurring in the area

- 1a. Dorsal fin continuous, not divided between spinous and soft-rayed parts (Fig. 1); body depth distinctly greater than head length . . . ***Plagiogeneion rubiginosum***
- 1b. Dorsal fin divided to base, or spinous part separated by a distinct gap from soft-rayed fin; body depth less than or equal to head length → 2

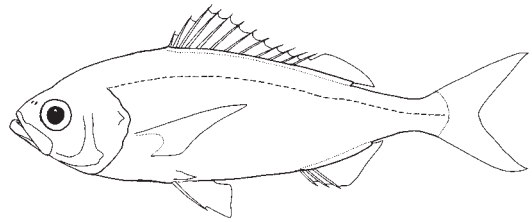


Fig. 1 *Plagiogeneion rubiginosum*

- 2a. Dorsal fin divided to base before last spine, but no distinct gap between the 2 parts (Fig. 2); dorsal-fin spines 11 ***Erythrocles monodi***
- 2b. Spinous dorsal fin separated from soft dorsal by a wide gap (Fig. 3); dorsal-fin spines 12 or 13 → 3

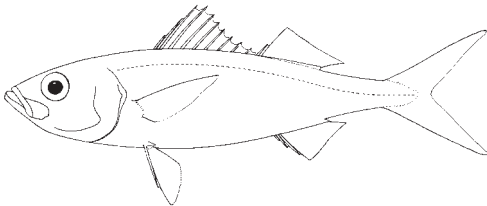


Fig. 2 *Erythrocles monodi*

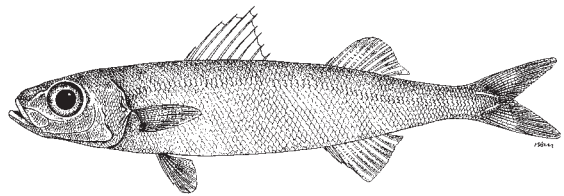


Fig. 3 *Emmelichthys ruber*

- 3a. Posterior 2 to 4 dorsal-fin spines vestigial, buried in mid-dorsal musculature; scales continuous across gap between spinous and soft dorsal fins; lateral-line scales 71 to 74 ***Emmelichthys ruber***
- 3b. Posterior dorsal spines short, but protruding distinctly above dorsal body profile; lateral-line scales 87 to 98 ***Emmelichthys nitidus***

List of species occurring in the area

The symbol is given when species accounts are included.

- Emmelichthys nitidus* Richardson, 1845.
- Emmelichthys ruber* (Trunov, 1976).
- Erythrocles monodi* Poll and Cadenat, 1954.
- Plagiogeneion rubiginosus* (Hutton, 1875).^{1/}

^{1/} *Plagiogeneion rubiginosum* (Hutton, 1875) has been reported from Vema Seamount west of Cape Town (31°38'S, 08°21.5'E). It seems likely that this widely distributed Indo-West Pacific species may be found at St Helena or off Walvis Bay.

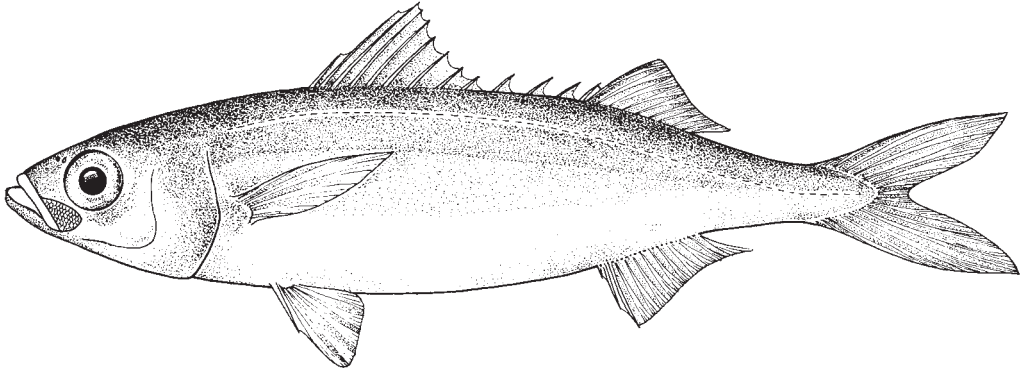
References

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- Heemstra, P.C. & Randall, J.E.** 1977. A revision of the Emmelichthyidae (Pisces: Perciformes). *Australian Journal of Marine and Freshwater Research*, 1977, 28: 361–396.
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***Emmelichthys nitidus* Richardson, 1845**

Frequent synonyms misidentifications: None / None.

FAO names: En – Cape bonnetmouth; Fr – Andorreve du Cap; Sp – Adorrero del Cabo.



Diagnostic characters: Body elongate, fusiform, body depth less than head length, contained 4.1 to 5.2 times in standard length. Eye large, diameter equals snout length; snout conical; gill rakers on first arch 10 to 12 on upper limb, 27 to 31 on lower limb. Two distinct, fleshy protuberances on rear margin of gill cavity. Front part of dorsal fin with 9 or 10 spines connected by membranes followed by 2 or 3 short isolated spines, last spine connected to base of first soft ray; soft dorsal fin with 9 to 11 rays; anal fin with 3 spines, 9 or 10 soft rays; pectoral-fin rays 20 to 23. Lateral-line scales 87 to 98. Caudal peduncle with a fleshy midlateral keel on fish larger than 30 cm standard length. **Colour:** head and body of adult reddish silver, darker (bluish grey or reddish brown) dorsally, rosy pink laterally and silvery below; fins pale reddish. Juveniles less than 9 cm standard length silvery, with 8 or 9 dark bars across dorsal surface of body.

Size: Maximum total length 55 cm.

Habitat, biology, and fisheries: Adults occur near soft (sand or mud) bottoms in depths of 100 to 500 m. Feeds on macro-zooplankton, mainly krill and copepods. Reported to be abundant in some areas. Caught with trawls. Flesh excellent.

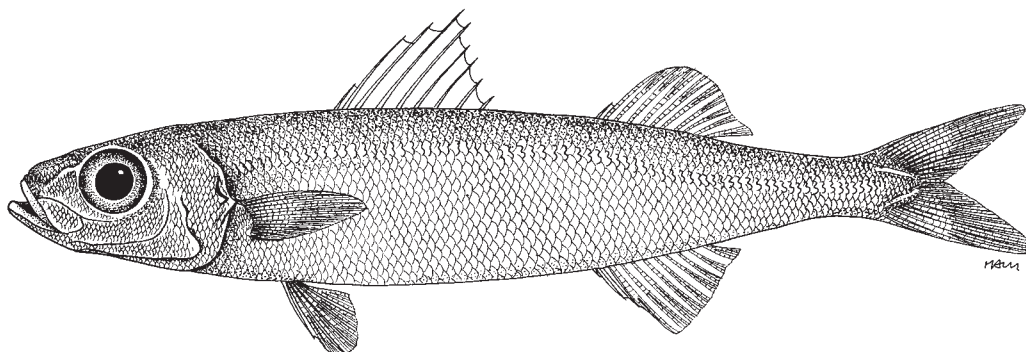
Distribution: Namibia, South Africa (south coast), Australia (south coast), New Zealand, St Paul and Amsterdam islands and Tristan da Cunha.



***Emmelichthys ruber* (Trunov, 1976)**

Frequent synonyms / misidentifications: None / None.

FAO names: None.



Diagnostic characters: Body elongate, fusiform, its depth contained 4.5 to 5.2 times in standard length, distinctly less than head length. Gill rakers on first arch 8 to 12 on upper limb, 24 to 27 on lower limb; shallow groove on upper part of rear margin of gill cavity, no groove or lobe on ventral margin. **Two dorsal fins, first with 7 to 9 spines connected by membranes, followed by 3 to 5 spines reduced to buried nubbins (visible on radiographs)**; scales continuous across the gap between dorsal fins; second dorsal fin with 1 spine, 9 to 11 soft rays; anal fin with 3 slender spines, 9 or 10 soft rays; caudal fin distinctly forked; pectoral-fin rays 19 or 20. Lateral-line scales 71 to 74. **Colour:** reddish dorsally, silvery below with reddish cast; iris yellow orange.

Size: Maximum total length 30 cm.

Habitat, biology, and fisheries: Larvae and juveniles occur near the surface; adults demersal found in large aggregations in depths of 100 to 200 m. Feeds on macro-zooplankton. Apparently not abundant and of no commercial importance. Caught incidentally with trawls.

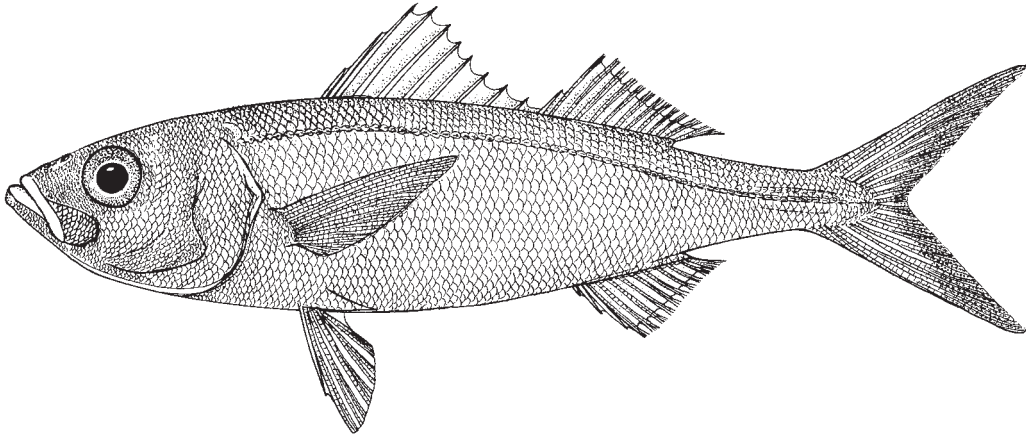
Distribution: In the area, known only from St Helena Island; also reported from Jamaica, Gulf of Mexico and Bermuda.



***Erythrocles monodi* Poll and Cadenat, 1954**

Frequent synonyms misidentifications: None / None.

FAO names: En – Atlantic rubyfish.



Diagnostic characters: Body oblong, subcylindrical, its depth contained 3.6 to 4.4 times in standard length. Gill rakers 9 to 12 upper limb, 27 to 29 on lower limb. A low fleshy protuberance on lower rear margin of gill cavity. **Dorsal fin divided to base before last spine**, with 11 spines and 11 or 12 soft rays, last spine about twice length of penultimate spine; anal fin with 3 spines, 9 or 10 soft rays; caudal fin distinctly forked; pectoral fin length 1.2 to 1.4 times in head. Lateral-line scales 68 to 72. Caudal peduncle with fleshy midlateral keel on fish larger than 30 cm standard length. **Colour:** head and body reddish, darker (reddish brown) dorsally, silvery below; pectoral and tail fins scarlet.

Size: Maximum total length 55 cm; common to 40 cm.

Habitat, biology, and fisheries: Adults demersal on sand or mud bottoms in depths of 100 to 300 m. Feeds on macro-zooplankton. Reported to be common in some areas. Excellent foodfish; marketed fresh or frozen. Separate statistics are not reported for this species.

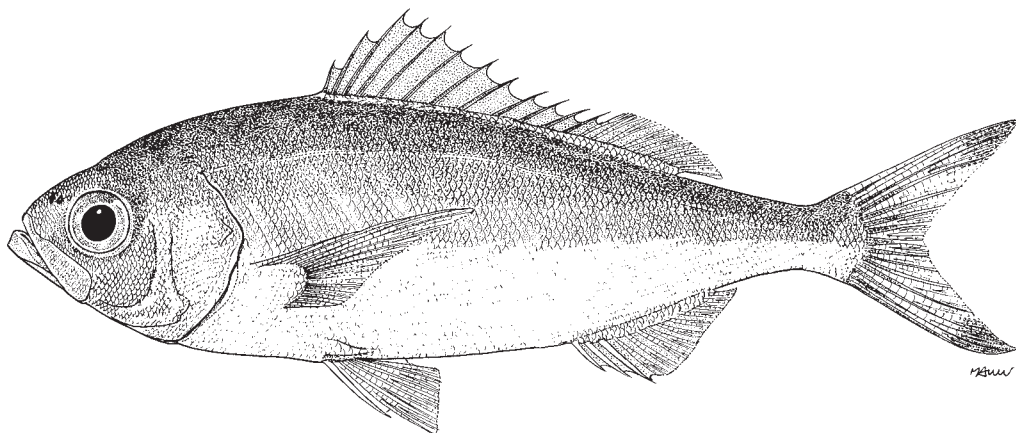
Distribution: Eastern Atlantic, from Mauritania to Angola; 1 recent record from France (Bay of Biscay). Western Atlantic from Caribbean, Gulf of Mexico and southeast coast of the United States.



***Plagiogeneion rubiginosum* (Hutton, 1875)**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Rubyfish.



Diagnostic characters: Body oblong, moderately compressed, its depth contained 2.8 to 3.2 times in standard length. Head completely scaly; eye diameter greater than snout length; nostrils elliptical, close together, posterior rim of front nostrils with broad flap reaching to or across rear nostril; ventral edge of preorbital bone serrate; preopercle angle broadly rounded. Gill rakers 10 to 12 on upper limb, 26 to 31 on lower limb; low fleshy protuberance on ventral part of rear margin of gill cavity. **Dorsal fin continuous, with 12 spines, 10 to 12 soft rays, fin margin only slightly notched before soft-rayed part; penultimate and last spines subequal;** anal fin with 3 spines, 10 soft rays; caudal fin distinctly forked; pectoral-fin rays 19 to 22. Lateral-line scales 67 to 73. **Colour:** head and body reddish, darker (reddish brown) dorsally, silvery below; pectoral and tail fins scarlet.

Size: Maximum total length 60 cm; common to 40 cm.

Habitat, biology, and fisheries: Adults demersal on sand or mud bottoms in depths of 200 to 500 m. Feeds on macro-zooplankton. Reported as common in some areas. Separate statistics are not reported for this species. Caught with trawls. Excellent foodfish; marketed fresh or frozen.

Distribution: South Africa (south coast), Australia (south coast), New Zealand, St Paul and Amsterdam Islands and Vema Seamount west of Cape Town. Likely to occur off Walvis Bay, Namibia.

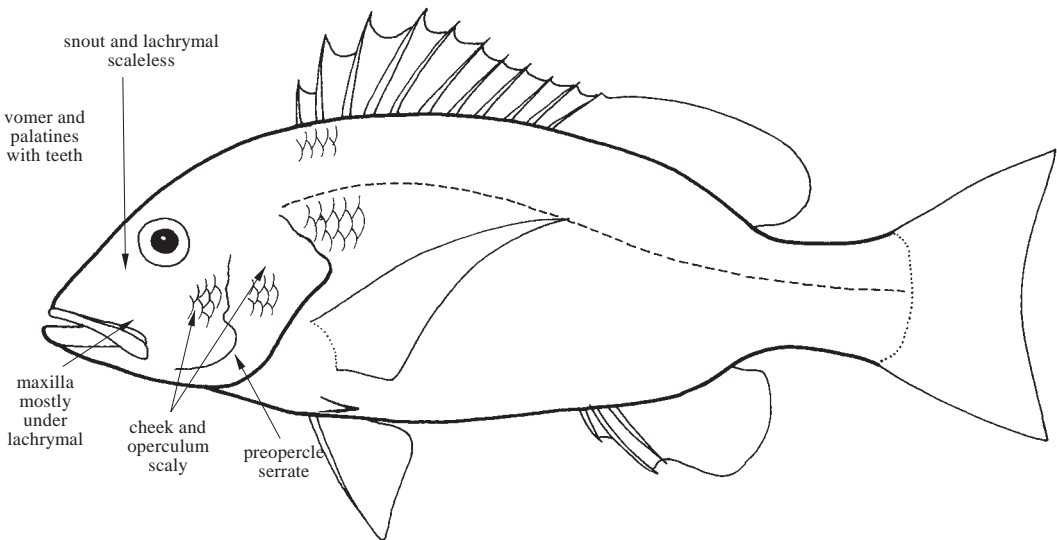


LUTJANIDAE

Snappers

K.E. Carpenter, Old Dominion University, Norfolk, VA, USA (after Allen, 1981)

Diagnostic characters (applies to eastern Atlantic species): Perch-like fishes, oblong in shape, moderately compressed. Head large, usually triangular with a pointed snout; mouth terminal and fairly large, slightly protrusible; **maxilla broadest posteriorly, sliding (at least partly) under the preorbital bone for the greater part of its upper edge**; 2 nostrils on each side; no enlarged pores on chin; anterior part of head (snout and preorbital area) without scales; scales present on cheek and on gill cover; **preopercle usually serrate**; gill membranes separate, free from isthmus; **jaw teeth usually in a few rows, conical and sharp (some species have well developed canines) but molars always absent; teeth usually present on roof of mouth (vomer and palatines)**. Dorsal fin single without a deep notch, with 10 to 12 spines and 9 to 15 soft rays; pelvic fins with 1 spine and 5 soft rays, set under the pectoral fins; anal fin slightly shorter than soft portion of dorsal fin, with 3 spines and 7 to 9 soft rays; caudal fin forked, lunate, emarginated, or truncate. Body covered with small or moderate ctenoid scales (rough to touch). **Colour**: variable, but often dark grey to brown or blackish and whitish ventrally.

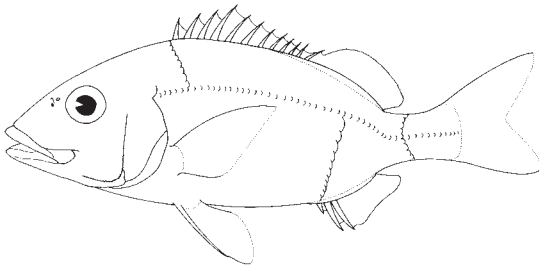


Habitat, biology, and fisheries: Mostly demersal species common in tropical, less common on subtropical-temperate areas, ranging from shallow coastal waters to considerable depths (continental slope). Some species are found in brackish estuaries and may enter rivers, especially in their juvenile stage; also may be found in hypersaline lagoons. Some species may form aggregations. All snappers are predators, usually active at night, dawn, and dusk, feeding mainly on demersal organisms, including crustaceans and fishes, sometimes also cuttlefish and worms. All species of this family are commercially exploited; although separate statistics (and biological data) by species are not available. The flesh is highly esteemed for its delicate taste, although some species (particularly in the Indo-Pacific region) have occasionally been reported to cause poisoning (ciguatera).

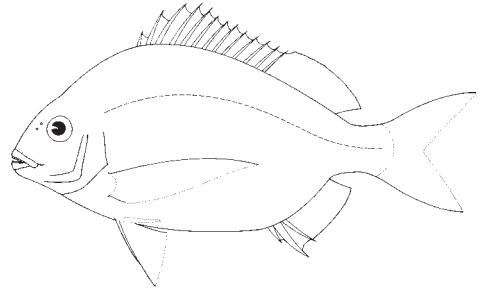
Similar families occurring in the area

Haemulidae: no teeth on roof of mouth; no strong canines; scales present between mouth and eye and on snout; chin with conspicuous pores.

Sparidae: molar-like teeth laterally in jaws in many species; no teeth on roof of mouth, edge of preopercle smooth; 6 branchiostegal rays (7 in Lutjanidae); distal end of premaxilla overlapping maxilla laterally (medial to maxilla in Lutjanidae).

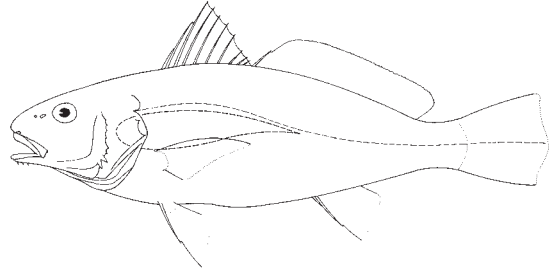


Haemulidae



Sparidae

Sciaenidae: anal fin with never more than 2 spines (3 in Lutjanidae); lateral-line scales extending to hind margin of caudal fin; swimbladder usually large and complicated (except in *Menticirrhus* where it is rudimentary), or absent.



Sciaenidae

Key to species of Lutjanidae occurring in the area

- 1a. Caudal fin deeply forked (Fig. 1); no scales on dorsal and anal fins; scales small, about 65 in lateral line ***Apsilus fuscus***
- 1b. Caudal fin truncate or emarginate (Fig. 2); scales on dorsal and anal fins; scales moderate, about 50 or less in lateral line (*Lutjanus*). → 2

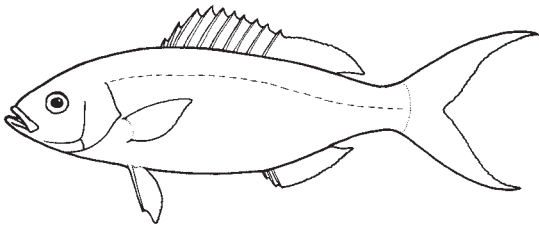


Fig. 1 *Apsilus fuscus*

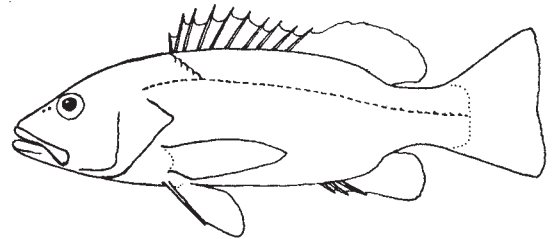


Fig. 2 *Lutjanus*

- 2a. Line from tip of snout to middle of caudal-fin base passes through lower part of eye (Fig. 3); 12 to 15 total well formed (excluding rudiments) gill rakers on first arch (Fig. 4); 4 or 5 transverse scale rows on cheek; vomer with posterior extension (Fig. 5) ***Lutjanus fulgens***
- 2b. Line from tip of snout to middle of caudal-fin base passes just below or well below lower edge of eye (Fig. 6); 5 to 9 total well formed (excluding rudiments) gill rakers on first arch; 6 to 10 transverse scale rows on cheek; vomer usually without posterior extension (except in *Lutjanus gorensis*) → **3**

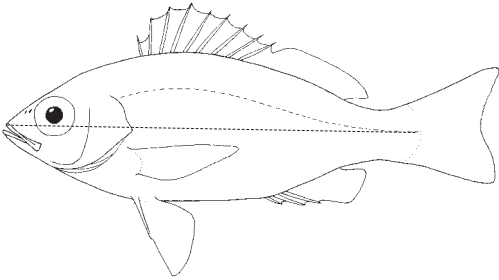


Fig. 3 *Lutjanus fulgens*

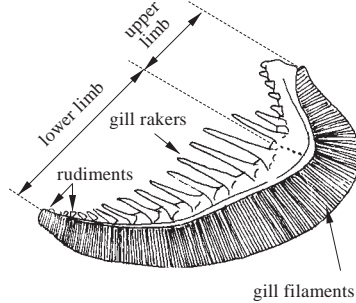


Fig. 4 anterior gill arch

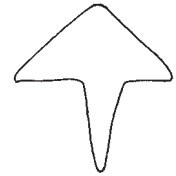


Fig. 5 vomerine teeth

- 3a. Lateral line with 42 to 45 scales; scale rows from origin of anal fin to lateral line 12 or 13 (Fig. 7) → **4**
- 3b. Lateral line with 44 to 48 scales; scale rows from origin of anal fin to lateral line 15 to 17 → **5**

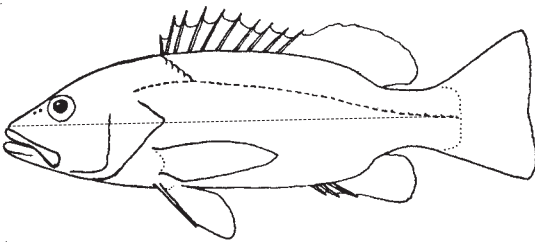


Fig. 6 *Lutjanus*

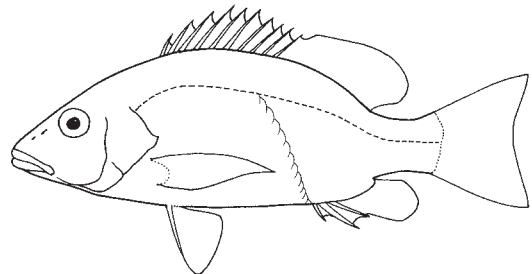


Fig. 7 *Lutjanus gorensis*

- 4a. Vomer with posterior extension (Fig. 5); 43 to 45 lateral-line scales; blue stripe on head, sometimes extending from near tip of snout to angle of opercle (Fig. 8) ***Lutjanus gorensis***
- 4b. Vomer without posterior extension; 42 to 43 lateral-line scales; no blue stripe on head (Fig. 9) ***Lutjanus agennes***

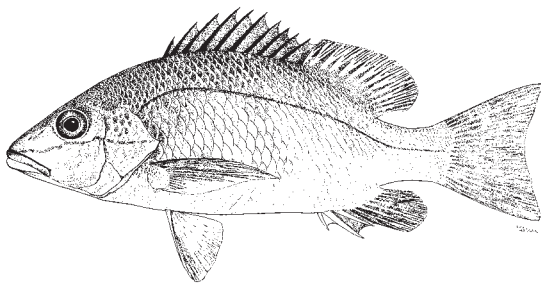


Fig. 8 *Lutjanus gorensis*

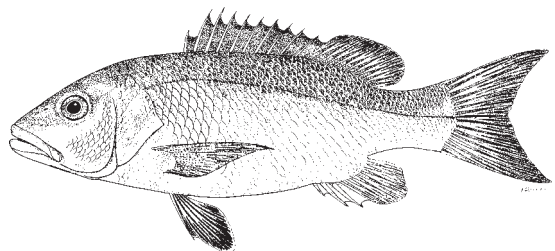








Fig. 9 *Lutjanus agennes*

- 5a. Cheek with 8 or 9 scale rows in transverse series; 8 or 9 total well formed (excluding rudiments) gill rakers on first arch ***Lutjanus endecacanthus***
- 5b. Cheek with 9 or 10 scale rows in transverse series; 5 to 8 total well formed (excluding rudiments) gill rakers on first arch. ***Lutjanus dentatus***

List of species occurring in the area

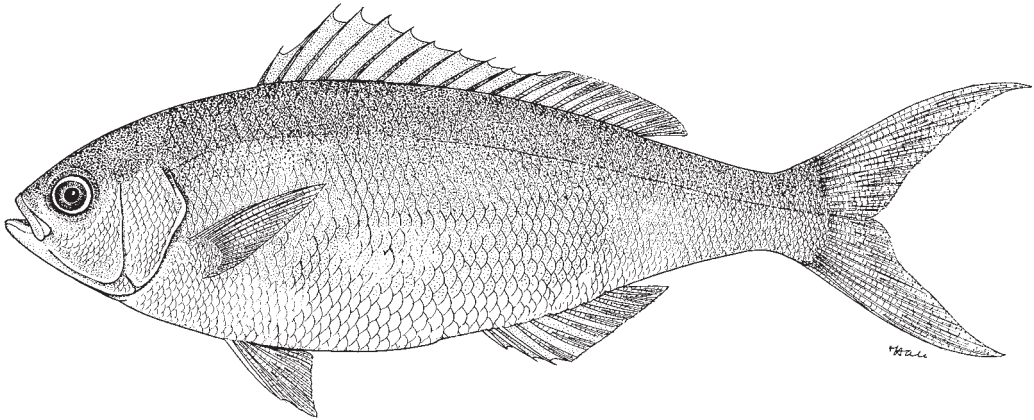
The symbol  is given when species accounts are included

-  *Apsilus fuscus* Valenciennes, 1830.
-  *Lutjanus agennes* Bleeker, 1863.
-  *Lutjanus dentatus* (Duméril, 1861).
-  *Lutjanus endecacanthus* Bleeker, 1863.
-  *Lutjanus fulgens* (Valenciennes, 1830).
-  *Lutjanus goreensis* (Valenciennes, 1830).

Apsilus fuscus Valenciennes, 1830

Frequent synonyms / misidentifications: None / None.

FAO names: En – African fork-tail snapper; Fr – Vivaneau fourche d’Afrique; Sp – Pargo tijera.



Diagnostic characters: Body moderately elongate, fusiform and compressed. Maxilla extending posteriorly to below front of eye; teeth in jaws all villiform, no enlarged canines; teeth also present on vomer and palatines (roof of mouth); interorbital space broad and convex. **Dorsal and anal fins scaleless;** none of dorsal and anal rays noticeably elongated; dorsal fin continuous, not incised at junction of soft and spiny portions, with 10 spines and 10 soft rays; anal fin with 3 spines and 8 soft rays; pectoral fins shorter than head and not reaching level of anal fin; **caudal fin strongly forked. Scales in lateral line about 64 to 68. Colour:** generally brown, lighter on ventral surface.

Size: Maximum to 75 cm; common from 50 to 60 cm.

Habitat, biology, and fisheries: Inhabits depths between 15 and 300 m. Feeds on small fishes, squids, and crustaceans. Deep coral and rock reefs. Separate statistics are not reported for this species. Caught with handlines, set nets, and bottom trawls. Marketed mainly fresh.

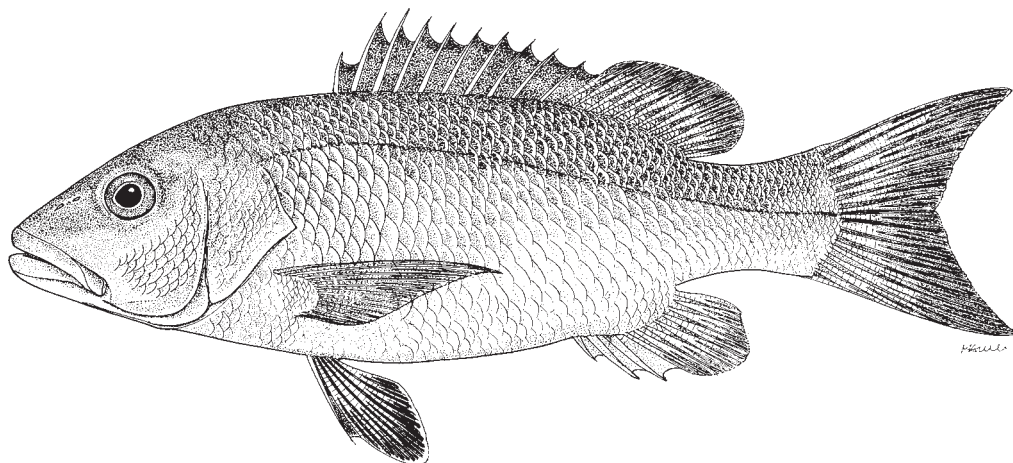
Distribution: Tropical and subtropical coast of West Africa from Mauritania to Namibia, and the Cape Verde Islands.



***Lutjanus agennes* Bleeker, 1863**

Frequent synonyms / misidentifications: None / *Lutjanus modestus* Bleeker, 1863 (= *L. endecacanthus*).

FAO names: En – African red snapper; Fr – Vivaneau africain rouge; Sp – Pargo colorado africano.



Diagnostic characters: Body relatively deep for the genus. Head pointed, dorsal profile of forehead somewhat angular; **preorbital bone broad**; maxilla extending nearly to mid-eye level; **vomerine teeth in a crescent patch**; **7 to 9 well formed** (i.e. excluding rudiments) **gill rakers** on first gill arch. Dorsal fin with 10 spines and 14 or 15 soft rays; anal fin with 3 spines and 8 soft rays. Scales moderate-sized, about 42 to 43 in lateral line; **12 or 13 longitudinal scale rows from anal-fin origin to lateral line**; **5 or 6 scale rows on cheek**. **Colour:** reddish brown or slightly orange dorsally grading to whitish ventrally, tips of pelvic fins dark; Juveniles with series of about 6 to 8 vertical rows of small white spots or narrow bars on sides.

Size: Maximum: to 139 cm; common to 50 cm.

Habitat, biology, and fisheries: Occurs on rocky bottoms and coral reefs. Also common in brackish lagoons and found in rivers, particularly the juveniles. Feeds mainly on fishes and crustaceans. Shallow inshore waters. Separate statistics are not reported for this species. Caught with handlines and fixed bottom nets. Marketed mainly fresh.

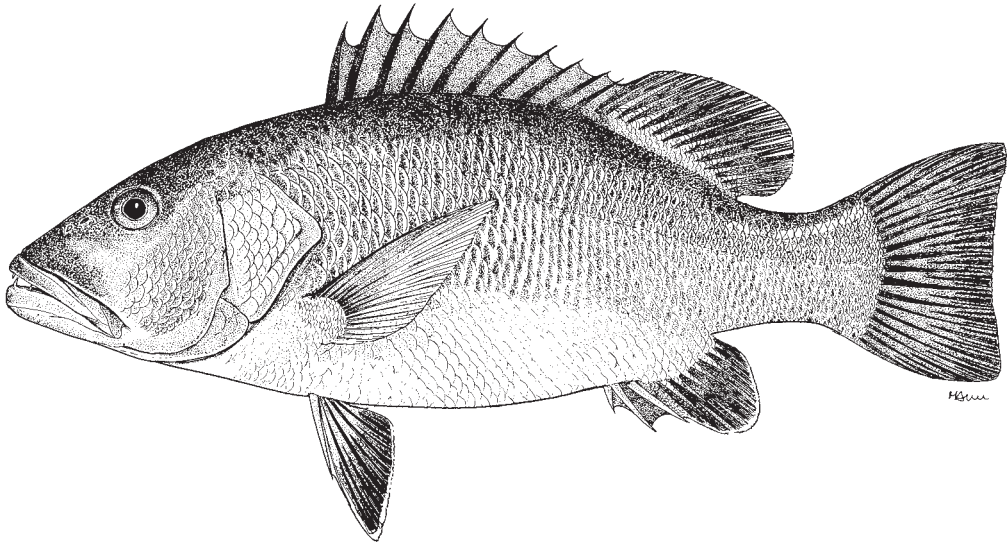
Distribution: Known only from the West African coast in the region between Senegal and Angola.



Lutjanus dentatus (Duméril, 1861)

Frequent synonyms / misidentifications: *Lutjanus eutactus* Bleeker, 1863 / None.

FAO names: En – African brown snapper; Fr – Vivaneau brun d'Afrique; Sp – Pargo marrón africano.



Diagnostic characters: Body relatively deep for the genus. Head slightly rounded, snout somewhat blunt, dorsal profile curving gently; **preorbital bone broad**; maxilla extending to about mid-eye level or beyond; vomerine teeth in a ^- shaped patch; **5 to 8 well formed (excluding rudiments) gill rakers** on first gill arch. Dorsal fin with 10 spines and 13 or 14 soft rays; anal fin with 3 spines and 8 soft rays. Scales moderate-sized, 45 to 48 in lateral line; **longitudinal scale rows above lateral line rising obliquely** (i.e. slanting toward dorsal profile); **15 to 17 longitudinal scale rows from anal-fin origin to lateral line**; **9 or 10 scale rows on cheek**. **Colour:** smoky grey dorsally and whitish or pink ventrally; juveniles with series of alternating light and dark bars of about equal widths on sides.

Size: Maximum to 150 cm; common to 50 cm.

Habitat, biology, and fisheries: Occurs on rocky bottoms and coral reefs. Also common in brackish lagoons and sometimes in rivers. Feeds on fishes and crustaceans. Shallow inshore waters. Separate statistics are not reported for this species. Caught with handlines and fixed bottom nets. Marketed mainly fresh.

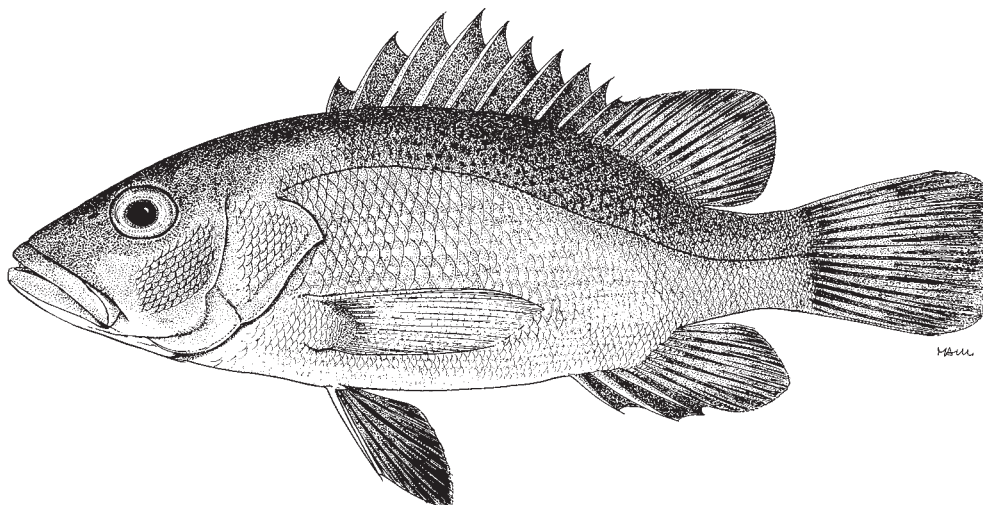
Distribution: Known only from the West African coast from Senegal to Angola, primarily in the Gulf of Guinea.



***Lutjanus endecacanthus* Bleeker, 1863**

Frequent synonyms / misidentifications: *Lutjanus modestus* Bleeker, 1863 / *Lutjanus dentatus*.

FAO names: En – Guinea snapper; Fr – Vivaneau de Guinée; Sp – Pargo de Guinea.



Diagnostic characters: Body moderately deep for the genus. Head pointed, dorsal profile somewhat angular; preorbital bone broad; maxilla level with front part of eye; **vomerine teeth usually in triangular patch; about 7 to 9 well formed** (excluding rudiments) **gill rakers** on first gill arch. Dorsal fin with 10 spines (holotype has aberrant count of 11 spines) and 13 to 15 soft rays; anal fin with 3 spines and 8 soft rays. Scales moderate-sized, 44 to 48 in lateral line; **16 or 17 longitudinal scale rows from anal-fin origin to lateral line; 8 to 10 scale rows on cheek.** **Colour:** brown to dark brown, darkest on upper back and grading to silvery white on ventral portion; scales below lateral line frequently with pale centres forming longitudinal stripes (1 per scale row); dorsal, anal, caudal, and **pelvic fins mainly dark brown**; juveniles (below about 20 cm standard length) frequently with a series of 6 to 8 vertical rows of small white spots on sides and a pair of blue lines on cheek below eye.

Size: To 85 cm.

Habitat, biology, and fisheries: Occurs on rocky bottoms and coral reefs. Also found in brackish lagoons and sometimes in rivers. Feeds on fishes and crustaceans. Shallow inshore waters. Separate statistics are not reported for this species. Caught with handlines and fixed bottom nets. Marketed mainly fresh.

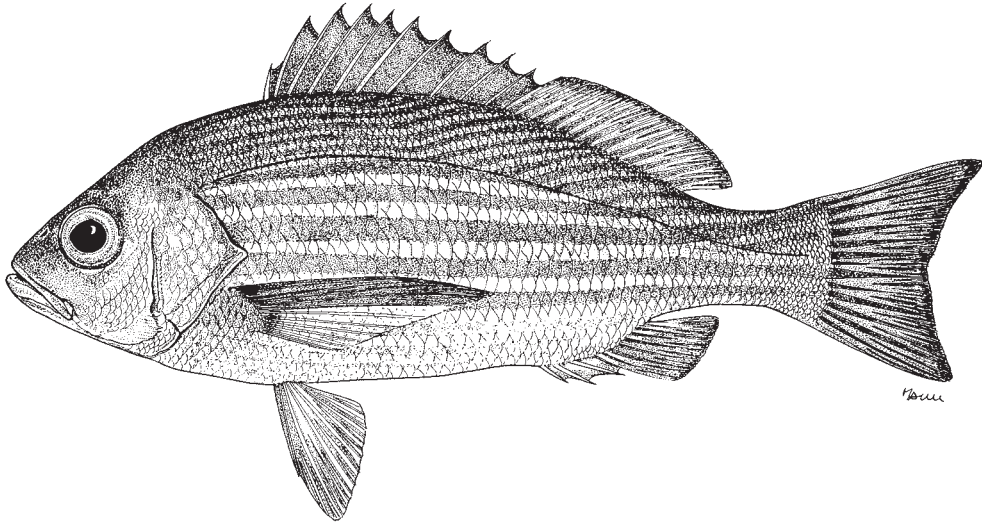
Distribution: Known only from the West African coast between Ghana and the Congo River mouth.



Lutjanus fulgens (Valenciennes, 1830)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Golden African snapper; Fr – Vivaneau doré; Sp – Pargo dorado africano.



Diagnostic characters: Body moderately fusiform for the genus. Head relatively blunt compared with other *Lutjanus*; snout short, much less than eye diameter; eye very large, preorbital bone very narrow, eye transected by a line drawn from tip of snout to middle of caudal-fin base; maxilla extending to about mid-eye level; vomerine teeth in a triangular patch with pronounced posterior extension medially. Dorsal fin with 10 spines and 13 or 14 soft rays; anal fin with 3 spines and 8 soft rays; 12 to 16 well formed (excluding rudiments) gill rakers on first gill arch. Scales moderate-sized, about 43 to 48 in lateral line; 13 or 14 longitudinal scale rows from anal-fin origin to lateral line; 4 or 5 scale rows on cheek. **Colour:** generally vivid pink with golden longitudinal bands (1 per scale row) on sides.

Size: Maximum to 60 cm; common to 50 cm.

Habitat, biology, and fisheries: Occurs on rocky bottoms at moderate depths and also found in deeper offshore trawling grounds. Feeds on fishes and crustaceans on inshore reefs and offshore trawling grounds down to at least 150 m depth. Separate statistics are not reported for this species. Caught with handlines and trawl nets. Marketed mainly fresh.

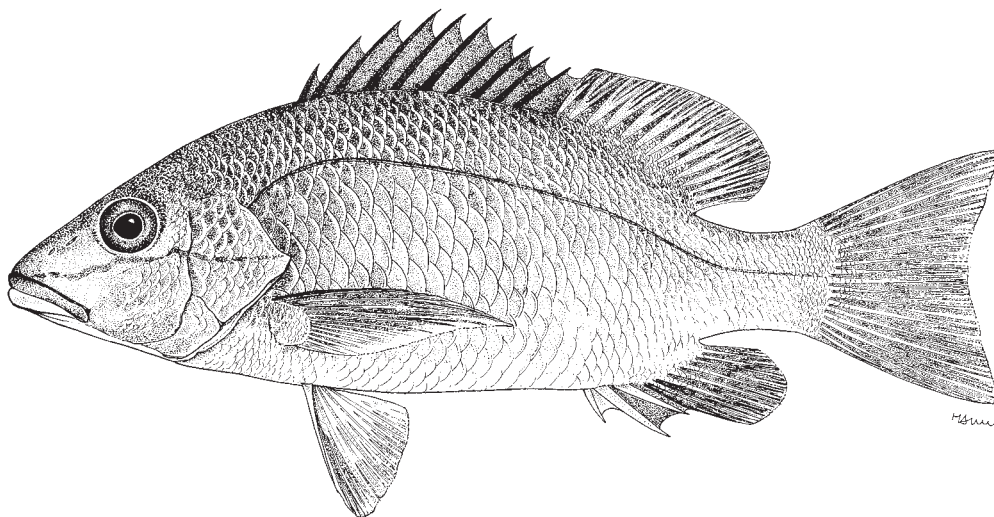
Distribution: Known only from the West African coast, primarily in the Gulf of Guinea.



Lutjanus goreensis (Valenciennes, 1830)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Gorean snapper; Fr – Vivaneau de Goré; Sp – Pargo de Gorea.



Diagnostic characters: Body relatively deep for the genus. Head pointed, its dorsal profile steep; eye large; **preorbital bone broad**; maxilla extending to about mideye level; **vomerine teeth in a triangular patch with a pronounced posterior extension medially**. Dorsal fin with 10 spines and 14 or 15 soft rays; anal fin with 3 spines and 8 soft rays; **about 7 to 9 well formed (excluding rudiments) gill rakers on first gill arch**. Scales moderate-sized, about 43 to 46 in lateral line; **12 to 14 longitudinal scale rows from anal-fin origin to lateral line**; **6 or 7 scale rows on cheek**. **Colour:** vivid pink grading to whitish on ventral portion with a narrow blue subocular band, or row of broken spots; **blue stripe on head, sometimes extending from near tip of snout to angle of opercle**; small specimens from inshore areas brownish.

Size: Maximum to 80 cm; common to 60 cm.

Habitat, biology, and fisheries: Occurs on rocky bottoms and in the vicinity of coral reefs. The young are frequently encountered in coastal waters, particularly estuaries and sometimes in rivers. A voracious predator feeding mainly on fishes and bottom-dwelling invertebrates. Mainly inshore areas to depths of about 70 m. Separate statistics are not reported for this species. Caught with handlines, fixed bottom nets, and trawl nets. Marketed mainly fresh.

Distribution: Known only from the West African coast, primarily the Gulf of Guinea and Cape Verde Islands.



Habitat, biology, and fisheries: A sluggish offshore fish that often floats on its side near the surface in the company of floating objects, occasionally drifting into shallow water. The young often drift with floating sargassum and mimic mangrove leaves. Caught with haul seines, gillnets, and on line gear. Marketed fresh. The flesh is said to be of excellent quality.

Distribution: In the area, presumably along the coast from the Straits of Gibraltar to the Gulf of Guinea, including Madeira, although reliable records still lacking from Angola, the Canary Islands, and Cape Verde Islands. A cosmopolitan warm water species that is also reported from the Mediterranean.

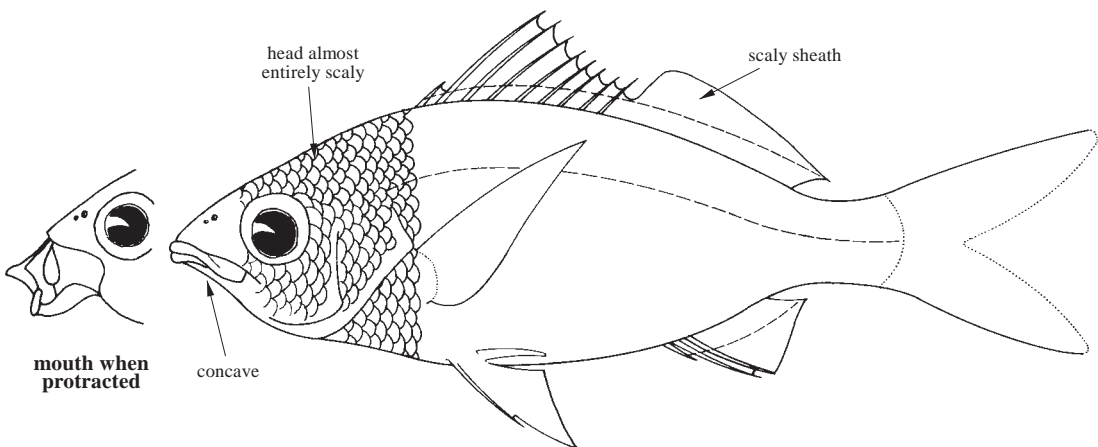


GERREIDAE

Mojarras

by Y. Iwatsuki, Department of Marine Biology and Environmental Sciences, Faculty of Agriculture, University of Miyazaki, Japan

Diagnostic characters: Body compressed, slender to deep (but deep bodied gerreids not occurring in the area). **Mouth small and very protrusible, arching downward when protracted; teeth on jaws present as minute, but no teeth in vomer, palatines and tongue;** maxilla naked, its posterior margin beyond or not beyond a vertical through anterior margin of eye; no supramaxilla. **Snout pointed.** Preorbital (lacrimal) and preopercle bones smooth or weakly serrated. Dorsal fin more or less notched; **second dorsal fin spine always much higher than first;** last dorsal- and anal-fin rays split to their base (but counted as 1); dorsal and anal fins generally transparent, naked, but **dorsal- and anal-fin bases sheathed by a row of high scales, with which the fins can be folded;** **pelvic-fin origin below or somewhat behind pectoral-fin base and bearing a long, scale-like axillary process;** caudal fin forked with 15 branched rays and its posterior tips strongly or weakly pointed posteriorly. **Cycloid scales moderate to large,** and present on occipital, frontal and lateral part of head and body but often deciduous; **pored lateral line complete and continuous;** premaxillary groove and preopercular flanges usually scaleless but scaled in some species; **most of head and body covered with conspicuous shiny scales.** Gill rakers developed but short, upper series shorter than lower series, some upper gill rakers rudimentary, lowest gill raker of lower series usually longer than uppermost. Pharyngeal teeth conical and/or molariform at species level. Six branchiostegals. Vertebrae 10 + 14. Gas bladder present. **Colour: head and body usually silvery with glittering scales,** but dark grey or olive green when viewed from above; often with faint indistinct markings, such as spots, bands or lines.



Habitat, biology, and fisheries: Small to large silvery fishes (usually about 10 to 20 cm in total length, some species attain over 40 cm total length) of shallow circumtropical to temperate region (usually less than 50 m at depth); a few species prefer more temperate waters throughout the Indo-West Pacific region; common in estuaries, tidal creeks, lagoons, and shallow coastal sandy and/or muddy bottoms influenced by freshwater basin; some species occur in freshwater. Gerreids feed on Copepoda, Decapoda, Polychaeta, Amphipoda, Gastropoda and Bivalvia (personal observation by author). Presumably sustained for food chain basis of shallow coastal sandy ecosystems, being eaten by other predators. Of greater fishery interest in some large species (except in eastern central Atlantic) as human food and abundant species are commercially important as dried foodfish, duck food and excellent live bait, but these are not usually of greater interest to anglers and professional fishermen. Utilized fresh and smoked, occasionally processed to fishmeal.

Similar families occurring in the area

No other family has the following combination of characters that characterizes the mojarras: ground colour predominantly silvery, mouth strongly protrusible, teeth villiform, present only in jaws; anterior part of lower head profile as well as interorbital region concave.

Centracanthidae: mouth also strongly protractile, but not pointing downward when protracted; dorsal fin (in West African representatives) scarcely notched.

Key to genera of Gerreidae occurring in the area^{1/}

- 1a. First anal pterygiophore cylindrical at top, gradually conical to bottom, its open top being connected with posterior part of gas bladder (Fig. 1a); usually 7 anal soft fin rays . . . ***Eucinostomus***
- 1b. First anal pterygiophore like 1 strong spine, its base a somewhat wide plate (Fig. 1b); 8 anal soft fin rays ***Gerres***

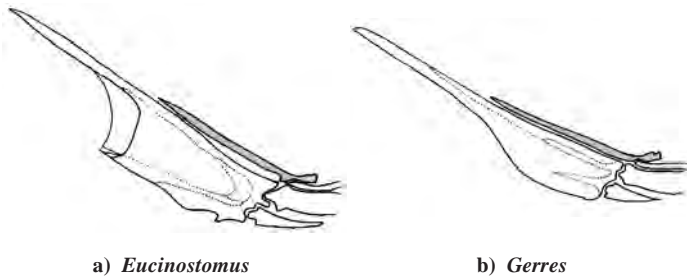



Fig. 1 anal pterygiophore

Key to species of Gerreidae occurring in the area


- 1a. Seven soft anal-fin rays; dorsal fin strongly notched between spinous and soft fin; no stripes and no bands on body; a distinct large black blotch on upper part of second to sixth spinous dorsal fin, translucent or whitish part below, and a dusky area at base; tips of pectoral fins just reaching over or to first dorsal soft ray vertically below and falling short of first anal-fin spine origin vertically; nostrils contiguous with very narrow membrane, subtly placed nearer to eye than to tip of snout in adults ***Eucinostomus melanopterus***
- 1b. Eight soft anal-fin rays; dorsal fin weakly notched between spinous and soft fin; dark stripes along longitudinal scale rows and above lateral line and sometimes 7 to 14 indistinct vertical bars (half of pupil diameter in width) on body; no large black patch on tip of spinous dorsal fin; tips of pectoral fins extending beyond first dorsal soft ray vertically below and also anus clearly, sometimes beyond anal-fin spine origin in smaller specimens; nostrils continuous, subtly placed midway between eye and tip of snout ***Gerres nigri***

^{1/} The generic nomenclature of this family is still poorly understood. Further study is needed. Some authors use only 1 genus, *Gerres*, for both West African species but the type species of the genus *Eucinostomus*, *E. argenteus* Baird and Girard in Baird, 1855 (western central Atlantic species; USNM syntypes), has a cylindrical first anal pterygiophore, also observed in the West African *Eucinostomus melanopterus* (Bleeker, 1863) (see Fig. 1A, holotype condition in *E. melanopterus*). This is a character of the genus *Eucinostomus*, while a type species of the genus *Gerres*, *G. vaigiensis* Quoy and Gaimard, 1824 (= *Gerres oyena*), shows similarity to Fig. 1B (see the condition, holotype of *G. vaigiensis*). The generic character of *Eucinostomus* is herein noted as a viable character for the genus *Eucinostomus*.

List of species occurring in the area

The symbol  is given when species accounts are included.

 *Eucinostomus melanopterus* (Bleeker, 1863).^{2/}

 *Gerres nigri* Günther, 1859.^{3/}

References

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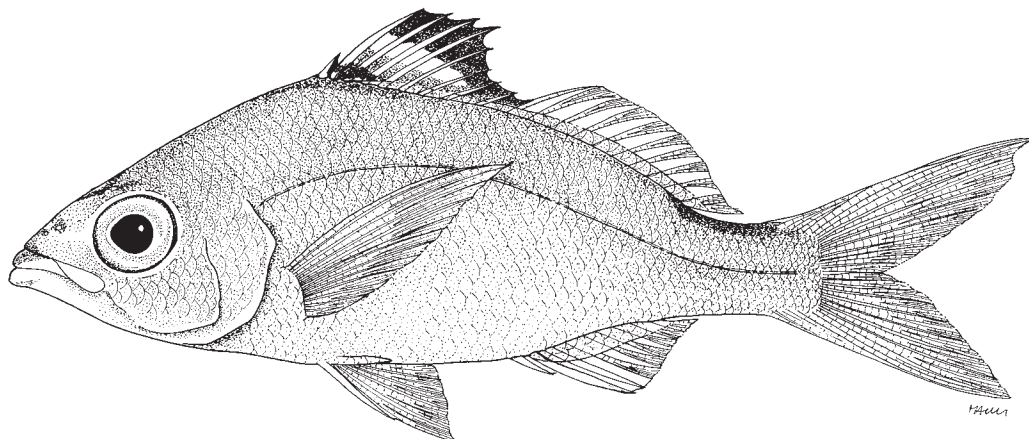
^{2/} The author has studied whether or not the 2 forms described as *E. melanopterus* from the eastern and western central Atlantic are really a same species and confirmed several subtle different characters between them. Further study is needed. A world revision of the family, at generic and specific level, is urgently needed as well. Lists of species occurring in the area consist of 2 species accounts, *Eucinostomus melanopterus* and *Gerres nigri*. Identification basically follows Roux (1981,1986, 1990).

^{3/} Bauchot and Desoutter (1989) concluded that *Gerres bilobus* Cuvier *in* Cuvier and Valenciennes, 1830 is synonymized under *Eucinostomus melanopterus* (Bleeker, 1863), while Roux (1986) justified *Gerres octactis* as a junior synonym of *Gerres nigri* Günther, 1859. Further review is needed for the taxonomic placement of these 2 species in eastern central African gerreids.

Eucinostomus melanopterus (Bleeker, 1863)

Frequent synonyms / misidentifications: *Gerres melanopterus* Bleeker, 1863 / None.

FAO names: En – Flagfin mojarra; Fr – Blanche drapeau; Sp – Mojarrita de ley.



Diagnostic characters: Body oblong and compressed, its depth contained 2.5 to 4.0 times in standard length (SL). Head contained 2.7 to 3.9 times in standard length; snout pointed, slightly shorter than eye in juveniles or almost same in larger adults; mouth strongly protrusible, the maxilla reaching backward to slightly beyond anterior eye margin; villiform teeth present in both jaws, but absent on roof of mouth; **nostrils contiguous with very narrow membrane, subtly placed nearer to eye than to tip of snout in adults.** Dorsal fin continuous, deeply notched, with 9 spines and 10 soft rays, the first spine very short; anal fin with 3 spines and **7 soft rays; tips of pectoral fins just reaching over or to first dorsal soft ray vertically below and falling short of first anal-fin spine origin vertically;** caudal fin deeply forked. Scales cycloid; lateral line with 42 to 45 pored scales to caudal base and 3 to 5 on latter; 4.5 to 5.5 scales above and 8.5 to 10.5 below lateral line. **Colour:** back olive, sides silvery; **a black blotch on tip of second to sixth spinous dorsal fin, translucent or whitish below and dusky in their base;** pelvic fins slightly black.

Size: Maximum to about 27 cm; common to 15 cm.

Habitat, biology, and fisheries: A coastal species, found on sand and mud bottoms, rarely beyond 25 m depth; enters estuaries and coastal lagoons; often forming sizeable schools. Feeds on small bottom-dwelling animals, particularly worms. Separate statistics are not reported for this species. Caught with beach seines, setnets, trawls and handlines. Fresh and smoked, occasionally processed to fishmeal.

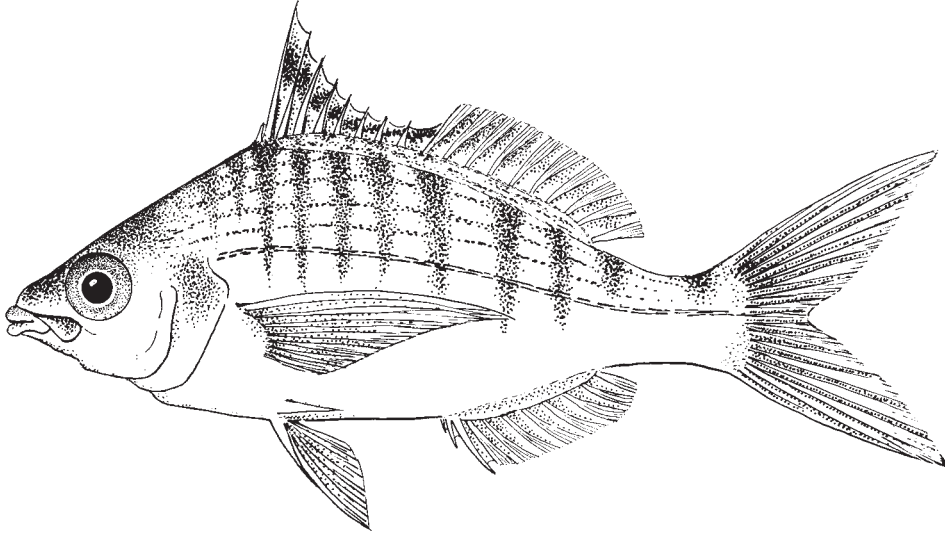
Distribution: In the area reported from Senegal, through the western central Atlantic, to Angola.



***Gerres nigri* Günther, 1859**

Frequent synonyms / misidentifications: *Gerres octactis* Bleeker, 1863 / None.

FAO names: En – Guinean striped mojarra; Fr – Friture rayée; Sp – Mojarra guineana.



Diagnostic characters: Body oblong and compressed, its depth contained 2.4 to 3.7 times in standard length (SL). Head contained 2.8 to 3.4 times in standard length; snout pointed, usually shorter than eye diameter; mouth strongly protrusible, the maxilla reaching backward slightly beyond anterior margin of eye; villiform teeth present in both jaws, but absent on roof of mouth; **nostrils continuous, subtly placed midway between eye and tip of snout**. Dorsal fin continuous, moderately notched, with 9 spines and 10 soft rays, the first spine very short; anal fin with 3 spines and **8 soft rays; tips of pectoral fins extending beyond first dorsal soft ray vertically below and also anus clearly, often anal-fin spine origin**; caudal fin deeply forked. Scales large, cycloid; lateral line with 42 to 46 pored scales to caudal base and 3 to 6 on latter; 5.5 to 6.5 scales above and 8.5 to 9.5 below lateral line. **Colour:** back olive brownish, sides silvery **with dark stripes along longitudinal scale rows and above lateral line and often also 7-14 vertical bars (half of pupil diameter in width) on body (distinctive in live or after death or preserved specimens); no distinct blotch on tip of spinous dorsal fin** in juveniles but sometimes 2 faint longitudinal series of small black spots-like on spinous dorsal fin; pelvic fins often black.

Size: Maximum to probably 20 cm; common to 15 cm.

Habitat, biology, and fisheries: A coastal species found on sand and mud bottoms to about 60 m depth; also enters estuaries and coastal lagoons, often forming schools. Taken by artisanal and trawl fisheries throughout its range. Separate statistics are not reported for this species. Caught with fixed bottom nets, trawls and on line gear. Fresh and smoked, rarely processed to fishmeal.

Distribution: In the area reported from Senegal, through the western central Atlantic, to northern Angola.

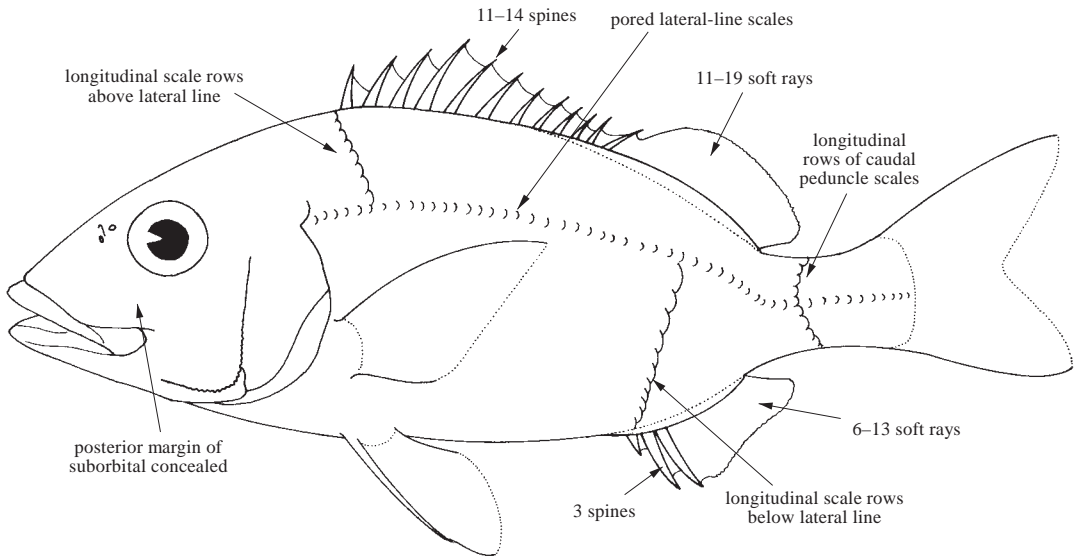


HAEMULIDAE

Grunts

by K.E. Carpenter, Old Dominion University, Norfolk, VA and
G.D. Johnson, National Museum of Natural History, Smithsonian Institution, Washington, DC, USA

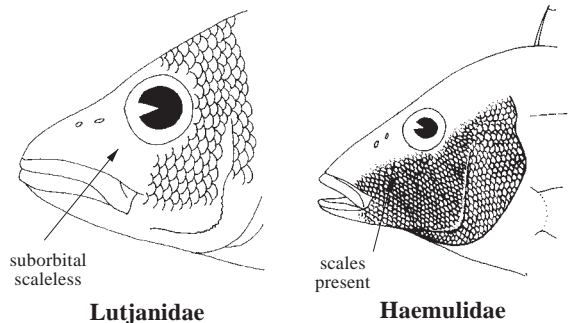
Diagnostic characters: Oblong, compressed, perch-like fishes to 60 cm total length. Head profile more or less convex in most species; mouth small to moderate, lips sometimes thick; **chin with 2 to 6 pores anteriorly**, teeth conical, in narrow bands in each jaw, the outer series enlarged, but no strong canines; roof of mouth toothless; **posterior margin of suborbital not exposed**; preopercle with posterior margin slightly concave and serrated; opercle with or without a spine. Dorsal fin single, with 10 to 14 strong spines and generally 11 to 19 soft rays; pelvic fins below pectoral-fin bases, with 1 spine and 5 soft rays; anal fin with 3 spines, the second often very prominent, and 6 to 13 soft rays; caudal fin emarginate to forked. Scales ctenoid (rough to touch), **extending onto entire head** (except front of snout, lips and chin). **Colour:** highly variable, ranging from uniformly coloured to striped, banded, blotched and spotted.



Habitat, biology, and fisheries: Small- to medium-sized fishes, nearly all from shallow coastal waters in tropical and subtropical regions. All of the species occurring in the area are regularly exploited by local artisanal fisheries or taken as bycatch in inshore trawling operations. At present, the most important commercial species is *Brachydeuterus auritus*. They are good foodfishes, often consumed fresh, but also dried-salted.

Similar families occurring in the area

Lutjanidae: no pores on chin; teeth present on roof of mouth; strong canine teeth frequently present in jaws; no scales between eye and mouth; spines of dorsal and anal fins weaker than in Haemulidae.

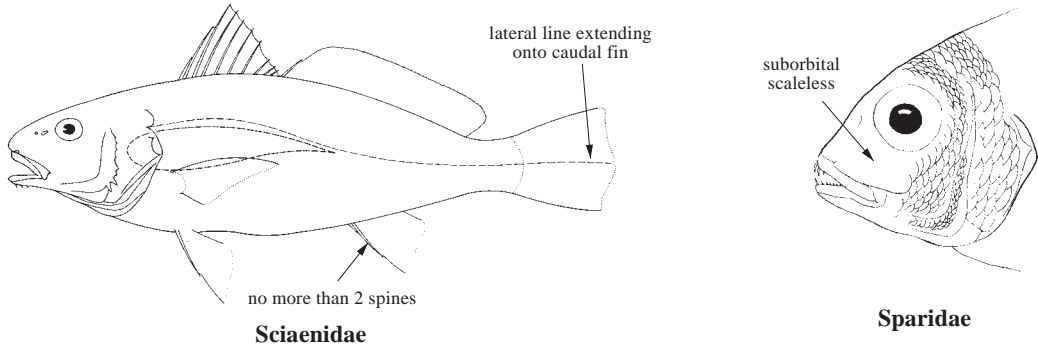


Lutjanidae

Haemulidae

Sciaenidae: anal fin with never more than 2 spines (3 in Haemulidae); lateral-line scales extending to hind margin of caudal fin; swimbladder usually large and complicated (except in *Menticirrhus* where it is rudimentary), or absent; canine-like teeth sometimes present.

Sparidae: suborbital area scaleless; no serrations on margin of preopercle; 2 pores not present beneath chin.



Key to species of Haemulidae occurring in the area

- 1a. Right and left elements of lower jaw posterior to symphysis separated at ventral midline by fleshy isthmus; 2 or 3 pairs of pores on chin (Figs 1, 2 and 3) → 2
- 1b. Right and left elements of lower jaw close to ventral midline covering fleshy isthmus (unless branchial basket unnaturally distended ventrally forcing lower jaw apart); 1 pair of small chin pores at symphysis of low lip and a single pit opening to a pair of pores at symphysis of lower jaw (Fig. 4) or 2 pairs of exposed pores (similar to Fig. 1 except with fleshy isthmus covered) → 6

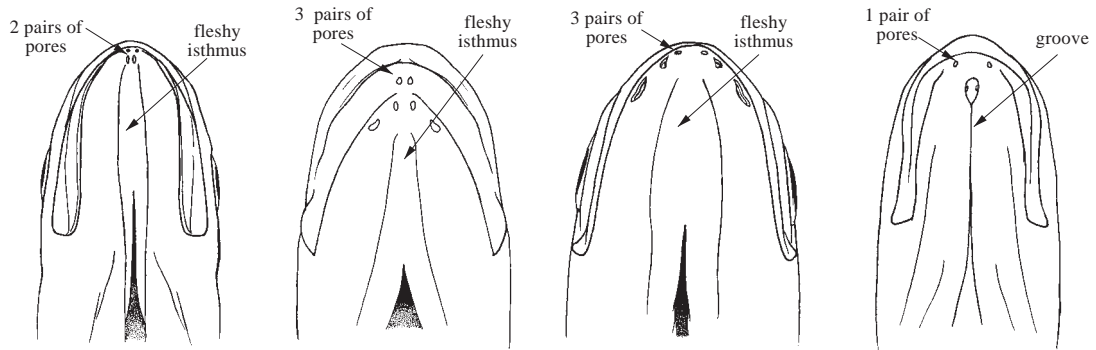


Fig. 1 underside of head Fig. 2 underside of head Fig. 3 underside of head Fig. 4 underside of head

- 2a. Two pairs of pores on chin (Fig. 1); dorsal fin deeply incised between spinous and soft-rayed portions (Fig. 5); dorsal fin with 11 to 13 soft rays; eye large, orbit length 1.2 to 1.6 times snout length ***Brachydeuterus auritus***

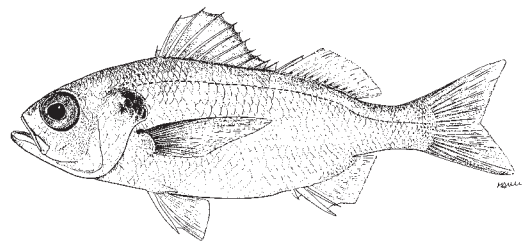


Fig. 5 *Brachydeuterus auritus*

- 2b. Three pairs of pores on chin (Figs 2 and 3); dorsal fin not incised or moderately incised; dorsal fin with 13 to 19 soft rays; eye moderately large, orbit length less than 1.2 times snout length → 3

- 3a. Lips thick (Fig. 6a); maxilla moderately short, when mouth closed not reaching or just reaching a level with anterior eye margin; body moderately deep, 2 to 2.5 times in standard length; dorsal fin with 16 to 19 soft rays **(Plectorhinchus)** → 4
- 3b. Lips thin to moderate (Fig. 6b); with mouth closed, maxilla reaching well posterior to a level of anterior eye margin; body depth 2.7 to 3.1 times in standard length; dorsal fin with 14 to 16 soft rays **(Parapristipoma)** → 5

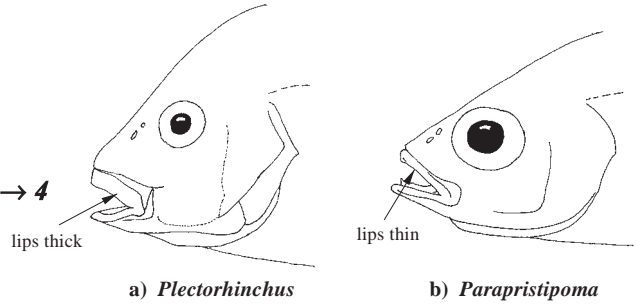


Fig. 6

- 4a. Anal fin with 7 soft rays; 15 to 18 gill rakers on first arch; 43 to 47 pored lateral-line scales; caudal fin truncate to rounded (Fig. 7) **Plectorhinchus macrolepis**
- 4b. Anal fin with 8 or 9 soft rays; 19 or 20 gill rakers on first arch; 54 to 57 pored lateral-line scales; caudal fin emarginate (Fig. 8) **Plectorhinchus mediterraneus**

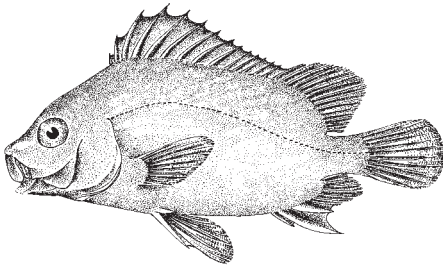


Fig. 7 *Plectorhinchus macrolepis*

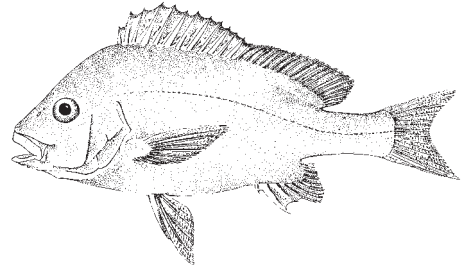


Fig. 8 *Plectorhinchus mediterraneus*

- 5a. Body without stripes, uniform violet-brown, or brownish head and body and yellow caudal peduncle and fins (Fig. 9) **Parapristipoma humile**
- 5b. Side of body and head with 4 longitudinal stripes (Fig. 10) **Parapristipoma octolineatum**

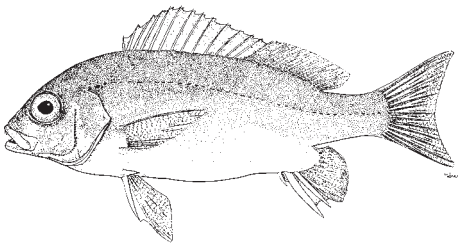


Fig. 9 *Parapristipoma humile*

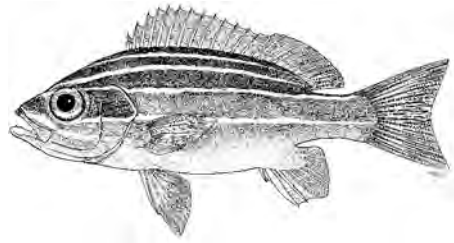


Fig. 10 *Parapristipoma octolineatum*

- 6a. Two pairs of exposed pores on chin; anal fin with 3 spines and 16 soft rays **Parakuhlia macrophthalmus**
- 6b. One pair of exposed pores on tip of chin and 1 median pit just anterior to isthmus containing a pair of pores; anal with 3 spines and 8 to 13 soft rays → 7
- 7a. Anal fin with 11 to 14 soft rays; body sometimes with large blotches but never spots or spots arranged in stripes **Pomadasyis incisus**
- 7b. Anal fin with 8 to 10 soft rays; body usually with spots or spots arranged linearly into stripes → 8

- 8a. Anal fin most frequently with 8 soft rays; back and sides with small dark spots arranged in sinous oblique or horizontal lines (Fig. 11); yellow blotch on snout ***Pomadasys jubelini***
- 8b. Anal fin most frequently with either 9 or 10 soft rays; spots on body arranged in irregular pattern or spots above lateral line anteriorly in oblique curved pattern; no yellow blotch on snout → 9

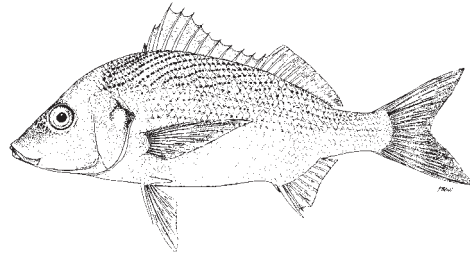


Fig. 11 *Pomadasys jubelini*

- 9a. Anal fin most frequently with 9 soft rays; upper back anterior to line from origin of dorsal fin to origin of lateral line typically without spots or with a few faint spots (Fig. 12); typically faint spots or no spots present in scale rows above, below and on anterior scales of lateral line ***Pomadasys rogerii***
- 9b. Anal fin most frequently with 10 soft rays; upper back anterior to line of origin of dorsal fin to origin of lateral line typically with distinct spots (Fig. 13); spots present in scale rows above, below and on anterior scales of lateral line ***Pomadasys perotaei***

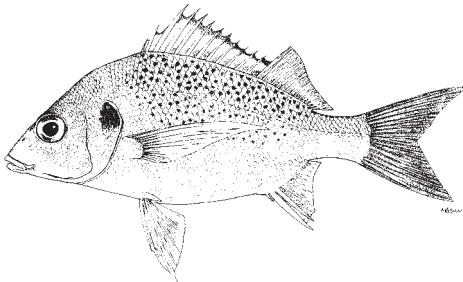


Fig. 12 *Pomadasys rogerii*

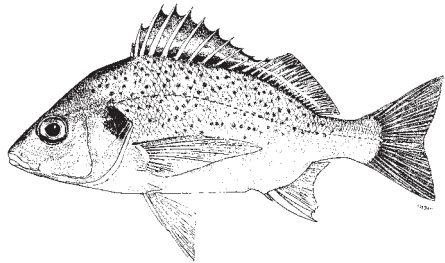













Fig. 13 *Pomadasys perotaei*

List of species occurring in the area

The symbol  is given when species accounts are included. The nomenclature and taxonomic status of some of the West African species in this family, genus *Pomadasys*, have been much confused. The identity of *Pomadasys incisus* is well established but the 3 species of *Pomadasys* with spots on the sides have been mixed up in the literature.

-  *Brachydeuterus auritus* (Valenciennes, 1832).
-  *Parakuhlia macrophthalmus* (Osorio, 1893),
-  *Parapristipoma humile* (Bowdich, 1825).
-  *Parapristipoma octolineatum* (Valenciennes, 1833).
-  *Plectorhinchus macrolepis* (Boulenger, 1899).
-  *Plectorhinchus mediterraneus* (Guichenot, 1850).
-  *Pomadasys incisus* (Bowdich, 1825).
-  *Pomadasys jubelini* (Cuvier, 1830).
-  *Pomadasys perotaei* (Cuvier, 1830).
-  *Pomadasys rogerii* (Cuvier, 1830).

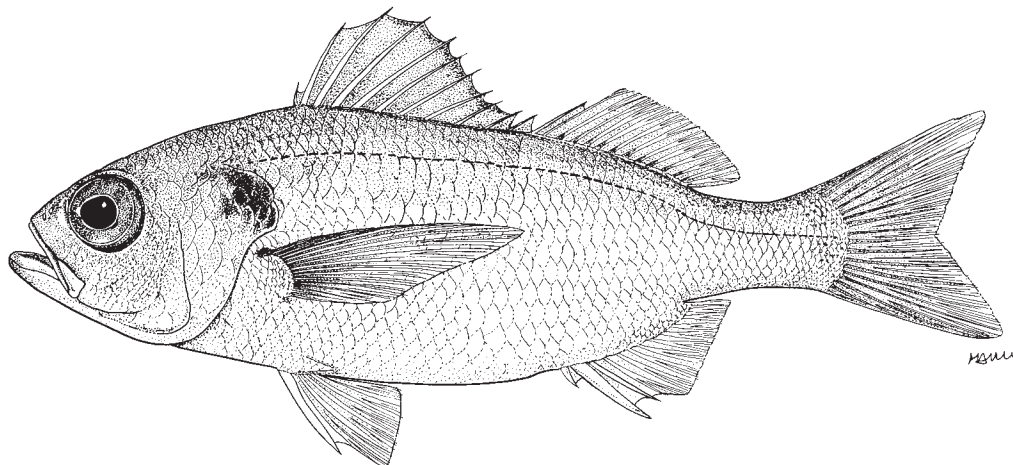
Reference

Roux, C. 1981. Pomadasyidae. In W. Fischer, G. Bianchi & W.B. Scott, eds. *FAO Species identification sheets for fishery purposes. Eastern Central Atlantic*. FAO, Rome. Vol. 3, pp. var.

***Brachydeuterus auritus* (Valenciennes, 1832)**

Frequent synonyms / misidentifications: *Otoperca aurita* (Valenciennes, 1832) / None.

FAO names: En – Bigeye grunt; Fr – Lippu pelon; Sp – Burro ojon.



Diagnostic characters: Body oblong and compressed, its depth contained 2.6 to 3.0 times in standard length. Mouth large and protrusible; eye large, orbit length 2.8 to 3.6 times in head length; **snout shorter than eye diameter; right and left elements of lower jaw posterior to symphysis separated at ventral midline by fleshy isthmus; chin with a pair of small pores near lips and another pair of pores, very close to each other, at symphysis of lower jaw;** with 12 moderately strong spines and 11 to 13 soft rays; anal fin with 3 spines and 9 or 10 (rarely 8) soft rays; caudal fin deeply emarginate. Lateral-line scales 48 to 52; 4 or 5 scale rows above and 11 or 12 below lateral line. **Colour:** back bluish, sometimes small dark spots present on dorsal fin near base.

Size: Maximum to 30 cm; common to 23 cm.

Habitat, biology, and fisheries: Inhabits coastal waters between 10 and 100 m depth, but is more common between 30 and 80 m. Inner shelf waters throughout its range. This is the most heavily exploited of the pomadaspid species in the area. Caught with bottom trawls, gillnets, setnets and purse seines. Marketed fresh, smoked, dried-salted and reduced to fishmeal. However, reported to be discarded in some countries (i.e. Senegal) in the northern part of the area.

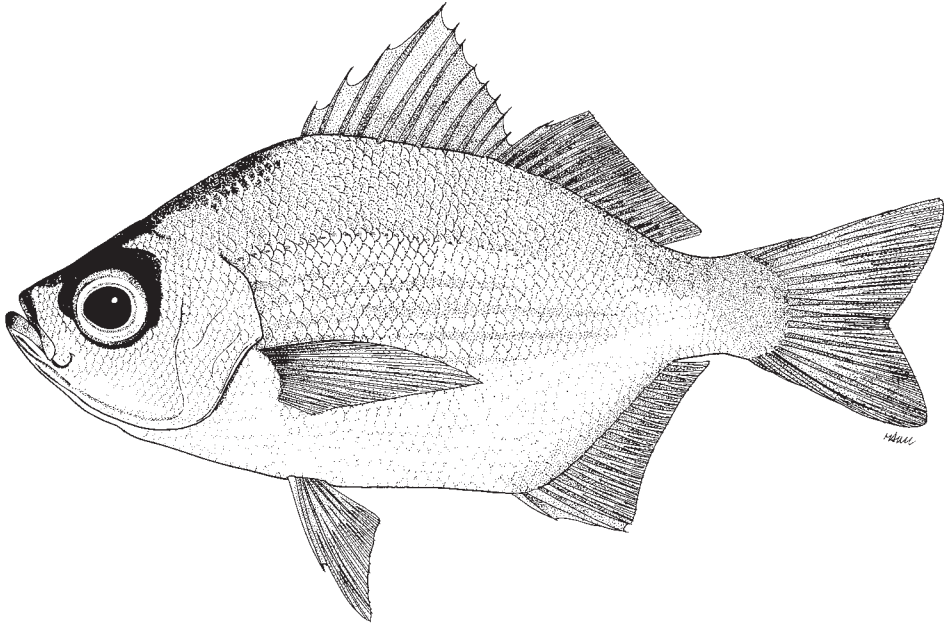
Distribution: Along the West African coast from Mauritania (exceptionally Morocco) to Angola.



***Parakuhlia macrophthalmus* (Osório, 1893)**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Dara; Fr – Crocro à gros yeux; Sp – Dara.



Diagnostic characters: Body ovate, moderately deep and laterally compressed. Dorsal profile of head relatively steep, slightly concave over eye. Preorbital without serrate and **preopercle margin strongly serrate**. Eyes large. Snout short and blunt. **Mouth large, oblique and protusible**. Numerous bands of villiform teeth in jaws and on vomer; palatines toothless. **A single dorsal fin, deeply notched between spinous and soft-rayed portions, with 11 spines in anterior section and 1 spine and 15 or 16 soft rays posteriorly**; base of soft dorsal fin slightly shorter than base of anal fin. **Anal fin with 3 spines and 16 soft rays**. **Pectoral fins with 17 rays**, reaching the level of anus. Caudal fin slightly emarginated. Scales ctenoid, moderately large, 50 or 51 in lateral line. Well-developed scaly sheath at base of dorsal and anal fins. **Colour:** mostly silvery, slightly darker on dorsal surface. All fins, base of dorsal and anal fins, and caudal peduncle dark yellow.

Remark: This species was placed in the family Kuhliidae but otherwise recognized as belonging to the family Haemulidae.

Size: Maximum size 20 cm total length; common to 15 cm total length.

Habitat, biology, and fisheries: Demersal species, inhabits inshore waters, frequenting rocky coast and beaches to depths of 20 m. No data about feeding and spawning. Separate statistics not reported for this species which is not considered to be of commercial importance. Caught mainly with setnets, seines or on hook-and-line. Marketed fresh; eaten fried or smoked.

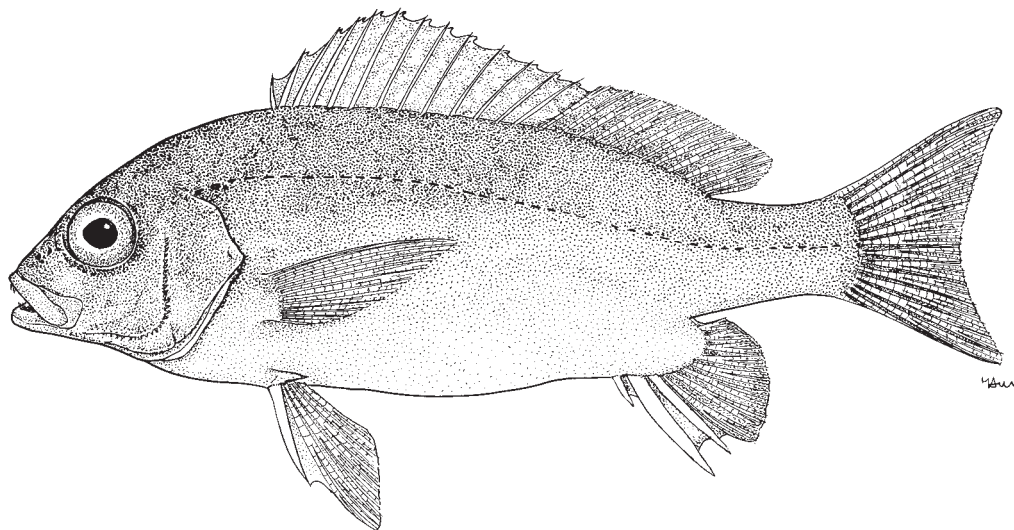
Distribution: Along the coasts of West Africa from Senegal to Angola, mainly in the Gulf of Guinea.



***Parapristipoma humile* (Bowdich, 1825)**

Frequent synonyms / misidentifications: *Pristipoma humilis* Bowdich, 1825; *Parapristoma macrops* (Pelegrin, 1912) / *Parapristipoma octolineatum*.

FAO names: **En** – Guinea grunt; **Fr** – Grondeur bouche d'or; **Sp** – Burro boca de oro.



Diagnostic characters: Body elongate and compressed. Head 3.0 to 3.4 times in standard length. Snout nearly as long as orbit diameter; mouth slightly oblique, nearly terminal; **lips moderately thin; right and left elements of lower jaw posterior to symphysis separated at ventral midline by fleshy isthmus; chin with 3 pairs of pores (anterior pair smaller than the others);** teeth conical, in several bands; preopercle serrated; 21 to 23 gill rakers on lower limb of first arch. **Dorsal fin with 13 spines and 13 to 15 soft rays;** anal fin with 3 spines and 7 or 8 soft rays. Scales ctenoid (rough to touch), 52 to 59 in lateral line. **Colour:** body mostly brownish to greyish; caudal peduncle and caudal fin yellow; other fins yellowish to orangish, pelvic-fin spine and anterior anal-fin spine whitish.

Size: Maximum to 36 cm.

Habitat, biology, and fisheries: Inhabits shallow waters between the coastline and about 100 m depth on sand, muddy sand and rock bottoms. Continental shelf throughout its range but apparently not abundant. Separate statistics are not reported for this species. Caught mainly with bottom trawls. Marketed mostly fresh.

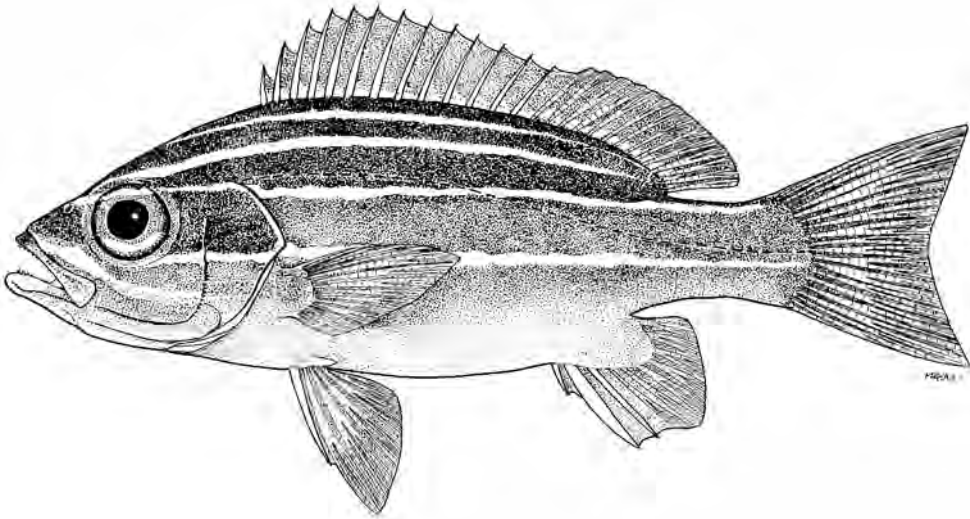
Distribution: From the Straits of Gibraltar to Angola, northward extending into the Mediterranean. Very common in the Cape Verde Islands.



Parapristipoma octolineatum (Valenciennes, 1833)

Frequent synonyms / misidentifications: *Pristipoma octolineatum* Valenciennes, 1833; *Diagramma octolineatum* (Valenciennes, 1833) / *Parapristipoma humile*.

FAO names: En – African striped grunt; Fr – Grondeur rayé; Sp – Burro listado.



Diagnostic characters: Body elongate and compressed. Head contained 3 to 3.15 times in standard length; **snout rounded, shorter than eye diameter**; mouth slightly oblique; the maxilla extending to anterior eye margin; lips moderately thin; **right and left elements of lower jaw posterior to symphysis separated at ventral midline by fleshy isthmus; chin with 3 pairs of pores (anterior pair smaller than the others)**; preopercle serrated; 21 to 23 gill rakers on lower limb of first arch. **Dorsal fin with 13 spines and 14 or 15 soft rays**; anal fin with 3 spines and 7 soft rays. Scales ctenoid (rough to touch); 53 to 58 in lateral line. **Colour:** brownish with **4 longitudinal whitish to bluish stripes along back and sides beginning on head**; stripes on much larger individuals faded; fins yellowish to brownish.

Size: Maximum possibly 40 cm; common to 25 cm.

Habitat, biology, and fisheries: Inhabits sand and rock bottoms in shallow waters from the shoreline to about 180 m depth. Feeds on crustaceans and molluscs. Taken occasionally throughout its range, but apparently not abundant. Separate statistics are not reported for this species. Caught with trammel nets, bottom trawls and on line gear. Marketed mostly fresh.

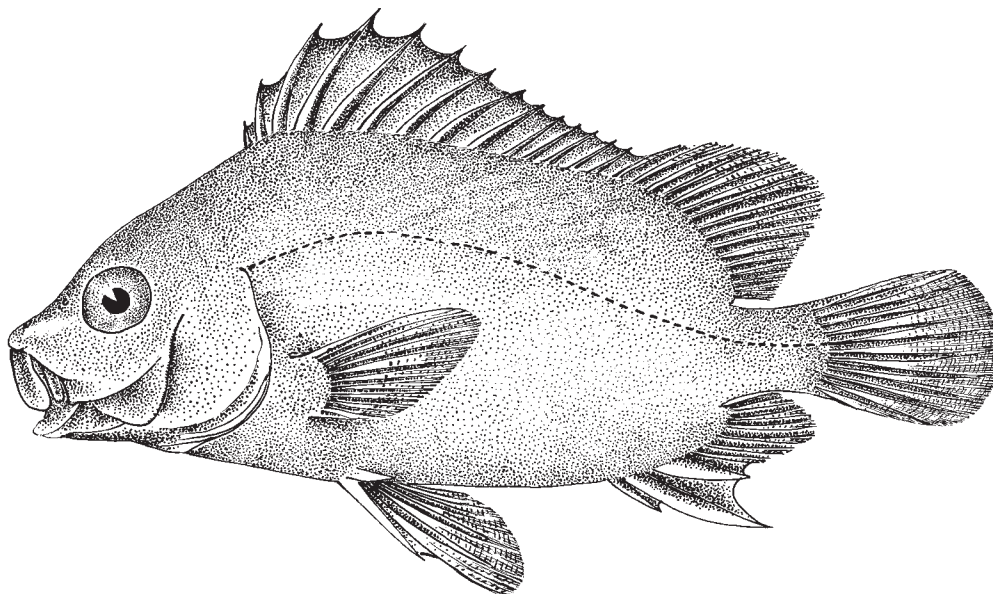
Distribution: West African coast including islands, from the Straits of Gibraltar to Angola; northward extending into the western Mediterranean and along the coasts of Portugal and Spain.



***Plectorhinchus macrolepis* (Boulenger, 1899)**

Frequent synonyms / misidentifications: *Diagramma macrolepis* Boulenger, 1899 / *Plectorhinchus mediterraneus*.

FAO names: En – Biglip grunt; Fr – Diagramme à grosses lèvres; Sp – Burro labiogrueso.



Diagnostic characters: Body oblong and compressed, **moderately deep** (depth contained about 3 times in standard length). Snout equal to, or slightly longer than, eye diameter; eye large (3.5 times in head length); mouth oblique, the maxilla not reaching to level of anterior eye margin; **lips very thick**; teeth sparse in number, small, conical, arranged in several bands; **right and left element of lower jaw posterior to symphysis separated at ventral midline by fleshy isthmus**; chin with 3 pairs of pores, but no median groove on chin; preopercle strongly serrated; **15 to 18 (usually 16) gill rakers on lower limb of first arch**. **Dorsal fin with 14 strong spines, the fifth longest, and 16 soft rays**; **anal fin with 3 spines and 7 soft rays**; caudal fin rounded. Scales ctenoid (rough to touch), 44 to 46 in lateral line. **Colour:** body uniform dark brown with light blotches on sides in young individuals; fins dark brownish to blackish.

Size: Maximum to 47 cm.

Habitat, biology, and fisheries: Inhabits coastal waters from 0 to 25 m depth; also occurs in brackish waters. Occasionally taken throughout its range, but apparently never abundant. Separate statistics are not reported for this species. Caught with bottom trawls and several types of artisanal gear. Probably marketed fresh.

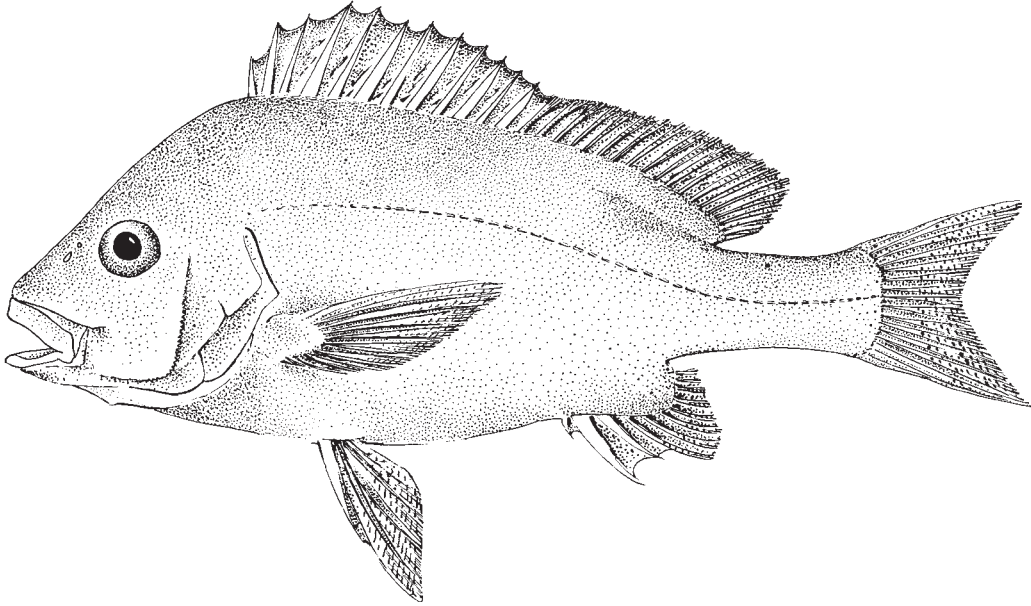
Distribution: West African coast, from Senegal to Congo.



Plectorhinchus mediterraneus (Guichenot, 1850)

Frequent synonyms / misidentifications: *Diagramma mediterraneum* Guichenot, 1850; *Parapristipoma mediterraneum* (Guichenot, 1850) / *Plectorhincus macrolepis*.

FAO names: En – Rubberlip grunt; Fr – Diagramme gris; Sp – Burro chiclero.



Diagnostic characters: **Body** oblong and compressed, its **depth contained 2.4 to 2.5 times in standard length**. Snout 1.3 to 1.8 times the eye diameter; eye medium-sized (3.5 to 5 times in head length); mouth oblique, the maxilla reaching to anterior eye margin; **lips relatively thick**; teeth conical, set in several bands in jaws; **right and left elements of lower jaw posterior to symphysis separated at ventral midline by fleshy isthmus**; chin with **3 pairs of pores (anterior pair smaller than the others)**; preopercle serrated; **19 or 20 gill rakers on first arch. Dorsal fin with 10 to 13 spines and 17 to 20 soft rays; anal fin with 3 spines and 8 or 9 soft rays**; caudal fin emarginate with pointed lobes. Scales ctenoid (rough to touch) 54 to 57 in lateral line. **Colour:** body greyish to brownish, lighter stripes, another indistinct dark stripe just below soft dorsal fin and curving onto upper caudal peduncle; fins greyish to brownish, the tips generally darker, especially the pectoral fins.

Size: Maximum to 80 cm.

Habitat, biology, and fisheries: Inhabits sand and muddy sand bottoms from the coastline to about 180 m depth. Feeds on benthic and planktonic crustaceans and molluscs. Coastal waters throughout its range. Reported to be abundant in some localities (occasionally making up over 40% of trawl catches), especially in winter. Separate statistics are not reported for this species. Caught with pelagic and bottom trawls, fixed bottom nets and on line gear. Marketed fresh and dried-salted.

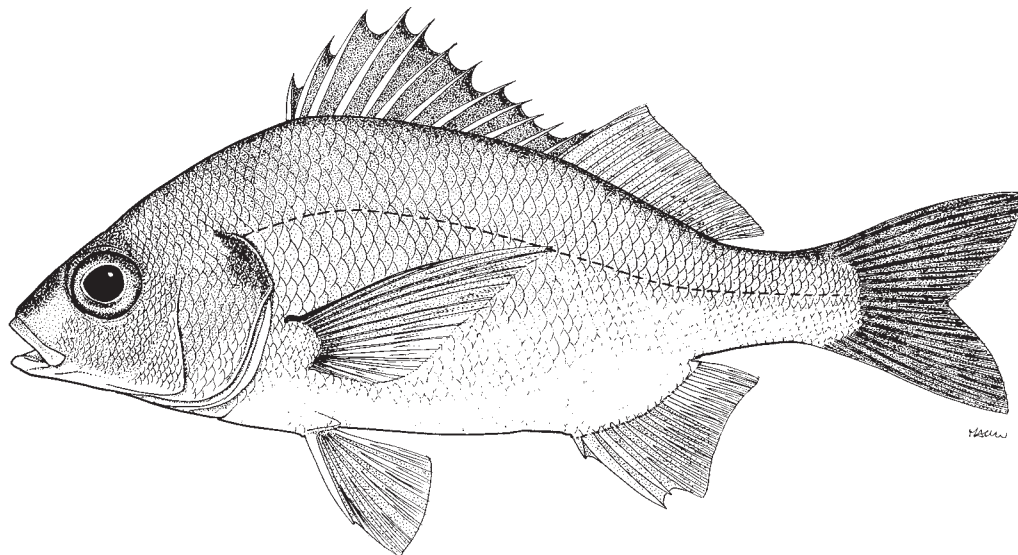
Distribution: In the area, from the Straits of Gibraltar to Namibia; northward extending into the Mediterranean and along the coasts of Spain and Portugal.



Pomadasys incisus (Bowdich, 1825)

Frequent synonyms / misidentifications: *Pomadasys bennetti* Lowe, 1838 / None.

FAO names: En – Bastard grunt; Fr – Grondeur métis; Sp – Ronco mestizo.



Diagnostic characters: Body oblong and compressed, more convex dorsally, its depth contained 2.4 to 2.7 times in standard length. Head 2.7 to 3.2 times in standard length; **snout length 0.9 to 1.4 times the orbit diameter**; orbit diameter 3.2 to 3.8 times in head length; mouth slightly oblique, the maxilla barely reaching to level of anterior eye margin and entirely concealed beneath the preorbital bones; **right and left elements of lower jaw close at ventral midline covering fleshy isthmus; 1 pair of small chin pores at symphysis of low lip and a single pit opening to a pair of pores at symphysis of lower jaw**; teeth villiform, arranged in bands in both jaws; **11 to 15 gill rakers on lower lobe of first arch**. Dorsal fin with 12 spines and 15 or 16 soft rays; **anal fin with 3 spines and 11 to 13 soft rays**, the second spine strongest; caudal fin emarginate. Scales moderately ctenoid, 51 to 53 in lateral line. **Colour:** background silvery grey, with a dark blotch on posterior edge of opercle. **Sometimes with large blotches in juveniles, but never with spots or stripes.** Pectoral, pelvic and anal fins yellowish, dorsal and caudal fin yellowish to blackish.

Size: Maximum to at least 50 cm; common to 25 cm.

Habitat, biology, and fisheries: Inhabits mainly rocky bottoms in coastal waters from 10 to about 100 m depth. Coastal waters throughout its range; apparently moderately abundant locally. Separate statistics are not reported for this species. Caught with bottom trawls, purse seines and setnets. Marketed fresh and dried-salted.

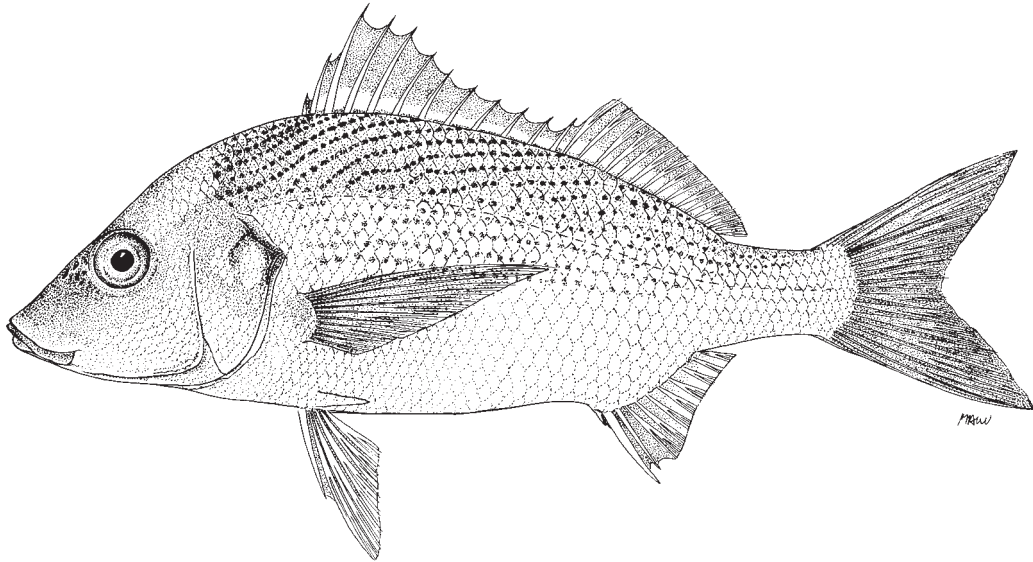
Distribution: In the area, from the Straits of Gibraltar to Angola including Madeira, the Canaries and Cape Verde Islands. Northward extending into the western Mediterranean to the French Ligurian Sea.



Pomadasys jubelini (Cuvier, 1830)

Frequent synonyms / misidentifications: None / *Pomadasys rogerii*.

FAO names: En – Sompat grunt; Fr – Grondeur sompat; Sp – Ronco sompat.



Diagnostic characters: Body oblong and compressed, its depth contained 2.7 to 3.1 times in standard length. Head length 2.6 to 3.0 times in standard length; snout long in large individuals and pointed, its length 0.8 to 1.1 times in orbit diameter; eye moderately small, orbit diameter 3.0 to 3.6 times in head length; mouth slightly oblique, **right and left elements of lower jaw close at ventral midline covering fleshy isthmus; 1 pair of small chin pores at symphysis of lower lip and a single pit opening to a pair of pores at symphysis of lower jaw;** teeth conical, arranged in bands, those in outer band slightly larger; preopercle serrated posteriorly; **12 to 15 gill rakers on lower limb of first arch.** Dorsal fin with 12 spines and 15 to 17 soft rays; **anal fin with 3 spines, and typically 8 soft rays,** the first spine very short, the second long; caudal fin strongly emarginate. Scales ctenoid (rough to touch), 51 to 55 in lateral line. **Colour:** background silvery, **back and sides with small dark spots arranged in sinuous oblique or horizontal lines;** fins grey, the dorsal with a light longitudinal band; **a golden yellow blotch on snout and a yellow golden to darkish blotch on upper angle of opercle.**

Size: Maximum to 60 cm; common to 40 cm (about 0.9 kg).

Habitat, biology, and fisheries: A bottom-living, but periodically pelagic species usually inhabiting littoral waters to about 25 m depth, but has been reported to extend down to about 90 m. Feeds on crustaceans, worms and molluscs. Shallow waters throughout its range; locally abundant. Separate statistics are not reported for this species. Caught with pelagic and bottom trawls, beach seines and setnets. Marketed mainly fresh; also dried-salted.

Distribution: West African coast from Mauritania to Angola.

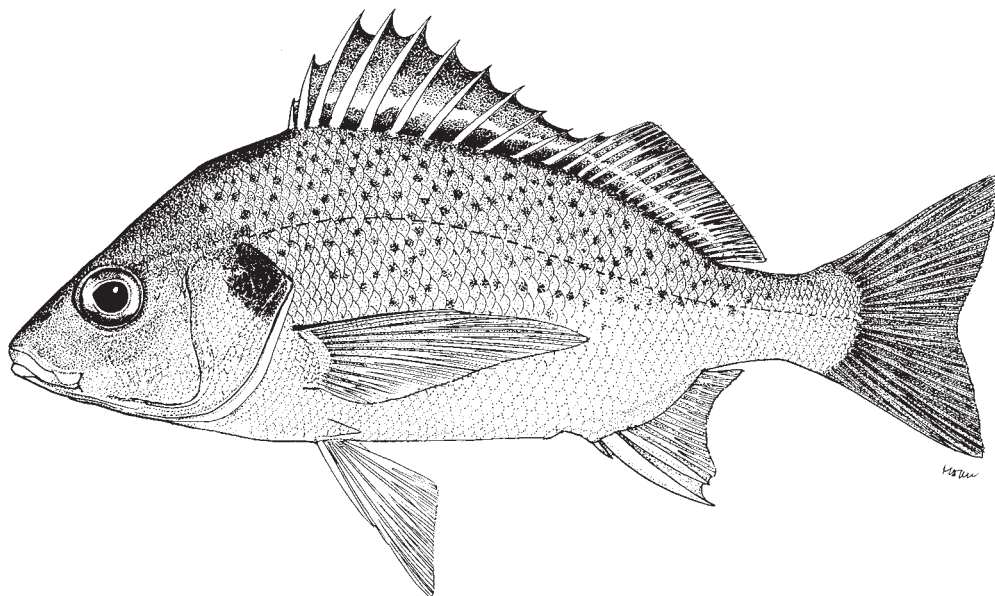
Note: Previous FAO and other publications have illustrated *Pomadasys jubelini* as *P. rogerii* and vice versa. An examination of the type material indicates that the present illustrations have been arranged correctly.



***Pomadasys perotaei* (Cuvier, 1830)**

Frequent synonyms / misidentifications: *Pomadasys peroteti* (misspelling of Cuvier 1830); *P. perotoei* (Cuvier, 1830) / *Pomadasys jubelini*; *P. rogerii*.

FAO names: **En** – Parrot grunt; **Fr** – Grandeur perroquet; **Sp** – Ronco loro.



Diagnostic characters: Body oblong and compressed, its depth contained 2.2 to 2.8 times in standard length. Head contained about 2.8 to 3.0 times in standard length; snout length less than orbit diameter; **eye large, orbit diameter 4.0 to 4.3 times in head length**; mouth moderately small, barely reaching to anterior eye margin; **right and left elements of lower jaw close at ventral midline covering fleshy isthmus; 1 pair of small chin pores at symphysis of lower lip and a single pit opening to a pair of pores at symphysis of lower jaw**; teeth conical, set in bands in both jaws; preopercle serrated at its hind edge; **15 to 17 gill rakers on lower limb of first arch**. Dorsal fin with 10 to 12 spines and 15 or 17 soft rays, with a scaly sheath at its base; **anal fin with 3 spines and typically 10 soft rays**, first spine very short, the second long; pectoral fin very long, almost reaching level of anus. **Colour:** back silvery grey with a bluish cast, belly silvery; light brown spots (darker in preserved specimens) irregularly spread on back and sides; **upper back anterior to line from origin of dorsal fin to origin of lateral line typically with distinct spots; spots present in scale rows above, below and on anterior scales of lateral line**; spots sometimes arranged in oblique and curved lines anteriorly above lateral line, this line pattern less distinct sometimes with age and scale damage. A dark or yellow blotch always present on upper angle of opercle. Dorsal fin membranes brown, darker along fin base and upper edge of spinous portion, with a light band running along midline of fin; tip of lower lobe of caudal fin sometimes yellowish.

Size: Maximum to 23 cm.

Habitat, biology, and fisheries: Coastal waters throughout its range, including brackish water habitats. Separate statistics are not reported for this species; probably often confused with other *Pomadasys* species. Caught with bottom trawls, purse seines and on line gear. Marketed fresh and dried-salted.

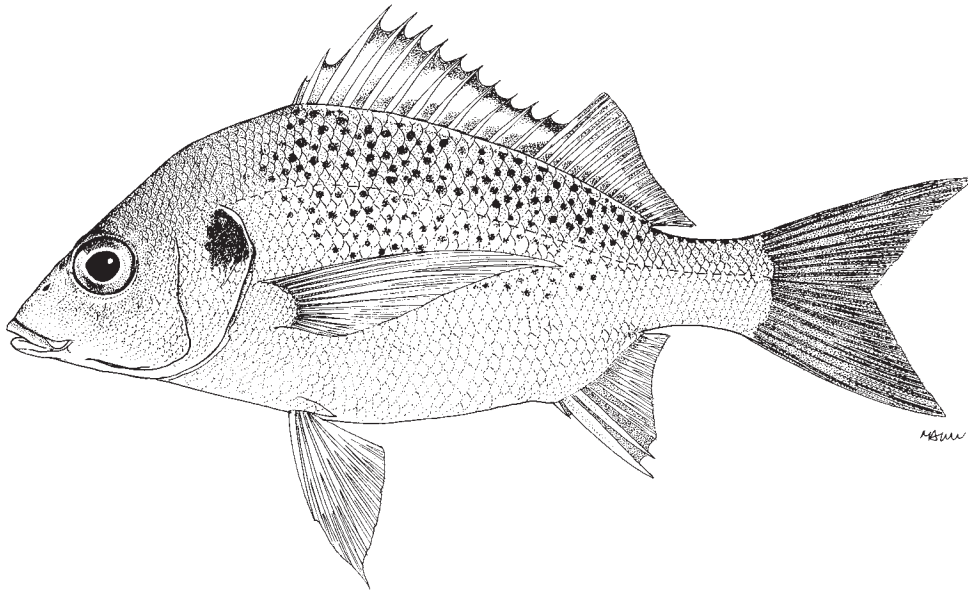
Distribution: From Mauritania to Angola.



***Pomadasys rogerii* (Cuvier, 1830)**

Frequent synonyms / misidentifications: None / *Pomadasys jubelini* (Cuvier, 1830).

FAO names: En – Pignout grunt; Fr – Grondeur nez de cochon; Sp – Ronco trompudo.



Diagnostic characters: Body oblong and compressed, its depth contained 2.6 to 2.9 times in standard length. Snout length 0.6 to 1.1 times in orbit diameter; eye moderately small, orbit diameter 2.9 to 4.2 times in head length; mouth slightly oblique, the maxilla not or barely reaching to anterior eye margin; **right and left elements of lower jaw close at ventral midline covering fleshy isthmus; 1 pair of small chin pores at symphysis of low lip and a single pit opening to a pair of pores at symphysis of lower jaw;** teeth conical, set in bands in both jaws, those in outer band strongest; preopercle serrated posteriorly, the serrations stronger at angle; **11 to 15 gill rakers on lower limb of first arch.** Dorsal fin with 12 spines and 14 to 16 soft rays, the first soft ray longer than the last spine; **anal fin with 3 spines, and typically 9 or 10 soft rays,** first spine very short, the second long; caudal fin emarginate. Scales slightly ctenoid, 45 to 52 in lateral line. **Colour:** background silvery, lighter ventrally, with **blackish or dark brown rounded spots irregularly spread on back and sides; upper back anterior to line from origin of dorsal fin to origin of lateral line typically without spots or with a few faint spots; typically faint spots or no spots present in scale rows above, below and on anterior scales of lateral line;** fins whitish to blackish.

Size: Maximum to 60 cm; common to 45 cm.

Habitat, biology, and fisheries: Inhabits coastal waters to depths of about 100 m, but is most common between 25 and 50 m. Feeds on crustaceans, worms and molluscs. Coastal waters throughout its range; apparently moderately abundant. Caught with bottom trawls, purse seines and on line gear. Marketed fresh and dried-salted.

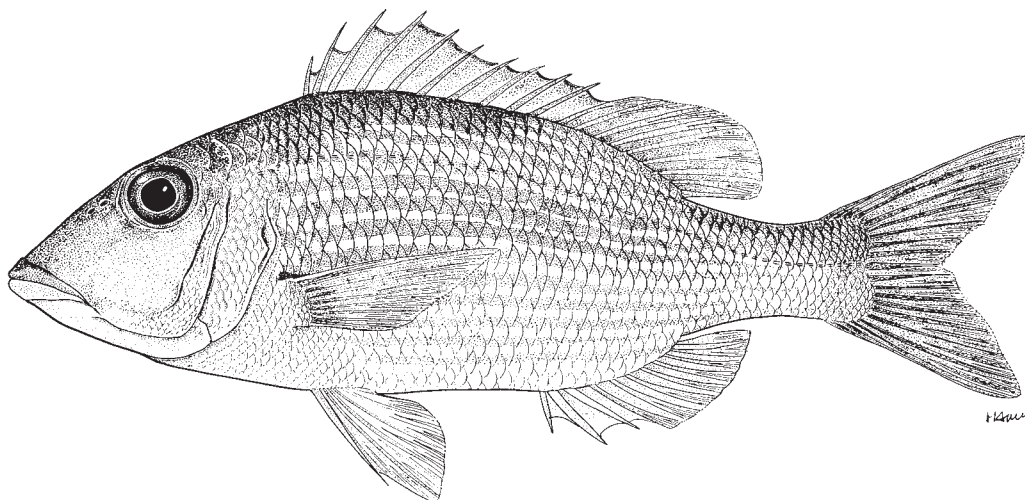
Distribution: West African coast from Mauritania to Angola.

Remarks: *Pomadasys jubelini* was mistakenly keyed as *P. rogerii* in the 1985 version of this guide, resulting in some confusion.



LETHRINIDAE**Emperors**

K.E. Carpenter, Old Dominion University, Norfolk, VA, USA

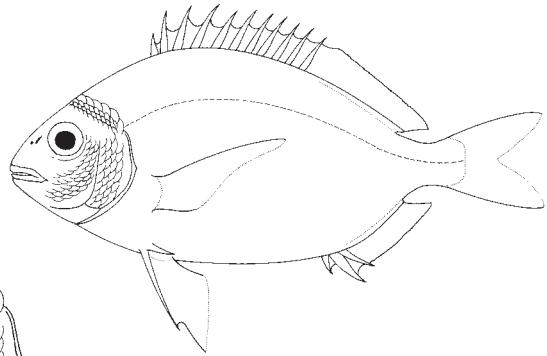
A single species occurring in the area.***Lethrinus atlanticus* Valenciennes, 1830****Frequent synonyms / misidentifications:** None / None.**FAO names:** **En** – Atlantic emperor; **Fr** – Empéreur atlantique; **Sp** – Emperador atlántico.

Diagnostic characters: Body moderately deep, its depth 2.5 to 2.8 times in standard length. Head length 0.9 to 1.0 time in body depth, 2.7 to 3.0 times in standard length, dorsal profile near eye nearly straight or slightly convex; snout moderately long and pointed, its length 1.9 to 2.4 times in head length, measured without the lip the snout is 0.8 to 1.0 time in cheek height, its profile fairly steep and straight, snout angle relative to upper jaw between 55 and 60 degrees; interorbital space nearly flat or slightly convex; eye situated close to dorsal profile, its length 3.4 to 4.3 times in head length; cheek moderately high, its length 2.6 to 3.3 times in head length; lateral teeth in jaws all conical; palate toothless; outer surface of maxilla smooth, without a knob or pronounced longitudinal ridge. Dorsal fin with 10 spines and 9 soft rays, the fourth dorsal spine usually the longest, its length 2.4 to 3.0 times in body depth; anal fin with 3 spines and 8 soft rays, the first soft ray the longest, its length greater than the base of the soft portion of the anal fin and 0.7 to 0.8 times in the length of the entire anal-fin base; pectoral-fin rays 13; pelvic-fin membranes usually with fairly dense melanophores, except the membranes between the rays closest to the body. Lateral-line scales 42 to 46; cheek without scales; 4.5 scale rows between lateral line and base of middle dorsal-fin spines; 13 or 14 scale rows in transverse series between origin of anal fin and lateral line; 13 or 14 rows in lower series of scales around caudal peduncle; 4 to 7 scales in supratemporal patch; inner surface of pectoral-fin axil scaleless; posterior angle of operculum fully scaled. **Colour:** olive green or brown and pinkish, cheeks with a network of fine reticulations below the eye.

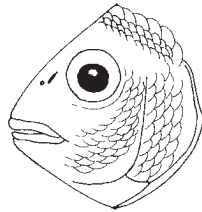
Similar families occurring in the area

Sparidae: cheek scaled (naked in *Lethrinus*); dorsal fin with 10 to 13 spines and 9 to 16 soft rays (10 spines and 9 soft rays in *L. atlanticus*).

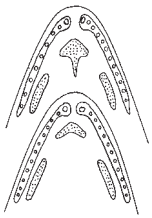
Lutjanidae (genus *Lutjanus*): cheek scaled (naked in *Lethrinus*); teeth present on palate (toothless in *Lethrinus*); dorsal fin with 12 to 15 soft rays (9 soft rays in *L. atlanticus*).



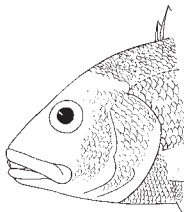
Sparidae



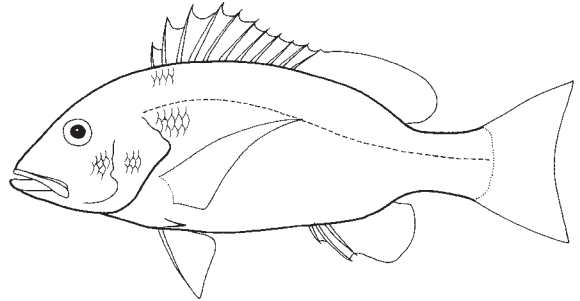
lateral view of head



teeth



lateral view of head



Lutjanidae

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

Habitat, biology, and fisheries: Inhabits shallow coastal waters to about 70 m. It feeds primarily on bottom-living invertebrates. Caught with bottom trawls, setnets, purse seines and on hook-and-lines. Usually marketed fresh, smoked, and dried-salted.

Distribution: West coast of Africa from Senegal to Congo, Cape Verde Islands, Principe Islands, São Tomé Islands and Rôlas Islands.

Reference

Carpenter, K.C. & Allen, G.R. 1989. Emperor fishes and large-eye breams of the world (family Lethrinidae). An annotated and illustrated catalogue of lethrinid species known to date. *FAO Fisheries Synopsis*, (125) Vol. 9: 116 p.

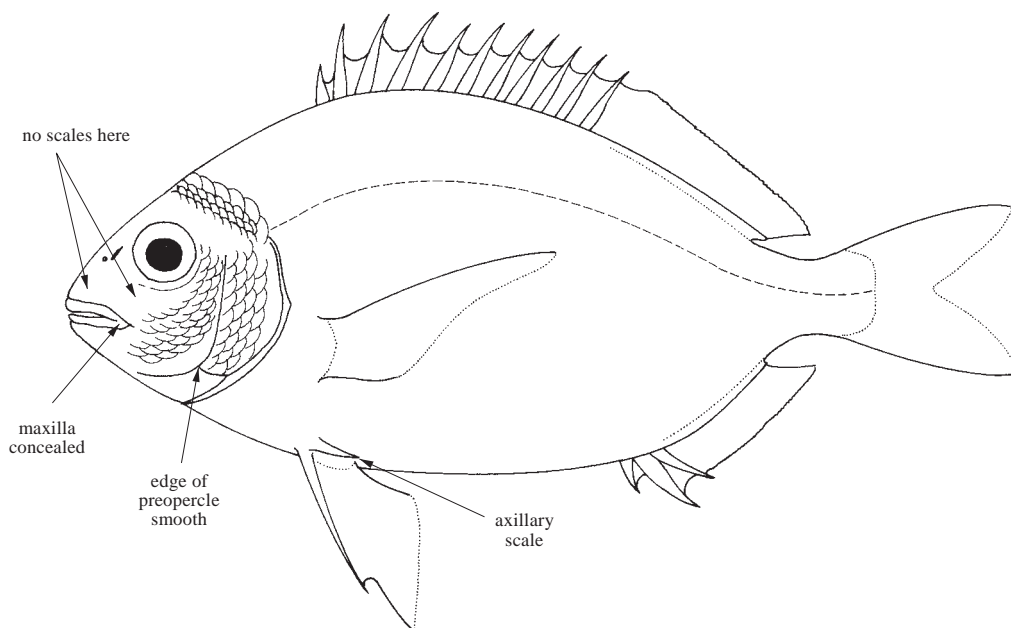


SPARIDAE

Porgies (picarels)

by K.E. Carpenter, Old Dominion University, Norfolk, VA, USA and Y. Iwatsuki, University of Miyazaki, Miyazaki, Japan
(after Bauchot, Hureau, and Miguel, 1981)

Diagnostic characters: Moderately small to large-sized perch-like fishes to 100 cm total length. Body fusiform to oval, more or less deep and compressed. Head often large; **snout and suborbital region scaleless, cheeks scaly**, preopercle with or without scales, **its posterior edge without spines or denticulations**; opercle scaly, without spines; mouth small, horizontal or oblique, **upper jaw slightly to very protrusible (in *Centracanthus* and *Spicara*); no supramaxilla; upper jaw never extending backward beyond a vertical line through middle of eye; premaxilla overlaps maxilla at distal tip; maxilla without scales** concealed under the preorbital bone when mouth is closed; **teeth cardiform to well developed, differentiated in conical (canine-like), flattened (incisor-like) or rounded, forming a pavement (molar-like)**; vomer and palatines (roof of mouth) toothless or with small teeth (only in some *Spicara*). A single dorsal fin with 10 to 15 spines and 9 to 18 soft rays, the spiny and soft portions not separated by a notch; first 2 spines sometimes very short, the 2 or 3 following ones occasionally prolonged and filamentous; pectoral fins usually long and pointed; pelvic fins inserted on, or just behind, a vertical line through pectoral-fin bases, with 1 spine and 5 soft rays and **an axillary scale at their bases**; anal fin with 3 spines and 7 to 16 soft rays; caudal fin more or less deeply forked. A single, well developed and continuous lateral line extending backward to base of caudal fin. Scales cycloid or slightly ctenoid. **Colour:** highly variable: more or less dark pink, red or grey, often with silvery reflections, dark spots, lines, bands or bars. Yellow spots on head often appear during the spawning season.



Habitat, biology, and fisheries: Fishes from tropical and temperate waters, only exceptionally found in cold waters and rarely entering brackish areas. They are demersal inhabitants of the continental shelf and the slope, gradually descending to deeper waters toward the equator in the Northern Hemisphere. The young usually occur in waters shallower than the adults. The smaller species, as well as the young of large species usually form aggregations, while the adults are solitary. Many species are hermaphroditic, although hermaphroditism is never simultaneous: at the age of first sexual maturity, the majority of individuals are males (protandric hermaphroditism) or females (protogynic hermaphroditism). The importance of this family for fisheries is based mostly on its richness in food species than on the abundance of any species in particular. Since the best yields are obtained on fishing grounds between 30 and 100 m depth the sparid fisheries along the West African coast have been very intensive and this has led to a drop in the catches.

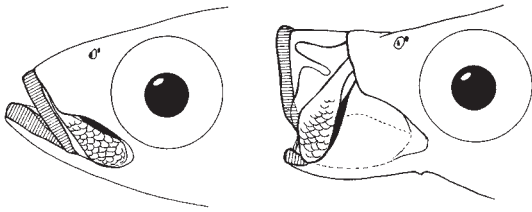
Remarks: The taxonomy of many genera of sparids is in a state of fluctuation because of recent molecular and morphological evidence. A primary taxonomic character for subfamilies and genera of sparids has been dentition and trophic type. While dentition is a useful tool for identification, it is clear that each trophic type has evolved several times separately within sparid fishes. Historically, species of the previously recognized family Centracanthidae has variously been placed in its own family and also included within the Sparidae. They differ from other sparids in that they have a highly protrusible upper jaw. It is clear from both morphological and molecular evidence that pronounced jaw protrusibility has evolved separately at least 4 times within sparid fishes and that currently recognized members of the Centracanthidae all belong within the Sparidae. Furthermore, the genus *Spicara* is polyphyletic and members currently recognized in this genus belong in at least 3 different genera. Similarly, the currently recognized members of the genus *Pagellus* undoubtedly belong in at least 2 different genera. I maintain the current taxonomy for these genera but recognize that this taxonomy will change in the near future.

Similar families occurring in the area

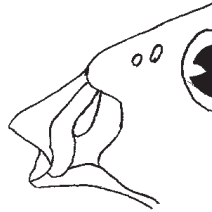
Emmelichthyidae (bear some resemblance to *Centracanthus* and *Spicara* because of pronounced jaw protrusibility but differ from these genera in the following): maxilla broad and scaly, exposed when mouth is closed; supramaxilla well developed. Also, none of the West African species with large dark blotches and 1, *Emmelichthys ruber*, with 2 separate dorsal fins.

Gerreidae (bear some resemblance to *Centracanthus* and *Spicara* because of pronounced jaw protrusibility but differ from these genera in the following): dorsal fin spines 9 or 10 (11 to 13 in *Centracanthus* and *Spicara*); maxilla not covered by preorbital bone when mouth is closed; mouth pointing downward when protracted.

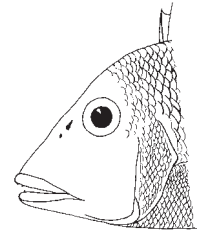
Lethrinidae: cheek and preopercle scaleless (cheek always scaled in Sparidae).



Emmelichthyidae

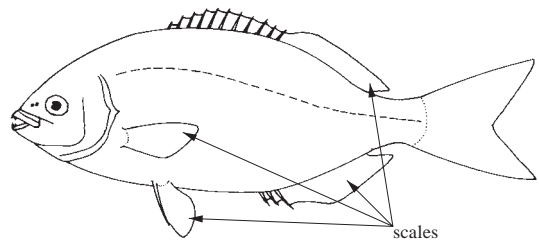


Gerreidae



Lethrinidae

Kyphosidae: fins covered to a large extent (except the spinous portion of dorsal fin) with very small scales (scaleless in Sparidae); suborbital space very narrow, leaving the maxilla largely exposed; teeth characteristically shaped like hockey-sticks.

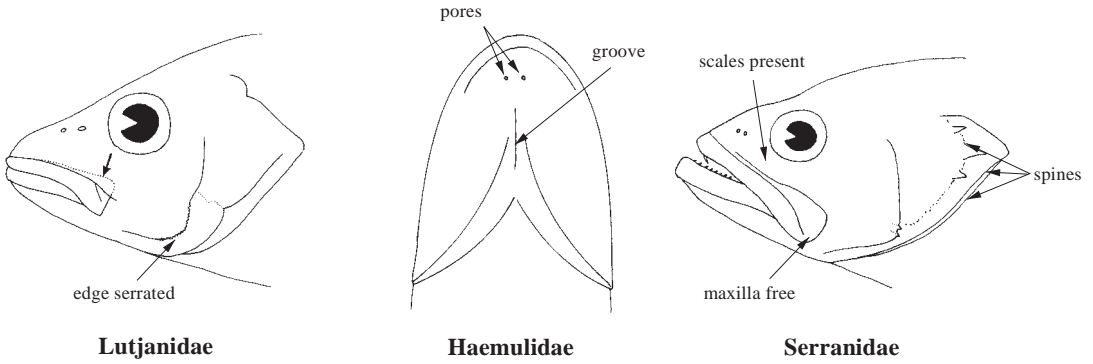


Kyphosidae

Lutjanidae: edge of preopercle denticulated; teeth usually present on roof of mouth (cheeks never scaled and roof of mouth toothless in sparid genera that superficially resemble lutjanids).

Haemulidae: edge of preopercle serrated; at least 2 mental pores and a depression or groove behind the symphysis of lower jaws.

Serranidae: suborbital region entirely scaled (scaleless in Sparidae); maxilla completely free (largely concealed by the suborbital bone in Sparidae); opercle with 1 to 3 spines (none in Sparidae).



Key to genera and species of monotypic genera of Sparidae occurring in the area

Note: Not included in this key is the genus *Chrysoblephus*. See remarks under **List of species**.

- 1a. Mouth strongly protrusible (Fig. 1) → 2
- 1b. Mouth only weakly to moderately protrusible (Fig. 2) → 3

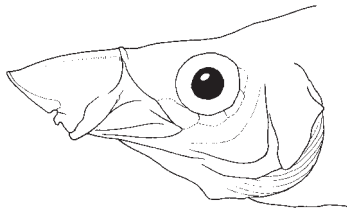


Fig. 1

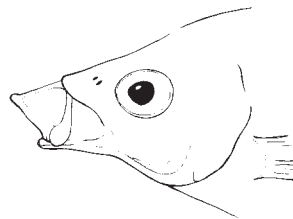


Fig. 2

- 2a. Body elongate; depth less than head length and contained 5.0 to 5.6 times in standard length; lateral-line scales 86 to 89; dorsal-fin margin notched before soft-rayed portion (Fig. 3) ***Centracanthus cirrus***
- 2b. Body depth greater than head length, contained 2.4 to 4.7 times in standard length; lateral-line scales 48 to 81; dorsal-fin margin continuous, or only slightly notched (Fig. 4) ***Spicara***

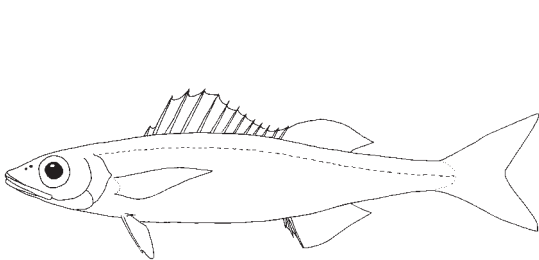


Fig. 3 *Centracanthus cirrus*

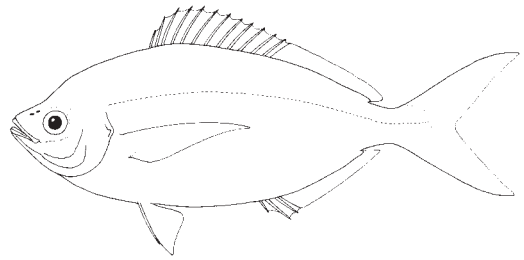


Fig. 4 *Spicara melanurus*

- 3a. Lateral teeth cutting or pointed (no molars) → 4
- 3b. Lateral teeth molar-like (Figs 5 and 6) → 9

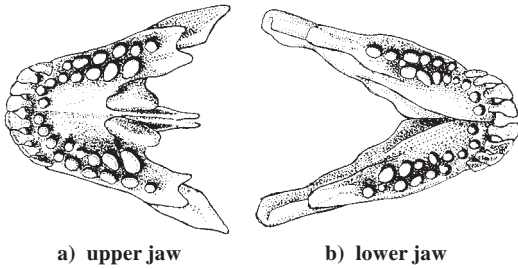


Fig. 5 *Diplodus bellottii*

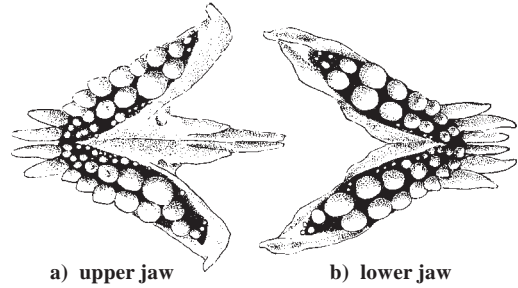


Fig. 6 *Sparus aurata*

- 4a. Anteriorly in each jaw, 4 to 8 strong canines, sometimes fang-like (Fig. 7) *Dentex*
- 4b. Numerous incisors (Figs 8, 9 and 10) or at least 10 conical teeth (Fig. 11) anteriorly in each jaw → 5

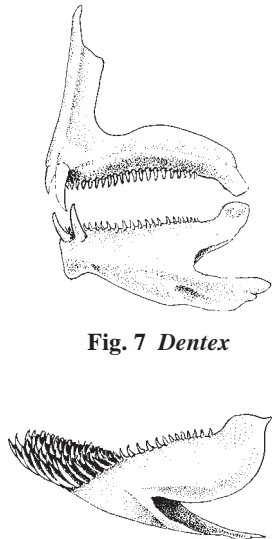


Fig. 7 *Dentex*

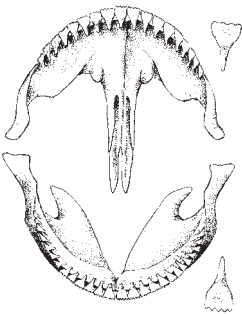


Fig. 8 *Boops*

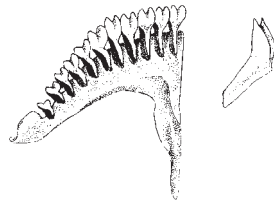


Fig. 9 *Sarpa*

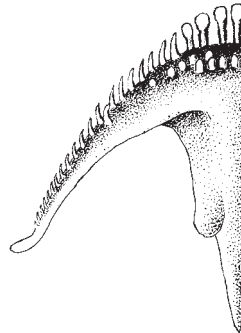


Fig. 10 *Oblada*

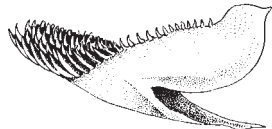


Fig. 11 *Spondylisoma*

- 5a. A single row of incisors in both jaws (Figs 8 and 9) → 6
- 5b. Several rows of teeth in each jaw (Fig. 11) → 7

- 6a. Dorsal fin with 11 or 12 spines; body oblong (Fig. 12) *Sarpa salpa*
- 6b. Dorsal fin with 13 to 15 spines; body fusiform (Fig.13) *Boops boops*

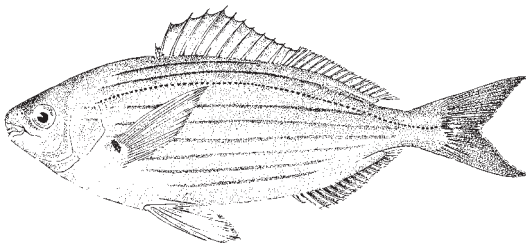


Fig. 12 *Sarpa salpa*

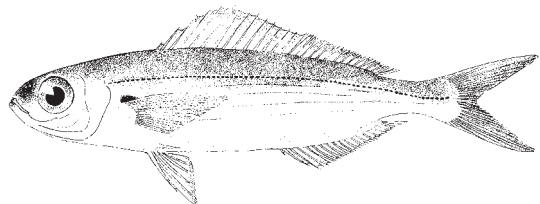


Fig. 13 *Boops boops*

- 7a. Each jaw anteriorly with 1 outer row of incisors flanked posteriorly by small granular teeth (Fig. 10); a black blotch margined with white on caudal peduncle (Fig. 14) ***Oblada melanura***
- 7b. Each jaw anteriorly with an outer row of pointed teeth followed by cardiform teeth (Fig. 8); no blotch on caudal peduncle → 8

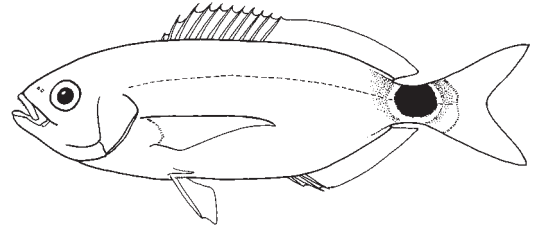


Fig. 14 *Oblada melanura*

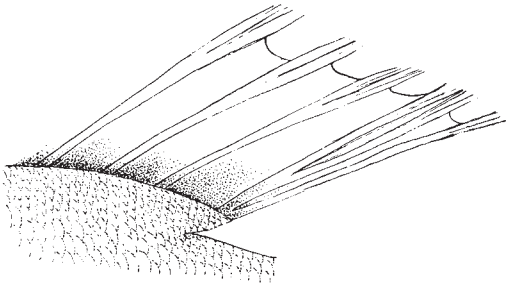


Fig. 15 *Spondyliosoma* (dorsal fin)

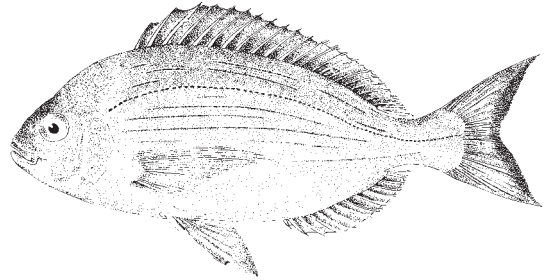


Fig. 16 *Spondyliosoma cantharus*

- 8a. Bases of soft portions of dorsal and anal fins unscaled but inserted in a scaly sheath (Figs 15 and 16); longitudinal yellow-golden lines on sides ***Spondyliosoma cantharus***
- 8b. Bases of soft portions of dorsal and anal fins scaly, not inserted in a sheath (Figs 17 and 18); no longitudinal lines on sides ***Pachymetopon blochii***

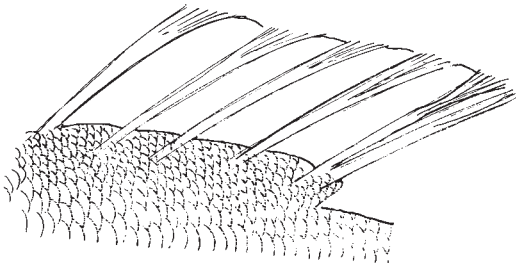


Fig. 17 *Pachymetopon* (dorsal fin)

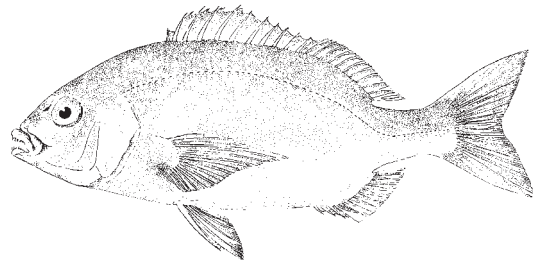
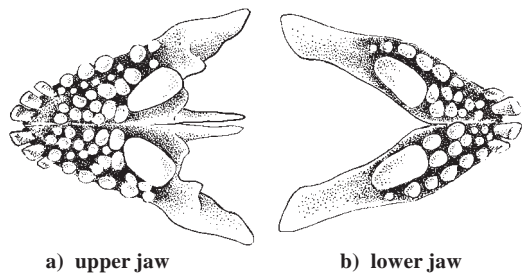


Fig. 18 *Pachymetopon blochii*

- 9a. Anterior teeth incisor-like (Fig. 5) → 10
- 9b. Anterior teeth canine-like, not incisor-like (Fig. 6) → 11
- 10a. Upper jaw with 4 to 6 medial incisors; a pair of enlarged molars posteriorly in each jaw (Fig. 19) ***Rhabdosargus globiceps***
- 10b. Upper jaw with 8 to 12 medial incisors; no greatly enlarged pair of molars in jaw (Fig. 5) ***Diplodus***



a) upper jaw b) lower jaw

Fig. 19 *Rhabdosargus globiceps* (teeth)

11a. Each jaw with 4 to 6 stronger canines anteriorly in each jaw (Fig. 20). → 12

11b. Numerous small and pointed teeth (at least 8) anteriorly in each jaw (Fig. 21). → 13

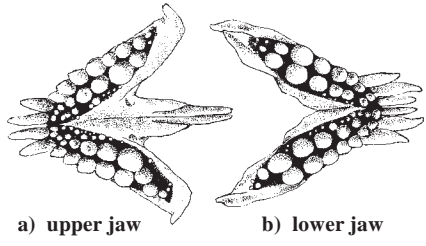


Fig. 20 Sparus (teeth)

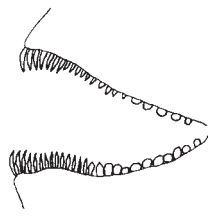


Fig. 21 Pagellus (teeth)

12a. Scales in lateral line 73 to 85; a large black blotch at origin of lateral line; a golden band between eyes (Fig. 22) *Sparus aurata*

12b. Scales in lateral line 48 to 60; no large blotch at origin of lateral line *Pagrus*

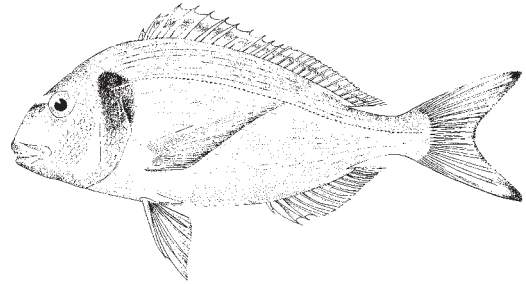


Fig. 22 Sparus aurata

13a. Posterior nostril slit-like (Fig. 23); numerous grey cross-bars *Lithognathus*

13b. Posterior nostril circular or oval (Fig. 24); no permanent pink cross-bars (exceptionally faint pink cross-bars corresponding to a fright pattern) *Pagellus*

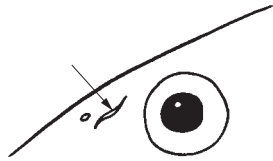


Fig. 23 Lithognathus

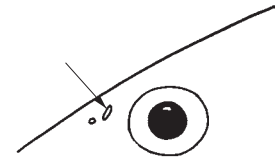


Fig. 24 Pagellus

Key to species (formerly or currently) of the genus Dentex occurring in the area

1a. First and second dorsal-fin spines very short, the following more or less filamentous and decreasing in length from the third to the fourth (Fig. 25); a dark blotch at end of dorsal-fin base (Figs 26 and 27) → 2

1b. Dorsal-fin spines increasing in length from first to fourth or fifth, equal in length thereafter; no spot or blotch on base of soft portion of dorsal fin (Fig. 28) → 4

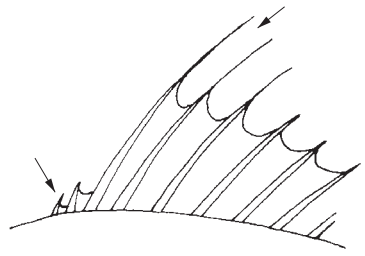


Fig. 25 spiny portion of dorsal fin

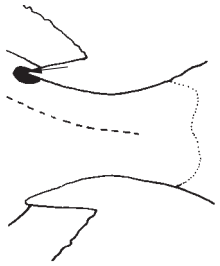


Fig. 26 Dentex gibbosus

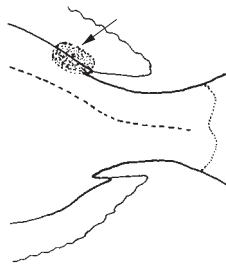


Fig. 27 Dentex canariensis

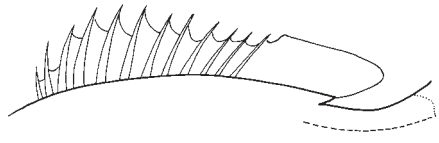


Fig. 28 spiny portion of dorsal fin

- 2a. A small black spot just behind dorsal fin (Fig. 26) *Dentex gibbosus*
- 2b. A large, dark red blotch on bases of last dorsal-fin rays (Fig. 27) → 3

- 3a. Lower arm of first gill arch with 10 to 13 gill rakers *Dentex canariensis*
- 3b. Lower arm of first gill arch with 14 to 16 gill rakers *Dentex barnardi*

- 4a. Lower jaw prominent, chin prominent; scalation continuous from cheek to preopercle (Fig. 29) *Virididentex acromegalus*

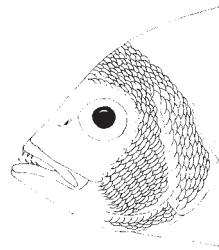


Fig. 29 *Virididentex acromegalus*

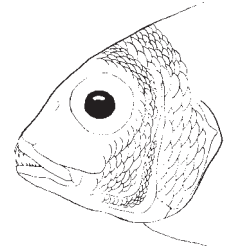


Fig. 30 *Dentex acromegalus*

- 4b. Jaws subequal, chin indistinct; scalation interrupted between cheek and preopercle (Fig. 30). → 5

- 5a. Lateral line with 62 to 68 scales; 11 dorsal-fin spines *Dentex dentex*

- 5b. Less than 62 scales along lateral line; 12 dorsal-fin spines (exceptionally 11). → 6

- 6a. Lower arm of first gill arch with 17 to 20 gill rakers; lower canines clearly less well developed than uppers (Fig. 31) *Dentex macrophthalmus*

- 6b. Less than 15 lower gill rakers; upper and lower canines equally developed (Fig. 32) → 7

- 7a. Fork of caudal fin margined with dark red (Fig. 33) *Dentex maroccanus*

- 7b. Caudal fin uniform reddish → 8

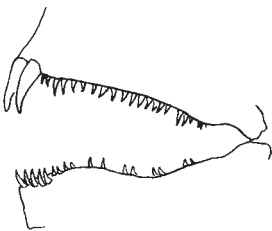


Fig. 31 *Dentex macrophthalmus*

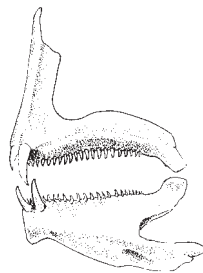


Fig. 32 *Dentex*

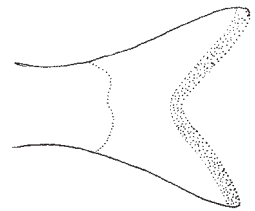


Fig. 33 *Dentex maroccanus* (caudal fin)

- 8a. Lower arm of first gill arch with 12 to 14 gill rakers; dorsal profile of head convex; suborbital space narrow (12 to 14% of head length, Fig. 34); interorbital space wide (27 to 32% of head length) *Dentex congoensis*

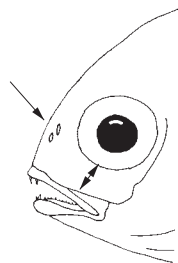


Fig. 34 *Dentex congoensis*

- 8b. Lower arm of first gill arch with 9 to 10 gill rakers; dorsal profile of head straight; suborbital space wide (17 to 21% of head length, Fig. 35); interorbital space narrow (21 to 25% of head length). . . *Dentex angolensis*

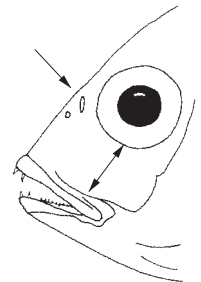


Fig. 35 *Dentex angolensis*

Key to species and subspecies of the genus *Diplodus* occurring in the area

- 1a. Upper jaw with row of 10 to 12 incisors, no small molars behind this row (Fig. 36); more or less wide, dark cross-bars on sides (Figs 37 and 38) → 2
- 1b. Upper jaw with row of 8 (exceptionally 10) incisors (Figs 39 to 41), small molars behind the incisors (except in *Diplodus puntazzo*, Fig. 39) sides with or without dark cross-bars; these bars, when present, much narrower than lighter interspaces → 3

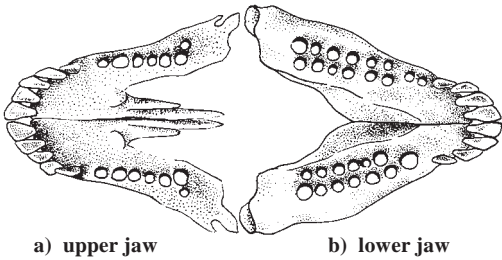


Fig. 36 *Diplodus fasciatus* (teeth)

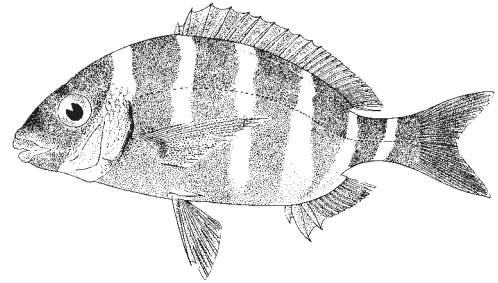


Fig. 37 *Diplodus fasciatus*

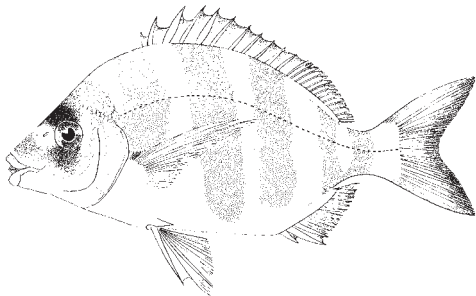


Fig. 38 *Diplodus cervinus cervinus*

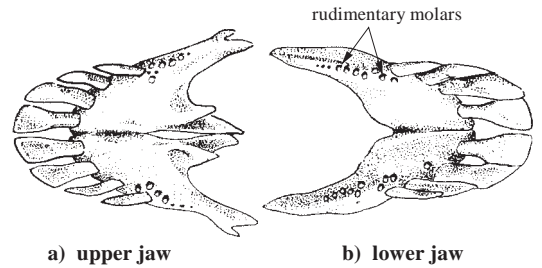


Fig. 39 *Diplodus puntazzo* (teeth)

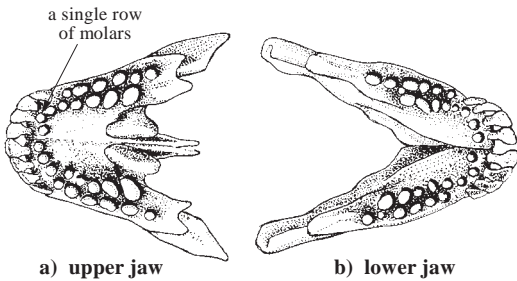


Fig. 40 *Diplodus bellottii* (teeth)

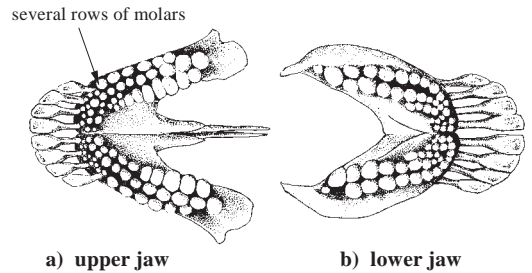


Fig. 41 *Diplodus prayensis* (teeth)

- 2a. Background colour dark, with light cross-bars on upper two-thirds of sides (Fig. 37); 15 to 21 total gill rakers on first arch ***Diplodus fasciatus***
- 2b. Background colour light, with dark cross-bars on sides (Fig. 38); 15 to 19 total gill rakers on first arch ***Diplodus cervinus cervinus***
- 3a. Molars very rudimentary (Fig. 39) ***Diplodus puntazzo***
- 3b. Molars well developed (Figs 40 and 41) → 4
- 4a. A single row of molars behind the row of incisors (Fig. 40); scales along lateral line 48 to 54; 10 or 11 dorsal-fin spines ***Diplodus bellottii***

- 4b. More than 1 row of small molars behind the row of incisors (Fig. 41); scales along lateral line 48 to 71; 11 or 12 dorsal-fin spines → 5
- 5a. Nuchal band present (Figs 42 and 43) → 6
- 5b. Nuchal band absent → 7

- 6a. Nuchal band large, triangular; hind edge of branchiostegal membrane light coloured (Fig. 42) ***Diplodus vulgaris***
- 6b. Nuchal band faint; hind edge of branchiostegal membrane black (Fig. 43) ***Diplodus prayensis***
(restricted to the Cape Verde Islands)

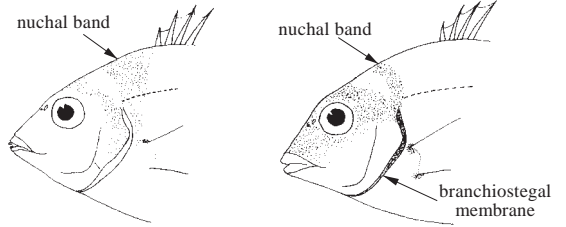


Fig. 42 *Diplodus vulgaris* Fig. 43 *Diplodus prayensis*

- 7a. Peduncular bar nearly continuous around caudal peduncle (Fig. 44); scales in lateral line 48 to 56; dorsal-fin spines 11 ***Diplodus annularis***
- 7b. Peduncular bar saddle-shaped (Fig.45); lateral-line scales 57 to 71; dorsal-fin spines 11 or 12; if locality is Ascension Island =*Diplodus sargus ascensionis*, if locality is St Helena Island =*Diplodus sargus helenae* otherwise → 8

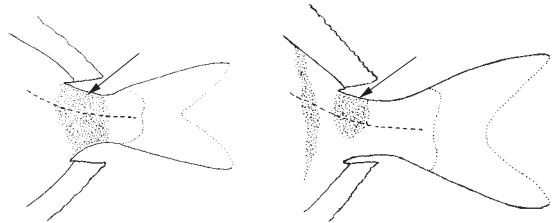


Fig. 44 *Diplodus annularis*

Fig. 45 *Diplodus sargus cadenati*

- 8a. Sides with 4 or 5 very distinct cross-bars (Fig. 46). ***Diplodus sargus lineatus***
(restricted to the Cape Verde Islands)
- 8b. Sides with 8 or 9 cross-bars (Figs 47 and 48) → 9

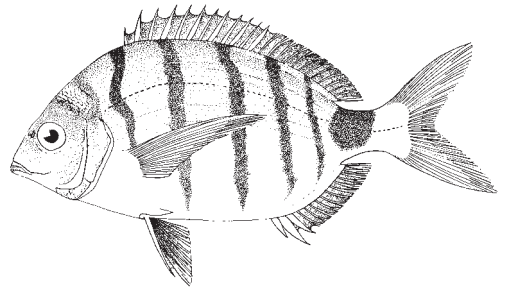


Fig. 46 *Diplodus sargus lineatus*

- 9a. Cross-bars uniform in colour tone (Fig. 47) ***Diplodus capensis***
(south of Angola)
- 9b. Cross-bars alternately light and dark (Fig. 48) ***Diplodus sargus cadenati***
(north of Cape Verde)

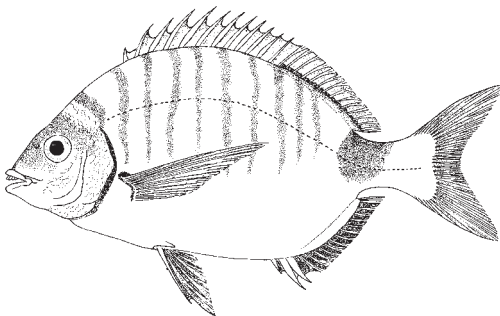


Fig. 47 *Diplodus capensis*

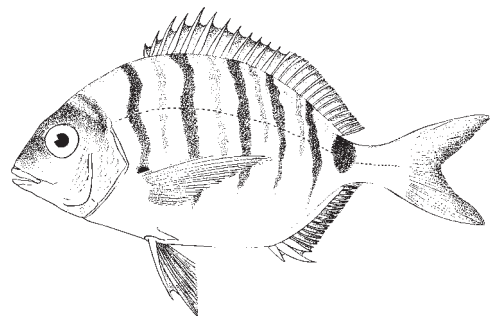


Fig. 48 *Diplodus sargus cadenati*

Key to species of the genus *Lithognathus* occurring in the area

- 1a. Lateral-line scales 59 to 65; dorsal fin with 11 to 13 soft rays; anal fin with 10 or 11 soft rays; more than 10 narrow, dark, irregular bars on body (Fig. 49) ***Lithognathus mormyrus***
- 1b. Lateral-line scales 45 to 49; dorsal fin with 9 or 10 soft rays; anal fin with 8 or 9 soft rays; 7 wide dark bars on body that fade with age (Fig. 50) ***Lithognathus aureti***

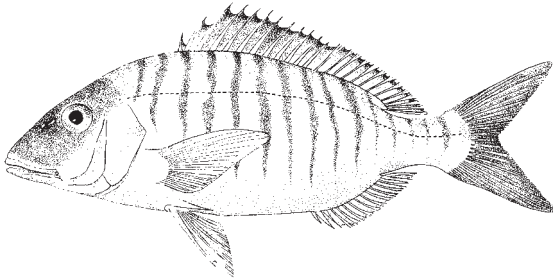


Fig. 49 *Lithognathus mormyrus*

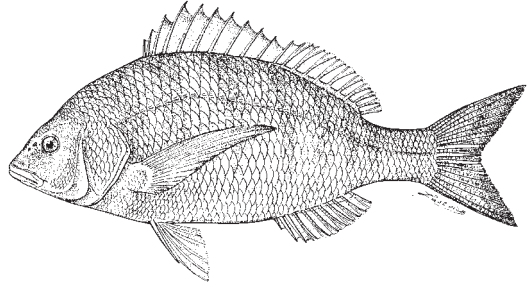


Fig. 50 *Lithognathus aureti*

Key to species of the genus *Pagellus* occurring in the area

- 1a. Scalation on top of head ending behind a transverse line through middle of eyes (Figs 51 and 52); interior of mouth orange-red → **2**
- 1b. Scalation on top of head ending in front of a transverse line through middle of eye (Fig. 53); interior of mouth whitish or greyish → **3**

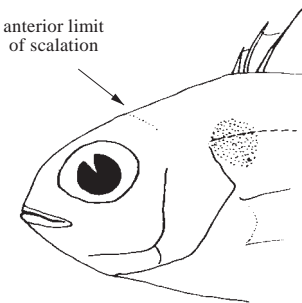


Fig. 51 *Pagellus bogaraveo*

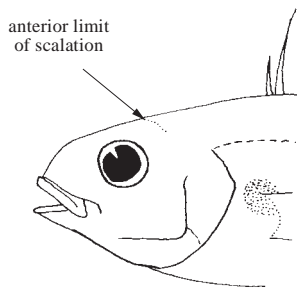


Fig. 52 *Pagellus acarne*

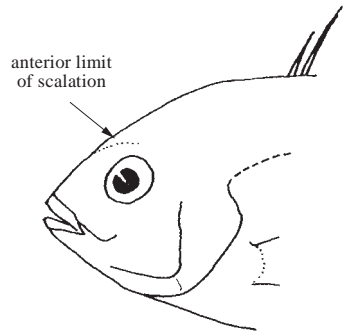


Fig. 53 *Pagellus bellottii*

- 2a. Anal-fin rays 11 or 12; eye diameter greater than length of snout; a dark blotch at origin of lateral line (Fig. 51) ***Pagellus bogaraveo***
- 2b. Anal-fin rays 9 or 10; eye diameter smaller than, or equal to length of snout; a very dark red blotch at upper level of pectoral fin insertion (Fig. 52) ***Pagellus acarne***

- 3a. Length of anal-fin base greater than distance from snout tip to posterior margin of eye (Fig. 54); 10 soft anal-fin rays ***Pagellus bellottii***
- 3b. Length of anal-fin base shorter than distance from snout tip to posterior margin of eye (Fig. 55); 8 or 9 soft anal-fin rays ***Pagellus erythrinus***

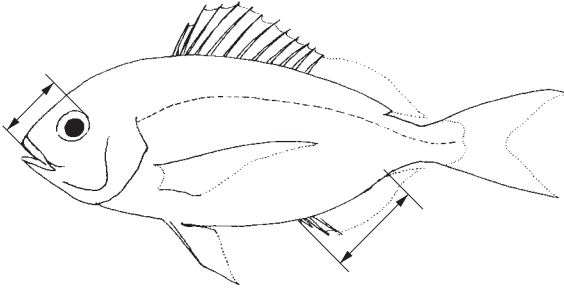


Fig. 54 *Pagellus bellottii*

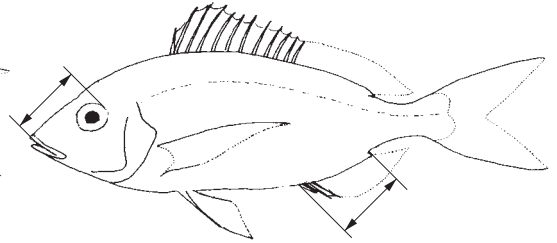


Fig. 55 *Pagellus erythrinus*

Key to the species and subspecies of the genus *Pagrus* occurring in the area

- 1a. First 2 dorsal fin spines very short, third to fifth long and filamentous in young (Figs 56 and 57) → 2
- 1b. First 2 dorsal fin spines not much shorter than the following, none of the latter filamentous. → 3
- 2a. Pelvic fins wine red, their first soft ray non-filamentous; edge of opercle dark; 4 or 5 dark cross-bars, especially visible in young (Fig. 56) ***Pagrus auriga***
- 2b. Pelvic fins greyish white, their first soft rays filamentous; edge of opercle light coloured; no dark cross-bars, but large, blue-black spots on back and sides (Fig. 57) . . . ***Pagrus caeruleostictus***

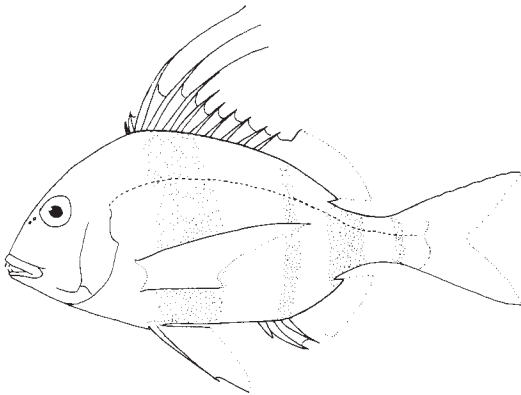


Fig. 56 *Pagrus auriga*

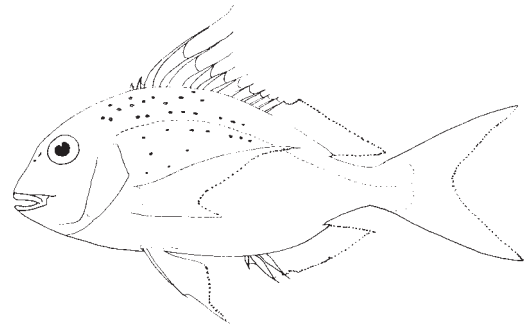


Fig. 57 *Pagrus caeruleostictus*

- 3a. Tips of caudal fin white; no distinct spot at pectoral-fin axil (Fig. 58); first soft ray of pelvic fins not filamentous; 5.5 scale rows between upper profile (at midpoint of spinous dorsal-fin base) and lateral line ***Pagrus pagrus***
- 3b. Caudal fin without white tips; a large, dark red blotch at bases of pectoral fins; first soft ray of pelvic fins filamentous (Fig. 59); 4.5 scale rows between upper profile (at midpoint of spinous dorsal-fin base) and lateral line ***Pagrus africanus***

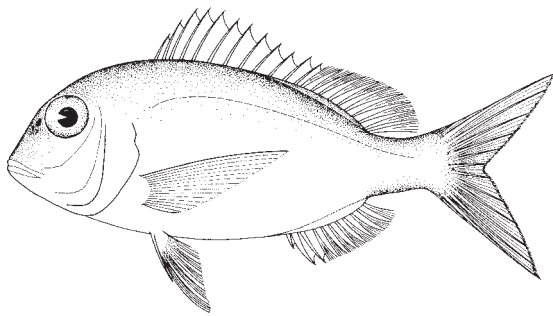


Fig. 58 *Pagrus pagrus*

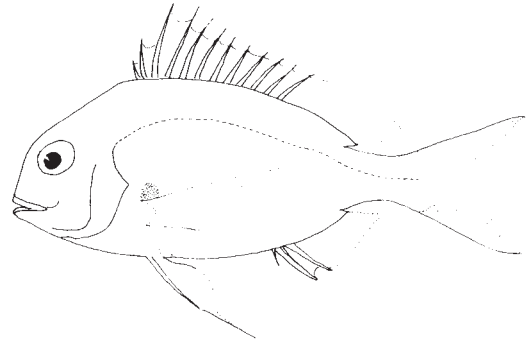


Fig. 59 *Pagrus africanus*

Key to species of the genus *Spicara* occurring in the area

- 1a. Lateral-line scales 48 to 50; anal fin with 8 soft rays; eye large; body silvery, without a distinct blackish blotch on sides or caudal peduncle (Fig. 60) ***Spicara alta***
- 1b. Lateral-line scales more than 60; anal fin with 9 to 17 soft rays; eye moderate in size; body with distinct blackish blotch on caudal peduncle (Fig. 61) or on sides (Figs 62 and 63) → 2

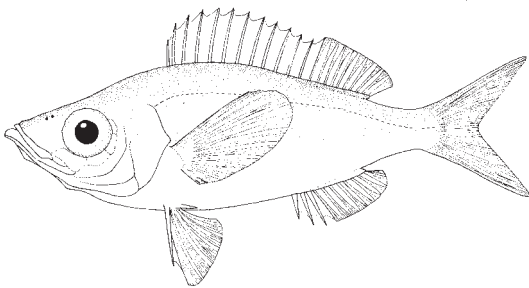


Fig. 60 *Spicara alta*

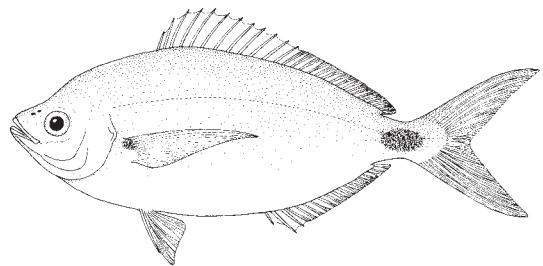
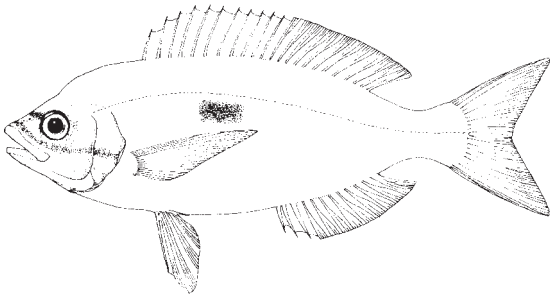
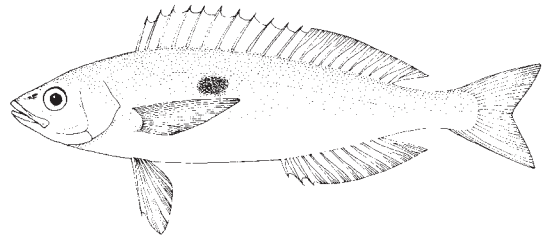



Fig. 61 *Spicara melanurus*

- 2a. Anal fin with 15 to 17 soft rays; black blotch or saddle, variable in size with age, present on caudal peduncle (Fig. 61) ***Spicara melanurus***
- 2b. Anal fin with fewer than 11 soft rays; black blotch on sides (Figs 62 and 63). → 3

- 3a. Body moderately deep, its depth 2.9 to 3.5 times in standard length (Fig. 62); lateral-line scales 68 to 73 *Spicara maena*
- 3b. Body slender, its depth 3.7 to 4.7 times in standard length (Fig. 63); lateral-line scales 75 to 81 *Spicara smaris*

Fig. 62 *Spicara maena*Fig. 63 *Spicara smaris*

List of species occurring in the area

The symbol  is given when species accounts are included. Note: *Chrysoblephus gibbiceps* was included in a previous list of species from the area but there are no confirmed records of this species within our area. Another member of the genus, *Chrysoblephus laticeps*, has been reported from Namibia but it is very rare and these reports are probably based on waifs and probably only occur in southern Namibia, out of the range of the eastern central Atlantic area.

-  *Boops boops* (Linnaeus, 1758).
-  *Centracanthus cirrus* Rafinesque, 1810.
-  *Dentex angolensis* Poll and Maul, 1953.
-  *Dentex barnardi* Cadenat, 1970.
-  *Dentex canariensis* Steindachner, 1881.
-  *Dentex congoensis* Poll, 1954.
-  *Dentex dentex* (Linnaeus, 1758).
-  *Dentex gibbosus* (Rafinesque, 1810).
-  *Dentex macrophthalmus* (Bloch, 1791).
-  *Dentex maroccanus* Valenciennes, 1830.
-  *Diplodus annularis* (Linnaeus, 1758).
-  *Diplodus bellottii* (Steindachner, 1882).
-  *Diplodus capensis* (Smith, 1844).
-  *Diplodus cervinus cervinus* (Lowe, 1838).
-  *Diplodus fasciatus* (Valenciennes, 1830).
-  *Diplodus prayensis* (Cadenat, 1964).
-  *Diplodus puntazzo* (Walbaum, 1792).
-  *Diplodus sargus ascensionis* (Valenciennes, 1830).
-  *Diplodus sargus cadenati* de la Paz, Bauchot and Daget, 1974.
-  *Diplodus sargus helenae* (Sauvage, 1879).
-  *Diplodus sargus lineatus* (Valenciennes, 1830).
-  *Diplodus vulgaris* (Geoffroy Saint Hilaire, 1817).
-  *Lithognathus aureti* Smith, 1962.
-  *Lithognathus mormyrus* (Linnaeus, 1758).

- *Oblada melanura* (Linnaeus, 1758).
- *Pachymetopon blochii* (Valenciennes, 1830).
- *Pagellus acarne* (Risso, 1827).
- *Pagellus bellottii* Steindachner, 1882.
- *Pagellus bogaraveo* (Brünnich, 1768).
- *Pagellus erythrinus* (Linnaeus, 1758).
- *Pagrus africanus* Akazaki, 1962.
- *Pagrus auriga* (Valenciennes, 1843).
- *Pagrus caeruleostictus* (Valenciennes, 1830).
- *Pagrus pagrus* (Linnaeus, 1758).
- *Rhabdosargus globiceps* (Valenciennes, 1830).
- *Sarpa salpa* (Linnaeus, 1758).
- *Sparus aurata* Linnaeus, 1758.
- *Spicara alta* (Osório, 1917).
- *Spicara maena* (Linnaeus, 1758).
- *Spicara melanurus* (Valenciennes, 1830).
- *Spicara smaris* (Linnaeus, 1758).
- *Spondylisoma cantharus* (Linnaeus, 1758).
- *Virididentex acromegalus* (Osório, 1911).

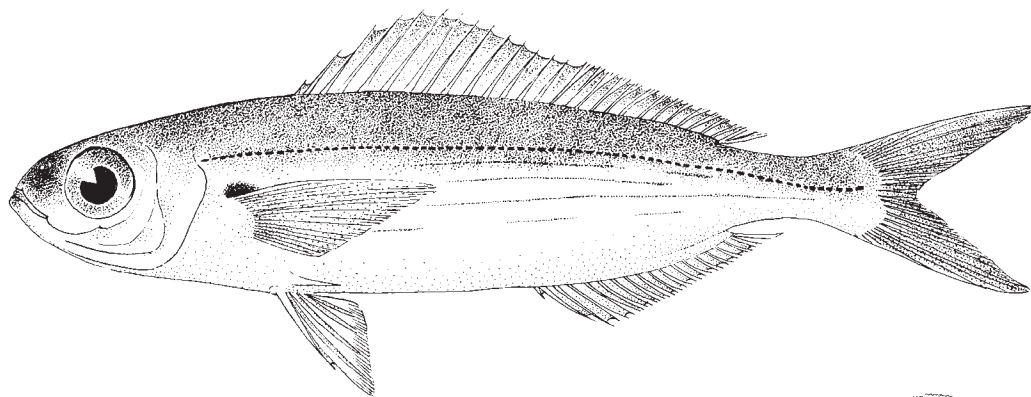
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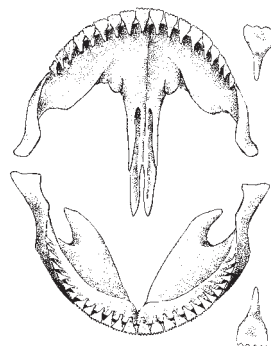
***Boops boops* (Linnaeus, 1758)**

Frequent synonyms / misidentifications: *Box boops* (Linnaeus, 1758) / None.

FAO names: En – Bogue; Fr – Bogue; Sp – Boga.



Diagnostic characters: Body fusiform, moderately low and very slightly compressed, its anterior part subcylindrical in cross-section. Eye large, its diameter greater than snout length; scales on top of head reaching forward just beyond level of posterior eye margins; mouth small, oblique; lips very thin; **all teeth incisor-like, set in a single row in both jaws**; cutting edges of upper teeth with 4 points, lower teeth with 5 points (the central point largest); gill rakers on lower arm of first arch 16 to 20, 7 or 8 upper arm. **Dorsal fin with 13 to 15 spines** and 12 to 16 soft rays; anal fin with 3 spines and 14 to 16 soft rays; pectoral fins short, not reaching to anus; caudal fin forked. Scales along lateral line 69 to 80. **Colour:** back bluish or greenish, sides with silvery or golden reflections and with 3 to 5 golden yellow longitudinal lines; a small brown spot restricted to pectoral-fin axils; lateral line dark; fins light.



teeth

Size: Maximum: 36 cm; common to 20 cm.

Habitat, biology, and fisheries: A demersal, as well as semi-pelagic, species living on all types of bottom (sand, mud, rock, seagrass beds) over the continental shelf and upper slope to depths of 250 m, more common in the upper 100 m and sometimes in coastal waters. Moves in aggregations, ascending to the surface mainly at night. In the northern part of the area, spawning takes place from March to May. Omnivorous, feeding on crustaceans and plankton. A moderately abundant species, but not intensively fished in this area; scarcely exploited in the Gulf of Guinea. Caught on line gear, with bottom trawls and purse seines; also with beach seines and trammel nets. Marketed fresh frozen, dried-salted or smoked; also used for fishmeal and oil and commonly as bait in tuna fisheries.

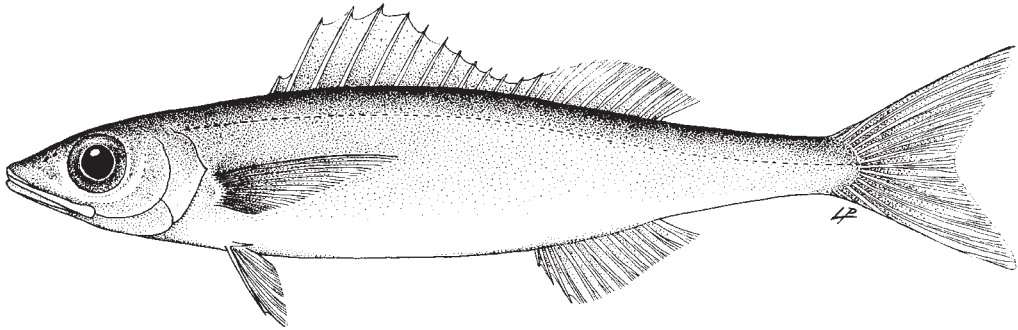
Distribution: Coast of West Africa from the Straits of Gibraltar to Angola and around Madeira, the Canary, Cape Verde and São Tomé-Príncipe islands. Also occurring in the Mediterranean and the North Atlantic up to Norway.



***Centracanthus cirrus* Rafinesque, 1810**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Curled picarel; Fr – Picarel guetteur; Sp – Jerret imperial.



Diagnostic characters: Body elongate, subcylindrical, its depth 5.0 to 5.6 times in standard length. **Upper jaw very protrusible; maxilla unscaled, covered by the preorbital bone;** gill rakers 8 to 10 on upper and 16 to 20 on lower limb of first arch; jaws with minute teeth, none on vomer or palatines. **Dorsal-fin margin notched before soft-rayed portion;** penultimate spine shortest, about one-third of length of fourth spine; dorsal spines 13, soft rays 10; anal fin with 3 spines and 10 soft rays. Lateral-line scales 86 to 89 to base of caudal fin. Swimbladder not bifurcate. **Colour:** brownish dorsally, silvery below.

Size: Maximum to 20 cm; common to 15 cm.

Habitat, biology, and fisheries: Over the continental shelf down to 200 m depth. Feeds on small fishes and crustaceans. Trawlable bottoms in depths of 10 to 200 m. Not of much commercial importance, but locally moderately abundant. Separate statistics are not reported for this species. Caught with trammel nets and bottom trawls. Probably marketed fresh or dried-salted, but its flesh is not highly esteemed; also reduced to fishmeal and oil.

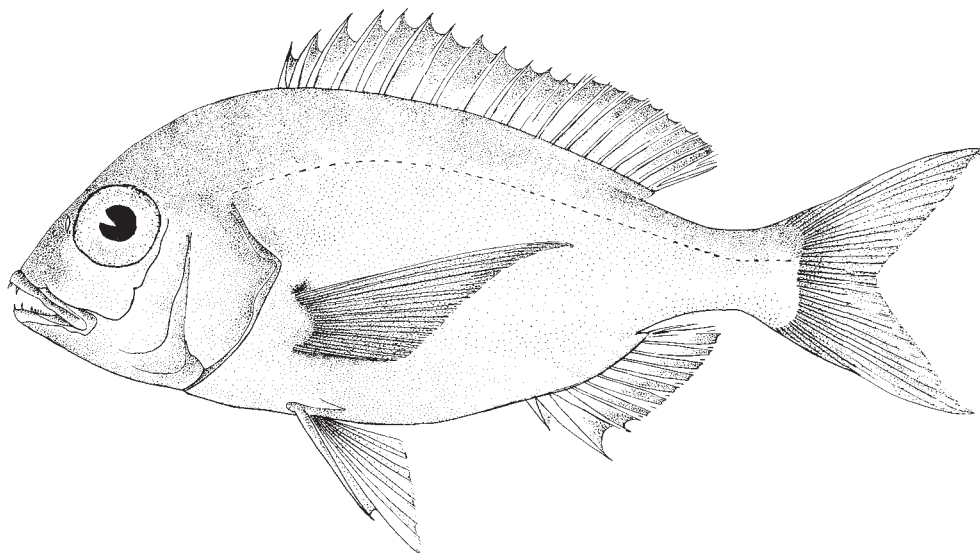
Distribution: In the area, from the Straits of Gibraltar to southern Morocco, including Madeira and the Canary Islands. Northward extending into the Mediterranean and in the eastern Atlantic to Portugal and the Azores.



Dentex angolensis Poll and Maul, 1953

Frequent synonyms / misidentifications: *Dentex polli* Roux, 1954 / None.

FAO names: En – Angolan dentex; Fr – Denté angolais; Sp – Dentón angoleño.



Diagnostic characters: Body oval, moderately deep and compressed. **Head profile straight; interorbital space narrow** (21 to 25% of head length); **suborbital space wide** (17 to 21% of head length); scales present on cheeks and anterior part of preopercle; mouth low, slightly oblique; **several rows of canine-like teeth**, outer row the strongest, **the anterior 4 to 6 teeth in each jaw the largest**, the uppers visible when mouth is closed; **gill rakers on lower limb of first arch 9 or 10**, 6 to 9 upper limb and midequal thereafter, and 9 or 10 soft rays; anal fin with 3 spines and 7 or 8 soft rays. **Scales along lateral line 45 to 49.** **Colour:** red with silvery reflections, head darker and belly lighter; a small dark area above the insertions of pectoral fins; dorsal and anal fins red except on their bases; pelvic fins light coloured; pectoral fins and caudal fin reddish.

Size: Maximum: 35 cm; common to 24 cm.

Habitat, biology, and fisheries: Inhabits various types of bottoms on the continental shelf and the slope, in a depth from 15 to 300 m; old individuals occurring in deeper waters. A protogynous hermaphrodite (the majority of individuals are first females and become males at 18 to 23 cm). In the Gulf of Guinea there are 2 spawning seasons, the most important extending from May to July. Carnivorous, feeding chiefly on crustaceans; also on fish, sometimes on molluscs and worms. From Agadir to Angola a seasonal fishery linked to upwellings (maximum landings from June to October). Caught with bottom trawls and bottom longlines. Marketed fresh or frozen, sometimes dried-salted (flesh highly esteemed); also used for fishmeal and oil.

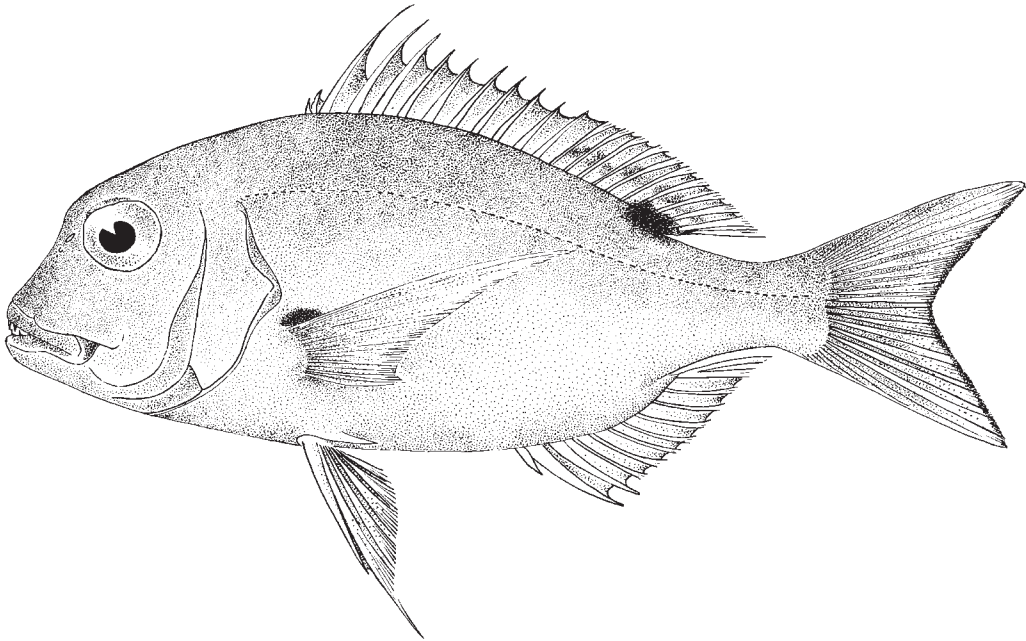
Distribution: Along the west coast of Africa from Morocco (33°N) to Angola.



Dentex barnardi Cadenat, 1970

Frequent synonyms / misidentifications: None / None.

FAO names: En – Barnard dentex; Fr – Denté austral; Sp – Chacarona sureña.



Diagnostic characters: Body oval, moderately deep and compressed. Head profile regularly inclined from nape downward and more abrupt below eye; a frontal hump developing with age; eye diameter greater than width of suborbital space in large individuals; 5 to 8 scales on cheeks, some scarcely visible scales on lower part of preopercle; mouth low, slightly oblique, jaws subequal; **several rows of canine-like teeth**, outer row the strongest, **the anterior 4 to 6 teeth the largest**; gill rakers on lower limb of first arch 14 to 16, 8 to 11 on upper limb. **Dorsal fin with 12 spines and 9 or 10 soft rays; the first 2 spines extremely short, the following long and more or less filamentous, especially in the young**, and decreasing in length from the third or fourth backward; anal fin with 3 spines and 8 soft rays; first soft ray of pelvic fins filamentous. Scales along lateral line 58 to 63.

Colour: more or less bright red with silvery reflections; **a dark red spot posteriorly on dorsal-fin base extending well beyond the scaly sheath**; a dark area at pectoral fin axils; more or less aligned dark spots on soft portion of dorsal fin; caudal fin red with a fine black edge.

Size: Maximum: 40 cm; common to 25 cm.

Habitat, biology, and fisheries: A demersal fish inhabiting trawlable bottoms from depths of 40 to 100 m. Carnivorous. Fished throughout its range with bottom trawls. Separate statistics are not reported for this species. Marketed fresh; flesh highly esteemed.

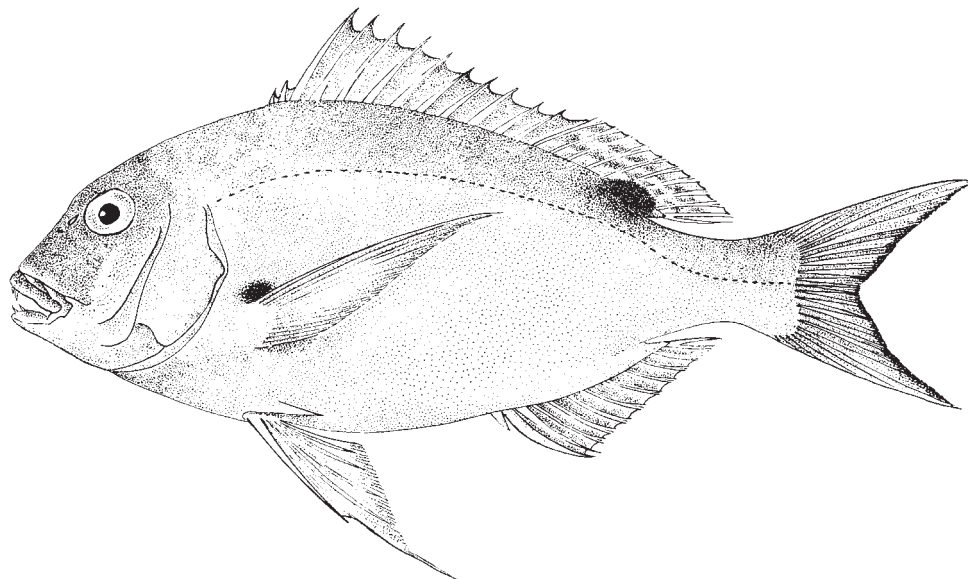
Distribution: Along the West African coast from Gabon (3°S) to Angola (17°S).



Dentex canariensis Steindachner, 1881

Frequent synonyms / misidentifications: *Dentex nufar* Valenciennes, 1830 / None.

FAO names: **En** – Canary dentex; **Fr** – Denté à tache rouge; **Sp** – Chacarona de Canarias.



Diagnostic characters: Body oval, moderately deep and compressed. Head profile regularly convex except for a slight hump on front; eye diameter smaller than width of suborbital space in large individuals; cheeks scaly (7 to 9 rows); some small, scarcely visible scales also present on preopercle throughout its height; mouth low, slightly oblique; jaws subequal; **several rows of canine-like teeth, outer row the strongest, the anterior 4 to 6 the strongest in each jaw, gill rakers on lower limb of first arch 10 to 13, 6 to 9 upper limb.** Dorsal fin with 12 spines and 9 or 10 soft rays; **first 2 spines very short, the following more or less filamentous** and decreasing in length from the third or fourth backward; anal fin with 3 spines and 8 or 9 soft rays; first soft ray of pelvic fins filamentous. Scales along lateral line 61 to 68. **Colour:** reddish with silvery reflections; belly lighter and head darker; **a dark red spot posteriorly on base of dorsal fin extending well beyond the scaly sheath;** a dark area at axil of pectoral fin; more or less aligned dark spots on soft portion of dorsal fin; **caudal fin dark red, very finely edged with black.** In some individuals, a greenish yellow band between eyes.

Size: Maximum: 100 cm; common to 35 cm.

Habitat, biology, and fisheries: Demersal on various types of bottom, but especially rocky substrate usually to depths of about 150 m (rarely reported to 450 m), the depth range increasing with age. Sexual maturity is reached in the second year, and in the northern part of the Gulf of Guinea, intermittent spawning occurs from July to September, with a second, shorter spawning period in January. Carnivorous; the young are plankton-feeders, the adults feed particularly on fish, crustaceans and cephalopods. A seasonal fishery linked to upwellings. Separate statistics are not reported for this species. Caught with bottom trawls, trammel nets, and on line gear. Marketed fresh or frozen (flesh highly esteemed); also used for fishmeal and oil.

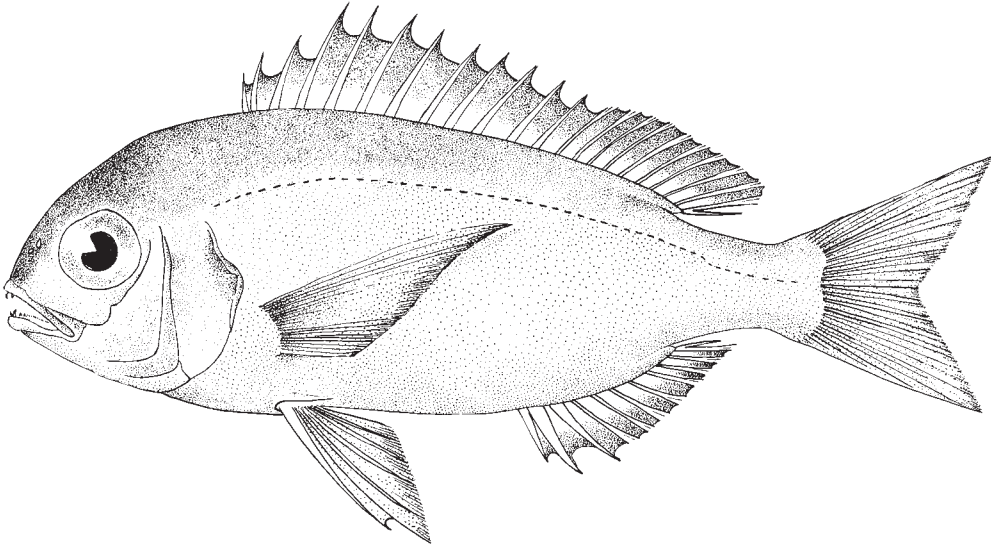
Distribution: Along the West African coast from Cape Bojador to Angola; absent around islands, including the Canaries.



Dentex congoensis Poll, 1954

Frequent synonyms / misidentifications: None / None.

FAO names: En – Congo dentex; Fr – Denté congolais; Sp – Dentón congolés.



Diagnostic characters: Body oval and compressed. Head profile regularly convex; **interorbital space wide** (27 to 32% of head length); **suborbital space narrow** (12 to 14% of head length); cheeks scaly; scales also present on preopercle except at its posterior margin; mouth low, slightly oblique; jaws subequal; **several rows of canine-like teeth**, outer row the strongest, **the anterior 4 to 6 the strongest in each jaw**, the uppers visible when mouth is closed; **gill rakers on lower limb of first arch 12 to 14**, and 6 to 9 upper limb. Dorsal fin with 12 spines and 9 or 10 soft rays, the spines increasing in length up to the fourth or fifth, the following subequal; anal fin with 3 spines and 7 or 8 soft rays. Scales along lateral line 45 to 47. **Colour:** red with silvery reflections, head darker and belly lighter; dorsal and anal fins red distally, whitish at bases; pectoral fins and caudal fin pinkish red; pelvic fins whitish.

Size: Maximum: 30 cm; common to 20 cm.

Habitat, biology, and fisheries: Inhabits various types of bottoms on the continental shelf and upper slope, down to at least 200 m, older individuals occurring at greater depths. A carnivore feeding chiefly on fish, and to a lesser extent, on tunicates and molluscs. Fished throughout its range. A seasonal fishery linked to upwellings (peak from July to October). Separate statistics are not reported for this species. Caught with bottom trawls, bottom longlines and on other line gear. Marketed, fresh or frozen, rarely smoked (flesh highly esteemed); also used for fishmeal and oil.

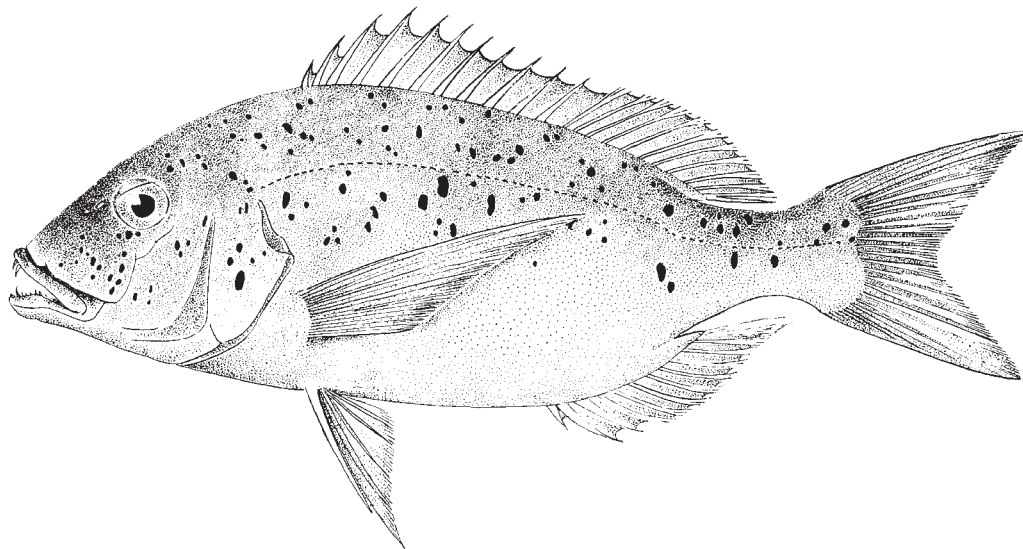
Distribution: Along the West African coast from Senegal to Angola.



Dentex dentex (Linnaeus, 1758)

Frequent synonyms / misidentifications: *Dentex vulgaris* Valenciennes, 1830 / None.

FAO names: En – Common dentex; Fr – Denté commun; Sp – Dentón.



Diagnostic characters: Body oval, moderately deep and compressed. Head profile smoothly rounded in adults but almost straight in young; a slight frontal hump in very large individuals; eye small, suborbital space wide; cheeks scaly; scales also present on preopercle except at its posterior margin; mouth low, slightly oblique; **several rows of canine-like teeth**, outer row by far the strongest with **4 to 6 very well-developed anterior teeth in each jaw**; gill rakers on lower limb of first arch 9 or 10 and 8 or 9 on upper limb. **Dorsal fin with 11 spines and 11 or 12 soft rays, the spines increasing in length from the first to the fourth or fifth and subequal thereafter**; anal fin with 3 spines and 7 to 9 soft rays. Scales along lateral line 62 to 68. **Colour:** the young are greyish, **spotted with black on back and upper sides**, becoming pink with sexual maturity; old individuals are bluish grey and the dark spots become more or less diffuse with age. Some individuals have a yellow tinge behind the mouth and on the gill cover.

Size: Maximum: 100 cm; common to 50 cm.

Habitat, biology, and fisheries: A demersal species inhabiting hard bottoms (rock or rubble) down to a depth of 200 m. Adults solitary, the young gregarious. A carnivore feeding on fish, molluscs and cephalopods. Of limited importance to fisheries along West Africa. Caught with bottom trawls, lines, traps (young) and sometimes trammel nets. Marketed fresh or frozen (flesh highly esteemed); also used for fishmeal and oil.

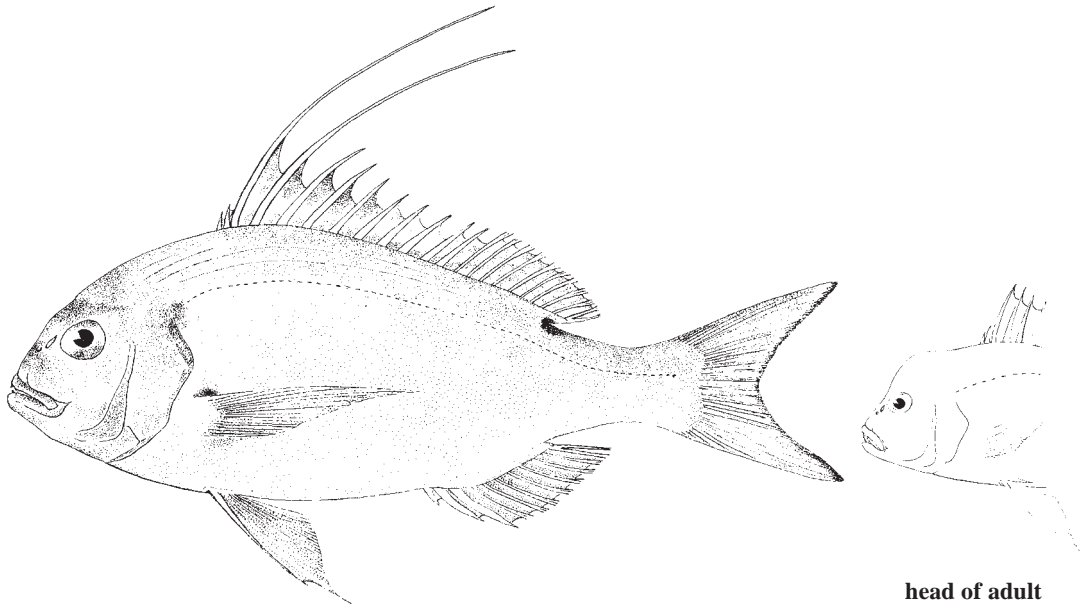
Distribution: Along the West African coast north of Cape Blanc (exceptionally further south) and around the Canary Islands and Madeira. Also present in the Mediterranean and in the North Atlantic to the British Isles.



***Dentex gibbosus* (Rafinesque, 1810)**

Frequent synonyms / misidentifications: *Dentex filusus* Valenciennes, 1841 / None.

FAO names: **En** – Pink dentex; **Fr** – Gros denté rose; **Sp** – Sama de pluma.



Diagnostic characters: Body oval, more or less elongate, compressed. **Head profile** regularly convex in the young, **but older individuals develop a conspicuous hump on front**; eye diameter about equal to width of suborbital space; cheeks scaly; sometimes also small scales present on entire height of preopercle; mouth low, slightly oblique; jaws subequal; **several rows of canine-like teeth**, outer row the strongest **with 4 to 6 developed anteriorly in each jaw**; gill rakers on lower limb of first arch 8 to 10, 6 to 8 on upper limb. Dorsal fin with 12 spines and 10 or 11 soft rays; **first 2 dorsal-fin spines very short, those following very long and filamentous in young individuals** and decreasing in length from the third backward; anal fin with 3 spines and 7 to 9 soft rays; **first soft ray of pelvic fin filamentous**. Scales along lateral line 52 to 62. **Colour:** reddish with bluish silvery reflections; belly lighter and head darker; **a small black spot behind posterior end of dorsal fin**; a brownish black spot at axil of pectoral fin; a dark area at upper angle of opercle; 1 or 2 dark lines on soft part of dorsal fin; caudal fin red, edged with black. Large individuals are often tinged wine red and spotted with black on head (males) or greyish (females).

Size: Maximum: 100 cm; common to 60 cm.

Habitat, biology, and fisheries: Demersal, inhabiting rocky and rubble bottoms and sand around rocks, from a depth of 20 to about 220 m. The young are found close to the shore, while the adults occur in offshore waters in the vicinity of the continental slope. A protandric hermaphrodite (the majority are males up to 50 cm length, transforming into females thereafter). Carnivorous, feeding chiefly on crustaceans, fish, and cephalopods. Mainly found in the central region of its distributional range. Separate statistics are not reported for this species. Caught with line gear (adults), bottom trawls and traps (young on the Canary Islands). Marketed fresh, frozen, or dried-salted (flesh highly esteemed); also used for fishmeal and oil.

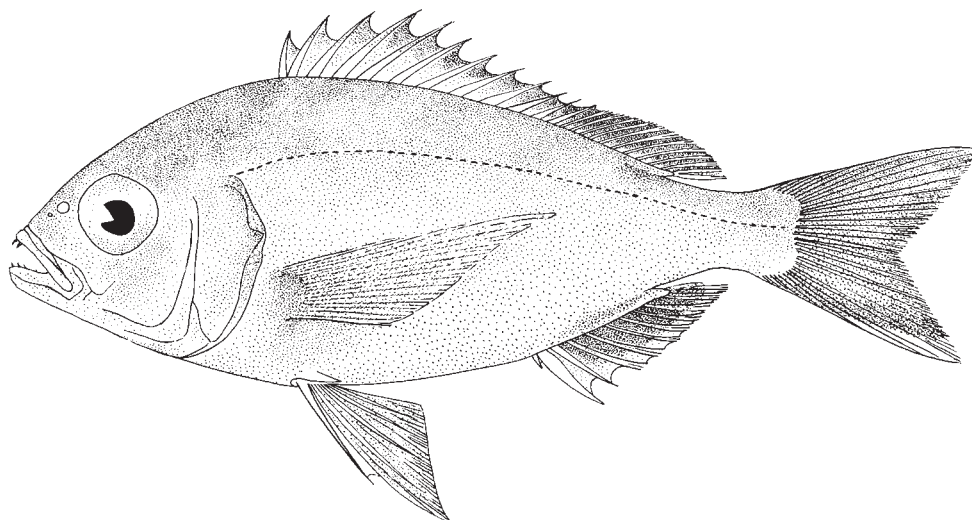
Distribution: Along the West African coast from the Straits of Gibraltar to Angola, and around the Canary and São Tomé-Príncipe Islands. Also present off Portugal and in the Mediterranean.



Dentex macrophthalmus (Bloch, 1791)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Large-eye dentex; Fr – Denté à gros yeux; Sp – Cachucho.



Diagnostic characters: Body oval and compressed. Head profile regularly inclined from nape; **eyes very large**, its diameter greater than snout length; suborbital space narrow; posterior nostril rounded; cheeks scaly; scales also on preopercle, except at its posterior margin; mouth low and oblique; **several rows of canine-like teeth**, outer row the strongest, with 4 well-developed anterior teeth (in upper jaw, visible when mouth is closed) and **10 small anterior teeth (clearly smaller than the upper canines) in lower jaw**; **gill rakers on lower limb of first arch 17 to 20**, 9 to 12 on upper limb. Dorsal fin with 11 or 12 spines and 10 or 11 soft rays, the spines increasing in length from the first to the fourth or fifth and subequal thereafter; anal fin with 3 spines and 8 soft rays. Scales along lateral line 49 to 55. **Colour:** body and fins reddish, lateral line more bright red; spinous portion of dorsal fin whitish at base; anal fin edged with white; **inferior margin of lower caudal-fin lobe white**. The coloration becomes more intense during the spawning season.

Size: Maximum: 65 cm; common to 24 cm.

Habitat, biology, and fisheries: Demersal, inhabiting rocky or sandy bottoms from 30 to 500 m, individuals gradually descending to greater depths with age. Stocks migrate seasonally between the coast and deeper waters in accordance with local hydrographic conditions and their life cycle. Reproduction takes place from the second year onward, with intermittent spawning activity from October to April north of Cape Verde over the edge of the continental shelf and the slopes of canyons (cold waters). Adults are carnivorous, feeding chiefly on fish and crustaceans; the young are plankton-feeders. In the northern part of the area this is the most abundant among the species of *Dentex*. A seasonal fishery takes place at the time of spawning concentrations. Caught with bottom trawls, bottom longlines and on hook-and-line. Marketed fresh or frozen (flesh highly esteemed); also used for fishmeal and oil.

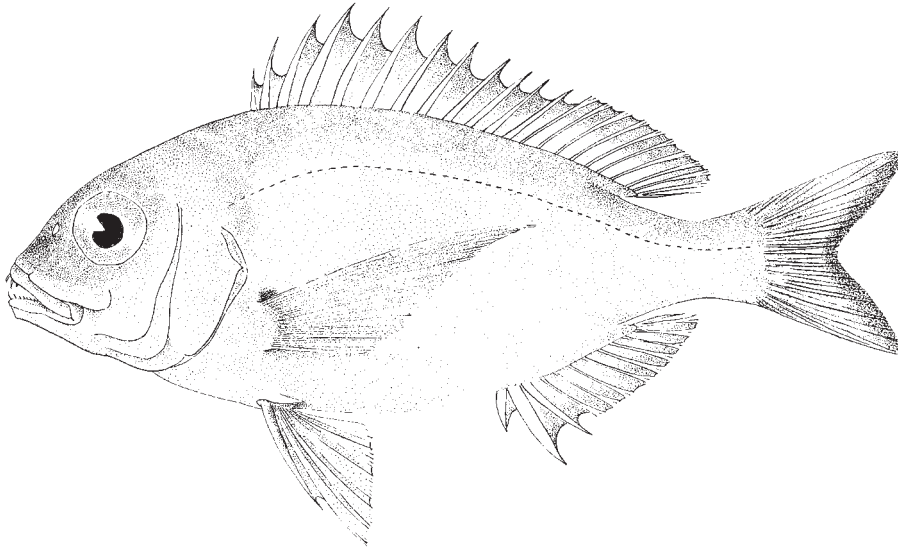
Distribution: Along the West African coast from the Straits of Gibraltar to Cape Verde including the Canary Islands, and to Namibia. Also off Portugal and in the Mediterranean.



Dentex maroccanus Valenciennes, 1830

Frequent synonyms / misidentifications: None / None.

FAO names: En – Morocco dentex; Fr – Denté du Maroc; Sp – Sama marroquí.



Diagnostic characters: Body oval and compressed. Head profile moderately regular, steeper in front of eye; cheeks scaly; scales also on preopercle except at its posterior margin; mouth low, very slightly oblique; **several rows of canine-like teeth**, outer row the strongest, **the anterior 4 to 6 teeth in each jaw the largest**, the uppers visible when mouth is closed; **gill rakers on lower limb of first arch 9 to 12**, 7 to 9 on upper limb. **Dorsal fin with 12 spines** and 10 or 11 soft rays, the spines increasing in length up to the fourth or fifth and subequal thereafter (longest spine 44 to 51% of head length); anal fin with 3 spines and 8 or 9 soft rays. Scales along lateral line 46 to 51. **Colour:** light red with silvery reflections; head darker and fins pinkish; distal part of dorsal and anal fins more intensely reddish; **fork of caudal fin edged with dark red**; a very small dark spot above base of pectoral fin. Males display a more intense coloration during the spawning season.

Size: Maximum: 45 cm; common to 25 cm.

Habitat, biology, and fisheries: Demersal, inhabiting various types of bottom but preferring gravel or rubble, from a depth of 20 to about 500 m, abundance varying with depth according to the latitudes. Seasonal spawning activities between depths of 50 and 100 m with a peak from May to August north of Cape Verde. Carnivorous feeding chiefly on crustaceans, fish, and secondarily on molluscs. Fished south of Agadir, particularly south of Cape Blanc. Together with *Dentex macrophthalmus*, this is the most abundant among the *Dentex* species on the northwest African coast. Separate statistics are not reported for this species. Caught with bottom trawls and on line gear. Marketed fresh or frozen (flesh highly esteemed); also used for fishmeal and oil.

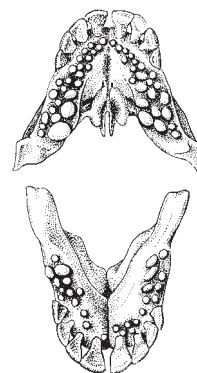
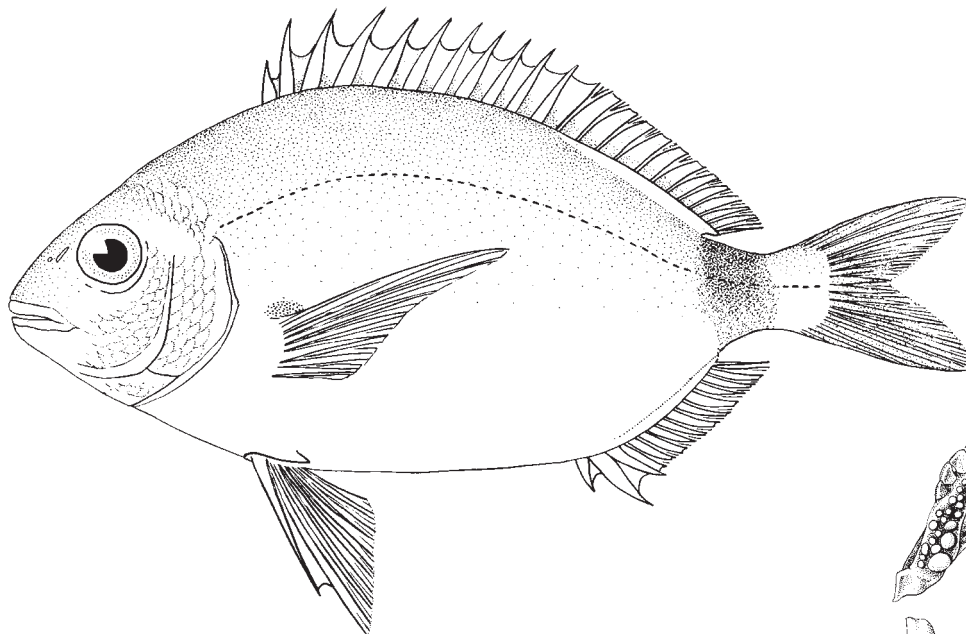
Distribution: Along the West African coast from Gibraltar to the Gulf of Guinea, possibly even further south. Northward extending to the Bay of Biscay (occasionally further north) and into the southwestern Mediterranean.



Diplodus annularis (Linnaeus, 1758)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Annular seabream; Fr – Sparailon commun; Sp – Raspallón.



teeth

Diagnostic characters: Body oval, moderately deep and compressed. Mouth slightly protrusible; **8 incisor-like teeth in each jaw, followed by 2 to 4 rows of molars in upper and 2 or 3 rows in lower jaw**; gill rakers on lower limb of first arch 9 to 12, 7 or 8 on upper limb. **Dorsal fin with 11 spines** and 11 to 13 soft rays; anal fin with 3 spines and 11 or 12 soft rays. **Scales along lateral line 48 to 56** (scales on base of caudal fin excluded). **Colour:** adults are yellowish grey with silvery reflections; an almost annular black band on caudal peduncle, behind dorsal fin; pelvic fins yellow, other fins light coloured. Juveniles with 5 narrow cross-bars on sides and the peduncular band very distinctly continuous around the caudal peduncle.

Size: Maximum: 20 cm; common to 15 cm.

Habitat, biology, and fisheries: Inhabits chiefly *Zostera* seagrass beds but is also found on rocky bottoms from the coastline to about 20 m depth. The sexes are separated, although these fish are potential hermaphrodites; certain individuals are protandric hermaphrodites (first males, then becoming females). Carnivorous, feeding on worms, crustaceans and molluscs occurring in seagrass beds. Regularly fished for, this being the most abundant species of *Diplodus* within its range. Separate statistics are not reported for this species. Caught with beach seines, bottom trawls and in traps. Marketed fresh, frozen or dried salted (flesh not highly esteemed); also apparently used for fishmeal and oil.

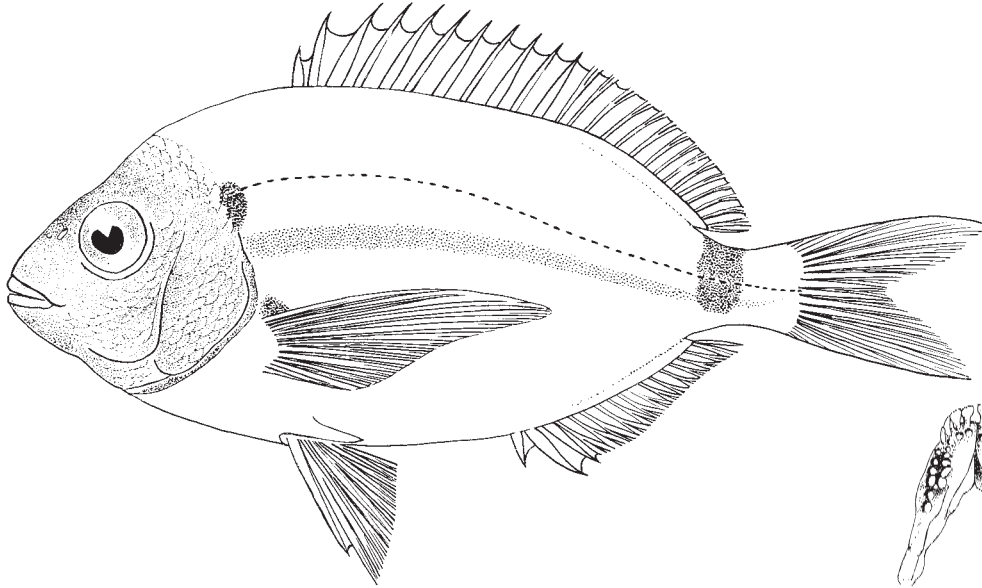
Distribution: Madeira and Canary Islands. Also in the Mediterranean and northward to the Bay of Biscay.



Diplodus bellottii (Steindachner, 1882)

Frequent synonyms / misidentifications: *Diplodus senegalensis* Cadenat, 1964 / None.

FAO names: **En** – Senegal seabream; **Fr** – Sparailon africain; **Sp** – Raspallón senegalés.



teeth

Diagnostic characters: Body oval, moderately deep and compressed. Mouth slightly protrusible; **8 chestnut-coloured, incisor-like teeth in each jaw, followed by 2, or exceptionally 3 rows of molars; a single row of molars behind the incisors;** gill rakers on lower limb of first arch 12 to 14, 6 to 9 upper limb. Dorsal fin with 10 or 11 spines and 13 to 15 soft rays; anal fin with 3 spines and 13 to 16 soft rays; caudal fin forked. **Scales along lateral line 48 to 54** (scales on caudal-fin base excluded). **Colour:** background colour silvery grey, head darker; **a dark, saddle-shaped bar on caudal peduncle; a dark blotch at origin of lateral line** extending onto upper angle of opercle; a small, more or less well-defined, dark spot at upper angle of pectoral-fin base; **a more or less visible dark longitudinal line** runs along middle of sides from opercle to caudal peduncle. Apart from the above described adult colour pattern, the juveniles have 5 broad cross-bars on sides.

Size: Maximum: 30 cm; common to 15 cm.

Habitat, biology, and fisheries: Found on the upper portions of the continental shelf, from the coastline to a depth of 100 m, but especially from 30 to 50 m. Occurs on various types of bottom and sometimes forms sizeable aggregations. Carnivorous, feeding on small benthic invertebrates. Not fished for intensively, but taken incidentally throughout its range. Separate statistics are not reported for this species. Caught on line gear and with trammel nets, trawls and beach seines. Marketed fresh, frozen or dried-salted (flesh not esteemed); also used for fishmeal and oil.

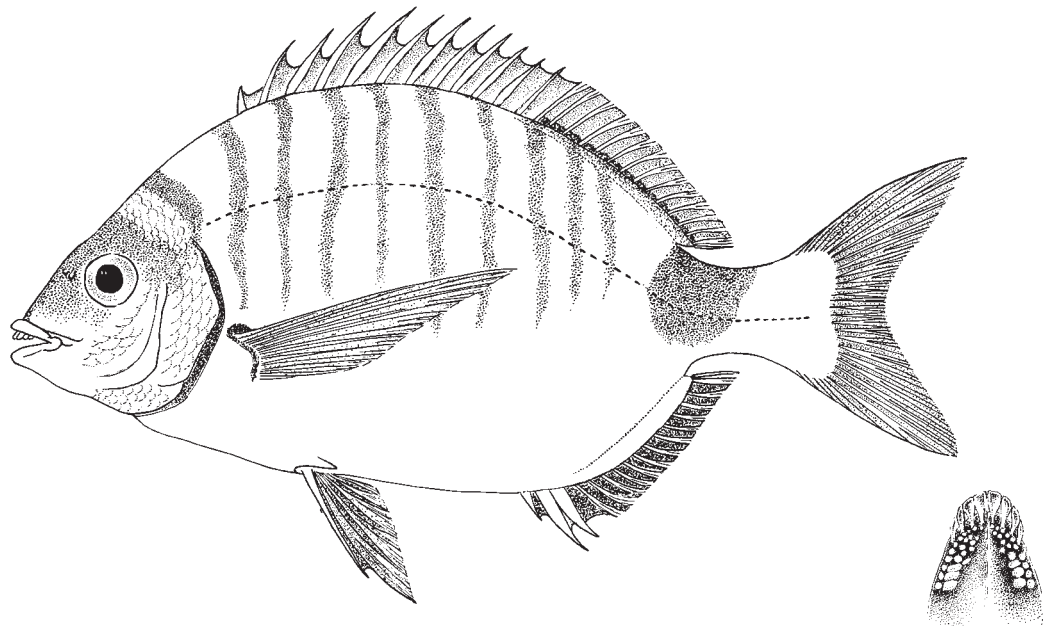
Distribution: Common from the Straits of Gibraltar to Senegal; absent from Madeira, the Canaries and the Cape Verde Islands.



Diplodus capensis (Smith, 1844)

Frequent synonyms / misidentifications: *Diplodus sargus capensis* (Smith, 1844) / None.

FAO names: En – White seabream (Cape); Fr – Sar commun du Cap; Sp – Sargo del Cabo.



teeth

Diagnostic characters: Body oval and deep. Mouth slightly protrusible, lips thin; **8 incisor-like teeth in each jaw**; 3 rows of molars in upper, and 2 rows in lower jaw; gill rakers on first arch 9 to 12 lower and 6 to 9 upper. **Dorsal fin with 12** (rarely 11) **spines** and 13 to 16 soft rays; anal fin with 3 spines and 13 or 14 soft rays; caudal fin forked. **Scales along lateral line 61 to 68** (scales on caudal-fin base excluded). **Colour:** background colour silvery grey; **9 narrow, equally dark cross-bars** running from dorsal profile to about two-thirds of body depth (tending to disappear in old individuals); a large, dark, saddle-shaped blotch on caudal peduncle; vertical and pelvic fins greyish.

Size: Maximum: 35 cm; common to 25 cm.

Habitat, biology, and fisheries: Inhabits rocky bottoms to about 50 m depth. Omnivorous, feeding on seaweeds and benthic invertebrates. Mainly in artisanal fisheries. Separate statistics are not reported for this species. Caught mainly on line gear. Marketed fresh, the flesh is not highly esteemed.

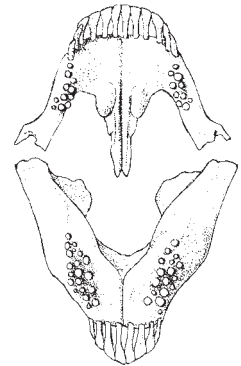
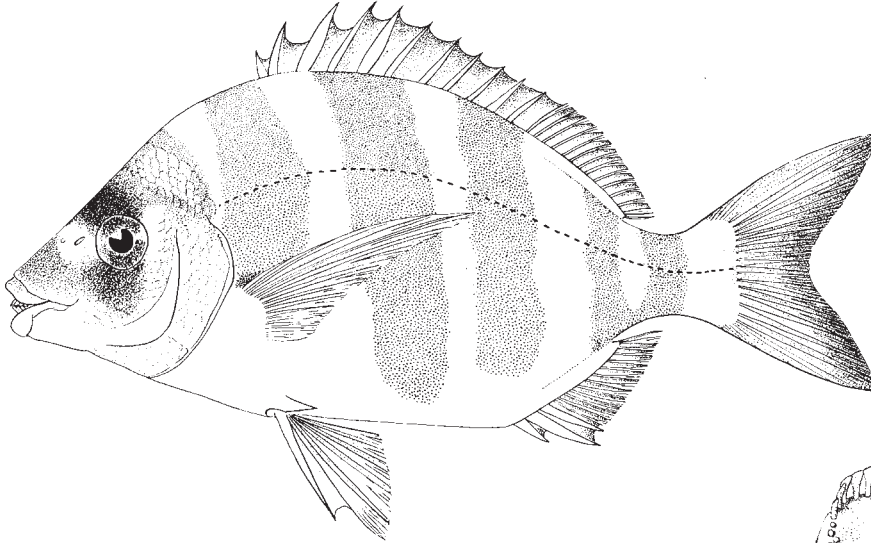
Distribution: Moderately restricted within the area, from Angola southward to South Africa.



***Diplodus cervinus cervinus* (Lowe, 1838)**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Zebra seabream; Fr – Sar à grosses lèvres; Sp – Sargo breado.



teeth

Diagnostic characters: Body oval, deep and compressed. Snout moderately pointed, mouth slightly protrusible, **lips thick; 10 to 12 incisor-like teeth in upper jaw, 8 in lower jaw, followed by 1 to 3 (usually 2) rows of small molars; gill rakers on lower limb of first arch 8 to 10, 7 to 9 on upper limb.** Dorsal fin with 11 or 12 spines increasing in length up to the fourth, and 11 to 14 soft rays; anal fin with 3 spines and 10 to 12 soft rays; caudal fin forked. Scales along lateral line 51 to 62 (scales on caudal-fin base excluded). **Colour:** background colour silvery grey with golden reflections; **5 broad, dark cross-bars on sides**, the first before dorsal fin, the last on caudal peduncle; a dark band on interorbital space extending onto eyes and cheeks; snout tip dark brown; a black spot at upper part of pectoral fin axil; vertical fins greyish, darker distally; pelvic fins dark. A yellow subocular spot appears during the reproductive period.

Size: Maximum: 55 cm; common to 35 cm.

Habitat, biology, and fisheries: Inhabits rocky bottoms from a depth of 30 to 80 m depth; may also occur down to 300 m on muddy bottoms; forms aggregations of 4 or 5 individuals of various sizes. Omnivorous, feeding on small invertebrates and seaweeds. Fished throughout the year on the Canary Islands. Separate statistics are not reported for this species. Caught on line gear, trammel nets, trawls and in traps. Marketed fresh or frozen (flesh esteemed); also used for fishmeal and oil.

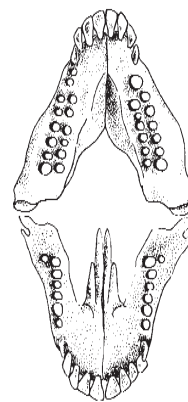
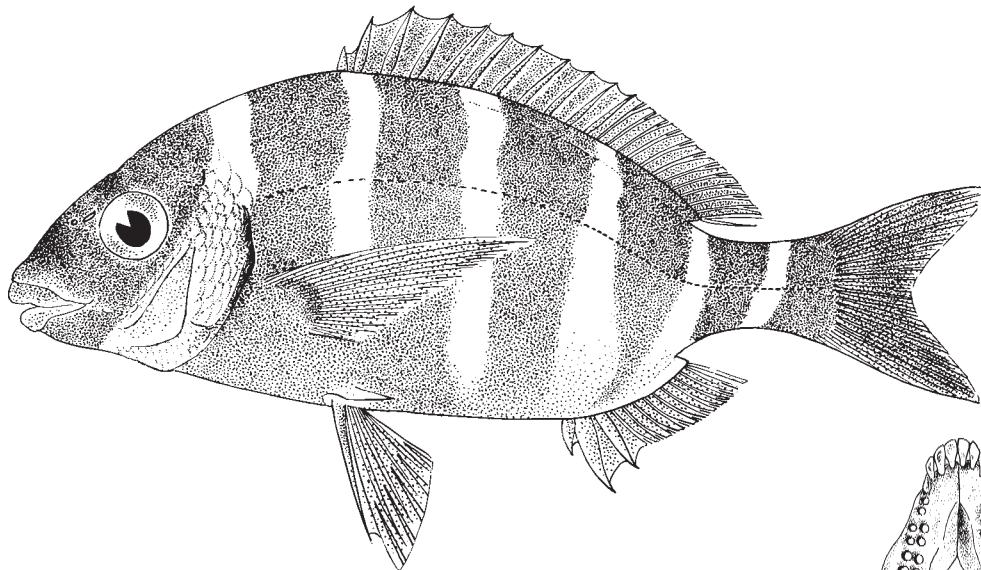
Distribution: Common from the Straits of Gibraltar to Senegal, including Madeira and the Canary Islands, but absent from the Cape Verde Islands off Senegal and from the Gulf of Guinea; also occurring from Angola to South Africa. Northward, extending into the Mediterranean.



Diplodus fasciatus (Valenciennes, 1830)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Banded seabream; Fr – Sar noir du Cap Vert; Sp – Sargo listado.



teeth

Diagnostic characters: Body oval and compressed. Mouth slightly protrusible, lips very thick; 10 to 12 incisor-like teeth in upper and 8 in lower jaw followed by 1 to 3 (generally 2) rows of molars; gill rakers on lower limb of first arch 10 to 12, 9 on upper limb. Dorsal fin with 10 to 12 spines increasing in length up to the fourth, and 11 to 13 soft rays; anal fin with 3 spines and 9 or 10 soft rays; caudal fin forked. Scales along lateral line 55 to 64 (scales on caudal-fin base excluded). **Colour:** background colour dark, belly lighter in the young; 6 narrow, light cross-bars on upper two-thirds of sides, the posteriormost at base of caudal fin; lips pink; pectoral fins yellow, other fins dark yellowish; a black bar covering interorbital space and snout; hind margin of opercle black.

Size: Maximum: 40 cm; common to 30 cm.

Habitat, biology, and fisheries: Inhabits rocky bottoms to a depth of about 100 m; may also live on sandy bottoms in deeper waters; usually occurs in groups of 5 individuals of different sizes. Omnivorous with predominantly carnivorous habits (small invertebrates). Fished throughout its range to depths of about 100 m. Separate statistics are not reported for this species. Caught on line gear. Marketed fresh (flesh esteemed).

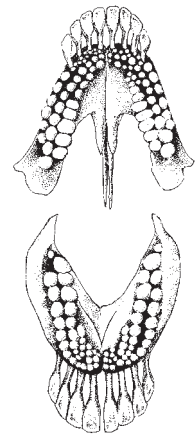
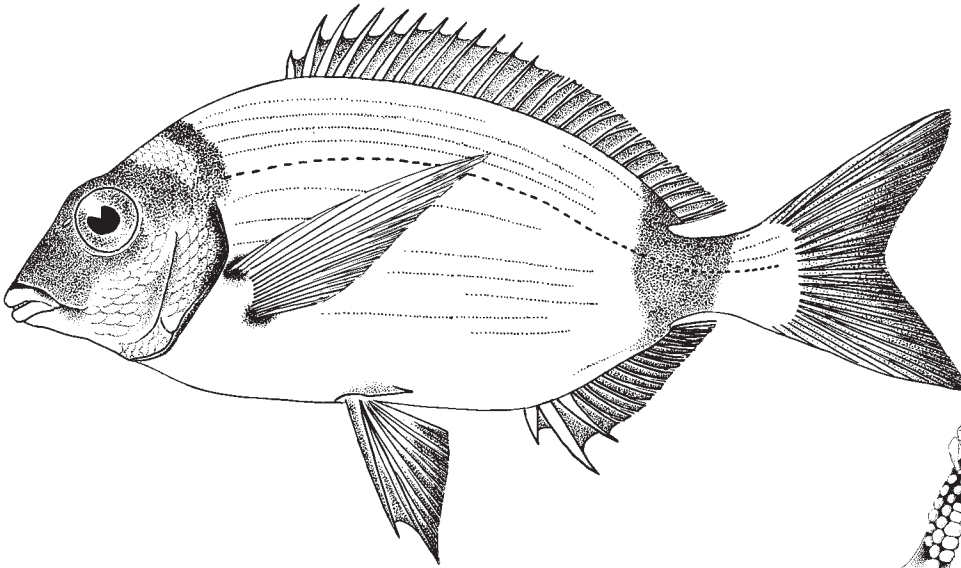
Distribution: Endemic to the Cape Verde Islands.



Diplodus prayensis Cadenat, 1964

Frequent synonyms / misidentifications: None / None.

FAO names: En – Two-banded seabream; Fr – Sar à tête noire du Cap Vert; Sp – Sargo dorado.



teeth

Diagnostic characters: Body oval and compressed. Mouth slightly protrusible, lips moderately thick; **8 chestnut-coloured, narrow (longer than broad) incisor-like teeth in each jaw, followed by 3 or 4 rows of small molars arranged in a horse-shoe pattern, and 2 or 3 rows of strong molars at sides of jaws;** gill rakers on lower limb of first arch 11 to 13, 6 to 10 on upper limb. **Dorsal fin with 12 spines** and 13 to 15 soft rays; anal fin with 3 spines and 12 or 13 soft rays; caudal fin forked. **Scales along lateral line 56 to 63** (scales on caudal-fin base excluded). **Colour:** background colour brownish to greenish, lighter on belly; alternately golden and greyish, longitudinal lines, running along scale rows on sides; **head dark** from nape to mouth, **with a light oval spot on nuchal scales; posterior margin of opercle and of branchiostegal membrane black;** a black spot at pectoral fin axils extending slightly above and below the fin insertion; pectoral fins light-coloured, other fins dark, almost black near margins. **In the young, the dark peduncular bar is saddle-shaped and located behind dorsal fin; in adults, this bar extends well onto base of posterior soft rays of dorsal and anal fins.**

Size: Maximum: 35 cm; common to 25 cm.

Habitat, biology, and fisheries: Inhabits rocky bottoms down to 100 m depth; may occur in deeper waters on muddy bottoms. Feeds on invertebrates and seaweeds. Separate statistics are not reported for this species. Caught on line gear. Marketed fresh (flesh esteemed).

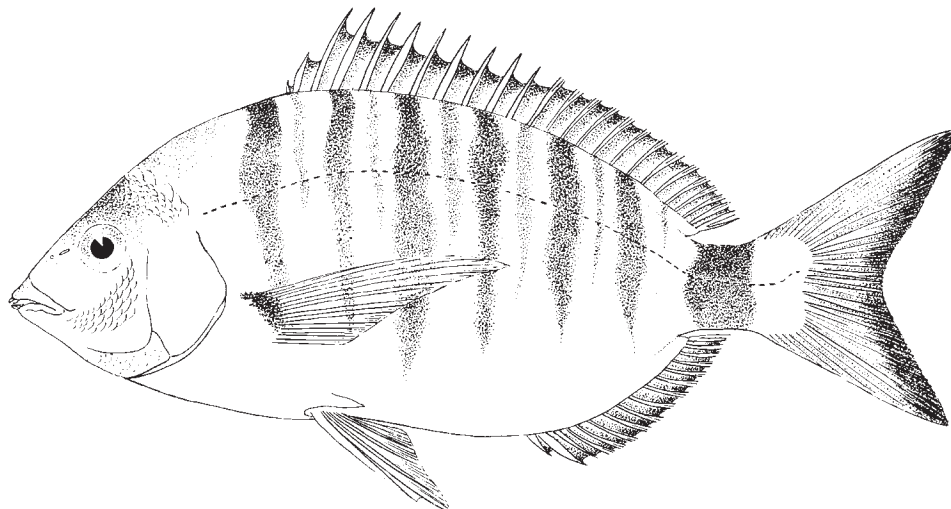
Distribution: Endemic to the Cape Verde Islands, where it replaces *D. vulgaris*.



Diplodus puntazzo (Walbaum, 1792)

Frequent synonyms / misidentifications: *Puntazzo puntazzo* (Cetti, 1777) / None.

FAO names: **En** – Sharpsnout seabream; **Fr** – Sar à museau pointu; **Sp** – Sargo picudo.



Diagnostic characters: Body oval and compressed. Snout pointed, jaws protrusible, lips thin; **8 conspicuously forward-pointing, chestnut-coloured, incisor-like teeth in each jaw, followed by 1 or 2 rows of small, very rudimentary molars tending to disappear in adults;** cheeks scaly, preopercle naked; gill rakers on lower limb of first arch 7 to 11, 5 to 7 on upper limb. Dorsal fin with 11 spines (first spine short) and 12 to 15 soft rays; anal fin with 3 spines and 11 to 13 soft rays; caudal fin forked. Scales along lateral line 53 to 64 (scales on caudal-fin base excluded). **Colour:** background colour silvery grey; **6 or 7 alternately very dark and lighter cross-bars on sides, sometimes disappearing completely after death; a large, dark, nearly annular bar on caudal peduncle,** more intense in young individuals; fork of caudal fin often edged with black; fins often greyish, darker distally; a very dark spot on upper angle of pectoral fin insertions.



teeth

Size: Maximum: 60 cm; common to 30 cm.

Habitat, biology, and fisheries: Inhabits rocky bottoms down to a depth of about 150 m, but is more common to 60 m. Forms small aggregations, the young living in littoral pools, the adults often occurring in the surf zone. Omnivorous, feeding on seaweeds, worms, molluscs and shrimps. A seasonal fishery along the Moroccan coast, but fished the year round on the Canary Islands. Separate statistics are not reported for this species. Caught on line gear, in traps (Canary Islands), with trammel nets and trawls. Marketed fresh or frozen (flesh not highly esteemed); also used for fishmeal and oil.

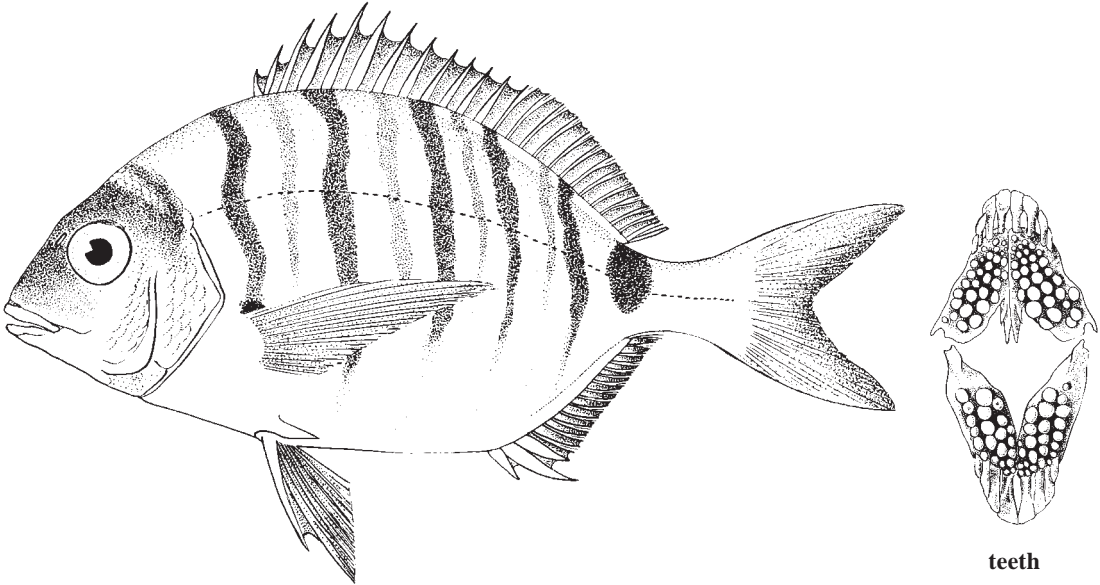
Distribution: Common from the Straits of Gibraltar to Sierra Leone; also present around the Canary and Cape Verde Islands but not off Madeira. Outside the area, recorded northward to the Bay of Biscay and also off South Africa.



***Diplodus sargus cadenati* de La Paz, Bauchot, and Daget, 1974**

Frequent synonyms / misidentifications: *Diplodus sargus typicus* Cadenat, 1964 / None.

FAO names: En – White seabream (Morocco); Fr – Sar commun du Maroc; Sp – Sargo marroquí.



Diagnostic characters: Body oval, moderately deep. Mouth slightly protrusible, lips thin; **8 incisor-like teeth (exceptionally 10) in upper, and 8 in lower jaw, followed by molars set in 3 or 4 (rarely 5) rows in upper and 2 or 3 (rarely 4) rows in lower jaw;** gill rakers on lower limb of first arch 9 to 12, 6 to 9 on upper limb. **Dorsal fin with 11 or 12 (rarely 13) spines** and 12 to 15 soft rays; anal fin with 3 spines and 12 to 14 soft rays; caudal fin forked. **Scales along lateral line 58 to 67** (scales on caudal-fin base excluded). **Colour:** background colour silvery grey, interorbital space and snout darker; **9 alternating dark and attenuated vertical bars on body covering about two-thirds of body depth from the dorsal profile downward** (in juveniles only the 5 darker bars are visible); **a saddle-like dark blotch on caudal peduncle**, just behind end of dorsal fin; dark longitudinal lines on sides running along scale rows throughout the entire depth of the body; pectoral-fin axils black; dorsal and anal fins grey, darker distally; pectoral and pelvic fins more or less dark; caudal fin grey, margined with black.

Size: Maximum: 45 cm; common to 25 cm.

Habitat, biology, and fisheries: A coastal, schooling species inhabiting rocky bottoms down to depths of 150 m, but especially abundant in the surf zone. The young occur in *Zostera* seagrass beds. Probably a protandric hermaphrodite (first male and then becoming female). Omnivorous, but prefers small crustaceans and molluscs; also feeds on seaweeds and may attack small corals. Mainly exploited by artisanal fisheries. Separate statistics are not reported for this species. Caught with trammel nets, beach seines and on hook-and-line on the Canary Islands; also with trawls. Marketed fresh or frozen (but the flesh is not very highly esteemed); also used for fishmeal and oil.

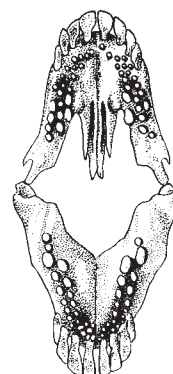
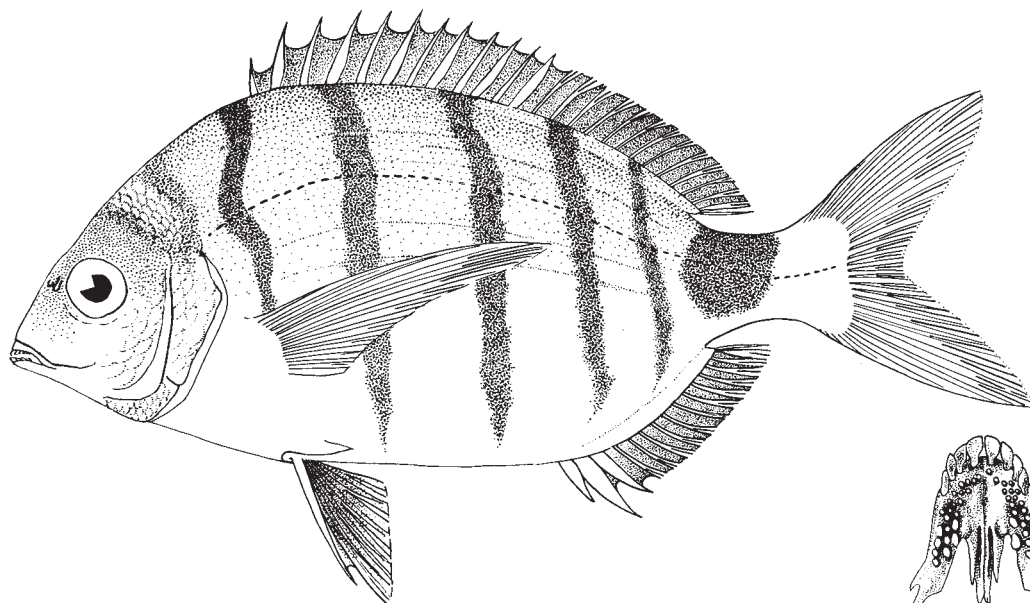
Distribution: Common along the West African coast from the Straits of Gibraltar to Senegal, and around Madaira and the Canary Islands, but absent from the Cape Verde Islands. Northward, extending up to the Bay of Biscay; in the Mediterranean it is replaced by the subspecies *Diplodus sargus sargus*.



***Diplodus sargus lineatus* (Valenciennes, 1830)**

Frequent synonyms / misidentifications: *Diplodus sargus insularum* Cadenat, 1964 / None.

FAO names: En – White seabream (Cape Verde); Fr – Sar commun du Cap Vert; Sp – Sargo de Cabo Verde.



teeth

Diagnostic characters: Body oval and deep. Mouth slightly protrusible; lips thin; **8 incisor-like teeth in each jaw; 3 (rarely 2) rows of molar teeth in upper, and 2 or 3 rows in lower jaw;** in addition, 2 or 3 irregular rows of small molars behind the incisors; gill rakers on lower limb of first arch 9 to 12, 6 to 9 upper limb. Dorsal fin with 11 or 12 spines (every second spine strong and silvery) and 13 to 15 soft rays; anal fin with 3 spines and 12 or 13 soft rays; caudal fin forked. **Scales along lateral line 57 to 65** (scales on caudal-fin base excluded). **Colour:** background colour a light greyish silver; 4 or 5 narrow black cross-bars running from dorsal profile to belly; a large, black saddle-shaped blotch on caudal peduncle; pelvic fins black except distally; dorsal and anal fins dark; pectoral fins light coloured.

Size: Maximum: 25 cm; common to 20 cm.

Habitat, biology, and fisheries: Inhabits rocky bottoms interspread with sand in nearshore waters to about 30 m depth or slightly more. Omnivorous, feeding on seaweeds and benthic invertebrates. Mainly landed in artisanal fisheries. Separate statistics are not reported for this species. Mainly caught on hook-and-line. Marketed fresh; flesh not highly esteemed.

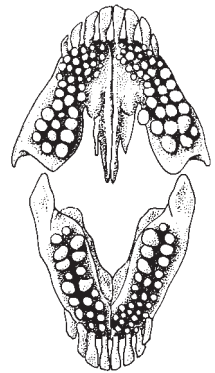
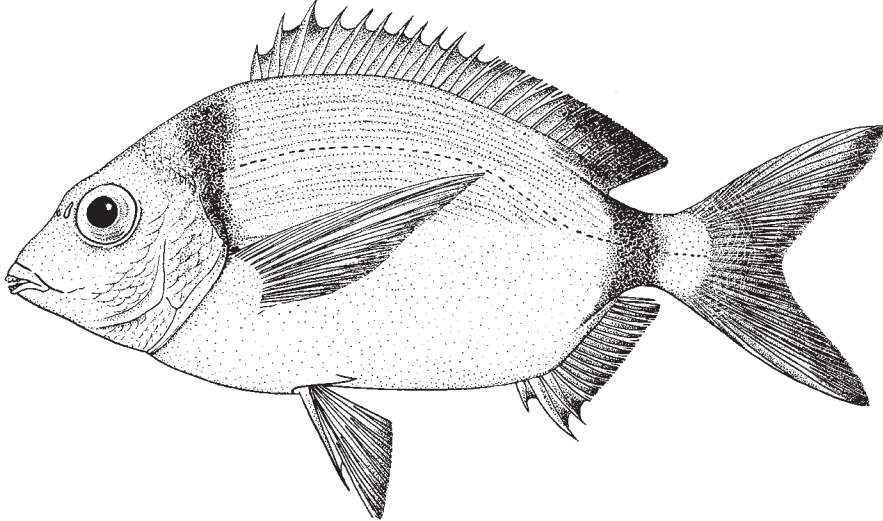
Distribution: This species is endemic to the Cape Verde Islands.



***Diplodus vulgaris* (Geoffroy Saint Hilaire, 1817)**

Frequent synonyms / misidentifications: None / None.

FAO names: **En** – Common two-banded seabream; **Fr** – Sar à tête noire; **Sp** – Sargo mojarra.



teeth

Diagnostic characters: Body oval, deep and compressed. Mouth slightly protrusible, lips moderately thick; **8 narrow, chestnut-coloured, incisor-like teeth in each jaw; 3 to 5 rows of molars in upper and 2 to 4 rows in lower jaw, set behind the incisors and on sides of jaws;** gill rakers on lower limb of first arch 10 to 12, 6 to 9 on upper limb. **Dorsal fin with 11 or 12 spines and 13 to 16 soft rays;** anal fin with 3 spines and 12 to 15 soft rays; caudal fin forked. Scales along lateral line 51 to 61 (scales on base of caudal fin excluded). **Colour:** background colour grey, brownish or greenish, lighter on belly; **a large, very dark nuchal band extending from origin of dorsal fin to pectoral-fin insertions and to the posterior margin of opercle; a dark annular band on caudal peduncle extending onto the bases of posterior dorsal- and anal-fin rays** (sometimes more restricted, not reaching dorsal and anal fins, in young individuals); pectoral fin axils black; caudal fin dark, almost black distally; other fins more or less dark, especially at margins.

Size: Maximum: 45 cm; common to 25 cm.

Habitat, biology, and fisheries: An euryhaline species (tolerating changes in water salinity) particularly inhabiting rocky and sometimes sandy bottoms to depths of 160 m, but more commonly in less than 50 m. The young are sometimes found in seagrass beds. Carnivorous, feeding on crustaceans, worms and molluscs. Fished throughout its range. Separate statistics are not reported for this species. Caught with trammel nets, trawls, on hook-and-line, in traps (Canary Islands) and with beach seines (young fish). Marketed fresh, frozen or dried-salted (flesh not very highly esteemed); also used for fishmeal and oil.

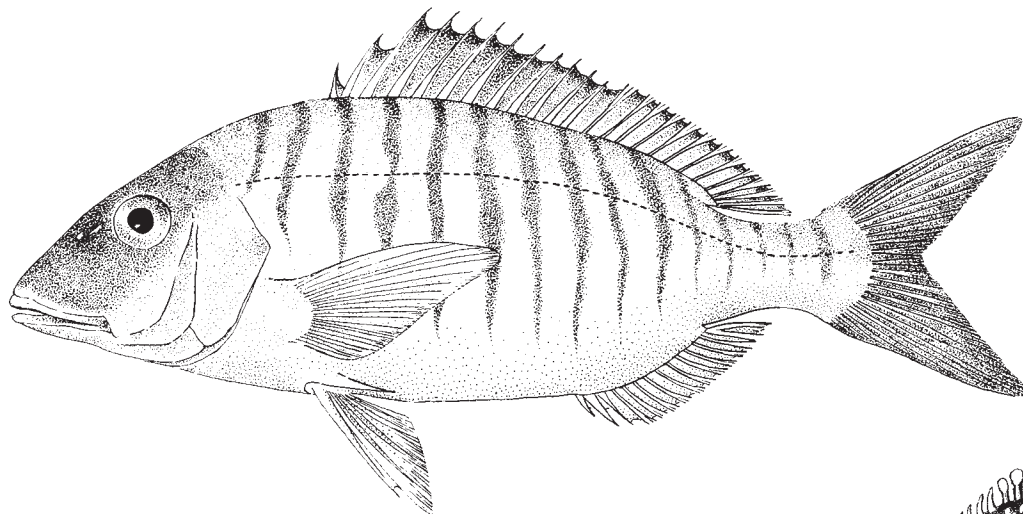
Distribution: Common along the West African coast from the Straits of Gibraltar to Senegal, around Madeira and the Canary Islands, but absent from the Cape Verde Islands. Northward extending into the Mediterranean and the Bay of Biscay.



Lithognathus mormyrus (Linnaeus, 1758)

Frequent synonyms / misidentifications: *Pagellus mormyrus* (Linnaeus, 1758) / None.

FAO names: En – Sand steenbras; Fr – Marbré; Sp – Herrera.



Diagnostic characters: Body oblong and compressed. Head profile straight; snout elongated and pointed; eye small; **posterior nostril slit-like**; scales on top of head not extending forward beyond level of posterior eye margin; preopercle broad, naked; mouth low and nearly horizontal, lips thick; **anterior teeth small, set in bands, followed by 3 to 6 rows of molars in upper, and 2 to 4 rows in lower jaw**; gill rakers on lower limb of first arch 14 to 17 and 9 to 11 on upper limb. Dorsal fin with 11 or 12 spines and 11 or 12 soft rays; anal fin with 3 spines and 10 or 11 soft rays; pectoral fins short, not reaching beyond anus. Scales along lateral line 59 to 65. **Colour:** grey with silvery reflections, darker dorsally; **14 or 15 narrow dark brown to grey vertical bars on sides**; interorbital space and snout dark brown; dorsal and caudal fins usually dark; other fins lighter, more or less yellow or pinkish.



teeth

Size: Maximum to 55 cm; common to 30 cm.

Habitat, biology, and fisheries: Lives over sandy or muddy-sand bottoms, as well as on seagrass beds, to a depth of about 150 m; sometimes enters brackish waters. Gregarious, occasionally forming sizeable schools. A protandric hermaphrodite (the majority of individuals are first males, then become females). Carnivorous, feeding on worms, molluscs and small crustaceans. Present throughout the year, but not sustaining an important fishery. Caught on line gear, with bottom trawls, beach seines, trammel nets and traps (Canary Islands). Marketed fresh or frozen (flesh esteemed); also used for fishmeal and oil.

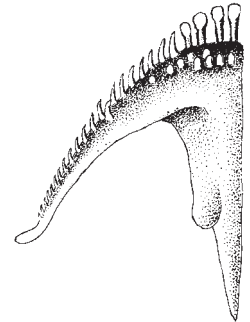
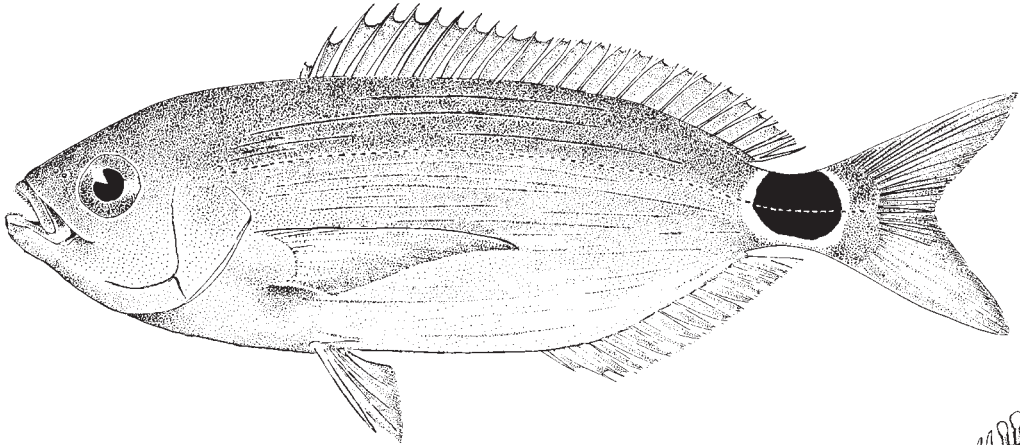
Distribution: Coast of West Africa from the Straits of Gibraltar to the Cape of Good Hope, and around Madeira and the Canary and Cape Verde Islands. Also northward to the Bay of Biscay, in the Mediterranean, the Red Sea and the Indian Ocean from the Cape of Good Hope to Natal.



Oblada melanura (Linnaeus, 1758)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Saddled seabream; Fr – Oblade; Sp – Oblada.



teeth

Diagnostic characters: Body oblong, slightly compressed. Head profile straight from nape forward; eye diameter at least twice the width of suborbital space; scales on top of head reaching forward to a line through middle of eyes or beyond; cheeks scaly; scales also present on preopercle except at its posterior margin; mouth oblique; **each jaw with an outer row of 8 to 10 median incisor-like teeth (their cutting edges very slightly notched), followed by small, slightly inward-curving, conical teeth**; anteriorly, the external row of incisors is followed by 2 or more rows of small granular teeth; gill rakers on lower limb of first arch 20 and 12 on upper limb. Dorsal fin with 11 spines and 13 or 14 soft rays; anal fin with 3 spines and 12 to 14 soft rays. Scales along lateral line 64 to 67 (plus 5 or 6 scales on base of caudal fin). **Colour:** silvery grey; back dark with bluish reflections; more or less visible dark longitudinal lines following the scale rows; **a large black, saddle-shaped blotch on caudal peduncle, margined with white**; fins light coloured.

Size: Maximum: 30 cm; common to 20 cm.

Habitat, biology, and fisheries: A coastal species forming aggregations over rocky bottoms or seagrass beds (zosteras and seaweeds) to depths of about 30 m. Omnivorous (but especially feeding on small invertebrates). No special fishery. Separate statistics are not reported for this species. Caught on line gear; sometimes with trammel nets and trawls. Marketed fresh or frozen (flesh not highly appreciated); also used for fishmeal and oil.

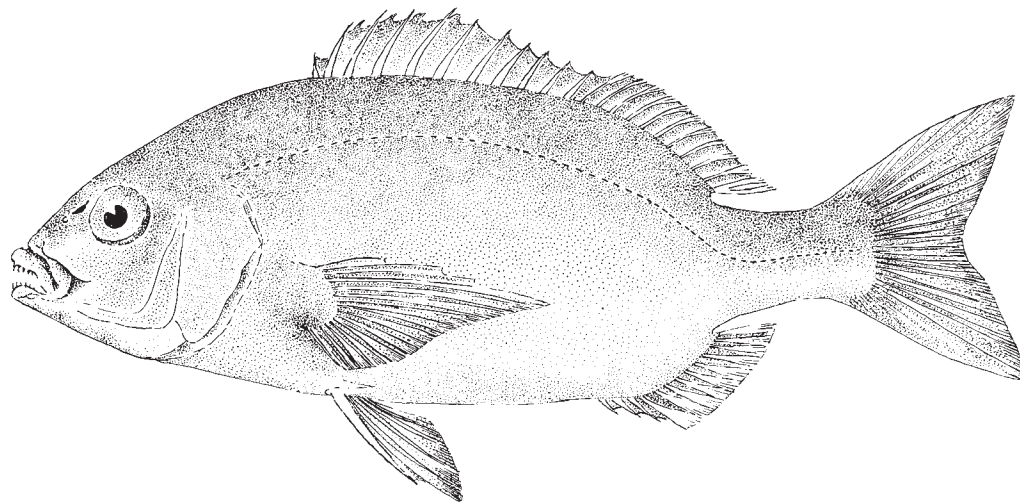
Distribution: Coast of West Africa from the Straits of Gibraltar to Angola, as well as around Madeira and the Canary and Cape Verde Islands. Northward extending into the Mediterranean and to the Bay of Biscay.



***Pachymetopon blochii* (Valenciennes, 1830)**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Hottentot seabream; Fr – Hottentot; Sp – Sargo hotentote.



Diagnostic characters: Body oval and compressed. Head profile almost straight from the nape downward; many rows of scales on cheeks but preopercle scaleless; mouth small, oblique; **4 or 5 rows of conical, pointed teeth**, those in outer range strongest, especially the anteriors; gill rakers on lower limb of first arch 13 or 14, 8 or 9 on upper limb. Dorsal fin with 10 or 11 spines and 11 or 12 soft rays; anal fin with 3 spines and 10 soft rays; **bases of soft dorsal and anal-fin rays scaly, but not embedded in a sheath**. Lateral-line scales 60 to 70. **Colour:** grey to brown with bronze reflections, paler on belly. Some individuals show a lighter colour with dark spots on cheeks, behind eye and on upper part of body.

Size: Maximum: 45 cm; common to 25 cm.

Habitat, biology, and fisheries: Inhabits rocky bottoms; spawning occurs throughout the year. Omnivorous (seaweeds, echinoderms, crustaceans, molluscs and worms). Fished throughout its range; more common around the Cape of Good Hope. Separate statistics are not reported for this species. Caught on line gear. Marketed fresh (flesh esteemed).

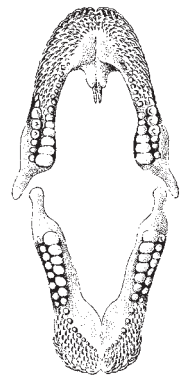
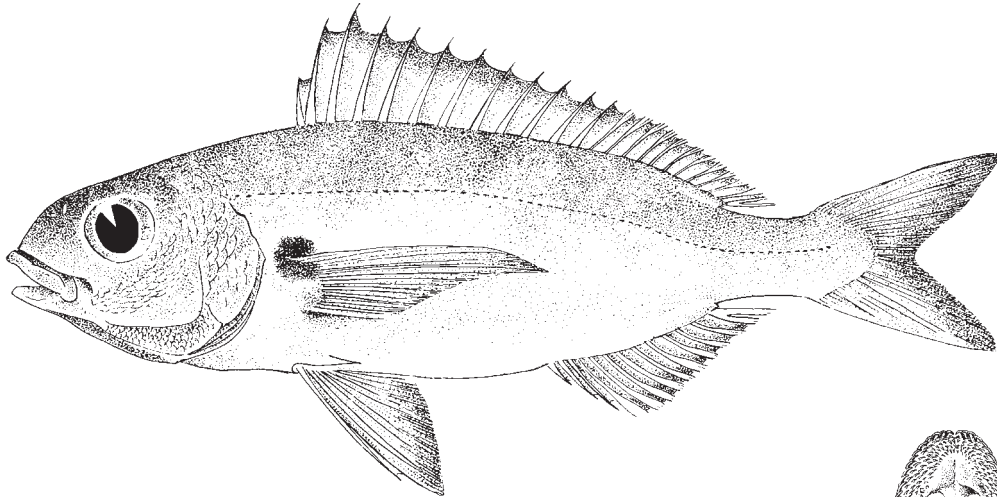
Distribution: West African coast from southern Angola to Cape Agulhas.



***Pagellus acarne* (Risso, 1827)**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Axillary seabream; Fr – Pageot acarne; Sp – Aligote.



teeth

Diagnostic characters: Body fusiform, moderately compressed. Head profile depressed above eye, snout conical; interorbital space flat; **eye diameter smaller than snout length**; **scales on top of head reaching forward to or beyond a line through posterior eye margins**; cheeks scaly, preopercle scaleless; mouth low, nearly horizontal; lips thick; **both jaws with pointed teeth anteriorly and molar-like teeth posteriorly**; an inner band of numerous slightly smaller, cardiform teeth behind the outer row of pointed teeth; gill rakers on lower limb of first arch 13 to 16, 9 to 12 on upper limb. Dorsal fin with 12 or 13 spines and 10 to 12 soft rays; anal fin with 3 spines and 9 or 10 soft rays; last dorsal and anal-fin rays clearly stronger than the preceding ones. Scales along lateral line 65 to 72. **Colour:** greyish pink, darker on back, lighter on belly; head darker, particularly between eyes; **a reddish black spot at pectoral-fin axils** extending onto upper part of fin base; fins more or less light pinkish; dorsal, anal and caudal fins sometimes with brownish red margins; inside of mouth orange red.

Size: Maximum to 35 cm; common to 25 cm.

Habitat, biology, and fisheries: A demersal species inhabiting various types of bottom, especially seagrass beds and sand down to a depth of 500 m, but more common between 40 and 100 m, the young nearer to the shore. Intermittent spawning takes place from March to August. A protandric hermaphrodite (most individuals are first males, then become females at a size of about 24 to 30 cm). Omnivorous, with preference for a carnivorous diet (feeds on worms, molluscs, small crustaceans). A very abundant species, especially in the northern part of its range. Caught with bottom trawls, on line gear and with beach seines (young). Marketed fresh, frozen, or dried salted (flesh not highly esteemed); also used for fishmeal and oil.

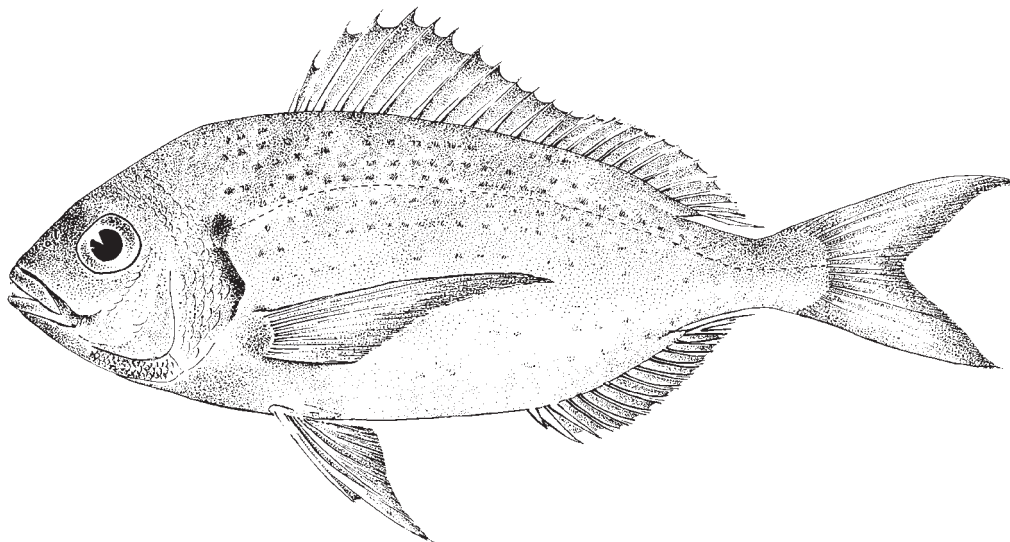
Distribution: From the Straits of Gibraltar to northern Senegal and around Madeira, the Canaries and the Cape Verde islands. Also in the Mediterranean and northward to the British Isles; occasionally to Denmark.



Pagellus bellottii Steindachner, 1882

Frequent synonyms / misidentifications: *Pagellus coupei* Dieuzeide, 1960 / None.

FAO names: En – Red pandora; Fr – Pageot à tache rouge; Sp – Breca chata.



Diagnostic characters: Body oblong and compressed. Head profile slightly, but regularly convex, becoming steeper from the nape downward in adults; a poorly developed median crest sometimes present on nape; **scales on top of head reaching forward to or beyond a line passing through anterior eye margins**; cheeks scaly, preopercle scaleless; mouth low, small, slightly oblique; **both jaws with pointed teeth anteriorly and molar-like ones posteriorly**; an inner band of numerous slightly smaller, cardiform teeth behind the outer row of pointed teeth; molars arranged in 2 rows; gill rakers on lower limb of first arch 9 or 10, 5 or 6 on upper limb. Dorsal fin with 12 spines and 11 or 12 soft rays; **anal fin with 3 spines and 10 soft rays**; **base of anal fin longer than distance from snout to posterior eye margin**. Scales along lateral line 54 to 60. **Colour:** more or less bright red with silvery reflections; often blue spots following scale rows on sides; interorbital space darker; a small, **dark red spot at origin of lateral line and along upper margin of opercle**; base of pectoral fin darker; fins pinkish yellow (in many specimens from the Gulf of Guinea) or greyish. Caudal fin often with red or orange margin; inside of mouth whitish. The red vertical bars described by authors may correspond to a light pattern.

Size: Maximum to 42 cm; common to 25 cm.

Habitat, biology, and fisheries: A demersal species inhabiting hard as well as sandy bottoms to depths of about 250 m; found in schools, especially in the upper 100 m. Intermittent spawning occurs from the second year onwards between May and November according to the latitude, the stock moving toward the coast to spawn. A protogynic hermaphrodite (the majority of individuals are first females, then become males). Omnivorous, with a predominantly carnivorous diet (including crustaceans, cephalopods, small fish, amphioxus and worms). Together with *Dentex macropthalmus*, this is the most abundant sparid species on the West African coast. The main fishery is south of 26°N. Caught with bottom trawls, on line gear and in traps (Canary Islands). Marketed fresh, smoked or frozen (flesh esteemed); also used for fishmeal and oil.

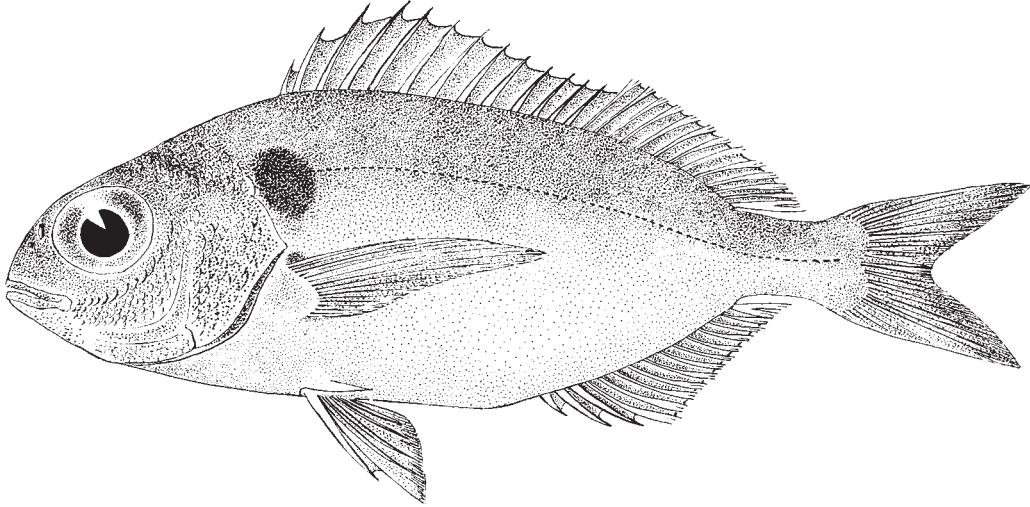
Distribution: From the Straits of Gibraltar to Angola, and around the Canary Islands. Also in the southwestern Mediterranean.



***Pagellus bogaraveo* (Brünnich, 1768)**

Frequent synonyms / misidentifications: *Pagellus centrodonatus* Delaroche, 1809 / None.

FAO names: En – Blackspot seabream; Fr – Dorade rose; Sp – Besugo.



Diagnostic characters: Body oblong. Head profile rounded, snout short; **eye diameter greater than snout length; scales on top of head reaching to a line between posterior halves of eyes;** cheeks scaly, preopercle scaleless; mouth low, nearly horizontal; **both jaws with pointed teeth anteriorly and molar-like teeth posteriorly;** an inner band of numerous, slightly smaller, cardiform teeth behind the outer row of pointed teeth; gill rakers on lower limb of first arch 18 or 19 and 11 to 13 on upper limb. Dorsal fin with 12 or 13 spines and 11 to 13 soft rays; **anal fin with 3 spines and 11 or 12 soft rays;** last dorsal and anal-fin rays stronger than the preceding ones. Scales along lateral line 68 to 74. **Colour:** a more or less reddish grey, darker on head, lighter on belly; a dark spot at pectoral-fin axils and **a large black blotch at origin of lateral line** (sometimes absent in young); fins more or less bright pink; inside of mouth orange red.

Size: Maximum to 65 cm; common to 35 cm.

Habitat, biology, and fisheries: A demersal fish inhabiting various types of bottom (rock, sand, mud) to depths of about 700 m, the young nearer to the shore, the adults on the continental slope, especially over muddy bottoms. Forms aggregations; spawning occurs from January to June when the adults move towards the coast up to the edge of the continental shelf. A protandric hermaphrodite (the majority of individuals are first males, then become females, at sizes of about 20 to 30 cm). Omnivorous, with a predominantly carnivorous diet (crustaceans, molluscs, worms, small fish). The West African coast represents the southern limit of the geographical range of this species. This, together with its occurrence in deep waters, explains why the catches from the area are comparatively small. Caught with bottom trawls and bottom longlines. Marketed fresh and frozen (flesh esteemed); also used for fishmeal and oil.

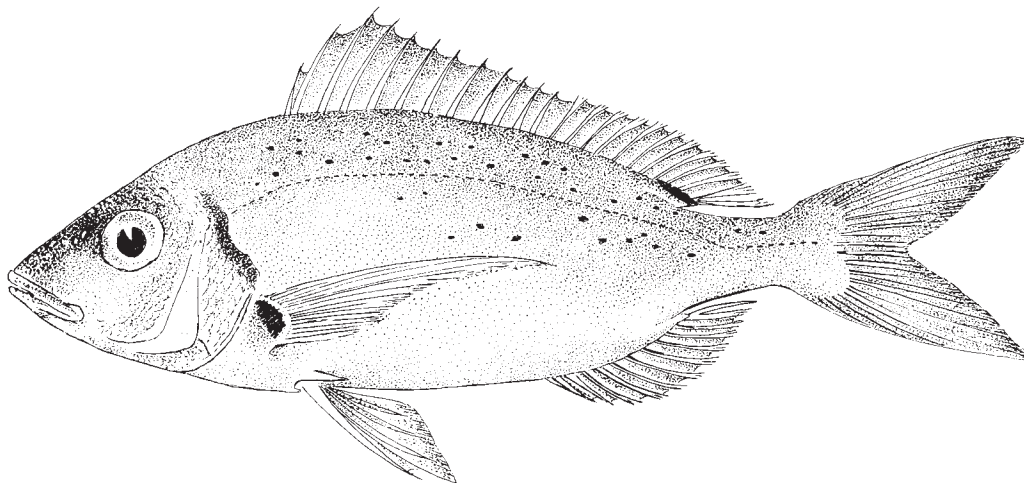
Distribution: From Gibraltar to Cape Blanc, exceptionally further south, and around Madeira and the Canary Islands. Also in the Mediterranean and northward to Norway.



***Pagellus erythrinus* (Linnaeus, 1758)**

Frequent synonyms / misidentifications: *Pagellus canariensis* Valenciennes, 1838 / None.

FAO names: En – Common pandora; Fr – Pageot commun; Sp – Breca.



Diagnostic characters: Body oval and compressed. **Head profile straight; eye diameter clearly smaller than snout length; scales on top of head reaching forward to level of anterior eye margin or beyond;** cheeks scaly, preopercle unscaled; mouth low, slightly oblique; lips thick; **both jaws with pointed teeth anteriorly and molar-like teeth posteriorly;** an inner band of numerous, slightly smaller, cardiform teeth behind the outer row of pointed teeth; molars in 2 or 3 (rarely 4) rows in upper and 2 (rarely 3) rows in lower jaw; gill rakers on lower limb of first arch 8 to 10, 5 or 6 on upper limb. Dorsal fin with 12 spines and 10 or 11 soft rays; anal fin with 3 spines and 8 or 9 soft rays; anal-fin base shorter than distance from snout to posterior eye margin. Lateral-line scales 55 to 65. **Colour:** a moderately bright pink marked with small blue spots on sides; head darker, especially between eyes and on snout profile; **posterior dorsal margin of opercle crimson red; a reddish spot on bases of pectoral fins;** inside of mouth whitish or greyish; sometimes a reddish spot on base of last dorsal-fin rays. The dark cross-bars described by some authors may correspond to a fright pattern.

Size: Maximum: 60 cm; common to 25 cm.

Habitat, biology, and fisheries: A demersal species inhabiting various types of bottom (rock, gravel, sand, mud) to depths of 220 m, but mainly in the upper 100 m, the young occurring nearer to the shore. During winter, the stocks move into deeper waters. A protogynic hermaphrodite (first females, becoming males in their third year at sizes of about 17 to 18 cm). Omnivorous, with a predominantly carnivorous diet (small fish, benthic invertebrates). Fished throughout its range; less common south of 19°N. Caught with bottom trawls, beach seines, on line gear and in traps (Canary Islands). Marketed fresh, frozen, smoked or dried-salted (flesh esteemed); also used for fishmeal and oil.

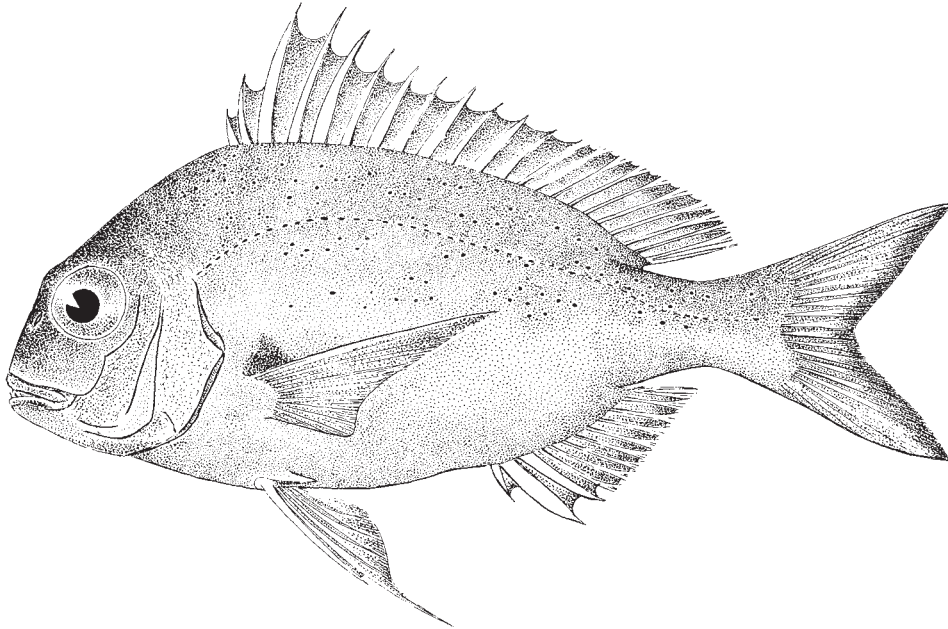
Distribution: Coast of West Africa from the Straits of Gibraltar to Guinea-Bissau including Madeira and Canary and Cape Verde Islands. Also in the Mediterranean and northward to Norway.



Pagrus africanus Akazaki, 1962

Frequent synonyms / misidentifications: *Pagrus pagrus* Linnaeus, 1758 (p.p.); *P. vulgaris* Valenciennes, 1830 / None.

FAO names: **En** – Southern common seabream; **Fr** – Pagre des tropiques; **Sp** – Pargo sureño.



Diagnostic characters: Body oval, moderately deep. Head profile convex, becoming clearly more abrupt in front of eye; 6 or 7 rows of scales on cheek; preopercle scaleless; **both jaws anteriorly with large, anterior canine-like teeth, 4 in upper and 6 in lower jaw, followed by smaller and blunter conical teeth that become progressively molar-like toward the posterior third of jaws;** the 2 outer rows of strong teeth are flanked, in the region anterior to the molars by several rows of very small teeth; gill rakers on first arch short, 9 to 11 lower and 6 or 7 upper. Dorsal fin with 12 spines and 10 or 11 soft rays; anal fin with 3 spines and 8 or 9 soft rays; **first soft ray of pelvic fins filamentous.** Scales along lateral line 48 to 56. **Colour:** pink with silvery reflections, lighter on belly; head darker; fine blue spots sometimes present on upper sides, particularly well developed in the young; **a dark red blotch at pectoral-fin axils extending well onto the fin bases;** dorsal, anal and caudal fins pink edged with orange distally.

Size: Maximum to 75 cm; common to 35 cm.

Habitat, biology, and fisheries: A demersal species inhabiting hard (rocks and rubble), sandy or muddy bottoms on the continental shelf and the upper slope to about 200 m depth, but not often beyond 150 m. The young occur nearer to the coast than the adults. Reproduction takes place from September onward. Carnivorous, capable of crushing molluscan shells; also feeding on fish. Fished throughout its range. Caught with bottom trawls, bottom fixed nets and on line gear. Marketed fresh, frozen or smoked; also used for fishmeal and oil.

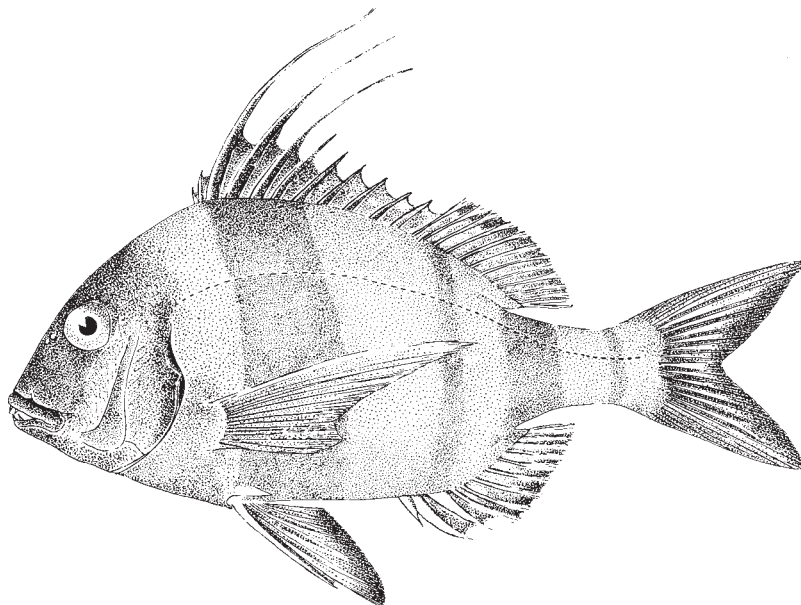
Distribution: West African coast from Mauritania to Angola, and Cape Verde Islands.



Pagrus auriga Valenciennes, 1843

Frequent synonyms / misidentifications: *Sparus auriga* (Valenciennes, 1843) / *Pagrus caeruleostictus*.

FAO names: En – Redbanded seabream; Fr – Pagre rayé; Sp – Pargo sémola.



Diagnostic characters: Body oval, deep and compressed. Head profile nearly straight, except for a slight hump above eyes; cheeks scaly; scalation on preopercle scarcely visible; mouth low, slightly oblique; jaws strong, lips thick; **anterior teeth canine-like, 4 in upper and 6 in lower jaw, followed by blunter teeth that become progressively molar-like and are arranged in 2 or 3 rows**; behind the row of large canine-like teeth there are some smaller teeth; gill rakers on lower limb of first arch 10 or 11 and 6 to 8 on upper limb. Dorsal fin with 11 spines and 10 to 12 soft rays, **the first 2 spines always very short, the third to fifth very long and filamentous, particularly in the young**; anal fin with 3 spines and 8 or 9 soft rays. Scales along lateral line 50 to 52. **Colour:** pink with silvery reflections and **4 or 5 dark red, alternately broad and narrow cross-bars**; adults of a more intense wine red with the cross-bars less well visible than in the young; head dark between nape and corner of mouth; **hind edge of opercle very dark**. Dorsal fin pink with some black on the membranes separating the filamentous spines and with orange on distal parts of soft rays; anal fin similar in colour to the dorsal; pectoral fins pinkish orange; pelvic fins wine red edged with black; caudal fin greyish at base, pink or orange edged with black distally.

Size: Maximum to 60 cm; common to 30 cm.

Habitat, biology, and fisheries: A coastal species inhabiting hard bottoms (rock or rubble) down to a depth of 170 m, the young near the coast. Carnivorous, feeding chiefly on molluscs, including cephalopods, and on crustaceans. Taken sporadically throughout its range. Separate statistics are not reported for this species. Caught on line gear and with trammel nets and bottom trawls. Marketed fresh or frozen (flesh highly esteemed); also used for fishmeal and oil.

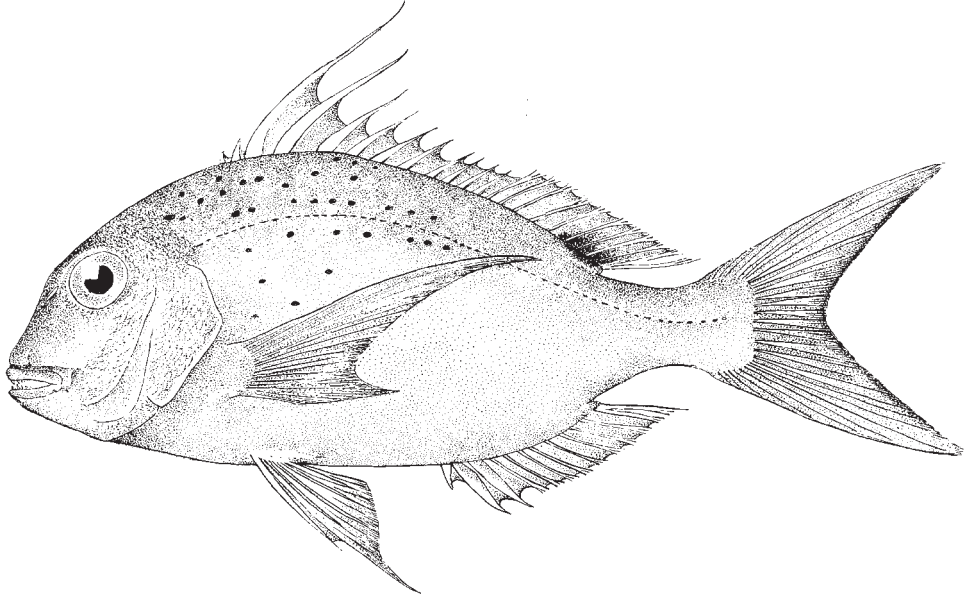
Distribution: From Gibraltar to Angola, including Madeira and the Canary Islands. Also in the southwestern Mediterranean and northward to Portugal.



***Pagrus caeruleostictus* (Valenciennes, 1830)**

Frequent synonyms / misidentifications: *Sparus ehrenbergii* (Valenciennes, 1830) / None.

FAO names: En – Bluespotted seabream; Fr – Pagre à points bleus; Sp – Hurta (= Zapata).



Diagnostic characters: Body oval, moderately deep and compressed. Head profile regularly convex above, becoming abruptly steeper below eye; cheek scaly; preopercle unscaled or with a few scattered, small scales; mouth low, slightly oblique; jaws very strong, lips thick; **anterior teeth canine-like, 4 in upper and 6 in lower jaw, followed by blunter teeth that become progressively molar-like and are arranged in 2 or 3 rows;** behind the row of large canine-like teeth there are some smaller teeth; gill rakers on lower limb of first arch 10 to 13, 6 or 7 on upper limb. **Dorsal fin with 11 or 12 spines and 9 to 11 soft rays; the first 2 spines always very short, the third to fifth longest, filamentous in the young;** anal fin with 3 spines and 8 or 9 soft rays; first soft ray of pelvic fins filamentous. Scales along lateral line 51 to 54. **Colour:** pink with silvery reflections and **large bluish black spots on back and sides;** head darker, particularly on the interorbital space; a dark spot at bases of last dorsal soft rays extending onto the sheath of the fin, but becoming lighter with age; caudal fin pinkish, the fork edged with black; other fins bluish or pinkish. Old individuals very often with numerous irregular dark spots on head and back; old males with yellow on the head during the reproduction season.

Size: Maximum to 72 cm; common to 50 cm.

Habitat, biology, and fisheries: A demersal species inhabiting hard bottoms (rocks and rubble) down to a depth of about 150 m, the older individuals in the deeper part of this range, the young in inshore areas. Sexual maturity is attained at the age of 2 years; spawning migrations occur parallel to the coast, with intermittent spawning activity taking place over soft bottoms in shallow water to the north of Cape Verde, throughout the hot season. Carnivorous, feeding chiefly on bivalves; also on crustaceans and fish. A seasonal fishery, particularly on spawning concentrations. Separate statistics are not reported. Caught on line gear, with bottom trawls and seines, and in traps (Canary Islands). Marketed fresh, frozen or smoked (flesh esteemed); also used for fishmeal and oil.

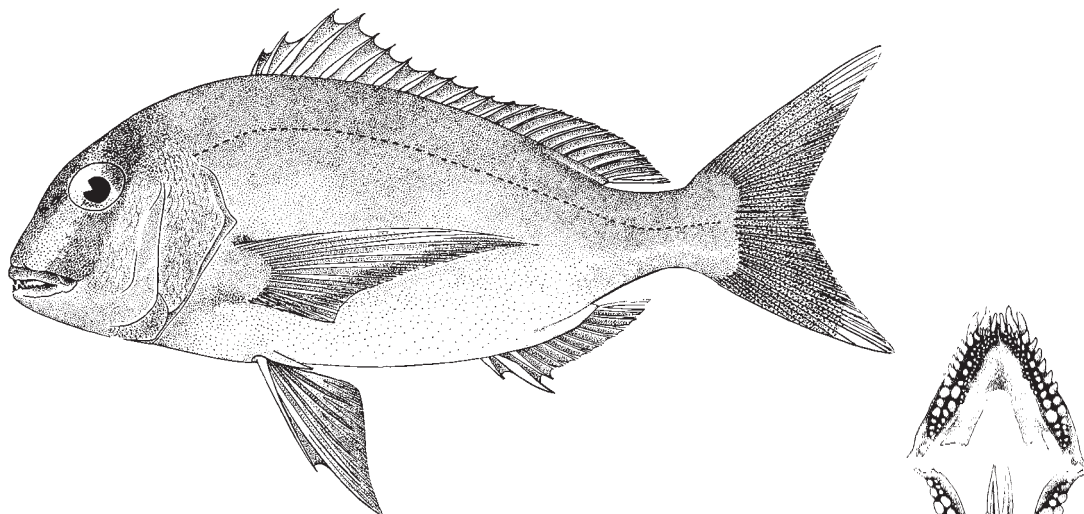
Distribution: From Gibraltar to Angola, including the Canary Islands. Also in the Mediterranean and northward to Portugal.



***Pagrus pagrus* (Linnaeus, 1758)**

Frequent synonyms / misidentifications: *Pargus pagrus pagrus* (Linnaeus, 1758); *P. vulgaris* Valenciennes, 1830 / None.

FAO names: En – Red porgy; Fr – Pagre commun; Sp – Pargo.



Diagnostic characters: Body oval, moderately deep. Head profile convex, slightly steeper in front of eye; 6 or 7 rows of scales on cheeks; preopercle scaleless; **both jaws anteriorly with large canine-like teeth, 4 in upper and 6 in lower jaw, followed by smaller and blunter canine-like teeth that become progressively molar-like toward the posterior third of jaws**; the 2 outer rows of strong teeth are flanked in the region anterior to the molars by several rows of very small teeth; gill rakers short, lower limb of first arch with 8 to 10, 6 to 8 on upper limb. Dorsal fin with 12 spines and 9 to 12 soft rays; anal fin with 3 spines and 8 or 9 soft rays. Scales along lateral line 52 to 60. **Colour:** pink with silvery reflections, lighter on belly; head dark from nape to angle of mouth; sometimes, fine blue dots present on upper sides, particularly conspicuous in young individuals; often a somewhat darker area at pectoral fin axils; **caudal fin dark pink, with both tips white**; other fins pinkish.

Size: Maximum to 75 cm; common to 35 cm.

Habitat, biology, and fisheries: A demersal species inhabiting hard (rock and rubble) or sandy bottoms (the young often found on seagrass beds) of the continental shelf and the slope down to a depth of about 250 m, although usually less than 100 m. Spawning takes place from May to June. Carnivorous, crushing their food (mainly crustaceans, fishes and molluscs). A moderately abundant species, especially in the northern part of its range, and around the Canary Islands. Caught with bottom trawls, line gear, fixed nets, traps and beach seines. Utilized fresh or frozen, sometimes dried-salted (flesh highly esteemed); also reduced to fishmeal and oil.

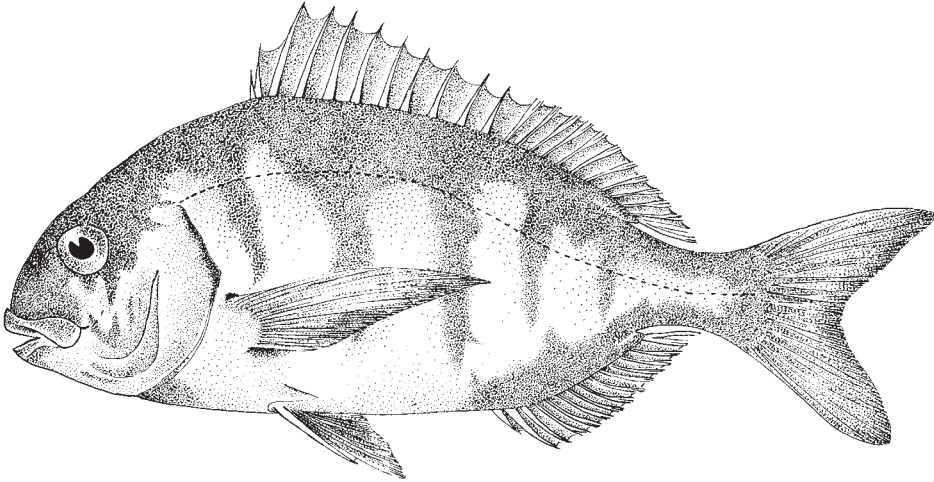
Distribution: From the Straits of Gibraltar to 15°N (rare southward of 20°N) including Madeira and the Canary Islands. Also in the Mediterranean and northward to the British Isles.



***Rhabdosargus globiceps* (Valenciennes, 1830)**

Frequent synonyms / misidentifications: None / None.

FAO names: En – White stumpnose; Fr – Sargue austral; Sp – Pargo ñato.

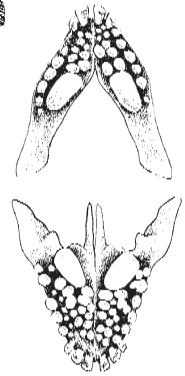


Diagnostic characters: Body oval and compressed. Head profile showing a slight depression above the eye, and a hump on front in adults; preopercle scaleless; mouth terminal, nearly horizontal; **teeth incisor-like, short and stout** (pointed in young), **4 to 6 in upper and 4 to 8 in lower jaw, followed by molars** (4 or 5 rows in upper and 3 or 4 rows in lower jaw); gill rakers on lower limb of first arch 7 to 10 and 5 to 7 on upper limb. Dorsal fin with 11 spines and 11 to 13 soft rays; anal fin with 3 spines and 10 or 11 soft rays. Scales along lateral line 57 to 61. **Colour:** silvery grey; belly lighter, head darker, especially on interorbital region; 5 to 7 dark vertical bars; pectoral-fin axils and margin of opercle black; fins dark.

Size: Maximum to 65 cm; common to 40 cm.

Habitat, biology, and fisheries: Prefers sandy bottoms. The young often enter estuaries. Regularly fished throughout its range. Separate statistics are not reported for this species. Caught on line gear, using lights. Marketed fresh; an excellent foodfish.

Distribution: From Angola to the Cape of Good Hope and in the Indian Ocean northward to Natal.



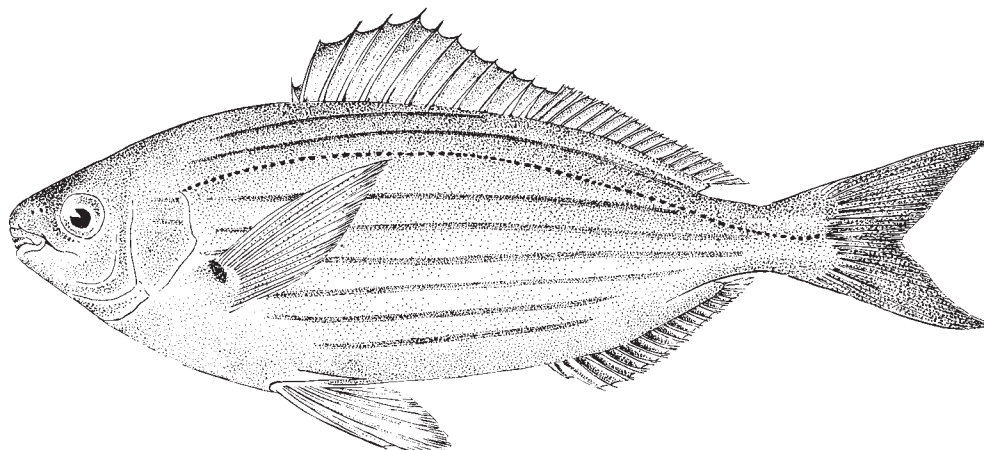
teeth



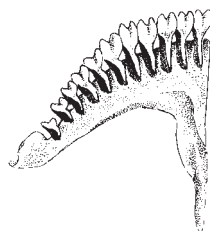
Sarpa salpa (Linnaeus, 1758)

Frequent synonyms / misidentifications: *Boops salpa* (Linnaeus, 1758) / None.

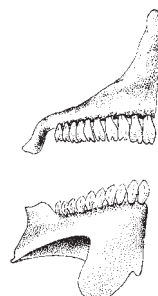
FAO names: En – Salema; Fr – Saupe; Sp – Salema.



Diagnostic characters: Body oblong and moderately compressed. Head small, snout blunt; preopercle scaleless; upper jaw slightly projecting; mouth terminal, small; lips thick; a single row of incisor-like teeth in each jaw, those on upper jaw notched at edges, those in lower jaw with a depression on their outer surface and ending in a single triangular point; all incisors with roots exposed, easily visible inside mouth; gill rakers on lower limb of first arch 12 to 14, 6 or 7 on upper limb. **Dorsal fin with 11 or 12 spines** and 14 to 17 soft rays; anal fin with 3 spines and 13 to 15 soft rays; pectoral fins short, not reaching to anus. Scales along lateral line 70 to 80. **Colour: bluish grey with 10 or 11 more or less orange-golden longitudinal lines** following the scale rows; head darker, belly lighter; eye yellow, interorbital space dark; **lateral line dark and very distinct; a small black spot at upper part of pectoral-fin base**; caudal fin dark grey, other fins lighter.



teeth



teeth

Size: Maximum to 45 cm; common to 35 cm.

Habitat, biology, and fisheries: Inhabits rocky or sandy bottoms covered with seaweeds, to depths of about 70 m. Gregarious, sometimes forming sizeable schools; spawning occurs from March to April and from September to November north of Senegal. Mainly herbivorous, but sometimes also feeding on small crustaceans. Exploited by an irregular and not very important fishery. Separate statistics are not reported for this species. Caught on line gear, with bottom trawls, trammel nets, beach seines and in traps (Canary Islands). Marketed fresh or frozen, sometimes dried-salted (flesh not very highly esteemed); also used for fishmeal and oil.

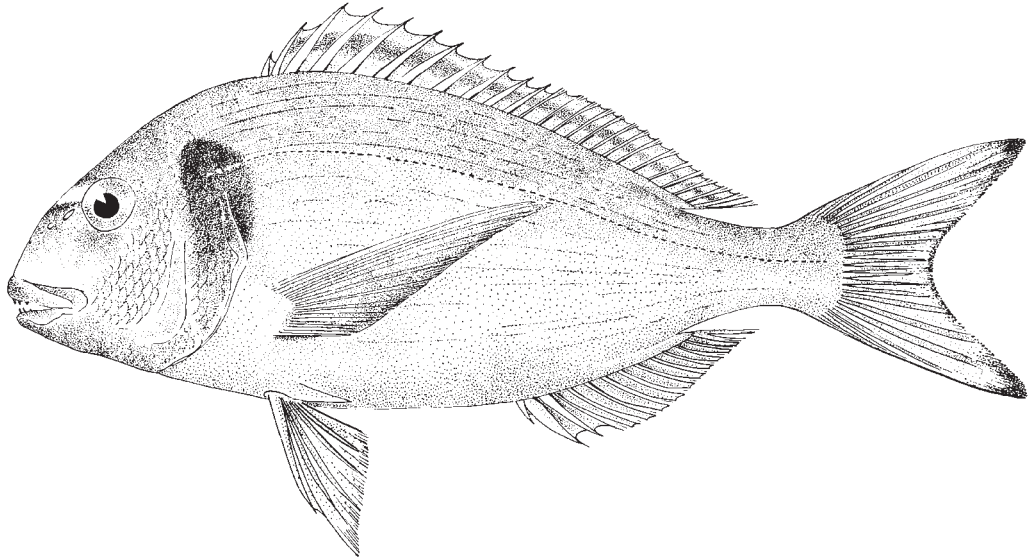
Distribution: From the Straits of Gibraltar to Sierra Leone, around Madeira and the Canary and Cape Verde Islands, and in the south from Congo to South Africa. Also in the Mediterranean and northward to the Bay of Biscay.



Sparus aurata Linnaeus, 1758

Frequent synonyms / misidentifications: None / None.

FAO names: **En** – Gilthead seabream; **Fr** – Dorade royale; **Sp** – Dorado.



Diagnostic characters: Body oval, moderately deep and compressed. Head profile regularly curved; eye small; cheeks scaly, preopercle scaleless; mouth low, very slightly oblique; lips thick; **4 to 6 canine-like teeth anteriorly in each jaw, followed posteriorly by blunter teeth which become progressively molar-like and are arranged in 2 to 4 rows** (teeth in the 2 outer rows stronger); gill rakers on lower limb of first arch short, 7 or 8, and 5 (rarely 4) to 6 on upper limb. Dorsal fin with 11 spines and 13 to 14 soft rays; anal with 3 spines and 11 or 12 soft rays. **Scales along lateral line 73 to 85.** **Colour:** silvery grey; **a large black blotch at origin of lateral line** extending on upper margin of opercle where it is edged below by a reddish area; a golden band between eyes edged by 2 dark areas (not well defined in young individuals); dark longitudinal lines often present on sides of body; a dark band on dorsal fin; fork and tips of caudal fin edged with black.

Size: Maximum to 70 cm; common to 35 cm.

Habitat, biology, and fisheries: A coastal species, inhabiting seagrass beds and sandy bottoms as well as in the surf zone commonly to depths of about 30 m, but the adults may occur to 150 m depth. Euryhaline, entering brackish waters; a sedentary fish, solitary or forming small aggregations. A protandric hermaphrodite (the majority of individuals are first males, then become females, at about 3 years of age). Spawning occurs from October to December. Mainly carnivorous, (molluscs, particularly mussels which it can easily crush, crustaceans and fish); but accessorially herbivorous. The richest fishing grounds are located between 36°N to 21°S, the species being less common further south and around the Canary Islands. Fished most intensively from February to October. Separate statistics are not reported for this species. Caught on line gear, with trammel nets, bottom trawls, beach seines and traps. Marketed fresh or frozen (flesh highly esteemed); also used for fishmeal and oil.

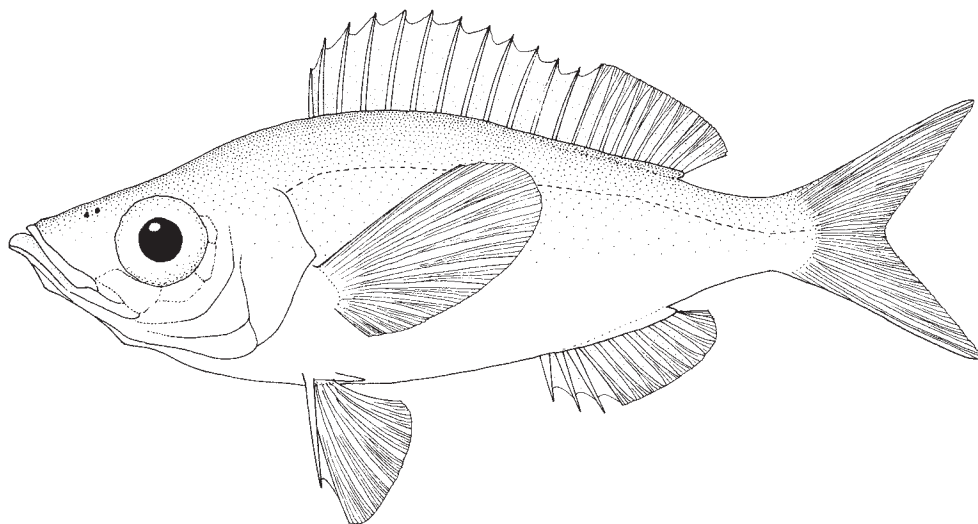
Distribution: From the Straits of Gibraltar to Senegal and around the Canary Islands. Also in the Mediterranean and northward to the British Isles.



Spicara alta (Osório, 1917)

Frequent synonyms / misidentifications: *Smaris macrophthalmus* Cadenat, 1937 / None.

FAO names: En – Bigeye picarel; Fr – Picarel à gros yeux; Sp – Chucla ojona.



Diagnostic characters: Body oblong, somewhat compressed, its depth contained 2.7 to 3.1 times in standard length. **Eyes large; upper jaw greatly protrusible;** jaws with bands of villiform teeth, none on vomer or palatines (roof of mouth); lower limb of first gill arch with 19 or 20 gill rakers. **Dorsal fin not deeply notched, with 12 spines and 10 soft rays;** anal fin with 3 spines and 8 soft rays. Lateral-line scales 48 to 50. **Colour:** silvery, reddish dorsally; no distinct dark markings.

Size: Maximum to at least 26 cm (possibly to 35 cm); common to 20 cm.

Habitat, biology, and fisheries: On the continental shelf in depths of 100 to 250 m; most abundant between 150 and 200 m. Feeds on the larger zooplankton organisms. Trawlable bottoms in depths of 100 to 200 m. Of minor commercial importance at present, but sometimes occurs in great concentrations off Cape Blanc, Senegal; often taken as bycatch by offshore trawling fleets. Separate statistics are not reported for this species. Caught mainly with bottom trawls. Marketed fresh (refrigerated) or reduced to fishmeal and oil.

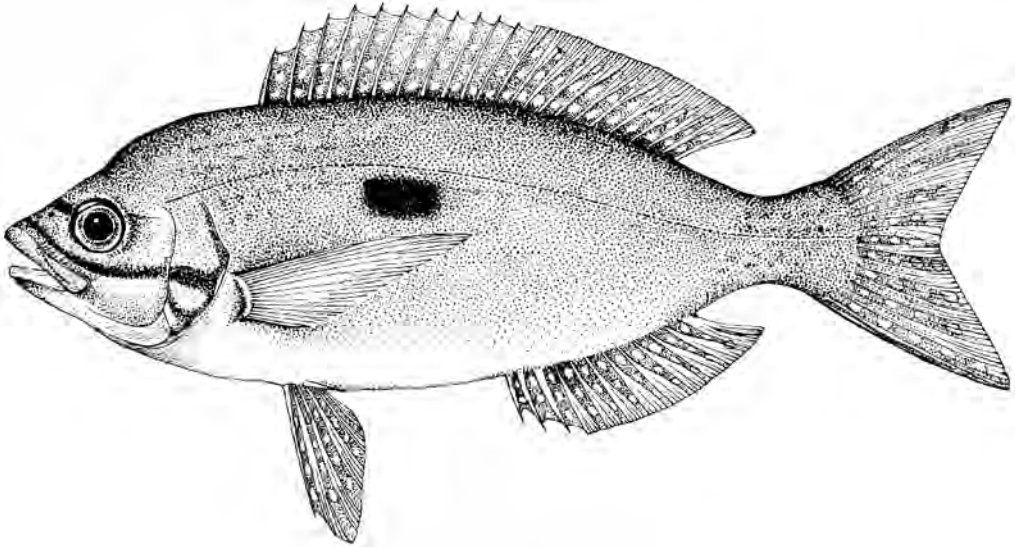
Distribution: From Senegal to southern Angola.



Spicara maena (Linnaeus, 1758)

Frequent synonyms / misidentifications: *Maena chryselis* (Valenciennes, 1830); *M. maena* (Linnaeus, 1758) / *Spicara flexuosa* Rafinesque, 1810.

FAO names: En – Blotched picarel; Fr – Mendole (= Picarel, Area 37); Sp – Chucla.



Diagnostic characters: Body oblong, somewhat compressed, its depth 2.9 to 3.5 times in standard length. **Upper jaw very protrusible;** jaws with bands of villiform teeth, the outer series larger, with a few small canines at front of jaws; vomerine teeth small or absent. Lower limb of first arch with 20 to 22 gill rakers. **Dorsal fin unnotched, with 11 spines and 10 to 12 soft rays; anal fin with 3 spines and 9 or 10 rays. Lateral-line scales 68 to 73.** Swimbladder bifurcate posteriorly. **Colour:** variable with age and sex; **always a dusky black blotch close below lateral line and above end of pectoral fin.**

Size: Maximum to 25 cm; common to 20 cm.

Habitat, biology, and fisheries: Over the continental shelf in depths of 100 to 200 m. Feeds mainly on small crustaceans. Trawled in depths of 100 to 200 m; of minor commercial importance. Separate statistics for this species are not collected within the area. Marketed fresh.

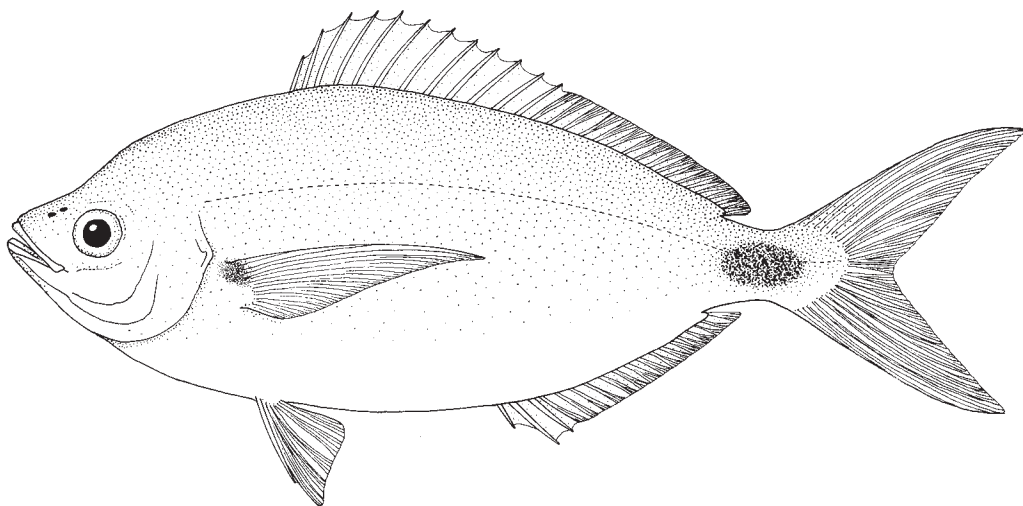
Distribution: In the area, from the Straits of Gibraltar to southern Morocco, including the Canary Islands. Northward extending into the Mediterranean and in the eastern Atlantic to Portugal and the Azores.



***Spicara melanurus* (Valenciennes, 1830)**

Frequent synonyms / misidentifications: *Spicara nigricauda* (Norman, 1931) / None.

FAO names: En – Blackspot picarel; Fr – Picarel de l'Atlantique sud-est; Sp – Sucla.



Diagnostic characters: Body oblong, somewhat compressed; its depth 2.3 to 3 times in standard length. **Upper jaw very protrusible;** jaws with a narrow band of fine, pointed teeth; lower limb of first arch with 14 to 17 gill rakers. **Dorsal fin unnotched, with 12 spines and 15 to 18 soft rays; anal fin with 3 spines and 15 to 17 soft rays;** a low scaly sheath at base of soft dorsal and anal fins. **Lateral-line scales 64 to 74,** plus several on base of caudal fin. **Colour:** body bluish silvery grey dorsally, silvery white below; **a large oval blackish blotch laterally on caudal peduncle, variable in size with age, more a saddle-shaped blotch in juveniles;** pectoral-fin bases blackish dorsally; a median golden streak along each row of dorsal body scales.

Size: Maximum to 30 cm; common to 25 cm.

Habitat, biology, and fisheries: Neritic over the continental shelf. Separate statistics are not reported for this species.

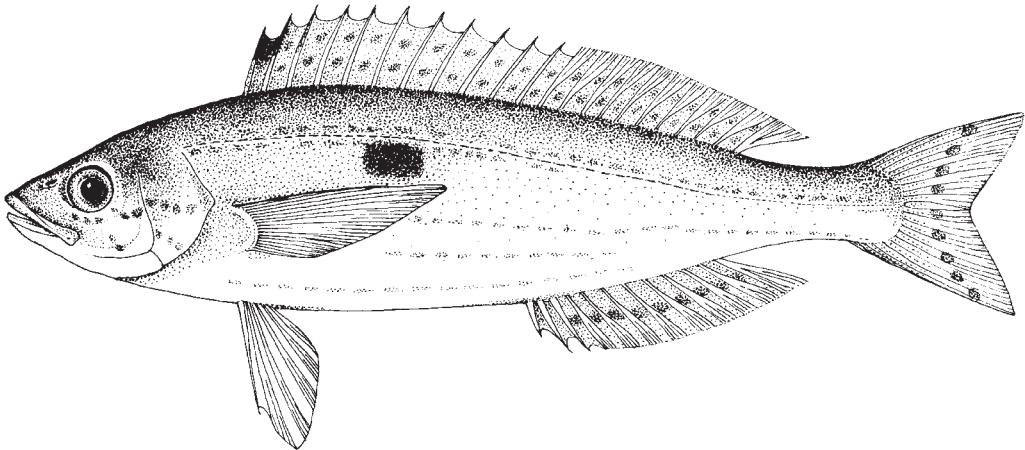
Distribution: From Senegal and Cape Verde Islands to Angola.



***Spicara smaris* (Linnaeus, 1758)**

Frequent synonyms / misidentifications: *Maena smaris* (Linnaeus, 1758) / None.

FAO names: En – Picarel; Fr – Picarel; Sp – Caramel.



Diagnostic characters: Body slender and elongate, its depth contained 3.7 to 4.7 times in standard length. **Upper jaw very protrusible;** jaws with bands of villiform teeth; vomerine teeth small or absent; lower limb of first gill arch with 20 to 22 gill rakers. Dorsal fin unnotched with 11 spines and 10 to 12 soft rays; anal fin with 3 spines and 9 or 10 soft rays. **Lateral-line scales 75 to 81.** Swimbladder bifurcate posteriorly. **Colour:** back greyish brown or greyish yellow, with moderately indistinct brown cross-bars; a black rectangular blotch present between lateral line and pectoral fin.

Size: Maximum to 20 cm; common to about 15 cm.

Habitat, biology, and fisheries: Lives over muddy and vegetated bottoms from the littoral zone to depths of about 200 m. Feeds on crustaceans and molluscs. Trawlable grounds off Morocco; of moderately small commercial importance. Separate statistics are not reported for this species. Caught with trammel nets, bottom trawls and pots. Marketed mostly fresh.

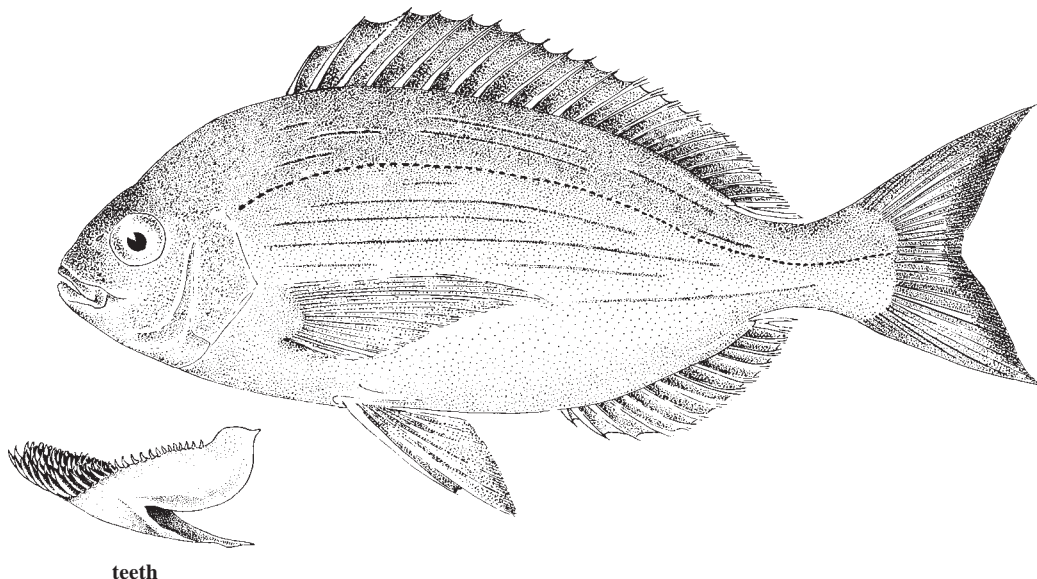
Distribution: In the area, from the Straits of Gibraltar to southern Morocco. Northward extending into the Mediterranean and in the eastern Atlantic to Portugal.



***Spondyliosoma cantharus* (Linnaeus, 1758)**

Frequent synonyms / misidentifications: *Cantharus cantharus* (Linnaeus, 1758) / None.

FAO names: En – Black seabream; Fr – Dorade grise; Sp – Chopa.



Diagnostic characters: Body oval, compressed. **Dorsal profile of head depressed above eyes;** snout short; suborbital space narrow; cheek scaly, preopercle scaleless; mouth oblique; **4 to 6 rows of pointed teeth in each jaw**, those in outer row largest, especially in front; gill rakers on lower limb of first arch 14 to 16 and 8 or 9 on upper limb. Dorsal fin with 11 spines and 11 to 13 soft rays; anal fin with 3 spines and 9 to 11 soft rays. Scales along lateral line 66 to 75. **Colour:** silvery grey with bluish, greenish or pinkish reflections; a whitish sheen in mature females; head darker, especially between the eyes and on snout; **more or less discontinuous, yellow golden longitudinal lines on sides;** vertical fins darker than body; fork of caudal fin usually edged with black; sometimes 5 or 6 grey cross-bars, especially in young, probably corresponding to a fright pattern.

Size: Maximum to 60 cm; common to 30 cm.

Habitat, biology, and fisheries: A demersal species inhabiting the continental shelf, especially on seagrass beds and rocky or sandy bottoms to about 300 m depth; the young are found in shallower water, to about 50 m depth. Gregarious, sometimes forming sizeable schools. Spawning takes place from March to May in the northern part of its range; the eggs are laid on sand. This species is believed to be a protogynic hermaphrodite (predominance of females over males in individuals at first maturity). Omnivorous, feeding on seaweeds and small invertebrates, especially crustaceans. Fished throughout its range, particularly to the north of Senegal. Caught on line gear, with pelagic and bottom trawls, beach seines and traps. Utilized fresh, frozen or dried-salted; also reduced to fishmeal and oil.

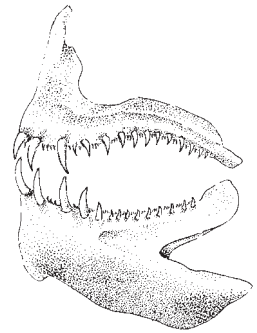
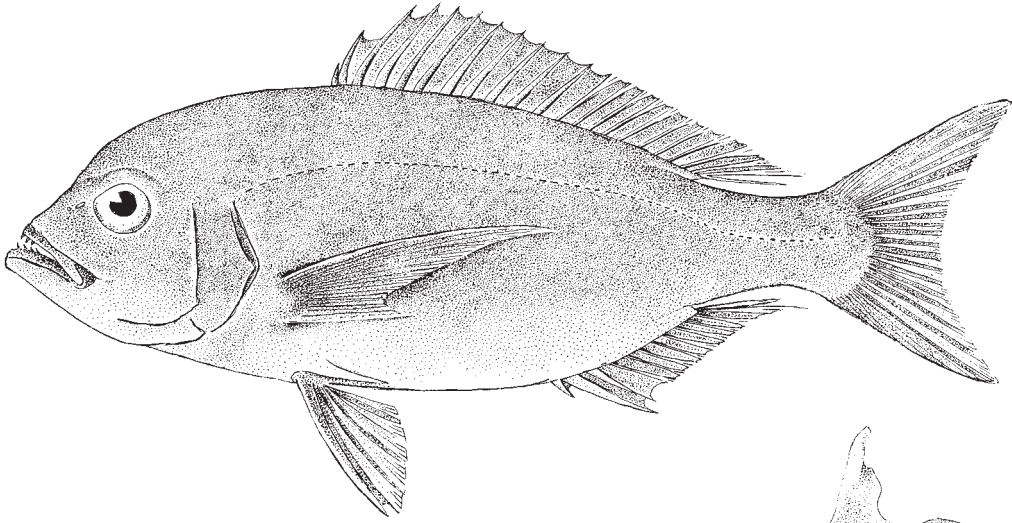
Distribution: From Gibraltar to Angola, including Madeira and the Canary and Cape Verde Islands. Also in the Mediterranean and northward to Scandinavia.



***Virididentex acromegalus* (Osório, 1911)**

Frequent synonyms / misidentifications: *Dentex acromegalus* Osório, 1911 / None.

FAO names: En – Bulldog dentex; Fr – Denté du Cap Vert; Sp – Sama bocona.



teeth

Diagnostic characters: Body oblong and compressed. Head profile convex at nape, depressed in front of eye; eye small, its diameter equal to width of suborbital space and clearly shorter than length of snout; scalation on top of head extending clearly beyond anterior margin of eyes but separated from eyes by an elongate depression; **scalation on sides of head (13 to 15 rows) not interrupted between cheek and preopercle**, but posterior margin of the latter naked; small scales on suborbital space; mouth slightly superior and oblique, the **lower jaw strong and projecting, chin prominent**; **all teeth canine-like**, arranged in several rows, the outer row (often the only 1 visible) much stronger than the others, the **6 to 8 anterior teeth long and sharply pointed**; gill rakers on lower limb of first arch 13 to 17, and 8 or 9 on upper limb. Dorsal fin with 11 spines, the fourth or fifth longest, and 11 soft rays, the last of which is elongate and thread-like; anal fin with 3 spines and 8 or 9 soft rays, the last one also long and thread-like; **pelvic fins with a broad, flattened spine** and a well developed axillary scale. Scales along lateral line 57 to 60. **Colour:** a uniform brownish with reddish, greenish or bluish reflections; belly lighter; fins reddish.

Size: Maximum to 45 cm; common to 30 cm.

Habitat, biology, and fisheries: A demersal species, inhabiting hard bottoms; fished between about 40 and 60 m depth. Carnivorous. Separate statistics are not reported for this species. Caught on line gear. Marketed fresh (flesh esteemed).

Distribution: Endemic of the Cape Verde Islands.

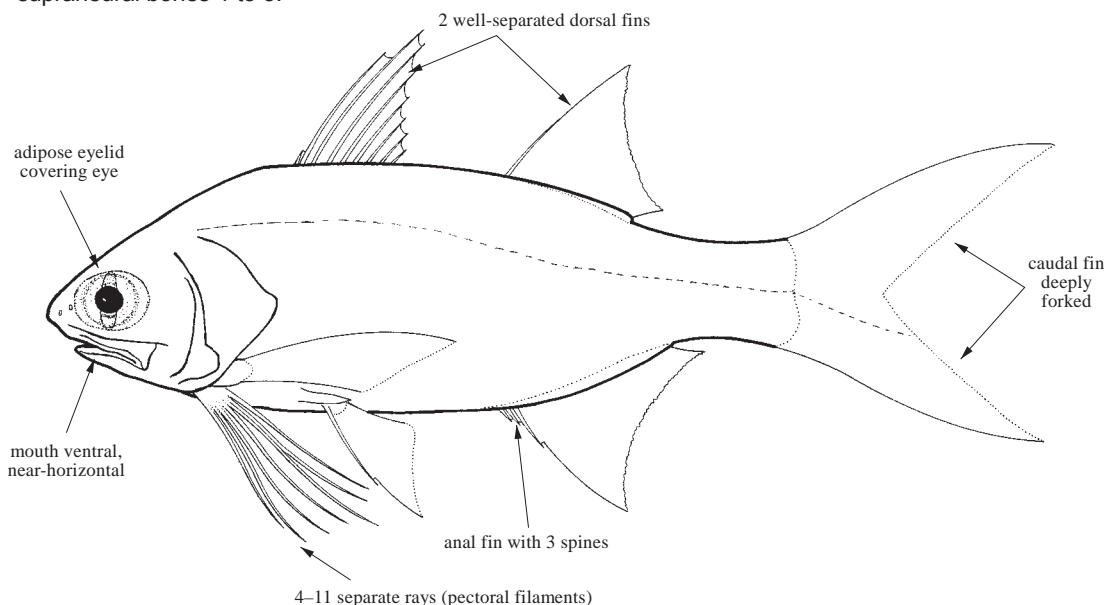


POLYNEMIDAE

Threadfins

by H. Motomura, Kagoshima University Museum, Kagoshima, Japan

D **Diagnostic characters** (for species in the ECA area): Body elongate to moderately deep, compressed. **Snout obtusely conical, overhanging. Adipose eyelid (firm transparent gelatinous tissue) covering eye;** 5 infraorbitals. **Mouth ventral, near-horizontal and large;** lip on upper jaw absent or poorly developed; maxilla extending beyond level of posterior margin of eye; supramaxilla absent; teeth villiform in broad bands on jaws, palatines and ectopterygoids; canine, molariform or incisiform teeth absent. Posterior margin of preopercle serrated (without serrations in *Pentanemus*); 7 branchiostegal rays, 1 ray present on epihyal. **Two well-separated dorsal fins;** first dorsal fin with 8 spines (first spine very small); second dorsal fin with 1 spine and 13 to 15 soft rays; **anal fin with 3 spines** and 10 to 30 soft rays (the last dorsal- and anal-fin soft rays usually split to their base but counted as a single ray); **pectoral fins divided into an upper part with 12 to 16 rays joined by membrane and a lower part with 4 to 11 separate rays (pectoral filaments);** pelvic fin with 1 spine and 5 soft rays; scaly process (axillary scale) present at base of pelvic fin; caudal fin deeply forked; small scales covering most of dorsal, pectoral, anal and caudal fins; trisegmental pterygiophores absent. Scales weakly ctenoid, extending onto head; lateral line simple, extending from upper end of gill opening to posterior margin of caudal-fin membrane. Vertebrae 10 precaudal and 14 caudal; supraneural bones 1 to 3.



Habitat, biology, and fisheries: Polynemids are epibenthic fishes occurring on sandy and muddy bottoms in coastal waters and estuaries, although juveniles are found in seagrass beds and tidepools. As major predators of coastal and estuarine ecosystems, most polynemids generally feed on a variety of fishes and crustaceans. The pectoral fins of polynemids are their most distinctive feature, being divided into an upper part with the rays joined by membrane and a lower part with 4 to 11 separate rays (for species in the eastern central Atlantic area). The pectoral filaments have been considered to be useful as a sense organ to search for food in muddy waters where vision may be limited due to turbid waters. Judging from the few species that have been studied, most polynemids exhibit protandry, their sex changing from male to female with fish growth. Information on the larval development of polynemids is minimal. Eggs are spherical and pelagic. Polynemids are of considerable importance in commercial fisheries in the eastern central Atlantic. The annual catch of polynemids from the area averaged about 39 000 tonnes in the period 2000–2006.

Remarks: Forty-three species in 8 genera of polynemids are currently recognized worldwide and 3 species in 3 genera of these occur in the eastern central Atlantic. The 3 species are endemic to the area.

Similar families occurring in the area

No other family has the following combination of characters: adipose eyelid covering eye; 2 well-separated dorsal fins; pectoral fins divided into an upper part with 12 to 16 rays joined by membrane and a lower part with 4 to 11 separate rays (pectoral filaments); anal fin with 3 spines.

Key to the species of Polynemidae occurring in the area

- 1a. Upper pectoral filaments extending well beyond level of posterior tips of caudal-fin lobes and shortest filament extending beyond at least level of anal-fin origin; posterior tip of pectoral fin extending beyond level of anal-fin origin; anal fin with 24 to 30 soft rays; posterior margin of preopercle not serrated (Fig. 1); tooth plates on palatines shorter than those on ectopterygoids ***Pentanemus quinquarius***
- 1b. Pectoral filaments not reaching level of anal-fin origin; posterior tip of pectoral fin not reaching level of anal-fin origin; anal fin with 10 or 11 soft rays; posterior margin of preopercle serrated; tooth plates on palatines longer than those on ectopterygoids → 2
- 2a. Pectoral filaments 9 to 11; pored lateral-line scales 45 to 50; lateral line extending to lower end of upper caudal-fin lobe (Fig. 2); vomerine teeth absent; supraneural bone 1 ***Galeoides decadactylus***
- 2b. Pectoral filaments 4; pored lateral-line scales 70 or 71; lateral line extending to upper end of lower caudal-fin lobe (Fig. 3); vomerine teeth present; supraneural bones 2 ***Polydactylus quadrifilis***

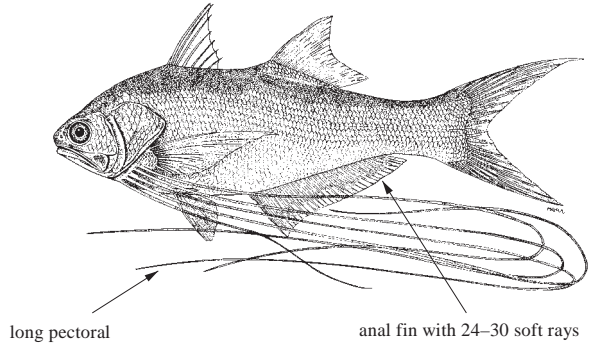


Fig. 1 *Pentanemus quinquarius*

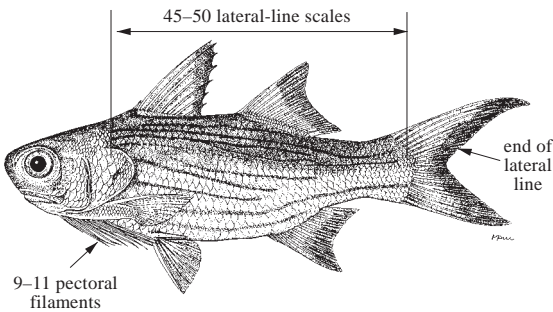


Fig. 2 *Galeoides decadactylus*

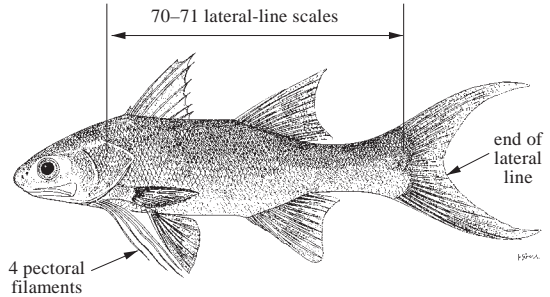






Fig. 3 *Polydactylus quadrifilis*

List of species occurring in the area

The symbol  is given when species accounts are included.

-  *Galeoides decadactylus* (Bloch, 1795).
-  *Pentanemus quinquarius* (Linnaeus, 1758).
-  *Polydactylus quadrifilis* (Cuvier, 1829).

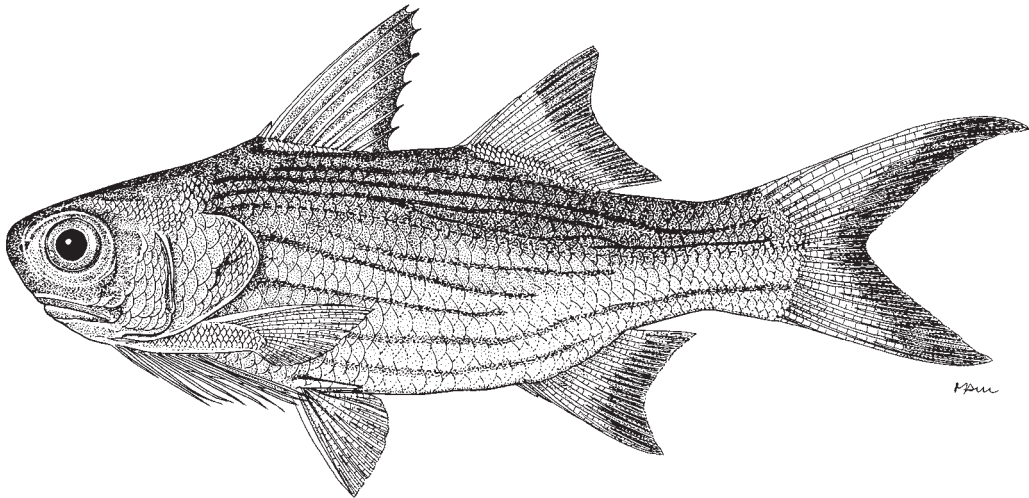
References

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***Galeoides decadactylus* (Bloch, 1795)**

Frequent synonyms / misidentifications: *Polynemus polydactylus* Vahl, 1798; *P. enneadactylus* Cuvier, 1829; *P. astrolabi* Sauvage, 1881 / None.

FAO names: **En** – Lesser African threadfin; **Fr** – Petit capitaine; **Sp** – Barbudo enero africano.



Diagnostic characters: A medium-sized species. Body moderately deep, body depth at first dorsal-fin origin 29 to 35% (mean 32%) of standard length; head length 31 to 36% (mean 33%) of standard length. Adipose eyelid well developed; eye diameter greater than snout length. Lip on lower jaw well developed, dentary teeth restricted to dorsal surface; width of tooth band on upper and lower jaws greater than space (on symphysis) separating tooth bands on opposing premaxillae; teeth villiform in broad bands on jaws, palatines and ectopterygoids, **tooth plates on palatines longer than those on ectopterygoids**; tooth plates on ectopterygoids conspicuously small; **vomerine tooth plate covered with skin and teeth absent**. Posterior margin of maxilla reaching to (or just short of) level of posterior margin of adipose eyelid; upper-jaw length 12 to 14% (mean 13%) of standard length; maxillary scales absent. **Posterior margin of preopercle serrated**. Basisphenoid in contact with prootic; sphenotics not visible dorsally between anterior margins of parietal and pterotic. First dorsal fin with 8 spines; second dorsal fin with 1 spine and 13 or 14 (mode 13) soft rays; **anal fin with 3 spines and 10 or 11 (mode 11) soft rays, anal-fin base less than second dorsal-fin base**; pectoral fin with 12 to 15 (mode 15) unbranched rays, its length 21 to 25% (mean 23%) of standard length, posterior tip just short of level of posterior tip of pelvic fin; pectoral-fin insertion well below midline of body; pectoral-fin base (including base of pectoral filaments) greater than or equal to upper-jaw length; **pectoral filaments 9 to 11 (mode 9)**; first filament shortest, not reaching to level of pelvic-fin origin; uppermost filament longest, its length 21 to 33% (mean 27%) of standard length, reaching to or extending beyond level of pelvic-fin origin; caudal fin deeply forked, upper and lower caudal-fin lobes not filamentous, upper caudal-fin lobe 31 to 43% (mean 38%) and lower caudal-fin lobe 33 to 36% (mean 34%) of standard length. **Pored lateral-line scales 45 to 50 (mode 46); lateral line simple, extending from upper end of gill opening to lower end of upper caudal-fin lobe**; scale rows above lateral line 5 or 6 (mode 5), below 7 to 9 (mode 8). Gill rakers 9 to 14 on upper limb, 15 to 23 on lower limb, 24 to 36 total; gill rakers decreasing with fish growth. Vertebrae 10 precaudal and 14 caudal; **supraneural bone 1**. Swimbladder simple, extending beyond anal-fin origin. **Colour:** upper sides of head and trunk with brown tinge, becoming silver on lower sides; posterior margins of first, second dorsal, and caudal fins dense black, remaining parts blackish; pelvic and anal fin white; pectoral fin mostly black; base of pectoral filaments white, becoming blackish on posterior tips; **a black spot, its diameter approximately equal to eye diameter, present below anterior part of lateral line; several brown stripes along longitudinal scale rows above and below lateral line** (disappeared in preserved specimens).

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

Habitat, biology, and fisheries: Usually taken on muddy bottoms in shallow coastal waters from depths of 10 to 70 m, and frequently found in estuaries and lagoons. Generally feeds on crustaceans and small fishes; detritus amounted to about 30% of food contained in the stomachs of the estuarine specimens (versus 0% in open sea specimens). About 25% of females developed directly from the juvenile stages, the others developing female gonads after passing through a non-functional hermaphroditic stage arising in apparently normal males. Spawning of the species occurs in all months, peaking in the dry season, but almost ceasing during the rainy season in Nigerian waters. Lengths ranged from 150 mm total length for males to 255 mm for secondary females, the species growing rapidly during the first year. At 1 year, the species averages 207 mm total length, 317 mm at 2 years and 390 mm at 3 years. The species is an important component in the commercial trawl fishery, constituting between 10 and 20% of the total landings by weight. The annual catch from the area averaged 15 600 tonnes in the period 2000–2006, mainly caught by Nigeria, Ghana, Senegal and Gabon.

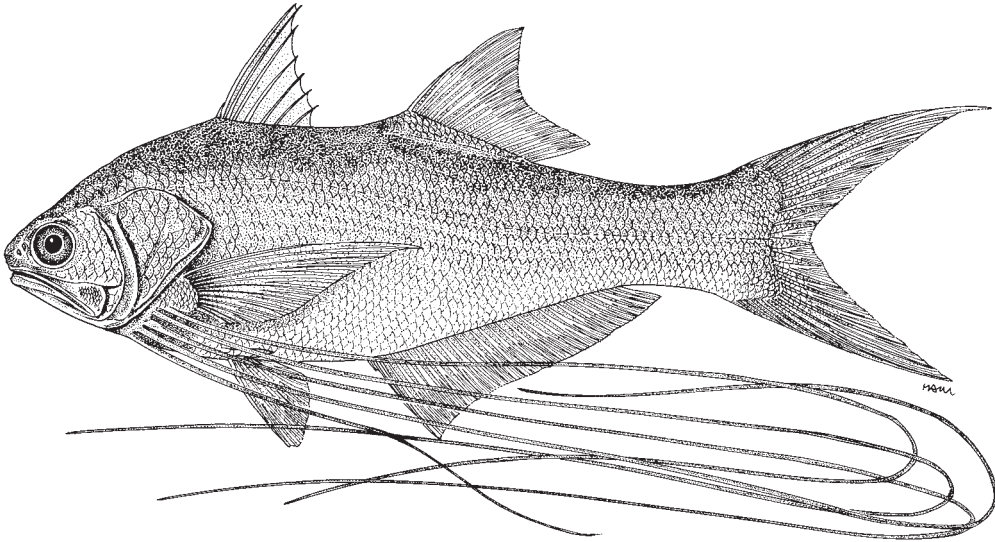
Distribution: Generally distributed from Morocco to Angola, west coast of Africa; also rarely occurs in Algeria, northern Africa and Namibia, southern Africa.



***Pentanemus quinquarius* (Linnaeus, 1758)**

Frequent synonyms / misidentifications: *Polynemus artedii* Bennett, 1831; *P. macronemus* Pel, 1851 / None.

FAO names: En – Royal threadfin; Fr – Capitaine royal; Sp – Barbudo real.



Diagnostic characters: A medium-sized species. Body depth at first dorsal-fin origin 26 to 33% (mean 30%) of standard length; head length 27 to 31% (mean 30%) of standard length. Adipose eyelid developed; eye diameter greater than snout length. Lip on lower jaw well developed, dentary teeth restricted to dorsal surface; width of tooth band on upper and lower jaws narrower than space (on symphysis) separating tooth bands on opposing premaxillae; teeth villiform in broad bands on jaws, palatines and ectopterygoids, **tooth plates on palatines shorter than those on ectopterygoids**; tooth plates on palatines conspicuously small; **vomerine tooth plate covered with skin and teeth absent**. Posterior margin of maxilla extending beyond level of posterior margin of adipose eyelid; upper-jaw length 14 to 15% (mean 14%) of standard length; maxillary scales absent. **Posterior margin of preopercle not serrated**. Basisphenoid in contact with prootic; sphenotics not visible dorsally between anterior margins of parietal and pterotic. First dorsal fin with 8 spines; second dorsal fin with 1 spine and 14 or 15 (mode 15) soft rays; **anal fin with 3 spines and 24 to 30 (mode 28) soft rays, anal-fin base longer than second dorsal-fin base**; pectoral fin with 14 to 16 (mode 15) unbranched rays, its length 30 to 42% (mean 36%) of standard length, posterior tip reaching to or just short of level of midpoint of anal-fin base; pectoral-fin insertion well below midline of body; pectoral-fin base (including base of pectoral filaments) less than upper-jaw length; **pectoral filaments 5**; first filament shortest, just reaching to or extending beyond level of anal-fin origin; second to fifth pectoral filaments extending well beyond level of posterior tips of caudal-fin lobes; third pectoral filament longest, its length 242 to 296% (mean 266%) of standard length; caudal fin deeply forked, upper and lower caudal-fin lobes not filamentous, upper caudal-fin lobe 36 to 46% (mean 42%) and lower caudal-fin lobe 38 to 47% (mean 43%) of standard length. **Pored lateral-line scales 68 to 76 (mode 72); lateral line simple, extending from upper end of gill opening to mid-distal margin of caudal-fin membrane**; scale rows above lateral line 8 or 9 (mode 9), below 15 or 16 (mode 16). Gill rakers 18 to 23 on upper limb, 28 to 32 on lower limb, 47 to 53 total. Vertebrae 10 precaudal and 14 caudal; **supraneural bones 3**. Swimbladder present, well developed. **Colour:** upper sides of head and trunk with golden tinge, becoming silver on lower sides; margins of first, second dorsal, and caudal fins black, remaining parts blackish; pelvic and anal fin white; pectoral fin yellow with melanophores; base of pectoral filaments white, becoming blackish on posterior tips.

Size: Maximum total length 35 cm, common to 25 cm.

Habitat, biology, and fisheries: Generally taken on muddy bottoms in shallow coastal waters from depths of 10 to 70 m, and frequently found in estuaries and lagoons. Generally feeds on crustaceans and small fishes. The species has a normal bisexual reproductive cycle, the sex composition being: males about 45%, hermaphrodites less than 0.01% and females about 55%. Spawning of the species occurs in all months, peaking in the dry season and almost ceasing during the rainy season in Nigerian waters. The species reaches sexual maturity at less than 6 months of age (about 150 mm total length). At 3 months, the species averages 100 mm total length, 175 mm at 6 months and about 250 mm at 1 year. The species is one of the most important fisheries species off the west coast of Africa, being caught mainly by trawl, but sometimes by gillnet and beach seine. The annual catch from the area averaged 2 200 tonnes in the period 2000–2006.

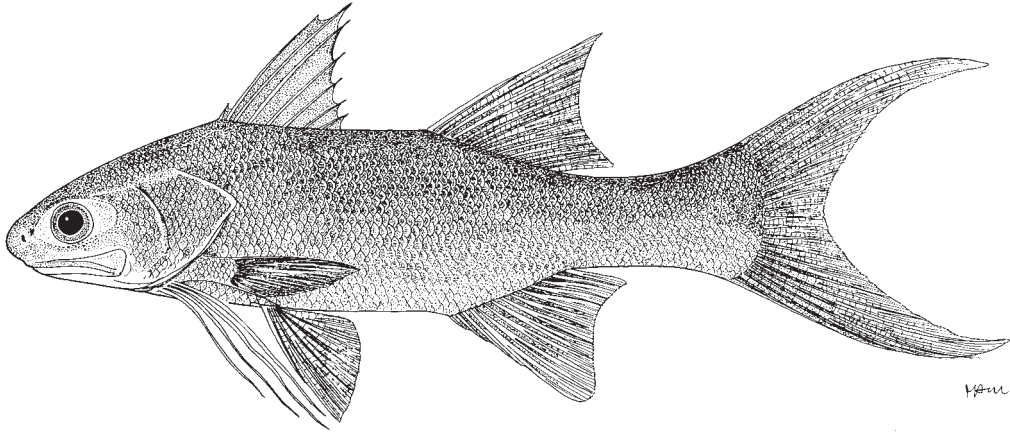
Distribution: West coast of Africa from Senegal to Angola.



***Polydactylus quadrifilis* (Cuvier, 1829)**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Giant African threadfin; Fr – Gros capitaine; Sp – Barbudo gigante africano.



Diagnostic characters: A large species. Body depth at first dorsal-fin origin 24 to 27% (mean 25%) of standard length; head length 30 to 34% (mean 32%) of standard length. Snout pointed; occipital profile nearly straight. Posterior margin of maxilla not reaching to or just reaching to level of posterior margin of adipose eyelid; upper-jaw length 13 to 14% (mean 14%) of standard length; depth of posterior margin of maxilla less than eye diameter; lip on lower jaw well-developed, dentary teeth restricted to dorsal surface; **teeth villiform in broad bands on vomer, palatines and ectopterygoids. Posterior margin of preopercle serrated.** First dorsal fin with 8 spines, second spine more robust than others; second dorsal fin with 1 spine and 13 soft rays; **anal fin with 3 spines and 11 soft rays, anal-fin base approximately equal to second dorsal-fin base;** pectoral fin with 12 or 13 (mode 13) rays (all rays unbranched), its length 20 to 24% (mean 22%) of standard length, posterior tip not reaching to level of posterior tip of pelvic fin; **pectoral filaments 4;** first (shortest) to third pectoral filaments, extending beyond level of pelvic-fin origin, but not reaching to level of posterior tip of pelvic fin; fourth pectoral filament longest, its length 27 to 39% (mean 33%) of standard length, just short of or extending slightly beyond level of posterior tip of pelvic fin; caudal fin deeply forked, upper and lower caudal-fin lobes not filamentous, upper caudal-fin lobe 34 to 41% (mean 38%) and lower lobe 33 to 40% (mean 37%) of standard length. **Pored lateral-line scales 70 or 71 (mode 70); lateral line simple, extending from upper end of gill opening to upper end of lower caudal-fin lobe;** scale rows above lateral line 8 or 9 (mode 9), below 11 to 13 (mode 11). Gill rakers 8 or 9 (mode 9) on upper limb, 12 to 14 (mode 14) on lower limb, 21 to 23 (mode 23) total. Vertebrae 10 precaudal and 14 caudal; **supraneural bones 2.** Swimbladder present, well developed. **Colour:** head and upper sides of trunk tinged slightly blackish silver, becoming lighter silver on lower sides; abdominal region white; snout semi-transparent; first and second dorsal fins and caudal fin pale with blackish posterior margins; pectoral fin vivid yellow; pectoral filaments white; anterior margins and origins of pelvic and anal fins white, other parts dusky.

Size: Maximum total length 2 m, common to 1.5 m.

Habitat, biology, and fisheries: Occurs on sandy and muddy bottoms in shallow waters (less than 55 m), sometimes also in brackish waters. Feeds mainly on crabs and fishes. The species is one of the most important fishery (mainly caught by trawl, gillnet and beach seine) and sport species on the west coast of Africa. The annual catch from the area averaged 18 000 tonnes in the period 2000–2006, with Nigeria catching 125 000 tonnes.

Distribution: West coast of Africa from Senegal to Congo.

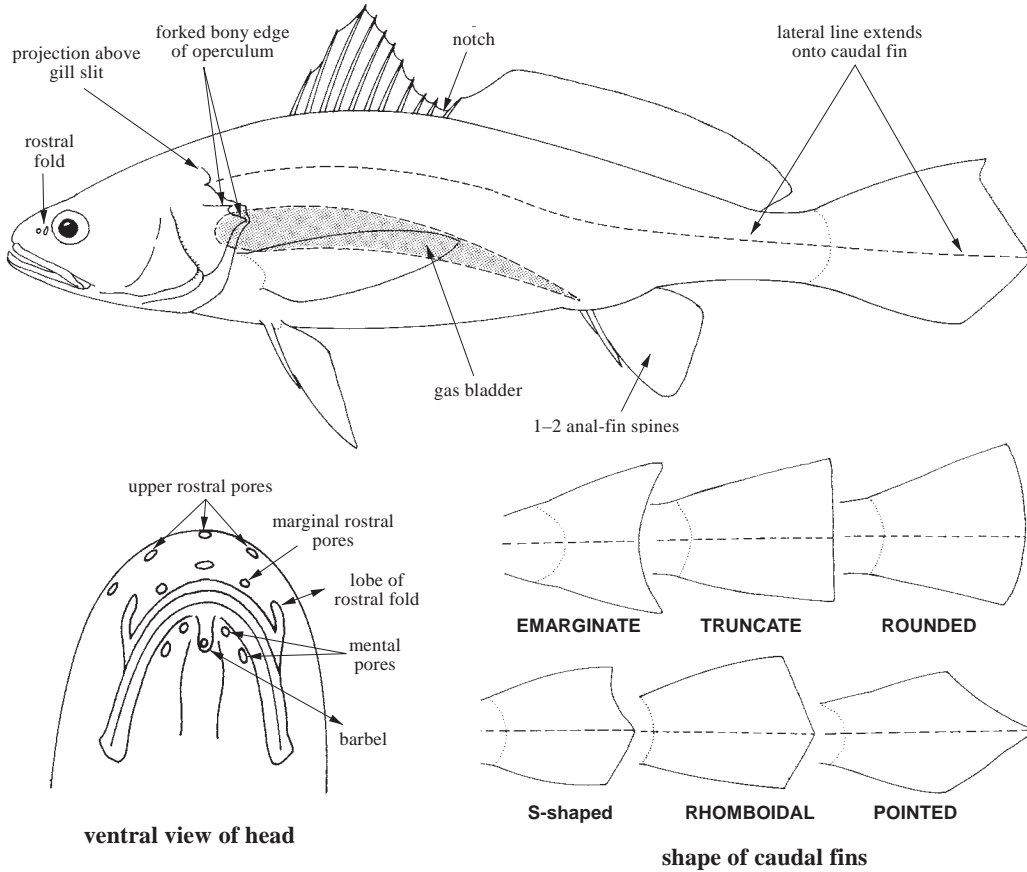


SCIAENIDAE

Croakers (drums)

by N.L. Chao, Global Sciaenidae Conservation Network (NMMBA, Checheng)

Diagnostic characters: Small to large (20 to 200 cm), most with fairly elongate and compressed body completely scaled, except at the tip of snout, few with moderately high body (*Sciaena*, *Umbrina*). **Head short to medium-sized, usually with bony ridges on top of skull, cavernous canals visible externally in some** (*Pteroscion peli*). Eye size variable, its diameter 3.5 to 9 times in head length. Mouth position and size variable, from large, oblique with lower jaw projecting (*Atractoscion*) to moderately small, near horizontal and inferior (*Sciaena*) or with a barbel (*Umbrina*). **Sensory pores present at tip of snout (rostral or upper pores 3 to 5, absent in some) and on lower margin of snout (marginal pores 5), which is often divided into lobes below the marginal pores. Tip of lower jaw (chin) with 4 to 6 mental pores; one genus (*Umbrina*) has a single, short and rigid barbel perforated with a pore at its tip.** Teeth small, villiform (*Sciaena*, *Umbrina*), or sharp, conical (*Atractoscion*), set in bands or ridges on jaws; many with outer row teeth of upper jaw and inner row teeth of lower jaw slightly enlarged (*Argyrosomus*, *Pseudotolithus*); a pair of larger canine-like teeth also found at the tip of upper jaw (species of *Pseudotolithus*); **roof of mouth toothless.** Gill cover fully scaled, preopercular margin smooth or serrated, some with sharp spines at the angle. **Dorsal fin long, continuous with a deep notch between spinous (anterior) and soft (posterior) portions.** Spinous dorsal fin with 9 to 11 spines (mostly 10), soft portion with 1 spine at its origin and 22 to 39 soft rays; **anal fin with 2 spines**, 6 to 9 soft rays; pectoral fins short and rounded to long and pointed, with 15 to 19 long rays (1 to 3 unbranched short rays at the base of upper margin). **Caudal fin often pointed in juveniles, becoming emarginated, truncate to rhomboidal, or S-shaped** (upper lobe slightly concaved and lower lobe rounded) in adults. Scales ctenoid (edge denticulate, sandy to touch, *Umbrina*) or cycloid (edge flat, smooth to touch, subgenus of *Pseudotolithus*, *Hostia*) cover entire body, except tip of snout where scales often absent or partially embedded under skin. Cycloid scales may cover entire fish (*Hostia*) or on head and breast of otherwise mainly ctenoid scaled fishes. **A single continuous lateral line extending from upper corner of gill cover to the tip or end margin of caudal fin; pored lateral-line scales often covered with intercalated small scales**, which often make the lateral line appear somewhat thicker or difficult to distinguish individual pored scales; often the lateral-line pored scale counts are inconsistent and not diagnostic for species identification. The base of soft dorsal and anal fins often with a scaly sheath formed by 1 to 3 rows of small scales, which may also continue onto membranes between the soft rays. Caudal fin usually covered with small scales at base, on membranes between soft rays and between pores on lateral-line scales. Total number of vertebrae usually 25; ventral side of the first few vertebrae often slightly expanded laterally, where gas bladder firmly attached. A well-developed gas bladder present in all croakers in the area, consisting of a carrot-shaped main chamber or with a series of variably developed appendages (or diverticula) sprouting out from the front end or along the sides of main chamber. A pair of large earstones (sagittae) found inside skull. **Colour:** variable from yellowish silver to greyish dark, back often with dark spots along oblique scale rows forming wavy stripes, become horizontal or faded ventrally; distal portions of all fins tend to be darker, black tipped or edged; pelvic, anal and lower edge of caudal fins from pale to jet black, often yellowish among adults during spawning season; a dark blotch often present at pectoral-fin bases; inside of mouth and gill cavity often dusky to jet black, showing through opercle bones externally as a diffuse dark blotch.



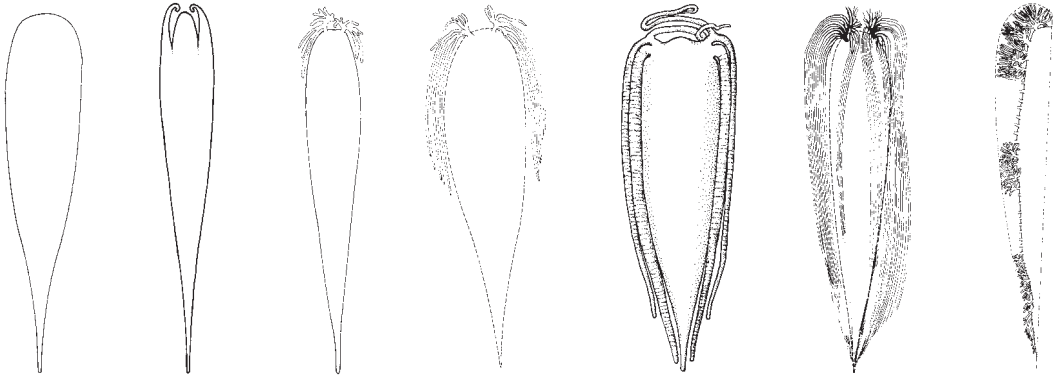
Habitat, biology, and fisheries: Croakers are primarily coastal marine and estuarine fishes; no species is confined to freshwater rivers of Africa. While the large majority live over sandy or muddy bottoms near river run-offs and along shoreline to 50 m depth: few species are found in deeper water (*Miracorvina* and *Pteroscion* to 350 m) and others have adapted to midwater (*Pteroscion peli*); special habitats such as rocky shore or reefs (*Umbrina ronchus*) and coastal lagoons (*Pseudotolithus senegallus*). Many croakers use estuarine environments seasonally as nursery grounds during their juvenile phase (young-of-the-year) and as feeding grounds during young adult phase, others are year-round inhabitants of estuaries and coastal lagoons. Croakers are mostly demersal fishes, usually randomly scattered or in small patches, sometimes forming larger aggregations during spawning and feeding migrations. Seasonally, some species migrate to certain limited geographic areas in large quantities, and move into estuaries or along shorelines; hence local artisanal and subsistence fisheries also exploit them. Croakers often represent a major component of near-shore bottom trawl catches and bycatches (in the Gulf of Guinea, croakers are reported to account for more than 30% of the total demersal landings, and catch rates are also high on trawling grounds off Angola). Actual landings are probably much higher since available statistics only cover a few species and most species are lumped together with other fishes. They are taken also with other types of gear, especially gillnets, pound nets and artisan beach haul seines; medium to large sized surf-living species are also caught by anglers. Most croakers are valuable foodfish, especially the larger species. Gas bladders of croaker are used to produce isinglass for industrial use and as an esteemed oriental delicacy. Over fishing (including bycatch) and changing coastal environmental conditions have reduced many local stocks, especially the large species (e.g. *Argyrosomus regius* and *Pseudotolithus senegallus*).

Similar families occurring in the area

All other perch-like fishes in the area have the following combination of characters: lateral line not extending to the end of caudal fin (except that of polynemids) and anal fin with 3 spines (2 in sciaenids).

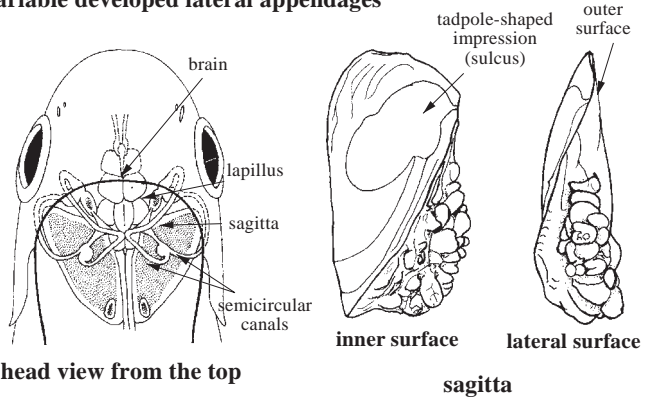
Identification note: Anatomic characters of gas bladders and ear stones (sagittal otoliths) are particularly helpful in the identification of genera and species in this family.

Gas bladder is located between the viscera and the backbone (vertebral column). It is well developed, but consists of a single chamber in all East Atlantic sciaenids. The organ is a carrot-shaped gas chamber (primitive condition in *Sciaena* and *Umbrina*) and some have developed anterior and lateral appendages (or diverticula) from the main chamber (derived conditions), which are also useful in identifying species. Gas bladder is readily exposed after gutting the fish in some genera (i.e. *Argyrosomus*, *Atractoscion*, *Miracorvina*, *Pteroscion* and *Pseudotolithus*). It becomes necessary to also remove organs further ahead, in order to examine the anterior appendages.



gas bladders with variable developed lateral appendages

Otoliths (earstones) are located in the ear capsules below the soft brain tissues toward ventral side of the cranium (see figures); croakers always have a large pair of sagitta ear stones, while the other 2 pairs (lapillus and asteriscus) are rudimentary in all East Atlantic species. The sagitta bears a tadpole-shaped impression with a shallow head (sulcus) and a deeply grooved and often hooked or J-shaped tail (cauda). The overall shape and thickness of the sagitta are characteristic for each genus, and the profile of the tadpole impression can also aid species identification.



To examine the otoliths it is necessary to remove them from the ear capsules by the following methods: (1) from the upper end of gill arches, remove the cover skin and tissue, and cut off ventral lateral floor of the skull; (2) cut head open from the top above preopercular margin (holding knife perpendicular on top of head at an angle of 45°) to remove the roof of skull and extract otoliths with a pair of forceps from ear capsules below the brain tissues on ventral-lateral sides of the cranium. After the roof of cranium has been removed, a pair of large sagitta otoliths (stippled) are located in the ear capsules under the brain tissue. All sciaenids have large otoliths.

Key to genera, subgenera and species occurring in the area

- 1a. Tip of chin with a short rigid barbel perforated by a pore at its tip (Fig. 1) *Umbrina*
- 1b. Chin without barbel → 2

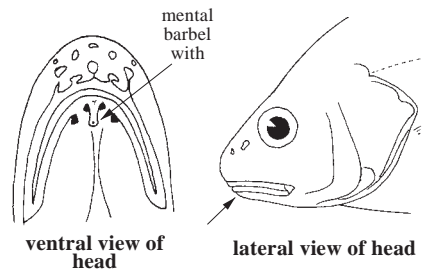


Fig. 1 *Umbrina*

Fig. 2 *Sciaena*

- 2a. Mouth moderately small, inferior and near horizontal; lower jaw never projecting beyond upper jaw (Figs 2 to 5); teeth villiform, set in bands with 1 or 2 rows slightly enlarged teeth on jaws; pectoral, pelvic and anal fins jet black → 3
- 2b. Mouth large, oblique, terminal or with lower jaw projecting (Figs 7 and 8); teeth conical, set in narrow bands or ridges on jaws, often with 1 or more rows of distinctly larger teeth, some canine-like on tip of upper jaw (Fig. 8); fins dusky → 5
- 3a. Back smoothly arched, snout blunt and rounded, body elongated, somewhat rounded in cross-section, tapering to a long caudal fin (Fig. 3); eye small, more than 7 times in head length; spinous dorsal fin with 7 or 8 spines; scales cycloid ***Pseudotolithus (Hostia) moorii***
(West Africa coast at least from Gambia to Angola)
- 3b. Back strongly arched, snout conical, body oblong, compressed, caudal fin truncate or S-shaped, but never long and pointed (Figs 4 and 5); eye moderately large, less than 5.5 times in head length, spinous dorsal fin with 9 or more spines; scales ctenoid → 4

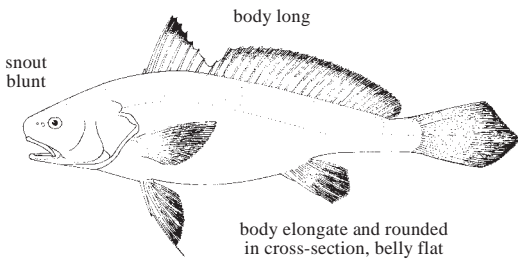


Fig. 3 *Pseudotolithus (Hostia) moorii*

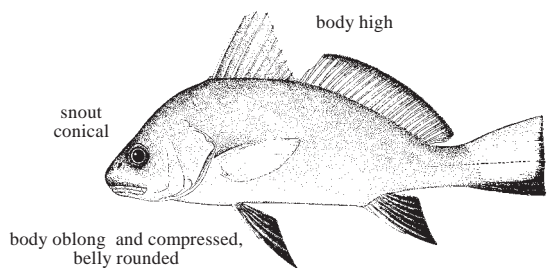


Fig. 4 *Sciaena umbra*

- 4a. Spinous dorsal fin high with 10 to 12 spines, tip of longest spine reaching beyond first ray of soft dorsal fin (Fig. 4), soft dorsal fin short with 23 to 25 rays; gas bladder carrot-shaped without lateral appendages (Fig. 6a) ***Sciaena umbra***
(from British Channel to Mauritania, Canary Islands, throughout Mediterranean and Black Sea)
- 4b. Spinous dorsal fin low with 9 spines, tip of longest spine falling short of first soft ray (Fig. 5); soft dorsal fin long with 35 to 39 rays; gas bladder with dozens of tubular appendages, extending from the front of gas bladder along sides of main chamber to beyond its tip (Fig. 6b) ***Pseudotolithus (Pinnacorvina) epipercus***
(West Africa coast at least from Guinea to Angola)

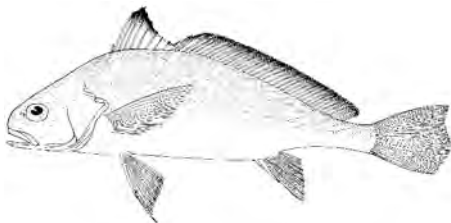


Fig. 5 *Pseudotolithus (Pinnacorvina) epipercus*

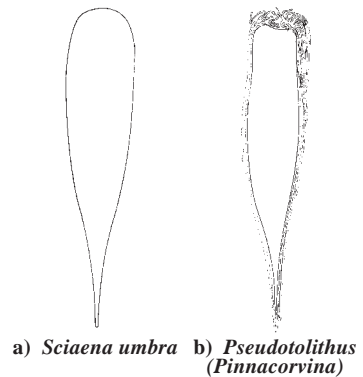
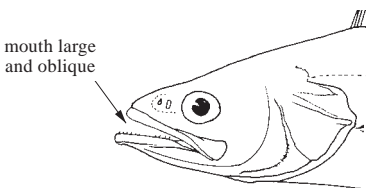
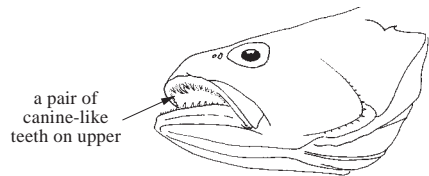


Fig. 6 gas bladders

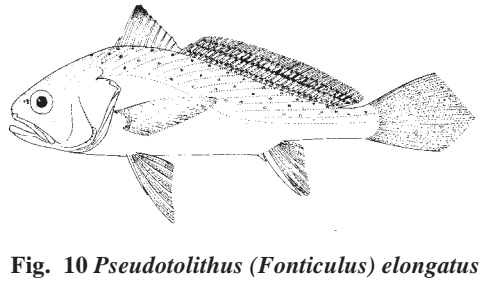
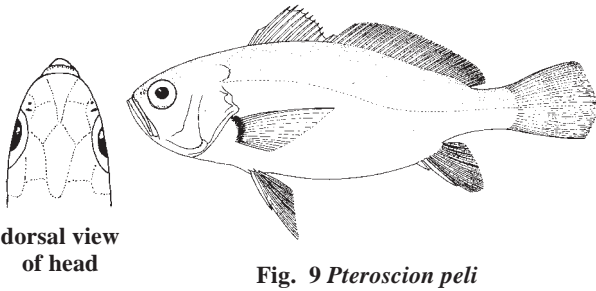


lateral view of head
Fig. 7 *Atractoscion*



lateral view of head
Fig. 8 *Pseudotolithus*

- 5a. Body short and robust, its depth less than 3.5 times of total length (Fig. 9); top of head cavernous, spongy to touch; mouth strongly oblique, pointed upward exceeding 45° angle; gill rakers longer than gill filaments at the angle (Fig. 11a), 23 or more on first gill arch; gas bladder with a pair of short arborescent appendages anterolaterally (Fig. 12b) . . . ***Pteroscion peli***
(West African coast from Senegal to South Africa)
- 5b. Body fusiform to elongate, its depth more than 4 times of total length (Fig. 10); top of head cavernous but firm to touch; mouth slightly oblique or pointed upward, but with less than 30° angle; gill rakers shorter than filaments (Fig. 11b), 22 or less total gill rakers on first gill arch; gas bladder with variable number of long tubular or arborescent appendages (Fig. 12) → 6



- 6a. Caudal fin emarginated (Fig. 13a); gill rakers short, rudimentary; gas bladder with a pair of anterior horn-like appendages (Fig. 12a); teeth sharp set in broad bands 4 to 6 rows on tip of jaws ***Atractoscion aequidens***

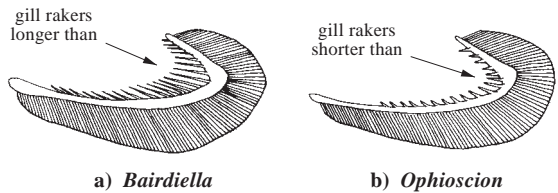


Fig. 11 first gill arch

- 6b. Caudal fin S-shaped, rhomboidal to pointed (Fig. 13b–d); gill rakers slender; gas bladder either with few to numerous long tubular appendages or dozens of arborescent diverticula (Fig. 12 b–g); 2 or 3 rows of teeth on tip of jaws → 7

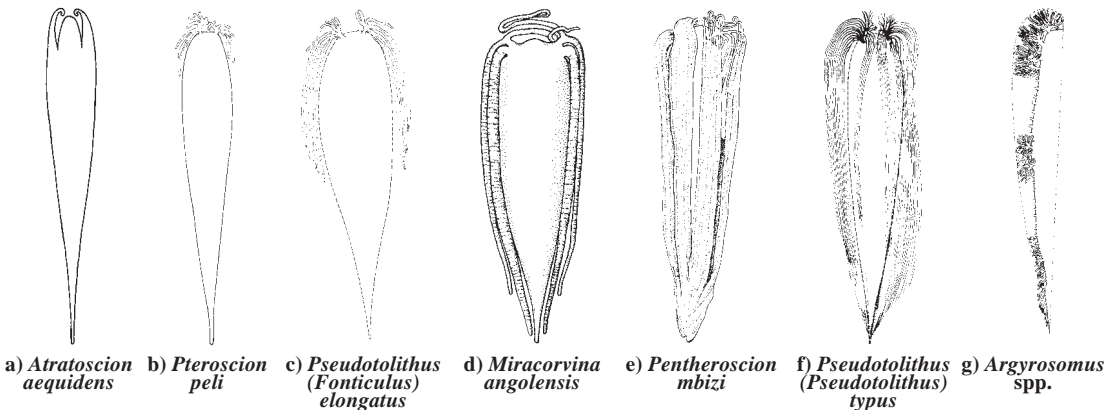


Fig. 12 gas bladders

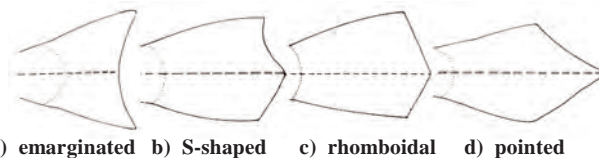


Fig. 13 caudal-fin shapes

- 7a. Eye large, less than 3.5 times in head length, greater than snout length (Fig. 14a); roof of mouth and inside of gill cover entirely jet black (Fig. 15a) → 8
- 7b. Eye small to medium, more than 4 times in head length; equal or less than snout length (Fig. 14b); roof of mouth pale to yellowish; inside of gill cover dusky or partially black (Fig. 15b) → 9

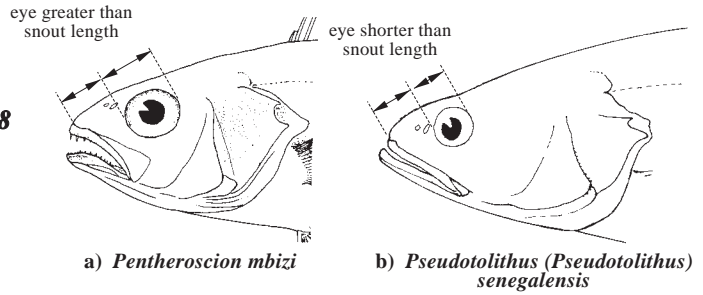


Fig. 14

- 8a. Anal fin with 7 soft rays, second anal spine short but stout (Fig. 16b); gas bladder with a pair of thin tubular branches coiled anteriorly, 2 pairs of thick and long posterior appendages running along side of gas chamber (Fig. 12d)

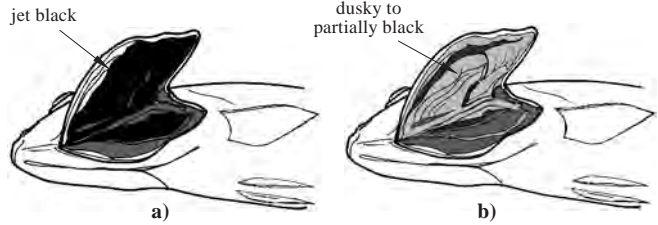


Fig. 15 opercle lining

. *Miracorvina angolensis*

(West African coast at least from Gabon to Angola)

- 8b. Anal fin with 9 soft rays, second anal spine short and thin (Fig. 16c); gas bladder with a pair of anterior arborescent diverticula, each divided into several long tubular branches extend posteriorly, often embedded in fat tissues that encapsulated the tip of gas bladder (Fig. 12e) *Pentheroscion mbizi*
(West African coast at least from Ghana to Angola)

- 9a. Anal fin with 6 soft rays; second anal-fin spine very strong, about the length of first ray (Fig. 16a), or less than 2 times in head length; gas bladder with a pair of arborescent appendages with short to medium long tubular branches, longest one reaching to middle of gas bladder (Fig. 12c). *Pseudotolithus (Fonticulus) elongatus*
(West African coast at least from Senegal to Angola)

- 9b. Anal fin with 7 or more soft rays; second anal-fin spine weaker, less than two-thirds of first soft ray height (Fig. 16 b, c) or more than 3 times in head length, soft anal ray 7 or more; gas bladder with few to numerous long tubular appendages (Fig. 12c-f) or dozens of small arborescent diverticula along sides of gas chamber (Fig. 12g) → 10

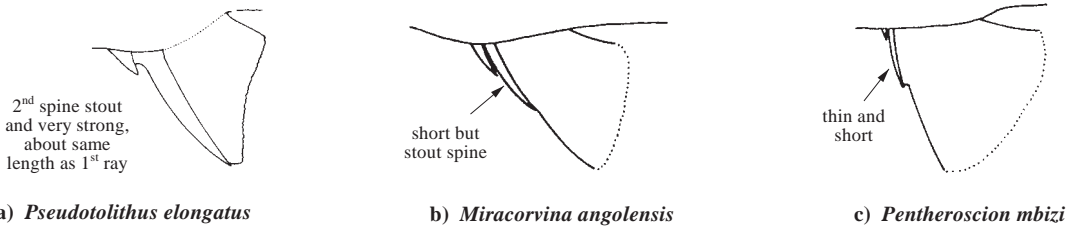


Fig. 16 relative size and length of second anal spine compared to first soft ray height

- 10a. Three to 5 pores present on tip of snout (Fig. 17); gill rakers equal to or shorter than filaments at angle of gill arch (Fig. 11a); gas bladder with 25 to 42 small arborescent appendages along the side of bladder (Fig. 12g) **Argyrosomus**
- 10b. No upper pores on tip of snout (Fig. 17); gill rakers equal to or longer than filaments at angle of gill arch (Fig. 11a); gas bladder with a pair of anterior appendages, each divided into numerous long and thin tubular branches running along the bladder (Fig. 12f) **Pseudotolithus (Pseudotolithus)**

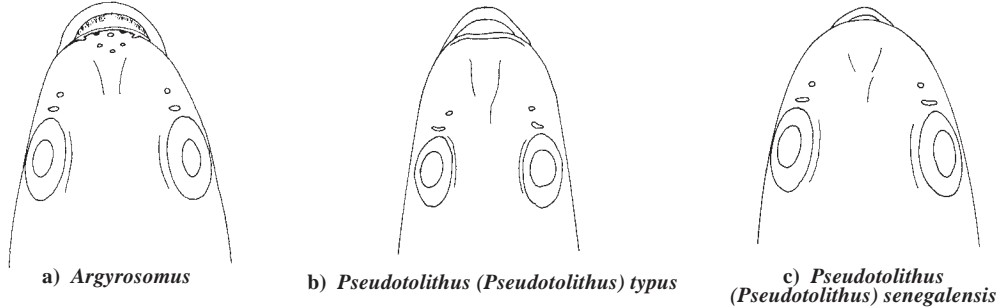


Fig. 17 eye diameter and interorbital width

Key to the species of *Argyrosomus* occurring in the area

- 1a. Eye diameter greater than or equal to interorbital width, 4.5 to 5.5 times in head length; gas bladder with 25 to 35 arborescent appendages along sides of bladder . **Argyrosomus hololepidotus** (West African coast from Ghana to South Africa, also to eastern Australia)
- 1b. Eye diameter smaller than interorbital width (Fig. 16b), 5.7 to 6.9 times in head length; gas bladder with 36 to 42 arborescent appendages along sides of bladder **Argyrosomus regius** (from British Isles to Congo, also throughout Mediterranean and Black Sea)

Key to the species of *Pseudotolithus (Pseudotolithus)* occurring in the area

- 1a. Body rather long and rounded in cross-section; head conical, nape slightly concaved (Fig. 18a); eye small, 8 to 9 times in head length; spinous dorsal fin with 9 spines **Pseudotolithus (Pseudotolithus) typus** (West African coast at least from Morocco to Angola)
- 1b. Body moderately elongate and compressed, never rounded; head and nape evenly arched (Fig. 18b–c); eye medium sized, 4 to 6.5 times in head length; spinous dorsal fin with 10 spines → 2

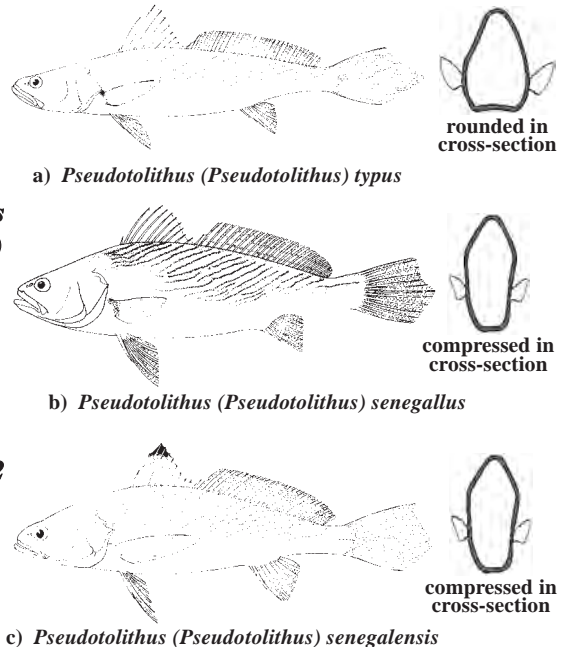


Fig. 18

- 2a. Pectoral fins short, 18 to 20% of standard length, its tip extends short of pelvic fin (Fig. 18b); dorsal fin with 25 to 27 soft rays, its membrane speckled with 2 rows of dark spots ***Pseudotolithus (Pseudotolithus) senegallus***
(from Senegal southward at least to Angola)
- 2b. Pectoral fins moderately long, 25 to 28% of standard length, its tip extends beyond that of pelvic fin (Fig. 18c); dorsal fin with 28 to 32 soft rays, its membrane pale without dark spots ***Pseudotolithus (Pseudotolithus) senegalensis***
(from Morocco to Angola)

Key to the species of *Umbrina* occurring in the area

- 1a. Spinous dorsal fin high, its tip reaching beyond third soft ray when depressed (Fig. 19a); posterior portion of dorsal fin usually with 29 to 31 soft rays . . . ***Umbrina steindachneri***
(West African coast from Guinea to Angola, rare or not identified correctly)
- 1b. Spinous dorsal fin tip reaching to or short of third soft ray when depressed (Fig. 19b); posterior portion of dorsal fin usually with 29 or fewer soft rays → 2
(except with individuals of *U. canariensis*, which may have up to 30 rays, or a misidentification of *U. steindachneri*)

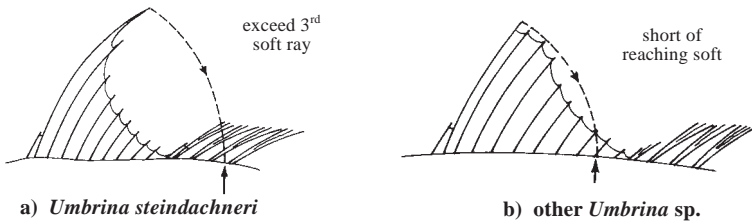


Fig. 19 spinous dorsal fin

- 2a. Membranes along entire hind margin of gill cover jet black (Fig.20a); soft dorsal-fin rays 22 to 25 ***Umbrina cirrosa***
(from the Bay of Biscay to Senegal, including Canary Islands, also throughout the Mediterranean and Black Sea)
- 2b. Membranes along hind margin of gill cover pale to dusky, never black edged (Fig. 20b); soft dorsal fin with 25 or more rays → 3
- 3a. Eye large, 4.7 or less times in head length; greater than interorbital width; dorsal fin with 27 to 31 soft rays; second anal spine longer than two-thirds of first anal ray (Fig.16b) ***Umbrina canariensis***
(from the Bay of Biscay to South Africa, including Canary Islands, also in Mediterranean)
- 3b. Eye moderately large, 5.2 to 6.5 times in head length, less than interorbital width; dorsal fin with 25 to 27 soft rays; second anal spine shorter than two-thirds of first soft ray (Fig. 16d) ***Umbrina ronchus***
(from Gibraltar to Angola, including Canary Islands, also in Mediterranean)

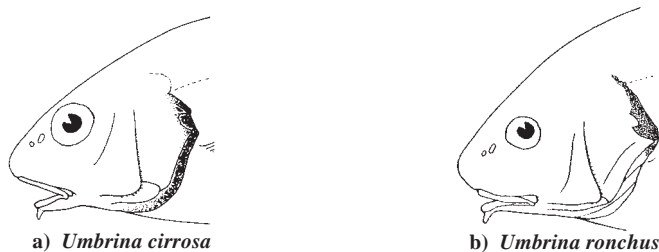




















Fig. 20 gill cover membrane pigmentation

List of species occurring in the area

The symbol  is given when species accounts are included.

-  *Argyrosomus hololepidotus* (Lacépède, 1801).
-  *Argyrosomus regius* (Asso y del Rio, 1801).
-  *Atractoscion aequidens* (Cuvier, 1830).
-  *Miracorvina angolensis* (Norman, 1935).
-  *Pentheroscion mbizi* (Poll, 1950).
-  *Pseudotolithus (Pinnacorvina) epipecus* (Bleeker, 1863).
-  *Pseudotolithus (Fonticulus) elongatus* (Bowdich, 1825).
-  *Pseudotolithus (Hostia) moorii* (Günther, 1865).
-  *Pseudotolithus (Pseudotolithus) senegalensis* (Valenciennes, 1833).
-  *Pseudotolithus (Pseudotolithus) senegallus* Bleeker, 1863.
-  *Pseudotolithus (Pseudotolithus) typus* Bleeker, 1863.
-  *Pteroscion peli* (Bleeker, 1863).
-  *Sciaena umbra* Linnaeus, 1758.
-  *Umbrina canariensis* Valenciennes, 1843.
-  *Umbrina cirrosa* (Linnaeus, 1758).
-  *Umbrina ronchus* Valenciennes, 1843.
-  *Umbrina steindachneri* Cadenat, 1951.

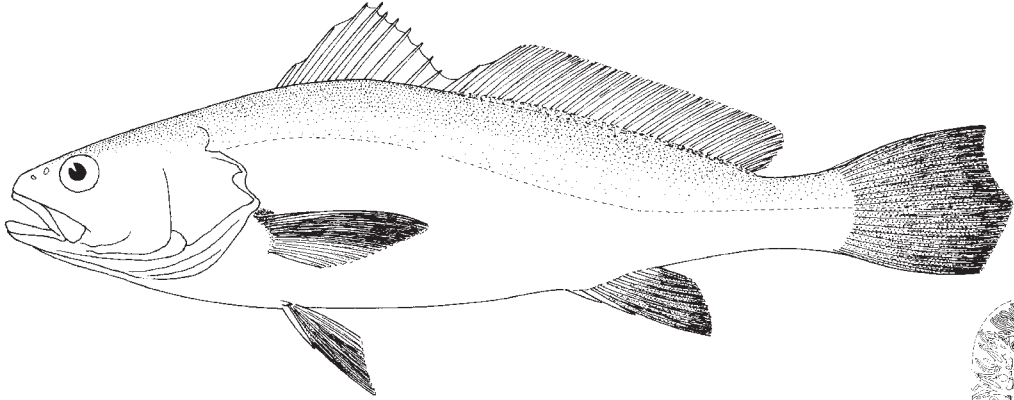
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***Argyrosomus hololepidotus* (Lacépède, 1801)**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Southern meagre; Fr – Maigre du Sud; Sp – Corvina del Sur.



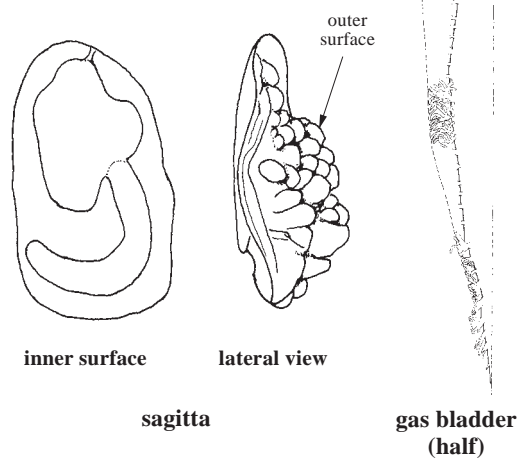
Diagnostic characters: A large, elongate and moderately compressed fish. **Eye moderately large, its diameter greater than interorbital width, 5.1 to 5.5 times in head length. Mouth large, terminal and oblique;** maxilla reaching beyond middle of eye. Teeth set in narrow ridges with 2 to 4 rows on jaws, **upper jaw with several enlarged teeth on outer row, a pair of larger canine-like teeth at the tip;** lower jaw with a row of enlarged teeth, stronger posterior. Chin without barbel, but 6 mental pores; snout with 8 pores (3 upper and 5 marginal). Gill rakers slender, 12 to 17 on first gill arch, shorter than gill filaments at the angle. Preopercle margin finely serrated, no conspicuous spines at the angle. Spinous dorsal fin with 10 spines, posterior portion with 1 spine and 29 or 30 soft rays; pectoral fins short, 20 to 22% of standard length; anal fin with 2 spines and 7 soft rays (rarely 8), second spine weak, less than half length of first soft ray; caudal fin S-shaped.

Gas bladder with 25 to 35 arborescent appendages along entire lateral sides of main chamber. Sagitta (earstone) ovoid, its outer surface with thick granules. Scales ctenoid except on snout and below eyes. **Colour:** silvery grey, dark on back, inside of mouth yellowish to orange; distal portions of caudal, anal, pelvic fins darker; pectoral fin axils with a distinct dark blotch. Opercle lining dark showing externally a dark blotch.

Size: To 200 cm; common from 30 to 40 cm.

Habitat, biology, and fisheries: A coastal fish, inhabits over mud bottom from 15 to 150 m depth. Caught from the bottom as well as in midwater, common in southern Angola.

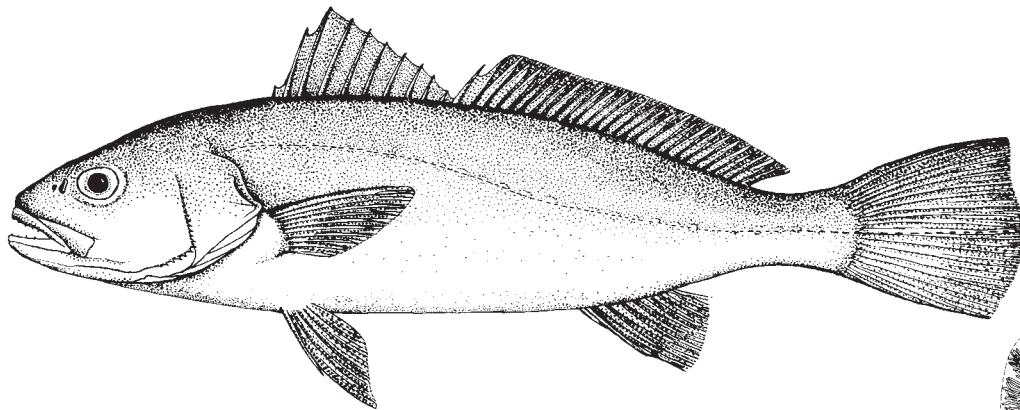
Distribution: Reported along West African coast from Mauritania to South Africa, in the West Indian Ocean to Australia. The species is also referred to as endemic to Madagascar. Further study of this widely distributed species may result in additional species.



***Argyrosomus regius* (Asso y del Rio, 1801)**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Meagre; Fr – Maigre commun; Sp – Corvina.

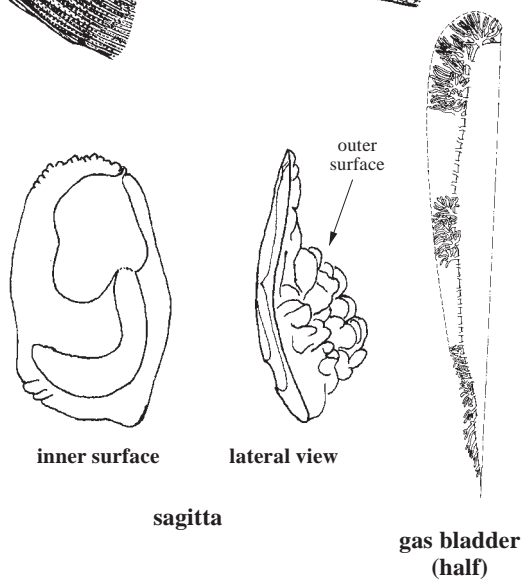


Diagnostic characters: A large, elongate and moderately compressed fish. **Eye moderately small, its diameter less than interorbital width, 5.7 to 7.1 times in head length.** **Mouth large, terminal and oblique;** maxilla reaching beyond middle of eye. Teeth set in ridge with 2 to 4 rows on jaws, **upper jaw with several enlarged teeth on outer row, stronger at front, but not canine-like;** lower jaw with several enlarged teeth on inner row, stronger posterior. Chin without barbel, but 6 mental pores; snout with 8 to 10 pores (3 or 5 upper and 5 marginal). Gill rakers slender, 11 to 14 on first gill arch, **shorter than gill filaments at the angle.** Preopercle margin slightly serrate, often with short spines at the angle. Spinous dorsal fin with 9 or 10 spines, posterior portion with 1 spine and 26 to 29 soft rays; pectoral fins short, 18 to 20% of standard length; anal fin with 2 spines and 7 soft rays (rarely 8), second spine weak, less than half of first soft ray; caudal fin rhomboidal to S-shaped. **Gas bladder with 36 to 42 arborescent appendages running along sides of bladder.** Sagitta (earstone) ovoid, its outer surface with thick granules. Scales ctenoid on body and head, few cycloids on breast, snout and around eyes. **Colour:** silvery grey with a bronze reflection on back, inside of mouth yellowish to orange; distal portions of caudal, anal, pelvic fins darker; pectoral fin axils variably pigmented. Opercle lining dark showing externally a dark blotch.

Size: To 200 cm; common to 50 cm.

Habitat, biology, and fisheries: Inhabits coastal water from 15 to 200 m depth (unconfirmed record to 400 m); also enters estuaries and coastal lagoons. Caught from the bottom as well as mid to surface waters.

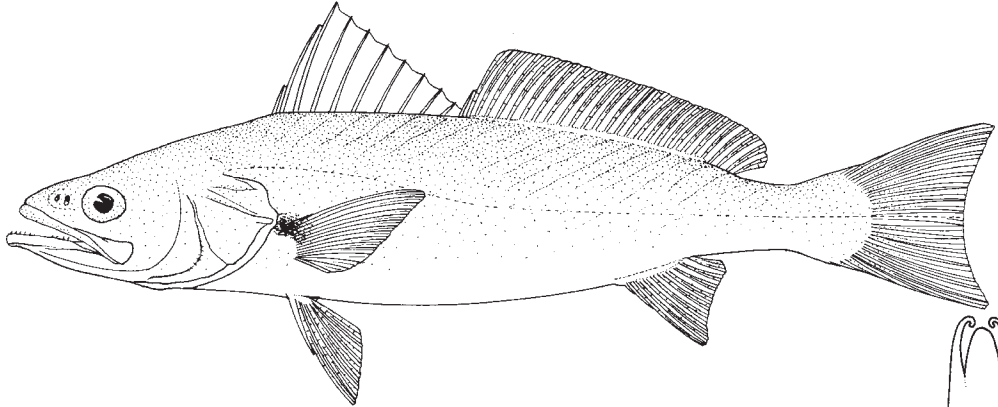
Distribution: African coast from Gibraltar to Congo, also throughout Mediterranean and northward to British Isles.



Atractoscion aequidens (Cuvier, 1830)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Geelbek croaker; Fr – Téraglin; Sp – Corvinata prieta.



Diagnostic characters: A large, elongate and moderately compressed fish. **Eye moderately small, its diameter less than interorbital width, 5.3 to 6.9 times in head length.** **Mouth large and oblique, lower jaw projecting;** maxilla extending beyond eye. Teeth set in narrow bands with 4 to 6 rows at tip of jaws, narrow down to 1 or 2 rows posterior, **outer row teeth on upper jaw distinctly large and sharper at front, but not canine-like;** lower jaw also with 1 enlarged tooth on inner row, stronger posterior. Chin without barbel or conspicuous pores; snout with 5 marginal pores. Gill rakers very short, tubercular, 12 to 16 on first gill arch. Preopercle margin weakly serrate. Spinous dorsal fin with 10 spines, posterior portion with 1 spine and 26 to 31 soft rays; anal fin with 2 spines and **9 soft rays**, the spines tightly bound to the first ray; caudal fin truncate to emarginated. **Gas bladder long, with a pair of horn-like appendages extending forward to transverse septum or curving back against the septum.** Sagitta (earstone) ovoid, slightly elongate, with a thick middle portion. Scales rather small (more than 70 along lateral line), ctenoid on body and head. Base of soft dorsal fin with a sheath of 2 small scale rows. **Colour:** silvery grey with bluish or bronze reflections on back and often with faint oblique lines along the scale rows; pelvic and anal fins pale to yellowish; pectoral fin axils with a black blotch. Opercle lining dark showing externally a dark blotch.

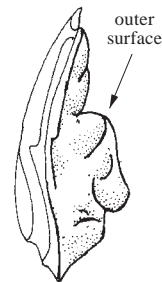
Size: To 130 cm; common to 50 cm.

Habitat, biology, and fisheries: Inhabit coastal waters from 15 to 200 m depth (unconfirmed record to 400 m); also enter estuaries and coastal lagoons. Caught from the bottom as well as mid to surface waters.

Distribution: West African coast from Gulf of Guinea to South Africa (a single record from Mauritania). Western Indian Ocean: off Mozambique and South Africa. Eastern Indian Ocean: Australia.



inner surface



lateral view

sagitta



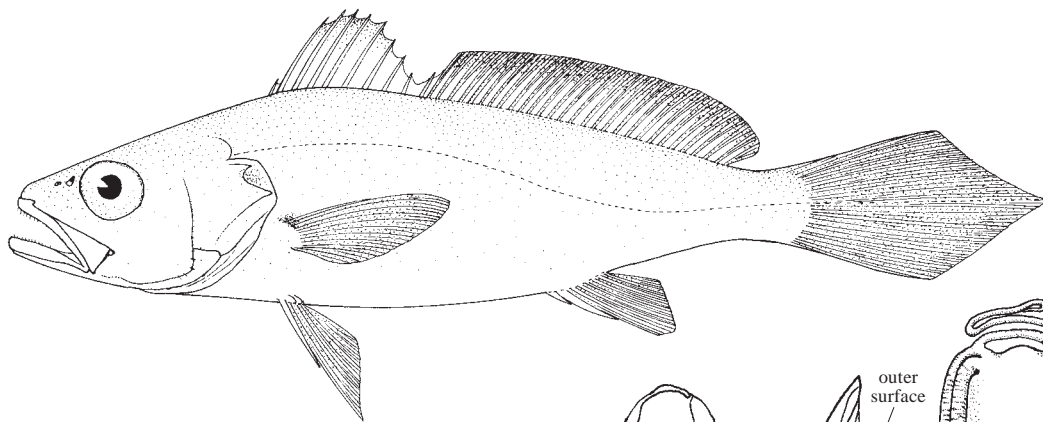
gas bladder



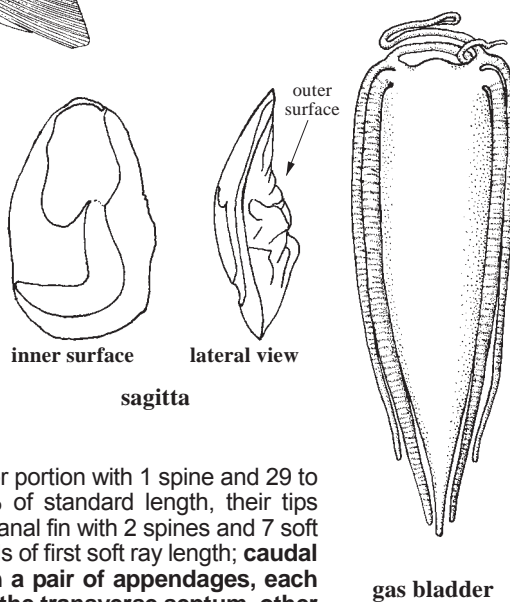
Miracorvina angolensis (Norman, 1935)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Angolan croaker; Fr – Coubrine de l'Angola; Sp – Corvina de Angola.



Diagnostic characters: A medium size fish, moderately elongate and compressed. **Eye large, its diameter greater than interorbital width, 3.6 to 3.8 times in head length. Mouth large and oblique;** maxilla extending to below middle of eye. Teeth conical, 1 to 3 rows, set in narrow ridges on jaws; **outer row teeth on upper jaw distinctly larger and sharper at front;** lower jaw also with a row of enlarged teeth, stronger in the middle. Chin without barbel, but 6 conspicuous pores; snout with 5 marginal pores. Gill rakers slender, 14 to 19 on first gill arch, but much shorter than gill filaments at the angle; preopercle margin smooth. Spinous dorsal fin with 9 spines, posterior portion with 1 spine and 29 to 31 soft rays; pectoral fins moderately long, 20 to 24% of standard length, their tips reaching slightly behind that of pelvic fins when pressed; anal fin with 2 spines and 7 soft rays, second spine rather thick and strong about two-thirds of first soft ray length; **caudal fin acutely rhomboidal to pointed. Gas bladder, with a pair of appendages, each divided into 3 tubes, the anterior ones coiled against the transverse septum, other 2 pairs, thick and extending backward along side the bladder.**



Sagitta (earstone) ovoid, posterior half much thicker. Scales large (<45 along lateral line), ctenoid, except on cheeks and snout. Base of soft dorsal and anal fins with a sheath of 2 or 3 row small scales.

Colour: silvery grey, darker above, no distinct pigment markers on body; **inside of mouth, and of gill cover jet black**, showing externally a large dark blotch; pelvic and anal fins pale to yellowish; distal portions of spinous dorsal, anal, caudal and pectoral fins darker.

Size: To 75 cm; common to 40 cm.

Habitat, biology, and fisheries: Inhabit over sandy and rock bottoms in deeper shelf and slope waters, ranging from 50 to at least 300 m depth, below the thermocline. Spawning occurs from August to November in waters of 15 to 16°C off Angola.

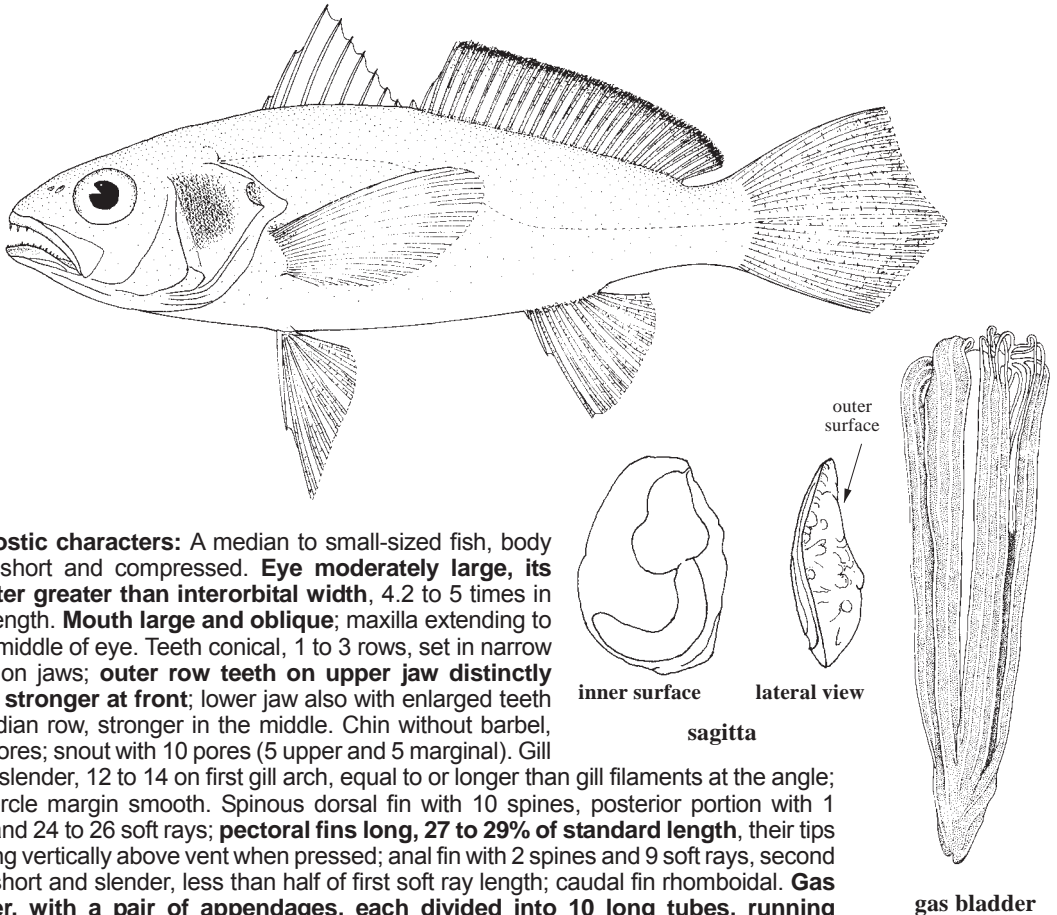
Distribution: West African endemic from Sierra Leone to southern Angola.



***Pentheroscion mbizi* (Poll, 1950)**

Frequent synonyms / misidentifications: None / None.

FAO names: **En** – Blackmouth croaker; **Fr** – Coubrine à bouche noire; **Sp** – Corvina bocanegra.



Diagnostic characters: A median to small-sized fish, body rather short and compressed. **Eye moderately large, its diameter greater than interorbital width**, 4.2 to 5 times in head length. **Mouth large and oblique**; maxilla extending to below middle of eye. Teeth conical, 1 to 3 rows, set in narrow ridges on jaws; **outer row teeth on upper jaw distinctly larger, stronger at front**; lower jaw also with enlarged teeth on median row, stronger in the middle. Chin without barbel, but 6 pores; snout with 10 pores (5 upper and 5 marginal). Gill rakers slender, 12 to 14 on first gill arch, equal to or longer than gill filaments at the angle; preopercle margin smooth. Spinous dorsal fin with 10 spines, posterior portion with 1 spine and 24 to 26 soft rays; **pectoral fins long, 27 to 29% of standard length**, their tips reaching vertically above vent when pressed; anal fin with 2 spines and 9 soft rays, second spine short and slender, less than half of first soft ray length; caudal fin rhomboidal. **Gas bladder, with a pair of appendages, each divided into 10 long tubes, running backward along side of bladder, often embedded in a sheath of fatty tissue enveloping gas bladder as a mantle.** Sagitta (earstone) ovoid, outer surface slightly granulated. Scales ctenoid on body, cycloid on head. **Colour:** silvery grey, darker above; **inside of mouth, and of gill cover jet black**, showing externally a large dark blotch; soft rays on dorsal fin black edged, pelvic and anal fins pale to yellowish; distal portions of spinous dorsal, anal, caudal and pectoral fins darkish.

Size: To 45 cm; common to 25 cm.

Habitat, biology, and fisheries: Found over mud, sand and rock bottoms and midwater in deeper shelf and slope waters, ranging from 50 to at least 350 m depth, most common between 80 and 160 m. Taken as bycatches in trawl fisheries throughout its range, constitutes 4% of all sciaenid catches off Angola.

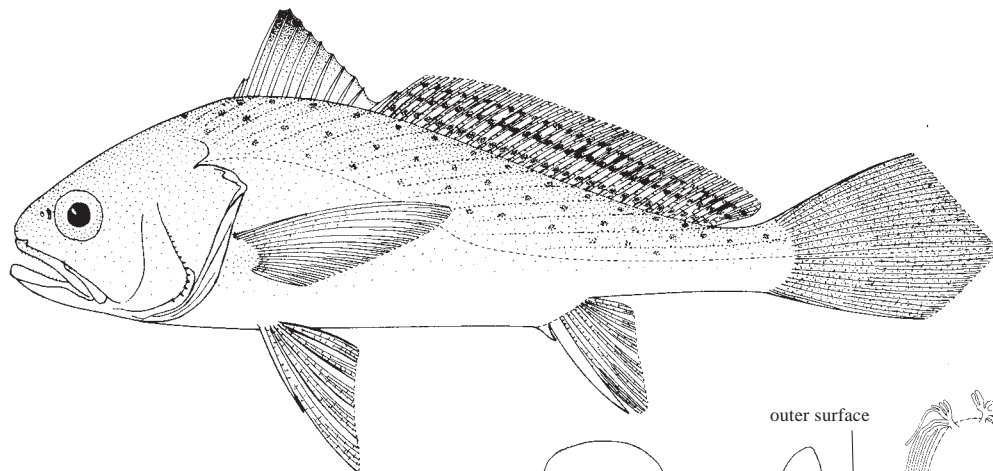
Distribution: West African endemic from Guinea to southern Angola.



***Pseudotolithus (Fonticulus) elongatus* (Bowdich, 1825)**

Frequent synonyms / misidentifications: *Corvina nigrita* Cuvier, 1830 / None.

FAO names: En – Bobo croaker; Fr – Otolithe bobo; Sp – Corvina bobo.



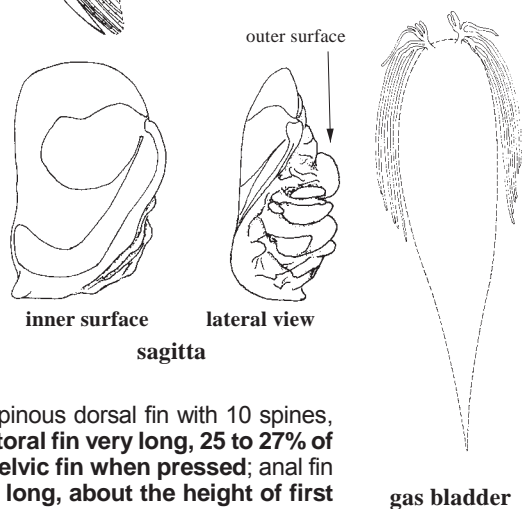
Diagnostic characters: A medium-sized fish, body rather elongate and compressed. **Head short and high; eye large, its diameter greater than interorbital width or 3.6 to 4.6 times in head length;** Mouth large, oblique with lower jaw slightly projecting; maxilla extending beyond eye. Teeth small, set in narrow ridges on jaws, outer row on upper jaw and inner row on lower jaw slightly enlarged. Chin without barbel, but 6 mental pores; snout with 5 marginal pores. Gill rakers long and slender, 19 to 22 on first gill arch, longer than gill filaments at the angle. Preopercle margin serrate, often with few sharp spines at angle. Spinous dorsal fin with 10 spines, posterior portion with 1 spine and 29 to 34 soft rays; **pectoral fin very long, 25 to 27% of standard length, its tip falling much behind that of pelvic fin when pressed;** anal fin with 2 spines and 6 soft rays, **second spine thick and long, about the height of first soft ray;** caudal fin pointed in juveniles and becoming rhomboidal in adults. **Gas bladder with a pair of anterior appendages sprouting into several short anterior branches and 6 long tubules running backward to the middle of bladder.**

Sagitta (earstone) thick, twisted along the longitudinal axis, with strongly granulated outer surface. Scales ctenoid on body, cycloid on head and breast. **Colour:** silvery grey with a reddish tint, back often with oblique lines and scattered spots; soft dorsal fin often with 1 to 3 longitudinal rows of dotted lines. Tip of spinous dorsal and caudal fins darkish; belly, pelvic, anal and lower caudal fins pale, becoming yellowish during spawning season. Inside of mouth pale, but opercle lining dark, showing externally a dark blotch.

Size: To 45 cm; common to 30 cm.

Habitat, biology, and fisheries: Inhabits muddy bottom in coastal waters, usually from shoreline to at least 50 m depth, also enters estuaries and coastal lagoons; moves off shore to 100 m depth to spawn during the rainy season. Feeds mainly on shrimps and other crustaceans. Captured by artisanal and trawl fisheries through out its range.

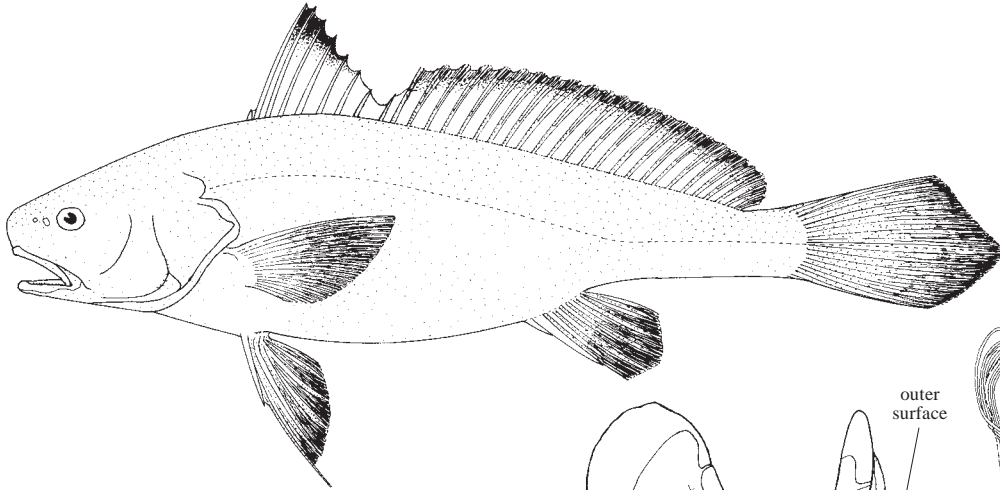
Distribution: West African endemic from Senegal to Angola.



***Pseudotolithus (Hostia) moorii* (Günther, 1865)**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Cameroon croaker; Fr – Otolithe carmerounais; Sp – Corvina de Camerún.

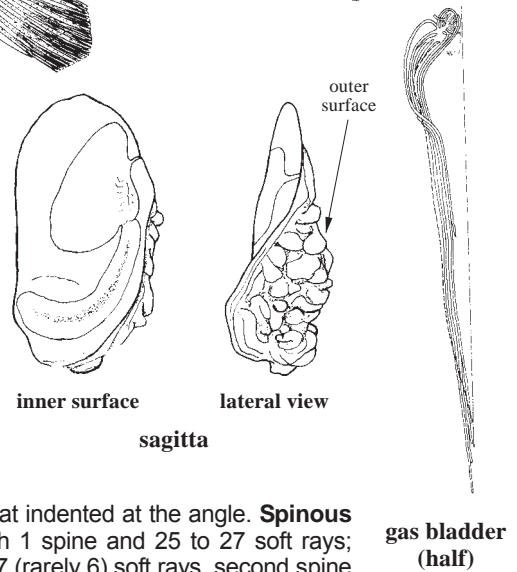


Diagnostic characters: A medium-sized fish, **body elongate and rounded in cross section**. **Eye small, its diameter 7 to 8 times in head length**. **Mouth moderately large, inferior and horizontal**; maxilla extending beyond eye. Teeth villiform, set in bands on jaws, outer row teeth on upper jaw distinctly larger and closely set; lower jaw teeth subequal. Chin without barbel, but 6 mental pores, median pair minute; **snout quite blunt and rounded**, with 5 closely set marginal pores, but no upper pores. Gill rakers short and stout, 14 to 17 on first gill arch. Preopercle margin smooth, somewhat indented at the angle. **Spinous dorsal fin with 8 (rarely 7) spines**, posterior portion with 1 spine and 25 to 27 soft rays; **pectoral fins short and broad**; anal fin with 2 spines and 7 (rarely 6) soft rays, second spine short but stout, about half of first soft ray height; caudal fin acutely rhomboidal, asymmetrically pointed. **Gas bladder with a pair of arborescent appendages sprouting into few short anterior branches and a series of long tubes running backward along sides of bladder to well beyond its tip**. Sagitta (earstone) thick, twisted along longitudinal axis, its outer surface strongly granulate. Scales all cycloid (smooth to touch). **Colour:** uniformly dark grey; **pectoral, pelvic and anal fins jet black**, distal portions of dorsal and caudal fins black. Roof of mouth and inside of gill cover black.

Size: To 50 cm; common to 25 cm.

Habitat, biology, and fisheries: Inhabits over mud and sandy mud bottoms in coastal waters, usually from 15 to 70 m depth. Feeds on small shrimps, worms and other bottom dwelling invertebrates. Caught throughout its range, but apparently not abundant.

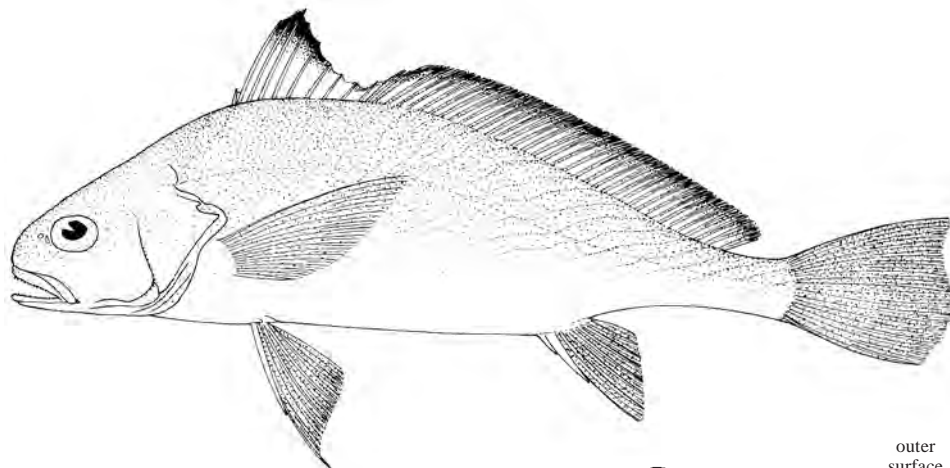
Distribution: West African endemic from Gambia to Angola.



***Pseudotolithus (Pinnacorvina) epipercus* Bleeker, 1863**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Guinea croaker; Fr – Otolithe guinéen; Sp – Corvina de Guinea.



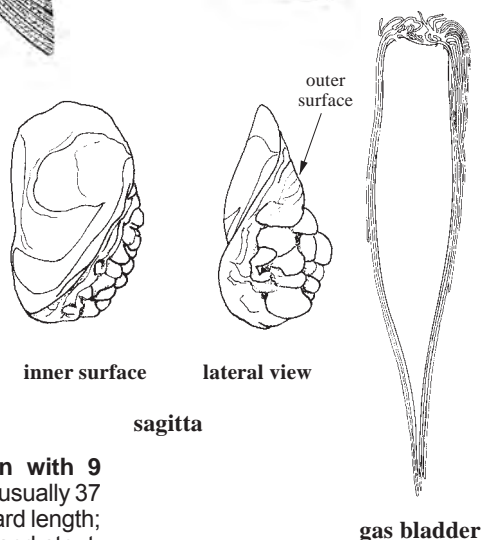
Diagnostic characters: A medium-sized fish, body moderately elongate and compressed. **Eyes large, greater than the narrow interorbital distance, its diameter 3.6 to 4.1 times in head length. Mouth small, inferior, nearly horizontal;** maxilla extending behind middle of eye. Teeth villiform, set in bands on jaws, outer row teeth on upper jaw distinctly larger and closely set; lower jaw teeth with a slightly enlarged medial row. Chin without barbel, but 6 mental pores, median pair minute; **snout quite blunt and rounded**, with 5 marginal pores only. Gill rakers rather long and slender, 14 to 18 on first gill arch, but shorter than gill filaments at the angle.

Preopercle margin slightly indented. **Spinous dorsal fin with 9 spines**, posterior portion with 1 spine and 35 to 39 soft rays (usually 37 to 38); both pectoral and pelvic fins long, 25 to 30% of standard length; anal fin with 2 spines and 7 soft rays, second spine short and stout, about half of first soft ray height; caudal fin rhomboidal to S-shaped. **Gas bladder with a pair of arborescent appendages sprouting from front end into variably developed tubes extending well beyond posterior end of bladder.** Sagitta (earstone) thick, twisted along longitudinal axis with large granulates on outer surface. Scales mostly ctenoid except few small cycloids on breast and below eyes. **Colour:** a grayish dark fish; side with numerous oblique wavy lines along scale rows, extending onto head and lower half of body; **pectoral, pelvic and anal fins jet black**, distal portions of dorsal and caudal fins black. Roof of mouth dusky, lining of gill cover black, appearing externally a darker blotch on opercle.

Size: To 60 cm; common to 35 cm.

Habitat, biology, and fisheries: Inhabits over mud and sandy mud bottom in coastal waters to about 70 m deep, but also moves to deeper waters (to about 160 m). Feeds on benthic invertebrates. Caught by artisanal and trawl fisheries through its range.

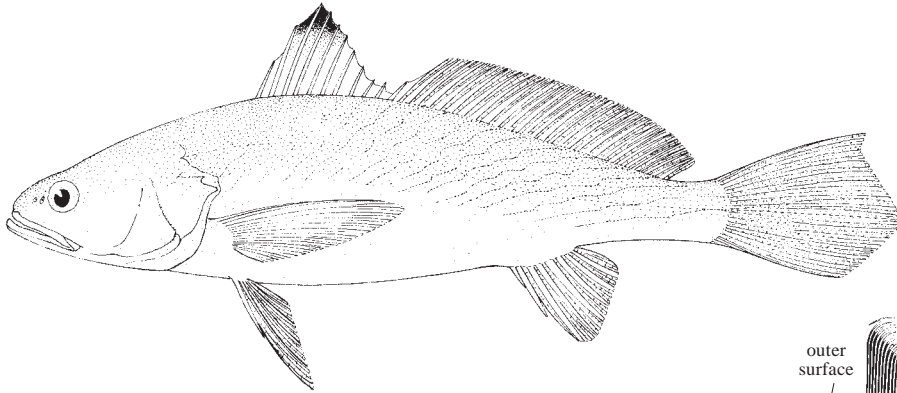
Distribution: West African endemic from Guinea-Bissau to Angola.



***Pseudotolithus (Pseudotolithus) senegalensis* (Valenciennes, 1833)**

Frequent synonyms / misidentifications: None / *Pseudotolithus senegallus*.

FAO names: **En** – Cassava croaker; **Fr** – Otolithe sénégalais; **Sp** – Corvina casava.

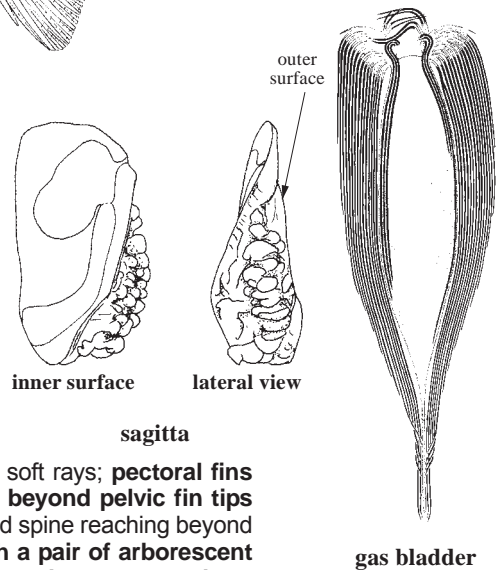


Diagnostic characters: A large, elongate and moderately compressed fish. **Eye medium, 5.7 to 6.4 times in head length, its diameter less than the interorbital width. Mouth large, oblique, lower jaw slightly projecting;** maxilla reaching beyond eye. Teeth in narrow ridges on jaws, outer row teeth on upper jaw distinctly larger and sharp **with a pair of canine-like teeth anteriorly;** lower jaw with few large teeth, middle ones longer. Chin without barbel, but 6 mental pores; snout with 5 marginal pores. Gill rakers 12 or 13 on first gill arch, longer than gill filaments at the angle. Preopercle margin serrate, often with few stronger spines at the angle. Spinous dorsal fin with 10 spines, posterior portion with 1 spine and 28 to 33 soft rays; **pectoral fins long, 25 to 28% of standard length, their tips reaching beyond pelvic fin tips when pressed;** anal fin with 2 spines and 7 soft rays, second spine reaching beyond half of first soft ray; caudal fin S-shaped. **Gas bladder with a pair of arborescent appendages, dividing into short anterior branches and numerous long posterior appendages, running along sides of bladder; the dorsal lateral ones more numerous and longer than ventral ones.** Sagitta (earstone) thick, twisted along longitudinal axis, its outer surface heavily granulated. Scales ctenoid except on top of head and suborbital region. **Colour:** silvery grey to yellowish, back with distinct dark oblique wavy lines along scale rows, extending to head and becoming horizontal posteriorly. Opercle lining jet black, showing through a dark blotch externally. Axils of pectoral-fin base dark, distal portions of caudal, anal and pelvic fin darkish.

Size: To 100 cm; common to 50 cm.

Habitat, biology, and fisheries: Inhabits mud and sandy mud bottoms in coastal waters from the shoreline to at least 150 m depth, but most abundant in less than 60 m water at temperature above 18°C, often enter estuaries.

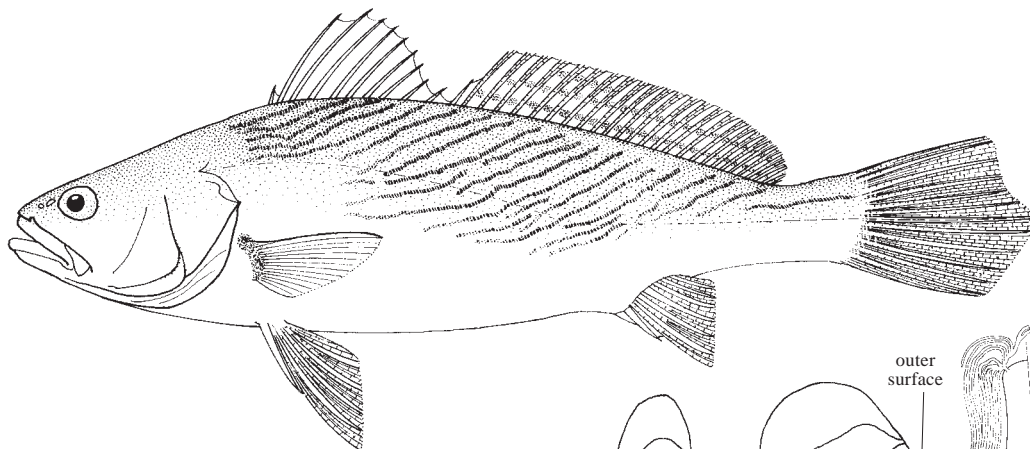
Distribution: Endemic to West Africa from Cape Verde Islands and Mauritania to Angola. Rarely in Morocco.



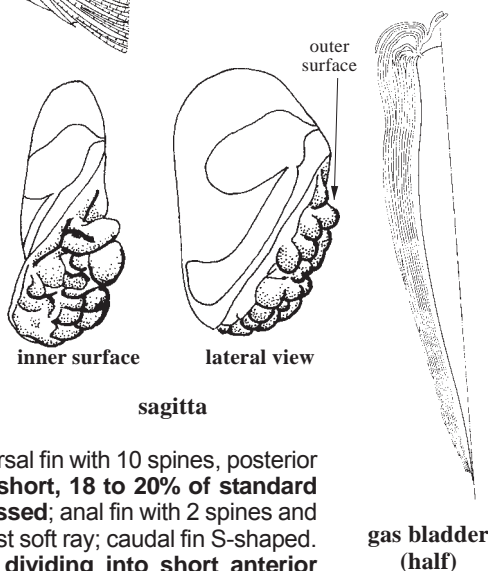
***Pseudotolithus (Pseudotolithus) senegallus* Cuvier, 1830**

Frequent synonyms / misidentifications: *Pseudotolithus brachygnathus* Bleeker, 1863 / *Pseudotolithus senegalensis*.

FAO names: **En** – Law croaker; **Fr** – Otolithe gabo; **Sp** – Corvina reina.



Diagnostic characters: A large, elongate and moderately compressed fish. **Eye moderately large, 4.1 to 6.1 times in head length its diameter greater than interorbital width.** **Mouth large, oblique, lower jaw slightly projecting;** maxilla reaching beyond middle of eye. Teeth set in narrow ridges on jaws, outer row teeth on upper jaw distinctly larger and sharp **with a pair of canine-like teeth anteriorly;** lower jaw also with several sharp teeth. Chin without barbel, but 6 mental pores; snout with 5 marginal pores. Gill rakers 16 to 18 on first gill arch, longer than gill filaments at the angle. Preopercle margin serrate, often with sharp spines at angle. Spinous dorsal fin with 10 spines, posterior portion with 1 spine and 25 to 27 soft rays; **pectoral fins short, 18 to 20% of standard length, their tips falling short of pelvic fin tips when pressed;** anal fin with 2 spines and 7 soft rays, second spine short and stout, less than half of first soft ray; caudal fin S-shaped. **Gas bladder with a pair of arborescent appendages dividing into short anterior branches and a dozen or so long tubular posterior appendages, running along sides of bladder beyond its tip.** Sagitta (earstone) thick, twisted along longitudinal axis, its outer surface granulate. Scales ctenoid on body, mostly cycloid on head. **Colour:** silvery grey to yellowish with a reddish hue on the back and dotted oblique wavy stripes along scale rows, becoming faint ventrally. Pectoral fin axils variably dark to black. Opercle lining dusky externally. Soft portion of dorsal fin often with 2 or 3 dotted longitudinal lines.



Size: To 230 cm; common from 30 to 50 cm.

Habitat, biology, and fisheries: Inhabits mud and sandy mud bottoms in coastal waters, usually from shoreline to at least 150 m depth, also found in hypersaline lagoons. Target fishery species makes up 7% of total croaker landings in Angola.

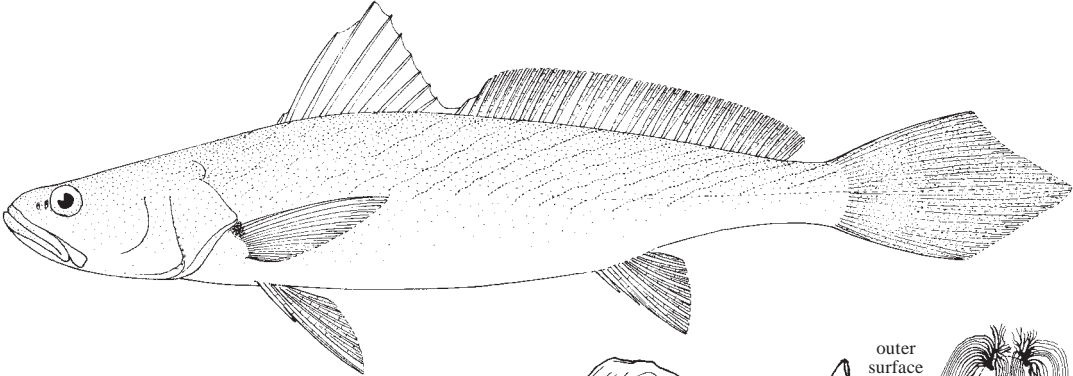
Distribution: Endemic to African coast from Senegal southward to Angola.



***Pseudotolithus (Pseudotolithus) typus* Bleeker, 1863**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Longneck croaker; Fr – Otolithe nanka; Sp – Corvina bosoro.



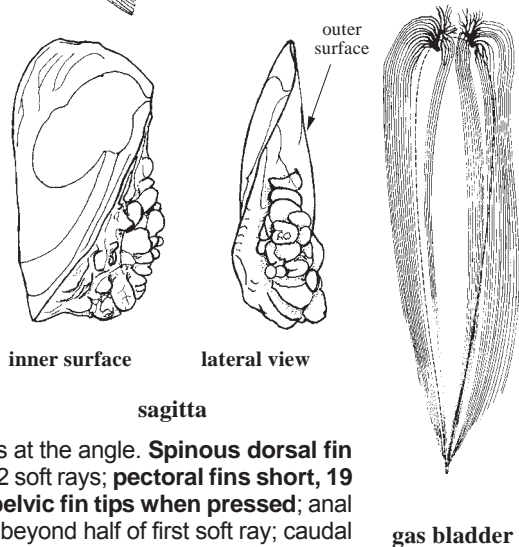
Diagnostic characters: A large fish, body long and rounded in cross section. **Head elongate, conical with slightly concaved nape; interorbital width very narrow. Eye rather small, 8 or 9 times in head length, but its diameter greater than the very narrow interorbital width. Mouth large, oblique, lower jaw slightly projecting;** maxilla reaching beyond eye. Teeth in narrow ridges on jaws, outer row teeth on upper jaw distinctly larger and sharp **with a pair of canine-like teeth anteriorly**; lower jaw with a row of large teeth. Chin without barbel, but 6 mental pores; snout with 5 marginal pores. Gill rakers 14 to 21 on first gill arch, longer than gill filaments at the angle.

Preopercle margin smooth, often with few flexible spines at the angle. **Spinous dorsal fin with 9 spines**, posterior portion with 1 spine and 28 to 32 soft rays; **pectoral fins short, 19 to 21% of standard length, their tips falling short of pelvic fin tips when pressed**; anal fin with 2 spines and 7 soft rays, second spine reaching beyond half of first soft ray; caudal fin S-shaped. **Gas bladder with a pair of arborescent appendages, dividing into short anterior branches and numerous long posterior appendages, running along sides of bladder; the dorsal lateral ones more numerous and longer than ventral ones.** Sagitta (earstone) thick, twisted along longitudinal axis, its outer surface heavily granulated. Scales ctenoid on body and head, cycloid on snout and suborbital region. **Colour:** silvery grey to yellowish, back with dotted oblique lines along scale rows, becoming horizontal and undulating posteriorly. Opercle lining darkish, showing externally a dark blotch. Spinous dorsal fin dark tipped.

Size: To 120 cm; commonly from 30 to 50 cm.

Habitat, biology, and fisheries: Inhabits mud, sandy mud and rock bottoms in coastal waters, usually from shoreline to at least 150 m depth, juveniles in shallow water, rarely enter estuaries. Spawning from November to March in waters of 22 to 25°C.

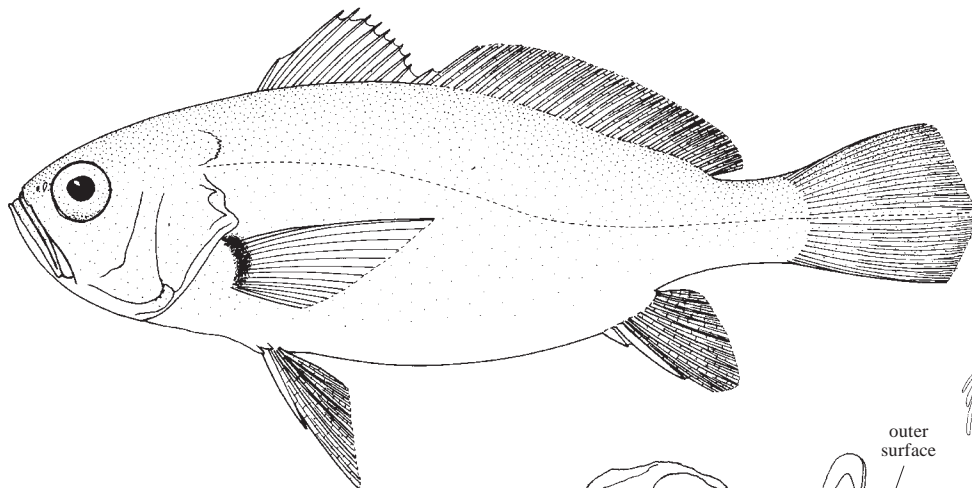
Distribution: West African coast from Morocco to Angola.



***Pteroscion peli* (Bleeker, 1863)**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Boe drum; Fr – Coubrine pélin; Sp – Bombache boé.



Diagnostic characters: A small sized fish, body rather short and robust. **Top of head cavernous, soft to touch; eye large, its diameter greater than interorbital width**, 3.7 to 4 times in head length.

Mouth large and strongly oblique, lower jaw projecting. Teeth conical, 1 to 3 rows, set in narrow ridges on jaws; outer row on upper jaw and inner row on lower jaw slightly enlarged. Chin without barbel, but 4 minute mental pores; snout with 5 marginal pores only. Gill rakers long and slender, 23 to 26 on first gill arch; Preopercle margin nearly smooth. Spinous dorsal fin with 10 spines, posterior portion with 1 spine and 27 to 26 soft rays; pectoral fins long, 26 to 28% of standard length, its tip reaching beyond that of pelvic fin when pressed; **anal fin with 2 spines and 9 soft rays** (rarely 8), second spine strong, about two-thirds of first soft ray length; caudal fin rhomboidal.

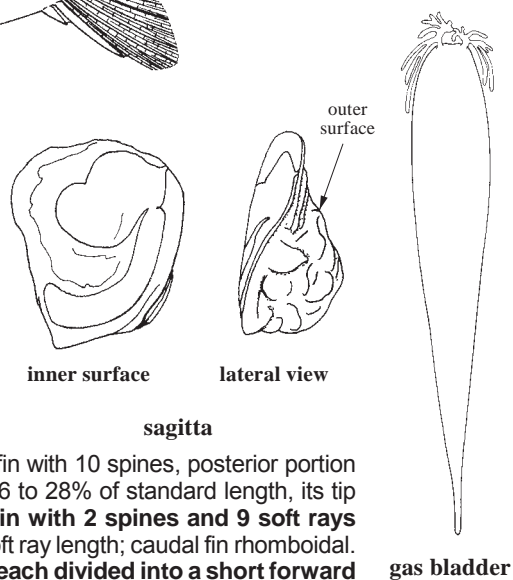
Gas bladder, with a pair of arborescent appendages, each divided into a short forward

branches and longer tubular branches running backward to anterior 1/4 of bladder. Sagitta (earstone) ovoid and very thick, outer surface slightly granulated. Scales large and thin, mostly ctenoid except few cycloid on snout and below eyes. **Colour:** silvery greyish olive on back, lighter below; inside of gill cover dusty dorsally; fins pale to yellowish, a dark blotch at the axils of pectoral fins.

Size: To 35 cm; common to 20 cm.

Habitat, biology, and fisheries: Found in midwaters, also over mud and sandy mud bottoms of coastal waters, from shoreline to 200 m depth, but more abundant above 50 m, commonly caught throughout its range, constitutes 6% of total sciaenid caught off Angola.

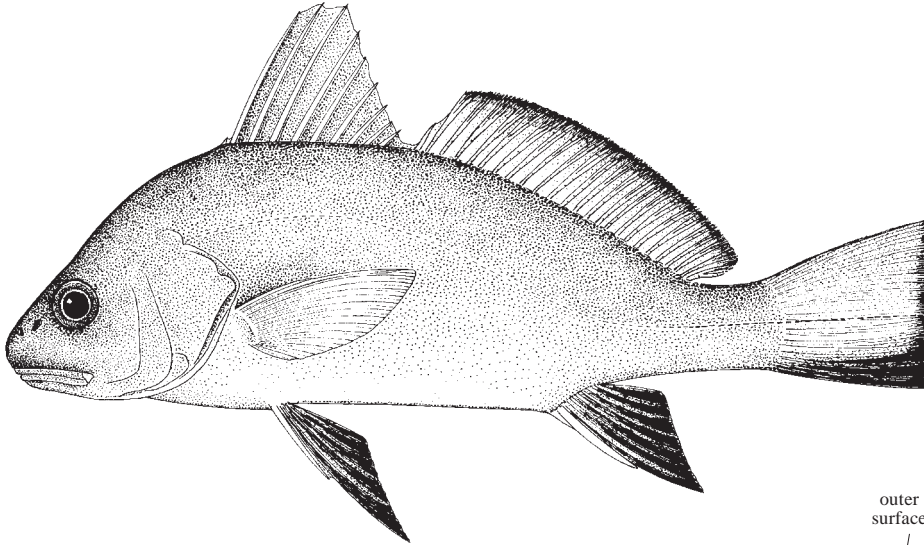
Distribution: West African endemic from Senegal to southern Angola.



***Sciaena umbra* Linnaeus, 1758**

Frequent synonyms / misidentifications: *Corvina nigra* (Bloch, 1791) / None.

FAO names: En – Brown meagre; Fr – Corb commun; Sp – Corvallo.

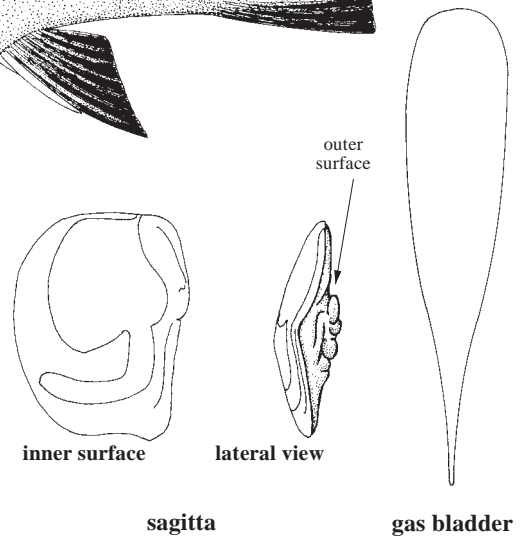


Diagnostic characters: A medium size, deep-bodied and compressed fish, dorsal profile strongly arched. **Mouth small, inferior;** maxilla reaching near hind margin of eye. Teeth villiform, set in bands on jaws. Chin without barbel, but with 5 conspicuous mental pores; snout with 10 pores (5 upper and 5 marginal), its lower edge deeply notched below marginal pores. Gill rakers short, 12 to 16 on first arch. Preopercle margin slightly serrate, often with several short spines at the angle. Spinous dorsal fin with 10 or 11 spines, posterior portion with 1 spine and 23 to 26 soft rays; anal fin with 2 spines and 7 soft rays, second spine strong, about two-thirds of first soft ray length; caudal fin truncate to slightly emarginate. **Gas bladder simple, carrot-shaped. Sagitta oval and moderately thick.** Scales ctenoid on body and nape, cycloid on rest of head. **Colour:** greyish silver with golden or metallic hue; opercle lining dusky dark at dorsal corner of gill cover. **Pelvic and anal fins jet black,** soft dorsal fin and lower edge of caudal fins dark.

Size: To 50 cm; common to 30 cm.

Habitat, biology, and fisheries: Inhabits shallow coastal waters from 20 to 180 m depth, mainly over sandy and rocky bottoms; often enter estuaries. Feeds mainly on bottom invertebrates, more active at night.

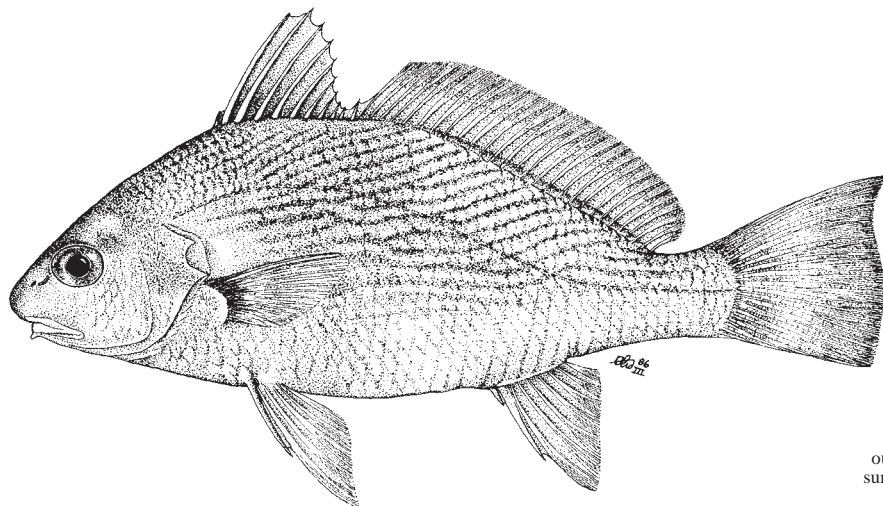
Distribution: Eastern Atlantic, coast of Europe and Africa from British Channel to Senegal, including Canary and Cape Verde islands, also throughout the Mediterranean and Black Sea.



Umbrina canariensis Valenciennes, 1843

Frequent synonyms / misidentifications: None / *Umbrina steindachneri*.

FAO names: En – Canary drum; Fr – Ombrine bronze; Sp – Verrugato de Canarias.



Diagnostic characters: A medium size, deep-bodied and compressed fish, dorsal profile strongly arched.

Mouth moderately small, inferior; maxilla reaching beyond middle of eye. Teeth villiform, set in broad bands on jaws. **Chin with a short, blunt, rigid barbel, perforated by a pore at tip,** and 4 marginal pores; snout with 10 pores (5 upper and 5 marginal). Gill rakers short, 14 to 17 (plus 1 or 2 tubercles at either end). Preopercle margin slightly serrate.

Spinous dorsal fin with 10 spines, posterior portion with 1 spine and 26 to 30 soft rays (mostly 27 to 29;

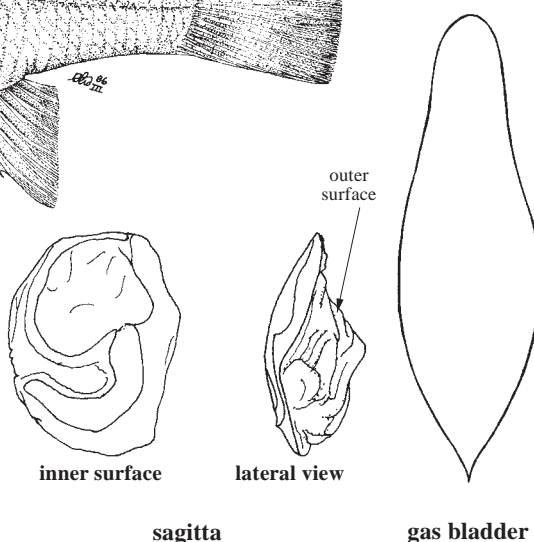
see remarks); anal fin with 2 spines and 7 rays (rarely 8), second spine long, more than 2/3 length of first soft ray; caudal fin truncate to slightly S-shaped. **Gas bladder simple, carrot-shaped.** Sagitta oval and thick. Scales ctenoid on body and head; cycloid on tip of snout and suborbital region; soft dorsal fin with a row of scales sheath at base. **Colour:** silvery grey, back darker with a greenish tint, side with dotted oblique wavy stripes along scale rows, extending to head and becoming faint ventrally. Opercle lining jet black, extending externally to upper margin of opercular flap. Distal portions of dorsal, caudal, anal and pelvic fins darkish.

Size: To 63 cm; common to 30 cm.

Habitat, biology, and fisheries: Found in shallow mud and sandy bottoms of the shelf and upper slope to 300 m depth, common between 160 and 180 m at 14 to 15°C, young mostly found within 100 m depth. Feed on benthic invertebrates.

Distribution: Throughout the region, from Gibraltar to Namibia, including Canary and Cape Verde islands. Also found from the Bay of Biscay to western Mediterranean, and south to South Africa.

Remarks: A higher number of recorded dorsal soft rays (>29) may be from misidentifications of *Umbrina steindachneri*, especially in the southern part of its range.



sagitta

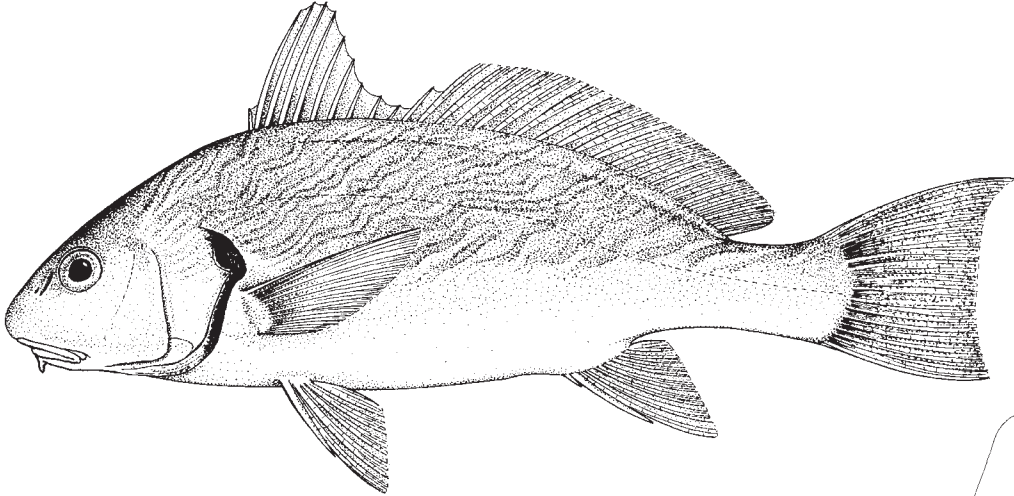
gas bladder



Umbrina cirrosa (Linnaeus, 1758)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Shi drum; Fr – Ombrine côtière; Sp – Verrugato fusco.

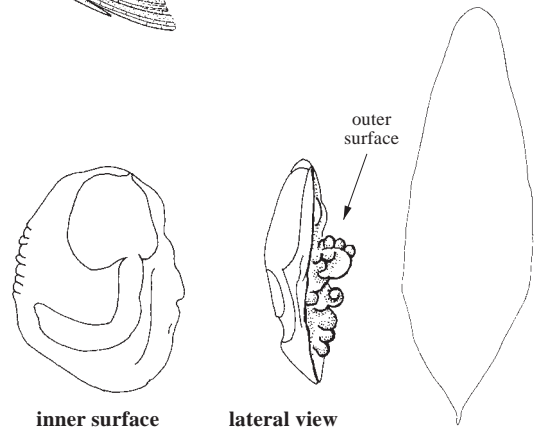


Diagnostic characters: A large, deep-bodied and compressed fish, dorsal profile strongly arched. **Mouth moderately small, inferior;** maxilla reaching beyond middle of eye. Teeth villiform, set in broad bands on jaws. **Chin with a short, blunt, rigid barbel, perforated by a pore at tip,** and 4 mental pores; snout with 10 pores (5 upper and 5 marginal). Gill rakers short, 11 to 13 (plus 1 or 2 tubercles at either end). Preopercle margin slightly serrate. Spinous dorsal fin with 9 or 10 spines, posterior portion with 1 spine and 23 to 25 soft rays; anal fin with 2 spines and 7 or 8 soft rays, second spine moderate long, half to two-thirds of first soft ray; caudal fin truncate to slightly S-shaped. **Gas bladder simple, carrot-shaped. Sagitta oval and thick.** Scales mostly ctenoid on body and head, cycloid on breast, snout and suborbital region; soft dorsal fin with a row of scales sheath at its base. **Colour:** greyish silver or brownish with a metallic hue, and oblique wavy stripes, becoming faint ventrally. Opercle lining black, extending behind gill cover and through opercle as a dark blotch externally. Tip of spinous dorsal and hind margin of caudal fin dusky.

Size: To 70 cm; common to 30 cm.

Habitat, biology, and fisheries: Inhabits coastal waters from shoreline to 100 m depth, mainly over sandy and rocky bottoms; juvenile often found in estuaries. Feeds mainly on bottom invertebrates.

Distribution: Eastern Atlantic, coast of Europe and Africa from Bay of Biscay to Guinea, including Canary and Cape Verde islands, also throughout the Mediterranean, Black Sea and Sea of Azov, penetrating Suez Canal to Gulf of Suez.



sagitta

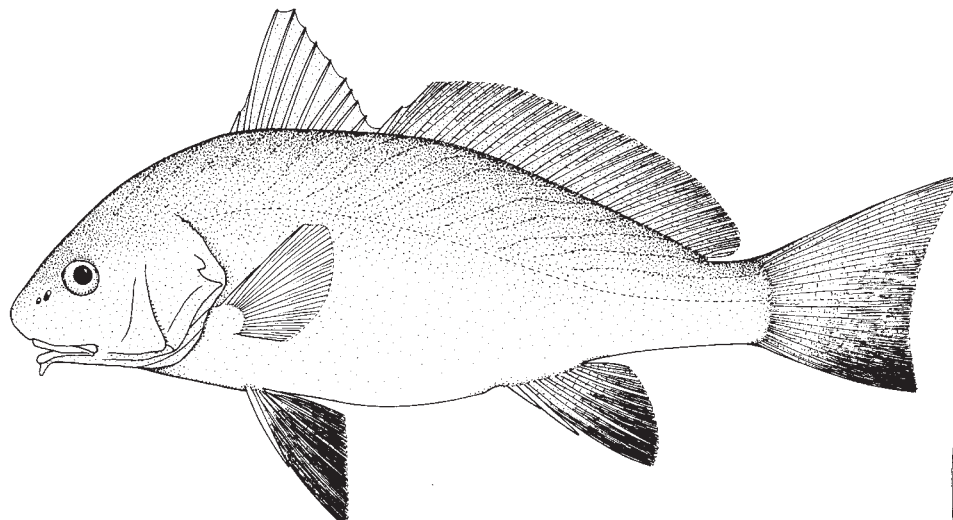
gas bladder



Umbrina ronchus Valenciennes, 1843

Frequent synonyms / misidentifications: *Umbrina fusca* Dardignac, 1958 / None.

FAO names: En – Fusca drum; Fr – Ombrine fusca; Sp – Verrugato fusco.



Diagnostic characters: A large, rather elongate and compressed fish, nape elevated. **Mouth moderately small, inferior**; maxilla reaching beyond middle of eye. Teeth villiform, set in broad bands on jaws. **Chin with a short, blunt, rigid barbel, perforated by a pore at tip**, and 4 mental pores; snout with 10 pores (5 upper and 5 marginal), lower margin of snout deeply notched below marginal pores. Gill rakers short, 11 to 13 (plus 1 or 2 tubercles at either end). Preopercle margin slightly serrated. Spinous dorsal fin with 10 spines, posterior portion with 1 spine and 25 to 27 soft rays; anal fin with 2 spines and 7 rays, second spine long, about half of first soft ray; caudal fin truncate to slightly emarginated.

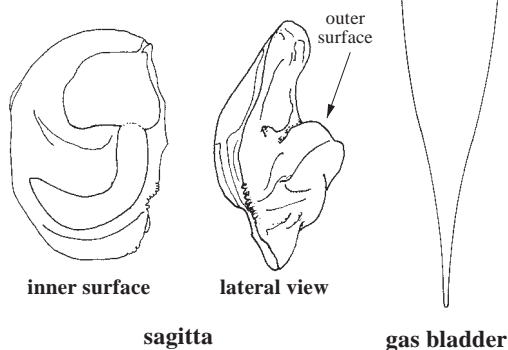
Gas bladder simple, carrot-shaped. Sagitta oval and thick. Scales mostly ctenoid, cycloid on snout and below eyes.

Colour: brownish silvery dark on back with purplish dotted oblique wavy stripes along scale rows, becoming faint with growth. Opercle lining blackish showing a dark blotch externally and at upper corner of gill cover. Distal parts of caudal, anal and pelvic fins darker.

Size: To 80 cm; common to 30 cm.

Habitat, biology, and fisheries: Inshore among rocks and off sandy beaches, from 20 to 200 m depth; juveniles often in littoral areas, but do not enter estuaries. Adults maturing at 3 years, spawning occurs between June and August.

Distribution: Throughout the region, from Gibraltar to Angola, including Canary and Cape Verde islands, also western Mediterranean.



sagitta

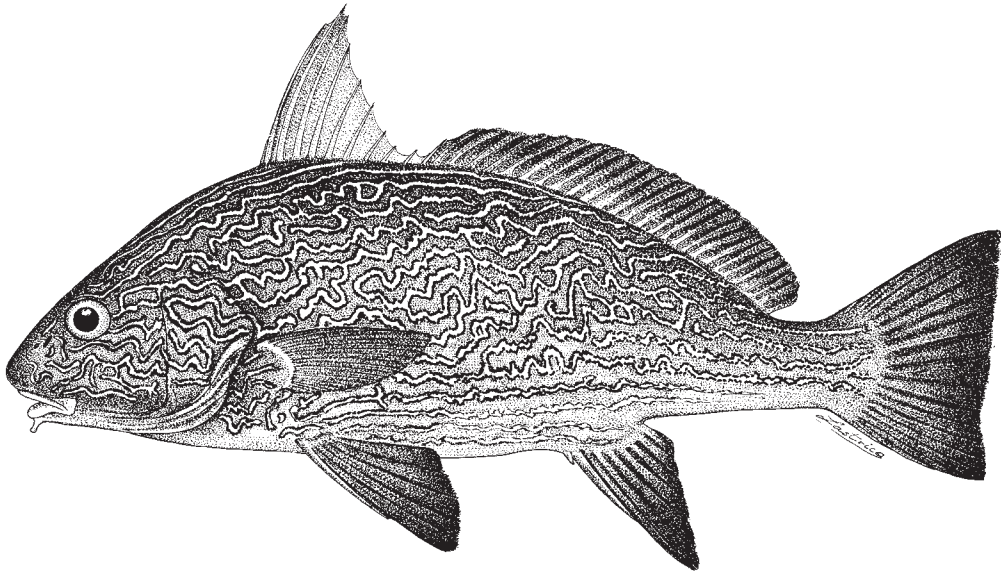
gas bladder



***Umbrina steindachneri* Cadenat 1951**

Frequent synonyms / misidentifications: *Umbrina cirrosa* var. *canariensis* (non Valenciennes) / *Umbrina canariensis*.

FAO names: **En** – Steindachner's drum; **Fr** – Ombrine de Steindachner; **Sp** – Verrugato de Steindachner.



Diagnostic characters: A medium size, deep-bodied and compressed fish, dorsal profile strongly arched. **Mouth moderately small, inferior;** maxilla reaching beyond middle of eye. Teeth villiform, set in broad bands on jaws. **Chin with a short, blunt, rigid barbel, perforated by a pore at its tip** and 4 mental pores; snout with 10 pores (5 upper and 5 marginal). Eye large, 3.5 to 4.0 times in head length. Gill rakers short, 13 to 14. Preopercle margin slightly serrate. **Spinous dorsal fin high, with 10 spines, its tip reaching beyond the third soft ray when depressed,** posterior portion of dorsal fin with 1 spine and 29 to 32 soft rays; anal fin with 2 spines and 7 soft rays, second spine moderate long, two-thirds or more of first soft ray; caudal fin truncate to slightly S-shaped. **Gas bladder simple, carrot-shaped.** Sagitta oval and thick. Scales mostly ctenoid. **Colour:** greyish silver, brownish with oblique stripes along scale rows on back, extend onto head and become faint ventrally. Opercle lining dark grey to black, but not visible externally through gill cover. Distal portions of spinous dorsal, pelvic and anal fins darker.

Size: To 47 cm; common to 25 cm.

Habitat, biology, and fisheries: Not often recorded, inhabits coastal waters from 15 to 100 m depth.

Distribution: West African coast from Mauritania to Angola.

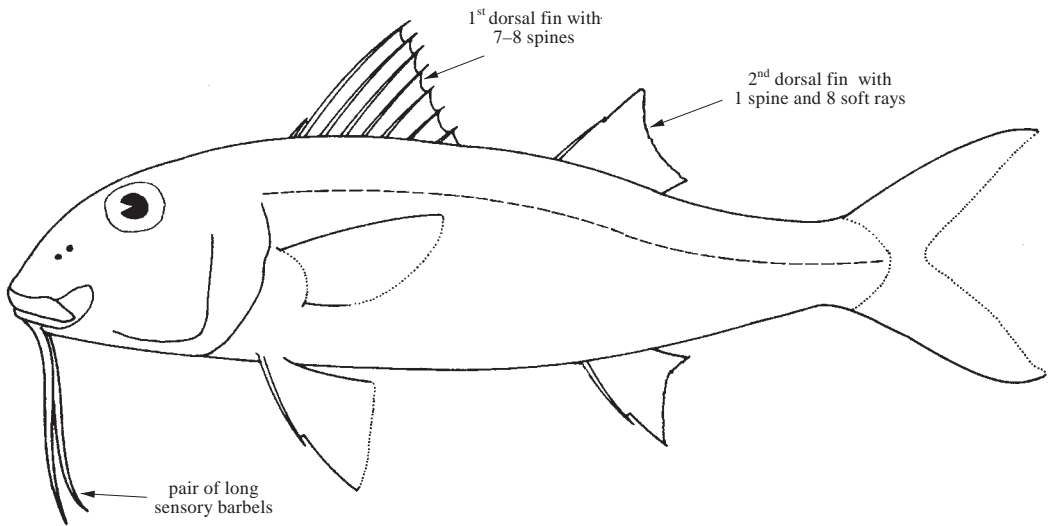


MULLIDAE

Goatfishes, red mullets

by D. Golani, The Hebrew University of Jerusalem, Jerusalem, Israel

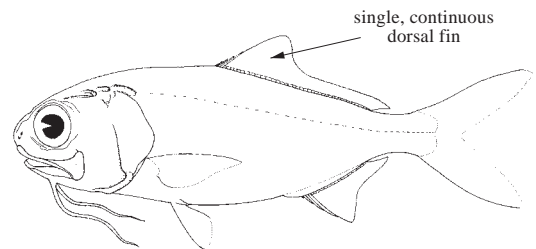
Diagnostic characters: Small to medium-sized fishes (to 60 cm); body moderately elongated and slightly compressed. Eyes on the upper part of head. Mouth horizontal or slightly oblique, located ventral on head; upper jaw slightly protruding, teeth conical or small. **Chin has a pair of long barbels that can be folded back into a median groove on throat.** **Two well-separated dorsal fins, the first higher than the second, with 7 or 8 spines; second dorsal with 1 spine and 7 or 8 soft rays.** Anal fin with 1 spine and 7 or 8 soft rays. Caudal fin forked. Pectoral fin with 13 to 17 soft rays; pelvic fin located below pectoral fin, with 1 spine and 5 soft rays. Scales large and finely ctenoid. Continuous lateral line. **Colour:** predominantly red; some species whitish or brownish with spots, stripes or marks.



Habitat, biology, and fisheries: Goatfishes are demersal fish that occupy sandy or muddy bottom substrates, but also coral or other hard substrates. Found usually in depths to 100 m but some species descend to 400 m. Forage near the sea floor using the long barbel equipped with chemoreceptors to detect prey in the substrate. Food consists mainly of benthic invertebrates and occasionally small fishes as well. Barbels are used in some species also during courtship. Eggs and larvae pelagic and settle on the sea bottom after a few weeks to several months. Goatfishes are highly esteemed fish and considered as an important target species. Caught in the eastern central Atlantic region primarily by trawling; elsewhere also by trammel nets, hook-and-line, traps and spears.

Similar families occurring in the area

Polymixiidae: the only other family with a pair of chin barbels occurring in the eastern central Atlantic. Distinguishable from goatfishes by having a deeper body, a single continuous dorsal fin with 5 spines; anal fin with 4 spines and large eyes with diameter equal to or larger than snout length.








Polymixiidae

Key to the species of Mullidae occurring in the area

- 1a. Teeth present in both jaws; a spine on the upper posterior opercle margin → **2**
- 1b. No teeth in lower jaw; no spine on the opercle → **3**
- 2a. Strong conical teeth, visible when mouth closed in large specimens; 28 to 32 lateral-line scales; body reddish to pink with 3 or 4 longitudinal red to brownish yellow lines ***Pseudupeneus prayensis***
- 2b. Small teeth arranged in 2 or 3 rows, not visible when mouth closed; 34 to 39 lateral-line scales; body whitish grey to light olive-green with yellow stripe from eye to caudal-fin base ***Mulloidichthys martinicus***
- 3a. Head profile steep (in specimens over 12 cm); barbels subequal to pectoral-fin length; body rosy to red without markings on fins ***Mullus barbatus***
- 3b. Head profile less steep; barbels longer than pectoral fin; body red with either several yellow longitudinal stripes or with brown back, first dorsal fin with clear yellow and/or dark marking ***Mullus surmuletus***

List of species occurring in the area

The symbol  is given when species accounts are included.

-  *Mulloidichthys martinicus* (Cuvier, 1829).
-  *Mullus barbatus* Linnaeus, 1758.
-  *Mullus surmuletus* Linnaeus, 1758.
-  *Pseudupeneus prayensis* (Cuvier, 1829).

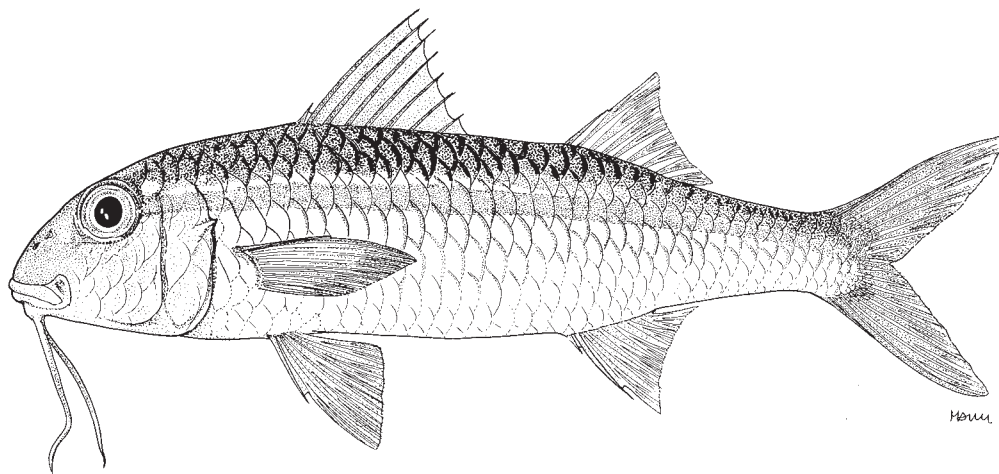
References

- Hureau, J.-C. 1986. Mullidae. In P.J.P. Whitehead, M.-L. Bauchot, J.-C. Hureau, J. Nielsen & E. Tortonese, eds. *Fishes of the northeastern Atlantic and the Mediterranean*, volume II. Paris, UNESCO, pp. 877–882.
- Ben-Tuvia, A. 1981. Mullidae. In W. Fischer, G. Bianchi & W.B. Scott, eds. *FAO species identification sheets for fishery purposes. Eastern Central Atlantic; fishing areas 34, 47 (in part)*, volume III. Rome, Department of Fisheries and Oceans Canada and FAO, (unpaginated).
- Ben-Tuvia, A. 1990. Mullidae. In J.-C. Quéro, J.-C. Hureau, C. Karrer, A. Post & L. Saldanha, eds. *Check-list of the fishes of the eastern tropical Atlantic*. Paris, UNESCO, pp. 827–829.

Mulloidichthys martinicus (Cuvier, 1829)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Yellow goatfish; Fr – Capucin jaune; Sp – Salmonete amarillo.



Diagnostic characters: Body elongate and slightly compressed, depth 3.4 to 4.0 times in standard length. Snout short, blunt and slightly convex. Mouth small, the maxilla not reaching the vertical of anterior edge of eye. Small teeth on both jaws in 3 anterior rows, narrowing to 2 on sides of jaw, ending in 1 row at the back of the jaw. No teeth on vomer or palatines. A pair of long barbels on chin. Short spine on the posterior margin of opercle. First dorsal fin much higher than second with 8 spines, first spine very small. Second dorsal fin shorter with 1 spine and 8 soft rays. Anal fin with 1 spine and 7 soft rays. Pectoral fin with 15 to 17 rays. Lateral-line scales 34 to 39. Gill rakers 28 to 33. **Colour:** whitish grey to light olive-green body, dorsal light blue to grey. Bright yellow stripe from eye to caudal-fin base. All fins yellow.

Size: Maximum to 40 cm; common to 28 cm.

Habitat, biology, and fisheries: Found in shallow waters (to 70 m) usually in schools of various sizes. Feeds mainly at night on benthic invertebrates, including polychaetes, molluscs and crustaceans. Single individuals caught; too rare for commercial importance in the eastern central Atlantic.

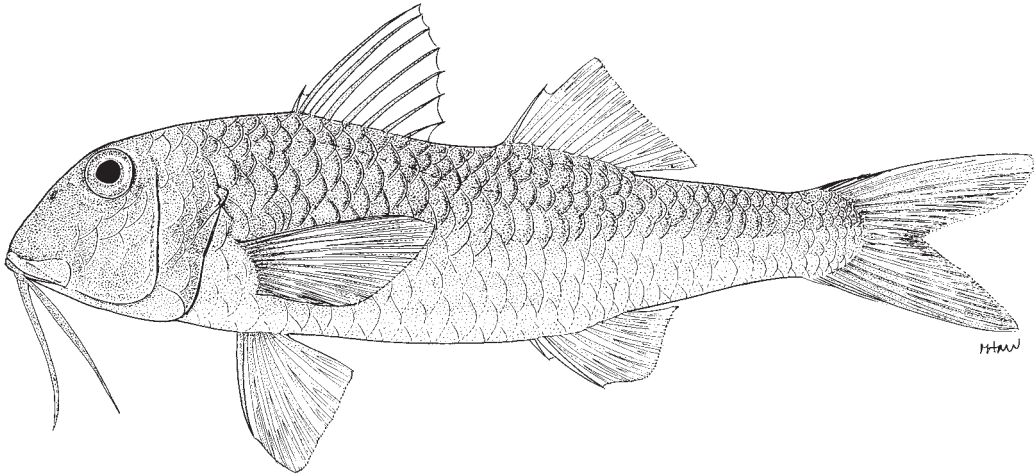
Distribution: In the eastern central Atlantic found rarely at islands. Not yet known from the African coastline. Elsewhere in the western Atlantic from Bermuda and Florida to Brazil.



***Mullus barbatus* Linnaeus, 1758**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Red mullet; Fr – Rouget de vase; Sp – Salmonete de fango.



Diagnostic characters: Body moderately elongated and slightly compressed; the depth 3.5 to 4.3 times in standard length. **Snout short, head profile steep (in fish longer than 12 cm).** Mouth small, ventral on head; **maxilla reaching vertical anterior of eye.** Small villiform teeth in lower jaw; **no teeth in upper jaw; minute teeth on vomer and palatines.** A pair of barbels on chin, subequal to pectoral-fin length. **No spine on the opercle.** First dorsal fin with 8 spines (rarely, 7); first spine very short. Second dorsal fin with 1 spine and 8 soft rays. Anal fin with 1 spine and 7 or 8 soft rays. Pectoral rays 16 or 17. Lateral-line scales 32 to 36. Gill rakers 22 to 25. **Colour:** rosy to reddish, fins light pink to almost transparent without marking.

Size: Maximum to 30 cm; common from 10 to 22 cm.

Habitat, biology, and fisheries: Demersal on sandy or muddy substrate to 300 m. Feeds on benthic and sub-benthic invertebrates. Spawning season in spring and summer. Caught by trawl. An important target species. No separate statistics for species of *Mullus* are given.

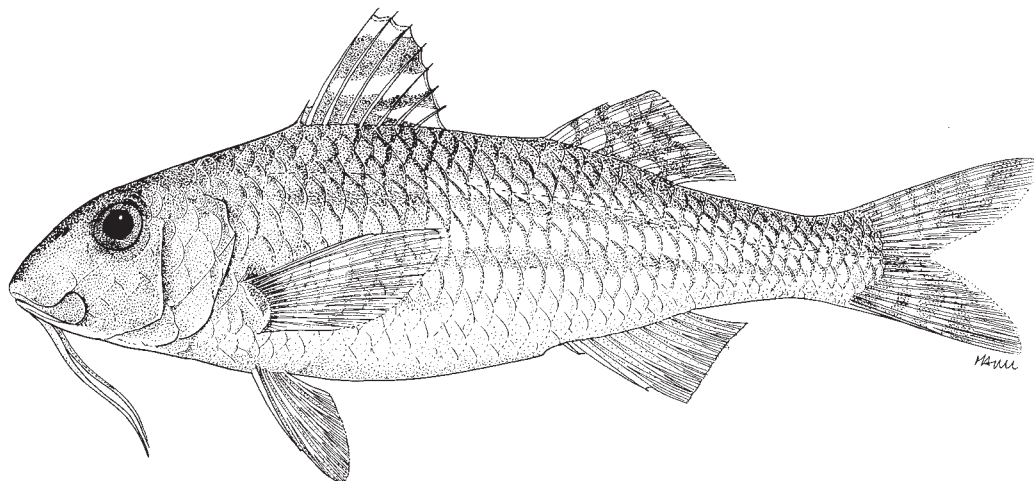
Distribution: Scandinavia to Senegal, the entire Mediterranean and the Black Sea.



Mullus surmuletus Linnaeus, 1758

Frequent synonyms / misidentifications: None / None.

FAO names: En – Surmullet (AFS: Red mullet); Fr – Rouget de roche; Sp – Salmonete de roca.



Diagnostic characters: Body moderately elongate and slightly compressed, the depth 3.5 to 4.3 times in standard length. **Snout not very steep.** Small mouth inferior in position, **maxilla reaching below anterior vertical of eye.** Small villiform teeth on lower jaw. **Very small teeth on palatines and vomer.** A pair of barbels on chin; barbels longer than pectoral fin in large specimens. **No spine on the opercle.** First dorsal fin with 8 spines (rarely, 9), first spine very small. Second dorsal fin with 1 spine and 7 or 8 soft rays. Anal fin with 1 spine and 7 or 8 soft rays. Pectoral fin with 15 to 17 soft rays. Lateral-line scales 33 to 36. Gill rakers 23 to 26. **Colour:** This fish has 2 distinct colour patterns: in coastal habitats near rocks, brown back turning reddish brown toward the ventral surface, with brown outlines of scales. In open deeper substrates, red with several yellow longitudinal stripes. In both colour patterns, the first dorsal fin displays distinct yellow or dark markings.

Size: Maximum to 40 cm; common from 10 to 22 cm.

Habitat, biology, and fisheries: Demersal on sandy, often near rocks, and muddy substrates to depths of 300 m. Feeds chiefly on benthic crustaceans and other invertebrates. Spawning season from late winter to summer. Caught by trammel nets and trawling. No separate statistics for species of *Mullus* are given.

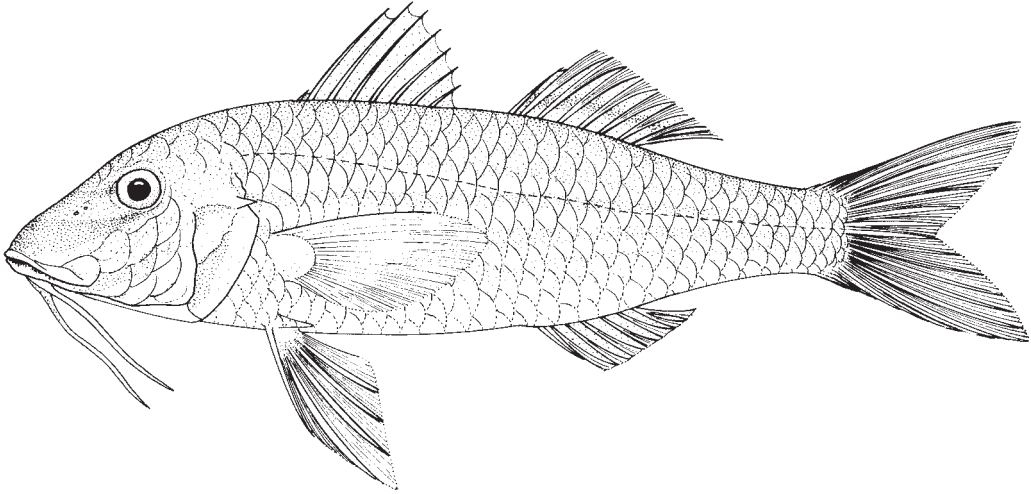
Distribution: From the North Sea to Senegal, the entire Mediterranean and the Black Sea.



***Pseudupeneus prayensis* (Cuvier, 1829)**

Frequent synonyms / misidentifications: None / None.

FAO names: En – West African goatfish; Fr – Rouget du Sénégal; Sp – Salmonete barbudo.



Diagnostic characters: Body moderately elongate and slightly compressed, the depth 3.5 to 4.0 times in standard length. **Snout somewhat pointed, head profile gently convex.** Mouth inferior in position, **maxilla not reaching anterior vertical of eye.** **Strong conical teeth in both jaws.** No teeth on roof of mouth. One pair of long barbels on the chin. **One spine on the posterior opercle margin.** First dorsal fin has 8 spines and is only slightly higher than second dorsal fin, which has 1 spine and 8 soft rays. Anal fin with 1 spine and 7 or 8 soft rays. Pectoral fin has 15 or 16 soft rays. Lateral-line scales 28 to 32. Gill rakers 22 to 26. **Colour:** pinkish red with 3 or 4 longitudinal darker red to brownish yellow lines.

Size: Maximum to 55 cm; common to 35 cm.

Habitat, biology, and fisheries: Muddy or sandy substrate to depths of 300 m, but usually found in the upper 50 m. Feeds on benthic invertebrates. Caught mainly by trawling, occasionally by trammel and entangling nets.

Distribution: Morocco to Angola, vary rarely found in the western Mediterranean.

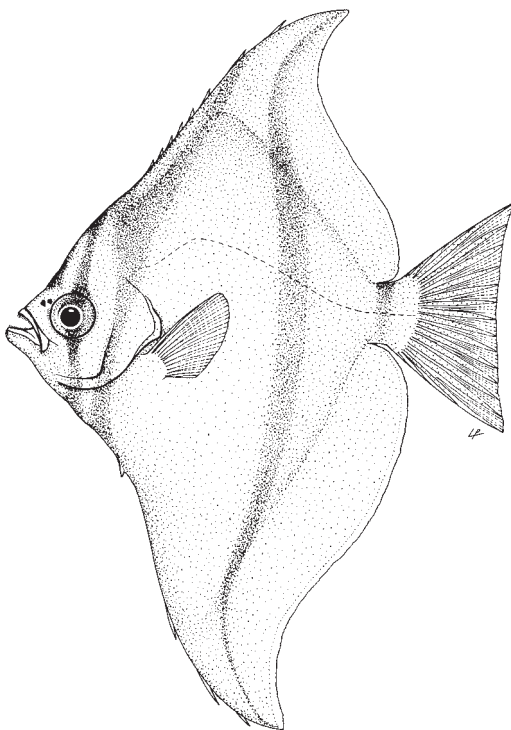


MONODACTYLIDAE**Moonfishes (fingerfishes)**

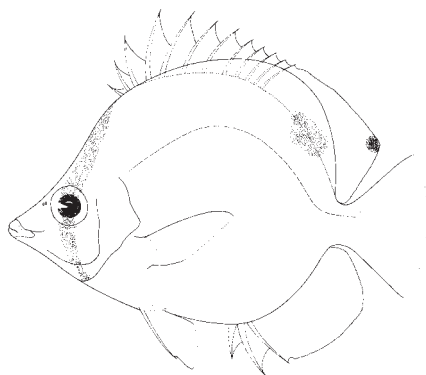
M. Desoutter, Muséum National d'Histoire Naturelle, Paris, France

A single species occurring in the area***Monodactylus sebae* (Cuvier, 1829)****Frequent synonyms / misidentifications:** *Psettias sebae* (Cuvier, 1829); *Psettus sebae* Cuvier, 1829 / None.**FAO names:** En – African moony; Fr – Breton africain; Sp – Rambali.

Diagnostic characters: Body very deep, depth about equal to length without tail, strongly compressed laterally. Forehead profile very steep. Head small with large eyes; snout obtuse. Mouth small, oblique, lower jaw protruding, maxilla reaching level of front edge of pupil. Bands of villiform teeth in jaws, and granular teeth on tongue, vomer and palatines. Preopercle edge mostly smooth. **Dorsal and anal fins long-based, triangular, greatly elevated anteriorly. A single dorsal fin with 7 or 8 graduated spines, only the extremity of spines visible and 32 to 38 soft rays. Anal fin with 3 spines and 36 to 38 soft rays;** pectoral fins short with 16 to 18 rays; **pelvic fins very small and rudimentary in the adults** and present in the juveniles. Small scales covering the body, head and base of dorsal and anal fins, about 50 tubular scales in lateral line. **Colour: silvery grey with 4 dark brown to blackish vertical bands**, 1 through eye, 1 from anterior edge of dorsal fin to anterior edge of anal fin, another from tip of elevated dorsal fin to tip of anal fin, and 1 across caudal peduncle; fins translucent to dusky black.

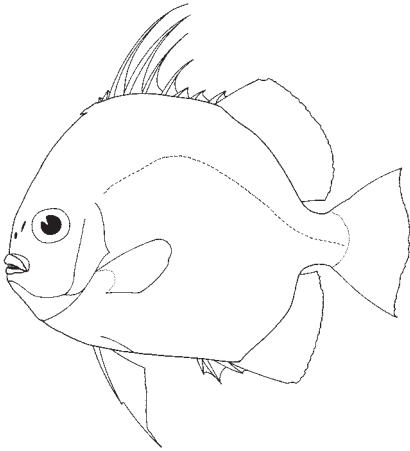
**Similar families occurring in the area**

Chaetodontidae: dorsal and anal fins not greatly elevated; pelvic fins not rudimentary; dorsal fin with 11 to 13 spines visible and less than 25 soft rays.

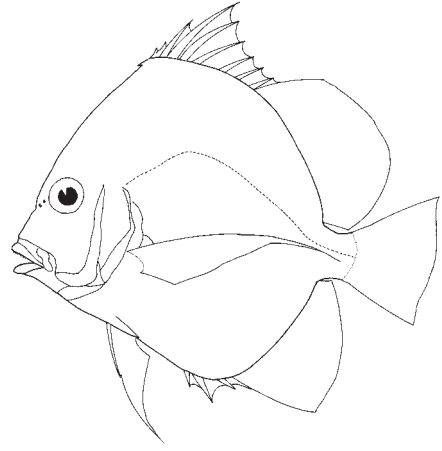
**Chaetodontidae**

Ephippidae: a deep notch between spiny and soft parts of dorsal fin; 1 or more dorsal spines prolonged into filaments; dorsal and anal fins not greatly elevated; pelvic fins not rudimentary; soft dorsal and anal-fin rays 15 to 20 rays.

Drepanidae: a deep notch between spiny and soft parts of dorsal fin; pectoral fins falcate and very elongate, reaching nearly to base of caudal fin; pelvic fins not rudimentary.



Ephippidae



Drepanidae

Size: Maximum size 25 cm total length, common to 15 cm.

Habitat, biology, and fisheries: Inhabits shallow marine waters but mainly estuaries and mangroves; enters lagoons and estuaries; the lower reaches of freshwater streams. Also occurs in the sea, particularly in shallow embayments and in harbours in the vicinity of wreckage, wharf pilings, and stone jetties. Found in schools composed of several hundred individuals. Feeding shrimps and zooplankton. No data about spawning. No separate statistics reported for this species which is not considered to be commercially important but this species may be important in the aquarium trade. Caught mainly with cast and seine nets next to shore. Marketed fresh, but not often seen in markets.

Distribution: Along the West African coast from Senegal to Angola, and the Canary Islands.



DREPANEIDAE

Sicklefish

by P.C. Heemstra, South African Institute for Aquatic Biodiversity, Grahamstown, South Africa

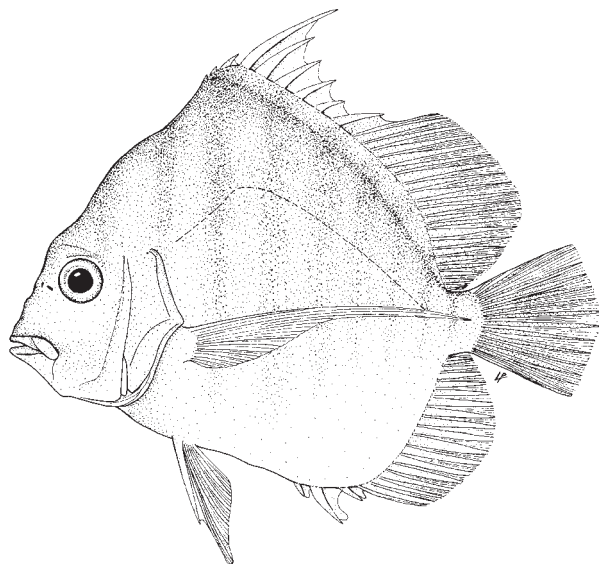
A single species occurring in the area.

Drepane africana Osorio, 1892

Frequent synonyms / misidentifications: *Drepane luna* (Cope, 1867) / None.

FAO names: En – African sicklefish; Fr – Forgeron ailé; Sp – Catemo africano.

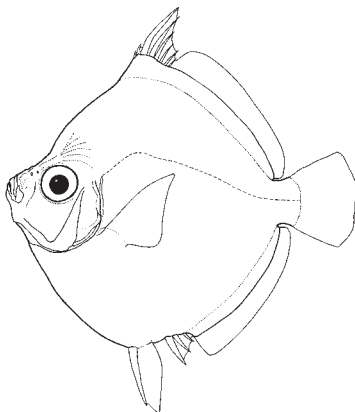
Diagnostic characters: Body deep, rhomboid, strongly compressed; its depth about twice head length (size to about 50 cm). Forehead profile very steep; interorbital space slightly convex; lower edge of preopercle finely serrate; mouth small, upper jaw protrusile, lips fleshy; jaws with bands of slender, brush-like teeth, palate toothless. **Dorsal fin notched between spinous and soft portions, with 8 or 9 spines and 20 or 21 soft rays; anal fin with 3 distinct spines and 17 to 19 soft rays; pectoral fins falcate and very elongate, with 15 to 17 rays, reaching nearly to base of caudal fin;** caudal fin slightly rounded, bluntly wedge-shaped, or double emarginate, middle rays longest. Scales finely ctenoid, moderate in size, about 45 to 48 in lateral line. **Colour:** primarily silvery white, darker dorsally; a series of about 8 vertical dark bars frequently present but often faint on sides.



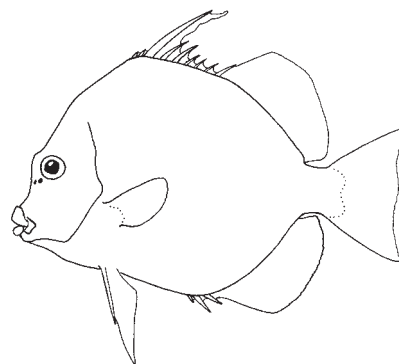
Similar families occurring in the area

Antigoniidae: pectoral fins bluntly pointed, shorter than head, with 13 to 15 rays; dorsal-fin rays 32 to 36; anal-fin rays 29 to 33; caudal fin with 10 branched rays.

Ephippidae: pectoral fins shorter than head and rounded; upper jaw not protrusile.



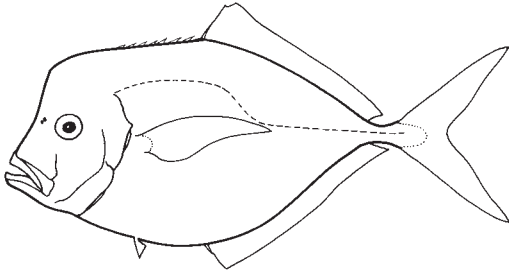
Antigoniidae



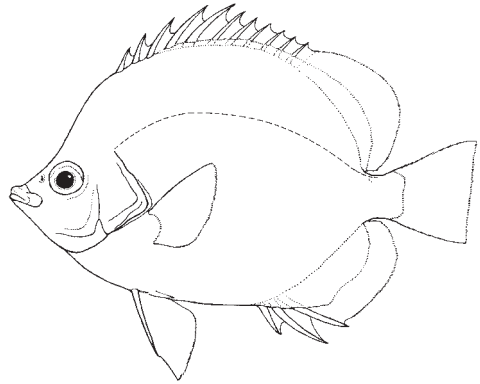
Ephippidae

Carangidae: *Selene dorsalis* and juvenile *Alectis* spp. are very compressed, but they have forked caudal fins and greatly elongated dorsal-fin spines and anterior anal-fin rays.

Chaetodontidae: no deep notch in dorsal fin between spinous and soft-rayed parts; dorsal-fin spines 11 to 13; pectoral fin not reaching much past anal-fin origin; front head profile concave.



Carangidae



Chaetodontidae

Size: Maximum to 40 cm; common to 30 cm.

Habitat, biology, and fisheries: Demersal fish. Locally abundant on some sandy or sandy-mud trawling grounds at depths between about 20 and 50 m. Sometimes occurs in large schools. Feeds primarily on small benthic invertebrates. Commercially important in some countries (Nigeria). Caught mainly with trawl gear and purse seines. Marketed fresh or dried-salted; flesh excellent.

Distribution: Mauritania to Angola, São Tomé, Cape Verde Islands.



Reference

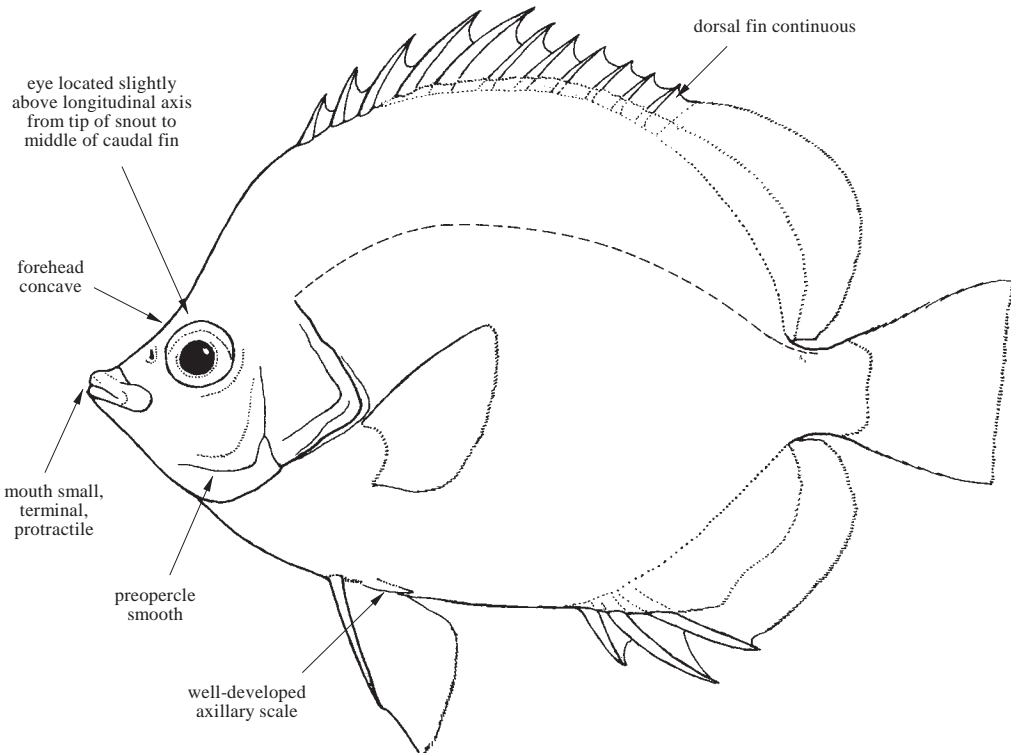
Lloris, D. & Rucabado, J. 1987. Revisión sistemática y distribución geográfica de la Familia Drepanidae (Pisces, Osteichthyes). *Museo de Zoología Miscellaneous Publication*, 11: 277–288.

CHAETODONTIDAE

Butterflyfishes

by N. Bailly, Muséum National d'Histoire Naturelle, Paris, France, and the World Fish Center, Los Baños, Philippines

D **Diagnostic characters** (referring only to Eastern Central Atlantic species): Small to medium-sized fishes (maximum total length 27 cm), with body deep and strongly compressed, orbicular in shape (excluding fins). Head small, about as high as long with **forehead from nape to snout tip clearly concave**; **preopercle smooth never with a strong spine at angle**. **Eye small to medium, located just on or slightly above longitudinal axis from tip of snout to middle of caudal fin**. Snout short to slightly elongated, pointed. Mouth small, terminal, protractile, the gape not extending to anterior rim of orbit. **Teeth setiform, villiform, or bristle-like, usually arranged in brush-like bands on jaws**; no teeth present on roof of mouth (palatine and vomer). Six or 7 branchiostegal rays with gill membranes narrowly attached to isthmus; pseudobranchiae present; 15 to 18 short gill rakers. A single dorsal fin with 11 to 13 strong, stout spines, and 19 to 24 soft branched rays; no procumbent (forward pointing) spine in front of dorsal fin; continuous; first few to several interspinous membranes deeply incised; no extremely elongated ray or short horizontal filamentous extension of ray. Anal fin with 3 strong, stout spines, and 15 to 19 soft rays; interspinous membranes deeply incised; margin usually rounded but sometimes angular. Pectoral fins with 13 to 16 soft rays. Pelvic fins with 1 stout spine and 5 branched rays. Caudal fin rounded, truncated to slightly emarginated, usually with 17 principal rays, 15 of which are branched. Scales ctenoid, rounded to angular in shape; covering head, body, extending onto soft portions of vertical fins; small to medium-sized, largest in centre of body, smaller on head, thorax, belly, caudal peduncle, and median fins; **well-developed axillary scaly process present at upper base of pelvic-fin spine**; lateral-line scales 39 to 46, extending to or nearly to base of caudal fin or ending near base of dorsal fin soft part; 6 to 11 series of scale rows from origin of dorsal fin to lateral line; 17 to 23 series of scale rows from origin of anal fin to lateral line. Twenty-four vertebrae (11 + 13). Supraoccipital crest, predorsal bones, and first dorsal pterygiophore articulated. Pelagic larvae with bony plates in head region present, called the 'tholichthys'. **Colour:** in the area, white, white with various yellow to brownish patterns, yellow, brownish and black, bicoloured or with 1 or 4 vertical dark bars; **the eye is obscured within a dark vertical ocular bar or dark region on the head**.

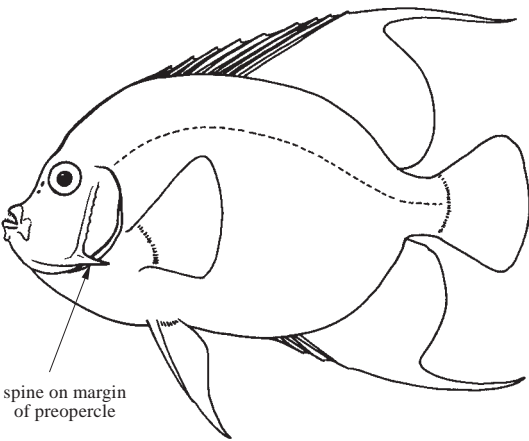


Habitat, biology, and fisheries: Predominantly littoral coral reef or rocky bottom fishes in tropical to warm-temperate waters. In the area, they occur between 0 and 150 m, and they also occur above soft bottoms. Usually live in pairs, but also single, or in small to larger groups (more frequently in juveniles). They feed diurnally on coral polyps (in reef areas), colonial sea anemones (zoantharians), tentacles of tube worms, and other bottom invertebrates and algae. Because of their relatively small size, they have little value as foodfishes but they do have current or potential commercial value as aquarium fishes.

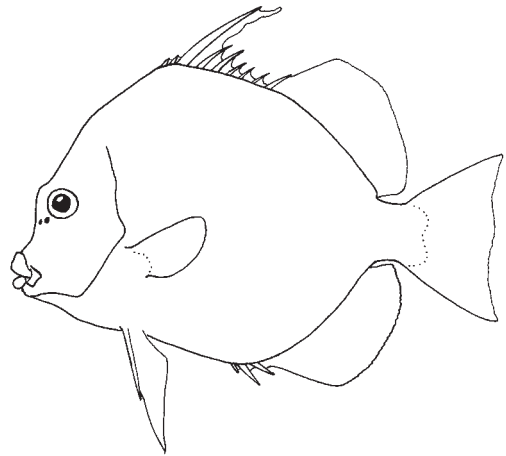
Similar families occurring in the area

Pomacanthidae: similar in general body shape and colour pattern to Chaetodontidae, but easily distinguished in having a spine on margin of preopercle. Also, species of Pomacanthidae do not possess a scaly axillary process at base of pelvic fins, nor produced snouts.

Ephippidae: generally less colourful as adults, and distinguished by greatly enlarged dorsal and anal fins as adults.



Pomacanthidae



Ephippidae

Key to the species of Chaetodontidae occurring in the area (excluding St Paul's Rocks)

- 1a. No vertical bars; bicoloured, with brownish head up to dorsal-fin origin to blackish belly backward to anal fin posterior tip, and upper-side and caudal peduncle white (Fig. 1); snout slightly elongated ***Prognathodes dichrous***
- 1b. One to 4 dark vertical bars; the first bar is on eye; snout short or slightly elongated → 2

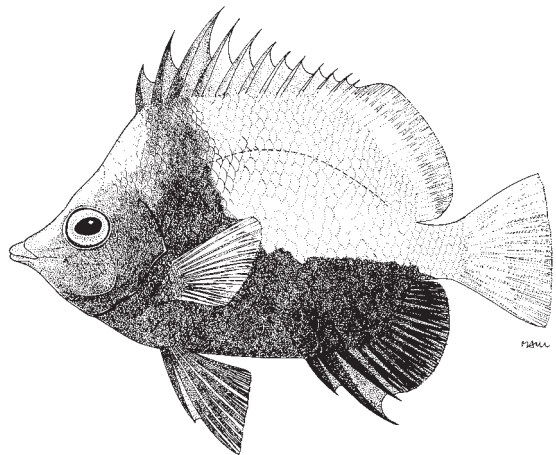


Fig. 1 *Prognathodes dichrous*

- 2a. Four dark vertical bars, the first and fourth black, the second and third brownish (all black when dead); the fourth on the caudal peduncle (and on the posterior dorsal-fin border when dead); a blacker spot at the top of the third bar at the junction of the dorsal fin spinous and soft parts (included in bar when dead); black first bar extending downward from nape to eye, continuing downward to lower border of opercle; pelvic fin fully yellow; snout short (Fig. 2) ***Chaetodon hoefleri***
- 2b. One to 3 black vertical bars, no bar on caudal peduncle; snout short or shortly elongated → 3
- 3a. Three dark vertical bars (Fig. 3); first black bar extending downward from nape to eye, continuing downward to lower border of opercle; the 2 following bars wider than the first bar; the second 1 greyish with yellow borders down to below the pectoral fin; the third the widest and brownish on soft part of the dorsal fin and the caudal peduncle; first dorsal spines, anal and pelvic fins full yellow; snout slightly elongate ***Chaetodon robustus***
- 3b. One or 2 dark vertical bars; snout short or slightly elongate → 4

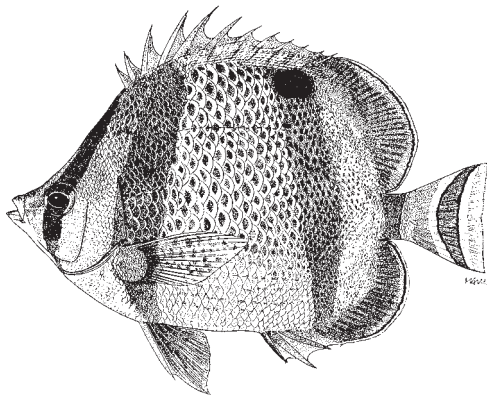


Fig. 2 *Chaetodon hoefleri*

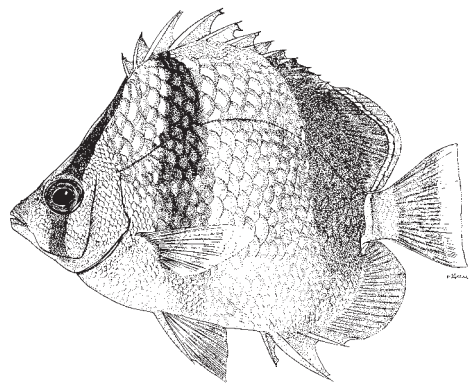


Fig. 3 *Chaetodon robustus*

- 4a. Two dark vertical bars; first black bar extending from nape downward to the eye, continuing shortly almost horizontally to the mouth gape; pelvic fins plain yellow; snout slightly elongated (Fig. 4) ***Prognathodes marcellae***
- 4b. One brownish vertical bar extending from nape downward to eye, continuing further down but not reaching the lower border of opercle; pelvic fins white, border of dorsal and anal, and caudal peduncle yellow; snout short (Fig. 5) ***Chaetodon sanctaehelenae***

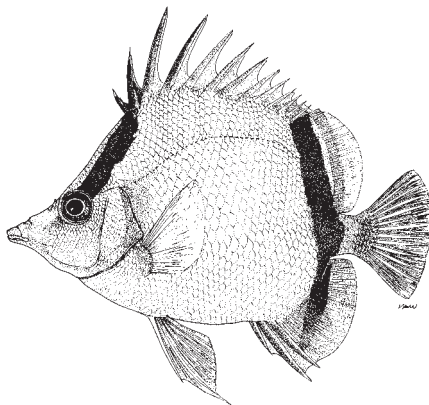


Fig. 4 *Prognathodes marcellae*

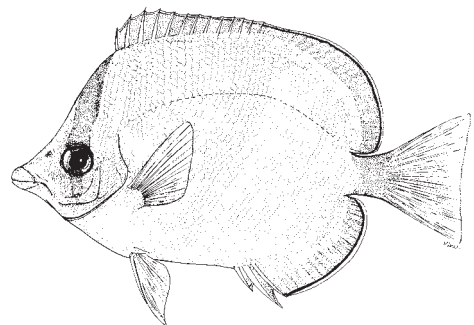




Fig. 5 *Chaetodon sanctaehelenae*

List of species occurring in the area

The symbol  is given when species accounts are included.


 *Chaetodon hoefleri* Steindachner, 1881.

 *Chaetodon robustus* Günther, 1860.

 *Chaetodon sanctaehelenae* Günther, 1868.

Chaetodon striatus Linnaeus, 1758, St Paul's Rocks.

 *Prognathodes dichrous* (Günther, 1869).

 *Prognathodes marcellae* (Poll, 1950).

Prognathodes obliquus (Lubbock and Edwards, 1980).

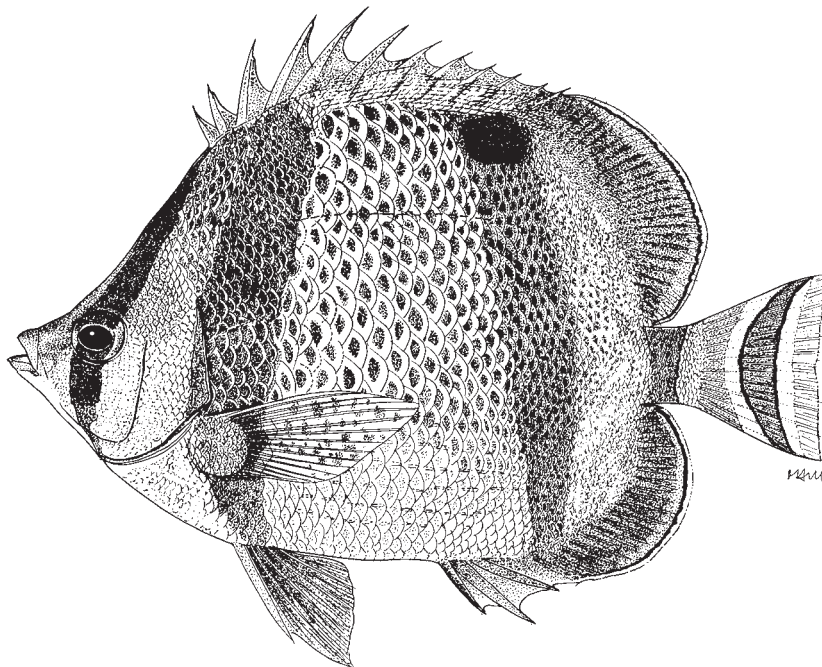
Reference

Allen, G.R., Steene, R.C. & Allen, M. 1998. *A guide to angelfishes and butterflyfishes*. Odyssey Publishing/Tropical Reef Research, 250 p.

***Chaetodon hoefleri* Steindachner, 1881**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Four-banded butterflyfish.



Diagnostic characters: **Snout short.** Dorsal fin with 11 spines and 21 to 24 soft rays; anal fin with 3 spines and 16 or 18 soft rays. Pectoral fin moderate, with 14 or 16 rays. Lateral-line scales 39 to 45. **Colour:** body yellowish with scale edges darkly marked (whitely marked when dead); **4 dark vertical bars**, the first and fourth black, the second and third brownish (all black when dead); the fourth on the caudal peduncle (and on the posterior dorsal-fin border when dead); a blacker spot at the top of the third bar at the junction of the dorsal fin spinous and soft parts (included in bar when dead); first black bar extending downward from nape to eye, continuing downward to lower border of opercle; dorsal and anal fins yellowish with a thin black line bordering their posterior edge; pectoral fins clear; pelvic fin full yellow; caudal fin almost orange with white-hyaline vertical bar and edge.

Size: Maximum total length about 27 cm, most commonly up to 17 cm.

Habitat, biology, and fisheries: Coastal species from 10 to 150 m, most commonly from 20 to 75 m; prefers hard or rocky substrate, but also trawled on sandy or muddy bottoms. Solitary or comes in pairs when adults, possibly gregarious when young. Feeds on bottom invertebrates. Aquarium trade from capture.

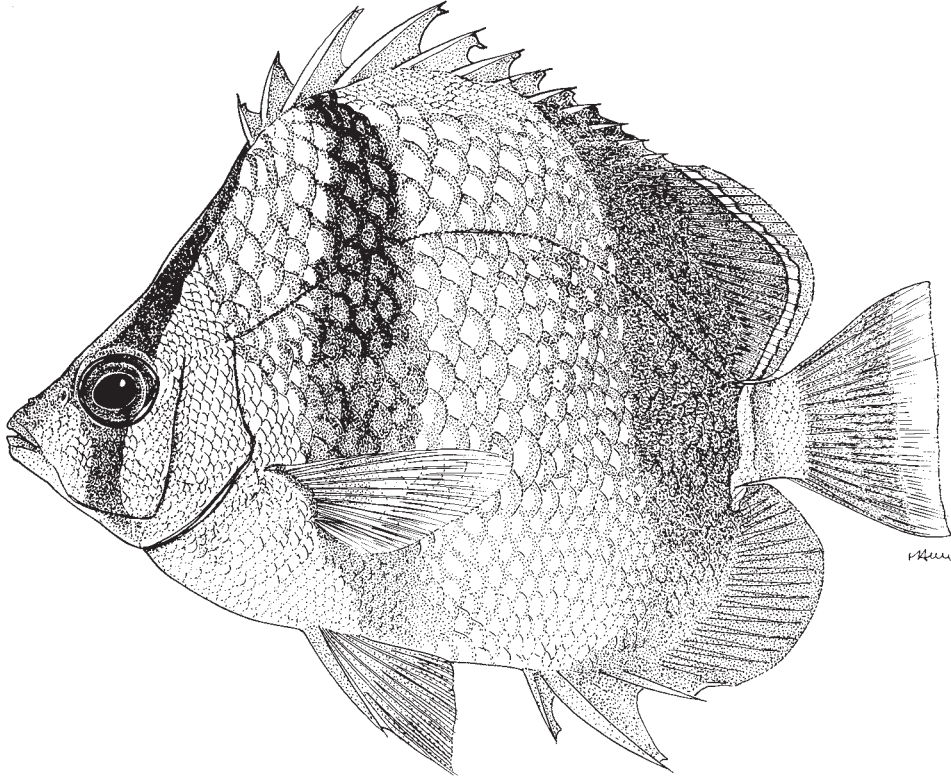
Distribution: Canary Islands, Mauritania (Cape Blanc and Levrier Bay) to southern Angola, Cape Verde Islands, São Tomé and Príncipe Islands. Two records in the Mediterranean. Records from Morocco to be confirmed but most probable.



***Chaetodon robustus* Günther, 1860**

Frequent synonyms / misidentifications: None / None.

FAO names: None.



Diagnostic characters: Snout slightly elongated. Dorsal fin with 11 spines and 21 to 24 soft rays. Anal fin with 3 spines and 16 or 17 soft rays. Pectoral fin moderate, with 15 rays. Lateral-line scales 38 to 42. **Colour:** body white with scale edges yellow; **3 dark vertical bars**; first black bar extending downward from nape to eye, continuing downward to lower border of opercle; the 2 following bars wider than the first bar; the second greyish with yellow borders below the lateral line; the third the widest and brownish on soft part of the dorsal fin and the caudal peduncle; first dorsal spines, anal and pelvic fins full yellow; a thin white line bordering the dorsal posterior edge, crossing the caudal peduncle to reach the posterior anal-fin base; caudal fin white-hyaline; pectoral fin clear with yellowish base.

Size: Maximum total length about 14,5 cm.

Habitat, biology, and fisheries: Coastal species, between 30 and 70 m, most commonly between 40 to 50 m. Occurs over rocky areas.

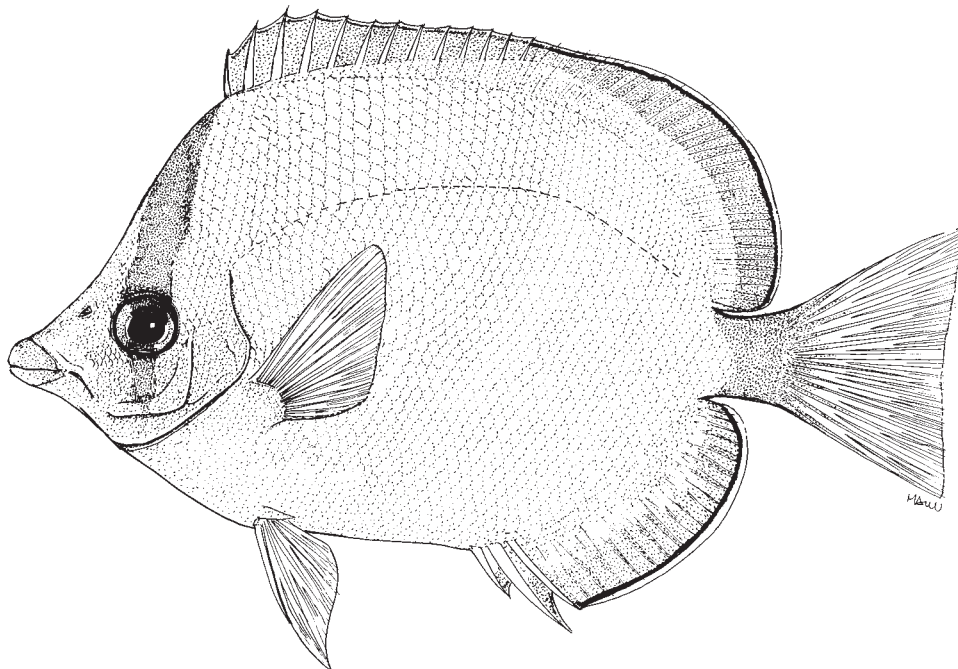
Distribution: Senegal to Gulf of Guinea, Cape Verde Islands, São Tomé Island. Records from Mauritania to be confirmed.



***Chaetodon sanctaehelenae* Günther, 1868**

Frequent synonyms / misidentifications: None / None.

FAO names: En – None.



Diagnostic characters: Snout short. Dorsal fin with 13 spines and 21 or 23 soft rays; anal fin with 3 spines and 19 soft rays. Pectoral fin moderate, with 14 to 15 rays. Lateral-line scales 42 to 46, pores 41 to 45. **Colour:** body white, 1 brownish vertical bar, the first bar, extending downward from nape to eye, continuing downward but not reaching the lower edge of opercle; edge of dorsal and anal fins yellow bordered with black; caudal peduncle yellow and caudal fin hyaline; pectoral fin hyaline; pelvic fins white.

Size: Maximum total length about 18 cm.

Habitat, biology, and fisheries: Littoral species, between 0 and 25 m, most commonly between 0 to 15 m. Usually observed in pairs or large groups; buoyant eggs. Called a cunning fish since it can nibble the bait from a hook without taking the hook into its mouth. The juvenile *Thalassoma sanctaehelenae* (Valenciennes, 1839) has been observed cleaning its parasites.

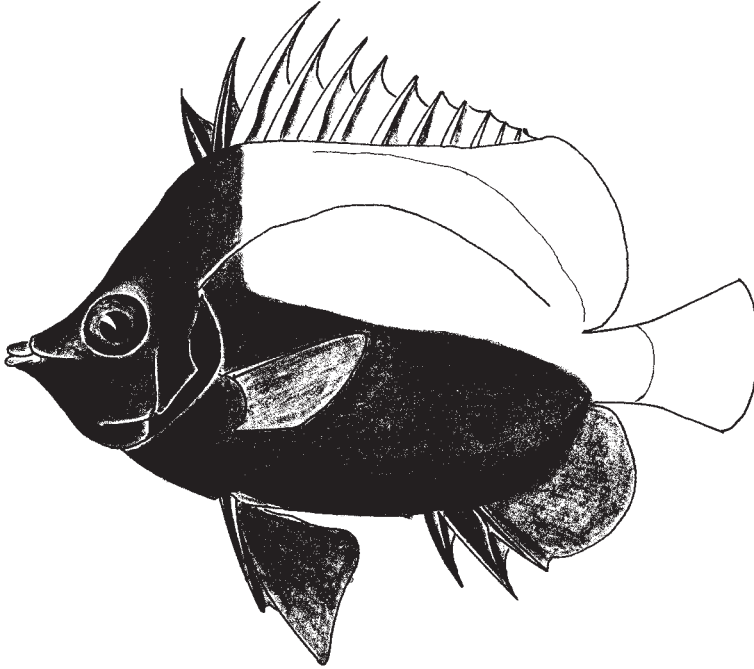
Distribution: Ascension and St Helena Islands. Records from Canary Islands and Liberia.



***Prognathodes dichrous* (Günther, 1869)**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Bicolor butterflyfish.



Diagnostic characters: Snout slightly elongated. Dorsal fin with 12 spines and 19 to 21 soft rays; anal fin with 3 spines and 15 or 16 soft rays. Pectoral fin moderate, with 14 rays. Lateral-line scales 43. **Colour:** no vertical bars; bicoloured, with from head up to dorsal-fin origin brownish and belly backward to anal fin posterior tip blackish, and upper-side and caudal peduncle white. Anal and pelvic fins brownish to dark; dorsal and caudal fins white-hyaline; pectoral fins clear.

Size: Maximum total length about 16 cm.

Habitat, biology, and fisheries: Littoral species, between 3 and at least 120 m, more generally between 15 and 35 m. Occasionally encountered in caves or at the bases of overhangs. Usually occurs in pairs that browse over the rocky substratum in search of benthic invertebrates.

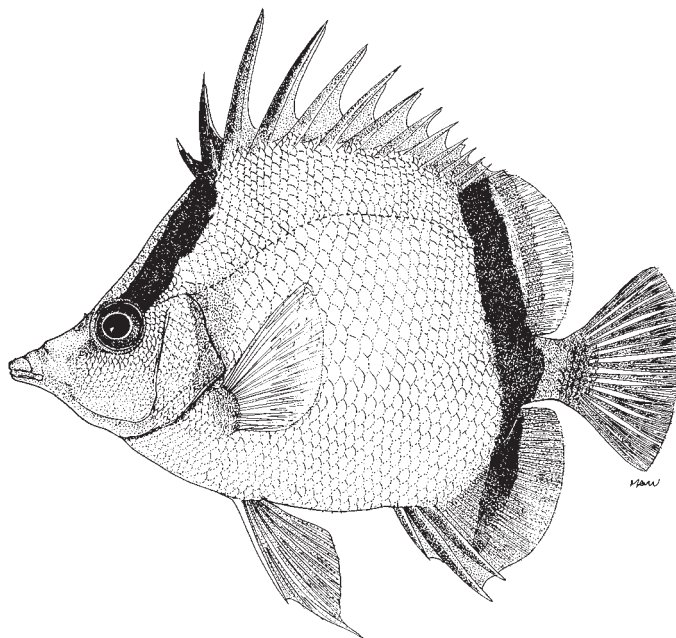
Distribution: Saint Helena and Ascension Islands. Records from Liberia to be confirmed.



***Prognathodes marcellae* (Poll, 1950)**

Frequent synonyms / misidentifications: *Chaetodon marcellae* Poll, 1950; *Chaetodon altipinnis* Cadenat, 1951 / None.

FAO names: En – None.



Diagnostic characters: Snout slightly elongated. Dorsal fin with 13 spines and 19 or 20 soft rays. Anal fin with 3 spines and 15 or 16 rays. Pectoral fins moderate, with 13 or 14 rays. Lateral-line scales 39 to 44. **Colour:** body yellowish with scales visible; **2 dark vertical bars**; first black bar extending downward from nape, **continuing shortly almost horizontally to the mouth gape**; dorsal and anal fins, and caudal peduncle yellow; caudal fin yellow-hyaline; pectoral fins clear; pelvic fins full yellow.

Size: Maximum total length about 14 cm.

Habitats, biology, and fisheries: A coastal species, between 12 and 140 m, most common between 35 and 40 m. Prefers slopes adjacent to cool upwellings but deeper specimens were collected on soft bottoms. Form pairs for breeding.

Distribution: Senegal to Gulf of Guinea, Cape Verde Islands, with reports from Angola.

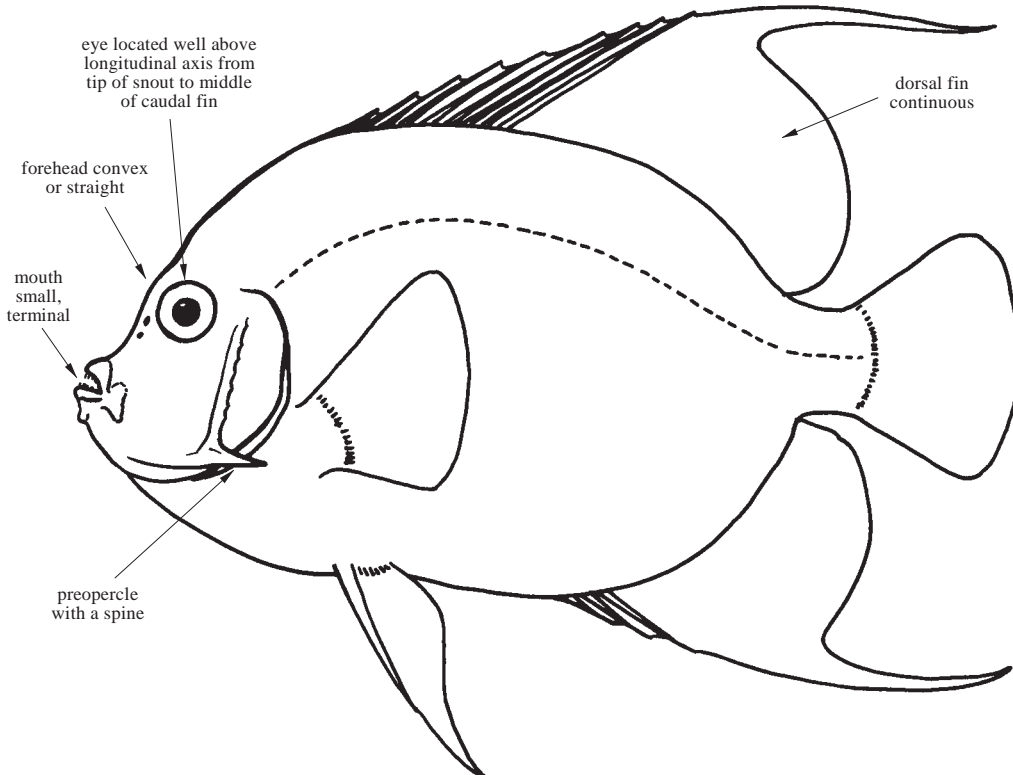


POMACANTHIDAE

Angelfishes

by N. Bailly, Muséum National d'Histoire Naturelle, Paris, France and the World Fish Center, Los Baños, Philippines

D **Diagnostic characters** (referring only to Eastern Central Atlantic species): Small to medium-sized fishes (from 6 to 45 cm), with body deep and strongly compressed, oblong to oval in shape. Head small, about as high as long with **forehead from nape to snout convex or straight**; **1 prominent spine at angle of preopercle**. Eye small to medium, **located above longitudinal axis from tip of snout to middle of caudal fin**. **Snout short, not produced**. Mouth small, terminal, protractile, gape not extending to anterior rim of orbit. **Teeth setiform, villiform or bristle-like, usually tricuspid, usually arranged in brush-like bands on jaws**; no teeth present on roof of mouth (palatine and vomer). Nine to 25 short gill rakers. **A single dorsal fin with 9 to 15 strong, stout spines and 15 to 33 branched rays**; no procumbent (forward pointing) spine in front of dorsal fin, **fin continuous and relatively smooth** with no notch between spinous and soft parts; first few to several interspinous membranes deeply incised; some species with filamentous extension of 1 or more soft dorsal-fin rays at dorsoposterior margin of fin. Anal fin with 3 strong, stout spines, and 14 to 25 branched rays; interspinous membranes deeply incised; some species with filamentous extension of 1 or more soft anal-fin rays at ventroposterior margin of fin. Caudal fin rounded. Pectoral fins with 16 to 21 soft rays. Pelvic fins with 1 stout spine and 5 soft branched rays. Scales coarsely ctenoid, rounded to angular in shape; covering head, body, and extending onto soft portions of vertical fins; small to medium-sized, largest in centre of body, smaller on head, thorax, belly, caudal peduncle, and vertical fins; number of lateral-line scales variable, ranging from 30 to 90 (depending on genus); **no axillary scaly process at pelvic-fin base**. Lateral line complete or missing a few scales at downward curvature below soft dorsal fin. **Larval stage without 'tholichthys' plates (of Chaetodontidae)**. Vertebrae 10+14. **Colour: species brightly coloured with complex and varied colour patterns; juveniles of *Pomacanthus* with alternating black, blue, and white vertical bands, strikingly different in colour from adults, which vary from species to species.**

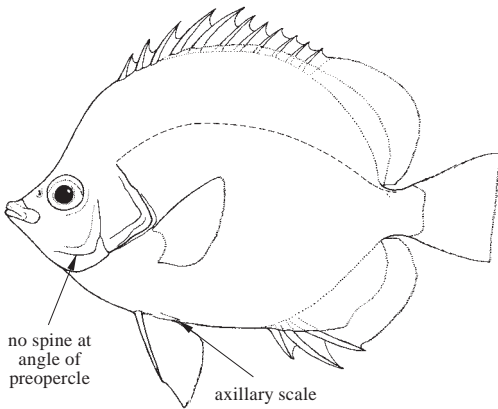


Habitat, biology, and fisheries: Predominantly coral reef or littoral rocky bottom fishes in tropical waters. Most species closely associated with the substratum, adults feeding on sponges and other marine invertebrates, and juveniles principally algae with some small benthic invertebrates. Although sometimes harvested as foodfish, the primary fishery value of Pomacanthidae is through the ornamental marine aquarium trade, where they are the second most-frequently exported fish by number, and highest in total value of all families of aquarium fishes in trade.

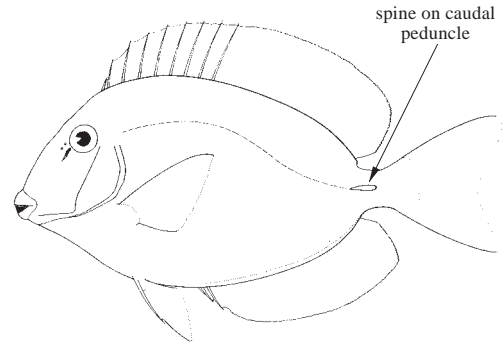
Similar families occurring in the area

Chaetodontidae: similar in general body shape and colour pattern to Pomacanthidae, but easily distinguished in lacking the spine on margin of preopercle. Also, species of Chaetodontidae possess a scaly axillary process at base of pelvic fins, usually have dark ocular bands and false-eye spots, and often have produced snouts.

Acanthuridae: similar general body shape and some species with bright colours; however, species of Acanthuridae can easily be distinguished by the presence of a fixed or retractable sharp spine on the caudal peduncle, and lack of spines at angle of preopercle. Also, Acanthuridae typically have fewer dorsal-fin spines (4 to 9) than most species of Pomacanthidae.



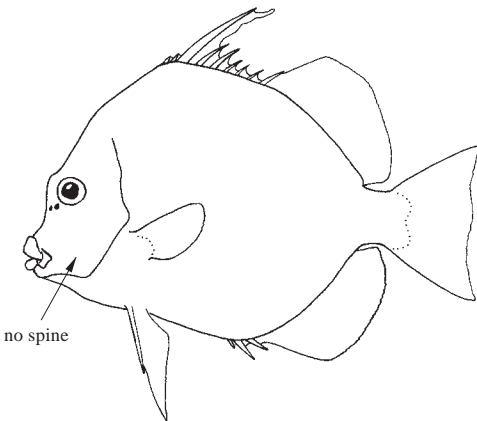
Chaetodontidae



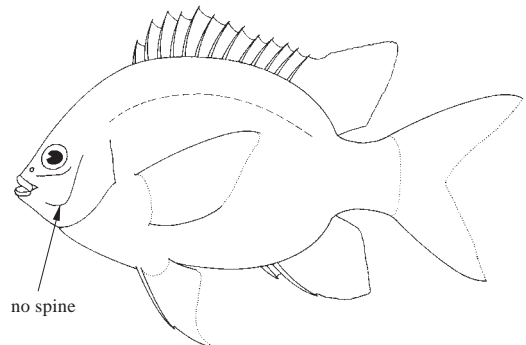
Acanthuridae

Ehippidae: lack spines at angle of preopercle; generally less colourful as adults, and distinguished by greatly enlarged dorsal and anal fins as adults.

Pomacentridae: superficially resemble species of *Centropyge*, but lack spines at angle of preopercle.



Ehippidae




Pomacentridae

Key to the species of Pomacanthidae occurring in the area (not including St Paul's Rocks)

- 1a.** Body elongated with head rounded; no filamentous extension of the soft part of the dorsal and anal fins; general colour alive: bright blue with snout tip, dorsal and caudal fins yellow to orange ***Centropyge resplendens***
- 1b.** Body orbicular with head triangular; filamentous extension of the soft part of the dorsal and anal fins; general colour not as above → **2**
- 2a.** Body colour yellowish brownish, with 3 large bands alternatively brownish, yellowish whitish, brownish; juvenile blue with a whitish vertical band, and orange snout and caudal fin; 1 dark spot above the pectoral-fin base ***Holacanthus africanus***
- 2b.** Body colour bluish to dark, side punctuated with whitish to gold (on scale edges); white vertical bands in juveniles but none in adults; head smoothly blue with mouth white; eye yellow bordered; pectoral-fin base yellow without spot above ***Pomacanthus paru***

List of species occurring in the area

The symbol  is given when species accounts are included.

 *Centropyge resplendens* Lubbock and Sankey, 1975.

 *Holacanthus africanus* Cadenat, 1951.

Holacanthus ciliaris (Linnaeus, 1758), St Paul's Rocks and western Atlantic.

 *Pomacanthus paru* (Bloch, 1787).

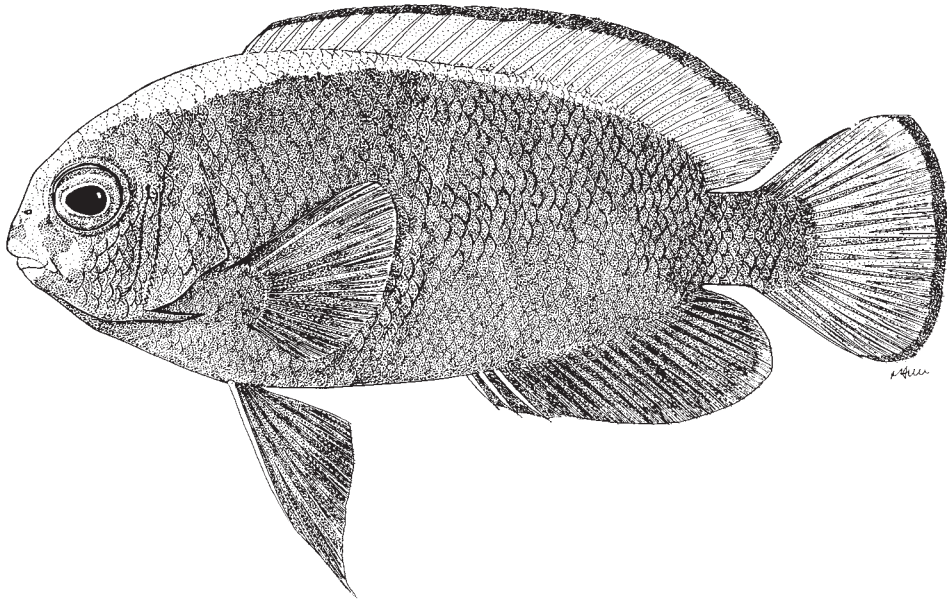
Reference

Allen, G.R., Steene, R.C. & Allen, M. 1998. *A guide to angelfishes and butterflyfishes*. Odyssey Publishing/Tropical Reef Research, 250 p.

***Centropyge resplendens* Lubbock and Sankey, 1975**

Frequent synonyms / misidentifications: None / None.

FAO names: None.



Diagnostic characters: Snout short. Dorsal fin with 14 spines and 16 or 17 soft rays; anal fin with 3 spines and 17 or 18 soft rays. Pectoral fin moderate, with 16 rays. Lateral-line scales 39 or 40. **Colour:** **body bright blue yellowish with snout tip and nape (sometimes not) yellow to orange; dorsal and caudal fins yellow with edge bordered with a blue line; anal, pectoral and pelvic fin blue; anal fin posterior tip yellow.**

Size: Maximum total length about 6 cm.

Habitat, biology, and fisheries: Littoral species from 15 to 40 m. Prefers rocks and rubbles. Has been reared in captivity. Aquarium trade.

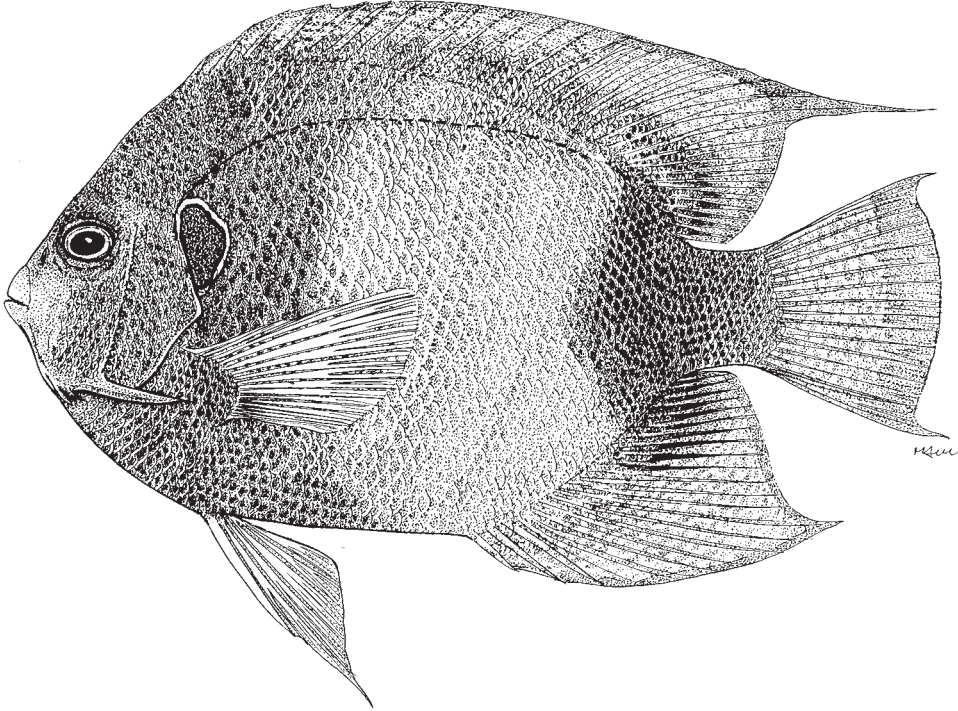
Distribution: Endemic to Ascension Island.



***Holacanthus africanus* Cadenat, 1951**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Guinean angelfish.



Diagnostic characters: Snout slightly elongated. Dorsal fin with 14 spines and 19 or 20 soft rays. Anal fin with 3 spines and 20 or 21 soft rays. Pectoral fin moderate, with 18 rays. Scales in lateral line usually 42 to 49. **Colour:** body colour yellowish brownish, with 3 large bands alternatively brownish, yellowish whitish, brownish; one dark spot above the pectoral-fin base; mouth and all fins yellowish. Juvenile blue with a vertical whitish band, with orange snout and caudal fin; body progressively becoming brownish, and fins orange then brownish.

Size: Maximum total length about 45 cm.

Habitat, biology, and fisheries: Littoral species, between 1 and 40 m. Occurs among rocks. Possible aquarium trade but rarely seen. Little is known about its biology.

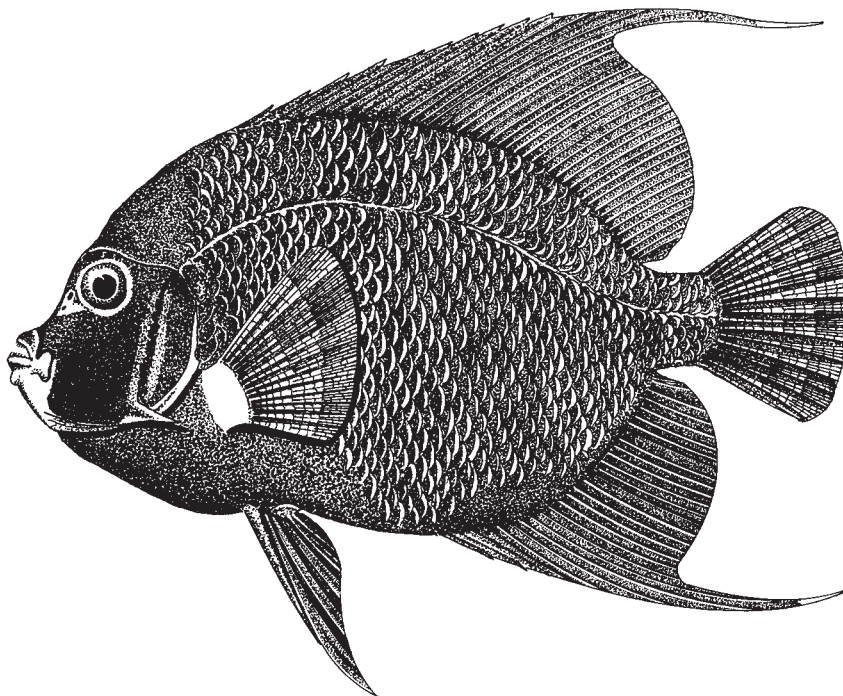
Distribution: Senegal to Democratic Republic of the Congo, Cape Verde Islands, São Tomé Island. More common in Ghana. Records exist in collections for Angola and Namibia but need to be confirmed and published.



Pomacanthus paru (Bloch, 1787)

Frequent synonyms / misidentifications: None / None.

FAO names: En – (French angelfish).



Diagnostic characters: Snout short. Dorsal fin with 10 spines and 29 to 31 soft rays; anal fin with 3 spines and 22 to 24 soft rays. Pectoral fin moderate, with 19 or 20 rays. **Colour:** body colour bluish to black; juveniles only with white vertical bands; head smoothly blue with mouth white; eye yellow bordered; with a horizontal bar onward from eye; preopercular spine yellow; side dark blue with posterior scale edge whitish to gold except on belly; pectoral-fin base yellow without spot above; all fins blue-hyaline with white marks on vertical fins.

Size: Maximum total length about 41.1 cm.

Habitat, biology, and fisheries: Coastal species, between 3 and 100 m. Common in shallow reefs, often near sea fans, usually in pairs. Feed on sponges, algae, bryozoans, zoantharians, gorgonians, and tunicates; spawning pairs are strongly territorial, with usually both members vigorously defending their areas against neighbouring pairs; juveniles tend cleaning stations where they service a broad range of clients, including jacks, snappers, morays, grunts, surgeonfishes, and wrasses. Flesh considered good quality but there are reports for ciguatera poisoning; marketed fresh. Has been reared in captivity. Aquarium trade.

Distribution: Brazil, Caribbean, St Paul's Rocks and Ascension Island.

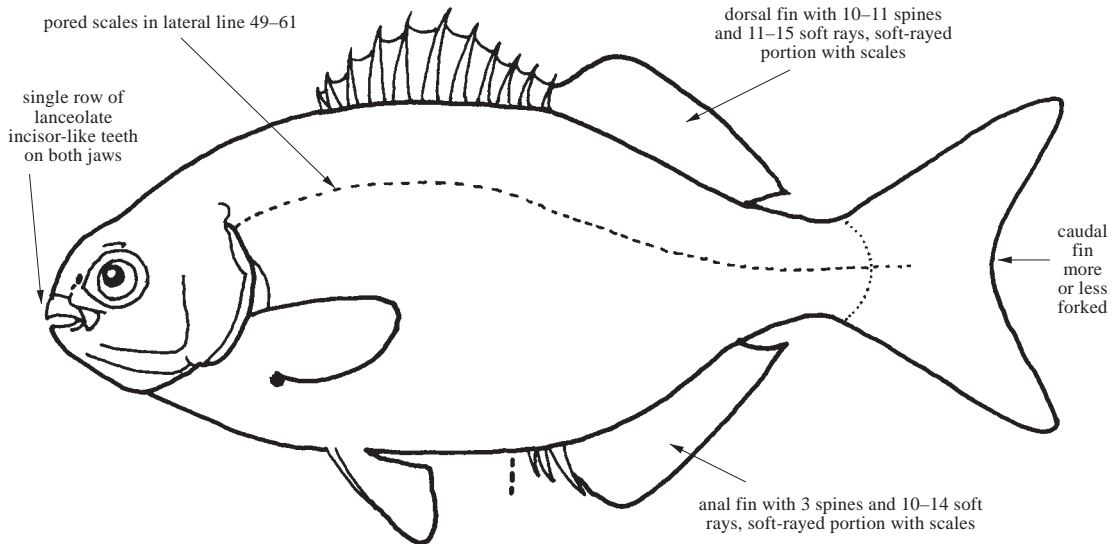


KYPHOSIDAE

Sea chubs

by K. Sakai, Noto Marine Center, Ishikawa, Japan and T. Nakabo, Kyoto University Museum, Kyoto, Japan

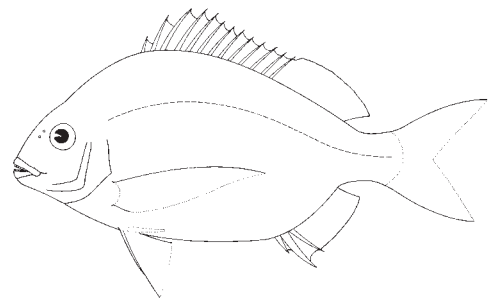
Diagnostic characters: Medium-sized fishes (to 90 cm); body elliptical, moderately compressed. Head small. Snout short. Eye moderately small, its diameter shorter than snout length. **Mouth small, terminal, single outer row of lanceolate incisor-like teeth on both jaws.** Preorbital region narrow, covering a little part of maxilla; maxilla barely reaching vertical of anterior margin of eye. **First gill arch with 5 to 10 gill rakers on upper limb, 14 to 24 on lower limb (total 19 to 34).** **Dorsal fin continuous, beginning above origin of pelvic fins, with 10 or 11 spines and 11 to 15 soft rays; anal fin beginning slightly behind middle of body, with 3 spines and 10 to 14 soft rays;** pectoral fins bluntly pointed posteriorly, with 16 to 21 rays, slightly longer than pelvic fins; pelvic fins beginning behind pectoral-fin base; caudal fin more or less forked, the lobes pointed. **Scales ctenoid and not deciduous, extending onto most of soft portions of dorsal and anal fins and proximal part of caudal fin.** **Pored scales in lateral line 49 to 61;** scales in longitudinal row 49 to 73; scales above lateral line to origin of dorsal fin 7 to 16, scales below lateral line to origin of anal fin 15 to 26. Vertebral number 10 or 11 (abdominal) + 15 or 16 (caudal) = 25 or 26. **Colour:** body bluish silver, bluish brown, or silvery grey dorsally and dusky grey or silver ventrally; with distinct longitudinal lines on sides.



Habitat, biology, and fisheries: Occur on rocky and coral reefs in tropical to temperate waters. Herbivorous, feeding primarily on benthic algae. Schooling, sometimes in groups composed of several species of kypnosids. Juveniles often occur far out at sea beneath floating debris and seaweeds. Generally reported to be palatable, but not highly valued; occasionally said to be bad-flavoured. Taken by handline, gillnet, and spear.

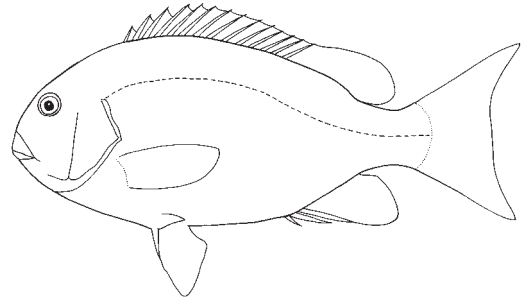
Similar families occurring in the area

Sparidae: both jaws with conical (canine-like) or molariform teeth; soft rayed portion of dorsal and anal fins without scales; preorbital somewhat broad, covering maxilla region; pectoral fins clearly longer than pelvic fins, pointed posteriorly.



Sparidae

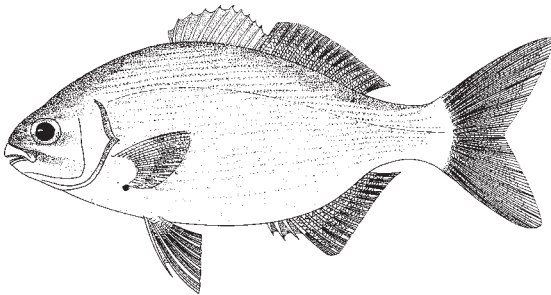
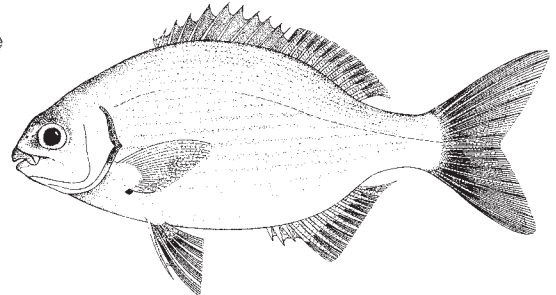
Girellidae: outer teeth tricuspid in both jaws; more dorsal-fin spines (14 or 15 dorsal-fin spines versus 10 or 11 in Kyphosids); caudal peduncle deeper; caudal fin slightly emarginated.




Girellidae

Key to the species of Kyphosidae occurring in the area

- 1a. Dorsal fin with 13 or 14 (usually 14) soft rays, base of soft-rayed portion equal to or a little longer than base of spinous portion; anal fin with 12 or 13 (usually 13) soft rays; gill rakers 26 to 30 on first gill arch (Fig. 1) ***Kyphosus incisor***
- 1b. Dorsal fin with 12 soft rays, base of soft-rayed portion equal to or a little shorter than base of spinous portion; anal fin with 11 soft rays; gill rakers 24 to 27 on first gill arch (Fig. 2) ***Kyphosus bosquii***

Fig. 1 *Kyphosus incisor*Fig. 2 *Kyphosus bosquii*

List of species occurring in the area

The symbol  is given when species accounts are included.

 *Kyphosus bosquii* (Lacépède, 1802).

 *Kyphosus incisor* (Cuvier, 1831).

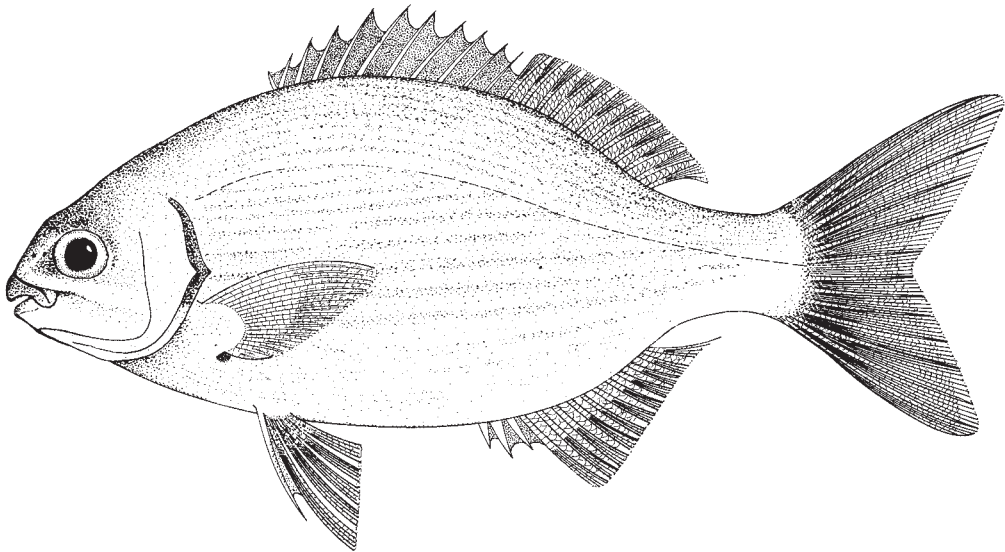
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Kyphosus bosquii (Lacépède, 1802)

Frequent synonyms / misidentifications: *Kyphosus sectator* (Linnaeus, 1758) / None.

FAO names: En – Bermuda sea chub; Fr – Calicagère blanche; Sp – Chopa blanca.



Diagnostic characters: Body elliptical elongate, its depth 40 to 48%, its width 12 to 18% of standard length; caudal peduncle length 18 to 22%, its depth 10 to 12% of standard length. Head length 25 to 32% of standard length, dorsal contour of head before eye slightly steep; interorbital space slightly convex, its width 10 to 12% of standard length. Eye moderately small. Snout short, its length longer than eye diameter. Mouth terminal, horizontal; anterior tip of upper jaw pointed; number of lanceolate incisor-like teeth 26 to 36 on upper jaw, 24 to 36 on lower jaw in specimens greater than about 20 cm standard length; both jaws with narrow inner bands of small, canine-like teeth behind incisor-like teeth; maxilla reaching vertical of anterior margin of eye. Preorbital region without scales, ventral margin of lachrymal minutely serrate. **First gill arch with 6 to 8 gill rakers on upper limb, 17 to 19 on lower limb (total 24 to 27). Dorsal fin with 11 spines, fifth to seventh spine longest, and 12 soft rays; base of spinous portion equal to or a little longer than base of soft-rayed portion; anterior part of soft-rayed portion not convex, the margin straight, the longest soft ray (usually third or fourth) a little shorter than the longest dorsal spine. Anal fin with 3 spines, third spine longest, and 11 soft rays; anterior part of soft-rayed portion slightly elevated, the longest soft ray (first or second) clearly longer than the longest dorsal spine in specimens greater than about 30 cm standard length, but equal to or a little shorter in smaller specimens.** Pectoral fin with 18 or 19 rays, bluntly pointed posteriorly. Pelvic fin not reaching anus when depressed. Caudal fin forked shallowly, the lobes pointed. **Pored scales on lateral line 52 to 56; scales above lateral line 11 to 14; scales below lateral line 19 to 24; scales in longitudinal row 61 to 66.** **Colour:** body bluish grey dorsally, bright silver ventrally, with several bluish brown or bluish grey longitudinal lines on flank, sometimes with assumed pattern of numerous eye-sized white spots, uniformly dusky grey in specimens greater than about 50 cm standard length; head with 2 oblique bluish brown or bluish grey bands, 1 through eye, the other 1 below eye; preorbital space between both bands is bright silver; dorsal and anal fin bluish grey, the margin of soft rayed portion with a darker band, the base of its with silver band; pectoral fins silver near base, the distal half slightly darker; caudal fin bluish grey near base, the margin with a darker band.

Size: Maximum to 76 cm total length, commonly to 40 cm total length.

Habitat, biology, and fisheries: Inhabits coastal areas, primarily around coral and rocky reefs, often occurring in the inner reefs and the seagrass beds. Herbivorous. Occasionally schools in groups with other kyphosid fishes. Juveniles often occur far out at sea beneath floating debris and seaweeds. Caught by gillnets, handlines, and spears.

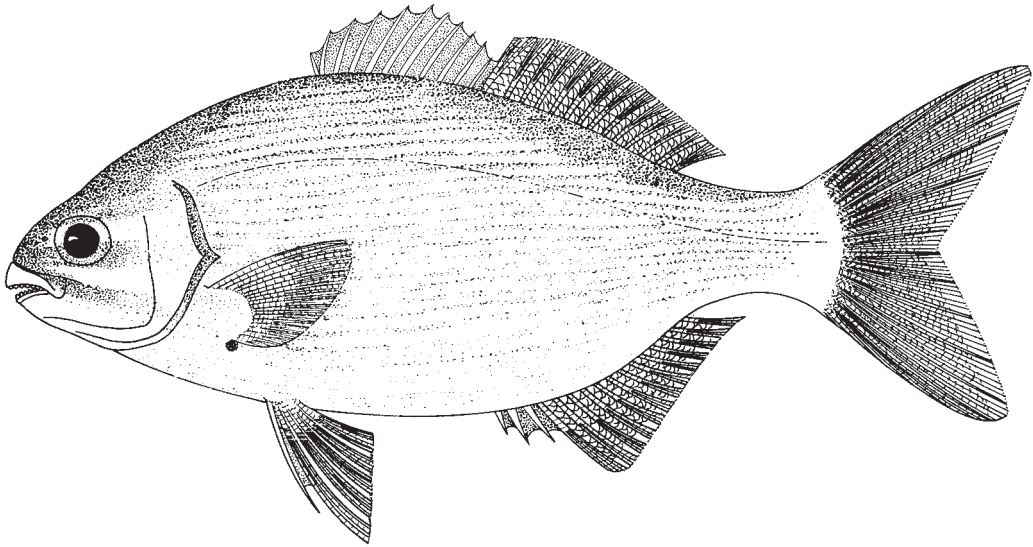
Distribution: In the eastern Atlantic from Morocco, throughout Madeira, Canary Islands, and Cape Verde Islands, including Ascension and St Helena Island, and southward to Angola; in the Mediterranean (very rare) and western Atlantic from New England, Bermuda, throughout the Caribbean Sea and Gulf of Mexico, and southward to Brazil.



***Kyphosus incisor* (Cuvier, 1831)**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Yellow sea chub; Fr – Calicagère jaune; Sp – Chopa amarilla.



Diagnostic characters: Body elliptical elongate, its depth 37 to 48%, its width 14 to 19% of standard length; caudal peduncle length 16 to 21%, its depth 10 to 12% of standard length. Head length 25 to 30% of standard length, dorsal contour of head before eye slightly steep; interorbital space slightly convex, its width 10 to 12% of standard length. Eye moderately small. Snout short, its length longer than eye diameter. Mouth terminal, horizontal; anterior tip of upper jaw pointed; number of lanceolate incisor-like teeth 20 to 38 on upper jaw, 24 to 39 on lower jaw in specimens greater than about 10 cm standard length; both jaws with narrow inner bands of small, canine-like teeth behind incisor-like teeth; maxilla barely reaching vertical of anterior margin of eye. Preorbital region without scales, ventral margin of lachrymal not serrate. **First gill arch with 7 to 9 gill rakers on upper limb, 19 to 22 on lower limb (total 26 to 30). Dorsal fin with 11 spines, fifth to seventh spine longest, and 13 or 14 (usually 14) soft rays; base of spinous portion equal to or a little shorter than base of soft-rayed portion;** anterior part of soft-rayed portion slightly convex, third or fourth soft ray longest, the longest soft ray a little shorter than the longest dorsal spine. **Anal fin with 3 spines, third spine longest, and 12 or 13 (usually 13) soft rays; anterior part of soft-rayed portion slightly elevated; the longest soft ray (first or second) equal to or a little longer than the longest dorsal spine.** Pectoral fin with 18 to 20 rays, bluntly pointed posteriorly. Pelvic fin not reaching anus when depressed. Caudal fin forked shallowly, the lobes pointed. **Pored scales on lateral line 52 to 54; scales above lateral line 11 to 16; scales below lateral line 17 to 22; scales in longitudinal row 57 to 64.** **Colour:** body bluish silver dorsally, bright silver ventrally, with several bluish brown or yellow longitudinal lines on flank, sometimes with assumed pattern of numerous eye-sized white spots, uniformly dusky blue in specimens greater than about 50 cm standard length; head with 2 oblique bluish brown or yellow bands, 1 through eye, the other 1 below eye; preorbital space between both bands is bright silver; dorsal and anal fins dark blue, the margin of soft rayed portion of dorsal and anal fins with a darker band, the base of it with silver band; pectoral fins silver near base, the distal half slightly darker; caudal fin bluish silver near base, the margin with a darker band.

Size: Maximum to 90 cm total length, commonly to 60 cm total length.

Habitat, biology, and fisheries: Inhabits coastal areas, primarily around coral and rocky reefs, often occurring far offshore and among floating sargassum seaweeds. Herbivorous. Occasionally schools in groups with other kyphosid fishes. Juveniles often occur far out at sea beneath floating debris and seaweeds. Caught by gillnets, handlines, and spears.

Distribution: In the eastern Atlantic from Morocco, throughout Madeira, Canary Islands, Cape Verde Islands, and southward to Angola; in the western Atlantic from New England, Bermuda, throughout the Caribbean Sea and Gulf of Mexico, and southward to Brazil.

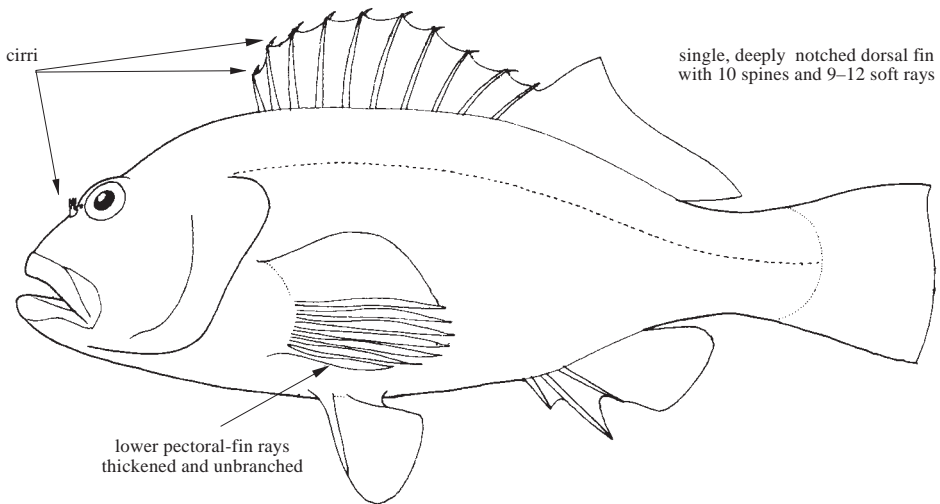


CIRRHITIDAE

Hawkfishes

by L.A. Rocha, California Academy of Sciences, San Francisco, California, USA

Diagnostic characters: Small tropical fishes (to 18 cm in the area) with a **continuous dorsal fin notched between spinous and soft portion, with 10 spines, and 11 soft rays** (the space between spines greater than between soft rays, thus the longer length of the spinous portion of the dorsal); **a tuft of cirri from membrane near tip of each dorsal spine**; anal fin with 3 spines and 5 to 7 soft rays; caudal fin with 15 rays; **pectoral fins with 14 rays, the lower 5 to 7 rays unbranched and usually enlarged**; pelvic fins with 1 spine and 5 rays; **a fringe of cirri on hind edge of anterior nostril**; no swimbladder. **Colour:** brown, grey or white; *Amblycirrhitus pinos* with numerous bright orange spots on head and dorsal fin; *Cirrhitus atlanticus* with white spots on sides of body.

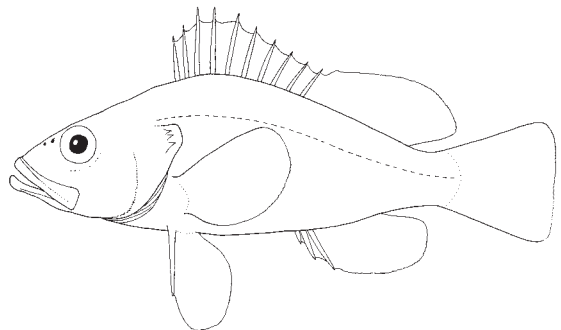


Habitat, biology and fisheries: Hawkfish are a small, predatory family of fish that spend most of their time on protruding coral blocks or branches of the reef. They are ambush predators, using their pectoral fins to 'sit up' and watch for prey. The name 'hawkfish' comes from this predatory, 'hunting like a hawk' behaviour. They are protogynous hermaphrodites, their social system is based on male territoriality and male dominated harems. Spawning takes place in the water column a few metres above the reef. Some species are of commercial value as aquarium fish.

Remarks: The hawkfish family consists of 9 genera and 32 species, but only the genera *Amblycirrhitus* and *Cirrhitus* occur in the Atlantic. The diagnosis given above is based on the 3 Atlantic species.

Similar families occurring in the area

Some species of the families Serranidae (genus *Serranus*) and Scorpaenidae, are similar in being small, having very similar fin ray and scale counts and in their predatory behaviour. However, none have their lower 5 to 7 pectoral-fin rays unbranched and not linked by membranes at their tips. Also, none have a tuft of cirri from membrane near tip of each dorsal spine.





Serranidae (*Serranus*)


Key to the species of Cirrhitidae occurring in the area

- 1a. Lower 5 pectoral rays unbranched → 2
- 1b. Lower 7 pectoral rays unbranched ***Cirrhitus atlanticus***
- 2a. Head, anterior part of body and dorsal fin with small spots, orange in life, pale in preserved specimens; black bars below soft dorsal fin and across caudal peduncle, visible in preserved specimens ***Amblycirrhitus pinos***
- 2b. Head, anterior part of body and dorsal fin whitish with no spots as described above; indistinct bars on posterior part of body, not visible in preserved specimens ***Amblycirrhitus earnshawi***

List of species occurring in the area

The symbol  is given when species accounts are included.

 *Amblycirrhitus earnshawi* Lubbock, 1978.

 *Amblycirrhitus pinos* (Mowbray, 1927).

 *Cirrhitus atlanticus* Osório, 1893.

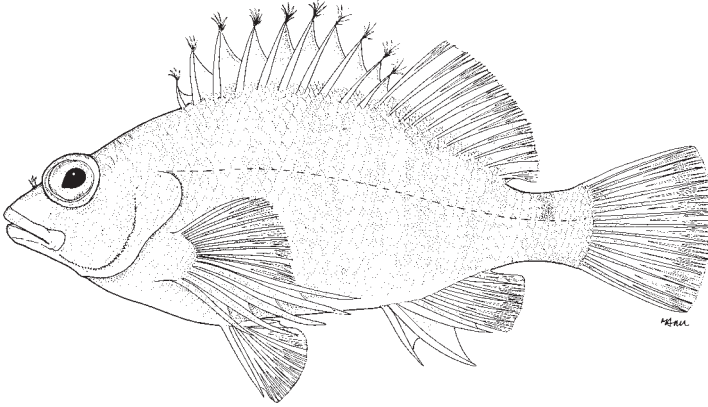
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- Lubbock, R.** 1978. A new hawkfish of the genus *Amblycirrhitus* Gill 1862, from Ascension Island/South Atlantic (Pisces: Perciformes: Percoidei: Cirrhitidae). *Senckenbergiana Biologica*, 58: 261–265.
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***Amblycirrhitus earnshawi* Lubbock, 1978**

En – White hawkfish.

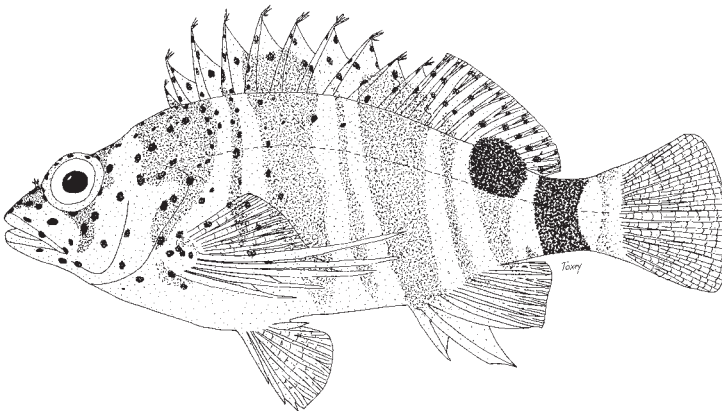
Maximum size to about 7 cm, found in shallow water (3 to 25 m). Body oval (body depth about 2.8 times in standard length) and moderately compressed. Snout short and pointed. Lower 5 pectoral rays unbranched. Mouth moderately large; teeth present on vomer and palatines. This species is very similar in morphology to *Amblycirrhitus pinos*, with colour being the only diagnostic character. Body white, with faint indication of 5 broad bars, and 3 narrow bars between the first 4 broad ones; the fifth broad bar (across caudal peduncle) the darkest. The pattern formed by the bars is exactly the same as that of *A. pinos*. Endemic to Ascension Island.



***Amblycirrhitus pinos* (Mowbray, 1927)**

En – Redspotted hawkfish.

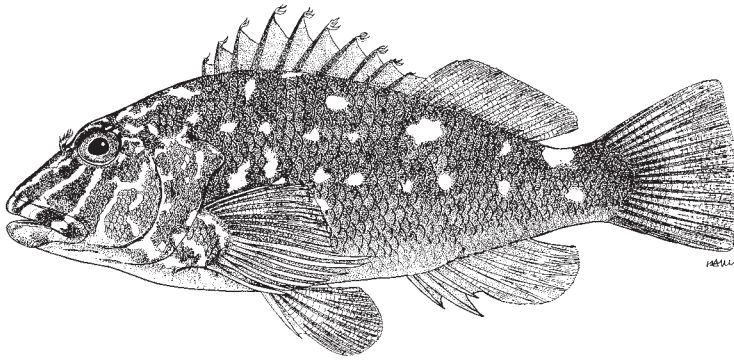
Maximum size to about 9.5 cm, found in shallow water (5 to 25 m). Body oval (body depth about 2.8 times in standard length) and moderately compressed. Snout pointed, but short, its length 4.0 to 4.5 times in head length. Lower 5 pectoral rays unbranched. Mouth moderately large; teeth present on vomer and palatines. Body with 5 broad dark bars, the first 3 yellowish brown, the upper rounded part of the fourth black, and the fifth (across caudal peduncle) entirely black; white interspaces between first 4 dark bars bisected by a narrow yellowish brown bar; head, anterior portion of body, and dorsal fin with bright orange-red dots. This species is of commercial value as an aquarium fish. Found at the tropical western Atlantic and St Helena Island.



***Cirrhitus atlanticus* Osório, 1893**

En – West African hawkfish.

Maximum size to 18 cm, found in shallow water (5 to 10 m). Body elongated (depth of body about 3 to 3.5 times in standard length) and not compressed. Snout long and pointed. Lower 7 pectoral rays unbranched. Mouth moderately large; teeth present on vomer and palatines. Body dark brown, the upper posterior half darker; 6 white blotches at base of dorsal fin (the last 4 more conspicuous); the 2 larger white spots are the fourth (at base of first dorsal ray) and the last (at posterior half of caudal peduncle); a row of 3 or 4 white spots on upper anterior portion of body, in a line behind the eye; a third row of white spots just below lateral line, from behind the opercle to caudal peduncle; a series of pale brown stripes on head radiating from eye. Known from São Tomé and Príncipe, Annobon Islands and Ghana.

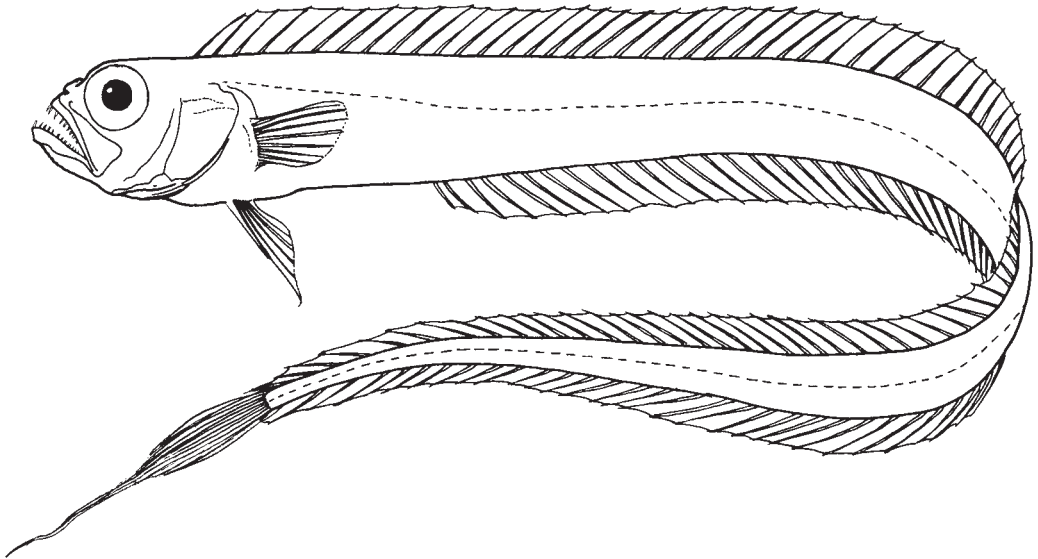


CEPOLIDAE

Bandfishes

by W.F. Smith-Vaniz, Florida Museum of Natural History, University of Florida, Gainesville, FL, USA

Diagnostic characters: Small (20 to 25 cm) to medium-sized (to 80 cm total length), with body very elongate, slender (body depth 12.5 to 20 times in total length) and compressed, **ribbon-like and gradually tapering to a pointed tail**. Head short, **with a blunt snout, oblique mouth and large eyes**; a single row of widely spaced teeth in each jaw. Anal opening placed far forward. **Dorsal-fin base very long and continuous, with 2 or (usually) 3 slender and very flexible spines and 52 to 67 soft rays, originating slightly posterior to head and extending to caudal fin**; pectoral fins short and rounded; pelvic fins thoracic in position, inserted at level or slightly in advance of pectoral-fin bases, with 1 spine and 5 soft rays; **anal-fin base very long**, with 0 or (usually) 1 very slender spine and 46 to 62 soft rays; caudal fin lanceolate, connected by membrane to dorsal and anal fins, with 12 segmented rays. Lateral line high on body, close to dorsal-fin base, terminating near end of fin. Scales cycloid and minute. Vertebrae 14 to 16 precaudal, 40 to 56 caudal, and 55 to 71 total. **Colour: generally reddish, orange or yellowish**, dorsal fin sometimes with a dark spot anteriorly, and dark stripe on membrane (usually hidden) connecting the premaxillary and maxillary bones of the upper jaw.



Habitat, biology, and fisheries: Occur singly or in groups on muddy or fine sand bottoms at depths between 15 and 400 m. Lives in self-made vertical burrows but may be found free swimming in midwater. Feeds on zooplankton, primarily small crustaceans and chaetognaths. In some Mediterranean countries they are marketed fresh and used for fish soups. Along the West African coast, they are often taken as bycatch in the trawl fisheries; they are consumed occasionally, and also utilized for fishmeal and oil.

Similar families occurring in the area

The elongate, ribbon-like body, long anal fin and blunt snout readily distinguish the bandfishes from other families. Furthermore, other elongate, ribbon-like and superficially similar fishes usually lack pelvic fins or these fins are in a different position.


Key to species of Cepolidae occurring in the area

- 1a.** Dorsal fin with 65 to 70 total elements; 68 to 71 total vertebrae *Cepola macrophthalma*
1b. Dorsal fin with 55 to 61 total elements; 53 to 63 total vertebrae *Cepola pauciradiata*

List of species occurring in the area

The symbol  is given when species accounts are included.

 *Cepola macrophthalma* (Linnaeus, 1758).

 *Cepola pauciradiata* Cadenat, 1950.

References

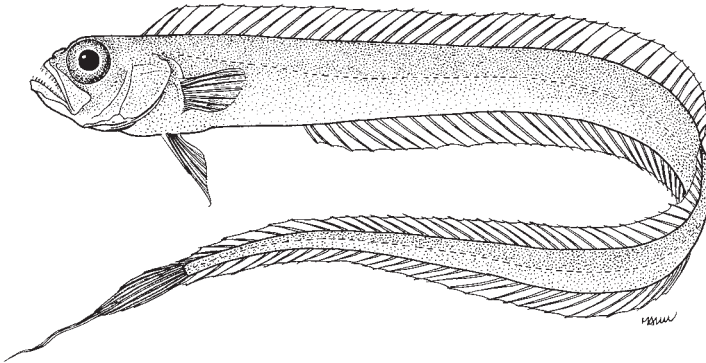
Atkinson, J.A. & Pullin, R.S.V. 1996. Observations on the burrows and burrowing behaviour of the red band-fish, *Cepola rubescens* L. *Marine Ecology*, 17(1–3): 23–40.

Cadenat, J. 1950. Description de quatre Téléostéens nouveaux de la cote occidentale d'Afrique. *Bulletin du Muséum National d'Histoire Naturelle (Sér 2)*, 21[1949]: 663–664.

***Cepola macrophthalma* (Linnaeus, 1758)**

En – Red bandfish; **Fr** – Cépole commune; **Sp** – Cinta colorada.

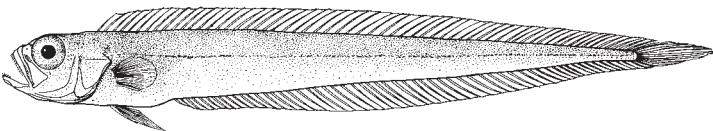
Maximum size to 80 cm total length; common to 40 cm. Mediterranean Sea, northward to the Orkney Islands, Scotland, Canary Islands, and on continental shelf from Morocco to Mauritania (southern limit poorly known) in depths from 15 to 400 m on mud or fine sand bottom. *Cepola rubescens* Linnaeus, 1764 is a junior synonym.



***Cepola pauciradiata* Cadnenat, 1950**

En – Guinean bandfish.

Maximum size 23 cm total length. Known from Senegal to Angola in depths of about 25 to 100 m on mud or fine sand bottom. Possibly also a junior synonym of *Cepola macrophthalma*.



DINOPERCIDAE

Cavebass

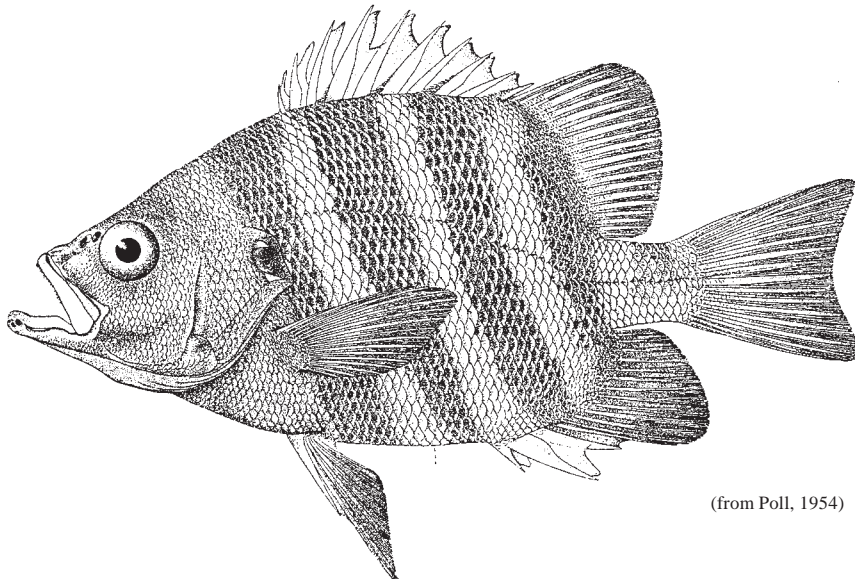
by Y. Iwatsuki, Faculty of Agriculture, University of Miyazaki, Japan and
P.C. Heemstra, South African Institute for Aquatic Biodiversity, Grahamstown, South Africa

A single species occurring in the area.

Centrarchops atlanticus (Reichenow, 1877)

Frequent synonyms / misidentifications: *Centrarchops chapini* Fowler, 1923, formerly as valid [see Remarks below] / None.

FAO names: En – Barred seabass.



(from Poll, 1954)

Diagnostic characters: Body deep, moderately compressed, body depth much greater than head length and about half of standard length; attains 30 cm. Dorsal head profile almost straight; head length 2.6 to 2.9 times in standard length; eye diameter slightly greater than interorbital width, ~ twice preorbital width, subequal to snout length and 4.1 to 4.4 times in head length; nostrils elongate, close to front edge of eye, the front one larger, with a skinny rim produced into a large flap posteriorly, rear nostril with a narrow fringed skinny rim interorbital slightly convex. Upper jaw slightly protrusile; maxilla naked, not covered by preorbital bone when mouth is closed; supramaxilla well developed; lips, front of lower jaw, maxilla, snout and gular area covered with minute, fleshy villi and rugose skin that give the lips and chin a furry appearance; 4 large tubular pores on front of lower jaw. A band of small, slightly curved, conical teeth in both jaws, the outer teeth slightly enlarged; narrow V-shaped band of small conical teeth on vomer and a band of similar teeth on palatines; teeth on jaws and palate mostly hidden by fleshy villi. Preopercle edge distinctly serrate, serrae at angle slightly enlarged; rear edge of opercle with 2 flat spines. Branchiostegal rays 7, membranes narrowly joined at front of isthmus. Gill rakers well developed, 12 or 13 on upper limb, 21 to 24 on lower limb. **Dorsal fin with 9 or 10 stout, heteracanthous spines, 18 or 19 rays, the fin margin distinctly indented before soft-rayed part, interspinous membranes deeply incised, their rear edge attached to lateral surface of each spine;** anal fin with 3 stout, heteracanthous spines, 13 or 14 rays; caudal fin truncate or slightly emarginate, with 9+8 principal rays, 8+7 branched rays; pectoral fins shorter than head, with 17 to 19 rays, uppermost 2 rays unbranched, the rest branched; pelvic fins with 1 spine and 5 rays. Head, body and proximal part of caudal and soft-rayed parts of dorsal and anal fins covered with small ctenoid scales; lateral line with 50 to 53 tubed scales to caudal-fin base and running along middle caudal rays at least halfway to rear edge of fin;

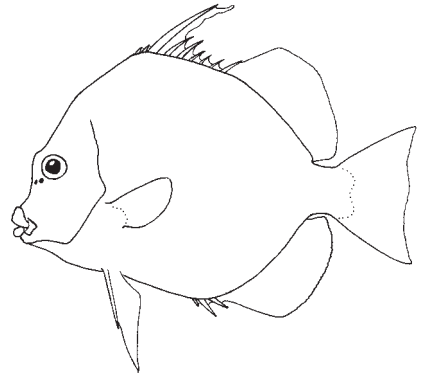
no enlarged scale or axillary flap at base of pelvic fins; no scaly flap of skin at upper end of pectoral-fin base. Swimbladder large, with thick, tough walls and 3 pairs of large intrinsic muscles. Vertebrae 10+14. Brownish with 5 broad, dark oblique bars on body; black blotch between opercular spines.

Similar families occurring in the area

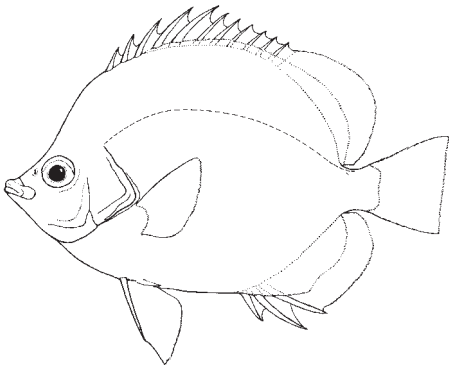
Ehippidae: eye well above horizontal axis through upper jaw symphysis; eye diameter less than or subequal to preorbital width; branchiostegal membranes broadly joined to isthmus, the gill opening not extending much below level of pectoral-fin base.

Chaetodontidae: no deep notch in dorsal fin between spinous and soft-rayed parts; dorsal-fin spines 11 to 14; front head profile concave; base of pelvic fins with scaly axillary process.

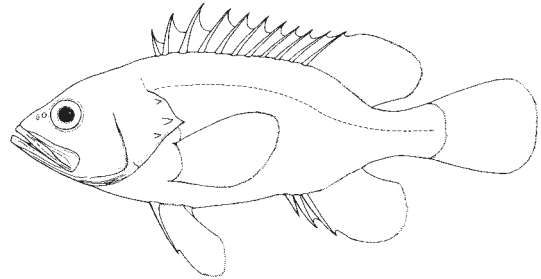
Serranidae: head length greater than or equal to body depth; 3 flat spines on rear edge of opercle; anal-fin rays 7 to 11; dorsal-fin spines not heteracanthous.



Ehippidae



Chaetodontidae

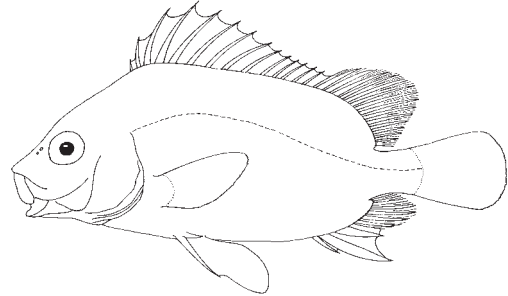


Serranidae

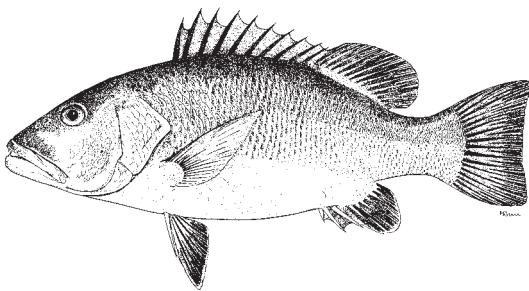
Haemulidae: maxilla partly covered by preorbital bone when mouth is closed; pelvic-fin axillary process well developed; no teeth on vomer or palatines.

Lutjanidae: no large pores at front of lower jaw; no distinct notch in dorsal-fin margin before soft dorsal fin; dorsal fin soft rays 9 to 15.

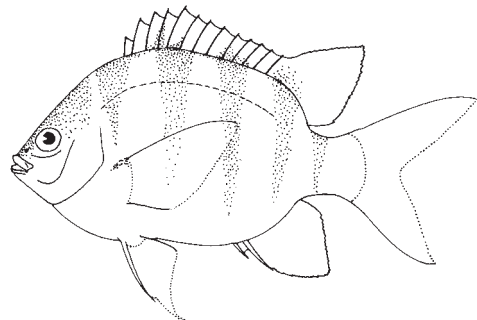
Pomacentridae: single nostril on each side of snout; mouth small, maxilla not reaching vertical at front edge of eye; dorsal fin with 10 to 14 spines; tail fin forked.



Haemulidae



Lutjanidae



Pomacentridae

Size: Maximum size 34 cm; common to 30 cm.

Habitat, biology, and fisheries: Taken occasionally on sandy or sandy-mud trawling grounds in depths of 20 to 50 m. Biology unknown. Flesh excellent.

Distribution: Congo to northern Angola; probably extends northwards to Gabon.

Remarks: *Centrarchops atlanticus* (Reichenow, 1877) was overlooked although Heemstra and Hecht (1986) proposed the new family Dinopercidae, and identified *Centrarchops chapini* Fowler, 1923 as a valid species in the family. Subsequently, the holotype (SMB 10179) of *C. atlanticus* was confirmed as the same species, *C. chapini*. Accordingly, *C. atlanticus* is justified as a senior synonym of *C. chapini*.



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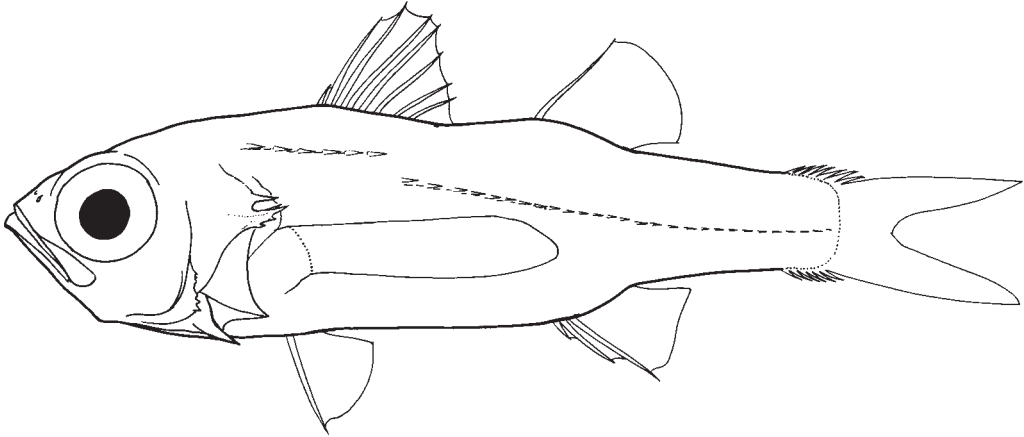
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HOWELLIDAE

Pricklefishes

by P.C. Heemstra, South African Institute for Aquatic Biodiversity, Grahamstown, South Africa

Dagnostic characters: **Body fusiform, depth less than head length, 3.3 to 3.8 times in standard length; the largest species attains 12 cm.** Head length 2.7 to 3.1 times in standard length; snout conical; **eye large, its diameter distinctly more than snout length, contained 2.3 to 2.9 times in head length;** mouth large, terminal and slightly protrusile; upper jaw length subequal to eye diameter; **maxilla expanded posteriorly (distally), mostly exposed when mouth is closed and reaching below middle of eye; proximal half of maxilla trough shaped, the upper and lower edges curled laterally; no supramaxilla; a single series of villiform teeth on jaws;** vomer edentate or with a few minute teeth; palatines edentate or with 1 row of minute teeth. **Two spines on upper edge of orbit, 1 over front edge of eye, the second above rear edge of eye.** Inter-orbital area flat; pineal organ visible in middle of posterior interorbital area. Posterior nostril at base of front orbital spine and near front edge of eye; anterior nostril halfway between rear nostril and front edge of snout. **Opercle with 1 to 6 sharp spines on posterior tip and 1 separate spine slightly above; ventral end of subopercle with 1 to 4 spines, rear end of interopercle with 1 large spine;** preopercle ridge smooth, the vertical limb of the edge smooth dorsally, but serrate ventrally; lower limb of edge smooth. Branchiostegal rays 7, membranes narrowly joined at anterior end of isthmus; gill rakers long and slender, 6 to 10 on upper limb, 19 to 23 on lower limb. **Two separate dorsal fins, first with 7 or 8 spines, second fin with 1 spine and 8 to 10 soft rays; distance between dorsal fins subequal to length of spinous dorsal-fin base; anal fin with 3 slender spines, 6 to 8 soft rays; pectoral fins subequal to head length, reaching past anal-fin spines;** pelvic fins with 1 spine and 5 branched rays; inserted below or slightly in front of pectoral-fin base; caudal fin emarginate or slightly forked, with 15 branched rays. **Head and body covered with spinoid scales;** lateral line continuous or interrupted. Vertebrae 10 + 15 or 16. **Colour:** usually dark brown or blackish.



Habitat, biology, and fisheries: During the day, pricklefish occur in loose aggregations usually near the bottom in 74 to 2 200 m; at night, they migrate to near the surface. Caught mainly with bottom trawls. Common in some areas, but too small and usually not abundant enough to be of commercial importance.

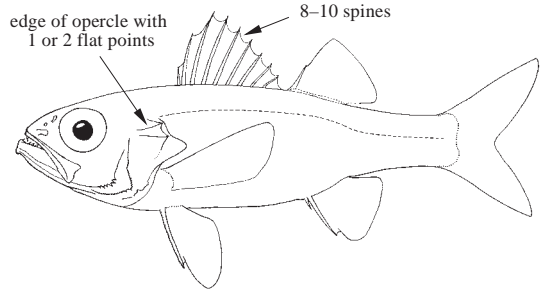
Remarks: Ogilby (1899) created a new genus *Howella* and erected a new family Howellidae for an unusual new species found on the beach at Lord Howe Island between Australia and New Zealand. The family currently comprises a single genus with about 7 species; 3 species are known in the eastern central Atlantic. *Howella* species are placed by some recent authors in the Acropomatidae, Epigonidae, Cheilodipteridae, Moronidae or Percichthyidae. The genus *Percichthys* comprises 2 species of freshwater fishes in Chile and Argentina; they have 31 to 36 vertebrae and are not closely related to the Howellidae. The “common name” basslet is used for various small serranid fishes, and the English name “pricklefishes” is here adopted for howellid species in allusion to the distinctive spinoid scales and spinous head bones of these fish.

Similar families occurring in the area

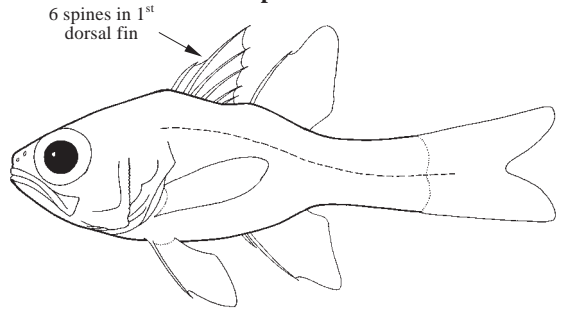
Acropomatidae: rear edge of opercle with 2 flat points; dorsal fin divided to base or as 2 separate fins, spinous fin with 9 or 10 spines, soft-rayed fin with 1 spine and 9 or 10 rays; anal fin with 2 slender spines, 7 to 10 rays; scales cycloid, deciduous.

Epigonidae: maxilla narrow, greatest width less than 1/5 eye diameter; first dorsal fin with 6 to 8 spines; anal fin with 2 spines and 8 or 9 soft rays.

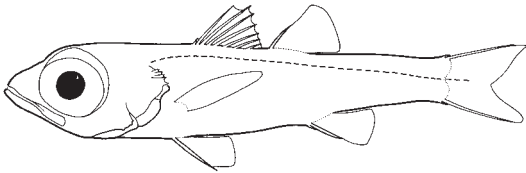
Apogonidae: first dorsal fin with 6 or 7 spines; anal fin spines 2; pelvic fins reach anus.



Acropomatidae



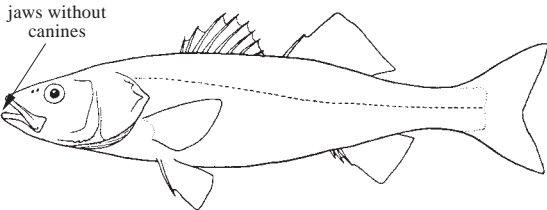
Apogonidae



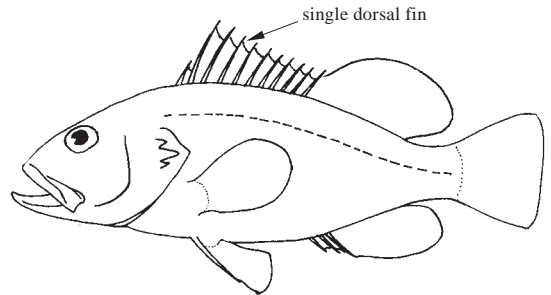
Epigonidae

Moronidae: opercle ends in 2 flat points; dorsal fin notched to the base in front of soft-rayed part, with 8 or 9 spines in first part, 1 spine and 10 to 13 in second fin.

Serranidae: single dorsal fin; 3 spines on opercle; most species with 3 anal-fin spines.



Moronidae




Serranidae

Key to species of Howellidae occurring in the area


- 1a. First dorsal-fin spine more than half length of second spine; 1 or 2 separate spines at rear end of opercle; lateral line continuous or interrupted below second dorsal fin ***Howella simplex***
- 1b. First dorsal-fin spine less than half length of second spine; a cluster of 3 to 6 spines at rear end of opercle; lateral line interrupted below gap between dorsal fins → 2
- 2a. Four or 5 rows of scales from lateral line to second dorsal-fin origin; dorsal-fin soft rays 8 or 9; anal-fin soft rays 6 or 7; pectoral-fin rays 15 to 17 ***Howella sherborni***
- 2b. Three rows of scales from lateral line to second dorsal-fin origin; dorsal-fin soft rays 9 or 10; anal-fin soft rays 7 or 8; pectoral-fin rays 14 to 16 ***Howella atlantica***

List of species occurring in the area

The symbol  is given when species accounts are included.

 *Howella atlantica* Post and Quéro, 1991.

 *Howella sherborni* (Norman, 1930).

 *Howella simplex* Parr, 1933.

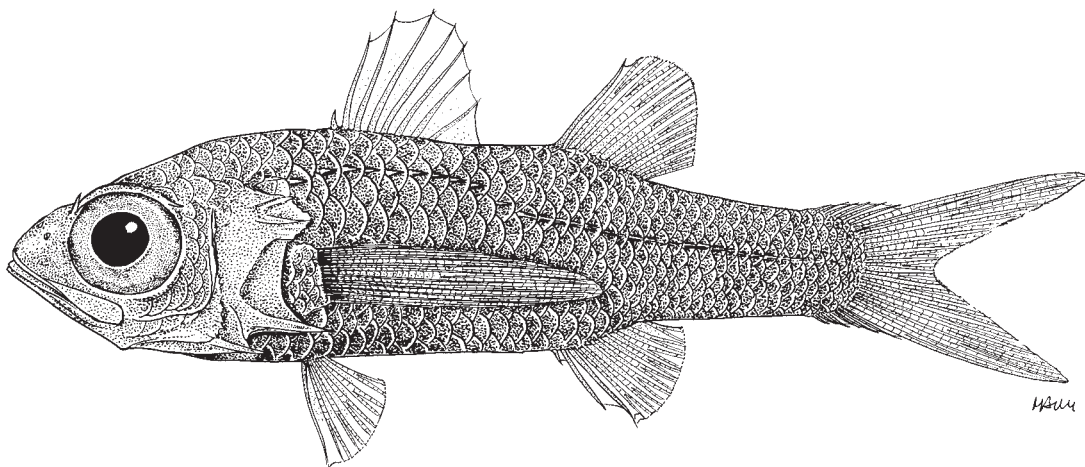
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Howella atlantica Post and Quéro, 1991

Frequent synonyms / misidentifications: *Howella brodiei atlantica* Post and Quéro, 1991 / *Howella sherborni* (non Norman, 1930); *H. brodiei* (non Ogilby, 1899).

FAO names: None.



Diagnostic characters: Body depth contained 3.5 to 3.8 times in standard length; head length 2.8 to 3.1 times in standard length. Eye diameter 2.3 to 2.5 times in head length. **Rear end of opercle with 2 spines.** Gill rakers 6 to 9 on upper limb, 20 to 23 on lower limb of first arch. **First dorsal fin with 7 or 8 spines, the first spine minute, about 0.1 of length of second spine; second dorsal fin with 1 spine, 9 or 10 soft rays; anal fin with 3 slender spines, 7 or 8 rays; pectoral-fin rays 14 to 16. Scales adherent; 3 rows of scales between second dorsal-fin origin and lateral line.** Lateral line divided into 3 segments, total scales 35 to 39 (1 to 3 + 6 to 9 + 19 to 22). **Colour:** adult dark brown, head paler.

Size: Maximum total length 11 cm.

Habitat, biology, and fisheries: Adults occur near the bottom in 275 to 2 200 m; migrate to near the surface at night; juveniles found in 26 to 300 m in midwater. Probably feeds on zooplankton, mainly copepods. Reported to be abundant in some areas, but separate statistics are not available for this species. Caught with trawls.

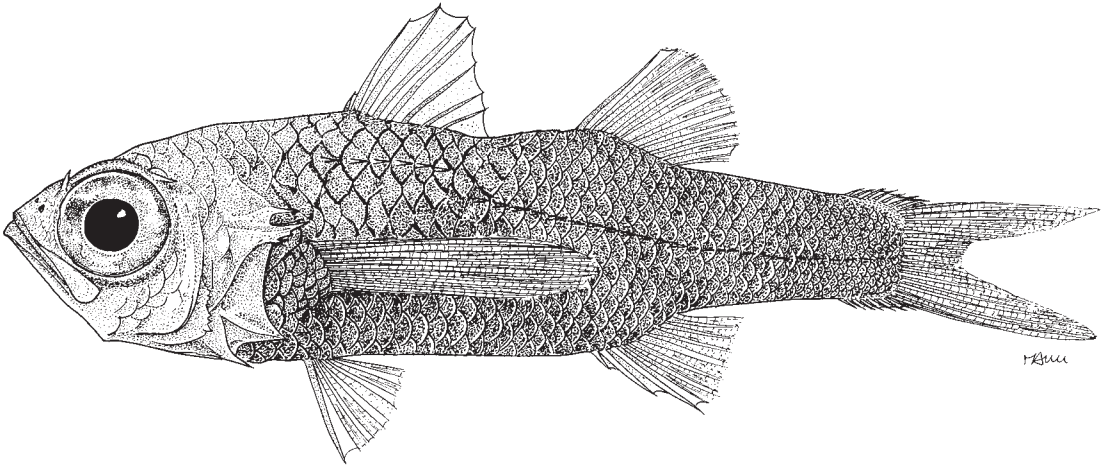
Distribution: Azores, Madeira, Canaries, Cape Verde islands, Ascension, St Helena, west African coast from Morocco to Senegal, tropical western Atlantic, Caribbean, and central Atlantic off Brazil. Adults occur from Iceland to Atlantic coast of France (Bay of Biscay).



Howella sherborni (Norman, 1930)

Frequent synonyms / misidentifications: None / *Howella brodiei* Ogilby, 1899.

FAO names: None.



Diagnostic characters: Body depth contained 3.3 to 3.6 times in standard length; head length 2.6 to 3.0 times in head. Eye diameter 2.1 to 3.4 times in head. **Rear tip of opercle with a cluster of 3 to 8 radiating sharp spines and a separate sharp spine (sometimes bifurcate) slightly above; ventral end of subopercle with a single large spine, sometimes with 1 to 4 smaller accessory spines, rear end of interopercle with 1 large spine;** preopercle ridge smooth, the vertical limb of the edge smooth dorsally, but serrate ventrally; lower limb of preopercle edge smooth. Gill rakers 7 to 9 on upper limb, 19 to 23 on lower limb of first arch. **First dorsal fin with 7 or 8 spines; second dorsal fin with 1 spine, 8 or 9 soft rays; anal fin with 3 slender spines, 6 or 7 rays; pectoral-fin rays 15 to 17. Scales adherent, 4 or 5 rows of scales from second dorsal-fin origin to lateral line.** Lateral line interrupted, scales 36 to 41 (1 or 2 + 7 to 9 + 25 to 32). **Colour:** adults dark brown, head paler.

Size: Maximum total length 11 cm.

Habitat, biology, and fisheries: Adults occur near bottom in 70 to 2 350 m during the day, and migrate to near surface at night; juveniles found in 20 to 300 m in midwater. Probably feeds on zooplankton, mainly copepods. Separate statistics are not reported for this species. Caught with trawls.

Distribution: West coast of South Africa, near Vema Seamount, east of Gough Island; and southwestern Atlantic off southern Brazil, Uruguay and Argentina. Will probably be found off Namibia.

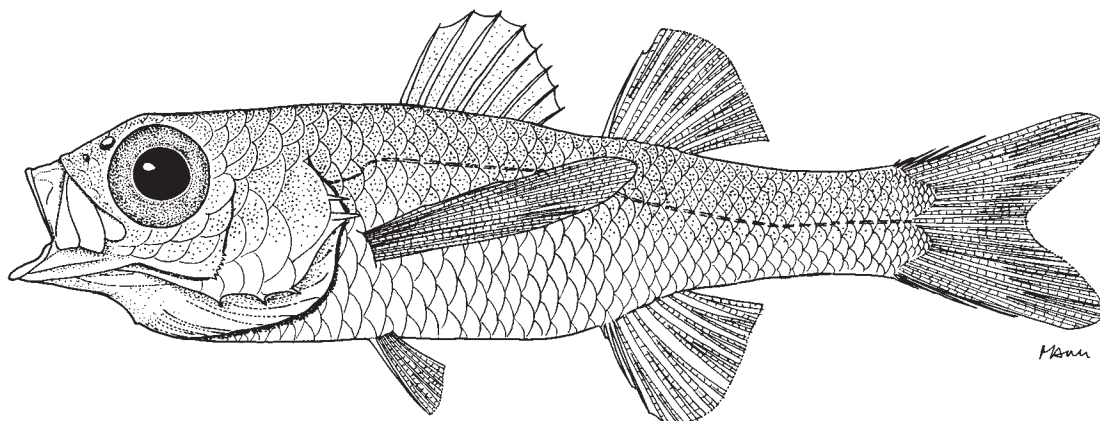
Remarks: Norman's (1930) original figure of the holotype is inaccurate in showing 3 rows of scales between the origin of the second dorsal fin and lateral line. The holotype has 4 rows of scales between the second dorsal fin origin and the lateral line, and the species has 4 or 5 rows of scales in this area.



Howella simplex Parr, 1933

Frequent synonyms / misidentifications: *Bathysphaerenops simplex* (Parr, 1933) / *Howella brodiei* Ogilby, 1899.

FAO names: None.



Diagnostic characters: Body depth contained 3.3 to 4.1 times in standard length; head length 2.8 to 3.4 times in standard length. Eye diameter 2.1 to 2.8 times in head length. Gill rakers 6 to 8 on upper limb, 17 to 21 on lower limb of first arch. Rear tip of opercle with 2 separate spines; lower end of subopercle with 2 large, separate spines; rear end of interopercle with a single large spine. First dorsal fin with 8 spines, first spine more than half length of second spine; second dorsal fin with 1 spine, 9 soft rays; anal fin with 3 slender spines, 7 rays; pectoral-fin rays 13 or 14. Scales deciduous; 3 or 4 rows of scales from second dorsal-fin origin to lateral line. Lateral line continuous or interrupted below soft dorsal fin, scales 30 to 34. **Colour:** uniform dark brown.

Size: Maximum total length 10 cm.

Habitat, biology, and fisheries: Adults occur in 100 to 300 m. Separate statistics are not reported for this species. Caught with trawls. No commercial importance to fisheries.

Distribution: Caribbean (off Cuba, Bahamas and Puerto Rico), central Atlantic (south and northeast of St Paul's Rocks), western and central Pacific.



INERMIIDAE

Bonnetmouths, bogas

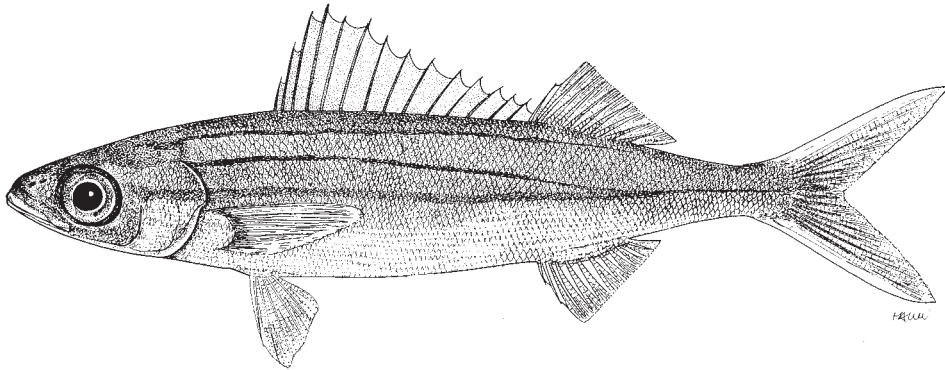
by P.C. Heemstra, South African Institute for Aquatic Biodiversity, Grahamstown, South Africa

A single species occurring in the area.

Haemulon vittatum (Poey, 1860)

Frequent synonyms / misidentifications: *Inermia vittata* Poey, 1860 / *Emmelichthyops atlanticus* Schultz, 1945.

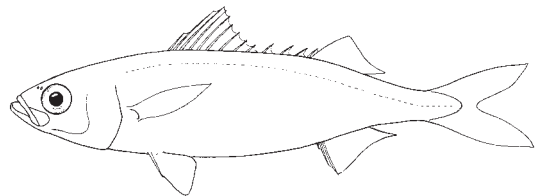
FAO names: En – Boga.



Diagnostic characters: Body elongate, subcylindrical, depth about 4.5 to 5.0 times in standard length; attain 11 to 23 cm. **Upper jaw very protrusile; maxilla naked, mostly covered by preorbital bone when mouth is closed; no supramaxilla; jaws, vomer and palatines toothless; dorsal fin deeply notched before soft-rayed part;** rear edge of opercle with inconspicuous, flat point; preopercle edge thin, upper edge smooth, angle with a few minute serrae; body and head (except snout tip) covered with small, ctenoid scales; branchiostegal rays 7, membranes separate, free from isthmus; gill rakers long and numerous, 8 on upper limb, 23 to 25 on lower limb; vertebrae 12 +14. First dorsal fin with 14 slender spines; second dorsal with 1 spine and 9 or 10 segmented rays; spinous fin higher than soft-rayed fin; anal fin below soft dorsal fin, with 2 or 3 spines and 9 or 10 soft rays; soft dorsal and anal fins with a scaly sheath at base that is best developed posteriorly; caudal fin deeply forked; pectoral fins pointed, shorter than head, with 19 or 20 rays; pelvic fins with 1 spine, 5 rays, and a large axillary process of fused scales, and another midventral scaly process between the fins. Lateral line single, continuous, slightly curved, with 80 to 85 scales. Swimbladder elongate, fusiform, not bifurcate at either end. **Colour:** head and body blue dorsally, reddish pink or greyish blue dorsally and silvery blue below; 3 narrow dark stripes from head to tail, the lowest stripe running along lateral line.

Similar families occurring in the area

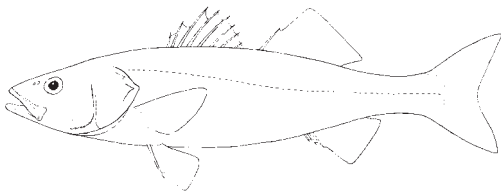
Emmelichthyidae: maxilla broad, scaly, exposed when mouth is closed: supramaxilla long and slender.



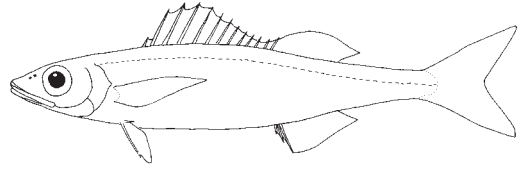
Emmelichthyidae

Moronidae: upper jaw not protrusile; maxilla not scaly; lower edge of preopercle with large forward-directed spines.

Centracanthidae: distal end of maxilla and premaxilla loosely connected; jaws with cardiform teeth.

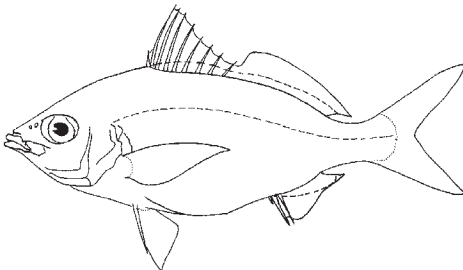


Moronidae

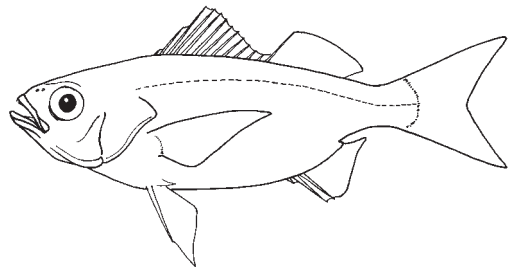


Centracanthidae

Gerreidae and Haemulidae: body deeper.

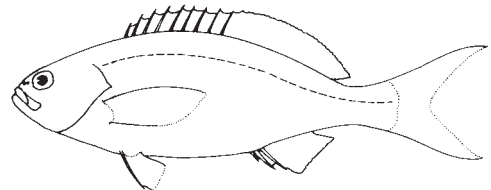


Gerreidae



Haemulidae

Other superficially similar percoid fishes (*Paranthias furcifer* [Serranidae], Pomatomidae): upper jaw not greatly protrusile; teeth present on jaws, vomer and palatines; scaly axillary process at base of pelvic fins rudimentary or absent.



Serranidae

Size: Maximum total length 23 cm.

Habitat, biology and fisheries: Occurs in schools over or near reefs in 15 to 50 m. Feeds on larger zooplankton organisms: salps, fish and crustacean larvae, pteropods, mysid and sergistid shrimps, krill, amphipods, and small mesopelagic fish (myctophids, astronethids, paralepidids etc.). Uncommon, and of no commercial importance. Separate statistics are not reported for this species. Caught with trawls.

Distribution: In the eastern central Atlantic, known only from the coast of Guinea-Bissau. Common in the western Atlantic from Bermuda, Bahamas, Florida, Belize, Cuba, and most Caribbean islands and northern coast of South America.

Remarks: Eschmeyer's Catalog of Fishes places this species, formerly known as *Inermia vittata*, in the family Haemulidae, but for this guide the species is placed in Inermiidae to be consistent with the family designation at the time of writing.



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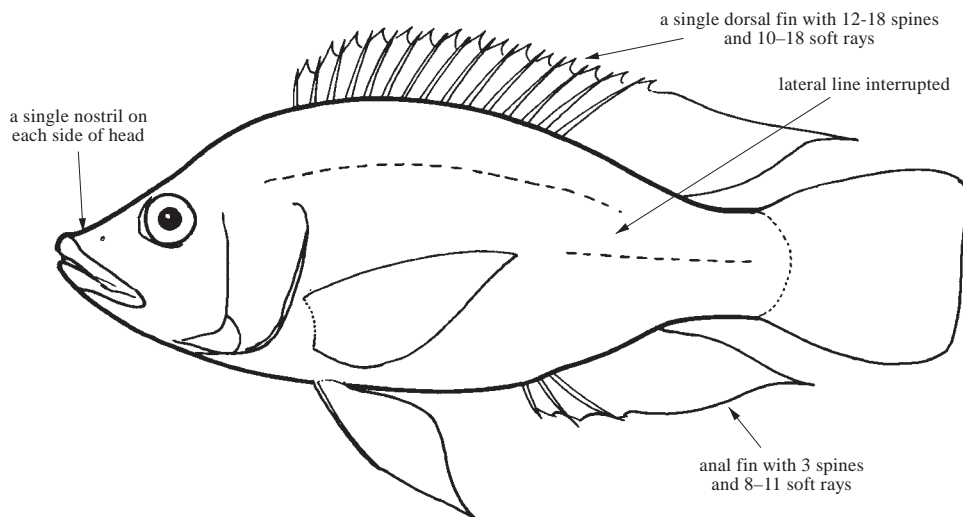
Suborder LABROIDEI

CICHLIDAE

Cichlids

by R.C. Schelly and M.L.J. Stiassny, American Museum of Natural History, New York, NY, USA

Diagnostic characters: Small to medium-sized (to about 60 cm standard length; typically under 40 cm standard length), moderately deep-bodied and laterally compressed fishes. **Head with a single nostril on each side;** jaws protrusible; oral teeth unicuspid, bicuspid, or tricuspid; **lower pharyngeals (throat jaws) fused into a single, triangular plate.** Gill rakers on lower part of first arch number 6 to 19 (19 to 26 in *Oreochromis niloticus*). **A single dorsal fin with 12 to 18 spines** and 10 to 15 (16 to 18 in *Tylochromis*) soft rays; **anal fin with 3 spines** and 8 to 11 soft rays; caudal fin rounded, truncate, or somewhat emarginate. **Lateral line interrupted, forming distinct upper and lower branches,** with 26 to 34 (37 to 42 in *Tylochromis*) scales. Scales cycloid. **Colour:** body colour patterns complex and variable; from olivaceous, iridescent blue or green, red, yellow, silvery grey, to blackish, often with dark vertical bars, horizontal bands, or spots; dorsal, anal and caudal fins may have spots, blotches, or dark vertical bands, and may have an orange, red, black, or yellow border.



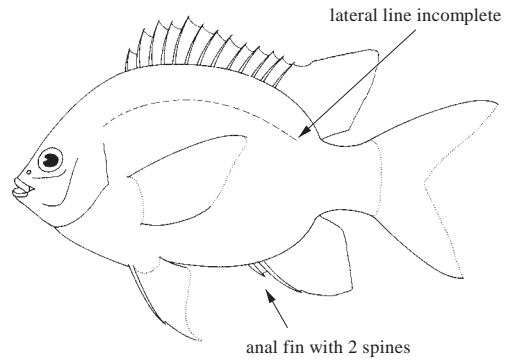
Habitat, biology, and fisheries: Primarily freshwater fishes, some species are tolerant of brackish water and may be encountered in estuaries. A few species, like *Sarotherodon melanotheron*, a primarily brackish water species, can tolerate high salinity and may be encountered coastally. Though all species included here occur naturally in at least part of the area, *Oreochromis* and some tilapiine species have been translocated within the region and around the world, mostly for aquaculture. *Hemichromis* and *Tylochromis* are predaceous (*Tylochromis* species are benthic macrophages). The remaining species (all tilapiines) are mostly herbivorous, feeding on phytoplankton, algae, macrophytes, detritus, and occasionally bivalves. Cichlids exhibit complex breeding behaviours that include pair formation, nest-building, and parental care of young. Of the species considered here, *Coptodon*, *Pelmatolapia* and *Hemichromis* are substrate brooders, while the remaining species are mouthbrooders. Many cichlids are important in freshwater aquaculture and in the aquarium trade.

Remarks: Some of the species included here show considerable geographic variation, and further studies may warrant recognition of additional species. Loiselle (1979) included 8 species in the genus *Hemichromis* in coastal West Africa, but more recent authors have recognized fewer species owing to the difficulties distinguishing them. Trewavas (1983) recognized 4 subspecies of *Oreochromis niloticus*, of which only *Oreochromis niloticus niloticus* occurs naturally in the region, and 5 subspecies within *Sarotherodon melanotheron*, 4 of which occur in brackish or saltwater in the region. More recently, one of those subspecies, *Sarotherodon melanotheron nigripinnis*, was elevated to species level, and 2 subspecies were identified within *S. nigripinnis*.

Similar families occurring in the area

Cichlids are easily distinguished from non-perciform families of fishes by perciform characters such as spines in fins and a pelvic fin with a single spine followed by 5 soft rays. Among perciforms, cichlids are distinguished from all other families except damselfishes (Pomacentridae) by having a single nostril on each side of the head and an interrupted lateral line.

Pomacentridae: can be distinguished from cichlids based on the following characters: almost always have 2 anal-fin spines (versus 3 in cichlids); lateral line typically incomplete, terminating anterior to caudal peduncle (versus interrupted lateral line with lower branch on caudal peduncle in cichlids); caudal fin typically strongly forked (versus rounded, truncate, or emarginate caudal fin in cichlids).



Pomacentridae

Key to the species of Cichlidae occurring in the area

- 1a. Outer jaw teeth conical, unicuspid; no black "tilapia mark" at junction of spinous and soft part of dorsal fin → 2
- 1b. Jaw teeth fine, bicuspid or tricuspid; juveniles and sometimes adults with black "tilapia mark" at junction of spinous and soft part of dorsal fin → 6

- 2a. Lower branch of lateral line extends far anteriorly on the flank, strongly overlapping with upper branch; trifurcation of lower lateral-line branch over caudal fin; extremely short first anal-fin spine followed by 2 spines of almost equal length (Fig. 1) → 3
- 2b. Lower lateral line branch does not extend far anteriorly; no trifurcation of pored scales on caudal fin; anal-fin spines of gradually increasing length → 4

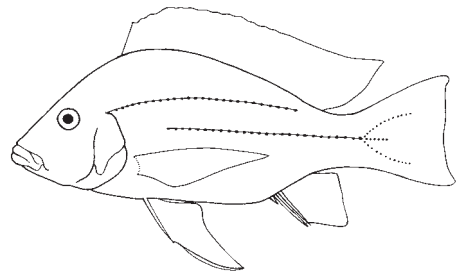


Fig. 1

- 3a. Closed mouth approximately horizontal; full, fleshy lips visible in dorsal view (Fig. 2) *Tylochromis jentinki* (Fig. 3)
- 3b. Closed mouth inclined 15 to 20° from horizontal; thin lips not visible in dorsal view (Fig. 4) *Tylochromis intermedius* (Fig. 5)

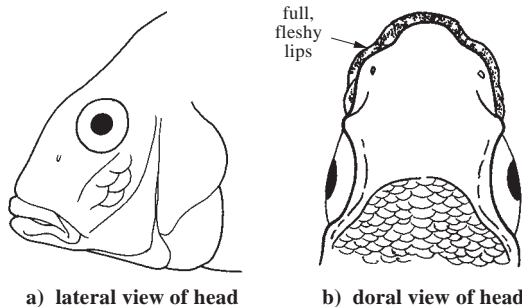


Fig. 2 *Tylochromis jentinki*

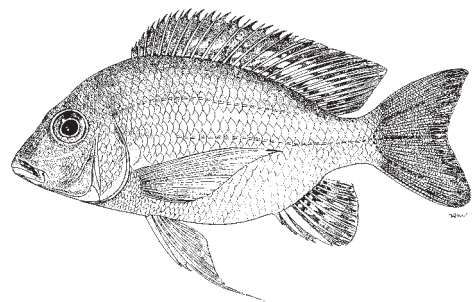


Fig. 3 *Tylochromis jentinki*

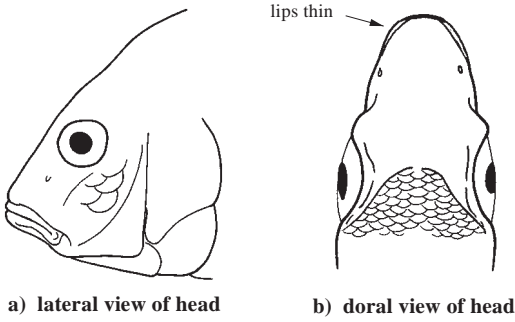


Fig. 4 *Tylochromis intermedius*

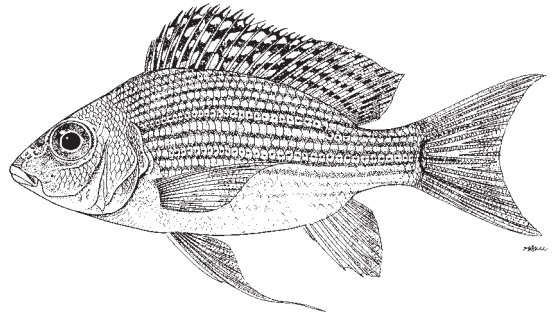


Fig. 5 *Tylochromis intermedius*

- 4a. Five dark blotches or vertical bands on flanks; head profile straight or concave → 5
- 4b. Two dark blotches on flanks; snout profile straight or convex (Fig. 6) ***Hemichromis bimaculatus* group**

(including *H. bimaculatus*, *H. cristatus*, *H. guttatus*, *H. letourneuxi*, *H. paynei*, and *H. stellifer*)

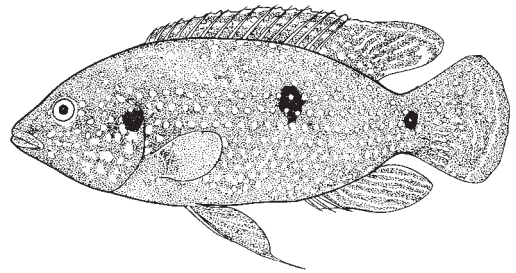


Fig. 6 *Hemichromis bimaculatus*

- 5a. Five dark blotches on flanks are ovoid with distinct edges (Fig. 7) ***Hemichromis elongatus***
- 5b. Five dark blotches on flanks are circular with indistinct edges and with intervening small, dark speckles (Fig.8) ***Hemichromis fasciatus***

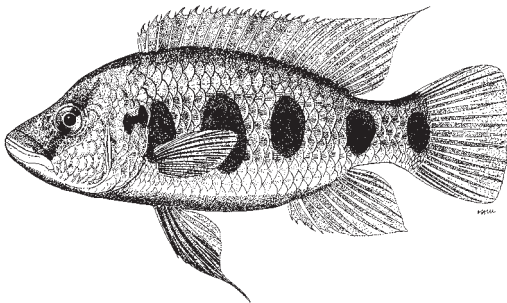


Fig. 7 *Hemichromis elongatus*

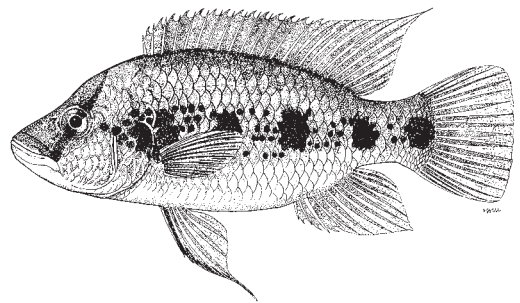
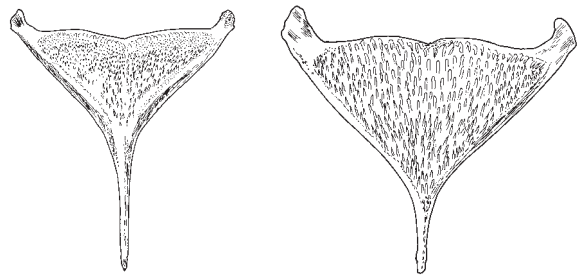


Fig. 8 *Hemichromis fasciatus*

- 6a. Lower pharyngeal element longer than wide, with anterior lamella longer than dentigerous surface (Fig. 9a); 12 to 26 gill rakers on lower limb of first gill arch → 7
- 6b. Lower pharyngeal element as long as wide, with anterior lamella not longer than dentigerous surface (Fig. 9b); 7 to 16 gill rakers on lower limb of first gill arch → 8



a) *Oreochromis niloticus* b) *Coptodon rendalli*

Fig. 9 pharyngeal bone

- 7a. Scales on belly considerably smaller than flank scales; 19 to 26 gill rakers on lower limb of first arch; caudal fin mostly covered with narrow dark bars (Fig. 10) ***Oreochromis niloticus***
- 7b. Scales on belly only slightly smaller than flank scales; 12 to 19 gill rakers on lower limb of first arch; often with intense patches of black; caudal fin lacking dark vertical bars (Fig. 11) ***Sarotherodon melanotheron* group**
(including *S. melanotheron* and *S. nigripinnis*)

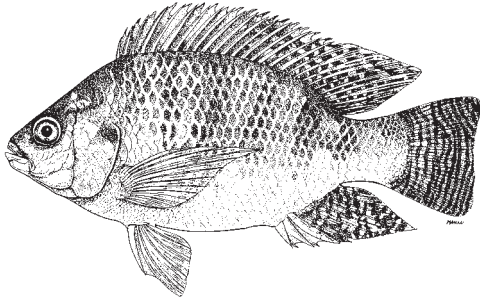


Fig. 10 *Oreochromis niloticus*

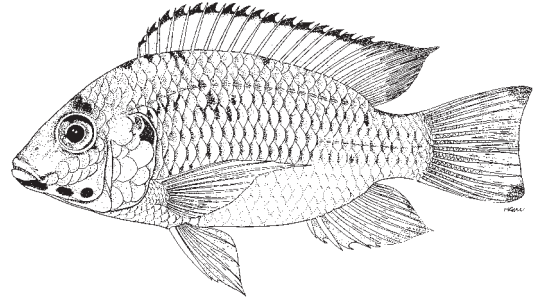
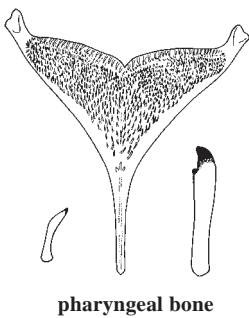


Fig. 11 *Sarotherodon melanotheron*

- 8a. Twelve to 16 gill rakers on lower limb of first gill arch, flanks may have dark blotches → 9
- 8b. Eleven or fewer gill rakers on lower limb of first gill arch; flanks lack dark blotches, but may have indistinct bands → 10
- 9a. Dark blotches in middle of flanks, body sometimes blackish; head profile rounded; teeth on lower pharyngeal jaw small, forming a felt-like covering (Fig. 12) ***Pelmatolapia mariae***
- 9b. Flanks olive brown, with dark vertical bars present only in juveniles; head profile straight; teeth on lower pharyngeal jaw relatively strong, not felt-like (Fig. 13) ***Pelmatolapia cabrae***



pharyngeal bone

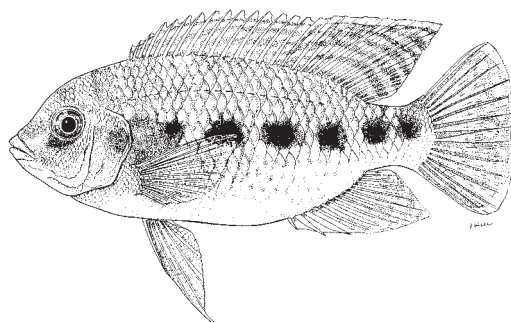
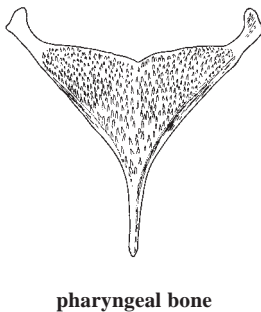


Fig. 12 *Pelmatolapia mariae*



pharyngeal bone

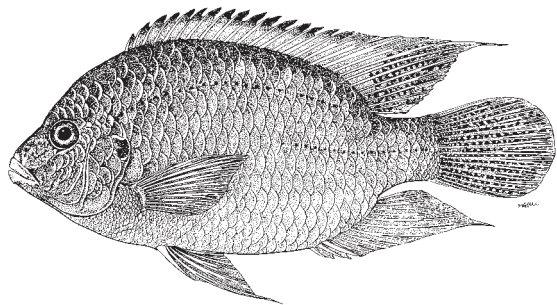


Fig. 13 *Pelmatolapia cabrae*

- 10a. Base of flank scales with dark lines (Fig. 14); lacking longitudinal band on flanks → 11
- 10b. Base of flank scales lacking dark lines; longitudinal band appears on flanks when stressed (Fig. 14) *Coptodon zillii*

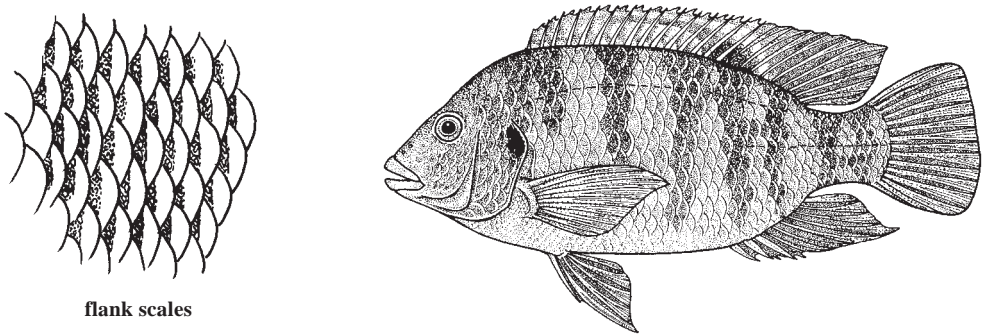


Fig. 14 *Coptodon zillii*

- 11a. Bright red throat and chest in adults; anal fin and lower half of caudal fin reddish (Fig. 15) *Coptodon rendalli*
- 11b. Creamy white throat and chest, anal fin and caudal fin greyish or transparent (Fig. 16) *Coptodon guineensis*

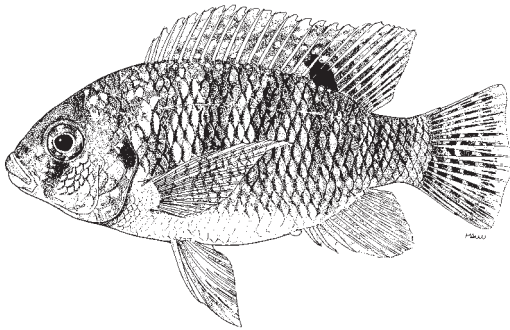


Fig. 15 *Coptodon rendalli*

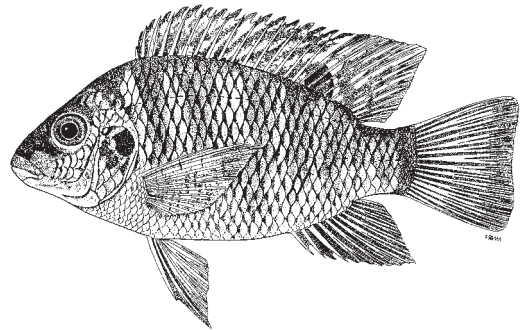


Fig. 16 *Coptodon guineensis*

List of species occurring in the area

- Coptodon guineensis* (Bleeker in Günther, 1862). To 28.2 cm standard length. Coastal basins from Senegal to Angola.
- Coptodon mariae* (Boulenger, 1899). To 39.4 cm. Coastal basins from Côte d'Ivoire to Cameroon.
- rendalli* (Boulenger, 1897). To 45.0 cm. Reported from Senegal and Niger Rivers, Cameroon, Gabon, Democratic Republic of the Congo, Angola, and Namibia. Introduced in Côte d'Ivoire, and probably elsewhere, for aquaculture.
- Coptodon zillii* (Gervais, 1848). To 40.0 cm standard length. Scattered West African coastal localities from Morocco to Nigeria.
- Hemichromis bimaculatus* Gill, 1862. To 9.2 cm standard length. Coastal basins from Guinea to Liberia.
- Hemichromis cristatus* Loisel, 1979. To 6.7 cm standard length. Coastal basins of Guinea and Sierra Leone.
- Hemichromis elongatus* (Guichenot in Duméril, 1861). To 15.0 cm. Coastal basins from Guinea to Angola.
- Hemichromis fasciatus* Peters, 1857. To 26.5 cm. Coastal basins from Senegal to Nigeria.

- Hemichromis guttatus* Günther, 1862. To 7.8 cm standard length. Coastal basins from Côte d'Ivoire to Cameroon.
- Hemichromis letourneuxi* Sauvage, 1880. To 11.9 cm standard length. Coastal basins from Senegal to Ghana.
- Hemichromis paynei* Loiséle, 1979. To 7.2 cm standard length. Coastal basins from Guinea to Liberia.
- Hemichromis stellifer* Loiséle, 1979. To 8.0 cm standard length. Coastal basins from Equatorial Guinea to Democratic Republic of the Congo.
- Oreochromis niloticus* (Linnaeus, 1758). To 60.0 cm standard length. Niger, Benue, Volta, Gambia, and Senegal Rivers. Also introduced in the region for aquaculture.
- Pelmatolapia cabrae* (Boulenger, 1899). To 37.0 cm. Coastal basins from Equatorial Guinea to Angola.
- Pelmatolapia mariae* (Boulenger, 1899). To 39.4 cm. Coastal basins from Côte d'Ivoire to Cameroon.
- Sarotherodon melanotheron* Rüppell, 1852. To 25.0 cm standard length. Brackish estuaries and lagoons from Senegal to Cameroon.
- Sarotherodon nigripinnis* (Guichenot in Duméril, 1861). To 21.5 cm standard length. Brackish estuaries from Equatorial Guinea to Democratic republic of the Congo.
- Tylochromis intermedius* (Boulenger, 1916). To 23.0 cm standard length. Coastal basins from Gambia to Ghana.
- Tylochromis jentinki* (Steindachner, 1894). To 27.0 cm standard length. Coastal basins from Gambia to Ghana.

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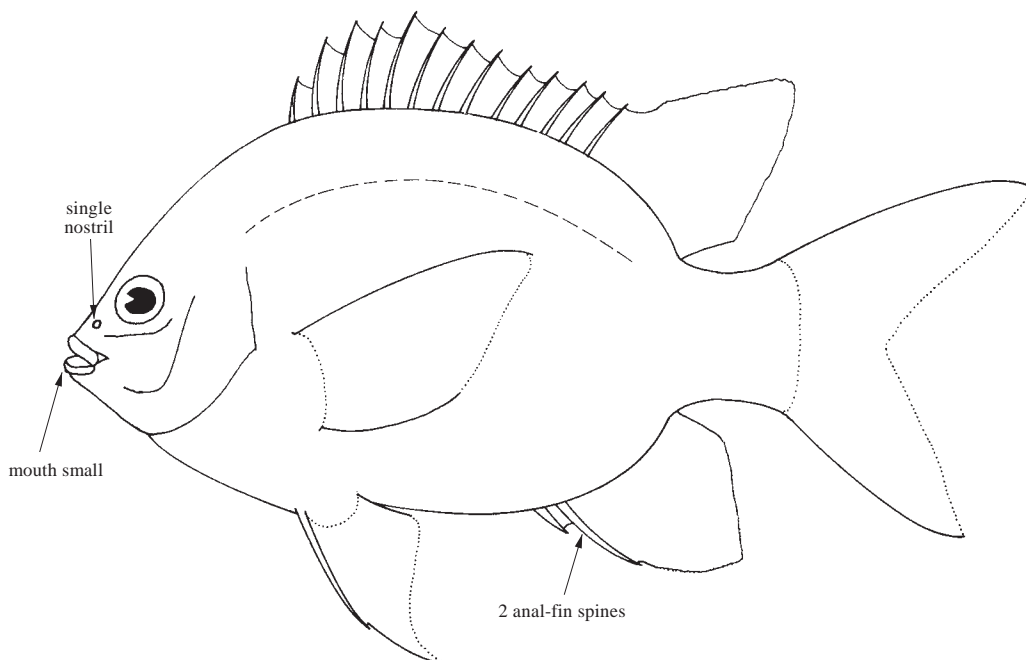
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POMACENTRIDAE

Damselfishes

by A.J. Edwards, Newcastle University, Newcastle upon Tyne, UK

Diagnostic characters: Small fishes, 35 cm maximum, usually less than 15 cm in total length. Most are deep-bodied and laterally compressed, with a **small mouth and moderately to highly protrusible jaws**. Teeth in jaws conical, incisiform or brush-like, **but never molar-like or fang-like**. **A single pair of nostrils in Atlantic species;** preorbital and usually suborbitals (a ring of bones below the eye) not attached to the cheek; gill rakers small, rarely more numerous than 35 to 40 on first arch; lower pharyngeals (tooth-bearing fifth ceratobranchials, "throat-teeth") completely fused into a plate. Dorsal fin with 10 to 14 spines (usually 12 or 13); **anal fin always with 2 spines**. Scales ctenoid (rough-to-touch), in Atlantic species fewer than 30 in a longitudinal row from behind gill cover to base of caudal fin. Lateral line with tube-bearing scales which extend to below end of dorsal fin, then continuing as a row of tiny pits to middle of caudal-fin base. **Colour:** constant in some genera, highly variable in others. Many damselfishes are brightly coloured; adults are often less brilliant than juveniles and frequently there is a gradual transition from a specific juvenile colour pattern to a different adult pattern; temporary spawning coloration can be assumed or discarded in seconds.



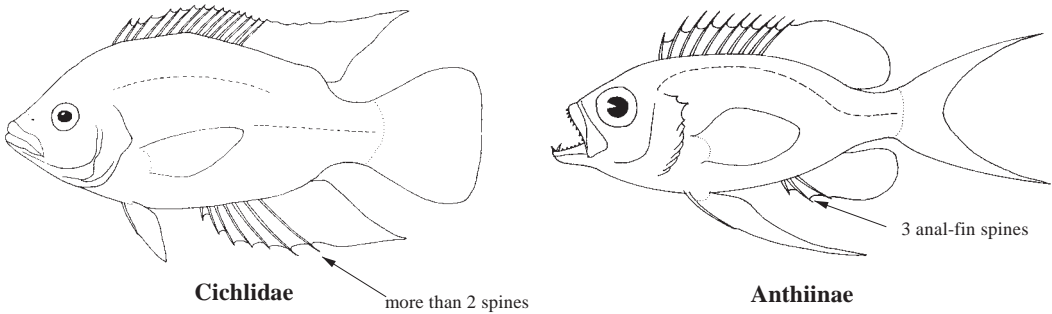
Habitat, biology, and fisheries: Most species of damselfishes are restricted to shallow rocky, coral or algal reefs at depths less than 15 m; a few species enter lagoons, estuaries and the lower reaches of fresh-water streams. The larger species may be caught with small hooks; also taken in traps and with cast-nets and seines; a small number of species occur in deeper water (down to several hundred metres) and may be incidentally taken in trawls. Most damselfishes are commercially unimportant, but several are a component of artisanal subsistence fisheries. Some species may be utilized in the aquarium trade but there is at present little evidence for this in the eastern central Atlantic.

Remarks: The taxonomy of West African damselfishes is still unclear with the status of at least 2 nominal species unknown (see Edwards, 1986) and the status of eastern Atlantic populations of widespread amphi-Atlantic species such as *Chromis multilineata* requiring further study. The distribution of *Abudefduf hoefleri* is uncertain with few specimens studied. The species list and identification sheets should therefore be regarded as provisional.

Similar families occurring in the area

Cichlidae: similar in general appearance, but usually with more than 2 spines in anal fin; preorbital and suborbitals attached to cheek. Normally confined to fresh or brackish water.

Serranidae (Anthiinae): generally resemble the pomacentrid genus *Chromis*, but easily distinguished by the presence of 3 anal-fin spines, enlarged canine teeth, and double nostrils.



Key to species of Pomacentridae occurring in the area

- 1a. Teeth in upper jaw conical (Fig. 1a) or incisiform (Fig. 1b), but never flexible or brush-like; no notch in preorbital bone bordering the jaw (Fig. 2a) → 2
- 1b. Teeth in upper jaw flexible, brush-like; a pronounced notch in preorbital bone bordering the jaw (Fig. 2b) *Microspathodon frontatus*

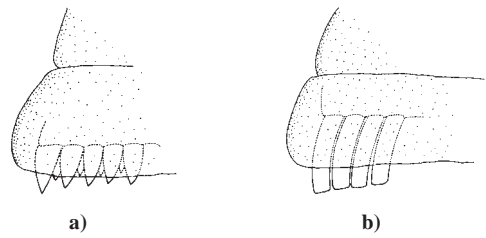


Fig. 1 dentition of upper jaw

- 2a. Dorsal-fin spines 12 to 14; preopercular margin entire (smooth, Fig. 2b) or, if crenulate or finely serrated, then dorsal-fin soft rays 11 or 12 and anal-fin soft rays 10 or 11 → 3
- 2b. Dorsal-fin spines 12; suborbital and preopercle serrated (Fig. 2a); dorsal-fin soft rays 14 to 17 and anal-fin soft rays 13 to 15 (*Stegastes*) → 5

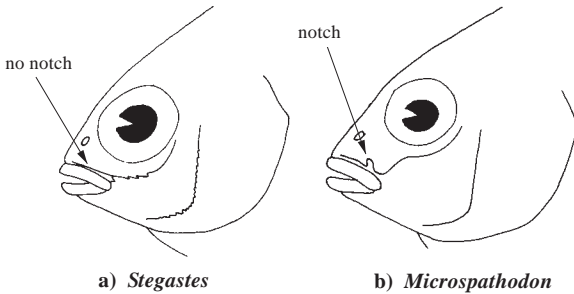


Fig. 2 lateral view of head

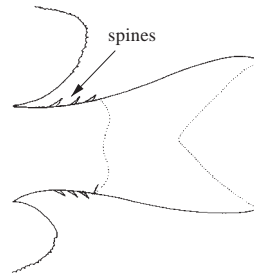


Fig. 3 lateral view of caudal region

- 3a. Teeth conical (Fig. 1a) in 2 to 4 rows; upper and lower edges of caudal-fin base with 2 or 3 projecting spines (Fig. 3) (*Chromis*) → 8
- 3b. Teeth incisiform (Fig. 1b) in a single row; upper and lower edges of caudal-fin base without projecting spines → 4

- 4a. Dorsal-fin soft rays 15 to 18 (rarely 15) (*Similiparma*) → 13
- 4b. Dorsal-fin soft rays 11 to 14 (*Abudefduf*) → 14
- 5a. Adults with a uniform yellow-orange (usually) to dark greenish to yellowish brown ground coloration; pectoral and caudal fins yellow-orange; near-vertical dark stripes along edges of scale rows present on flanks below lateral line and above level of pectoral-fin base; juveniles primarily yellow with a black ocellus at base of rear of spinous part of dorsal fin; endemic to St Paul's Rocks *Stegastes sanctipauli*
- 5b. Coloration not as above → 6
- 6a. Gill rakers on lower limb of first gill arch 9 or 10; total gill rakers on first gill arch 15 to 19 (modally 17) *Stegastes imbricatus*
- 6b. Gill rakers on lower limb of first gill arch 11 to 14; total gill rakers on first gill arch 18 to 23 → 7
- 7a. Head and most of body bluish, caudal peduncle and caudal fin bright yellow; greatest body depth 39.7 to 47.9% of standard length; endemic to Ascension Island . . . *Stegastes lubbocki*
- 7b. Head and body uniform greyish brown, darker dorsally, all fins dusky; juveniles with posterior of caudal peduncle and caudal fin pale brownish white; greatest body depth 47.7 to 52.1% of standard length; endemic to St Helena Island *Stegastes sanctaehelenae*
- 8a. Dorsal fin-spines 13 or 14 (very rarely 12); dorsal rays 9 to 12 (very rarely 8); anal rays 10 to 12 (occasionally 9) → 9
- 8b. Dorsal fin-spines 12 (rarely 13); dorsal rays 12 (rarely 11 or 13); anal rays 12 (rarely 11) *Chromis multilineata*
- 9a. Dorsal fin-spines usually 13 (rarely 12 and occasionally 14); length of anal-fin base 23.8 to 27.2% of standard length; predorsal length 28.7 to 32.1% of standard length; endemic to St Helena Island *Chromis sanctaehelenae*
- 9b. Dorsal fin-spines 14; length of anal-fin base 19.8 to 24.9% of standard length; predorsal length 30.1 to 36.2% of standard length → 10
- 10a. Dorsal-fin soft rays 12; pectoral rays usually 20 (occasionally 19 or 21); tubed lateral-line scales 18 or 19 (usually 19); gill rakers on lower limb of first gill arch 22 to 24 (modally 23); second anal spine longer than longest anal ray; length of second anal spine 18.0 to 22.2% of standard length; caudal fin lacking dark bands along upper and lower margins *Chromis lubbocki*
- 10b. Not as above; dorsal rays usually less than 12; second anal spine shorter than longest anal ray → 11
- 11a. Pectoral rays 20 (occasionally 19 or 21); greatest body depth usually less than 44.7% of standard length (40.3 to 44.7% of standard length); 23 to 25 gill rakers on lower limb of first gill arch *Chromis cadenati*
- 11b. Pectoral rays 17 to 19 (rarely 20); greatest body depth usually greater than 44.7% of standard length (44.7 to 52.5% of standard length); 20 to 22 gill rakers on lower limb of first gill arch (rarely 23) → 12

- 12a. Black bands not present along margins of median fins (although these may be darkish grey); juveniles with neon blue longitudinal stripes; pectoral rays 17 or 18 (usually 18); number of soft anal-fin or dorsal-fin rays rarely more than 10; length of longest dorsal ray less than 22% of standard length (19.7 to 21.7% of standard length); length of caudal peduncle 15.3 to 17.5% of standard length ***Chromis chromis***
- 12b. Adults with blackish bands along distal edges of dorsal and anal fins and upper and lower margins of caudal fin; juveniles similarly coloured to adult; pectoral rays usually 19 or 20 (rarely 18); number of soft anal-fin and dorsal-fin rays almost always 11 or 12; length of longest dorsal ray greater than 22% of standard length (22.3 to 26.5% of standard length); length of caudal peduncle 11.7 to 15.7% of standard length . . ***Chromis limbata***

- 13a. Dorsal-fin soft rays 15 to 17 (usually 16); anal-fin soft rays 12 to 14 (usually 13); pectoral-fin rays 19 to 21 (usually 20); adults and juveniles with mainly dark brown or blackish body and dark caudal fin ***Similiparma lurida***
- 13b. Dorsal-fin soft rays 17 or 18; anal-fin soft rays 14; pectoral-fin rays 22 or 23; adults with dark body but white caudal fin; juveniles yellow with scattered violet dots. . ***Similiparma hermani***

- 14a. Suborbitals tightly bound to cheek with lower suborbital margin covered by scales (Fig. 4); dorsal-fin soft rays 11 or 12 (usually 12); anal-fin soft rays 10 or 11 (usually 10); total gill rakers on first gill arch 18 to 23 ***Abudefduf taurus***
- 14b. Suborbitals free with lower suborbital margin exposed; dorsal-fin soft rays 12 to 14; anal-fin soft rays 10 to 13; total gill rakers on first gill arch 23 to 31 → 15

- 15a. Dorsal-fin soft rays 13 or 14 (modally 14); anal-fin soft rays 13; body pastel blue to dark grey blue in colour with about 4 faint vertical stripes . . . ***Abudefduf hoefleri***
- 15b. Dorsal-fin soft rays 12 or 13 (modally 13); anal-fin soft rays 10 to 13 (modally 12); 5 prominent vertical black bars on sides that narrow towards belly, interspaces wider than bars ***Abudefduf saxatilis***

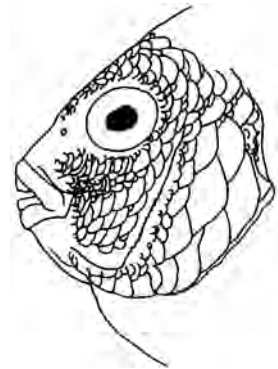














Fig. 4

List of species occurring in the area

The symbol  is given when species accounts are given.

-  *Abudefduf hoefleri* (Steindachner, 1881).
-  *Abudefduf saxatilis* (Linnaeus, 1758).
-  *Abudefduf taurus* (Müller and Troschel, 1848).
-  *Chromis cadenati* Whitley, 1951.
-  *Chromis chromis* (Linnaeus, 1758).
-  *Chromis limbata* (Valenciennes, 1833).
-  *Chromis lubbocki* Edwards, 1986.
-  *Chromis multilineata* (Guichenot, 1853).
-  *Chromis sanctaehelenae* Edwards in Edwards and Glass, 1987.
-  *Microspathodon frontatus* Emery, 1970.
-  *Similiparma hermani* (Steindachner, 1887).
-  *Similiparma lurida* (Cuvier, 1830).

- 🐟 *Stegastes imbricatus* Jenyns, 1840.
- 🐟 *Stegastes lubbocki* Allen and Smith, 1992.
- 🐟 *Stegastes sanctaehelenae* (Sauvage, 1879).
- 🐟 *Stegastes sanctipauli* Lubbock and Edwards, 1981.

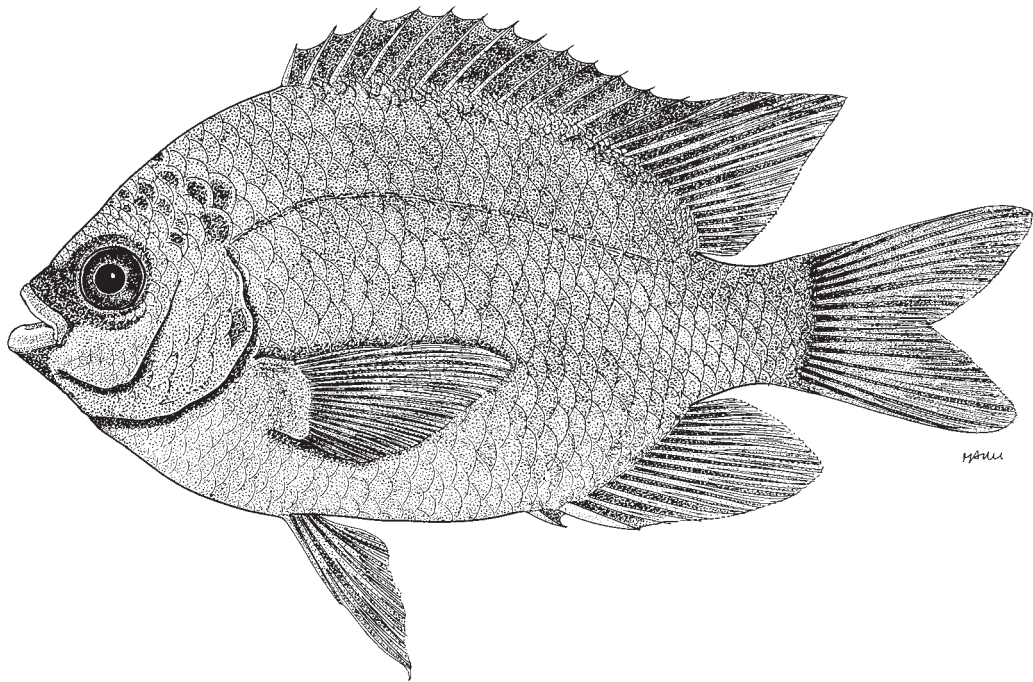
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Abudefduf hoefleri (Steindachner, 1881)

Frequent synonyms / misidentifications: None / None.

FAO names: En – African sergeant.



Diagnostic characters: Body moderately deep, greatest body depth 49.3 to 55.1% of standard length; caudal peduncle tending to be shallower than that of *Abudefduf saxatilis*, its least depth 14.7 to 15.7% of standard length; third dorsal spine 12.9 to 14.0% of standard length; head fairly short at 25.0 to 27.3% of standard length. **Dorsal fin with 13 spines and 13 or 14 (modally 14) soft rays; anal fin with 2 spines and 13 soft rays;** pectoral-fin rays 19 or 20. Tubed lateral-line scales 21. Three and a half scale rows between lateral line and base of dorsal fin. Gill rakers on lower limb of first gill arch 18 or 19; total gill rakers on first arch 26 to 28. **Colour:** described originally as having a blue-violet body coloration with each scale on the trunk having a more-or-less sharply defined, bright gold-yellow spot. Colour in life appears to be largely pastel blue with dark centres to a line of scales on nape and some scales above and behind the eye; snout dark blue. Scales on flanks tend to be light centrally with dark edges in dead specimens. Some individuals have about 4 faint vertical bars on the sides of the body that become more obvious after death. Newly dead specimens dark blue grey.

Size: To 22.5 cm total length.

Habitat, biology, and fisheries: The species is common at the Cape Verde Archipelago, São Tomé and at Príncipe in a depth range of 0 m to at least 20 m in similar habitats to *Abudefduf saxatilis*. Spawning pairs have been observed at 8 to 20 m depth. The species can be very territorial and live close to the bottom (much like breeding *Abudefduf saxatilis*). Also reported to be common in lagoons and eaten after being smoked in Benin and as occurring in shallow water in Guinea-Bissau where it is found in fish markets.

Distribution: Recorded from the Cape Verde Archipelago, Gorée in Senegal (where originally described), Guinea-Bissau, Benin, from Ilhéu das Rôlas off São Tomé, and from Príncipe.

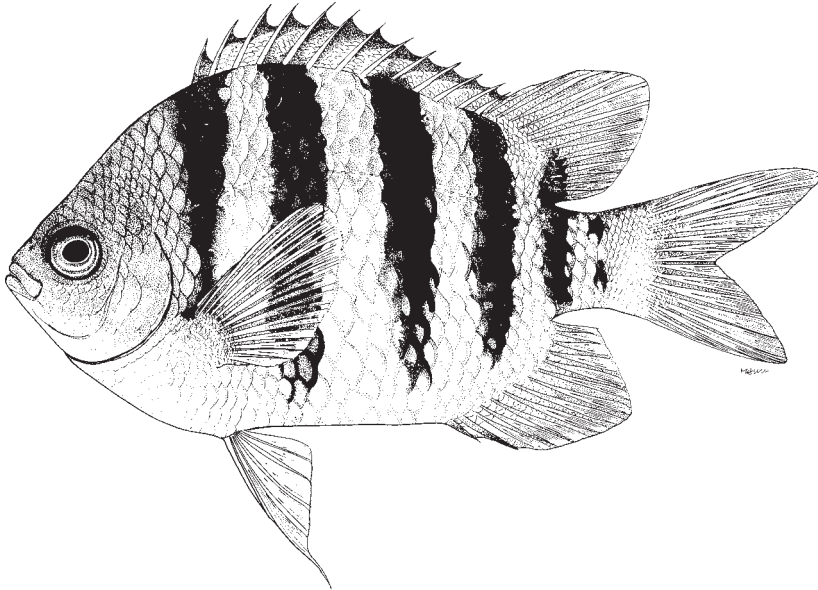
Remarks: This species is poorly known and the characters given above are based on only a few specimens from the Cape Verde Archipelago and Príncipe, ranging from 16 to 22.5 cm total length. Although *Abudefduf hoefleri* have similar coloration to breeding male *A. saxatilis*, molecular studies indicate that *A. hoefleri* is distinct from *A. saxatilis* (D.R. Robertson, pers. comm.), as well as the characters listed above.



***Abudefduf saxatilis* (Linnaeus, 1758)**

Frequent synonyms / misidentifications: *Abudefduf marginatus* (Bloch, 1787) / None.

FAO names: En – Sergeant-major; Fr – Chauffet soleil; Sp – Petaca rayada.



Diagnostic characters: Body deep, laterally compressed. Mouth small, moderately protrusible; **teeth in a single row, incisiform**, each with a small notch on upper edge in large individuals; **preorbital bone narrow without a notch above upper lip; suborbital bones smooth and not attached to cheek; preopercle with a smooth edge. Dorsal fin with 13 spines and 12 or 13 (modally 13) soft rays; anal fin with 2 spines and 10 to 13 (rarely 10, modally 12) soft rays; pectoral-fin rays 16 to 20; caudal fin forked.** Gill rakers on first gill arch 23 to 31. **Colour:** back and sides often bright greenish yellow, belly bluish white; 5 **prominent vertical black bars on sides that narrow towards belly; interspaces wider than bars** and a sixth faint bar on upper caudal peduncle. Sometimes the entire body bluish to white except for the black bars. A dark spot at base of pectoral fin.

Size: To 22.9 cm total length; maximum weight 200 g.

Habitat, biology, and fisheries: Normally a shallow-water species (usually found at depths <10 m). Conspicuous as juveniles in tide pools, and as adults feeding in schools over rocks. Adult males adopt a bluish ground colour when guarding eggs. Attracted to divers who feed fish. Has been reared in captivity. Depth limit around 15 m. Feeds on plankton, benthic invertebrates, and plants. Caught mainly in subsistence fisheries in shore seines and by handlines or cast nets. Separate statistics are not reported for this species. Marketed or consumed fresh.

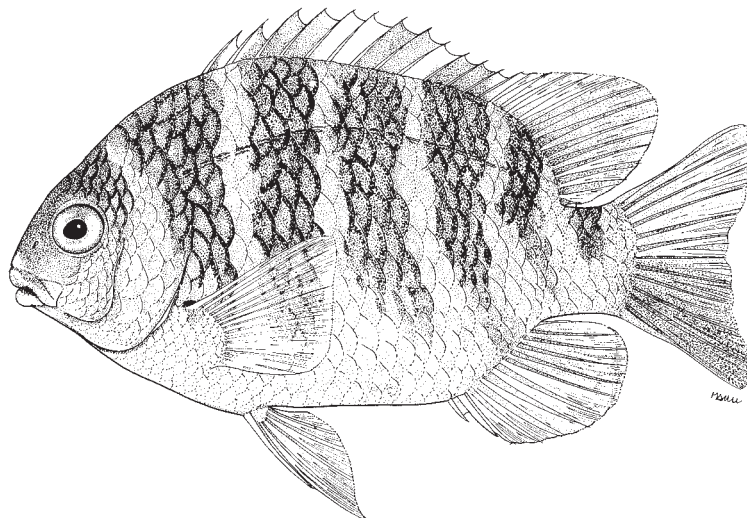
Distribution: Tropical and subtropical Atlantic 43°N to 35°S; occurring in the area from the Cape Verde Archipelago southwards to Angola with records from Cape Verde Islands, Senegal, Guinea-Bissau, Guinea, Sierra Leone, Ghana, Bioko (formerly Fernando Póo), Príncipe, São Tomé, Annobón, Congo and northern Angola as well as central Atlantic islands of St Paul's Rocks, Ascension and St Helena. Vagrants have recently been recorded from a harbour in the Canary Islands and from the south coast of Madeira Island.



Abudefduf taurus (Müller and Troschel, 1848)

Frequent synonyms / misidentifications: *Abudefduf analogus* (Gill, 1863) / *Abudefduf hoefleri* (in Ghana).

FAO names: En – Night sergeant; Fr – Chauffet de nuit; Sp – Petaca toro.



Diagnostic characters: Body deep, somewhat laterally compressed but robust. Mouth small to medium-sized, moderately protrusible; **teeth in a single row, incisiform**, each with a conspicuous notch on upper edge in large individuals; preorbital bone moderately expanded, **without a notch above upper lip**; **suborbitals smooth and attached to cheek with lower margin usually obscured by scales**; **preopercle with a crenulate or finely serrate edge**. **Dorsal fin with 13 spines** and 11 or 12 (usually 12) soft rays; anal fin with 2 spines and **10 or 11 soft rays**; caudal fin bluntly forked. Gill rakers on first gill arch 18 to 21. **Colour:** back and sides pale or yellowish brown; **5 wide dark brown bars ending bluntly on the upper belly**; **interspaces narrower than bars**, and a sixth diffuse bar sometimes present on upper half of caudal peduncle; a very large and prominent spot in axil of pectoral fins. In juveniles, bars extend further onto belly and anterior 2 bars on body are interrupted by whitish scales at about the level of the lateral-line.

Size: To at least 17.5 cm total length in area. Reported to 25 cm total length in western Atlantic.

Habitat, biology, and fisheries: Normally a very shallow-water species, characteristically found in rockpools and very turbulent, wave-swept rock and sand areas in less than 5 m depth (usually less than 2 m) occasionally in water of somewhat reduced salinity. The adults and juveniles do not form schools, but feed as individuals on a herbivorous diet of algae and seagrasses. Adults also feed on *Zoanthus* and hydroids while juveniles feed on copepods. Occasional in subsistence fisheries in cast nets or spiral nets, but usually by handlines or beach seines. Marketed or consumed fresh. Separate statistics are not reported for this species.

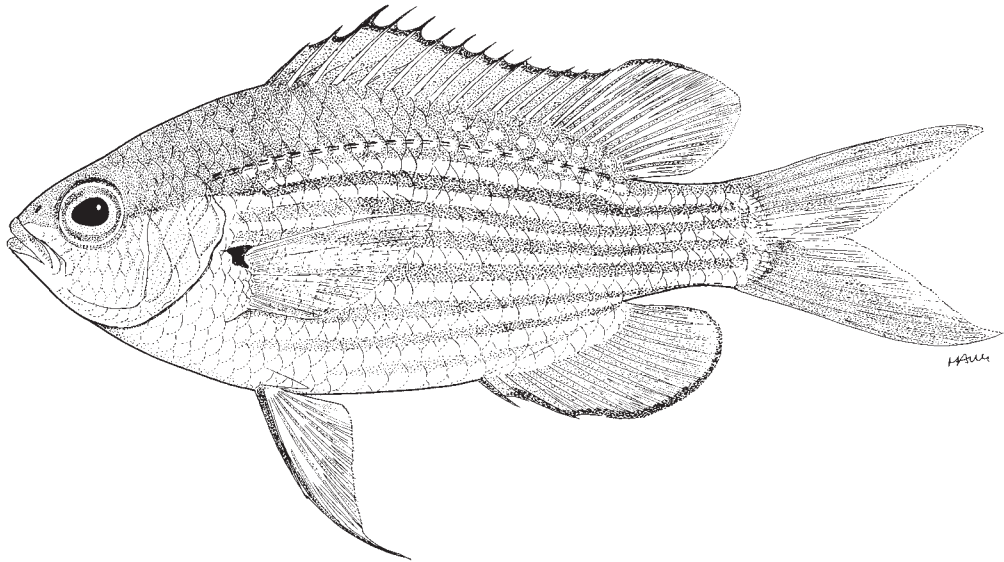
Distribution: In the area recorded from the Cape Verde Archipelago, Senegal, Guinea-Bissau, Ghana, Cameroon, São Tomé, Annobón and southwards to Namibe (formerly Moçamedes) in Angola. Also known from southern Florida, Gulf of Mexico, and Caribbean Sea in the western Atlantic. Not recorded from central Atlantic islands of St Paul's Rocks, Ascension or St Helena.



Chromis cadenati Whitley, 1951

Frequent synonyms / misidentifications: *Chromis lineatus* Cadenat, 1950 / *Chromis chromis*.

FAO names: En – Cadenat's chromis; Fr – Sergeant africain; Sp – Castañeta rayada.



Diagnostic characters: Body relatively elongate, the depth 40.3 to 44.7% of standard length. **Dorsal fin with 14 spines and usually 11 soft rays;** anal fin with 2 spines and 11 (rarely 10 or 12) soft rays; pectoral fins with usually 20 (occasionally 19 or 21) rays; second anal-fin spine always shorter than the longest anal-fin soft ray; caudal fin forked. Tubed-scales in lateral line 18 to 20 (usually 20). Gill rakers on lower limb of first gill arch 23 to 25. **Colour:** yellow or golden brown becoming silvery ventrally, with silvery stripes on flanks. On flanks each scale dark-edged, centrally pale, imparting an overall appearance of **longitudinal stripes** (5 to 7 below the lateral line); **dorsal and anal fins yellow with blue edging;** **upper and lower margins of caudal fin yellow** with central rays duskier; **a dark blotch present in pectoral-fin axil extending only to upper part of pectoral-fin base.**

Size: Maximum 19 cm; common to 15 cm.

Habitat, biology, and fisheries: Inhabits shallow coastal waters (to about 70 m depth). A schooling fish feeding on plankton and probably small benthic crustaceans; builds nests guarded by the male. Apparently fished in shallow waters (20 to 70 m deep) in Senegal and Ghana. Separate statistics are not reported for this species. Caught incidentally on hook-and-line, and in purse seines and trawls. Marketed mostly fresh, smoked or dried salted.

Distribution: Recorded from the mainland coast of West Africa off Senegal, Guinea, Guinea-Bissau, Liberia, Ghana and Gabon.

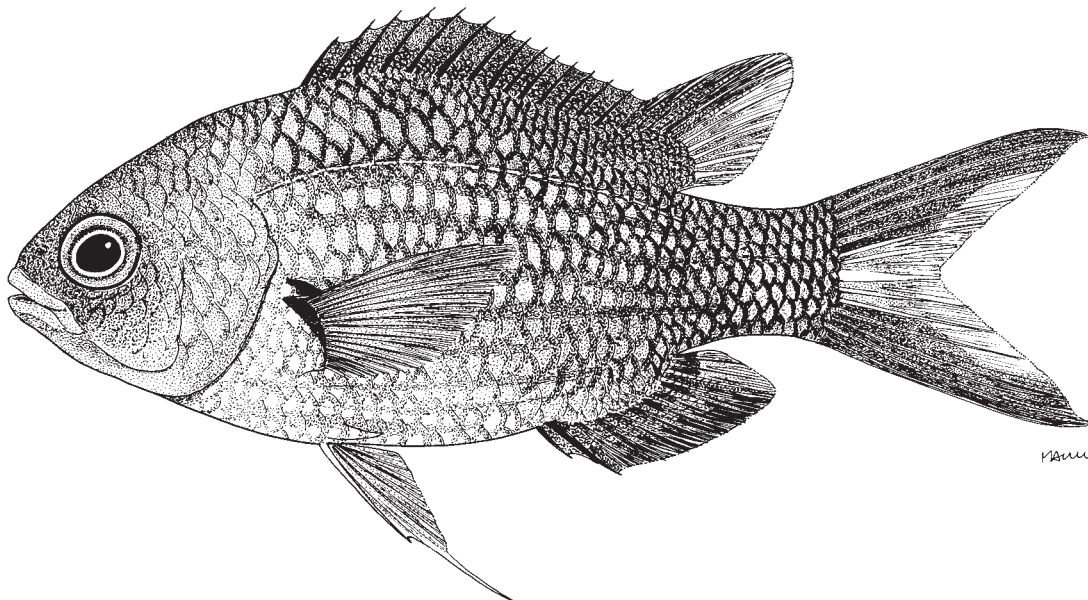
Remarks: Originally named *Chromis lineatus* by Cadenat (1950), but this name was preoccupied by *C. lineatus* Fowler and Bean, 1928 from the Philippines. Whitley (1951) proposed *C. cadenati* as a replacement name. Cadenat's original description is dated December 1949 but was not apparently published until 1950.



***Chromis chromis* (Linnaeus, 1758)**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Damselfish; Fr – Castagnole; Sp – Castañuela.



Diagnostic characters: Body relatively elongate, the depth 44.7 to 51.9% of standard length. Dorsal fin with 14 spines and 8 to 11 soft rays; anal fin with 2 spines and 9 to 11 soft rays; pectoral fins with 17 or 18 (usually 18) rays; second anal-fin spine always shorter than the longest anal-fin soft ray; caudal fin forked. Tubed-scales in lateral line 16 to 19 (usually 18 or 17). Gill rakers on lower limb of first gill arch 20 to 23.

Colour: body chestnut brown with pale centres to scales giving appearance of 8 or 9 longitudinal pale stripes; fins generally dusky with dusky (darkish grey) bands bordering upper and lower lobes of caudal fin with medial-fin rays pale. Dusky bands on caudal-fin lobes not as dark as in *C. limbata*. Juveniles are darker with several neon blue longitudinal stripes on head and body.

Size: To at least 12.6 cm total length.

Habitat, biology, and fisheries: Occurs mainly in rocky areas at depths of 3 to 35 m. Often seen in large schools (up to several hundred individuals) in midwater above or near rocky reefs. Feeds on plankton and small benthic invertebrates. Multiple synchronous spawning occurs with males setting up breeding territories close together, usually in rocky areas, and spawning over a 3-day period. Males then guard eggs. Juveniles tend to hide in crevices and stay close to the bottom. Caught incidentally on hook-and-line and in nets.

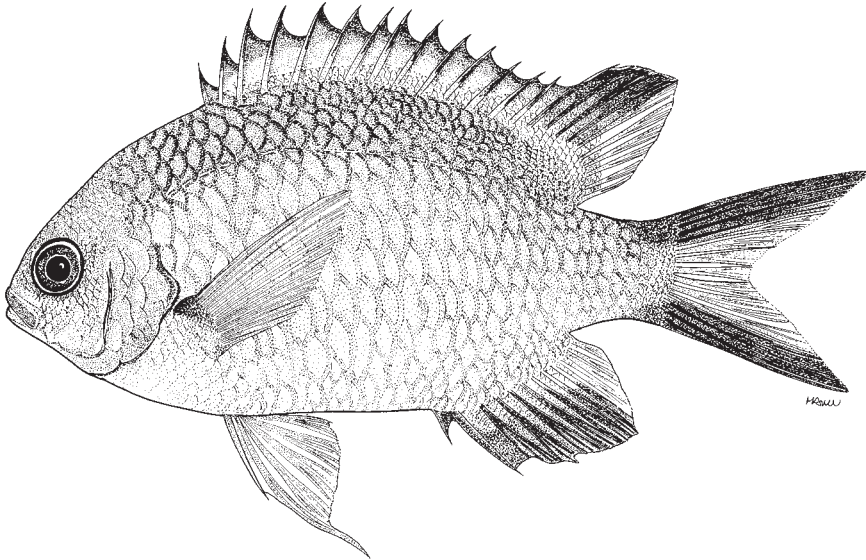
Distribution: This Mediterranean species may be found in the northeast of the area off the coast of Morocco as it is known to occur outside the Straits of Gibraltar along the coast of Spain and on the coast of southern Portugal. Recorded otherwise from the Mediterranean Sea, Black Sea and Sea of Azov.



Chromis limbata (Valenciennes, 1833)

Frequent synonyms: None / *Chromis chromis*.

FAO names: En – Azones chromis; Fr – Castagnole à queue rayée; Sp – Fula blanca.



Diagnostic characters: Body somewhat elongate, the depth 45.8 to 52.5% of standard length. **Dorsal fin with 14 spines** and usually 11 (11 or 12) soft rays; anal fin with 2 spines and 10 to 12 (usually 11) soft rays; **pectoral fins with usually 19 (18 to 20) rays**; second anal-fin spine always shorter than the longest anal-fin soft ray; caudal fin forked. Scales in lateral line usually 18 (17 to 20). Gill rakers on lower limb of first gill arch 20 to 22. **Colour:** golden brown, slightly darker on back. Each scale dark-edged posteriorly and darkly pigmented centrally; dorsal and anal fins with dark (blackish) bands distally throughout most of their length, but bright orange or white on posterior fin rays and membranes and scales on fin bases pale; **caudal fin with dark to black band on outer parts of each lobe, but sharply changing to orange or white on middle rays**; **a dark blotch present on pectoral fin axil and covering entire outer face of fin base**. Often 2 dark bands (with whitish band in between) running obliquely from snout along upper lip and through anterior of eye respectively to ventral edge of preopercle. The males show a distinctively different colour than the females while guarding the nests (sky blue to mauve with an almost white belly); the darker coloration of the fins, characteristic of the species, disappears in breeding males. Once preserved, the dark pigmentation reappears.

Size: Maximum 14 cm total length; common to 12 cm.

Habitat, biology, and fisheries: Occurs in rocky areas from 3 m to at least 35 m depth being most abundant between 5 and 20 m. Females and non-nesting males may aggregate in schools of up to 40 individuals in open water, feeding on plankton but may also stay close to rocks feeding on benthic crustaceans. Males build nests in cracks in the rocks and guard eggs and many adopt a sky blue to mauve coloration during the breeding season. Breeding territories are about 2.5 m². Has been recorded in catches from many areas as *C. chromis* but this may be a mix of species. Separate statistics are not reported for this species. Caught regularly on line, in purse seines and trawls. Marketed mostly fresh, smoked or dried salted.

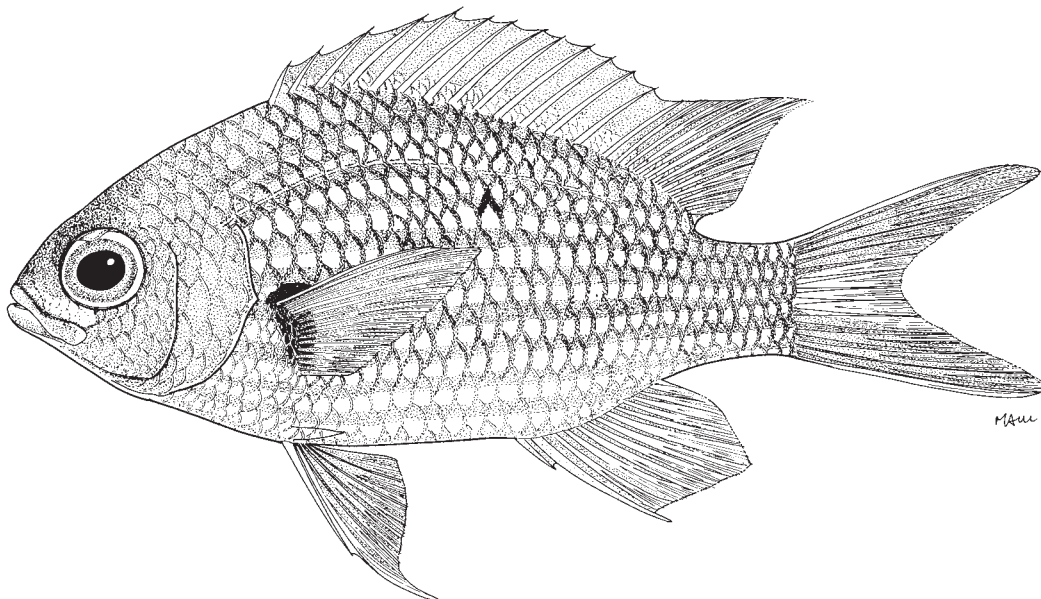
Distribution: Recorded from the Azores, Madeira, Canary Islands and mainland coast of West Africa from Western Sahara (to at least 25°N), and Senegal through Guinea-Bissau, Guinea, Ghana and Gabon to at least as far south as Pointe Noire in the Congo. Records of *C. chromis* from off Mauritania/Western Sahara are most likely this species.



Chromis lubbocki Edwards, 1986

Frequent synonyms/ misidentifications: None / *Chromis lineatus*; *C. chromis*.

FAO names: En – Lubbock's chromis.



Diagnostic characters: Body relatively elongate, the depth 40.6 to 50.1% of standard length. **Dorsal fin with 14 spines and 12 soft rays**; anal fin with 2 spines and 11 soft rays; pectoral fins with 19 to 21 (usually 20) rays; caudal fin forked. Second anal-fin spine always longer than the longest anal-fin soft ray. Tubed-scales in lateral line 18 or 19 (usually 19). Gill rakers on lower limb of first gill arch 22 to 24. **Colour:** head and body greyish brown, centres of scales pale so that each scale clearly delineated by its darker edge; horizontal rows of pale scales with dark edges give striped appearance (usually 8 faint stripes); dorsal and anal fins yellow with anal spines and tips of dorsal spines light blue; outer margins of caudal fin yellow, with edges tinted bluish white; black spot at anterior of pectoral-fin base, and large dark spot on inside of pectoral axil clearly visible when fin lowered.

Size: To at least 15 cm total length.

Habitat, biology, and fisheries: Inhabits shallow waters (usually seen at <10 m depth), often in mixed schools with *Chromis multilineata*. A schooling fish feeding on plankton and probably small benthic crustaceans. Separate statistics are not reported for this species. Fisheries status unknown but likely to be caught incidentally on hook-and-line, and in nets.

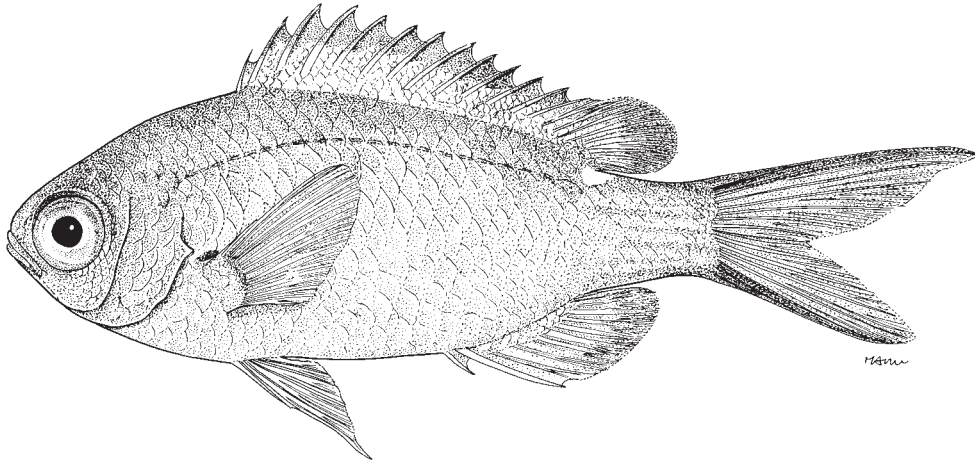
Distribution: Known only from the Cape Verde Archipelago.



Chromis multilineata (Guichenot, 1853)

Frequent synonyms / misidentifications: *Chromis cautus* (Troschel, 1866); *C. marginatus* (Castelnau, 1855) / None.

FAO names: **En** – Brown chromis; **Fr** – Sergeant cromis; **Sp** – Jaqueta parda.



Diagnostic characters: Body relatively elongate, somewhat compressed laterally. Mouth small and very protrusible, forming a distinct tube when extended; **teeth conical and small, in 2 to 8 rows**; preorbital bone narrow, without a notch, but with a bony projection protruding slightly just above upper lip; suborbitals smooth and not attached to cheek; preopercle with a finely serrated edge. **Dorsal fin with 12 spines** (very rarely 13) and 12 soft rays (rarely 11 or 13); anal fin with 2 spines and 12 soft rays (rarely 11); caudal fin deeply forked with elongate tips. **Colour:** greyish green to olive brown on back and sides, becoming pale to white or silvery ventrally; **margins of dorsal and anal fins as well as central portion and tips of caudal fin yellow or clear, upper and lower margins of caudal fin distinctly dark; a large black spot in axil of pectoral fin (most of it hidden beneath the fin);** often a prominent white spot immediately behind last dorsal-fin ray.

Size: To at least 16.5 cm total length.

Habitat, biology, and fisheries: Found in a wide range of habitats, but most commonly forms moderate-sized feeding-schools over rocky reefs, rising high above the bottom to feed on plankton, primarily copepods. Often seen in mixed schools with *Chromis lubbocki* at the Cape Verde Islands. Depth range from shallow patchy reef areas and shore rubble to over 40 m. Caught incidentally throughout its range, mainly in subsistence fisheries with cast nets and gillnets (gillnets infrequently used for inshore reef areas) or small handlines. Rarely marketed, but used primarily as subsistence food. Separate statistics are not reported for this species.

Distribution: In the area recorded from the Cape Verde Archipelago, Ghana, São Tomé, Príncipe and the Congo as well as at the central Atlantic islands of St Paul's Rocks, Ascension and St Helena. Also known in the western Atlantic from north Florida, Texas, Caribbean Sea to mid-Brazil.

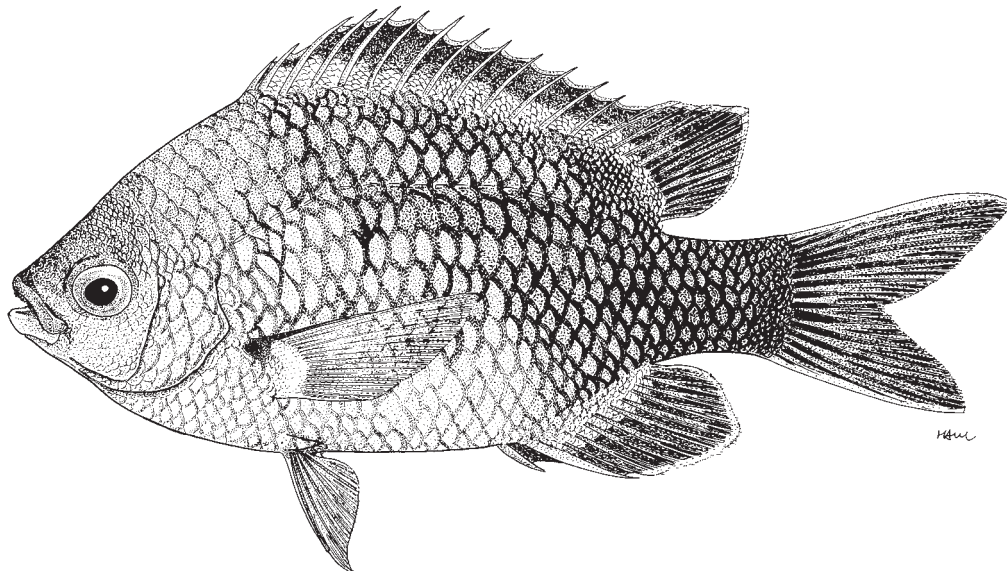
Remarks: If West African populations of *Chromis multilineata* are found to be genetically distinct from those in the western Atlantic, the first available name would appear to be *Chromis cauta* (Troschel, 1866) (type-locality: Cape Verde Archipelago).



Chromis sanctaehelenae Edwards in Edwards and Glass, 1987

Frequent synonyms / misidentifications: None / *Chromis insolata* (Cuvier, 1830).

FAO names: En – Saint Helena chromis.



Diagnostic characters: Body relatively elongate, the depth 47.0 to 54.1% of standard length. Diameter of orbit 8.5 to 12.0% of standard length. **Dorsal fin with 12 to 14 spines (usually 13, rarely 12) and 11 or 12 soft rays**; anal fin with 2 spines and 11 or 12 soft rays; pectoral fins with 19 to 21 (usually 20) rays; caudal fin forked. Second anal-fin spine always shorter than the longest anal-fin soft ray. Tubed-scales in lateral line 17 to 19 (usually 18 or 19). Gill rakers on lower limb of first gill arch 21 to 24. **Colour:** body silvery grey, weakly counter-shaded to brownish dorsally; fins dusky, caudal-fin lobes finely edged in white to pale blue both dorsally and ventrally; dorsal, anal and pelvic fins finely edged in light blue; pectoral fins with dark spot in axil and over much of pectoral base in younger fish, in older fish small silvery scales are prominent on pectoral-fin base and dark patch is reduced in extent.

Size: To at least 16.5 cm total length.

Habitat, biology, and fisheries: Common in schools from about 5 m to at least 35 m depth. Usually found in rocky areas, often feeding on plankton in the water column, but also observed over rubble patches in deeper water. Not used for food.

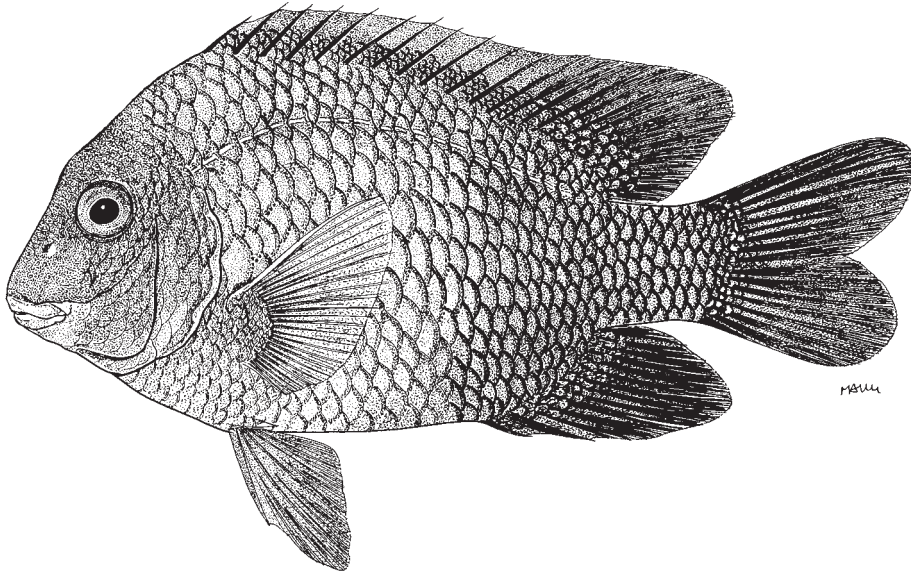
Distribution: Known only from St Helena Island.



***Microspathodon frontatus* Emery, 1970**

Frequent synonyms / misidentifications: None / *Microspathodon chrysurus* (Cuvier, 1830).

FAO names: En – Guinean damselfish.



Diagnostic characters: Body deep and robust. Mouth small to medium-sized, scarcely protrusible, lower jaw rocking downward in an almost circular motion to open mouth; **teeth in upper jaw in a single row, fine, brush-like, incisiform, and very flexible**; lower jaw teeth also in a single row, incisiform and stout; **preorbital bone very broad and distinctly notched above upper lip**; **suborbitals smooth and not attached to cheek**; **preopercle with a smooth edge**. Dorsal fin with 12 spines and 16 (rarely 17) soft rays; anal fin with 2 spines and 13 (rarely 12) soft rays; pectoral fin with 22 to 25 (usually 23 or 24) rays; caudal fin bluntly forked. Tubed lateral-line scales 20 to 22 (usually 21). **Colour:** adults normally uniform dark brown with faint dark vertical bars on body; all fins dark; faint dark spot in pectoral axil. Juveniles (up to about 40 mm standard length) uniform yellowish brown with dark brown edges to scale rows forming vertical lines on sides of body; black saddle (similar in size to eye) present just behind dorsal fin on base of caudal peduncle and smaller dark blotch on base of pectoral fin; scattered small blue spots present on head around eye and posterior part of body; fins dusky with soft dorsal and caudal fin yellowish.

Size: To 21 cm total length.

Habitat, biology, and fisheries: Normally a very shallow-water species, characteristically found on rocky or rubbly areas on sandy shores to depths of 3 m. Aggressive and territorial from juvenile to adult stages. Depth limit usually 7 to 10 m. Feeds primarily on algae but ingests associated crustaceans (e.g. isopods) as well. Likely to be caught mainly in subsistence fisheries by cast nets or handlines. Most likely used as subsistence food by local fishermen, but may be marketed fresh or smoked and dried.

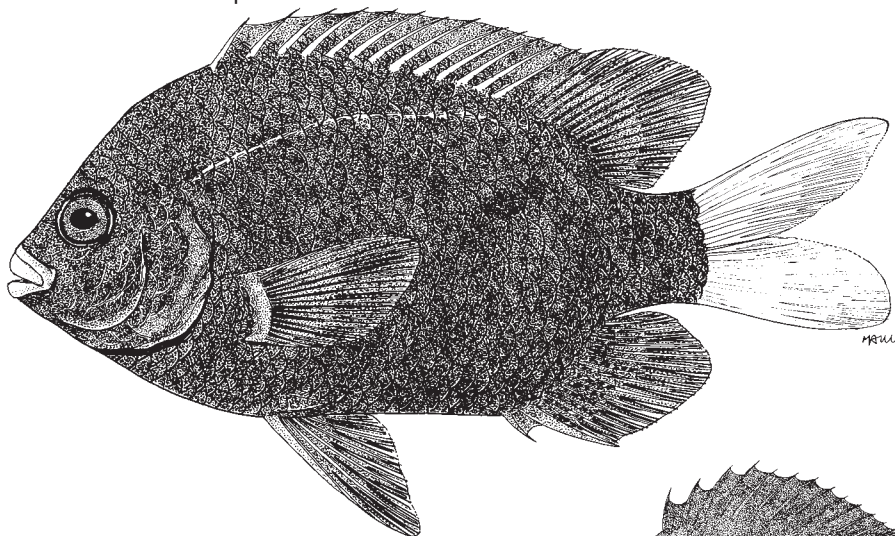
Distribution: Recorded from Ghana, Bioko (formerly Fernando Pó), São Tomé and Annobón. Probably occurs in rocky habitats at intermediate locations in the Gulf of Guinea.



Similiparma hermani (Steindachner, 1887)

Frequent synonyms / misidentifications: *Glyphidodon (Parma) hermani* Steindachner, 1887 / *Glyphidodon chrysurus* Cuvier, 1830 – adults; *Stegastes leucostictus* (Müller and Troschel, 1848) – juveniles.

FAO names: En – Cape damsel.

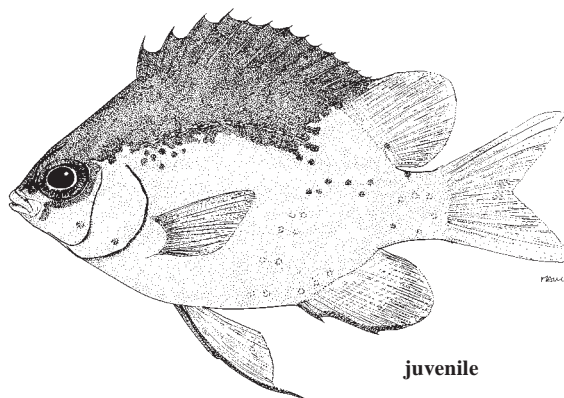


Diagnostic characters: Body moderately deep, the depth 53.0 to 56.5% of standard length. Teeth incisiform with rounded, entire margins. Suborbital margin free, smooth to crenulate, frequently with fine serrations posteriorly. **Dorsal fin with 13 spines and 17 or 18 (usually 18) soft rays**; anal fin with 2 spines and 14 soft rays; pectoral fins with 22 or 23 rays; caudal fin forked. Tubed-scales in lateral line 22 to 24 (usually 23 or 24). Gill rakers on lower limb of first gill arch 12 or 13 (total gill rakers 16 to 18). **Colour:** adults very dark brown with an abruptly white caudal fin. Juveniles mostly bright yellow with scattered violet dots; dorsal surfaces of the head, postorbital and suborbital margins and upper third of sides below spinous part of dorsal fin brilliant blue to electric blue.

Size: To at least 19 cm total length.

Habitat, biology, and fisheries: Moderately common in rocky areas to 15 m depth. Fisheries use unknown but may be caught incidentally in artisanal fisheries.

Distribution: Endemic to the Cape Verde Archipelago.



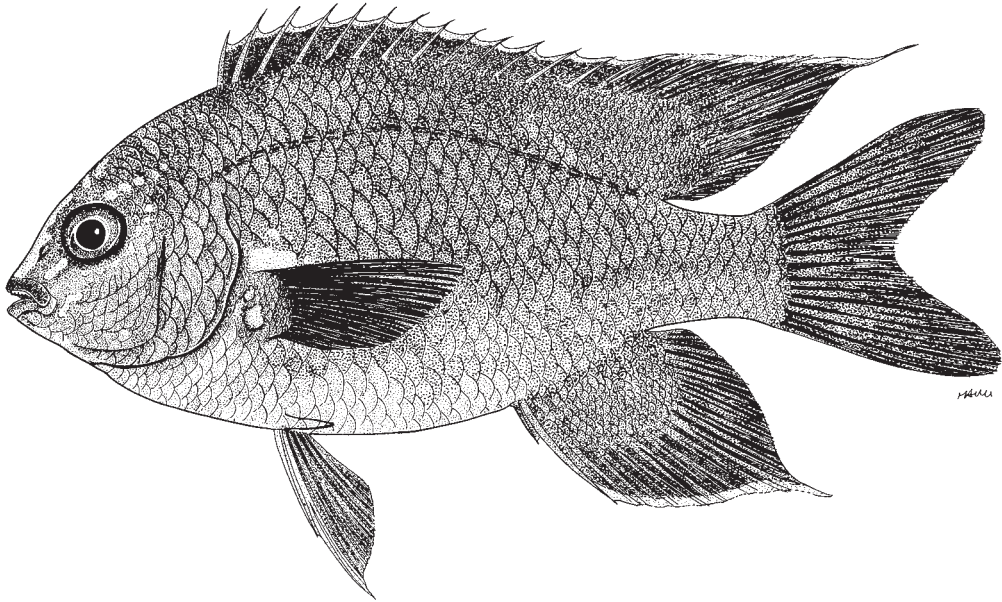
juvenile



***Similiparma lurida* (Cuvier, 1830)**

Frequent synonyms / misidentifications: *Abudefduf luridus* (Cuvier, 1830) / None.

FAO names: En – Canary damsel; Sp – Fula negra.



Diagnostic characters: Body relatively elongate, the depth 47.7 to 52.3% of standard length. **Dorsal fin with 13 spines (very rarely 14) and 15 to 17 soft rays (usually 16)**; anal fin with 2 spines and 12 to 14 (usually 13) soft rays; **pectoral fins with 19 to 21 (usually 20) rays**; caudal fin forked. Tubed-scales in lateral line 20 to 22 (modally 21). Gill rakers on lower limb of first gill arch 11 or 12; total gill rakers on first arch 14 to 19. **Colour:** non-breeding individuals are predominantly black or very dark brown, becoming a little paler on the belly with an iridescent blue crescent of scales above and behind the base of the pectoral fin, an iridescent blue streak on the pelvic spine and along outer edge of the anal fin, and oblique lines of blue to purplish blue spots under the eye, through the top of the eye and on the forehead. Iridescent blue colours fade to dull blue after death. Breeding males have the same blue markings, but the body is dark brown rather than black. Juveniles have a dark brown body and fins and in addition to the blue markings of the adult have lines of blue spots continuing posteriorly behind the head following the curve of back and a bright blue spot on the dorsal surface of the caudal peduncle.

Size: To at least 16 cm total length.

Habitat, biology, and fisheries: The species is commonly found in shallow water in rocky areas from rockpools to a maximum depth of about 35 m but is most abundant at 5 to 20 m. They feed on filamentous algae and associated organisms. Both sexes are territorial. Males guard eggs and nesting males are aggressively territorial occupying a home range of about 4 m² and exhibiting agonistic behaviour to all fish within about 0.5 m of the home range centred on the nest. Non-nesting individuals move within a home range of about 50 m². Said to be fished for among rocks in Senegal.

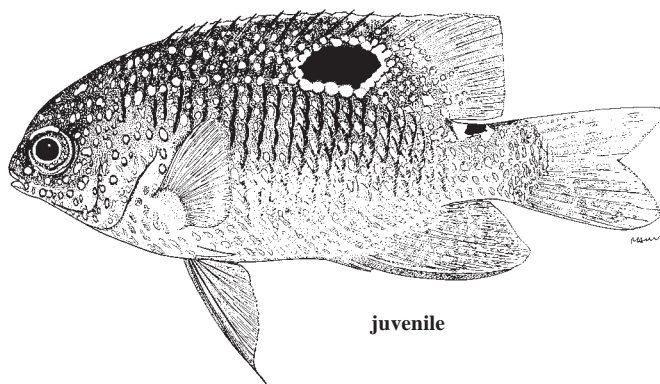
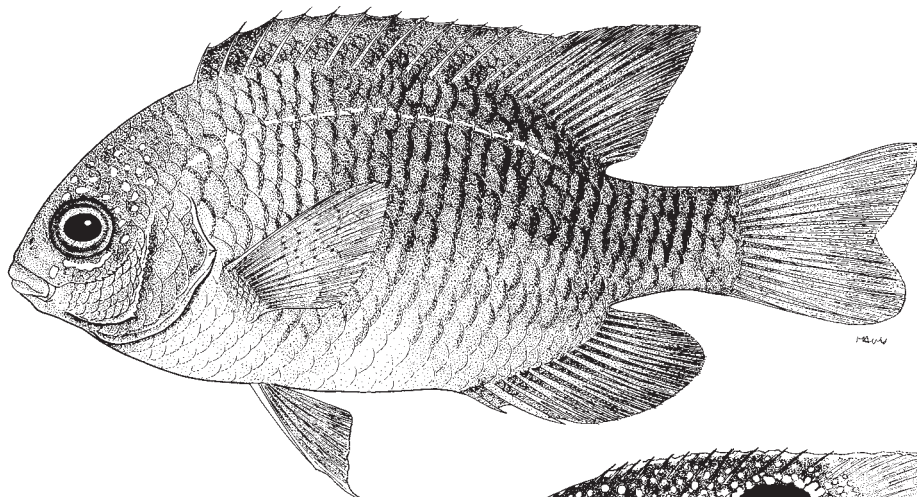
Distribution: Reliably recorded from the Azores, Madeira, Salvage Islands, Canary Islands, and the Cape Verde Archipelago. It is also reported from Senegal and Guinea-Bissau.



***Stegastes imbricatus* Jenyns, 1840**

Frequent synonyms / misidentifications: None / *Stegastes leucostictus* (Müller and Troschel, 1848).

FAO names: En – Cape Verde gregory.



juvenile

Diagnostic characters: Body moderately deep, the depth 45.2 to 53.7% of standard length. **Dorsal fin with 12 spines and 14 to 17 (usually 16) soft rays;** anal fin with 2 spines and 13 to 15 (usually 14) soft rays; pectoral fins with 20 to 22 (rarely 22) rays; caudal fin bluntly forked. Tubed-scales in lateral line 19 or 20 (usually 20). Gill rakers on lower limb of first gill arch 9 or 10; total gill rakers on first arch 15 to 19. **Colour:** adults uniform brownish with violet-blue spots on forehead and suborbital area; fins dusky; dark blotch on pectoral axil. Juveniles brownish grey with lines of pale blue spots on head, dorsal part of body and dorsal fin; a large blue ringed ocellus (diameter greater than eye) at base of dorsal fin towards rear of spinous part and anterior of soft dorsal; small blue ringed ocellus on back of caudal peduncle just behind dorsal fin.

Size: To at least 12.5 cm total length.

Habitat, biology, and fisheries: Found in shallow water rocky areas from rockpools to at least 15 m depth. May be caught incidentally in artisanal fisheries.

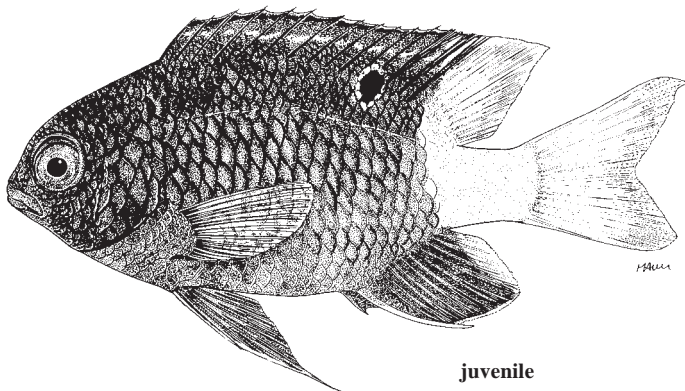
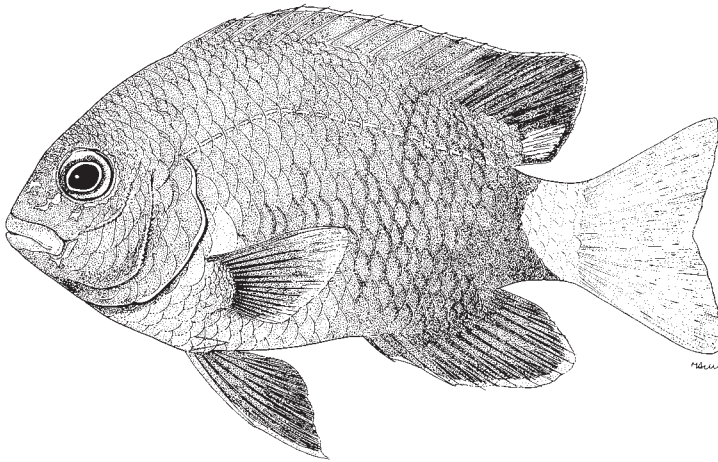
Distribution: Recorded from the Cape Verde Archipelago, Senegal, Guinea-Bissau, Ghana, São Tomé, Príncipe and Annobón southwards to Namibe (formerly Moçamedes) in Angola.



Stegastes lubbocki Allen and Smith, 1992

En – Ascension gregory.

Maximum size at least 12 cm total length; appears to mature at 4 to 5 cm standard length. Not used for food. Head and most of body dark brownish black with violet-blue flecks on head; **caudal peduncle and caudal fin bright yellow**; pectoral fin orange-yellow; all dark adults are seen rarely. Juveniles (< 25 mm standard length) are similar in colour to adults but have many bluish spots on head and also have posterior parts of soft dorsal and anal fins bright yellow and a blue-edged black ocellus covering base of first few soft dorsal-fin rays. Body relatively elongate, the depth 40.0 to 47.6% of standard length. **Dorsal fin with 12 spines and 14 to 17 (usually 16) soft rays**; anal fin with 2 spines and 13 or 14 soft rays; pectoral fins with 19 to 21 (rarely 21) rays; caudal fin bluntly forked. Tubed-scales in lateral line 18 to 21 (usually 20). Gill rakers on lower limb of first gill arch 11 to 14. Endemic to Ascension Island.

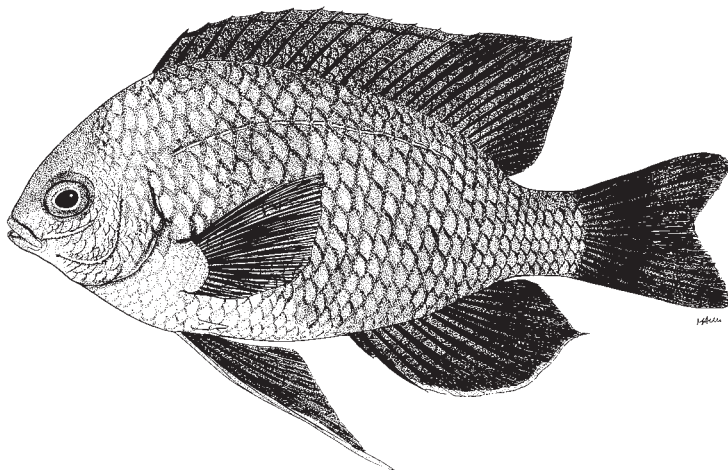


juvenile

***Stegastes sanctaehelenae* (Sauvage, 1879)**

En – Saint Helena gregory.

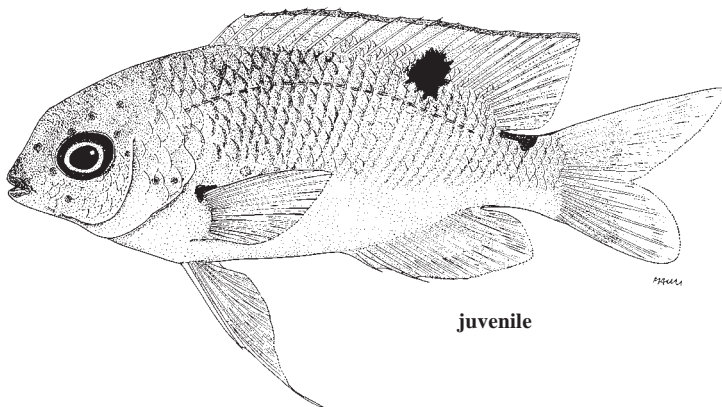
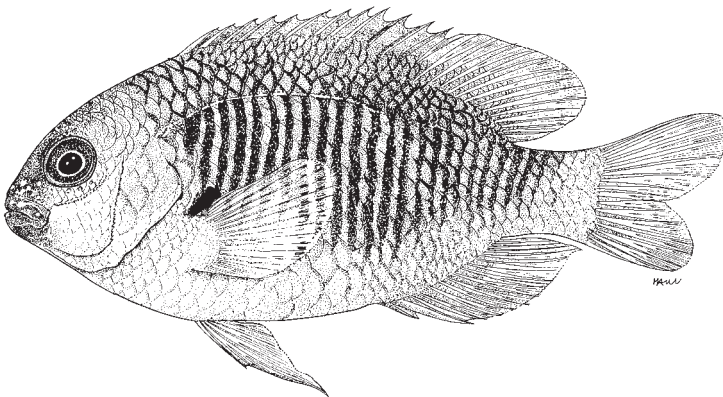
Maximum size at least 11 cm total length. Common from 2 m to at least 35 m depth in rocky areas and amongst rubble. Strongly territorial. Feeds primarily on algae. Not used for food. **Adults a uniform greyish brown, darker dorsally; all fins dusky.** Juveniles (<35 to 40 mm standard length) with similar body coloration but with pale caudal peduncle and fin, dark spot on base of anterior portion of the soft dorsal fin, and a yellowish hyaline pectoral fin. Body moderately deep, the depth 47.7 to 52.1% of standard length. Lower margin of suborbitals and hind margin of preopercle strongly serrated. **Dorsal fin with 12 spines and 15 to 17 (usually 16) soft rays;** anal fin with 2 spines and 14 or 15 (usually 14) soft rays; pectoral fins with 19 to 21 (usually 20) rays; caudal fin bluntly forked. Tubed-scales in lateral line 20 or 21 (usually 20). Gill rakers on lower limb of first gill arch 12 or 13; total gill rakers 20 to 23 (modally 22). Endemic to St Helena Island.



***Stegastes sanctipauli* Lubbock and Edwards, 1981**

En – Saint Paul's gregory.

Maximum size at least 11.5 cm total length. Common from rockpools to a depth of at least 50 m living around rocks and in rubble. Strongly territorial. Feeds primarily on algae. Not used for food. Adults with a ground coloration varying from almost uniform yellow-orange to dark greenish to yellowish brown, with **most individuals bright yellow-orange becoming dusky olive to yellowish brown dorsally**; near-vertical dark stripes along edges of scale rows present on flanks below lateral line and above level of pectoral-fin base; scattered purplish blue spots on head; conspicuous black spot (about size of eye) on upper side of pectoral-fin base; dark saddle on caudal peduncle. **Juveniles** (<35 to 40 mm standard length) **yellow** becoming slightly dusky dorsally; scattered blue-violet spots on head and body; faint dark near-vertical stripes along edges of scale rows present on flanks above level of pectoral-fin base between nape and black ocellus on base of dorsal fin; blue spot above pectoral-fin base; submarginal dark stripe along spinous part of dorsal fin; black spot on upper caudal peduncle. Body relatively shallow, the depth 43.5 to 47.1% of standard length. Lower margin of suborbitals and hind margin of preopercle serrated. **Dorsal fin with 12 spines and 14 or 15 (usually 15) soft rays**; anal fin with 2 spines and **13 soft rays**; pectoral fins with 19 to 21 (usually 20) rays; caudal fin bluntly forked. Tubed-scales in lateral line 19 or 20 (usually 20). Gill rakers on lower limb of first gill arch 10 to 12. Endemic to St Paul's Rocks. Similar to *Stegastes rocasensis* (Emery, 1972) from Atol das Rocas and Fernando de Noronha, stray juveniles of which have been recorded at St Paul's Rocks.



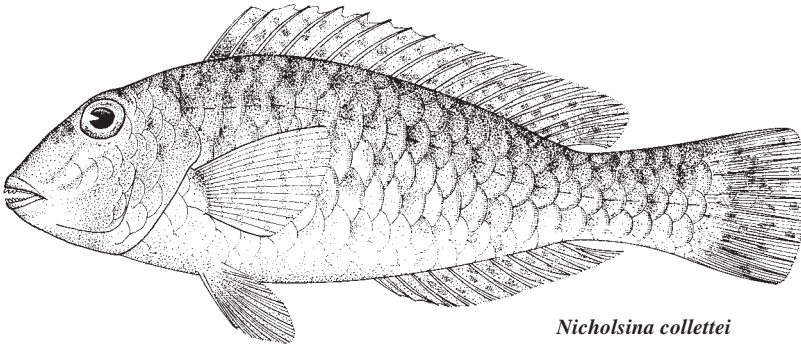
juvenile

SCARIDAE

Parrotfishes

by M.W. Westneat, Field Museum of Natural History, Chicago, IL 60605, USA

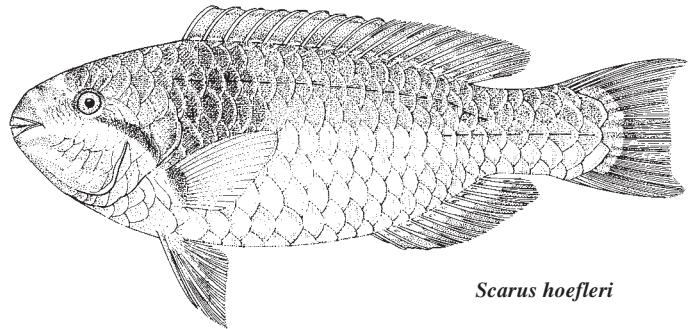
Diagnostic characters: Parrotfishes range in size from small 8 to 10 cm adults to large individuals about 50 cm long. They are colourful abundant fishes in habitats ranging from coral reef to sand and seagrass beds. Body oblong, moderately compressed, the head generally bluntly rounded anteriorly; **teeth in most species fused to form a pair of beak-like plates in each jaw, some species fused at base with individual teeth clearly visible, others with teeth visible at margins of tooth plates; large and heavy scales in regular rows on the head and body; discontinuous lateral line; pharyngeal dentition unique**, the interlocking upper pharyngeals with rows of molariform teeth on a convex surface which bear against the molariform teeth on the concave surface of the lower pharyngeal jaw. A continuous dorsal fin with 9 slender, often flexible spines and 10 soft rays; anal fin with 3 spines and 9 soft rays; caudal fin varying from rounded to lunate, the shape often changing with growth. Scales large, cycloid (smooth to touch), 22 to 24 on lateral line; fins without scales except for a basal row on median fins of most species. **Colour:** parrotfishes are often spectacularly colourful, particularly the terminal phase males, with **bright blue, green and orange patterns on both head and body**. Many species exhibit striking sexual dichromatism and some alter their colours to match the surroundings. Initial-phase fish (only females in some species but either sex for others) are generally less colourful with body brown, reddish or grey, sometimes with stripes.



Nicholsina collettei

Habitat, biology, and fisheries:

Parrotfishes are abundant on coral reefs, where they often are the largest component of the fish biomass. They are generally small to medium-sized (maximum size in the eastern central Atlantic about 60 cm) herbivorous fishes. Depth distribution is primarily 1 to 30 m, with some species occurring down to 80 m. Adult scarids are grazing animals, feeding on the close-cropped algal and bacterial mat covering dead corals and rocks, seagrasses, and by



Scarus hoefleri

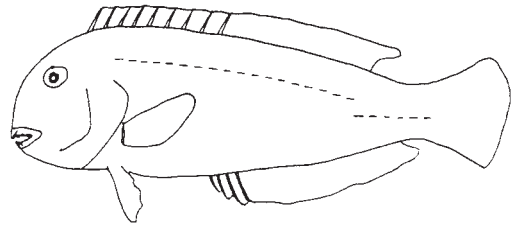
crushing bits of coral that may contain invertebrate prey. Juveniles feed on small invertebrates. Parrotfishes feed continuously during the day, often in mixed schools, biting at rocks and corals. They usually scrape some of the coral or ingest sand while feeding and grind this in their pharyngeal mill with the plant food. In pulverizing the coral rock fragments and sand they create substantial quantities of sediment. In many areas they are probably the principal producers of sand. Two types of spawning behaviour have been observed for some scarids. Spawning may take place in an aggregation of initial-phase fish; individual groups of fish dart upward from the aggregation, releasing eggs and sperm at the peak of these upward dashes. The second pattern of reproduction consists of pair-spawning; a terminal male defends a territory from other males, courts females within his territory, and spawns individually with them. At night, some species of *Scarus* are capable of secreting an enveloping cocoon of

mucus in which the fish sleeps until daylight. Parrotfishes are caught in traps, nets and by spear. Due to their abundance, they are often marketed for food and *Scarus* species are occasionally found in the aquarium trade.

Remarks: Parrotfishes are currently considered a subfamily of the Labridae, but the original family designation at the time of writing is retained here for the sake of organization.

Similar families occurring in the area

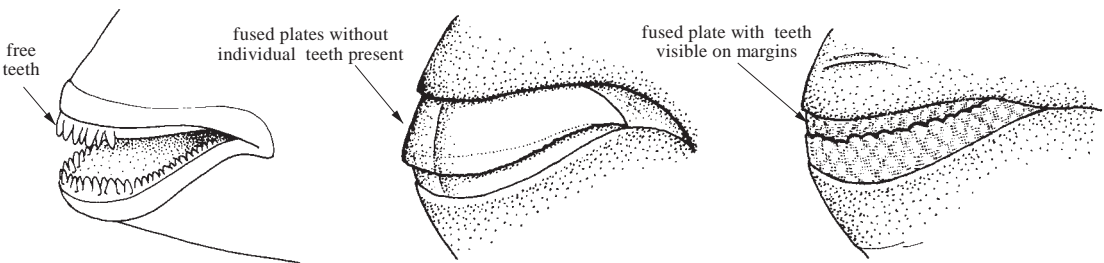
Labridae: parrotfishes are believed to have evolved from a subgroup within the Labridae. The beak-like plates of the Scaridae, coupled with other features such as the large scales and often bright colours usually preclude their being confused with any other family of fishes. The more basal members of the family, such as *Nicholsina collettei*, in which the teeth are not fully fused into a beak, might be confused with labrid fishes.



Labridae

Key to genera of Scaridae occurring in the area

- 1a. Teeth united only basally (incisor-like teeth evident outside at front of jaws) (Fig. 1a), the jaws not overlapping at front when closed ***Nicholsina collettei***
- 1b. Teeth fully coalesced to form beak-like jaws (Fig. 1b–c) which overlap anteriorly when closed → 2
- 2a. Lower dental plates included within the upper when mouth is closed (overbite; Fig. 1b); edge and outer surface of dental plates relatively smooth; dorsal spines flexible; 3 rows of scales on cheek. Greenish body with the bases of most of the scales light rose red (males) or 3 irregular dark bars on the body, 2 faint pale stripes on abdomen, and a dark spot at pectoral base (females) ***Scarus hoefleri***
- 2b. Upper dental plates included within the lower when mouth is closed (underbite; Fig. 1c); edge of dental plates crenulate and outer surface nodular; dorsal spines pungent (sharp-tipped); 1 row of scales on cheek → 3



a) *Nicholsina*

b) *Scarus*


c) *Sparisoma*

Fig. 1


- 3a. Initial-phase fish colour variable, may be purplish brown, greyish brown, olive, red, or mixtures of these, pale ventrally; adults bright red with a dark saddle between eye and dorsal fin extending onto pectoral-fin base; second small yellow saddle on dorsal caudal peduncle ***Sparisoma cretense***
- 3b. Initial-phase fish usually mottled brown, with a yellowish caudal fin or row of white spots along belly, adults green or blue (not red as above) → 4

- 4a. Initial-phase fish mottled grey-brown, caudal peduncle and fin yellow, pelvic and anal fins light red; terminal-phase males primarily dull green with a black spot on upper half of pectoral-fin base ***Sparisoma choati***
- 4b. Initial-phase fish brownish yellow, with a row of white spots along body below dorsal fin; male silvery blue with a row of dark spots forming a broken line along body below dorsal fin and caudal peduncle ***Sparisoma strigatum***
(known only from St Helena and Ascension)

List of species occurring in the area

The symbol  is given when species accounts are included.

 *Nicholsina collettei* (Schultz, 1968).

 *Scarus hoefleri* (Steindachner, 1881).

 *Sparisoma choati* Rocha, Brito and Robertson, 2012.

 *Sparisoma cretense* (Linnaeus, 1758).

Sparisoma strigatum (Günther, 1862). To 50 cm. St Helena and Ascension islands.

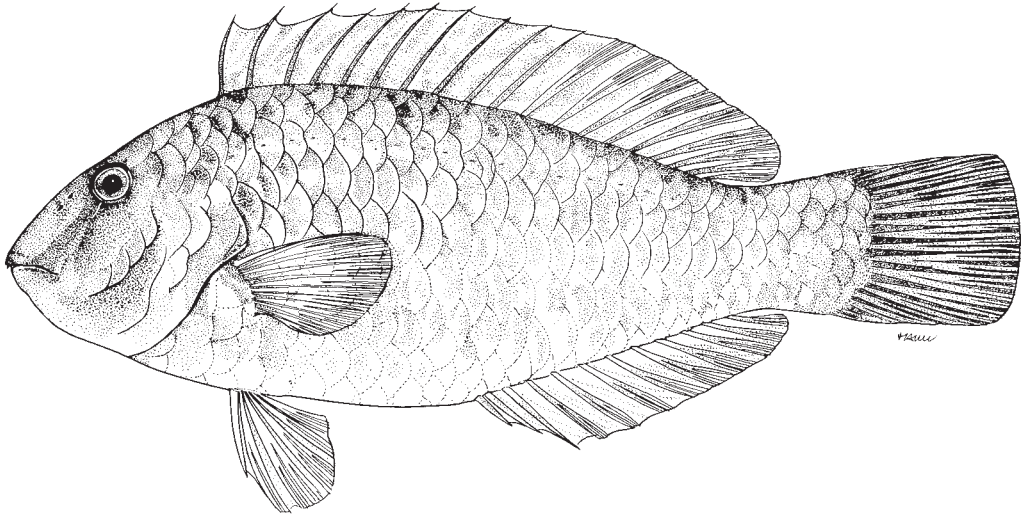
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- Rocha, L.A., Brito, A. & Robertson, D.R. 2012. *Sparisoma choati*, a new species of Parrotfish (Labridae: Scarinae) from the tropical eastern Atlantic. *Zootaxa*, 3152: 61–67.
- Westneat, M.W. 2003. Scaridae. In K. Carpenter, ed. The living marine resources of the Western Central Atlantic, Volume 3: Bony fishes part 2 (Opistognathidae to Molidae), sea turtles and marine mammals. *FAO species identification guide for fishery purposes and American Society of Ichthyologists and Herpetologists Special Publication No. 5*. Rome, FAO, pp. 1723–1739.

***Nicholsina collettei* (Schultz, 1968)**

Frequent synonyms / misidentifications: *Nicholsina usta* (Valenciennes, 1840) / *Sparisoma choati*.

FAO names: En – Emerald parrotfish; Fr – Perroquet émeraude; Sp – Loro jabonero.



Diagnostic characters: Body somewhat elongate, the depth contained 3 to 3.2 times in standard length. **A small dermal cirrus at edge of anterior nostril;** snout somewhat pointed; **teeth fused only basally, thus not fully coalesced to form dental plates.** Pectoral-fin rays 13; caudal fin slightly rounded. **Gill rakers 12 or 13.** Median predorsal scales 4 or 5; 1 row of scales on cheek. **Colour:** mottled olive green on back, the scales of sides with bluish white centres and reddish edges; head below level of mouth yellow; 2 diagonal narrow red-orange bands on cheek; median fins reddish, the dorsal fin with a black blotch at front.

Size: To 30 cm.

Habitat, biology, and fisheries: Inhabits seagrass beds, usually in very shallow water but has been recorded at depths of over 80 m. Largely herbivorous, feeding on sea grass, but probably gains nutrients from small invertebrates as well. This species is not commonly marketed for food.

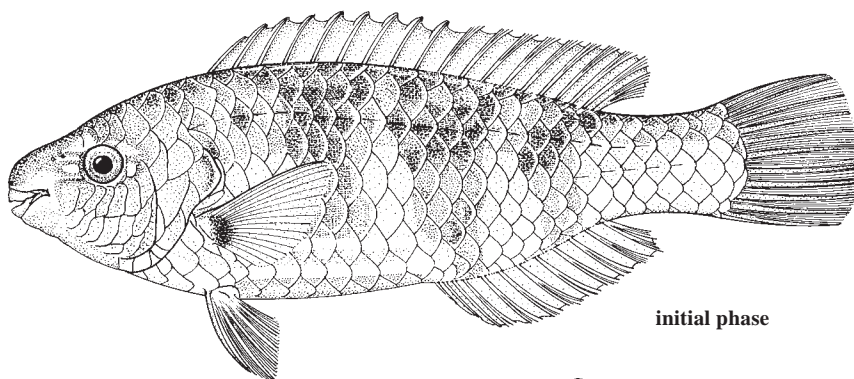
Distribution: Eastern Atlantic: Senegal to Annobon Island (off Gabon). Records of *Cryptotomus* species from Senegal and Sierra Leone and of *Sparisoma radians* from Annobon Island were probably this species.



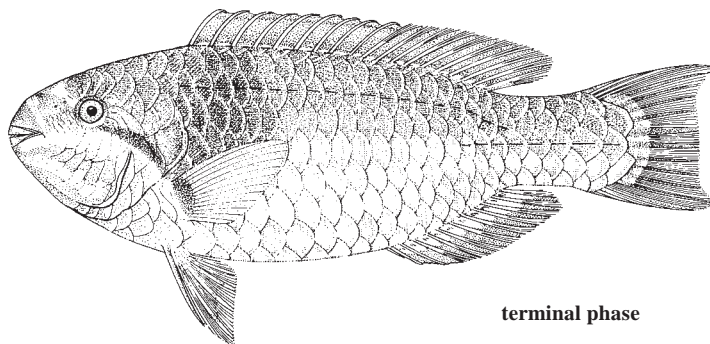
Scarus hoefleri (Steindachner, 1881)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Guinean parrotfish; Fr – Perroquet de Guinée; Sp – Loro de Guinea.



initial phase



terminal phase

Diagnostic characters: Depth of body contained about 2.7 to 3 times in standard length. Interorbital space very convex.

Teeth fully fused to form a pair of beak-like plates in each jaw, the upper plates slightly overlapping the lower when mouth is closed. Dorsal spines flexible; pectoral-fin rays 14; caudal fin of initial phase rounded, of terminal phase emarginate. Median predorsal

scales 7; 3 rows of scales on cheek, the lowermost consisting of 2 or 3 (usually 2) scales. **Colour:** initial-phase fish have 3 irregular dark bars on the body, 2 faint pale stripes on abdomen, and a dark spot at pectoral base. Terminal males are greenish, the bases of most of the scales light rose red; snout deep grass-green crossed dorsally by 2 diagonal red bands, one passing from eye to eye and the other nearly linking corners of mouth; upper lip yellowish; dental plates blue-green; a transverse red band on chin; cheeks red; a blackish violet streak passing from eye to pectoral base; dorsal fin reddish; anal fin light grey-green basally, the outer half reddish; caudal dark green-grey with a reddish yellow medial bar.

Size: Maximum to 60 cm; common to 40 cm.

Habitat, biology, and fisheries: Occurs in rocky areas along the coast. Caught incidentally throughout its range. Taken mainly in traps and by gillnetting, but also in trawls and drift nets. Probably marketed fresh. Consumption of this species reported to be forbidden in Nigeria and Côte d'Ivoire.

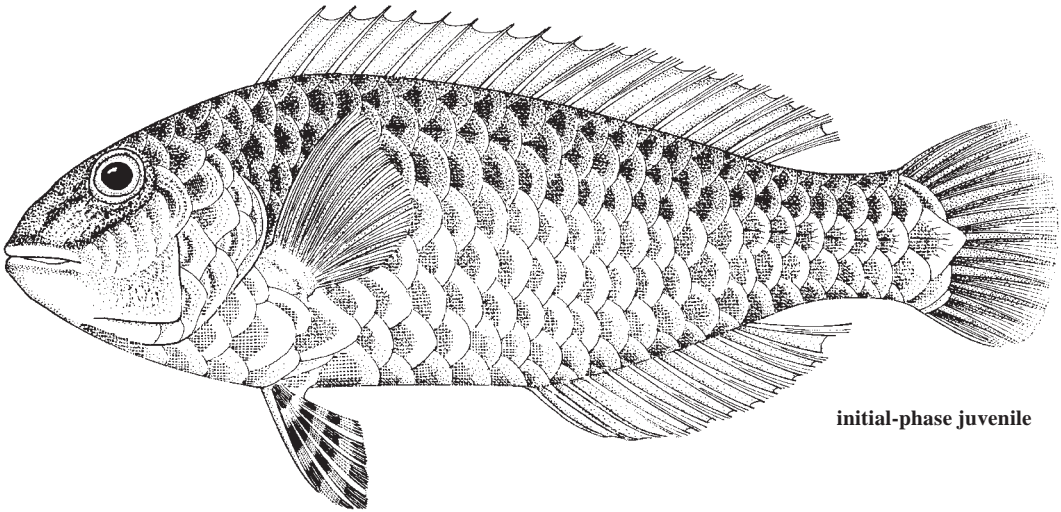
Distribution: Tropical eastern Atlantic from Senegal through the Gulf of Guinea to Pointe Noire, Congo.



***Sparisoma cretense* (Linnaeus, 1758)**

Frequent synonyms / misidentifications: *Euscarus cretensis* (Linnaeus, 1758) / None.

FAO names: En – Parrotfish; Fr – Perroquet vieillard; Sp – Loro viejo.



initial-phase juvenile

Diagnostic characters: Depth of body contained about 3 to 3.2 times in standard length. Interorbital space nearly flat; **teeth fully fused to form a pair of beak-like plates in each jaw, the upper plates included within the lower when mouth is closed**; dorsal spines flexible; pectoral-fin rays 14; gill membranes without a free fold over isthmus; **caudal fin rounded**; **median predorsal scales 5 (occasionally 6)**; **1 row of scales on cheek**. **Colour:** initial-phase juveniles variable, the ground colour may be purplish brown, greyish brown, olive, red and mixtures of these, pale ventrally; **adults bright red with a dark saddle appearing as a dark blotch between eye and dorsal fin extending ventrally onto pectoral-fin base**; **second small yellow saddle on dorsal caudal peduncle**; scattered small whitish spots may be present on back and sides, some of which tend to form longitudinal series; posterior end of opercular flap blackish; posterior border of caudal fin pale.

Size: Maximum to 50 cm; common to 15 cm.

Habitat, biology, and fisheries: A shallow-water species of rocky shores. Caught incidentally throughout its range. Marketed fresh. Under consideration for mariculture in the Canary Islands. The related *S. strigatum* is known only from St Helena and Ascension Islands.

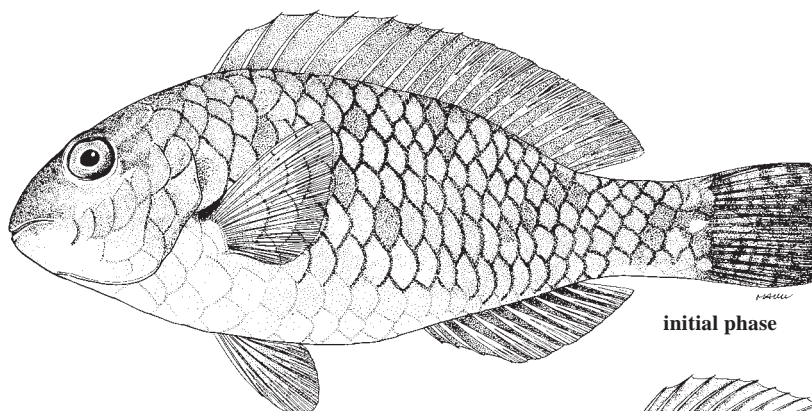
Distribution: Occurs around the Azores, Madeira and Canary Islands, as well as along the west coast of Africa to at least Senegal. Also, northward into the Mediterranean and to Portugal.



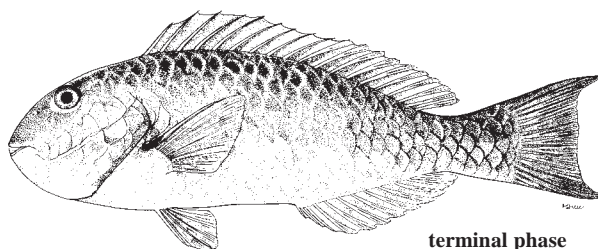
Sparisoma choati Rocha, Brito and Robertson, 2012

Frequent synonyms / misidentifications: *Sparisoma rubripinne* (Valenciennes, 1840) / *Sparisoma cretense*.

FAO names: **En** – West African parrotfish; **Fr** – Perroquet basto; **Sp** – Loro basto.



initial phase



terminal phase

Diagnostic characters: Body moderately deep, depth contained 2.5 to 2.7 times in standard length. **Interorbital space convex; a membranous flap on anterior nostril, palmate, with 12 to 20 cirri (except in juveniles); teeth fused to form a pair of beak-like plates in each jaw, the lower plates slightly overlapping the upper when mouth is closed; edges of dental plates scalloped and outer surface nodular due to shape of individual teeth involved in fusion to form plates. Tips of interspinous membranes of dorsal fin with numerous cirri (may be reduced to 1 in large adults); pectoral-fin rays 12 or 13; caudal fin rounded in young, truncate in intermediate sizes and emarginate in adults. Gill rakers 11 to 14. Median predorsal scales 4; 1 row of scales on cheek. Colour: initial-phase fish mottled light greyish brown, the edges of the scales darker than the centres; 2 narrow pale bands alternate with broader dark ones across chin; caudal peduncle and fin yellow; pelvic and anal fins light red. Terminal phase individuals with brownish red head and upper half of anterior two-thirds of body; ventral portion of central third of body yellowish green; posterior third of body dark greenish grey; black spot on upper fifth of pectoral-fin base; pectoral fins dark olive, the outer edge pale.**

Size: Maximum size to about 32 cm.

Habitat, biology, and fisheries: Inhabits coral reefs and seagrass beds. A common shallow-water reef fish; occurs more inshore than other scarid fishes. Feeds by taking single large bites of plant matter rather than rapid series of nips like most *Scarus*. This species is caught mainly in traps and nets, occasionally by spearing. Initial-phase fish can rapidly assume a mottled pattern when coming to rest on the bottom. Spawning has been observed by aggregations of initial-phase fish and by pairs of the 2 different colour phases. This species is caught mainly in traps and nets, occasionally by spearing.

Distribution: Eastern Atlantic from Cape Verde Islands and Senegal south to the offshore islands of the Gulf of Guinea and northern Angola.

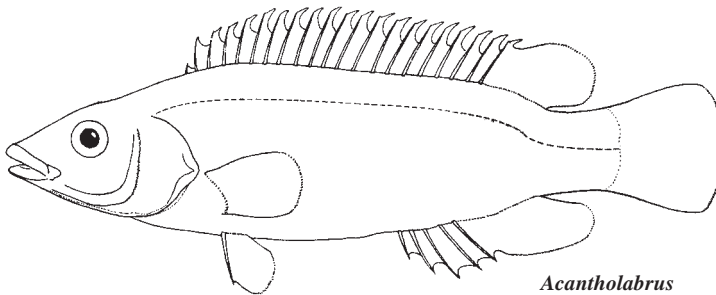


LABRIDAE

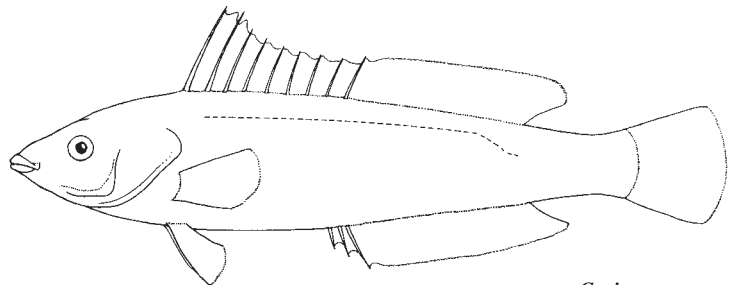
Wrasses, hogfishes, razorfishes

by M. W. Westneat, Field Museum of Natural History, Chicago, IL 60605, USA

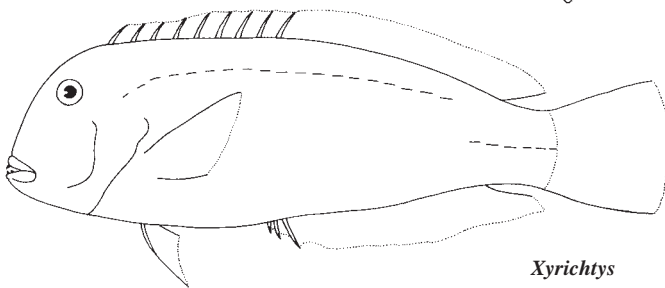
Diagnostic characters: Wrasses are a diverse group of fishes that vary in body shape, size, coloration and habitat. Most species are small, attaining a maximum body length of less than 20 cm. In the eastern central Atlantic they range from the small dwarf wrasse (*Doratonotus*) to the large ballan wrasse (*Labrus*), which grows to more than 50 cm and a weight of 10 kg. Most wrasses, especially the small species, are abundant where they occur. Body slightly to extremely compressed. **Mouth terminal, usually with prominent lips; mouth slightly to highly protrusible; maxilla not exposed on the cheek; teeth in jaws usually separate and caniniform, the anteriormost 1 or 2 pairs typically enlarged and often directed forward; pharyngeal jaws (located at base of throat) strong with pharyngeal teeth either sharp, conical, or broad and molariform; gill membrane partially united.** A single, long-based dorsal fin (except *Xyrichtys*, in which the first 2 spines are separate); **dorsal-fin spines 8 to 21**, spines rigid to flexible; spines and rays usually of similar length, but some species have elongate first few spines or elongate posteriormost rays. Pectoral fins robust, ranging in shape from broad and paddle-like (in *Labrus*, *Centrolabrus*) to long and wing-like (e.g. *Thalassoma*). Scales cycloid (smooth to touch) and highly variable in size among species; head never fully scaled; lateral line below most of dorsal fin smooth, but often abruptly curved ventrally or discontinuous below posterior portion of soft dorsal fin. **Colour:** most species with bright and intricate colour patterns, including stripes, bars, spots, blotches, and ocelli of various shades of brown, blue, green, red, yellow and white. Patterns often change with age and with sex-reversal in this group.



Acantholabrus



Coris



Xyrichtys

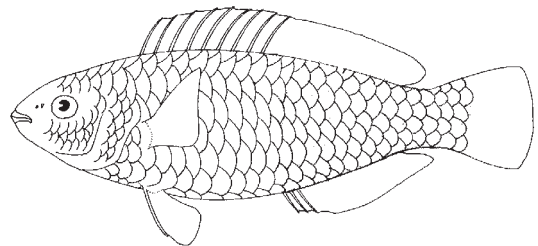
examples of body shapes

Habitat, biology, and fisheries: Labrids occupy a number of different habitats including algal beds, sandy patch reefs, plain sand bottom, coral reefs and rocky flats. Eastern Atlantic forms are common in both warm and cool waters at shallow to moderate depths (from the shore to at least 120 m). Prominent canine teeth in the front of the mouth form one of the characteristic features of most wrasses, and these fishes are carnivorous and often voracious. Many wrasses feed on gastropods and bivalves by crushing the shells in the pharyngeal jaws formed by ceratobranchial and pharyngobranchial bones. Also among the Atlantic wrasses are piscivores, planktivores, and generalist predators. A number of the smaller wrasses have been identified as cleaners that feed on the ectoparasites of other fishes. In contrast to most other fishes, the majority of wrasses swim largely with their pectoral fins.

Most labrids have 3 colour patterns; juvenile, initial phase and terminal phase. Wrasses show strong sexual dichromatism (sexual differences in colour), and many species change remarkably from young to adult in colour pattern and in body shape. For most species colour changes can be associated with protogyny, the changing of sex from female to male. Wrasses are diurnal, taking cover in reef crevices or burrowing into the sediment at night. Razorfishes dive into the sand even during daylight hours to escape predators. The commercial importance of labrid fishes lies primarily in their popularity as aquarium fishes, due to their beautiful colours. The hogfishes and larger temperate species such as *Labrus* are considered excellent foodfishes. Members of this family are often taken in bottom trawls and by various artisanal gear, although none of the species seems to be the object of a special fishery.

Similar families occurring in the area

Scaridae: parrotfishes are now known to be nested within the family Labridae, and can be considered a labrid subfamily. Mouth not protrusible; teeth in jaws coalesced at base or fused into a bony, parrot-like beak, except for *Sparisoma* and *Nicholsina* species which have many individual closely packed teeth; when not fused, a pair of canine teeth usually directed horizontally to the side of upper jaw; lips continuous with facial skin, without an indentation.



Scaridae

Key to genera of Labridae occurring in the area

- 1a. Less than 10 spines in dorsal fin; lateral line abruptly curved or interrupted below soft portion of dorsal fin (Fig. 1) → 2
- 1b. More than 10 dorsal spines; lateral line smoothly curved (Fig. 2) → 5
- 2a. Lateral line continuous (Fig. 2) → 3
- 2b. Lateral line interrupted (Fig. 1) → 4

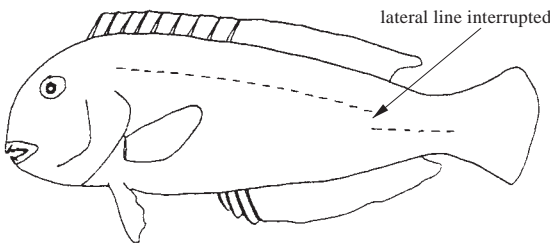


Fig. 1 Xyrichtys

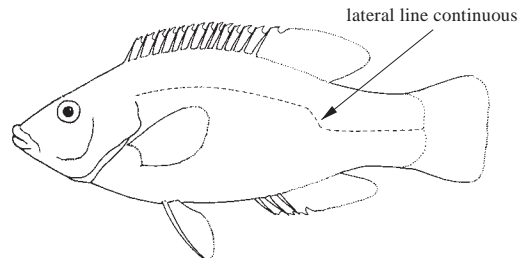


Fig. 2 Symphodus

- 3a. Dorsal-fin spines 8; lateral-line scales less than 30 ***Thalassoma***
- 3b. Dorsal-fin spines 9; lateral-line scales more than 70 ***Coris***

- 4a. Twelve branched, segmented rays in dorsal and anal fins; lateral-line scales 29 ***Xyrichtys***
- 4b. Ten branched, segmented rays in dorsal and anal fins; lateral-line scales 23 ***Doratonotus***

- 5a. Anal-fin spines 4 to 6 ***Acantholabrus***
- 5b. Anal-fin spines 3 → **6**

- 6a. Upper jaw with a prominent, recurved posterior canine (Fig. 3) → **7**
- 6b. Upper jaw without a prominent, recurved posterior canine → **8**

- 7a. Dorsal-fin spines 12; branched, segmented anal-fin rays 12 (rarely 11 or 13). ***Bodianus***
- 7b. Dorsal-fin spines 14 to 17; branched, segmented anal-fin rays 8 to 10 (rarely 11). . ***Lappanella***

- 8a. Lateral-line scales 43 to 55 ***Labrus***
- 8b. Lateral-line scales 30 to 35 ***Symphodus***

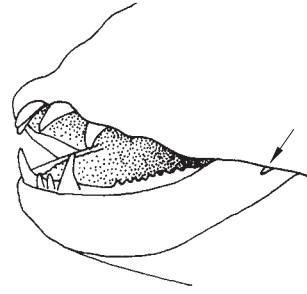


Fig. 3 *Bodianus*

List of species occurring in the area

The symbol is given when species accounts are included.

- Acantholabrus palloni* (Risso, 1810).
- Bodianus insularis* Gomon and Lubbock, 1980.
- Bodianus scrofa* (Valenciennes, 1839).
- Bodianus speciosus* (Bowdich, 1825).
- Coris atlantica* Günther, 1862. To 25 cm. Senegal and Cape Verde to Gabon.
- Coris julis* (Linnaeus, 1758).
- Doratonotus megalepis* Günther, 1862.
- Labrus bergylta* Ascanius, 1767.
- Labrus mixtus* Linnaeus, 1758.
- Labrus merula* Linnaeus, 1758. To 45 cm. Portugal to Morocco, Azores, Mediterranean.
- Labrus viridis* Linnaeus, 1758. To 47 cm. Portugal to Morocco, Mediterranean, Black Sea.
- Lappanella fasciata* (Cocco, 1833).
- Lappanella guineensis* Bauchot, 1969. From Sierra Leone. To 11.8 cm. Sierra Leone.
- Symphodus bailloni* (Valenciennes, 1839).
- Symphodus mediterraneus* (Linnaeus, 1758).
- Symphodus melops* (Linnaeus, 1758).
- Symphodus tinca* (Linnaeus, 1758). To 44 cm. Spain to Morocco, Mediterranean, Black Sea.
- Symphodus trutta* (Lowe, 1834).
- Thalassoma ascensionis* (Quoy and Gaimard, 1834). To 10 cm. Ascension Island, St Helena.

Thalassoma newtoni (Osório, 1891). To 10 cm. São Tomé.

➤ *Thalassoma pavo* (Linnaeus, 1758).

Thalassoma sanctaehelenae (Valenciennes, 1839). To 10 cm. St Helena.

Xyrichtys blanchardi (Cadenat and Marchal, 1963). To 21 cm. Ascension Island, St Helena.

➤ *Xyrichtys novacula* (Linnaeus, 1758).

Xyrichtys sanctaehelenae (Günther, 1868). To 23 cm. St Helena.

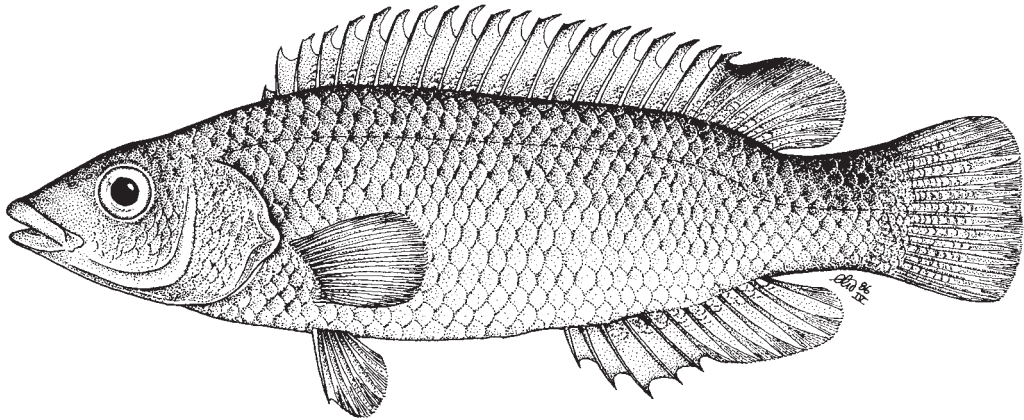
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Acantholabrus palloni (Risso, 1810)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Scale-rayed wrasse; Fr – Roucaou; Sp – Tordo de fondo.



Diagnostic characters: Body moderately slender. Dorsal profile of head nearly straight; tip of snout forming an acute angle; jaws prominent, each with 4 canines anteriorly. **Dorsal fin continuous, with 19 to 21 spines and 7 to 10 soft rays**, the spines and anterior soft rays of similar length; anal fin with 5 spines 5 to 8 soft rays; pectoral fins with 2 unbranched and 14 or 15 branched rays; caudal fin truncate to rounded. **Lateral line smoothly curved, uninterrupted, with 40 to 45 pored scales**; scales extending onto bases of dorsal and anal fins. **Colour:** body mostly brown to reddish, pale below. Lateral line often paler or darker than body ground colour. **Series of 6 or 7 pale spots on body along upper sides below dorsal fin, last on caudal peduncle. Last pale spot lies between 2 dark spots, 1 on upper part of caudal peduncle and 1 in the end of the spiny part of the dorsal fin.**

Size: Maximum to 25 cm.

Habitat, biology, and fisheries: This species appears to be relatively solitary, and lives at the deeper range of labrid habitats, at depths of 30 to 500 m along coastal waters near rocky or sandy bottoms. Feeds on benthic invertebrates.

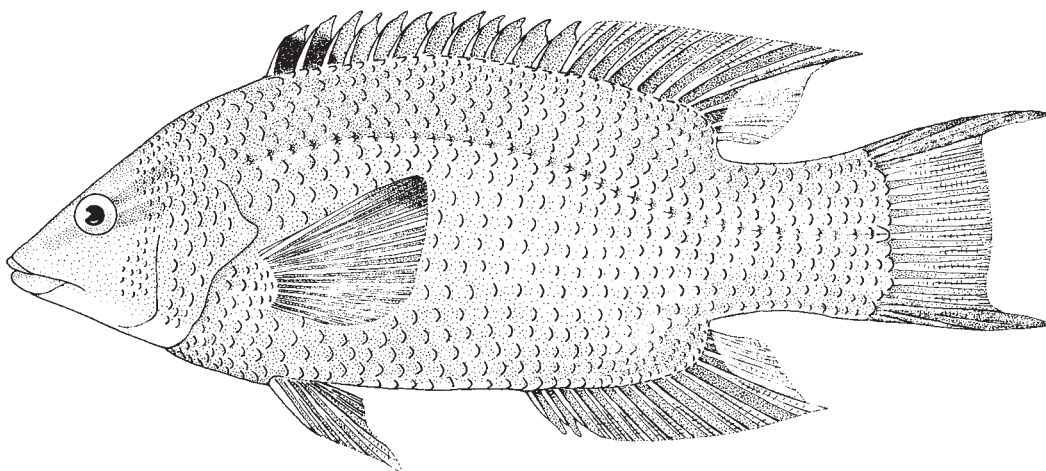
Distribution: Norway south to Cape Lopez, Gabon and including Madeira, Azores and the Canary Islands. Also in the Mediterranean and Adriatic seas.



Bodianus insularis Gomon and Lubbock, 1980

Frequent synonyms / misidentifications: None / None.

FAO names: En – Island hogfish; Fr – Pourceau des îles; Sp – Vieja isleña.



Diagnostic characters: Body moderately deep. Dorsal profile of head nearly straight; tip of snout forming an acute angle; jaws prominent, each with 4 strong canines anteriorly and a large curved canine on each side at rear of upper jaw. **Dorsal fin continuous, with 12 spines and 10 soft rays**, the spines and anterior soft rays of similar length; **posterior tips of dorsal and anal fins pointed, each forming an elongate filament that often extends beyond the scaly caudal-fin base in adults; pectoral fins with 2 unbranched and 14 (rarely 15) branched rays**; pelvic fins slightly filamentous in adults; **upper and lower corners of caudal fin forming filamentous lobes in adults**. Lateral line smoothly curved, uninterrupted, **with 33 or 34 pored scales**; scales extending onto bases of dorsal and anal fins. **Colour:** adults are bright red, each body scale on posterior side of head with a bluish spot; chin white; dorsal and anal fins with dark blue margins; a black spot between first few dorsal-fin spines, and a blackish blotch at tip of pectoral fins. Very large individuals are mostly dark grey to black; juveniles, brilliant yellow.

Size: Maximum to 33 cm.

Habitat, biology, and fisheries: This species has been taken in areas of rock and rubble bottom associated with sand. Recorded from 12 to 50 m depth. Caught incidentally in local artisanal fisheries.

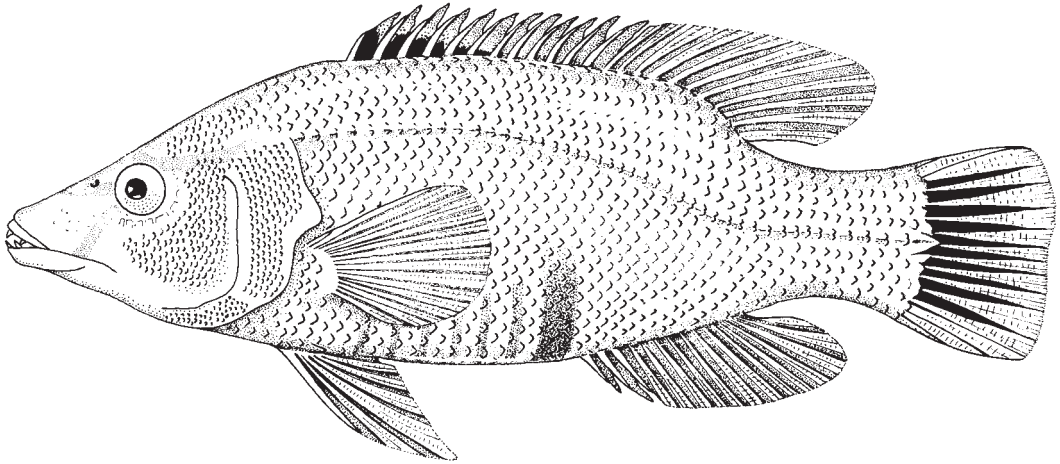
Distribution: Known from Ascension Island, St Helena and St Paul's Rocks.



Bodianus scrofa (Valenciennes, 1839)

Frequent synonyms / misidentifications: *Pseudolepidaplois scrofa* (Valenciennes, 1839) / None.

FAO names: En – Barred hogfish; Fr – Pourceau; Sp – Vieja.



Diagnostic characters: Body of moderate depth. Dorsal profile of head nearly straight, tip of snout forming an acute angle; jaws prominent, each with 4 strong canines anteriorly and a large curved canine on each side at rear of upper jaw. **Dorsal fin continuous, with 12 spines and 10 soft rays**, the spines and anterior soft rays of similar length, **posterior ends of dorsal and anal fins rounded, not reaching to posterior edge of scaly caudal-fin base; pectoral fins with 2 unbranched and 15 (rarely 16) branched rays**; pelvic fins not filamentous; **upper and lower corners of caudal fin usually rounded, not forming filamentous lobes in adults. Lateral line smoothly curved, uninterrupted, with 46 to 50 pored scales**; scales extending onto bases of dorsal and anal fins. **Colour:** adults are red, with 1 black and several dusky bars ventrally on sides; dorsal fin red anteriorly, yellow posteriorly, with a blackish spot between the first 3 and 4 spines; middle of caudal fin yellow with black longitudinal streaks on membranes. Juveniles with dusky vermiculations on body.

Size: Maximum to 43 cm.

Habitat, biology, and fisheries: Prefers rocky bottoms in shallow to moderately deep waters (20 to 100 m). Apparently not fished in sizeable quantities. Taken almost exclusively on hook-and-line, rarely in nets.

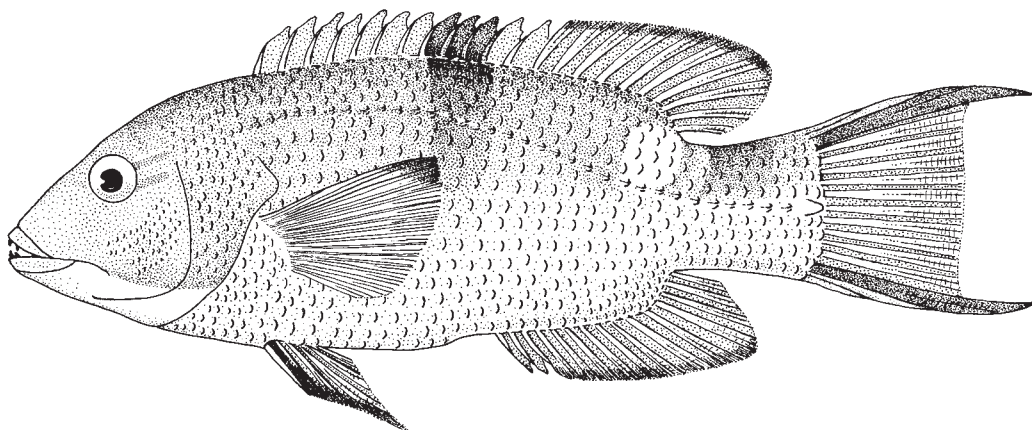
Distribution: Madeira, the Canaries, the Cape Verde Islands and along the African coast in the Cape Verde region; outside the area it ranges to the Azores Islands.



Bodianus speciosus (Bowdich, 1825)

Frequent synonyms / misidentifications: *Diastodon speciosus* Bowdich, 1825 / None.

FAO names: En – Blackbar hogfish; Fr – Pourceau dos noir; Sp – Vieja lomonegro.



Diagnostic characters: Body moderately deep. Dorsal profile of head rather straight, more curved in very large individuals; tip of snout forming an acute angle; jaws prominent, each with 4 strong canines anteriorly and a large curved canine on each side at rear of upper jaw. **Dorsal fin continuous, with 12 spines and 10 soft rays**, the spines and anterior soft rays of similar length; **posterior tip of fin rounded to pointed, not forming a filament in adults; rear tips of dorsal and anal fins barely reaching to or beyond posterior edge of scaly caudal-fin base in largest specimens; pectoral fins with 2 unbranched and 15 (rarely 14 or 16) branched rays**; pelvic fins somewhat filamentous in adults; **upper and lower corners of caudal fin forming filamentous lobes in adults. Lateral line smoothly curved, uninterrupted, with 33 or 34 pored scales**; scales extending onto bases of dorsal and anal fins. **Colour:** adults are red, with a violet-tinged black bar on back below the last few dorsal-fin spines; a whitish spot present below last soft rays of dorsal fin in all but very large adults; lower sides of head and body yellowish white to white; cheeks with numerous small orange spots; dorsal and anal fins red, with blackish margins; pectoral fins tipped with black. Juveniles purplish, with bright yellow on head and a large black spot on dorsal fin immediately behind last spine.

Size: Maximum to 48 cm.

Habitat, biology, and fisheries: Prefers areas associated with rocky cover, but is also caught in eel-grass beds. Taken between 1 and 75 m depth. Coastal waters down to about 70 m depth. Separate statistics are not reported for this species. Taken in trawls (as bycatch) and on hook-and-line; also caught in traps and with spears (divers). Marketed fresh.

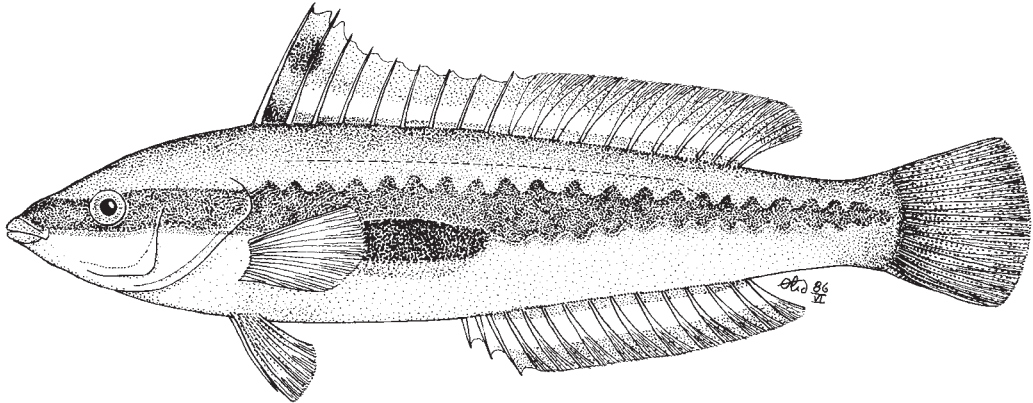
Distribution: Cape Verde Islands and along coast to Angola.



Coris julis (Linnaeus, 1758)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Rainbow wrasse; Fr – Girelle; Sp – Julia.



Diagnostic characters: Body moderately narrow. Dorsal profile of head only slightly curved; tip of snout forming an acute angle; a single pair of enlarged canines anteriorly in each jaw; posterior canines absent. **Dorsal fin continuous, with 9 spines and 12 soft rays**, the first few spines of large individuals longer than succeeding spines; no other spines or rays in any of the fins especially elongate. **Lateral line uninterrupted, but bent abruptly downward below posterior end of dorsal fin, with 73 to 80 pored scales.** **Colour:** body greenish to reddish brown with a broad yellow midlateral stripe; underside whitish. Large individuals with a black and orange spot on the elongate anterior dorsal-fin spines, as well as a black mark behind the pectoral fin; lateral stripe more orange and irregularly shaped in larger fishes.

Size: Maximum to 25 cm total length.

Habitat, biology, and fisheries: Most common in shallow rocky areas and along the edges of sea-grass beds (depth range from 1 to 120 m). Feeds mainly on small crustaceans and molluscs. Taken all along the coast but not in sizeable quantities. Separate statistics are not reported for this species. Taken on hook-and-line, in trawls and by spear guns (divers). Marketed fresh.

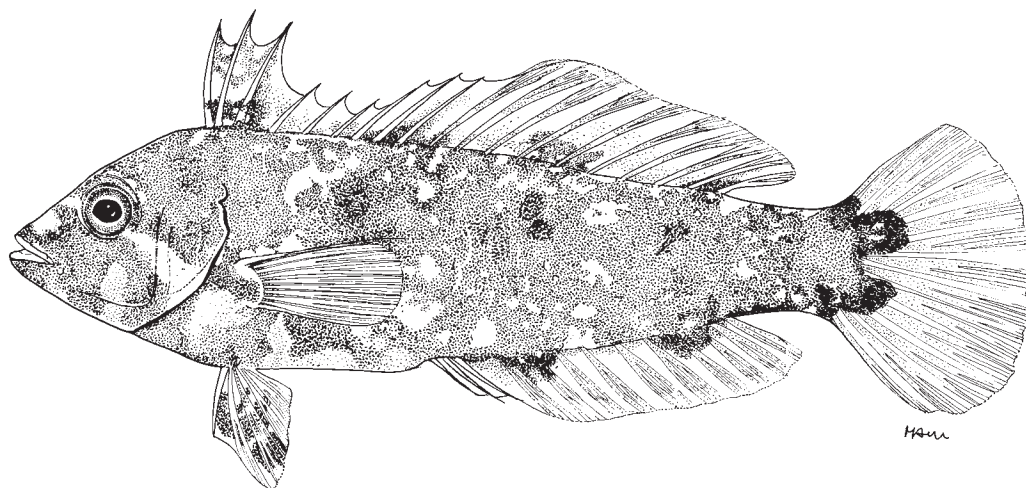
Distribution: Eastern Atlantic, Sweden to Canary Islands. Also known from the Mediterranean Sea, around the Azores and along the European coast northward to the southern edge of the British Isles. The closely related *Coris atlantica* occurs from Cape Verde south to Cape Lopez, but not St Helena and Ascension islands.



***Doratonotus megalepis* Günther, 1862**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Dwarf wrasse.



Diagnostic characters: Body moderately deep, depth 2.5 to 3.1 times in standard length. Head small, dorsal profile of head slightly concave; snout pointed; large scales on head except for top and region before eye; upper jaw protractile; teeth small, increasing in size to form 2 small canines at front of upper and lower jaw; a small canine tooth posteriorly at rear of upper jaw. **Dorsal fin continuous, 9 spines and 10 rays; first 3 and last 3 spines longer than central 3;** anal fin with 3 spines and 9 rays; pectoral-fin rays 11 or 12; caudal fin rounded. **Gill rakers 15 or 16. Lateral line interrupted, with 17 pored scales in upper portion and 4 on peduncular portion.** **Colour:** body colour variable, primarily pale green or green to mottled reddish brown or a translucent orange with a few rows of large brownish spots and with more numerous rows of white spots superimposed on these; an oblique white bar on cheek.

Size: Smallest wrasse in area, maximum length to about 8 cm.

Habitat, biology, and fisheries: Inhabits shallow sea-grass beds. Feeds on small fishes and invertebrates. This species is not marketed for food, and is rarely seen in the aquarium trade.

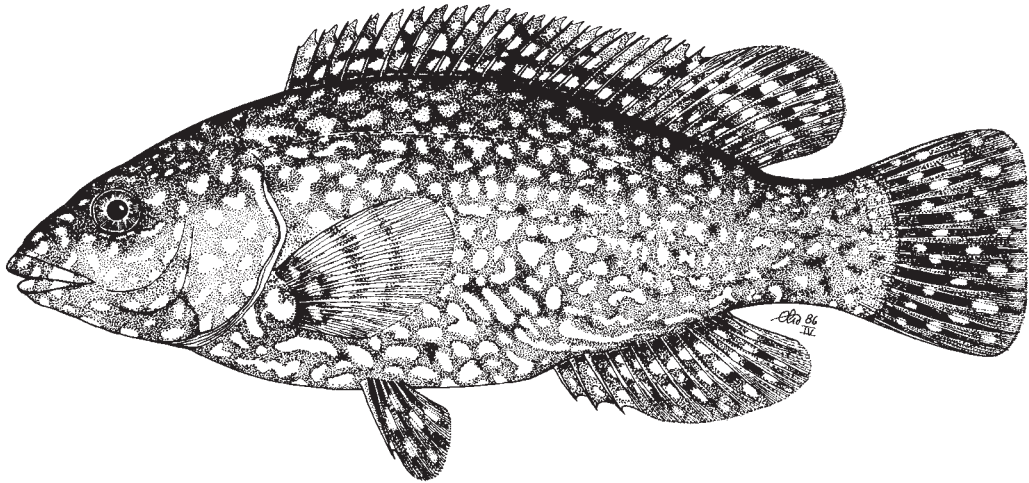
Distribution: A western Atlantic species widely distributed in Bermuda, Florida Keys and Caribbean Sea, in eastern Atlantic is known only from Cape Verde Islands and São Tomé.



***Labrus bergylta* Ascarius, 1767**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Ballan wrasse; Fr – Vieille commune; Sp – Maragota.



Diagnostic characters: Body moderately deep, thick; head broad, its length less than or equal to body depth; **jaws prominent with thick lips**, each jaw with strong canines anteriorly, often rounded in large individuals. **Dorsal fin continuous, with 18 to 21 spines and 9 to 13 soft rays**, the spines and anterior soft rays of similar length; anal fin with 3 spines and 8 to 12 rays. **Lateral line smoothly curved, uninterrupted, with 41 to 47 pored scales.** **Colour:** highly variable colour patterns, with body, head and fins often brown to reddish with numerous small white spots. Some specimens are more green, with white spots or a pattern of vertical dark bars, or with a large lateral white stripe. Juveniles often an emerald green with fewer markings.

Size: Maximum to 60 cm.

Habitat, biology, and fisheries: Prefers areas associated with rocky cover, and algal beds in shallow water down to 50 m depth. Juveniles often found in the intertidal zone. All are born females and change sex when they are 4 to 14 years old. Diet is benthic invertebrates. A popular sport fish frequently caught on hook-and-line; also caught in traps and with spears (divers).

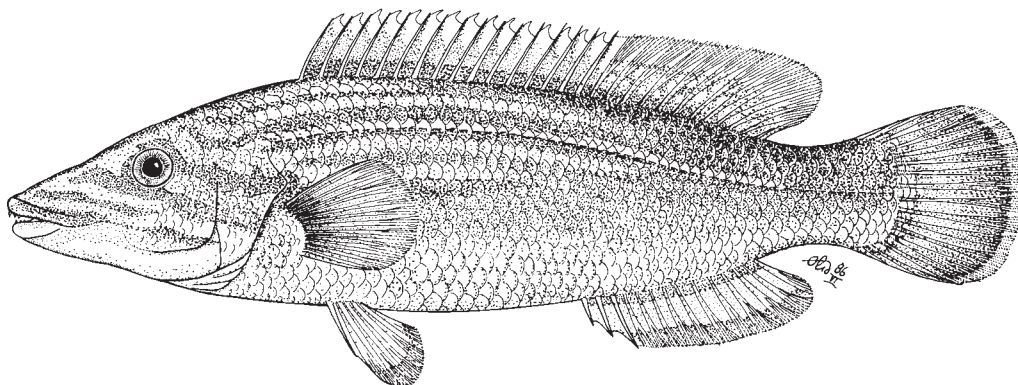
Distribution: Eastern Atlantic from Norway to Morocco, Madeira, the Azores and Canary Islands.



Labrus mixtus Linnaeus, 1758

Frequent synonyms / misidentifications: *Labrus bimaculatus* Linnaeus, 1758 / None.

FAO names: En – Cuckoo wrasse; Fr – Vieille coquette; Sp – Gallano.



Diagnostic characters: Body moderately slender; head longer than high and longer than body depth; **snout pointed and jaws prominent with thick lips**, each jaw with strong canines anteriorly, usually sharp. **Dorsal fin continuous and uniform in height, with 16 to 19 spines and 11 to 14 soft rays**; anal fin with 3 spines and 9 to 12 rays. **Lateral line smoothly curved, uninterrupted, with 45 to 48 pored scales.** **Colour:** males with blue head and upper back marked with green, body and fins yellow or orange with blue stripes and blotches on back, sides and fins. Females and juveniles orange, pink, or bright red with 3 dark blotches on back, front 2 extending onto soft portion of dorsal fin.

Size: Maximum to 35 cm.

Habitat, biology, and fisheries: Rocky reefs to 200 m, usually found in 40 to 80 m depth. Usually solitary or observed in pairs with young, guarding a nest of seaweed. Diet is benthic invertebrates. Occasionally caught on hook-and-line; also caught in trawls and with spears (divers).

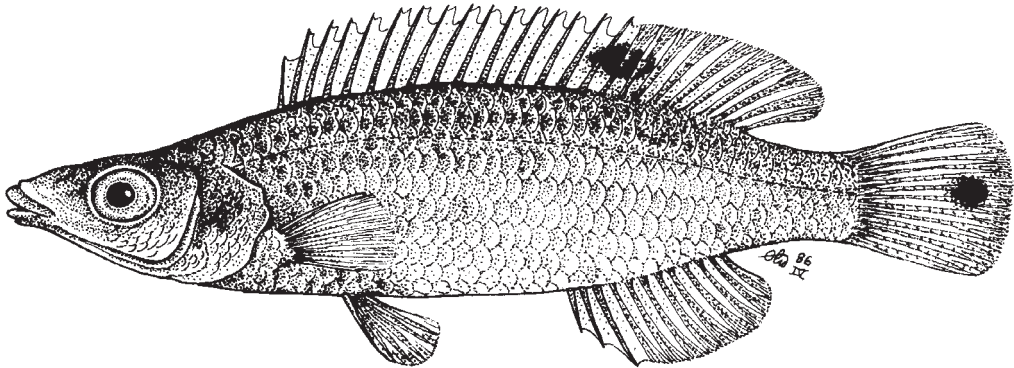
Distribution: Eastern Atlantic: Norway south to Senegal, Azores and Madeira. Also in the Mediterranean.



Lappanella fasciata (Cocco, 1833)

Frequent synonyms / misidentifications: *Ctenolabrus iris* Valenciennes, 1839 / None.

FAO names: En – Sharp-toothed wrasse.



Diagnostic characters: Body slender, snout pointed, mouth large and terminal with moderately large lips. Head longer than body depth; preopercular edge serrated. Two rows of canine teeth, front one of first row longer and protruding; hind canine present in corner of mouth. **Dorsal fin continuous with 16 or 17 spines and 9 to 12 soft rays**; anal fin with 3 spines and 8 to 11 rays. Scales rather large; head scaly except for snout (some scales between eyes); 1 or 2 rows of scales extend onto bases of dorsal and anal fins. Lateral line continuous with 35 to 38 scales. **Colour:** no sexual dimorphism; **body reddish, pink or orange**. A dark blotch on dorsal fin, on end of spiny portion and beginning of soft rays. Another one on upper part of caudal peduncle. A small dark spot on middle of caudal fin.

Size: Maximum to 14 cm.

Habitat, biology, and fisheries: Found in deep rocky areas, at depths of 100 to 200 m. Feeds on crabs, gastropods and polychaetes. Not exploited commercially.

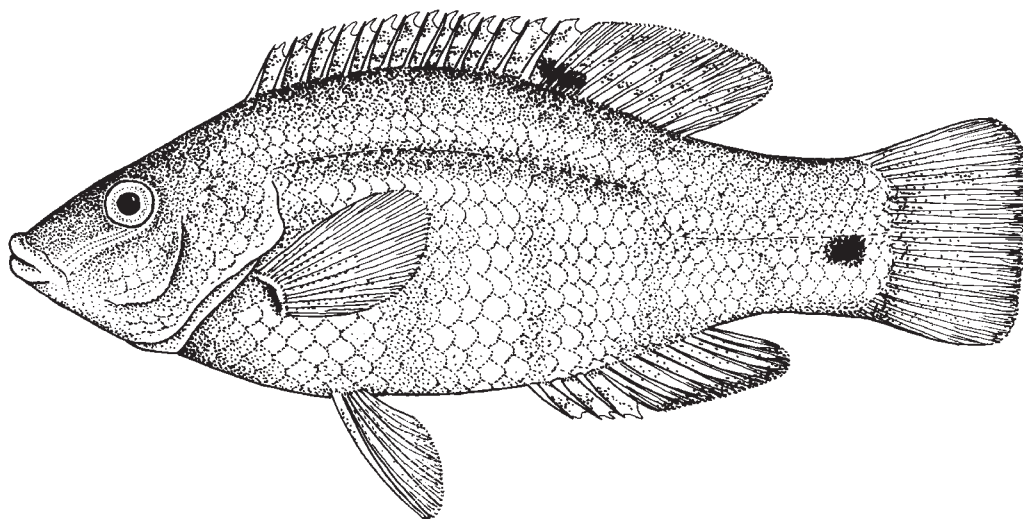
Distribution: Eastern Atlantic: Madeira, the western Mediterranean and Adriatic seas.



Symphodus bailloni (Valenciennes, 1839)

Frequent synonyms / misidentifications: *Crenilabrus bailloni* Valenciennes, 1839 / None.

FAO names: En – Baillon's wrasse; Fr – Vieille; Sp – Tort.



Diagnostic characters: Body moderately deep; snout short, lips large; head length equal to or shorter than body depth; preopercular edge serrated. **Teeth small and numerous (50 to 130).** **Dorsal fin continuous with 14 or 15 spines and 9 to 11 soft rays;** anal fin with 3 spines and 9 to 11 rays. **Dorsal and anal-fin base scaleless.** Lateral line continuous with 33 to 38 scales. **Colour:** a sexually dimorphic species. **Both sexes with a dark spot on caudal peduncle and another brown-black or dark blue spot on beginning of soft part of dorsal fin; a blue arc on base of pectoral fin.** Often 5 vertical dark brown patches on upper part of flanks, sometimes reaching belly and anal fin. Juveniles and females mostly brown, paler on belly; **3 longitudinal dark brown stripes on middle and upper sides.** A large dark brown, bar-like blotch on snout. **Adult females: dark grey or black urogenital papilla. Males: greenish, reddish or bright brown. Head with brown-green, orange stripes.**

Size: Maximum to 20 cm.

Habitat, biology, and fisheries: Found in rocky weedy areas, at depths of 1 to 50 m. Feeds on crabs, gastropods and polychaetes. Not exploited commercially.

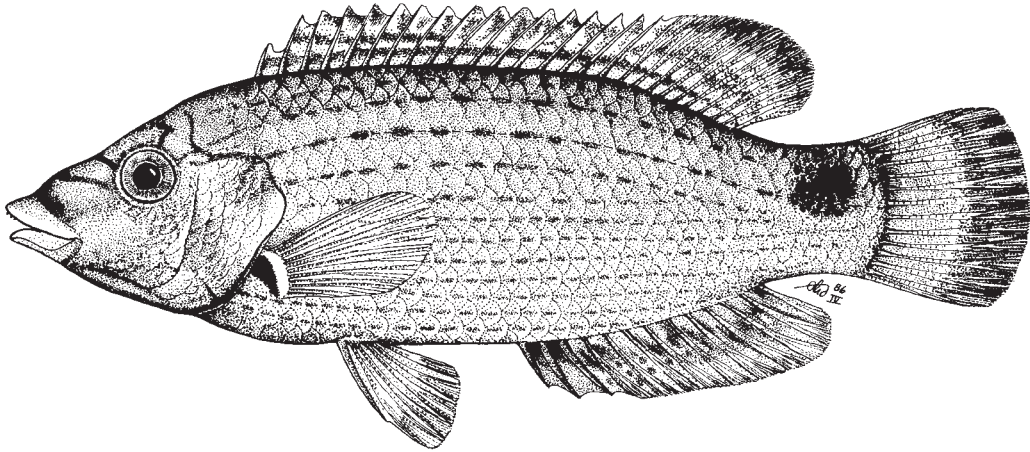
Distribution: Eastern Atlantic, from North Sea to Mauritania. Also in the Mediterranean off the coast of Spain and the Balearic Islands.



Symphodus mediterraneus (Linnaeus, 1758)

Frequent synonyms / misidentifications: *Crenilabrus mediterraneus* (Linnaeus, 1758) / None.

FAO names: En – Axillary wrasse; Fr – Crénilabre rouqué; Sp – Tordo de roca.



Diagnostic characters: Body moderately deep; **snout pointed with large lips; head length roughly equal to body depth;** preopercular edge serrated. Mouth small, jaws with 2 prominent front canines. **Dorsal fin continuous with 15 to 18 spines** and 8 to 11 soft rays; anal fin with 3 spines and 8 to 11 rays. **Dorsal and anal-fin base scaleless. Lateral line continuous with 30 to 35 scales.** **Colour:** a sexually dimorphic species. **Both sexes with a large dark mark at base of pectoral fin (blue with a yellow margin in male, dark brown in female), another on caudal peduncle, above lateral line.** Females and juveniles: yellowish brown to mottled darker brown, with a **prominent dark blue urogenital papilla in adult females.** Males: grey to bluish, brownish, pinkish or greenish, with some longitudinal lines of small light spots on the upper part of the sides. During spawning season red to brownish, bluish or green, upper part darker, with some blue or green to brownish stripes on snout and cheeks. Throat and front part of belly usually light blue.

Size: Maximum to 18 cm.

Habitat, biology, and fisheries: Found primarily in eel-grass areas, at depths of 1 to 50 m. Feeds on molluscs, gastropods and other benthic invertebrates. Occasionally part of subsistence fisheries and found in the aquarium trade.

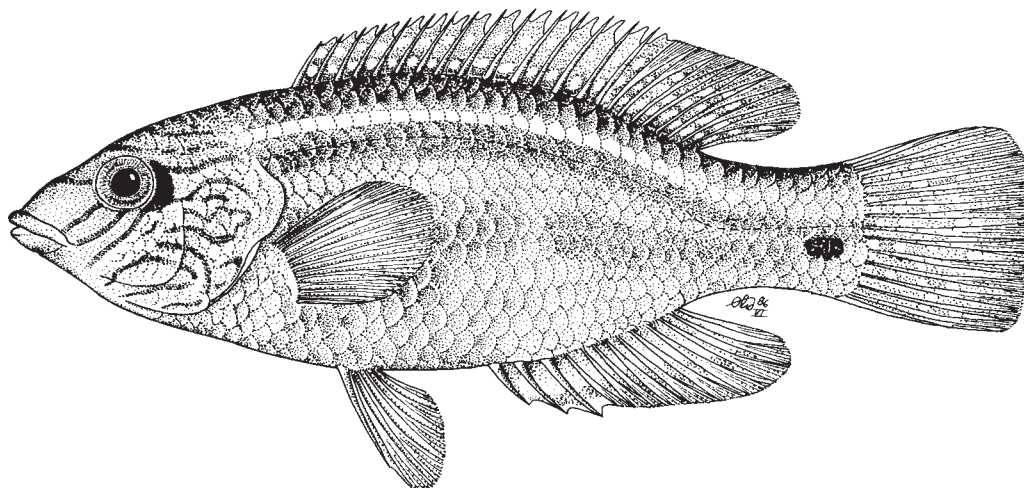
Distribution: Portugal to northern Morocco, including Azores and Madeira and Canary Islands, and also throughout the Mediterranean.



***Symphodus melops* (Linnaeus, 1758)**

Frequent synonyms / misidentifications: *Crenilabrus melops* (Linnaeus, 1758) / None.

FAO names: En – Corkwing wrasse; Fr – Crénilabre mélops; Sp – Porredana.



Diagnostic characters: Body moderately deep; snout short with large lips; head length equal to or slightly greater than body depth; preopercular edge serrated. Mouth small, jaws with 2 small front canines. Dorsal fin continuous with 14 to 17 spines and 8 to 10 soft rays; anal fin with 3 spines and 8 to 11 rays. Dorsal- and anal-fin base scaleless. Lateral line continuous with 31 to 37 scales. **Colour:** a sexually dimorphic species, highly variable. Both sexes with brown to greenish ground colour, a crescent-like dark brown, black, dark reddish or dark blue mark behind eye (sometimes not very evident), and a small dark spot on caudal peduncle, just below lateral line. Often 5 large brown blotches near dorsal fin. Females and juveniles: brown or greenish to brown, with numerous spots on body more or less longitudinally lined, some sinuous lines on head and 5 blotches on dorsal fin. Adult females with a prominent dark blue urogenital papilla. **Males more brightly coloured; in spawning season often grey to greenish conspicuously red marbled, with red sinuous stripes on head.**

Size: Maximum to 28 cm.

Habitat, biology, and fisheries: Found primarily in rocky areas, lagoons and eel-grass beds, at depths of 1 to 30 m. This is a schooling, gregarious fish with mixed ages in schools. In summer, a seaweed nest is built by males among rocks or in crevices, where pairs will guard young. Sex reversal sometimes observed. Feeds on molluscs, hydroids, bryozoans, worms and various crustaceans. Occasionally part of subsistence fisheries and found in the aquarium trade.

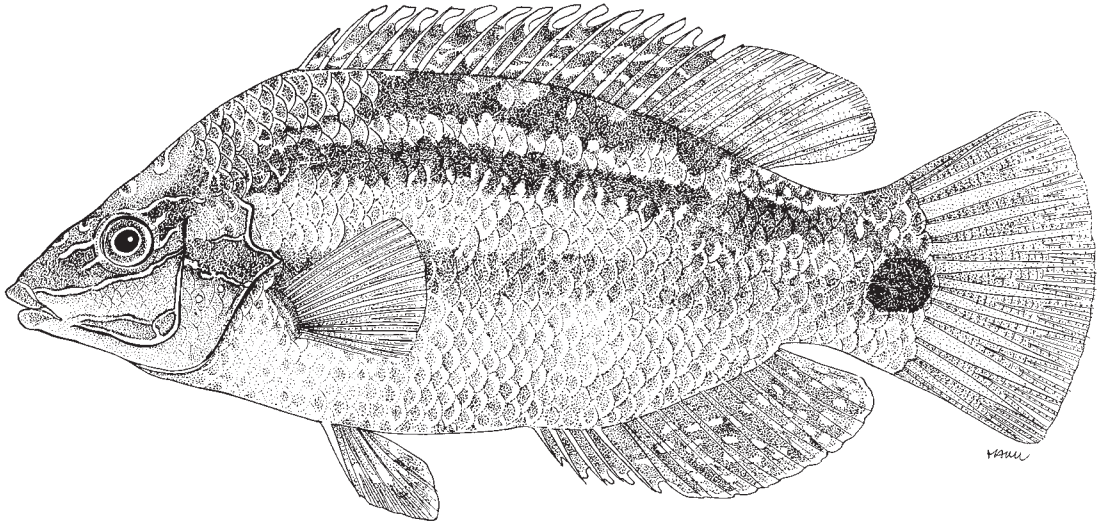
Distribution: Eastern Atlantic: Norway to Morocco and the Azores, western Mediterranean and Adriatic seas.



***Symphodus trutta* (Lowe, 1834)**

Frequent synonyms / misidentifications: *Centrolabrus trutta* (Lowe, 1834); *Crenilabrus trutta* Lowe, 1834, *C. romeritus* Valenciennes, 1843 / None.

FAO names: En – Emerald wrasse; Fr – Centrolabre truite; Sp – Romero.



Diagnostic characters: Body moderately deep, head and mouth small; tip of snout forming an acute angle; preopercle edge serrated. Dorsal fin continuous, with 15 to 17 spines and 8 or 9 soft rays; anal fin with 4 or 5 spines and 8 or 9 rays. Lateral line smoothly curved, uninterrupted, with 33 or 34 pored scales; 1 row of scales on bases of soft dorsal and anal fins. **Colour:** dark brown to greenish, with a spot present on each body scale; a round black spot on centre of caudal fin near peduncle; a dark line extending posteriorly and dorsally from near mouth corner to behind eye.

Size: Maximum to 18 cm.

Habitat, biology, and fisheries: Inhabits rocky areas and eel-grass beds in shallow areas down to 15 m. Not often captured for food or aquarium trade.

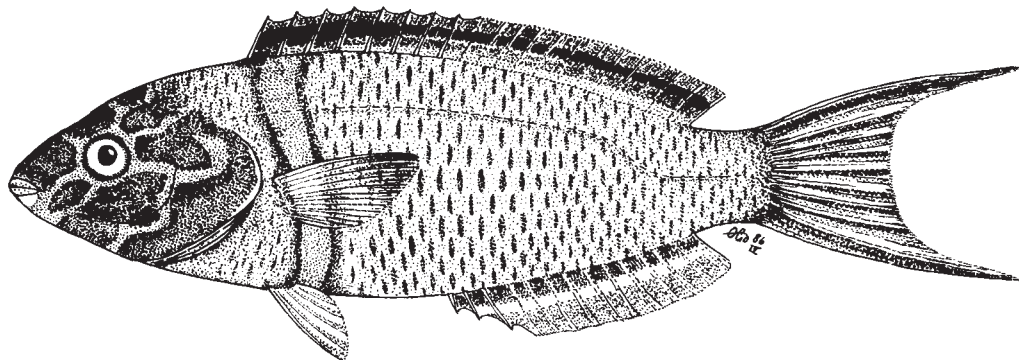
Distribution: Eastern Atlantic: Azores, Madeira, and Canary Islands.



Thalassoma pavo (Linnaeus, 1758)

Frequent synonyms / misidentifications: None / *Thalassoma newtoni* (Osório, 1891).

FAO names: En – Ornate wrasse; Fr – Girelle paon; Sp – Fredi.



Diagnostic characters: Body slender and compressed; snout blunt and mouth small; head length about equal to body depth; preopercular edge smooth. Jaws with 1 row of small canine teeth, 2 larger canines in each jaw anteriorly. **Dorsal fin continuous with 8 spines and 12 or 13 soft rays**; anal fin with 3 spines and 10 to 12 rays. Upper and lower caudal rays prolonged to form lunate tail in large adults. **Dorsal and anal-fin base scaleless. Lateral line continuous with 26 to 31 scales.** **Colour:** strong sexual dimorphism. Males with greenish brown body with dark vertical lines on each scale; **head dark red with a reticulate blue pattern; a conspicuous vertical blue stripe, from base of dorsal fin to belly behind pectoral-fin base, often outlined with red; blue, black and dark red bands along fins.** Females and juveniles with brown-green ground colour, numerous dark vertical lines and **5 conspicuous blue vertical bands on body; head brownish with reticulate blue lines; fins with blue and red longitudinal stripes.**

Size: Maximum to 25 cm.

Habitat, biology, and fisheries: Found primarily in rocky areas and eel-grass beds, at depths of 1 to 150 m. Usually solitary, sometimes in small groups. Feeds on small molluscs and crustaceans. Found in the aquarium trade.

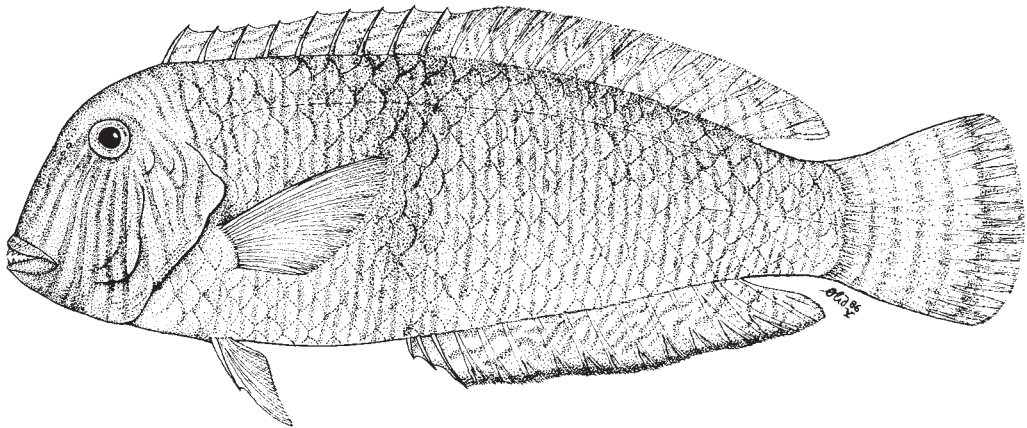
Distribution: Eastern Atlantic: Portugal to Azores, Madeira, Canary and Cape Verde Islands, along coast to Gabon. Also in the Mediterranean. Closely related *T. newtoni* from Senegal to São Tomé.



***Xyrichtys novacula* (Linnaeus, 1758)**

Frequent synonyms / misidentifications: *Xyrichtys psittacus* (Linnaeus, 1766); *Hemipteronotus novacula* (Linnaeus, 1758) / None.

FAO names: En – Pearly razorfish; Fr – Donzelle lame; Sp – Raó.



Diagnostic characters: Body deep, strongly compressed. Dorsal profile of head rounded; **edge of snout blade-like, nearly vertical in adults**; a single pair of enlarged canines present anteriorly in each jaw; posterior canines absent. **Dorsal fin continuous, originating on top of head close behind eyes**, with 9 spines (first 2 more flexible than others) and 12 soft rays; none of the fins with particularly elongate spines or rays. **Lateral line with 29 pored scales, interrupted posteriorly**, a separate rear portion positioned midlaterally **on caudal peduncle**. Sides of head below and behind eyes mostly naked; scales not extending onto bases of dorsal and anal fins. **Colour:** back of large individuals dull green, sides orangish with a blue mark on each scale; a vertical red bar present on sides just posterior to pectoral fins; a number of alternating blue and orange vertical lines on head below and behind eye; alternating wavy blue and orange oblique lines also located posteriorly on dorsal and anal fins; similar vertical lines present on caudal fin. Lines on fins less prominent in very large individuals.

Size: Maximum to 25.5 cm.

Habitat, biology, and fisheries: Inhabits clear water areas with sandy bottoms, often associated with patches of grass or coral rubble. The species is found at depth ranging from 1 to 90 m. Individuals escape capture by diving into the sand and burrowing into the bottom. Feeds mostly on molluscs; also on crabs and shrimps. Coastal waters down to about 60 m depth. Caught mainly on hook-and-line; also with spear guns (divers), rarely with trawls.

Distribution: Eastern Atlantic: Portugal to south of Cape Lopez, Gabon and including the islands of Azores, Madeira, the Canary Islands, and into the Mediterranean.



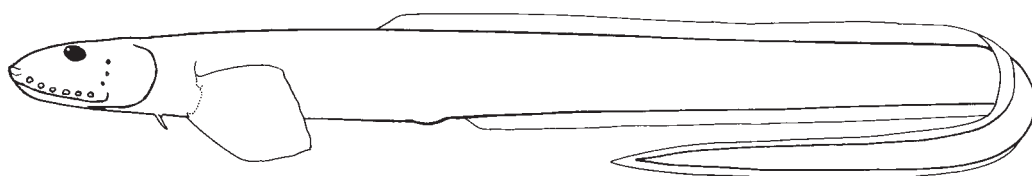
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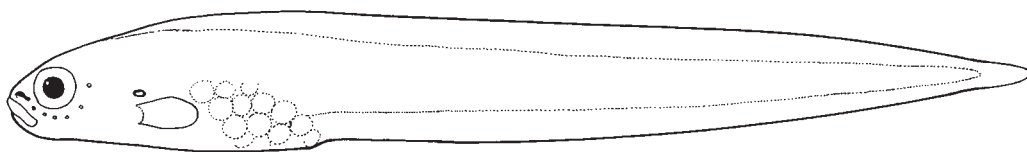
Eelpouts

by M.E. Anderson, South African Institute of Aquatic Biodiversity, Grahamstown, South Africa

Diagnostic characters: Small to medium-sized fishes, adults attaining 12 cm (*Melanostigma atlanticum*) to over 50 cm (*Pachycara* spp.) in the area. **Body elongate, eel-like, tail compressed.** Head ovoid to round, without spines, papillae or cirri. Head pores small and rounded or large and oval (*Lycenchelys alba*). Eye moderate, near top of head. Snout short and blunt (*M. atlanticum*) to long and flat (*L. alba*); **nostrils single, tubular.** Mouth small to moderate; teeth small, conical, in 2 or 3 rows anteriorly, single row behind; teeth present on vomer and palatines, absent on tongue. Branchiostegal rays 6. Gill rakers few, blunt and triangular, or furcate in *Pachycara crossacanthum*. Branchiostegal membranes broadly fused to isthmus; gill opening extending ventrally to about lower end of pectoral base, or gill opening a small pore above pectoral fin (*M. atlanticum*). **Dorsal and anal fins confluent with caudal, without spines;** dorsal-fin rays 90 to 114; anal-fin rays 75 to 110; caudal-fin rays 8 to 12; pectoral-fin rays 13 to 23, or 6 to 8 (*M. atlanticum*); **pelvic-fin rays 2 or 3** or absent (*M. atlanticum*). Scales minute, cycloid, imbedded or absent (*M. atlanticum*). Lateral line(s) of superficial neuromasts not in canals, extending to tail tip or absent (*M. atlanticum*). **Gas bladder absent. Ovary single.** Pyloric caeca reduced to two small nubs. **Colour:** uniformly dark brown to black except *L. alba* and young of *M. atlanticum*, which are cream. Head usually darker than body; eyes blue or black.



Lycenchelys alba



Melanostigma atlanticum

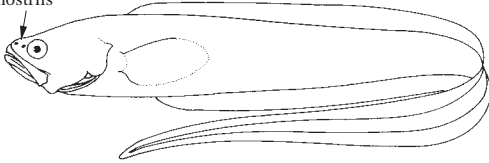
Habitat, biology, and fisheries: All eelpouts in the area are benthic except *Melanostigma atlanticum* which is primarily mesopelagic. The benthic species mostly feed on gammaridean amphipods, other small crustaceans, polychaetes and bivalves. They mature near their maximum sizes and females produce few large eggs probably laid in shallow depressions in muddy bottoms. The mesopelagic *M. atlanticum* is known to burrow in soft sediment in groups for egg laying. The benthic species in the area occur from the upper slope around 700 m to the abyssal plain at over 4 000 m. No interest to fisheries.

Similar families occurring in the area

Carapidae: anal-fin origin in advance of dorsal-fin origin except in *Snyderidia canina* (which has only 3 developed gill rakers and 24 to 27 pectoral-fin rays); 2 pairs of nostrils; bilobed ovary; gas bladder present.

Ophidiidae: 2 pairs of nostrils, bilobed ovary; gas bladder present; pelvic fins (when present) under preopercle or chin.

2 pairs of
nostrils



Carapidae

2 pairs of nostrils

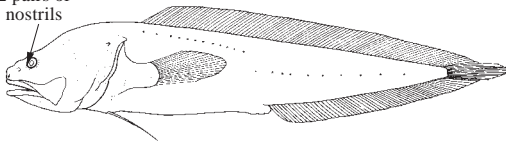


Ophidiidae

Bythitidae: 2 pairs of nostrils; bilobed ovary; gas bladder present; pelvic fins (when present) of a single ray except in *Thalassobathia pelagica*, which has 2; viviparous, males with intromittent organ; opercular spine usually strong but may be buried in flesh; branchiostegal rays 7 to 9.

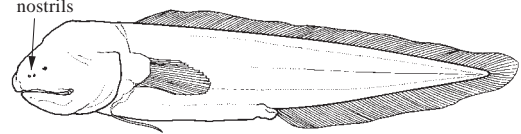
Aphyonidae: 2 pairs of nostrils; bilobed ovary; gas bladder present; pelvic fin with 1 ray; viviparous, males with intromittent organ; eyes degenerate.

2 pairs of
nostrils



Bythitidae

2 pairs of
nostrils



Aphyonidae

List of species occurring in the area

Lycenchelys alba (Vaillant, 1888). To 280 mm. Both sides of North Atlantic; in eastern Atlantic: Rockall to off the Azores; 2 646 to 4 100 m.

Lycodes terraenovae Collett, 1896. To 505 mm. Both sides of North Atlantic; in eastern Atlantic: Rockall to South Africa; 522 to 2 064 m.

Melanostigma atlanticum Koefoed, 1952. To 120 mm. Both sides of North Atlantic; in eastern Atlantic: Faeroe-Iceland Ridge to off Mauritania; also mid-Atlantic Ridge and Mediterranean Sea; about 70 to 1 000 m.

Pachycara bulbiceps (Garman, 1899). To 525 mm. Both sides of North Atlantic; in eastern Atlantic: off Ireland to Senegal; also eastern Pacific; 2 400 to 4 780 m.

Pachycara crassiceps (Roule, 1916). To 540 mm. Off Ireland to South Africa; 652 to 2 191 m.

Pachycara crossacanthum Anderson, 1989. To 370 mm. Off Senegal to Angola; 672 to 1 050 m.

References

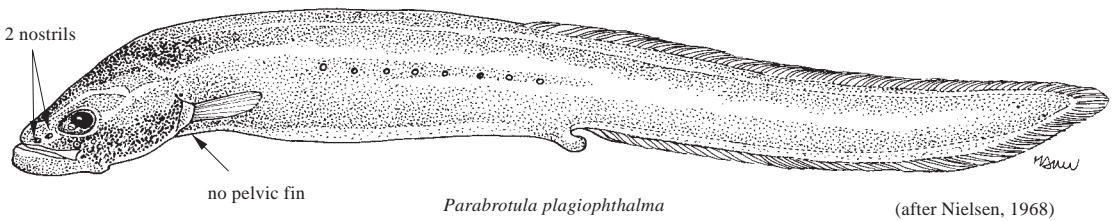
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PARABROTULIDAE

False brotulas

by J. G. Nielsen, Zoological Museum, National History Museum of Denmark, University of Copenhagen, Denmark

Diagnostic characters: Body eel-like; **scales absent**; **vertical fins united**, pectoral fins with 7 or 8 rays and pelvic fins absent; dorsal-fin origin slightly anterior to anal-fin origin near mid-point of fish; lower jaw protruding; **a pair of nostrils on each side of the snout**; gill slit long; gill rakers poorly developed; number of dorsal and anal fin rays corresponds to the number of vertebrae; vertebral centra almost square in a lateral view; swimbladder absent; **viviparous, male intromittent organ with a recurved urogenital hood and a long penis**. Standard length up to 60 mm. **Colour:** body with black to brownish or transparent skin.



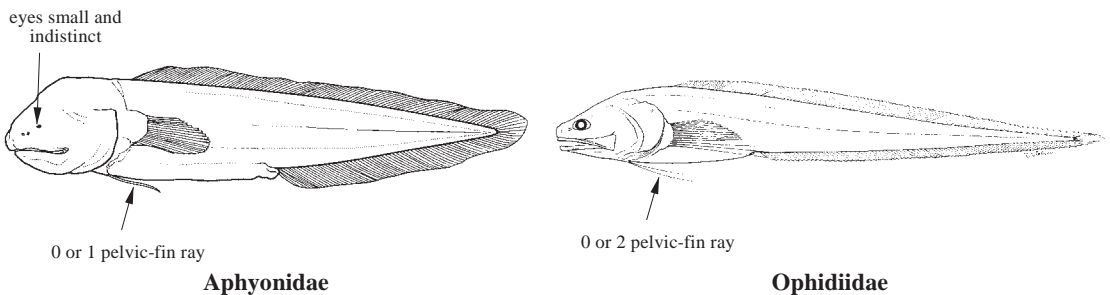
Habitat, biology, and fisheries: Distributed in temperate and tropical areas of all oceans, most commonly caught in the Atlantic. They occur deep pelagically between 600 and 1 500 m, occasionally near the bottom. Viviparous, with up to 8 mm long newly born specimens. No commercial importance.

Remarks: Nielsen (1968) removed the present 2 genera from the ophidiiform fishes to the Zoarcidae, forming a new subfamily, Parabrotulinae. Smith and Heemstra (1986) argued for the two genera being derived from the ophidiiform family Aphyonidae, based on personal communication by M. Eric Anderson, but they kept the Parabrotulidae among the zoarciform fishes. Nelson (1994) has the Parabrotulidae among the ophidiiform fishes, based on Smith and Heemstra (1986), but mentions that more research is necessary in order to find the correct placement of the Parabrotulidae.

Similar families occurring in the area

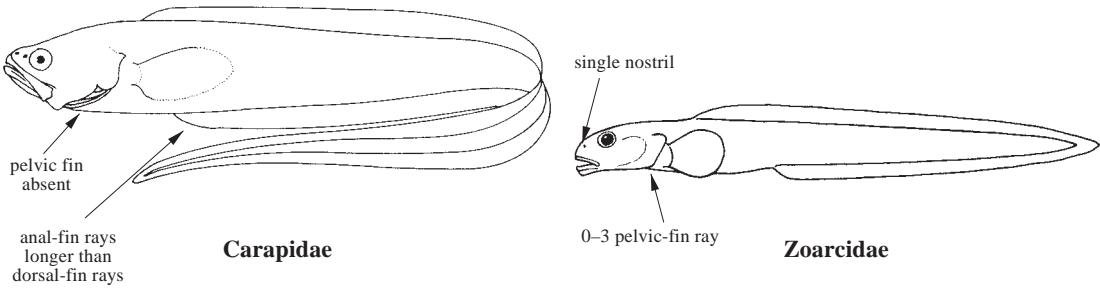
Aphyonidae: scales absent; eyes poorly developed or not visible; dorsal- and anal-fin rays outnumber the vertebrae.

Ophidiidae: scales present; dorsal- and anal-fin rays outnumber the vertebrae.



Carapidae: anal opening placed below pectoral fins; dorsal- and anal-fin rays outnumber the vertebrae.

Zoarcidae: a single nostril on each side of the snout; no distinct male copulatory organ; dorsal- and anal-fin rays correspond to the number of vertebrae.



Key to the species of Parabrotulidae occurring in the area

- 1a. Black to brownish skin; premaxillaries edentate; head profile slender; caudal tip pointed ***Parabrotula plagiophthalma***
- 1b. Transparent skin; premaxillaries dentigerous; head profile robust; caudal tip square ***Leucobrotula adipata***

List of species occurring in the area

Leucobrotula adipata Koefoed, 1952. To 6 cm. Northeast Atlantic (20° to 55° N).

Parabrotula plagiophthalma Zugmayer, 1911. To 5.5 cm. In all oceans, most commonly caught in the North Atlantic.

References

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Nielsen, J.G. 1968. Redescription and reassignment of *Parabrotula* and *Leucobrotula* (Pisces, Zoarcidae). *Videnskabelige Meddelelser Dansk Naturhistorisk Forening*, 131: 225–250.

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Smith, M.M. & Heemstra, P.C. 1986. *Smith’s Sea Fishes*. Johannesburg, Macmillan South Africa, 1047 pp.

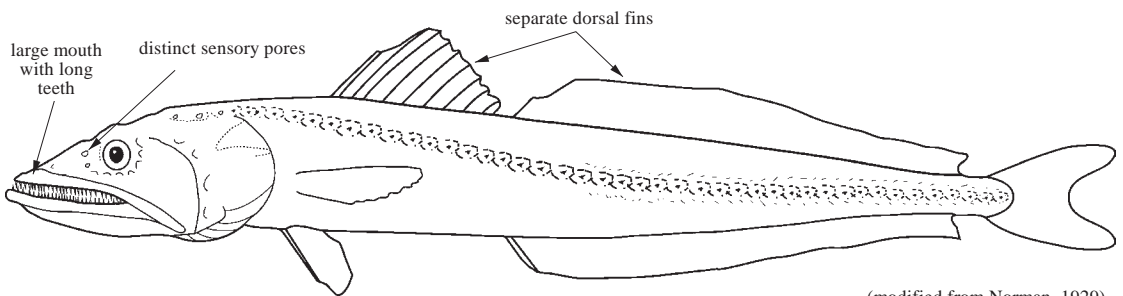
Suborder TRACHINOIDEI

CHIASMODONTIDAE

Swallowers

by W.L. Smith, The University of Kansas, Lawrence, KS, USA

Diagnostic characters: Elongate, slightly compressed, moderate sized (to 40 cm total length) perciform fishes. Eyes small to moderate. Head with rounded or elongate snout, longer than eye diameter; **cranium with distinct sensory pores and rugose bones. Mouth large, nearly horizontal, extending beyond eye; premaxilla and maxilla non-protractile, slender.** Teeth typically long and slender, present on jaws and palatines, variously present on vomer. Branchiostegal rays 6 or 7. Gill membranes separate and free from isthmus. Dorsal fins separate, first fin short with 7 to 13 spines, second long with 0 or 1 flexible spine and 18 to 30 segmented soft rays; **anal fin long with 1 spine and 17 to 29 soft rays. Pectoral fins larger than pelvic fins.** Body naked, occasionally with spinoid scales covering body, or with 1 to many rows of prickles above and below lateral line. Photophores present in *Pseudoscopelus*, absent in other genera. Single lateral line with a series of obvious pores usually midlateral along length of body. Skeleton mildly reduced; pelvic bones separate from each other and not associated with the pectoral girdle; total vertebrae 33 to 48. **Most species have highly distensible guts** and are capable of swallowing extremely large prey items (including individuals longer than the fish itself). **Colour:** uniformly black or dark brown.



(modified from Norman, 1929)

Habitat, biology, and fisheries: Meso- and bathypelagic fishes, which are occasionally collected in deep midwater trawls; juveniles and larvae encountered in shallower waters; most species broadly distributed in multiple oceans. Adults feed primarily on fishes.

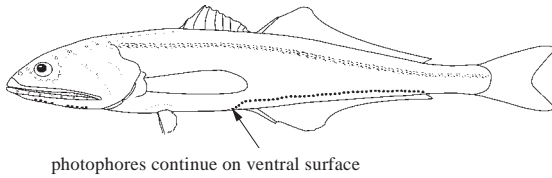
Remarks: The genera *Chiasmodon* and *Pseudoscopelus* need revision. Examples of the current species-level problems include the validity of *C. braueri* and *C. subniger*. Specifically, the validity of *Chiasmodon subniger* has been questioned because most postlarvae of *Chiasmodon* (specimens <35 mm standard length) have spinoid scales, which was the key diagnostic feature.

Similar families occurring in the area

None, no other mesopelagic or bathypelagic fishes have separate dorsal fins containing true spines and a rugose head with distinct sensory pores.

Key to the species of Chiasmodontidae occurring in the area

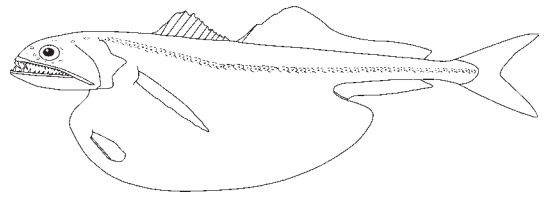
- 1a. Photophores present (Fig. 1) (*Pseudoscopelus*) → 2
- 1b. Photophores absent (Fig. 2) → 4



photophores continue on ventral surface

(modified from Goode & Bean, 1896)

Fig. 1 *Pseudoscopelus*

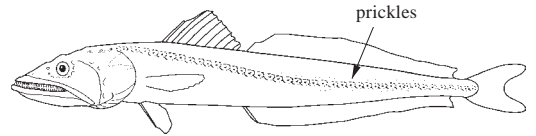


(modified from Goode & Bean, 1896)

Fig. 2 *Chiasmodon*

- 2a. Bony scutes along first dorsal-fin base; snout with striking reniform (kidney-shaped) concavity *Pseudoscopelus scutatus*
- 2b. Scutes absent; snout lacking distinct reniform concavity → 3
- 3a. Pectoral fin less than twice the length of the pelvic fin; longest ray in second dorsal fin about twice as long as longest dorsal spine *Pseudoscopelus altipinnis*
- 3b. Pectoral fin more than twice the length of the pelvic fin; longest ray in second dorsal fin less than 1.6 times as long as longest dorsal spine *Pseudoscopelus scriptus*

- 4a. One to many rows of prickles along sides of body above and below lateral line (Fig. 3); jaw teeth arranged in bands of up to 3 or 4 teeth wide (*Dysalotus*) → 5
- 4b. No large prickles along sides of body, jaw teeth arranged in bands of 1 or 2 rows (*Chiasmodon, Kali*) → 6



(modified from Norman, 1929)

Fig. 3 *Dysalotus*

- 5a. Single row of emergent prickles above and below lateral line (Fig. 4); vomerine teeth present *Dysalotus oligoscolus*
- 5b. Two or more (often many) rows of emergent prickles above and below lateral line (Fig. 5); vomerine teeth absent *Dysalotus alcocki*

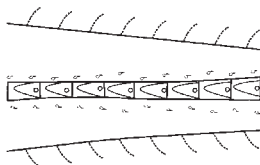


Fig. 4 *Dysalotus oligoscolus*

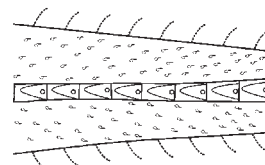
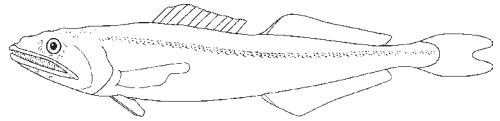


Fig. 5 *Dysalotus alcocki*

- 6a. One or more of the 3 anteriormost jaw teeth distinctly longer than the posterior teeth; gill tooth plates absent; 43 to 48 vertebrae (Fig. 2) *Chiasmodon* spp.
- 6b. None of the 3 anteriormost jaw teeth distinctly longer than the posterior teeth; toothplates (with 1 to 3 teeth per plate) present on first 3 gill arches; 33 to 41 vertebrae (*Kali*) → 7
- 7a. Segmented dorsal-fin rays 18 to 21 → 8
- 7b. Segmented dorsal-fin rays 22 to 26 → 9

- 8a. Nine or ten dorsal-fin spines; 3 or 4 teeth in inner row of upper jaw; 7 to 10 teeth in inner row of lower jaw ***Kali macrura***
- 8b. Eleven or 12 dorsal-fin spines; 9 to 13 teeth in inner row of upper jaw; 7 to 19 teeth in inner row of lower jaw ***Kali parri***
- 9a. Six to 12 teeth in outer row of upper and lower jaws ***Kali indica***
- 9b. Fourteen to 38 teeth in outer row of upper and lower jaws → **10**
- 10a. Ten or 11 pectoral-fin rays . . . ***Kali macrodon***
- 10b. Twelve or 13 pectoral-fin rays . . ***Kali kerberti***
(Fig. 6)



(modified from Johnson and Cohen, 1974)

Fig. 6 adult *Kali***List of species occurring in the area**

- Chiasmodon bolangeri* Osório, 1909. To 26 cm total length; meso- or bathypelagic Atlantic. Accepted synonym of *C. niger*.
- Chiasmodon braueri* Weber, 1913. To at least 5 cm total length; bathypelagic, known from the Eastern Central Atlantic and Banda Sea.
- Chiasmodon niger* Johnson, 1864. To 33 cm total length; meso- or bathypelagic worldwide.
- Chiasmodon subniger* Garman, 1899. To 40 cm total length; meso- or bathypelagic worldwide.
- Dysalotus alcocki* MacGilchrist, 1905. To 23 cm total length; meso- or bathypelagic worldwide.
- Dysalotus oligoscolus* Johnson and Cohen, 1974. To 33 cm total length; meso- or bathypelagic worldwide.
- Kali indica* Lloyd, 1909. To 27 cm total length; bathypelagic worldwide.
- Kali kerberti* (Weber, 1913). To 27 cm total length; bathypelagic worldwide.
- Kali macrodon* (Norman, 1929). To 27 cm total length; bathypelagic worldwide.
- Kali macrura* (Parr, 1933). To 27 cm total length; bathypelagic worldwide.
- Kali parri* Johnson and Cohen, 1974. To 23 cm total length; bathypelagic Atlantic.
- Pseudoscopelus altipinnis* Parr, 1933. To 20 cm total length; bathypelagic Atlantic and possibly Western Pacific.
- Pseudoscopelus scriptus* Lütken, 1892. To at least 14 cm total length; bathypelagic worldwide.
- Pseudoscopelus scutatus* Krefft, 1971. To at least 12 cm total length; bathypelagic Atlantic and Pacific.

References

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PINGUIPEDIDAE

Sandperches

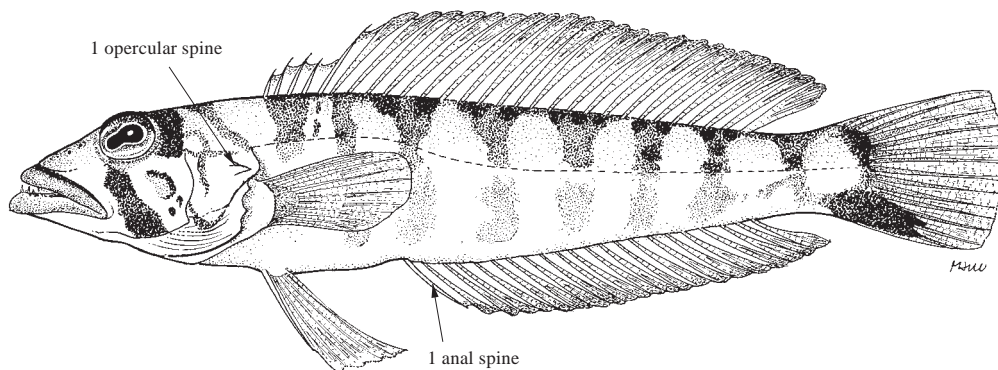
by W.L. Smith, The University of Kansas, Lawrence, KS, USA

A single species occurring in the area.

Parapercis atlantica (Vaillant, 1887)

Frequent synonyms / misidentifications: *Neopercis atlantica* Vaillant, 1887; *N. ledanoisi* Cadenat, 1937 / None.

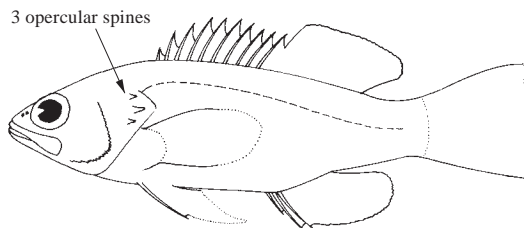
FAO names: En – Cape Verde sandperch.



Diagnostic characters: Elongate, slightly compressed, moderate sized (to at least 15 cm total length) perciform fishes. **Eyes small to moderate, protruding slightly above dorsal profile of head. Head pointed.** Mouth moderate, protractile and terminal; recurved canine teeth in an outer row at front of jaws; villiform teeth behind anterior canines; vomerine and palatine teeth present. **Single posteriorly-directed spine on opercle** and upper margin of subopercle; gill membranes united, free from isthmus except anteriorly; branchiostegal rays 6. **Continuous dorsal fin with 5 spines and 24 soft rays; anal fin with 1 spine and 20 soft rays;** caudal fin emarginated; 18 pectoral rays; pelvic fins with 1 spine and 5 soft rays, pelvics inserted below pectoral fins. Lateral line continuous with about 68 scales; scales absent on occiput, interorbital, snout, dorsal fin, and anal fin. **Colour:** light or white background with 8 to 9 dark bars on body; distinct bars behind and below eye.

Similar families occurring in the area

Most elongate perciform fishes in the area can be distinguished from pinguipedids by the presence of 2 distinct dorsal fins and/or the lack of anal spines. Pinguipedids have a single dorsal fin and 1 anal spine. Some serranid species are particularly similar and can be further distinguished by the presence of 3 opercular spines (1 in pinguipedids).



Serranidae

Habitat, biology, and fisheries: The single species from this area is known only from type specimens that were taken at depths between 180 and 200 m. Sandperches are typically found on sedimentary or rubble bottoms. Many species have been shown to be protogynous hermaphrodites, but little is known about the habitat and biology of *Parapercis atlantica*.

Remarks: Recently, *Parapercis roseoviridis* (Gilbert, 1905) was collected from the southeast Atlantic Ocean around Valdivia Bank and Vema Seamount. This is the second pinguipedid known from the Atlantic, and it is quite similar to *Parapercis atlantica*, including the conspicuous banding pattern. However, it can readily be distinguished from *P. atlantica* by its lower lateral-line scale count (< 64 scales) and its lack of the diagnostic bars below and directly behind the eye.

Distribution: Only known from the Cape Verde Islands.



References

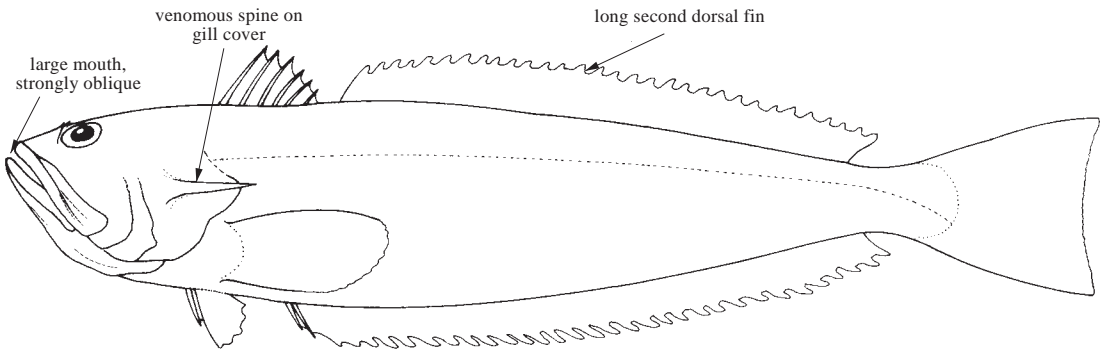
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TRACHINIDAE

Weeverfishes

by W.L. Smith, The University of Kansas, Lawrence, KS, USA (after Roux, 1981, 1990)

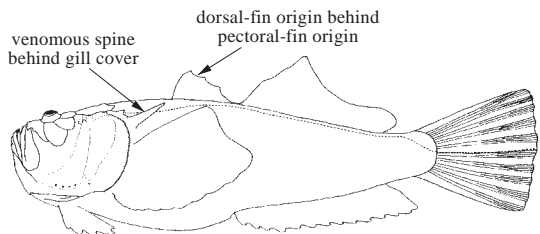
Diagnostic characters: Elongate, rather compressed, moderate-sized (to 45 cm total length) perciform fishes. **Eyes small (eye diameter contained 4 to 5 times in head length), approaching or protruding slightly above dorsal profile of head;** head small with a short snout; **mouth large, strongly oblique, extending to posterior margin of eye or just beyond when mouth is closed;** villiform teeth in jaws and on palate; vomerine teeth absent or present. **Dorsal fins separate, first fin short with 5 to 8 spines; second fin long with 0 spines and 21 to 32 segmented soft rays;** anal fin long with 1 or 2 spines and 24 to 34 segmented soft rays. Pectoral fins with 15 rays. Pelvic fins in advance of and smaller than pectoral fins. **Large, venomous spine on gill cover and venomous dorsal spines.** Vertebrae 34 to 43. Body covered with small, cycloid or ctenoid scales in oblique series; lateral line straight, occasionally ventrally displaced on caudal peduncle. Gas bladder absent. **Colour:** variable across species, ranging from off-white to greenish yellow to dark brown; most species have spots, oblique lines, or reticulations.



Habitat, biology, and fisheries: Littoral or benthic fishes inhabiting sandy or muddy bottoms on the continental shelf (occasionally collected deeper between 150 and 200 m). They are frequently encountered buried in the sediment with their eyes and venomous dorsal spines exposed. Envenomation can result in serious injuries or death, so exercise caution when handling fresh specimens. They feed primarily on small invertebrates and fishes. Reproduction often occurs during spring and summer (oviparous eggs and pelagic larvae). Weeverfishes are typically taken in trawls and with various forms of artisanal gear (e.g. traps, tines, beach seines). They are not of great commercial importance, but they are consumed in many localities and marketed fresh.

Similar families occurring in the area

Uranoscopidae: large, dorsally flattened head (smaller, rounder head in Trachinidae); strong venomous spine behind gill cover; dorsal-fin origin behind pectoral origin; vertebrae 24 to 26.



Uranoscopidae

Key to the species of Trachinidae occurring in the area

- 1a. Segmented dorsal-fin rays extending beyond dorsal-fin membrane and approximately twice the length of segmented anal-fin rays (Fig. 1) → 2
- 1b. Segmented dorsal-fin rays approximately equal in length when compared to segmented anal-fin rays and not extending significantly beyond dorsal-fin membrane (Fig. 2) → 3

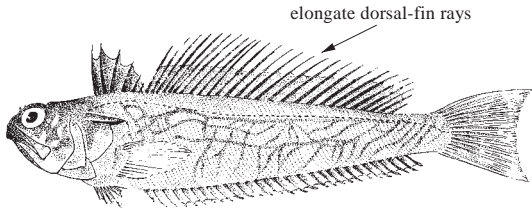


Fig. 1 *Trachinus collignoni*

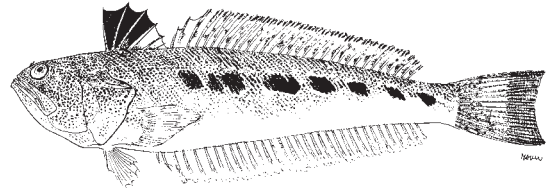


Fig. 2 *Trachinus araneus*

- 2a. Seventy-five or more scales in lateral-line along body; body with spots on sides (often forming speckled bands), but never forming an irregular network ***Trachinus pellegrini***
- 2b. Seventy-four or fewer scales in lateral-line along body; body with dark lines forming an irregular network on body (Fig. 1) ***Trachinus collignoni***
- 3a. Eleven or more gill rakers on lower limb of first gill arch → 4
- 3b. Six to 10 gill rakers on lower limb of first gill arch → 6

- 4a. No spines on anterodorsal margin of orbit (Fig. 3), 13 or fewer (usually 12) gill rakers on lower limb of first gill arch ***Echiichthys vipera***
- 4b. Two spines on anterodorsal margin of orbit (Fig. 4); 14 or more gill rakers on lower limb of first gill arch → 5

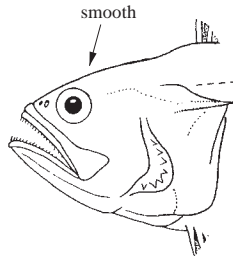


Fig. 3 *Echiichthys vipera*

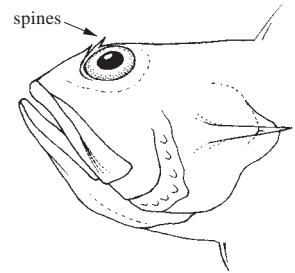


Fig. 4 *Trachinus draco*

- 5a. Blue or black blotch (at least the diameter of the eye) above and behind pectoral fin; blue or dark-grey lines on body, wavy anteriorly, nearly horizontal in posterior third of body (Fig. 5), usually 14 gill rakers on lower limb of first gill arch ***Trachinus armatus***
- 5b. No large blotch above and behind pectoral fin; no dark lines directed downward and backward (Fig. 6), usually 15 gill rakers on lower limb of first gill arch ***Trachinus draco***

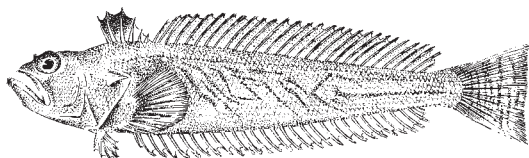
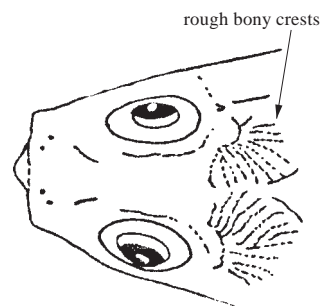


Fig. 5 *Trachinus armatus*












Fig. 6 *Trachinus draco*

- 6a. Seven or fewer gill rakers on lower limb of first gill arch; rough bony crests on head posterior to eyes (Fig. 7) ***Trachinus radiatus***
- 6b. Ten gill rakers on lower limb of first gill arch; no radiating bony crests on head → 7
- 7a. Twelve to 14 nearly parallel oblique lines on body ***Trachinus lineolatus***
- 7b. One to 3 longitudinal rows of spots, not lines, on body (Fig. 2) ***Trachinus araneus***

Fig. 7 *Trachinus radiatus*

List of species occurring in the area

The symbol  is given when species accounts are included.

-  *Echiichthys vipera* (Cuvier, 1829).
-  *Trachinus araneus* Cuvier, 1829.
-  *Trachinus armatus* Bleeker, 1861.
-  *Trachinus collignoni* Roux, 1957.
-  *Trachinus draco* Linnaeus, 1758 .
-  *Trachinus lineolatus* Fischer, 1885.
-  *Trachinus pellegrini* Cadenat, 1937.
-  *Trachinus radiatus* Cuvier, 1829.

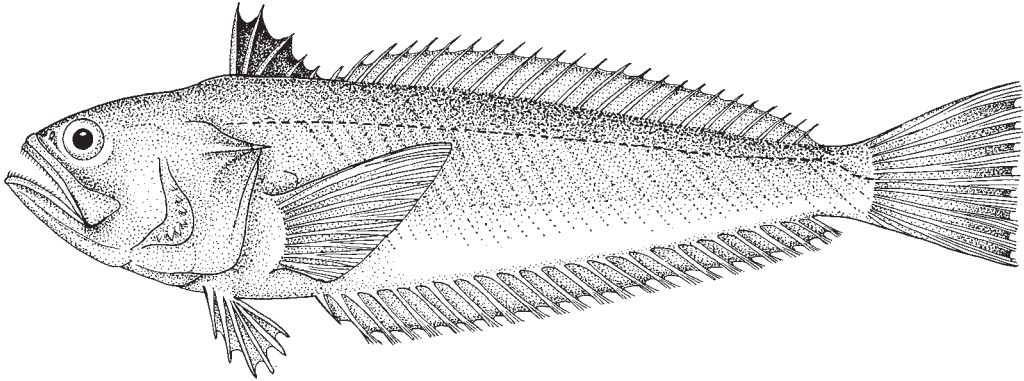
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***Echiichthys vipera* (Cuvier, 1829)**

Frequent synonyms / misidentifications: *Trachinus vipera* Cuvier, 1829; *T. horridus* Gronow, 1854 / None.

FAO names: **En** – Lesser weever; **Fr** – Petite vive; **Sp** – Salvariego.



Diagnostic characters: Body elongate and compressed, its depth greater than one-fifth of total length. Eyes small (eye diameter contained 4 to 5 times in head length); mouth large, strongly oblique, the maxilla extending just beyond posterior margin of orbit when mouth is closed; villiform depressible teeth arranged in bands in both jaws; vomerine and palatine teeth present. Twelve or 13 gill rakers on lower limb of first gill arch. Two dorsal fins, the first fin short, with 5 to 8 spines, the second fin long, with 21 to 24 segmented soft rays; anal fin with 1 spine and **24 to 26 segmented soft rays**. Scales small, approximately 60 in lateral line, absent on cheek. Strong venomous spine on opercle. **Anterodorsal spines on head in adults lacking.** **Colour:** yellowish or brownish above, white below, **numerous small darker spots following the scale rows**. First dorsal fin almost entirely black; caudal fin edged with black.

Size: Maximum 15 cm; common to 10 cm.

Habitat, biology, and fisheries: Inhabits sandy bottoms in littoral and shallow coastal waters, often burrowing in the substrate, moving into somewhat greater depths during winter. The dorsal-fin spines and the spine on the gill cover are venomous. Feeds mainly on small invertebrates (crustaceans) and small fishes. Frequently found in markets, but not of great commercial importance. Separate statistics are not reported for this species. Caught mainly with bottom trawls and various types of artisanal gear (e.g. traps, lines, beach seines).

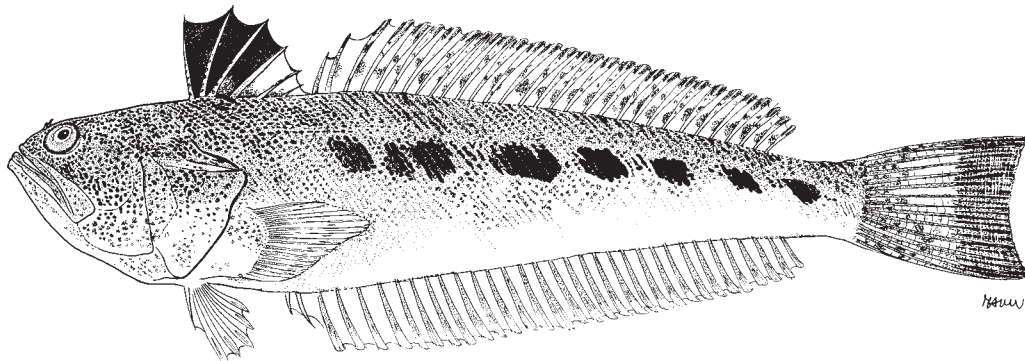
Distribution: Within the area, apparently restricted to the coast of Morocco, the Canary Islands, and Madeira. Northward extending into the Mediterranean and along the Atlantic coast of Europe up to Norway.



***Trachinus araneus* Cuvier, 1829**

Frequent synonyms / misidentifications: None / *Trachinus radiatus*.

FAO names: En – Spotted weever; Fr – Vive araignée; Sp – Araña.



Diagnostic characters: Body elongate and compressed, its depth contained approximately 4.3 times in standard length. Eyes small (eye diameter contained 4 to 5 times in head length), near dorsal profile of head; **width of interorbital space about equal to eye diameter**; snout short (4.3 to 5.5 times in postorbital length); mouth large, oblique, and not protrusible, the maxilla extending slightly beyond posterior margin of orbit when mouth is closed; villiform depressible teeth in both jaws; vomerine and palatine teeth present. **Ten gill rakers on lower limb of first gill arch**. Two dorsal fins, the first short, with 6 or 7 spines, the second long, with 26 to 29 segmented soft rays; anal fin with 2 spines and 29 to 31 segmented soft rays nearly equal in length to dorsal soft rays. Scales small, 79 or 80 in lateral line, cheek scaled. A strong venomous spine on opercle; spines also present in preorbital region and on preopercle. **Colour:** back and sides light yellowish grey, **usually with 1 to 3 longitudinal rows of more or less rounded to quadrangular dark spots**.

Size: Maximum 45 cm; common to 25 cm.

Habitat, biology, and fisheries: Inhabits shallow waters from the coastline to about 100 m depth, burrowing in the sand. The first dorsal-fin spines and the spine on the gill cover are venomous. Feeds mainly on small invertebrates (crustaceans) and small fishes. Taken incidentally throughout its range, but apparently not abundant. Separate statistics are not reported for this species. Caught with bottom trawls and various types of artisanal gear (e.g. traps, lines) and marketed fresh.

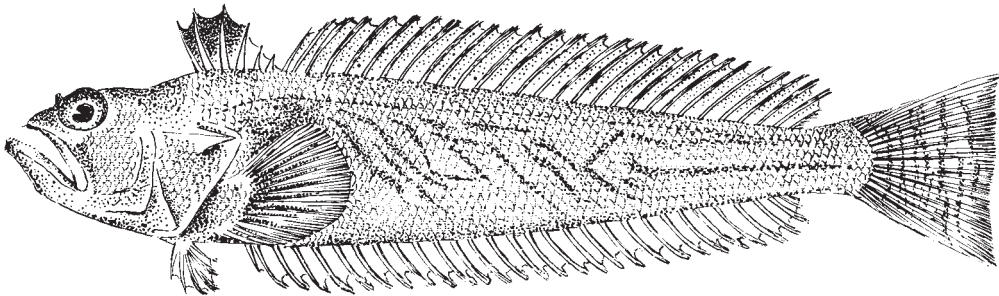
Distribution: Within the area, from Morocco to southern Angola; northward extending into the Mediterranean and along the Atlantic coast of Europe to southern Portugal.



***Trachinus armatus* Bleeker, 1861**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Guinean weever; Fr – Vive guinéenne; Sp – Araña de Guinea.



Diagnostic characters: Body elongate and compressed, its depth contained 4.4 to 4.7 times in standard length. Eyes of moderate size (eye diameter contained 3.7 to 4.2 times in head length), near dorsal profile of head; snout very short (3.0 to 3.4 times in postorbital length); mouth large, oblique, and not protrusible, the maxilla extending just beyond posterior margin of orbit when mouth is closed; villiform, depressible teeth in both jaws; vomerine and palatine teeth present. **Usually 14 gill rakers on lower limb of first gill arch.** Two dorsal fins, the first short, with 6 spines, the second long, with 29 or 30 segmented soft rays; anal fin with 2 spines and 29 or 30 segmented soft rays, nearly equal in length to dorsal soft rays. Scales small, 75 to 77 in lateral line, cheek scaled. A strong venomous spine on opercle; spines also present in preorbital region, snout, and on preopercle. **Colour:** light brown, somewhat darker on back; **body with a characteristic blue or black blotch (as large or larger than eye diameter) above and behind pectoral fin and dark oblique lines, wavy in front, and horizontal posteriorly;** dorsal fin mostly dark grey or black.

Size: Maximum 35 cm; common to 25 cm.

Habitat, biology, and fisheries: Inhabits shallow waters in seagrass beds or burrowing in sand or mud from about 15 to 150 m; usually found in less than 50 m. The first dorsal-fin spines and the spine on the gill cover are venomous. Feeds chiefly on small invertebrates (crustaceans) and small fishes. Taken by trawl and artisanal fisheries throughout its range, but it is apparently not abundant. Separate statistics are not reported for this species. Caught with bottom trawls and various types of artisanal gear (e.g. trammel nets, lines, traps) and marketed fresh.

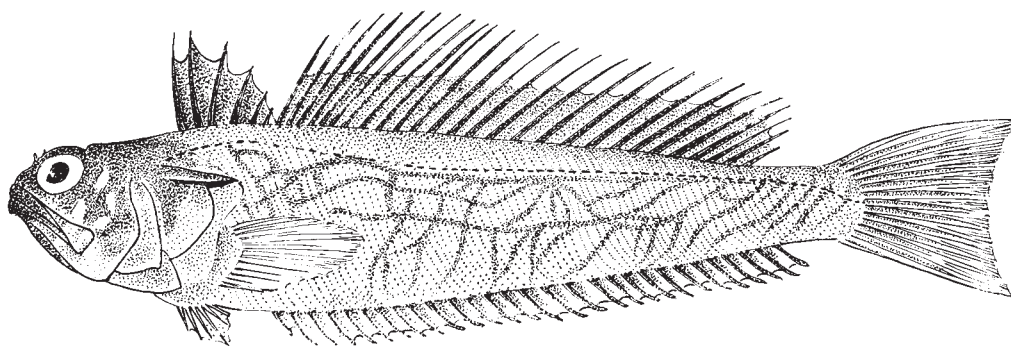
Distribution: From Mauritania to Namibia and the Cape Verde Islands.



***Trachinus collignoni* Roux, 1957**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Sailfin weever; Fr – Vive peigne; Sp – Araña aletona.



Diagnostic characters: Body elongate and strongly compressed. Eyes of moderate size (eye diameter contained about 4 times in head length), near dorsal profile of head; mouth large, oblique, and not protrusible; snout short; villiform, depressible teeth arranged in bands in both jaws; vomerine and palatine teeth present. Thirteen gill rakers on lower limb of first gill arch. Two dorsal fins, the first short, with 6 spines, the second long, with 27 long, segmented soft rays; rays extending beyond dorsal-fin membrane and approximately twice the length of anal-fin rays; anal fin **with 27 to 29 segmented soft rays**. Scales small, 73 in lateral line. Strong venomous spine on opercle; spines present in preorbital region. **Colour:** light brown with an irregular network of dark lines on sides; no black spot on first dorsal fin.

Size: Maximum to at least 20 cm; common to 15 cm.

Habitat, biology, and fisheries: Inhabits littoral and shallow coastal waters on soft bottoms. The first dorsal-fin spines and the spine on the gill cover are venomous. Taken by trawl, but apparently not abundant. Separate statistics are not reported for this species.

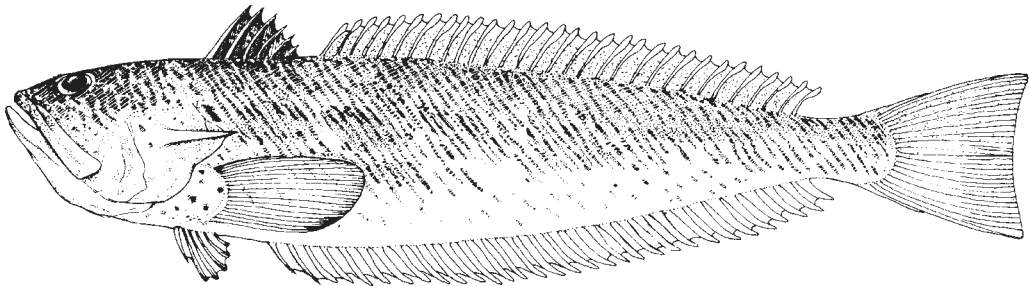
Distribution: Known from Senegal to central Angola and the Cape Verde Islands.



Trachinus draco Linnaeus, 1758

Frequent synonyms / misidentifications: *Trachinus lineatus* Bloch and Schneider, 1801 / None.

FAO names: En – Greater weever; Fr – Grande vive; Sp – Escorpión.



Diagnostic characters: Body elongate and compressed, **its depth less than one-fifth of total length**. Eyes small, near dorsal profile of head; **width of interorbital space about equal to eye diameter**; mouth large, oblique, and not protrusible, the maxilla extending beyond posterior margin of orbit when mouth is closed; villiform, depressible teeth arranged in bands in both jaws; vomerine and palatine teeth present; usually 15 gill rakers on lower limb of first gill arch. Two dorsal fins, the first short, with 5 to 7 spines, the second long, with 29 to 32 segmented soft rays; **anal fin with 2 spines and 27 to 34 segmented soft rays** about equal in length to dorsal soft rays. Scales small, 80 to 83 in lateral line, cheek scaled. Strong venomous spine on opercle; anterodorsal spines on heads present. **Colour: dorsally green with brown or green scales arranged in oblique rows forming numerous dark lines directed downward and backward**; lateral and ventral surfaces light yellow.

Size: Maximum 45 cm; common to 25 cm.

Habitat, biology, and fisheries: Inhabits muddy bottoms, often burrowing in the substrate, from the coastline to about 200 m depth; most common between 20 and 50 m, but migrating into deeper waters (to 100 m) during winter. The first dorsal-fin spines and the spine on the gill cover are venomous. Feeds chiefly on small invertebrates (crustaceans) and small fishes. Regularly found in local markets in Morocco, Canary Islands, and Madeira. Separate statistics are not reported for this species. Caught mainly with bottom trawls and artisanal gear (e.g. traps, lines) and marketed fresh.

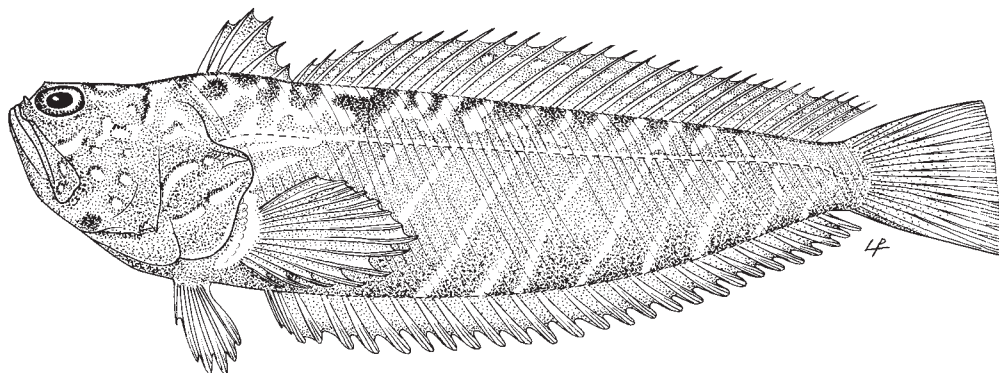
Distribution: Within the area, known from Morocco to Mauritania, the Canary Islands, and Madeira. Northward extending into the Mediterranean and Black Seas up the Atlantic coast to Norway.



***Trachinus lineolatus* Fischer, 1885**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Striped weever; Fr – Vive rayée; Sp – Escorpión rayado.



Diagnostic characters: Body elongate and compressed, its depth contained 3.7 to 3.8 times in standard length. Eyes small, (eye diameter contained 4.9 to 5.0 times in head length), near dorsal profile of head; mouth large, oblique, and not protrusible; villiform teeth in jaws as well as on palate. **Ten gill rakers on lower limb of first gill arch.** Two dorsal fins, the first short, with 6 spines, **the second long, with 26 segmented soft rays;** anal fin with 2 spines and 27 or 28 segmented soft rays, about equal in length to dorsal soft rays. Strong venomous spine on opercle; single spines present in preorbital region and on snout. Scales small, 61 or 62 in lateral line. **Colour: light brown, with 12 to 14 yellow or orange oblique lines running forward and downward on body;** interradiol membrane between first 3 spines of dorsal fin black.

Size: Maximum 15 cm; common to 10 cm.

Habitat, biology, and fisheries: Inhabits soft bottoms in littoral areas and shallow coastal waters. The first dorsal-fin spines and the spine on the gill cover are venomous. Taken by trawl, but apparently not abundant. Separate statistics are not reported for this species.

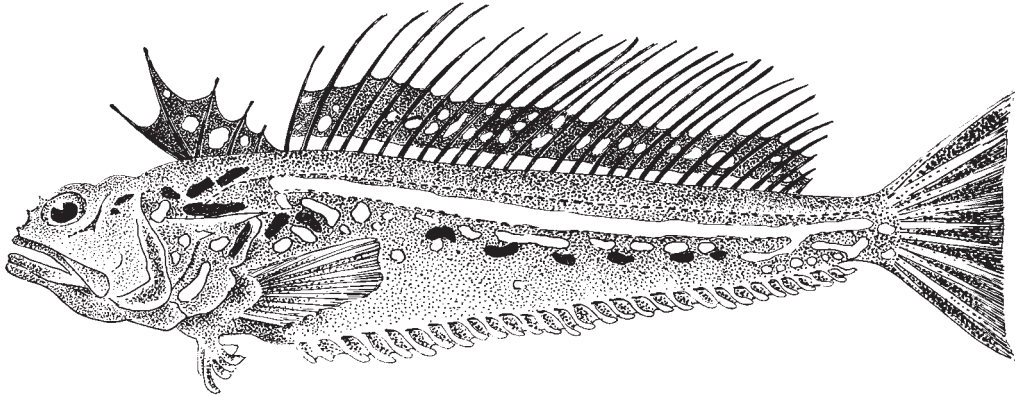
Distribution: Tropical coast of West Africa recorded from Guinea, Sierra Leone, São Tomé, and Gabon.



Trachinus pellegrini Cadenat, 1937

Frequent synonyms / misidentifications: None / None.

FAO names: En – Cape Verde weever; Fr – Vive du Cap Vert; Sp – Araña de Cabo Verde.



Diagnostic characters: Body elongate and strongly compressed. Eyes of moderate size (eye diameter contained 3.4 to 3.7 times in head length), near dorsal profile of head; snout short (about 5 times in postorbital length); mouth large, oblique, and not protrusible; villiform, depressible teeth arranged in bands in both jaws; vomerine and palatine teeth present. Twelve gill rakers and 2 tubercles on lower limb of first gill arch. Two dorsal fins, the first short, with 6 spines, **the second long, with 27 or 28 long, segmented soft rays; rays extending beyond dorsal-fin membrane and approximately twice the length of segmented anal-fin rays;** anal fin with 29 or 30 segmented soft rays. Scales small, 82 in lateral line. Upper margin of opercle with a strong crest ending in a venomous spine; spines are present in preorbital region along with a blunt point at angle of preopercle. **Colour:** dorsal surface blue or grey anteriorly, becoming darker posteriorly; sides violet, **yellow band running from opercular spine backward to caudal fin parallel to lateral line; a series of yellow spots and blotches below the yellow band, forming an irregular line;** brown spots on head and below the yellow band. First and second dorsal fins bluish grey with yellow round spots on membrane, but no black spot on first dorsal; caudal fin violet.

Size: Maximum 20 cm; common to 15 cm.

Habitat, biology, and fisheries: Inhabits rock and sand bottoms in littoral areas and coastal waters to 150 m depth. The first dorsal-fin spines and the spine on the gill cover are venomous. Feeds chiefly on small invertebrates (crustaceans) and occasionally small fishes. Taken occasionally by trawl and artisanal fisheries, but reported to be common in certain areas. Separate statistics are not reported for this species. Caught with bottom trawls and marketed fresh.

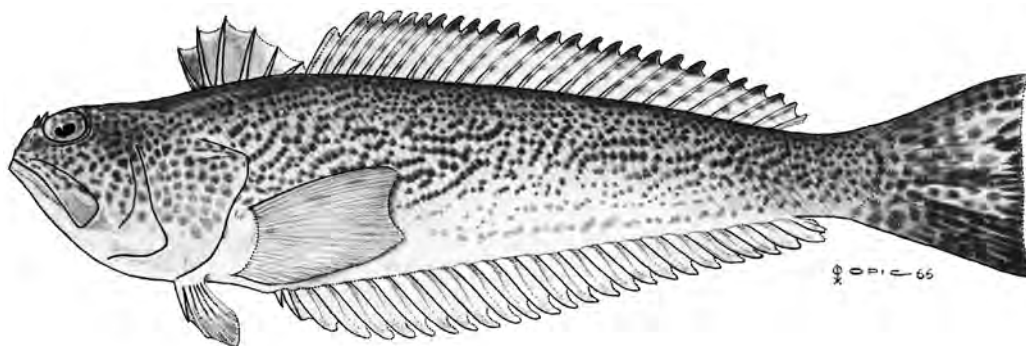
Distribution: Canary and Cape Verde Islands as well as tropical coast of West Africa, from Senegal to Cameroon.



Trachinus radiatus Cuvier, 1829

Frequent synonyms / misidentifications: *Pseudotrachinus pardalis* Bleeker, 1861; *Trachinus vainus* Rafinesque, 1810 / *Trachinus araneus*.

FAO names: En – Starry weever; Fr – Vive à tête rayonnée; Sp – Víbora.



Diagnostic characters: Body elongate and compressed throughout its length, its depth contained about 4 times in standard length. Eyes small (eye diameter contained 5 times in head length); width of interorbital space about half the eye diameter; mouth large, strongly oblique, and not protrusible, the maxilla extending beyond posterior margin of orbit, when mouth is closed; snout short, about 3 times in postorbital length; villiform depressible teeth arranged in bands in both jaws; vomerine and palatine teeth present. **Six or 7 gill rakers on lower limb of first gill arch.** Two dorsal fins, the first short, with 6 or 7 spines, the second long, with 24 to 29 (usually 25) segmented soft rays; anal fin with 2 spines and 25 to 29 segmented soft rays about equal in length to dorsal soft rays. Scales small, 69 in lateral line (excluding those on caudal-fin base), cheek scaled. Strong venomous spine on opercle; spines present in preorbital region; **preopercular spine absent. Five groups of pronounced radiating bony crests present on top of head behind eyes.** **Colour:** a whitish background including numerous brown spots and vermiculations on head and body; first dorsal fin mostly black; soft dorsal and anal fins with grey spots.

Size: Maximum 45 cm; common to 25 cm.

Habitat, biology, and fisheries: Inhabits sand and mud bottoms of the continental shelf between the coastline and 150 m depth, burying in the substrate. The first dorsal-fin spines and the spine on the gill cover are venomous. Feeds chiefly on small invertebrates (crustaceans) and small fishes. Taken by trawl and artisanal fisheries throughout its range. Separate statistics are not reported for this species. Caught chiefly with bottom trawls and marketed fresh.

Distribution: Within the area, from Gibraltar southward to Angola. Northward extending into the Mediterranean and along the Atlantic coast to Portugal.

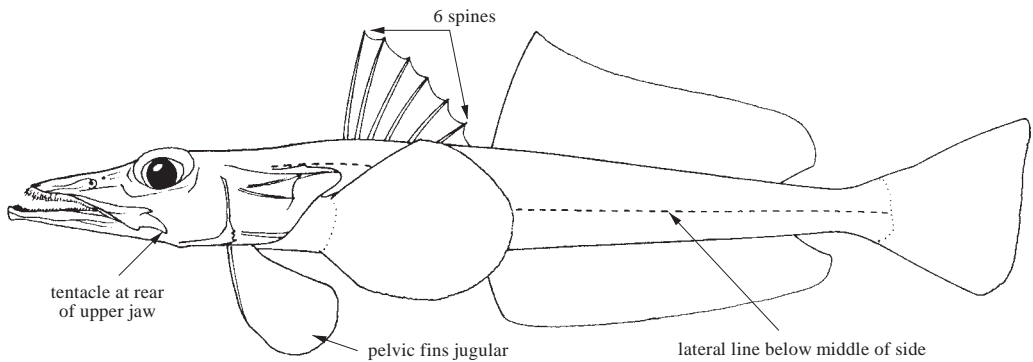


PERCOPHIDAE

Duckbills

by B.A. Thompson (+), Louisiana State University, Baton Rouge, LA, USA

Diagnostic characters (E. Atlantic forms only): Medium-sized (to 25 cm) trachinoid fishes; body elongate; **head and anterior body flattened; eyes large (no dorsal iris flap), located dorsally on head, with interorbit very narrow; mouth large with lower jaw extending beyond upper, often with anterior lower jaw teeth exposed. Maxillary tentacle present;** anterior-projecting maxillary spines absent. Subocular canal short, with only 3 pores. Two dorsal fins, the first with 6 spines, the second with 14 to 17 rays; anal fin without spines, with 17 to 19 segmented rays; pectoral fin long and wide with 25 to 28 rays; pelvic fin jugular with 1 spine and five segmented rays; interpelvic space wide; caudal fin with 10 or 11 branched rays. **Single post-temporal spine located at beginning of lateral line; lateral line arched anteriorly then descends to lower side of body; anterior 4 or 5 lateral-line scales keeled;** lateral line with 45 to 61 pored scales; body and head with peripheral ctenoid scales, but some cycloid scales on belly. Twenty-eight to 30 vertebrae. **Colour:** body sometimes blotched; black fleckings and blotches on some fins; caudal fin may possess an ocellus (young and females most often).

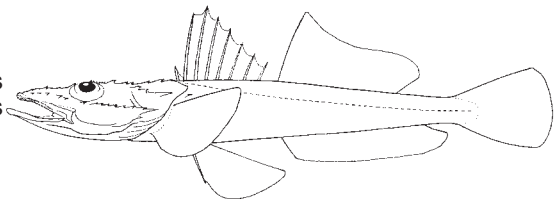


Habitat, biology, and fisheries: Benthic, found on continental shelf from depths of 100 to 500 m. Predatory, feeding on small fishes and shrimp. Species with separate sexes; with sexual dimorphism in body and fin pigment patterns and genital papilla size (males large, females small). Little is known about reproduction or general biology. No fishery.

Remarks: Three subfamilies: Percophinae (1 genus, 1 species), Bembropinae (2 genera, 25 species), and Hemerocoetinae (8 genera, about 23 species).

Similar families occurring in the area

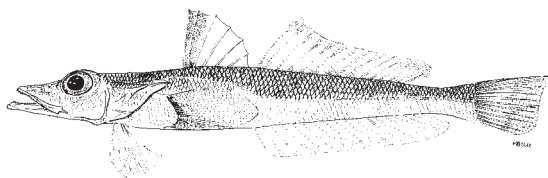
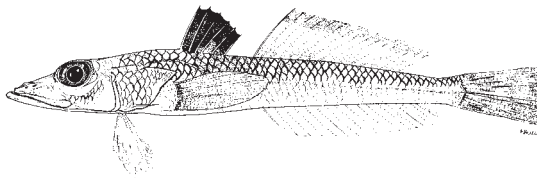
Platycephalidae: numerous spines and bony ridges on head and 8 or 9 dorsal-fin spines (6 dorsal spines in Percophidae).



Platycephalidae


Key to species of Percophidae occurring in the area

- 1a. Fifty-four to 61 lateral-line scales, usually 15 dorsal and 18 anal rays, dark pigment usually only occurring on first 2 membranes of spinous dorsal fin (Fig. 1) . . . ***Bembrops cadenati***
- 1b. Forty-five to 52 lateral-line scales, usually 16 dorsal and 17 or 18 anal rays, dark shiny black pigment occurring on all membranes of spinous dorsal fin (Fig. 2) ***Bembrops greyi***

Fig. 1 *Bembrops cadenati*Fig. 2 *Bembrops greyi***List of species occurring in the area**

The symbol  is given when species accounts are included.

 *Bembrops cadenati* Das and Nelson, 1996.

 *Bembrops greyi* Poll, 1959.

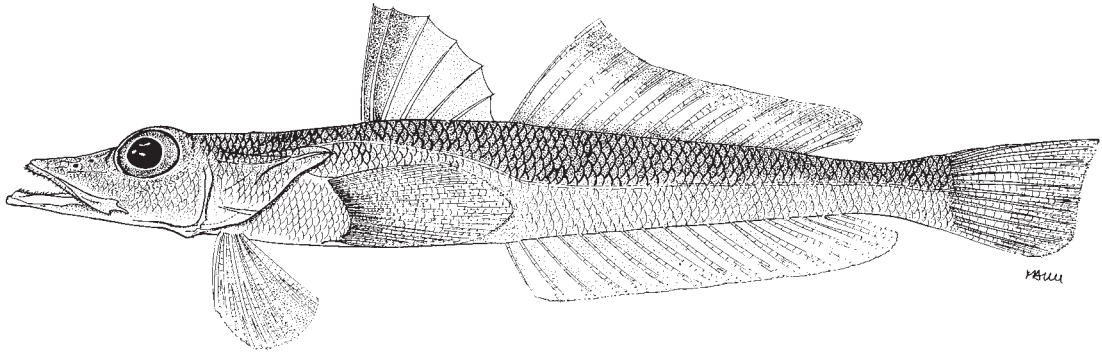
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- Poll, M.** 1959. Poissons IV. Teleosteens Acanthopterygiens (Deuxième Partie). *Expédition Océanographique Belge dans les Eaux Côtières Africaines de l'Atlantique Sud. (1948-1949)* 4(3B): 1–417.
- Thompson, B.A. & Suttkus, R.D.** 1998. A review of western north Atlantic species of *Bembrops*, with descriptions of three new species, and additional comments on two eastern Atlantic species (Pisces: Percophidae). *Proceedings of the Biological Society of Washington*, 111: 954–985.

Bembrops cadenati Das and Nelson, 1996

Frequent synonyms / misidentifications: None / *Bembrops heterurus* (Ribeiro, 1903).

FAO names: **En** – Robust duckbill; **Fr** – Platête commun; **Sp** – Pez palo común.



Diagnostic characters: Body elongate with head and anterior body dorsoventrally flattened. Eyes large and located dorsally on head. Mouth large with lower jaw extending beyond upper, anterior lower teeth exposed. Maxillary tentacle extending from rear of upper jaw. Spinous dorsal fin with 6 spines; second dorsal fin with 14 or 15 soft rays; anal fin with 18 or 19 (usually 18) soft rays; pectoral fin with 26 or 27 soft rays. Pored lateral-line scales 54 to 61. Snout/orbit ratio 1.1 to 1.4. Spinous dorsal fin with dark pigment (not shiny black) only in first 2 membranes. Total gill rakers 18 to 20. Vertebrae usually 28. **Colour:** dorsal part of body dark tan, lighter tan below; upper body scales with dark edges. Spinous dorsal fin with dark pigment in first or first 2 membranes, other membranes only slightly dusky or clear; second dorsal with 2 bands running length of fin – 1 distal, 1 basal often interrupted with clear areas; anal fin usually clear, some males with slight duskiness; caudal fin with no distinct pattern, slight dark wash in larger adults; dark pigment along rays of pectoral fin, darker at base of centre rays; pelvic fin dusky to dark on posterior half of fin.

Size: Maximum size 24 cm total length; common to about 20 cm total length.

Habitat, biology, and fisheries: Primarily on soft mud bottoms of continental shelf from 64 to 494 m depth, most records between 150 and 300 m, some indications juveniles at shallowest depths. Occasionally taken together with *B. greyi*. Feeds on small shrimp and fishes.

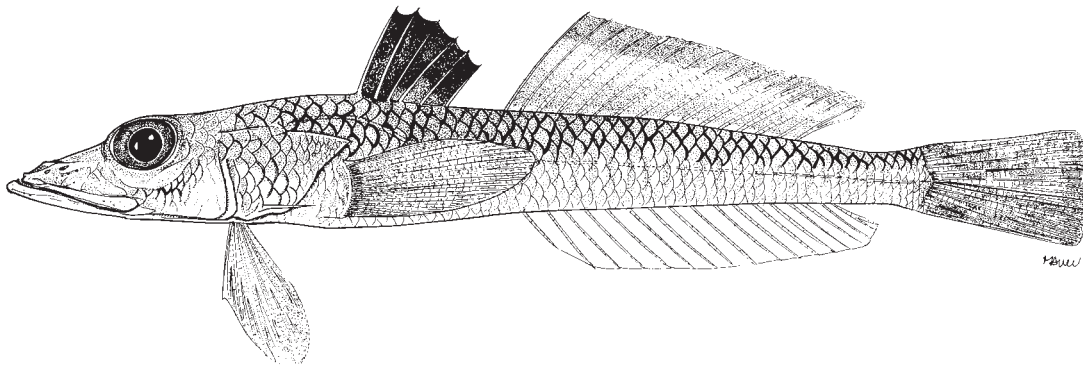
Distribution: Eastern Atlantic Ocean off tropical Africa; Guinea and Sierra Leone; eastward along Liberia, Côte d'Ivoire and Ghana to Lagos and Nigeria; southward to Congo and northern Angola.



***Bembrops greyi* Poll, 1959**

Frequent synonyms / misidentifications: *Bembrops grayae* Poll, 1959 / None.

FAO Names: En – Roundtail duckbill; Fr – Platête de Guinée; Sp – Pez palo guineano.



Diagnostic characters: Body elongate with **head and anterior body dorsoventrally flattened**. Eyes large and located dorsally on head. **Mouth large with lower jaw extending beyond upper, anterior lower jaw teeth exposed. Maxillary tentacle extending from rear of upper jaw.** Spinous dorsal fin with 6 spines; second dorsal fin with 15 or 16 soft rays, anal fin with 17 or 18 soft rays; pectoral fin with 25 to 27 soft rays. **Pored lateral-line scales 45 to 52. Snout/orbit ratio 0.8 to 1.1. Spinous dorsal fin with nearly all membranes shiny black, occasionally with small clear 'windows'.** Total gill rakers 16 to 18. Vertebrae usually 30. **Colour:** dorsal body scales with distinctive black edging. Some yellow on body and fins fading in preservative (these areas are then clear in fins). Spinous dorsal fin nearly all black, but with some clear membrane areas, more clear areas in males; second dorsal with 2 bands running length of fin – 1 basal, 1 distal; anal fin clear in females, sometimes dusky in males; female with strong ocellus at upper base of caudal fin, males lack ocellus, some diffuse pigment at base; 2 dark bands and mottling in posterior half of caudal fin; dark pigment along rays of pectoral fin, fin also has dark crescent at fin base on medial side of fin; pelvic fin with posterior half of fin dusky, anterior half of fin clear.

Size: Maximum size 26 cm total length; common to about 20 cm total length.

Habitat, biology, and fisheries: Primarily on soft mud bottoms of continental shelf from 100 to 420 m depth, most records between 300 and 400 m, juveniles at shallowest depths. Feeds on small fishes and crustaceans, mostly shrimp.

Distribution: Eastern Atlantic Ocean off tropical Africa; Guinea and Sierra Leone, eastward along Liberia, Côte d'Ivoire, and Ghana to Lagos and Nigeria; southward to Congo and northern Angola.

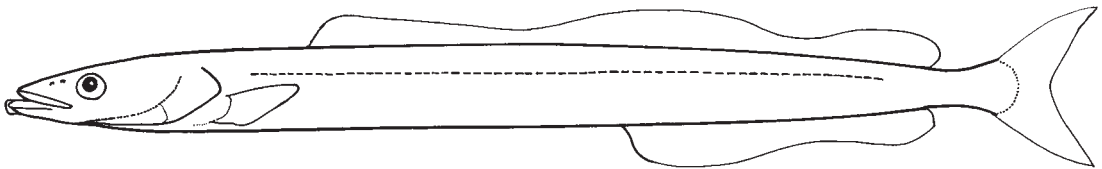


AMMODYTIDAE

Sandlances

by M.S. Nizinski, National Marine Fisheries Service, National Museum of Natural History, Washington, DC, USA

Diagnostic characters: Small fishes (to about 20 cm). Body elongate, subcylindrical, **without scales, except posterior third of body with some small, inconspicuous cycloid scales loosely arranged alongside and posterior to lateral-line canals** and also present ventrolaterally. **Ventrolateral skin-folds extending from pectoral-fin base to beyond anal fin.** Mouth large, terminal; **lower jaw conspicuously protruding beyond upper**; teeth absent. Dorsal-fin origin posterior to vertical through pectoral-fin tip, dorsal fin elongate, continuous, with its dorsal margin undulated, with 49 to 59 rays; anal-fin origin posterior to vertical through midpoint of dorsal fin, anal fin about one-half as long as dorsal fin, with 24 to 31 rays; caudal fin shallowly forked, separate from dorsal and anal fins; pectoral fins placed ventrolaterally anteriorly, with 12 to 15 rays; pelvic fins absent. No oblique lateral plicae. **Lateral line branched, with pores at ends of branches, twice as many pores below lateral line as above lateral line** (45 to 47 pores above lateral line in *Gymnammodytes capensis*). Swimbladder absent. **Colour:** dorsum bluish, golden brown or greenish, ventrum white and sides silvery.



Habitat, biology, and fisheries: Coastal, restricted to shallower sand, shell and fine-gravel bottoms of the continental shelf, particularly in offshore habitats. Often abundant, schooling, but able to burrow rapidly head first into the sediment when disturbed. Adults and juveniles alternate between active feeding in the water column by day, and inactivity within the substratum by night; may also enter the substratum during the daytime; northern species inactive during winter months. Activity cycles of species in the area not well known. Feed on zooplankton. Assumed that all species lay demersal, adhesive eggs that attach to sand grains. Larvae and postlarvae are planktonic and in some areas may dominate the ichthyoplankton particularly during peak spawning seasons (winter for *Gymnammodytes cicerelus* in the Mediterranean Sea). Spawning seasons not well known for species in the area. Separate statistics are not reported for this family; no landings reported from the area. Used for bait and food on a small scale in some areas, but the major fishery for northern species is for fishmeal and fish oil when captured in quantities. Important prey for piscivorous fishes, birds and mammals.

Remarks: The specific status of *G. capensis* is uncertain. No diagnostic morphological characters have been identified to accurately distinguish individual specimens of *G. cicerelus* and *G. capensis*. Identification of members of these taxa has been based primarily on the known geographic distributions of the named populations. Until a thorough systematic revision is completed for this genus, species names applied to regional populations of sandlances will continue to be used.

Similar families occurring in the area

Not likely confused with any other families in the area.

List of species occurring in the area

Gymnammodytes capensis (Barnard, 1927). To 17 cm. Angola to Delagao Bay, Mozambique.

Gymnammodytes cicerelus (Rafinesque, 1810). To 15 cm. In area from southern Morocco, Mauritania, Senegal, Angola; also Portugal, the Azores, Mediterranean, Adriatic, Aegean and Black seas.

References

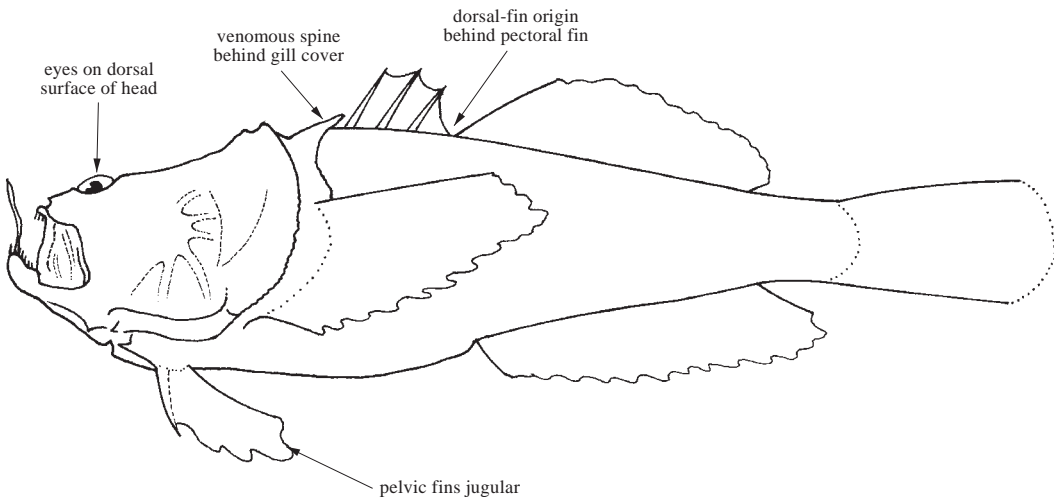
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URANOSCOPIDAE

Stargazers

by W.L. Smith, The University of Kansas, Lawrence, KS, USA (after Roux, 1981, 1990)

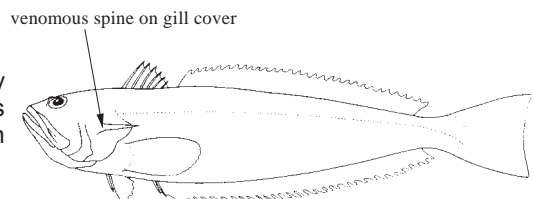
Diagnostic characters: Somewhat elongate, moderate sized (to 50 cm total length) perciform fishes with a subconical body. **Head broad, deep, cuboid, and flattened dorsally;** dorsal and lateral surfaces of head almost entirely encased in sculptured bones; **eyes small and on dorsal surface of head**, not protruding; mouth large, strongly oblique to vertical; lips fringed; small villiform teeth in jaws and on palate; premaxilla protrusible; retractile tentacle often inside of mouth, near symphysis of lower jaw. Gill openings large, gill membranes nearly separate and free from isthmus. Dorsal fins separate, **first fin (origin posterior to pectoral fin) short with 3 or 4 spines;** second fin long with 0 spines and 13 to 15 segmented soft rays; anal fin long with 0 or 1 spine and 12 to 14 segmented soft rays; pectoral fins broad based; **pelvic fins jugular with 1 spine and 5 segmented soft rays;** caudal fin truncate to rounded. Scales, when present, small and arranged in regular oblique rows; ventral surface naked. **Venomous cleithral spine behind opercle and above pectoral fin.** **Colour:** usually grey or reddish brown dorsally and laterally; whitish or yellowish ventrally; body often with light blotches, spots, or speckling.



Habitat, biology, and fisheries: Stargazers occur in littoral areas and waters of the continental shelf and upper slope to depths of 400 m. All species are bottom-dwelling, usually in sandy or muddy sediments leaving only their eyes exposed. They are carnivorous ambush predators. Some species are slightly electric, but they are not thought to be strong enough to be harmful to humans; the sharp humeral spine is venomous. Although stargazers are not abundant or commercially important, they are edible and appreciated as food fishes. They are typically taken as bycatch in trawl fisheries, but several species are also caught using bottom trawls, fixed bottom nets, and other artisanal gear. All species are marketed fresh and dried-salted. Additionally, some species are reduced for fishmeal.

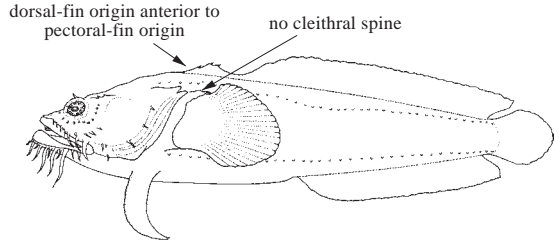
Similar families occurring in the area

Trachinidae: small, rounded head (large, dorsally flattened head in Uranoscopidae); strong venomous spine on gill cover; dorsal-fin origin equal to or in advance of pectoral origin; vertebrae 34 to 43.



Trachinidae

Batrachoididae: gill openings small, restricted to sides of body; cleithral spine lacking; dorsal-fin origin equal to or in advance of pectoral origin.



Batrachoididae

Key to species of Uranoscopidae occurring in the area

- 1a. Origin of first dorsal fin surrounded by a large, distinct white patch (Fig. 1) → 2
- 1b. Origin of first dorsal fin not surrounded by a large, distinct white patch (Fig. 2) → 3

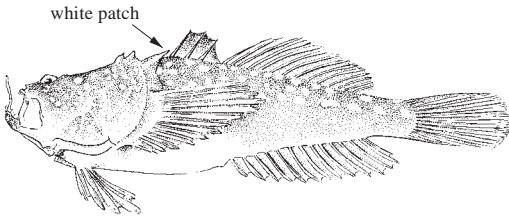


Fig. 1 *Uranoscopus polli*

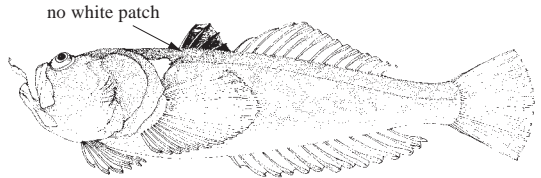


Fig. 2 *Uranoscopus scaber*

- 2a. Interorbital space wide, greater than 18.5% of head length (Fig. 3); scales below lateral line 58 to 60 ***Uranoscopus polli***
- 2b. Interorbital space narrow, less than 17.5% of head length (Fig. 4); scales below lateral line fewer than 58 ***Uranoscopus cadenati***
- 3a. Venomous cleithral spine long, greater than 32% of head length; mouth tentacle rounded and white (Fig. 5) ***Uranoscopus albesca***
- 3b. Venomous cleithral spine short, less than 25% of head length; mouth tentacle long, slender, and grey. ***Uranoscopus scaber***

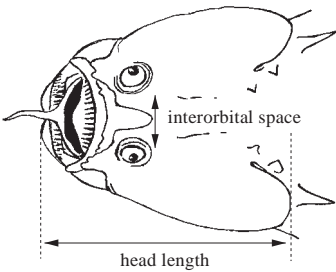


Fig. 3 *Uranoscopus polli*

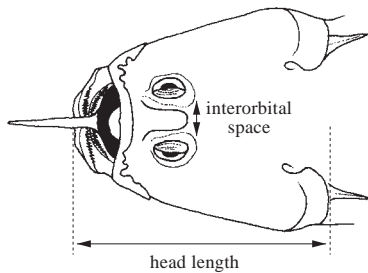


Fig. 4 *Uranoscopus cadenati*

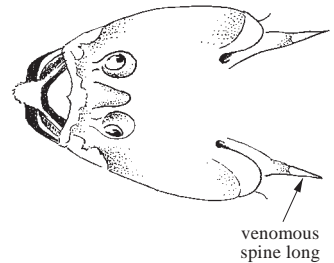




Fig. 5 *Uranoscopus albesca*


List of species occurring in the area

The symbol  is given when species accounts are included.

 *Uranoscopus albesca* Regan, 1915.

 *Uranoscopus cadenati* Poll, 1959.

 *Uranoscopus polli* Cadenat, 1951.

 *Uranoscopus scaber* Linnaeus, 1758.

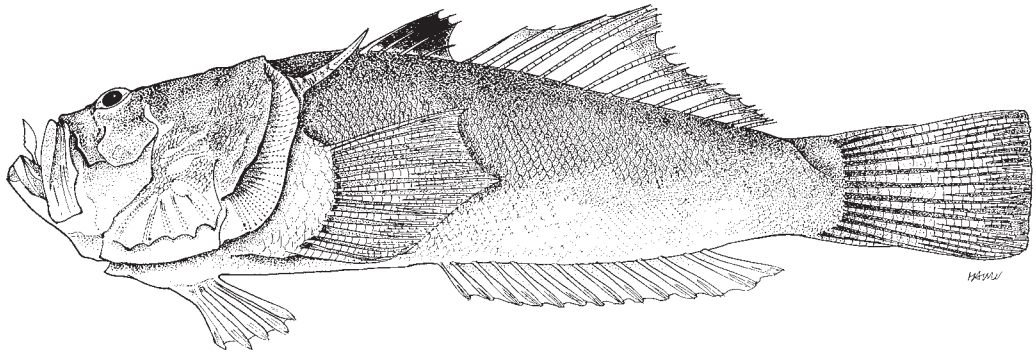
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***Uranoscopus albesca* Regan, 1915**

Frequent synonyms / misidentifications None / None.

FAO names: En – Longspine stargazer; Fr – Uranoscope miou; Sp – Miracielo espinón.



Diagnostic characters: Body robust anteriorly, somewhat compressed posteriorly, its depth contained 3.5 (juveniles) to 4.0 times in standard length. Head large and flat dorsally, only slightly longer than wide [contained 2.7 (juveniles) to 3.1 times in standard length], eyes on top of head, small, their diameter 4.5 (juveniles) to slightly over 7.0 times in head length; **interorbital space small, contained 5.1 (juveniles) to 6.4 times in head length; postorbital length 3.6 to 4.4 times greater than snout length;** upper corners of gill openings close together (distance between them 2.2 and 2.6 times in head length); mouth vertical; **3 rows of teeth anteriorly in upper jaw and 2 rows in lower jaw;** teeth on vomer in 2 patches; **tentacle of lower jaw inside mouth rounded, as broad as long, shorter than eye diameter;** 4 or 5 spines on lower margin of preopercle and 1 on subopercle; **humeral spine long, contained 2.4 to 3.0 times in head length; a single, short occipital spine on each side near edge of gill cover.** First dorsal fin with 3 or 4 spines, second dorsal with 13 or 14 segmented soft rays; anal fin with 0 spines and 13 or 14 segmented soft rays. Scales in lateral line 50 to 55. **Colour:** light greyish brown dorsally and laterally, white ventrally; first dorsal fin mostly black, **its origin not surrounded by a white patch; mouth tentacle white.**

Size: Maximum 35 cm; common to 25 cm.

Habitat, biology, and fisheries: Lives buried in sand and mud bottoms of the continental shelf and upper slope, between about 30 and 350 m depth. Feeds primarily on fishes and cephalopods. Collected mainly as bycatch in trawl fisheries (bottom trawls). Separate statistics are not reported for this species. Marketed fresh, dried-salted, and reduced to fishmeal.

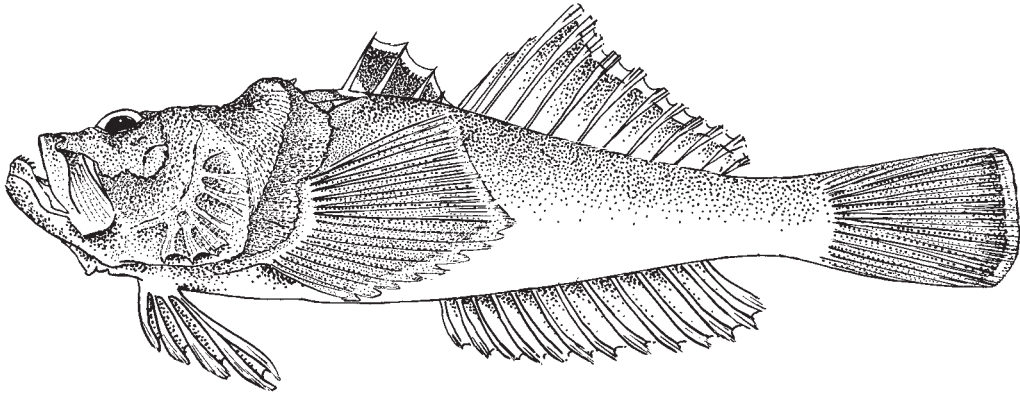
Distribution: Known from central Senegal to central Angola.



Uranoscopus cadenati Poll, 1959

Frequent synonyms / misidentifications: None / None.

FAO names: En – West African stargazer; Fr – Uranoscope boeuf; Sp – Miracielo africano.



Diagnostic characters: Body robust anteriorly, somewhat compressed posteriorly, its depth contained 3.7 to 4.5 times in standard length. Head large and flat dorsally, its length 1.2 to 1.3 times greater than the width; eyes on top of head, moderate-sized, their diameter 5.0 to 5.6 times in head length; **interorbital space narrow, contained 5.8 to 6.1 times in head length; postorbital length 3.6 to 4.2 times greater than snout length;** upper corners of gill openings rather close together (distance between them 2.3 and 2.6 times in head length); mouth vertical; 2 rows of teeth in upper and 1 row in lower jaw; teeth on vomer in 2 patches; **tentacle of lower jaw inside mouth narrow, almost as long as eye diameter;** 4 to 6 spines on lower margin of preopercle and 1 on subopercle; **humeral spine contained 4.3 to 5.0 times in head length; hind margin of head with 2 almost contiguous flat and rough areas.** First dorsal fin with 3 or 4 spines; second dorsal with 13 or 14 segmented soft rays; anal fin with 0 spines and 14 segmented soft rays. **About 50 scales in lateral line;** no scales on ventral surface, nape, and area surrounding first dorsal fin. **Colour:** reddish brown dorsally and laterally, white ventrally; young individuals with white spots on head and body. First dorsal fin black edged with white, its origin surrounded by a distinct white patch; mouth tentacle grey.

Size: Maximum 50 cm; common to 30 cm.

Habitat, biology, and fisheries: Lives buried in sand and mud bottoms of the continental shelf and upper slope, between about 30 and 300 m depth. Feeds primarily on crustaceans and fishes. Collected mainly as bycatch in trawl fisheries (bottom trawls and fixed bottom nets) or occasionally with artisanal gear. Separate statistics are not reported for this species. Marketed fresh, dried-salted, and reduced to fishmeal.

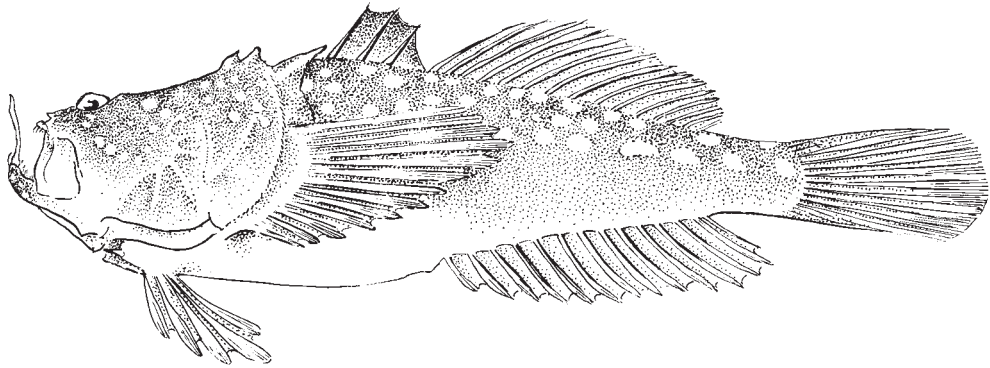
Distribution: Known from northern Senegal to central Angola.



***Uranoscopus polli* Cadenat, 1951**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Whitespotted stargazer; Fr – Uranoscope à points blancs; Sp – Miracielo moteado.



Diagnostic characters: Body robust anteriorly, somewhat compressed posteriorly, its depth contained 3.9 to 4.3 times in standard length. Head large and flat dorsally, its length 1.1 to 1.3 times greater than the width (2.8 to 2.9 times in standard length); eyes on top of head, small, their diameter 5.7 to 6.1 times in head length; **interorbital space broad, contained 5.2 to 5.4 times in head length; postorbital length 4.6 to 5.0 times greater than snout length;** upper corners of gill openings widely separated (distance between them 1.9 and 2.2 times in head length); mouth vertical, lips fringed; 2 rows of teeth anteriorly in upper and lower jaw; teeth on vomer in 2 patches; **tentacle of lower jaw inside mouth almost thread-like, about as long as eye diameter;** 4 spines on lower margin of preopercle and 1 on subopercle; **humeral spine contained 4.8 to 5.1 times in head length; 3 occipital spines on each side.** First dorsal fin with 4 spines, second dorsal with 14 segmented soft rays; anal fin with 0 spines and 14 segmented soft rays. **Scales in lateral line 58 to 60.** **Colour:** dorsally and laterally reddish brown with diffuse white spots, white ventrally. **First dorsal fin black, except for a white base of first spine, its origin surrounded by a distinct white patch; mouth tentacle edged with black.**

Size: Maximum 35 cm; common to 30 cm.

Habitat, biology, and fisheries: Lives buried in sand and mud bottoms and occasionally on rocky substrates. Feeds primarily on fishes. Collected mainly as bycatch in trawl fisheries (bottom trawls and fixed bottom nets). Marketed fresh, dried-salted, and used for fishmeal by industrial offshore fleets.

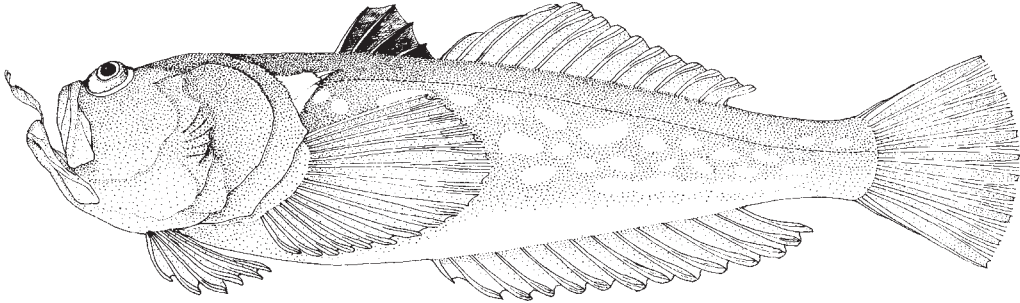
Distribution: Known from Guinea to the Congo and the Cape Verde Islands.



***Uranoscopus scaber* Linnaeus, 1758**

Frequent synonyms / misidentifications: *Uranoscopus bufo* Valenciennes, 1843; *U. occidentalis* Agassiz, 1831 / None.

FAO names: En – Stargazer; Fr – Uranoscope; Sp – Rata.



Diagnostic characters: Body robust anteriorly, somewhat compressed posteriorly, **its depth contained 4.5 to 5.0 times in total length**. Head large and flat dorsally, **its length 3.0 to 3.3 times in standard length**; eyes on top of head, small, **their diameter 6 to 8 times in head length**; interorbital space contained 5.0 to 5.7 times in head length; postorbital length 4.0 to 4.8 times greater than snout length; upper corners of gill openings widely separated (distance between them 1.6 and 1.8 times in head length); mouth vertical, the lower lip fringed; **tentacle of lower jaw inside mouth long and narrow** (as long as, or longer than eye diameter); **humeral spine contained 4.0 to 4.4 times in head length**. First dorsal fin with 3 or 4 spines, second dorsal with 13 to 15 segmented soft rays; anal fin with 1 spine and 12 to 14 segmented soft rays. **Scales in lateral line 76 to 90**. **Colour:** greyish brown dorsally and laterally, speckled with white, yellowish white ventrally. **First dorsal fin black, its origin not surrounded by a distinct white patch; mouth tentacle greyish.**

Size: Maximum 40 cm; common to 30 cm.

Habitat, biology, and fisheries: Lives buried in sand and mud of the continental shelf and upper slope, between 15 and about 400 m depth. Feeds primarily on fishes. Collected mainly with bottom trawls. Marketed fresh and dried-salted.

Distribution: Widespread in the Mediterranean and Black seas as well as along the Atlantic coast of Europe up to Portugal and the Bay of Biscay. Within the area, known from Morocco with reports of the species being collected along the African coast down to Senegal.



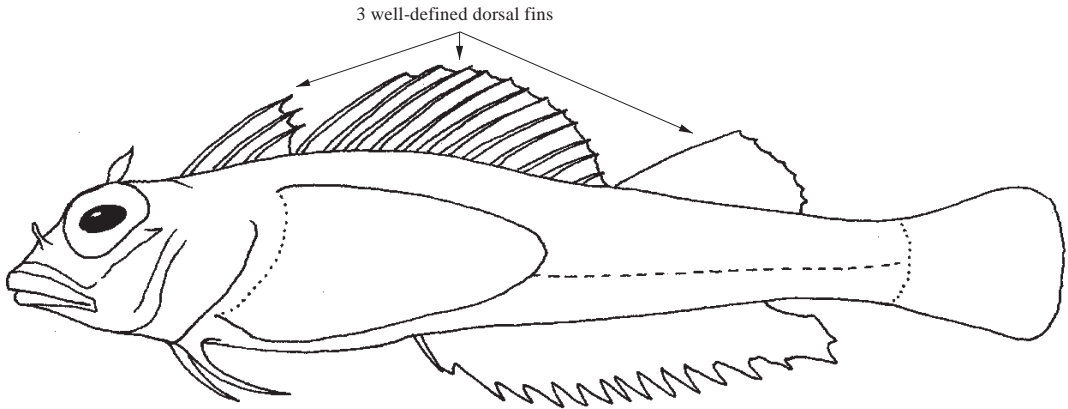
Suborder BLENNIOIDEI

TRIPTERYGIIDAE

Triplefins

by J.T. Williams, National Museum of Natural History, Washington, DC, USA

Diagnostic characters: Small, slender fishes, largest specimens about 9 cm standard length. **Three well-defined dorsal fins: first with 3 spines, second with 10 to 18 spines, third with 7 to 14 segmented rays; last dorsal-fin spine and first segmented ray borne on separate pterygiophores;** cirri often present on top of eye and on rim of anterior nostril; upper and lower jaws each with broad band of conical teeth; **ctenoid scales on body;** pectoral-fin base and belly naked or covered with cycloid scales; lateral line interrupted at midbody, anterior lateral-line scales pored, posterior scales notched; pelvic fin with 2 simple segmented rays and 1 embedded spine, inserted anterior to pectoral-fin base; caudal fin with 13 segmented rays, 9 of which are branched. **Colour:** females drab, body with brown or black bars on a pale background; males with black head and yellow or reddish brown body.

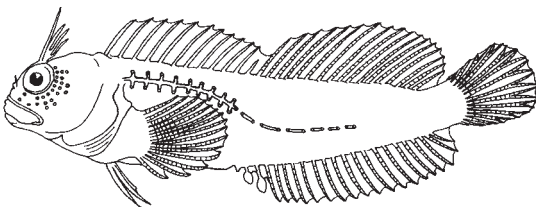


Habitat, biology, and fisheries: Triplefins are benthic, coastal fishes, usually living at very shallow depths, but some species occur at depths to about 40 m; found on rock and coral reefs. The small triplefins in this area are not eaten, but the colourful males have potential in the aquarium fish trade.

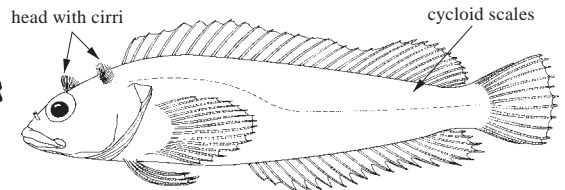
Similar families occurring in the area

Blenniidae: body without scales.

Labrisomidae: body with cycloid scales; caudal-fin rays always unbranched.



Blenniidae




Labrisomidae

Key to the species of Tripterygiidae occurring in the area

- 1a. Anal fin with 1 spine and 18 to 20 rays *Helcogramma ascensionis*
- 1b. Anal fin with 2 spines and more than 23 rays *Tripterygion delaisi*

List of species occurring in the area

The symbol  is given when species accounts are included.

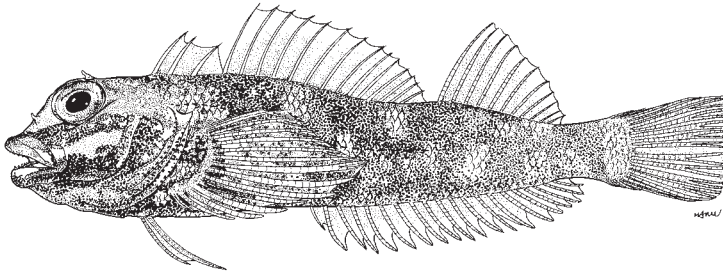
 *Helcogramma ascensionis* Lubbock, 1980.

 *Tripterygion delaisi* Cadenat and Blache, 1970.

***Helcogramma ascensionis* Lubbock, 1980**

En – Hotlips triplefin.

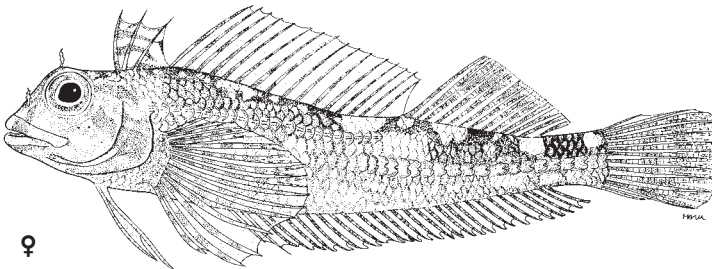
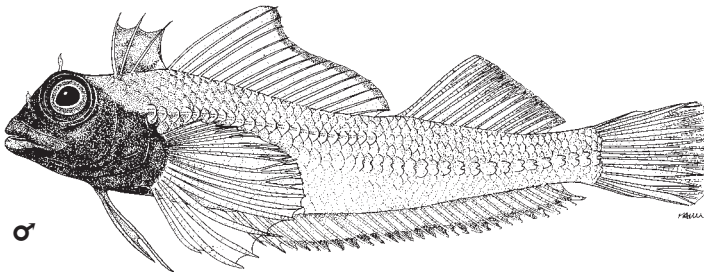
Maximum size is about 3.5 cm. Occurs in shallow water in large rockpools and among rocks near shore. Feeds on benthic invertebrates. This species is endemic to Ascension and St Helena Islands.



***Tripterygion delaisi* Cadenat and Blache, 1970**

En – Black-faced blenny; **Sp** – Cabecinegro.

Maximum size is about 8.9 cm. Occurs in shallow water on rocky shores. Feeds on benthic invertebrates. Eastern Atlantic and Mediterranean Sea: English Channel southwards and along the coast of west Africa, including Madeira, Azores and the Canary Islands, south to Senegal. Inhabits shallow coastal waters with rocky substrate.

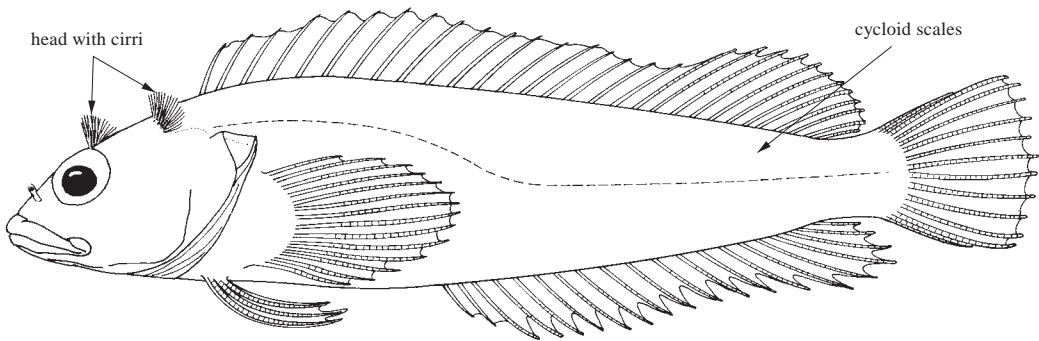


LABRISOMIDAE

Labrisomids

by J.T. Williams and V.G. Springer, National Museum of Natural History, Washington, DC, USA

Diagnostic characters: Small, often elongate fishes; largest species about 23 cm standard length, most under 10 cm standard length. **Head with cirri or fleshy flaps on anterior nostrils, eyes, and laterally on nape;** gill membranes continuous with each other across posteroventral surface of head. Each jaw with an outer row of relatively large, canine-like teeth, often with patches of smaller teeth behind; teeth usually also present on vomer and sometimes on palatines (roof of mouth). Dorsal and anal fins long, frequently highest anteriorly; **dorsal-fin spines often flexible, more numerous than the segmented dorsal-fin rays;** 2 usually flexible spines in anal fin; pelvic fins inserted anterior to pectoral-fin bases, **with 1 spine not visible externally and 3 segmented rays;** **all fin rays, including those of caudal, unbranched (simple).** Lateral-line tubed scales extend full length of body. **Body fully scaled with cycloid (smooth to touch) scales.** **Colour:** varying from drab to brilliant hues; usually with irregular vertical bands, spots or marbled pattern.

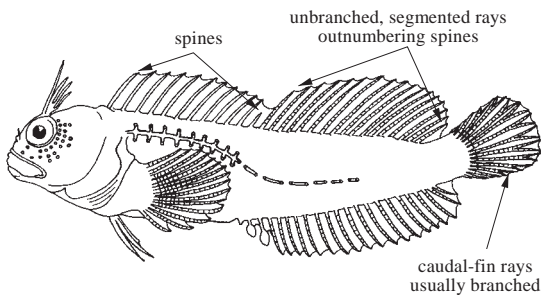


Habitat, biology, and fisheries: Benthic fishes restricted to rocky, shelly, or coral reefs in shallow water. The larvae, which are scaleless and often lack cirri, are often misidentified as Blenniidae. The presence of more spines than rays in the dorsal fin is an aid to identification. Labrisomids have no commercial importance in this region. They are edible, but rarely consumed.

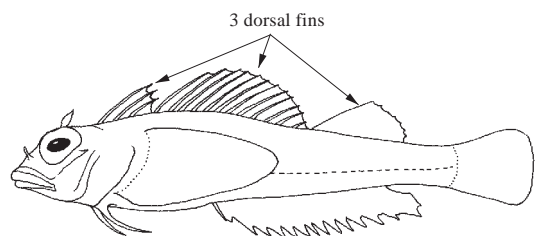
Similar families occurring in the area

Blenniidae: caudal-fin rays branched; scales always absent; lateral-line tubes in naked (unscaled) skin of body, always more segmented (soft) dorsal-fin rays than spines.

Tripterygiidae: caudal-fin rays branched; usually 3 clearly defined dorsal fins, posteriormost dorsal-fin spines always completely separated from soft rays; scales ctenoid (rough to touch).



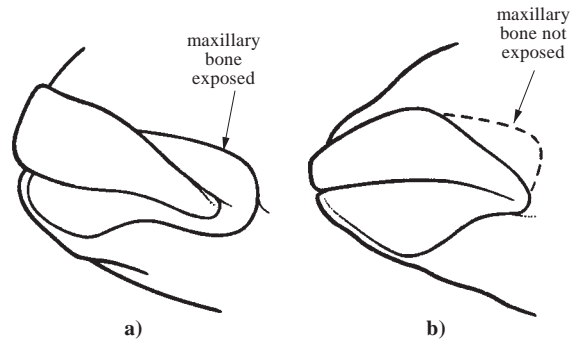
Blenniidae




Tripterygiidae

Key to the species of Labrisomidae occurring in the area

- 1a.** Maxillary bone completely or almost completely exposed when mouth closed (Fig. 1a); patches of small teeth behind outer row of large teeth in upper jaw; spinous part of dorsal fin without notch; palatine teeth present. *Labrisomus nuchipinnis*
- 1b.** Maxillary bone almost completely sheathed (hidden) when mouth closed (Fig. 1b); no small teeth behind outer row of large teeth in either jaw; spinous part of dorsal fin clearly notched after the first 3 spines; palatine teeth absent . . . *Malacoctenus africanus*

**Fig. 1 lateral view of mouth****List of species occurring in the area**

The symbol  is given when species accounts are included.

 *Labrisomus nuchipinnis* (Quoy and Gaimard, 1824).

 *Malacoctenus africanus* Cadenat, 1951.

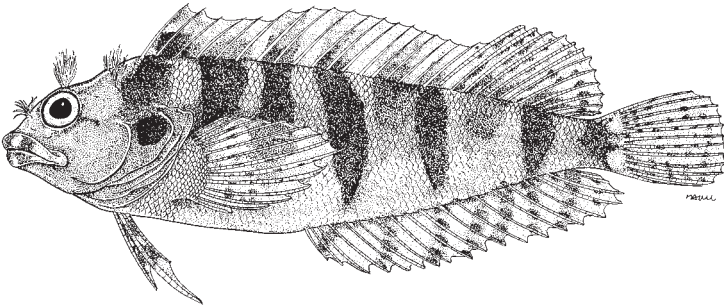
Reference

Springer, V.G. 1959. *Systematics and zoogeography of the clinid fishes of the subtribe Labrisomini Hubbs*. Publication of the Institute of Marine Science, University of Texas, 5: 417–492.

***Labrisomus nuchipinnis* (Quoy and Gaimard, 1824)**

En – Hairy blenny; **Sp** – Trambollo peludo.

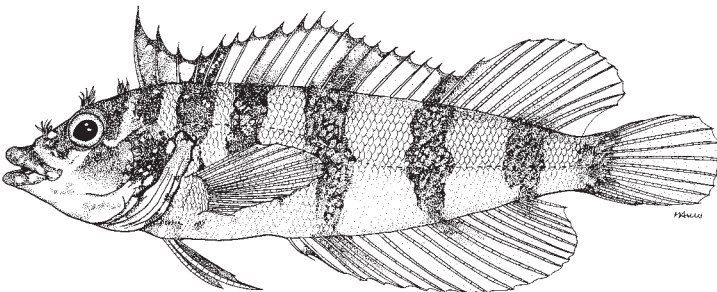
Maximum size to about 19 cm. Lives on rocky or rubble areas on shores with algal mats, and may be found in seagrass beds in shallow water. May be eaten, but not used commercially in the region. Distributed from Madeira, Canary Islands, Cape Verde, and the coast of West Africa south to equatorial Guinea in the eastern Atlantic; disjunct populations currently recognized as the same species (actually a species complex of different species) occur in the western Atlantic from Bermuda, Florida and the Gulf of Mexico, southward throughout the Caribbean to Southern Brazil. The eastern Atlantic populations of the *Labrisomus nuchipinnis* species complex represent a distinct species, different from the several *nuchipinnis*-like species in the Caribbean and western Atlantic. At least 1 species name *Clinus canariensis* Valenciennes, 1838, is available for the eastern Atlantic species, but additional taxonomic study is required before the eastern Atlantic species can be recognized under the species name *Labrisomus canariensis*.



***Malacoctenus africanus* Cadenat, 1951**

En – Orangesaddled blenny.

Maximum size to about 7.5 cm. Lives on rocky substrates in shallow water. Not used commercially. Known only from the islands of Gorée and N'Gor (Senegal). It is only known from Senegal. The *Malacoctenus* at Cape Verde is an undescribed species, so we do not treat it.

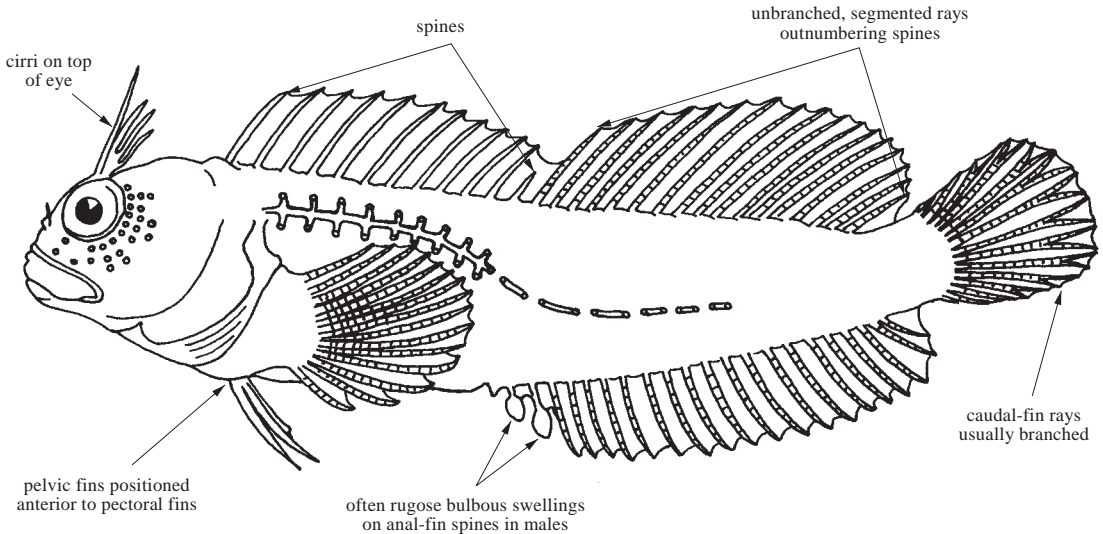


BLENNIIDAE

Combtooth blennies

by J.T. Williams and V.G. Springer, National Museum of Natural History, Washington, DC, USA

Diagnostic characters: Small, slender fishes, largest species to about 20 cm standard length, most under 15 cm standard length. **All species lack scales. Head usually with cirri or fleshy flaps on eye**, sometimes also on anterior nostril and nape; eyes high on sides of head; **mouth ventral, upper jaw not protractile. A single row of incisor-like teeth in each jaw and often an enlarged canine-like tooth posteriorly on each side of lower and, sometimes, upper jaw**; teeth rarely present on roof of mouth (rarely on vomer, never on palatines). Gill membranes either continuous with each other across ventroposterior surface of head or restricted to sides of head (a separate gill opening on each side). **Dorsal and anal fins long, their spines usually flexible; dorsal fin occasionally high anteriorly, with fewer spines than segmented (soft) rays; 2 spines in anal fin, scarcely differentiated from the segmented rays, the first not visible in females, both often supporting fleshy, bulbous, rugose swellings at their tips in males; pelvic fins inserted anterior to base of pectoral fins, with 1 spine (not visible) and 2 to 4 segmented rays; all segmented fin rays, except those of caudal fin, unbranched (simple).** Lateral-line tubes or canals in naked, unscaled skin of body varying from complete (extending entire length of body) to present only anteriorly on body. **Colour:** highly variable, usually drab, often mottled or with irregular stripes or bands on body.

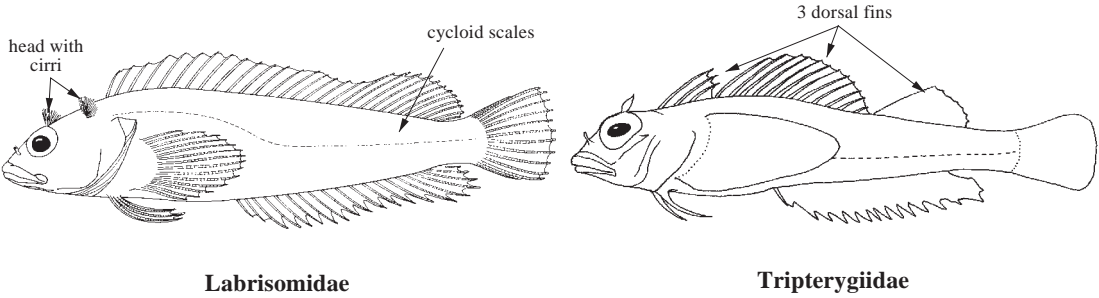


Habitat, biology, and fisheries: Blennies are benthic, coastal fishes, usually living at very shallow depths; often found in tide-pools, on wharf pilings, oyster reefs, rock and coral reefs; occasionally in marine grass beds. The larvae of some species have 2 to 4 recurved, laterally directed canine teeth at the front of each jaw; others have spines at the lower angle of the preopercle, or darkly pigmented areas on the pectoral fins. Although very abundant in littoral areas, none of the blenniids in the area are of commercial importance, mainly because of their small size; blennies are occasionally found in the aquarium fish trade; they are often caught in traps or bottom trawls, but usually are not eaten.

Similar families occurring in the area

Labrisomidae: body with scales; caudal-fin rays always unbranched; more dorsal-fin spines than segmented rays.

Tripterygiidae: body always scaled; 3 clearly defined dorsal fins.



Key to Blenniidae occurring in the area

- 1a. More than 120 freely movable teeth in each jaw → 2
- 1b. Fewer than 70 (usually fewer than 40) scarcely movable teeth in each jaw → 4

- 2a. Pectoral-fin rays usually 15; scarcely any indentation separating the spinous and rayed portions of dorsal fin; lateral line consisting of 2 disconnected, elongate portions, anterior portion overlapping anterior end of ventral portion (Fig. 1); total dorsal-fin elements 32 or more; ventral margin of upper lip and dorsal margin of lower lip crenulate ***Ophioblennius atlanticus***
- 2b. Pectoral-fin rays usually 14; dorsal fin separated into 2 portions by deep notch reaching dorsal contour of body (Fig. 2a); dorsal-fin spines usually 13, the last tiny and difficult to see; lateral line consisting of single continuous portion, continuous portion followed by series of short disconnected tubes; total dorsal-fin elements 27 to 29; ventral margin of upper lip crenulate on lateral thirds, entire on middle third (Fig. 2b). → 3

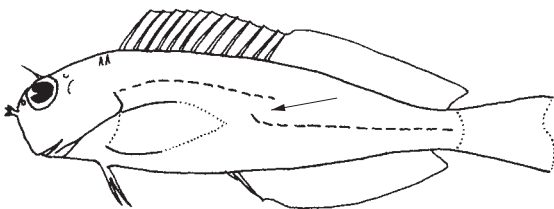
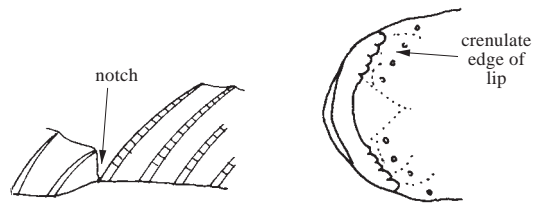


Fig. 1 *Ophioblennius*



a) midportion of dorsal fin b) underside of head
Fig. 2

- 3a. Humeral area (region just above and posterior to dorsal limit of pectoral-fin base) with irregular eye-sized, quadrate black blotch; upper lip with solid stripes ***Entomacrodus textilis***
- 3b. Humeral area without distinct black blotch; upper lip with black dots arranged in vertical rows ***Entomacrodus cadenati***

- 4a. Gill openings not continuous, each restricted to side of head (Fig. 3a) → 5
- 4b. Gill opening continuous from one side of head to other across ventral surface of head (Fig. 3b) → 11

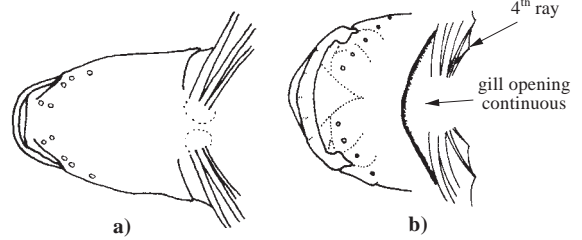


Fig. 3 underside of head

- 5a. Short skin flap present posterior to gill opening and directly above pectoral-fin base (Fig. 4); entire lateral line composed of short separate tubes, each with a pore at either end, and without transverse branches (Fig. 5); pectoral-fin rays 12 or 13 → 6
- 5b. No skin flap above pectoral-fin base; lateral line a continuous tube anteriorly, with regularly spaced short transverse branches (Fig. 6); pectoral-fin rays 14 → 9

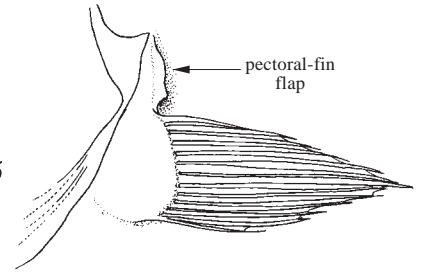


Fig. 4 *Blennius normani*

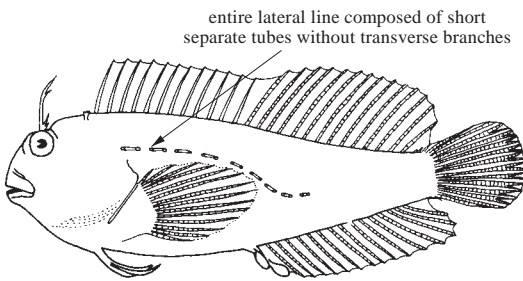


Fig. 5

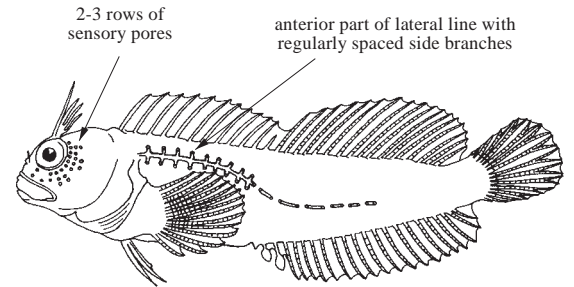


Fig. 6

- 6a. Dorsal-fin spines 11; pectoral-fin rays 12; segmented caudal-fin rays 13 → 7
- 6b. Dorsal-fin spines 10; pectoral-fin rays 13; segmented caudal-fin rays 11 → 8

- 7a. Supraorbital tentacle broad, fleshy, with fringed edges (Fig. 7); segmented dorsal-fin rays usually 14 *Blennius ocellaris*
- 7b. Supraorbital tentacle thin and narrow without fringed edges (Fig. 8); segmented dorsal-fin rays usually 13 *Blennius normani*

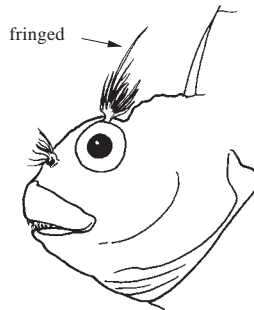


Fig. 7 *Blennius ocellaris*

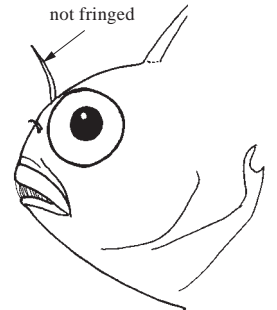


Fig. 8 *Blennius normani*

- 8a. Segmented dorsal-fin rays 16; segmented anal-fin rays 16 *Spaniblennius rioudourensis*
- 8b. Segmented dorsal-fin rays 14; segmented anal-fin rays 15 *Spaniblennius clandestinus*

- 9a. Rounded fleshy crest present on top of head between eyes (Fig. 9). *Hypleurochilus langi*
- 9b. Fleshy crest absent on top of head → 10

- 10a. Segmented dorsal-fin rays 13 or 14; segmented anal-fin rays 15 or 16 *Hypleurochilus bananensis*
- 10b. Segmented dorsal-fin rays 15; segmented anal-fin rays 17 *Hypleurochilus aequipinnis*

- 11a. Cirri absent on top of each eye. → 12
- 11b. Cirri present on top of each eye (Fig. 6) → 17

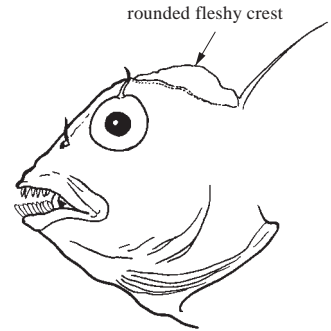


Fig. 9 *Hypleurochilus langi*

- 12a. Erectile triangular flap present on top of head between posterior parts of eyes (Fig. 10); upper lip produced beyond angle of mouth to form fleshy flap (Fig. 10); enlarged canine tooth present posteriorly on each side of lower jaw, none in upper jaw; teeth on vomer present *Coryphoblennius galerita*
- 12b. No triangular flap on top of head between posterior parts of eyes; upper lip not produced as fleshy flap at angle of mouth; enlarged canine tooth present posteriorly on each side of each jaw; teeth on vomer present or absent → 13

- 13a. Anterior part of lateral line with regularly spaced side branches (Fig. 6); infraorbital with only 1 row of sensory pores (Fig. 6) → 14
- 13b. Anterior part of lateral line without regularly spaced side branches (Fig. 11); infraorbital with only one row of sensory pores (Fig. 11) *Lipophrys trigloides*

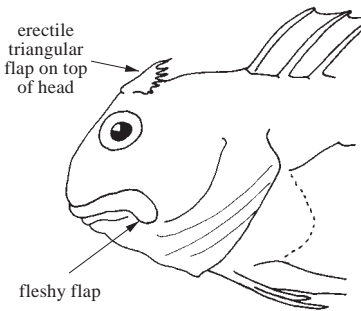


Fig. 10 *Coryphoblennius*

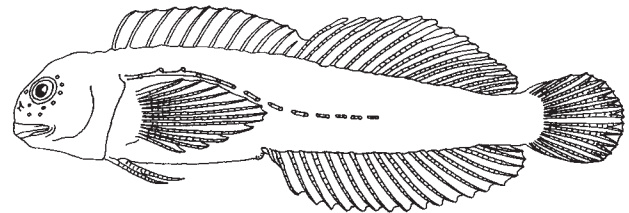


Fig. 11 *Lipophrys*

- 14a. Pectoral-fin rays 13 *Lipophrys pholis*
- 14b. Pectoral-fin rays 12 → 15

- 15a. Large, dark eye-sized spot on side of head posterior to eye. *Microlipophrys velifer*
- 15b. No large dark spot on side of head posterior to eye → 16

- 16a. Anterior nostril with small tentacle on both anterior and posterior rims; segmented anal-fin rays 17 to 19 ***Microlipophrys caboverdensis***
- 16b. Anterior nostril with small tentacle only on posterior rim; segmented anal-fin rays 14 to 16 ***Micrilipophrys bauchotae***

- 17a. Numerous cirri present on top of head and on top of each eye (Fig. 12) → 18
- 17b. Cirri present only on top of each eye → 21

- 18a. Head, pectoral-fin base, and body covered with large, half-pupil sized, black spots; segmented anal-fin rays usually 18; caudal vertebrae 25 or 26 . . . ***Scartella springeri***

- 18b. Head and pectoral-fin base without large, dark spots or with very fine black dots; body with or without black spots; segmented anal-fin rays usually 14 to 17; caudal vertebrae 22 to 24 → 19

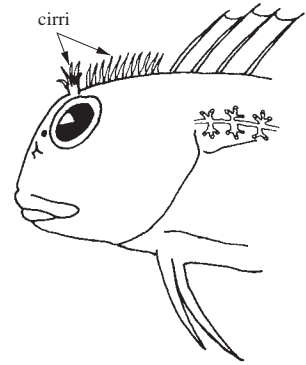


Fig. 12 *Scartella*

- 19a. Cirri in nuchal row 5 to 10 ***Scartella nuchifilis***
- 19b. Cirri in nuchal row 10 to 70 → 20

- 20a. Body covered with distinct black spots ***Scartella caboverdiana***
- 20b. Body variously mottled with broken bars, but without distinct black spots ***Scartella cristata***

- 21a. Lateral line composed of short, separate tubes, each with pore at either end, and without transverse branches (Fig. 4); pectoral-fin rays 12 ***Bathyblennius antholops***

- 21b. Lateral line forming continuous tube anteriorly, with regularly spaced, short transverse branches (Fig. 5); pectoral fin-rays 13 or 14 → 22

- 22a. Segmented pelvic-fin ***Parablennius cornutus***
- 22b. Segmented pelvic-fin rays 3 → 23

- 23a. Pectoral-fin rays 13 → 24
- 23b. Pectoral-fin rays 14 → 25

- 24a. Dorsal-fin spines 12; precaudal vertebrae 11 ***Parablennius sanguinolentus***
- 24b. Dorsal-fin spines 11; precaudal vertebrae 10 ***Parablennius parvicornis***

- 25a. Dorsal-fin spines 13 → 26
- 25b. Dorsal-fin spines 12 → 27

- 26a. Segmented anal-fin rays 21 or 22; caudal vertebrae 28 or 29 ***Parablennius ruber***
- 26b. Segmented anal-fin rays 19 or 20; caudal vertebrae 26 or 27 ***Parablennius gattorugine***

- 27a. Orbital sensory canal posterior to eye with 1 pore at each pore position (Fig. 13a)
 ***Parablennius tentacularis***
- 27b. Orbital sensory canal posterior to eye with 2 or more pores at each pore position
 (Fig. 13b). → 28

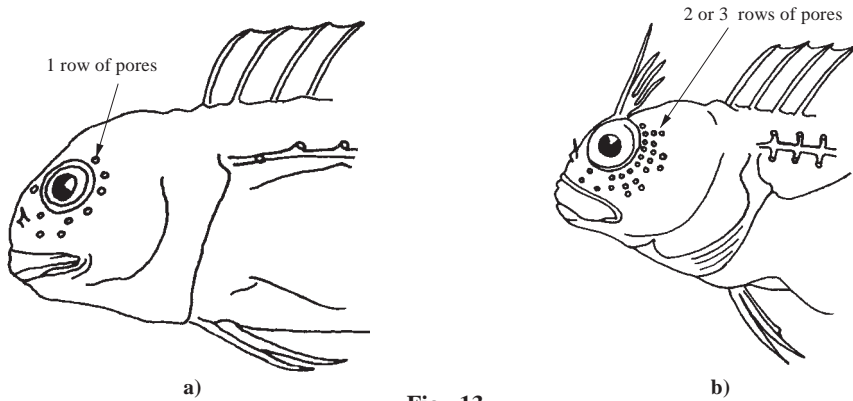


Fig. 13

- 28a. Lateral line consisting of continuous anterior portion followed on midbody by series of short, separate, bi-pored tubes; vomer with teeth → 29
- 28b. Lateral line consisting of only continuous anterior portion; vomer without teeth → 30

- 29a. Longest dorsal-fin spines longer than longest segmented dorsal-fin rays . . . ***Parablennius dialloi***
- 29b. Longest dorsal-fin spines about same length as longest segmented dorsal-fin rays
 ***Parablennius incognitus***

- 30a. Segmented dorsal-fin rays 20 to 22; segmented anal-fin rays 22 to 24; caudal vertebrae 28 to 30 ***Parablennius pilicornis***
- 30b. Segmented dorsal-fin rays 16 to 19; segmented anal-fin rays 18 to 21; caudal vertebrae 24 to 27 → 31

- 31a. Caudal fin with alternating broad dark bands and narrow pale bands . . . ***Parablennius verryckeni***
- 31b. Caudal fin without bands → 32

- 32a. Membrane between anteriormost 2 dorsal-fin spines unmarked or with small dark spot; males with dark fleshy swellings on anal-fin spines ***Parablennius gorensis***
- 32b. Membranes between anteriormost 3 dorsal-fin spines with well-defined oval-shaped dark spot; males with white fleshy swellings on anal-fin spines → 33

- 33a. Segmented dorsal-fin rays 16 to 18; segmented anal-fin rays 18 to 20; caudal vertebrae 24 or 25 ***Parablennius sierraensis***
- 33b. Segmented dorsal-fin rays 19 or 20; segmented anal-fin rays 21 or 22; caudal vertebrae 27 ***Parablennius salensis***

List of species occurring in the area

- Bathylbennius antholops* (Springer and Smith-Vaniz, 1970) (previously listed as *Blennius antholops*). To 5.4 cm standard length. Known from a single specimen taken at 101 to 128 m in the Gulf of Guinea.
- Blennius normani* Poll, 1949. To 11 cm. Occurs at depths as great as 400 m. Mauritania to Angola.
- Blennius ocellaris* Linnaeus, 1758. To 20 cm. Occurs at depths as great as 200 m. Morocco to the English Channel, and from the Mediterranean and Black seas.
- Coryphoblennius galerita* (Linnaeus, 1758). To 7.6 cm standard length. Morocco, Madeira, Canary Islands, Mediterranean Sea, north to England.
- Entomacrodus cadenati* Springer, 1967. To 6.9 cm standard length. Senegal to Guinea, Cape Verde, Ile de Roumé and Annobon Island.
- Entomacrodus textilis* (Valenciennes, 1836). To 6 cm standard length. Ascension and St Helena.
- Hypleurochilus aequipinnis* (Günther, 1861). To 6 cm standard length. Shallow water along rocky coasts from Senegal and Cameroon.
- Hypleurochilus bananensis* (Poll, 1959). To 10.5 cm standard length. Shallow water along rocky coasts; Mediterranean Sea, Senegal to Congo.
- Hypleurochilus langi* (Fowler, 1923). To 7 cm standard length. Shallow water along rocky coasts from Senegal to Congo, Annobon Island.
- Lipophrys pholis* (Linnaeus, 1758) (previously listed as *Blennius pholis*). To 18 cm, possibly to 30 cm. Norway to Madeira, the Canary Islands and Mauritania, also in the Mediterranean and the Balearics.
- Lipophrys trigloides* (Valenciennes, 1836) (previously listed as *Blennius trigloides*). To 13 cm. Known from France, Iberian Peninsula, Morocco, Mediterranean and the Sea of Marmara southward to Senegal, Canaries and Madeira.
- Microlipophrys bauchotae* (Wirtz and Bath, 1982). To 44.4 cm. Known only from Cameroon and Fernando Po (now called Bioko).
- Microlipophrys caboverdensis* (Wirtz and Bath, 1989). To 4 cm. Known only from Cape Verde.
- Microlipophrys velifer* (Norman, 1935) (previously listed as *Blennius velifer*). To 3 cm. Senegal and Cape Verde to Angola.
- Ophioblennius atlanticus* (Valenciennes, 1836). To 7 cm standard length. Azores and Madeira, Canary, Ascension, St Helena, Cape Verde, São Tomé and Annobon Islands; St Paul's Rocks, and along the coast of west Africa from Senegal to Angola. There are several undescribed species recognized by Carole Baldwin (personal communication) that are included here under the name *Ophioblennius atlanticus*, which was originally described from and may be resstricted to Madeira.
- Parablennius cornutus* (Linnaeus, 1758). Frequent synonym: *Blennius cornutus* Linnaeus, 1758. Maximum size 15 cm standard length. Known from Namibia to Sodwana Bay, South Africa.
- Parablennius dialloi* Bath, 1990. To 5.9 cm. Known from Cape Verde to Angola.
- Parablennius gattorugine* (Linnaeus, 1758). To 30 cm. Known from Ireland to Morocco and the Mediterranean Sea.
- Parablennius goreensis* (Valenciennes, 1836). To 7 cm standard length. Known from Senegal.
- Parablennius incognitus* (Bath, 1968). To 5.8 cm standard length. Known from the Strait of Gibraltar through the Mediterranean.
- Parablennius parvicornis* (Valenciennes, 1836). To 12 cm standard length. Known to Congo, including the Canary Islands, Cape Verde, Azores, and Madeira.
- Parablennius pilicornis* (Cuvier, 1829) (previously listed as *Blennius pilicornis*). To 12.7 cm standard length. Known from Spain and Portugal to Namibia, Natal to Knysna in South Africa, Mediterranean, also in Brazil and Argentina.
- Parablennius ruber* (Valenciennes, 1836). To 1.4 cm. Known from Portugal, Azores, and Madeira.

- Parablennius salensis* Bath, 1990. To 6 cm. Known from Cape Verde Islands.
- Parablennius sanguinolentus* (Pallas, 1814). To 20 cm standard length. Known from France to Morocco, Mediterranean, and Black Sea.
- Parablennius sierraensis* Bath, 1990. To 3.7 cm. Known from Cape Verde to Angola.
- Parablennius tentacularis* (Brunnich, 1768) (previously listed as *Blennius tentacularis*). To 15 cm. Known from Portugal, Spain and Morocco south to Guinea, Canary Islands, Mediterranean, Sea of Marmara, and Black Sea.
- Parablennius verryckenii* (Poll, 1959). To 4.9 cm. Known from Congo to Sierra Leone.
- Scartella caboverdiana* Bath, 1990. To 6 cm. Known only from Cape Verde Islands.
- Scartella cristata* (Linnaeus, 1758) (previously listed as *Blennius cristatus*). To 12 cm. Known from Mauritania and the Canary Islands to Namibia, found in sub-tropical to temperate waters worldwide, but taxonomic study is needed to determine species limits.
- Scartella nuchifilis* (Valenciennes, 1836) (previously listed as *Blennius nuchifilis*). To 6.6 cm. Known only from Ascension Island.
- Scartella springeri* (Bauchot, 1967) (previously listed as *Blennius springeri*). To 8.2 cm. Known only from St Helena.
- Spaniblennius clandestinus* Bath and Wirtz, 1989. To 5.6 cm. Known from Cape Verde to Angola.
- Spaniblennius riodourensis* (Metzelaar, 1919). To 5.1 cm. Known from Mauritania and Morocco.

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- Bath, H.** 1990. Über eine Art der Gattung *Scartella* von den Kapverdischen Inseln (Pisces: Blenniidae). *Mitteilungen der Pollichia*, 77: 395–407.
- Springer, V.G.** 1967. Revision of the circumtropical shorefish genus *Entomacrodus* (Blenniidae: Salariae). *Proceedings of the U.S. National Museum*, 122(3582): 1–150, 30 pls.

A

- africanus, Malacoctenus* 2798
ascensionis, Helcogramma 2795

B

- BLENNIOIDEI 2793
 Black-faced blenny 2795
BLENNIIDAE 2793,2796,**2799**

C

- Cabecinegro 2795
canariensis, Clinus 2798
canariensis, Labrisomus 2798
Clinus canariensis 2798
 Combtooth blennies 2799

D

- delaisi, Tripterygion* 2795

H

- Hairy blenny 2798
Helcogramma ascensionis 2795
 Hotlips triplefin 2795

L

- LABRISOMIDAE** 2793,**2796**,2800
 Labrisomids 2796
Labrisomus canariensis 2798
Labrisomus nuchipinnis 2798

M

- Malacoctenus* 2798
Malacoctenus africanus 2798

N

- nuchipinnis, Labrisomus* 2798

O

- Orangesaddled blenny 2798

T

- Trambollo peludo 2798
 Triplefins 2793
TRIPTERYGIIDAE **2793**,2796,2800
Tripterygion delaisi 2795

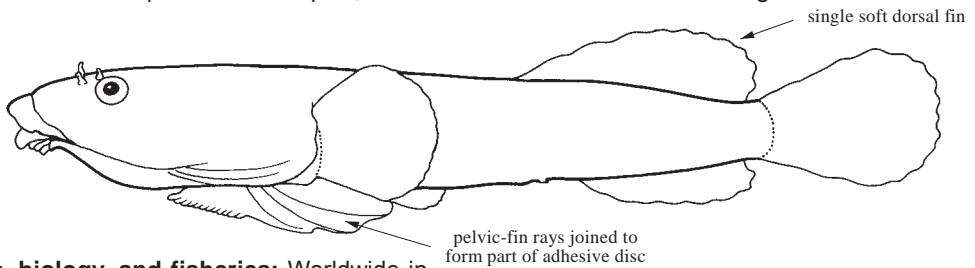
Suborder GOBIESOCOIDEI

GOBIESOCIDAE

Clingfishes

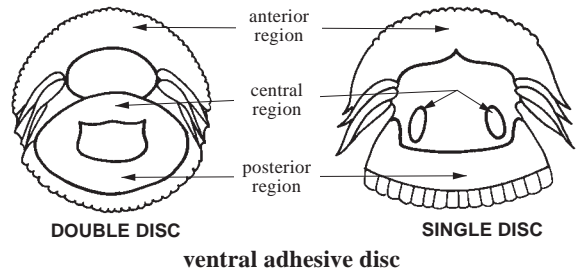
by R. Fricke, Lauda-Königshofen, Germany and Staatliches Museum für Naturkunde Stuttgart, Germany;
 J.C. Briggs, Oregon State University, USA and J.D. McEachran, Texas A & M University, USA

Diagnostic characters: Small to very small (to about 7 cm total length). Generally anteriorly depressed and posteriorly subcylindrical to compressed; with a **ventral adhesive disc**. Snout elongate or short, and depressed or tubular. Nostrils paired, with anterior opening tubular and posterior opening usually tubular or extended. Eye on dorsolateral aspect of head and small to moderate in size. Mouth small to moderate and terminal to subterminal. Jaw teeth villiform to fang-like and in patches or rows. Gill membranes usually free of isthmus but occasionally attached. Gills on 3 to 3.5 arches (no slit behind last arch). **Dorsal fin single, posteriorly located, consisting entirely of rays.** Anal fin lacks spines and similar in size, shape, and position to dorsal fin. Pectoral fin broad and fan-like. **Pelvic fins with 4 rays and joined to form lateral edges of adhesive disc located between head and trunk. Fourth ray of pelvic fins joined to lower portion of pectoral-fin base by membrane. Free edge of posterior section of disc extends dorsally to axial dermal flap. Disc bears flattened papillae along its anterior lateral margins, posterior margin, and central region.** When papillae of central region continuous with papillae of posterior region, 2 sucking discs formed. When papillae of central region separate from those of posterior region 1 disc formed. Scales absent. Sensory pores on head only. Vertebrae number 25 to 54. **Colour:** dorsal surface greenish, grey or dark brown and often patterned with spots, reticulations or bars. Ventral surface light to white.



Habitat, biology, and fisheries: Worldwide in shallow tropical to warm temperate seas, brackish and fresh waters. Adhesive disc is used to attach fish to hard substrates and plants, often in areas subjected to wave or tidal action.

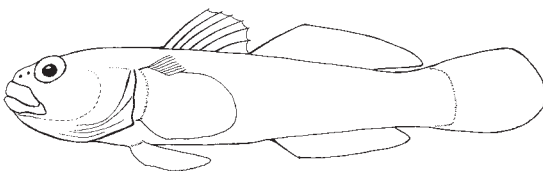
Remarks: There are about 167 species in 48 genera worldwide, 13 species in 5 genera in area.



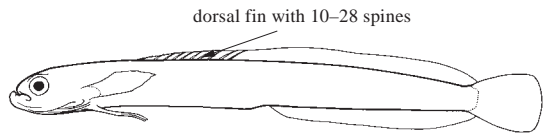
Similar families occurring in the area

Gobiidae: have 2 dorsal fins; most species have scales.

Microdesmidae: lack a ventral adhesive disc; dorsal and anal fin usually have long bases; have embedded scales.



Gobiidae



dorsal fin with 10–28 spines

Microdesmidae

Key to the species of Gobiesocidae occurring in the area

- 1a. Subopercular spine strong and pungent *Opeatogenys cadenati*
 1b. Subopercular spine absent → 2
- 2a. Jaw teeth consist of small incisors on either side of symphysis followed by 1 to 3
 canines on each side; gill rakers on third arch 6 → 3
 2b. Jaw teeth conical, not incisor or canine-like; gill rakers on third arch 7 to 18 → 7
- 3a. Maxilla with a conspicuous white barbel in male; upper jaw with 4 or 5 incisors . *Apletodon barbatus*
 3b. Maxilla without a barbel in male; upper jaw with 1 to 3 incisors → 4
- 4a. Mandibular-canal pores 0; head length 2.4 to 3.0 (mean 2.7) in SL *Apletodon dentatus*
 4b. Mandibular-canal pores 3; head length 2.2 to 2.8 (mean 2.4) in SL → 5
- 5a. Males: head width 3.6 to 4.0 (mean 3.8) in SL; snout long, more or less pointed,
 conical, preorbital length 3.1 to 4.0 in head length *Apletodon wirtzi*
 5b. Males: head width 2.4 to 3.4 in SL; snout short, rounded, preorbital length 2.7 to 3.4 in
 head length → 6
- 6a. Males: head width 2.9 to 3.4 (mean 3.3) in SL; anal papillae small, indistinct, both
 sexes: anal-fin length in distance between anus and anal-fin origin 1.0 to 1.7 (mean
 1.4) *Apletodon incognitus*
 6b. Males: head width 2.4 to 3.0 (mean 2.7) in SL; anal papillae large, distinct; both sexes:
 anal-fin length in distance between anus and anal-fin origin 1.5 to 2.3 (mean 1.9)
 *Apletodon pellegrini*
- 7a. Dorsal-fin rays 13 to 21; anal-fin rays 9 to 12 → 8
 7b. Dorsal-fin rays 4 to 9; anal-fin rays 3 to 8 → 9
- 8a. Anterior nostril with prominent cirrus; dorsal and anal fins broadly joined to caudal fin;
 posterior region of disc with row of 3 to 6 flattened papillae; pectoral-fin rays 20 to 23
 *Lepadogaster lepadogaster*
 8b. Anterior nostril with very small dermal flap; dorsal and anal fins separated from caudal
 fin; posterior region of disc with row of 7 to 9 flattened papillae; pectoral-fin rays 26
 to 29 *Lepadogaster candolii*
- 9a. Central anterior region of disc with papillae; fleshy pad present on lower part of
 pectoral-fin base; vertebrae 28 *Lecanogaster chrysea*
 9b. Central anterior region of disc without papillae; fleshy pad absent on lower part of
 pectoral-fin base; vertebrae 30 to 32 → 10
- 10a. Dorsal-fin rays 4 to 8; anal-fin rays 3 to 7 → 11
 10b. Dorsal-fin rays 9; anal-fin rays 8 → 12
- 11a. Pectoral-fin rays 21 to 24; caudal-peduncle depth 1.2 to 1.5 (mean 1.3); eye diameter
 3.7 to 4.9 (mean 4.1) in head length *Diplecogaster bimaculata*
 11b. Pectoral-fin rays 25 to 26; caudal-peduncle depth 1.0 to 1.2 (mean 1.1); eye diameter 3.2
 to 3.9 (mean 3.6) in head length *Diplecogaster pectoralis*

- 12a.** Pelvic disc with lateral papillae in region A (anterior section); disc region B (posterior section) with 5 rows of papillae; mandibular canal with 1 pore; principal caudal-fin rays 16; interorbital distance 5.4 in head length; distance between disc and anus 19% of SL
 ***Diplecogaster ctenocrypta***
- 12b.** Pelvic disc without lateral papillae in region A; disc region B with 2 rows of weak papillae; mandibular pores missing; principal caudal-fin rays 14 to 15; interorbital distance 4.1 to 4.6 in head length; distance between disc and anus 14 to 17% of SL
 ***Diplecogaster tonstricula***

List of species occurring in the area

- Apletodon barbatus* Fricke, Wirtz and Brito, 2010. 1.8 cm TL. Cape Verde Islands, 5 to 15 m depth.
- Apletodon dentatus* (Facciola, 1887). 5.2 cm TL. Canary Islands north to Scotland; Mediterranean and Black Sea, 0 to 35 m depth.
- Apletodon incognitus* Hofrichther and Patzner, 1997. 4 cm TL. Azores and Canary Islands, Mediterranean Sea. 2 to 15 m depth.
- Apletodon pellegrini* (Chabanaud, 1925). 5 cm TL. Madeira, Canary Islands, mainland: Western Sahara to Port Alfred, South Africa. 0 to 10 m depth.
- Apletodon wirtzi* Fricke, 2007. 2.2 cm TL. São Tomé and Príncipe, Cameroon, possibly Annobon Island. 0 to 2 m depth.
- Diplecogaster bimaculata* (Bonnaterre, 1788). 6 cm TL. Norway and Faroes to Gibraltar, western Mediterranean and Adriatic. 0 to 40 m depth.
- Diplecogaster ctenocrypta* Briggs, 1955. 1.8 cm TL. Canary Islands. 90 m.
- Diplecogaster pectoralis* Briggs, 1955. 5 cm TL. Canary Islands, Madeira, Azores, Cape Verde Islands.
- Diplecogaster tonstricula* Fricke, Wirtz and Brito, 2015. 2.7 cm TL. Canary Islands, Senegal.
- Lecanogaster chrysea* Briggs, 1957. 2.1 cm TL. Ghana.
- Lepadogaster candolii* Risso, 1810. 7.5 cm TL. British Isles to Canary Islands, including Mediterranean Sea and Black Sea.
- Lepadogaster lepadogaster* (Bonnaterre, 1788). 7.5 cm TL. Eastern and central Mediterranean Seas, Black Sea; to Madeira and Canary Islands.
- Opeatogenys cadenati* Briggs, 1957. 2.1 cm TL. Ghana, Senegal and Morocco.

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- Briggs, J.C.** 1957. A new genus and two new species of eastern Atlantic clingfishes. *Copeia*, 1957 (no. 3): 204–208.
- Briggs, J.C.** 1990. Gobiesocidae. In J.-C. Quéro, J.-C. Hureau, C. Karrer & L. Saldanha, eds. *Check-list of the fishes of the eastern tropical Atlantic*, Paris, UNESCO, 2: 474–478.
- Fricke, R.** 2007. A new species of the clingfish genus *Apletodon* (Teleostei: Gobiesocidae) from São Tomé and Príncipe, Eastern Central Atlantic. *Ichthyological Research*, 54(no. 1): 68–73.
- Fricke, R., Wirtz, P. & Brito, A.** 2010. A new species of the clingfish genus *Apletodon* (Teleostei: Gobiesocidae) from the Cape Verde Islands, Eastern Central Atlantic. *Ichthyological Research*, 57(no. 1): 91–97.
- Fricke, R., Wirtz, P. & Brito, A.** 2015. *Diplecogaster tonstricula*, a new species of cleaning clingfish (Teleostei: Gobiesocidae) from the Canary Islands and Senegal, eastern Atlantic Ocean, with a review of the *Diplecogaster-ctenocrypta* species-group. *Journal of Natural History*, 1–18. [Published online].

New Index

C

Clingfishes 2807

G**GOBIESOCIDAE** 2807

GOBIESOCOIDEI 2807

GOBIIDAE 2807**M****MICRODESMIDAE** 2807

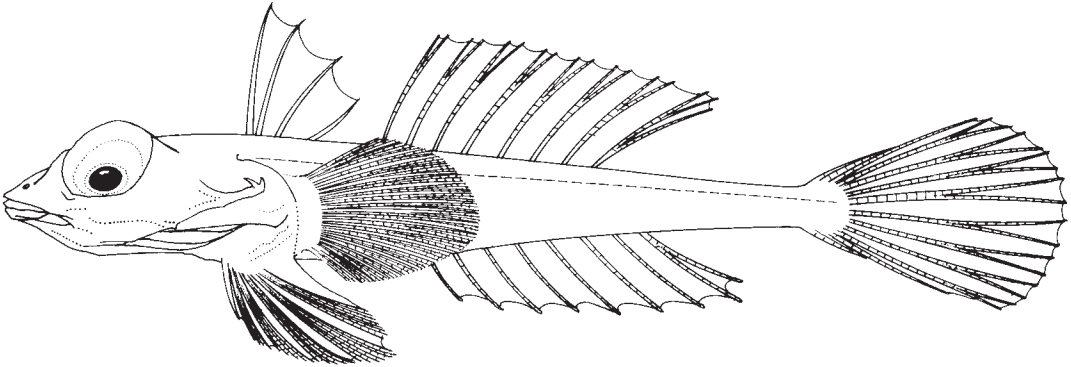
Suborder CALLIONYMOIDEI

CALLIONYMIDAE

Dragonets

by R. Fricke, Lauda-Königshofen, Germany and Staatliches Museum für Naturkunde, Stuttgart, Germany

D **Diagnostic characters:** Small fishes rarely reaching more than 30 cm total length. Body elongate and somewhat depressed. Head triangular when seen from above. **Preopercular spine strong, elongate, usually with additional points on dorsal margin and base in various arrangements.** Operculum and suboperculum without spines. **Gill opening reduced to a small pore** situated above the preopercular spine. Mouth small and terminal, premaxillary may be extended ventrally. Eyes large, situated dorsally on head. **Scales absent**, but lateral line complete, often extending onto caudal fin. Two separate dorsal fins, the first with 3 or 4 weak spines, the second with 5 to 10 soft rays, the last divided through its base. First dorsal fin often high, in males occasionally with filaments. Anal fin with 7 to 11 soft rays, the last divided through its base. Pectoral fin large, rounded, with 16 to 25 soft rays. Pelvic fin with 1 spine and 5 branched soft rays, beginning below preopercular spine. Caudal fin elongate, occasionally with long filamentous central rays in males. **Colour:** pale sandy yellow to mottled with white, brown or black; **most species strongly sexually dichromic and dimorphic (e.g. spinous dorsal fin often higher in males);** males often colourful, mottled or streaked with pink, red, yellow, or blue.

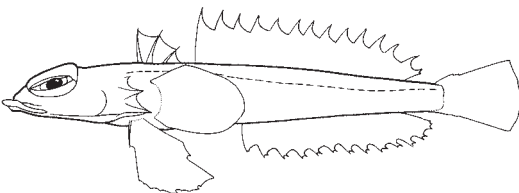


Habitat, biology, and fisheries: Dragonets are benthic fishes of tropical and temperate waters. Most species live on sand or mud, but a few occur between seagrass, on bottoms consisting of larger gravel or on rocky or coral reefs. The depth distribution ranges from very shallow water (even tide pools) to 900 m. Dragonets are taken as bycatch in bottom trawls, but are only locally marketed. Some species are commercially used in aquarium fish trade. Family classification according to Fricke (2002).

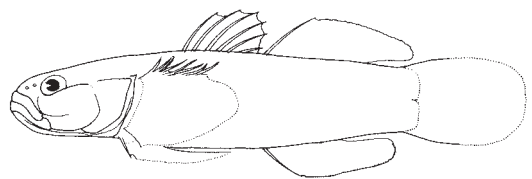
Similar families occurring in the area

Draconettidae: lack the strong spine with additional points on the preopercle but have a strong, simple spine each on the opercle and subopercle.

Gobiidae: lack the strong spine on the preopercle; body usually scaly; pelvic fins fused to a ventral disc.

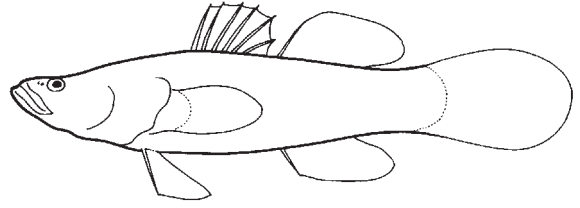


Draconettidae



Gobiidae

Eleotridae: lack the strong spine on the preopercle; body usually scaly.



Eleotridae

Key to the species of Callionymidae occurring in the area

- 1a. Operculum with a free flap of skin (Fig. 1), which may be connected to the body in its upper half → 2
- 1b. Operculum without a free flap of skin → 3

- 2a. Lower lip with large erect papillae (Fig. 2); sides of body without a ventrolateral fold of skin *Draculo shango*
- 2b. Lower lip without papillae; sides of body with a ventrolateral fold of skin consisting of disconnected segments *Protogrammus sousai*

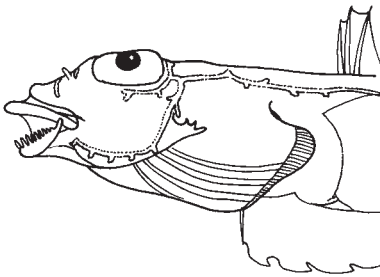


Fig. 1 operculum with free flap of skin

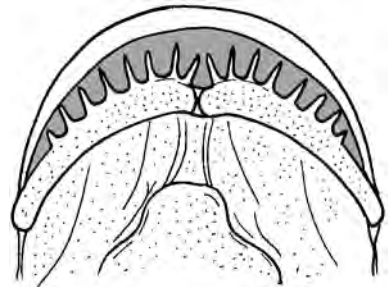


Fig. 2 lower lip of *Draculo shango*

- 3a. Preopercular spine only consisting of main tip, without additional dorsal or basal points (Fig. 3); lateral line double along sides of body, with many long dorsal and ventral branches which are branched themselves *Paracallionymus costatus*
- 3b. Preopercular spine with 1 to 6 dorsal points additional to the main tip, occasionally also with a basal antrorse tip (Fig. 4); lateral line single, branches (if any) very short, not branched themselves → 4

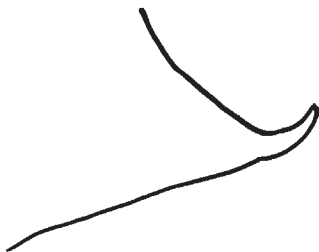


Fig. 3 simple left preopercular spine of *Paracallionymus costatus*



Fig. 4 left preopercular spines with additional points

- 4a. Second dorsal-fin rays branched (in specimens longer than 2 cm) (Fig. 5); gill opening sublateral in position (Fig. 6); no (or very small) membrane behind last spine of first dorsal fin (Fig. 7) → 5
- 4b. Second dorsal-fin rays unbranched (except for last which is divided through its base) (Fig. 8); gill opening dorsal in position (Fig. 9); membrane behind last spine of first dorsal fin present (Fig. 10) → 7

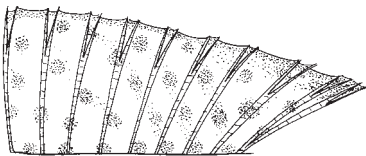


Fig. 5 second dorsal-fin rays distally branched

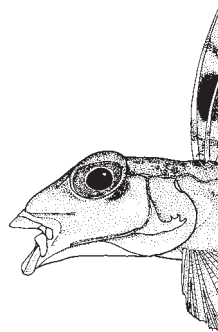


Fig. 6 gill opening sublateral in position

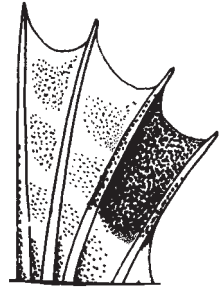


Fig. 7 no or small membrane behind first dorsal fin

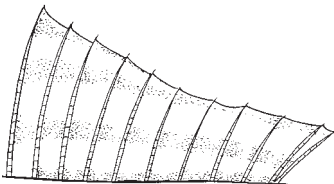


Fig. 8 second dorsal-fin rays unbranched

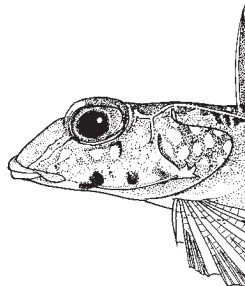


Fig. 9 gill opening dorsal in position



Fig. 10 large membrane behind first dorsal fin

- 5a. Anal fin consistently with 7 rays, the last divided through its base; first spine of first dorsal fin filamentous in males; caudal fin without filaments; preopercular spine with 2 dorsal points additional to the main tip *Synchiropus valdiviae*
- 5b. Anal fin with 8 rays (rarely 7 or 9), the last divided through its base; first dorsal fin without filaments in males; caudal fin with 2 short median filaments in the male; preopercular spine with 1 (rarely 2) dorsal points additional to the main tip → 6
- 6a. Second dorsal fin with 9 oblique dark stripes; dorsal half of caudal fin with 4 oblique dark streaks, caudal fin distally not black *Synchiropus* sp.
- 6b. Second dorsal fin without oblique dark stripes, but pale or with irregular spots; caudal fin more or less pale, distally black *Synchiropus phaeton*

7a. First dorsal fin with 3 spines (Fig. 11)
..... *Callionymus risso*

7b. First dorsal fin with 4 spines (Fig. 12) . . . → 8

8a. Second dorsal fin with 6 or 7 soft rays (the last divided through its base); male with vertical blue streaks along sides of body *Callionymus pusillus*

8b. Second dorsal fin with 8 to 10 soft rays (the last divided through its base); no vertical blue streaks along sides of body → 9

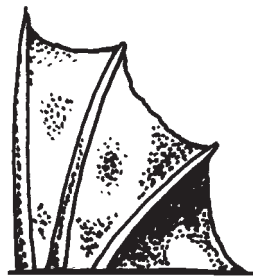


Fig. 11 first dorsal fin with 3 spines

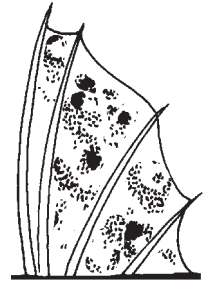


Fig. 12 first dorsal fin with 4 spines

9a. Second dorsal fin with 10 soft rays (the last divided through its base) . . . *Callionymus reticulatus*

9b. Second dorsal fin with 9 soft rays (the last divided through its base) → 10

10a. Anal fin with 8 rays (the last divided through its base) *Callionymus bairdi*

10b. Anal fin with 9 rays (the last divided through its base) → 11

11a. Second dorsal fin distally convex, with horizontal rows of black blotches (Fig. 13) *Callionymus maculatus* (male)

11b. Second dorsal fin distally straight, without large black blotches → 12

12a. First dorsal fin elongate, much higher than second dorsal fin (Fig. 14)
. *Callionymus lyra* (male)

12b. First dorsal fin not elongate, lower than second dorsal fin → 13

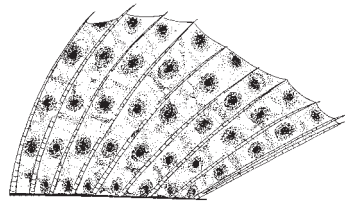


Fig. 13 convex second dorsal fin in male of *Callionymus maculatus*



Fig. 14 elongate first dorsal fin in male of *Callionymus lyra*

13a. Second dorsal fin with a horizontal dusky streak; dorsal points on preopercular spine with a small basal hook (Fig. 15); head without a dusky streak running from eye to premaxilla *Callionymus lyra* (female)

13b. Second dorsal fin plain pale; dorsal points on preopercular spine without a basal hook (Fig. 16); head with a dusky streak running from eye to premaxilla *Callionymus maculatus* (female)















Fig. 15 left preopercular spine of *Callionymus lyra*



Fig. 16 left preopercular spine of *Callionymus maculatus*

List of species occurring in the area

The symbol  is given when species accounts are included.

-  *Callionymus bairdi* Jordan, 1888.
-  *Callionymus lyra* Linnaeus, 1758.
-  *Callionymus maculatus* Rafinesque, 1810.
-  *Callionymus pusillus* Delaroche, 1809.
-  *Callionymus reticulatus* Valenciennes in Cuvier and Valenciennes, 1837.
-  *Callionymus risso* Lesueur, 1814.
-  *Draculo shango* (Davis and Robins, 1966).
-  *Paracallionymus costatus* (Boulenger, 1898).
-  *Protogrammus sousai* (Maul, 1972).
-  *Synchiropus phaeton* (Günther, 1861).
-  *Synchiropus valdiviae* (Trunov, 1981).
-  *Synchiropus* sp. (to be described by R. Fricke).

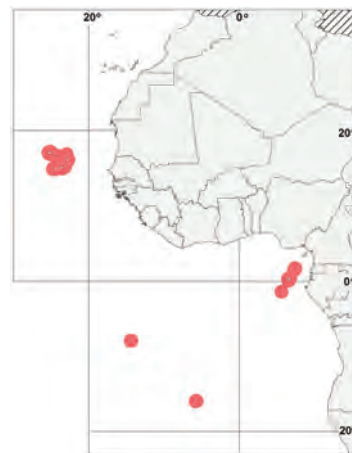
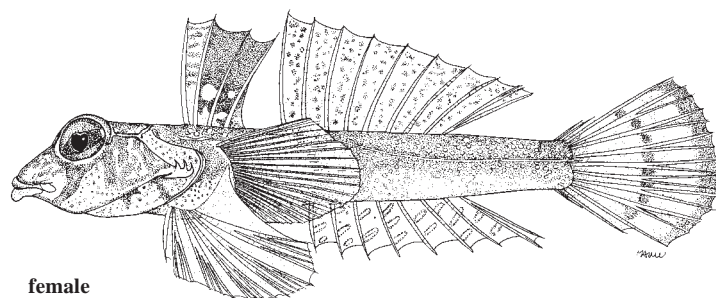
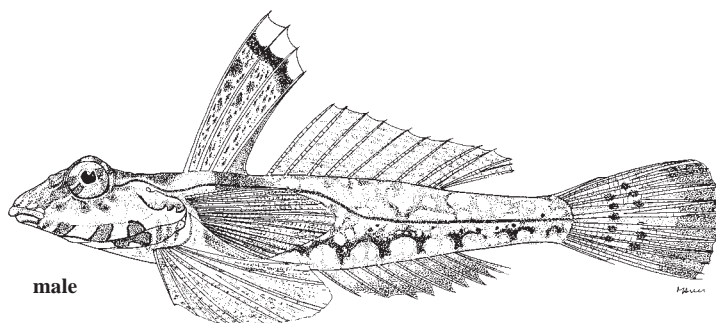
References

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- Fricke, R.** 1985. *Protogrammus*, a new genus of dragonets (Callionymidae), with a redescription of *P. sousai* from Great Meteor Bank, Eastern Atlantic. *Japanese Journal of Ichthyology*, 32(3): 294–298.
- Fricke, R.** 2002. Annotated checklist of the dragonet families Callionymidae and Draconettidae (Teleostei: Callionymoidei), with comments on callionymid fish classification. *Stuttgarter Beiträge zur Naturkunde*, (A)645: 1–103.

***Callionymus bairdi* Jordan, 1888**

En – Baird's dragonet (AFS: Lancer dragonet); **Fr** – Dragonet de Baird.

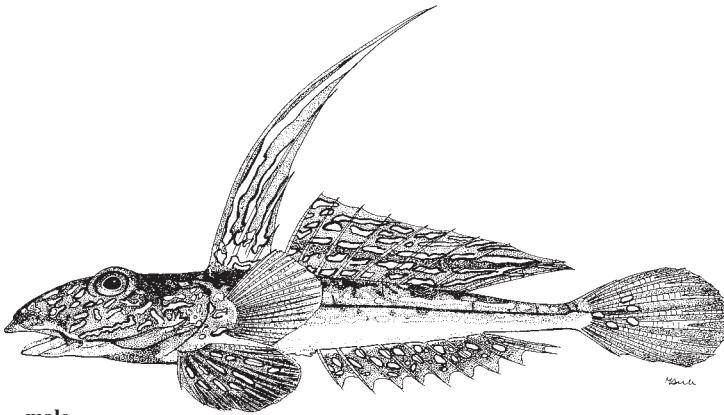
Maximum total length about 10 cm. Preopercular spine with an antrorse tip at its base and 2 to 8 curved points on its dorsal margin, additional to the main tip. First dorsal fin with 4 spines, high in the male, without filaments, low in the female; second dorsal fin with 9 or 10 soft rays, the last divided through its base, the posterior 1 to 3 may be branched; anal fin with 8 (or 9) soft rays, the last divided through its base; pectoral fin with 18 to 24 soft rays. Brown, with small dark saddles and variable dusky mottlings. First dorsal fin in male brown, distally white, membranes with dark blotches and streaks. Found at depths of 0.6 to 91 m (young specimens shallower than 15 m, older specimens deeper). Cape Verde Islands, São Tomé and Príncipe, Ascension Island, St Helena; Canada south to Brazil in western Atlantic.



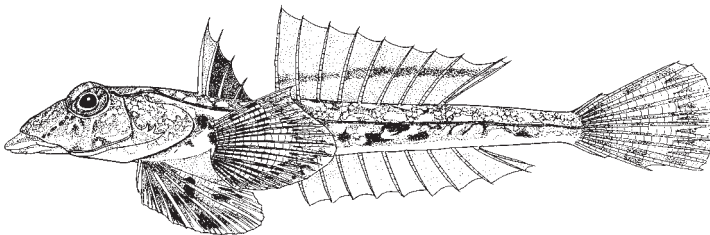
***Callionymus lyra* Linnaeus, 1758**

En – Dragonet; **Fr** – Dragonet lyra; **Sp** – Primita.

Maximum total length about 30 cm. Preopercular spine with an antrorse tip at its base and 2 (or 3) large points with small basal hooks on its dorsal margin, additional to the main tip. First dorsal fin with 4 spines, very high in the male, low in the female; second dorsal and anal fins with 9 soft rays, the last divided through its base. Pectoral fin with 19 to 23 soft rays. Sand yellow to brown, sides and back with brown marblings and lines. Sides in male with brilliant blue streaks. Breast dark grey in male. Found on sand at depths of 1 to 440 m. Iceland and Norway south to Canary Islands and Mauritania; Mediterranean and Black seas.



male

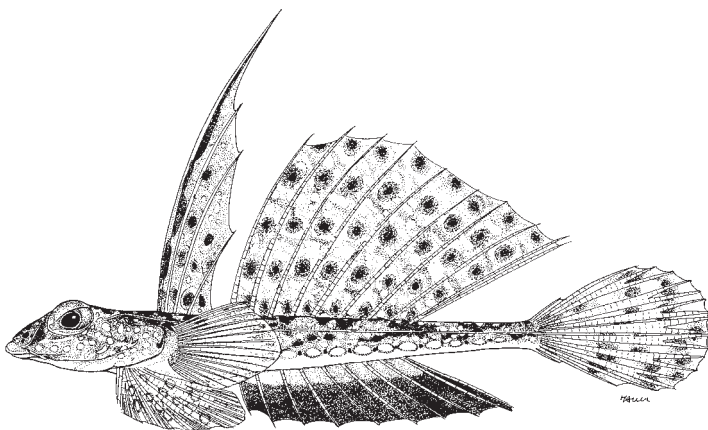


female

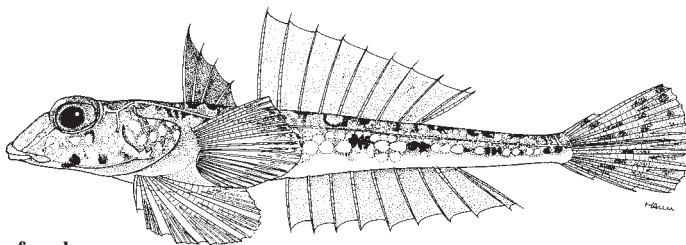
***Callionymus maculatus* Rafinesque, 1810**

En – Spotted dragonet; **Fr** – Dragonet tacheté; **Sp** – Lagarto.

Maximum total length about 16 cm. Preopercular spine with an antrorse tip at its base and 2 (or 3) curved points on its dorsal margin, additional to the short main tip. First dorsal fin with 4 spines, high in males, the first spine filamentous, low in females; second dorsal and anal fins with 9 soft rays, the last divided through its base; second dorsal fin distally convex in males, distally straight in females; pectoral fin with 17 to 22 soft rays. Sand yellow to brown, back with small white blotches, sides usually with 2 rows of dark spots. First and second dorsal fins in male with horizontal rows of large black blotches. Found on sand at depths of 22 to 630 m. Iceland and Norway south to Senegal; Mediterranean Sea.



male

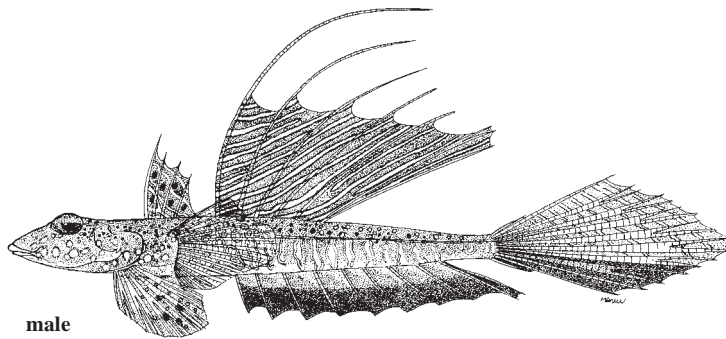


female

***Callionymus pusillus* Delaroche, 1809**

En – Sailfin dragonet; **Fr** – Dragonet voilier.

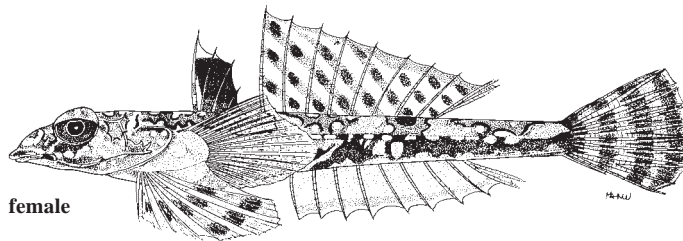
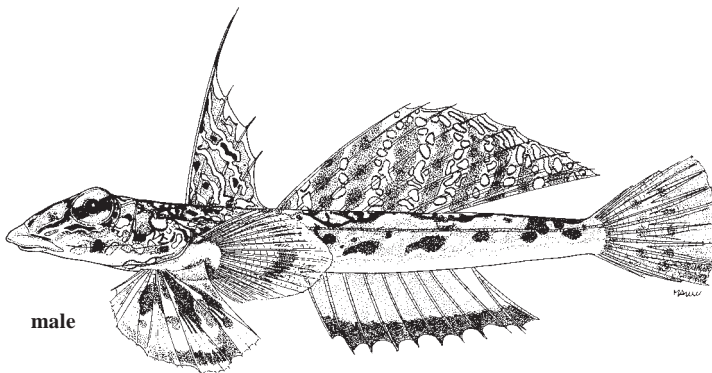
Maximum total length about 15 cm. Preopercular spine with or without a weak antrorse tip at its base and 2 curved points on its dorsal margin additional to the main tip. First dorsal fin with 4 spines, low in both sexes; second dorsal fin with 5 to 7 soft rays, the last divided through its base, high in the male, rays filamentous, much lower and without filaments in the female; anal fin with 8 or 9 soft rays, the last divided through its base; pectoral fin with 18 to 20 soft rays. Sand yellow, with small blackish and white spots. Sides in the male with vertical blue streaks. Anal fin in the male distally black. Found on sand at depths of 0.5 to 10 m. Southern Portugal and southern Spain; Mediterranean and Black seas.



Callionymus reticulatus Valenciennes in Cuvier and Valenciennes, 1837

En – Reticulated dragonet; Fr – Dragonet reticulée.

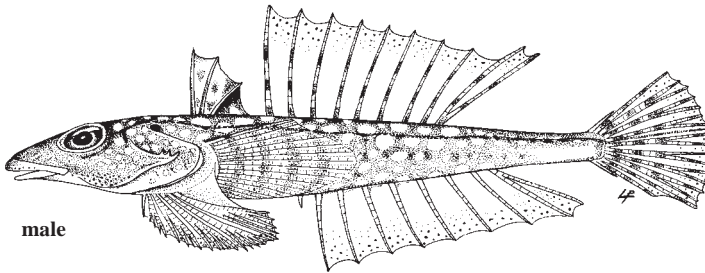
Maximum total length about 15 cm. Preopercular spine with or without a weak antrorse tip at its base and 2 curved points on its dorsal margin additional to the small main tip. First dorsal fin with 4 spines, relatively high in the male, the first spine with a short filament, low in the female; second dorsal fin with 9 soft rays, the last divided through its base, fin high and distally convex in the male, lower and distally straight in the female; anal fin with 9 (or 10) soft rays, the last divided through its base. Brown, back with 4 or 5 dark brown saddles and many small white blotches. Second dorsal fin in male with oblique rows of dark blotches. Anal fin in male distally black. Found on gravel at depths of 0.5 to 110 m. Norway south to Western Sahara; southern Spain in western Mediterranean.



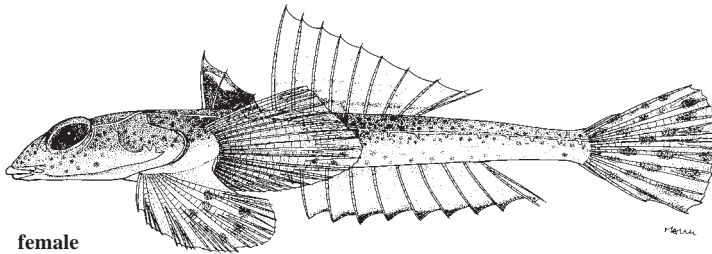
***Callionymus risso* Lesueur, 1814**

En – Risso's dragonet; **Fr** – Dragonet de Risso; **Sp** – Fardatgo.

Maximum total length about 9 cm. Preopercular spine with or without a weak antrorse tip at its base and 2 curved points on its dorsal margin additional to the main tip. First dorsal fin with 3 spines, low in both sexes; second dorsal fin with (7) 8 or 9 soft rays, the last divided through its base; anal fin with 8 or 9 soft rays, the last divided through its base; pectoral-fin rays 16 to 20. Brown, back and sides spotted with black. First dorsal fin light in male, with a few black spots, blackish in female. Found on sand and mud at depths of 5 to 150 m. Southern Portugal and southern Spain; Mediterranean and Black seas.



male



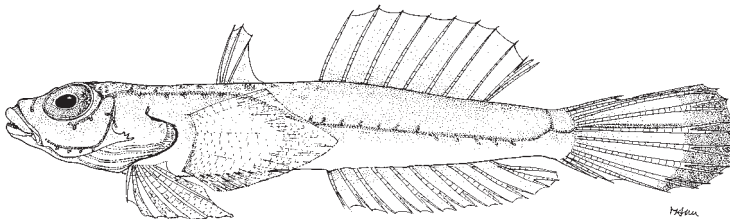
female



***Draculo shango* (Davis and Robins, 1966)**

En – Shango dragonet; **Fr** – Dragonet de Shango.

Maximum total length about 4 cm. Preopercular spine with 1 or 2 curved points on its dorsal margin additional to the main tip. Lower lip with large erect papillae. Operculum with a free flap of skin. First dorsal fin low, with 3 spines. Second dorsal fin with 9 (or 10) soft rays, the last divided through its base. Anal fin with 9 to 11 (usually 10) branched soft rays, the last divided through its base. Pectoral fin with 19 to 22 soft rays. Pale to sand yellow, back occasionally with a few dusky spots. This species is found in the surf zone on fine quartz sand. Nigeria to Cameroon.



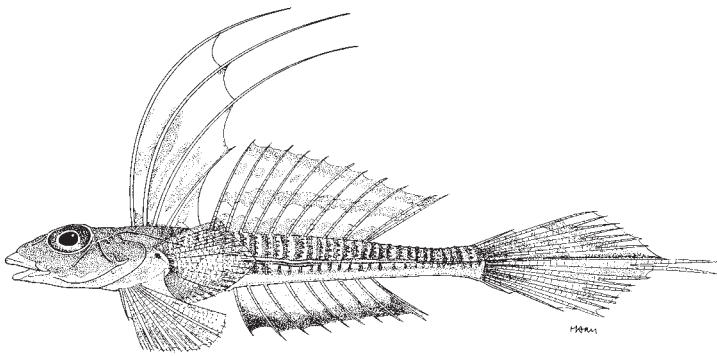
male



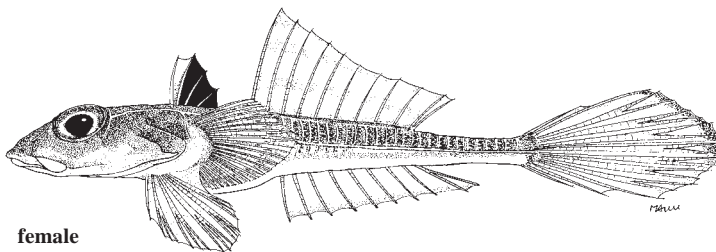
***Paracallionymus costatus* (Boulenger, 1898)**

En – Ladder dragonet; **Fr** – Dragonet lyre du Cap.

Maximum total length about 15 cm. Preopercular spine consisting of a single main tip, without additional basal, dorsal or ventral points. Lateral line double, with numerous long branches. First dorsal fin with 4 spines, high in the male, first to third spines with long filaments, low in the female, without filaments; second dorsal fin with 10 unbranched soft rays, the last divided through its base; anal fin with 9 unbranched soft rays, the last divided through its base; pectoral fin with 19 to 23 soft rays. Brown or grey, sides with dark spots, fins pale except dark areas on the first dorsal fin in females and the anal fin distally dusky in males. Found on sand and mud at depths of 37 to 457 m. Namibia southward around the Cape of Good Hope to southern Mozambique.



male

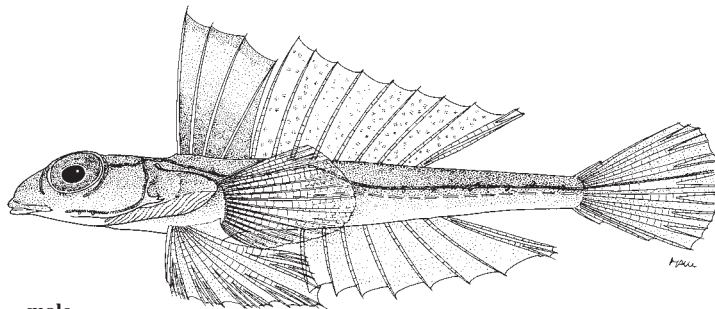


female

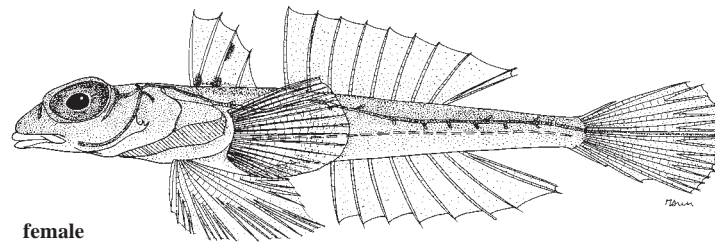
***Protogrammus sousai* (Maul, 1972)**

En – Meteor dragonet; **Fr** – Dragonet de Météor.

Maximum total length about 7 cm. Preopercular spine with a weak antrorse tip or a sharp keel at its base and one curved point on its dorsal margin additional to the main tip. Operculum with a free flap of skin which is attached to the body in its upper half. Sides of body with a ventrolateral fold of skin consisting of disconnected segments. First dorsal fin with 4 spines, but without filaments; second dorsal fin with 9 unbranched soft rays, the last divided through its base; anal fin with 8 unbranched soft rays, the last divided through its base; pectoral fin with 20 or 21 soft rays. Caudal fin distally convex, without filaments. Found on sand at 310 to 320 m depth. Known only from Great Meteor Seamount.



male



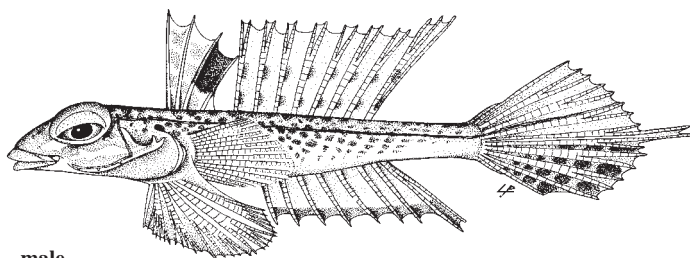
female



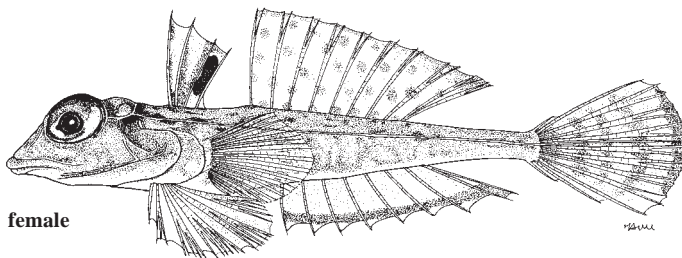
Synchiropus phaeton (Günther, 1861)

En – Phaeton dragonet; **Fr** – Dragonet de Phaeton; **Sp** – Lagarto rojo.

Maximum total length about 18 cm. Preopercular spine with an upcurved main tip and 1 additional curved point on its dorsal margin. First dorsal fin with 4 spines, without filaments; second dorsal fin with 9 (or 10) branched soft rays, the last divided through its base; anal fin with (7) 8 (or 9) unbranched soft rays, the last divided at its base; pectoral fin with 18 to 25 soft rays; caudal fin distally convex in females, with 2 short distal filaments in males. Pale yellow to orange or rose pink, with irregular markings; first dorsal fin with a black blotch on third membrane; second dorsal fin pale or with irregular dark spots; anal fin with a distal black streak; caudal fin distally black. Found on mud at depths of 99 to 650 m. Azores and Portugal south to Gabon; Mediterranean Sea.



male

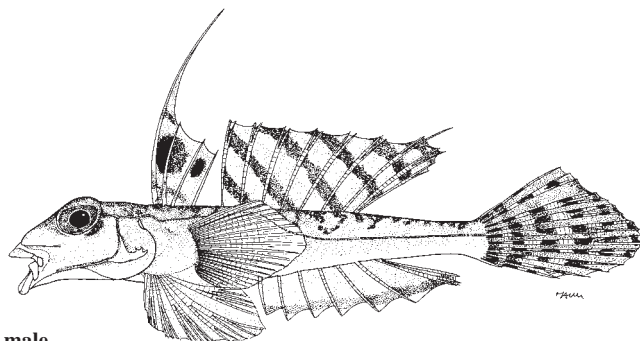


female

***Synchiropus valdiviae*** (Trunov, 1981)

En – Valdivia dragonet; **Fr** – Dragonet de Valdivia.

Maximum total length about 22 cm. Preopercular spine with an upcurved main tip and 2 additional curved points on its dorsal margin. First dorsal fin with 4 spines, first spine filamentous in male; second dorsal fin with 8 branched soft rays, the last divided through its base; anal fin with 7 unbranched soft rays, the last divided through its base; pectoral fin with 22 or 23 soft rays. Found on sand at depths of 210 to 235 m. Walvis Ridge, southeast Atlantic.



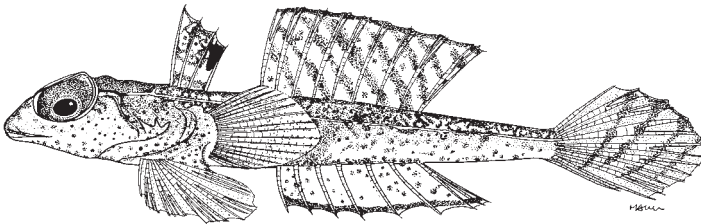
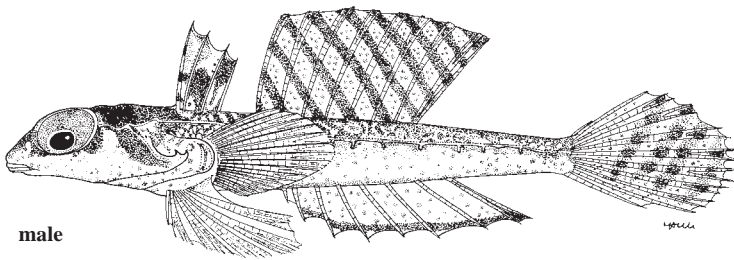
male



***Synchiropus* sp. (to be described by R. Fricke)**

En – Guinea dragonet; **Fr** – Dragonet de Guinée.

Maximum total length about 17 cm. Preopercular spine with an upcurved main tip and 1 (or 2) additional curved point on its dorsal margin. First dorsal fin with 4 spines, without filaments; second dorsal fin with 8 (or 9) branched soft rays, the last divided through its base; second dorsal fin distally convex in males, straight in females; anal fin with (7) 8 unbranched soft rays, the last divided through its base; pectoral fin with 21 to 24 soft rays; caudal fin distally convex or with 2 short distal filaments in females, with several short distal filaments in males. Pale yellow to orange or rose pink, with irregular darker markings and white blotches; first dorsal fin with a black blotch on third membrane; second dorsal fin with 9 oblique dark streaks; anal fin with a distal black streak; dorsal half of caudal fin with 4 oblique dark bands. Found on mud at depths of 200 to 300 m. Guinea-Bissau south to Angola.



female

DRACONETTIDAE**Deepwater dragonets**

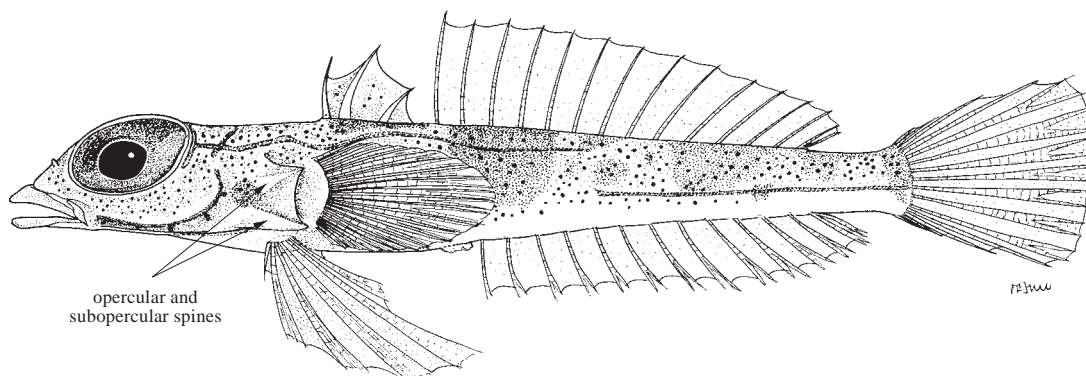
by R. Fricke, Lauda-Königshofen, Germany and Staatliches Museum für Naturkunde, Stuttgart, Germany

A single species occurring in the area.

Centrodraco acanthopoma (Regan, 1904)

Frequent synonyms / misidentifications: None / None.

FAO names: **En** – Atlantic deepwater dragonet; **Fr** – Dragonet profonde de l'Atlantique; **Sp** – Lagarto profundo atlantico.

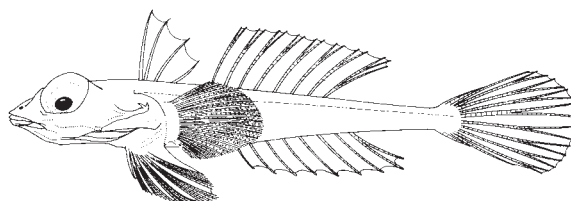


Diagnostic characters: Small fishes rarely reaching more than 8 cm total length. Body elongate and somewhat depressed. **Operculum and suboperculum each with a strong, simple spine.** Preoperculum without spines. **Gill opening wide.** Mouth relatively small and terminal, premaxillary may be protruded ventrally. Eyes large, situated dorsally on head. **Scales absent**, but lateral line present, grooved. Two separate dorsal fins. First dorsal fin with 3 strong spines; second dorsal fin with 14 unbranched soft rays, the last divided at its base. First dorsal fin low in both sexes, without filaments. Anal fin with 13 branched soft rays, the last divided at its base. Pectoral fin large, rounded, with 24 to 26 soft rays. Pelvic fin with 1 spine and 5 branched soft rays, situated below operculum. Caudal fin relatively small, distally straight to slightly convex, without filaments. **Colour:** head and body whitish, with many small dark spots and 4 broad dark grey saddles. First dorsal fin dark in males, pale in females; second dorsal fin with a distal series of dark spots in males, pale in females. Other fins translucent.

Size: Maximum to 8 cm.

Similar families occurring in the area

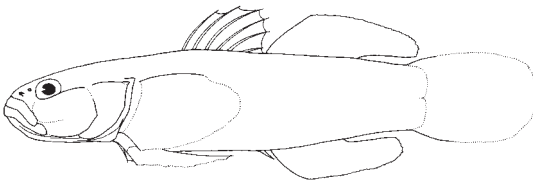
Callionymidae: lack the strong, simple spines on the operculum and suboperculum, but have a preopercular spine with additional points instead.



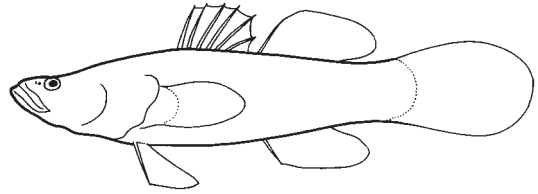
Callionymidae

Gobiidae: lack the strong spines on the operculum and suboperculum; body usually scaly; pelvic fins fused to a ventral disc.

Eleotridae: lack the strong spines on the operculum and suboperculum; body usually scaly.



Gobiidae



Eleotridae

Habitat, biology, and fisheries: Benthic on sand or mud, on the continental slope and on seamounts, at depths of 300 to 505 m in the eastern Atlantic region, but at 384 to 594 m in the western North Atlantic. The species has been found on *Munida* spp. and *Nephrops norvegicus* grounds, at 12° to 13°C. Eastern Atlantic deepwater dragonets are rarely taken as bycatch in bottom trawls.

Distribution: Meteor Bank, Josephine Bank, Madeira, and off Morocco; also in western Atlantic from Florida to Georgia, USA.



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A

Atlantic deepwater dragonet 2825

B

Baird's dragonet 2815

C

CALLIONYMOIDEI 2810

CALLIONYMIDAE 2810,2825*Callionymus bairdi* 2815*Callionymus lyra* 2816*Callionymus maculatus* 2817*Callionymus pusillus* 2818*Callionymus reticulatus* 2819*Callionymus risso* 2820*Centrodraco acanthopoma* 2825**D**

Deepwater dragonets 2825

DRACONETTIDAE 2810,2825*Draculo shango* 2820

Dragonet 2816

Dragonet de Baird 2815

Dragonet de Guinea 2824

Dragonet de Météor 2822

Dragonet de Phaeton 2823

Dragonet de Risso 2820

Dragonet de Shango 2820

Dragonet de Valdivia 2823

Dragonet lyra 2816

Dragonet lyre du Cap 2821

Dragonet profonde de l'Atlantique 2825

Dragonet reticulée 2819

Dragonet tacheté 2817

Dragonet voilier 2818

Dragonets 2810

E**ELEOTRIDAE** 2811,2826**F**

Fardatgo 2820

G**GOBIIDAE** 2810,2826

Guinea dragonet 2824

L

Ladder dragonet 2821

Lagarto 2817

Lagarto profundo atlantico 2825

Lagarto rojo 2823

Lancer dragonet 2815

M

Meteor dragonet 2822

P*Paracallionymus costatus* 2821

Phaeton dragonet 2823

Primita 2816

Protogrammus sousai 2822**R**

Reticulated dragonet 2819

Risso's dragonet 2820

S

Sailfin dragonet 2818

Shango dragonet 2820

Spotted dragonet 2817

Synchiropus phaeton 2823*Synchiropus* sp. 2824*Synchiropus valdiviae* 2823**V**

Valdivia dragonet 2823

A*acanthopoma, Centrodraco* 2825**B***bairdi, Callionymus* 2815**C***costatus, Paracallionymus* 2821**L***lyra, Callionymus* 2816**M***maculatus, Callionymus* 2817**P***phaeton, Synchiropus* 2823*pusillus, Callionymus* 2818**R***reticulatus, Callionymus* 2819*risso, Callionymus* 2820

S

- shango*, *Draculo* 2820
sousai, *Protogrammus* 2822

V

- valdiviae*, *Synchiropus* 2823

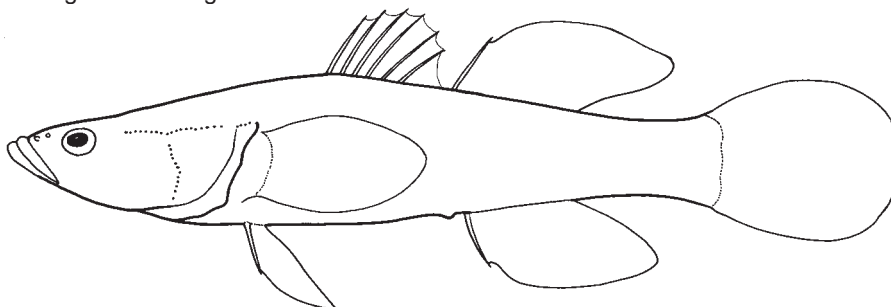
Suborder GOBIOIDEI

ELEOTRIDAE

Sleeper gobies, sleepers

by P.J. Miller, School of Biological Sciences, University of Bristol, Bristol, UK

Diagnostic characters: Small to medium-sized fishes (adults 11 to 30 cm in length) with a cylindrical to somewhat compressed body. Head typically depressed, with widely spaced eyes, and prominent cheeks but head more compressed with narrower cheeks in *Dormitator*. **Six branchiostegal rays.** Two separate dorsal fins, the first with 6 to 8 flexible spines, the second with 1 spine and 8 to 10 soft rays; second dorsal-fin base not longer than the distance between its posterior end and the origin of the caudal fin. Anal fin with 1 spine and 6 to 8 soft rays, the last second dorsal and anal ray divided through base (counted as one). **Pelvic fins (1 spine and 5 soft rays) separate, without connecting membrane between bases.** There is **no body lateral-line system** but canals are retained on the head in *Butis* and *Bostrychus*. All genera have longitudinal and, except in *Dormitator*, transverse rows of free neuromast organs ("sensory papillae"), whose patterns are important in gobiid systematics. **Colour:** fawn or olive with mottling and sometimes paler back than underside or indistinct vertical banding; males tend to be darker especially during the breeding season.

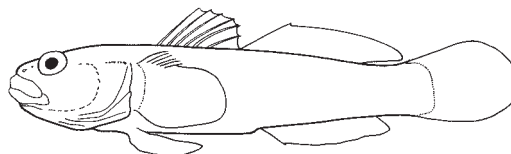


Habitat, biology, and fisheries: Sleeper gobies are typically sit-and-wait predators of invertebrates or small fish, bottom-living in lagoons, estuaries and freshwater ecosystems, *Dormitator* tending to live above the bottom. With establishment of a territory and mating after courtship behaviour, pyriform demersal eggs are deposited in a patch on a nest surface and guarded by the male. After hatching, larvae are normally planktonic for a time before adopting the benthic life. None of the eastern central Atlantic species is of commercial importance, but larger individuals in catches from cast-netting, fish-weirs, or basket-traps, may be sold in local markets.

Remarks: *Guavina guavina* (Valenciennes, 1837) is a tropical western Atlantic species recorded from Macias Nguema (Fernando Po) but is probably a misidentification. *Dormitator pleurops* (Boulenger, 1909) is believed to be based on a specimen of the western Atlantic *D. maculatus*, that was erroneously believed to have originated from West Africa (F. Pezold). These records are doubtful and these species are not included in the key.

Similar families occurring in the area

Gobiidae: pelvic fins usually united into a disc or at least connected by low membrane between bases of last soft rays; base of second dorsal fin much longer than distance from the end of the base to origin of the caudal fin; adult size mostly less than 20 cm.



Gobiidae

Key to species occurring in the area

- 1a. Body with 25 to 30 scales in lateral series → 2
- 1b. Body with 39 to more than 80 scales in lateral series → 3

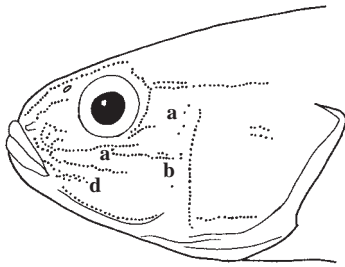


Fig. 1 *Dormitator lebretonis*

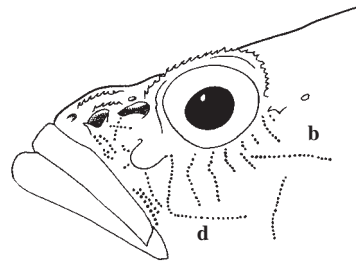


Fig. 2 *Butis koilomatodon*

- 2a. Upper rim of eye, and snout, smooth, without blunt serrations; cheek sensory papillae in longitudinal rows, row a around lower edge of eye (Fig. 1); no head canals; dark blotch above upper rear corner of opercle. *Dormitator lebretonis*
- 2b. Upper edge of eye and snout with rows of blunt serrations; flat fleshy plate between eye and upper jaw; cheek sensory papillae in vertical as well as longitudinal rows, without a longitudinal row around lower edge of eye (Fig. 2); head canals and pores present *Butis koilomatodon*
- 3a. Scales in lateral series 39 to 70; no head canals; a spine at lower corner of opercle (Fig. 3), more or less covered by skin and curving downwards (*Eleotris*) → 4
- 3b. Scales in lateral series 78 to 86; head canals present, with minute pores on snout, interorbit, behind eye, and along rear of cheek; no spine at lower corner of opercle; dark spot in upper corner of caudal-fin base *Bostrychus africanus*
- 4a. Thirty-six to 49 (33 to 54) scales in lateral series; opercle without (Fig. 3) or with (Fig. 4) additional transverse row of (*ot'*) near rear edge, between rows *os* and *oi*; 1 or 2 cheek rows penetrating row *d*. → 5
- 4b. Fifty-five to 58 (53 to 63) scales in lateral series; opercle with additional row *ot'*; no cheek rows through row *d*; additional short tracts of cheek papillae in larger fish. . *Eleotris vittata*
- 5a. Forty-four to 49 (40 to 54) scales in lateral series; 2 rows (3 and 4) penetrating row *d*; opercle with upper row *os* curving down to meet rear end of row *oi* (Fig. 3) . . . *Eleotris daganensis*
- 5b. Thirty-six to 41 (33 to 43) scales in lateral series; opercle with additional transverse row *ot'*; 1 cheek row (4) penetrating row *d* (Fig. 4); some additional short tracts of cheek papillae in larger fish. *Eleotris senegalensis*

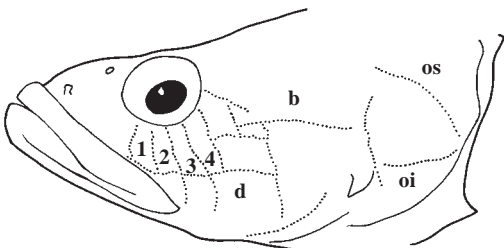


Fig. 3 *Eleotris daganensis*

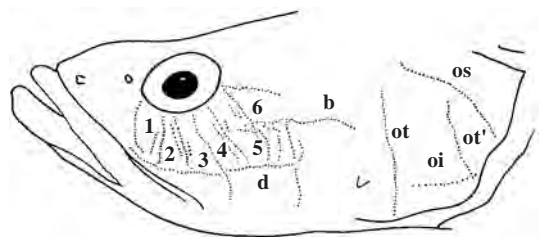


Fig. 4 *Eleotris vittata*

List of species occurring in the area

- Bostrychus africanus* (Steindachner, 1879). To 21.0 cm. Senegal to Angola (Benguela); Gulf of Guinea islands.
- Butis koilomatodon* (Bleeker, 1849). To 8.3 cm in area. Guinea, Nigeria (Port Harcourt), Cameroon; East Africa to the Phillipines.
- Dormitator lebretonis* (Steindachner, 1870). To 12.4 cm. Senegal (St Louis) to Angola (Cunene River); Gulf of Guinea islands; possibly Morocco.
- Eleotris daganensis* Steindachner, 1870. To 12.1 cm. Senegal (Dagana) to Angola (Cunene River).
- Eleotris senegalensis* Steindachner, 1870. To 20.8 cm. Senegal (Dagana) to Angola (Cabinda).
- Eleotris vittata* Duméril, 1861. To 28.0 cm. Senegal to Angola (Cunene); Gulf of Guinea islands.

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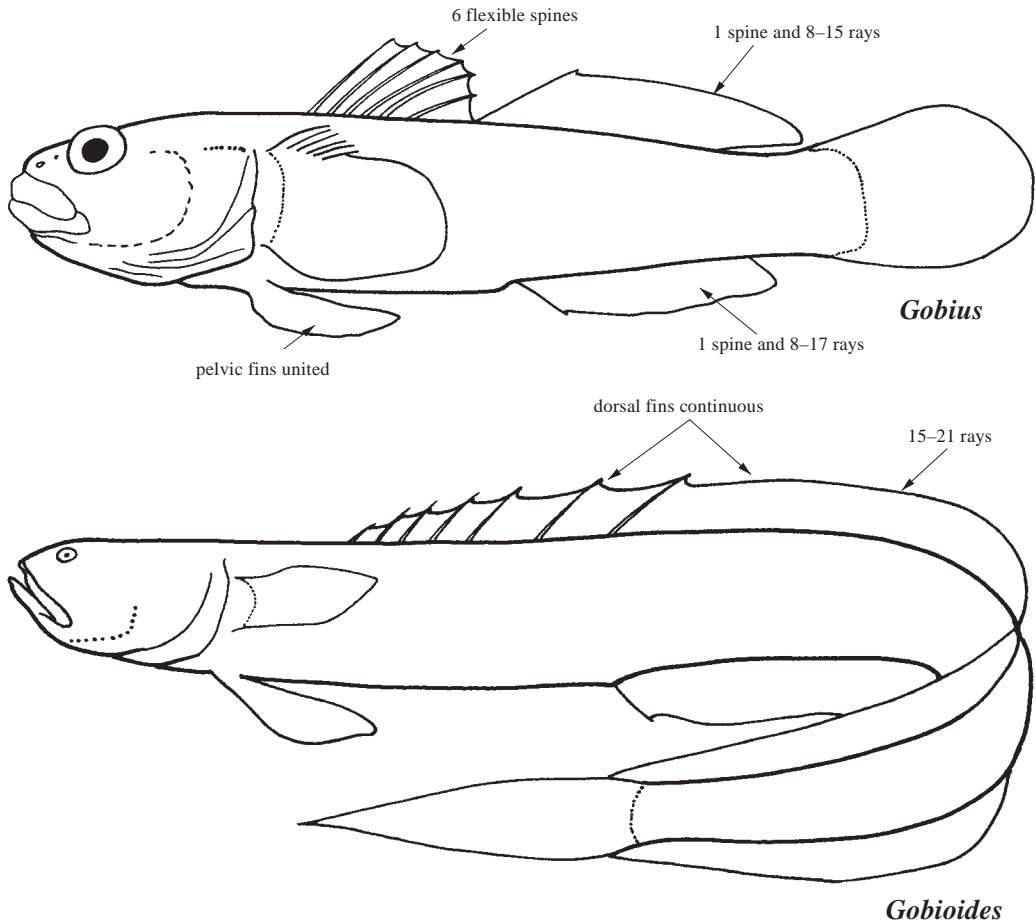
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GOBIIDAE

Gobies

by P.J. Miller, School of Biological Sciences, University of Bristol, Bristol, UK and
E.O. Murdy (Oxudercinae), Department of Biological Sciences, George Washington University, Washington, D.C., USA

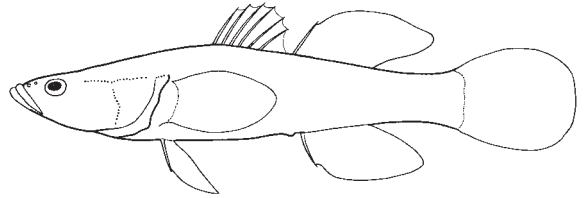
D **Diagnostic characters:** Small to medium-sized fishes (between 2 and 36 cm in length) with a cylindrical, more or less compressed body. Head rounded and depressed; eyes usually close together, dorsolateral; cheeks prominent. **Five branchiostegal rays.** Two dorsal fins, the first with typically 6 flexible spines (not more than 2 in *Crystallogobius*), the second with 1 spine and 8 to 15 segmented rays, but dorsal fins are continuous, with 15 to 21 rays, in *Gobioides*; second dorsal-fin base much longer than distance between its posterior end and the origin of the caudal fin. Anal fin with 1 spine and 8 to 17 soft rays, the last second dorsal and anal ray divided to the base (counted as one). **Pelvic fins (1 spine and 5 soft rays) typically united into a simple disc, completed by an anterior transverse membrane between the spinous rays, or, if mostly separate, still connected by a low transverse membrane between the bases of the fifth soft rays.** There is **no body lateral-line system** but canals are variously retained on the head together with longitudinal and transverse rows of free neuromast organs ("sensory papillae"), whose patterns, together with canal extent, are important in gobiid systematics. **Colour:** is highly variable, fawn or olive with mottling but some species have bands or stripes, and males tend to be darker especially during the breeding season; the nektonic *Crystallogobius* is mostly transparent.



Habitat, biology, and fisheries: Most gobies are small predators on invertebrates or young fish, bottom-living in a variety of offshore marine to freshwater ecosystems, from fine deposits to stony or coralline grounds, intertidal pools, estuaries, lagoons and rivers. The mudskippers are 'amphibious' in mangrove habitats. With establishment of a territory and mating after courtship behaviour, pyriform demersal eggs are deposited in a patch on a nest surface and guarded by the male. After hatching, larvae are normally planktonic for a time before adopting a benthic life. None of the eastern central Atlantic species is of significant commercial importance within this area, but larger individuals of any species occur in catches from cast-netting, weirs, or baskets, and would be sold in local markets, while gobies in the bycatch from offshore trawling may be reduced to fishmeal and oil.

Similar families occurring in the area

Eleotridae: pelvic fins separate, without low connecting membrane between bases of last soft rays; second dorsal-fin base not longer than distance from posterior end of base to origin of caudal fin.



Eleotridae

Key to the subfamilies of Gobiidae occurring in the area

- 1a. Eyes within dorsal profile of head, without lower eyelid fold; pectoral-fin bases flat, flanking side of body; pelvic fins typically united into a disc; fully aquatic → 2
- 1b. Eyes prominent, above dorsal profile of head, with lower eyelid fold; pectoral fins with muscular bases; pelvic fins connected only at bases; semi-aquatic, mud-skipping on mangrove and estuarine flats at low tide **Oxudercinae**
(*Periophthalmus barbarus*)

- 2a. Pelvic disc normally elliptical in outline, not fused to abdomen, or pelvic fins separate except for low connecting membrane; if pelvic disc short and rounded, then upper pectoral rays mostly free from membrane; teeth caniniform, lower lip without fleshy swellings → 3
- 2b. Pelvic disc short, rounded, attached to abdomen for much of length; moveable setiform, and fixed caniniform teeth; no free pectoral rays; lower lip with fleshy swellings **Sicydiinae**

- 3a. Last vertical transverse row of cheek papillae descends behind longitudinal row *a*; if canals present, 1 anterior interorbital canal pore (λ) and oculoscapular pore β usually present (Fig. 1a); vertebrae (including urostyle), at least 27 or 28 **Gobiinae**
- 3b. Row *d* extends rearwards below last vertical transverse cheek row; if canals present, paired anterior interorbital pores (Fig. 1b); no oculoscapular pore β ; vertebrae 26; first dorsal fin and second dorsal fin typically contiguous or slightly separated but continuous in elongate *Gobioides* **Gobionellinae**

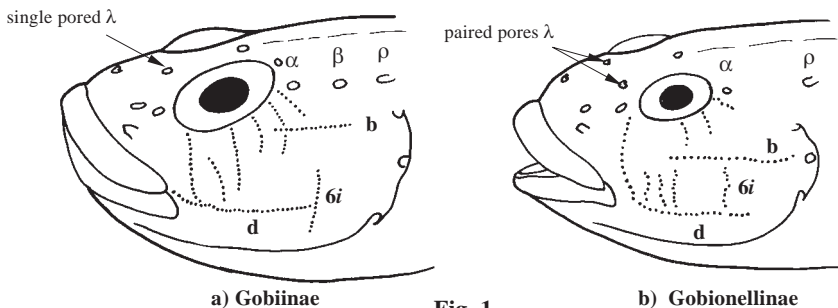


Fig. 1

Key to the species of Gobiinae occurring in the area

- 1a. Body more or less opaque; spinous dorsal rays at least 5, typically 6 → 2
- 1b. Body transparent; not more than 2 or 3 spinous rays in first dorsal fin (absent in females) but second dorsal fin with 1 spine and 18 to 20 soft rays; anal fin with 1 spine and 20 or 21 soft rays; vertebrae (including urostyle) 30 (29 to 31); usually nektonic *Crystallogobius linearis*

- 2a. Cheek with transverse and longitudinal rows of papillae → 3
- 2b. Cheek with only longitudinal rows of papillae → 34

- 3a. Pelvic fins joined in midline, forming a disc with transverse anterior membrane (Fig. 2a) → 4
- 3b. Pelvic fins separate, connected by very shallow transverse posterior membrane between the last soft rays (Fig. 2b) → 30

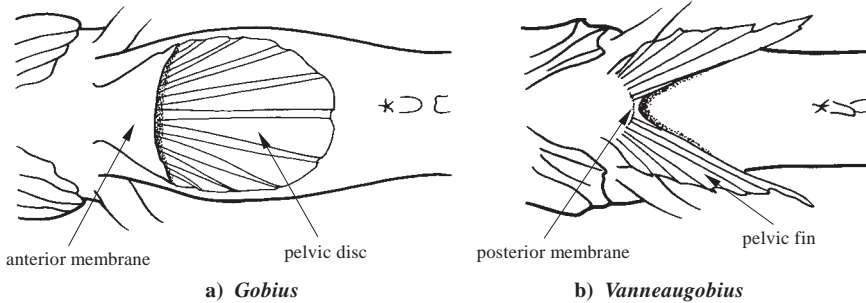


Fig. 2

- 4a. Cheek with only transverse rows descending from lower margin of eye → 5
- 4b. Cheek with longitudinal row a along lower margin of eye (Fig. 3) (*Pomatoschistus*) → 29

- 5a. Lower jaw (preopercular-mandibular) row *i* without short transverse rows behind chin fold; chin barbels absent → 6
- 5b. Lower jaw row *i* with short transverse rows; if latter indistinct, then chin fold with paired barbels (Fig. 4) → 26

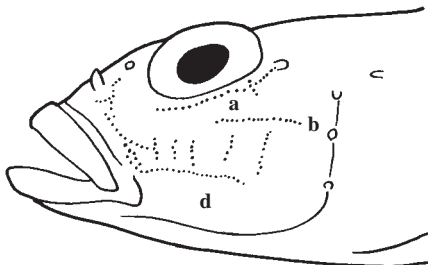


Fig. 3 *Pomatoschistus microps*

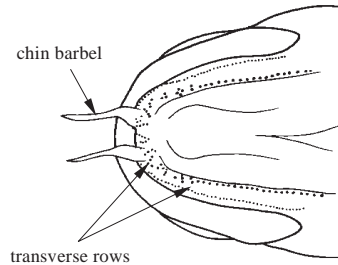


Fig. 4 *Sufflogobius bibarbatus*

- 11a. Second dorsal fin I, 13 or 14; anal fin I, 11 or 12; pectoral fin 18 to 20, uppermost 5 pectoral rays free from membrane, branched; scales in lateral series 53-55 (48 to 57); anterior nostril rim process usually simple ***Mauligobius maderensis***
- 11b. Second dorsal fin I, 10; anal fin I, 8 or 9; pectoral fin 24 to 26, uppermost 9 pectoral rays free and multifid; scales in lateral series 40 to 45; anterior nostril rim process with several branches ***Mauligobius nigri***
- 12a. Anterior nostril rim without processes; pectoral fin uppermost rays within fin membrane; cheek row 6*i* extends downwards to row *e*. **(*Thorogobius*) → 13**
- 12b. Anterior nostril rim with at least a lappet or thin process; uppermost pectoral rays more or less free; row 6*i* ends well above row *e* (Fig. 6b) **(*Gobius*) → 15**
- 13a. Predorsal scales present; first dorsal rays elongate ***Thorogobius angolensis***
- 13b. Predorsal scales absent; first dorsal rays not elongate **→ 14**
- 14a. Second dorsal fin I, 11 (10 to 12); anal fin I, 10; pectoral fin 17 to 19 (17 to 20); scales in lateral series 36 to 38 (33 to 42); head canal pores narrow, pore β less than distance between it and pore α ; head and body with orange spots; first dorsal fin dark spot ***Thorogobius ephippiatus***
- 14b. Second dorsal fin I, 10; anal fin I, 9; pectoral fin 20; scales in lateral series 27 or 28; canal pores wide, pore β equal in diameter to distance between it and pore α ***Thorogobius rofeni***
- 15a. Row x' extends anterior to pore β ; cheek scaled posteriorly; sensory papillae black, lips and cheek marked red ***Gobius cruentatus***
- 15b. Row x' not extending anterior to pore β (Fig. 6b) **→ 16**
- 16a. Cheek longitudinal row *d* continuous **→ 17**
- 16b. Row *d* in 2 horizontal parts (Fig. 6b) **→ 20**
- 17a. First dorsal fin with anterior distal dark spot; scales in lateral series 49 to 55 ***Gobius rubropunctatus***
- 17b. First dorsal fin with or without anterior distal dark spot, but, if latter present, scales in lateral series 32 to 42. **→ 18**
- 18a. Scales in lateral series 59 to 67; pelvic disc anterior membrane with large lateral lobes ***Gobius cobitis***
- 18b. Scales in lateral series not more than 55; pelvic disc without enlarged lateral lobes **→ 19**
- 19a. Nape scaled; first dorsal fin with spot in upper anterior corner, and middle rays more or less elongate; scales in lateral series 32 to 42 ***Gobius niger***
- 19b. Nape scaled; first dorsal fin without upper spot; scales in lateral series 41 to 55 ***Gobius senegambiensis***
- 19c. Nape without scales; first dorsal fin without upper spot, rays more or less elongate; scales in lateral series 32 to 35 ***Gobius roulei***
- 20a. Head and body with longitudinal stripes; scales in lateral series 49 to 54 ***Gobius tetrophthalmus***
- 20b. Head and body without stripes **→ 21**
- 21a. First dorsal fin with pale edge; anterior nostril rim process branched **→ 22**
- 21b. First dorsal fin without pale edge; anterior nostril rim with a thin process or lappet **→ 23**

- 22a. Scales in lateral series 33 to 36 ***Gobius ateriformis***
- 22b. Scales in lateral series 50 to 55 (46 to 59) ***Gobius paganellus***

- 23a. Scales in lateral series 50 to 56; body with longitudinal rows of small dark spots; pelvic disc complete ***Gobius buccichi***
- 23b. Scales in lateral series not more than 50; disc more or less emarginated → 24

- 24a. Pectoral fin upper origin with dark mark longer than deep; anterior nostril with thin process ***Gobius gasteveni***
- 24b. Pectoral mark deeper than long; anterior nostril with triangular lappet → 25

- 25a. Cheek transverse rows before longitudinal row *b* longest anteriorly, posterior rows well above row *d*; pelvic disc distal third emarginate ***Gobius auratus***
- 25b. Cheek transverse rows of similar length, ending near row *d*, except for last row; pelvic disc emarginate for about one-eighth of length ***Gobius xanthocephalus***

- 26a. Chin fold without barbels; pectoral-fin base with vertical pale bar. ***Caffrogobius nudiceps***
- 26b. Chin fold with paired barbels (Fig. 4) → 27

- 27a. Scales in lateral series fewer than 40. (***Nematogobius***) → 28
- 27b. Scales in lateral series 47 to 55; second dorsal fin I, 13 (12 to 14); anal fin I, 12 (11 or 12) ***Sufflogobius bibarbatus***

- 28a. Barbel at least as long as eye diameter; pectoral fin 18 or 19 (17 to 19); predorsal scales about 10 along dorsal midline; brackish and fresh waters . . . ***Nematogobius maindroni***
- 28b. Chin barbels shorter than eye diameter; pectoral fin 22 to 25; predorsal scales 15 to 20; littoral ***Nematogobius brachynemus***

- 29a. Dorsal fins lacking series of conspicuous dark spots, except in rear of first dorsal fin, conspicuous in male; vertebrae 31(30 to 32) ***Pomatoschistus microps***
- 29b. Dorsal fins with series of prominent dark spots in both sexes; vertebrae 30 (30 or 31) ***Pomatoschistus pictus***

- 30a. Two transverse rows of cheek papillae (5*i*, 6*i*) below row *b* (Fig. 7a) . . . (***Wheelerigobius***) → 31
- 30b. One row (5*i* + 6*i*) of cheek papillae below row *b*, at anterior end (Fig. 7b) . . (***Vanneaugobius***) → 32

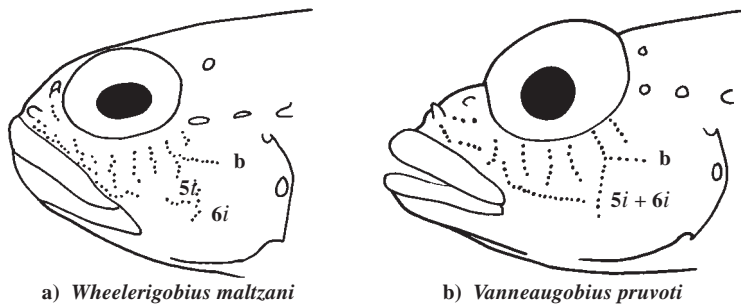


Fig. 7

- 31a. Pectoral-fin rays 18 or 19; scales in lateral series 25 to 27; anterior dorsal row *n* short, with 6 or 7 papillae; first dorsal fin with yellow band; nape uniformly stippled; canal pores elongate; fifth pelvic soft ray branched at about middle of length. ***Wheelerigobius maltzani***
- 31b. Pectoral-fin rays 20; scales in lateral series 29 or 30; anterior dorsal row *n* with 13 or 14; first dorsal fin without yellow band; nape spotted; canal pores little elongate; fifth pelvic soft ray unbranched or bifid near tip. ***Wheelerigobius wirtzi***

- 32a. Posterior oculoscapular canal above opercle; suborbital row *d* without anterior horizontal part; first dorsal-fin spines III and IV very elongate in males, at least to rear of second dorsal fin; second dorsal fin I,10 (10 or 11), anal fin I,9; fifth pelvic soft ray branched once, as long as shortest branch of ray 4; 43 mm ***Vanneaugobius canariensis***
- 32b. No posterior oculoscapular canal above opercle; suborbital row *d* with anterior horizontal part; first dorsal-fin spines III and IV not markedly elongate in males, and first dorsal-fin spine I may be longest of fin; fifth pelvic soft ray unbranched, about half to three-fifths length of ray 4 → 33

- 33a. Second dorsal fin I,11, anal fin I,10 ***Vanneaugobius pruvoti***
- 33b. Second dorsal fin I,10, anal fin I,9 ***Vanneaugobius dollfusi***

- 34a. Anterior transverse membrane present between spinous rays of pelvic disc, or, if lacking or vestigial, caudal peduncle without sharply defined pale band → 35
- 34b. Pelvic disc lacking anterior transverse membrane; caudal peduncle with pale band; cheek papillae few, some rows represented by a single papilla ***Lebetus guilleti***

- 35a. Scales absent, anal fin (I,15) with more rays than second dorsal fin (I,12); brackish water ***Ebomegobius goodi***
- 35b. Scales present → 36

- 36a. One or 2 papillae at or below anterior end of longitudinal cheek row *b* (Fig. 8) → 37
- 36b. One or 2 longitudinal rows (*c*, *cp*) of papillae below row *b* (Fig 9). → 39

- 37a. Head canals present, with extra pores at least in interorbit (Fig. 8); second spinous ray of first dorsal fin elongate → 38
- 37b. Head canals absent ***Priolepis ascensionis***

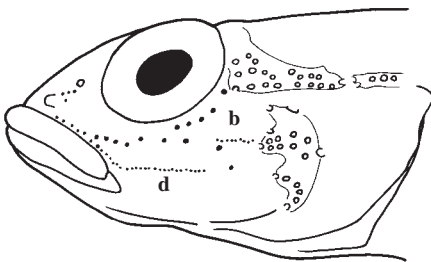


Fig. 8 *Deltentosteus quadrimaculatus*

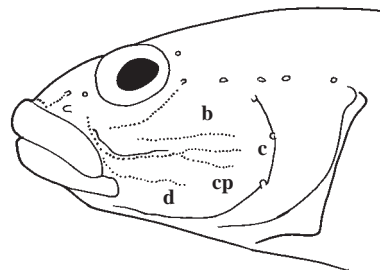


Fig. 9 *Bathygobius soporator*

- 38a. Preopercular canal with 3 pores; predorsal and nape naked; first dorsal fin without rear spot; vertebrae 30. ***Buenia affinis***
- 38b. Preopercular canal greatly expanded with many additional pores (Fig. 8); predorsal and nape scales present; first dorsal fin with black spot in rear corner; vertebrae 33 ***Deltentosteus quadrimaculatus***

- 39a. Head canals present → 40
- 39b. Head canals absent; interorbit with longitudinal series (*p*) of large sensory papillae (Fig. 10) (*Lesueurigobius*) → 44
- 40a. Uppermost pectoral rays within fin membrane; cheek smooth → 41
- 40b. Uppermost pectoral rays free distally from membrane; cheek more or less grooved (*Bathygobius*) → 42

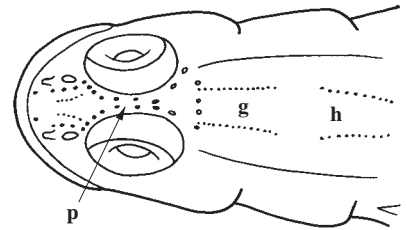


Fig. 10 *Lesueurigobius suerii*

- 41a. Predorsal area with low median ridge; body with series of short vertical dark marks along lateral midline; caudal fin moderately lanceolate; scales in lateral series 30 to 35 *Porogobius schlegelii*
- 41b. Predorsal area without median ridge; body with dark blotches along lateral midline; caudal fin rounded; scales in lateral series 23 to 27 *Favonigobius thomasi*
- 42a. Body with 3 wide oblique dark bands (middle often paler), numerous light striae along body; first dorsal fin distal pale, middle dark band; predorsal scales, 20 to 21 (17 to 25), extending forwards to well before level of preopercle, anterior edge of scaled area convex forwards in dorsal view; second dorsal fin I,9 (8 or 9); anal fin I,8; pectoral fin 19 or 20 (18 to 21) *Bathygobius soporator*
- 42b. Body with 3 broken or continuous longitudinal dark bands, respectively along lateral midline, dorsolateral flank, and adjoining dorsal-fin bases; transverse oblique banding never prominent; no pale striae along sides of body; dorsal fins with proximal narrow dark band and stippled distally; predorsal scales, 15 to 18 (13 to 21) mostly not extending before level of preopercle; second dorsal fin I,10 (9 or 10); anal fin I,9 (8 or 9); pectoral fin 18 or 19 (17 to 20) → 43
- 43a. Longitudinal bands broken into longitudinal blotches corresponding with indistinct darker oblique shading; body below lateral midline typically with few to many tiny intense dark dots; lower jaw with dark spots; predorsal scales, 15 or 16 (13 to 18) with, viewed from above, anterior edge of scaled area more or less deeply concave laterally; pectoral fin 19 (18 to 20), with 3 uppermost rays well free from membrane *Bathygobius burtoni*
- 43b. Longitudinal bands more or less continuous, often intense, with upper bands continuing onto nape; body below lateral midline without tiny intense dark dots; cheek striped longitudinally, lower jaw with pale spots; predorsal scales, 17 or 18 (14 to 21) with anterior edge of scaled area only slightly concave laterally; pectoral fin 18 (17 to 19), with 3 or fewer uppermost rays well free from membrane *Bathygobius casamancus*
- 44a. Nape scaled; sensory papillae anterior dorsal rows *g* and *h* united or only a long continous row present → 45
- 44b. Nape naked; sensory papillae rows *g* and *h* distinct (Fig. 10). → 47
- 45a. Anterior dorsal rows *g* and *h* continuous, forming dermal ridge on each side of midline; coloration with diffuse vertical yellow and dark bands; pectoral rays 22 or more → 46
- 45b. Anterior dorsal row *g* developed but row *h* reduced to a few papillae or absent; coloration with yellow spots; anal fin I,12 to 15; pectoral fin 18 or 19 *Lesueurigobius friesii*
- 46a. Cheek naked; pectoral rays 22 *Lesueurigobius sanzi*
- 46b. Cheek with large scales; pectoral rays 25 or 26 (24 to 28) *Lesueurigobius koumansii*

- 47a. Pectoral rays 17 to 20; anal-fin rays I, 13 or 14; coloration with yellow and blue bands on cheek *Lesueurigobius suerii*
- 47b. Pectoral rays 22 to 24; anal-fin rays I, 14 or 15; cheek longitudinal row *b* distant from preopercle; body with narrow dark brown vertical bands *Lesueurigobius heterofasciatus*

Key to species of Gobionellinae occurring in the area

- 1a. First and second dorsal fins continuous (*Gobioides*) → 2
- 1b. First dorsal fin and second dorsal fin contiguous or separate → 3

- 2a. Jaw teeth in a single row; second dorsal and anal fin soft rays 14; vertebrae 26 *Gobioides africanus*
- 2b. Teeth of lower jaw in 2 rows; second dorsal and anal fin soft rays 19; vertebrae 31 *Gobioides sagitta*

- 3a. Posterior margin of gill chamber with fleshy processes (Fig. 11); lower jaw shorter than upper, mouth inferior; scales in lateral series 60 to 70; caudal fin rounded; brackish and fresh water. *Awaous lateristriga*
- 3b. Posterior margin of gill chamber smooth, without fleshy processes; lower jaw subequal to upper; caudal fin rounded to very lanceolate → 4

- 4a. Caudal fin elongate, lanceolate; longitudinal cheek row *b* extending forward to second transverse row (Fig. 12a); second dorsal rays I, 13; anal rays I, 14; scales in lateral series 60 to 63; inshore and estuarine *Gobionellus occidentalis*
- 4b. Caudal fin rounded or moderately pointed; second dorsal rays I, 11; anal fin rays I, 12; scales in lateral series not more than 40. → 5

- 5a. Fleshy lappet at angle of jaws (Fig. 12b); caudal fin and tip of tongue rounded; pelvic disc anterior membrane with minute papillae along free edge (Fig. 13). *Gnatholepis thompsoni*
- 5b. Angle of jaws without lappet; caudal fin moderately lanceolate; tip of tongue notched; pelvic anterior membrane with more or less smooth free edge *Ctenogobius lepturus*

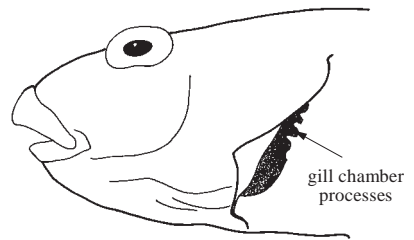


Fig. 11 *Awaous lateristriga*

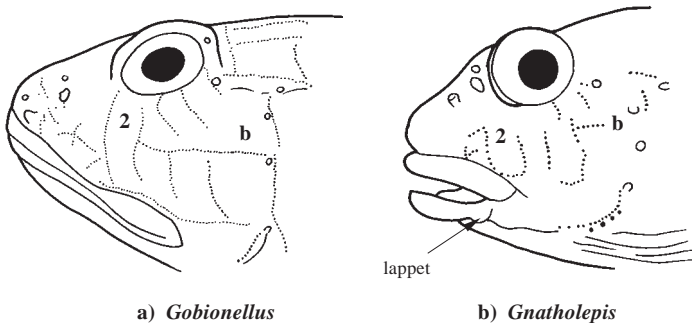


Fig. 12

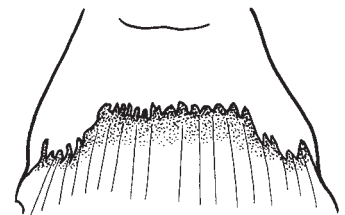


Fig. 13 *Gnatholepis*
(anterior membrane of pelvic disc)

Key to species of Sicydiinae occurring in the area

Note: Freshwater gobiids whose larvae and juveniles may be found in estuaries.

- 1a. Upper jaw without caniniform teeth; upper lip smooth or crenate (Fig. 14a); sides of body scaled anteriorly before origins of second dorsal and anal fins (***Sicydium***) → 2
- 1b. Upper jaw of males with caniniform teeth near corners of mouth; upper lip smooth (Fig. 14b); body not scaled before origins of second dorsal and anal fins . . . ***Parasicydium bandama***

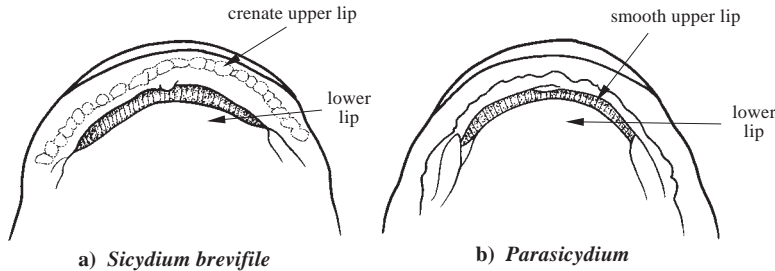


Fig. 14 mouths in ventral view

- 2a. Rear tip of upper jaw not usually below middle of eye; upper jaw with fewer than 50 teeth in a single row on each side → 3
- 2b. Rear tip of upper jaw to below or beyond posterior margin of eye; upper jaw with 60 or more teeth in 2 rows on each side ***Sicydium brevifile***
- 3a. Upper lip crenate; preopercular canal with 2 pores; 2 or 3 darker bands on cheek ***Sicydium crenilabrum***
- 3b. Upper lip smooth (see Fig. 13b for *Parasicydium*); preopercular canal with usually 3 pores; sides of body chequered with small light and dark patches ***Sicydium bustamentei***

List of species occurring in the area

The symbol ← is given when species accounts are included.

GOBIINAE

- Bathygobius burtoni* (O'Shaughnessy, 1875). To 8.0 cm. Ghana, Cameroon, Gulf of Guinea islands (excl. Annobon).
- Bathygobius casamancus* (Rochebrune, 1880). To 6.15 +1.45 cm. Mauritania (Iouik), Cape Verde Island, to Gulf of Guinea islands, to Angola.
- Bathygobius soporator* (Valenciennes, 1837). To 15.0 cm. Senegal and Cape Verde Islands to Angola, and Gulf of Guinea islands; also western Atlantic, North Carolina and Bermuda to Caribbean and South America (to southeast Brazil).
- Buenia affinis* Ijij, 1930. To 6.5 cm. Gran Canaria and Madeira.
- Caffrogobius nudiceps* (Cuvier in Cuvier and Valenciennes, 1837). To 140 mm. Namibia (Swakopmund) to South Africa (East London).
- Chromogobius britoi* Van Tassel, 2001. To 4.25 cm. Canary Islands.
- Corcyrogobius lubbocki* Miller, 1988. To 2.0 cm. Ghana and Annobon.
- Crystallogobius linearis* (von Düben, 1845). Males to 4.7 cm; females to 3.9 cm. Madeira to northern Norway and Mediterranean.

- Deltentosteus quadrimaculatus* (Valenciennes in Cuvier and Valenciennes, 1837). To 8.0 cm. Saharian fishing grounds to southern Bay of Biscay and Mediterranean.
- Didoogobius amicuscaridis* Schliewen and Kováčic, 2008. To 4 cm. São Tomé.
- Didogobius helenae* Van Tassel and Kramer, 2014. To 3.0 cm. Canary Islands.
- Didogobius kochi* Van Tassel, 1988. To 5.8 cm. Canaries and Cape Verde Islands.
- Didogobius wirtzi* Schliewen and Kováčic, 2008. To 3.9 cm. Cape Verdes.
- Ebomegobius goodi* Herre, 1946. To 4.25 cm (holotype). Kribi, Cameroon.
- Favonigobius thomasi* (Boulenger, 1916). To 5.9 cm. Senegal to Democratic Republic of Congo.
- Gobius ateriformis* Brito and Miller, 2001. To 6.75 cm. Cape Verde Islands.
- Gobius auratus* Risso, 1810. To 10.0 cm. Gran Canaria (?) to northern Spain and Mediterranean.
- Gobius bucchichi* Steindachner, 1870. To 10 cm. Morocco and Portugal (Algarve), Mediterranean and Black seas.
- Gobius cobitis* Pallas, 1814. To 27.0 cm. Agadir to western English Channel, Mediterranean and Black seas.
- Gobius cruentatus* Gmelin, 1789. To 18.0 cm. Senegal, Morocco to southwest Ireland and Mediterranean.
- Gobius fallax* Sarato, 1889. To 9.0 cm. Canary Islands (?) and Mediterranean.
- Gobius gasteveni* Miller, 1974. To 12.0 cm. Gran Canaria and Madeira; western English Channel.
- Gobius niger* Linnaeus, 1758. To 15.0 cm. Canary Islands, Senegal (15°N) and Mauritania (Baie de Arguin) to Norway and Baltic Sea; Mediterranean and Black seas; Suez Canal.
- Gobius paganellus* Linnaeus, 1758. To 12.0 cm. Senegal to British Isles, Canary Islands, Madeira and Azores, to western Scotland; Mediterranean and Black seas; Gulf of Eilat.
- Gobius roulei* de Buen, 1928. To 8.75 cm. Canary Islands (Fuerteventura); southwest Portugal, western Mediterranean and Adriatic seas.
- Gobius rubropunctatus* Delais, 1951. To 8.0 cm. Mauritania to Ghana.
- Gobius senegambiensis* Metzelaar, 1919. To 7.6 cm. Morocco (Cansado Bay) to Luanda, Gulf of Guinea Islands.
- Gobius tetrophthalmus* Brito and Miller, 2001. To 7.6 cm. Cape Verde Islands.
- Gobius xanthocephalus* Heymer and Zander, 1992. To 7.6 cm. Canary Islands, Madeira and western Mediterranean.
- Gorogobius nigricinctus* (Delais, 1951). To 4.0 cm. Senegal (Goree) to Ghana, and Annobon.
- Gorogobius stevcici* Kováčic and Schliewen, 2008. To 4.0 cm. São Tomé.
- Lebetus guilleti* (Le Danois, 1913). To 2.4 cm. Gran Canaria and Madeira; Portugal to Kattegat and Belt Seas; western Mediterranean (Banyuls).
- Lesueurigobius heterofasciatus* Maul, 1971. To 4.4 cm. Canaries, Madeira and Morocco (31° to 34°N).
- Lesueurigobius koumansi* (Norman, 1935). To 11.0 cm. Gabon (Cape Lopez) to Angola (Luanda) and possibly northern Namibia.
- Lesueurigobius friesii* (Malm, 1874). To 10.0 cm. Mauritania (Cape Corbiero to Nouakchott); Spain to Kattegat; Mediterranean to Sea of Marmora.
- Lesueurigobius sanzi* (de Buen, 1918). To 11.0 cm. Portugal to Mauritania; western Mediterranean.
- Lesueurigobius suerii* (Risso, 1810). To 5.0 cm. Canary Islands and Morocco to Mediterranean.
- Mauligobius maderensis* (Valenciennes in Cuvier and Valenciennes, 1837). To 15.0 cm. Madeira, Salvages, and Canary Islands.
- Mauligobius nigri* (Günther, 1861). To 8.6 cm. Cape Verde Islands and Equatorial Guinea; probably Gulf of Guinea islands.
- Nematogobius brachynemus* Pfaff, 1933. To 5.7 cm. Senegal (Dakar) to the Congo (Pointe Noire); Annobon.
- Nematogobius maindroni* (Sauvage, 1880) (= *N. ansorgii* Boulenger, 1910). To 8.0 cm. Senegal (St Louis) to Angola (Cunene R.); Gulf of Guinea islands.

- Pomatoschiostus microps* (Krøyer, 1838). To 6.4 cm. Mauritania and Western Sahara (?); Morocco to Norway and Baltic Sea; western Mediterranean.
- Pomatoschiostus pictus* (Malm, 1865). To 5.7 cm. Canaries; Madeira; Spain to Norway (Trondheim) and western Baltic; Mediterranean.
- Porogobius schlegelii* (Günther, 1861). To 14.9 cm. Possibly Cape Verde Islands and Senegal to the Congo (Pointe Noire); Gulf of Guinea islands.
- Priolepis ascensionis* Dawson and Edwards, 1987. To 4.5 cm. Ascension Island.
- Sufflogobius bibarbatus* (von Bonde, 1923). To 13.0 cm. Namibia (Swakopmund) to eastern Cape of Good Hope (St Sebastian Bay).
- Thorogobius angolensis* (Norman, 1935). To 10.7 cm. The Congo (Pointe Noire) to Angola.
- Thorogobius ephippiatus* (Lowe, 1839). To 13.0 cm. Madeira and Canary Islands to Kattegat and Mediterranean.
- Thorogobius rofeni* Miller, 1988. To 8.5 cm (holotype). Gulf of Guinea (off Cameroon).
- Vanneaugobius canariensis* Van Tassel, Miller and Brito, 1988. To 4.3 cm. Madeira and Canaries to Cape Verde Islands and Guinea (off Conakry).
- Vanneaugobius dollfusi* Brownell, 1978. To 3.9 cm. Mediterranean to Morocco (Agadir).
- Vanneaugobius pruvoti* (Fage, 1907). To 3.9 cm. Canary Islands; western Mediterranean.
- Wheelerigobius maltzani* (Steindachner, 1881). To 3.6 cm. Senegal (Rufisque) to Ghana and Annobon.
- Wheelerigobius wirtzi* Miller, 1988. To 3.53 cm. Cameroon (Victoria Bay).

GOBIONELLINAE

- Awaous lateristriga* (Duméril, 1861). To 26.4 cm. Senegal (St Louis) to Angola (Cunene R.), and Gulf of Guinea islands.
- Ctenogobius lepturus* (Pfaff, 1933). To 5.9 cm. Senegal (Joal) to the Congo (Zaire) and Gulf of Guinea islands.
- Gnatholepis thompsoni* (Jordan, 1904). To 8.2 cm. Canary Islands and Madeira to Cape Verde islands and Ghana, Ascension, St Helena; Western Atlantic, from Bermuda and Florida to Lesser Antilles and central America. Considered by some authors a synonym of *Gnatholepis cauerensis* (Bleeker, 1853).
- Gobioides africanus* (Giltay, 1935). To 12.9 cm. Senegal (St Louis) to Democratic Republic of Congo, Gulf of Guinea islands.
- Gobioides sagitta* (Günther, 1862). To 50.0 cm. Senegal to the Congo (Pointe Noire) and Democratic Republic of Congo, Gulf of Guinea islands.
- Gobionellus occidentalis* (Boulenger, 1909). To 19.6 cm. Guinea-Bissau (Gunnel R.) to Gabon (Cape Lopez), Gulf of Guinea islands.

OXUDERCINAE

- 🐡 *Periophthalmus barbarus* (Linnaeus, 1766).

SICYDIINAE

- Parasicydium bandama* Risch, 1980. To 5.3 cm. Côte d'Ivoire to Republic of the Congo.
- Sicydium brefile* Ogilvie-Grant, 1884. To 12.7 cm. Islands of Gulf of Guinea; possibly Cameroon.

Sicydium bustamentei Greeff, 1884. To 9.15 cm. Islands of Gulf of Guinea; possibly Cameroon. Placed in the genus *Awaous* in the subfamily Gobionellinae by some authors.
Sicydium crenilabrum Harrison, 1993. To 8.1 cm. Côte d'Ivoire to Republic of the Congo.

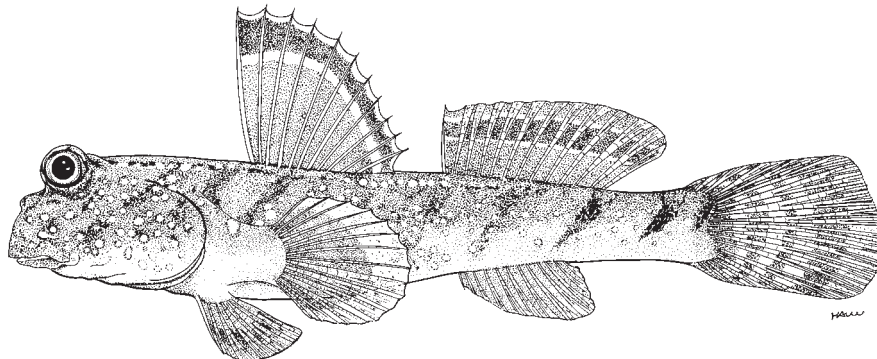
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***Periophthalmus barbarus* (Linnaeus, 1766)**

Frequent synonyms / misidentifications: *Periophthalmus koelreuteri* (Pallas, 1770); *P. papilio* Bloch and Schneider, 1801; *P. gabonicus* Duméril, 1861; *P. erythronemus* Guichenot, 1861 / None.

FAO names: **En** – Atlantic mudskipper; **Fr** – Sauteur de vase atlantique; **Sp** – Saltafango atlántico.



Diagnostic characters: **Eye large and erectile**, eyes close-set; dermal cup covering ventral portion of eye; fleshy ridge located anterior to eyes in midline; posterior naris not prominent, located anterolaterally to eye at lateral edge of fleshy ridge; no pores on head. First dorsal fin with 10 to 14 spines, height moderate; first dorsal-fin spinous ray slightly elongate in males; spinous dorsal-fin pterygiophore formula 3-230100. Second dorsal fin with 1 spine and 10 to 13 soft rays. Anal fin with 1 spine and 8 to 10 soft rays, anal-fin spinous ray much reduced; height of anal fin moderate, but less than that of second dorsal fin. **Pectoral-fin base long and muscular, almost “arm-like”**; pectoral fin broadly rounded and stiff; 12 to 14 rays, lowest 2 to 6 rays branched distally with segmentations close together. **Pelvic fins divided**, frenum absent. Caudal fin with 17 segmented rays, 12 to 15 of them branched, lowest rays thickened distally with segmentations close together. Scales cycloid, covering entire body except for snout, isthmus, and interorbital region; largest scales posteriorly, becoming very small on head and undersurface; scales in regular rows extending onto caudal fin; longitudinal scale count 86 to 107; predorsal scale count 28 to 36. Teeth in both jaws in a single row, those anterior typically larger and pointed; 14 to 25 caninoid teeth in upper jaw, 11 to 21 caninoid teeth in lower jaw; no canine teeth internal to symphysis of lower jaw. Vertebrae 10 precaudal and 16 caudal. **Colour:** head and body tannish to dark brown to blue-grey with blue-white spots on sides, cheeks, snout, and opercle; both dorsal fins with a wide, bright blue distal band edged by narrow white bands.

Size: Maximum possible 25 to 30 cm total length; commonly to 15 cm.

Habitat, biology, and fisheries: Mudskippers are associated typically with shallow coastal areas and are particularly abundant in brackish-water mangrove swamps and mud-flats. Mudskippers are unique among gobies in their semi-terrestrial habits and air-breathing ability. Various adaptations enable them to live and thrive in an aerial environment. Mudskippers can respire in air via modified epithelial surfaces in the buccal and branchial cavities as well as through highly vascularized skin. As long as these surfaces are kept moist, respiration can occur. At low tide, mudskippers will perch on exposed rocks or move about on the surface of the substrate feeding on crustaceans, gastropods, annelids, and insects. The muscular pectoral fins act like arms to enable mudskippers to crawl and even climb. To move quickly, the fish skips by curling and then flipping its powerful tail. It can skim across water by using its tail alone. At high tide, mudskippers typically retreat into burrows in the mud. Mudskippers are preyed upon by snakes and birds. Although they may be locally abundant and captured by various means, no commercial fishery exists but mudskippers may appear in local markets.

Distribution: Intertidal and mangrove areas of the eastern Atlantic from Morocco to Angola including São Tomé and Príncipe (approximately 30°N to 15°S).

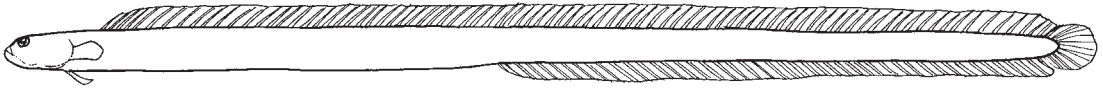


MICRODESMIDAE

Wormfishes

by C.E. Thacker, Natural History Museum of Los Angeles County, Los Angeles, CA, USA

Diagnostic characters: Small (to 27 cm; most 8 cm or less), **elongate fishes with single continuous dorsal fin including 13 to 26 spines and 28 to 66 soft rays.** Head blunt, eyes small, mouth small, with **protruding lower jaw.** Jaw teeth small and straight, pointed. Five branchiostegals. Anal fin with no spines and 41 to 47 soft rays. Caudal fin with 17 soft rays, rounded, usually joined in continuous finfold with dorsal and anal fins. Pectoral fins usually with 12 or 13 soft rays. **Pelvic fins small, separate, with 1 spine and 3 soft rays.** Scales small, cycloid, non-overlapping, absent on head. No lateral line. **Colour:** pink or tan ground colour, with scattered small or large spots or blotches.



Habitat, biology, and fisheries: Wormfishes inhabit shallow, inshore waters, including bays and estuaries, and are found buried in the sediment or in interstitial holes or burrows. They are most often caught by nightlighting or applying ichthyocide to the substrate and waiting for fish to emerge; pink wormfish may also be captured with bait pumps which pull the animals out of the burrows in which they hide. Wormfish are of no importance to commercial fisheries, but may be used as bait by sportfishers.

Remarks: These species are currently placed in the family Gobiidae by Eschmeyer's Catalog of Fishes. The family designated at the time of writing is being retained for the sake of organization.

Similar families occurring in the area

May be confused with elongate, slender gobies (such as *Gobioides*), blennies or small eels (family Congridae in particular). Wormfishes may be distinguished from these families on the basis of their small, separate pelvic fins; small, superior mouth with protruding lower jaw; lack of cirri on head; and single dorsal fin composed of both spines and rays. Distinguishing characters of these families as compared to wormfishes are the following:

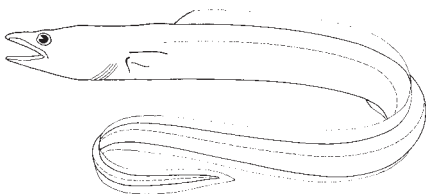
Gobiidae: pelvic fins not separate, fused into a ventral sucking disc; dorsal fin with 6 or fewer spines.

Congridae, Muraenidae: no pelvic fins; no spines.

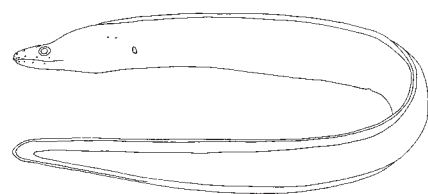


pelvic fins fused into a sucking disc

Gobiidae

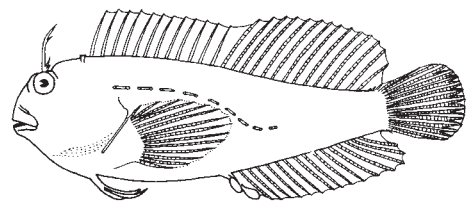


Congridae



Muraenidae

Blenniidae: no scales, caudal fin with 13 or fewer segmented rays.



Blenniidae

Key to species occurring in the area (from Dawson, 1979)

- 1a.** Dorsal spines 13 to 17; total dorsal-fin elements 47 to 50; anal-fin origin between verticals from dorsal-fin elements 18 to 20 ***Microdesmus aethiopicus***
- 1b.** Dorsal spines more than 18; total dorsal-fin elements more than 60; anal-fin origin behind vertical from dorsal-fin element 24 → **2**
- 2a.** Dorsal spines 19 to 22; total dorsal-fin elements 62 to 75 (modally 70); anal-fin origin between verticals from dorsal-fin elements 25 to 31 ***Microdesmus longipinnis***
- 2b.** Dorsal spines 25 to 26; total dorsal-fin elements 77 to 78; anal-fin origin between verticals from dorsal-fin elements 36 to 38 ***Microdesmus africanus***

List of species occurring in the area

Microdesmus africanus Dawson, 1979. To 7.5 cm. Congo River estuary.

Microdesmus aethiopicus (Chabanaud, 1927). To 7 cm. Cameroon, Congo River, Bioko.

Microdesmus longipinnis (Weymouth, 1910). To 27 cm. E Atlantic, W Atlantic, Senegal; widespread; Bermuda, southeast USA, northern Gulf of Mexico to Cayman Islands.

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A		<i>Periophthalmus barbarus</i>	2843
Atlantic mudskipper	2843	<i>Periophthalmus erythronemus</i>	2843
B		<i>Periophthalmus gabonicus</i>	2843
Blenniidae	2844	<i>Periophthalmus koelreuteri</i>	2843
<i>Bostrychus</i>	2827	<i>Periophthalmus papilio</i>	2843
<i>Butis</i>	2827	S	
C		Saltafango atlántico	2843
Congridae	2844	Sauteur de vase atlantique	2843
<i>Crystallogobius</i>	2830	Sleeper gobies	2827
D		Sleepers	2827
<i>Dormitator</i>	2827	W	
<i>Dormitator maculatus</i>	2827	Wormfishes	2844
<i>Dormitator pleurops</i>	2827	B	
E		<i>barbarus, Periophthalmus</i>	2843
ELEOTRIDAE	2827	E	
Eleotridae	2831	<i>erythronemus, Periophthalmus</i>	2843
G		G	
GOBIIDAE	2830	<i>gabonicus, Periophthalmus</i>	2843
GOBIOIDEI	2827	<i>guavina, Guavina</i>	2827
Gobies	2830	K	
Gobiidae	2827,2844	<i>koelreuteri, Periophthalmus</i>	2843
<i>Gobioides</i>	2830,2844	M	
<i>Guavina guavina</i>	2827	<i>maculatus, Dormitator</i>	2827
M		P	
MICRODESMIDAE	2844	<i>papilio, Periophthalmus</i>	2843
Muraenidae	2844	<i>pleurops, Dormitator</i>	2827
P			

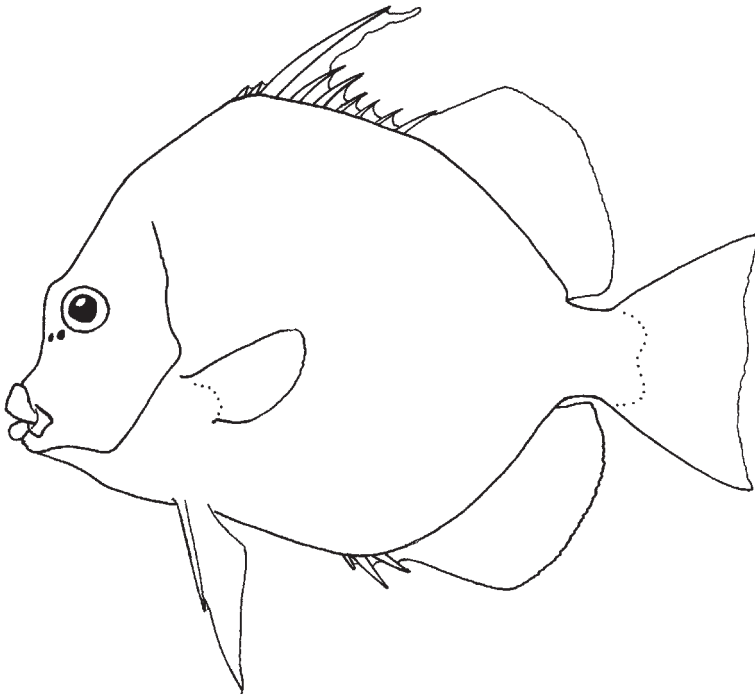
Suborder ACANTHUROIDEI

EPHIPPIDAE

Spadefishes, batfishes

by P.C. Heemstra, South African Institute for Aquatic Biodiversity, Grahamstown, South Africa

Dagnostic characters: **Body disc-shaped, strongly compressed (size to about 32 cm). Head short, its length less than half body depth.** Eye above horizontal axis through mouth; eye diameter subequal to preorbital depth. Mouth small, maxilla not reaching past vertical at front edge of eye; upper jaw not protrusile; **jaws with bands of slender, compressed teeth with a single lanceolate cusp**; no teeth on vomer or palatines. Preopercle weakly serrate; no spines on opercle. Branchiostegal rays 6 or 7, membranes broadly joined to isthmus, the gill opening not extending much below level of pectoral-fin base. Branchial skeleton distinctive in the reduced or absent basihyal (tongue) bone, the interarcual cartilage absent or reduced, and having a comb-like series of short, fleshy gill rakers loosely attached to upper limb of first gill arch; 8 to 10 gill rakers on lower limb. **Dorsal fin single, deeply notched before soft-rayed part, with 9 spines, 15 to 20 rays; anal fin with 3 spines, 15 to 17 rays; caudal fin truncate, slightly convex or double emarginate, with 15 branched rays; pectoral fins shorter than head;** pelvic fins with 1 large spine, 5 branched rays and well-developed scaly axillary process. Scales weakly ctenoid, narrowly exposed; minute scales extending over head and most of soft dorsal, anal and caudal fins; lateral-line scales 45 to 50. Interorbital area convex. Anterior nostril small, round, with fleshy rim, posterior nostril slit-like. Vertebrae 10 + 14. **Colour:** body silvery with 4 to 7 dark vertical bars.



Habitat, biology, and fisheries: Found in a variety of shallow-water habitats, estuaries, harbours and along open coasts over sand, mud and rocky reefs in depths of 10 to 45 m. Biology little known; feed on benthic invertebrates. Caught with trawls and large mesh gillnets.

Remarks: A motley assemblage of disparate fishes. The diagnostic characters above are based on the 2 species known from the area. The family is also represented in the western central Atlantic and Indo-Pacific region. Seven genera are currently assigned to this family.

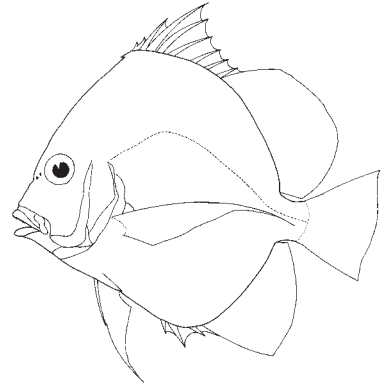
Similar families occurring in the area

Drepanidae: upper jaw very protrusile, forming a downward-pointing tube when protruded; pectoral fins falciform, elongate, reaching rear end of anal-fin base.

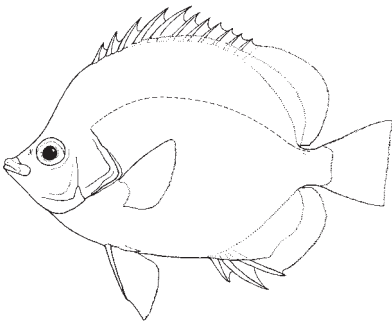
Chaetodontidae: dorsal fin continuous, with 6 to 17 spines, 14 to 34 rays; anal fin with 3 or 4 spines, 15 to 24 rays; branchiostegal membranes separate, narrowly joined to isthmus.

Pomacanthidae: preopercle serrate, with large spine at angle; dorsal fin with 11 to 16 spines, 14 to 23 rays; branchiostegal membranes separate, free from isthmus or narrowly joined to it.

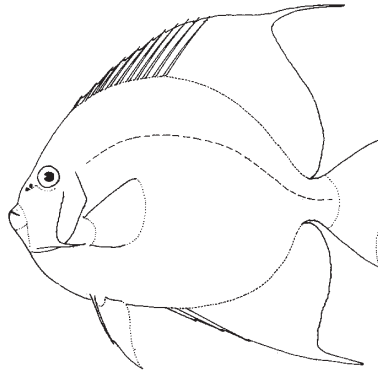
Monodactylidae: body greatly expanded vertically, body depth more than 3 times head length; pelvic fins rudimentary (small juveniles) or absent (adult); horizontal line through mouth bisects eye.



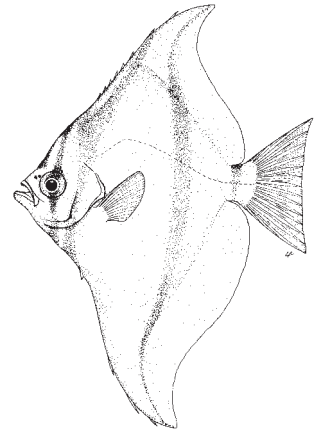
Drepanidae



Chaetodontidae



Pomacanthidae



Monodactylidae

Key to species occurring in the area

- 1a. Dorsal-fin spines 2 to 5 or 6, elongate, flexible, filamentous, reaching past base of first dorsal ray; dorsal-fin rays 18 to 20; caudal peduncle depth subequal to its length; body with 4 or 5 dark bars and dark saddle-blotch on peduncle *Ehippus goreensis*
- 1b. Third dorsal fin spine elongate but not flexible and not reaching past base of first dorsal ray; dorsal rays 21; peduncle depth more than its length; body with 3 or 4 faint dark bars *Chaetodipterus lippei*

List of species occurring in the area

The symbol indicates a species account is included.

Chaetodipterus lippei Steindachner, 1895.

Ehippus goreensis Cuvier, 1831.

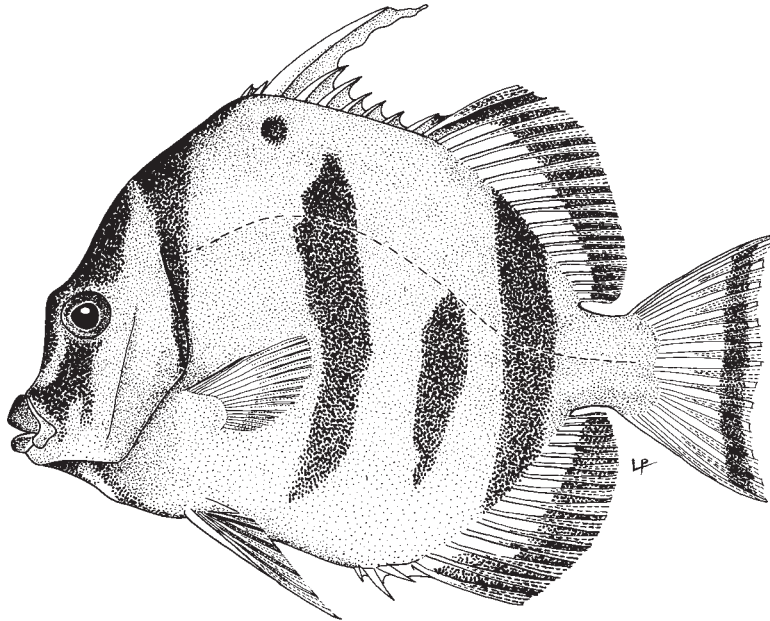
References

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***Chaetodipterus lippei* Steindachner, 1895**

Frequent Synonyms / Misidentifications: None / *Ehippus goreensis*.

FAO names: **En** – West African spadefish; **Fr** – Chèvre de mer noire; **Sp** – Paguala negra.



Diagnostic characters: Dorsal fin with 9 spines, 21 rays, third spine elongate, third and fourth spines thickened; anal fin with 3 stout spines, 15 to 17 rays; second spine longer than third, caudal fin double emarginate; pectoral fins shorter than head; pelvic fins with 1 spine, 5 rays, first ray elongate, distinctly longer than pectoral fin or head. Lateral-line scales about 50. **Colour:** head and body silvery, with 5 to 7 dark bars, first on head from interorbital area over eye to isthmus, second from nape to pelvic fin base, last a dark saddle on peduncle; pelvic fins blackish; median fins dusky.

Size: Maximum 30 cm.

Habitat, biology, and fisheries: Demersal, usually caught in trawls or large mesh gillnets. No information available on biology. Of minor importance to fisheries.

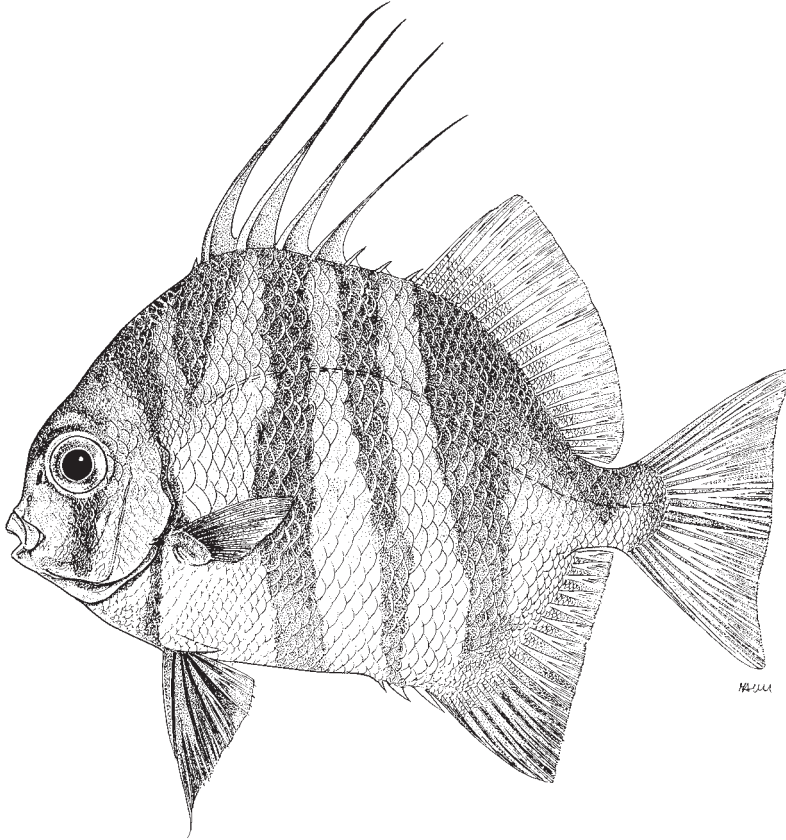
Distribution: Gulf of Guinea to Angola; not listed for São Tomé.



***Ephippus goreensis* (Cuvier, 1831)**

Frequent synonyms / misidentifications: *Chaetodipterus goreensis* (Cuvier, 1831) / None.

FAO names: En – African spadefish; Fr – Chèvre de mer; Sp – Paguala africana.



Diagnostic characters: Dorsal fin with 9 spines and 18 to 20 rays, the second to fifth spines greatly elongated and flexible, interspinous membranes deeply incised; anal fin with 3 spines, 15 to 18 rays; caudal fin double emarginate. Lateral-line scales 55 to 65. **Colour:** head and body silvery, with 6 or 7 dark bars, first on head from interorbital area over eye to isthmus, second from nape to pelvic fin base, last bar a dark saddle blotch on peduncle; pelvic fins blackish; median fins dusky.

Size: Maximum 19 cm.

Habitat, biology, and fisheries: Demersal; usually caught in trawls or large mesh gillnets. Feeds on benthic invertebrates. Of minor importance to fisheries.

Distribution: Senegal to Gabon, Cape Verde Islands, São Tomé, Príncipe.



ANTIGONIIDAE**Deep boarfish**

by P.C. Heemstra, South African Institute for Aquatic Biodiversity, Grahamstown, South Africa

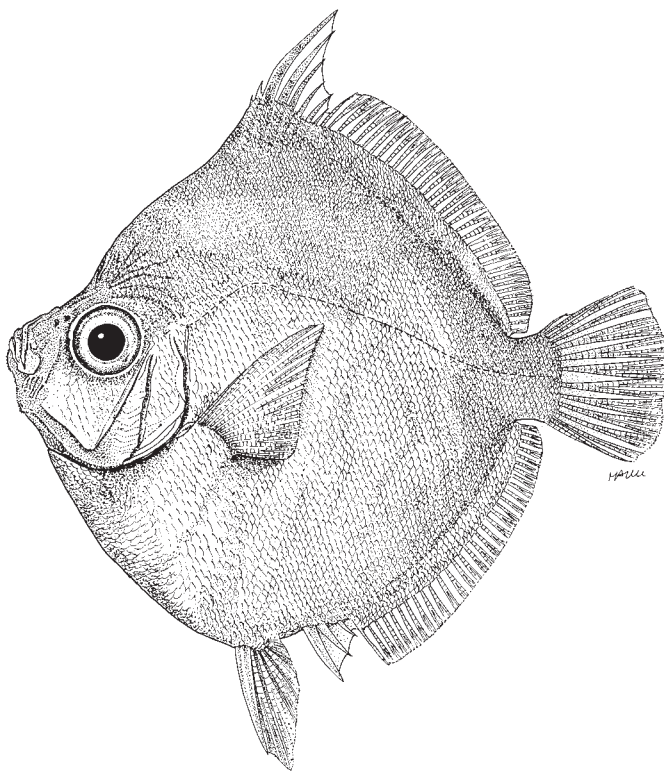
A single species occurring in the area.

***Antigonia capros* Lowe, 1843**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Deepbody boarfish; Fr – Sangleir chevrette; Sp – Ochavo.

Diagnostic characters: Body greatly compressed and elevated, body depth about 3 times head length and 0.8 to 1.0 times in standard length; attains 30 cm. Dorsal head profile concave; snout conical; eye diameter subequal to snout length, 2.0 to 2.6 times in head length; mouth small, protrusile; jaws with 1 or 2 rows of small conical teeth, none on vomer or palatines; **head bones rugose and spiny**; branchiostegal rays 6, the membranes separate, free from isthmus; gills 4, but fifth gill opening greatly restricted; gill rakers 18 to 22 on first gill arch. Dorsal fin notched between spinous and soft parts, with 8 (rarely 7 or 9) strong, grooved spines, and 32 to 36 soft rays; anal fin with 3 short spines, 29 to 33 soft rays; fin rays branched; pectoral fins bluntly pointed, slightly shorter than head, with 13 to 15 rays, uppermost ray short and spine-like; **caudal fin with 10 branched rays**; **pelvic fins with a strong, grooved spine and 5 branched rays**; dorsal, anal and pelvic-fin spines and rays bear numerous minute spinelets and scales. **Body covered with adherent spinoid scales; each scale with a row of spines along rear edge**; most species also have a cluster of short sharp spines on rear half of scale. Lateral line present, but tubed scales are difficult to count. Vertebrae 10+12.

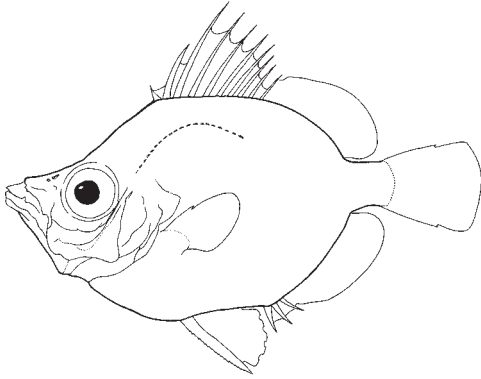


Remarks: The family Antigonidae is here limited to species of *Antigonia*. Previous accounts of *Antigonia* species in various FAO guides have included the species in the family Caproidae with *Capros aper*, but no convincing evidence that these 2 species belong to the same family has been published.

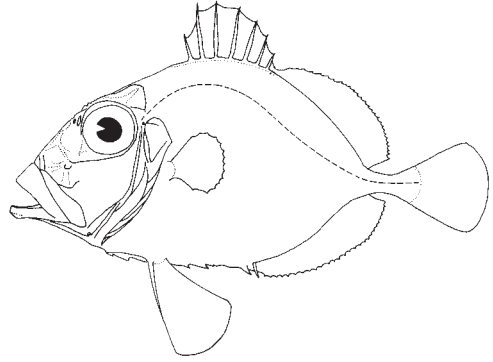
Similar families occurring in the area

Caproidae: body less deep, the depth 1.5 to 1.8 times in standard length; scales with a cluster of long slender spines; mouth large and very protrusile; gills 4 with a patent fifth gill opening; dorsal-fin rays 23 to 25; caudal-fin branched rays 12.

Zeidae: pelvic fins with 6 to 10 rays, with or without a spine; scales rudimentary or absent, or enlarged as bony plates or keeled scutes at base of dorsal and anal fins or midventrally along belly.



Caproidae

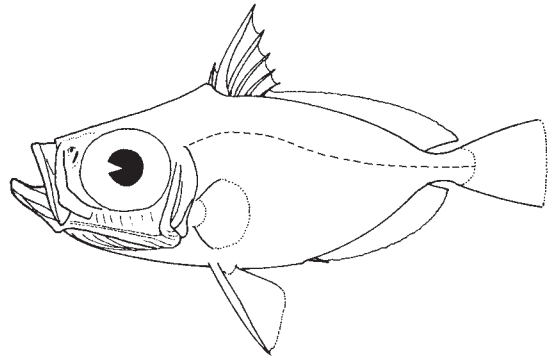


Zeidae

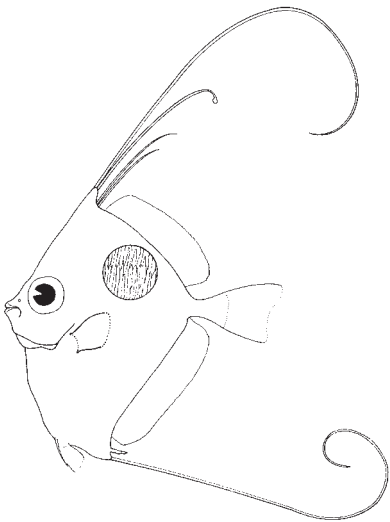
Zeniontidae: body oblong, its depth about equal to head length; pectoral fin short and rounded, its length about half head length; pelvic and second dorsal-fin spines can be locked erect.

Grammicolepidae: Pectoral fins less than half head length; scales vertically elongate, crenate.

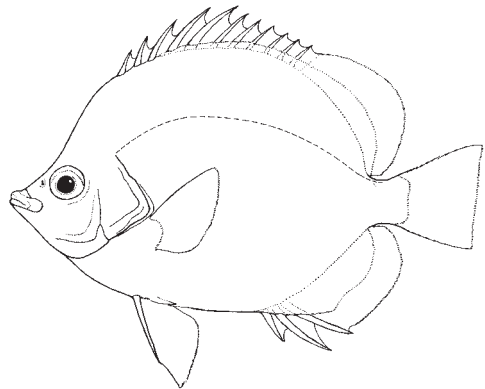
Chaetodontidae: no deep notch in dorsal-fin margin; dorsal-fin spines 11 to 13; scales cycloid or weakly ctenoid; upper jaw slightly protrusile; fin rays and spines smooth.



Zeniontidae



Grammicolepidae

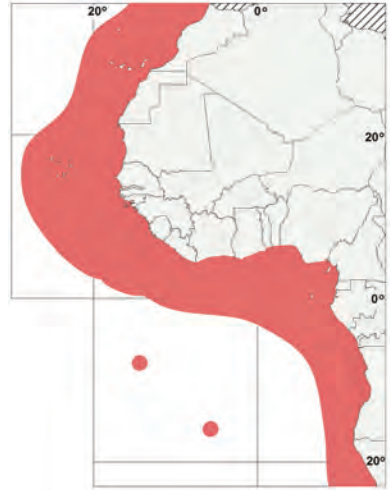


Chaetodontidae

Size: Maximum 30 cm.

Habitat, biology, and fisheries: Demersal fish found near bottom in depths of 50 to 900 m, mainly between 100 and 300 m; usually in aggregations. Feeds on molluscs and crustaceans. Juveniles found in midwater, probably feeding on plankton. Spawns during summer in tropical areas. Not used for food and of no commercial importance.

Distribution: Worldwide in tropical and temperate waters. Eastern Atlantic from France and Azores to Madeira, Canary Islands, Cape Verde Islands, Morocco to South Africa, St Helena and Ascension Island.



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LUVARIDAE

Louvar

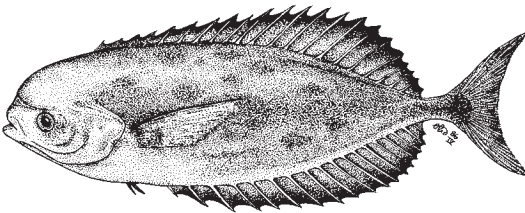
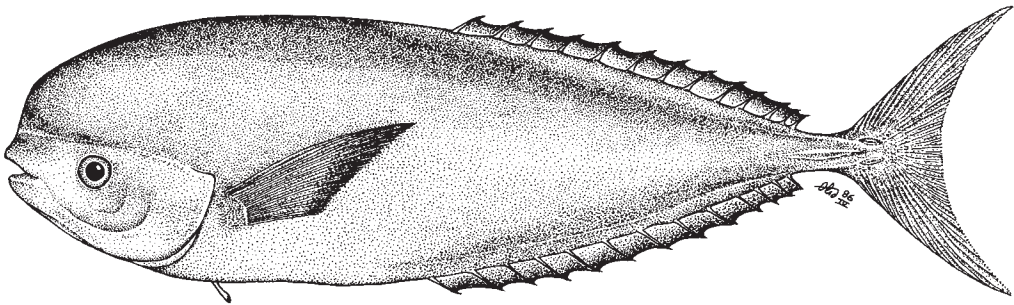
by B.B. Collette, National Marine Fisheries Service, National Systematics Laboratory,
National Museum of Natural History, Washington, DC, USA

A single species in this family.

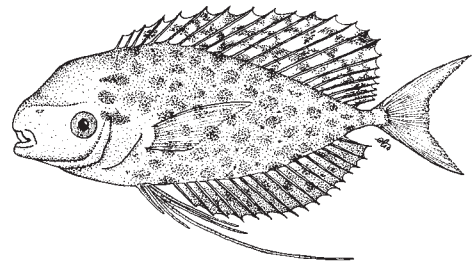
Luvarus imperialis Rafinesque, 1810

Frequent synonyms / misidentifications: None / None.

FAO names: En – Luvar (AFS: Louvar); Fr – Louvureau; Sp – Emperador.



“Luvarella” phase (38.4 cm)

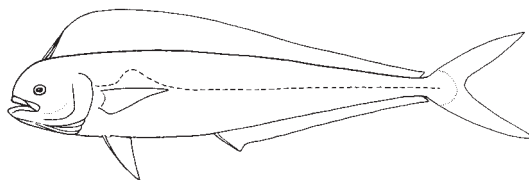


“Astrodermella” phase (9.5 cm)

Diagnostic characters: A large, heavily-built, blunt-snouted species reaching 2 m, commonly 1 m. **Profile of head rising steeply, the eye low, below midpoint of head depth.** Mouth small and toothless in adults. **Dorsal fin large in juveniles, with 22 to 24 rays, originating on the nape, much shorter in adults with 12 to 14 rays, originating in the middle of the body;** anal fin with 15 to 18 rays in juveniles, 13 or 14 rays in adults; pectoral fins well-developed, with 18 rays; pelvic fins in advance of pectoral fins, large in juveniles, rudimentary in adults; **caudal peduncle slender, with a prominent median keel and smaller accessory keels above and below the median keel;** caudal fin lunate. Scales small, scattered, and overlapping in juveniles. Vertebrae 9 precaudal + 13 caudal = 22 total. **Colour:** highly distinctive, **back metallic blue, sides pink-red, and belly silvery with rosy reflections;** dorsal fin pink in front, then blackish; pectoral, anal, and caudal fins pink or red.

Similar families occurring in the area

Coryphaenidae: profile of the snout of adult males is similar but the dorsal fin is much larger and originates on the back of the head; pelvic fins much better developed in adults; caudal peduncle without keels.



Size: Maximum 2 m total length, commonly to 1 m.

Habitat, biology, and fisheries: Oceanic, in deeper waters off continental shelves; sometimes in shallower waters near coasts (where most captures have been made); apparently solitary. Food: jellyfish, ctenophores, and salps; gut extremely long, 5 to 11 times standard length. Spawning in late spring and summer in the Mediterranean. Juveniles go through a dramatic metamorphosis in the shape and sizes of the head and fins leading to the names *hystricinella*, *astrodermella*, and *luvarella* for three stages of juveniles. Captured occasionally with purse seines. Rarely seen in markets.

Distribution: In the eastern Atlantic found from Bergen south to the Azores, Madeira, the Canary Islands and in the Mediterranean Sea. "*Hystricinella*" larvae (8.5 to 11.5 mm standard length) have been reported from 13°45'S to 6°05'E and 15°35'S to 8°36'E but the species appears to be absent from about 17°N to 14°S. Elsewhere, widespread in tropical and subtropical waters of the South Atlantic and northern and southern parts of the Indo-Pacific.

Coryphaenidae



References

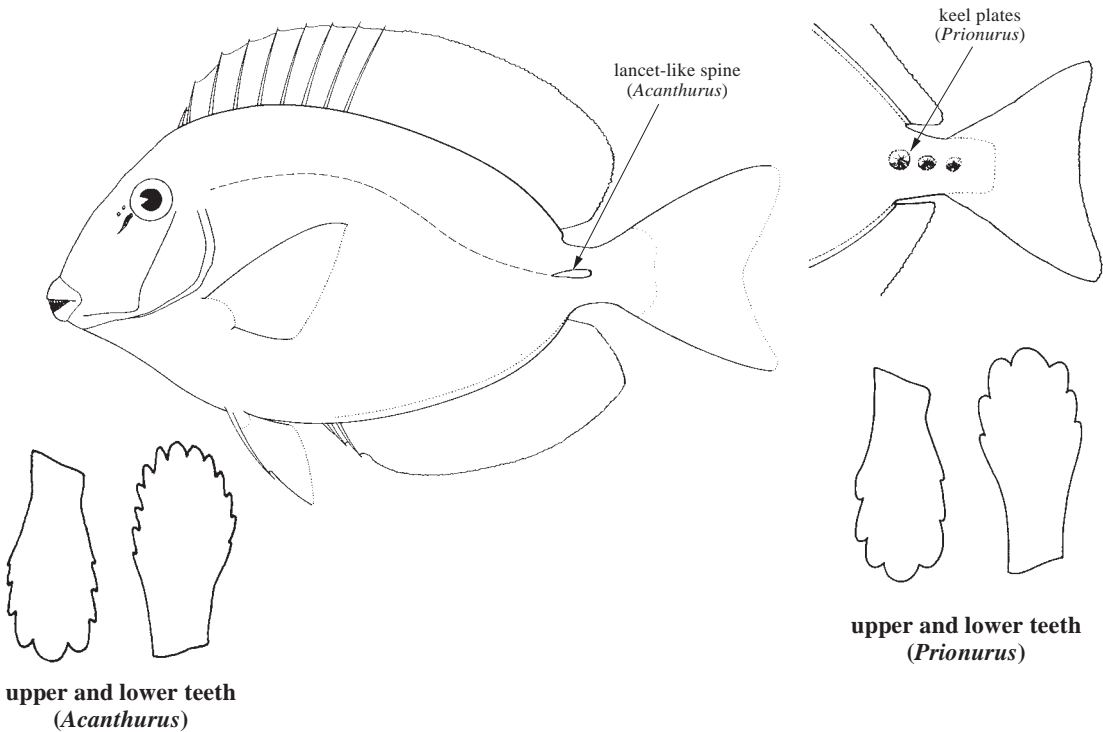
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ACANTHURIDAE

Surgeonfishes

by L.A. Rocha, California Academy of Sciences, San Francisco, California, USA

Diagnostic characters: Small to medium-sized fishes (to 45 cm in the area) with a **deep, compressed body and a lancet-like spine that fits into a horizontal groove on side of caudal peduncle (*Acanthurus*) or 3 keeled plates on side of caudal peduncle (*Prionurus*)**. Dorsal profile of head steep to concave. Eye high on head and a long preorbital bone. **Mouth small and low on head**, with close-set spatulate teeth that are denticulate on edges. **Dorsal fin continuous with 8 or 9 dorsal spines, 23 to 28 soft rays**, and no notch between spinous and soft portions. **Anal fin with 3 spines and 21 to 26 soft rays**. Caudal fin slightly to deeply emarginate. Paired fins of moderate size, the pectoral fins with 15 to 17 rays, the pelvic fins with 1 spine and 5 soft rays, their origin below lower base of pectoral fins. **Scales very small and ctenoid** (rough-edged). **Colour:** brown, grey, or blue, the young of *Acanthurus coeruleus* bright yellow, *Prionurus biafraensis* with numerous, very small dark spots.



Habitat, biology, and fisheries: Surgeonfishes are shallow-water coral reef fishes, but they venture into adjacent sand, rubble, and seagrass habitats. They are diurnal, seeking shelter in the reef to rest at night. The Atlantic species feed on benthic algae, especially filamentous species for which their close-set denticulate teeth (see illustration) are well suited. As is characteristic of herbivorous fishes, they have a very long digestive tract. Atlantic species of *Acanthurus* may form feeding aggregations, sometimes as mixed schools of more than one species. The folding spine on the side of the caudal peduncle is 'hinged' at the back; the sharp anterior tip and inner surface face forward when the tail is bent to the opposite side. Surgeonfishes are able to slash other fishes with this spine, and they use it in fights to establish social dominance. A side movement of the tail toward an intruding fish is generally all that is necessary for it to withdraw. Anyone handling these fishes when they are alive soon learns the threat of this spine. Even careless handling of dead specimens can result in cuts. The late postlarval stage of species of *Acanthurus* (termed the acronurus) is orbicular and transparent except for silvery over the abdomen. This larval form is often found in tuna stomachs. The family is not of great commercial importance, but surgeonfishes are abundant on reefs and form a major component of the catch of trap fishermen. They are also caught by gill nets and by spearing.

Remarks: The surgeonfish family consists of 6 genera and 72 species, but only the genera *Acanthurus* and *Prionurus* occur in the Atlantic. The diagnosis given above is based on the 5 Atlantic species.

Similar families occurring in the area

None. Fishes of other families may be high-bodied and have small mouths, such as the Chaetodontidae, but none have a folding spine or keeled plates on the side of the caudal peduncle.

Key to the species of Acanthuridae occurring in the area

- 1a. Dorsal-fin spines 9, a lancet-like spine that fits into a horizontal groove on side of caudal peduncle (Fig. 1a); dorsal profile of head steep; mouth not protrusible, no dark spots on body → 2
- 1b. Dorsal-fin spines 8; 3 keeled bluish black plates on side of caudal peduncle (Fig. 1b); dorsal profile of head concave; mouth protrusible; body covered with small dark spots *Prionurus biafraensis*

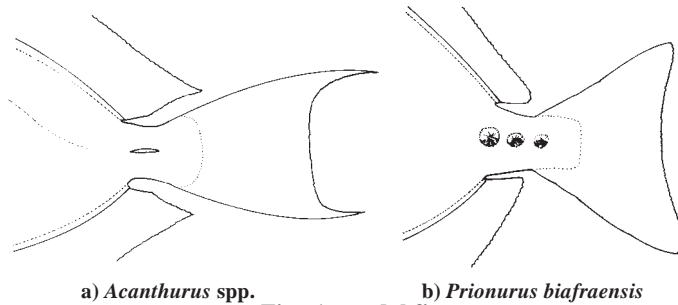








Fig. 1 caudal fin

- 2a. Anal-fin soft rays 24 to 26; dorsal-fin soft rays 25 to 28; colour of adults in life either yellowish brown with a bright yellow oval spot on caudal peduncle or bright blue without yellow spot on caudal peduncle → 3
- 2b. Anal-fin soft rays 21 to 23; dorsal-fin soft rays 23 to 26; colour of adults in life yellowish brown to dark greyish brown without yellow oval area on caudal peduncle → 4
- 3a. Body not very deep, the depth about 2.0 times in standard length; ground colour of adults in life light yellowish brown to dark greyish brown; a large, bright yellow oval area surrounding caudal peduncle; colour of juveniles in life not yellow *Acanthurus monroviae*
- 3b. Body very deep, the depth about 1.7 times in standard length; colour of adults in life blue to purplish grey with grey longitudinal lines on body; caudal peduncle not yellow; colour of juveniles in life bright yellow. *Acanthurus coeruleus*
- 4a. About 10 narrow dark bars on side of body; caudal fin without a distinct pale posterior margin (either absent or the width of a pencil line); no longitudinal lines on body; caudal fin slightly emarginate, the caudal concavity 17 to 38 in standard length (in specimens greater than 10 cm standard length); gill rakers 16 to 19 *Acanthurus chirurgus*
- 4b. No narrow dark bars on side of body; caudal fin with a distinct pale posterior margin, broader centrally, about 1/4 to 1/3 width of pupil in adults (wider in young); numerous, irregular pale bluish to dark blue longitudinal lines on body; caudal fin deeply emarginate, the caudal concavity 4.5 to 15.5 in standard length (in specimens greater than 10 cm standard length); gill rakers 18 to 24 *Acanthurus bahianus*

List of species occurring in the area

The symbol  is given when species accounts are included.

-  *Acanthurus bahianus* Castelnau, 1855.
-  *Acanthurus chirurgus* (Bloch, 1787).
-  *Acanthurus coeruleus* Bloch and Schneider, 1801.
-  *Acanthurus monroviae* Steindachner, 1876.
-  *Prionurus biafrensis* (Blache and Rossignol, 1961).

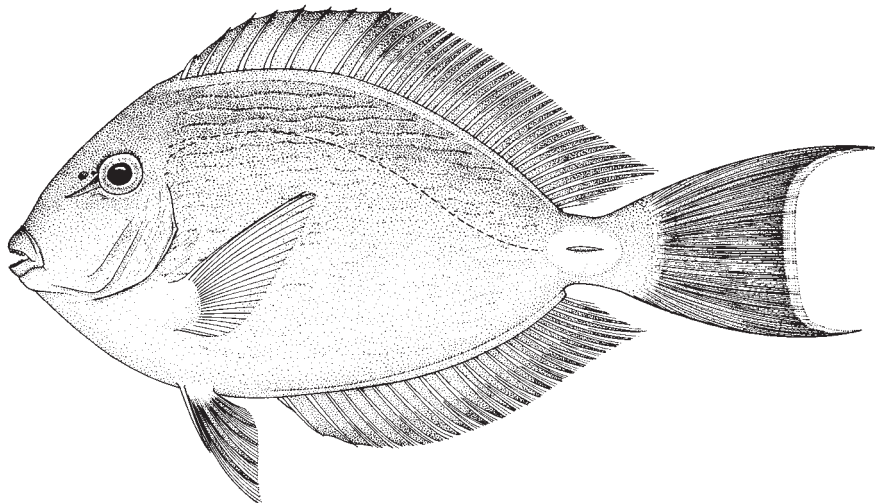
References

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Acanthurus monroviae Steindachner, 1876

Frequent synonyms / misidentifications: None / None.

FAO names: En – Monrovia doctorfish; Fr – Chirurgien chas-chas; Sp – Navajón caniveta.



Diagnostic characters: Body moderately compressed and deep, the depth contained about 2 times in standard length. A sharp lancet-like spine on side of caudal peduncle that fits into a horizontal groove. Mouth not protrusible, small, low on head; teeth close-set, spatulate, with denticulate edges, 18 upper and 19 lower in adults. A continuous unnotched dorsal fin with 9 spines and 25 to 27 soft rays. Anal fin with 3 spines and 24 to 26 soft rays. Pectoral fin rays 17. Caudal fin deeply emarginated, the caudal concavity (horizontal distance between tips of longest and shortest rays) 7.5 to 10 times in standard length (more concave with growth). **Colour:** body dark brown. Irregular longitudinal, undulating blue and light-yellow lines, more evident on the upper anterior third of the body. An elliptical bright yellow area on the caudal peduncle surrounds the orange caudal spine.

Size: Maximum to 45 cm, common 25 cm.

Habitat, biology, and fisheries: Mainly herbivorous but apparently supplements its diet with small benthic invertebrates and plankton. Caught mainly in fish traps and gill nets. Important only in subsistence fisheries.

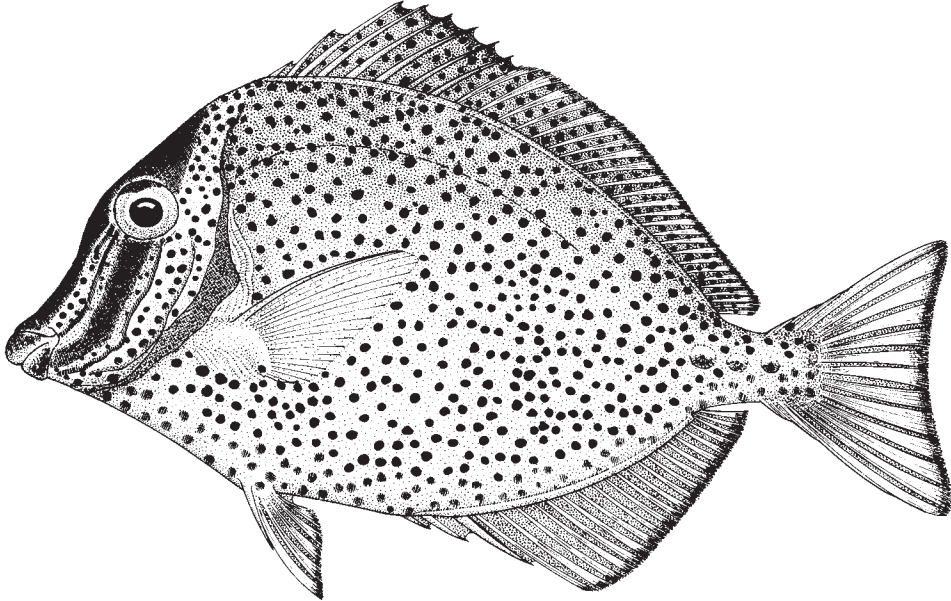
Distribution: Southern Morocco to Angola, including the Canary Islands, Cape Verde, São Tomé and Annabon. Recently recorded from the Mediterranean and southeastern Brazil.



Prionurus biafraensis (Blache and Rossignol, 1961)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Biafra doctorfish; Fr – Chirurgien biabra; Sp – Navajón de Biafra.



Diagnostic characters: Body moderately compressed and deep, the depth contained 1.8 times in standard length. Three sharp keeled plates on sides of caudal peduncle. Mouth protrusible, small, low on head; teeth close-set, spatulate, with denticulate edges. **Dorsal profile of snout concave.** **Continuous unnotched dorsal fin with 8 spines and 25 soft rays.** First dorsal spine very small. Anal fin with 3 spines and 21 soft rays. Pectoral fin rays 15. **Caudal slightly emarginated**, the caudal concavity (horizontal distance between tips of longest and shortest rays) 7.5 to 10 times in standard length (more concave with growth). **Colour:** body greyish brown. The entire body, head and fins except the pectorals covered with numerous small black spots. Two white vertical bands on head, the first from below the eye to mouth, the second from region immediately anterior to beginning of dorsal fin to base of operculum.

Size: Maximum to 25 cm, common 15 cm.

Habitat, biology, and fisheries: Mainly herbivorous but apparently supplements its diet with small benthic invertebrates and plankton. Caught mainly in fish traps and gill nets. Important only in subsistence fisheries.

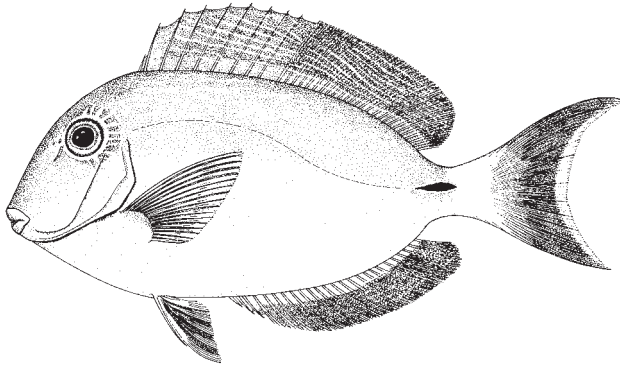
Distribution: Islands of the Gulf of Guinea and from Cape Lopez (Gabon) to Pointe-Noire (the Congo).



Acanthurus bahianus Castelnau, 1855

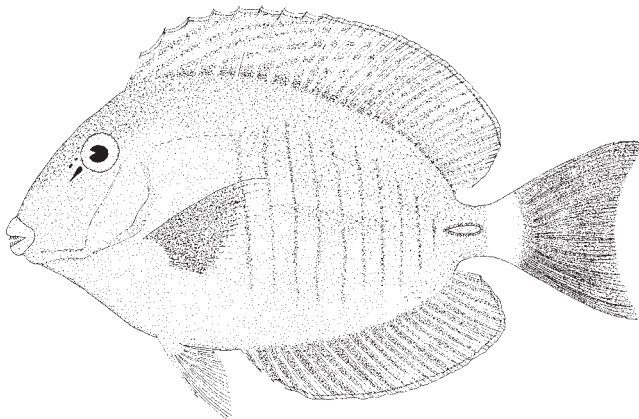
En – Ocean surgeon; **Fr** – Chirurgien marron; **Sp** – Navajón pardo.

Maximum size to about 36 cm, found in shallow water (1 to 30 m). Dorsal-fin spines 9, dorsal-fin soft rays 23 to 26. Body depth about 2 times in standard length; caudal fin moderately emarginate. Body light greyish brown to dark brown with 8 to 12 narrow dark bars on side (may be difficult to see on dark fish); dorsal and anal fins with faint longitudinal banding, the margins blue (more evident on anal fin); base of caudal fin usually with a distinct white bar, the posterior margin yellowish (South Atlantic population) or bluish white (North Atlantic). Inhabits shallow bottoms with coral or rocky formations; found in loose aggregations; often grazes over sand flats and ingests sand with its algae food. Occurs at the tropical western Atlantic, Ascension and St Helena.

***Acanthurus chirurgus*** (Bloch, 1787)

En – Doctorfish; **Fr** – Chirurgien docteur; **Sp** – Navajón cirujano.

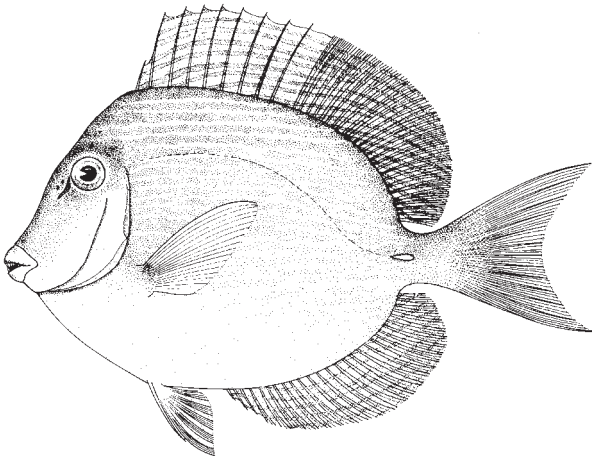
Maximum size to about 34 cm, found in relatively deep water (1 to 70 m). Dorsal-fin spines 9, dorsal-fin soft rays 24 to 25. Body depth about 2 times in standard length; caudal fin truncate in juveniles and slightly emarginate in adults. Body yellowish to greyish brown with pale greenish grey to pale blue longitudinal lines; short yellow lines radiating from posterior margin of eye within a narrow blue zone; dorsal fin with a blue margin and alternating bands of dull orange and bluish green; base of caudal fin often abruptly white or at least paler than body. Inhabits shallow reefs or rocky areas; found in loose aggregations; often grazes over sand flats and ingests sand with its algae food. Occurs at the tropical western Atlantic and Ascension Island; also reported from Senegal.



Acanthurus coeruleus Bloch and Schneider, 1801

En – Blue tang surgeonfish; **Fr** – Chirurgien bayolle; **Sp** – Navajón azul.

Maximum size to about 36 cm, found in relatively deep water (1 to 70 m). Dorsal-fin spines 9, dorsal-fin soft rays 26 to 28. Body very deep, the depth contained about 1.7 times in standard length; caudal fin truncate in juveniles and deeply emarginate in adults. Body blue to purplish grey with longitudinal grey lines; dorsal and anal fins blue with narrow oblique orange-brown bands; sheath of caudal spine white; juveniles bright yellow. Inhabits shallow reefs or rocky areas; may form large feeding aggregations; grazes on a wide variety of benthic algae, occasionally on sea grass. Contents of the digestive tract contain relatively little sand and other inorganic material. Occurs at the tropical western Atlantic and Ascension Island.



A

ACANTHURIDAE	2856
ACANTHUROIDEI	2846
ANTIGONIIDAE	2851,2853
<i>Acanthurus</i>	2856-2857
<i>Acanthurus bahianus</i>	2861
<i>Acanthurus chirurgus</i>	2861
<i>Acanthurus coeruleus</i>	2856,2862
<i>Acanthurus monroviae</i>	2859
African spadefish	2850
<i>Antigonia capros</i>	2851

B

Batfishes	2846
Biafra doctorfish	2860
Blue tang surgeonfish	2862

C

CAPROIDAE	2851-2852
<i>Capros aper</i>	2851
<i>Chaetodipterus gorensis</i>	2850
<i>Chaetodipterus lippei</i>	2849
CHAETODONTIDAE	2847,2852
Chirurgien bayolle	2862
Chirurgien biabra	2860
Chirurgien chas-chas	2859
Chirurgien docteur	2861
Chirurgien marron	2861
Chèvre de mer	2850
Chèvre de mer noire	2849
CORYPHAENIDAE	2855

D

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Deepbody boarfish	2851
Doctorfish	2861
DREPANIDAE	2847

E

EPHIPPIDAE	2846
Emperador	2854
<i>Ephippus gorensis</i>	2849-2850

G

GRAMMICOLEPIDAE	2852
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L

LUVARIDAE	2854
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Louvar	2854
Louvereau	2854
Luvar	2854
<i>Luvarus imperialis</i>	2854

M

MONODACTYLIDAE	2847
Monrovia doctorfish	2859

N

Navajón azul	2862
Navajón caniveta	2859
Navajón cirujano	2861
Navajón de Biafra	2860
Navajón pardo	2861

O

Ocean surgeon	2861
Ochavo	2851

P

Paguala africana	2850
Paguala negra	2849
POMACANTHIDAE	2847
<i>Prionurus</i>	2856-2857
<i>Prionurus biafraensis</i>	2856,2860

S

Sangleir chevrette	2851
Spadefishes	2846
Surgeonfishes	2856

W

West African spadefish	2849
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Z

ZEIDAE	2852
ZENIONTIDAE	2852

A

<i>aper, Capros</i>	2851
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B

<i>bahianus, Acanthurus</i>	2861
<i>biafraensis, Prionurus</i>	2856,2860

C

<i>capros, Antigonia</i>	2851
<i>chirurgus, Acanthurus</i>	2861
<i>coeruleus, Acanthurus</i>	2856,2862

G

goreensis, *Chaetodipterus* 2850
goreensis, *Ephippus* 2849-2850

I

imperialis, *Luvarus* 2854

L

lippei, *Chaetodipterus* 2849

M

monroviae, *Acanthurus* 2859

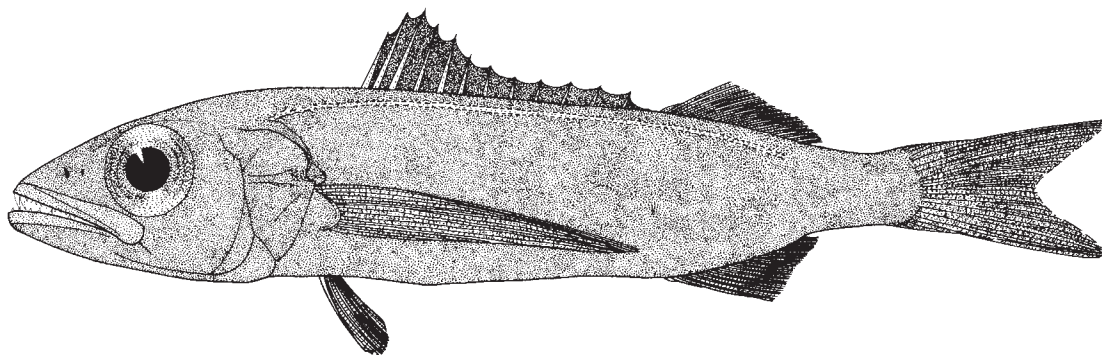
Suborder SCOMBROIDEI

SCOMBROLABRACIDAE

Longfin escolars

by I. Nakamura, Tuna Research and Conservation Center, Hopkins Marine Station, Stanford University, CA, USA and
N.V. Parin (†), P.P. Shirshov Institute of Oceanology, Russian Academy of Sciences, Moscow, Russia

D **Diagnostic characters:** Body moderately elongate and compressed. Head large, with a flat interorbital area. **Eye very large, its diameter almost as long as snout length.** Mouth large, slightly protractile. Lower jaw projecting a little beyond tip of upper. Two or 3 large fangs at front of upper jaw. Both jaws with strong lateral teeth, those in upper jaw more numerous and smaller than those of lower jaw. Several small teeth on vomer and small uniserial teeth on palatines. Two nasal openings (nostrils) on each side of snout. Lower limb of first gill arch with 4 or 5 well-developed denticulate gillrakers, about 10 clusters of minute spines on upper limb, and a large denticulate gillraker at corner of first gill arch. Two dorsal fins, the first with 12 spines and the second with 1 spine and 14 or 15 soft rays; base of first dorsal fin about twice base of second dorsal fin; origin of first dorsal fin slightly posterior to pectoral-fin base. Anal fin with 2 spines and 16 to 18 soft rays, similar to second dorsal fin in size and shape. Caudal fin forked and moderately small. **Pectoral fins very long, nearly reaching anal-fin origin.** Pelvic fins well developed, originating below origin of pectoral fins. **Lateral line single, running closely to dorsal contour, ending slightly before end of second dorsal fin.** No keels on caudal peduncle. Lateral-line scales about 44 to 49; scales irregular in size and shape, very deciduous. Vertebrae 30 (13 precaudal + 17 caudal). **Colour:** body uniformly dark brown without distinct markings, fins darker; buccal cavity black.

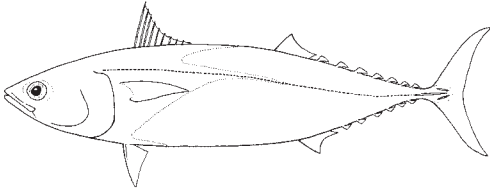


Habitat, biology and fisheries: This family has only 1 species, *Scombrolabrax heterolepis*. Inhabiting edge of continental shelf and slope at depth between 100 and 900 m. Found in stomachs of tunas, billfishes, large gempylid fishes and so on, but details of biology of this species unknown. Not commercially fished at present, caught only very incidentally by trawls.

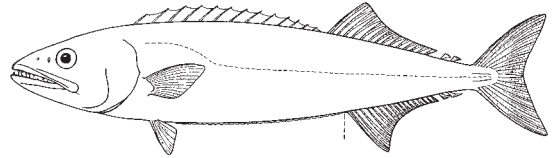
Similar families occurring in the area

Scombridae: caudal fin lunate; back blue or blue-black with bars, spots, or other dark markings; caudal keels present on caudal peduncle; dorsal and anal finlets present.

Gempylidae: eye smaller, its diameter not exceeding one half the length of snout; pectoral fins short, far anterior to anal-fin origin, if only a single lateral line present, not running close to dorsal contour.



Scombridae



Gempylidae

List of species occurring in the area

Scombrobrax heterolepis Roule, 1921. To 30 cm SL. Tropical and subtropical Indian, Pacific, and Atlantic oceans, except E Pacific and SE Atlantic.

References

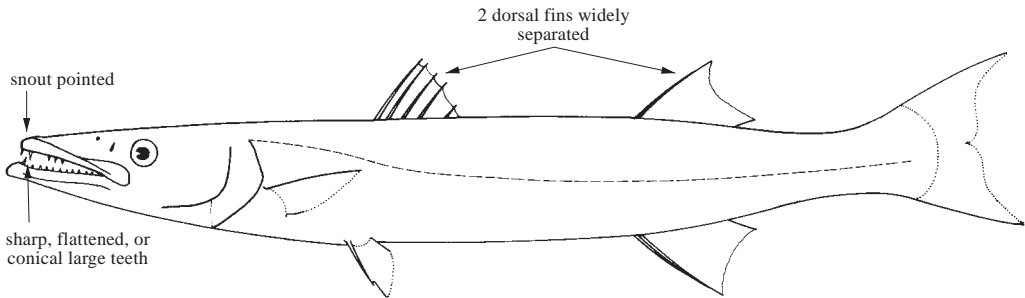
- Potthoff, T., Richards, W.J. & Ueyanagi, S. 1980. Development of *Scombrobrax heterolepis* (Pisces; Scombrobracidae) and comments on familial relationships. *Bulletin of Marine Science*, 30(2): 329–357.
- Nakamura, I. & Parin, N.V. 2002. Scombrobracidae. In K. Carpenter, ed. The living marine resources of the Western Central Atlantic, Volume 3. *FAO species identification guide for fishery purposes and American Society of Ichthyologists and Herpetologists Special Publication No. 5*. Rome, FAO, p. 1806.

SPHYRAENIDAE

Barracudas

by B.C. Russell, Museum & Art Gallery of the Northern Territory, Darwin, Australia (after de Sylva 1981)

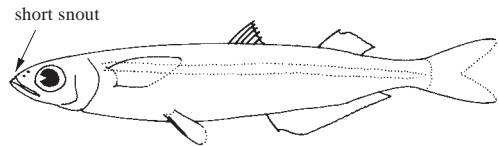
Diagnostic characters: Small to moderately large fishes, from about 30 to 205 cm total length. Body elongate, usually slightly compressed. Head large, with a **long, pointed snout**; **mouth large, horizontal, the lower jaw projecting beyond the upper**; **strong canine teeth of unequal size in jaws and on palatines (roof of mouth)**. **Two short and widely separated dorsal fins**, the first with 5 strong spines, inserted about opposite pelvic fins, the second (soft) opposite anal fin; pectoral fins short (shorter than head) and low-set; caudal fin forked. Lateral line well developed, nearly straight; scales cycloid (smooth to touch). **Colour:** usually grey to green or blue above, with silvery reflections, lighter below. Body sometimes with dark vertical bars or chevrons, longitudinal yellow stripes or dark blotches.



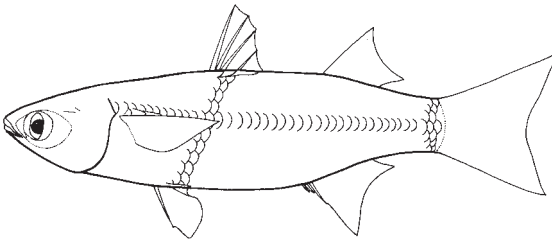
Habitat, biology, and fisheries: Voracious predators found in tropical to warm-temperate seas, generally in surface waters, but to depths of 100 m. Schooling or aggregating behaviour is mainly observed in small species or in young, while large adults are mostly solitary. Usually taken by trolling lines, also with gillnets and fixed bottom nets in some localities. The flesh is good-eating and marketed fresh, frozen, dried-salted or smoked.

Similar families occurring in the area

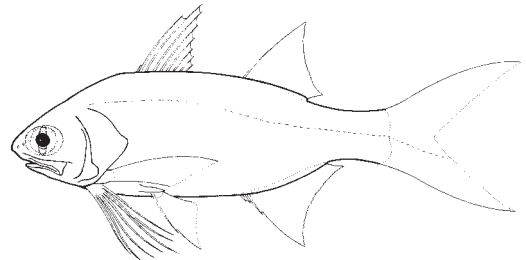
Atherinidae, Mugilidae, and Polynemidae: have 2 short, widely spaced dorsal fins but lack a large mouth with projecting lower jaw and strong teeth; the head and mouth are clearly smaller in Atherinidae and Mugilidae, and the lower pectoral-fin rays are long and filamentous in Polynemidae.



Atherinidae

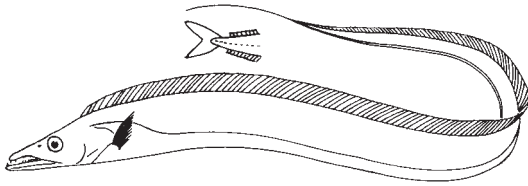


Mugilidae

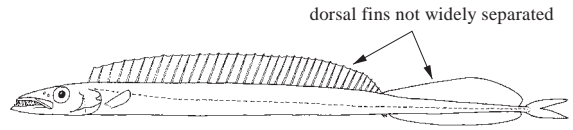


Polynemidae

Trichiuridae and Gempylidae: elongate snout, large mouth and canine teeth, but never 2 short and well spaced dorsal fins; also ribbon-like body in Trichiuridae.

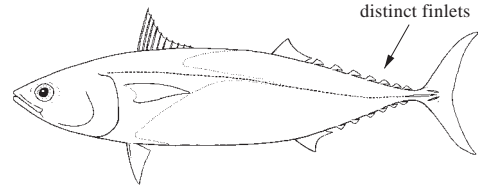


Trichiuridae



Gempylidae

Scombridae: relatively large mouth, lower jaw not projecting; 2 dorsal fins, with distinct finlets behind the second dorsal and anal fins.



Scombridae

Key to the species of Sphyraenidae occurring in the area

Note: *Sphyraena sphyraena* is considered by Cadenat (1964) to be divisible into 2 subspecies: *S. sphyraena sphyraena*, from the Mediterranean and North Atlantic, with 135 to 150 lateral line pores; and *S. sphyraena bocagei*, from tropical West Africa, with 120 to 130 lateral line pores.

- 1a. Lower jaw without fleshy knob, pectoral fins reaching to or beyond level of origin of ventral fins (Fig. 1a) → 2
- 1b. Lower jaw with fleshy knob; pectoral fins not reaching to level of origin of ventral fins (Fig. 1b). → 3

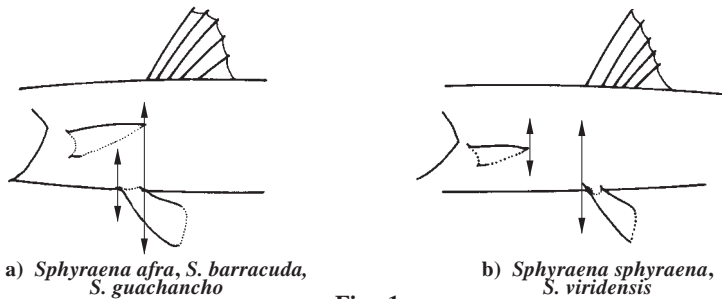


Fig. 1

- 2a. Lateral-line scales large, 75 to 85; sides of body with irregular black blotches . ***Sphyraena barracuda***
- 2b. Lateral line scales smaller, >100; sides of body without irregular black blotches → 4

- 3a.** Preopercle entirely scaled (Fig. 2a); single spine on opercle (Fig. 3a); second and third spines of first dorsal fin about equal to longest ray of second dorsal fin; inside of mouth of fresh specimens white *Sphyraena sphyraena*
- 3b.** Preopercle partially scaled, posterior border naked (Fig. 2b); 2 spines on opercle (Fig. 3b); second and third spines of first dorsal fin smaller than longest ray of second dorsal fin; inside of mouth of fresh specimens yellow *Sphyraena viridensis*

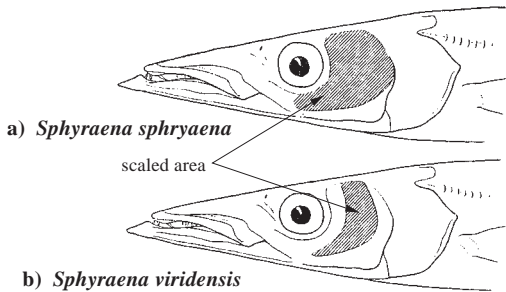


Fig. 2 extent of cheek scales

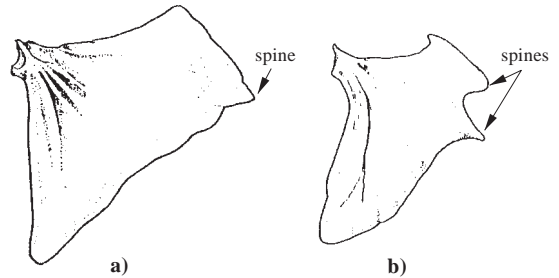
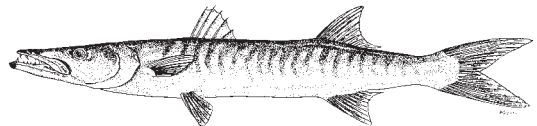








Fig. 3 opercular bone

- 4a.** Lateral-line scales 108 to 122; teeth angled backward; body greyish or olive brown above, sides silvery with a yellow to golden stripe; no dark bars on body (except small juveniles with broad black bars encircling body) (Fig. 4) *Sphyraena guachancho*
- 4b.** Lateral-line scales 122 to 140; teeth erect; body bluish, greenish, or brownish grey on back, becoming silvery white on belly; sides with about 20 dark chevron shaped cross-bars (Fig. 5) *Sphyraena afra*

Fig. 4 *Sphyraena guachancho*Fig. 5 *Sphyraena afra*

List of species occurring in the area

The symbol  is given when species accounts are included.

-  *Sphyraena afra* Peters, 1844.
-  *Sphyraena barracuda* (Edwards, 1771).
-  *Sphyraena guachancho* Cuvier, 1829.
-  *Sphyraena sphyraena* (Linnaeus, 1758).
-  *Sphyraena viridensis* Cuvier, 1829.

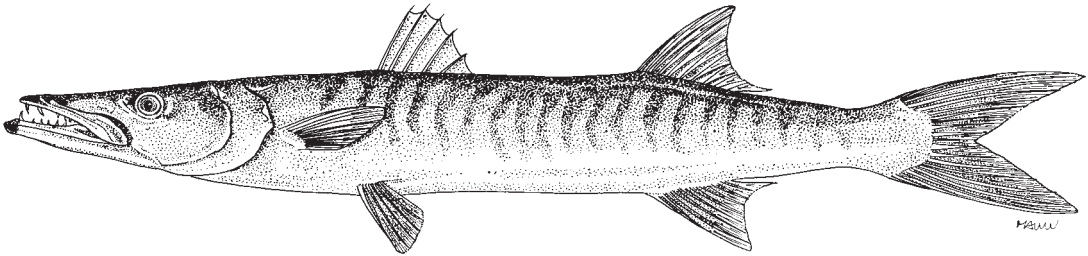
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- De Sylva, D.P.** 1990. Sphyraenidae. In J.-C. Quéro, J.-C. Hureau, C. Karrer, A. Post & L. Saldanha, eds. *Check-list of the fishes of the eastern Tropical Atlantic. Vol. 1*. Paris, UNESCO, pp. 860–864.

Sphyraena afra Peters, 1844

Frequent synonyms / misidentifications: *Sphyraena piscatorum* Cadenat, 1964 / *Sphyraena jello* (not of Cuvier) in some eastern Atlantic literature (Buttikofèr, 1890; Pauca, 1930), but this species does not occur in the eastern Atlantic Ocean.

FAO names: **En** – Guinean barracuda; **Fr** – Bécune guinéenne; **Sp** – Espetón de Guinea.



Diagnostic characters: Body elongate and slightly compressed, its depth about 20% of standard length. Head large, with a long, pointed snout; area between eyes flat or concave; **bony edge of opercle ending in 2 points**; mouth large; lower jaw without a fleshy tip; end of maxilla reaching anterior margin of eye, or nearly so; **teeth strong, pointed, contiguous, flattened, those in lower jaw erect** (never slanting backward) in juveniles as well as in adults; teeth also present on roof of mouth. **Dorsal-fin origin distinctly behind level of pelvic-fin origins; tips of appressed first rays of dorsal and anal fins reaching to ends of the last rays; tips of pectoral fins reaching past level of pelvic-fin origins.** Scales small, 122 to 140 lateral-line scales (between 125 and 132). **Colour:** bluish, greenish, or brownish grey on back, becoming silvery white on belly. **Sides marked with about 20 dark, largely open chevrons**, their apices directed forward; more apparent in small or medium-sized specimens, these chevrons tend to attenuate in very large individuals, where, however, they remain clearly apparent under certain conditions of light. Second dorsal fin dusky olive to brown, without a white tip; anal fin dusky to brown, with a faintly pale ventral margin; caudal fin uniformly dusky to dark brown, and without white tips.

Size: Maximum: 205 cm and 50 kg; common to 20 kg.

Habitat, biology, and fisheries: Coastal and offshore waters (large specimens). Most specimens reported appear to be large adults. Only a few large juveniles have been correctly identified as this species, and the seasonal distribution and habits are thus unknown. Voracious carnivore. Depth distribution is reported as from the surface to 75 m. Generally not subject to a specific fishery; reportedly caught mainly with handlines, trolling gear, bottom trawl, and nets. Marketed fresh, salted and smoked. Its flesh has never been reported as being poisonous; indeed, there are no documented reports of ciguatera from any *Sphyraena* species from the eastern central Atlantic. Separate statistics are not reported for this species.

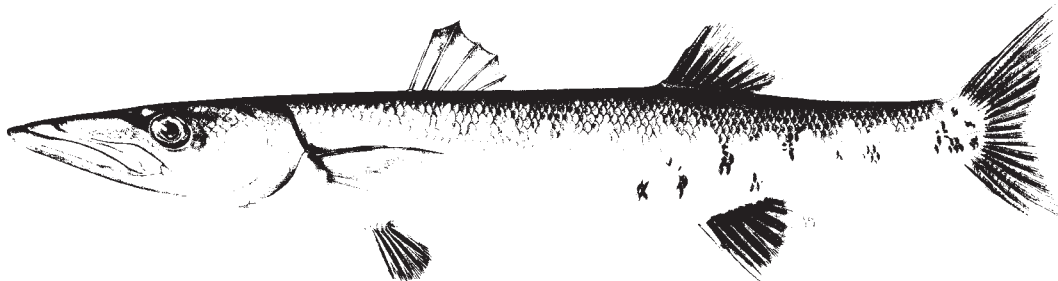
Distribution: Found only in the waters of West Africa from Senegal to Namibia. Reported from Konakri (Guinea), Freetown (Sierra Leone), Abidjan (Côte d'Ivoire), Lagos (Nigeria), and the Niger delta. Because of the difficulty in identifying the members of this genus and because of relatively little museum material, the actual distribution of this and other species is not well known. A specimen from Walvis Bay, Namibia, identified as *Sphyraena jello*, most likely represents *Sphyraena afra*.



***Sphyræna barracuda* (Edwards, 1771)**

Frequent synonyms / misidentifications: *Sphyræna picuda* Bloch and Schneider, 1801 / None.

FAO names: En – Great barracuda; Fr – Barracuda; Sp – Picuda barracuda.



Diagnostic characters: Body elongate and slightly compressed. Head large, with a long, pointed snout; area between eyes flat to concave; posterior edge of gill cover ending in 2 points; mouth large, tip of maxilla reaching to, or extending beyond, anterior eye margin in adult specimens; lower jaw projecting beyond upper jaw, without a distinct fleshy tip; strong, pointed, **contiguous vertical flattened teeth** of unequal size in both jaws; teeth also present on roof of mouth (palatines). **Origin of first (spinous) dorsal fin slightly behind pelvic-fin origin; anterior rays of second (soft) dorsal fin and of anal fin extending backward beyond posterior rays when fins are depressed; tips of appressed pectoral fins reaching to, or extending beyond, pelvic-fin origins. Scales rather large; fewer than 90 lateral-line pores. Colour:** deep green to steel grey above, sometimes with a purplish tinge; sides mostly silvery, abruptly becoming white on ventral surface. Adults have oblique, dark bars (variable in number but usually from 18 to 22) on upper sides in life, and usually **several to many scattered inky blotches variable in size and position on posterior part of lower sides** (persisting after death). Second dorsal, anal, and caudal fins violet to black with whitish tips.

Size: Maximum to 180 cm; common to 140 cm.

Habitat, biology, and fisheries: Adults of 150 cm and larger occur solitarily in high salinity coastal waters as well as in the open ocean, sometimes very far from land. This species is found predominantly at or near the surface, though it has been taken as deep as 100 m. Feeds mainly on littoral schooling and coral reef fishes. Offshore waters (occasional large specimens), generally not subject to a specific fishery; caught mainly with trolling lines by commercial and sport fishermen; also taken in gillnets and fixed bottom nets in Senegal and Côte d'Ivoire. Marketed frozen and canned in oil, as well as fresh and smoked. Also reduced to fishmeal. This fish is excellent eating, and ciguatera poisoning associated with this species in the tropical Western Atlantic and Pacific oceans has not been reported in the literature from the eastern Atlantic. Separate statistics are not reported for this species.

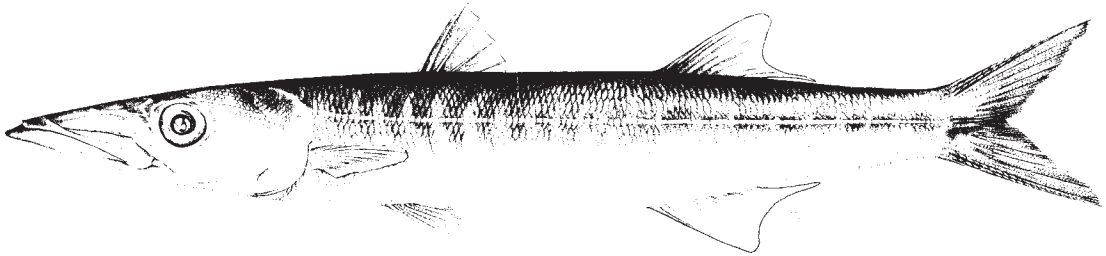
Distribution: Uncommon throughout the area. In the eastern Atlantic it has been recorded with certainty only from Sierra Leone, Côte d'Ivoire, Togo, Nigeria, and Goree. Also found in the western Atlantic, Indian Ocean and tropical central and western parts of the Pacific Ocean. Small individuals are rare in the eastern tropical Atlantic. Juveniles are reported from Lagos Lagoon.



***Sphyraena guachancho* Cuvier, 1829**

Frequent synonyms / misidentifications: *Sphyraena dubia* Bleeker, 1863 / None.

FAO names: **En** – Guachanche barracuda; **Fr** – Bécune guachanche; **Sp** – Picuda guachanche.



Diagnostic characters: Body elongate and slightly compressed. Head large, with a long, pointed snout; **area between eyes convex**; mouth large, tip of maxilla reaching to anterior eye margin in adult specimens; lower jaw projecting beyond upper jaw, without a distinct fleshy tip; strong, pointed, **backward-directed teeth** of unequal size in both jaws; teeth also present on roof of mouth (palatines). **Origin of first (spinous) dorsal fin slightly behind pelvic-fin origins; last rays of second (soft) dorsal fin and of anal fin extending backward beyond anterior rays when fins are depressed; tips of appressed pectoral fins reaching to, or extending beyond, pelvic-fin origins. Scales moderate-sized, 108 to 122 lateral-line scales. Colour:** grey to olive above; upper sides yellowish, lower sides and belly silvery. A faint, yellow to golden longitudinal lateral stripe in fresh specimens; margins of pelvic and anal fins black; tips of middle caudal rays black. Live adults have numerous chevron-shaped markings on sides, their apices directed forward.

Size: Reliably reported to 71 cm; common to 50 cm.

Habitat, biology, and fisheries: Coastal and estuarine waters of continental and island shelves and estuaries of the eastern Atlantic. Found in depths of 3 to 100 m. Shows distinctive seasonal movements associated with rainy and dry seasons. A schooling species occurring in shallow and generally turbid coastal waters over muddy bottoms, often ascending estuaries well into brackish waters. Feeds mainly on small fishes and shrimps. Caught mainly with fixed bottom nets, trawls, and handlines. Marketed fresh, smoked and fresh cooked. The flesh is excellent, especially when the fish is caught in clear waters. It has never been reported as poisonous anywhere within its range. Separate statistics are not reported for this species.

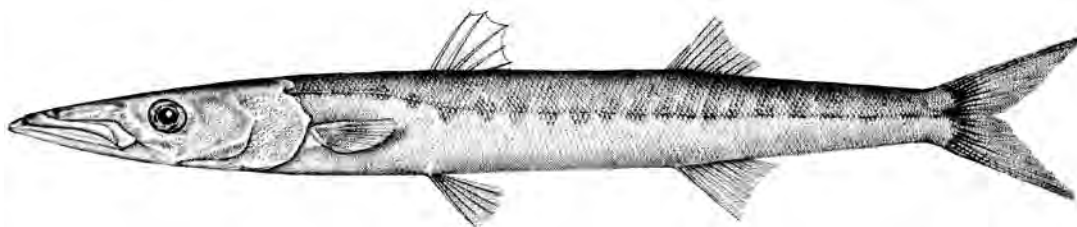
Distribution: Common in the eastern tropical Atlantic, from Senegal, Guinea, Sierra Leone, Côte d'Ivoire, Ghana, Togo, Dahomey, Nigeria, Cape Verde Islands, Angola, and the Canary Islands. Elsewhere in the western Atlantic, from Massachusetts to Brazil.



***Sphyraena sphyraena* (Linnaeus, 1758)**

Frequent synonyms / misidentifications: *Sphyraena spet* Lacépède, 1803; *Sphyraena vulgaris* Cuvier, 1829 (in part); *Sphyraena bocagei* Osorio, 1891; *Sphyraena sphyraena bocagei* Cadenat, 1964 / *Sphyraena viridensis*.

FAO names: **En** – European barracuda; **Fr** – Bécune européenne; **Sp** – Espetón.



Diagnostic characters: Body elongate and cylindrical, its depth about 10% of the standard length. Head large, with a long, pointed snout; **bony edge of opercle ending in a single point; tip of lower jaw with a distinctive fleshy tip; maxilla not reaching to anterior eye margin; teeth strong, conical, erect**, the width of their bases less than the interspace between adjacent teeth; teeth also present on roof of mouth. **Origin of first dorsal fin directly above, or slightly in front of, pelvic-fin origins; tips of pectoral fins not reaching origin of pelvics;** caudal fin deeply forked, the posterior margin of each lobe straight. Scales small, **lateral-line scales 120 to 150;** lateral-line scales toward the posterior forming a rather well-developed keel; **gill cover completely scaled.** **Colour:** bluish grey to leaden greenish on the back, becoming silvery white on lower flanks. A series of about 20 to 22 angled cross-bars along upper sides; upper part of head and maxilla blackish; fins blackish, the pelvics with white anterior margins. **Inside of mouth in fresh specimens whitish.**

Size: Maximum: 165 cm; common to 60 cm.

Habitat, biology, and fisheries: Inshore, coastal, and offshore waters. Found from the surface to 100 m depth. Larval stages reported from the eastern central Atlantic; eggs and larvae are known from the Mediterranean (Gulf of Naples), and developmental stages have been portrayed up to 200 mm. Feeds mainly on fishes but also a few cephalopods. Generally not subject to a specific fishery. Reportedly caught mainly with bottom or pelagic trawls, gillnets, fixed bottom nets, seines, beach seines and handlines. Marketed fresh, smoked, fried, and canned in oil. This species is caught by local and foreign trawlers, and is consumed locally as well as in several foreign markets. Separate statistics are not reported for this species.

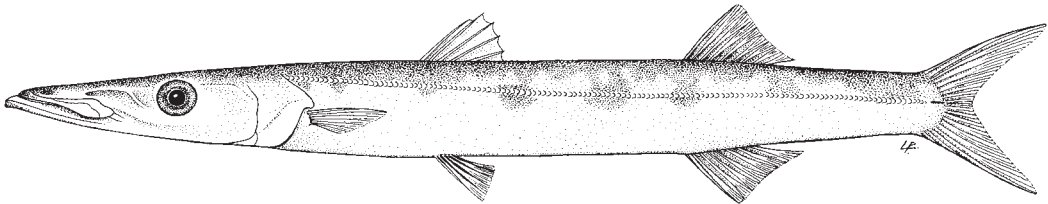
Distribution: Not rare in the eastern Atlantic. In the area, known from Cape Verde Islands and coast of West Africa to Angola; records of this species from the Azores, Madeira and Canary Islands are probably misidentifications of *Sphyraena viridensis*, also occurs throughout the Mediterranean Sea and in the Black Sea, and in the northern Atlantic to the Bay of Biscay. In the western Atlantic it occurs at Bermuda and off Brazil.



***Sphyraena viridensis* Cuvier, 1829**

Frequent synonyms / misidentifications: *Sphyraena viridescens* Jordan and Evermann, 1896 / *Sphyraena sphyraena* (not of Linnaeus).

FAO names: **En** – Yellowmouth barracuda; **Fr** – Bécune bouche jaune; **Sp** – Espetón boca amarilla.



Diagnostic characters: Body elongated and cylindrical. Head large, with a long, pointed snout; **bony edge of opercle ending in 2 points; tip of lower jaw with a distinctive fleshy tip; maxilla not reaching to anterior eye margin; teeth strong, conical, erect**, the width of their bases less than the interspace between adjacent teeth; teeth also present on roof of mouth. **Origin of first dorsal fin directly above, or slightly in front of, pelvic-fin origins; tips of pectoral fins not reaching origin of pelvics;** caudal fin deeply forked. Scales small; **gill cover only partially scaled.** **Colour:** bluish grey to leaden greenish on the back, becoming silvery white on lower flanks. A series of about 20 to 22 angled cross-bars along upper sides; upper part of head and maxillary blackish; fins blackish, the pelvics with white anterior margins. **Inside of mouth yellowish.**

Size: Maximum: 65 cm.

Habitat, biology, and fisheries: The habits of *Sphyraena viridensis* are not known for certain because of confusion with *S. sphyraena*, but are probably similar to that species. Fishing gear and utilization not recorded, but probably similar to *S. sphyraena*. Separate statistics are not reported for this species.

Distribution: The exact distribution and abundance of *Sphyraena viridensis* are unknown because most published records do not separate it from *S. sphyraena*. In the eastern central Atlantic it is known with certainty from the Cape Verde and Canary Islands. In the Mediterranean it has been reported from Lebanon and the eastern coast of Algeria, but because of past confusion with *S. sphyraena* the distribution of this species is insufficiently documented.

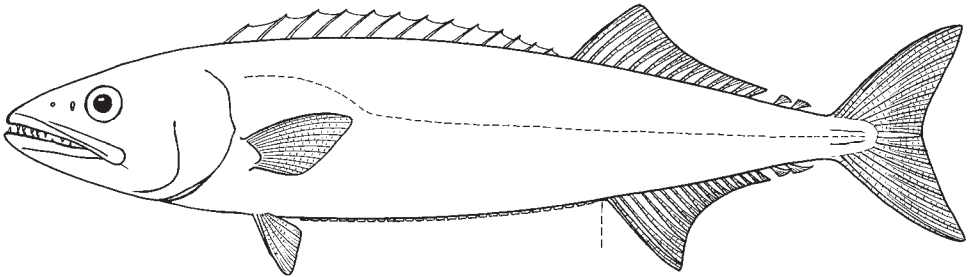


GEMPYLIDAE

Snake mackerels, escolars and oilfishes

by N.V. Parin (†), P.P. Shirshov Institute of Oceanology, Russian Academy of Sciences, Moscow, Russia and
I. Nakamura, Tuna Research and Conservation Center, Hopkins Marine Station, Stanford University, CA, USA

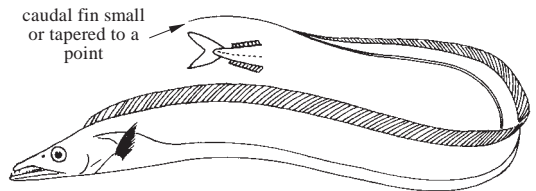
Diagnostic charactes: Medium size to large fishes (25 cm to 3 m total length). Body elongate, compressed or semifusiform. **Two nostrils each side of snout.** Mouth large. **Teeth strong, at front of upper jaw usually fang-like;** a pair of fangs in front of lower jaw. **Two dorsal fins followed by finlets in some species.** First dorsal fin with 8 to 10 spines. Second dorsal fin, with 0 to 1 spine and 17 to 44 rays (including finlets). Second dorsal-fin base shorter than first dorsal-fin base. Anal fin similar to second dorsal fin, with 0 to 3 spines and 12 to 37 rays (including finlets). Pectoral fins shorter than head. **Pelvic fins small, rudimentary or absent in adults of some species.** Caudal fin forked. Lateral line single or double, ending at caudal-fin base. No keels on caudal peduncle (except in *Lepidocybium*). Scales small to minute, or variously modified. Vertebrae generally about 35 except in *Gempylus* (about 50), *Paradiplospinus* and *Diplospinus* (both about 60). **Colour:** body usually brown, without distinct dark marks or blotches; lower sides and belly sometimes silvery. Fins usually dark.



Habitat, biology, and fisheries: Usually inhabit deep waters at depths of 200 to 500 m, both on slope and in the open ocean. Some species migrate to surface at night. Swift predators, feeding on fish and squid. Some species are frequently taken as bycatch in the tuna longline fishery. Flesh edible but oily, with purgative properties in some species. No catch statistics from fishing area 34 and 47.

Similar families occurring in the area

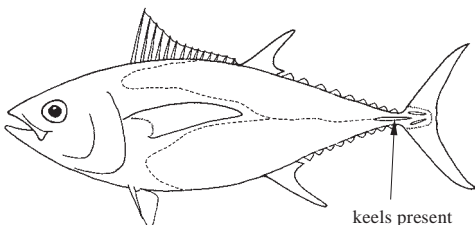
Trichiuridae: body more elongate. One nostril each side of snout. Single and very long dorsal fin, running almost entire length of body. No dorsal or anal finlets. Caudal fin either small or body tapering to a point. Pelvic fins reduced to scale-like spines, or absent.



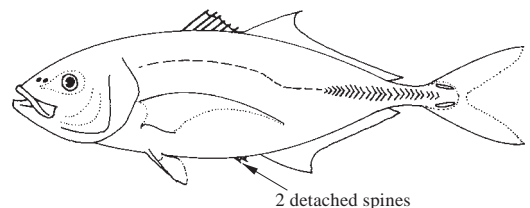
Trichiuridae

Scombridae: body fusiform. Back not brown, often with bars, spots or other dark markings. Keels present on caudal peduncle.

Carangidae: base of first dorsal fin shorter than that of second. Two detached spines usually visible in front of anal fin. Scutes often present along lateral line. Dorsal and anal finlets only presented in *Decapterus*, *Elagatis* and *Oligoplites*.



Scombridae



Carangidae

Key to the species occurring in the area

- 1a. Dorsal-fin elements more than 60, distance from anus to anal-fin origin equal or greater than snout length (Fig. 1) → 2
- 1b. Dorsal-fin elements, including finlets, less than 55; distance from anus to anal-fin origin much shorter than snout length, about equal to eye diameter (Fig. 2) → 3

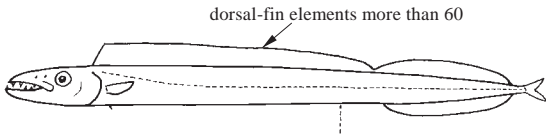


Fig. 1

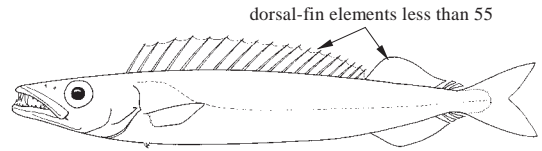


Fig. 2

- 2a. Anus mid-way between tip of snout and tip of caudal fin, in front of first anal spine by distance equal to head length and much longer than snout length; anterior part of anal fin with almost no fin membrane (Fig.3) ***Diplospinus multistriatus***
- 2b. Anus nearer tip of caudal fin than tip of snout, in front of first anal spine by distance much shorter than head length and nearly equal to snout length; anterior part of anal fin with fin membrane (Fig. 4) ***Paradiplospinus gracilis***

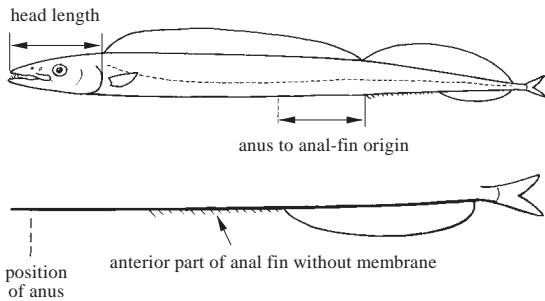


Fig. 3 *Diplospinus multistriatus*

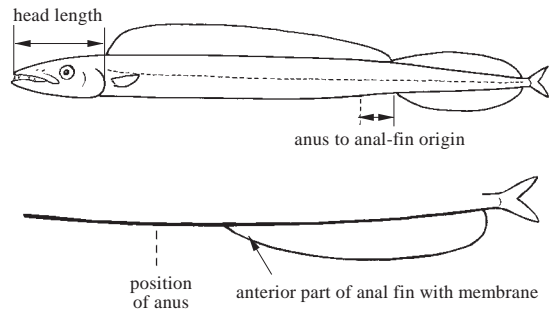


Fig. 4 *Paradiplospinus gracilis*

- 3a. Caudal peduncle with a prominent median keel and 2 supplemental keels above and below (Fig. 5); dorsal-fin spines 8 or 9; lateral line single, extremely sinuous (Fig. 6) ***Lepidocybium flavobrunneum***
- 3b. Caudal peduncle without keels; dorsal-fin spines more than 12; lateral line single or bifurcated, but not sinuous (Fig. 7) → 4

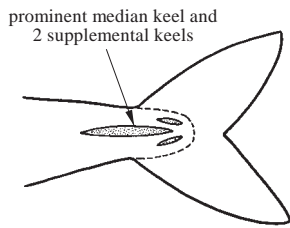


Fig. 5 caudal fin

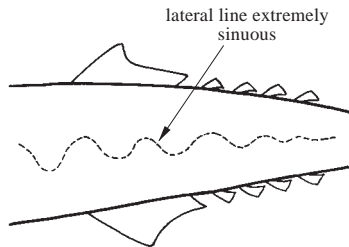


Fig. 6 *Lepidocybium flavobrunneum*

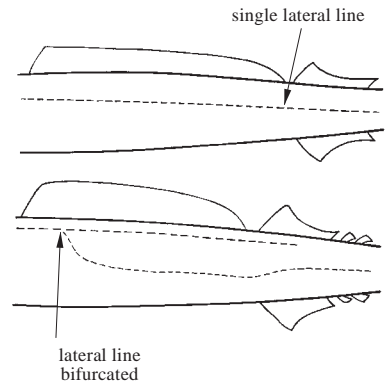


Fig. 7 lateral line

- 4a. Skin very rough; scales medium-sized, interspersed with spinous bony tubercles (Fig. 8); mid-ventral keel on belly (Fig. 9); lateral line single, obscure ***Ruvettus pretiosus***
- 4b. Skin rather smooth, scales small, not interspersed with spinous bony tubercles; no mid-ventral keel on belly; lateral line single or double, always obvious. → 5

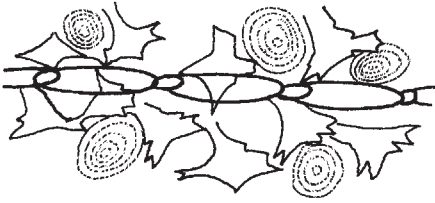


Fig. 8 skin, scales and bony tubercles



Fig. 9 *Ruvettus pretiosus*

- 5a. Two lateral lines (Fig. 10); dorsal-fin spines 26 to 32; 5 to 7 finlets behind both dorsal and anal fins; body depth 15 to 18 times in standard length ***Gempylus serpens***
- 5b. One lateral line (Fig 11); dorsal-fin spines 17 to 21; 2 finlets behind both dorsal and anal fins; body depth less than 13 times in standard length → 6

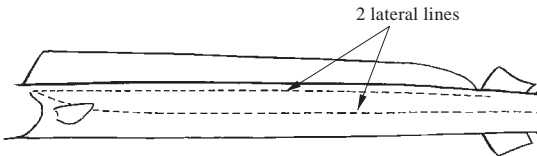


Fig. 10 *Gempylus serpens*

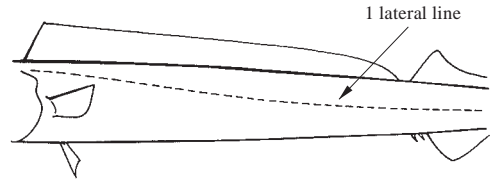


Fig. 11 *Nesiarchus nasutus*

- 6a. Pelvic fins well developed, with 1 spine and 5 soft rays; body depth 10 to 13 times in standard length ***Nesiarchus nasutus***
- 6b. Pelvic fins rudimentary, of a single spine; body depth 6.5 to 9 times in standard length → 7

- 7a. Two free anal-spines behind anus, first of them large, dagger-shaped; lateral line fairly straight (Fig.12); dorsal-fin spines 20 or 21 ***Nealotus tripes***
- 7b. No free anal-spines behind anus; lateral line curved abruptly downward anteriorly (Fig. 13); dorsal-fin spines 17 or 18 ***Promethichthys prometheus***

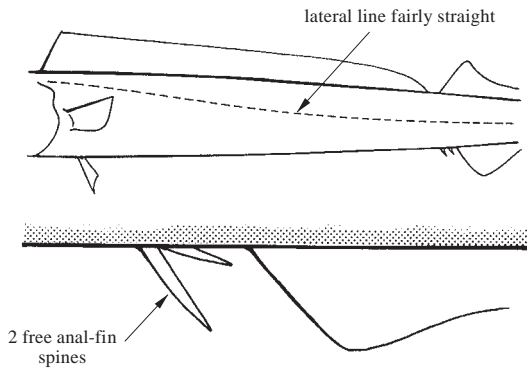


Fig. 12 *Nealotus tripes*

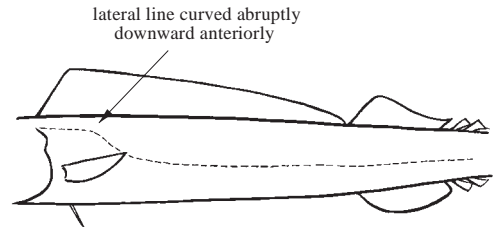










Fig. 13 *Promethichthys prometheus*

List of species occurring in the area

The symbol  is given when species accounts are included.

-  *Diplospinus multistriatus* Maul, 1948.
-  *Gempylus serpens* Cuvier, 1829.
-  *Lepidocybium flavobrunneum* (Smith, 1843).
-  *Nealotus tripes* Johnson, 1865.
-  *Nesiarchus nasutus* Johnson, 1862.
-  *Paradiplospinus gracilis* (Brauer, 1906).
-  *Promethichthys prometheus* (Cuvier, 1832).
-  *Ruvettus pretiosus* Cocco, 1833.

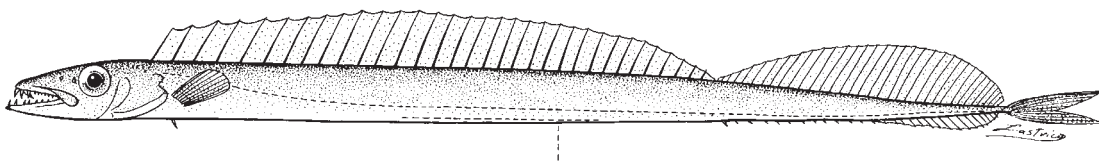
Reference

- Nakamura, I. & Parin, N.V.** 1993. Snake mackerels and cutlassfishes of the World (families Gempylidae and Trichiuridae). *FAO Fisheries Synopsis*, 125(15): 136 p.

Diplospinus multistriatus Maul, 1948

Frequent synonyms / misidentifications: None / None.

FAO names: En – Striped escolar; Fr – Escolier rayé; Sp – Escolar rayado.

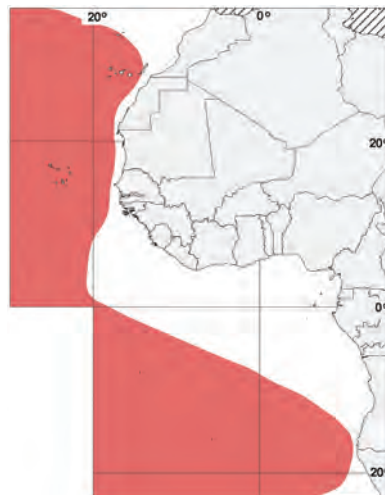


Diagnostic characters: Body extremely elongate and compressed. Depth 13 to 18 times in standard length. **Anus mid-way between tip of snout and tip of caudal fin, in front of first anal-fin spine by a distance equal to head length.** Head 6 times in standard length. **First dorsal fin with 30 to 36 spines; second dorsal fin with 35 to 44 rays**, its base about half the length of first dorsal-fin base. Anal fin with 2 small free spines and 28 to 35 soft rays. Pectoral fins with 11 to 13 rays. Pelvic fins reduced to a minute spine in adults. A single lateral line, situated closer to ventral profile than dorsal profile posteriorly. Vertebrae 57 to 64. **Colour:** silvery with narrow dark dotted lines along body; gill membranes jet-black.

Size: Maximum to about 20 cm standard length.

Habitat, biology, and fisheries: Oceanic, mesopelagic at depths to about 1 000 m. Rather common. Migrates upward at night from 100 to 200 m. Feeds on crustaceans and small fishes. Reproductive throughout the year. Of no importance to fisheries.

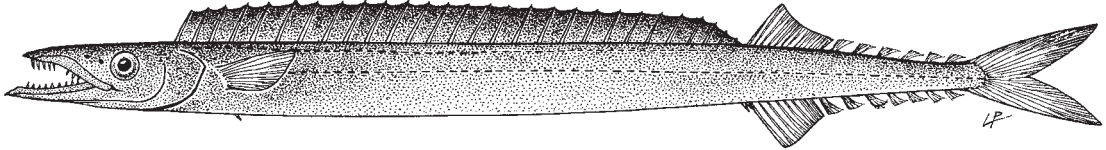
Distribution: Central water masses of all oceans. Rather common in the northern and southern parts of the area but absent in equatorial waters east of 20°W.



***Gempylus serpens* Cuvier, 1829**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Snake mackerel; Fr – Escolier serpent; Sp – Escolar de canal.

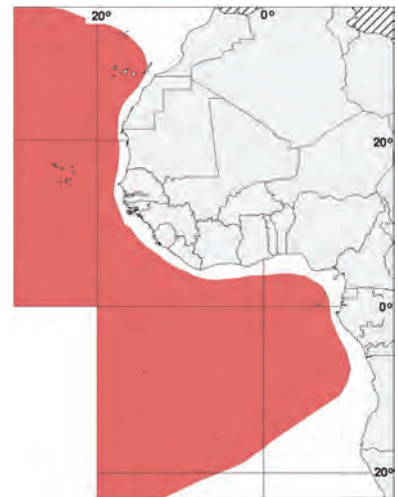


Diagnostic characters: Body elongate and compressed. Depth 15 to 18 times in standard length. Head 5.5 to 6 times in standard length. Lower jaw extends anterior to upper jaw, tips of both jaws with dermal processes. **First dorsal fin long , with 26 to 32 spines; second dorsal fin with a minute spine and 11 to 14 rays followed by 5 or 6 finlets.** Anal fin with 2 free and 1 comprised spine and 10 to 12 rays followed by 6 or 7 finlets. Pectoral fins with 12 to 15 rays. Pelvic fins reduced to 1 spine and 3 or 4 soft rays. **Two lateral lines, both originating below first spine of dorsal fin**, upper follows dorsal contour of body to end of first dorsal-fin base, the lower descends gradually posterior to about tip of pectoral fin and runs mid-laterally. Vertebrae 48 to 55. **Colour:** body dark brown; all fins dark brown with darker margins.

Size: Maximum to 1 m standard length, common to 60 cm.

Habitat, biology, and fisheries: Oceanic, epi- and mesopelagic from surface to depth of 200 m, perhaps deeper. Usually solitary. Rather common. Feeds on fishes (myctophids, exocoetids, sauries, scombrids), squid and crustaceans. Males mature at 43 cm standard length, females at 50 cm. Spawns in tropical waters throughout the year. Fecundity of about 300 thousand to million eggs. No special fishery, but appears sometimes as bycatch in tuna longline fishery.

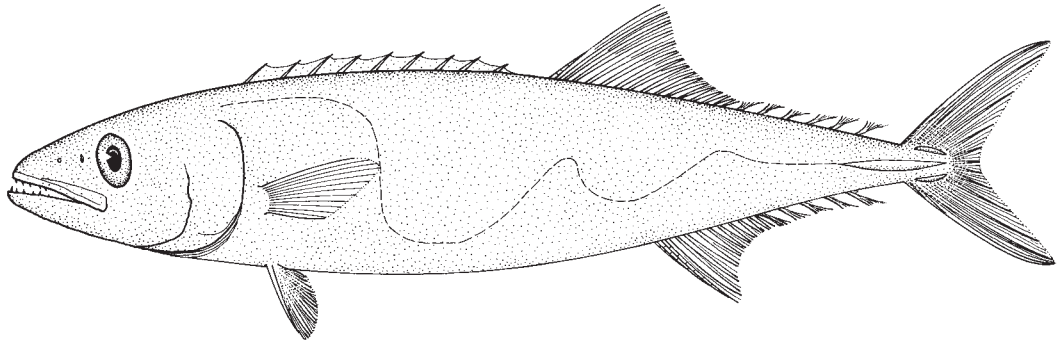
Distribution: Worldwide in the tropical and subtropical seas, including the eastern Central Atlantic except most northeastern and southeastern areas.



***Lepidocybium flavobrunneum* (Smith, 1843)**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Escolar; Fr – Escolier noir; Sp – Escolar negro.

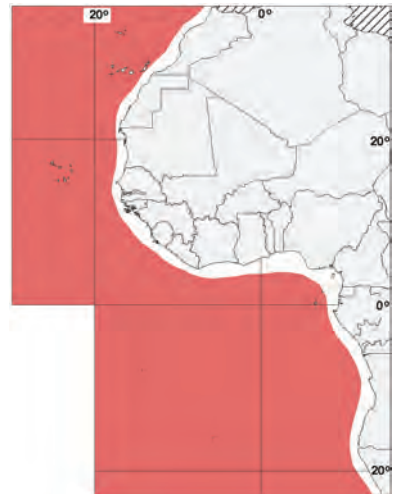


Diagnostic characters: Body semifusiform, slightly compressed. Depth 4.1 to 4.3 times in standard length. Head 3.6 to 3.7 times in standard length. Tips of both jaws without dermal processes. First dorsal fin very low, with 8 or 9 spines, well separated from the second. Second dorsal fin with 16 to 18 rays followed by 4 to 6 finlets. Anal fin with 1 or 2 comprised spines and 12 to 14 rays. Pectoral fins with 15 to 17 rays. Pelvic fins well developed, with 1 spine and 5 rays. **Caudal peduncle with a strong median keel, flanked by 2 supplementary keels, one on each side of the median keel. Lateral line single, sinuous.** Scales rather small. Vertebrae 31. **Colour:** body almost uniformly dark brown, becoming almost black with age.

Size: Maximum about 2 m standard length, common to 1.5 m.

Habitat, biology, and fisheries: Mostly over the continental slope, down to 200 m and more; not common offshore. Often migrates upward at night. Feeds on squids, fishes (bramids, coryphaenids, scombrids, etc.) and crustaceans. No target fisheries, but appears as bycatch in tuna longline fishery.

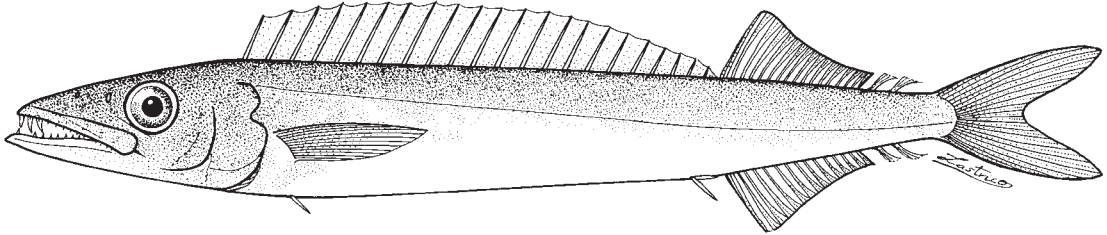
Distribution: Widely distributed in the tropical and subtropical seas, including the eastern Central Atlantic.



Nealotus tripes Johnson, 1865

Frequent synonyms / misidentifications: None / None.

FAO names: En – Black snake mackerel; Fr – Escolier reptile; Sp – Escolar oscuro.



Diagnostic characters: Body elongate and compressed. Depth 7 to 9 times in standard length. Head about 4 times in standard length. Tips of jaws without dermal processes. **First dorsal fin with 20 to 21 spines.** Second dorsal fin with 16 to 19 rays followed by 2 finlets. **Anal fin with 2 free spines, the first dagger-shaped,** the second smaller and parallel to ventral contour, and 15 to 19 rays followed by 2 finlets. Pectoral fins with 13 or 14 rays. Pelvic fins reduced to 1 small spine. **Lateral line single, fairly straight.** Scales large, easily deciduous. Vertebrae 36 to 38. **Colour:** body blackish brown, dorsal and anal fins brownish.

Size: Maximum 25 cm standard length, common to 15 cm.

Habitat, biology, and fisheries: Oceanic, epi- to mesopelagic from surface to about 600 m depth. Rather uncommon. Migrates to surface at nights. Feeds on myctophids and other small fishes, squids and crustaceans. Matures at 15 cm standard length. Of no importance to fisheries.

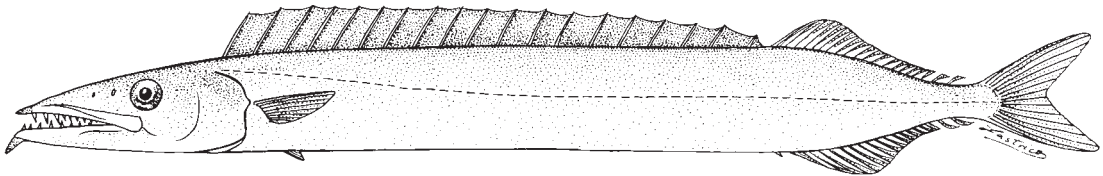
Distribution: Tropical and temperate waters of all oceans, including the eastern Central Atlantic.



***Nesiarchus nasutus* Johnson, 1862**

Frequent synonyms / misidentifications: None / None.

FAO names: **En** – Black gemfish; **Fr** – Escolier long nez; **Sp** – Escolar narigudo.



Diagnostic characters: Body fairly elongate and strongly compressed. **Depth 10 to 13 times in standard length.** Head 4.2 to 4.6 times in standard length. Lower jaw strongly extends anterior to upper jaw; **conical dermal process at tip of each jaw.** First dorsal fin long, with 19 to 21 spines. Second dorsal fin short, with 2 comprised spines and 19 to 24 rays including 2 finlets in adults (finlets not developed in juveniles). Anal fin a little shorter than second dorsal fin, with 2 comprised spines and 18 to 21 rays. Pectoral fins short, with 12 to 14 rays. **Pelvic fins shorter than pectoral fins, with 1 small spine and 5 rays.** Lateral line single, gradually sloping posteriorly and running midlaterally in hinder part of body. Vertebrae 34 to 35. **Colour:** body dark brown, with violet tint; fin membranes black.

Size: Maximum 1.3 m standard length, common to 80 cm.

Habitat, biology, and fisheries: Adults benthopelagic, dwelling on continental slope or underwater rises at about 200 m and deeper, migrates to mid-water at night. Feeds on squid, fish and crustaceans. Reproduces throughout the year in warm water. No special fishery.

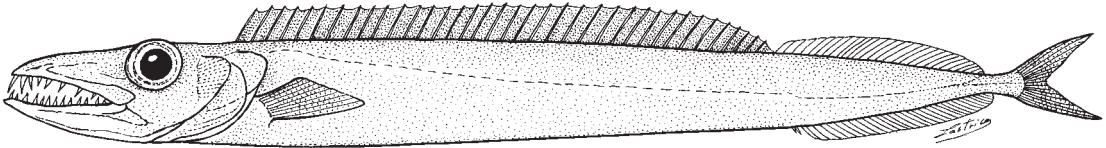
Distribution: Probably worldwide in the tropical and subtropical seas, known in the eastern Central Atlantic along the slope of northwestern Africa, in the equatorial area, and on the Walvis Ridge.



***Paradiplospinus gracilis* (Brauer, 1906)**

Frequent synonyms / misidentifications: None / None.

FAO names: **En** – Slender escolar; **Fr** – Escolier élégant; **Sp** – Escolar magro.



Diagnostic characters: Body elongate and compressed. Depth 12 to 16 times in standard length. Anus much nearer tip of caudal fin than tip of snout, in front of first anal-fin spine by a distance shorter than half of head length. Head 4.5 to 4.9 times in standard length. First dorsal spine with 35 to 38 spines. Second dorsal fin with 26 to 30 rays, its base less than half of first dorsal-fin base length. Anal fin with 2 small free spines and 24 to 29 soft rays. Pectoral fins with 12 to 14 rays. Pelvic fins reduced in adults. A single mid-lateral lateral line. Vertebrae 60 to 64. **Colour:** body and fins brownish black; gill membranes black.

Size: Maximum 43 cm standard length.

Habitat, biology, and fisheries: Benthopelagic on upper continental slope at depths from 370 to 630 m; juveniles mesopelagic. Not uncommon. Mature at 35 cm. Of no importance to fisheries.

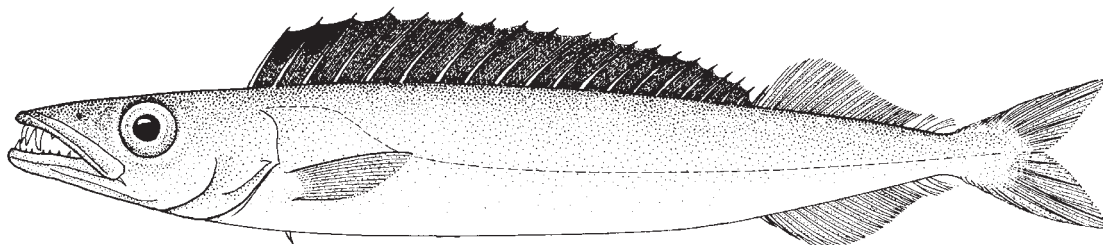
Distribution: Off Namibia and western South Africa from 17° 30'S to 31°S.



Promethichthys prometheus (Cuvier, 1832)

Frequent synonyms / misidentifications: None / None.

FAO names: **En** – Roudi escolar; **Fr** – Escolier clair; **Sp** – Escolar prometeo.



Diagnostic characters: Body moderately elongate and compressed. Depth 6.5 to 7 times in standard length. Head 3.5 to 3.7 times in standard length. Jaws without dermal processes. First dorsal fin with 17 to 19 spines. Second dorsal fin 2.5 times shorter than first dorsal fin, with 1 spine and 17 to 20 rays followed by 2 finlets. Anal fin with 2 (rarely 3) comprised spines and 15 to 17 rays followed by 2 finlets. Pectoral fins about equal to half of head length, with 13 or 14 rays. Pelvic fins entirely absent at more than 40 cm standard length (in smaller specimens represented by 1 spine that reduces with growth), underskin articulation on pelvic girdle before pectoral-fin base. **Lateral line single**, running subdorsally from above upper angle of gill opening to under fourth dorsal-fin spine, then **abruptly curving down and running mid-laterally**. Body entirely scaled at more than 20 to 25 cm standard length. Vertebrae 33 to 35. **Colour:** body greyish to copper brown; fins blackish.

Size: Maximum 1 m standard length.

Habitat, biology, and fisheries: Benthopelagic on continental slope, around islands and submarine rises at 100 to 750 m. Migrates to mid-water at night. Feeds on fishes, cephalopods and crustaceans. No special fishery exists.

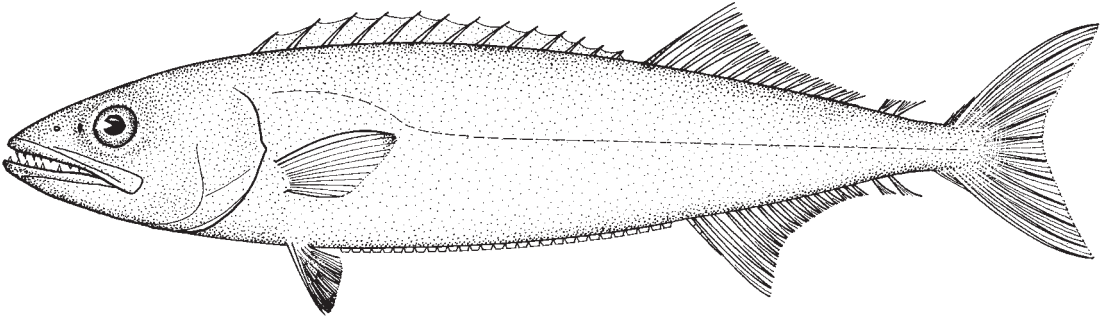
Distribution: Tropical and subtropical waters of all oceans. Within the area along the entire African slope, off Madeira, Canary Islands, Cape Verde Island and on underwater rises.



Ruvettus pretiosus Cocco, 1833

Frequent synonyms / misidentifications: None / None.

FAO names: En – Oilfish; Fr – Rouvet; Sp – Escolar clavo.



Diagnostic characters: Body semifusiform and slightly compressed. Depth 4.3 to 4.9 in standard length. Head 3.3 to 3.7 times in standard length. Jaws without dermal processes. First dorsal fin low, with 13 to 15 spines. Second dorsal fin with 15 to 18 rays followed by 2 finlets. Anal fin with 15 to 18 rays followed by 2 finlets. Pectoral fins with about 15 rays. Pelvic fins well developed, with 1 spine and 5 rays. **Lateral line single**, often obscure. **Belly keeled by bony scales between pelvic fins and anus**. No caudal keels. Skin very rough. Small cycloid scales, interspersed with rows of sharp spiny tubercles. Vertebrae 32. **Colour:** body uniformly brown to dark brown, tips of pectoral and pelvic fins black.

Size: Maximum up to 3 m total length, common to 1.5 m standard length.

Habitat, biology, and fisheries: Oceanic, benthopelagic on continental slope and sea rises from about 100 to 700 m. Usually solitary or in pairs near sea bottom, rarely schooling. Feeds on fishes, squids and crustaceans. Caught as bycatch in tuna longline fishery at depth from 100 to 400 m. Flesh very oily, with purgative properties, if eaten much.

Distribution: Widely distributed in the tropical and warm-temperate seas of the world. Within the area known along the whole African slope, off Canary Islands, and on the sea ridges.

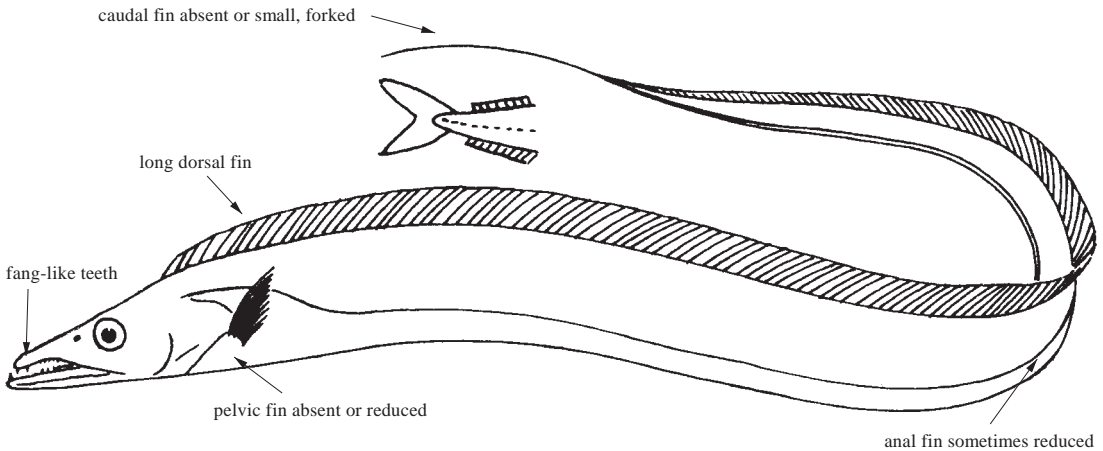


TRICHIURIDAE

Scabbardfishes (hairtails, frostfishes)

by N.V. Parin (+), P.P. Shirshov Institute of Oceanology, Moscow, Russian Academy of Sciences, Moscow, Russia and
I. Nakamura, Tuna Research and Conservation Center, Hopkins Marine Station, Stanford University, CA, USA

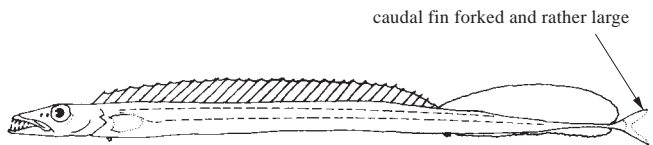
Diagnostic characters: Predominantly large fishes (to 1 to 2 m total length). **Body remarkably elongate and compressed, ribbon-like.** A single nostril each side of snout. Mouth large. **Teeth strong, usually fang-like at front of upper jaw and sometimes in anterior part of lower jaw.** A single dorsal fin running almost entire length of body; its spinous portion either short and continuous with very long soft portion, or moderately long, not shorter than half of soft portion length, and separated from soft portion by a notch. Anal fin preceded by 2 free spines behind anus (first inconspicuous and the second variously enlarged), with absent or reduced (sometimes restricted to posterior part of the fin) soft rays. Pectoral fins with 12 rays, rather small and situated mid-laterally or lower on sides. **Pelvic fins absent or reduced** to 1 flattened spine and 0 to 1 tiny soft rays. Caudal fin either small and forked, or absent. Lateral line single. Scales absent. No keels on caudal peduncle. Vertebrae 97 to 158. **Colour:** body silvery to black with iridescent tint. Fins usually paler.



Habitat, biology, and fisheries: Benthopelagic on continental shelves and slopes, and underwater rises from surface to about 1 600 m deep. Voracious predators feeding on fishes, squids and crustaceans. Eggs and larvae pelagic. Several species exploited commercially, 3 of them (*Aphanopus carbo*, *Lepidopus caudatus*, and *Trichiurus lepturus*) in fishing areas 34 and 41. Though flesh scanty, meat excellent to eat. Marketed mostly fresh, salted or frozen.

Similar families occurring in the area

Gempylidae: body less elongated; 2 nostrils each side of snout; 2 dorsal fins always well defined, first dorsal fin longer than the second one; dorsal and anal finlets present in many species. Caudal fin forked and rather large. Pelvic fins well developed in some species.



Gempylidae

Key to species occurring in the area

- 1a. Caudal fin present, small and forked (Fig. 1a); pelvic fins present, but strongly reduced, modified to a scale-like process (flattened spine) with 0 to 2 tiny soft rays (Fig. 1b) (totally absent in adult *Aphanopus*) → 2
- 1b. Caudal fin absent, body tapering into a hair-like process (Fig. 2); pelvic fins absent ***Trichiurus lepturus***

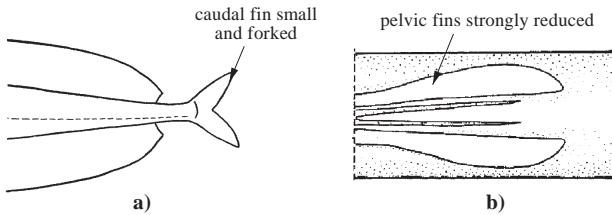


Fig. 1 caudal and pelvic fins

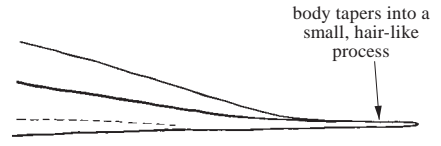


Fig. 2 *Trichiurus lepturus* caudal fin

- 2a. Head profile rising very gradually from tip of snout to origin of dorsal fin, without forming a sagittal crest (Fig. 3a); spinous part of dorsal fin long (not shorter than half of soft-ray part), with 38 to 44 not very weak spines well differing from subsequent rays), divided by notch from soft-ray part (Fig. 3b) → 3
- 2b. Head profile with a prominent sagittal crest (Fig. 4a); spinous part of dorsal fin short, with 10 or less very weak spines (hardly differing from subsequent rays), not divided by notch from soft-rays part (Fig. 4b) → 6

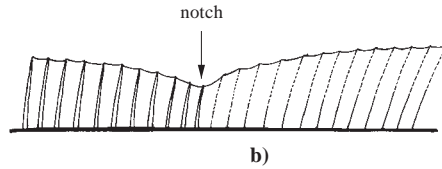
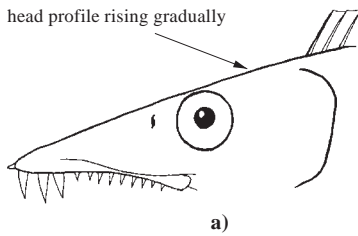


Fig. 3

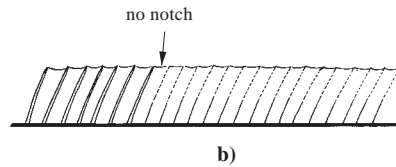
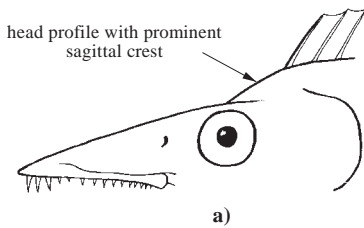


Fig. 4

- 3a. Spinous part of dorsal fin only slightly shorter than the soft part; 102 or less total dorsal-fin elements; second anal spine strong, dagger-like → 4
- 3b. Spinous part of dorsal fin about half as long as soft part; 125 or more total dorsal-fin elements; second anal spine delicate, scale-like → 5

- 4a. Total dorsal-fin elements 90 to 96; dorsal-fin spines 38 to 41 ***Aphanopus carbo***
- 4b. Total dorsal-fin elements 96 to 102; dorsal-fin spines 40 to 44 ***Aphanopus intermedius***

- 5a. Scale-like pelvic fins inserted behind pectoral-fin base (Fig. 5); total dorsal-fin elements 148 to 155 ***Benthodesmus simonyi***
- 5b. Scale-like pelvic fins inserted before pectoral-fin base; total dorsal-fin elements 125 to 129 ***Benthodesmus tenuis***

- 6a. Head 7.5 to 8 times in standard length; orbits nearly touching dorsal profile (as in Fig. 4); depth in adults 11 to 18 in standard length; total dorsal-fin elements 83 to 110. → 7
- 6b. Head 12 to 13.5 times in standard length; orbits far not touching dorsal profile (Fig. 6); depth in adults 25 to 28 in standard length; total dorsal-fin elements 116 to 123 . . . ***Assurger anzac***

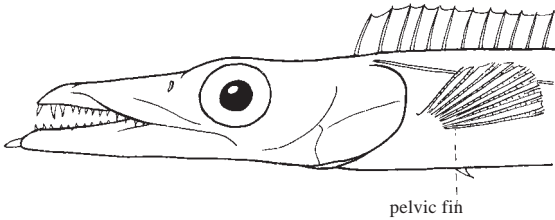


Fig. 5 *Benthodesmus simonyi*



Fig. 6 *Assurger anzac*

- 7a. Upper head profile concave; interorbital space flat or slightly concave (Fig. 7); total dorsal-fin elements 98 to 110 ***Lepidopus caudatus***
- 7b. Upper head profile slightly convex; interorbital space convex (Fig. 8); total dorsal-fin elements 83 to 89 ***Lepidopus dubius***

interorbital space flat or slightly concave



Fig. 7 *Lepidopus caudatus*
front view of upper head profile

interorbital space convex

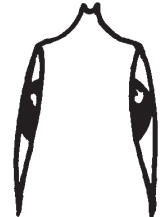










Fig. 8 *Lepidopus dubius*
front view of upper head profile

List of species occurring in the area

The symbol  is given when species accounts are given.

-  *Aphanopus carbo* Lowe, 1839.
-  *Aphanopus intermedius* Parin, 1983.
-  *Assurger anzac* (Alexander, 1917).
-  *Benthodesmus simonyi* (Steindachner, 1891).
-  *Benthodesmus tenuis* (Günther, 1877).
-  *Lepidopus caudatus* (Euphrasen, 1788).
-  *Lepidopus dubius* Parin and Mikhailin, 1981.
-  *Trichiurus lepturus* Linnaeus, 1758.

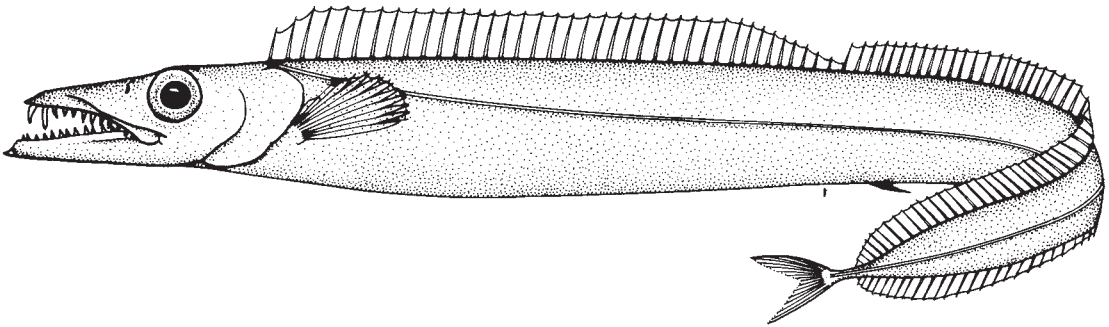
Reference

Nakamura, I. & Parin, N.V. 1993. Snake mackerels and cutlassfishes of the world (families Gempylidae and Trichiuridae). *FAO Fisheries Synopsis*, 125(15): 136 p.

Aphanopus carbo Lowe, 1839

Frequent synonyms / misidentifications: None / None.

FAO names: En – Black scabbardfish; Fr – Sabre noir; Sp – Sable negro.



Diagnostic characters: Body elongate. Depth 10.8 to 13.4 times in standard length. Head 4.7 to 5.2 times in standard length, with upper profile smooth, gently rising from snout to dorsal-fin origin. **Interorbital space and nape flattened, without sagittal crest.** Eye 4.9 to 5.9 times in head; situated near dorsal contour. **Dorsal fin with 38 to 40 spines and 52 to 56 soft rays (totally 90 to 96 fin elements), partly divided by deep notch,** base of spinous part only slightly shorter than the soft part. Anal fin with 2 close-set free spines well detached from the rest of fin, the second spine very strong, dagger-like, with 44 to 48 soft rays. Pelvic fins absent in adults. **Caudal fin forked.** Vertebrae 97 to 100. **Colour:** body coppery black with iridescent tint.

Size: Maximum 1.1 m standard length.

Habitat, biology, and fisheries: Benthopelagic at 200 to 1 600 m, juveniles mesopelagic. Migrates to mid-water at night. Feeds on crustaceans and fishes. Matures at 80 cm. Rare. Commercially exploited in Madeira.

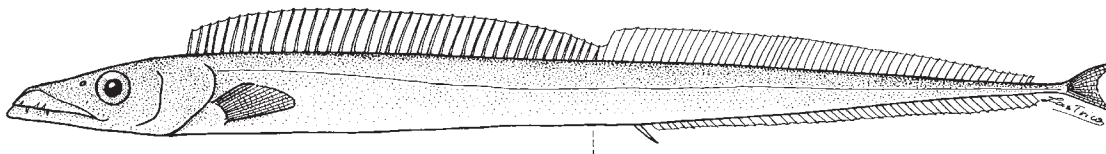
Distribution: North Atlantic Ocean. Within the area known only from off Madeira, and Meteor Seamount.



***Aphanopus intermedius* Parin, 1983**

Frequent synonyms / misidentifications: None / *Aphanopus carbo*.

FAO names: **En** – Intermediate scabbardfish; **Fr** – Poisson-sabre tachuo; **Sp** – Sable intermedio.



Diagnostic characters: Body elongate. Depth 12.0 to 16.4 times in standard length. Head 4.9 to 5.5 times in standard length, with upper profile smooth, gently rising from snout to dorsal-fin origin. **Interorbital space and nape flattened, without sagittal crest.** Eye 5.0 to 6.0 times in head, situated near dorsal contour. **Dorsal fin with 40 to 44 spines and 54 to 59 soft rays (totally 96 to 102 fin elements), partly divided by deep notch,** base of spinous part only slightly shorter than the soft part. Anal fin with 2 free close-set spines well detached from the rest of fin, the second spine very strong, dagger-like, and 46 to 50 rays. Pelvic fins absent in adults. Caudal fin forked. Vertebrae 102 to 107. **Colour:** body black.

Size: Maximum 1 m standard length.

Habitat, biology, and fisheries: Benthopelagic at 800 to 1 300 m. Rather rare within the area. Of no importance to fisheries.

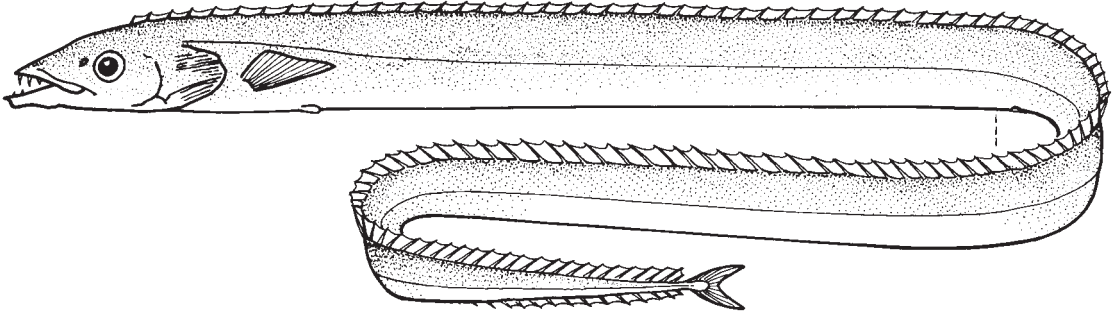
Distribution: Tropical and warm-waters of the Atlantic Ocean. In the eastern Atlantic known from Madeira, off Western Sahara to Mauritania and Gabon to Namibia as well as from underwater rises in southwestern part of the area.



Assurger anzac (Alexander, 1917)

Frequent synonyms / misidentifications: None / None.

FAO names: **En** – Razorback scabbardfish; **Fr** – Poisson-sabre rasoir; **Sp** – Sable aserrado.



Diagnostic characters: Body extremely elongate. Depth 25.1 to 28.0 times in standard length. Head 12.1 to 13.5 times in standard length, with upper profile straight or scarcely convex, gently rising from tip of snout to dorsal-fin origin. **Interorbital space and nape convex, with sagittal crest strongly elevated.** Eye 7.4 to 8.0 times in head, situated laterally. **Dorsal fin with a few weak anterior spines hardly differing from soft rays, totally 116 to 123 fin elements.** Anal fin with 2 close-set free spines well detached from the rest of the fin, the second small and scale-like, with only 14 to 17 external soft rays, confined to posterior portion of the fin. Pelvic fins of 1 scale-like spine and 1 tiny soft ray. **Caudal fin small, forked.** Vertebrae 125 to 129. **Colour:** body silvery, dorsal-fin membrane black anteriorly.

Size: Maximum 225 cm standard length.

Habitat, biology, and fisheries: Probably benthopelagic at 150 to 400 m, juveniles epi- or mesopelagic. Feeds on fishes and squids. Of no importance to fisheries.

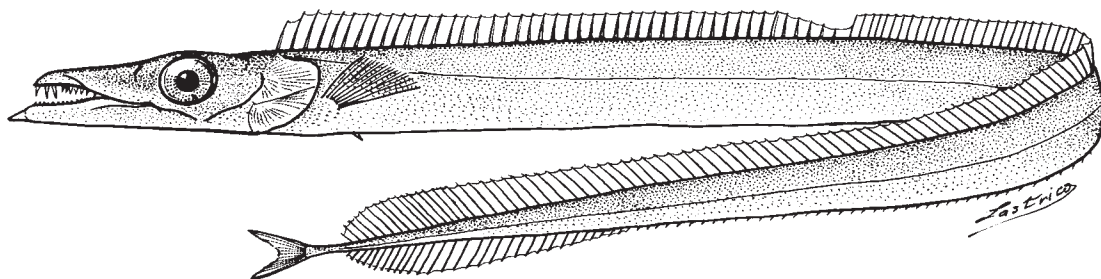
Distribution: Subtropical and warm-temperate waters of both the Northern and the Southern Hemispheres. In the eastern central Atlantic yet known only at Walvis Ridge but may be found elsewhere.



***Benthodesmus simonyi* (Steindachner, 1891)**

Frequent synonyms / misidentifications: *Benthodesmus atlanticus* Goode and Bean, 1896 / None.

FAO names: En – Simony's frostfish (AFS: North Atlantic frostfish); Fr – Poisson sabre ganse; Sp – Cintilla de Simony.



Diagnostic characters: Body extremely elongated. Depth 22.0 to 27.1 times in standard length. Head 7.0 to 8.0 times in standard length, with upper profile smooth, gently rising from tip of snout to dorsal-fin origin. **Interorbital space and nape flattened, without sagittal crest.** Eye 5.1 to 5.8 times in head, situated near dorsal contour. **Dorsal fin with 36 to 39 spines and 92 to 99 soft rays (totally 129 to 137 fin elements), partly divided by deep notch,** base of spinous part about twice shorter than the soft part. Anal fin with 2 free close-set spines well detached from the rest of fin, the second spine delicate, of cardiform shape, and 93 to 102 soft rays (external soft rays developed only in last third of fin base). **Pelvic fins** diminutive, composed of a scale-like spine and a rudimentary ray, **inserted well behind pectoral-fin base.** **Caudal fin forked.** Vertebrae 153 to 158. **Colour:** body silvery, jaws and opercle blackish.

Size: Maximum 1.3 m standard length.

Habitat, biology, and fisheries: Benthopelagic at 200 to 900 m on continental slope and underwater rises; juveniles mesopelagic. No importance to fisheries.

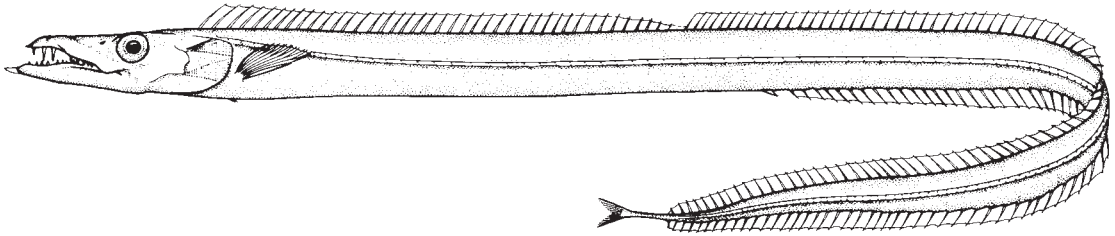
Distribution: The North Atlantic Ocean. Within the area known from off Madeira, Canary and Cape Verde Islands.



Benthodesmus tenuis (Günther, 1877)

Frequent synonyms / misidentifications: None / *Benthodesmus atlanticus* Goode and Bean, 1896; (= *B. simonyi*).

FAO names: **En** – Slender frostfish; **Fr** – Sabre fleuret; **Sp** – Cintilla.



Diagnostic characters: Body extremely elongated. Depth 25 to 31 times in standard length. Head 7.3 to 7.8 times in standard length, upper profile smooth, gently rising from tip of snout to dorsal-fin origin, **interorbital space and nape flattened, without sagittal crest**. Eye 5.9 to 7.5 times in head, situated near dorsal contour. **Dorsal fin with 39 to 42 spines and 80 to 86 soft rays (totally 120 to 125 fin elements), partly divided by deep notch**, base of spinous part about twice shorter than the soft part. Anal fin with 2 free close-set spines detached from the rest of fin, the second spine delicate, cardiform, and 70 to 75 soft rays, all of them external. **Pelvic fins** diminutive, **inserted well before or below pectoral-fin base**. **Caudal fin forked**. Vertebrae 123 to 128. **Colour:** body silvery, jaws and opercle blackish.

Size: Maximum 70 cm standard length.

Habitat, biology, and fisheries: Benthopelagic at 200 to 850 m; juveniles mesopelagic. No importance to fisheries.

Distribution: In the eastern Atlantic along the African slope from Congo to Namibia. Also reported from the western Atlantic, the Indian and Pacific oceans.

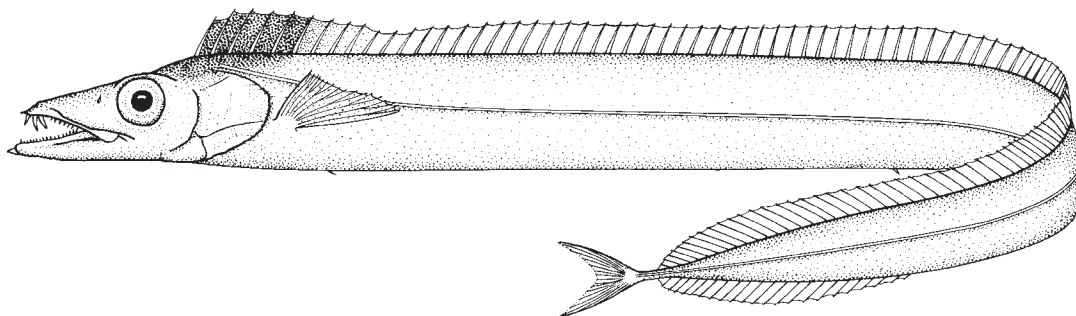
Remarks: It is possible that *B. tenuis* may represent a group of closely related species. Meristics given in this account based only on the eastern Atlantic specimens.



Lepidopus caudatus (Euphrasen, 1788)

Frequent synonyms / misidentifications: *Lepidopus lex* Phillips, 1932 / None.

FAO names: En – Silver scabbardfish; Fr – Sabre argenté; Sp – Pez cinto.



Diagnostic characters: Body elongate and compressed. Depth 10.9 to 15.4 times in standard length. Head 5.7 to 6.8 times in standard length, with upper profile oblique concave, gently rising from snout to middle of orbits and more steeply to dorsal-fin origin. **Interorbital space flat or slightly concave, sagittal crest confined to nape.** Eye 4.9 to 6.1 times in head. **Dorsal-fin elements 98 to 110.** Anal fin with 2 close-set weak spines well detached from the rest of the fin, the second spine plate-like or triangular, and with 59 to 66 soft rays. Pectoral fins with 12 rays. **Pelvic fins reduced, scale-like. Caudal fin forked.** **Colour:** body uniformly silver, dorsal fin blackish grey or with black margin.

Size: Maximum 205 cm standard length in the eastern North Atlantic, usually 100 to 135 cm standard length.

Habitat, biology, and fisheries: Benthopelagic on continental shelf and upper slope down to 400 m, usually over sandy and muddy bottoms from 100 to 250 m. Migrates into mid-water at night. Schooling. Feeds on crustaceans, small squid and fish. Attains length of 125 cm at 9 years of age in the southern East Atlantic and 160 cm at 13 years in the northern East Atlantic. Important commercial species off Morocco, Mauritania and Namibia.

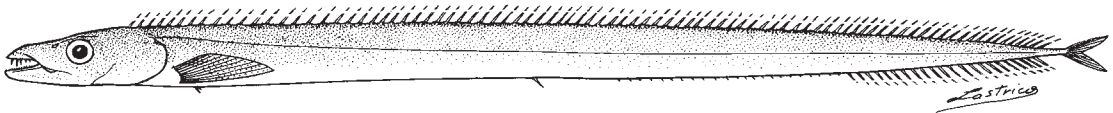
Distribution: Eastern North and South Atlantic, southern Indian Ocean and southern Pacific off Australia and New Zealand. In the area from off Morocco to Senegal including Madeira and Canaries, and from off Namibia and South Africa.



Lepidopus dubius Parin and Mikhailin, 1981

Frequent synonyms / misidentifications: None / None.

FAO names: En – Doubtful scabbardfish; Fr – Poisson sabre énigme; Sp – Pez cinto enigma.



Diagnostic characters: Body elongate and compressed. Depth 16.4 to 18.5 times in standard length. Head 6.4 to 6.8 times in standard length, with upper profile slightly convex, gently rising from snout to nape. **Interorbital space convex, sagittal crest confined to nape.** Eye 5.3 to 5.6 times in head. **Dorsal-fin elements (83) 85 to 89.** Anal fin with 2 close-set weak spines well detached from the rest of the fin, the second spine weak, cardiform, and with 48 to 53 soft rays. Pectoral fins with 12 rays. **Pelvic fins reduced, scale-like. Caudal fin forked.** **Colour:** body silvery, edges of jaws and opercle blackish.

Size: Maximum 43 cm standard length.

Habitat, biology, and fisheries: Benthopelagic from 320 to 500 m; juveniles epi- and mesopelagic from 20 to 220 m. No importance to fisheries.

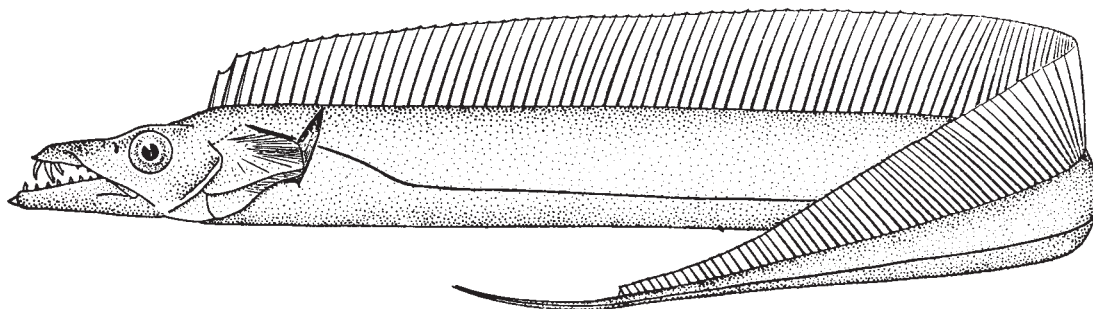
Distribution: Southeastern tropical Atlantic from the equator to 14° 30' S.



Trichiurus lepturus Linnaeus, 1758

Frequent synonyms / misidentifications: None / None.

FAO names: **En** – Largehead hairtail (AFS: Atlantic cutlassfish); **Fr** – Poisson-sabre commun; **Sp** – Pez sable.



Diagnostic characters: **Body elongate and strongly compressed, ribbon-like, tapering to a point** (tip often broken). Depth about 15 to 18 times in total length. Head about 6 to 8 times in total length, with upper profile slightly concave, gently rising from snout to dorsal-fin origin. **Interorbital space and nape convex, with sagittal crest elevated.** Eye 5 to 7 times in head, nearly touching upper profile. **Dorsal fin** rather high, very long, **with 3 spines and 130 to 135 rays, not divided by notch.** Anal fin reduced to about 100 to 105 minute spinules, usually embedded in skin or slightly breaking through. Pectoral fins directed upward, with 1 spine and 11 to 13 rays. **Pelvic fins absent. No caudal fin.** **Colour:** fresh specimens steel blue with silvery reflection, pectoral fin semitransparent, other fins sometimes tinged with pale yellow; the colour becomes uniform silvery grey after death.

Size: Maximum 1.2 m total length, common 50 to 100 cm.

Habitat, biology, and fisheries: Benthopelagic on continental shelf to 100 m depth, usually in shallow coastal waters over muddy bottom, occasionally at surface at night. Young and immature specimens feed on crustaceans and small fishes; adults more piscivorous. Matures at about 2 years. Eggs pelagic. Commercial species. Caught mainly with bottom trawls and beach seines, also trammel nets, purse seines and handlines. Marketed fresh, frozen and salted.

Distribution: Throughout tropical and temperate waters of the world. In the eastern Atlantic along the whole African coast.

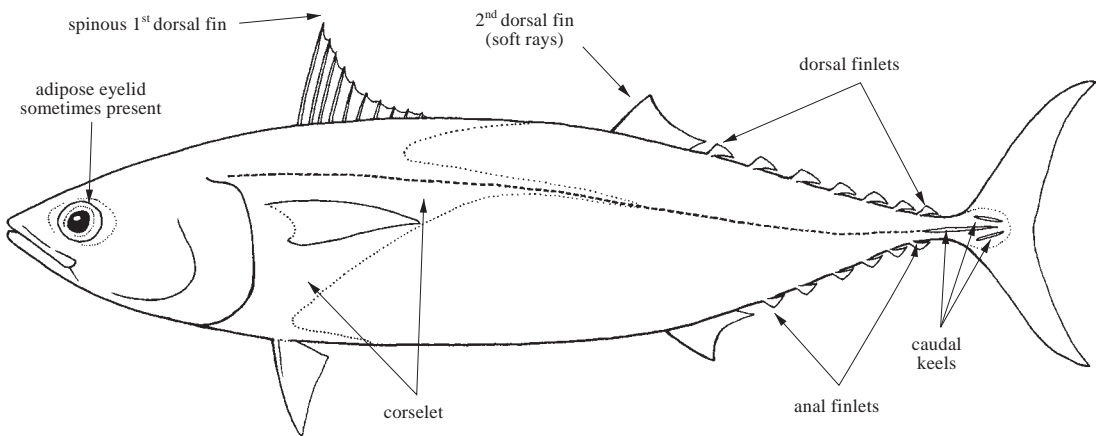


SCOMBRIDAE

Mackerels and tunas

by B.B. Collette, National Marine Fisheries Service, National Systematics Laboratory,
National Museum of Natural History, Washington, DC, USA

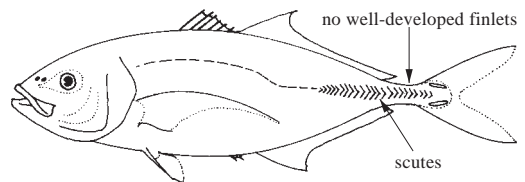
Diagnostic characters: Medium to large fishes (to 3 m) with elongate and fusiform body, moderately compressed in some genera. Snout pointed; adipose eyelid sometimes present (*Scomber*); premaxillae beak-like, free from nasal bones which are separated by ethmoid bone; mouth rather large; teeth in jaws strong, moderate or weak; no true canines; palate and tongue may have teeth. Two dorsal fins; anterior fin usually short and separated from posterior fin; **5 to 10 finlets present behind dorsal and anal fins; caudal fin deeply forked** with supporting caudal rays completely covering hypural plate; pectoral fins placed high; pelvic fins moderate or small. **At least 2 small keels on each side of caudal peduncle, a larger keel in between in many species.** Lateral line simple. Vertebrae 31 to 66. Body either uniformly covered with small to moderate scales (e.g. *Scomber*, *Scomberomorus*) or a corselet developed (area behind head and around pectoral fins covered with moderately large, thick scales) and rest of body naked (*Auxis*, *Euthynnus*, *Katsuwonus*), or covered with small scales (*Thunnus*). **Colour:** *Scomber* species are usually bluish or greenish above with a pattern of wavy bands on upper sides and silvery below; *Scomberomorus* and *Acanthocybium* are blue-grey above and silvery below with dark vertical bars or spots on sides. *Sarda* has 5 to 11 dark oblique stripes on back; *Euthynnus* has a striped pattern on back and several dark spots between pectoral and pelvic fins; *Katsuwonus* has 4 to 6 conspicuous longitudinal stripes on belly; *Auxis* and *Thunnus* are deep blue/black above; most species of *Thunnus* have bright yellow finlets with black borders.



Habitat, biology, and fisheries: A diverse group of pelagic fishes. Some smaller species inhabit coastal waters while the larger ones, especially *Thunnus thynnus*, carry out transoceanic migrations. All scombrids are excellent foodfishes and many of them are of significant importance in coastal pelagic or oceanic commercial and sports fisheries.

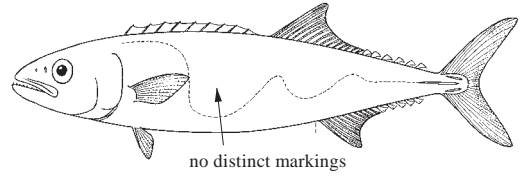
Similar families occurring in the area

Carangidae: dorsal-fin spines 3 to 8 (9 to 27 in Scombridae); frequently scutes developed along the posterior part of the lateral line and usually no well-developed finlets (except in *Oligoplites* with a series of dorsal and anal finlets; *Elagatis* and *Decapterus* with 1 dorsal and 1 anal finlet); they also have 2 detached spines in front of anal fin.



Carangidae

Gempylidae: back usually brown, rarely blue-brown; no distinct markings on body; no keels on caudal peduncle, except in *Lepidocybium*.



Gempylidae (*Lepidocybium*)

Key to the species of Scombridae occurring in the area

- 1a. Two small keels on either side of caudal peduncle (Fig. 1a); 5 dorsal and 5 anal finlets; adipose eyelids cover anterior and posterior portions of eye (***Scomber***) → 2
- 1b. Two small keels and a large median keel between them on either side of caudal peduncle (Fig. 1b); 7 to 10 dorsal and 7 to 10 anal finlets; no adipose eyelids. → 3

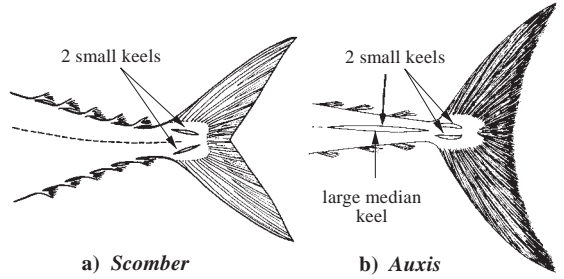
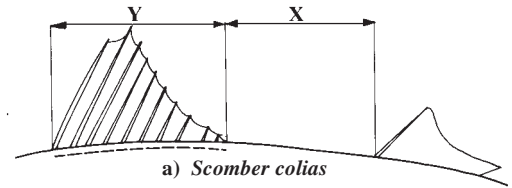
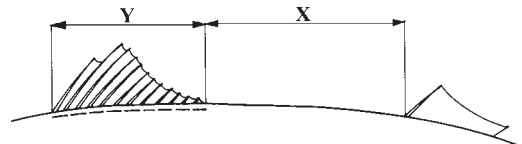


Fig. 1 caudal keels

- 2a. First dorsal-fin spines 8 to 10; space between end of first dorsal-fin groove and origin of second dorsal fin (x) equal to or less than length of groove (y) (Fig. 2a); swimbladder present; belly marked with numerous dusky rounded blotches; 14 precaudal + 17 caudal vertebrae; 12 to 15 interneural bones under first dorsal fin ***Scomber colias***



- 2b. First dorsal-fin spines 11 to 13; space between end of first dorsal-fin groove and origin of second dorsal fin (x) greater than length of groove (y), about 1.5 times as long (Fig. 2b); swimbladder absent; belly unmarked; 13 precaudal + 18 caudal vertebrae; 21 to 28 interneural bones under first dorsal fin ***Scomber scombrus***



b) *Scomber scombrus*

Fig. 2 dorsal fins

- 3a. Teeth in jaws strong, compressed, almost triangular or knife-like; corselet of scales obscure → 4
- 3b. Teeth in jaws slender, conical, hardly compressed; corselet of scales well developed → 6

- 4a. Snout as long as rest of head; no gillrakers; 23 to 27 spines in first dorsal fin; posterior end of maxilla concealed under preorbital bone (Fig. 3a) . . . ***Acanthocybium solandri***
- 4b. Snout much shorter than rest of head; at least 3 gillrakers present; 14 to 19 spines in first dorsal fin; posterior end of maxilla exposed (Fig. 3b). . . **(*Scomberomorus*) → 5**

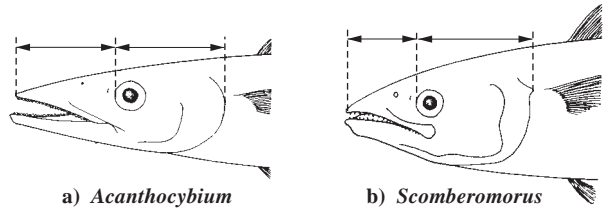


Fig. 3 lateral view of head

- 5a. Lateral line with a deep dip below second dorsal fin; total gillrakers on first arch 3 to 8
 ***Scomberomorus commerson***
- 5b. Lateral line straight or descending gradually; total gillrakers on first arch 12 to 15
 ***Scomberomorus tritor***

- 6a. Upper surface of tongue without cartilaginous longitudinal ridges (Fig. 4a). → 7
- 6b. Upper surface of tongue with 2 longitudinal ridges (Fig. 4b). → 8

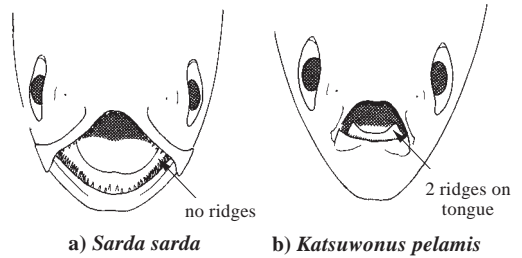


Fig. 4 anterior view of head

- 7a. Five to 11 narrow, dark longitudinal stripes on upper part of body (Fig. 5); 20 to 23 spines in first dorsal fin; no teeth on upper surface of tongue . . . ***Sarda sarda***
- 7b. No stripes on body; 12 to 14 spines in first dorsal fin; 2 tooth patches on upper surface of tongue . . . ***Orcynopsis unicolor***

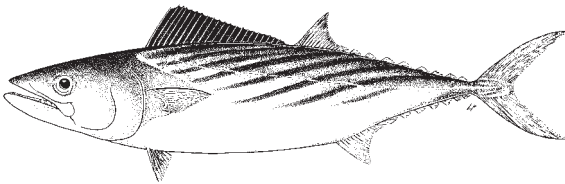


Fig. 5 *Sarda sarda*

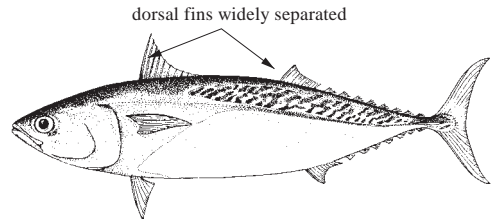


Fig. 6 *Auxis thazard thazard*

- 8a. First and second dorsal fins widely separated, the space between them equal to length of first dorsal-fin base (Fig. 6); 9 to 12 spines in first dorsal fin; interpelvic process single and long, at least as long as longest pelvic-fin ray (Fig. 7a) ***Auxis* → 9**
- 8b. First and second dorsal fins barely separated, at most by eye diameter (Figs 8 and 9); 12 to 16 spines in first dorsal fin; interpelvic process bifid and short, much shorter than pelvic-fin rays (Fig. 7b) → 10

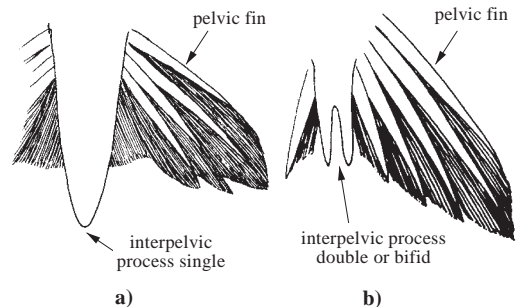


Fig. 7 interpelvic process

- 9a. Posterior extension of corselet narrow, only 1 to 5 scales wide under origin of second dorsal fin; pectoral fin extends posteriorly beyond a vertical with the anterior margin of the dorsal scaleless area ***Auxis thazard thazard***
- 9b. Posterior extension of corselet much wider, usually 10 to 15 scales wide under origin of second dorsal fin; pectoral fin does not extend posteriorly as far as a vertical with the anterior margin of the dorsal scaleless area ***Auxis rochei rochei***

- 10a. Three to five prominent dark longitudinal stripes on belly (Fig. 8); gillrakers 53 to 63 on first arch ***Katsuwonus pelamis***
- 10b. No dark longitudinal stripes on belly; gillrakers 19 to 45 on first arch → 11

- 11a. Body naked behind corselet of enlarged and thickened scales; several black spots usually present between pectoral and pelvic-fin bases (Fig. 9); 26 or 27 pectoral-fin rays ***Euthynnus alletteratus***
- 11b. Body covered with very small scales behind corselet; no black spots on body; 30 to 36 pectoral fin rays **(*Thunnus*) → 12**

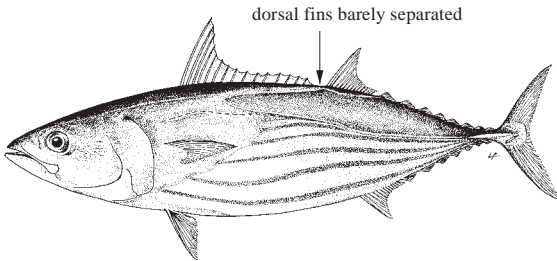


Fig. 8 *Katsuwonus pelamis*

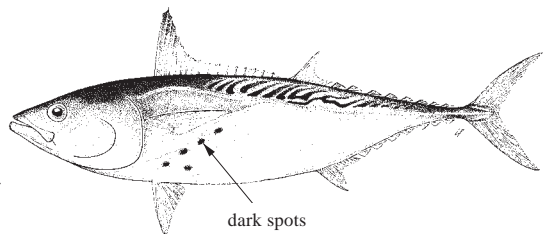


Fig. 9 *Euthynnus alletteratus*

- 12a. Ventral surface of liver without striations; right lobe of liver much longer than left or central lobes; second dorsal and anal fins of larger individuals (120 cm fork length and longer) elongate, more than 20% of fork length ***Thunnus albacares***
- 12b. Ventral surface of liver covered with prominent striations; central lobe of liver equal to or longer than left and right lobes → 13

- 13a. Total gillrakers on first arch 31 to 43; pectoral fin short, less than 80% of head length, 16.8 to 21.7% of fork length ***Thunnus thynnus***
- 13b. Total gillrakers on first arch 23 to 31; pectoral fin moderate to long, more than 80% of head length → 14

- 14a. Caudal fin with a narrow white posterior border; pectoral fin very long, reaching well past end of second dorsal-fin base; greatest body depth at or slightly before level of second dorsal fin ***Thunnus alalunga***
- 14b. Caudal fin without white posterior border; pectoral fin short or moderate in length, reaching end of second dorsal-fin base (except in small individuals); greatest body depth about middle of body, near middle of first dorsal fin ***Thunnus obesus***

List of species occurring in the area

The symbol  is given when species accounts are included

-  *Acanthocybium solandri* (Cuvier, 1832).
-  *Auxis rochei rochei* (Risso, 1810).
-  *Auxis thazard thazard* (Lacépède, 1800).
-  *Euthynnus alletteratus* (Rafinesque, 1810).
-  *Katsuwonus pelamis* (Linnaeus, 1758).
-  *Orcynopsis unicolor* (Geoffrey St Hilaire, 1817).
-  *Sarda sarda* (Bloch, 1793).
-  *Scomber colias* Gmelin, 1789.
-  *Scomber scombrus* Linnaeus, 1758.
-  *Scomberomorus commerson* (Lacépède, 1800).
-  *Scomberomorus tritor* (Cuvier, 1832).
-  *Thunnus alalunga* (Bonnaterre, 1788).
-  *Thunnus albacares* (Bonnaterre, 1788).
-  *Thunnus obesus* (Lowe, 1839).
-  *Thunnus thynnus* (Linnaeus, 1758).

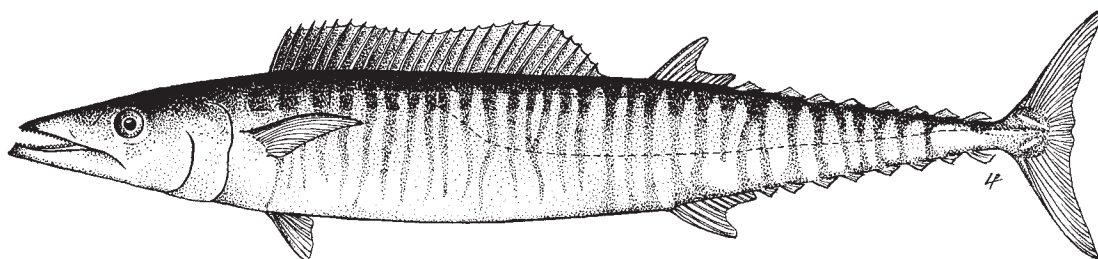
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- Yoshida, H.O.** 1980. Synopsis of biological data on bonitos of the genus *Sarda*. *NOAA Technical Report, NMFS Circular*, 432: 50 p.

Acanthocybium solandri (Cuvier, 1832)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Wahoo; Fr – Thazard-bâtard; Sp – Peto.



Diagnostic characters: Body very elongate, fusiform and only slightly laterally compressed. **Snout about as long as the rest of head; teeth in jaws strong, compressed, almost triangular. Gillrakers absent; posterior part of maxilla completely concealed under preorbital bone.** Two dorsal fins, the first with 23 to 27 spines; 7 to 10 dorsal and anal finlets; 2 small flaps (interpelvic process) between pelvic fins. Lateral line single, abruptly curving downward under first dorsal fin. Swimbladder present. Vertebrae 62 to 64. **Colour:** back iridescent bluish green; **24 to 30 cobalt-blue vertical bars on sides** which extend to below lateral line.

Size: Maximum to 210 cm fork length. The IGFA all-tackle game fish record is 83.5 kg for a fish caught off Cabo San Lucas, Baja California in 2005.

Habitat, biology, and fisheries: An offshore pelagic species, spending most of its time above the thermocline. Piscivorous, preying on squids and pelagic fishes such as scombrids, flyingfishes, herrings, scads, and lanternfishes. Spawning seems to extend over a long period of the year. Fecundity is high, 6 million eggs were estimated for a 131 cm female. An excellent food fish, greatly appreciated wherever it occurs. Primarily a sports fish on light to heavy tackle, surface trolling with spoon, feather lure, strip bait, or flyingfish or halfbeak. Marketed mostly fresh.

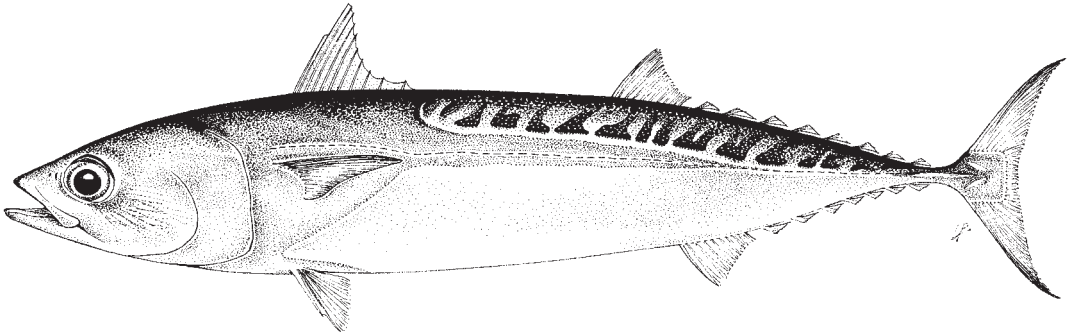
Distribution: A cosmopolitan warm-water species usually found well offshore. Exact range in the eastern Atlantic is not well known but there are records from the Azores, Canary and Cape Verde islands, Mauritania, Senegal, Guinea, Togo, Dahomey, Nigeria, São Tomé, and St Helena.



***Auxis rochei* (Risso, 1810)**

Frequent synonyms / misidentifications: *Auxis thynnoides* Bleeker, 1855; *A. maru* Kishinouye, 1915 / *Auxis thazard*.

FAO names: En – Bullet tuna; Fr – Bonitou (= Auxide, Area 31); Sp – Melva.



Diagnostic characters: Body robust, elongate and rounded. Gillrakers 40 to 47 on first gill arch, usually 42 or more. **Two dorsal fins separated by a large interspace** (at least equal to length of first dorsal-fin base); 9 to 12 spines in first dorsal fin; **the second fin followed by 8 finlets**; **pectoral fins short, not reaching vertical line from anterior margin of scaleless area above corselet**; **a large, single-pointed flap** (interpelvic process) **between pelvic fins**; **anal fin followed by 7 finlets**. **Body naked except for corselet, which is wide (usually 10 to 15 scales wide under second dorsal-fin origin)**. A strong central keel on each side of caudal-fin base between 2 smaller keels. Swimbladder absent. Vertebrae 20 precaudal plus 19 caudal, total 39. **Colour:** back bluish, turning to deep purple or almost black on the head; **a pattern of 15 or more fairly broad, nearly vertical dark bars in the scaleless area**; belly white; pectoral and pelvic fins purple, their inner sides black.

Size: Maximum to 50 cm fork length; common to 35 cm. The IGFA all-tackle game fish record is 1.8 kg for a fish caught off l'Ampolla, Spain in 2004.

Habitat, biology, and fisheries: Adults have been taken largely in inshore waters and near islands. Feed on small fishes, especially clupeoids; also on crustaceans, especially megalops larvae and larval stomatopods, and on squids. Predators include tunas and billfishes. Fork length at first maturity off Gibraltar is 35 cm in females and 36.5 cm in males. Females spawn from 31 000 to 103 000 eggs and average 52 000 eggs/spawning. Caught with purse seines, liftnets, traps, pole-and-line, and by trolling. Marketed fresh and frozen. No specific fishery exists; caught with other species throughout its range.

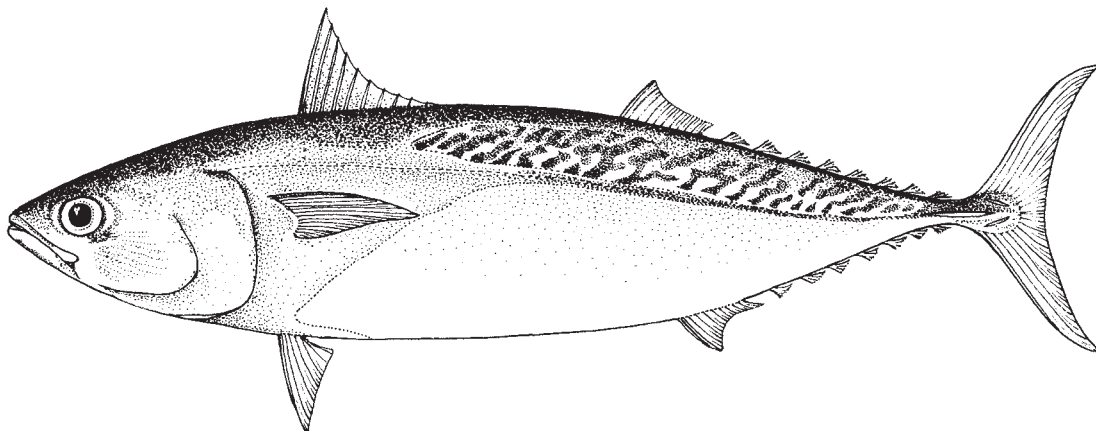
Distribution: A cosmopolitan warm-water species that occurs sporadically throughout the eastern central Atlantic. Until recently, only 1 species was recognized in this area, so exact distribution of the 2 species (*A. rochei* and *A. thazard*) is not well known. *Auxis rochei* appears to be the more common of the 2 in the eastern Atlantic and Mediterranean and is known from the Azores, Canary and Cape Verde Islands, Guinea to Angola, and St Helena. Replaced by *A. r. eudorax* in the eastern Pacific.



Auxis thazard (Lacépède, 1800)

Frequent synonyms / misidentifications: *Auxis tapeinosoma* Bleeker, 1854; *A. hira* Kishinouye, 1915 / None.

FAO names: **En** – Frigate tuna; **Fr** – Auxide; **Sp** – Melva.



Diagnostic characters: Body robust, elongate and rounded. Gillrakers 36 to 44 on first gill arch, usually 42 or fewer. **Two dorsal fins, the first with 10 to 12 spines, separated from the second by a large interspace** (at least equal to length of first dorsal-fin base), **the second fin followed by 8 finlets; pectoral fins short, but reaching past vertical line from anterior margin of scaleless area above corselet; a large single-pointed flap** (interpelvic process) **between pelvic fins; anal fin followed by 7 finlets. Body naked except for the corselet, which is narrow in its posterior part (no more than 5 scales wide under second dorsal-fin origin).** A strong central keel on each side of caudal-fin base between 2 smaller keels. Swimbladder absent. Vertebrae 20 precaudal plus 19 caudal, total 39. **Colour:** back bluish, turning to deep purple or almost black on the head; **a pattern of 15 or more narrow, oblique to nearly horizontal, dark wavy lines in the scaleless area above lateral line;** belly white; pectoral and pelvic fins purple, their inner sides black.

Size: Maximum to 58 cm fork length; common to 40 cm (larger than *A. rochei*). The IGFA all-tackle game fish record is 1.7 kg for a fish caught in New South Wales, Australia in 1998.

Habitat, biology, and fisheries: Mainly coastal waters. Feed on small pelagic organisms, such as anchovies, silversides and other small fishes; also on crustaceans and squids. Predators include tunas and billfishes. Fecundity varies between 200 000 and 1.06 million eggs per spawning, correlated with size of females. Larvae and juveniles are abundant in oceanic as well as coastal waters. Adults are caught with beach seines, driftnets, purse seines, and by trolling. Marketed fresh; possibly also frozen.

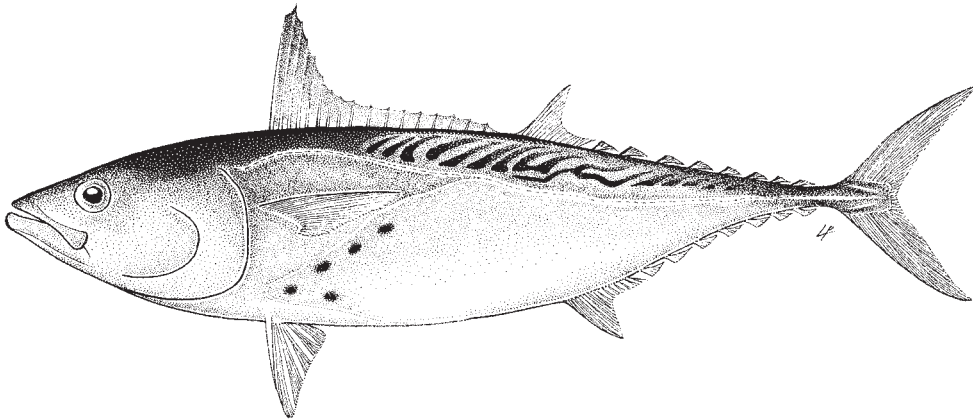
Distribution: A cosmopolitan warm-water species that occurs sporadically throughout the eastern central Atlantic. Until recently, only 1 species, currently known as *A. rochei*, was recognized in the eastern Atlantic so the exact distribution of the 2 species is not well known. Definitely known from Cape Verde Islands, Senegal to Angola, and St Helena.



Euthynnus alletteratus (Rafinesque, 1810)

Frequent synonyms / misidentifications: *Euthynnus quadripunctatus* (Geoffrey St Hilaire, 1817) / None.

FAO names: **En** – Little tunny; **Fr** – Thonine commune (= Thonine, Area 31); **Sp** – Bacoreta.



Diagnostic characters: A large fish, body robust and fusiform. Gillrakers 37 to 45 on first gill arch. Two dorsal fins separated by a narrow space (not wider than eye diameter); **anterior spines in dorsal fin much higher than those midway, giving the fin a strongly concave outline**; 13 to 15 spines in first dorsal fin; second dorsal fin with 11 or 12 rays, much lower than first, followed by 8 finlets; pectoral fins short; 2 flaps (interpelvic process) between pelvic fins; **anal fin with 11 to 13 rays followed by 7 or 8 finlets**. Body naked, except for the corselet and lateral line. Caudal peduncle very slender, bearing on either side a prominent central keel between 2 small keels at bases of caudal-fin lobes. Swimbladder absent. Vertebrae 39. **Colour:** back dark blue **with a complicated striped pattern not extending forward beyond middle of first dorsal fin**; lower sides and belly silvery white; **several characteristic dark spots between pelvic and pectoral fins** (not always very conspicuous).

Size: Maximum to 100 cm fork length; common to 85 cm, and about 7 kg weight. The IGFA all-tackle gamefish record is 16.3 kg for a fish caught off Washington Canyon, New Jersey, USA in 2006.

Habitat, biology, and fisheries: Found in surface waters, mainly on the continental shelf or around islands. Less migratory than *Katsuwonus pelamis* or other tunas; usually found in coastal areas with swift currents, near shoals and offshore islands. Feeds mainly on small fishes such as clupeoids and other pelagic species, as well as on fish larvae, squids and crustaceans. At times, schools can be located by the presence of diving birds that are also feeding on the smaller fishes. Size at first maturity off Dakar, Senegal is 39.7 cm for males, 38.6 cm for females. Spawning is extended in the Gulf of Guinea, at least from October to June. Fecundity of a 75 cm fish off Dakar was estimated at 1 575 000 eggs. In open waters little tunny are fished with purse seines and trolling lines; young individuals are also taken with beach seines. Because of its abundance in inshore waters, it is a popular sports fish, commonly taken by trolling feather jigs, spoons, or strip bait. Marketed mainly fresh, also canned.

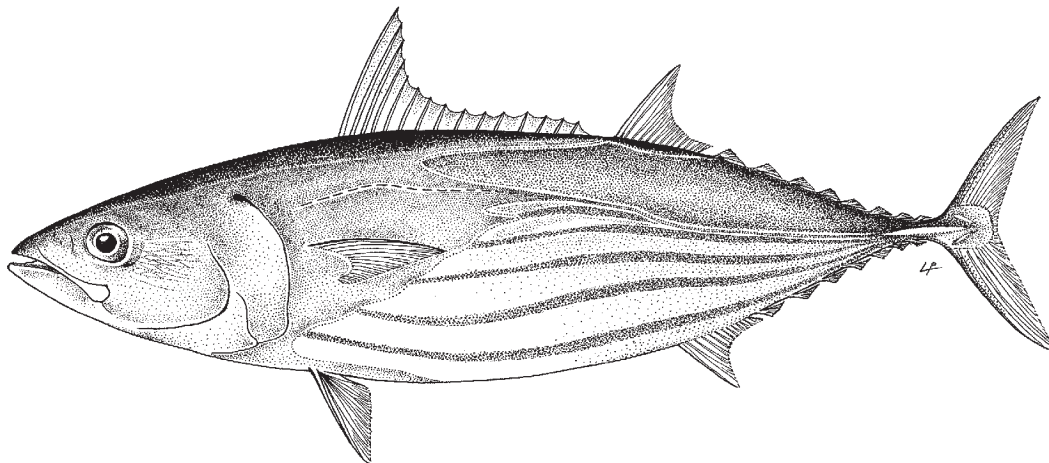
Distribution: From the Canary and Cape Verde islands and Mauritania southward along the coast in the Gulf of Guinea to Baía dos Tigres, Angola. Also found in the Mediterranean Sea and the western Atlantic.



***Katsuwonus pelamis* (Linnaeus, 1758)**

Frequent synonyms / misidentifications: *Euthynnus pelamis* (Linnaeus, 1758) / None.

FAO names: En – Skipjack tuna; Fr – Listao; Sp – Listado.

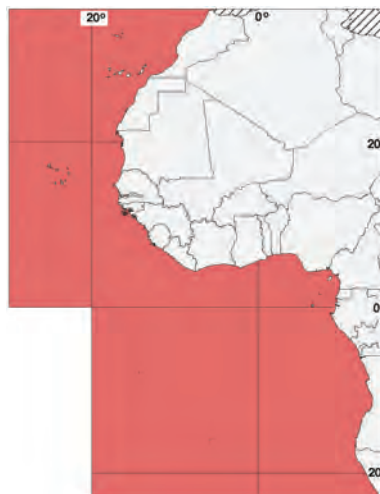


Diagnostic characters: Body fusiform, elongate and rounded. **Gillrakers numerous, 53 to 63 on first gill arch. Two dorsal fins separated by a small interspace** (not larger than eye), **the first with 14 to 16 spines, the second followed by 7 to 9 finlets**; pectoral fins short with 26 or 27 rays; 2 flaps (interpelvic process) between pelvic fins; anal fin followed by 7 or 8 finlets. Body scaleless except for the corselet and lateral line. A strong keel on each side of base of caudal fin between 2 smaller keels. Swimbladder absent. Vertebrae 41. **Colour:** back dark purplish blue, lower sides and belly silvery, **with 4 to 6 very conspicuous longitudinal dark bands** which in live specimens may appear as discontinuous lines of dark blotches.

Size: Maximum to 100 cm fork length; common to 80 cm. The IGFA all-tackle game fish record is 20.5 kg for a fish caught in Baja California in 1996.

Habitat, biology, and fisheries: An epipelagic, oceanic species with adults distributed roughly within the 15° isotherm, overall temperature range of occurrence 14.7 to 30°C. Occurs in large schools in deep coastal and oceanic waters, generally above the thermocline. Feeds on fishes, cephalopods, and crustaceans. Caught mainly by pole-and-line; also with purse seines. Also an important game fish usually taken by trolling on light tackle using plugs, spoons, feathers, or strip bait. Marketed canned or frozen.

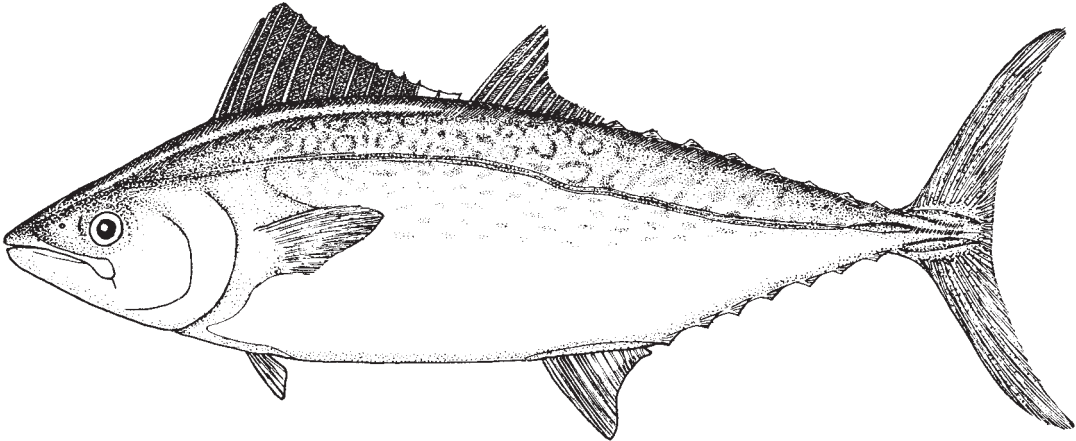
Distribution: Cosmopolitan in tropical and subtropical seas warmer than 15°C. Found along the entire coast of West Africa and at St Helena.



Orcynopsis unicolor (Geoffroy St Hilaire, 1817)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Plain bonito; Fr – Palomette; Sp – Tasarte.



Diagnostic characters: Body relatively short and deep, strongly compressed. Mouth rather large, upper jaw reaching to hind margin of eye; 13 to 29 conical teeth on upper jaw, 10 to 23 on lower jaw; **2 tooth patches on upper surface of tongue; gillrakers on first arch 12 to 17, usually 14 to 16.** Dorsal fins close together, **the first (spiny) short and high (12 to 14 spines)** and almost straight in outline; the second with 12 to 15 rays followed by 7 to 9 finlets; anal fin with 14 to 16 rays followed by 6 to 8 finlets; pectoral fins short (21 to 23 rays); interpelvic process small and bifid. Body naked behind well developed corselet except for a band of scales along the bases of the dorsal fins and patches of scales around the bases of the pectoral and pelvic fins; caudal peduncle slender, with a well developed lateral keel between 2 smaller keels on each side. Swimbladder absent. Vertebrae 37 to 39. **Colour:** back blue-black with faint mottled pattern laterally but **no prominent stripes or spots**; lower sides silvery; anterior three-quarters of first dorsal fin black, second dorsal fin and dorsal finlets dark, some yellow on anal fin.

Size: Maximum size 130 cm fork length and 13.1 kg; common to 90 cm and 4 to 5 kg.

Habitat, biology, and fisheries: An epipelagic neritic species confined primarily to temperate coastal waters but juveniles may be encountered in waters up to 30°C. Feeds mainly on small schooling fishes, especially sardines, anchovies, jacks, and mackerels. A 5 or 6 kg female contained 500 000 to 600 000 eggs. There seems to be no fishery directed at this species. Caught mainly by pole-and-line; also with purse seines. Marketed canned or frozen.

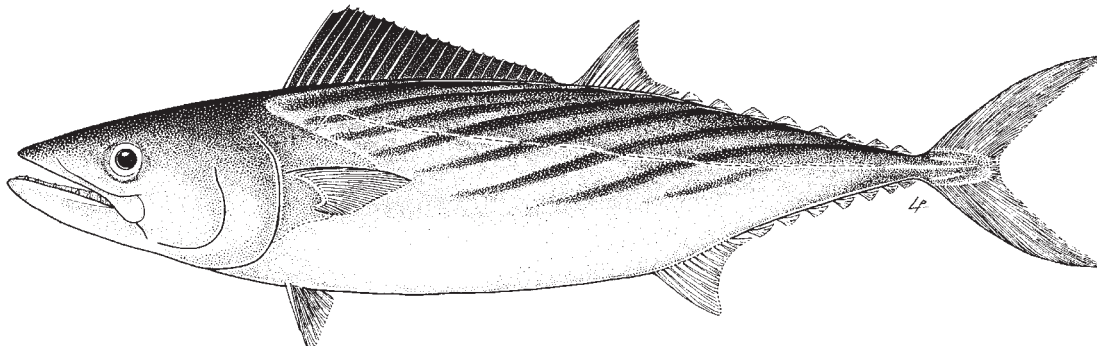
Distribution: An eastern Atlantic endemic whose range is centred in the southern Mediterranean Sea but extends north to Oslo, Norway and southward to Dakar, Senegal. Not known from the Azores, Madeira, or the Cape Verde Islands. Rare in the Canary Islands.



Sarda sarda (Bloch, 1793)

Frequent synonyms / misidentifications: None / None.

FAO names: **En** – Atlantic bonito; **Fr** – Bonito à dos rayé (= Pélamide, Area 31); **Sp** – Bonito del Atlántico.



Diagnostic characters: A small, relatively narrow-bodied tuna. **Mouth rather wide, upper jaw reaching to hind margin of eye or beyond;** no tooth patches on upper surface of tongue; teeth in jaws slender and conical, 13 to 28 on upper jaw, 10 to 24 on lower jaw; **16 to 23 gillrakers on first arch.** Dorsal fins close together, **the first (spiny) very long, with 20 to 23 spines and straight or only slightly concave in outline;** 7 to 9 dorsal and 6 to 8 anal finlets; pectoral fins short with 23 to 26 rays; pelvic fins separated by 2 flaps (interpelvic process). Body entirely covered with scales which are minute except on the well-developed corselet; caudal peduncle slender, with a well-developed lateral keel between 2 smaller keels on each side. Swimbladder absent. Vertebrae 50 to 55. **Colour:** back and upper sides steel-blue, with **5 to 11 dark slightly oblique stripes** running forward and downward; lower sides and belly silvery.

Size: Maximum to 85 cm fork length and 5 kg weight; common to 50 cm and about 2 kg weight. The IGFA all-tackle game fish record is 8.3 kg for a fish caught at Faial Island, Azores in 1953.

Habitat, biology, and fisheries: A epipelagic migratory species often schooling near the surface in inshore waters mainly over the continental shelf. Feeds mostly on fishes, particularly small clupeoids, gadoids and mackerels. In the eastern Atlantic, spawning occurs from December to June, including peaks in January and April off Dakar, and from June to July in Moroccan waters. In coastal waters it is caught mostly with gillnets and purse seines, while trolling lines are more often used offshore. Marketed mainly fresh and canned.

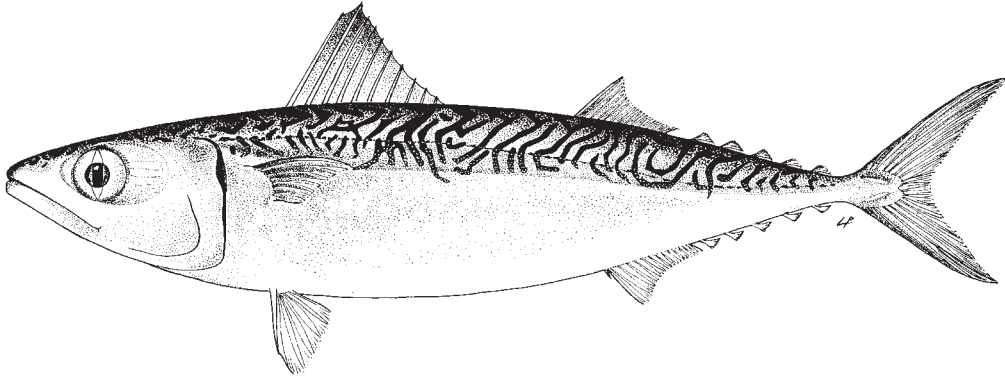
Distribution: In the eastern Atlantic, extends from near Oslo, Norway, southward to Port Elizabeth, South Africa including the Mediterranean and Black seas. It is known from all along the coast of West Africa from Morocco to Namibia and in the Azores, Canary, and Cape Verde islands. It is also found in the western Atlantic from Massachusetts to northern Argentina.



Scomber colias Gmelin, 1789

Frequent synonyms / misidentifications: *Pneumatophorus colias* (Gmelin, 1789); *Scomber japonicus* Houttuyn, 1782 / None.

FAO names: **En** – Atlantic chub mackerel; **Fr** – Maquereau espagnol; **Sp** – Estornino.



Diagnostic characters: Body elongate and rounded, snout pointed, caudal peduncle slim. Front and hind margins of eye covered by an adipose eyelid. **Two widely separated dorsal fins (interspace equal to or less than length of first dorsal-fin base); the first with 8 to 10 spines; 5 dorsal and 5 anal finlets;** a single small flap (interpelvic process) between pelvic fins. Scales behind head and around pectoral fins larger and more conspicuous than those covering rest of body, but no well-developed corselet. Two small keels on each side of caudal peduncle (at base of caudal-fin lobes), **but no central keel between them.** Swimbladder present. Vertebrae 14 precaudal plus 17 caudal, 31 total; **12 to 15 interneural bones under first dorsal fin.** **Colour:** back steel-blue crossed by faint wavy lines; **lower sides and belly silvery-yellow with numerous dusky rounded blotches.**

Size: Maximum to 50 cm fork length; common to 30 cm. The IGFA all-tackle game fish record for the closely related *S. japonicus* is 2.2 kg for a fish caught at Guadalupe Island, Mexico in 1986.

Habitat, biology, and fisheries: A schooling pelagic species found mostly in coastal waters. Feeds on small pelagic fishes, especially clupeoids, and pelagic invertebrates. Seasonal migrations may be very extended. Spawning most often occurs at water temperatures of 15 to 20°C. Caught with purse seines, often together with sardines, sometimes using light; also with trolling lines, gillnets, traps, beach seines and midwater trawls. Marketed fresh, frozen, smoked, salted and occasionally also canned.

Distribution: Inhabits temperate and subtropical waters of the Atlantic Ocean and adjacent seas. In the eastern Atlantic, known from the Mediterranean and Black seas, Madeira, the Canary Islands and from 10°N to 16°S in the Gulf of Guinea, south to Moçâmedes and Baía de Tigres, Angola, and at St Helena. Also found around the Cape of Good Hope.

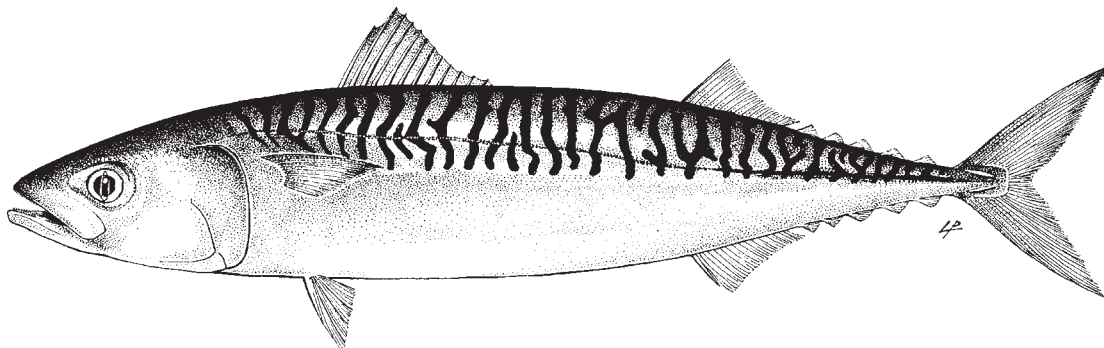
Remarks: Based on morphological and molecular data, the Atlantic chub mackerel is now considered distinct from the Indo-Pacific chub mackerel, *S. japonicus* Houttuyn, 1782.



Scomber scombrus Linnaeus, 1758

Frequent synonyms / misidentifications: None / None.

FAO names: En – Atlantic mackerel; Fr – Maquereau commun (= Maquereau de l'Atlantique, Area 37); Sp – Caballa del Atlántico.



Diagnostic characters: Body elongate and rounded, snout pointed, caudal peduncle slim. Front and hind margins of eye covered by an adipose eyelid. **Two widely separated dorsal fins (interspace greater than length of first dorsal-fin base), the first with 11 to 13 spines; 5 dorsal and 5 anal finlets;** a single small flap (interpelvic process) between pelvic fins. Scales behind head and around pectoral fins larger and more conspicuous than those covering rest of body, but no well-developed corselet. Two small keels on each side of caudal peduncle (at base of caudal-fin lobes), **but no central keel between them.** Swimbladder absent. Vertebrae 13 precaudal plus 18 caudal equals 31 total; **21 to 28 interneural bones under first dorsal fin.** **Colour:** back brilliant blue-green with a series of dark curving lines across the back; sides metallic; **lower sides and belly white without any blotches.**

Size: Maximum to 50 cm fork length; common to 30 cm. The IGFA all-tackle game fish record is 1.2 kg for a fish caught in Norway in 1992.

Habitat, biology, and fisheries: A schooling pelagic fish inhabiting cold and temperate waters, most abundant over the continental shelf. Feeds chiefly on pelagic invertebrates and on herring, pilchard, sprat and eels. Spawns from March to April in the Mediterranean. Length at first maturity about 30 cm fork length at an age of 2 or 3 years. Fecundity in a medium-sized female ranges between 200 000 and 450 000 eggs per season, increasing with size. Caught with purse seines, often together with sardines, sometimes using light; also with trolling lines, gillnets, traps, beach seines and midwater trawls. Marketed fresh, frozen, smoked, salted and occasionally also canned. Of relatively little importance in Area 34 but a very important species further north in both the eastern and western North Atlantic.

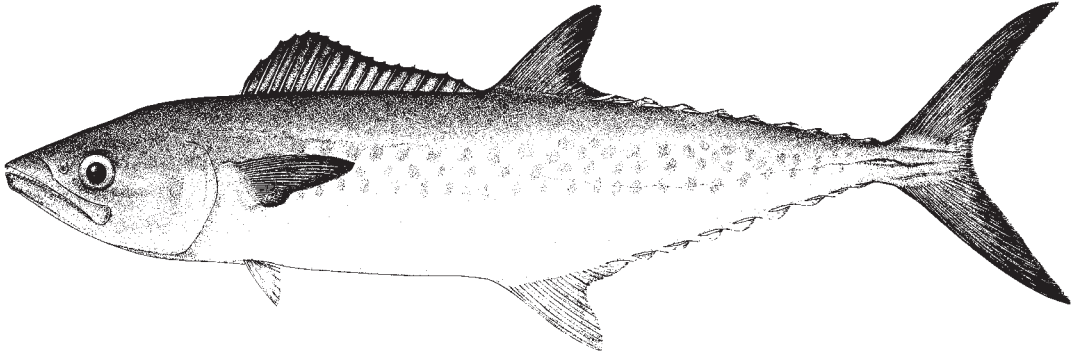
Distribution: A North Atlantic species found from the North Sea and Mediterranean Sea south to Cabo Bojador (26°N) of the northwest coast of Africa. Also found in the western Atlantic from Labrador to Cape Lookout, North Carolina. There is 1 old unconfirmed record from the Canary Islands.



Scomberomorus tritor (Cuvier, 1832)

Frequent synonyms / misidentifications: None / *Scomberomorus maculatus* (Mitchill, 1815).

FAO names: En – West African Spanish mackerel; Fr – Thazard blanc; Sp – Carite lusitánico.



Diagnostic characters: Body elongate, strongly compressed. Snout much shorter than rest of head; posterior part of maxilla exposed, reaching to a vertical from hind margin of eye; **12 to 15 teeth on upper, 17 to 19 on lower jaw, compressed, almost triangular; gillrakers on first arch (1 to 3 on upper limb; 10 to 13, usually 11, on lower limb; 12 to 15 total).** Two scarcely separated dorsal fins, the first with 15 to 18 spines; the second with 17 to 20 fin rays; dorsal and anal finlets 7 to 9, usually 8; 2 flaps (interpelvic process) between pelvic fins. **Lateral line straight or gradually curving down toward caudal peduncle.** Body entirely covered with small scales, no corselet developed; pectoral fins without scales, except at bases, 20 to 22 fin rays. Swimbladder absent. Vertebrae 46 or 47. **Colour:** back bluish green, **sides silvery with about 3 rows of vertically elongate spots,** some large individuals with thin vertical bars; **anterior half of first dorsal fin and margin of posterior half of first fin black, base of posterior half white.**

Size: Maximum to at least 98 cm fork length in females, 84 cm in males; commonly 50 to 70 cm. The IGFA all-tackle game fish record is 6.0 kg for a fish caught at Grand Bereby, Côte d'Ivoire in 1998.

Habitat, biology, and fisheries: An epipelagic neritic species penetrating into coastal lagoons. Tends to form schools. Feeds on small fishes, especially sardines and anchovies. Spawning season extends from April to October in Senegal. A 95-cm female contained about 1 million eggs. Age at first maturity 45 cm for both sexes. Caught mainly with purse seines, and on line gear. Marketed mostly fresh or frozen; the flesh is highly appreciated.

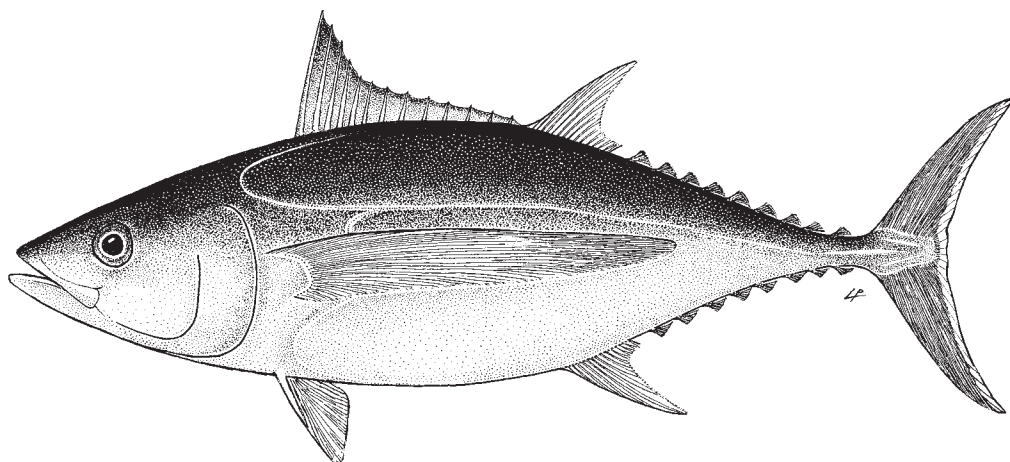
Distribution: An eastern Atlantic species whose range is concentrated in the Gulf of Guinea from the Canary Islands, Dakar and São Tomé south to Baía dos Tigres, Angola. Rare in the northern Mediterranean Sea, along the coasts of France and Italy. Has erroneously been considered conspecific with a similar western Atlantic species, *S. maculatus*.



Thunnus alalunga (Bonnaterre, 1788)

Frequent synonyms / misidentifications: *Germo alalunga* (Bonnaterre, 1788); *Thunnus germo* (Lacépède, 1801) / None.

FAO names: En – Albacore; Fr – Germon; Sp – Atún blanco (= Albacora).

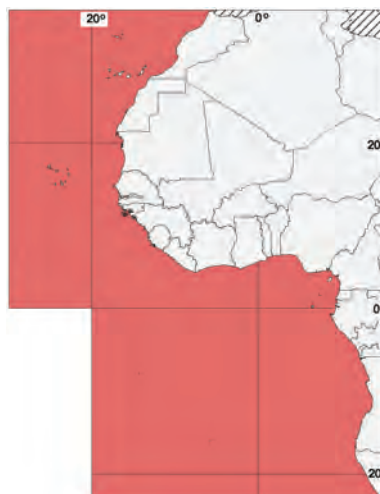


Diagnostic characters: A large species with an elongate, fusiform body, **deepest at a more posterior point** than in other tunas (**at, or only slightly anterior to, second dorsal fin** rather than near middle of first dorsal-fin base). Eyes rather large; gillrakers 25 to 31 on first arch. Two dorsal fins separated only by a narrow interspace, the second clearly lower than the first and followed by 7 to 9 finlets; **pectoral fins remarkably long, usually 30% of fork length or longer, reaching well beyond origin of second dorsal fin** (usually up to second dorsal finlet); 2 flaps (interpelvic process) between pelvic fins; anal fin followed by 7 or 8 finlets. Small scales on body; corselet of larger scales developed but not very distinct. Caudal peduncle very slender, bearing on each side a strong lateral keel between 2 smaller keels. **Liver striated on ventral surface**, central lobe longest. Swimbladder present. Vertebrae 18 precaudal plus 21 caudal equals 39 total. **Colour:** back metallic dark blue, lower sides and belly whitish; a faint lateral iridescent blue band runs along sides in live fish; first dorsal fin deep yellow, second dorsal and anal fins light yellow, **anal finlets dark; posterior margin of caudal fin white.**

Size: Maximum 127 cm fork length; common to 100 cm. The IGFA all-tackle game fish record is 40.0 kg for a fish caught at Gran Canaria, Canary Islands in 1977.

Habitat, biology, and fisheries: Oceanic, epipelagic, the young often in large schools; found below the thermocline or at temperatures of 17 to 21°C. Feeds on many kinds of organisms, particularly fishes, squids and crustaceans. Fecundity generally increases with size, a 20-kg female may produce between 2 and 3 million eggs per season, which are released in at least 2 batches. Caught with purse seines, longlines, and by trolling. Marketed mainly canned or frozen.

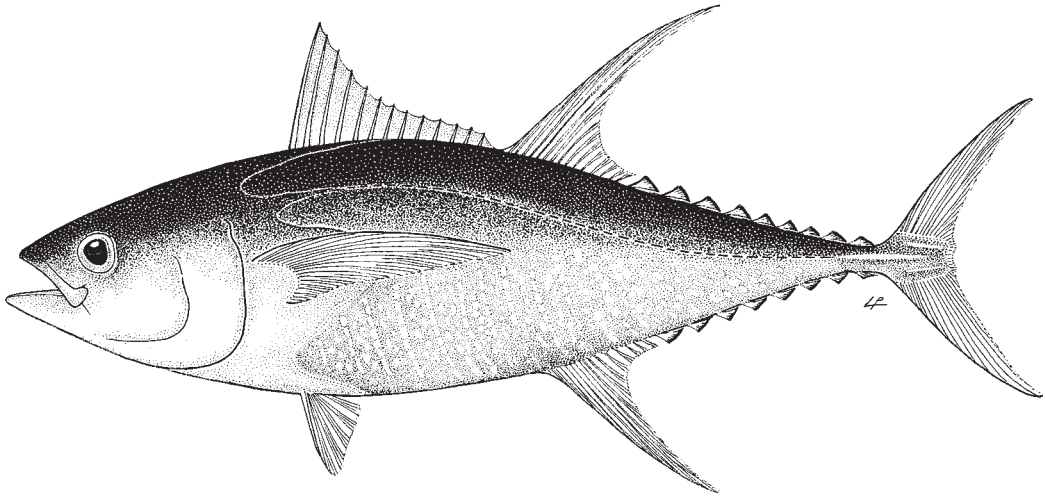
Distribution: A cosmopolitan species, often extending into cool waters. In the eastern Atlantic, its range extends from Great Britain to St Helena and South Africa and it also occurs in the Mediterranean Sea.



Thunnus albacares (Bonnaterre, 1788)

Frequent synonyms / misidentifications: *Neothunnus macropterus* (Temminck and Schlegel, 1844); *N. albacora* (Lowe, 1839); *Thunnus argentivittatus* (Cuvier, 1832) / None.

FAO names: **En** – Yellowfin tuna; **Fr** – Albacore (= Thon albacore, Area 31); **Sp** – Rabil.

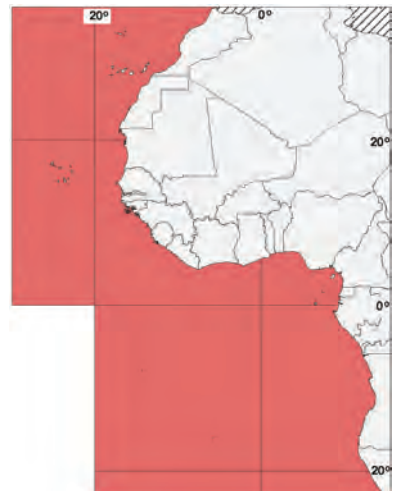


Diagnostic characters: Large species with an elongate, fusiform body, slightly compressed from side to side. Gillrakers 26 to 34 on first arch. **Two dorsal fins, separated only by a narrow interspace**, the second followed by 8 to 10 finlets; anal fin followed by 7 to 10 finlets; 2 flaps (interpelvic process) between pelvic fins; **large specimens have very long second dorsal and anal fins**, becoming well over 20% of fork length; **pectoral fins moderately long, usually reaching beyond second dorsal-fin origin but not beyond end of its base**, usually 22 to 31% of fork length. Body with very small scales; **corselet of larger scales developed but not very distinct**. Caudal peduncle very slender, bearing on each side a strong lateral keel between 2 smaller keels. **No striations on ventral surface of liver**, right lobe longest. Swimbladder present. Vertebrae 18 precaudal plus 21 caudal equals 39 total. **Colour:** back metallic dark blue changing through yellow to silver on belly; **belly frequently crossed by about 20 broken, nearly vertical lines**; dorsal and anal fins, and dorsal and anal finlets, bright yellow, the finlets with a narrow black border.

Size: Maximum to over 200 cm fork length; common to 150 cm. The IGFA all-tackle game fish record is a 193-kg fish caught off Baja California in 2012.

Habitat, biology, and fisheries: Epipelagic, oceanic, above and below the thermocline. The thermal barriers to its occurrence are roughly between 18° and 31°C. Feeds on a wide variety of fishes, crustaceans, and cephalopods. Spawning occurs throughout the year in the central tropical waters of its distribution. Caught mainly with longlines and purse seines. Marketed fresh, frozen, or canned.

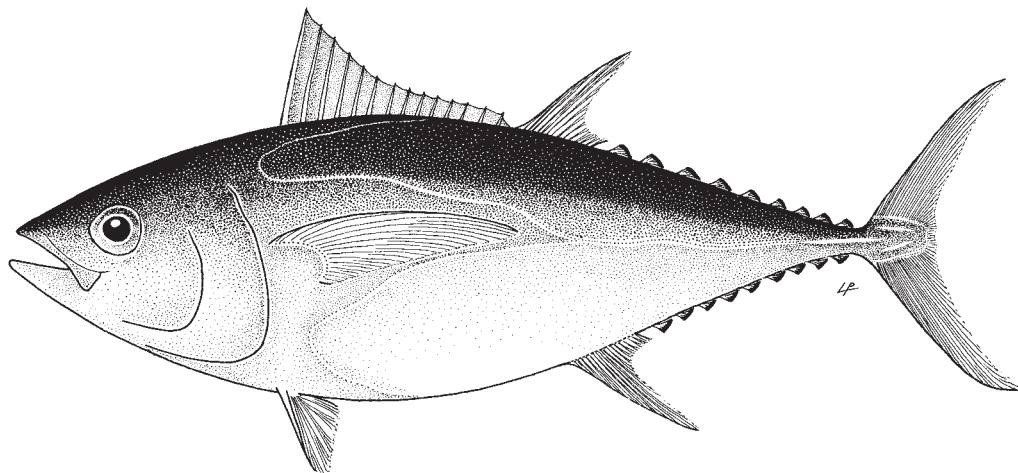
Distribution: A pantropical species. In the eastern Atlantic it is known from the Azores, southern Portugal, and the Cape Verde Islands southward throughout the Gulf of Guinea to St Helena and South Africa.



Thunnus obesus (Lowe, 1839)

Frequent synonyms / misidentifications: *Parathunnus mebachi* (Kishinouye, 1915); *P. sibi* (Temminck and Schlegel, 1844) / None.

FAO names: En – Bigeye tuna; Fr – Thon obèse (= Patudo, Area 31); Sp – Patudo.



Diagnostic characters: A large species with robust, fusiform body, slightly compressed from side to side. **Gillrakers 23 to 31 on first arch.** Two dorsal fins, separated only by a narrow interspace, the second followed by 8 to 10 finlets; **pectoral fins moderately long** (22 to 31% of fork length) **in large specimens** (over 110 cm fork length), **but very long** (as long as in *T. alalunga*) **in smaller specimens**; 2 flaps (interpelvic process) between pelvic fins; anal fin followed by 7 to 10 finlets. Very small scales on body; **corselet of larger and thicker scales developed, but not very distinct.** Caudal peduncle very slender, with a strong lateral keel between 2 smaller keels. **Ventral surface of liver striated**, central lobe the longest. Swimbladder present. Vertebrae 18 precaudal plus 21 caudal equals 39 total. **Colour:** back metallic dark blue, lower sides and belly whitish; a lateral iridescent blue band runs along sides in live specimens; first dorsal fin deep yellow, second dorsal and anal fins light yellow, **finlets bright yellow edged with black.**

Size: Maximum length over 200 cm fork length, common to 180 cm. The IGFA all-tackle Atlantic game fish record is 178.0 kg for a fish caught at Gran Canaria, Canary Islands in 1996.

Habitat, biology, and fisheries: An epipelagic and mesopelagic oceanic species, taken from the surface to depths of 250 m at water temperatures of 13° to 29°C. Bigeye feed on a variety of fishes, cephalopods, and crustaceans. Mature fish spawn at least twice a year producing 2.9 to 6.3 million eggs per spawning. Caught mainly with longlines, occasionally, purse seines are also used. Marketed mainly canned or frozen.

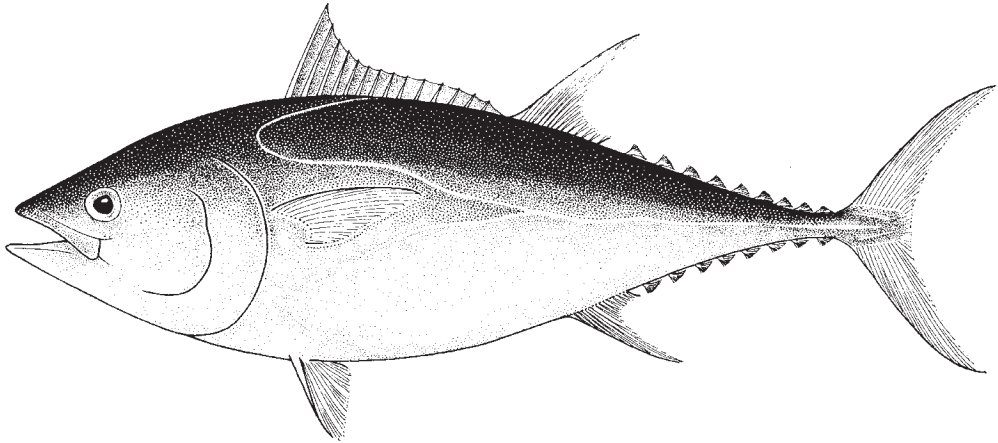
Distribution: A pantropical species. In the eastern Atlantic, it is known from the Azores and Madeira southward through the Gulf of Guinea to St Helena and South Africa.



Thunnus thynnus (Linnaeus, 1758)

Frequent synonyms / misidentifications: *Thunnus thynnus thynnus* (Linnaeus, 1758) / None.

FAO names: **En** – Atlantic bluefin tuna; **Fr** – Thon rouge de l'Atlantique; **Sp** – Atún rojo del Atlántico.



Diagnostic characters: A very large species with a fusiform and rounded body (nearly circular in cross section), very robust in front. **Gillrakers 34 to 43 on first arch.** Two dorsal fins separated only by a narrow interspace, the second higher than the first; 8 to 10 finlets present behind the second dorsal and 7 to 9 behind the anal fin; **pectoral fins very short, less than 80% of head length, never reaching the interspace between the dorsal fins;** 2 separate flaps (interpelvic process) between the pelvic fins; a well-developed, although not particularly conspicuous corselet; very small scales on rest of body. Caudal peduncle slender, with a strong lateral keel between 2 small keels located at the bases of the caudal-fin lobes. **Ventral surface of liver striated**, centre lobe longest. Swimbladder present. Vertebrae 18 precaudal plus 21 caudal equals 39 total. **Colour:** back dark blue or black, lower sides and belly silvery white with colourless transverse lines alternated with rows of colourless dots (the latter dominate in older fish), visible only in fresh specimens; first dorsal fin yellow or bluish, **the second reddish brown;** anal fin and finlets dusky yellow edged with black; lateral keel black in adults.

Size: Maximum to over 300 cm fork length; common to 200 cm. The IGFA all-tackle game fish record is a 678.6-kg fish caught in Nova Scotia in 1979.

Habitat, biology, and fisheries: An epipelagic, very fast swimming species known to effect transoceanic migrations; the young generally form schools, sometimes together with other scombrid species of similar size; immature individuals are found in warm waters only, while adults also enter cold waters in search of food. Outside the spawning season it is a voracious predator which preys on many kinds of fishes, crustaceans and cephalopods. Primarily taken on longlines. Bluefin is the most highly valued tuna for sashimi. A large part of the catch is air-shipped fresh or frozen to Japan for preparation as sashimi.

Distribution: A North Atlantic Ocean species found in the Mediterranean Sea and from Norway and Great Britain southward to the Azores, Morocco, the Canary Islands, and Mauritania. There is also a population off Cape Town, South Africa.

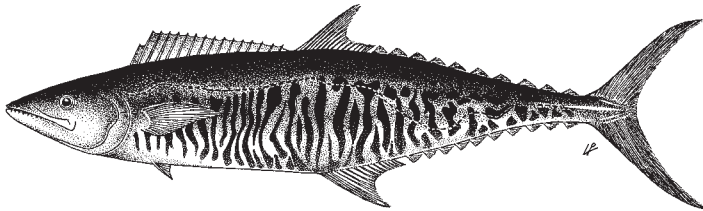
Remarks: Replaced by *Thunnus orientalis* in the North Pacific, once considered a subspecies of *T. thynnus* but now considered a full species.



Scomberomorus commerson (Lacépède, 1800)

En – Narrow-barred Spanish mackerel; **Fr** – Thazard rayé Indo-Pacifique; **Sp** – Carite estriado Indo-Pacífico.

Maximum size to about 220 cm fork length. IGFA all tackle gamefish record is a 44.9-kg fish caught in South Africa in 1982. Epipelagic. An important food fish throughout much of the tropical Indo-West Pacific. A recent immigrant to the eastern Mediterranean Sea by way of the Suez Canal and also known from 1 record from the east central Atlantic, from St Helena.



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<i>Benthodesmus simonyi</i>	2891-2892	Escolier reptile	2880
<i>Benthodesmus tenuis</i>	2892	Escolier serpent	2878
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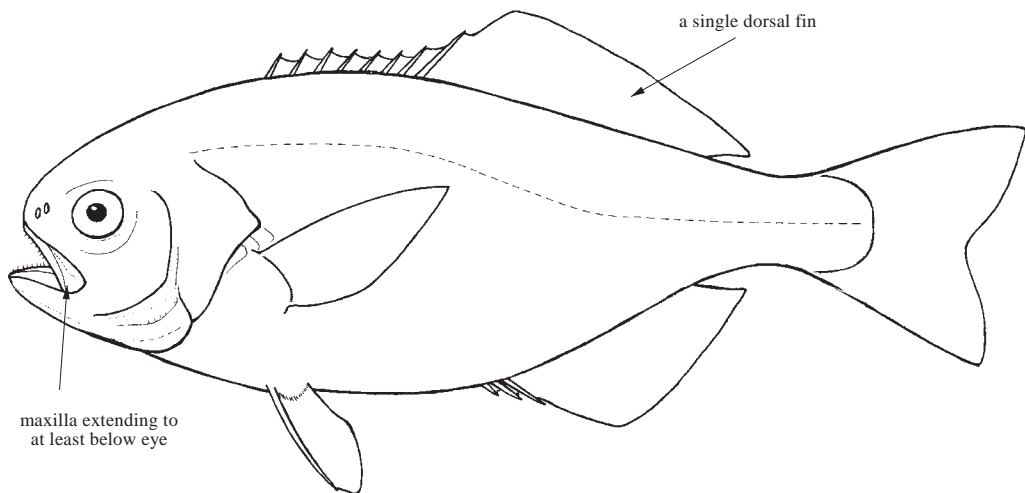
Suborder STROMATEOIDEI

CENTROLOPHIDAE

Medusafishes (ruffs, barrellfish)

by R.L. Haedrich, Memorial University, St. John's, Newfoundland, Canada

Diagnostic characters: Medium-sized to large (50 to 120 cm) fishes with an elongate to deep body, somewhat compressed but fairly thick; caudal peduncle deep and moderate in length. Snout blunt, longer than or about equal to eye diameter; **mouth large, maxilla extending to at least below eye**; supramaxilla present; **small conical teeth in 1 row in jaws; no teeth on vomer, palatines or basibranchials**; adipose tissue around eyes not conspicuously developed; preopercle margin usually denticulate, but spinulose in most small specimens and in *Schedophilus*; opercle thin, with 2 flat, weak points, the margin denticulate; **7 branchiostegal rays**. **A single continuous dorsal fin**, its rays preceded by 5 to 9 short, stout spines not graduating to rays (*Hyperoglyphe*) or 3 to 7 thin weaker spines that do graduate to rays (*Schedophilus*); anal fin with 3 spines not separated from rays; **dorsal and anal fins never falcate**, their bases unequal, dorsal longer than anal; pelvic fins inserting under pectoral-fin base, attached to the abdomen by a thin membrane and folding into a broad shallow groove; pectoral fins usually not prolonged, broad; caudal fin broad and not deeply forked. Scales moderate to small, usually cycloid (but with small cteni in *Schedophilus medusophagus*) and easily shed; head conspicuously naked and covered with small pores. **Colour:** generally uniformly dark green to grey, or brownish, with an indistinct vertical, or more usually horizontal, pattern of darker irregular stripes; eyes often golden.



Habitat, biology, and fisheries: Pelagic, mesopelagic, and epibenthic deep-water fishes of warm and temperate seas; often in deep water at the edge of the continental shelf, in submarine canyons or near oceanic islands. Larvae occur in the plankton, and juveniles and young adults commonly associate, often in loose but large schools, with pelagic medusae or floating objects such as boxes or barrels; feed on jellyfish, crustaceans, salps, and small fishes. There is no special fishery for ruffs anywhere in the area, but specimens are caught occasionally and are highly esteemed for food in some places. Adults of *Hyperoglyphe* live in deep submarine canyons where they are caught on deep lines, and there is an incidental deep-line fishery for *Schedophilus ovalis* in the eastern Atlantic at Madeira.

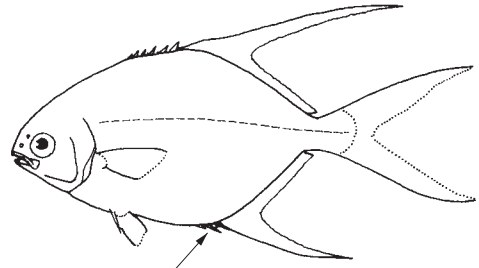
Remarks: *Schedophilus* appears to be polyphyletic (McDowall 1982, Bolch *et al.* 1994) and the relationship between species assigned to that genus and *Hyperoglyphe* is in need of reexamination.

Similar families occurring in the area

Carangidae: 2 detached stout spines precede anal fin; modified scales often present along posterior portion of lateral line and forming keels or scutes on the caudal peduncle.

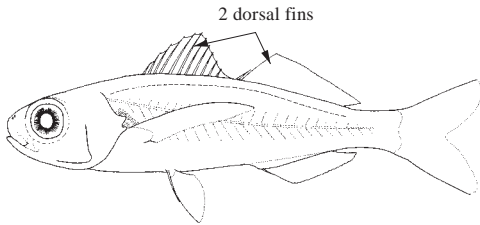
Nomeidae: 2 distinct dorsal fins, the first with about 10 long slender spines; mouth small, teeth present on vomer, palatines, and basibranchials.

Ariommatidae: 2 distinct dorsal fins, the first with about 10 long slender spines; mouth small; caudal peduncle very narrow and not compressed, with 2 fleshy keels on each side at base of caudal fin.



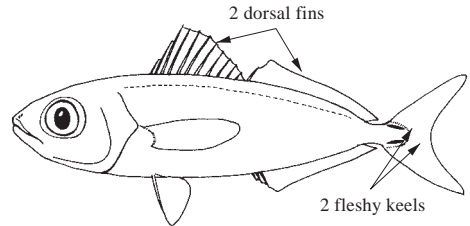
2 detached spines

Carangidae



2 dorsal fins

Nomeidae



2 dorsal fins

2 fleshy keels

Ariommatidae

Key to the species of Centrolophidae occurring in the area

- 1a. Median-fin spines weak, very difficult to distinguish from rays; body soft and limp → 2
- 1b. Median-fin spines 5 to 8, strong, easily distinguished; body firm → 3

2a. Weak denticles on preopercular margin. Dorsal-fin spines plus soft rays 37 to 41, anal-fin spines plus soft rays 23 to 26 (Fig. 1) ***Centrolophus niger***

2b. About 12 prominent spines on preopercular margin. Dorsal-fin spines plus soft rays 44 to 50, anal-fin spines plus soft rays 28 to 31 ***Schedophilus medusophagus***

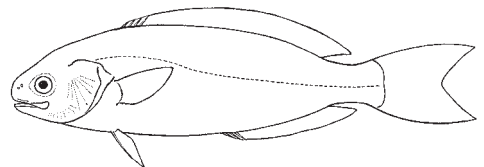


Fig. 1 *Centrolophus*

3a. Origin of dorsal fin usually before insertion of pectoral fins, but over pectoral-fin insertion in very large specimens; spines only moderately developed and all graduating to rays; body depth usually greater than 35% standard length (Fig. 2) → 4

3b. Dorsal-fin origin over or a little behind pectoral-fin insertion; spines stout, shorter than and not increasing regularly in length to the rays; body depth about 30 to 35% standard length (Fig. 3) → 5

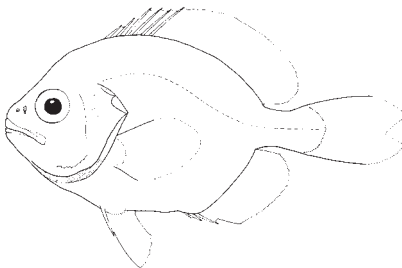


Fig. 2 *Schedophilus*

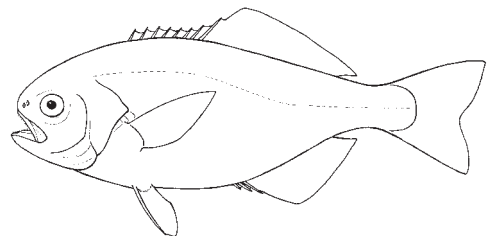


Fig. 3 *Hyperoglyphe*

- 4a. Dorsal-fin soft rays 30 to 32; anal-fin soft rays 20 to 24 *Schedophilus ovalis*
 4b. Dorsal-fin soft rays 23 to 26; anal-fin soft rays 16 to 19 *Schedophilus pemarko*
- 5a. Dorsal-fin soft rays 19 to 21 *Hyperglyphe perciformis*
 5b. Dorsal-fin soft rays 23 to 25 *Schedophilus velaini*

List of species occurring in the area

- Centrolophus niger* (Gmelin, 1789). To 120 cm. Oceanic off northwest Africa and Madeira and through the Mediterranean to the Adriatic, generally across the North Atlantic from New York to the British Isles.
- Hyperglyphe perciformis* (Mitchill, 1818). To 100 cm. May be found as a vagrant in the northern part of the area. Normal range Atlantic E coast of the USA from Florida to Nova Scotia, but regularly straying to Europe and into the Mediterranean.
- Schedophilus medusophagus* (Cocco, 1839). To at least 50 cm, most specimens known are juveniles. Oceanic, N Sargasso Sea, NE Atlantic, and Mediterranean, may stray into the northern part of the area.
- Schedophilus ovalis* (Cuvier, 1833). To 100 cm, commonly 40 to 60 cm. Mediterranean and NE Atlantic, Madeira, Azores, Canary Islands and perhaps to South Africa, straying to Bermuda.
- Schedophilus pemarko* (Poll, 1959). To 30 cm. Through the Gulf of Guinea from Cabo Blanco to the Kunene River, rarely straying to SE Caribbean.
- Schedophilus velaini* (Sauvage, 1879). To at least 70 cm. St Helena (type locality) and deep waters, perhaps localized in submarine canyons, along the coast from Ghana to South Africa.

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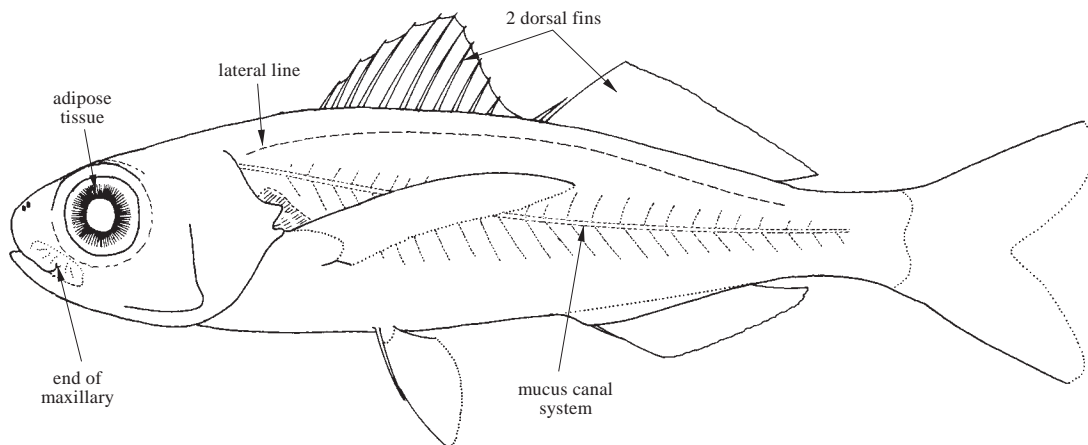
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NOMEIDAE

Driftfishes (Man-of-war fishes)

by R.L. Haedrich, Memorial University, St. John's, Newfoundland, Canada

D **Diagnostic characters:** Slender to deep, **laterally compressed oceanic stromateoid fishes** of moderate to large size (20 to 100 cm); in *Psenes* young are quite deep-bodied becoming less so with growth. Adipose tissue around eyes developed in most species; **mouth small, maxilla rarely extending to below eye**, supramaxillary absent; **teeth small, conical, or cusped (in some *Psenes*)**, **approximately uniserial in the jaws and also present on vomer, palatines (roof of mouth), and basibranchials**; pharyngeal sacs with papillae in upper and lower sections, papillae in about 5 broad longitudinal bands, their bases stellate, teeth seated on top of a central stalk; preopercular margin entire or finely denticulate; operculum very thin, with 2 flat, weak points; **6 branchiostegal rays**. **Two dorsal fins, the first with about 10 slender spines** folding into a groove, the longest spine at least as long as longest ray of second (soft) dorsal fin; anal fin with 1 to 3 spines, not separated from the soft rays; **soft dorsal- and anal-fin bases approximately the same length and sheathed by scales**; **pectoral fins become long and almost wing-like with growth, their bases inclined about 45°**; caudal fin forked; pelvic fins often attached to abdomen by thin membrane and fold into a narrow groove, the fins greatly produced and expanded in young *Nomeus* and some *Psenes*. Lateral line high, following dorsal profile and often not extending onto caudal peduncle. **Skin thin; subdermal mucus canal system well developed and visible in most species, main canal down the side of the body may be mistaken for a lateral line**; scales small to large, cycloid (smooth-edged) or with very weak cteni (*Psenes pellucidus*), thin and easily shed. Vertebrae 30 to 33, 41 or 42; caudal skeleton with 4 hypural and 3 epural bones. **Colour:** *Cubiceps* species generally dark blue to brownish dorsally, light-coloured or silvery on sides with no mottling or stripes; may become uniformly dark with age. *Nomeus* bright blue above, with a splotched and mottled blue pattern overlaying the silvery sides; pelvic fins black; large specimens are more uniformly coloured, resembling *Cubiceps*. Young *Psenes* striped or mottled, dark over light, on sides and back, but older ones uniformly dark blue or black.



Habitat, biology, and fisheries: Epi- and mesopelagic regions of the high seas and around oceanic islands; the young found in the upper surface layers, adults deeper (some, like *Nomeus* and some *Psenes*, may be deep benthic on the slope). Many *Cubiceps* make daily vertical migrations in the deep scattering layer. Sometimes found in large aggregations, and most often in association with jellyfish (siphonophores, especially *Physalia*, and medusae). Feed on zooplankton and jellyfishes of all kinds, occasionally taking small fish. There is no fishery for Nomeidae in the area.

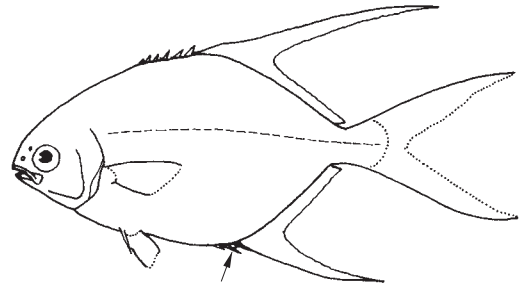
Remarks: The species in this family of rarely encountered oceanic fishes remain to be adequately worked out, especially in the case of *Nomeus* (presumed monotypic) and *Psenes* (with a number of very widespread species). The problem is compounded by the fact that counts are very similar and the appearance and body proportions change considerably with growth. The circumtropical species *Psenes cyanophrys* may comprise a complex of species.

Similar families occurring in the area

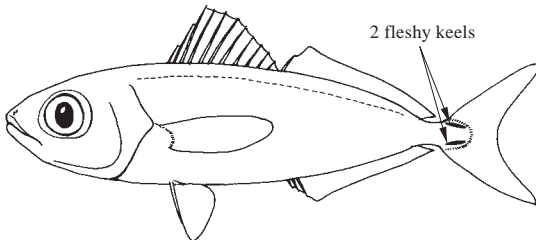
Carangidae: some species similar in shape and colour pattern, but can be distinguished by the 2 heavy spines ahead of the anal fin and in many species by the scutes along the side of the caudal peduncle.

Ariommatidae: body rounded; caudal peduncle very narrow, with 2 low fleshy keels on each side of the base of the fin, and no teeth on the roof of the mouth.

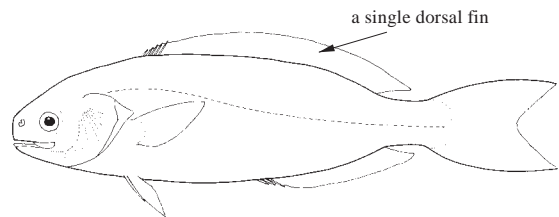
Centrolophidae: a single dorsal fin with relatively heavy short spines preceding the longer rays; mouth large, tip of maxillary usually extending well beyond anterior eye margin; 7 branchiostegal rays (6 in Nomeidae); no teeth on roof of mouth or on basibranchials; pharyngeal sacs with irregularly shaped papillae (bases of papillae stellate in Nomeidae).



2 detached spines

Carangidae

2 fleshy keels

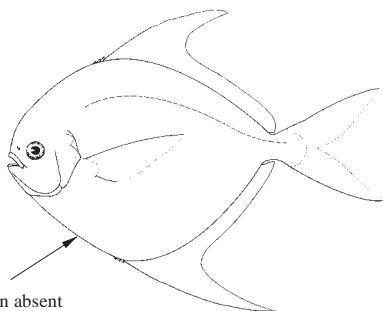
Ariommatidae

a single dorsal fin

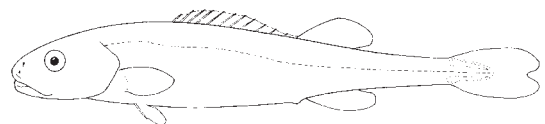
Centrolophidae

Stromateidae: body moderately deep; dorsal fin single, continuous with very few spines (usually only 3 very weak ones); pelvic fins absent; no teeth on roof of mouth.

Tetragonuridae: first dorsal fin much lower and longer-based than second dorsal; scales with heavy keels, very adherent and forming a geodesic pattern around the body; two lateral keels formed of modified scales at the base of the caudal fin.



pelvic fin absent

Stromateidae**Tetragonuridae**

Key to the species of Nomeidae occurring in the area

- 1a. Origin of dorsal fin before, or directly over in large specimens, insertion of pectoral fins; no scales on top of head forward of eyes (Fig. 1a); body usually deep (maximum depth about 2.5 times in length or less), but elongate in large specimens of some species (*Psenes*) → 2
- 1b. Origin of dorsal fin behind or directly over (in small specimens) insertion of pectoral fins; scales on top of head extend forward of eyes (Fig. 1b); body usually elongate (maximum depth more than 3 times in length) → 5

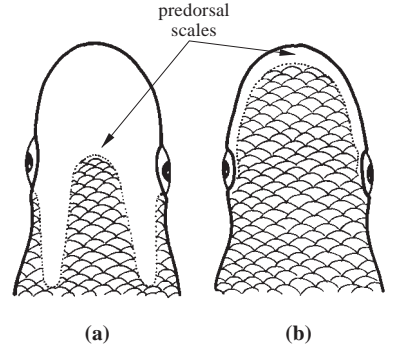


Fig. 1 dorsal view of head

- 2a. Lower jaw teeth pointed or only slightly flattened, similar to those in upper jaw; clear pattern of fine horizontal lines along sides of body (Fig. 2) *Psenes cyanophrys*
- 2b. Lower jaw teeth long, compressed, contiguous, very different from those in upper jaw; body colour mottled or spotted (in young specimens) or uniformly dark brown → 3
- 3a. Second dorsal-fin rays 27 to 32; anal-fin rays 28 to 34; body musculature very soft and flabby, bases of median fins translucent, vertebrae 40 to 42 (Fig. 3) *Psenes pellucidus*
- 3b. Second dorsal-fin rays less than 25; anal-fin rays 21 to 23; body musculature firm, bases of median fins not translucent, vertebrae 31 to 35 → 4

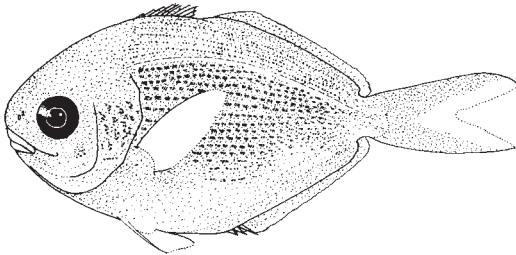


Fig. 2 *Psenes cyanophrys*

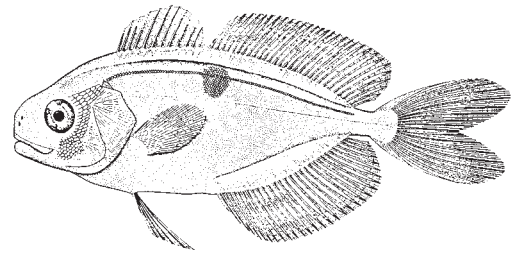


Fig. 3 *Psenes pellucidus*

- 4a. Second dorsal-fin rays 18 to 23, vertebrae 31 (Fig. 4) *Psenes arafurensis*
- 4b. Second dorsal-fin rays 22 to 24, vertebrae 33 to 35 (Fig. 5) *Psenes maculatus*

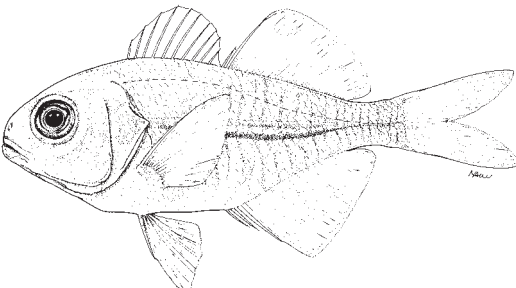


Fig. 4 *Psenes arafurensis*

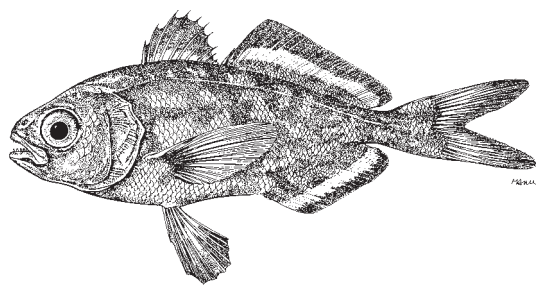


Fig. 5 *Psenes maculatus*

- 5a. No teeth on tongue → 6
- 5b. Teeth on tongue (all *Cubiceps* except *C. paradoxus*) → 7

- 6a. Pelvic fins insert before or under insertion of pectoral fins (possibly behind in very large specimens); anal fin with 24 to 29 rays and 1 or 2 spines; vertebrae 41 (*Nomeus*) (Fig. 6) ***Nomeus gronovii***
- 6b. Pelvic fins insert under end or behind base of pectoral fins; anal fin with 20 or 21 rays and 3 spines; vertebrae 31 ***Cubiceps paradoxus***

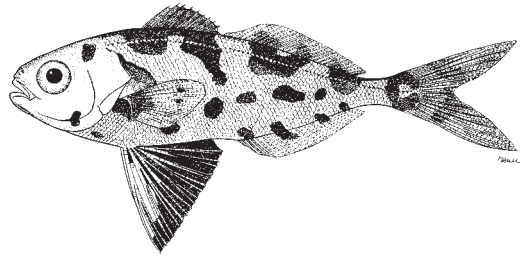


Fig. 6 *Nomeus gronovii*

- 7a. Teeth on tongue and on roof of mouth pointed, in a single median row (Figs 7a and 8) ***Cubiceps capensis***
- 7b. Teeth on tongue and on roof of mouth knobby, in a broad patch (Fig. 7b) → 8

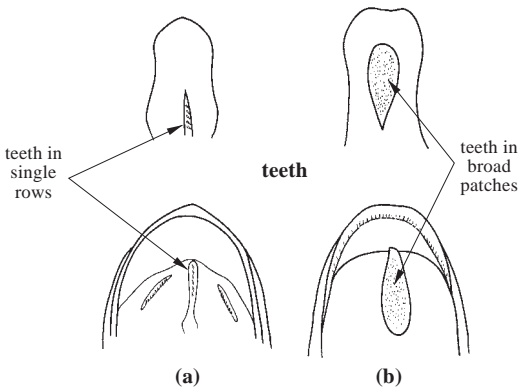


Fig. 7 roof of mouth

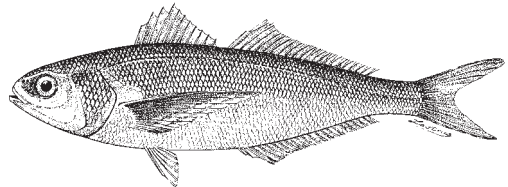


Fig. 8 *Cubiceps capensis*

- 8a. Anal fin with 3 spines and 19 to 23 soft rays; dorsal-fin rays 21 to 24; vertebrae 32 to 34, usually 33; no thin bony keel on chest; scales on head reach to tip of snout (Fig. 9) ***Cubiceps gracilis***
- 8b. Anal fin with 2 spines and 14 to 17 soft rays; dorsal-fin rays 15 to 18; vertebrae 31; conspicuous thin bony keel on chest; no scales on head before eyes, snout naked (Fig. 10) ***Cubiceps pauciradiatus***

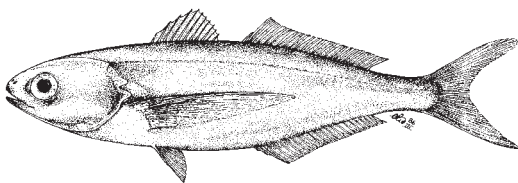


Fig. 9 *Cubiceps gracilis*

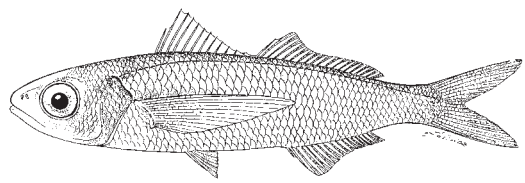


Fig. 10 *Cubiceps pauciradiatus*

NOTE: The widespread Pacific species *Cubiceps baxteri* McCulloch, 1923 (dorsal-fin rays 20 to 23, anal-fin spines 3, anal-fin rays 19 to 22, vertebrae 31) has been reported from the SW Atlantic and might be expected in the area.

List of species occurring in the area

- Cubiceps capensis* (Smith, 1845). To 100 cm. Circumglobal in subtropical waters of all oceans, rarely seen.
- Cubiceps gracilis* (Lowe, 1843). To 75 cm. A northern peripheral species, widespread in warm and temperate waters N of 30°N in the W and 12°N (Canary Current) in the E of the N Atlantic.
- Cubiceps paradoxus* Butler, 1979. To 57 cm. Known from only a few specimens in the E and N central Pacific but with 2 recent records from off Mauritania.
- Cubiceps pauciradiatus* Günther, 1872. To 20 cm. Equatorial and central waters of all oceans; found in areas of elevated production as a member of a vertically-migrating deep scattering layer.
- Nomeus gronovii* (Gmelin, 1789). To 40 cm. Reported from northwest Africa and the Canary Islands but considered rare in the area, more common in the Caribbean; circumtropical in all oceans.
- Psenes arafurensis* Günther, 1889. To 25 cm. Circumglobal in warm waters of all oceans.
- Psenes cyanophrys* Valenciennes, 1833. To at least 20 cm (only immature specimens known). Generally circumglobal in warm waters of all oceans.
- Psenes maculatus* Lütken, 1880. To at least 10 cm (only immature specimens known). Temperate waters of the eastern Atlantic, and possibly expected in the area; circumglobal in temperate oceans, absent from tropical regions.
- Psenes pellucidus* Lütken, 1880. To 80 cm. Sargasso Sea, and circumglobal in warm waters of all oceans.

References

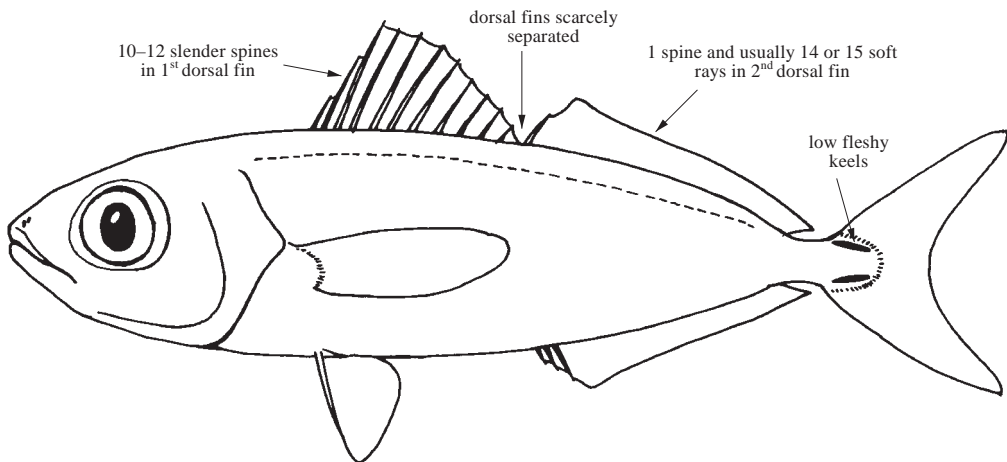
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ARIOMMATIDAE

Ariommas

by R.L. Haedrich, Memorial University, St. John's, Newfoundland, Canada

D **Diagnostic characters:** Small fishes, to about 20 cm, with body slender and rounded; caudal peduncle short and slender, not compressed, its width about equal to its depth; 2 low fleshy keels on each side of caudal peduncle near caudal-fin base. Head long; eye moderate to large, centrally located and surrounded by well-developed adipose tissue extending forward around the nostrils; operculum thin, its margin smooth; gill openings large. Snout short and blunt. Mouth small, end of maxilla before front of eye; **upper jaw almost completely covered by preorbital bone when mouth is closed; jaw teeth minute, conical, in a single row; no teeth on vomer, palatines (roof of mouth), or basibranchials;** papillae in pharyngeal sacs with flat rounded bases, small teeth seated all along a large central stalk; 6 branchiostegal rays. **Two dorsal fins, scarcely separated; the first dorsal fin with 10 to 12 long slender spines** almost twice as long as any of the rays of the second dorsal fin, depressible into a groove; **second dorsal and anal fins about the same length, each with 14 or 15 (rarely 13 or 16) rays;** caudal fin stiff and markedly forked; pectoral fins not produced; pelvic fins inserting under or behind pectoral-fin base and folding into a broad groove along ventral midline. Lateral line high, following dorsal profile; scales with branched tubes not extending onto caudal peduncle; a branch of the lateral line extending forward in a bony tract arched to over the eye. Scales large, cycloid, very thin, and easily shed, not covering bases of the median fins; top of snout naked, scales extend forward on top of head only to above eye. **Colour:** silvery, with a purple, brown, or blue tinge; juveniles of all with 3 dark vertical bands.

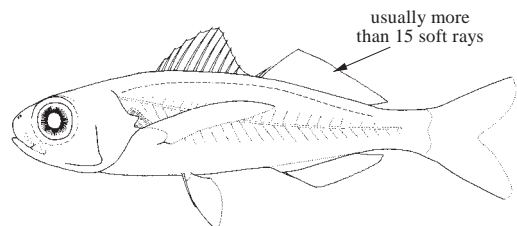


Habitat, biology, and fisheries: Schooling-fishes generally found offshore in deep water over muddy bottoms on the continental shelf and upper continental slope; juveniles occur near the surface. The flesh is rich in fat and is highly esteemed. These fishes have potential as objects of a fishery, but this remains largely unrealized; fisheries have been conducted off West Africa.

Remarks: All *Ariomma* species (there is only 1 genus in the family) are very similar; fin counts and other meristic data are virtually the same worldwide.

Similar families occurring in the area

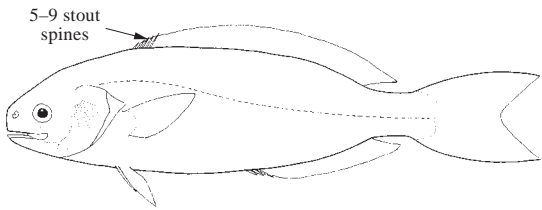
Nomeidae (especially species of *Cubiceps*): caudal peduncle compressed and deep, more than 5% of the standard length, lacking low fleshy keels; teeth present on roof of mouth and often on tongue; usually more than 15 soft rays in second dorsal fin.



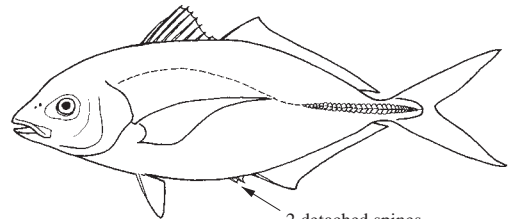
Nomeidae

Centrolophidae: 5 to 9 moderately stout spines in first dorsal fin, all shorter than rays of second dorsal fin; mouth large, tip of maxilla usually under posterior half of eye; caudal peduncle deep and compressed, without fleshy keels.

Carangidae: 2 detached stout spines preceding anal fin; 3 to 8 spines in first dorsal fin, generally shorter than or equal in length to rays of second dorsal fin; modified scales along posterior portion of lateral line may form a single keel on side of caudal peduncle.

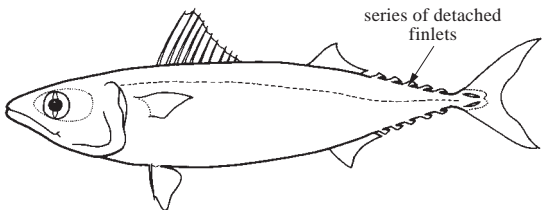


Centrolophidae

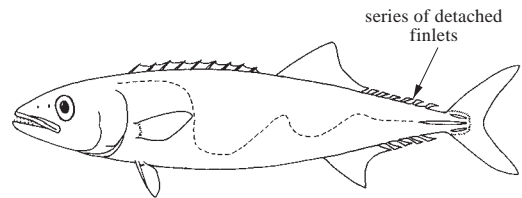


Carangidae

Scombridae and Gempylidae (*Lepidocybium* and *Ruvettus*): snout pointed; base of second dorsal fin shorter than base of first dorsal fin, a series of detached finlets behind the second dorsal and anal fins; teeth prominent.



Scombridae






Gempylidae

Key to the species of Ariommatidae occurring in the area

- 1a. Colour pale brown or blue dorsally with a silvery underside, peritoneum pale; lateral-line scales 30 to 45, large; scales on top of head extend only to front of pupil ***Ariomma bondi***
- 1b. Colour uniformly dark brown to blackish, peritoneum dark; lateral-line scales 50 to 65, small; scales on top of head extend to front of eye ***Ariomma melanum***

List of species occurring in the area

The symbol  is given when species accounts are included.

-  *Ariomma bondi* Fowler, 1930.
- Ariomma luridum* Jordan and Snyder, 1904.^{1/}
-  *Ariomma melanum* (Ginsburg, 1954).

^{1/} The oceanic Pacific species *Ariomma luridum* has been reported from the tropical Atlantic, and there is evidence that *A. helenae* Trunov 1976, described and known only from the island of St Helena, is a synonym. The status of these relative to the more neritic *A. bondi* and *A. melanum* requires further study.

References

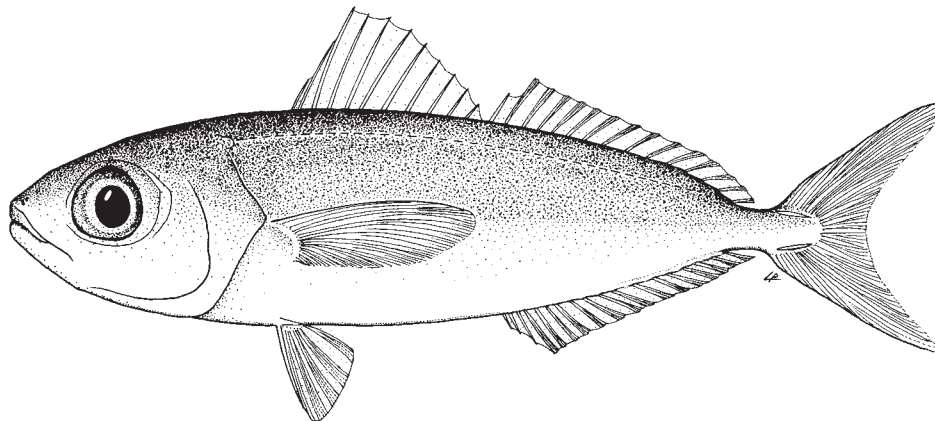
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Ariomma bondi Fowler, 1930

IMB

Frequent synonyms / misidentifications: *Paracubiceps ledanoisi* Belloc, 1937; *Cubiceps nigriargenteus* Ginsburg, 1954; *Ariomma ledanoisi* (Belloc, 1937) / *Ariomma melanum*.

FAO names: **En** – Silver-rag driftfish; **Fr** – Ariomme grise; **Sp** – Arioma lucia.



Diagnostic characters: **Body elongate**, moderately slender, and somewhat compressed; **caudal peduncle square in cross-section, its depth less than 5% standard length, with 2 low fleshy keels on each side** near caudal-fin base. **Eye large**, its diameter slightly longer than snout; snout blunt, not rounded; mouth small, end of maxilla scarcely reaching to anterior eye margin; lower jaw slightly projecting beyond the upper; **teeth in jaws minute, in a single row, those in lower jaw often with tiny cusps; no teeth on roof or floor of mouth**. Two separate dorsal fins, the first higher than the second, with about 11 flexible spines depressible into a groove; pectoral fins not extending beyond vertical from last dorsal-fin spine; pelvic fins inserting under pectoral-fin base and folding into a shallow but prominent groove; **caudal fin rigid and deeply forked**. Lateral line high, following dorsal profile but with tubed scales not extending onto caudal peduncle; pores and canals of cephalic lateral line only moderately developed. Scales conspicuously large, especially those around midpoint of sides, cycloid (smooth), easily detached, **about 30 to 45 in lateral line; scalation on head extending no further forward than anterior border of pupil**. **Colour:** dark blue on back, silvery below, without spots as adults; the young have 3 to 6 dark bars on sides; **peritoneum silvery or pale with scattered melanophores**.

Size: Maximum 25 cm; common to 20 cm.

Habitat, biology, and fisheries: Demersal or benthopelagic on outer continental shelf, usually over muddy bottoms; taken in 40 to 450 m, but most common above 275 m; juveniles occur in surface waters. Schooling; can be very abundant locally. Feeds mainly on small crustaceans. Caught with bottom trawls; not the object of a directed fishery, but perhaps with potential for development. Marketed fresh and canned in Africa; also used for fishmeal and oil. Separate statistics are not kept for this species.

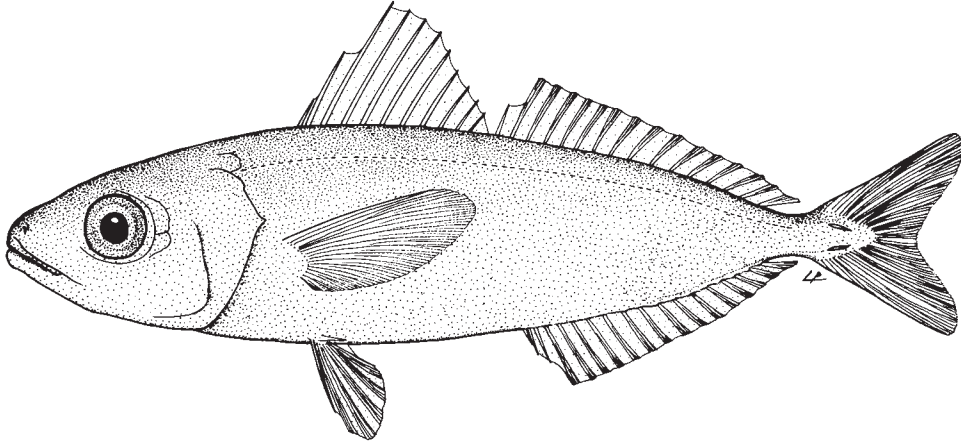
Distribution: West Africa from Senegal to Gabon as a member of the deep sparid subcommunity. In the western Atlantic from Nova Scotia to Uruguay.



Ariomma melanum (Ginsburg, 1954)

Frequent synonyms / misidentifications: *Paracubiceps multisquamus* Marchal, 1962; *Ariomma multisquamus* (Marchal, 1962) / *Ariomma bondi*.

FAO names: En – Brown drifffish; Fr – Ariomme brune; Sp – Arioma parda.



Diagnostic characters: **Body elongate**, moderately slender and somewhat compressed; **caudal peduncle square in cross-section, its depth less than 5% standard length, with 2 low fleshy keels on each side near caudal-fin base.** **Eye moderate**, its diameter equal to or a little less than length of snout; snout blunt, not rounded; **mouth small**, end of maxilla not reaching to below eye; lower jaw slightly projecting beyond upper; **teeth in jaws minute, in 1 row, those in lower jaw often with tiny cusps; no teeth on roof or floor of mouth.** **Two separate dorsal fins**, the first higher than the second, with about 11 flexible spines depressible into a groove; pectoral fins not extending beyond vertical line from last dorsal-fin spine; pelvic fins inserting behind end of pectoral-fin base and folding into a shallow midventral groove; **caudal fin rigid and forked.** Lateral line high, following dorsal profile but with tubed scales not extending onto caudal peduncle; pores and canals of cephalic lateral line well developed and conspicuous. **Scales relatively small**, cycloid (smooth), easily detached, **about 50 to 65 in lateral line; scalation on head extending to anterior margin of eye.** **Colour:** **uniformly brown or bluish brown**, in life sometimes with a silvery cast; the young have 3 to 6 dark bars on sides; **peritoneum dark brown to black.**

Size: Maximum 25 cm; common to 20 cm.

Habitat, biology, and fisheries: Demersal or benthopelagic in deep water, 140 to 750 m, on the upper continental slope, usually over soft bottoms; juveniles occur in surface waters. Schooling, can be very abundant locally. Feeds mainly on small crustaceans. Caught with deep bottom trawls; marketed fresh and canned; also used for fishmeal and oil. Separate statistics are not kept for this species.

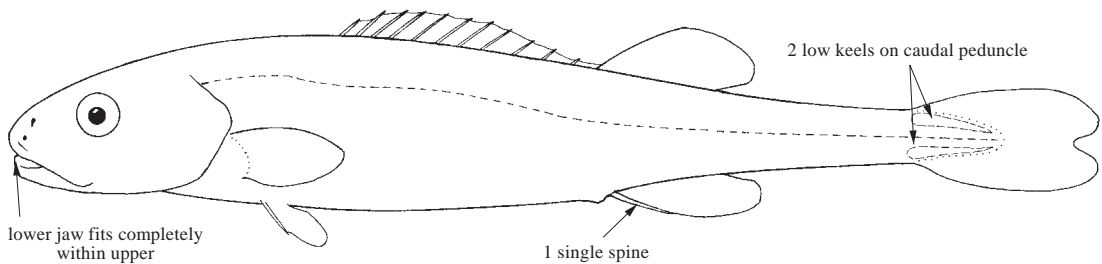
Distribution: West Africa from Mauritania to Angola as a dominant member of the continental slope community. In the western Atlantic from New York to Panama.



TETRAGONURIDAE**Squaretails**

by R.L. Haedrich, Memorial University, St. John's, Newfoundland, Canada

Diagnostic characters: Medium-sized fishes (to 70 cm) with **elongate body, rounded in cross-section; caudal peduncle long and thick, square in cross-section, with modified scales forming 2 low keels on each side.** Snout blunt and broad, operculum fleshy; eyes generally lack adipose tissue, and usually with a series of small grooves in the posterior rim; **mouth box-like, with lower jaw fitting completely within upper jaw when closed; teeth in upper jaw small and recurved, those in lower jaw large, laterally flattened, knife-like, and close-set;** strong recurved teeth present on vomer and palatines. Two dorsal fins, the first with 14 to 17 short spines that fold into a groove; second dorsal and anal fins similar in shape and size, the bases shorter than base of first dorsal fin; dorsal-fin rays almost twice length of dorsal-fin spines; 1 anal-fin spine; pectoral fins moderately short and rounded. **Scales moderate in size, with heavy longitudinal keels, firmly attached, rows forming a pronounced geodesic pattern around body;** small scales extending onto bases of median fins; lateral line present but tubed scales absent. Skin thick, with tiny pores; top of head and snout naked. **Colour:** brown or blackish.



Habitat, biology, and fisheries: Oceanic fishes of warm and temperate waters, the young epipelagic and the adults presumably mesopelagic; most adults are taken singly far out at sea or occasionally stranded on shores near deep water; juveniles commonly live within the body cavity of pelagic tunicates, especially *Salpa* and *Pyrosoma*. The teeth are adapted for browsing on soft-bodied coelenterates (medusae), ctenophores, and especially salps; also feeds on macrozooplankton; spawning occurs in spring and summer in the eastern Atlantic. Of no interest to fisheries; the flesh of *Tetragonurus cuvieri* is reported to be poisonous.

Similar families occurring in the area

The elongate, rounded shape, the heavy keeled scales in their characteristic geodesic pattern, and the box-like mouth with the lower jaw fitting completely within the upper make up a unique combination such that no other fish can be confused with this family.

Key to species of Tetragonuridae occurring in the area

- 1a. Dorsal-fin origin over or behind vertical from tip of pectoral fin; snout clearly longer than eye diameter; 97 to 114 scale rows to origin of caudal keels *Tetragonurus cuvieri*
- 1b. Dorsal-fin origin over or before vertical through final third of pectoral fin; snout only slightly longer than eye diameter; 73 to 95 scale rows to origin of caudal keels *Tetragonurus atlanticus*

List of species occurring in the area

Two of the 3 species in the family occur in the eastern central Atlantic.

Tetragonurus atlanticus Lowe, 1839. Size to 50 cm. Warm waters, Atlantic, Pacific, and Indian.

Tetragonurus cuvieri Risso, 1810. Size to 70 cm. Temperate, W Mediterranean, Atlantic, and Pacific.

References

Grey, M. 1955. Fishes of the genus *Tetragonurus* Risso 1810. *Dana Report*, 41: 1–75.

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STROMATEIDAE

Butterfishes

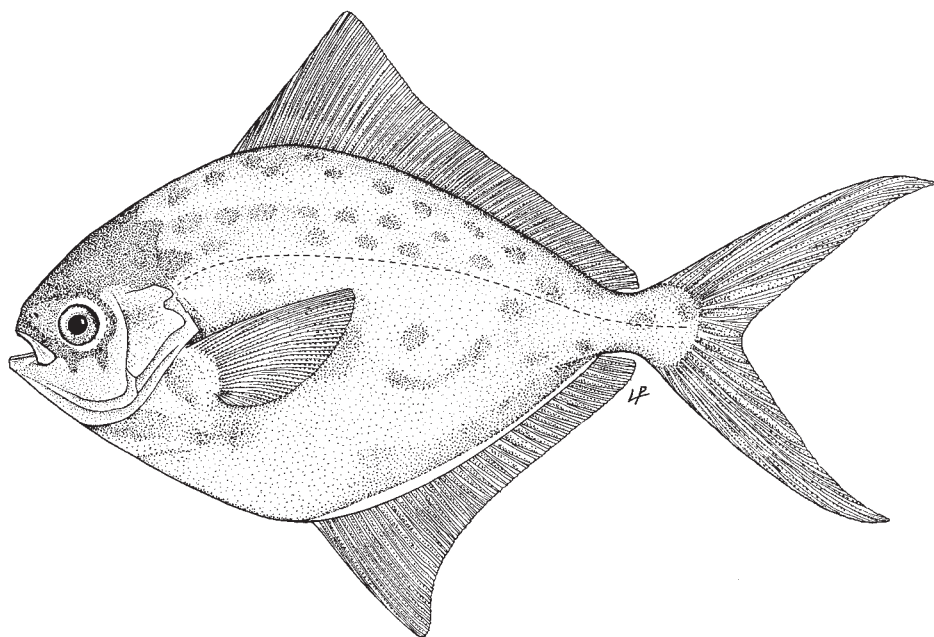
by R.L. Haedrich, Memorial University, St. John's, Newfoundland, Canada

A single species in this family in the area.

Stromateus fiatola Linnaeus, 1758

Frequent synonyms / misidentifications: *Stromateus fasciatus* (Risso, 1827); *S. microchirus* (Cuvier, 1833); *S. capensis* Pappe, 1853 / None.

FAO names: En – Blue butterfish; Fr – Fiatole; Sp – Palometa fiátola.



Diagnostic characters: Medium-sized (to 50 cm) **silvery fish with body and head deep and compressed**. Eye small, surrounded by adipose tissue which extends forward around the nostrils; snout short and blunt; **mouth small**; maxillary ends before anterior eye margin; teeth in jaws small, in a single row; no teeth on floor or roof of mouth, but toothed pharyngeal sac present. **Dorsal and anal fins long**, the dorsal fin longer than the anal and beginning over the pectoral-fin base, both fins with the anterior rays longer than those which follow but fins not falcate, the length of the longest rays about equal to the head, **no preceding spines**; **caudal fin stiff and deeply forked**, both its lobes longer than head; pectoral fins broad and wing-like, about equal in length to the head; **pelvic fins absent in adults** but present in young <10 cm, inserted directly under pectoral-fin base. Lateral line slightly elevated, following dorsal profile; scales small and easily detached, extending onto cheeks and bases of the median fins; top of the head naked. **Colour:** blue to brown with a silvery cast and numerous dark spots on the back; lighter on sides and below with a few irregular and darker longitudinal bands. Fins dusky, usually darker than the body. Young with 4 to 8 vertical bands.

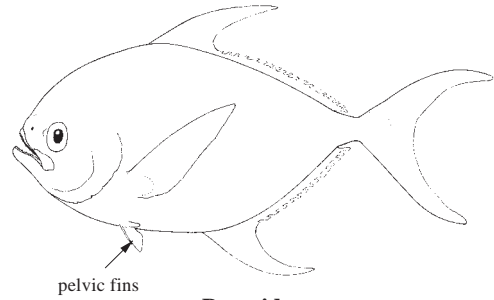
Similar families occurring in the area

Adults of all similar families can easily be distinguished by the presence of pelvic fins. Additional distinguishing characters follow.

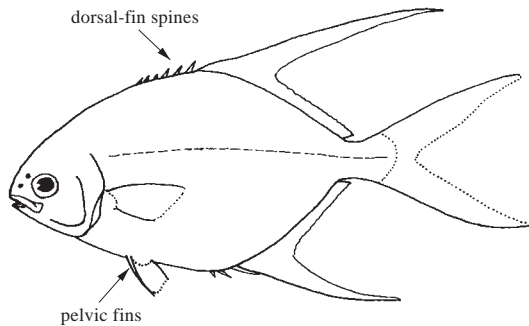
Bramidae: similarly-shaped but much heavier bodies and fins with pelvic fins present; maxillary exposed and extending to below middle of eye; scales large and often keeled.

Carangidae (particularly the genus *Trachinotus*): 2 detached spines in front of anal fin and scutes present on caudal peduncle in many species; in *Trachinotus*, dorsal fin with 6 low spines and dorsal and anal fins clearly falcate.

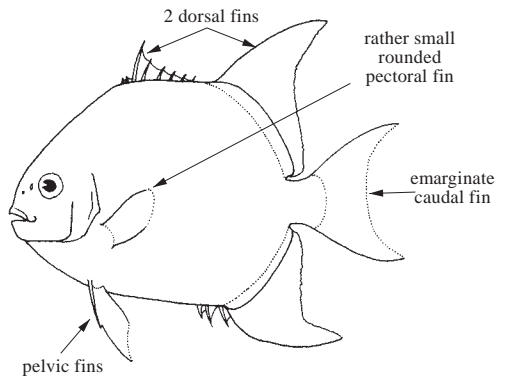
Ephippidae: 2 dorsal fins, the spinous and soft portions separated by a deep notch; pectoral fins small (shorter than head) and rounded; caudal fin emarginate.



Bramidae



Carangidae



Ephippidae

Size: Maximum to 50 cm, commonly to 40 cm.

Habitat, biology, and fisheries: A pelagic fish forming schools in coastal bays and waters over the continental shelf, usually at depths from 10 to 70 m but occasionally as deep as 160 m; rare around oceanic islands but reported from the Canaries. Juveniles found in coastal waters under floating weeds or in association with medusae. Feeds on zooplankton, jellyfish and small fishes. Caught mainly with otter trawls, purse seines and fixed trap nets, less commonly on lines. The flesh is excellent eating; usually marketed fresh, and more occasionally salted or frozen, but fisheries are modest. The presence of trypanorhynchid cestodes in the flesh may affect marketability in the Gulf of Guinea. Can be used for fishmeal or oil.

Distribution: Portuguese and rarely Spanish continental shelf waters south along the coasts of Africa to the Cape of Good Hope; found throughout the Mediterranean.

References

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New Index

A

- Arioma lucia 2927
 Arioma parda 2928
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Suborder CAPROIDAE

CAPROIDAE

Boarfish

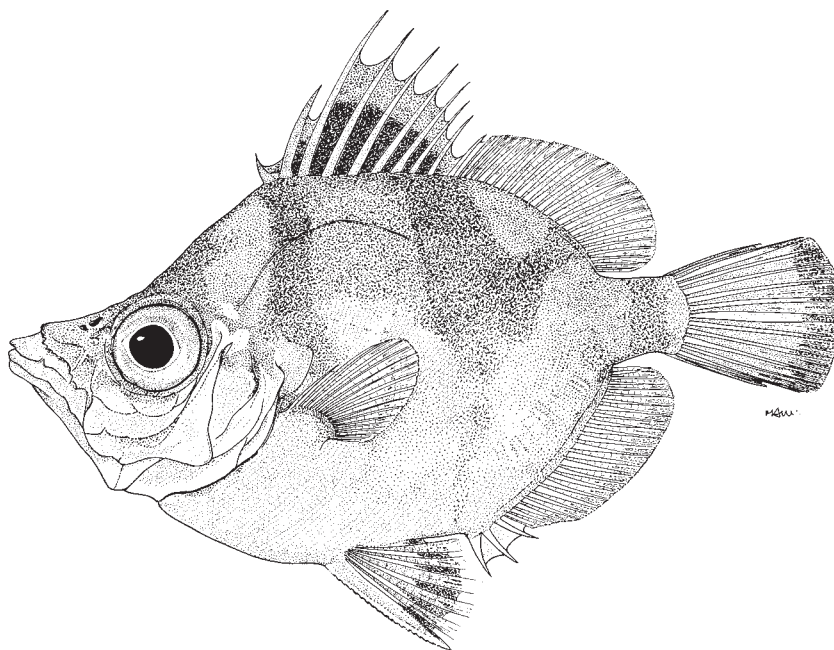
by P.C. Heemstra, South African Institute for Aquatic Biodiversity, Grahamstown, South Africa

A single species occurring in the area.

Capros aper (Linnaeus, 1758)

Frequent synonyms / misidentifications: None / None.

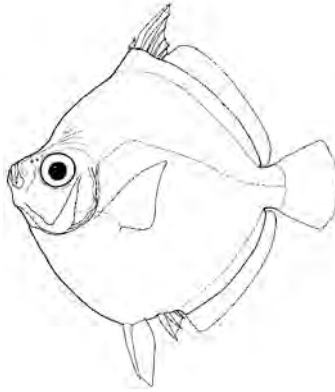
FAO names: En – Boarfish; Fr – Sanglier; Sp – Ochavo.



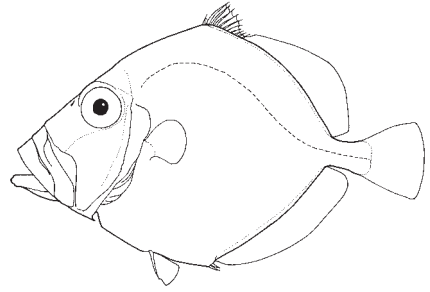
Diagnostic characters: Body deep, compressed, body depth distinctly more than head length and contained 1.7 to 1.9 times in standard length; attains 16 cm. Dorsal-head profile concave; snout conical; eye diameter subequal to snout length including upper jaw; mouth large, very protrusible; ascending process of premaxilla reaches past vertical at midorbit; a thick ligament connecting tip of premaxilla to tip of maxilla; a pair of spiny plates dorsally on premaxillae near symphysis; jaws with 4 or 5 separate rows of slender teeth; vomer with a cloverleaf-shaped patch of minute teeth and a few minute teeth on anterior end of palatines; head bones rugose and spiniferous; branchiostegal rays 6, the membranes separate, free from isthmus; gills 4; gill rakers short, 3 or 4 + 11 on first arch. Dorsal fin deeply notched between spinous and soft parts, with 9 or 10 strong, grooved spines, 23 to 25 branched rays; anal fin with 3 short, stout spines, 22 to 24 rays; pectoral fins short and rounded, about half head length, with 15 rays, the uppermost ray short and spinelike; **caudal fin with 14 principal rays, 12 branched rays;** pelvic fins with a strong, grooved spine and 5 branched rays; dorsal, anal and pelvic-fin spines and rays bear numerous minute spinelets. **Body covered with spinoid scales; each scale hidden by a cluster of long slender spinelets.** Lateral line with about 20 tubes, ending below last dorsal-fin spine. Vertebrae 10+12; no supraneural bones. **Colour:** head and body silver-gold, eye pale yellow; spinous dorsal fin black with broad red margin; soft dorsal, anal and caudal fins black, with dusky yellow margin; pelvic fins red.

Similar families occurring in the area

Antigoniidae: body extremely deep, the depth 0.8 to 1.2 times in standard length; scales with serrate ridge or keel and small denticles; caudal-fin branched rays 10; mouth small, oblique; pectoral-fin length subequal to head length.

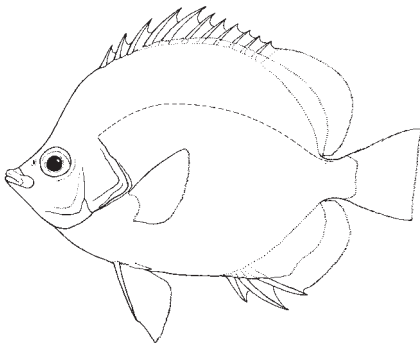
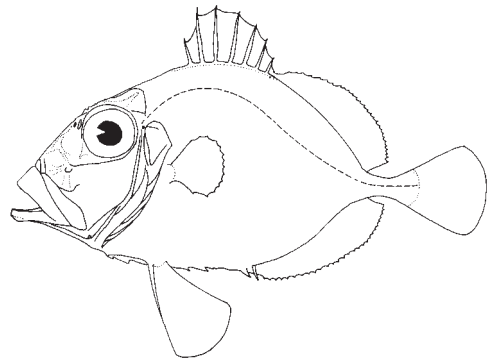
**Antigoniidae**

Cyttidae: anal fin with 2 minute spines, 36 to 38 rays; branchiostegal rays 7; gills 3.5 (no gill opening medial to fourth gill); zip-like double row of small scutes along ventral midline from isthmus to anal fin.

**Cyttidae**

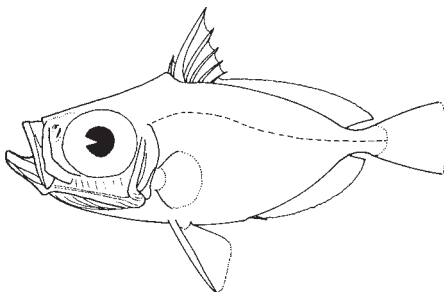
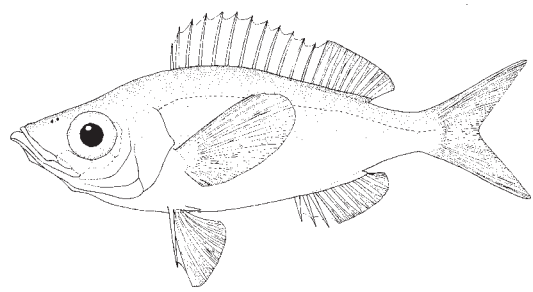
Chaetodontidae: no deep notch in dorsal-fin margin; dorsal-fin spines 11 to 13; scales cycloid or weakly ctenoid; upper jaw slightly protrusile; fin rays and spines smooth.

Zeidae: pelvic fins with 6 to 10 rays, with or without a spine; scales rudimentary or absent or enlarged as bony plates or keeled scutes at base of dorsal and anal fins or midventrally along belly; branchiostegals 7; gills 3.5 (no gill opening medial to fourth ceratobranchial).

**Chaetodontidae****Zeidae**

Zeniontidae: body depth subequal to head length, about 2.5 times in standard length; pectoral fins shorter than eye diameter; branchiostegals 7; gills 3.5 (no gill opening medial to fourth ceratobranchial).

Centracanthidae: body oblong or elongate, its depth 2.2 to 3.1 times in standard length; scales weakly ctenoid; dorsal fin with 12 spines, 10 soft rays; anal-fin rays 8; head bones smooth.

**Zeniontidae****Centracanthidae**

Size: Maximum to 19 cm.

Habitat, biology, and fisheries: Demersal fish occurring near the bottom over rocky or coral reefs and sandy bottom in depths of 25 to 600 m. Feeds on macrozooplankton (mysid shrimps, krill and copepods), also worms and benthic crustaceans. Occurs in loose aggregations of 20 to 50 fish.

Distribution: Eastern Atlantic and Mediterranean from Norway, United Kingdom, France, Azores, Madeira, Canaries, Cape Verde Islands to Senegal. Spawns in summer off Ireland, in spring and summer in Mediterranean.

Remarks: The family Caproidae is here limited to *Capros aper*. Previous accounts of this family in various FAO guides have included the species *Antigonia capros* in this family, but no convincing evidence has been published to show that these two genera belong in the same family.



Reference

Quéro, J.-C. 1986. Caproidae. In P.J.P. Whitehead, M.-L. Bauchot, J.-C. Hureau, J. Nielsen, E. Tortonese, eds. *Fishes of the North-eastern Atlantic and the Mediterranean*. Paris, UNESCO Vol. 2: 777–779.

New Index

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Suborder XIPHIOIDEI

XIPHIIDAE

Swordfish

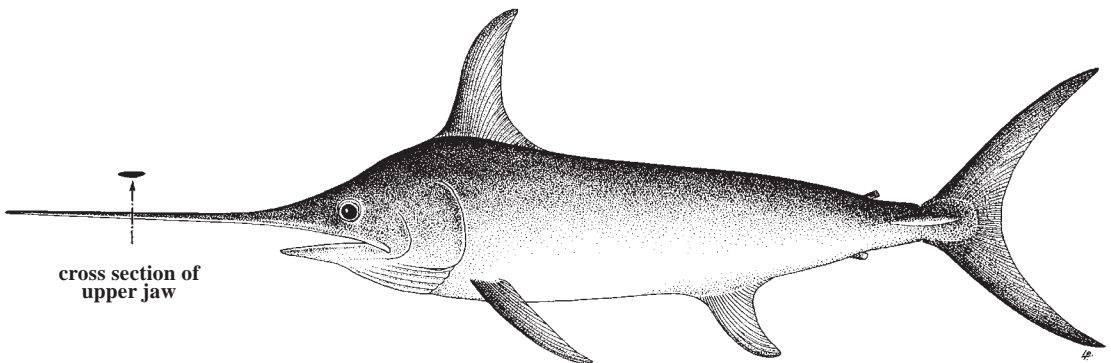
by I. Nakamura, Tuna Research and Conservation Center, Hopkins Marine Station, Stanford University, CA, USA

A single species in this family.

Xiphias gladius Linnaeus, 1758

Frequent synonyms / misidentifications: None / None.

FAO names : En – Swordfish; Fr – Espadon; Sp – Pez espada.

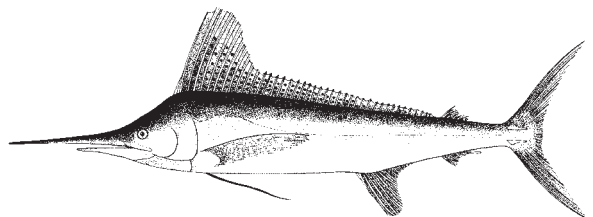


Diagnostic characters: A large fish of rounded body in cross-section, very robust in front; **snout (upper jaw) ending in a long, flattened, sword-like structure**; no gill rakers; gill filaments reticulated. Dorsal and anal fins each consisting of 2 widely separated portions in adults, but both fins continuous and single in young. Pectoral fins falcate and low in position. **Pelvic fins absent. A large, strong, lateral keel on each side of caudal peduncle. A deep caudal notch each dorsally and ventrally just in front of base of caudal fin. Scales present in adults but under thick layer of epidermis**, peculiar scale-like structures present in young. Lateral line exists in young and juveniles, but disappearing with growth. Vertebrae 26 (16 precaudal + 10 caudal or 15 + 11). **Colour:** back and upper sides brownish black, lower sides and belly light brown. No remarkable markings on body.

Similar species occurring in the area

Istiophoridae (*Tetrapturus* and *Makaira* species): snout also prolonged into a bill, but rounded in cross-section, not flattened; pelvic fins present, long, narrow and rigid; 2 caudal keels on each side of caudal peduncle. A shallow caudal notch each dorsally and ventrally in front of base of caudal fin. Lateral line always present.

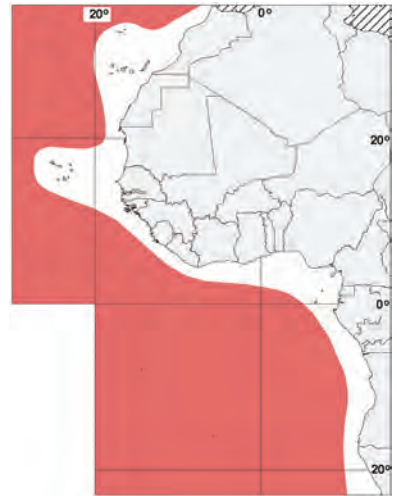
Size: Maximum to 4.5 m; common to 2.2 m.



Istiophoridae

Habitat, biology, and fisheries: A highly migratory and aggressive fish, adult fish generally not forming large schools; found in offshore and oceanic waters. This species has a large temperature tolerance ranging from 5 to 27°C, which may give extensive distribution to the swordfish. Feeds on a wide range of fishes, especially schooling species such as sardines, anchovies, sauries, mackerels, jack mackerels and so on; also on pelagic crustaceans and cephalopods, particularly pelagic squids. It is reported to use its sword to hit and kill larger prey. In surface waters at night and moderately deeper waters during the day throughout its range. In the Atlantic Ocean, swordfish spawn in upper layer at depths between surface to about 75 m, at temperatures around 23°C and salinity of 33.8 to 37.4‰. Female gonads usually contain 2 to 5 million eggs. Caught mainly with harpooning and surface longlining for commercial fisheries; also by trolling for sports fishing. Marketed fresh, iced and frozen. Meat is highly appreciated for being tender and delicious and is mostly used for steaks, saute and teriyaki. Large individuals may develop high concentrations of mercury in their flesh.

Distribution: Worldwide in tropical and temperate waters, found throughout the area. Migrating into the Mediterranean and some spawning takes place there.



References

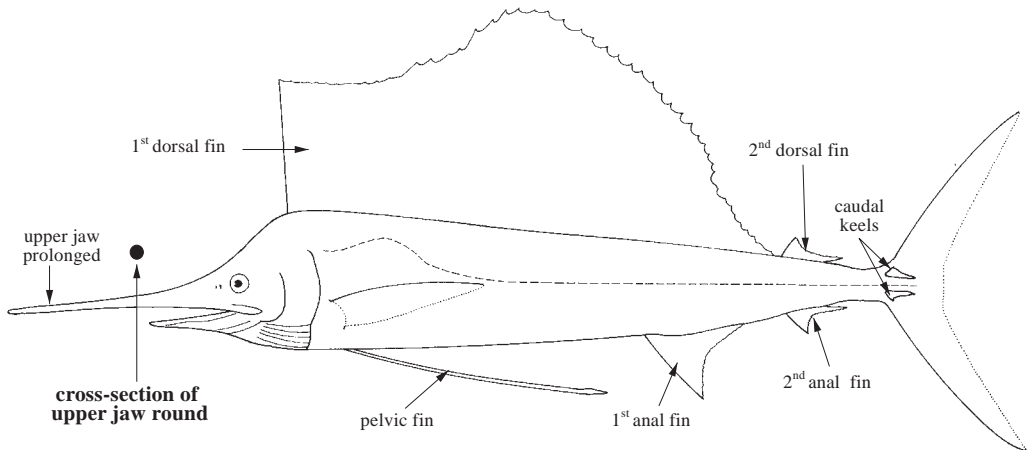
- Nakamura, I.** 1985. FAO species catalogue. Vol. 5. Billfishes of the world. An annotated and illustrated catalogue of marlins, sailfishes and swordfishes known to date. *FAO Fisheries Synopsis*, 5(125):1–65.
- Nakamura, I.** 2002. Xiphiidae. In K. Carpenter, ed. The living marine resources of the Western Central Atlantic, Volume 3. *FAO species identification guide for fishery purposes and American Society of Ichthyologists and Herpetologists Special Publication No. 5*. Rome, FAO, p. 1858–1859.

ISTIOPHORIDAE

Billfishes (spearfishes, marlins and sailfishes)

by I. Nakamura, Tuna Research and Conservation Center, Hopkins Marine Station, Stanford University, CA, USA and
B.B. Collette, National Marine Fisheries Service, National Systematics Laboratory, National Museum of Natural History,
Washington, DC, USA

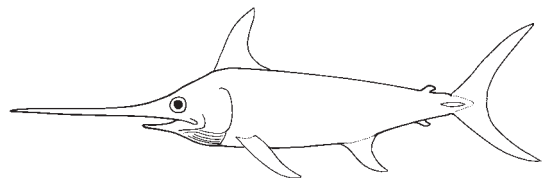
Diagnostic characters: Body elongate and more or less compressed. **Upper jaw prolonged into a long spear that is round in cross-section.** Mouth not protrusible, with fine, rasp-like teeth on both jaws; gill openings wide, left and right gill membrane united but free from isthmus; no gill rakers on gill arches, gill filaments reticulated. Two dorsal fins close together, the first much larger than the second; also 2 anal fins, the second much smaller than the first and similar in size and shape to second dorsal fin; first dorsal, pelvic and first anal fins can fold back into grooves; caudal fin large, strong and forked, with a pair of caudal keels on either side at base. **Upper keel slightly larger than lower keel.** **A shallow caudal notch on both upper and lower side of caudal peduncle.** Pectoral fins strong and falcate; pelvic fins consisting of 3 soft rays united with a spine, lateral line always well visible except in large specimens of *Makaira nigricans*. Body covered with more or less imbedded, narrow, and well-ossified pointed scales. Vertebrae 24. **Colour:** back and upper sides dark blue, lower sides and belly silvery white. In some species there are horizontally aligned spots or longitudinal lines on body and /or black spots on the first dorsal-fin membrane.



Habitat, biology, and fisheries: Istiophorid billfishes are primarily inhabitants of warm seas, usually the upper layers of water above the thermocline, but during the summer months they follow schools of smaller fishes to catch and eat into temperate and sometimes even colder waters. Being among the largest and swiftest teleost fishes of the oceans, they perform considerable, sometimes transoceanic, migrations. All billfishes are of some commercial value (high commercial value in Japanese markets) and provide excellent food. Most of the species are exploited commercially by surface longline, trolling, or setnet (fixed net), and all are regarded as excellent game fishes by trolling for sports fishermen.

Similar families occurring in the area

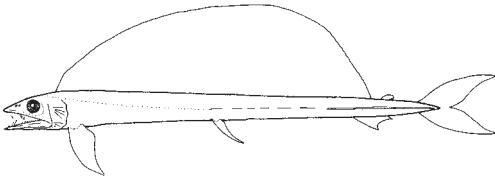
Xiphiidae: upper jaw prolonged like in the billfishes, but shaped as a long sword rather than a spear, its cross-section flat-oval (round in Istiophoridae); pelvic fins absent; a single large keel on either side of caudal-fin base (2 keels on Istiophoridae); a deep notch on both upper and lower profiles of caudal peduncle (shallower notch in Istiophoridae).



Xiphiidae

Alepisauridae: somewhat similar to sailfishes (species of *Istiophorus*) in sail-like first dorsal fin; but easily distinguished by their jelly-like body; the absence of prolonged jaws, of keels at base of caudal fin, and of scales on body; the presence of fang-like teeth and adipose fin situated postdorsally (instead of a rayed second dorsal fin); and the insertion of pelvic fins far behind pectoral fins.

Belonidae: large representative may be somewhat similar to small spearfishes or marlins (species of *Tetrapturus* or *Makaira*), but they have both jaws prolonged, dorsal and anal fins single and similar in size and shape, pectoral fins not falcate (except in *Ablennes*), and pelvic fins inserted far behind pectorals.



Alepisauridae



Belonidae

Key to the species of Istiophoridae occurring in the area

- 1a. First dorsal fin sail-like, considerably higher than body depth at level of midbody; pelvic-fin rays very long (almost reaching to anus), with a well developed membrane (Fig.1) ***Istiophorus platypterus***
- 1b. First dorsal fin not sail-like, slightly higher to lower than body depth at level of midbody; pelvic fins not as long (far from reaching to anus), with a moderately-developed membrane (Fig. 2) → 2
- 2a. Lateral line not straight, usually not visible in adults, characteristically a chicken wire-like pattern; anterior part of dorsal fin lower than body depth; profile of head between preorbital region and origin of first dorsal fin steeply elevated (Fig. 2) ; body not strongly compressed ***Makaira nigricans***
- 2b. Lateral line visible, a single straight line; anterior part of first dorsal fin slightly higher than, or nearly equal to body depth; profile of head between preorbital region and origin of first dorsal fin nearly flat to slightly elevated; body strongly compressed → 3

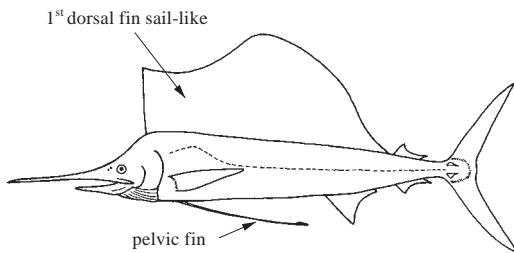


Fig. 1 *Istiophorus platypterus*

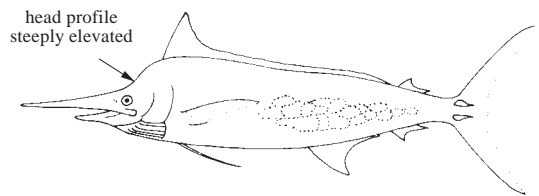




Fig. 2 *Makaira nigricans*

- 3a. Anus just in front of origin of anal fin, distance between anus and anal-fin origin less than half of anal-fin height; first dorsal fin prominently spotted ***Kajikia albida***
- 3b. Anus far anterior to anal-fin origin, distance between anus and anal-fin origin nearly equal to anal-fin height; first dorsal fin without spots (***Tetrapturus***) → 4

- 4a. Scales on sides of the body rounded at anterior end, soft with 2 to 3 posterior points
 *Tetrapturus georgii*
- 4b. Scales on the sides of the body pointed at anterior end, stiffer with 2 to 5 posterior
 points; bill long, its length usually equal to or slightly longer than head length; pectoral
 fins wide, long and rounded, longer than 18% of body length *Tetrapturus pfluegeri*

List of species occurring in the area

This symbol  is given when species accounts are included.

 *Istiophorus platypterus* (Shaw in Shaw and Nodder, 1792).

 *Kajikia albida* (Poey, 1860).

 *Makaira nigricans* Lacépède, 1802.

 *Tetrapturus georgii* Lowe, 1841.

 *Tetrapturus pfluegeri* Robins and de Sylva, 1963.

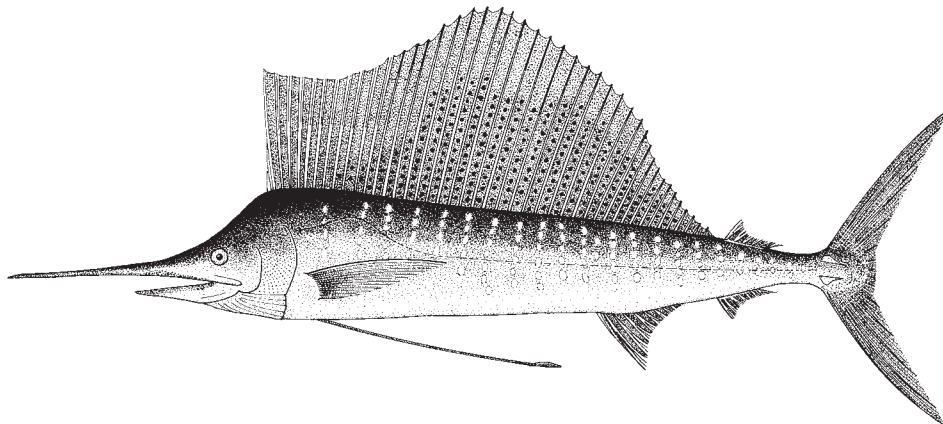
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- Nakamura, I. 2002. Istiophoridae. In K. Carpenter, ed. The living marine resources of the Western Central Atlantic, Volume 2: Bony fishes part 1 (Acipenseridae to Grammatidae). *FAO species identification guide for fishery purposes and American Society of Ichthyologists and Herpetologists Special Publication No. 5*. Rome, FAO, p. 1860–1866.

Istiophorus platypterus (Shaw in Shaw and Nodder, 1792)

Frequent synonyms / misidentifications: *Histiophorus albicans* (Latreille, 1804); *H. americanus* Cuvier 1832; *Istiophorus americanus* (Latreille, 1804) / None.

FAO names: En – Sailfish; Fr – Voilier; Sp – Pez vela.



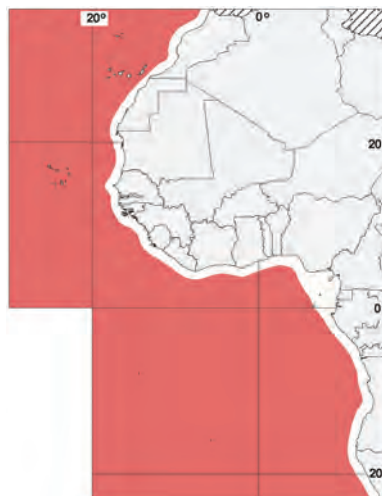
Diagnostic characters: Body elongate, much compressed. Upper jaw prolonged into a rather slender spear with round cross-section. Two dorsal fins, **the first large, sail-like, considerably higher than body depth throughout most of its length**, with 42 to 47 soft rays, the second small, with 6 or 7 soft rays; 2 separate anal fins, with 11 to 15 spines (first) and 6 or 7 soft rays (second); pectoral fins falcate with 17 to 20 soft rays; **pelvic fins very long, almost reaching to anus**, and consisting of 1 spine and 3 soft rays. Pectoral fins and caudal fin of young longer than those of Indo-Pacific sailfish. Lateral line visible, curved above pectoral fin, then almost straight to tail. Body covered with rather sparsely imbedded scales with a blunt point. Vertebrae 24 (12 precaudal + 12 caudal). Anus close to origin of first anal fin. **Colour:** body dark blue dorsally, brown-blue laterally, silvery white ventrally, first dorsal-fin membrane blue-black, covered with many small black spots; other fins brown-black; about 20 vertical bars consisting of several small pale blue spots on side of body.

Size: Maximum to about 3 m; common to 2.5 m. The IGFA all-tackle Atlantic game fish record is 64.4 kg for a fish caught off Lobito, Angola in 2014.

Habitat, biology, and fisheries: Coastal and offshore, fairly migratory, usually found above the thermocline, 10 m or shallower. Feeds on a wide variety of fishes, crustaceans, and cephalopods, mostly schooling animals. Good sportsfishing grounds off West African coast; commercial surface longline fishing grounds near shore throughout the Atlantic Ocean. Caught mainly with longlines (commercial fishing boats) and by trolling (sports fishermen). Marketed mostly raw or iced, and sometimes frozen; prepared as sashimi (sliced raw fish), teriyaki and fish cakes in Japan.

Distribution: Throughout tropical and subtropical (sometimes temperate) waters of the Atlantic and Indo-Pacific. Mostly offshore to coastal waters in the area between 50° N and 32° S. Sometimes migrating into the Mediterranean, but recently rare.

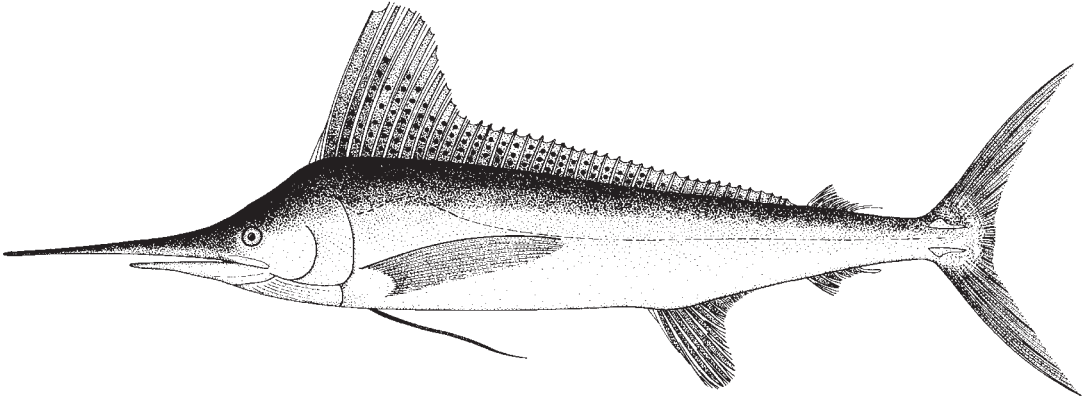
Remarks: The Atlantic population of this species was previously known as *Istiophorus albicans* (Latreille, 1804). Investigators have not found any morphological or genetic differences between Atlantic and Indo-Pacific sailfish.



Kajikia albida (Poey, 1860)

Frequent synonyms / misidentifications: *Makaira albida* (Poey, 1860); *Lamontella albida* (Poey, 1860); *Tetrapturus albidus* Poey, 1860 / None.

FAO names: **En** – White marlin; **Fr** – Makaire blanc; **Sp** – Aguja blanca.

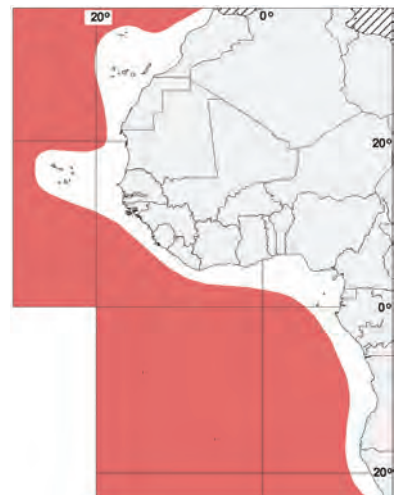


Diagnostic characters: Body elongate, compressed. Upper jaw prolonged into a spear with round cross-section. Two dorsal fins, the first (38 to 46 soft rays) long and low posteriorly, the second small with 5 or 6 soft rays; **height of anterior part of first dorsal fin nearly equal to body depth**; 2 separate anal fins with 12 to 17 spines (first) and 5 or 6 soft rays (second) respectively; pectoral fins falcate with 18 to 21 soft rays; **pelvic fins nearly equal to pectoral fins in length**, consisting of 1 spine and 3 soft rays; **tips of first dorsal, first anal and pectoral fins rounded**. Lateral line visible, curved above pectoral fin, then almost straight to tail. Body covered with densely imbedded scales ending in a single acute point. Anus close to origin of first anal fin. Vertebrae 24 (12 precaudal + 12 caudal). **Colour:** body dark blue to chocolate brown dorsally, brownish silvery white laterally, silvery white ventrally; first dorsal-fin membrane blue-black covered with many small black spots; other fins brown-black; when feeding more than 15 whitish vertical bars may appear.

Size: Maximum to about 3 m; common to 2.5 m. The IGFA all-tackle game fish record is 82.5 kg for a fish caught off Vitoria, Brazil in 1979.

Habitat, biology, and fisheries: Oceanic, highly migratory, usually found above the thermocline, above 20 m. Its distribution varies seasonally, reaching higher latitudes in both northern and southern hemispheres only during respective warm seasons. Feeds on a wide variety of fishes, crustaceans, and cephalopods, mainly schooling animals. Caught mainly with surface longlines for commercial fisheries and by trolling for sportsfishing. Marketed mostly frozen or iced; frozen material for fish processing in Japan.

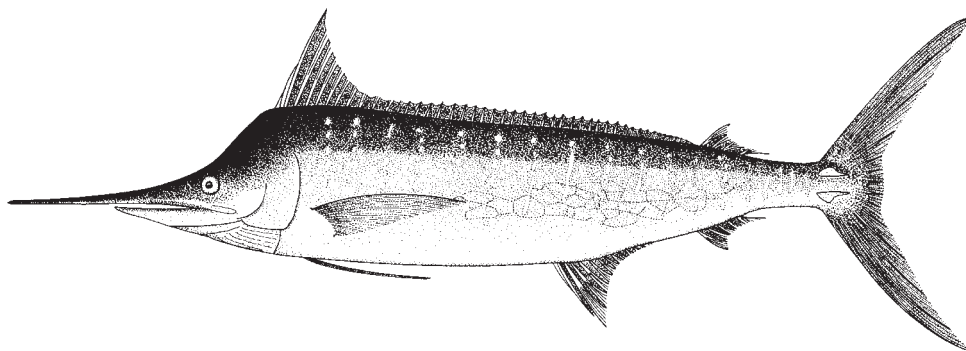
Distribution: Throughout tropical and subtropical (sometimes temperate) waters of the Atlantic and Indo-Pacific Oceans, between 45° N and 45° S in the eastern Atlantic. Rarely invades the Mediterranean.



Makaira nigricans Lacepède, 1802

Frequent synonyms / misidentifications: *Makaira ampla* (Poey, 1860) / None.

FAO names: En – Blue marlin; Fr – Makaïre bleu; Sp – Aguja azul.



Diagnostic characters: Body elongate, not strongly compressed. Upper jaw prolonged into a stout spear with round cross-section; **head profile between preorbital region and origin of first dorsal fin very steep**. Two dorsal fins, the first (39 to 43 soft rays) long and low posteriorly, the second small with 6 or 7 soft rays; **height of anterior part of first dorsal fin shorter than maximum body depth**; 2 separate anal fins with 13 to 15 spines (first) and 6 or 7 soft rays (second); pectoral fin falcate with 19 to 22 soft rays; pelvic fins shorter than pectoral fins, consisting of 1 spine and 3 soft rays. **Lateral-line system reticulated, hard to see in large specimens**. Body covered with densely imbedded, well-ossified scales ending in 1 or 2 long acute spines. Anus close to origin of first anal fin. Vertebrae 24 (11 precaudal + 13 caudal). **Colour:** body dark blue to chocolate brown dorsally, silvery white ventrally; first dorsal-fin membrane blue-black, usually unspotted; other fins brown-black; several vertical bars consisting of pale blue spots on body.

Size: Maximum to about 4 m; common to 3.5 m. The IGFA all-tackle game fish record is 636 kg for a fish caught off Vitoria, Brazil in 1992.

Habitat, biology, and fisheries: Oceanic, highly migratory with favouring warm waters, usually found above the thermocline. Feeds on a wide variety of fishes, crustaceans, and cephalopods, mostly schooling animals. Caught mainly with surface longlines for commercial fisheries and by trolling for sports fishing. Marketed mostly frozen or iced. Frozen fish mainly for processing in Japan.

Distribution: Throughout tropical and subtropical (sometimes temperate) waters of the Atlantic and Indo-Pacific, between 40°–45° N and 30° S in the eastern Atlantic. Not migrating into the Mediterranean.

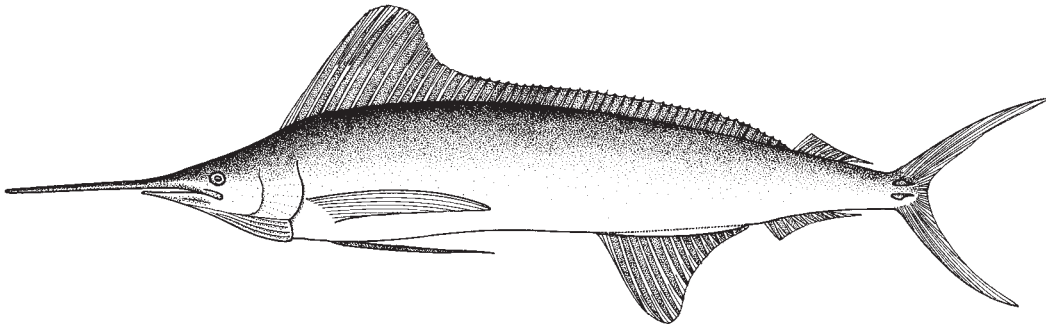
Remarks: Buonaccorsi *et al.* (2001) were not able to find evidence from mtDNA genotypes to indicate that Atlantic and Indo-Pacific blue marlins are separate species.



***Tetrapturus georgii* Lowe, 1841**

Frequent synonyms / misidentifications: *Tetrapturus georgei* Lowe, 1841 (misspelling) / *Kajikia albida*.

FAO names: **En** – Roundscale spearfish; **Fr** – Makaïre épée; **Sp** – Marlin peto.



Diagnostic characters: Body robust and compressed. Upper jaw prolonged into a long and slender spear with round cross-section. Nape moderately humped. Right and left branchiostegal membranes completely united to each other, but free from isthmus extending almost to edge of opercle. Two dorsal fins, the first (43 to 48 soft rays) higher than maximum body depth anteriorly, lower posteriorly; the second small with 6 or 7 rays, located slightly posterior to second anal fin; 2 separate anal fins, the first high and broadly rounded, with 14 to 16 rays, the second with 5 to 7 rays and very similar in size to second dorsal fin; pectoral fins long, subequal to pelvic fins, with 19 or 20 rays; pelvic fins long and slender. **Anus located moderately far from origin of first anal fin**, a distance equal to about half the height of the first anal fin. Lateral line single and simple. **Scales on sides of body rounded anteriorly**, only slightly imbricated and soft. Vertebrae 24 (12 precaudal and 12 caudal). **Colour:** body dark blue; **first dorsal completely unspotted.**

Size: Maximum to at least 160 cm body length, maximum weight 35 kg. The all-tackle game fish record is of a 31.75 kg (70 lb.) fish caught in Baltimore Canyon off Maryland in 2010.

Habitat, biology, and fisheries: Oceanic, highly migratory, found above the thermocline. Feeds largely on squids plus some fishes. Caught mainly with surface longlines for commercial fisheries and by trolling for sportfishing.

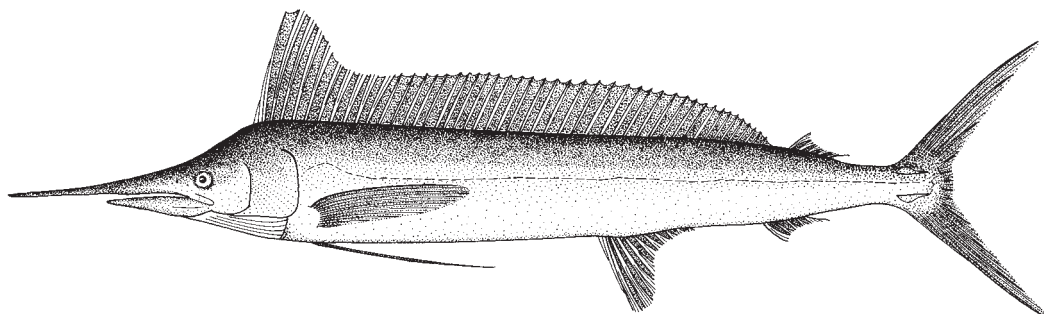
Distribution: Throughout tropical and subtropical (sometimes temperate) waters of the Atlantic Ocean and the Mediterranean Sea.



***Tetrapturus pfluegeri* Robins and de Sylva, 1963**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Longbill spearfish; Fr – Makaïre bécune; Sp – Aguja picuda.



Diagnostic characters: Body elongate, much compressed. **Upper jaw prolonged into a long, slender spear with round cross-section, usually equal to or slightly longer than head length.** Two dorsal fins, **the first (44 to 50 rays) long and moderately high throughout its length,** the second small with 6 or 7 soft rays; **height of anterior part of first dorsal fin slightly greater than body depth;** 2 separate anal fins with 12 to 17 spines (first) and 6 or 7 soft rays (second) respectively; pectoral fins falcate with 18 to 21 soft rays; pelvic fins slightly longer than pectoral fins, consisting of 1 spine and 3 soft rays. Body covered with densely imbedded scales ending in several points. **Anus well in front of origin of first anal fin.** Vertebrae 24 (12 precaudal + 12 caudal). **Colour:** body dark blue dorsally, brownish silvery white laterally, silvery white ventrally; first dorsal-fin membrane blue-black, unspotted; other fins brown-black; no bars or spots on body (few exceptions).

Size: Maximum to about 2.5 m; common to 2 m. The IGFA all-tackle game fish record is 58 kg for a fish caught in the Canary Islands in 1999.

Habitat, biology, and fisheries: Oceanic, highly migratory, usually found above the thermocline. Offshore and oceanic waters in the Atlantic Ocean. Feeds largely on pelagic fishes and squids. Based on occurrence of larvae and mature fish, spawning of this species take place throughout the wide areas of tropical and subtropical Atlantic Ocean. Separate statistics are not reported for this species; it is usually reported by the Japanese longliners together with sailfish catches. Caught with surface longlines as bycatch of commercial longliners for tunas. Marketed mostly frozen. Frozen fish for processing in Japan.

Distribution: Throughout tropical and subtropical (sometimes temperate) waters of the Atlantic Ocean, between 40° N and 30° S in the eastern Atlantic, chiefly distributed in offshore and oceanic waters. Not migrating into the Mediterranean.



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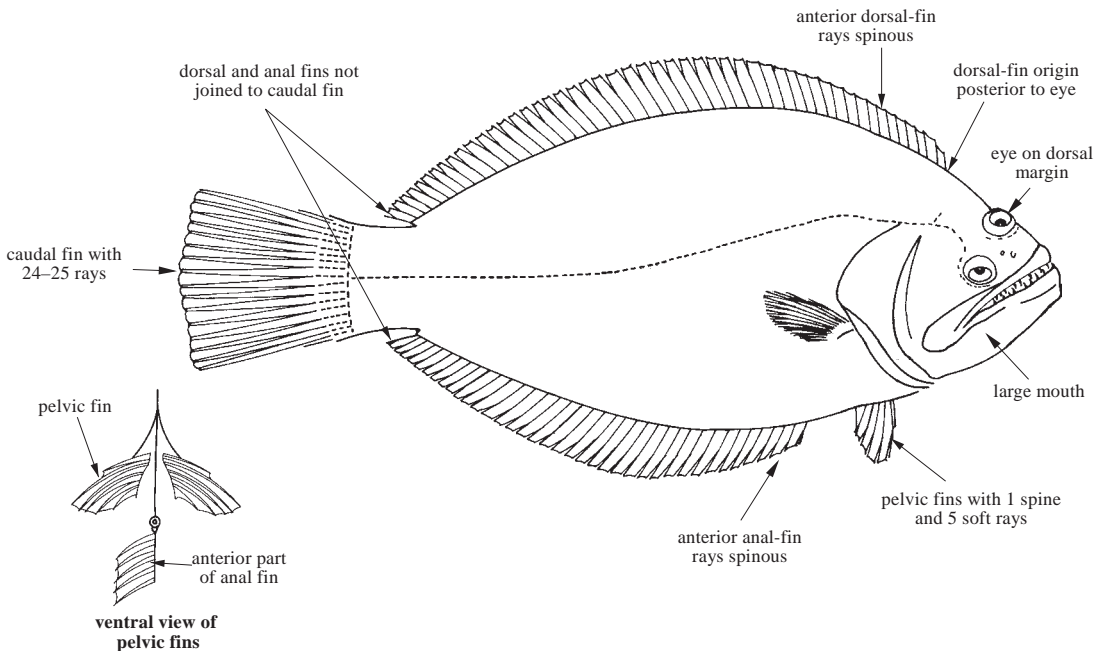
Order PLEURONECTIFORMES

PSETTODIDAE

Spiny turbot

by T.A. Munroe, National Marine Fisheries Service, National Systematics Laboratory, National Museum of Natural History, Washington, DC, USA

Diagnostic characters: Large flounders (to about 62 cm total length) with oval, flat and fairly thick body, and distinct caudal peduncle. Head large, robust. Both eyes either on left or on right side of head. **Upper eye on dorsal margin of head.** Mouth large, terminal, posterior end of jaws extending well beyond posterior margin of lower eye; lower jaw projecting; jaws with strong canine teeth, many with barbed tips. **Supramaxillary bone well developed. Vomer and palatines with teeth. Preopercular margin easily seen, not hidden by skin or scales.** Gill rakers small, fine, tooth-like. **Dorsal-fin origin well posterior to vertical through posterior margin of eyes; anterior dorsal- and anal-fin rays spinous.** Urinary papilla and anus on midventral line anterior to anal-fin origin; **caudal fin free from dorsal and anal fins, with truncate or double truncate posterior margin with 24 or 25 rays;** pectoral fins about equal in size, both with 13 to 17 rays. **Pelvic fins with 1 spine and 5 soft rays,** and nearly symmetrically placed on each side of midventral line. Scales small, weakly ctenoid on both sides of body; scales around caudal peduncle 28 to 43. Lateral line present on both sides of body, only slightly curved above pectoral fin, with 61 to 77 scales; no supratemporal branch, branch present below lower eye. Total vertebrae 24 (10 + 14). Epipleural and pleural ribs present. **Colour:** ocular side uniformly brownish or greyish, often with irregular darker spots and blotches. Blind side usually pale, but may be off-white or occasionally darker coloured. Dorsal and anal fins more or less light brownish or transparent, but without distinctive pigmentation. Caudal fin with or without series of darker spots and distal darker pigmentation.

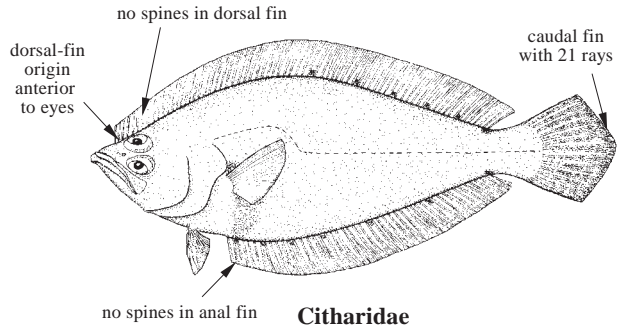


Habitat, biology, and fisheries: Bottom-living flatfishes occurring in coastal waters and on the continental shelf. Voracious predators consuming a variety of fishes and larger crustaceans. Caught mainly in trawls on the continental shelf and with a variety of gears in inshore artisanal fisheries. Often seen in markets, but do not seem to be abundant enough to support a special fishery. No separate catch statistics are reported for this species.

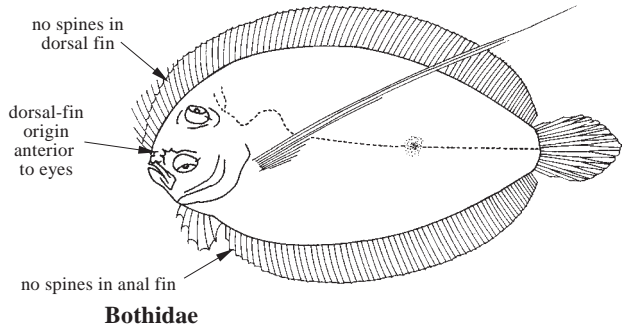
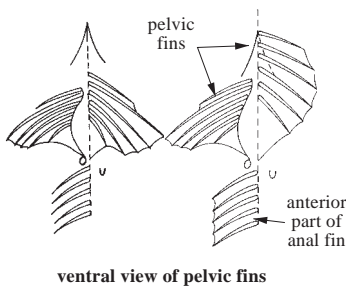
Remarks: The Psettodidae includes only one genus, *Psettodes*, with 3 species, 2 of which occur in the area.

Similar families occurring in the area

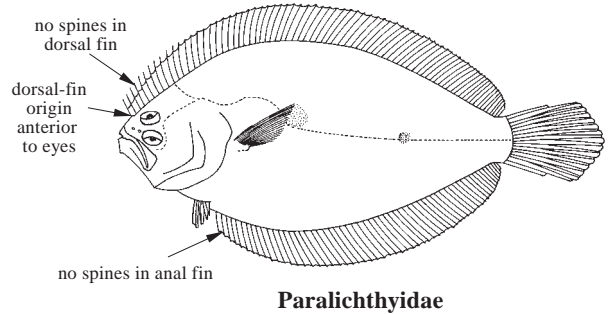
Citharidae: dorsal-fin origin anterior to posterior margin of upper eye; no spines in dorsal and anal fins; lateral line with high arch above pectoral fin; gill rakers elongate, not tooth-like; eyes usually on right side of head in some species and left side of head in others, reversals rare; anus and urinary papilla on left side.



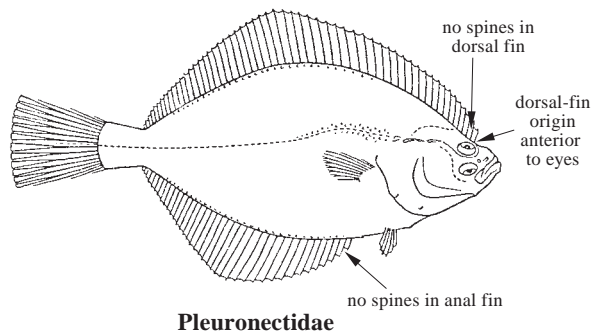
Bothidae: dorsal-fin origin anterior to upper eye; no spines in fins; lateral line with high arch over pectoral fin; no lateral line below eye; ocular-side pelvic fin on midventral line with origin anterior to that of blind-side counterpart; blind-side pelvic fin above midventral line; urinary papilla on left side; eyes nearly always on left side of head, reversals rare.



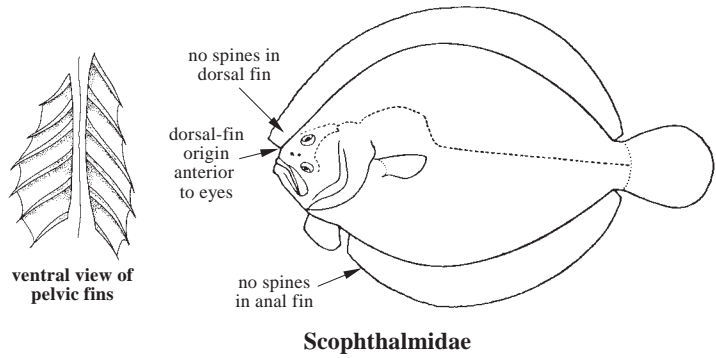
Paralichthyidae: dorsal-fin origin anterior to posterior margin of upper eye; no spines in fins; lateral line with high arch over pectoral fin; urinary papilla on right side (in species of *Cyclopsetta* group); eyes nearly always on left side of head, reversals rare.



Pleuronectidae: dorsal-fin origin anterior to posterior margin of upper eye; no fin spines; urinary papilla on right side; eyes nearly always on right side of head, reversals rare.

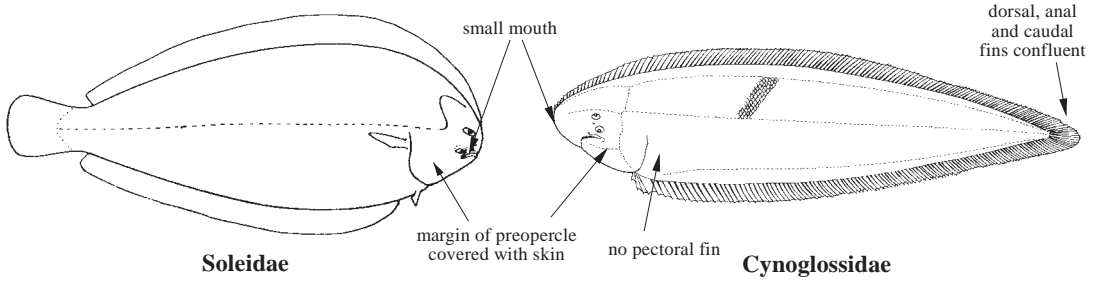


Scophthalmidae: dorsal-fin origin anterior to posterior margin of upper eye; no spines in fins; both pelvic fins elongate, placed close to midline and extending forward to urohyal; first ray of blind-side pelvic fin opposite second or third ray of ocular-side fin; lateral line with high arch above pectoral fin, and with distinct supratemporal branch; urinary papilla on left side; eyes on left side of head, reversals rare.



Soleidae: dorsal-fin origin anterior to posterior margin of upper eye; no spines in fins; margin of preopercle not distinct, covered with skin and scales; lower jaw not protruding; eyes on right side of head; reversals rare.

Cynoglossidae: dorsal-fin origin anterior to posterior margin of upper eye; no spines in fins; dorsal and anal fins joined to pointed caudal fin; margin of preopercle not distinct, covered with skin and scales; no pectoral fins in adults; only 1 pelvic fin in most species; lower jaw not protruding, rostral hook present below mouth (except *Symphurus*); eyes on left side of head, reversals rare.



Key to the species of Psettodidae occurring in the area

- 1a. Caudal fin with many large spots; 28 to 32 scales around caudal peduncle (Fig. 1a)
 ***Psettodes belcheri***
- 1b. Caudal fin without large spots; 34 to 43 scales around caudal peduncle (Fig. 1b)
 ***Psettodes bennetti***

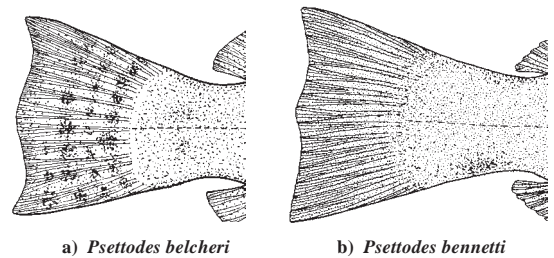


Fig. 1 caudal fin

List of species occurring in the area

The symbol is given when species accounts are included.

- Psettodes belcheri* Bennett, 1831.
- Psettodes bennetti* Steindachner, 1870.

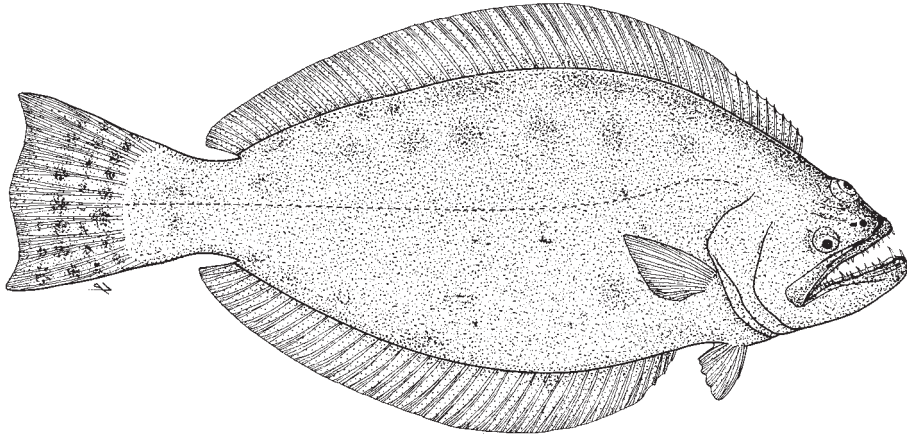
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- Stauch, A. & Cadenat, J.** 1965. Révision du genre *Psettodes* Bennett 1831 (Pisces: Teleostei, Heterosomata). *Cahiers ORSTOM, Série océanographie*, 3(4): 19–30.

***Psettodes belcheri* Bennett, 1831**

Frequent synonyms / misidentifications: None / *Psettodes bennetti*.

FAO names: En – Spottail spiny turbot; Fr – Turbot épineux tacheté; Sp – Perro.



Diagnostic characters: Body oval and flat, but thicker than in most other flatfishes; body depth 2.7 to 3.2 times in total length. Both eyes on either right or left side of head. Eyes large; **upper eye on dorsal surface of head** and in advance of lower eye; eyes separated by wide interorbital space. **Supramaxillary bone well developed.** Mouth large, extending well beyond vertical through posterior margin of lower eye; lower jaw projecting. **Jaws large, with strong canine teeth, many with barbed tips. Vomer and palatines with teeth. Preopercular margin easily seen, not hidden by skin and scales. Dorsal-fin origin well posterior to upper eye; anterior rays of dorsal and anal fins spinous;** dorsal-fin rays 50 to 56; anal-fin rays 38 to 42; urinary papilla and anus on midventral line anterior to origin of anal fin; **caudal fin free from dorsal and anal fins**, with truncate or double truncate posterior margin; pectoral fins on ocular and blind sides nearly equal in length, both with 14 to 17 rays; **pelvic fins with 1 spine and 5 soft rays, and nearly symmetrically placed on each side of midventral line.** Scales small, weakly ctenoid on both sides of body; lateral line present on both sides of body and only slightly curved above pectoral fin, with 65 to 74 scales, with no supratemporal branch, branch present below lower eye; **scales around caudal peduncle 28 to 32.** Epipleural and pleural ribs present. **Colour:** ocular side brownish with spots and blotches; blind side most often pale. Dorsal, anal and caudal fins darker; **many large, dark spots on caudal fin.**

Size: Maximum to 61 cm total length; common to 45 cm.

Habitat, biology, and fisheries: Inhabits muddy, sandy and rocky bottoms in estuaries, and in coastal waters from the shoreline to at least 150 m depth. Caught throughout its range, but apparently nowhere abundant. Separate statistics not reported for this species. Caught with bottom trawls, beach seines, castnets and other artisanal gear. Marketed fresh, smoked, and dried-salted; also used occasionally for fishmeal and oil.

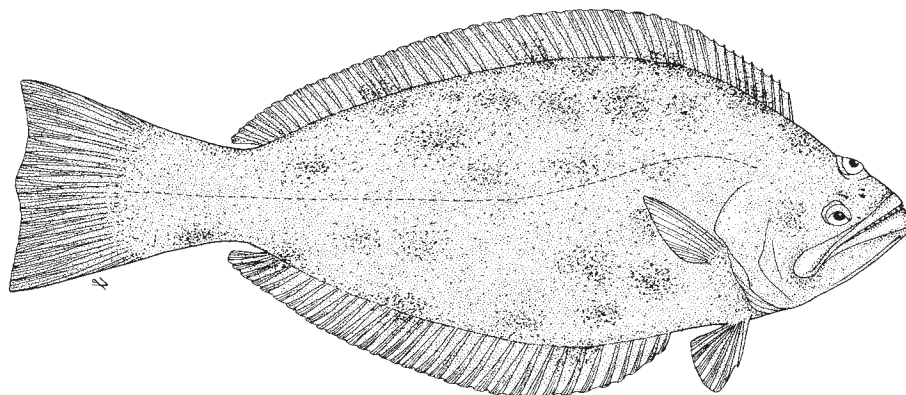
Distribution: Eastern Atlantic; West African coast from Western Sahara (about 24°N) and Mauritania, but more commonly from Guinea (about 10°N), to Angola (about 17°S).



Psettodes bennetti Steindachner, 1870

Frequent synonyms / misidentifications: None / *Psettodes belcheri*.

FAO names: En – Spiny turbot; Fr – Turbot épineux; Sp – Lenguado espinudo.



Diagnostic characters: Body oval and flat, but thicker than in most other flatfishes; body depth 2.9 to 3.4 times in total length. Both eyes on either right or left side of head. Eyes large; **upper eye on dorsal surface of head** and in advance of lower eye; eyes separated by wide interorbital space. **Supramaxillary bone well developed.** Mouth large, extending well beyond vertical through posterior margin of lower eye; lower jaw projecting. **Jaws large, with strong canine teeth, many with barbed tips. Vomer and palatines with teeth. Preopercular margin easily seen, not hidden by skin and scales. Dorsal-fin origin well posterior to upper eye; anterior rays of dorsal and anal fins spinous;** dorsal-fin rays 46 to 53; anal-fin rays 34 to 39; urinary papilla and anus on midventral line anterior to anal-fin origin; **caudal fin free from dorsal and anal fins**, with truncate or double truncate posterior margin. Pectoral fins on ocular and blind sides nearly equal in length; pectoral-fin rays 13 to 16. **Pelvic fins with 1 spine and 5 soft rays, and nearly symmetrically placed on each side of midventral line.** Scales small, weakly ctenoid on both sides of body; lateral line present on both sides of body and only slightly curved above pectoral fin, with no supratemporal branch, branch present below lower eye; lateral-line scales 66 to 74. **Scales around caudal peduncle 34 to 43.** Epipleural and pleural ribs present. **Colour:** ocular side uniformly brownish with irregular spots and blotches; blind side usually uniformly pale. **Caudal fin without dark spots.**

Size: Maximum to 54 cm total length; common to 40 cm.

Habitat, biology, and fisheries: Inhabits muddy, sandy and rocky bottoms from about 2 m or less in estuarine areas to 15 to 100 m, but usually less than 50 m, depth on the inner continental shelf. Caught throughout its range but apparently nowhere abundant. Separate statistics not reported for this species. Caught with bottom trawls and several types of artisanal gear. Marketed fresh, smoked and dried-salted; also used for fishmeal and oil.

Distribution: Eastern Atlantic; West African coast from Western Sahara (about 25°N) to Guinea (about 10°N).



CITHARIDAE

Largescale flounders

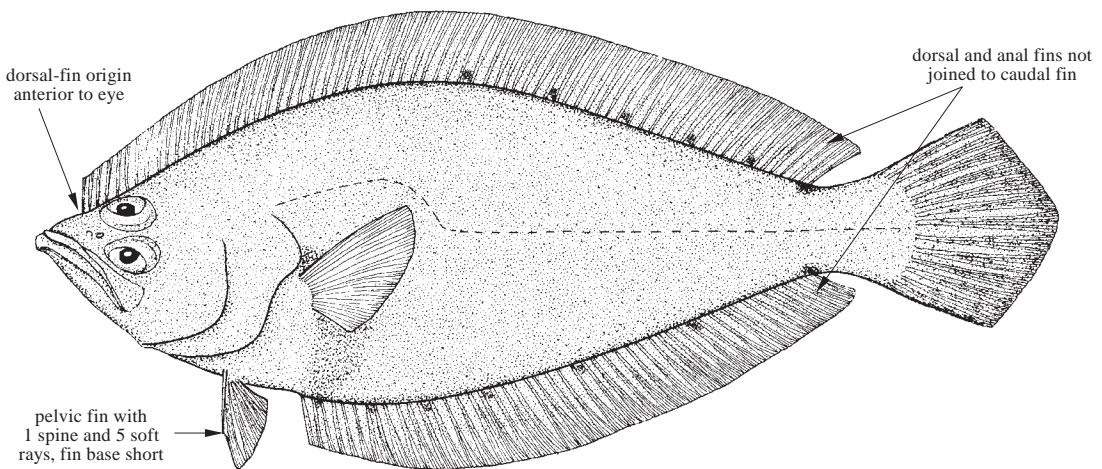
by T.A. Munroe, National Marine Fisheries Service, National Systematics Laboratory, National Museum of Natural History, Washington, DC, USA

A single species occurring in the area.

Citharus linguatula (Linnaeus, 1758)

Frequent synonyms / misidentifications: *Citharus macrolepidotus* (Bloch, 1787) / None.

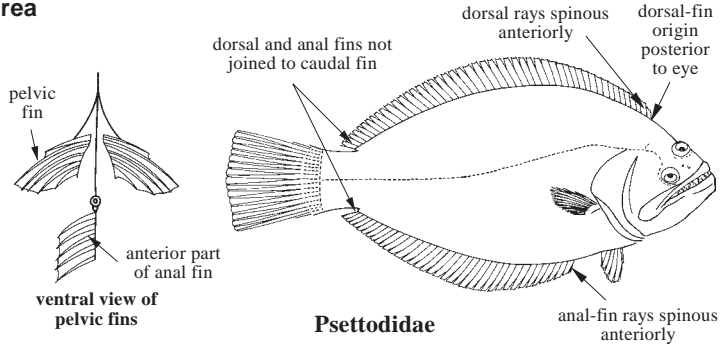
FAO names: En – Spotted flounder; Fr – Feuille; Sp – Solleta.



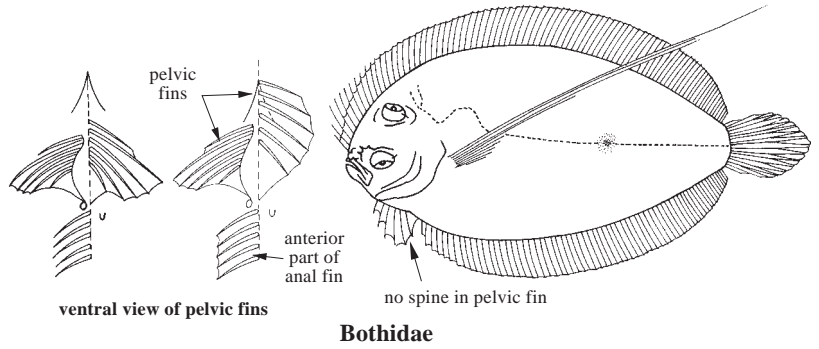
Diagnostic characters: Body elliptical, moderately compressed (size to about 30 cm). Head large, pointed; anterior profile gently concave anterior to upper eye. Snout pointed and moderately prolonged (slightly longer than eye diameter). **Eyes on left side of head** (reversals rare); eyes large, with upper slightly in advance of lower, separated by small interorbital space; upper eye close to dorsal profile of head. Mouth large, terminal, with lower jaw protruding; jaws large; posterior extent of jaws at point between verticals through posterior margin of pupil and posterior margin of lower eye; jaws obliquely angled posteriorly; jaw teeth not especially enlarged; several strong teeth on vomer. Gill membranes on both sides well separated. Gill rakers well developed, slender with small spines; 11 or 12 gill rakers on lower limb of first anterior gill arch. **Posterior border of preopercle free, clearly visible. Dorsal and anal fins without spines; dorsal-fin origin on blind side of head anterior to vertical through anterior margin of upper eye; dorsal-fin rays 64 to 72; anal-fin rays 44 to 48. Anus and urinary papilla on left side. Caudal fin not attached to dorsal and anal fins;** caudal fin double truncate with 21 fin rays (15 principal rays). Two pectoral fins; ocular-side pectoral fin with 10 fin rays. **Pelvic fins with short, subequal bases and with 1 spine and 5 soft rays. Lateral line developed on both sides, with high arch above pectoral fin;** lateral-line scales 35 to 39; supratemporal branch absent. Scales large, ctenoid on ocular side, cycloid or weakly ctenoid on blind side. **Colour:** ocular surface uniformly tan to light brown or yellowish with irregular darker stipplings and with **a conspicuous pair of black spots on the dorsal and ventral body margins at and slightly posterior to posterior ends of dorsal and anal fins.** Blind side usually whitish. Proximal regions of posterior half of dorsal fin and entire anal fin with a longitudinal series of dark spots.

Similar families occurring in the area

Psettodidae: dorsal-fin origin well posterior to posterior margin of upper eye; spines in anterior dorsal and anal fins; mouth extending well beyond vertical through posterior margin of lower eye; lateral line without high arch above pectoral fin; gill rakers tooth-like; upper eye on dorsal margin of head; anus and urinary papilla on midline.

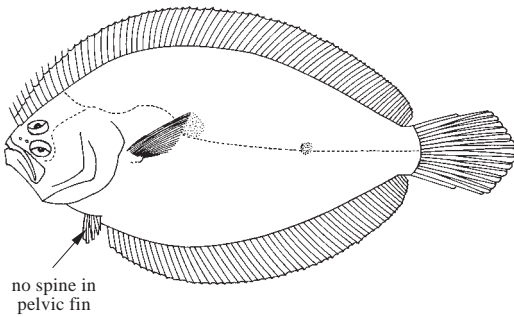


Bothidae: dorsal-fin origin anterior to upper eye; no spines in fins; lateral line with high arch over pectoral fin; no lateral line below eye; ocular-side pelvic fin on midventral line with origin anterior to that of blind-side counterpart; blind-side pelvic fin above midventral line; urinary papilla on left side; eyes nearly always on left side of head, reversals rare.

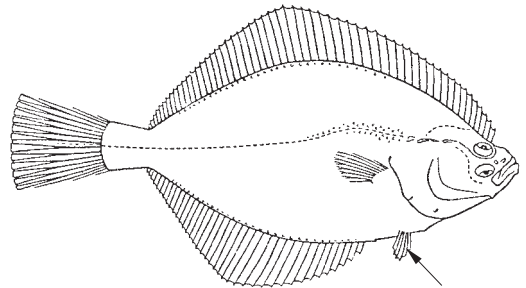


Paralichthyidae: dorsal-fin origin anterior to posterior margin of upper eye; no spines in fins; lateral line with high arch over pectoral fin (*Paralichthys* group); urinary papilla on right side (species of *Cyclopsetta* group); eyes nearly always on left side of head, reversals rare in most species.

Pleuronectidae: dorsal-fin origin anterior to posterior margin of upper eye; no spines in fins; urinary papilla on right side; eyes nearly always on right side of head, reversals rare.

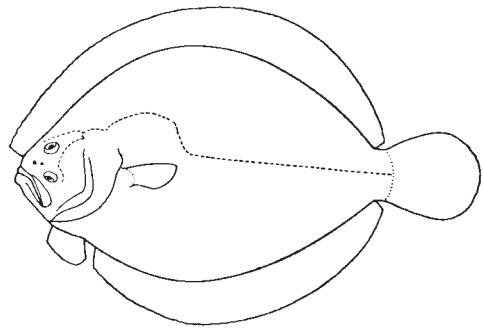
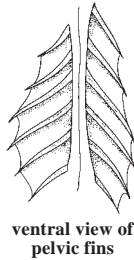


Paralichthyidae



Pleuronectidae

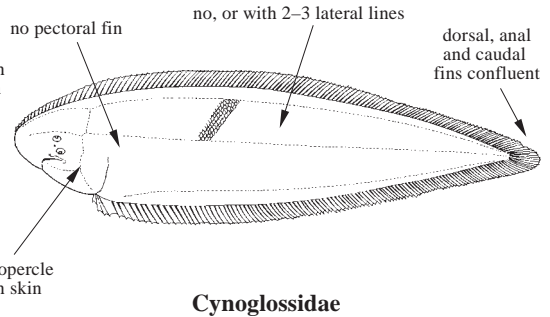
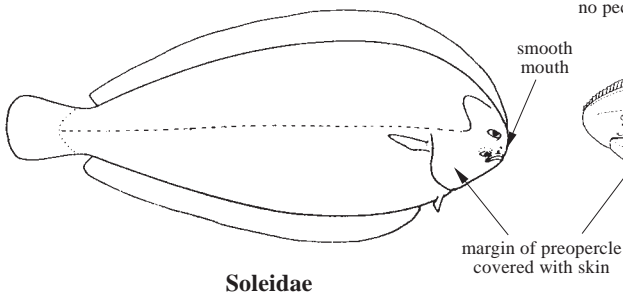
Scophthalmidae: dorsal-fin origin anterior to posterior margin of upper eye; no spines in fins; both pelvic fins elongate, placed close to midline and extending forward to urohyal; first ray of blind-side pelvic fin opposite second or third ray of ocular-side fin; lateral line with high arch above pectoral fin, and with distinct supratemporal branch; urinary papilla on left side; eyes on left side of head, reversals rare.



Scophthalmidae

Soleidae: dorsal-fin origin anterior to posterior margin of upper eye; no spines in fins; margin of preopercle not distinct, covered with skin and scales; lower jaw not protruding; eyes on right side of head; reversals rare.

Cynoglossidae: dorsal-fin origin anterior to posterior margin of upper eye; no spines in fins; dorsal and anal fins joined to pointed caudal fin; margin of preopercle not distinct, covered with skin and scales; no pectoral fins; only 1 pelvic fin in most species; lower jaw not protruding, rostral hook present below mouth (except *Symphurus*); eyes on left side of head, reversals rare.



Size: Maximum to about 30 cm; common to 10 to 20 cm.

Habitat, biology, and fisheries: Inhabits soft bottoms (sands, clay, mud) from the coastline to about 450 m depth on the continental shelf, but rarely caught at depths greater than 200 m. Larger fish tend to be found deeper than smaller ones. Feeds on Mysidacea and small fishes (mostly gobiids, but also small flatfishes), and to a lesser extent cephalopods, decapod crustaceans (crabs), amphipods and isopods. Smaller spotted flounders feed more heavily on mysids; larger fish consume more decapod crustaceans and fishes. Males mature by Age II; females by Age III, at sizes of 10 to 11 cm. Age estimates for Mediterranean population indicate males live to be 5 years of age; females to Age VII. Females grow faster, reach larger sizes and are heavier than males of same age. In the western Mediterranean Sea, spawning occurs during August and September. Regularly fished in shelf waters throughout its range, but not the object of a special fishery. Constitutes a proportion of industrial fish catches, is a bycatch species in demersal trawl fisheries, and enters into artisanal fisheries. Overfished in some regions. Separate statistics not usually reported for this species. Caught with bottom trawls and beach seines. Marketed mostly fresh or frozen; the flesh is not highly esteemed.

Distribution: Eastern Atlantic; Portugal and southward along west coast of Africa from Gibraltar to Angola (about 16°S); Canary Islands; Cape Verde Islands; throughout Mediterranean Sea.



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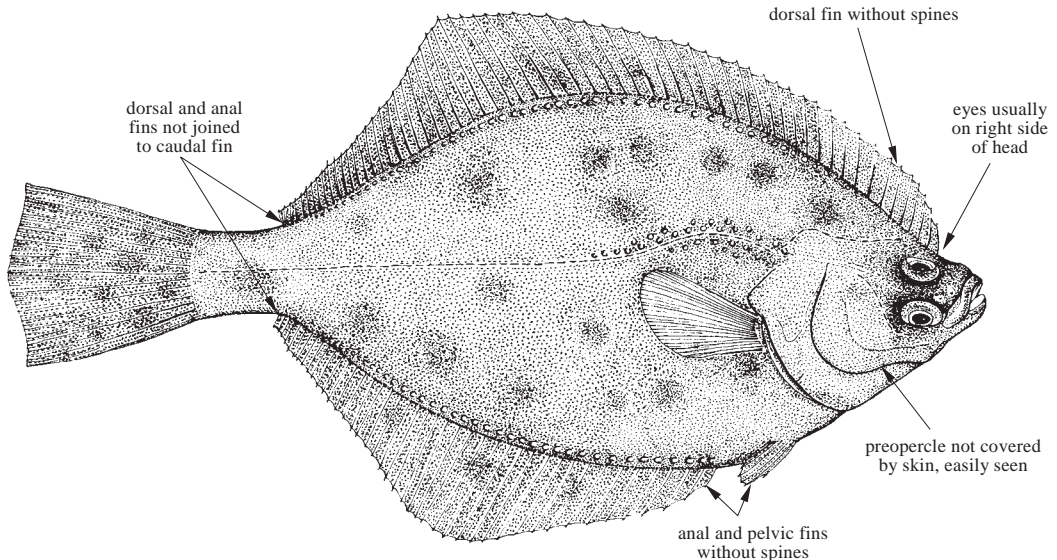
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PLEURONECTIDAE

Righteye flounders

by T.A. Munroe, National Marine Fisheries Service, National Systematics Laboratory, National Museum of Natural History, Washington, DC, USA

Diagnostic characters (based primarily on species occurring in the region): Body deep, rounded to elongate; some species reach nearly 2 m in length; species in the area can reach 100 cm, but most individuals seldom larger than 30 cm. **Flatfishes with eyes normally on right side of head** (populations of some species of *Platichthys* often with significant numbers, up to one-third, of reversed individuals). Eyes large, nearly equal in position; separated by small interorbital space. **Mouth small, terminal**; with thick, fleshy lips; jaws asymmetrical; dentition better developed on blind-side jaws. **Preopercular margin free, easily visible and not covered with skin and scales. Dorsal-fin origin above midpoint of upper eye; dorsal and anal fins without spines.** Urinary papilla on right side. **Caudal fin free from dorsal and anal fins.** Pectoral fins present on both sides of body. **Pelvic fins without spines; pelvic-fin bases of equal length. Lateral line equally developed on both sides of body; without high arch over pectoral fin.** Scales small, usually cycloid, sometimes also accompanied by various ossified tubercles. **Colour:** ocular side variable, generally uniformly brown, greyish or olive green with variable darker markings; some species also with faint to conspicuous orange spots.

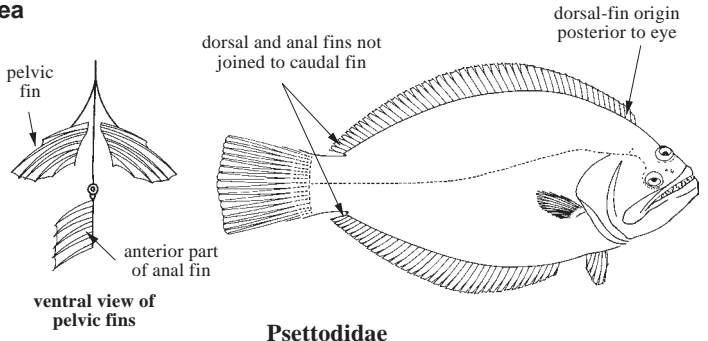


Habitat, biology, and fisheries: Benthic flatfishes of northern cold temperate and boreal seas found on a variety of substrata from soft mud and sand sediments to cobble and rocky habitats. Members of this family occur in waters from less than 1 m to more than 1 000 m on the continental slope. Most species are found in continental shelf waters; a few species penetrate far up in estuaries and occur in freshwater habitats. Species exhibit a variety of feeding specializations. Many consume benthic invertebrates, with most including a wide range of prey in their diets. Species with strong pharyngeal dentition crush mollusc shells, small echinoderms and crustaceans. Other species consume soft-bodied prey including worms, bivalve siphons. Eggs (in most species) and larvae pelagic. Important commercial fishes, especially in more northern seas. Rather large flatfishes scarcely entering Fishing Area 34 from the north, their main fishing grounds lying in higher latitudes off the Atlantic coasts of Europe and Iceland. Pleuronectids are excellent foodfishes highly desired for their fine white flesh and excellent texture. Captured in trawl fisheries, artisanal fisheries, and recreational fisheries. Marketed fresh and frozen.

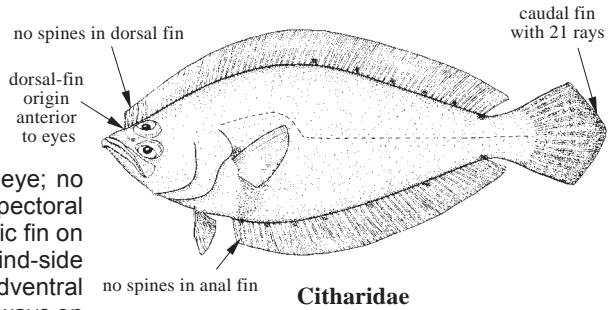
Remarks: Only 2 species of pleuronectid flounders have been reported from the area.

Similar families occurring in the area

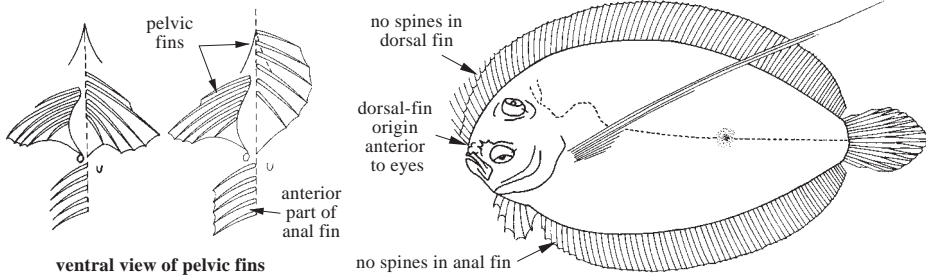
Psettodidae: dorsal-fin origin well posterior to posterior margin of upper eye; spines anteriorly in dorsal and anal fins; mouth extending well beyond vertical through posterior margin of lower eye; lateral line without high arch above pectoral fin; gill rakers tooth-like; upper eye on dorsal margin of head; urinary papilla on midline.



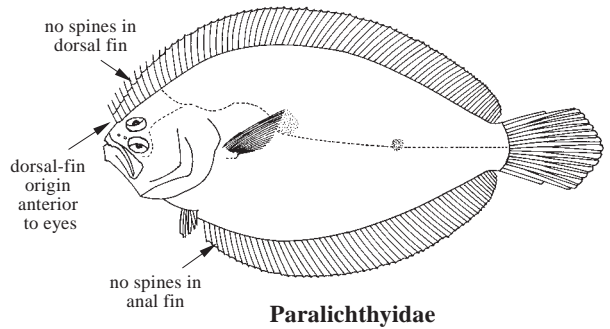
Citharidae: dorsal-fin origin anterior to posterior margin of upper eye; no spines in dorsal and anal fins; pelvic fins with 1 spine and 5 soft rays; lateral line with high arch above pectoral fin; gill rakers elongate, not tooth-like; eyes usually on left side of head (reversals rare); anus on left side of body.



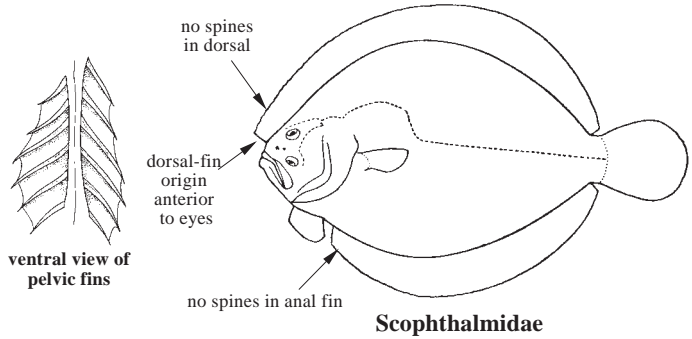
Bothidae: dorsal-fin origin anterior to upper eye; no spines in fins; lateral line with high arch over pectoral fin; no lateral line below eye; ocular-side pelvic fin on midventral line with origin anterior to that of blind-side counterpart; blind-side pelvic fin above midventral line; urinary papilla on left side; eyes nearly always on left side of head, reversals rare.



Paralichthyidae: dorsal-fin origin anterior to posterior margin of upper eye; lateral line with arch over pectoral fin; urinary papilla on right side (in species of *Cyclopsetta* group); eyes nearly always on left side of head, reversals rare in most species.

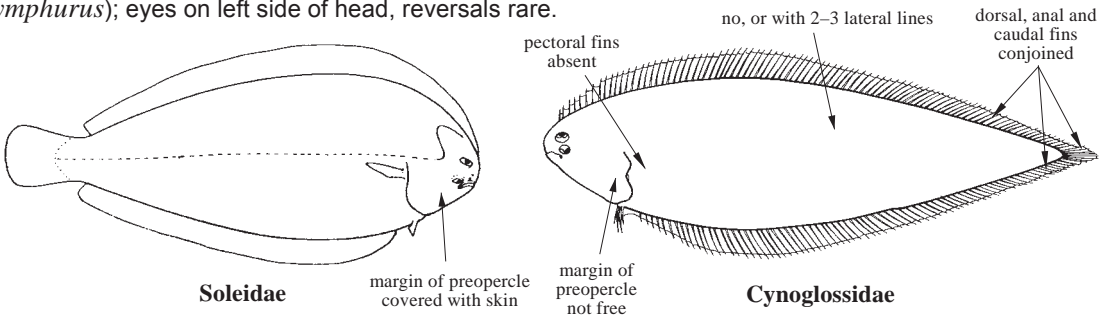


Scophthalmidae: dorsal-fin origin anterior to posterior margin of upper eye; both pelvic fins elongate, placed close to midline and extending forward to urohyal; first ray of blind-side pelvic fin opposite second or third ray of ocular-side fin; lateral line with high arch above pectoral fin, and with distinct supratemporal branch; urinary papilla on left side; eyes on left side of head, reversals rare.



Soleidae: dorsal-fin origin anterior to posterior margin of upper eye; margin of preopercle not distinct, covered with skin and scales; lower jaw not protruding; eyes on right side of head, reversals rare.

Cynoglossidae: dorsal-fin origin anterior to posterior margin of upper eye; dorsal and anal fins joined to pointed caudal fin; margin of preopercle not distinct, covered with skin and scales; no pectoral fins; only 1 pelvic fin in most species; lower jaw not protruding, rostral hook present below mouth (except *Symphurus*); eyes on left side of head, reversals rare.



Key to the species of Pleuronectidae occurring in the area

- 1a. A series of 4 to 7 bony tubercles on head region behind eyes; no rough scale at base of each dorsal- and anal-fin ray; ocular side of body with variable number of conspicuous, large red spots ***Pleuronectes platessa***
- 1b. No such tubercles present on head region behind eyes; a rough scale present at base of each dorsal- and anal-fin ray; ocular side of body without conspicuous, large red spots (faint to distinct red spots may be present) ***Platichthys flesus***

List of species occurring in the area

The symbol is given when species accounts are included.

Platichthys flesus (Linnaeus, 1758).

Pleuronectes platessa Linnaeus, 1758.

References

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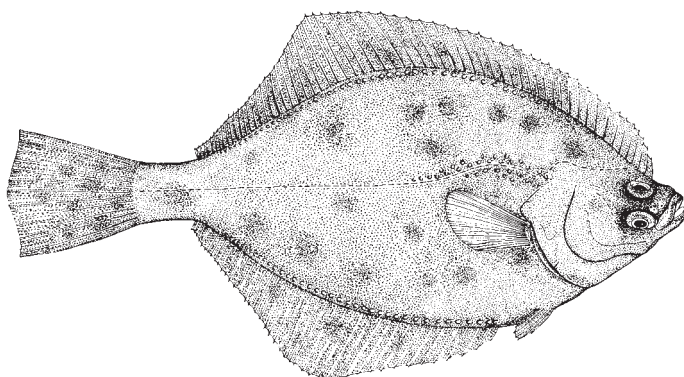
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***Platichthys flesus* (Linnaeus, 1758)**

En – European flounder; **Fr** – Flet d'Europe; **Sp** – Platija europea.

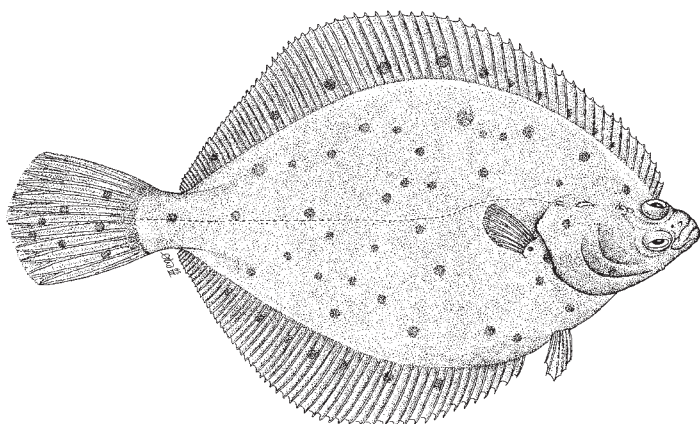
Maximum size to about 60 cm standard length, but more commonly from 10 to 30 cm. Occurs in shallow depths on various soft-bottoms; often found in brackish water and in coastal rivers and lakes; in coastal waters found on the inner shelf to about 60 m. Young fish feed on copepods, chironomids, amphipods and other small crustaceans including small crabs. Adults feed on a various small invertebrates including bivalve molluscs, polychaetes, crustaceans, and also small fishes. Males reach maturity by Age III; females by Age IV. Males live to be 7 years; females to 9 years. Highly esteemed food fish marketed fresh or frozen. Captured in trawl fisheries and artisanal fisheries. In the eastern Atlantic from the White Sea to the Mediterranean and Black seas; along west African coast from Gibraltar to Morocco.



***Pleuronectes platessa* Linnaeus, 1758**

En – European plaice; **Fr** – Plie d'Europe; **Sp** – Solla europea.

Maximum size to about 100 cm standard length, but seldom more than 35 to 40 cm. Occurs on a variety of bottom types including sand and gravel substrata, from a few metres to about 120 m; young fish are found in shallower waters and are often found in estuaries and coastal lagoons, older fishes usually occur in deeper waters. Feeds mainly on thin-shelled molluscs and polychaetes. Males mature at 2 to 6 years of age; females at 3 to 7 years of age. Males live for 11 or 12 years; females can live up to 24 years. The most important flatfish for fisheries in European waters. Supports substantial fisheries where found in abundance. Eastern Atlantic from the western Mediterranean and along European coasts to White Sea; occasionally off Greenland; along northwest coast of Africa from Gibraltar to Morocco.

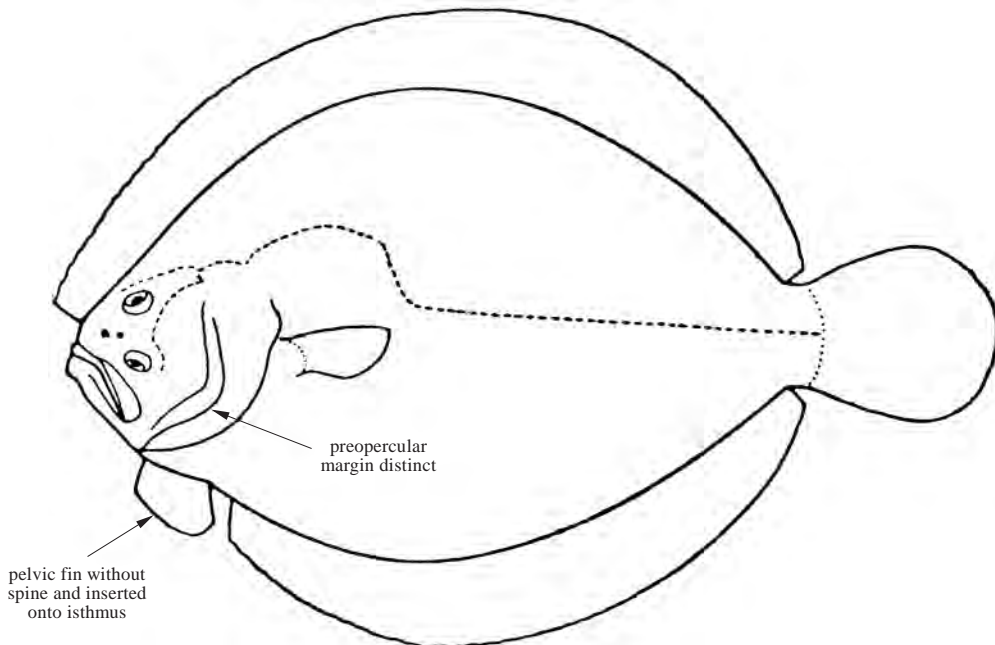


SCOPHTHALMIDAE

Turbots, megrims, brills

by T.A. Munroe, National Marine Fisheries Service, National Museum of Natural History, Washington, DC, USA and
B. Chanet, Département Systématique et Evolution, Muséum National d'Histoire Naturelle, Paris, France

Diagnostic characters: Robust, small to large-sized sinistral flatfishes (**eyes on left side of head, reversals rare**) with moderately compressed oval to rhomboid bodies (rhomboid species with body depth up to 1.4 to 1.5 in standard length). Head large (usually 4 times or less in standard length); anterior profile concave with slight notch anterior to upper eye. Snout equal to or longer than eye. **Eyes large, prominent;** separated by flat, narrow to moderate interorbital space shorter than or equal to eye diameter. No rostral or interorbital spines. **Mouth large, terminal; with protractile jaws and prominent lower jaw;** lips broad. Upper jaw extending posteriorly to or beyond vertical through middle of lower eye. A bony tubercle present at anterior end of ocular-side maxilla. Teeth about equally developed on both ocular- and blind-side jaws, teeth small, curved, pointed or conical, in narrow bands in both jaws, no canines, vomerine teeth present. Gill rakers long and slender. **Preopercular margin free.** Branchial septum with or without foramen between lower pharyngeals and urohyal. **No spiny rays in fins. Dorsal-fin origin anterior to vertical through anterior margin of upper eye; most fin rays branched. Anterior dorsal-fin rays long, and branched in some species, slightly longer than succeeding rays, and mostly free from membrane for greater part of their length. Dorsal-fin rays 64 to 71.** Dorsal and anal fins continued or not continued onto blind side of caudal peduncle. **Tip of first interhaemal spine not projecting in front of anal fin.** Pectoral fins usually unequal in size, that of ocular side slightly larger. **Bases of both pelvic fins elongate and of equal size; both pelvic-fin bases extend anteriorly onto isthmus; pelvic-fin bases asymmetrically positioned with that on ocular side extending forward onto tip of urohyal and that of blind-side on lateral shaft of urohyal.** Caudal fin rather long, rounded or obtusely pointed. **Scales ctenoid, cycloid or transformed into bony tubercles. Lateral line equally developed on both sides of body, with prominent arch above pectoral fin.** Vertebrae 10-11 + 20 to 25; with large haemapophyses. **Caudal vertebrae with asymmetrical transverse apophyses.** Urinary papilla on left side of body; anus on right side, above first anal-fin ray. Elongate supraoccipital process forming bridge with dorsal margin of blind-side frontal; this process often perforated by large foramen. **Colour:** ocular side variable depending on colour and texture of sea bottom; often light to medium brown with many small dark spots and numerous larger spots that continue onto dorsal, anal and caudal fins (spots on median fins somewhat larger than those on body). Pectoral fins also spotted. Blind side uniformly whitish.

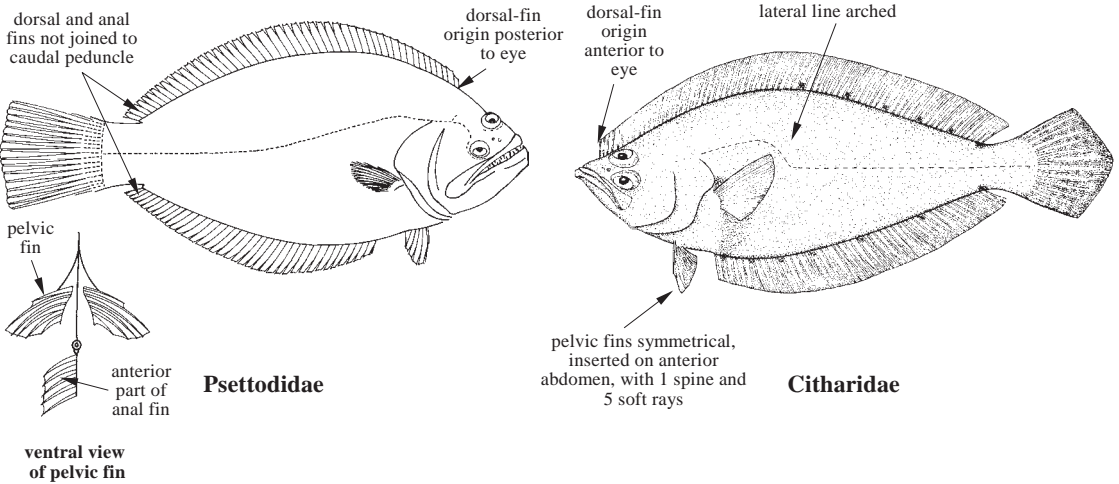


Habitat, biology, and fisheries: Benthic on the inner continental shelf from shallow subtidal areas to moderately deep waters on the outer shelf. Diurnal predators that feed on or close to the bottom on a variety of benthic invertebrates and small fishes. Rather large flatfishes scarcely entering Fishing Area 34 from the north, their main fishing grounds lying in higher latitudes off the Atlantic coasts of Europe and Iceland. Some scophthalmids are excellent foodfishes highly desired for their fine white flesh and excellent texture. Taken in bottom trawls off the coasts of Morocco and Mauritania, as well as around the Canary Islands, and may also enter artisanal fisheries, although separate statistics by species are not generally available. Separate statistics for *Lepidorhombus whiffiagonis* (landings often also include *L. boscii*) reported by Spain only (an average of 195 tonnes was caught during the period 2000–2006 with 730 tonnes in 2003). Marketed fresh or frozen.

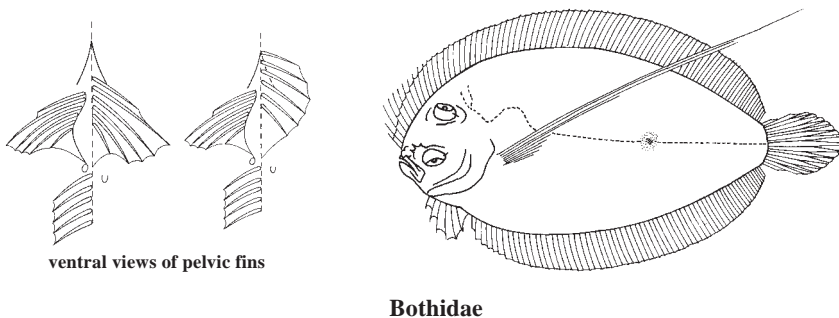
Similar families occurring in the area

Psettodidae: dorsal-fin origin well posterior to posterior margin of upper eye; spines in anterior dorsal and anal fins; mouth extending well beyond vertical through posterior margin of lower eye; lateral line without high arch above pectoral fin; gill rakers tooth-like; upper eye on top of head; urinary papilla and anus on on midline.

Citharidae: bases of both pelvic fins short and more symmetrically positioned; dorsal-fin origin anterior to posterior margin of upper eye; lateral line with high arch above pectoral fin; gill rakers elongate, not tooth-like; eyes usually on right side in some species and left side in others, reversals rare; urinary papilla and anus on left side.

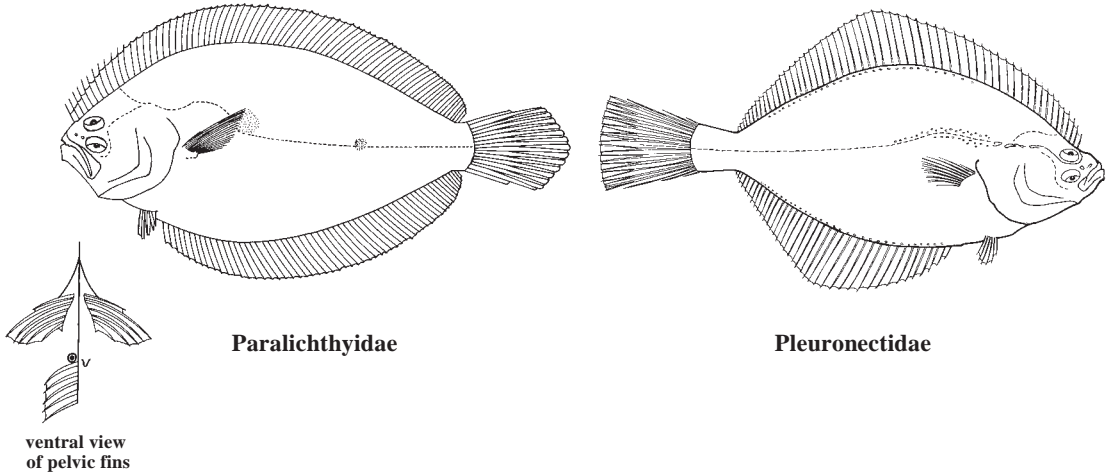


Bothidae: base of left pelvic fin elongate; base of right pelvic fin short; dorsal-fin origin anterior to upper eye; lateral line with high arch over pectoral fin; no lateral line below eye; ocular-side pelvic fin on midventral line with origin anterior to that of blind-side counterpart; blind-side pelvic fin above midventral line; urinary papilla on left side; eyes nearly always on left side of head, reversals rare.



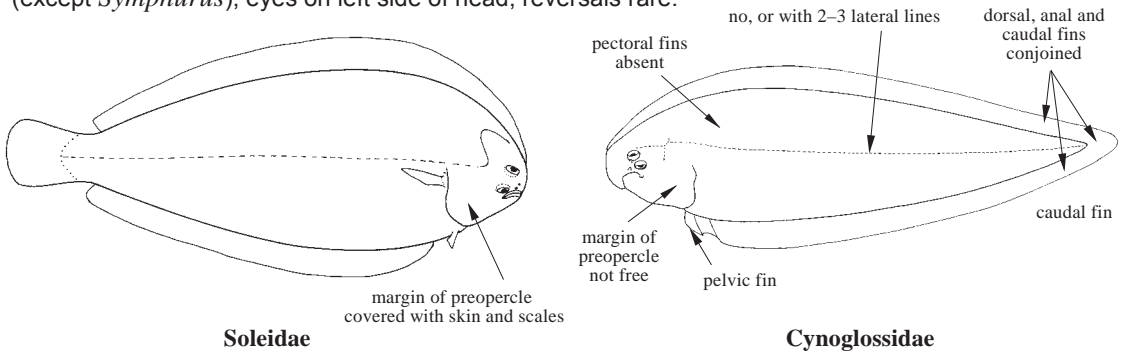
Paralichthyidae: dorsal-fin origin anterior to posterior margin of upper eye; lateral line with high arch over pectoral fin; pelvic fins inserted onto anterior abdomen; urinary papilla on right side (in species of *Cyclopsetta* group); eyes nearly always on left side of head, reversals rare.

Pleuronectidae: dorsal-fin origin anterior to posterior margin of upper eye; pelvic fins inserted onto anterior abdomen; urinary papilla on right side; eyes nearly always on right side of head, reversals rare.



Soleidae: dorsal-fin origin anterior to posterior margin of upper eye; margin of preopercle not distinct, covered with skin and scales; lower jaw not protruding; eyes on right side of head, reversals rare.

Cynoglossidae: dorsal-fin origin anterior to posterior margin of upper eye; dorsal and anal fins joined to pointed caudal fin; margin of preopercle not distinct, covered with skin and scales; no pectoral fins; only 1 pelvic fin in most species; mouth inferior, lower jaw not protruding, rostral hook present below mouth (except *Symphurus*); eyes on left side of head, reversals rare.



Key to species of Scopthalmidae occurring in the area

- 1a. Body oval to nearly circular; ocular-side scales cycloid or replaced by bony tubercles; caudal peduncle short; eyes widely separated, with interorbital space at least equal to or greater than eye diameter; no interbranchial foramen; 11 precaudal vertebrae → 2
- 1b. Body elongate; ocular-side scales ctenoid, without bony tubercles; caudal peduncle long; eyes separated by narrow interorbital space smaller than eye diameter; a large interbranchial foramen present; 10 precaudal vertebrae → 3

2a. Anterior dorsal-fin rays unbranched (Fig. 1); body completely lacking ctenoid or cycloid scales, but ocular side (at least) with scattered, bony tubercles; both sides of median fin rays without scales *Scophthalmus maximus*

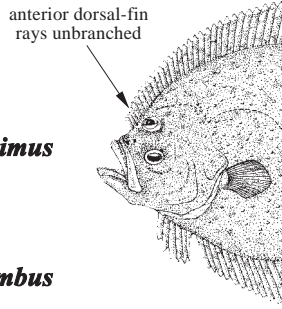


Fig. 1 *Scophthalmus maximus*

2b. Anterior dorsal-fin rays branched (Fig. 2); body with cycloid scales and without bony tubercles; both sides of median fin rays scaly. . *Scophthalmus rhombus*

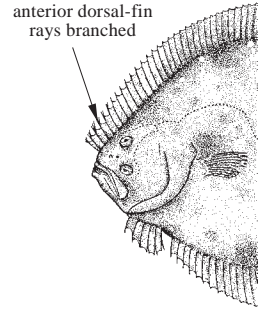


Fig. 2 *Scophthalmus rhombus*

3a. Ocular-side skin fragile, delicate, easily torn; ocular-side body uniformly sandy-coloured without dark black spots or blotches; ocular-side scales without strong, vertical ctenii; posterior margins of median fins not forming rounded extensions on blind side of body (bases of posteriormost median fin rays extending only slightly onto blind side of body); first dorsal-fin ray not elongate (Fig. 3) → 4

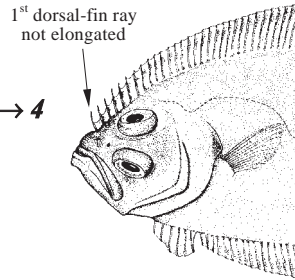


Fig. 3 *Lepidorhombus boscii*

3b. Ocular-side skin tough, not easily torn; ocular-side body with numerous large dark spots or blotches; ocular-side scales with strong, perpendicularly-oriented ctenii; posterior margins of median fins forming rounded extensions on blind side of body (bases of posteriormost median fin rays extending noticeably onto blind side of body); first dorsal-fin ray longer (to 2.5 times longer) than succeeding rays (Fig. 4) *Zeugopterus regius*

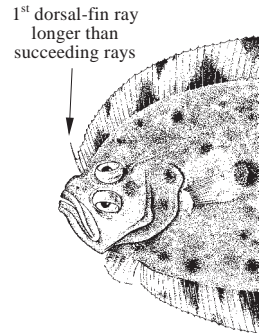


Fig. 4 *Zeugopterus regius*

4a. Two distinct black spots on posterior margin of dorsal and anal fins; 87 to 95 lateral-line scales (Fig. 5) *Lepidorhombus boscii*

4b. No distinct black spots on posterior margins of dorsal and anal fins; 95 to 109 lateral-line scales (Fig. 6) *Lepidorhombus whiffiagonis*

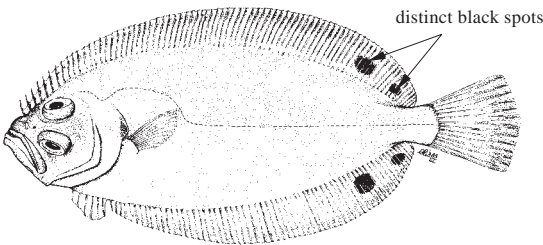


Fig. 5 *Lepidorhombus boscii*

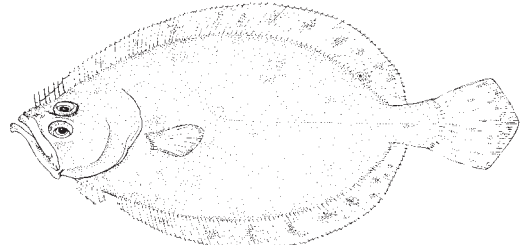








Fig. 6 *Lepidorhombus whiffiagonis*

List of species occurring in the area

The symbol  is given when species accounts are included.

-  *Lepidorhombus boscii* (Risso, 1810).
-  *Lepidorhombus whiffiagonis* (Walbaum, 1792).
-  *Scophthalmus maximus* (Linnaeus, 1758).
-  *Scophthalmus rhombus* (Linnaeus, 1758).
-  *Zeugopterus regius* (Bonnaterre, 1788).

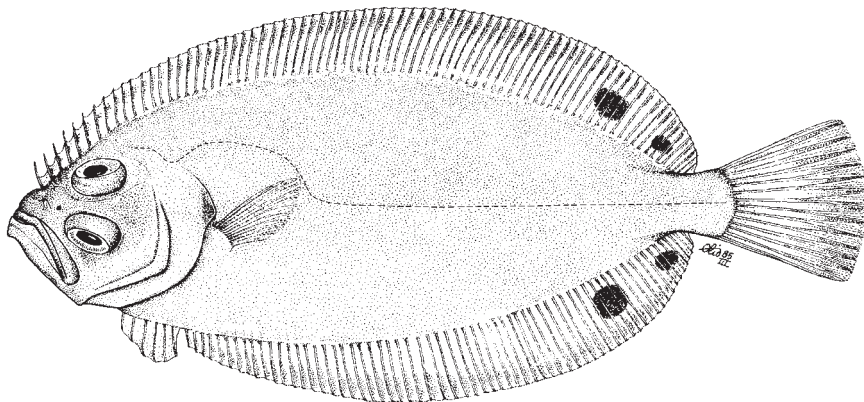
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***Lepidorhombus boscii* (Risso, 1810)**

Frequent synonyms / misidentifications: None / *Lepidorhombus whiffiagonis*.

FAO names: En – Four-spot megrim; Fr – Cardine à quatre taches; Sp – Gallo de cuatro manchas.



Diagnostic characters: Body elongate and compressed; greatest depth 2.5 times in standard length. Snout length shorter than eye diameter. Eyes on left side of head; close together; interorbital space narrow (smaller than eye diameter), with bony ridge; eye diameter greater than snout length. Mouth large; jaws oblique; maxilla extending posteriorly to vertical through midpoint of lower eye. Lower jaw scarcely protruding forward of upper jaw. Branchial septum perforated by large foramen located between inferior gill arch and urohyal. Lower branch of first gill arch with 12 to 14 gill rakers. Dorsal-fin rays 72 to 87; first dorsal-fin ray not elongate; anteriormost dorsal-fin rays unbranched and free from fin membrane distally. Anal-fin rays 60 to 69. No scales on median fin rays. Posterior margins of dorsal and anal fins not forming rounded extensions on blind side of body. Ocular-side pectoral fin with 11 to 12 rays. Bases of both pelvic fins elongate and of equal length; position of pelvic-fin bases asymmetrical with first ray of right pelvic fin opposite second or third ray of left pelvic fin. Caudal fin rounded or double truncated. Lateral-line scales 87 to 95; lateral line with distinct curve above pectoral fin. Ocular-side scales weakly ctenoid; blind-side scales cycloid. Vertebrae 10 + 32. **Colour:** ocular-side background colour uniformly yellowish, sandy or greyish brown. Dorsal and anal fins each with two distinct, darker spots posteriorly. Blind side whitish to light sand-coloured.

Size: Maximum total length about 44 cm, commonly to 30 cm total length.

Habitat, biology, and fisheries: Deepwater, benthic species usually inhabiting sandy or muddy bottoms of the continental shelf and upper continental slope from about 100 to 1 000+ m, but mainly from 200 to 400 m off Portugal, 100 to 500 m in the Mediterranean, and 300 to 400 m in the Atlantic. Feeds primarily on epibenthic crustaceans, cephalopods, other invertebrates and fishes. Smaller individuals feed on small crustaceans, larger ones consume a greater quantity of decapod crustaceans. A moderately long-lived species reaching ages to at least 13 years in females and 11 years for males. A relatively slow-growing species; females grow faster and reach larger sizes than do males. Spawning is not well known; it may occur along the outer continental shelf margin at considerable depths. Sexual maturity occurs at 3 or 4 years of age. Separate statistics are not generally reported for this species in the region; often included in landings of *L. whiffiagonis*. Of minor commercial importance further north and in the Mediterranean. Caught primarily as bycatch in semi-industrial and artisanal fisheries using bottom trawls. Not highly regarded as a foodfish because the flesh is soft and tasteless; gelatin extract prepared from skin treated with organic acids.

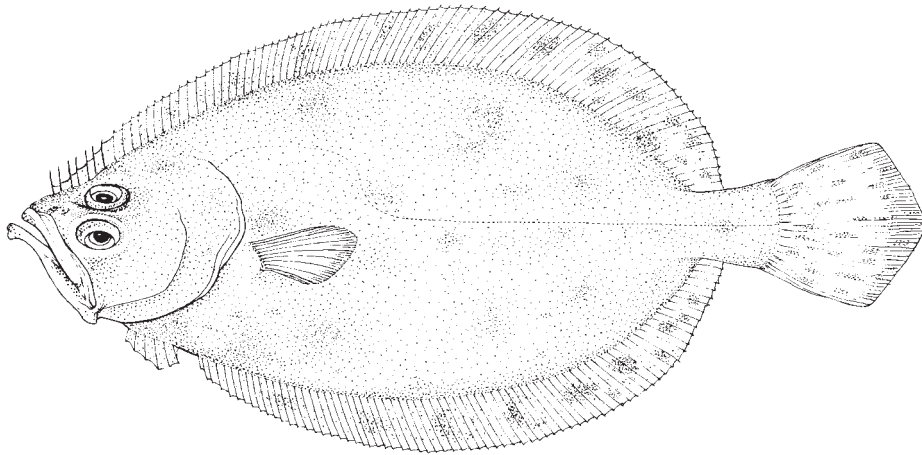
Distribution: Eastern Atlantic; coasts of western Europe from Scandinavia (64°N) and Faeroe Islands to about Cape Boujdour, Western Sahara (26°N); also western, central and eastern Mediterranean Sea.



***Lepidorhombus whiffiagonis* (Walbaum, 1792)**

Frequent synonyms / misidentifications: None / *Lepidorhombus boscii*.

FAO names: En – Megrim; Fr – Cardine franche; Sp – Gallo del Norte.



Diagnostic characters: Body elongate; greatest depth 2.5 times in standard length. Snout length greater than eye diameter. Eyes on left side of head, large; interorbital space narrow (smaller than eye diameter), with bony ridge; eye diameter less than snout length. Mouth large; jaws oblique; maxilla extending posteriorly to vertical through midpoint of lower eye. Lower jaw protruding forward of upper jaw. Branchial septum perforated by large foramen located between inferior gill arch and urohyal. Twelve to 14 gill rakers on first lower gill arch. Dorsal-fin rays 80 to 94; first dorsal-fin ray not elongate; anteriormost dorsal-fin rays unbranched and free from fin membrane distally. Anal-fin rays 61 to 75. Dorsal and anal fins terminate slightly on the blind side of the caudal peduncle. No scales on median fin rays. Posterior margins of dorsal and anal fins not forming rounded extensions on blind side of body. Ocular-side pectoral fin with 11 to 12 rays. Bases of both pelvic fins elongate and of equal length; pelvic-fin bases positioned asymmetrically with first ray of right pelvic fin opposite second or third ray of left pelvic fin. Caudal fin rounded or semi-truncated. Lateral-line scales 95 to 109; lateral line with distinct curve above pectoral fin. Scales on ocular side weakly ctenoid; blind-side scales cycloid. Vertebrae 10 + 32. Colour: ocular-side background colour uniformly yellowish, sandy or greyish brown with very small darker spots on some specimens. Dorsal and anal fins with indefinite darker spots posteriorly. Blind side whitish to light sand-coloured.

Size: Maximum to about 60 cm total length; common to 35 cm total length.

Habitat, biology, and fisheries: Benthic on sandy, muddy and shell-hash bottoms from 50 to about 800 m, but usually found between 100 and 300 m. Megrim are voracious predators feeding on pelagic prey, primarily fishes, but also including squids and crustaceans in their diets. Smaller megrim consume benthic crustaceans and annelids. Females grow faster than males, and attain larger sizes and greater ages (at least to 8 years of age). Sexual maturity occurs at 3 or 4 years and about 25 cm total length in males and 28 cm total length in females. Spawning season varies with latitude. An important commercial species further north. Separate statistics are not generally reported for this species in the region; landings of *L. boscii* often included with this species. Caught with bottom trawls in semi-industrial and artisanal fisheries. Marketed fresh or frozen, though this species is not highly regarded as a foodfish.

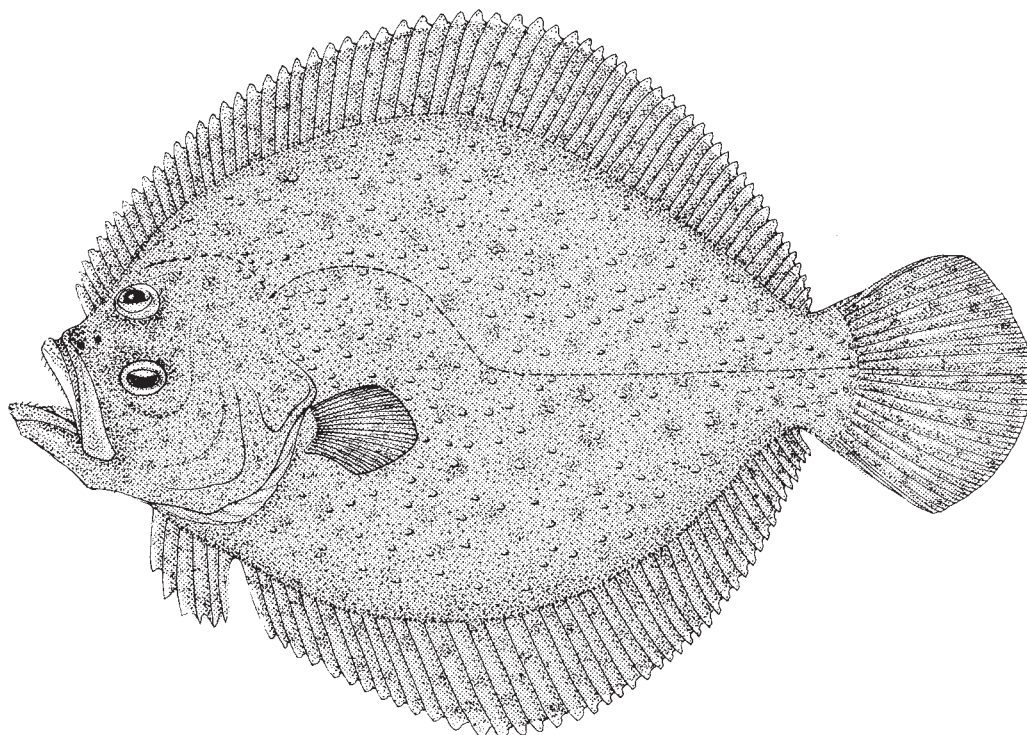
Distribution: Eastern Atlantic; coasts of western Europe and North Africa, from Scandinavia (64°N), Baltic Sea, to about Cape Boujdour, Western Sahara (26°N); also western, central and eastern Mediterranean Sea.



Scophthalmus maximus (Linnaeus, 1758)

Frequent synonyms / misidentifications: *Psetta maxima* (Linnaeus, 1758) / None.

FAO names: En – Turbot; Fr – Turbot; Sp – Rodaballo.



Diagnostic characters: Body deeply rhomboid; greatest depth 1.5 times in standard length. Dorsal profile of head concave in region anterior to upper eye. Snout relatively short, slightly longer than eye diameter. **Eyes on left side of head, widely separated; interorbital space nearly twice eye diameter in adults, less (about one eye diameter) in juveniles.** Mouth large, terminal, strongly oblique; posterior extent of jaws reaching vertical through midpoint of lower eye. Teeth small, pointed; in several bands; vomer with teeth. Ten to 12 gill rakers on lower branch of first gill arch. **Branchial septum entire.** Dorsal-fin rays 57 to 71; **anteriormost dorsal-fin rays not longer than others; unbranched and free from membrane distally;** dorsal-fin origin well anterior to vertical through front margin of eye. Anal-fin rays 43 to 52. Dorsal and anal fins terminating on anterior region of caudal peduncle. Fin rays of both dorsal and anal fins longest in middle of fin. **Both sides of median fin rays without scales.** Ocular-side pectoral fin with 11 or 12 rays; larger than blind-side counterpart. Both pelvic-fin bases elongate, of equal length; asymmetrically positioned with first ray of right pelvic opposite second or third ray of left pelvic fin. Caudal fin broadly rounded. **Ocular-side body without distinct ctenoid or cycloid scales, but with scattered pattern of bony tubercles on body and head (those of head smaller);** tubercles sometimes also present on blind side. **Lateral line well developed on both sides of body;** with arch above pectoral fin and with well-developed supratemporal branch. **Vertebrae 11 + 19 or 20.** **Colour:** very variable depending on substratum, but generally uniformly light to dark grey with many small dark and light rounded spots. Blind side usually uniformly whitish, occasionally with variable, irregular dark blotches. Fins mottled, dark brown with lighter spots and blotches.

Size: Maximum to 100 cm total length; commonly to 40 to 50 cm total length.

Habitat, biology, and fisheries: On sandy, rocky or mixed substrata in coastal waters (1 to about 70 m). Populations in the Baltic, Black and Azov seas commonly occur in oligohaline waters of about 10‰, but also inhabits waters with salinities of 2 to 3‰. A visually-oriented predator with adults feeding primarily on other bottom-living fishes including gobies, sandeels, herrings, young soles, and occasionally consuming decapod crustaceans and bivalve molluscs. Females are generally larger and grow faster than do males. Longevity to at least 17 years in males and 27 years in females. Females mature at 4 to 5 years of age; males at Age III. Spawning seasons vary between populations. In the Mediterranean, spawning occurs from late winter to early spring (February to March); in the North Sea spawning extends from April to August. Caught with bottom trawls in industrial and artisanal fisheries; also an important recreational species. Taken incidentally off Morocco. Separate statistics not reported for this species in this area. Marketed fresh and frozen; a highly esteemed foodfish. Also an important aquaculture species successfully spawned in laboratory conditions with larvae and juveniles produced in European culture facilities and shipped to grow-out facilities around the world.

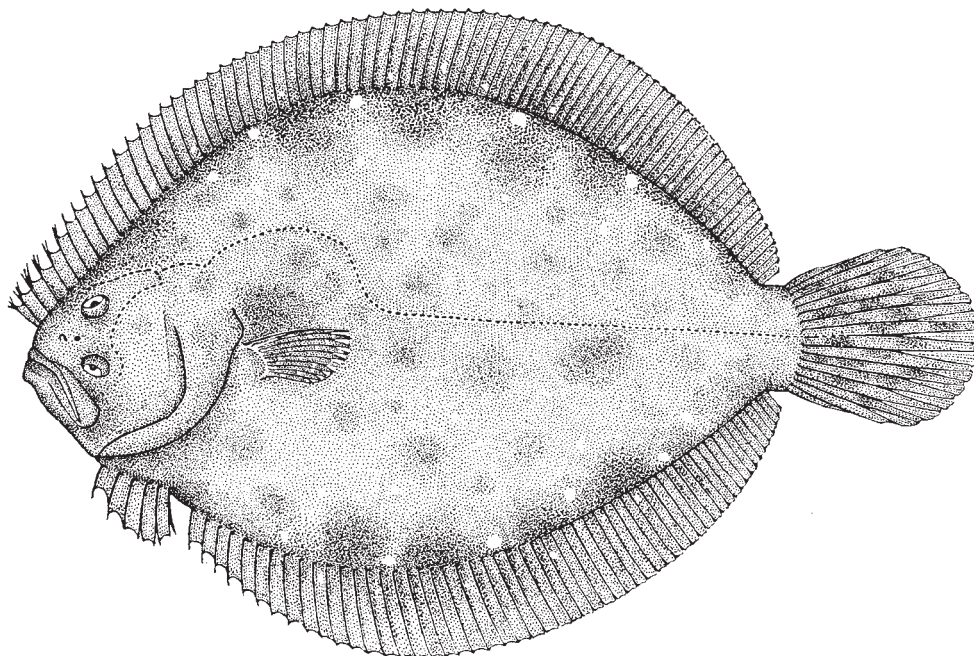
Distribution: Eastern Atlantic; from coastal waters of Norway above Arctic Circle, most of Baltic Sea, along western European coasts including Great Britain and western Ireland, south to off Cape Boujdour, Western Sahara (26°N); also throughout Mediterranean, Black Sea and Azov Sea. Single capture from Caspian Sea.



Scophthalmus rhombus (Linnaeus, 1758)

Frequent synonyms / misidentifications: *Rhombus laevis* Turton, 1800 / None.

FAO names: En – Brill; Fr – Barbue; Sp – Rémol.



Diagnostic characters: **Body thick, nearly circular; greatest depth 1.5 to 2.0 times in standard length.** Dorsal profile of head concave in region anterior to upper eye. Snout much longer than eye diameter. **Eyes on left side of head, separated by wide interorbital space (twice eye diameter).** Mouth large, terminal, strongly oblique; posterior extent of jaws reaching vertical through posterior margin of lower eye. Teeth small, pointed; in several bands; vomer with teeth. Ten to 13 gill rakers on lower branch of first gill arch. **Branchial septum entire.** Dorsal-fin rays 72 to 84; **anteriormost dorsal-fin rays not longer than others; branched and free from membrane distally;** dorsal-fin origin well anterior to vertical through front margin of eye. Anal-fin rays 53 to 65. Dorsal and anal fins terminating on anterior region of caudal peduncle. **Both sides of median fin rays mostly scaly.** Ocular-side pectoral fin larger than blind-side counterpart. Both pelvic-fin bases elongate, of equal length; asymmetrically positioned with first ray of right pelvic opposite second ray of left pelvic fin. Caudal fin rounded. **Scales cycloid, more or less imbricated, on both sides of body. Lateral line well developed on both sides of body;** lateral-line scales 115 to 124; lateral line with distinct arch above pectoral fin and with well-developed supratemporal branch. **Vertebrae 11 + 23 to 25.** **Colour:** variable depending on substratum, but generally greyish, sandy, brownish or reddish brown, with many small dark spots or pale areas outlined with darker pigment; pale spots more prominent along dorsal and ventral body margins. Fins mottled or spotted with darker brown.

Size: Maximum to 90 cm total length; common to about 45 cm total length.

Habitat, biology, and fisheries: Occurs on sandy and cobble bottoms in moderate depths (5 to 70 m) on the inner continental shelf; rare in brackish water. Occurs over a temperature range from about 5 to 22°C, and a salinity range of about 4 to 35‰. A visual predator consuming primarily fishes living on or near the bottom and in the water column including gobies, sandeels, scads, and anchovies, as well as epibenthic shrimps and squids. Females are generally larger and grow faster than do males. Longevity to at least 8 years in the Mediterranean and 13 years in the Atlantic. Females mature at 4 to 5 years of age; males at Age III. Spawning seasons vary between populations. In the Mediterranean, spawning occurs from late

winter to early spring (February to March); in the North and Irish seas spawning extends from April to August. Caught with bottom trawls in industrial and artisanal fisheries; also an important recreational species. Taken incidentally off northern Morocco. Separate statistics not reported for this species in this area. Marketed fresh and frozen; a highly esteemed foodfish.

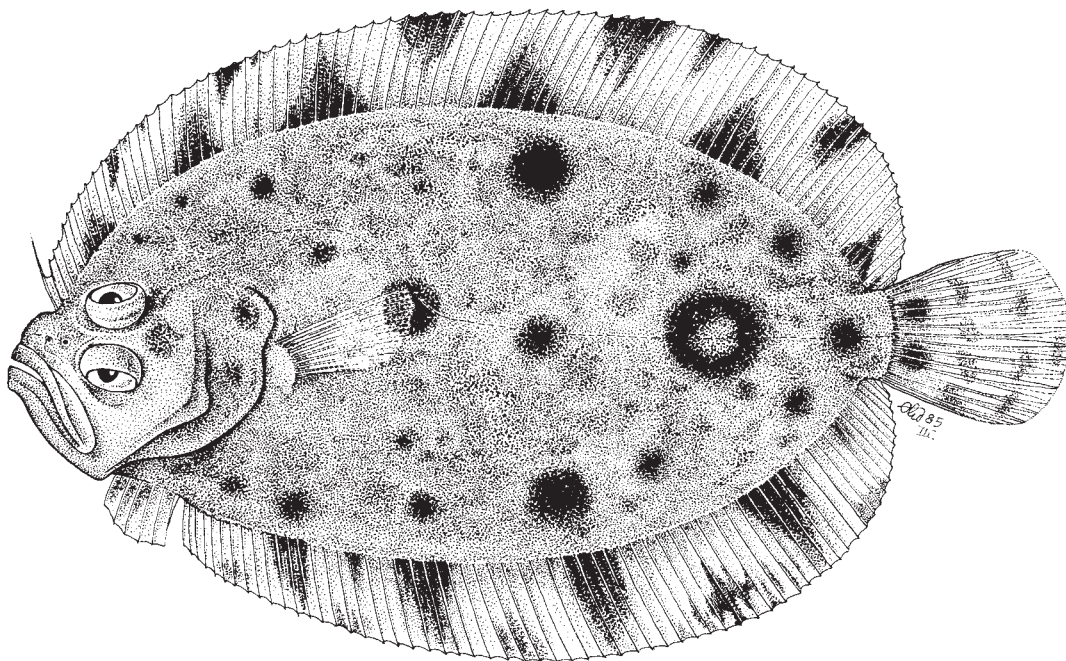
Distribution: Eastern Atlantic; coastal waters of western Europe from Scandinavia (64°N) and Baltic Sea, along western European coasts including United Kingdom and Ireland, south to Cape Boujdour (26°N), Western Sahara, North Africa; also Mediterranean, Black Sea.



***Zeugopterus regius* (Bonaterre, 1788)**

Frequent synonyms / misidentifications: *Phrynorhombus regius* (Bonaterre, 1788) / None.

FAO names: En – Eckström's topknot; Fr – Phrynorhombe maculé; Sp – Pelaya miserés.



Diagnostic characters: **Body elongate**; greatest depth about 2 times in standard length. Dorsal profile of head concave, **with distinct notch anterior to upper eye**. Snout long. **Eyes on left side of head, large (eye diameter nearly equal to snout length)**, covered with scales, nearly symmetrical in position (anterior margin of upper eye only slightly posterior to vertical through anterior margin of lower eye), **separated by narrow interorbital space about equal to one-half eye diameter**. Mouth large, terminal, strongly oblique; posterior extent of jaws about at vertical through midpoint of lower eye. Teeth relatively small; vomerine teeth absent. First lower gill arch with 11 or 12 gill rakers. **Branchial septum perforated by large foramen located between inferior gill arch and urohyal**. Dorsal-fin origin at vertical through internasal space on blind side of snout; dorsal-fin rays 70 to 80; **first dorsal-fin ray filiform, much longer than succeeding rays**. Anal-fin rays 60 to 68. Posterior ends of dorsal and anal fins located a short distance before caudal-fin base; **posterior margins of dorsal and anal fins forming rounded extensions on blind side of body**. Most of median fin rays scaly. **Caudal peduncle short, scarcely evident**. Caudal fin rounded. Ocular-side pectoral fin well developed with 9 or 10 rays, blind-side pectoral fin reduced. **Pelvic fins with long and equal bases**. **Lateral line with high arch above pectoral fin**; lateral-line scales 72 to 80. **Scales ctenoid on both sides of body**. **Ocular-side scales with strong, perpendicularly-oriented ctenii**. **Vertebrae 10 + 26**. **Colour:** ocular surface generally brown with many irregular darker spots and blotches and with 4 distinct, large, rounded spots: 1 on posterior lateral line anterior to caudal peduncle, another on body beneath distal tip of pectoral fin, and with 2 spots of similar size located about opposite each other on dorsal and ventral margins at midbody. Dorsal and anal fins with 2 alternating series (1 series on proximal and the other on distal margins of fins) of dark, triangular-shaped blotches separated by lighter pigmented areas. Caudal fin brownish overall with 2 or 3 vertical series of darker blotches on base (darkest series of blotches), midpoint and distal region of fin. Blind side whitish grey.

Size: Maximum about 20 cm total length; commonly to 10 to 15 cm.

Habitat, biology, and fisheries: Demersal on rocky bottoms (infrequently found in sandy habitats) on the continental shelf from depths around 10 to 180 m; occasionally found in shallower waters. Able to hang vertically on the side of rocks. Feeds on a variety of epibenthic invertebrates and small fishes. Reproduction occurs between February and August. Though esteemed as a foodfish, not targeted by specialized fisheries due to small size and general rarity. Captured in seines, trawl fisheries and in artisanal fisheries. Regularly appears in markets in the Mediterranean Sea. Marketed fresh primarily in southern European markets.

Distribution: Eastern Atlantic; from Trondheim Fjord, Norway (63°N), and coastal waters of western Sweden, British Isles, to Morocco (34°N); also northeastern, northcentral, and southwestern Mediterranean.

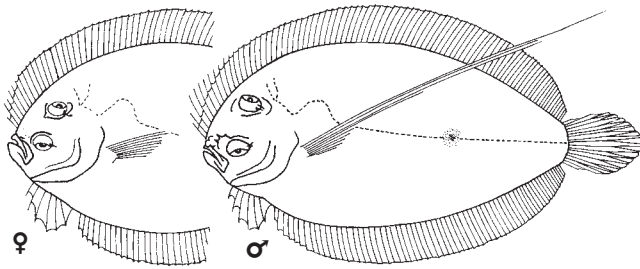
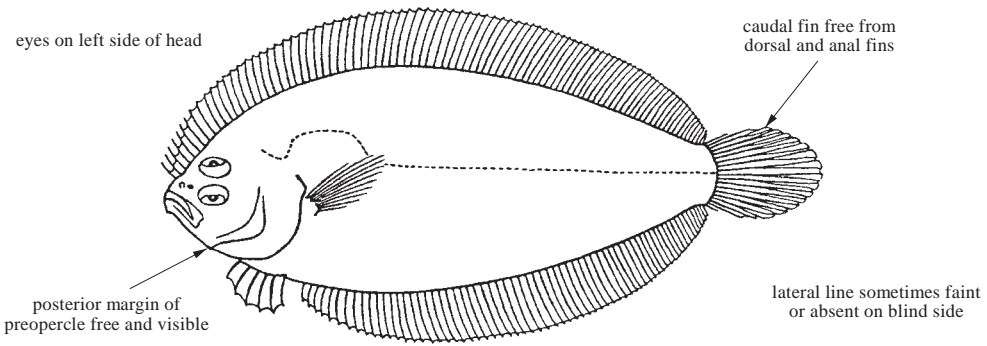


BOTHIDAE

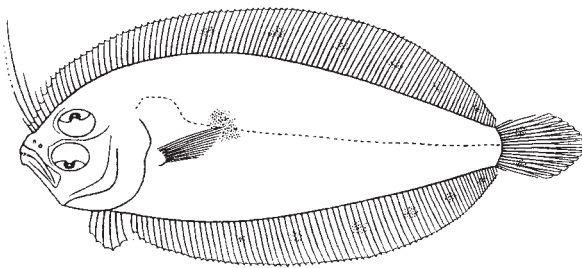
Lefteye flounders, moonflounders, scaldfishes

by T.A. Munroe, National Marine Fisheries Service, National Systematics Laboratory, National Museum of Natural History, Washington, DC, USA

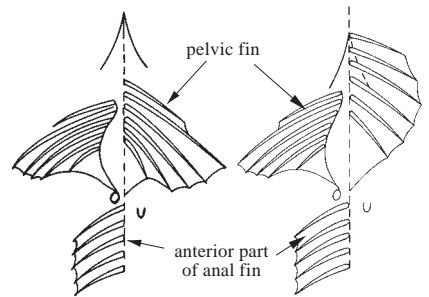
D **Diagnostic characters:** Flatfishes with eyes on left side of head (except for rare reversed individuals); spines sometimes present on head and snout anterior to eyes in males. Mouth protractile, asymmetrical, lower jaw moderately prominent; teeth in jaws sometimes canine-like. **Preopercle exposed, its posterior margin free and visible.** Dorsal fin long, originating above or in front of upper eye; **pectoral and pelvic fins present (except right pectoral fin lost in adults of *Monolene*); ocular-side pelvic fin larger than blind-side counterpart in some genera; caudal fin free from dorsal and anal fins.** Many species with pronounced sexual dimorphism, especially in position of the eyes, which in males have a greater separation than that of females. Also, **males of some species have prolonged anterior dorsal- and/or upper pectoral-fin rays. A single lateral line, sometimes forked behind upper eye, sometimes faint or absent on blind side.** **Colour:** ocular side light to dark brown to whitish, often with spots, blotches or ring-like markings (extensive marking often seen on species of *Bothus*); blind side usually pale or whitish; some larger specimens with dusky coloration on blind side; ambicoloration (ocular-side coloration replicated on blind side) may occasionally occur.



example of deep-bodied lefteye flounder



example of elongate-bodied lefteye flounder



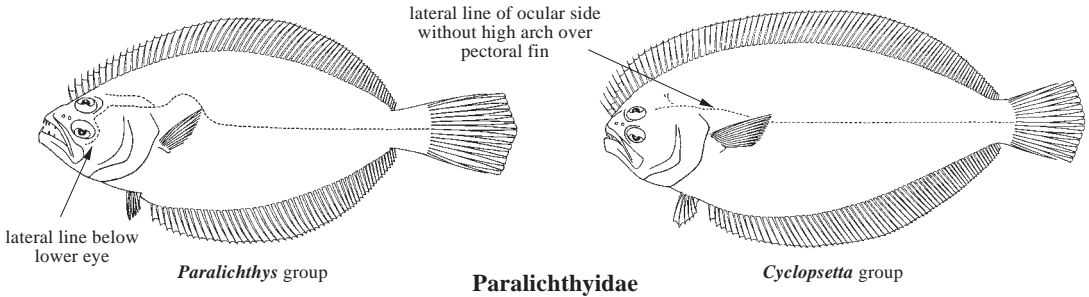
pelvic fin on eyed side only slightly anterior to that on blind side pelvic fin on eyed side far anterior to that on blind side

ventral views of pelvic fins

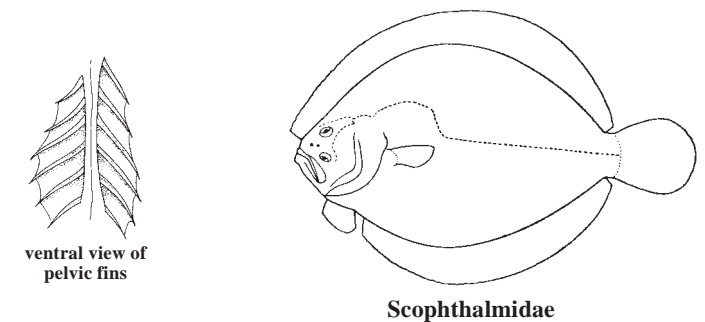
Habitat, biology, and fisheries: Left-eye flounders are bottom dwelling (demersal) predators that bury into the mud or sand substrata; once buried, the body outline and movable eyes are usually all that can be seen. Most species inhabit the continental shelf, but *Arnoglossus thori* may enter brackish waters and *Chascanopsetta lugubris* and *Monolene mertensi* occur on the continental slope (200 to 1 000 m or deeper). Some bothids have the ability to change colour rapidly in order to more nearly match their background. Some species show sexual dimorphism in interorbital width, origin of fin rays (dorsal, pectoral, or pelvic), cephalic spination or colour pattern. Species of Bothidae caught within Fishing Areas 34 and 47 represent only a small portion of the total biomass taken in this region, and are not the dominant flatfishes caught in the eastern central Atlantic. Most species are relatively small (maximum size varying from 16 to 25 cm, but some species of *Bothus* may reach over 40 cm). Larger bothid species are highly prized, good-eating fish, but generally bothids are too small and not usually caught in sufficient abundance to be of significant commercial importance. Bothids, although present in the fresh-fish markets throughout the region, constitute only an insignificant amount to these markets. All species caught are utilized. Commercial landings of Bothidae from the area are unknown as neither the species nor the family are treated separately.

Similar families occurring in the area

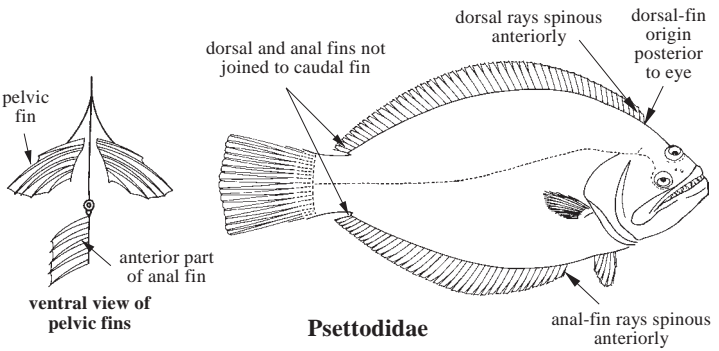
Paralichthyidae: lateral line developed on blind side; lateral line of ocular side with branch extending below lower eye (*Paralichthys* group) or absent in *Cyclopsetta* group; lateral line of ocular side without high arch over pectoral fin in *Cyclopsetta* group, with high arch in *Paralichthys* group; pelvic fin of ocular side on midventral line in *Cyclopsetta* group; urinary papilla on blind side in *Cyclopsetta* group.



Scophthalmidae: eyes usually on left side of head; both pelvic fins elongate, placed close to midline and extending forward to urohyal; pelvic fins free from anal fin, with first ray of blind-side fin opposite second or third ray of ocular-side fin; lateral line equally developed on both sides of body, with strong arch above pectoral fin, and with distinct supratemporal branch; urinary papilla on ocular side; small patch of teeth on vomer; with branched anterior dorsal-fin rays.

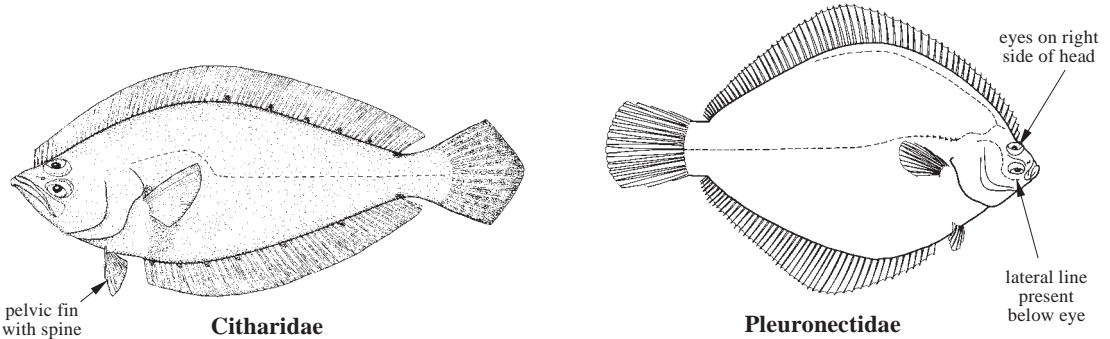


Psettodidae: dorsal-fin origin well behind posterior margin of upper eye; anterior dorsal-fin rays spinous; pelvic fins symmetrical in position, with 1 spine and 5 soft rays (no spine in Bothidae); upper eye close to or on dorsal margin.



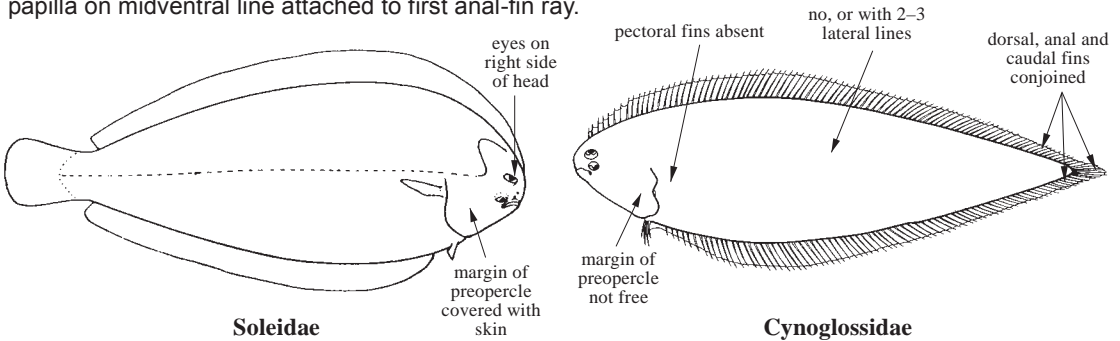
Citharidae: mouth large, maxilla reaching to or beyond vertical through posterior margin of lower eye; bases of both pelvic fins short; pelvic fins with 1 spine and 5 soft rays (no spine in Bothidae).

Pleuronectidae: both eyes usually on right side of head; lateral line present below lower eye; pelvic fins with short bases and symmetrically placed on either side of midventral line; urinary papilla on ocular side.



Soleidae: both eyes normally on right side of head, reversals rare; margin of preopercle hidden beneath skin.

Cynoglossidae: margin of preopercle not free (hidden beneath skin and scales); pectoral fins absent in adults; dorsal and anal fins joined to caudal fin; lateral line absent; no branched caudal-fin rays; urinary papilla on midventral line attached to first anal-fin ray.



Key to the species of Bothidae occurring in the area

- 1a. Both pectoral fins present; pelvic-fin bases unequal in length, ocular-side fin much longer and the first fin rays inserted notably anterior to fin of blind side (Fig. 1a) → 2
- 1b. Blind-side pectoral fin absent; pelvic-fin bases about equal in length (both short); first fin rays of ocular-side fin not inserted anterior to those of blind-side pelvic fin (Fig. 1b) (*Monolele*) → 11

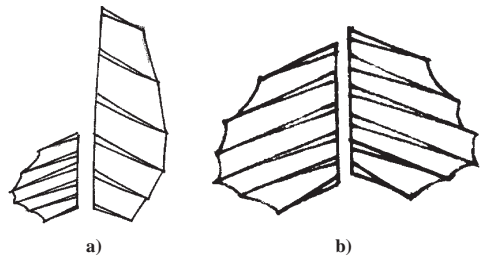


Fig. 1 pelvic-fin bases

- 2a. Mouth very large, maxilla greater than 50% of head length, extending well beyond vertical through posterior margin of lower eye (Fig. 2); gill rakers absent or rudimentary *Chascanopsetta lugubris*
- 2b. Mouth moderate to small, maxilla less than 50% of head length, not extending to vertical through posterior margin of lower eye (Fig. 3); gill rakers present and easily seen → 3

- 3a. Eyes separated by a wide, flat or concave space; inter-orbital width large (nearly equal to, or greater than eye diameter), wider in males; lower eye well in advance of upper eye; body depth generally greater than 50% of total length (Fig. 3) (***Bothus***) → 4
- 3b. Eyes separated by bony ridge or narrow concave space; interorbital width much less than eye diameter, similar in both sexes; lower eye only slightly in advance of upper eye; body depth less than 50% of total length (Fig. 4) (***Arnoglossus***) → 7

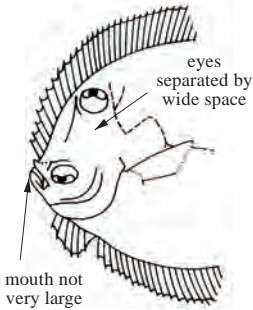


Fig. 2 *Bothus*

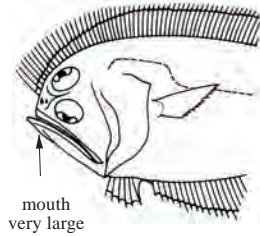


Fig. 3 *Chascanopsetta*

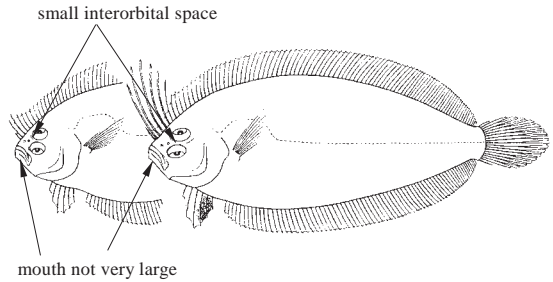
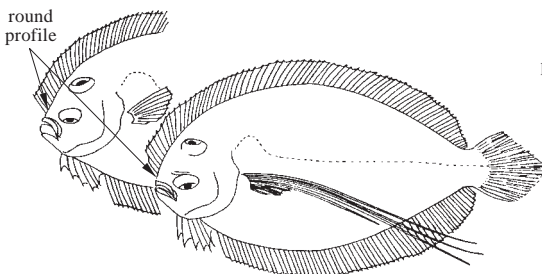
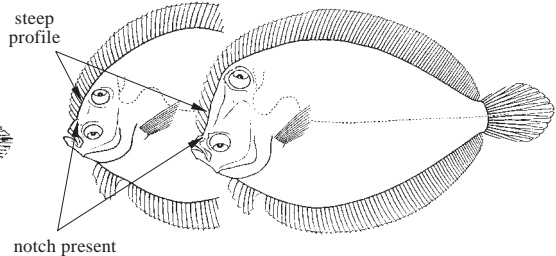


Fig. 4 *Arnoglossus*

- 4a. Ctenoid scales on both sides of body; anterior profile of head rounded (Fig. 5a); no notch on head profile above or anterior to lower eye (Fig. 5a); interorbital width narrower, not exceeding eye diameter in either sex; eyes positioned closer together with anterior margin of upper eye over or anterior to centre of lower eye (Fig. 5a) ***Bothus guibei***
- 4b. Scales ctenoid on ocular side and cycloid on blind side, or scales cycloid on both sides; anterior profile of head steeply sloping or nearly vertical (Fig. 5b); a slight notch on dorsal profile of head above and in front of lower eye (Fig. 5b); eyes positioned farther apart with interorbital space broad, about 60% or more of eye diameter in females and juveniles and greatly exceeding eye diameter in mature males; anterior margin of upper eye above or posterior to posterior margin of lower eye (Fig. 5b) → 5
- 5a. Eyes relatively small, eye diameter 16 to 22% head length, much less than snout length; anterior pectoral-fin rays of mature males greatly elongate, extending at least to caudal peduncle. ***Bothus lunatus***
- 5b. Eyes larger, eye diameter usually 21% or more of head length, greater than or equal to snout length; anterior pectoral-fin rays of mature males not elongate → 6



a) *Bothus guibei*



b) *Bothus podas*

Fig. 5

- 6a. Dorsal-fin rays 85 to 94; anal-fin rays 63 to 73; body depth 55 to 62% of standard length; eye diameter 25 to 30% of head length; anterior profile of head of mature males nearly vertical (Fig. 6a); 7 to 9 gill rakers on lower limb of first gill arch ***Bothus podas***
- 6b. Dorsal-fin rays 92 to 98; anal-fin rays 70 to 75; body depth 59 to 67% of standard length; eye diameter 21 to 25% of head length; anterior profile of head of mature males steeply sloping but not vertical (Fig. 6b); 9 or 10 gill rakers on lower limb of first gill arch ***Bothus mellissi***

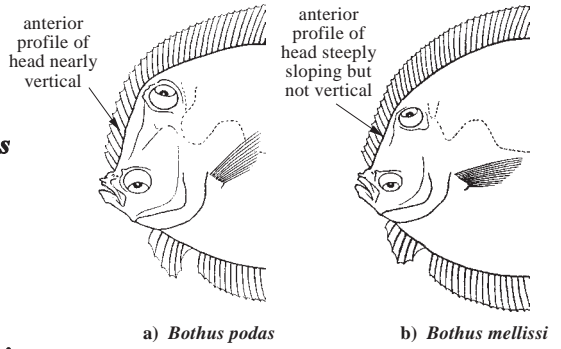


Fig. 6

- 7a. Dorsal-fin rays 110 to 118; anal-fin rays 86 to 94 ***Arnoglossus rueppelli***
- 7b. Dorsal-fin rays less than 110; anal-fin rays less than 85 → 8
- 8a. Dorsal-fin rays 81 to 93; anal-fin rays 61 to 74 → 9
- 8b. Dorsal-fin rays 95 to 106; anal-fin rays 74 to 82 → 10
- 9a. No elongate dorsal-fin rays; no dark markings on ocular-side pectoral fin; no series of dark spots present along base of caudal fin (Fig. 7a) ***Arnoglossus laterna***
- 9b. Second dorsal-fin ray of males elongate (more than 60% of head length) with dark-fringed, broad membrane (1st, 3rd, and 4th dorsal-fin rays may also be elongate, but these are only about one-third as long as second ray; Fig. 7b); ocular-side pelvic fin often with dark spot or blotch on posterior rays (Fig. 7b); a series of dark spots often present along base of caudal fin (Fig. 7b) ***Arnoglossus thori***

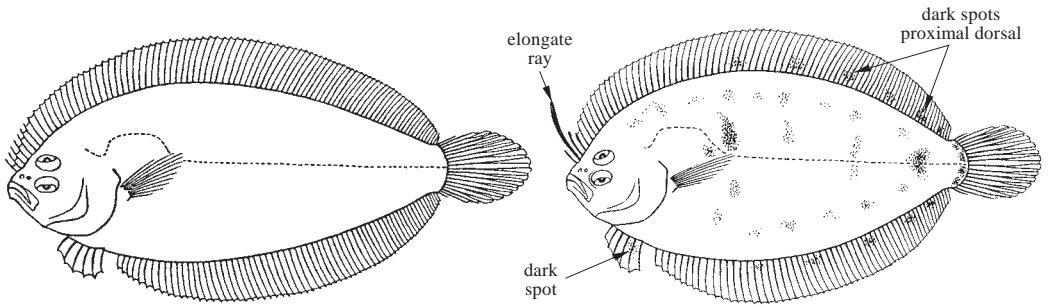
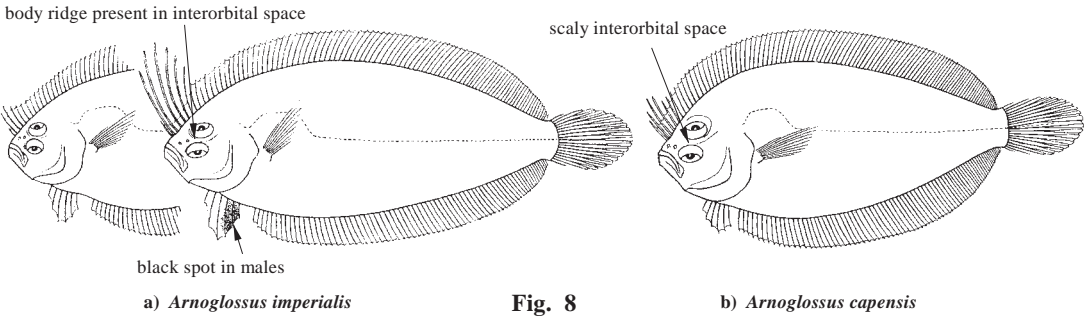
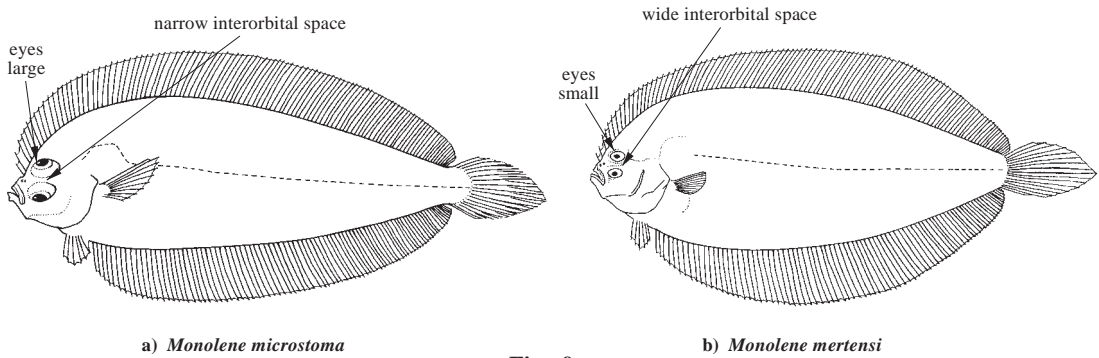


Fig. 7


- 10a. Dorsal-fin rays 2 to 5 or 2 to 6 elongate (elongate rays nearly equal to head length in males); eyes separated by a bony ridge; lateral-line scales 49 to 56; 6 to 9 gill rakers on lower limb of first gill arch; males with distinct black spot on posterior ocular-side pelvic-fin rays, females with greyish, sometimes indistinct, spot on posterior ocular-side pelvic-fin rays (Fig. 8a) ***Arnoglossus imperialis***
- 10b. Anterior 3 or 4 dorsal-fin rays of males noticeably prolonged and of nearly equal length (Fig. 8b); eyes separated by a concave scaly space; lateral-line scales 56 to 66; 10 to 13 gill rakers on lower limb of first gill arch; no dark markings on ocular-side pelvic-fin rays (Fig. 8b) ***Arnoglossus capensis***
















- 11a. Maxilla large, about 20 to 32% of head length; lateral-line scales greater than 100 (101 to 111) ***Monolene helenensis***
- 11b. Maxilla smaller, 25% or less of head length; lateral-line scales less than 100 → 12
- 12a. Eyes large (33 to 44% in head length) and separated by a narrow, bony ridge (Fig. 9a) ***Monolene microstoma***
- 12b. Eyes smaller (20 to 25% in head length) and separated by a wide interorbital space about equal to 50% of eye diameter (Fig. 9b) ***Monolene mertensi***



List of species occurring in the area

The symbol  is given when species accounts are included.

-  *Arnoglossus capensis* Boulenger, 1898.
-  *Arnoglossus imperialis* (Rafinesque, 1810).
-  *Arnoglossus laterna* (Walbaum, 1792).
-  *Arnoglossus rueppelii* (Cocco, 1844).
-  *Arnoglossus thori* Kyle, 1913.
-  *Bothus guibei* Stauch, 1966.
-  *Bothus lunatus* (Linnaeus, 1758).
-  *Bothus mellissi* Norman, 1931.
-  *Bothus podas* (Delaroche, 1809).
-  *Chascanopsetta lugubris* Alcock, 1894.
-  *Monolene helenensis* Amaoka and Imamura, 2000.
-  *Monolene mertensi* (Poll, 1959).
-  *Monolene microstoma* (Cadenat, 1937).

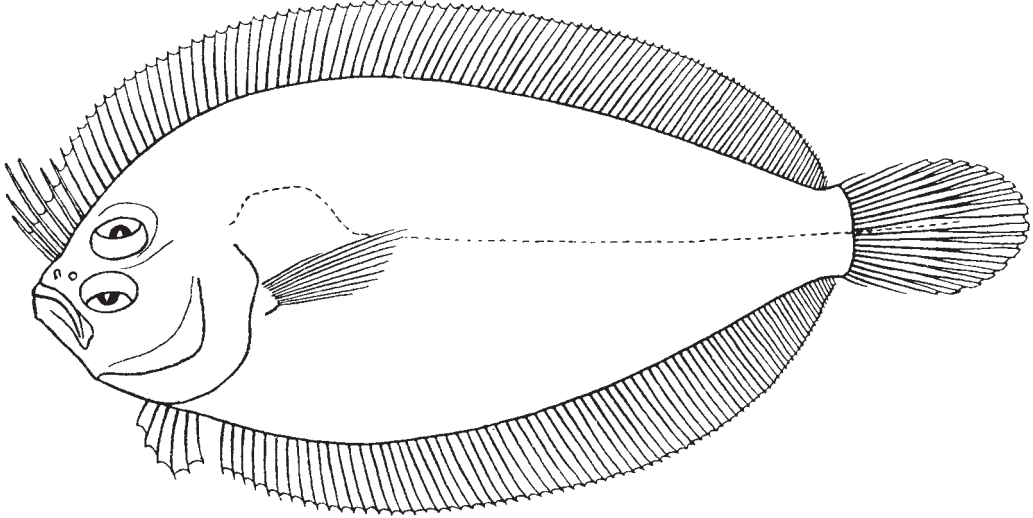
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***Arnoglossus capensis* Boulenger, 1898**

Frequent synonyms / misidentifications: *Arnoglossus entomorhynchus* Stauch, 1967 / None.

FAO names: **En** – Cape scaldfish; **Fr** – Arnoglosse du Cap; **Sp** – Peludilla del Cabo.



Diagnostic characters: Body ovate, greatest depth 40 to 45% of standard length; head length 22 to 28% of standard length. Snout shorter than eye; eye diameter 25 to 30% of head length; **eyes separated by a scaly, concave space equal to 30 to 40% of eye diameter**; lower eye slightly in advance of upper eye; maxilla about 33% of head length and slightly longer than or equal to eye diameter; maxilla extending posteriorly beyond vertical through anterior margin of lower eye; teeth small, scarcely enlarged anteriorly. **Gill rakers moderately long, 10 to 13 on lower limb of first arch. Dorsal-fin rays 96 to 103, anterior rays slightly prolonged, about equal to 50 to 65% of head length and distal half of rays free from membrane in both sexes; anal-fin rays 76 to 80;** pelvic-fin bases unequal in length, that on ocular side much longer. Scales on ocular side feebly ctenoid, those on blind side mostly cycloid. Lateral line with distinct arch above pectoral fin; **56 to 66 scales in lateral line. Colour:** ocular side brownish, with traces of darker markings; blind side light in colour. A series of indistinct dark spots on dorsal and anal fins; **no markings on pectoral or pelvic fins.**

Size: Maximum total length about 20 cm.

Habitat, biology, and fisheries: A benthic species occurring at depths of 70 to 200 m mainly on sandy, muddy and shell-hash bottoms on the continental shelf. Little additional information is available concerning this species. Not well known, probably taken incidentally on the continental shelf throughout its range. Separate statistics are not reported for this species; no directed fisheries. Captured mainly with trawls. Utilized fresh, especially in Ghana; also reduced to fishmeal and oil.

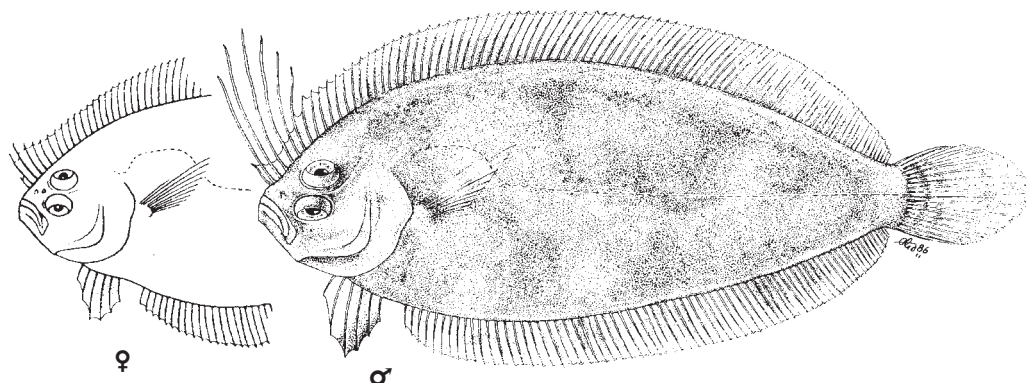
Distribution: Eastern Atlantic; West African coast from off Mauritania to Namibia; off St Helena and Ascension islands. Elsewhere: South Africa, Cape of Good Hope to Natal.



***Arnoglossus imperialis* (Rafinesque, 1810)**

Frequent synonyms / misidentifications: *Arnoglossus blachei* Stauch, 1965 / None.

FAO names: En – Imperial scldfish; Fr – Arnoglosse impérial; Sp – Serrandel imperial.



Diagnostic characters: Body ovate, greatest depth 36 to 42% of standard length; head length 22 to 26% of standard length. Snout shorter than eye; eye diameter 25 to 35% of head length; **eyes separated by bony ridge**; lower eye slightly in advance of upper eye; maxilla 33% of head length and about as long as eye, or slightly longer, extending posteriorly to vertical through anterior margin of lower eye; teeth small, not enlarged anteriorly. **Gill rakers moderately long, 8-10 on lower limb of first arch. Dorsal-fin rays 95 to 106, with second to fifth or sixth rays elongate and thickened in mature males; immature males and females with anterior rays not, or only slightly, elongate; anal-fin rays 74 to 82.** Pelvic-fin bases unequal in length, that on ocular side much longer. Ocular-side scales feebly ctenoid, blind-side scales cycloid. Lateral line with distinct arch above pectoral fin; **58 to 63 scales in lateral line.** **Colour:** ocular side greyish or brownish, with irregular darker markings; fins with some small spots or blotches; **males with distinctive red coloration on blind side; males with distinct black blotch on posterior part of pelvic fins; in females, this spot greyish and often indistinct.** Blind side light in colour, with no markings in either sex.

Size: Maximum total length about 25 cm.

Habitat, biology, and fisheries: Benthic species inhabiting depths of 15 to 350 m on mud, sand, shell, and coral bottoms on the continental shelf and the upper slope. Occurs more commonly on the mid and outer-continental shelf between 40 and 200 m depth. Reported to be rather common in local fish markets, and also to be taken regularly by offshore fleets. Separate statistics are not reported for this species. Caught mainly with bottom and pelagic trawls. Utilized mostly fresh, smoked and dried-salted; also reduced to fishmeal and oil.

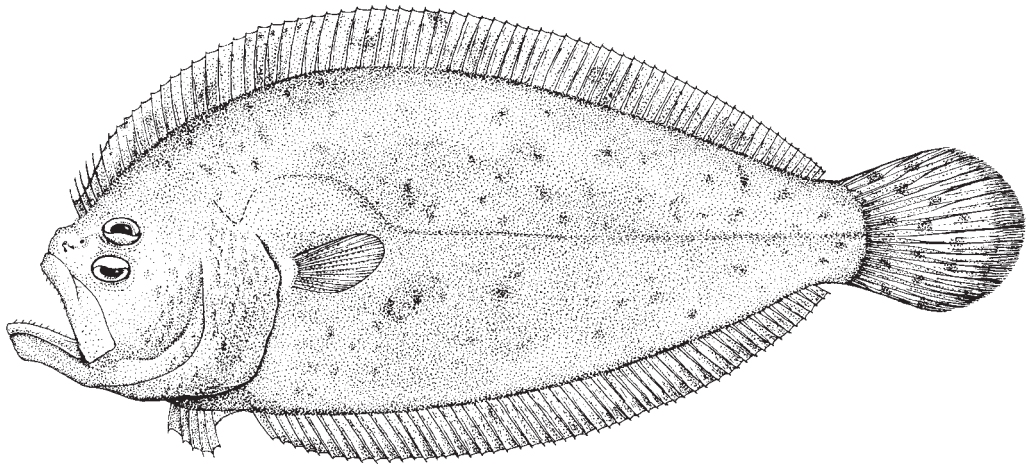
Distribution: Eastern Atlantic; present throughout the area from Morocco to Namibia, also Canary Islands (rare) and Madeira; elsewhere western Mediterranean and coastal Europe northward to Scotland.



***Arnoglossus laterna* (Walbaum, 1792)**

Frequent synonyms / misidentifications: *Arnoglossus macrostoma* Kyle, 1913 / None.

FAO names: En – Mediterranean scaldfish; Fr – Arnoglosse de Méditerranée; Sp – Serrandell.



Diagnostic characters: Body oval, thin, nearly transparent; greatest depth 36 to 43% of standard length. Head length 25 to 30% of standard length. Eye diameter 18 to 24% of head length; eyes separated by a small bony ridge. Snout as long as, or longer than, diameter of eye. Mouth large, 36 to 47% of head length; posterior border of maxilla at vertical through posterior margin of lower eye. Teeth small. **Gill rakers moderately long; 7 to 9 on first lower gill arch. Dorsal-fin rays 87 to 93; the first 5 or 6 as long as successive rays and with their distal ends free from the membrane. Anal-fin rays 65 to 74.** Scales weakly ctenoid on the ocular side, cycloid on the blind side. Lateral line with distinct arch above pectoral fin; **50 to 56 scales in lateral line.** **Colour:** ocular side uniformly brownish or greyish, sometimes with irregular darker markings. Dorsal and anal fins with indistinct darker spots and irregular marks; ocular-side pelvic fin with diffuse dark pigment in membranes.

Size: Maximum to about 20 cm standard length, common to about 15 cm.

Habitat, biology, and fisheries: Benthic species occurring on mixed or muddy bottoms on the continental shelf and upper continental slope at depths of 45 to 200 m. Feeds on small fishes and invertebrates. Spawns from April to August. Captured in industrial and artisanal trawl fisheries. Separate statistics not available for this species. Utilized mostly fresh, also dried and smoked.

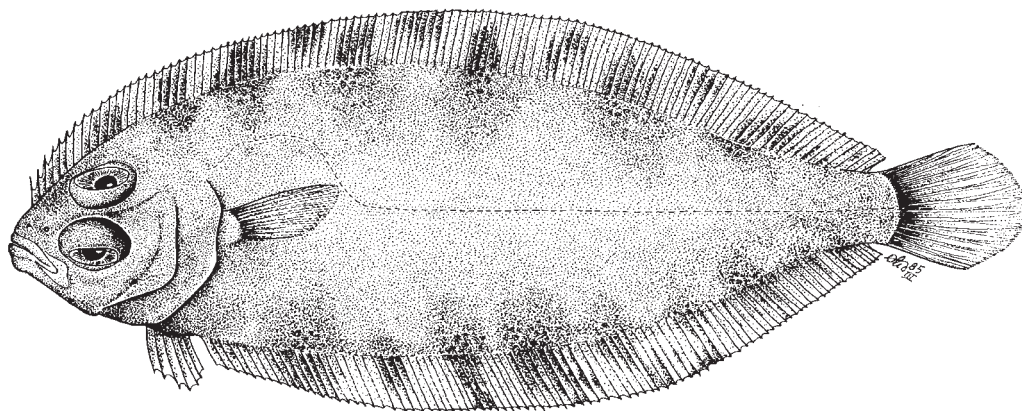
Distribution: Eastern Atlantic; West Africa, Morocco south to Angola; Madeira Islands. Elsewhere in the northeastern Atlantic northwards to Norway; Mediterranean and Black seas.



Arnoglossus rueppelii (Cocco, 1844)

Frequent synonyms / misidentifications: None / None.

FAO names: **En** – Rüppell's scaldback; **Fr** – Fausse limande de Rüppell; **Sp** – Peluda de Rüppell.



Diagnostic characters: Body elongate; greatest depth 28 to 33% of standard length. Eyes large, about equal to one-third head length; snout pointed. **Lower limb of first gill arch with about 11 long gill rakers. Dorsal-fin rays 110 to 118; anal-fin rays 86 to 94.** Lateral line with distinct arch above pectoral fin; about 75 scales in lateral line. **Colour:** uniformly brownish, sometimes with darker markings. Caudal fin with dark vertical band.

Size: Maximum standard length about 15 cm.

Habitat, biology, and fisheries: Benthic species inhabiting deep waters between 85 and 550 m, but usually taken between 200 and 500 m. Adults rarely caught. Feeds on small fishes and invertebrates. Spawns in the Mediterranean Sea during autumn. Taken in industrial and artisanal fisheries using bottom trawls. Occasionally occurring in markets. Utilized fresh or dried and salted.

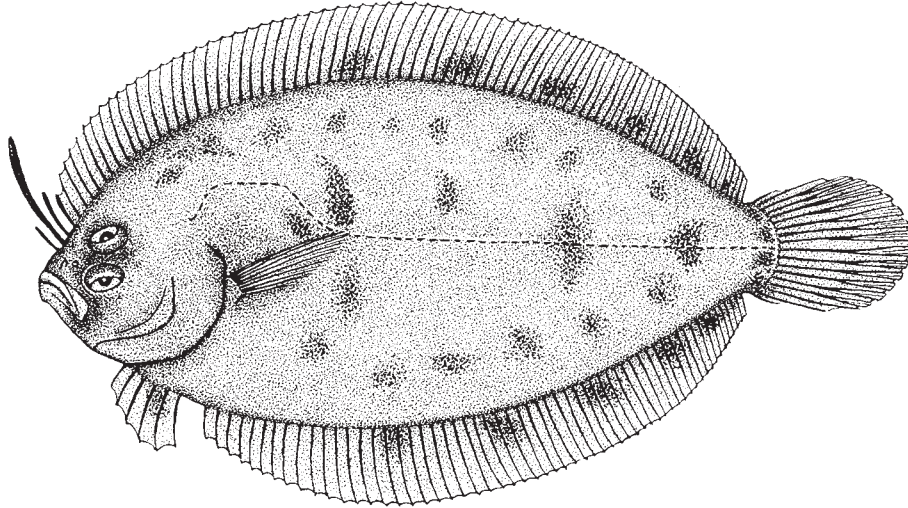
Distribution: Eastern Atlantic; West Africa south of Morocco to Cape Boujdour (about 24°N); Morocco, Canary Islands; elsewhere west of Gibraltar and northwestern Mediterranean and Aegean seas.



***Arnoglossus thori* Kyle, 1913**

Frequent synonyms / misidentifications: *Arnoglossus moltonii* Torchio, 1961 / None.

FAO names: **En** – Thor's scaldfish; **Fr** – Arnoglosse de Thor; **Sp** – Peludilla.



Diagnostic characters: Body ovate, greatest depth 40 to 48% of standard length; head length 22 to 27% of standard length. Snout as long as eye; eye diameter 22 to 27% of head length; **eyes separated by a narrow, concave space (bony ridge present in juveniles)**; lower eye slightly in advance of upper eye; maxilla about 35% of head length, longer than eye diameter, extending posteriorly to, or slightly beyond, anterior margin of lower eye; teeth small, not enlarged anteriorly. **Gill rakers short, 7 to 9 on lower limb of first arch. Dorsal-fin rays 81 to 91; second ray elongate (varying between about 60% of head length, to longer than head), fringed with conspicuous, broad, dark membrane giving it a pinnate appearance; first, third and fourth dorsal-fin rays may also be slightly elongate in some mature specimens; anal-fin rays 61 to 69;** pelvic-fin bases unequal in length, that on ocular side much longer. Ocular-side scales feebly ctenoid, blind-side scales cycloid. Lateral line with distinct arch above pectoral fin; **49 to 56 scales in lateral line. Colour:** ocular side brownish or greyish, with darker spots or blotches on lateral line, one behind anterior curve and one near distal end; generally, **with a series of dark spots along caudal-fin base** that may give appearance of a crossband; all fin rays with small dark melanophores; **ocular-side pelvic fin sometimes with diffuse spot on posterior portion; first 3 or 4 dorsal-fin rays generally blackish in adults, but only elongate second ray dark in immature specimens.** Blind side light in colour, with no special markings in either sex.

Size: Maximum to about 25 cm standard length, common to 15 cm.

Habitat, biology, and fisheries: Benthic species inhabiting hard sand and mud bottoms on the continental shelf between depths of 50 and 300 m. Feeds on small fishes and invertebrates. Spawns between April and July. Little additional information available concerning this species. Separate statistics are not reported for this species. Caught incidentally with bottom trawls in industrial and artisanal fisheries throughout its range. Utilized mostly fresh and dried salted.

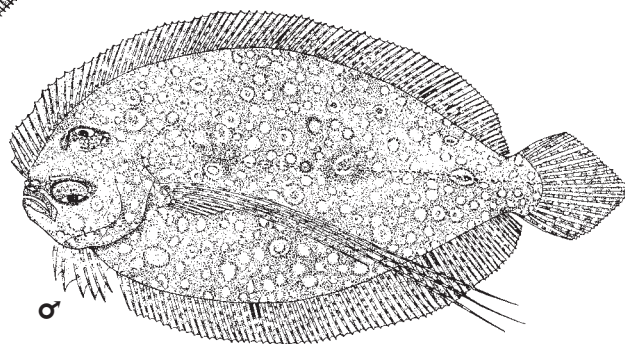
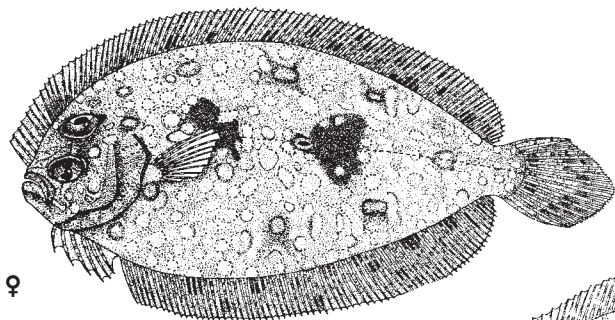
Distribution: Eastern Atlantic; from Straits of Gibraltar to Sierra Leone; Cape Verde Islands; Canary Islands (rare); elsewhere west coast of Ireland, off southern France, Spain and Portugal; Mediterranean Sea.



Bothus guibei Stauch, 1966

Frequent synonyms / misidentifications: None / None.

FAO names **En** – Guinean flounder; **Fr** – Rombou de Guinée; **Sp** – Lenguado de Guinea.



Diagnostic characters: Body ovate, greatest depth 50 to 56% of standard length; head length 26 to 30% of standard length. **Anterior profile of head rounded**, not steeply sloping; **no notch above and in front of lower eye**; eye diameter 21 to 28% of head length; interorbital space broader in males than in females and immature individuals, but not exceeding eye diameter in either sex; anterior margin of upper eye at or anterior to vertical through about centre of lower eye; snout and orbital area sometimes rugose in adult males; maxilla longer than eye diameter, 30 to 34% of head length; maxilla extending posteriorly to vertical through about anterior third of lower eye; teeth small, equally developed in both jaws; no enlarged canines. Gill rakers short, 6 to 8 on lower limb of first arch. Dorsal-fin rays 88 to 94, none of them elongate; anal-fin rays 67 to 75; anterior pectoral-fin rays prolonged in adult males, extending to caudal peduncle or beyond (not elongate in females); pelvic-fin bases unequal in length, that on ocular side much longer. Caudal fin bluntly triangular. **Scales ctenoid on both sides**. Lateral line with distinct arch above pectoral fin; **77 to 84 scales in lateral line**. **Colour** (males with more intense coloration) ocular side brownish to greyish, with numerous blotches and spots, some solid and others ocellated, giving the fish a mottled appearance; 3 more or less well defined spots on lateral line, a large, diffuse spot immediately behind curved portion of lateral line; a darker, smaller, better defined spot near middle of straight portion; and a third, less defined spot in peduncular region. Fins with numerous diffuse spots. Blind side uniformly light, except that head region may be spotted with brown.

Size: Maximum total length to about 29 cm.

Habitat, biology, and fisheries: Benthic species occurring in depths between 15 and 40 m. Little additional information is known concerning this species. Separate statistics are not reported for this species. Caught mainly by hand-held fishing poles; also with bottom trawls, beach seines, and on hook-and-line. Marketed mostly fresh and dried salted.

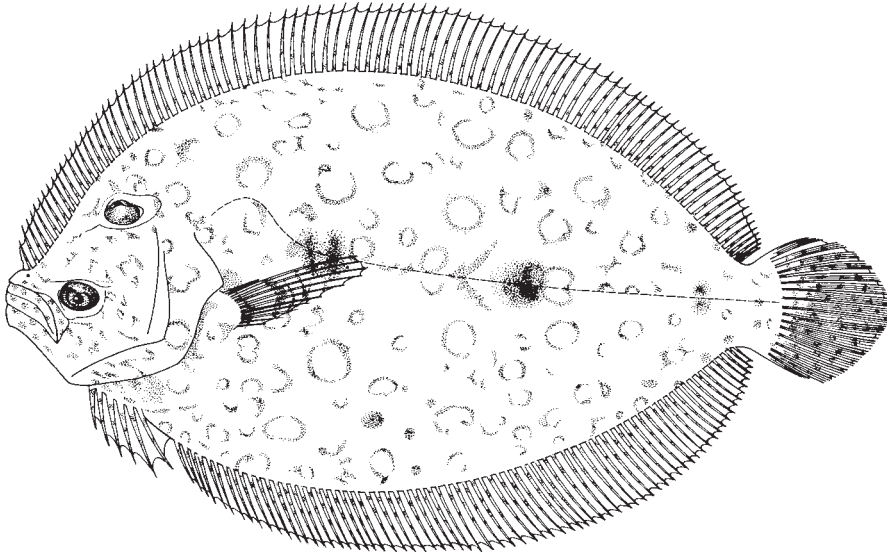
Distribution: Eastern Atlantic; from off Annobon Island, Biafra Bay, Gulf of Guinea and São Tomé Island.



Bothus lunatus (Linnaeus, 1758)

Frequent synonyms / misidentifications: *Bothus lunulatus* (misspelling) / None.

FAO names: En – Peacock flounder; Fr – Rombou lune; Sp – Lenguado ocelado.



Diagnostic characters: Body oval, moderately deep (greatest depth 48 to 59% of standard length). Dorsal profile of snout with distinct notch above nostril; a stout spine on snout of male (bony knob in female). Eye diameter 16 to 20% of head length; lower eye distinctly anterior to upper; interorbital space broad (notably broader in males than in females), eye diameter 77 to 83% of interorbital width. Mouth moderately large and oblique; maxilla extending slightly beyond vertical through anterior margin of lower eye. Jaws with irregular double row of small teeth. Lower limb of first gill arch with 8 to 10 gill rakers. Dorsal-fin rays 91 to 99. Dorsal-fin origin anterior to vertical at anterior nostril. Anal-fin rays 70 to 76. Caudal fin rounded to bluntly pointed. Ocular-side pectoral-fin rays 11 or 12; upper rays very elongate in males. Scales ctenoid on ocular side and cycloid on blind side. Lateral line with steep arch above pectoral fin; 83 to 95 scales on lateral line. **Colour:** grey-brown with numerous blue rings and curved spots covering entire ocular side; 2 or 3 large diffuse blackish spots on straight portion of lateral line. Large individuals with dark transverse bands on ocular-side pectoral fin. Can change colour rapidly.

Size: Maximum to about 45 cm; common to 35 cm.

Habitat, biology, and fisheries: Benthic species found among rocks and on rubble from near the shoreline to 100 m depth at Ascension Island.

Distribution: Eastern Atlantic: Ascension and São Tomé islands; widespread in tropical Atlantic.

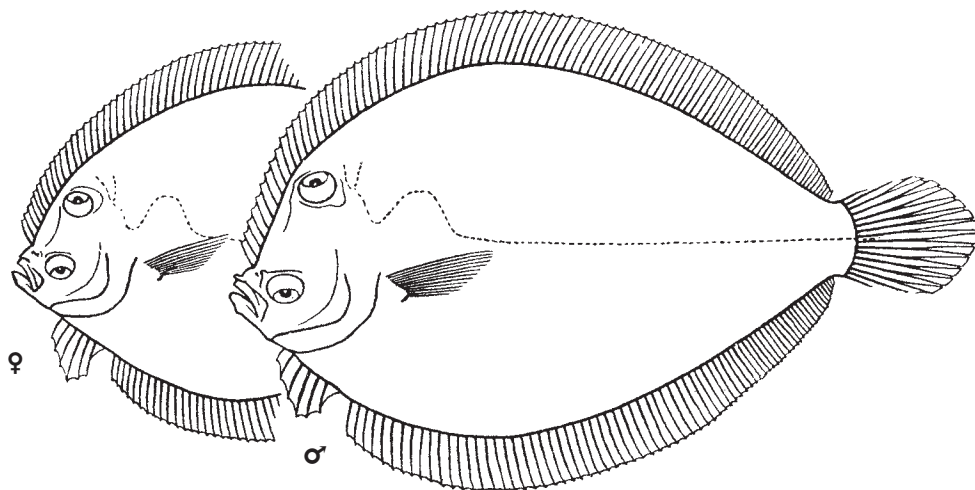
Remarks: *Bothus lunulatus* listed by F. Williams in the report on the Guinean trawling survey Vol. 1 general report, p. 817 cannot be traced. In Norman's 1934 Monograph of the flatfishes (p. 227), in the synonymy of *Bothus lunatus*, a reference is made to *Bothus lunulatus*, Poey 1875, *Annales de la Sociedad Española de Historia Natural*, p. 180. These 2 accounts may only represent misspellings of *B. lunatus*.



Bothus mellissi Norman, 1931

Frequent synonyms / misidentifications: None / *Bothus podas*.

FAO names: En – St Helena flounder; Fr – Rombou de St Hélène; Sp – Lengudo de Santa Elena.



Diagnostic characters: Body ovate, greatest depth 59 to 67% of standard length; head length 21 to 24% of standard length. Anterior profile of head steeply sloping, but not vertical; slight notch above and in front of lower eye; eye diameter 21 to 25% of head length; interorbital space broad, 60% of eye diameter (females and immature males) to well in excess of eye diameter (mature males); anterior margin of upper eye at vertical through posterior margin of lower eye; maxilla 25 to 31% of head length, longer than eye diameter, extending to below anterior portion of lower eye; teeth small, equally developed in both jaws; no enlarged canines. Gill rakers on lower limb of first arch 9 or 10. Dorsal-fin rays 92 to 98, none of them elongate; anal-fin rays 70 to 75. **Upper rays of ocular-side pectoral fin not prolonged in males.** Pelvic-fin bases unequal, that on ocular side much longer. **Scales ctenoid on ocular side, cycloid on blind side, 86 to 90 in lateral line.** **Colour:** ocular side brownish, blackish or greyish, usually covered with spots and ocelli, sometimes uniformly brownish. Live coloration similar to that of *Bothus lunatus* but with smaller light blue circles and no curved spots. Blind side light in colour with no special markings.

Size: Maximum length reported to 22 cm.

Habitat, biology, and fisheries: Inhabits mud, sand, gravel and shell bottoms, in depths between 5 and 100 m. Moderately common from about 5 to 100 m depth on sandy and gravelly areas at St Helena. Does not appear to occur in shallow water at Ascension Island. Little additional information is available concerning this species. Caught incidentally throughout its range. Separate statistics are not reported for this species. Caught with bottom trawls. Of no commercial importance.

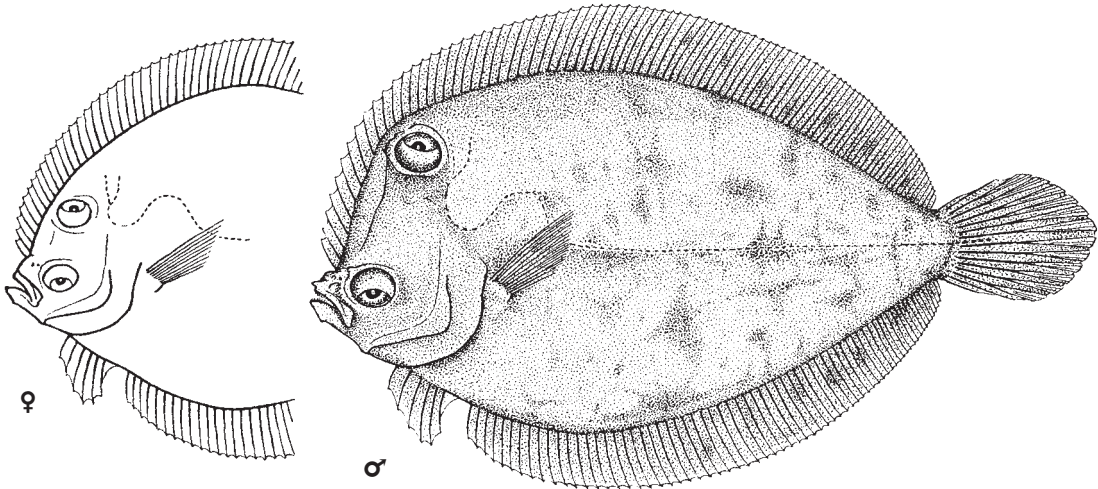
Distribution: Known only from St Helena and Ascension Island.



Bothus podas (Delaroche, 1809)

Frequent synonyms / misidentifications: *Rhombus maderensis* Lowe, 1834; *Bothus podas africanus* Nielsen, 1961 / *Bothus mellissi*.

FAO names: **En** – Wide-eyed flounder; **Fr** – Rombou podas; **Sp** – Podas.



Diagnostic characters: Body ovate, greatest depth 55 to 62% of standard length; head length 25 to 30% of standard length. **Anterior profile of head nearly vertical (mature males); slight notch above and in front of lower eye;** males with short spine on snout; eye diameter 25 to 30% of head length; **interorbital space broad, 60% of eye diameter (females and immature specimens) to much greater than eye diameter (mature males); anterior margin of upper eye posterodorsal to vertical through posterior margin of lower eye;** maxilla 27 to 31% of head length, longer than diameter of eye; posterior margin of maxilla extends to vertical through anterior margin of lower eye; teeth small, equally developed in both jaws; no enlarged canines. Gill rakers short, 7 to 9 on lower limb of first arch. Dorsal-fin rays 85 to 95, none of them elongate; anal-fin rays 63 to 73; pelvic-fin bases unequal in length, that of ocular side much longer. **Upper pectoral-fin rays of males not prolonged. Scales ctenoid on ocular side, cycloid on blind side.** Lateral line with distinct arch above pectoral fin; **75 to 92 scales in lateral line.** **Colour:** populations referred to as *Bothus podas podas* have the ocular side light brownish, usually covered with spots and/or ocelli; generally with a diffuse dark spot at junction of curved and straight parts of lateral line, and another more distinct spot on middle of straight part; coloration of median fins similar to that of body, with small brown spots on the pectoral fins. Ocular-side pelvic fin black; blind-side pelvic fin white to dusky. Blind side light in colour with no special markings. Populations referred to as *Bothus podas maderensis* have the ocular side generally dark brown to dark violet, seldom with spots. Meristic and morphometric values are quite broad in this account because the 3 subspecies are treated as a single species.

Size: Maximum length to 45 cm, common to 18 cm.

Habitat, biology, and fisheries: Inhabits sand, shell, mud and coral bottoms in depths from 15 to 400 m. Feeds on small invertebrates and fishes. Spawns between May and August. Caught throughout its range, but especially in inshore waters off Ghana and Senegal; probably not very abundant locally. Separate statistics are not reported for this species. Caught in industrial and artisanal fisheries with dredges, bottom trawls, set bottom nets, beach seines and dipnets. Marketed fresh, smoked and dried salted.

Distribution: Eastern Atlantic; West African coast from Gibraltar to Angola; also São Tomé Island; Madeira, Canary Islands and Cape Verde Islands; elsewhere Azores, throughout Mediterranean.

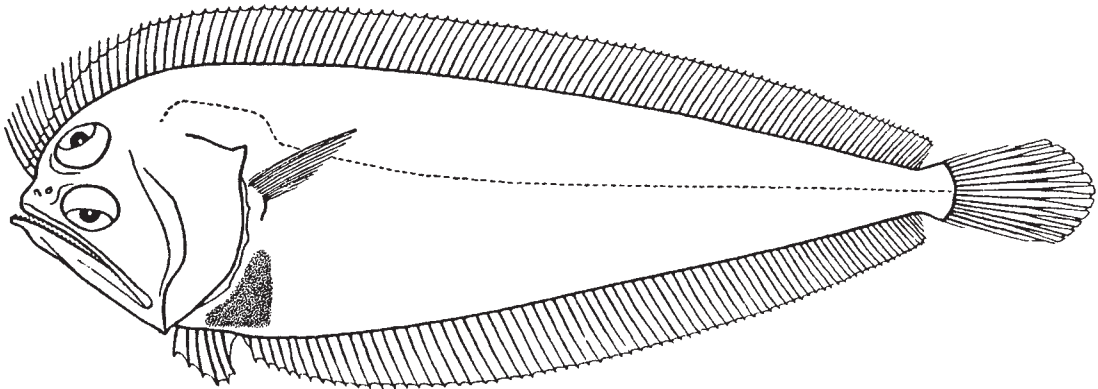
Remarks: Historically, several subspecies have been recognized. *Bothus podas maderensis* occurs at Madeira and the Canary Islands. It has 88 to 91 scales in the lateral line, 20 or 21 of which are in the curved portion of the lateral line. The ocular side is generally dark brown to dark violet, seldom with spots. *Bothus podas podas* occurs along the West African coast from Gibraltar to Angola and in the Mediterranean. It features 75 to 86 scales in the lateral line, of which 13 to 20 are in the curved portion. The ocular side is light brown with a varying number of darker spots. The systematics of these populations requires further investigation.



Chascanopsetta lugubris Alcock, 1894

Frequent synonyms / misidentifications: None / None.

FAO names: En – Pelican flounder; Fr – Perpeire pélican; Sp – Lenguado pelicano.



Diagnostic characters: Body elongate; greatest depth 25 to 33% of standard length. Head length 20 to 25% of standard length; eye diameter 24 to 28% of head length; interorbital space narrow; maxilla extremely long (70% of head length or greater) and oblique, posterior margin of maxilla extending well beyond vertical through posterior margin of lower eye; teeth small, slender (no distinct canines), those on lower jaw depressible. Gill rakers absent, although 1 or 2 rudiments may be present on lower limb of first arch. Dorsal-fin rays 114 to 122, none of them elongate; anal-fin rays 77 to 85; pelvic-fin bases unequal in length, that on ocular side much longer. Lateral line with distinct arch above pectoral fin. Scales small, cycloid on both sides, about 190 in lateral line. **Colour:** ocular side greyish or yellowish brown, with or without numerous spots; peritoneum black, distinctly visible through the thin abdominal walls; fins dusky. Blind side uniformly light.

Size: Maximum to 38 cm standard length, commonly to 25 cm.

Habitat, biology, and fisheries: Demersal, deepwater species inhabiting sand, mud and clay bottoms on the outer continental shelf and upper continental slope from depths of 120 to over 1 000 m. Little additional information is known concerning this species. Caught throughout its range, and reported to be very abundant in the southern part of the area. Separate statistics not reported for this species; no directed fishery. Caught as bycatch with bottom trawls. Not marketed.

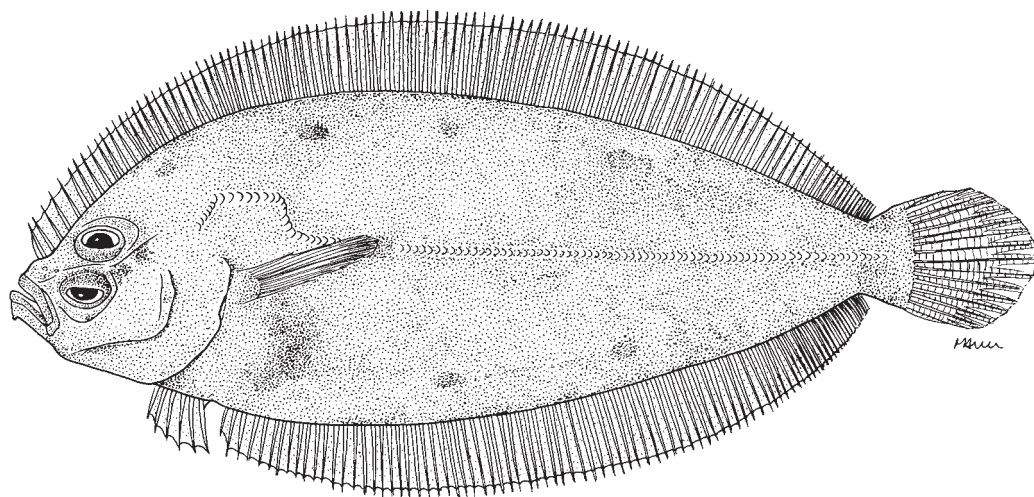
Distribution: Circumtropical; in the eastern Atlantic off West Africa from Senegal to Namibia; elsewhere South Africa to Cape of Good Hope, coast of Natal; western Atlantic from Florida to Brazil; Indo-Pacific, Japan Sea.



Monolene helenensis Amaoka and Imamura, 2000

Frequent synonyms / misidentifications: None / None.

FAO names: **En** – Saint Helena moonflounder; **Fr** – Monolène de Sainte Hélène; **Sp** – Monolena de Santa Helena.



Diagnostic characters: Body elliptical, greatest depth 36 to 39% of standard length; head small and rounded, with small notch above and anterior to lower eye; head length 24 to 28% of standard length. Eyes relatively large; eye diameter 28 to 31% of head length; eyes separated by a narrow, low bony ridge; maxilla relatively large, about 29 to 32% of head length; maxilla extending posterior to vertical through anterior margin of lower eye; mouth small; a prominent symphyseal knob on tip of lower jaw; teeth small, not enlarged anteriorly, equally developed on both jaws. **Dorsal-fin rays 108 to 116; anal-fin rays 89 to 92; pectoral fin on blind side absent in adults;** bases of pelvic fins about equal in length, both short. Scales ctenoid on ocular side, cycloid on blind side; **101 to 111 scales in lateral line.** **Colour:** ocular side uniformly pale brown with traces of dark markings (slightly behind junction of curved and straight portions and in middle of straight portion of lateral line, and along upper and lower margins of body). Blind side yellowish white. **Upper half of ocular-side pectoral fin blackish.**

Size: Maximum to 21 cm standard length.

Habitat, biology, and fisheries: A little known species captured at depths of 163 to 460 m. No additional information is available concerning this species. Of no commercial interest. Caught as bycatch with bottom trawls.

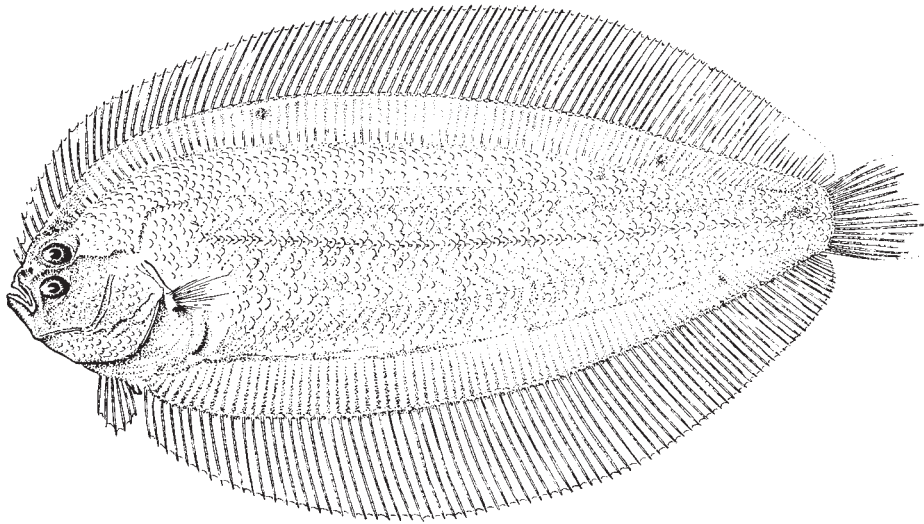
Distribution: Known only from the waters north of St Helena.



***Monolene mertensi* (Poll, 1959)**

Frequent synonyms / misidentifications: *Laeops mertensi* Poll, 1959 / None.

FAO names: En – Mertens' moonflounder; Fr – Monolène de Mertens; Sp – Monolena de Mertens.



Diagnostic characters: Body ovate, greatest depth 36 to 42% of standard length; head length 17 to 19% of standard length. Eyes small; eye diameter 20 to 25% of head length; interorbital space about 50% of eye diameter; maxilla short, about equal to eye diameter, extending posteriorly to anterior portion of eye; mouth small; teeth small, not enlarged anteriorly, equally developed on both jaws. Dorsal-fin rays 102 to 106; anal-fin rays 84 to 91; pectoral fin on blind side rudimentary in juveniles, absent in adults; bases of pelvic fins about equal in length, both short. Scales ctenoid on ocular side, cycloid on blind side; about 80 scales in lateral line. **Colour:** ocular side uniformly pale brown. Blind side whitish.

Size: Maximum total length to 10 cm.

Habitat, biology, and fisheries: Inhabits mud bottoms in depths of 100 to 700 m. No additional information is available concerning this species. Caught incidentally throughout its range. Separate statistics not reported for this species. Caught with bottom trawls.

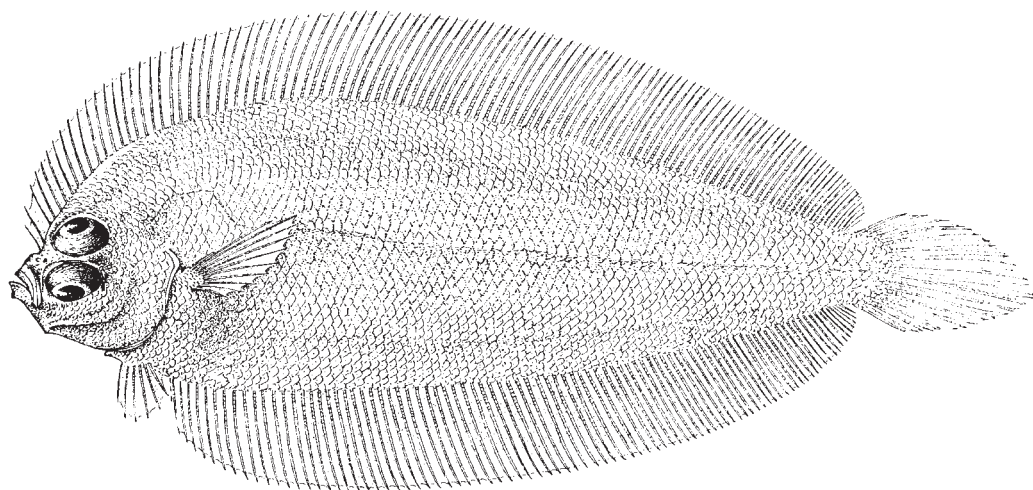
Distribution: Eastern Atlantic; off West Africa from about Guinea (10°N) to about southern Angola (15°S).



Monolene microstoma (Cadenat, 1937)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Smallmouth moonflounder; Fr – Monolène à petite bouche; Sp – Monolena bocachica.



Diagnostic characters: Body ovate; greatest depth 30 to 36% of standard length; head length 18 to 22% of standard length. Eye large; eye diameter 33 to 44% of head length; interorbital space narrow, eyes separated by bony ridge or narrow interorbital space; maxilla about 25% of head length and shorter than eye diameter, extending posteriorly to about anterior lower eye; teeth small, not enlarged anteriorly, equally developed on both sides of jaws. Gill rakers short. Dorsal-fin rays 102 to 112; anal-fin rays 84 to 93; pectoral fin absent on blind side; bases of pelvic fins about equal in length, both short. Scales ctenoid on ocular side, cycloid on blind side. Lateral line with distinct arch above pectoral fin; 77 to 83 scales in lateral line. **Colour:** ocular side brownish, with several inconspicuous darker blotches. Blind side whitish.

Size: Maximum total length to 20 cm.

Habitat, biology, and fisheries: Inhabits mud bottoms on the continental shelf in depths from about 25 to 400 m. No additional information is available concerning this species. Caught incidentally throughout its range. Separate statistics not reported for this species. Caught with bottom trawls. Marketed fresh or dried-salted.

Distribution: Eastern Atlantic; from Senegal to Namibia.

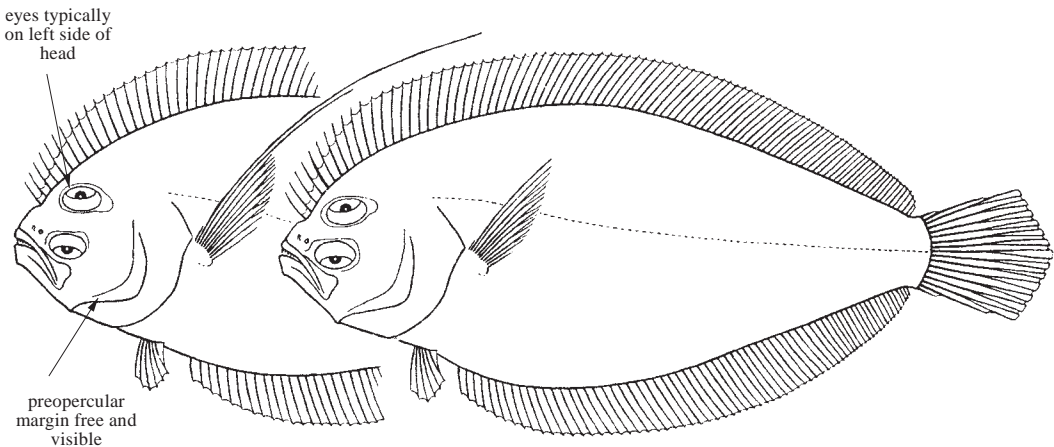


PARALICHTHYIDAE

Sand flounders

by T.A. Munroe, National Marine Fisheries Service, National Systematics Laboratory, National Museum of Natural History, Washington, DC, USA

Diagnostic characters: Small to moderate-sized flatfishes **with eyes on left side of head** (reversals frequent in some species occurring outside the Atlantic). Body elliptical to elongate. Dorsal profile of head concave in region anterior to upper eye; notch sometimes present on head in snout region. Snout large, bluntly pointed; about equal to eye diameter. Mouth large, protractile, oblique; jaws asymmetrical; lower jaw prominent with posterior extension at vertical through midpoint of eye; teeth in jaws sometimes canine-like; no teeth on vomer. **Preopercle exposed, its posterior margin free and visible, not hidden by skin or scales.** **Urinary papilla on right side (species of *Cyclopsetta* group)**, not attached to first anal-fin ray. Dorsal fin long, originating above or anterior to vertical through upper eye. **No spines present in fins. Dorsal and anal fins not attached to caudal fin. Both pectoral fins present, symmetrically positioned relative to each other and inserted posterior to isthmus; pelvic fins with 5 or 6 rays (6 rays in nearly all species); base of ocular-side pelvic fin on midventral line (*Cyclopsetta* group).** Caudal fin double truncate, with 17 or 18 rays, 10 to 13 rays branched (usually 11 or 13, rarely 10 or 12). **Lateral line present and obvious on both sides of body, without distinct high arch over pectoral fin; lateral line absent below lower eye.** Some species of *Syacium* and *Citharichthys* show sexual dimorphism in interorbital width, ocular-side pectoral-fin length, length of anterior dorsal-fin rays and coloration. **Colour:** ocular side uniformly brownish or greyish, often with spots, blotches or ocelli; blind side usually pale; although ambicoloration (eyed-side coloration replicated on blind side) may occasionally occur.

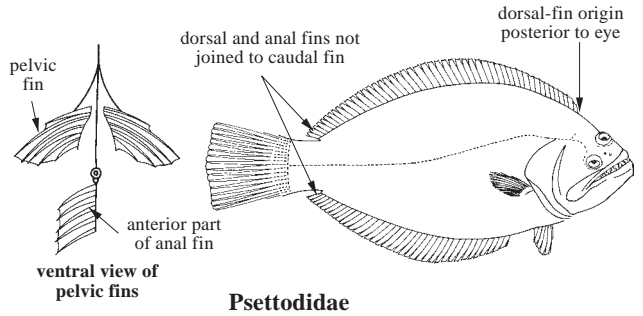


Habitat, biology, and fisheries: Sand flounders are bottom-dwelling predators, usually burying partially or almost entirely in sand or soft mud. They are capable of rapid changes in coloration which allows them to match their background almost perfectly. Most appear to feed on prey found on or near the bottom, but some larger species will rise off the bottom to capture prey. Most occur in shallow water, although some species also occur at slope depths (>200 m). Most paralichthyid flounders are good foodfishes, but only one species occurring in Fishing Area 34 has any economic importance. Other species are only of subsistence economic importance. Separate statistics for paralichthyid flounders are not reported from the area of interest. Catches for these species are generally included with those of the bothid flatfishes. Captured in trawls, seines, and hook-and-line. Species are used fresh, frozen, and for making fishmeal.

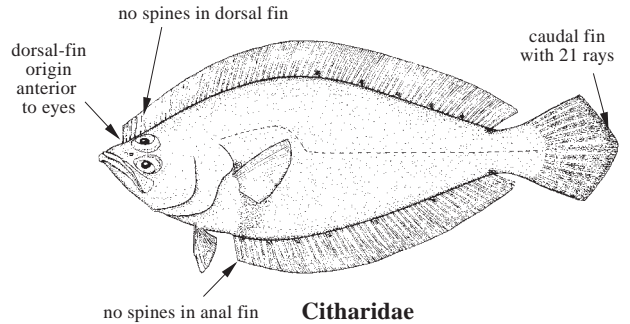
Remarks: Only 3 species of paralichthyid flounders, belonging to the *Cyclopsetta* group of the Paralichthyidae, occur in the eastern Atlantic.

Similar families occurring in the area

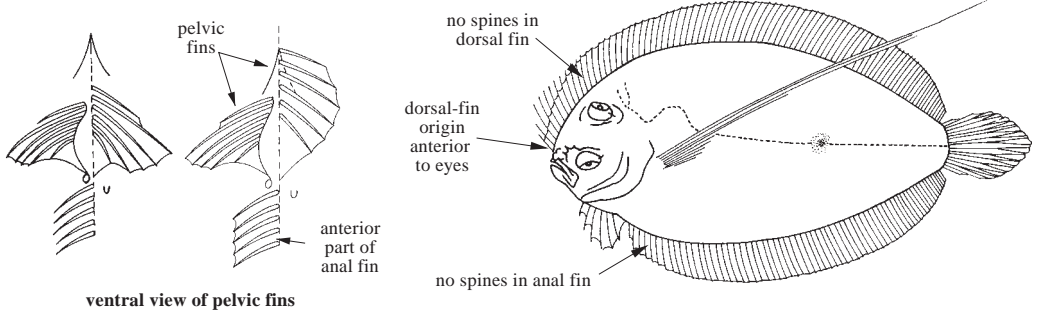
Psettodidae: dorsal-fin origin well posterior to posterior margin of upper eye; spines in anterior dorsal and anal fins; mouth extending well beyond vertical through posterior margin of lower eye; lateral line without high arch above pectoral fin; gill rakers tooth-like; upper eye on dorsal margin of head; pelvic fins with 1 spine and 5 soft rays (no spine in *Paralichthyidae*); urinary papilla and anus on midline.



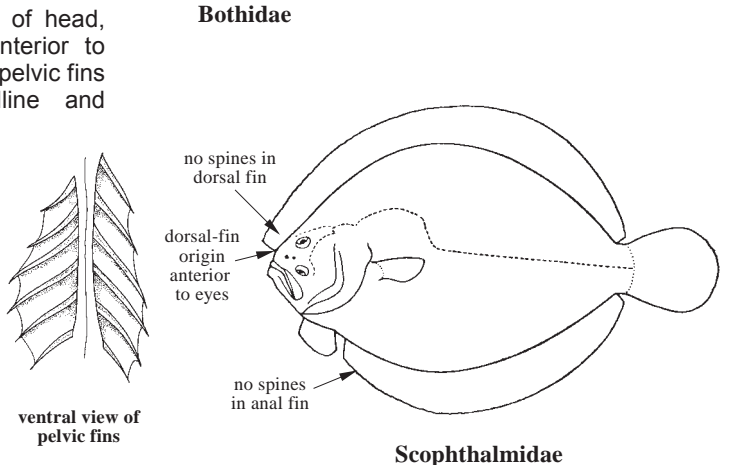
Citharidae: mouth large, maxilla reaching to or beyond vertical through posterior margin of lower eye; dorsal-fin origin anterior to posterior margin of upper eye; pelvic fin with 1 spine and 5 soft rays; bases of both pelvic fins short; caudal fin with 21 rays; lateral line with high arch above pectoral fin; gill rakers elongate, not tooth-like; eyes usually on right side of head in some species and left side of head in others, reversals rare; urinary papilla and anus on left side.



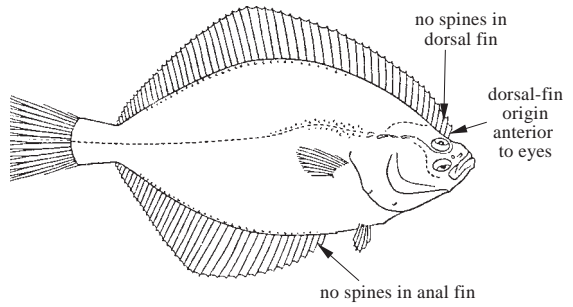
Bothidae: eyes nearly always on left side of head, reversals rare; lateral line absent or poorly developed on blind side; lateral line absent below lower eye (absent in *Cyclopsetta* group); lateral line of ocular side with high arch over pectoral fin (no high arch over pectoral fin in *Cyclopsetta* group); urinary papilla on left side (on right side in species of *Cyclopsetta* group).



Scophthalmidae: eyes on left side of head, reversals rare; dorsal-fin origin anterior to posterior margin of upper eye; both pelvic fins elongate, placed close to midline and extending forward to urohyal; first ray of blind-side pelvic fin opposite second or third ray of ocular-side fin; lateral line equally developed on both sides of body, with high arch above pectoral fin, and with distinct supratemporal branch (no high arch over pectoral fin in *Cyclopsetta* group); urinary papilla on left side (on right side in species of *Cyclopsetta* group); small patch of teeth on vomer.



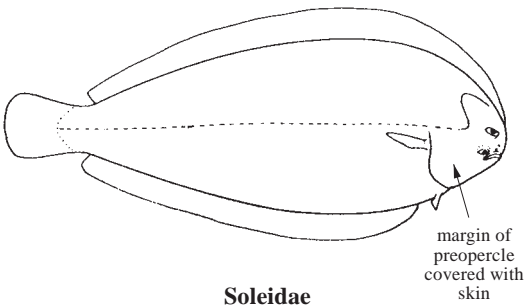
Pleuronectidae: eyes usually on right side of head; dorsal-fin origin anterior to posterior margin of upper eye; lateral line present below lower eye (absent in *Cyclopsetta* group); pelvic fins with short bases and symmetrically placed on either side of midventral line (left pelvic fin on midventral line in *Cyclopsetta* group).



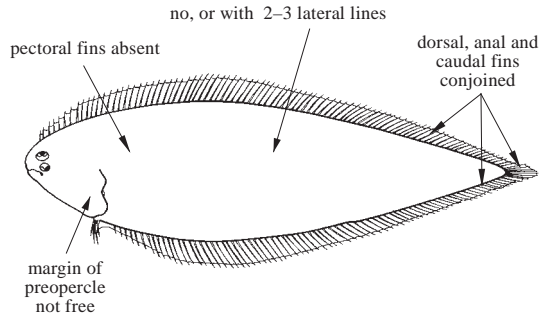
Pleuronectidae

Soleidae: eyes on right side of head, reversals rare; dorsal-fin origin anterior to posterior margin of upper eye; margin of preopercle not distinct (hidden beneath skin and scales); mouth small, lower jaw not protruding.

Cynoglossidae: eyes on left side of head, reversals rare; margin of preopercle not free (hidden beneath skin and scales); pectoral fins absent in adults; lateral line absent on both sides of body; no branched caudal-fin rays; urinary papilla on midventral line attached to first anal-fin ray; dorsal and anal fins joined to pointed caudal fin; only 1 pelvic fin in most species; lower jaw not protruding, rostral hook present below mouth (except *Symphurus*).



Soleidae



Cynoglossidae

Key to the species of Paralichthyidae occurring in the area

- 1a. Anterior profile of head distinctly rounded; upper jaw with 2 rows of fixed (immovable) teeth, single row of fixed (immovable) teeth in lower jaw; some jaw teeth canine-like; gill rakers short and stout (Fig. 1a) with serrations on posterior margins; 5 to 10 gill rakers on lower limb of first arch; scales ctenoid on ocular side, cycloid on blind side; interorbital space wider in males than females; males with first and second upper pectoral-fin rays of ocular-side fin elongate (Fig. 2) → 2
- 1b. Anterior profile of head distinctly concave; both jaws with single row of fixed (immovable) teeth; no canine-like teeth in jaws; gill rakers slender and moderately long (Fig. 1b); without serrations on posterior margins; 14 to 17 gill rakers on lower limb of first arch; scales cycloid or weakly ctenoid; interorbital space narrow in both sexes; first and second upper rays of ocular-side pectoral fin not elongate in males ***Citharichthys stampflii***

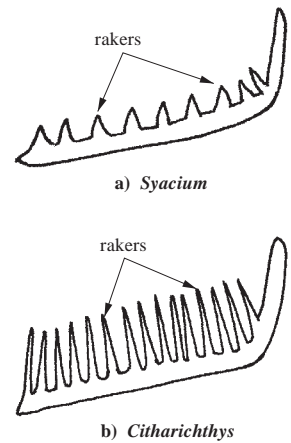


Fig. 1 first gill arch

- 2a. Lateral-line scales 52 to 60; interorbital space narrower (in fish >120 mm standard length, interorbital width usually equal to or less than eye diameter); eyes more symmetrically positioned in adults (anterior margin of upper eye usually at or anterior to vertical through anterior margin of pupil of lower eye); males without blue stripes on anterior snout region ***Syacium guineensis***
(West Africa)
- 2b. Lateral-line scales 44 to 57; interorbital space wider (in fish >120 mm standard length, interorbital width usually greater than eye diameter); eyes asymmetrically positioned in adults (anterior margin of upper eye usually posterior to vertical through anterior margin of pupil of lower eye); males with 2 blue stripes on snout region anterior to eyes (blue in life; black or dark brown in preserved specimens) ***Syacium papillosum***
(Ascension Island)

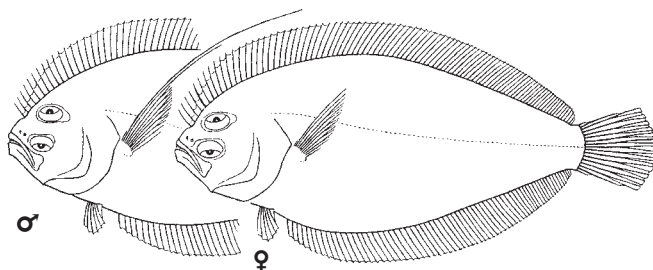



Fig. 2 *Syacium guineensis*

List of species occurring in the area

The symbol  is given when species accounts are included.

 *Citharichthys stampflii* (Steindachner, 1894).

 *Syacium guineensis* (Bleeker, 1862).

 *Syacium papillosum* (Linnaeus, 1758).

References

Hensley, D. 1995. Paralichthyidae. In W. Fischer, F. Krupp, W. Schneider, C. Sommer, K.E. Carpenter & V.H. Niem, eds. *Guía FAO para la identificación de especies para los fines de la pesca. Pacífico centro-oriental*. Rome, FAO. Vol 3: 1201–1813.

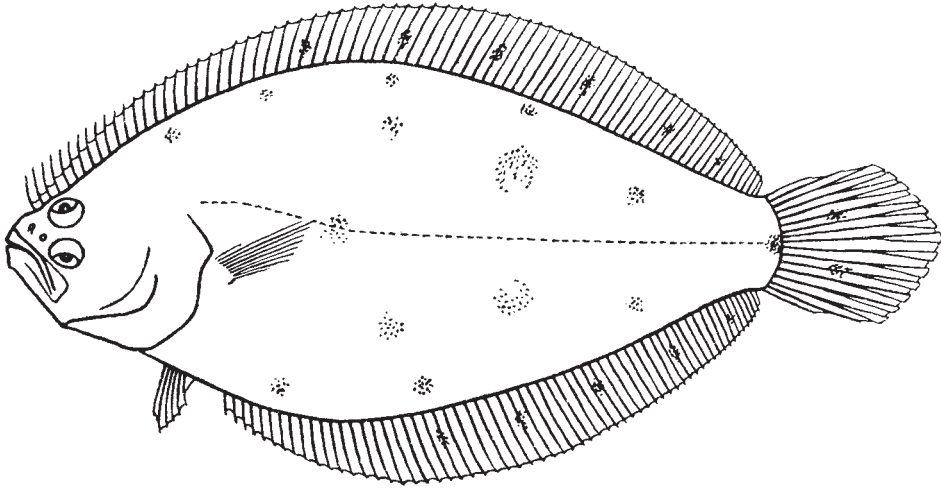
Munroe, T.A. 2003. Paralichthyidae. In K. Carpenter, ed. *The living marine resources of the Western Central Atlantic, Volume 3: Bony fishes part 2 (Opisthognathidae to Molidae), sea turtles and marine mammals*. *FAO Species Identification Guide for Fishery Purposes and American Society of Ichthyologists and Herpetologists Special Publication No. 5*. Rome, FAO, pp. 1898–1921.

Murakami, T. & Amaoka, K. 1992. Review of the genus *Syacium* (Paralichthyidae) with the description of a new species from Ecuador and Colombia. *Bulletin of the Faculty of Fisheries, Hokkaido University*, 43: 61–95.

Citharichthys stampflii (Steindachner, 1894)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Smooth flounder; Fr – Perpeire lisse; Sp – Lenguado liso.



Diagnostic characters: Body ovate, body depth 45 to 50% of standard length; head length 27 to 31% of standard length. **Anterior profile of head distinctly concave.** Snout relatively short and bluntly pointed, with shallow notch above eyes. **Eye diameter 16 to 23% of head length; interorbital space narrow, may be somewhat concave.** Maxilla 38 to 42% of head length; posterior extent of maxilla extending to point between verticals through middle and posterior margin of lower eye; **teeth uniserial on both jaws; no canine-like teeth.** Gill rakers moderately long and slender, 14 to 17 on lower limb of first arch. Dorsal fin commencing on blind side of head above space between nostrils; dorsal-fin rays 80 to 87; **anal-fin rays 59 to 65.** Pectoral fins unequal, that of ocular side larger than blind-side counterpart; **upper ocular-side pectoral-fin rays not elongate in males.** Bases of pelvic fins about equal in length, both short. Caudal fin double truncate. **Scales feebly ctenoid on ocular side, cycloid on blind side.** Accessory scales few. **Lateral line lacking distinct curve above pectoral fin; 46 to 50 scales in lateral line.** **Colour:** ocular surface brownish with darker spots and blotches, often with a series of conspicuous spots along body margins; dark spot at caudal-fin base, and similar spot on upper and lower caudal-fin rays; dorsal and anal fins each with row of dark spots. Blind side uniformly light.

Size: Maximum size about 15 cm standard length.

Habitat, biology, and fisheries: Inhabits estuarine and nearshore tidal waters to 50 m depth; also occurs in brackish water and reported to enter freshwater. Off tropical West Africa, caught throughout its range and can be fairly abundant in estuarine waters. Settlement of juveniles occurs in estuaries off Guinea-Bissau over a protracted period from October to April. Larger fish occur in deeper waters than those inhabited by juveniles. Caught incidentally; not of sufficient size or abundance to be commercially important. Separate statistics not reported for this species. Caught with bottom trawls, beach seines, dipnets and other artisanal gear. Marketed fresh and dried-salted.

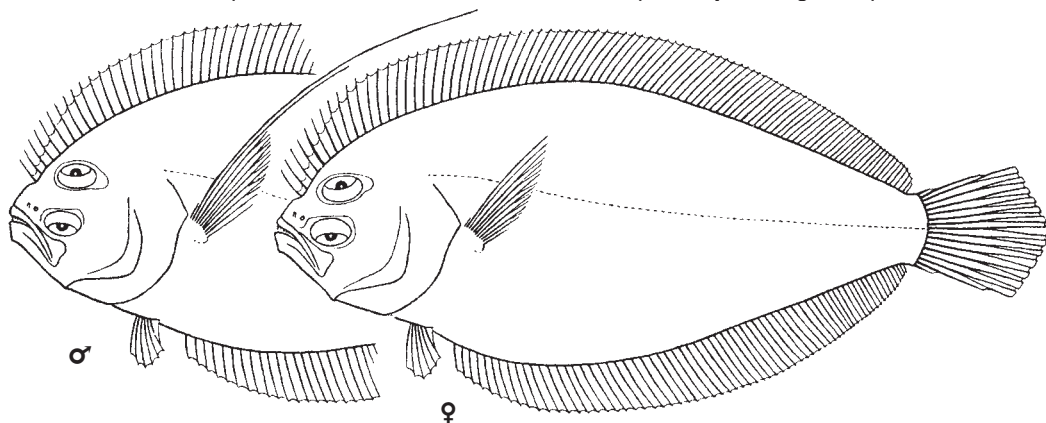
Distribution: Eastern Atlantic; West Africa from Senegal to Angola.



***Syacium guineensis* (Bleeker, 1862)**

Frequent synonyms / misidentifications: None / *Syacium micrurum* (Ranzani, 1842).

FAO names: En – Papillose flounder; Fr – Fausse limande paté; Sp – Lenguado paté.



Diagnostic characters: Body elongate; body depth 38 to 45% of standard length; head small, **smoothly rounded, with small notch anterior to upper eye**; head length 24 to 28% of standard length. Snout blunt and long, nearly equal to eye diameter. **Eyes moderate; diameter 21 to 29% of head length; interorbital space concave and narrow, equal to or less than pupil of lower eye; interorbital width greater in males than in females**; interorbital space of juveniles a bony ridge. Mouth large, jaws prominent; maxilla about 38 to 40% of head length; maxilla extending posteriorly to about vertical through centre of lower eye; teeth present in both jaws, biserial in upper and uniserial in lower, some anterior teeth of upper jaw canine-like; teeth about equally developed on ocular- and blind-side jaws. **Gill rakers short and stout, strongly serrated on posterior side, 7 to 9 on lower limb of first arch**. Dorsal-fin origin at vertical through posterior nostril on blind side. Dorsal-fin rays 83 to 93, no elongate fin rays; anal-fin rays 62 to 74; fin rays in mid-regions of both fins scaly. Ocular-side pectoral fin larger than that on blind side; 11 or 12 rays in ocular-side pectoral fin, 10 on blind side. **Upper 1 or 2 rays of pectoral fin elongate in males, not extending much beyond mid-point of body**; bases of pelvic fins about equal in length, both short and slightly asymmetrical in position with ocular-side fin slightly posterior to that of blind side. Caudal fin double truncate; caudal peduncle moderately deep. **Scales large, ctenoid on ocular side, cycloid on blind side**; accessory scales present on both sides, particularly in region of lateral line. **Lateral line lacking distinct curve above pectoral fin; 52 to 60 scales in lateral line**. Vertebrae 10 + 24 to 26. **Colour:** (more intense in males) ocular side tan to brownish, with or without numerous spots or blotches on body and median fins; several broad, dark, vertical lines across interorbital space; a dark, diffuse spot or spots on lateral line above distal part of pectoral fin; pectoral fin with diffuse cross-bars; both pelvic fins with fin rays darker than connecting membranes; ocular-side dorsal and anal fins with numerous dusky blotches that are nearly black at tips of fin rays; caudal fin with 2 horizontal series of 3, irregular blotches. Blind side uniformly off-white to yellowish; that of large males somewhat dusky.

Size: Maximum standard length to 40 cm, common to 30 cm.

Habitat, biology, and fisheries: Inhabits mud, sand, gravel and shell-hash bottoms in depths of 15 to 200 m, possibly even to 400 m. Little additional information known concerning this species. Caught off entire West African coast, both inshore and offshore. Most commercially important of the paralichthyid and bothid species occurring in the area. Separate statistics not reported for this species. Caught with bottom trawls, fixed bottom nets, and on line gear. Utilized fresh, smoked and dried-salted.

Distribution: Eastern Atlantic; West Africa from Western Sahara to Namibia; Cape Verde Islands.

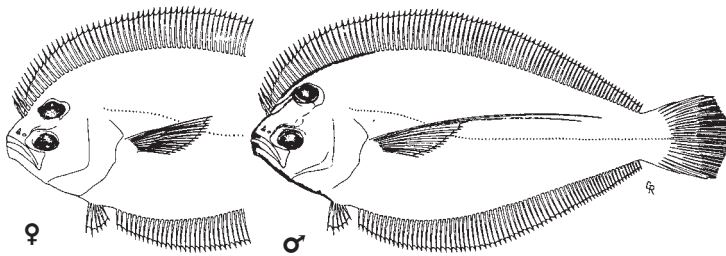


Syacium papillosum (Linnaeus, 1758)

Frequent synonyms / misidentifications: None / *Syacium micrurum* (Ranzani, 1842).

En – Dusky flounder; **Fr** – Fausse limande sombre; **Sp** – Lenguado fusco.

Maximum size 25 cm total length, commonly to 20 cm total length. On soft bottom habitats, usually at depths of 35 to 100 m, and possibly deeper (to depths of 140 m in the western Atlantic). No commercial fisheries for this species in the eastern Atlantic. Elsewhere, usually taken as bycatch in industrial trawl fisheries for shrimps and finfishes. Marketed fresh. Known only from Ascension Island in the eastern Atlantic; in the western Atlantic along coast of United States from North Carolina to Florida; Gulf of Mexico; West Indies; Tobago; Caribbean Sea south to Rio Grande do Sul, Brazil.

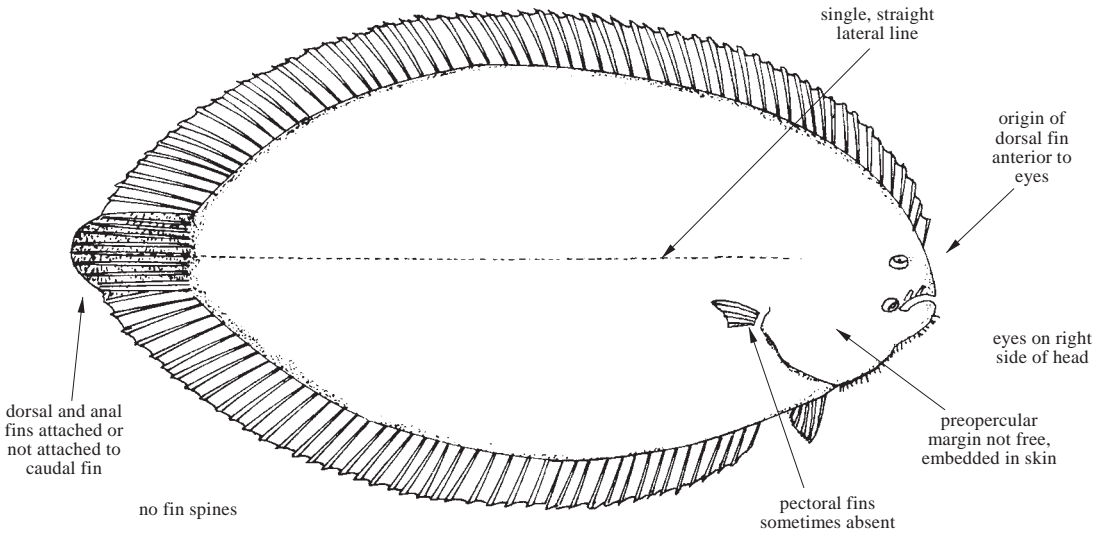


SOLEIDAE

Soles

M. Desoutter-Meniger, Muséum National d'Histoire Naturelle, Paris, France and
 T.A. Munroe, National Marine Fisheries Service, National Museum of Natural History, Washington, DC, USA

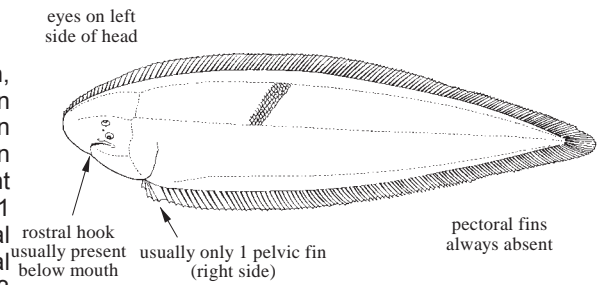
Diagnostic characters: Small to large-sized **dextral flatfishes (eyes on right side of head, reversals rare)** with strongly compressed, oval to more or less elongate bodies. Head relatively small; anterior profile rounded to slightly pointed. **Mouth small and asymmetrical, terminal or slightly inferior, more or less arched;** lips fleshy, smooth or fringed; snout sometimes hook-shaped; teeth small, villiform, better developed on blind-side jaws; no teeth on palatines (roof of mouth). **Preopercle without free margin, embedded in skin.** No spines in fins; dorsal fin extending far forward on head; dorsal and anal fins sometimes completely separate from caudal fin, in other cases, dorsal and anal fins united to caudal fin by a fine membrane, or with 3 fins continuous; pectoral fins sometimes absent; when present, right usually longer than left; pelvic fins sometimes asymmetrical, either free or joined to anal fin. Scales moderately large, cycloid or ctenoid, **sometimes modified into sensorial skin flaps fringed as sensory filaments.** Lateral line single and straight on body, sometimes branched on head (= supra-temporal branch). **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 whitish.



Habitat, biology, and fisheries: Benthic fishes, on sandy or muddy bottoms from near the shore zone to the outer continental shelf and upper continental slope at depths between 0 m and 1 000 m. Omnivorous species that feed on benthic invertebrates or fishes. Pelagic spawning. Many species of considerable economic importance. Average catches of 19 350 tonnes were reported in the region during the period 2000–2006, with 3 400 tonnes caught by Morocco, 2 200 tonnes by Spain, 2 800 tonnes by Nigeria and 7 600 tonnes by Angola.

Similar families occurring in the area

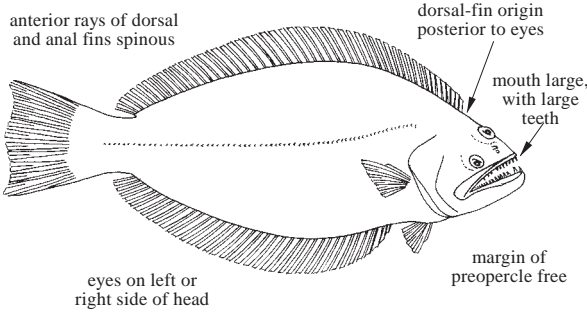
Cynoglossidae: also with small mouth, dorsal-fin origin far forward on head, no fin spines and preopercle margin embedded in skin, but eyes on left side of body (on right in Soleidae) and rostral hook usually present (except *Symphurus*). Also, usually only 1 pelvic fin, pectoral fins always absent, dorsal and anal fins always joined to pointed caudal fin; and with either no lateral line or with 2 or 3 lateral lines on ocular side.



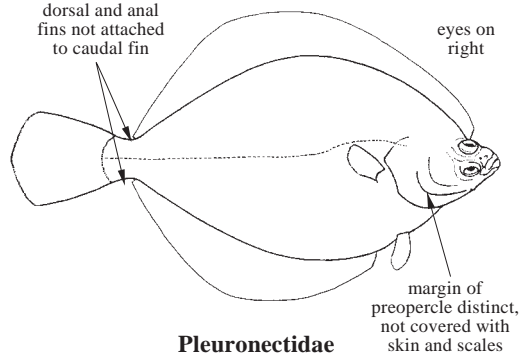
Cynoglossidae

Psettodidae: mouth large, with large teeth; dorsal fin well posterior to posterior margin of upper eye; anterior dorsal- and anal-fin rays spinous; margin of preopercle free and distinct, not embedded in skin; upper eye on top of head.

Pleuronectidae: mouth large and terminal with large teeth; lower jaw usually prominent; preopercle margin free and well visible; dorsal and anal fins without spines; dorsal-fin origin anterior to posterior margin of upper eye.

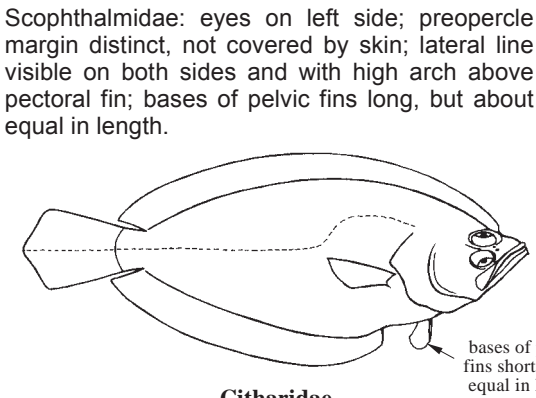


Psettodidae

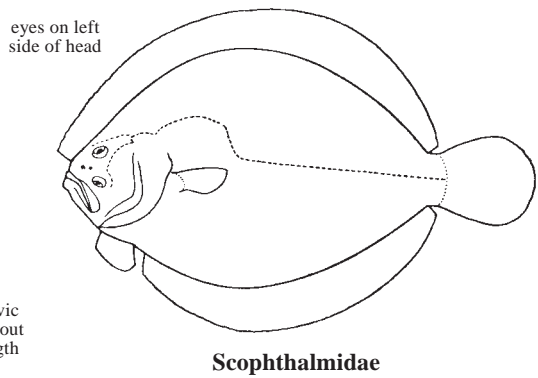


Pleuronectidae

Citharidae: eyes on left or right side; mouth large; preopercle margin distinct, not covered by skin; lateral line visible on both sides and with high arch above pectoral fin; bases of pelvic fins short, but about equal in length.



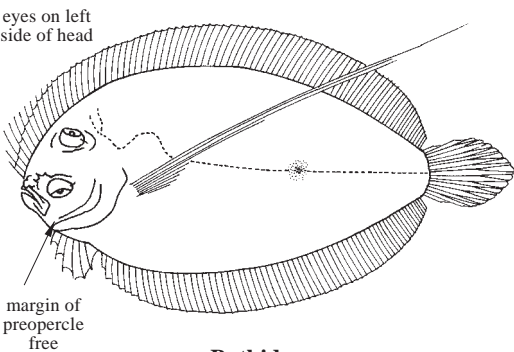
Citharidae



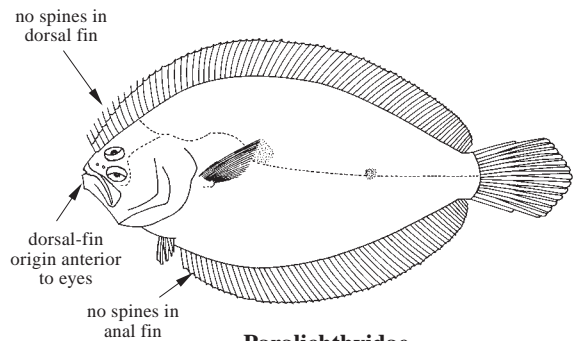
Scopthalmidae

Bothidae: eyes on left side (reversals rare); preopercle margin distinct, not covered by skin; lateral line visible on both sides and with high arch above pectoral fin; ocular-side pelvic fin on mid-ventral line with origin anterior to that of blind-side pelvic fin above mid-ventral line.

Paralichthyidae: eyes nearly always on left side, reversals rare; preopercle margin distinct, not covered by skin; dorsal-fin origin anterior to posterior margin of upper eye; lateral line with high arch over pectoral fin.



Bothidae



Paralichthyidae

Key to species of Soleidae occurring in the area

1a. Anterior snout with bony process; dorsal and anal fins confluent (broadly joined) with caudal fin (Fig.1) → **2**

1b. Anterior snout without bony process; caudal fin more or less separated from dorsal and anal fins (sometimes with membranous connection basally with posteriormost dorsal- and anal-fin rays) (Fig. 2). → **3**

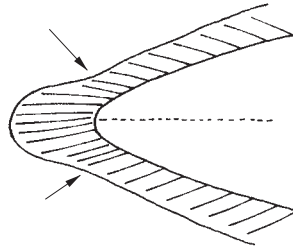


Fig. 1

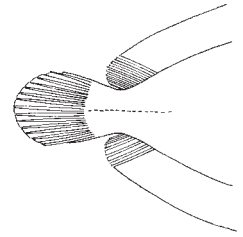


Fig. 2

2a. Body without white spots (Fig. 3); 18 caudal-fin rays ***Dagetichthys lusitanicus***

2b. Body with many white spots (Fig. 4); 16 caudal-fin rays ***Dagetichthys cadenati***

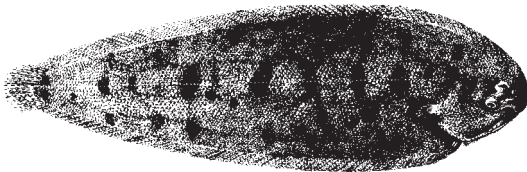


Fig. 3 *Dagetichthys lusitanicus*

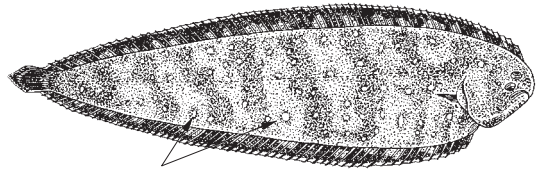


Fig. 4 *Dagetichthys cadenati*

3a. Both pectoral fins absent (Fig. 5) ***Heteromycteris proboscideus***

3b. At least one pectoral fin present → **4**

4a. Pectoral fin present on ocular side, absent on blind side (Fig. 6). ***Monochirus atlanticus***

4b. Both pectoral fins present (sometimes reduced) → **5**

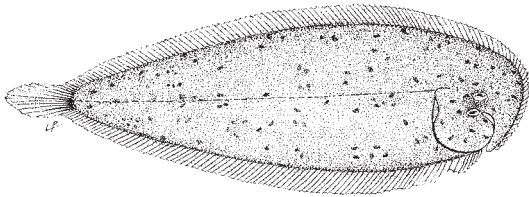


Fig. 5 *Heteromycteris proboscideus*

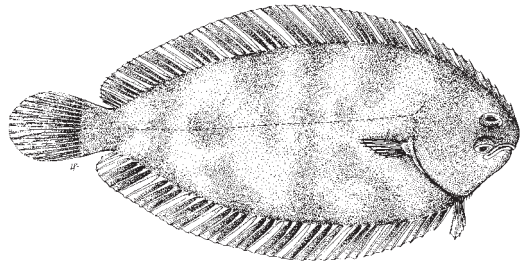


Fig. 6 *Monochirus atlanticus*

5a. Pectoral fin of blind side same size or slightly shorter than that on ocular side → **6**

5b. Pectoral fin of blind side reduced in size compared with ocular-side counterpart → **11**

6a. Anterior nostril of blind side a simple tube, not enlarged → **7**

6b. Anterior nostril of blind side enlarged → **8**

- 7a. Membrane between rays of ocular-side pectoral fin with same colour as that of body (Fig. 7) ***Solea solea***
- 7b. Membrane between rays of ocular-side pectoral fin darker than body colour (Fig. 8) ***Solea senegalensis***

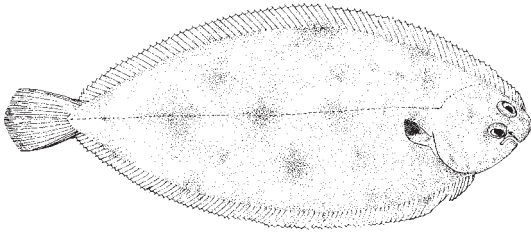


Fig. 7 *Solea solea*

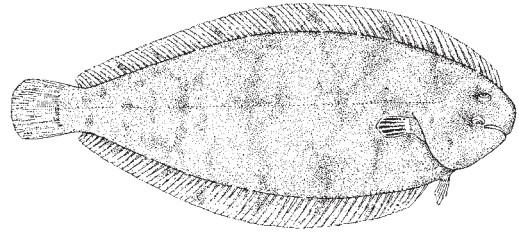


Fig. 8 *Solea senegalensis*

- 8a. Anterior nostril of blind side shaped like a cupula (Fig. 9a) ***Synapturichthys kleinii***
- 8b. Anterior nostril of blind side shaped like a rosette (Fig. 9b) → 9
- 9a. Ocular-side colour pattern featuring 3 ocelli along lateral line (Fig. 10) . . . ***Pegusa triophthalma***
- 9b. Ocular-side colour pattern not featuring 3 ocelli along lateral line → 10

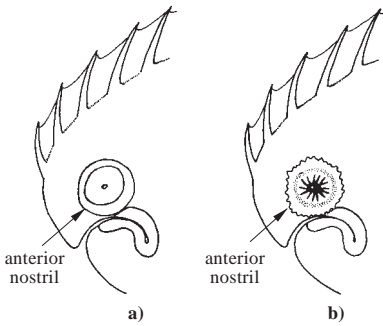


Fig. 9

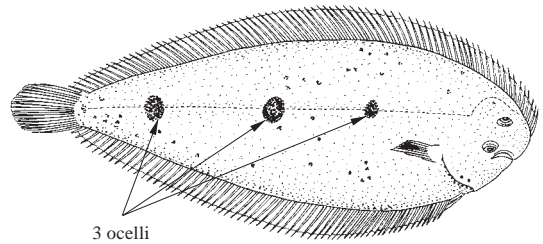
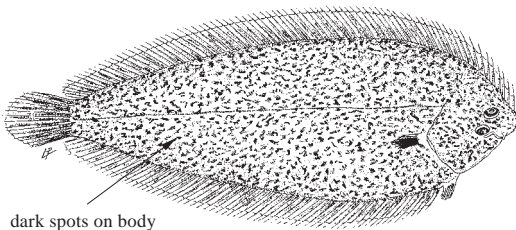


Fig. 10 *Pegusa triophthalma*

- 10a. Numerous dark spots on body (Fig. 11) ***Pegusa cadenati***
- 10b. No dark spots on body (diffuse blotches may be present) (Fig. 12) ***Pegusa lascaris***



dark spots on body

Fig. 11 *Pegusa cadenati*

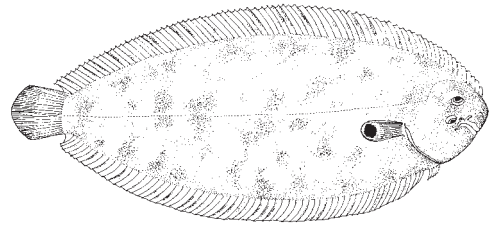


Fig. 12 *Pegusa lascaris*

- 11a. Ocelli present on ocular-side body → 12
- 11b. No ocelli on ocular-side body → 14

12a. Three pairs of ocelli on body near bases of dorsal and anal fins (Fig. 13); no dark spots or longitudinal lines on mid-body ***Microchirus hexophthalmus***

12b. Both dorsal and ventral ocelli and longitudinal lines or spots present on mid-body → 13

13a. Two pairs of ocelli along bases of dorsal and anal fins in combination with longitudinal bands on body; no dark blotch on mid-body just posterior to ocular-side pectoral fin (Fig. 14) ***Microchirus frechkopi***

13b. Two pairs of ocelli along bases of dorsal and anal fins in combination with dark cross-band on caudal peduncle and dark blotch on body mid-line just posterior to ocular-side pectoral fin (Fig. 15) ***Microchirus ocellatus***

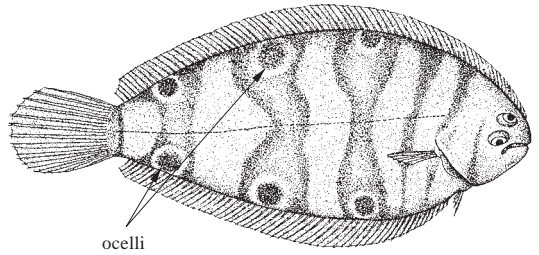


Fig. 13 *Microchirus hexophthalmus*

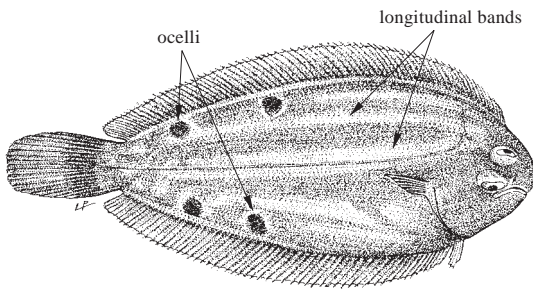


Fig. 14 *Microchirus frechkopi*

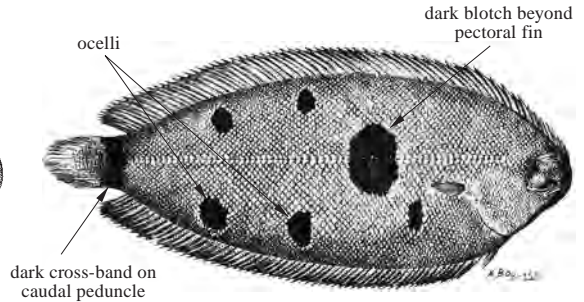


Fig. 15 *Microchirus ocellatus*

14a. Body elongate, especially in posterior half; supratemporal branch of lateral line describing an angular "S" (Fig. 16) ***Dicologlossa cuneata***

14b. Body oval; supratemporal branch of lateral line not describing an angular "S" → 15

15a. Posteriormost dorsal- and anal-fin rays completely separated from caudal peduncle. → 16

15b. Posteriormost dorsal- and anal-fin rays connected by membrane to caudal peduncle → 18

16a. Ocular side with small, dark, incomplete (mostly) cross-bands (Fig. 17). . ***Microchirus boscanion***

16b. Ocular side with large, dark, complete or incomplete cross-bands → 17

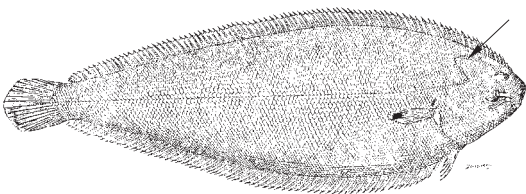


Fig. 16 *Dicologlossa cuneata*

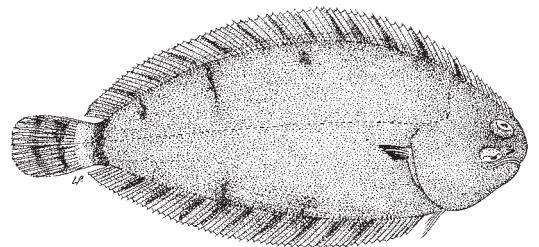


Fig. 17 *Microchirus boscanion*

- 17a. Blind-side pectoral fin white; with 3 or 4 rays (Fig. 18) ***Microchirus variegatus***
- 17b. Blind-side pectoral fin darkly pigmented; with 5 or 6 rays (Fig. 19) ***Microchirus wittei***

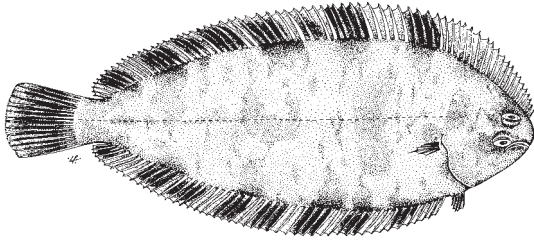


Fig. 18 *Microchirus variegatus*

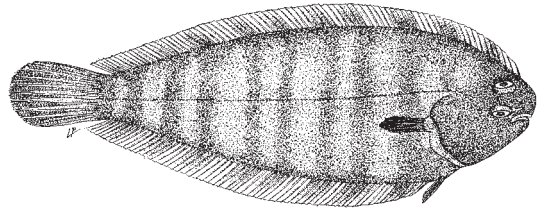


Fig. 19 *Microchirus wittei*

- 18a. Inside of mouth white → 19
- 18b. Inside of mouth black → 21

- 19a. Posterior part of ocular-side pectoral fin with a diamond-shaped blotch surrounded by white (Fig. 20) ***Vanstraelenia chirophthalma***

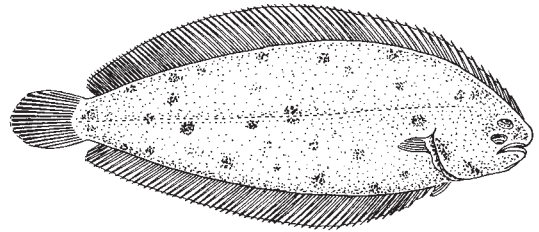


Fig. 20 *Vanstraelenia chirophthalma*

- 19b. No pigmented blotch on ocular-side pectoral fin → 20

- 20a. Body uniformly dark or medium-brown, without conspicuous blotches (Fig. 21) . . . ***Microchirus azevia***
- 20b. Body lighter with several dark brown, conspicuous blotches (Fig. 22) ***Buglossidium luteum***

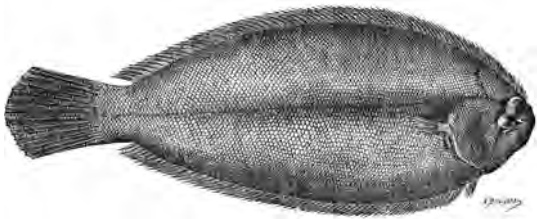


Fig. 21 *Microchirus azevia*

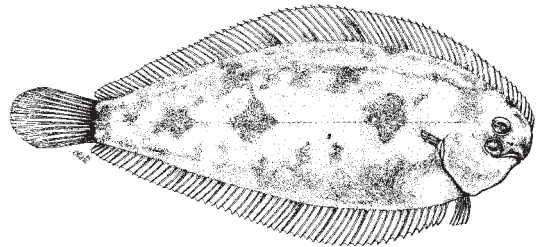


Fig. 22 *Buglossidium luteum*

- 21a. Dorsal-fin rays less than 80 (Fig. 23) ***Bathysolea polli***
- 21b. Dorsal-fin rays more than 80 (Fig. 24) ***Bathysolea profundicola***

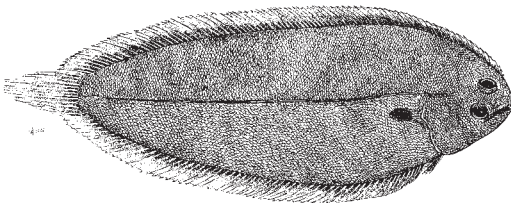


Fig. 22 *Bathysolea polli*

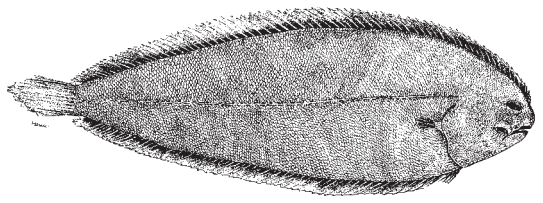



Fig. 23 *Bathysolea profundicola*

List of species occurring in the area

The symbol  is given when species accounts are included.

-  *Bathysolea polli* (Chabanaud, 1950).
-  *Bathysolea profundicola* (Vaillant, 1888).
-  *Buglossidium luteum* (Risso, 1810).
-  *Dagetichthys cadenati* (Chabanaud, 1847).
-  *Dagetichthys lusitanicus* (de Brito Capello, 1868).
-  *Dicologlossa cuneata* (Moreau, 1881).
-  *Heteromycteris proboscideus* (Chabanaud, 1925).
-  *Microchirus azevia* (de Brito Capello, 1867).
-  *Microchirus boscanion* (Chabanaud, 1926).
-  *Microchirus frechkopi* Chabanaud, 1952.
-  *Microchirus hexophthalmus* (Bennett, 1831).
-  *Microchirus ocellatus* (Linnaeus, 1758).
-  *Microchirus variegatus* (Donovan, 1808).
-  *Microchirus wittei* Chabanaud, 1950.
-  *Monochirus atlanticus* Chabanaud, 1940.
-  *Pegusa cadenati* Chabanaud, 1954.
-  *Pegusa lascaris* (Risso, 1810).
-  *Pegusa triophthalma* (Bleeker, 1863).
-  *Solea senegalensis* Kaup, 1858.
-  *Solea solea* (Linnaeus, 1758).
-  *Synapturichthys kleinii* (Risso, 1827).
-  *Vanstraelenia chirophthalma* (Regan, 1915).

Remarks: *Bathysolea lactea* Roule, 1916, doubtful species. No sheet provided for this species.

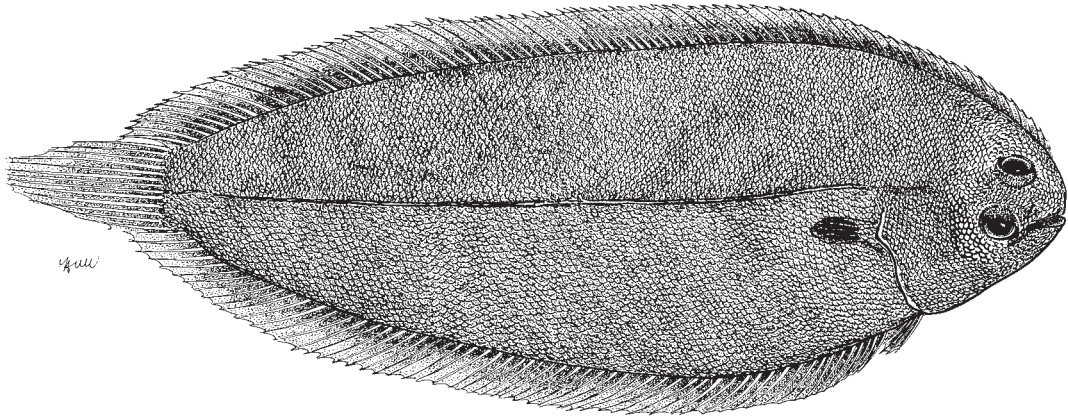
References

- Desoutter, M.** 1994. Révision des genres *Microchirus*, *Dicologlossa* et *Vanstraelenia* (Pleuronectiformes, Soleidae). *Cybium*, 18(3): 215–249.
- Desoutter, M. & Chapleau, F.** 1997. Taxonomic status of *Bathysolea profundicola* and *B. polli* (Soleidae, Pleuronectiformes) with notes on the genus. *Ichthyological Research*, 44(4): 399–412.
- Vachon, J., Chapleau F. & Desoutter-Meniger, M.** 2007. Révision taxinomique et phylogénie de *Dagetichthys* et *Synaptura* (Soleidae). *Cybium*, 31(4): 401–416.
- Vachon, J., Chapleau F. & Desoutter-Meniger, M.** 2008. Révision taxinomique du genre *Solea* et réhabilitation du genre *Banardichthys* (Soleidae; Pleuronectifomes). *Cybium*, 32(1): 9–26.

Bathysolea polli (Chabanaud, 1950)

Frequent synonyms / misidentifications: *Capartella polli* Chabanaud, 1950 / *Bathysolea profundicola*.

FAO names: **En** – Black sole; **Fr** – Sole noire; **Sp** – Lenguado negra.



Diagnostic characters: Body oval, elongate, laterally compressed; greatest depth in anterior one-third with gradual posterior taper. Head length about 4 times in standard length. Snout broadly rounded, short. Eyes separated by narrow, scaly, interorbital space; upper aspects of eyes scaly; upper eye less than its own diameter from dorsal profile of head. Ocular-side anterior nostril reaching anterior margin of lower eye. Blind-side anterior nostril not enlarged. Mouth symphysis reaching vertical through middle of lower eye. Dorsal-fin rays 72 to 82; dorsal-fin origin slightly in advance of vertical through anterior margin of upper eye; anal-fin rays 59 to 66; **basal one-third of posteriormost rays of dorsal- and anal-fin rays connected to caudal peduncle by membrane**; caudal peduncle distinct. **Pectoral fins filamentous; ocular-side pectoral-fin rays 3 to 5; blind-side pectoral-fin rays 2 or 3**; pectoral fins subequal; ocular-side pectoral fin longer than that on blind side; pectoral-fin rays simple. Lateral line with 91 to 119 scales; supratemporal branch of lateral line visible. **Colour:** ocular side dark brown; both lips dark; inside of mouth dark; dorsal, anal and caudal fins with darker brown pigments mainly on inter-radial fin membranes; ocular-side pectoral and pelvic fins darkly pigmented. Blind side whitish.

Size: Maximum to 30 cm total length.

Habitat, biology, and fisheries: Inhabits continental shelf and upper slope to 420 m. No data on feeding and spawning. Separate statistics are not reported for this species. No indication for marketing.

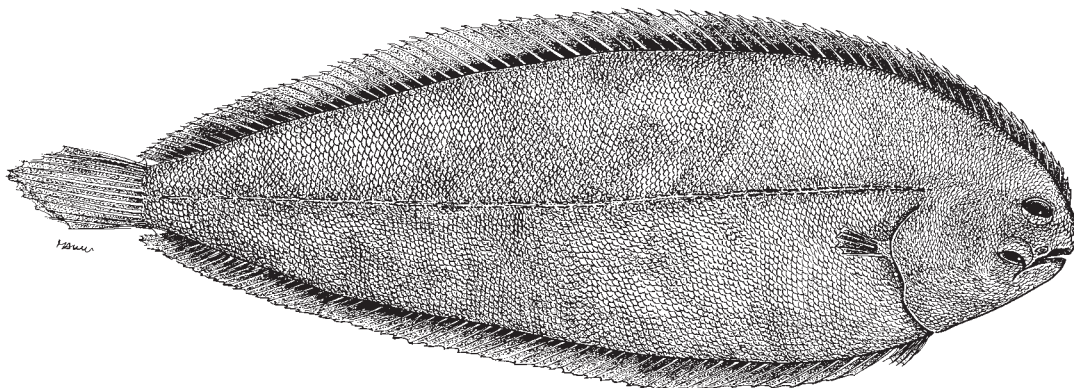
Distribution: Tropical eastern Atlantic from Senegal to Angola, possibly Mauritania.



Bathysolea profundicola (Vaillant, 1888)

Frequent synonyms / misidentifications: *Solea profundicola* Vaillant, 1888; *Microchirus profundicola* (Vaillant, 1888) / *Bathysolea polli*.

FAO names: **En** – Deep water sole; **Fr** – Sole de profondeur; **Sp** – Lenguado de profundidad.



Diagnostic characters: Body oval, elongate, laterally compressed; greatest depth near midpoint with moderate posterior taper. Head small, bluntly pointed. Snout short, bluntly pointed. Eyes separated by narrow, scaly, interorbital space; upper aspects of eyes scaly. Mouth symphysis reaching vertical through middle of lower eye. Ocular-side anterior nostril tubular, reaching anterior margin of lower eye. Blind-side anterior nostril not enlarged. Dorsal-fin rays 76 to 90; dorsal-fin origin slightly in advance of vertical through anterior margin of upper eye; anal-fin rays 62 to 85; **basal one-third of posteriormost rays of dorsal and anal fins with membraneous connection to caudal peduncle; caudal peduncle distinct. Pectoral fins filamentous;** ocular-side pectoral-fin rays 2 to 5; blind-side pectoral fin with 1 to 4 rays; blind-side fin shorter than ocular-side counterpart. Lateral line with 64 to 134 pored scales; supratemporal branch of lateral line visible. **Colour:** ocular side pale brown. **Darker pigmentation on upper and lower lips; inside of mouth dark.** Ocular sides of dorsal and anal fins with similar colour as that on ocular side of body except with darker brown interradiation membranes. Blind side whitish.

Size: Maximum to 25 cm total length.

Habitat, biology, and fisheries: Inhabits the outer continental shelf and upper continental slope at depths of 250 to 1 350 m, generally 250 to 600 m. Feeds on invertebrates such as amphipods and polychaetes. Spawning occurs throughout the year with maximums in winter and beginning of spring. Separate statistics not reported for this species. Marketed rarely, but marketed fresh when present in commercial catches.

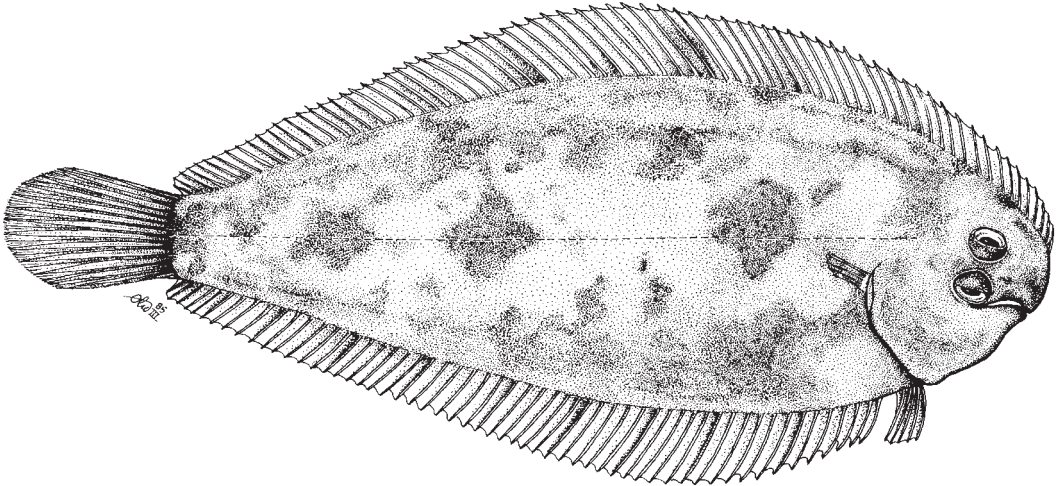
Distribution: Eastern Atlantic from southern Ireland to Angola. Also in Mediterranean Sea.



Buglossidium luteum (Risso, 1810)

Frequent synonyms / misidentifications: *Microchirus luteum* (Risso, 1810) / *Microchirus boscanion*.

FAO names: En – Solenette; Fr – Sole jaune; Sp – Tambor.



Diagnostic characters: Body oval, laterally compressed; greatest depth near midpoint with moderate anterior and posterior taper beyond this point. Head short, obtusely rounded anteriorly. Snout slightly longer than eye diameter; bluntly rounded. Eyes separated by narrow, scaly interorbital space. Ocular-side anterior nostril reaching vertical through anterior margin of lower eye; blind-side nostrils simple tubes, not enlarged. Mouth symphysis reaching vertical through centre or anterior third of lower eye. Dorsal-fin rays 61 to 80; anal-fin rays 48 to 61; **posteriormost rays of dorsal and anal fins with membraneous connection to caudal peduncle; caudal peduncle distinct.** Ocular-side pectoral-fin rays 3 to 5; blind-side pectoral-fin rays 1 to 5. Lateral line with 50 to 80 pored scales; **supratemporal branch of lateral line not visible.** **Colour:** ocular side of body yellow to reddish brown with some darker brown blotches; ocular sides of dorsal and anal fins with alternating series of 1 black fin-ray and 4 to 6 hyaline rays. Blind sides of dorsal and anal fins with same colour as that on ocular sides of fins. Blind side whitish.

Size: Maximum to 20 cm total length.

Habitat, biology, and fisheries: Demersal species on sandy bottoms at depths of 5 to 450 m on the continental shelf and upper continental slope, generally found from 10 to 40 m. Feeds mainly on crustaceans, bivalves, molluscs, and polychaetes. Spawning occurs in February to August. Of minor commercial importance; separate statistics not reported for this species. Taken in bottom trawls or shore seines. Marketed fresh, but only occasionally due to its small size.

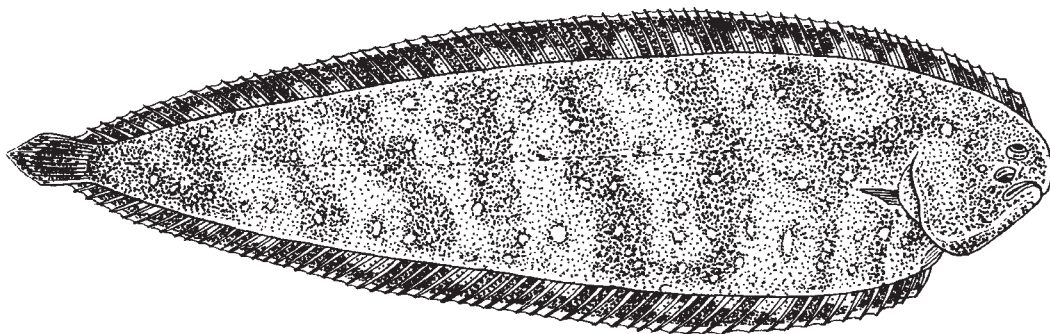
Distribution: Northeastern Atlantic from the Irish Sea and Channel Sea to Morocco; also in the Mediterranean Sea.



Dagetichthys cadenati (Chabanaud, 1947)

Frequent synonyms / misidentifications: None / *Dagetichthys lusitanicus*.

FAO names: En – Guinean sole; Fr – Sole-ruardon du Golfe; Sp – Lenguado de Guinea.



Diagnostic characters: Body elongate, greatest depth in anterior one-third with gradual anterior and posterior taper beyond this point. Snout short, bluntly rounded. Head length 15 to 19% of standard length; eye diameter 15% of head length. **Anterior snout with bony process.** Eyes separated by narrow, scaly, interorbital space. One or 2 cirri present between anterior and posterior nostrils. Ocular-side anterior nostril tubular, not reaching vertical through anterior margin of lower eye. **Blind-side anterior nostril not enlarged, but middle of excrescence limited by a non-scaly groove.** Mouth symphysis reaching vertical through posterior one-third of lower eye; lips with numerous labial papillae. Dorsal-fin rays 75 to 79. Anal-fin rays 59 to 62. **Caudal fin confluent with dorsal and anal fins; outer caudal rays broadly attached by a membrane to posteriormost fin ray of each of these fins; posteriormost fin ray about equal in length to preceding fin rays. Caudal peduncle not distinct.** Urinary papilla near anus. Pectoral fins equally developed with 6 to 8 fin rays; pelvic fins with 2 to 4 fin rays. Lateral line with 105 to 110 pored scales; supratemporal branch visible as a smooth rounded curve. Ocular-side scales ctenoid and rectangular. **Colour:** ocular side greyish brown to brownish violet with numerous, randomly scattered darker blotches of different sizes and with many white spots; lateral-line pores white. Vertical fins margined with white. Blind side whitish.

Size: Maximum to 35 cm total length.

Habitat, biology, and fisheries: Inhabits sand and mud bottoms from the coastline to about 50 m; also found in brackish waters. No data on feeding and spawning. Separate statistics not reported for this species. Taken in bottom trawls and shore seines. Marketed fresh.

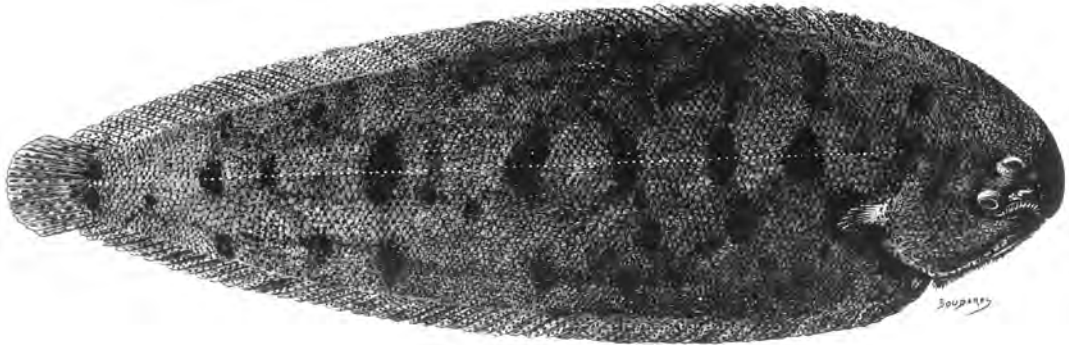
Distribution: Tropical Eastern Atlantic Ocean off West Africa from Senegal to Congo, principally in the Gulf of Guinea.



Dagetichthys lusitanicus (de Brito Capello, 1868)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Portuguese sole; Fr – Sole ruardon commune; Sp – Lenguado portugués.



Diagnostic characters: Body elongate, laterally compressed; greatest depth in anterior one-third with gradual anterior and posterior taper beyond this point. Head length 15 to 20% of standard length; eye diameter 15% of head length. **Anterior snout with bony process.** Eyes separated by narrow, scaly, interorbital space. One or 2 cirri between anterior and posterior ocular-side nostrils. Ocular-side anterior nostril tubular, not reaching vertical through anterior margin of lower eye. **Blind-side anterior nostril not enlarged, middle of excrescence limited by a non-scaly groove.** Mouth symphysis reaching vertical through posterior one-third of lower eye. Mouth short; lips with papillae. Dorsal-fin rays 71 to 84. Anal-fin rays 54 to 69. **Caudal fin confluent with dorsal and anal fins; outer caudal-fin rays broadly attached by membrane to posteriormost fin ray of each of these fins; posteriormost dorsal- and anal-fin rays about equal in length to that of preceding rays in each fin; caudal peduncle not distinct.** Urinary papilla near anus. Pectoral fins equally developed with 6 to 10 fin rays; pelvic fins with 2 to 4 fin rays. Lateral line with 105 to 135 pored scales; supratemporal branch forming smoothly rounded curve. Ocular-side scales ctenoid and rectangular. **Colour:** body colour variable. Ocular side usually greyish with blackish blotches tending to form longitudinal series; largest blotches concentrated on lateral line. Ocular-side pectoral fin dark. Blind side whitish.

Size: Maximum to 48 cm total length; common between 15 and 35 cm total length.

Habitat, biology, and fisheries: Inhabits mud and sand bottoms between the coastline and about 60 m. No data on feeding and spawning. Separate statistics not reported for this species. Taken in bottom trawls. Marketed fresh, sometimes frozen.

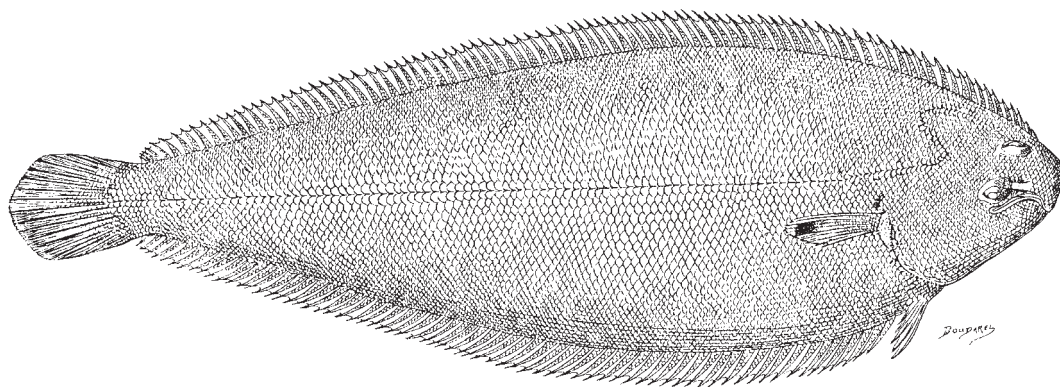
Distribution: Eastern Atlantic Ocean from Portugal and Gibraltar to Angola; also recorded from the Mediterranean Sea.



Dicologlossa cuneata (Moreau, 1881)

Frequent synonyms / misidentifications: *Dicologlossa cuneata* (Moreau, 1881); *Solea cuneata* (Moreau, 1881) / None.

FAO names: **En** – Wedge sole; **Fr** – Céteau; **Sp** – Acedia.



Diagnostic characters: **Body elongate, laterally compressed; with moderate anterior and posterior taper beyond this point; greatest depth (in anterior one-third) contained more than 3 times in standard length.** Snout angulate; upper eye separated from upper profile of head by distance smaller than its diameter. Eyes separated by narrow, scaly, interorbital space. Mouth symphysis reaching vertical through posterior margin of lower eye. Ocular-side anterior nostril tubular not reaching anterior margin of lower eye; anterior nostril of blind side not enlarged. Dorsal-fin rays 81 to 85, origin at vertical through anterior margin of upper eye; anal-fin rays 65 to 78; posteriormost rays of both fins with membraneous connection to caudal peduncle; caudal peduncle distinct; **pectoral fins equally well developed** with 8 to 10 fin rays. Scales ctenoid (rough); easily detached. Lateral line with 105 to 132 pored scales; **supratemporal branch of lateral line visible and describing an angular “S” on head.** **Colour:** ocular side chocolate brown to grey-brown with small bluish spots; ocular-side pectoral fin with a conspicuous oblong black blotch not reaching to posterior margin of fin. Blind side white.

Size: Maximum to 30 cm standard length, common between 10 and 22 cm standard length.

Habitat biology, and fisheries: Demersal on sandy or muddy-sand bottoms from 10 m to about 430 m depth. Occurs primarily in coastal seas in the northern part of its range (between 10 and 100 m), but occurring in much deeper water on the upper continental slope off Mauritania. Feeds mainly on crustaceans (primarily amphipods, but also small shrimps and crabs), also consumes worms and snails. Spawning occurs in autumn and winter. Separate statistics not reported for this species. Taken in bottom trawls. Marketed mostly fresh; the flesh of this small species is highly esteemed.

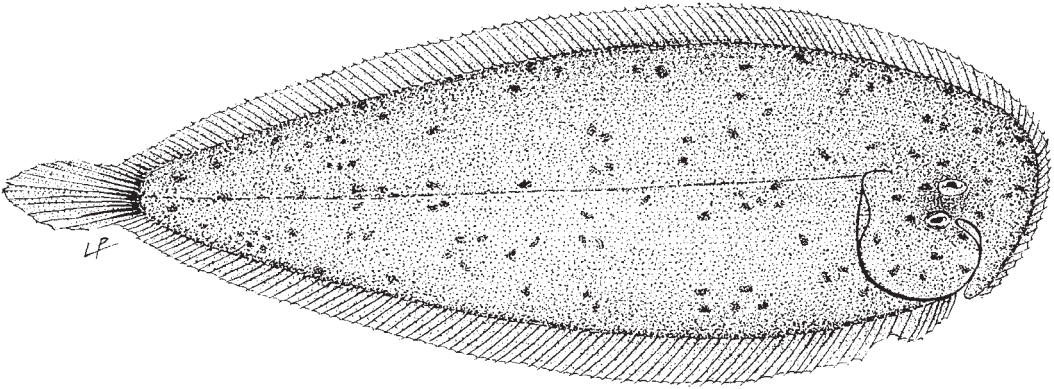
Distribution: Eastern Atlantic Ocean from the Bay of Biscay (La Rochelle) to Cape of Good Hope; abundant off Mauritania and Morocco; uncommon in Gulf of Guinea. Also occurs in the western Mediterranean Sea.



***Heteromycteris proboscideus* (Chabanaud, 1925)**

Frequent synonyms / misidentifications: None / None.

FAO names: En – True sole; Fr – Ceteau trompue; Sp – Acedia trompada.



Diagnostic characters: Body oval, elongate, laterally compressed; greatest depth in anterior one-third with slight anterior and moderate posterior taper beyond this point. Head moderately large, broadly rounded anteriorly. **Snout prominent and large, with snout distinctly hook-shaped, with its ventral terminus nearly reaching posteriorly to about the first pelvic-fin ray; mouth hooked.** Eyes small; lower eye distinctly distant from cephalic margin. **Only the tubular anterior nostril present on ocular side;** blind side with 2 nostrils; blind-side anterior nostril tubular with its distal tip dilated as a fringed, sharp rosette. Dorsal-fin rays 104 to 113, dorsal-fin origin on anterior rostral hook and ventral to opening of mouth; anal-fin rays 72 to 74; dorsal and anal fins with membraneous connection basally to caudal fin; caudal peduncle distinct from caudal fin. **No pectoral fins.** Pelvic fins asymmetrical; ocular-side pelvic fin with broad membraneous connection to anal fin. Lateral line with about 90 pored scales; supratemporal branch of lateral line visible. **Colour:** ocular side yellow with small dark brown to black spots; dorsal and anal fins with alternating series of several dark rays separated by several yellow rays. Blind side whitish.

Size: Maximum size to 10 cm total length.

Habitat biology, and fisheries: Demersal species essentially found in marine waters, but also occurring in estuarine habitats. Separate statistics not reported for this species. Marketed fresh, but not highly regarded as a food fish.

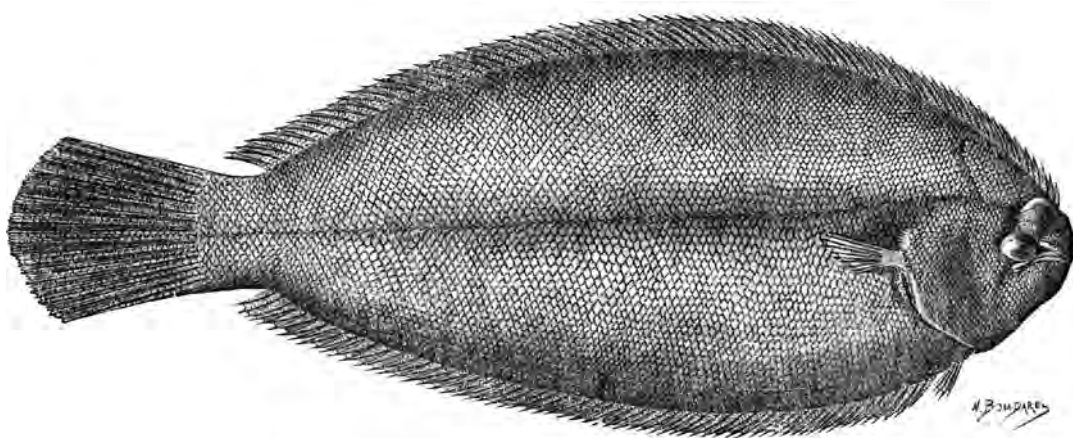
Distribution: Eastern tropical Atlantic from Mauritania to southern Angola.



Microchirus azevia (de Brito Capello, 1868)

Frequent synonyms / misidentifications: *Microchirus theophila* (Risso, 1810); *Solea theophila* (Risso, 1810); *S. azevia* de Brito Capello, 1867; *Dicologlossa azevia* (de Brito Capello, 1867) / None.

FAO names: En – Bastard sole; Fr – Sole-perdrix juive; Sp – Acevia.



Diagnostic characters: Body oval, laterally compressed; greatest depth near midpoint with moderate taper anterior and posterior to this point. Head moderate in size, rounded anteriorly. Snout short, rounded. Eyes separated by narrow, scaly, interorbital space. Mouth symphysis at vertical through centre of lower eye; tubular anterior nostril on ocular side reaching anterior margin of lower eye. Dorsal-fin rays 71 to 86; anal-fin rays 57 to 68. Basal one-third of posteriormost dorsal- and anal-fin rays connected to caudal peduncle by thin transparent membrane; caudal peduncle very distinct. Ocular-side pectoral fin with 6 to 8 fin rays, blind-side pectoral fin with 5 to 8 fin rays, **pectoral fins unequal, that of blind side shorter than counterpart on ocular side, first (dorsalmost) pectoral-fin ray on ocular side simple, the following fin rays bifid.** Lateral line with 98 to 137 pored scales; supratemporal branch of lateral line visible. **Colour:** ocular side uniformly greyish to reddish brown in adults, with 5 or 6 light-margined eyespots in young individuals up to 8 to 10 cm in length; pectoral fins blackish distally; blind side white.

Size: Maximum to 40 cm standard length.

Habitat biology, and fisheries: Inhabits sandy or muddy-sand bottoms between 40 and 340 m depth. Juveniles may be found in shallower waters, including estuaries. Feeds on small benthic invertebrates, mainly amphipods and polychaetes. No data available on spawning. Separate statistics not reported for this species. Taken in bottom trawls. Marketed mostly fresh, principally in Morocco.

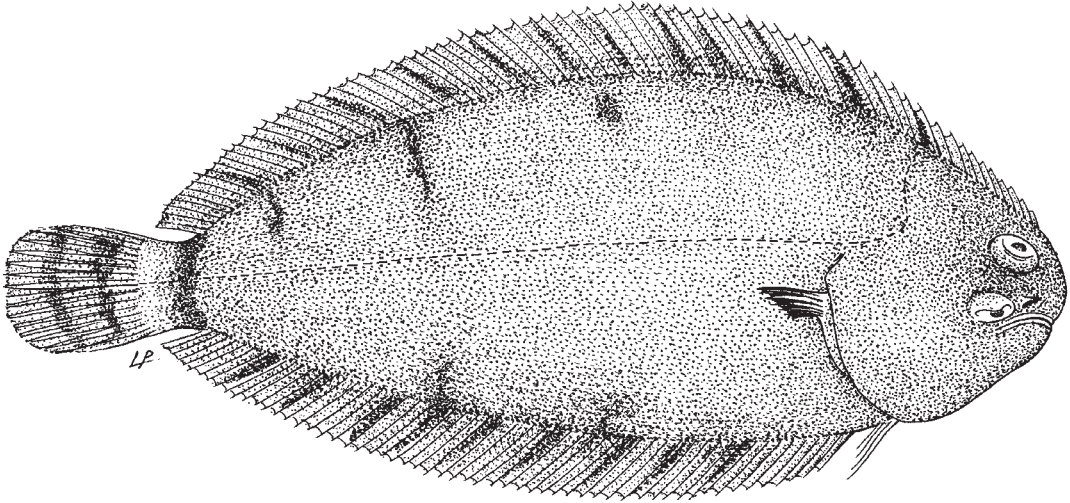
Distribution: Eastern Atlantic Ocean from coast of Portugal to Senegal; also present in the Canary Islands, extending into western Mediterranean Sea; absent in Gulf of Guinea.



Microchirus boscanion (Chabanaud, 1926)

Frequent synonyms / misidentifications: None / *Buglossidium luteum*.

FAO names: En – Lusitanian sole; Fr – Sole lusitanienne; Sp – Lenguado lusitanico.



Diagnostic characters: Body oval, stocky, laterally compressed; greatest depth near midpoint with moderate anterior and posterior taper beyond this point. Head relatively large, rounded anteriorly. Snout short, rounded. Eyes separated by narrow, scaly, interorbital space. Upper aspects of eyes scaly. Mouth symphysis located at vertical through posterior one-third of lower eye; tubular anterior nostril on ocular side directed backwards reaching anterior margin of lower eye. Dorsal-fin rays 70 to 80; anal-fin rays 54 to 63; ocular-side pectoral-fin rays 5 to 7; blind-side pectoral-fin rays 2 to 6; **pectoral fins unequal; blind-side pectoral fin shorter than that on ocular side; first (dorsalmost) pectoral-fin ray on ocular side simple, the following rays bifid**; lateral line with 59 to 78 pored scales; supratemporal branch of lateral line visible on anterior head. **Colour:** dark yellow to reddish brown, with 4 to 6 irregular blotches along bases of dorsal and anal fins; a dark transverse band (sometimes incomplete) on caudal peduncle; dorsal and anal fins with alternating series of 4 to 6 unpigmented rays and 1 or 2 darker rays. Pectoral fin darker than body. Blind side whitish; blind sides of dorsal and anal fins with similar coloration as that on ocular sides of these fins.

Size: Maximum to 20 cm total length.

Habitat biology, and fisheries: Inhabits muddy-sand bottoms on the continental shelf and upper continental slope at depths from 80 to 800 m. No data available on feeding or spawning. Separate statistics not reported for this species. Taken in bottom trawls. Marketed mostly fresh.

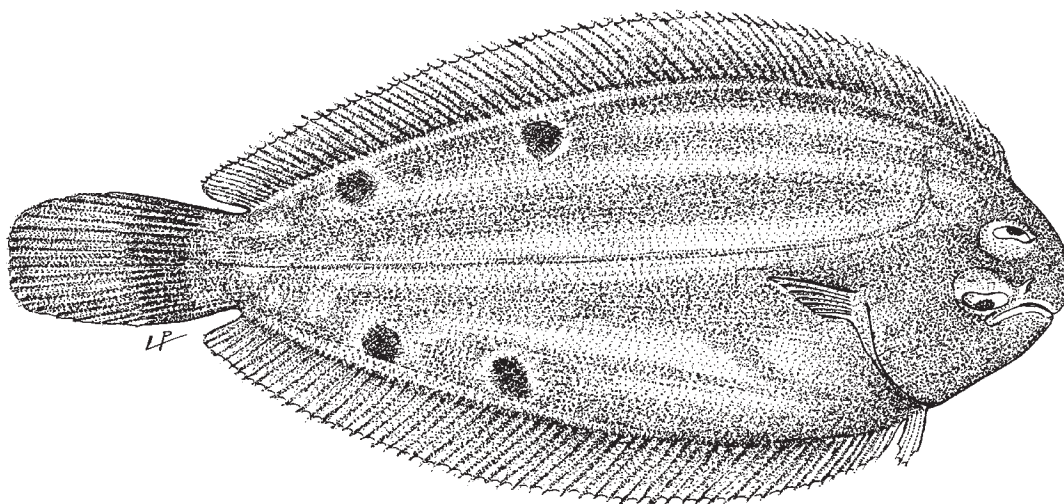
Distribution: Eastern Atlantic Ocean from Gulf of Cadix to northern Angola. In the northern Mediterranean Sea, off the Spanish coast to Gulf of Lyon.



***Microchirus frechkopi* Chabanaud, 1952**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Frechkop's sole; Fr – Sole de Frechkop; Sp – Sole de Freckop.



Diagnostic characters: Body oval, stocky, laterally compressed; greatest depth in anterior one-third with rapid anterior taper and more gradual posterior taper beyond this point. Head relatively large, bluntly pointed anteriorly. Snout small, bluntly pointed. Eyes separated by narrow, scaly, interorbital space. Upper aspects of eyes scaly. Mouth symphysis at vertical through centre of lower eye. Tubular ocular-side anterior nostril directed backwards reaching anterior margin of lower eye. Dorsal-fin rays 60 to 70; anal-fin rays 48 to 55; posteriormost dorsal- and anal-fin rays not connected to caudal peduncle; caudal peduncle distinct; ocular-side pectoral-fin rays 5 to 8; blind-side pectoral-fin rays 2 to 5; pectoral fins unequal, blind-side fin shorter than that on ocular side; first (dorsalmost) pectoral-fin ray on ocular side simple, the following rays bifid. Lateral line with 55 to 77 pored scales; supratemporal branch of lateral line visible. **Colour:** reddish with 5 or 6 darker longitudinal lines and with 4 dark brown eyespots in posterior one-half of body; dorsal and anal fins darker than body; ocular-side pectoral fin dark. Blind side whitish; blind sides of dorsal, anal, and caudal fins dark brown.

Size: Maximum to 20 cm total length.

Habitat, biology, and fisheries: Demersal species on sandy and muddy bottoms on the continental shelf. No data about feeding and spawning. Separate statistics not reported for this species. Taken in bottom trawls. Marketed mostly fresh.

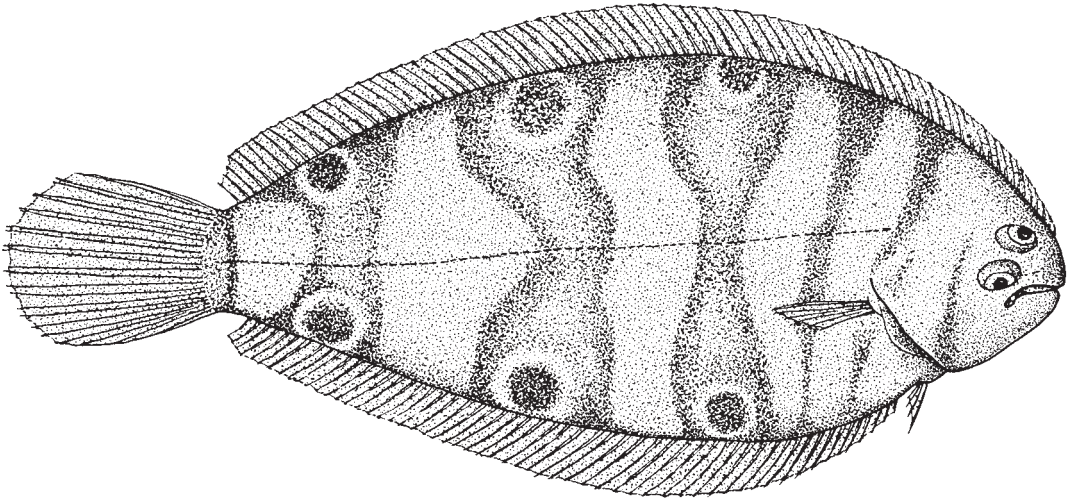
Distribution: Tropical Eastern Atlantic Ocean from Senegal to Gulf of Guinea.



***Microchirus hexophthalmus* (Bennett, 1831)**

Frequent synonyms / misidentification: *Dicologlossa hexophthalma* (Bennett, 1831); *Dicologlossa hexophthalma* (Bennett, 1831); *Solea microphthalma* Bennett, 1831 / None.

FAO names: En – Ocellated wedge sole; Fr – Céteau ocellée; Sp – Acedia ocelada.



Diagnostic characters: Body oval, laterally compressed; greatest depth near midpoint with rapid anterior and moderate posterior taper beyond this point. Head relatively small, bluntly rounded anteriorly. Snout short, rounded anteriorly. Eyes separated by narrow, scaly, interorbital space. Upper aspects of eyes scaly. Mouth symphysis at vertical through centre of lower eye. Ocular-side anterior nostril tubular, reaching anterior margin of lower eye. **Blind-side anterior nostril tubular, not enlarged. Dorsal-fin rays 65 to 80; anal-fin rays 52 to 64;** posteriormost fin rays of dorsal and anal fins connected to caudal peduncle by a small membrane, but caudal peduncle distinct. Ocular-side pectoral-fin rays 5 to 8; blind-side pectoral-fin rays 4 to 8; blind-side pectoral fin shorter than that of ocular side; first (dorsalmost) ray of ocular-side pectoral fin simple, the others bifid. Lateral line with 85 to 115 pored scales; supratemporal branch of lateral line visible. **Colour: ocular side reddish or brown with 6 dark brown ocellated spots (3 each along body near the bases of dorsal and anal fins), also with several dark crossbands.** Blind side whitish.

Size: Maximum to 20 cm total length.

Habitat, biology, and fisheries: Inhabits shallow waters, occasionally found deeper (up to 150 m depth). No data on feeding and spawning. Separate statistics not reported for this species. Taken in bottom trawls or shore seines. Marketed fresh.

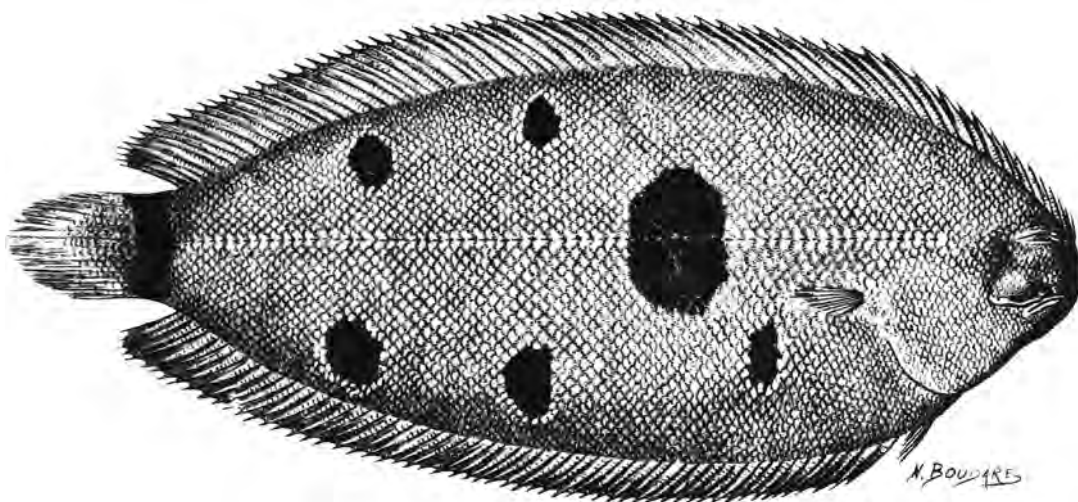
Distribution: Eastern Atlantic Ocean from Western Sahara to Angola, principally in the Gulf of Guinea; also from the Mediterranean coastal seas off Spain. Not known from the coast of Portugal and Morocco.



Microchirus ocellatus (Linnaeus, 1758)

Frequent synonyms / misidentifications: *Monochirus ocellatus* (Linnaeus, 1758) / None.

FAO names: En – Four-eyed sole; Fr – Sole ocellée; Sp – Tambor real.



Diagnostic characters: Body oval, elongate, laterally compressed; greatest depth about at midpoint with gradual anterior and posterior taper beyond this point. Head moderately large, obtusely pointed anteriorly. Snout short, rounded. Eyes contiguous. Upper aspects of eyes scaly. Mouth symphysis at vertical through centre of lower eye. Ocular-side anterior nostril tubular reaching to, or slightly beyond, anterior margin of lower eye. **Blind-side anterior nostril tubular. Dorsal-fin rays 61 to 77;** dorsal-fin origin anterior to vertical through anterior border of upper eye. **Anal-fin rays 48 to 58;** posteriormost rays of dorsal and anal fins not connected to caudal peduncle; caudal peduncle very distinct. Ocular-side pectoral-fin rays 6 to 8, the first (dorsalmost) simple and the others bifid; blind-side pectoral-fin rays 5 to 7; pectoral fins unequal, **blind-side pectoral fin shorter than ocular-side counterpart.** Lateral line with 54 to 78 pored scales; supratemporal branch of lateral line not very distinct. **Colour: ocular side reddish brown or brownish with large dark blotch on midbody and with 4, round, white-edged black ocelli on body (2 near dorsal-fin base and 2 near anal-fin base);** median fins with same general colour as that on body. Blind side whitish, fins dark.

Size: Maximum 20 cm total length, common between 10 and 20 cm total length.

Habitat, biology, and fisheries: Demersal species on mud and sand bottoms mainly around beds of eelgrass and on the continental shelf at 40 to 300 m. No data available on feeding and spawning. Separate statistics not reported for this species. Taken in bottom trawls and shore seines. Occasionally marketed fresh or frozen.

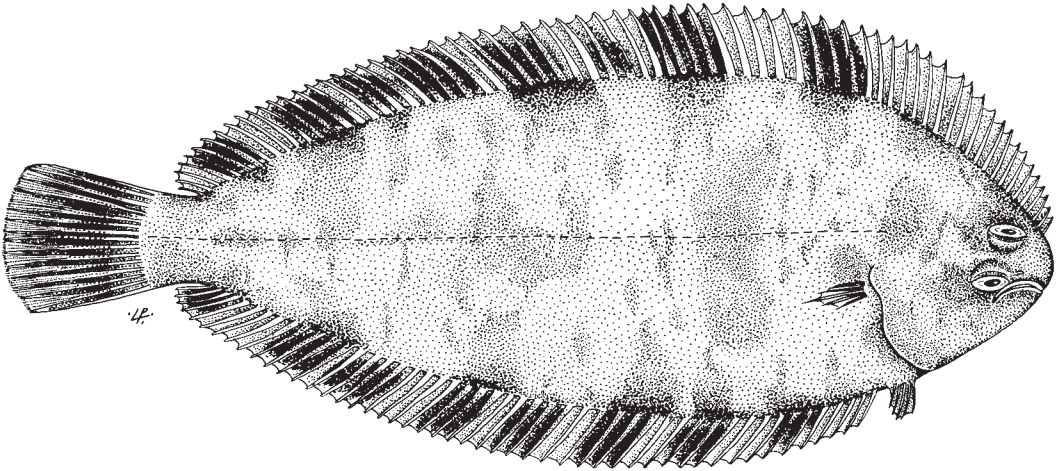
Distribution: Eastern Atlantic: from Canary and Madeira Islands to Sierra Leone, with disjunct population along coast of Natal, South Africa; also at southwest Iberian Peninsula in coastal Atlantic waters; and in the northern Mediterranean Sea to the Aegean Sea, and off Egypt.



***Microchirus variegatus* (Donovan, 1808)**

Frequent synonyms / misidentifications: None / *Microchirus wittei*.

FAO names: En – Thickbak sole; Fr – Sole-perdrix commune; Sp – Golleta.



Diagnostic characters: Body oval, elongate, laterally compressed; greatest depth in anterior one-third with more rapid anterior and more gradual posterior taper beyond this point. Eyes separated by narrow, scaly, interorbital space. Upper aspects of eyes scaly. Mouth symphysis reaching to vertical through centre of lower eye. **Anterior nostril tubular, reaching to or beyond anterior margin of lower eye. Blind-side anterior nostril tubular. Dorsal-fin rays 62 to 80, anal-fin rays 47 to 64;** posteriormost dorsal- and anal-fin rays not connected to caudal peduncle; caudal peduncle distinct; ocular-side pectoral fin with 2 to 5 rays, blind-side pectoral fin with 1 to 4 rays; pectoral fins unequal, blind-side pectoral fin shorter than that on ocular side; first (dorsalmost) pectoral-fin ray of ocular-side pectoral fin simple, the following rays bifid. Lateral line with 65 to 98 pored scales; supratemporal prolongation of lateral line visible. **Colour:** ocular side brownish red to brownish grey with 4 to 6 broad dark brown cross-bands on body and vertical fins; pectoral fins dark brown to blackish. Blind side uniformly whitish; blind sides of dorsal and anal fins with similar coloration as that on ocular sides of these fins.

Size: Maximum to 35 cm standard length; common between 18 and 20 cm standard length.

Habitat, biology, and fisheries: Demersal species on mud and sand bottoms between 80 and 400 m depth; also in eelgrass beds and on the continental shelf between 80 and 100 m. Feeds on wide range of small, bottom-living organisms, mainly crustaceans, such as amphipods and shrimps, also polychaetes and bivalve molluscs. Spawning occurs from February to August, varying according to geographical area. Separate statistics not reported for this species. Taken in bottom trawls. Marketed fresh, flesh well esteemed.

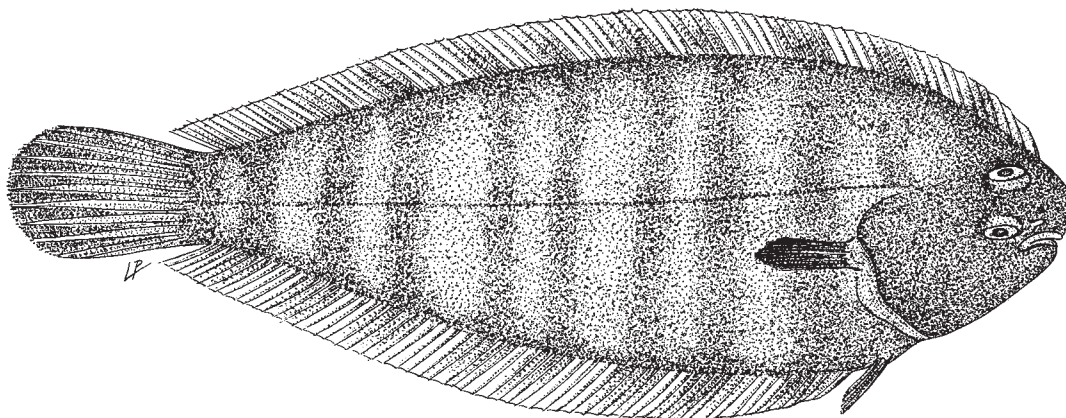
Distribution: Eastern Atlantic; in the area from Gibraltar to Senegal; also northward into the Mediterranean and along the Atlantic coast of Europe to the British Isles.



Microchirus wittei Chabanaud, 1950

Frequent synonyms / misidentifications: None / *Microchirus variegatus*.

FAO names: En – Banded sole; Fr – Sole fasciée; Sp – Tambor de bandas.



Diagnostic characters: Body oval, elongate, laterally compressed; greatest depth in anterior one-third with gradual anterior and posterior taper beyond this point. Head relatively large, slightly pointed anteriorly. Snout short, bluntly pointed. Eyes separated by scaly interorbital space. Upper aspects of eyes scaly. Mouth symphysis anterior to vertical through centre of lower eye. **Ocular-side anterior nostril tubular, reaching or not reaching anterior margin of lower eye. Blind-side anterior nostril tubular. Dorsal-fin rays 63 to 72; anal-fin rays 48 to 55;** posteriormost dorsal- and anal-fin rays not connected to caudal peduncle. Ocular-side pectoral fin with 6 to 9 rays; blind-side pectoral fin with 5 to 7 rays; pectoral fins unequal; blind-side pectoral fin shorter than that on ocular side; first ocular-side pectoral-fin ray simple, remaining rays bifid. Lateral line with 70 to 85 pored scales, supratemporal branch of lateral line visible. **Colour:** ocular side dark brown with 5 broad, dark brown cross-bands on body and vertical fins. Pectoral fin dark brown. Blind side whitish; blind sides of dorsal and anal fins with same coloration as that on ocular sides of these fins; pectoral fin dark.

Size: Maximum size to 25 cm total length.

Habitat, biology, and fisheries: Demersal species found on sand and mud bottoms at 145 to 460 m depth. No data available on feeding and spawning. Separate statistics not reported for this species. Taken in bottom trawls. Marketed fresh.

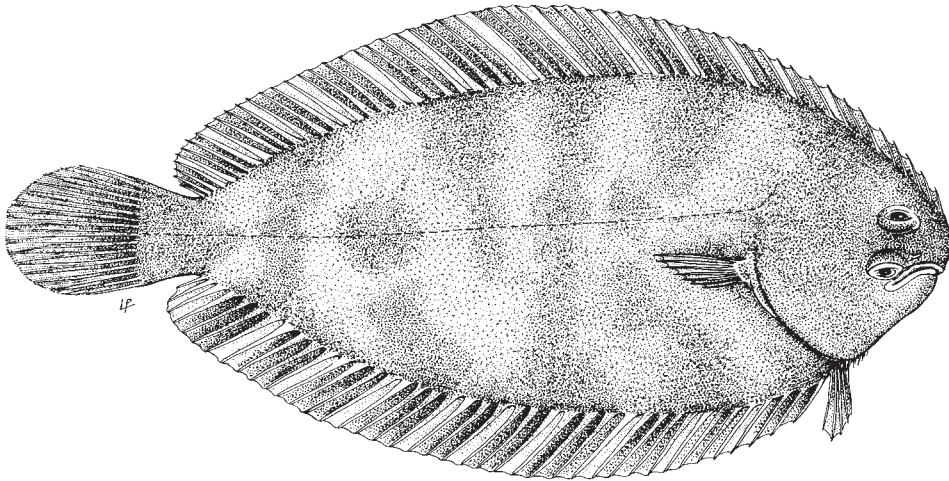
Distribution: Tropical Eastern Atlantic from Mauritania to Congo.



***Monochirus atlanticus* Chabanaud, 1940**

Frequent synonyms / misidentifications: *Monochirus hispidus* Rafinesque, 1814 / None.

FAO names: En – Whiskered sole.



Diagnostic characters: Body oval, stocky, laterally compressed; greatest depth in anterior one-third with moderate anterior and more gradual posterior taper beyond this point. Head relatively large, broadly rounded anteriorly. Snout short, rounded. Eyes separated by small, concave, interorbital space. Mouth symphysis reaching vertical through middle of lower eye. Ocular-side anterior nostril tubular, reaching beyond anterior margin of lower eye; blind-side anterior nostril tubular. **Dorsal-fin rays 50 to 58;** dorsal-fin origin anterior to vertical through anterior margin of eyes; **anal-fin rays 40 to 45;** dorsal and anal fins not connected to caudal peduncle; caudal peduncle very distinct. Ocular-side pectoral fin with 5 or 6 rays; pectoral fin absent on blind side. Scales trapezoid, very rough. Lateral line with 52 to 54 pored scales, supratemporal branch of lateral line not distinct. **Colour:** ocular side greyish or reddish brown with darker spots or irregular bands. Ocular sides of dorsal and anal fins with alternating series of 1 or 2 lightly pigmented and 4 to 6 darkly pigmented fin rays. Ocular-side pectoral fin darker than body colour. Blind side whitish.

Size: Maximum to 20 cm standard length, common between 10 and 15 cm standard length.

Habitat, biology, and fisheries: Demersal species on sand and mud bottoms on the continental shelf between 10 and 250 m depth, also occurring frequently near plant growth. No data on feeding or spawning. Separate statistics not reported for this species. Taken in bottom trawls and shore seines. Marketed fresh in some countries and rejected in others.

Distribution: Eastern Atlantic: Portugal to Ghana.

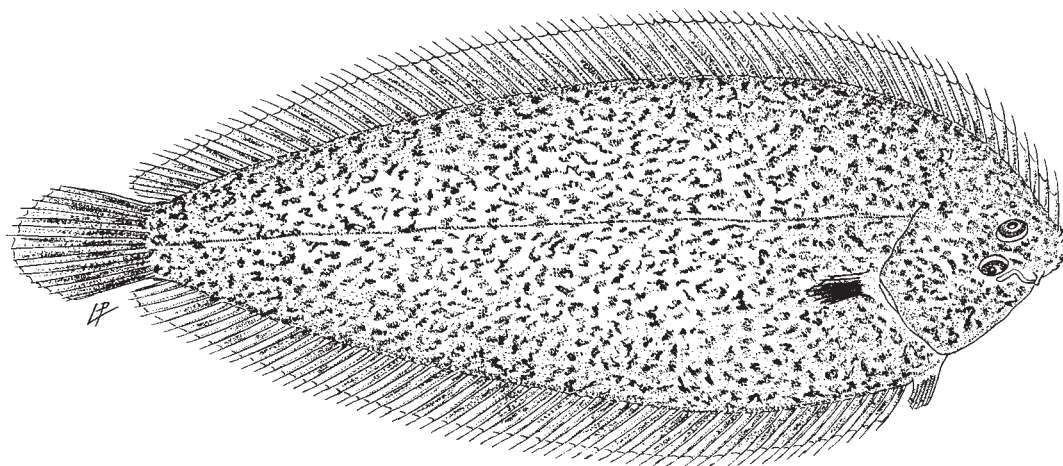
Remarks: According to F. Chapleau (pers. comm.), *Monochirus atlanticus* occurs along the west coast of Africa, while *M. hispidus* occurs in the Mediterranean Sea.



***Pegusa cadenati* Chabanaud, 1954**

Frequent synonyms / misidentifications: None / None.

FAO name: En – Cadenat's sole; Fr – Sole de Cadenat; Sp – Sortija de Cadenat.



Diagnostic characters: Body oval, elongate, laterally compressed; greatest depth near midpoint with moderate anterior and gradual posterior taper beyond this point. Head relatively small, pointed anteriorly. Snout short, bluntly pointed. Eyes separated by narrow, scaly, interorbital space. Mouth symphysis reaching vertical through middle of lower eye. Ocular-side anterior nostril tubular, reaching or not reaching anterior margin of lower eye; blind side of head covered with numerous short papillae; upper eye separated from dorsal profile of head by distance clearly greater than its diameter. **Blind-side anterior nostril enlarged and rosette-shaped**, its outer margin with long fringes; blind-side posterior nostril close to anterior nostril. Dorsal-fin rays 74 to 80; dorsal-fin origin distinctly in front of eyes on anterior profile of head; anal-fin rays 59 to 62. Posteriormost dorsal- and anal-fin rays with membrane connection to caudal peduncle; caudal peduncle distinct. Pectoral fins almost equally well developed on both sides, both pectoral fins with 7 to 9 rays. Lateral line with 86 to 100 pored scales; supratemporal branch of lateral line describing smooth curve on head. **Colour:** **ocular-side body reddish brown with numerous dark brown and smaller white spots**; dorsal and anal fins also covered with spots. Ocular-side pectoral fin reddish brown with black spot in middle of posterior part of fin. Fin spot margined with white dorsally and posteriorly. Distal tips of ocular-side pelvic-fin rays white. Blind side whitish.

Size: Maximum size to 18 cm standard length.

Habitat, biology, and fisheries: Demersal species in shallow waters on sand bottoms between 10 and 30 m depth. No data on feeding and spawning. Separate statistics not reported for this species. Taken in bottom trawls and in shore seines. Marketed fresh.

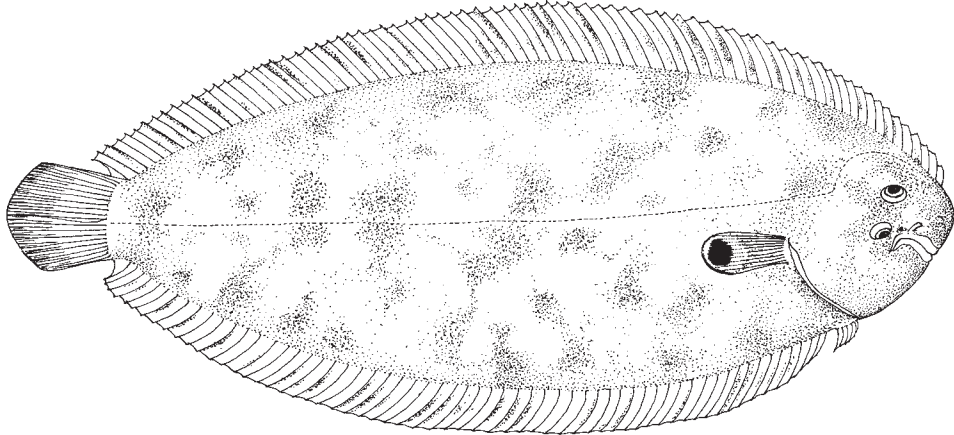
Distribution: Known only from Cape Verde Islands, but also reported in the Gulf of Guinea.



***Pegusa lascaris* (Risso, 1810)**

Frequent synonyms / mididentifications: *Solea lascaris* (Risso, 1810) / None.

FAO names: En – Sand sole; Fr – Sole-pole; Sp – Lengado de arena.



Diagnostic characters: Body oval, elongate, laterally compressed; greatest depth near midpoint with gradual anterior and posterior taper beyond this point. Head relatively large, bluntly pointed anteriorly. Snout long, bluntly pointed. Eyes separated by small, scaly, interorbital space. Mouth small, symphysis reaching vertical through middle of lower eye; inferior lip with papillae in centre. Upper eye separated from dorsal profile of head by distance clearly greater than its diameter. Blind side of head covered with modified scales. **Blind-side anterior nostril enlarged and rosette-shaped**, its outer margin with long fringe; blind-side posterior nostril close to anterior nostril. Dorsal-fin rays 70 to 90; dorsal-fin origin distinctly in front of eyes on anterior profile of head; anal-fin rays 58 to 75; pectoral fins equally well developed, each with 7 to 10 fin rays; **posteriormost dorsal- and anal-fin rays with membrane connection to base of caudal fin; caudal peduncle not distinct**. Lateral line with 98 to 145 pored scales; supratemporal branch of lateral line describing smooth curve on head. **Colour:** ocular-side body light yellowish brown to reddish brown with numerous, small, dark, diffuse blotches and whitish dots. Ocular sides of dorsal and anal fins with similar background coloration as that on body and with an alternating series of several lighter fin rays and 1 to 3 darker fin rays. Posterior ocular-side pectoral fin with conspicuous black spot margined with yellow and white. Blind side whitish.

Size: Maximum size to 40 cm standard length.

Habitat, biology, and fisheries: Demersal marine and also brackish water species. Inhabits gravel, sand or mud bottoms between 5 and 350 m, principally between 20 and 50 m. Juveniles found in estuaries and shallow waters. Feeds on small invertebrates, primarily crustaceans such as amphipods, mysids, shrimps, and decapods, as well as bivalves, other molluscs, and also polychaetes. Spawning occurs during spring and summer. Taken in bottom trawls and shore seines. Separate statistics not reported for this species. Marketed mostly fresh or frozen, flesh esteemed.

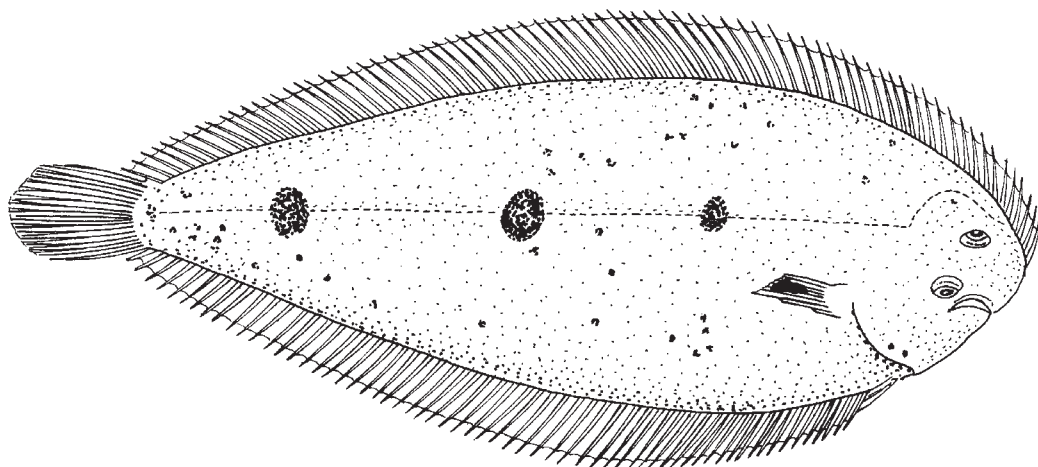
Distribution: Eastern Atlantic; West Africa from Morocco to Angola. Common in coastal waters from Morocco to the Gulf of Guinea. Elsewhere, along the Atlantic coast of Europe to the British Isles; a single capture from southward of Cape of Good Hope; also in the western Mediterranean Sea.



Pegusa triophthalma (Bleeker, 1863)

Frequent synonyms / misidentification: *Pegusa triophthalmus* (Bleeker, 1863); *Solea triophthalma* Bleeker, 1863 / None.

FAO names: **En** – Cyclope sole; **Fr** – Sole-pole à trois taches; **Sp** – Sortija tres ojos.



Diagnostic characters: Body oval, elongate; laterally compressed; greatest depth in anterior one-third with gradual anterior and posterior taper beyond this point. Head relatively small, broadly rounded anteriorly. Eyes separated by narrow, scaly, interorbital space. Upper eye separated from dorsal profile of head by a distance distinctly greater than its diameter. Mouth small; symphysis posterior to vertical through middle of lower eye; lips without papillae. **Blind-side anterior nostril enlarged and rosette-shaped**, its outer margin with long fringes; blind-side posterior nostril near anterior nostril. Dorsal-fin rays 75 to 83; dorsal-fin origin almost at tip of snout; anal-fin rays 58 to 65; pectoral fins equally well developed, each with 6 to 9 fin rays. Posteriormost dorsal- and anal-fin rays with membrane connected to caudal peduncle; caudal peduncle not distinct. Lateral line with 85 to 111 pored scales; supratemporal branch of lateral line describing smooth curve on head. **Colour: ocular side medium brown with 3 prominent black ocelli, outlined in white, on lateral line and numerous smaller, irregularly-shaped, bluish (black in perservative) and brown spots on body.** Ocular sides of dorsal and anal fins with similar background coloration as that on body and also with a longitudinal series of brown blotches in each fin. Ocular-side pectoral fin with black spot at its distal margin. Fin spot outlined in orange anterodorsally and white ventrally. Blind side whitish.

Size: Maximum 30 cm total length.

Habitat, biology, and fisheries: Inhabits sand bottoms between 10 and 30 m, principally between 15 and 25 m. Enters coastal lagoons. Feeds on small marine invertebrates such as molluscs. No data on spawning. Separate statistics not reported for this species. Taken in bottom trawls. Marketed mostly fresh.

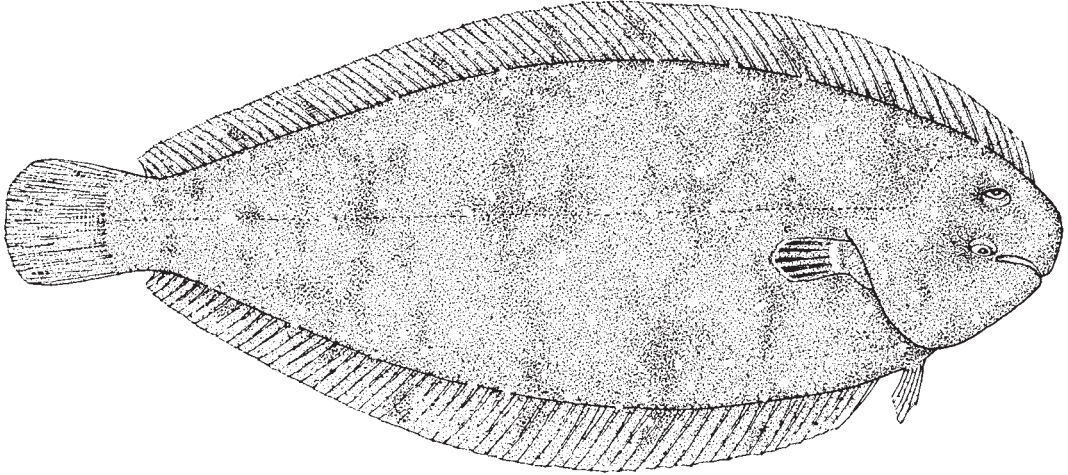
Distribution: Tropical Eastern Atlantic; off West Africa from Cape Blanc, Mauritania, to Angola, but essentially in the Gulf of Guinea.



***Solea senegalensis* Kaup, 1858**

Frequent synonyms / misidentifications: *Solea melanochira* Moreau, 1874 / None.

FAO names: En – Senegalese sole; Fr – Sole du Sénégal; Sp – Lenguado senegalés.



Diagnostic characters: Body oval, elongate, laterally compressed; greatest depth near midpoint with gradual anterior and posterior taper beyond this point. Head relatively small, bluntly rounded anteriorly. Snout larger than eye diameter, squarish anteriorly. Eyes separated by scaly interorbital space. Upper eye separated from dorsal profile of head by distance distinctly greater than its diameter. Jaws curved; lips simple; symphysis of mouth reaching vertical through posterior one-third of lower eye. Ocular-side anterior nostril tubular, not reaching (but sometimes nearly reaching) anterior margin of lower eye; **blind-side anterior nostril not enlarged**. Dorsal-fin rays 72 to 95; dorsal-fin origin on dorsal profile of head anterior to vertical through anterior margin of upper eye; anal-fin rays 61 to 75. **Pectoral fins equally well developed**, each with 8 to 12 fin rays; ocular-side pectoral fin symmetrically rounded. **Posteriormost rays of dorsal and anal fins connected to caudal peduncle by low membrane; caudal peduncle distinct**. Lateral line with 120 to 138 pored scales; **supratemporal branch of lateral line visible and describing smooth curve on head**. Scales ctenoid and rectangular. **Colour:** ocular side greyish to reddish brown in life with small blue spots tending to disappear after death; **pectoral fin of eye side with black membrane and greyish rays**; caudal fin uniformly coloured. Blind side whitish.

Size: Maximum to 60 cm standard length, common to 45 cm standard length.

Habitat, biology, and fisheries: Demersal on sand and mud bottoms of coastal waters, apparently a predominant littoral species from the shore line to about 65 m depth. Sometimes also found in estuaries. Feeds on benthic invertebrates such as polychaetes, bivalves, molluscs and small crustaceans. Spawning occurs in spring and summer. Separate statistics not reported for this species. Taken in bottom trawls. Marketed mostly fresh, flesh esteemed.

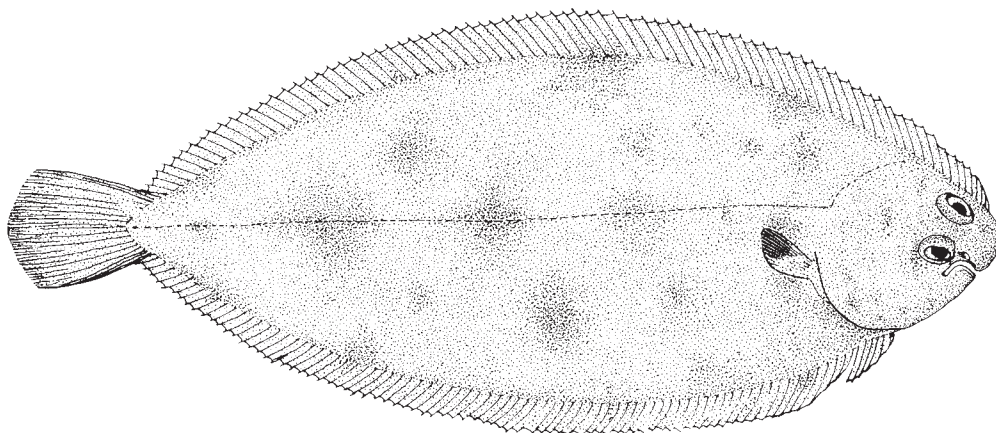
Distribution: Eastern Atlantic; off West Africa from Morocco to Senegal. Elsewhere, from La Rochelle and Bay of Biscay, France, and western Mediterranean Sea.



Solea solea (Linnaeus, 1758)

Frequent synonyms / misidentifications: *Solea vulgaris* Quensel, 1806 / None.

FAO names: **En** – Common sole; **Fr** – Sole commune; **Sp** – Lenguado común.



Diagnostic characters: Body oval, elongate, laterally compressed; greatest depth near midpoint with gradual anterior and posterior taper beyond this point. Head relatively small, bluntly pointed anteriorly. Snout shorter than eye diameter, bluntly pointed. Eyes separated by narrow, scaly, interorbital space. Upper eye separated from dorsal profile of head by distance equal to its diameter. Symphysis of mouth reaching vertical through posterior one-third of lower eye; lips without papillae. Blind side of head covered with numerous modified scales with fringes as sensory system. **Blind-side anterior nostril surrounded by small ridge, but not enlarged.** Ocular-side anterior nostril tubular, not reaching anterior margin of lower eye. Dorsal-fin rays 72 to 95; dorsal-fin origin on dorsal profile of head anterior to eyes; anal-fin rays 53 to 83. **Pectoral fins equally well developed, each with 7 to 10 fin rays;** ocular-side pectoral fin asymmetrical in shape. **Posteriormost dorsal- and anal-fin rays with membraneous connection to base of caudal peduncle, but caudal peduncle distinct.** Lateral line with 116 to 163 pored scales; supratemporal branch of lateral line describing smooth curve on head. Scales ctenoid, rectangular; scales on head smaller than those on body. **Colour:** ocular side greyish brown; ocular-side pectoral fin with black blotch restricted to distal end of fin. Posterior part of caudal fin darker than rest of fin. Blind side whitish.

Size: Maximum to 70 cm standard length; common to 45 cm standard length.

Habitat, biology, and fisheries: Demersal on sand and mud bottoms from the coastline to 130 m depth; sometimes in brackish waters; juveniles in lagoons. Migrates to deeper water during winter. Feeds on small soft-shelled bivalves, worms, crustaceans and small fishes. Spawning occurs from January to August. Catches reported for this species in the area slightly exceeded 6 000 tonnes. However, catches likely comprise several different species. Taken in bottom trawls and shore seines. Marketed fresh or frozen, both whole fish or fillets. Flesh highly esteemed.

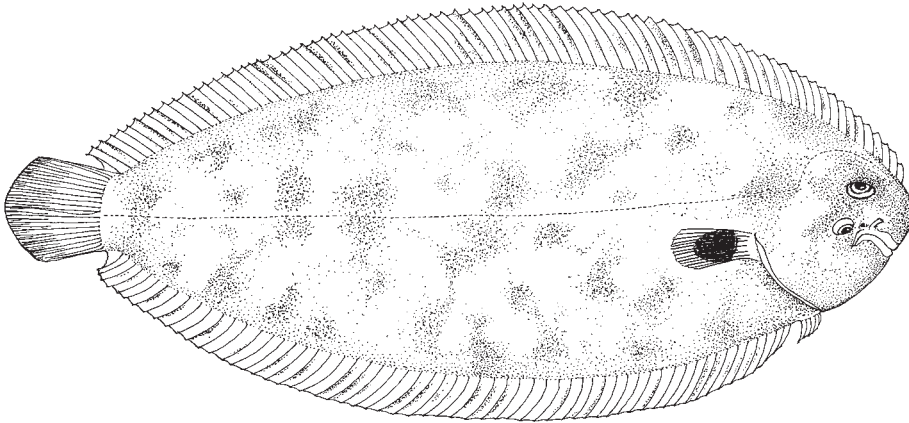
Distribution: Eastern Atlantic; in the area from Gibraltar to Cape Verde (Senegal). Elsewhere, in the Mediterranean Sea and along the Atlantic coast of Europe to the Faeroe Islands.



***Synapturichthys kleinii* (Risso, 1827)**

Frequent synonyms / misidentifications: *Solea kleinii* (Risso, 1827); *Pegusa kleini* (Risso, 1827) / None.

FAO names: En – Klein's sole; Fr – Sole tachetée; Sp – Lenguado de Klein.



anterior
nostril

blind-side view of head

Diagnostic characters: Body oval, elongate, laterally compressed; greatest depth near midpoint with gradual anterior and posterior taper beyond this point. Head relatively small, bluntly pointed anteriorly. Snout longer than eye diameter, bluntly pointed. Eyes separated by narrow, scaly, interorbital space. Upper eye less than its own diameter from dorsal profile of head. Mouth symphysis reaching vertical through middle of lower eye. Ocular-side anterior nostril reaching anterior margin of lower eye; lips with labial papillae. **Blind-side anterior nostril enlarged, cupula-shaped, well separated from posterior nostril.** Dorsal-fin rays 72 to 91; dorsal-fin origin on anterior profile of head anterior to vertical through anterior margin of upper eye; anal-fin rays 57 to 75. Pectoral fins equally well developed, each with 7 to 10 fin rays. Caudal fin with broad membraneous connection to posteriormost dorsal- and anal-fin rays; caudal peduncle distinct. Lateral line with 100 to 130 pored scales; supratemporal branch of lateral line visible, forming smoothly rounded curve. Ocular-side scales ctenoid and rectangular. **Colour:** ocular side light brown with darker, diffuse markings and numerous white spots; middle region of ocular-side pectoral fin with dark blotch margined with white; ocular sides of dorsal, anal and caudal fins with black margins; blind sides of dorsal, anal and caudal fins blackish. Blind side whitish.

Size: Maximum size to 40 cm total length.

Habitat, biology, and fisheries: Demersal on sand and mud bottoms between 20 and 460 m, but occurs mainly in shallow waters with seaweeds. Feeds on small benthic invertebrates, mainly crustaceans such as amphipods and crabs, also polychaetes, and bivalve and gastropod molluscs. No data on spawning. Separate statistics not reported for this species. Taken in bottom trawls and shore seines. Marketed fresh and dried.

Distribution: Eastern Atlantic and western Indian Ocean. Off West Africa, probably occurs along the Atlantic coasts of Morocco and the Canary Islands; also along coasts of Liberia and Ghana. Elsewhere, in western Mediterranean Sea and off South Africa, from Cape Town to Natal.

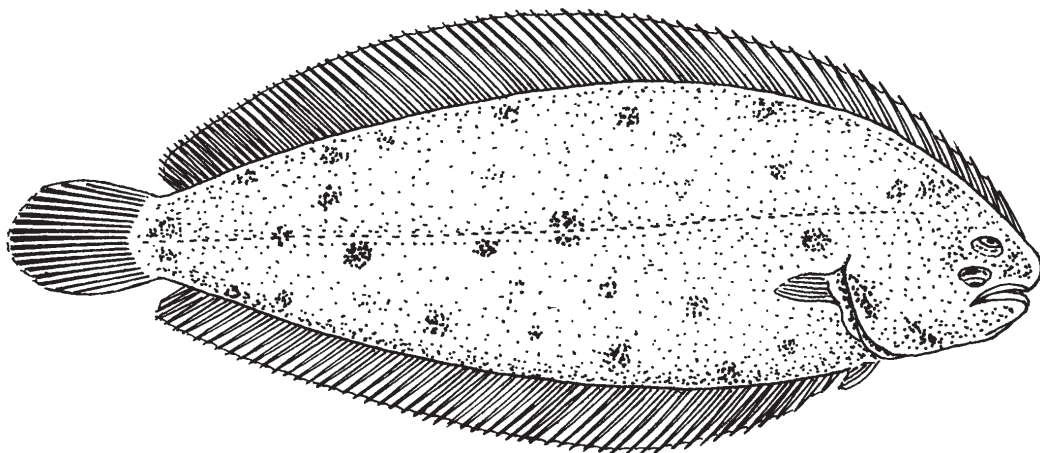
Remarks: Some studies refer to this species as *Solea kleinii* Bonaparte, 1833. However, authorship of this species properly belongs to Risso (1827).



Vanstraelenia chirophthalma (Regan, 1915)

Frequent synonyms / misidentifications: *Vanstraelenia insignis* Chabanaud, 1950; *Xenobuglossus elongatus* Chabanaud, 1950; *Vanstraelenia chirophthamus* (Regan, 1915) / None.

FAO names: **En** – African solenette; **Fr** – Sole-pole; **Sp** – Lenguadillo africano.



Diagnostic characters: Body oval, elongate, laterally compressed; greatest depth in anterior one-third with moderate anterior and gradual posterior taper beyond this point. Head relatively small, bluntly pointed anteriorly. Eyes separated by narrow, scaly, interorbital space. Upper aspects of eyes scaly. Mouth symphysis reaching point between verticals though centre and posterior margin of lower eye. Ocular-side anterior nostril tubular, not reaching anterior margin of lower eye. **Blind-side anterior nostril tubular.** Dorsal-fin rays 61 to 79; anal-fin rays 50 to 64; basal one-third of posteriormost dorsal- and anal-fin rays connected to caudal peduncle by delicate membrane; caudal peduncle distinct. Ocular-side pectoral fin with 6 to 10 rays, blind-side pectoral fin with 5 to 8 rays, blind-side pectoral fin less developed than that on ocular side; first (dorsalmost) pectoral-fin ray simple, the others bifid. Caudal fin rounded, with 20 fin rays. Lateral line with 65 to 96 pored scales; supratemporal branch of lateral line barely visible. **Colour:** ocular side brownish violet with black blotches arranged more or less distinctly in 3 longitudinal rows; **ocular-side pectoral fin darker than body and with dark diamond-shaped blotch surrounded by white pigment.** Blind side whitish.

Size: Maximum to 28 cm total length.

Habitat, biology, and fisheries: Demersal on mud and sand bottoms between 15 and 100 m. No data on feeding or spawning. Separate statistics not reported for this species. Taken in bottom trawls. Marketed fresh.

Distribution: Eastern Tropical Atlantic off West Africa from Senegal to Angola, principally in the Gulf of Guinea.

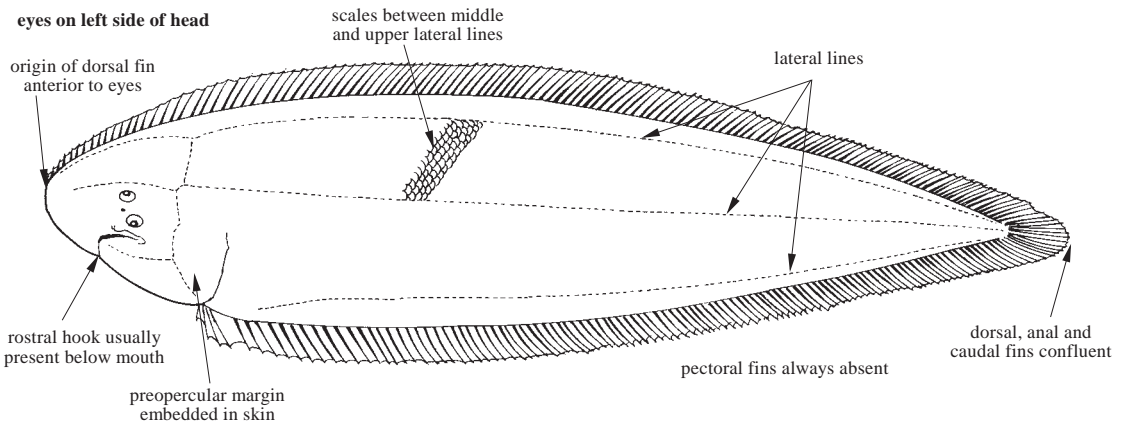


CYNOGLOSSIDAE

Tonguesoles and tonguefishes

by T.A. Munroe, National Marine Fisheries Service, National Museum of Natural History, Washington, DC, USA

Diagnostic characters: Large (70.0 cm total length) to small-sized (4.0 cm total length) species (most species < 30.0 cm total length) of **lance- or tongue-shaped flatfishes with eyes on left side of head.** **Body highly compressed and tapering to a point posteriorly.** Head bluntly rounded to pointed. Eyes relatively small; set close together, contiguous, or separated by interorbital space of variable width. Eastern Atlantic tonguesoles lack a pupillary operculum (pigmented flap of skin partially covering pupil). Snout short to long, bluntly rounded, pointed or with pronounced hook (*Cynoglossus*). Mouth small, subterminal in *Symphurus* and inferior in *Cynoglossus*. Jaws asymmetrical, moderately curved on ocular side and notably so on blind side; lower jaw not prominent; posterior extent of jaws reaching point between verticals through anterior and posterior margins of lower eye, or extending posterior to vertical through rear margin of lower eye; teeth minute and usually better developed on blind-side jaws; some species lacking teeth on ocular-side jaws. **Posterior margin of preopercle strongly attached to opercle, without free margin, and covered with skin and scales.** Dorsal fin reaching far forward onto head, usually well in advance of posterior border of upper eye; **dorsal and anal fins confluent with caudal fin. Pectoral fins absent or rudimentary. Usually only left pelvic fin (with 4 fin rays) present and located on median line** (some species of *Cynoglossus* also with right pelvic fin with 1 to 3 fin rays), pelvic fin connected to anal fin by delicate membrane (membrane often torn during capture of fish). No spines or spiny rays in dorsal, anal or pelvic fins. **Lateral line absent on both sides of body in *Symphurus*; in eastern Atlantic *Cynoglossus*, midlateral line well developed on ocular side accompanied by a margino-dorsal lateral line and frequently by a margino-ventral line; eastern Atlantic *Cynoglossus* with 1 or 2 lateral lines on blind side.** Scales ctenoid on both sides of body in *Symphurus*; in *Cynoglossus*, scales either ctenoid or cycloid on either side of body. **Colour:** ocular side usually uniformly brownish or greyish with some species featuring a variety of irregular patches, spots, or crossbands. Most species uniformly whitish or yellowish on blind side; others with darkly pigmented blind side, or blind side whitish with scattered, small, round melanophores (pepper-dots), especially at bases of fin rays. Body colour pattern (mostly intensity of background shading) may vary within a species. Dorsal, anal and caudal fins uniformly pigmented, or with blotches or spots of various sizes and intensity.



Habitat, biology, and fisheries: Small to large-sized benthic fishes found mainly on muddy and sandy bottoms, but some species inhabit a variety of other substrata. Tonguefishes occur throughout a wide depth range, from tidepools to deep waters on outer continental shelves and upper continental slopes (to about 1 500 m). Most species eat a variety of benthic and infaunal invertebrates including crustaceans, polychaetes, molluscs (gastropods and bivalves) and small echinoderms; occasionally small fishes are also consumed. Many species are nocturnally active. Sexes are separate; size dimorphism occurs in some species. Both subfamilies, the Cynoglossinae and Symphurinae, are present in the eastern Atlantic. Within the area of coverage, the Cynoglossinae is represented by one genus (*Cynoglossus*)

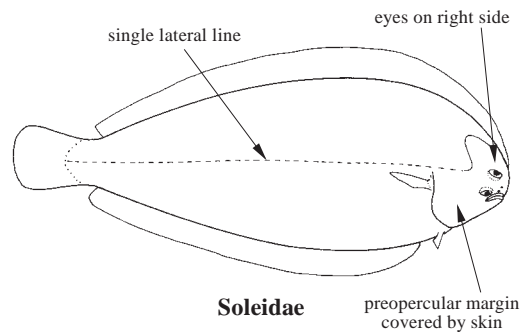
with five species. Most of these are larger-sized species that occur in sufficient abundance in some parts of the region to constitute commercial catches. The subfamily Symphurinae is represented in this region by a single genus (*Symphurus*) with seven species. None of these *Symphurus* attain sizes larger than about 14.0 cm total length and have little commercial potential in this region. Tonguefishes are commonly taken in trawl fisheries conducted in shelf waters and also contribute to beach seine catches in coastal regions. Catch statistics for individual species are not usually available.

Distribution: Species of *Cynoglossus* are found predominantly throughout tropical seas off West Africa. In the eastern Atlantic, there are isolated captures of *Cynoglossus browni* off the coasts of England and the Netherlands; *C. sinusarabici* occurs in the southeastern Mediterranean off Israel and Egypt as a Red Sea immigrant; and the majority of species (5) in the area of interest are found in coastal seas from Senegal to Angola and Namibia; other species of *Cynoglossus* occur off southern Namibia and South Africa. Species of *Symphurus* range northward occasionally to the Bay of Biscay (*S. nigrescens*, ca. 45°N), but they are more commonly collected further south throughout the Mediterranean Sea and southwards on the continental shelf and continental slope off tropical Africa to at least 20°S off Namibia; species of *Symphurus* are also found off South Africa and at several island groups in the eastern Atlantic.

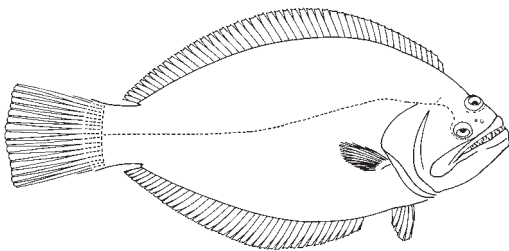
Similar families occurring in the area

Soleidae: also with small mouth, preopercular margin embedded in skin, no fin spines, dorsal-fin origin also far forward on head, pectoral fins small or absent and dorsal and anal fins confluent or not with caudal fin, but eyes on right side of head (eyes on left side in Cynoglossidae); reversals rare.

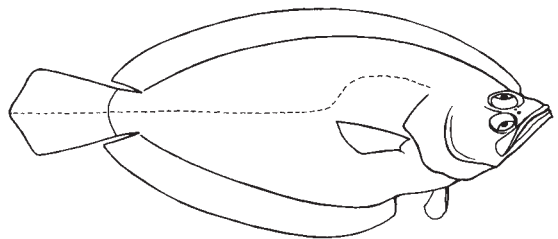
Psettodidae, Citharidae, Pleuronectidae, Paralichthyidae and Scopthalmidae: preopercular margin free (no free margin, preopercle hidden beneath skin in Cynoglossidae); dorsal and anal fins separate from caudal fin; pectoral fins well developed; mouth large with large teeth; dorsal fin not extending forward onto head and anterior dorsal- and anal-fin rays spinous in Psettodidae (dorsal fin on head and no spiny rays in Cynoglossidae); eyes on right side of head in Pleuronectidae, on left side in Citharidae, Bothidae, Paralichthyidae and Scopthalmidae.



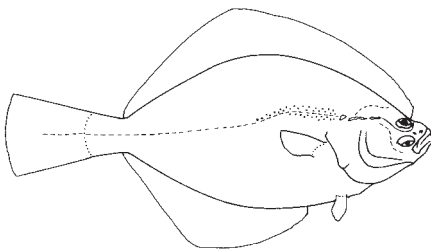
Soleidae



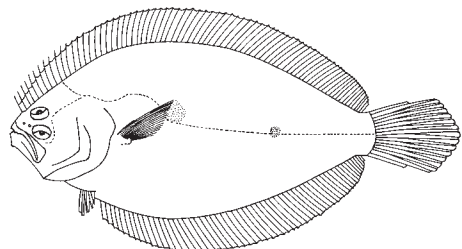
Psettodidae



Citharidae



Pleuronectidae



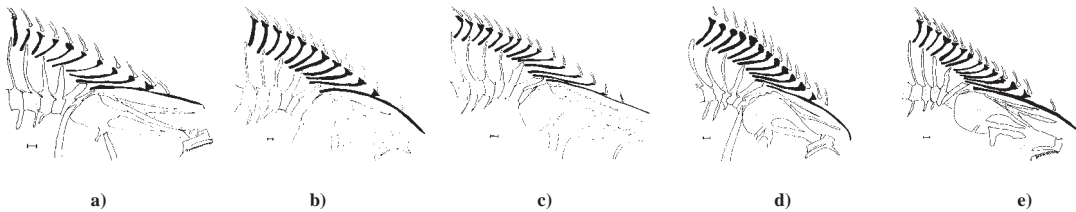
Paralichthyidae

Identification Notes

Midlateral-line scales: Midlateral-line scales in *Cynoglossus* are counted along the lateral line beginning with the pored scale at the base of the vertical lateral-line branch on the head (i.e. branch between midlateral and dorsolateral line) concluding with the pored scale at the base of the caudal fin.

Caudal-fin rays: Since the caudal fin is confluent with both the dorsal and anal fins, caudal-fin rays are best counted from the blind side of the fish using transmitted light. In order to observe the point where the caudal-fin rays articulate to the epural and hypural bones, it may be necessary to remove some scales and skin at the caudal-fin base.

Pterygiophores: Species of *Symphurus* are similar morphologically with widely overlapping fin ray and vertebral counts. Counting fin rays will not allow for identification of all species occurring in the eastern Atlantic. Of diagnostic value are the numbers of proximal dorsal-fin pterygiophores inserting into the anteriormost interneural spaces (the ID pattern; best observed on x-rays). All species of *Symphurus* have a single pterygiophore inserted into the first interneural space, a unique arrangement among the Cynoglossidae and related taxa. The species differ, however, in the numbers of proximal dorsal-fin pterygiophores inserting into interneural spaces two and three. ID pattern formulae reflect the numbers of pterygiophores inserting into successive interneural spaces, beginning with the first interneural space. Formulae for eastern Atlantic symphurine tonguefishes and the numbers of species (in parentheses) possessing each are as follows: 1-2-2-1-2 (1); 1-2-2-2-2 (1); 1-3-2-2-2 (4) and 1-3-3-2-2 (1). When used in combination with fin ray counts, ID pattern can facilitate the identification of individual specimens.



dorsal-fin pterygiophores of *Symphurus*

Key to species of Cynoglossidae occurring in the area

- 1a. No lateral lines present; snout not noticeably hooked, mouth subterminal (Fig. 1); a single pterygiophore inserted into first interneural space (***Symphurus***) → 2
- 1b. One or more lateral line(s) present on ocular side; snout hooked, mouth inferior (Fig. 2); more than one pterygiophore inserted into first interneural space. . . (***Cynoglossus***) → 8

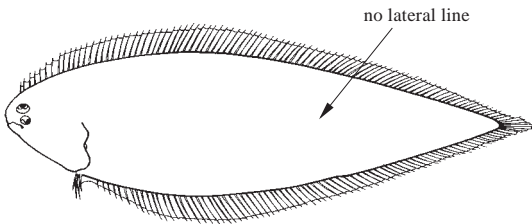


Fig. 1 *Symphurus*

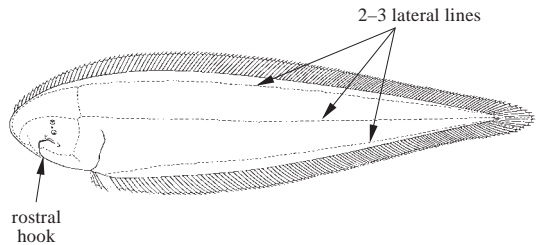


Fig. 2 *Cynoglossus*

- 2a. Dorsal-fin rays more than 100; body elongate with gradual posterior taper, depth nearly uniform for most of length; peritoneum black → 3
- 2b. Dorsal-fin rays fewer than 95; body deep with rapid posterior taper, greatest depth in anterior third of body; peritoneum black, spotted or unpigmented → 4

- 3a. Caudal-fin rays usually 12 (rarely 13); anal-fin rays 86 to 93; anal opening without ring of dark pigment; inner lining of operculum on both sides of body darkly pigmented; abdominal vertebrae 3+7; total vertebrae 55 to 59, but usually 56 to 58; ID pattern usually 1-2-2-2-1 or 1-2-2-1-2 ***Symphurus vanmelleae***
- 3b. Caudal-fin rays usually 14, occasionally 13; anal-fin rays 90 to 102; anal opening with ring of dark pigment; inner lining of operculum on both sides of body lightly pigmented; abdominal vertebrae 3+6; total vertebrae 56 to 61, but usually 58 to 60; ID pattern usually 1-2-2-2-2 ***Symphurus ligulatus***

- 4a. Small ctenoid scales present on blind sides of dorsal- and anal-fin rays; blind side of body with pepper-dot pigmentation usually heaviest on body near bases of dorsal and anal fins (Fig. 3); eye relatively small, usually only 7 to 9% head length; ID pattern usually 1-3-3 ***Symphurus normani***

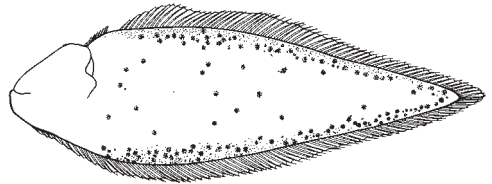


Fig. 3 blind side of body (*Symphurus normani*)

- 4b. Blind sides of dorsal- and anal-fin rays without small ctenoid scales; blind side of body without pepper-dot pigmentation; eye relatively large, usually larger than 10% head length; ID pattern usually 1-3-2 → 5
- 5a. Peritoneum black; 72 to 91 scales in longitudinal series; adults typically exceeding 70 mm standard length ***Symphurus nigrescens***
- 5b. Peritoneum unpigmented; 84 to 109 scales in longitudinal series; small species typically not exceeding 70 mm standard length → 6

- 6a. Ocular surface light yellow or cream coloured with incomplete, dark crossbands; without spherical spots along midline; fins unpigmented; snout 23.1 to 23.5% head length ***Symphurus tubbocki***
- 6b. Ocular surface dark chocolate brown with alternating, lighter X- and Y-shaped markings or with series of incomplete crossbands and spherical spots; fins pigmented; snout 15.4 to 23.0% head length. → 7

- 7a. Ocular surface dark chocolate brown with alternating, lighter X- and Y-shaped (Fig. 4) markings, without row of spherical spots along body midline; 101 to 109 scales in longitudinal series; 48 to 49 vertebrae ***Symphurus reticulatus***
- 7b. Ocular surface yellowish to dark brown, usually with a longitudinal series of non-interconnecting, incomplete crossbands, and with 1 to 3 spherical spots arranged in a longitudinal row along body midline (Fig. 5); 84 to 98 scales in longitudinal series; 45 to 48, (usually 46 to 47) vertebrae ***Symphurus insularis***

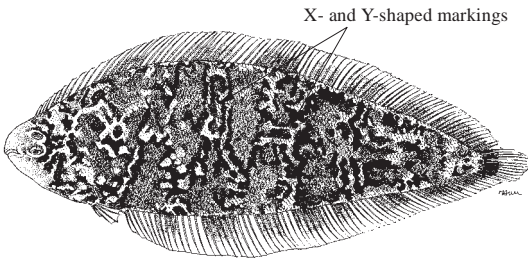


Fig. 4 *Symphurus reticulatus*

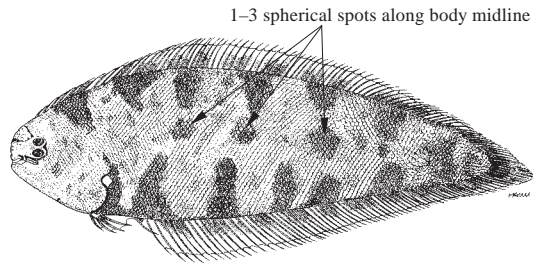










Fig. 5 *Symphurus insularis*

- 8a. No lateral lines on blind side of body → 9
- 8b. A single lateral line present on blind side of body → 10

- 9a. Ctenoid scales on both sides of body; 10 caudal-fin rays; 11 or 12 scales between ocular-side lateral lines; a single pelvic fin present; dorsal-fin rays 109 to 125; anal-fin rays 87 to 88; scales in midlateral line 68 to 72 *Cynoglossus cadenati*
- 9b. Ctenoid scales on ocular side, cycloid scales on blind side of body; 12 caudal-fin rays; 14 to 16 scales between ocular-side lateral lines; 2 pelvic fins present (left pelvic fin almost vestigial with 1 to 3 small fin rays); dorsal-fin rays 115 to 125; anal-fin rays 96 to 99; scales in midlateral line 84 to 91 *Cynoglossus browni*
- 10a. Three ocular-side lateral lines; blind-side inner opercular lining whitish . . . *Cynoglossus canariensis*
- 10b. Two ocular-side lateral lines; blind-side inner opercular lining black → 11
- 11a. Head broad, nearly as wide as long; snout rounded; 17 or 18 scales between ocular-side lateral lines; 89 to 108 scales on midlateral line; ocular side dark greenish brown or blackish *Cynoglossus senegalensis*
- 11b. Head longer than wide; snout pointed; 12 to 14 scales between ocular-side lateral lines; 85 to 96 scales on midlateral line; ocular side light sandy brown . . . *Cynoglossus monodi*

List of species occurring in the area

The symbol  is given when species accounts are included.

-  *Cynoglossus browni* Chabanaud, 1949.
-  *Cynoglossus cadenati* Chabanaud, 1947.
-  *Cynoglossus canariensis* Steindachner, 1882.
-  *Cynoglossus monodi* Chabanaud, 1949.
-  *Cynoglossus senegalensis* (Kaup, 1858).
-  *Symphurus insularis* Munroe, Brito and Hernández, 2000.
-  *Symphurus ligulatus* (Cocco, 1844).
-  *Symphurus lubbocki* Munroe, 1990.
-  *Symphurus nigrescens* Rafinesque, 1810.
-  *Symphurus normani* Chabanaud, 1950.
-  *Symphurus reticulatus* Munroe, 1990.
-  *Symphurus vanmelleae* Chabanaud, 1952.

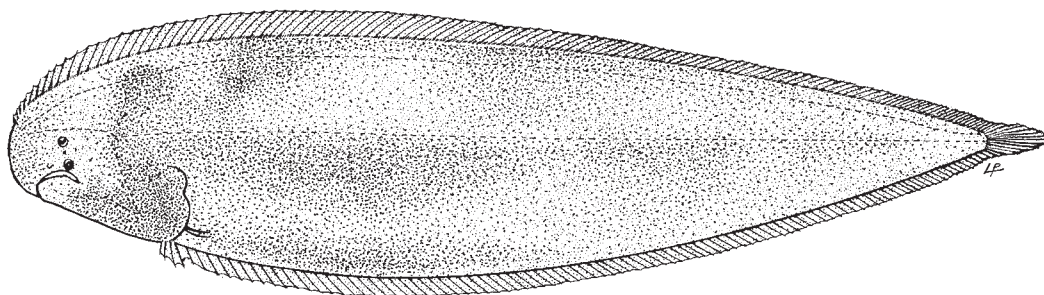
References

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- Munroe, T.A. 2003. Family Cynoglossidae. In K.E. Carpenter, ed. The Living Marine Resources of the Western Central Atlantic, Volume 3: Bony fishes part 2 (Opistognathidae to Molidae), sea turtles and marine mammals. *FAO Species identification guide for fishery purposes and American Society of Ichthyologists and Herpetologists Special Publication No. 5*. Rome, FAO, p. 1934–1959.
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***Cynoglossus browni* Chabanaud, 1949**

Frequent synonyms / misidentifications: None / None.

FAO names: **En** – Nigerian tonguesole; **Fr** – Sole-langue nigérienne; **Sp** – Lengua nigeriana.



Diagnostic characters: Body compressed and elongate. Eyes small; interorbital space broad. Snout bluntly rounded or slightly squarish; rostral hook short, not reaching to vertical through anterior margin of anterior nostril; maxilla extending well beyond vertical through posterior margin of lower eye; angle of mouth extending to beyond vertical from posterior margin of lower eye, and much nearer to tip of snout than to branchial opening. Dorsal-fin rays 115 to 125 rays, anal-fin rays 96 to 99. **Caudal-fin rays 12. Two pelvic fins present (left fin almost vestigial with 1 to 3 small fin rays). Scales ctenoid on ocular side, cycloid on blind side. Two lateral lines on ocular side, midlateral line with 84 to 91 scales; 14 to 16 scales between middle and upper lateral lines; no lateral line on blind side. Colour:** ocular surface uniformly dark brown; blind side rather whitish.

Size: Maximum to 60 cm total length; common to 30 cm total length.

Habitat, biology, and fisheries: Inhabits muddy and sandy bottoms in shallow waters at depths between 15 and 40 m (mainly 15 to 25 m) on the inner continental shelf. Juveniles and some adults occur in estuaries. Feeds on a variety of small, benthic invertebrates including polychaetes, bivalves, gastropods, shrimps, stomatopods, small crabs and amphipods. Found throughout its range on trawlable bottoms. Common, but not abundant. Separate statistics not reported for this species. Caught mainly with bottom trawls, fixed bottom nets and beach seines. Marketed mostly fresh and frozen. Regularly found in local markets (especially in Nigeria) and also exported (an important species in the Pusan fish market, Korea, for example).

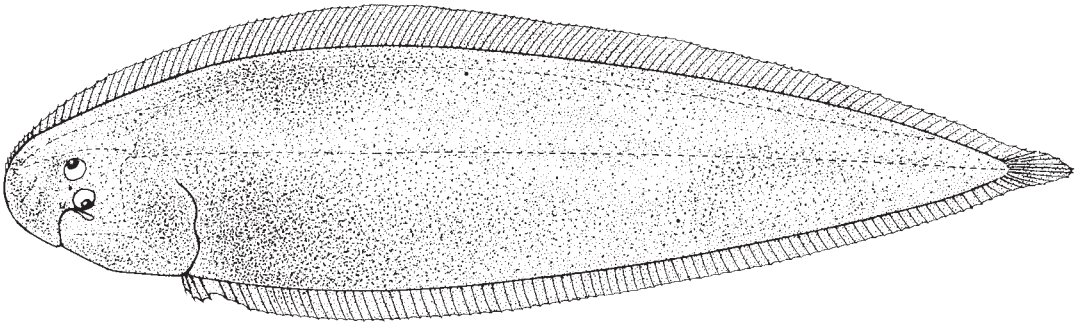
Distribution: Eastern Atlantic; Senegal to Angola; Cape Verde Islands; single records from the coasts of the United Kingdom and the Netherlands.



Cynoglossus cadenati Chabanaud, 1947

Frequent synonyms / misidentifications: None / None.

FAO names: En – Ghanian tonguesole; Fr – Sole-langue du Ghana; Sp – Lengua de Ghana.



Diagnostic characters: Body compressed and elongate. Eyes small; interorbital space broad. Snout broadly rounded; rostral hook short, extending posteriorly to vertical through anterior margin of anterior nostril; maxilla extending to vertical through posterior margin of lower eye; angle of mouth extending to below vertical from posterior half of lower eye, nearer to tip of snout than to branchial opening. Dorsal-fin rays 109 to 115; anal-fin rays 87 to 88. **Caudal-fin rays 10. Only right pelvic fin present. Scales ctenoid on both sides of body. Two lateral lines on ocular side, midlateral line with 68 to 72 scales; 11 or 12 scales between middle and upper lateral lines; no lateral line on blind side.** **Colour:** ocular surface uniformly brown without distinctive markings; blind side whitish.

Size: Maximum to 40 cm standard length; common to 15 cm.

Habitat, biology, and fisheries: Inhabits muddy and sandy bottoms in inshore waters between 10 and 30 m, but usually found shallower (to about 15 m) and in estuaries. Feeds predominantly on small benthic invertebrates. Found throughout its range on trawlable bottoms; apparently common, but not abundant. Separate statistics not reported for this species. Caught with bottom trawls, fixed bottom nets and beach seines. Marketed fresh or frozen.

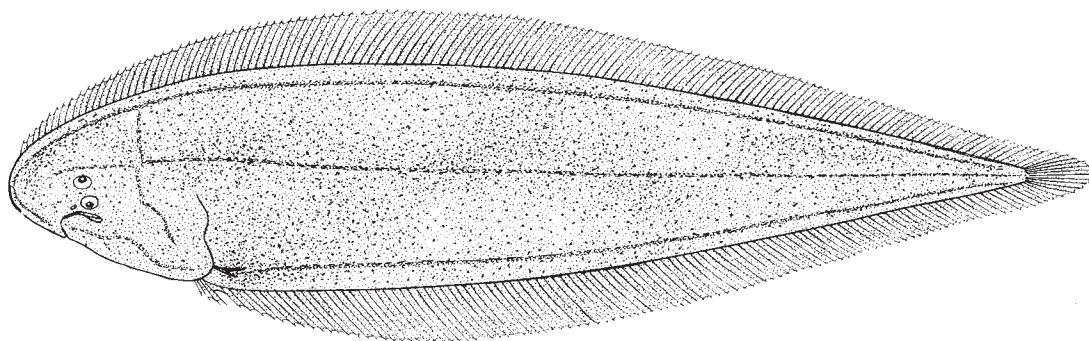
Distribution: Eastern Atlantic; Western Sahara to Angola.



***Cynoglossus canariensis* Steindachner, 1882**

Frequent synonyms / misidentifications: *Cynoglossus lagoensis* Regan, 1915 / None.

FAO names: En – Canary tonguesole; Fr – Sole-langue canarienne; Sp – Lengua de Canarias.



Diagnostic characters: Body compressed and elongate. Eyes small; interorbital space broad. Snout bluntly pointed; rostral hook short and just reaching to vertical through anterior margin of anterior nostril; maxilla extending well beyond vertical through posterior margin of lower eye; **angle of mouth extending beyond vertical through posterior margin of lower eye, nearer to tip of snout than to branchial opening.** Dorsal-fin rays about 125; anal-fin rays about 99. **Caudal-fin rays 12. Two pelvic fins present (left fin almost vestigial with only 1 to 3 small fin rays).** Scales ctenoid on anterior part of ocular side, cycloid posteriorly; scales cycloid on blind side. Three lateral lines on ocular side, midlateral line with 76 to 88 scales; 10 to 13 scales between middle and upper lateral lines; 1 lateral line on blind side. **Colour:** ocular surface uniformly brownish; blind side whitish. **Inner opercular lining on blind side whitish.**

Size: Maximum to 60 cm standard length; common to 40 cm.

Habitat, biology, and fisheries: Inhabits muddy and sandy bottoms between 10 and 300 m; commonly captured between 10 and 80 m; juveniles and some adults also occur in estuaries. Feeds predominantly on small benthic invertebrates and detritus. Off Côte d'Ivoire, males and females live to be about 8 years of age, although 80% or more of the population are Age III or younger. Most growth (about 50%) is achieved during first year of life and maturity occurs at about 1.5 years at lengths of about 29 to 34 cm. Growth rates are high for this species; females grow at a slower rate, but attain larger sizes than do males. Two spawning seasons, the first from April-July with a peak in May-June corresponds to the beginning of the dry season; the second spawning season extends from October-December and coincides with the end of the dry season. Common and abundant in some areas. Found throughout its range on trawlable bottoms; captured in artisanal fisheries and presently exploited by offshore fleets. May undertake seasonal movements into shallower waters. Separate statistics not reported for this species. Caught mainly with bottom trawls and fixed bottom nets. Marketed fresh or frozen. Common in local markets and also exported.

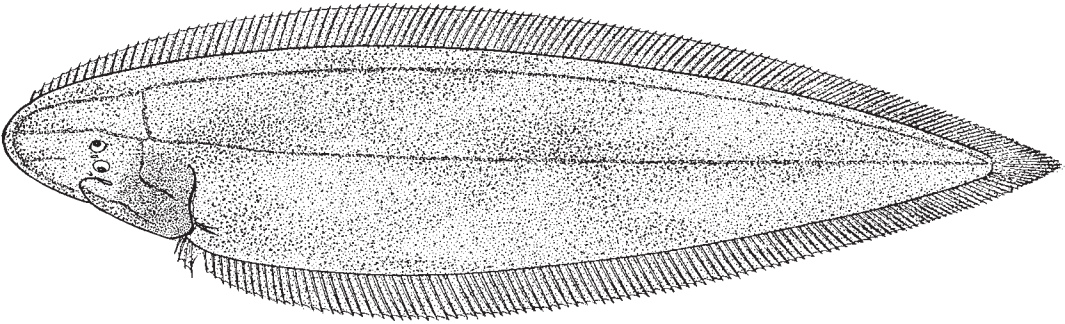
Distribution: Eastern Atlantic; Off West Africa from Mauritania to Angola; also Cape Verde Islands; doubtful for Canary Islands.



Cynoglossus monodi Chabanaud, 1949

Frequent synonyms / misidentifications: None / None.

FAO names: En – Guinean tonguesole; Fr – Sole-langue de Guinée; Sp – Lengua de Guinea.



Diagnostic characters: Body compressed and elongate. Eyes small; interorbital space rather narrow. Snout elongate and bluntly pointed; rostral hook short, not reaching vertical through anterior margin of anterior nostril; maxilla extending well beyond vertical through posterior margin of lower eye; **angle of mouth extending just posterior to vertical through posterior margin of lower eye, nearer to branchial opening than to tip of snout.** Dorsal-fin rays 125 to 131; anal-fin rays 99 to 105. **Caudal-fin rays 12. Two pelvic fins present (left fin vestigial with only 1 to 3 small fin rays).** Scales ctenoid on ocular side, cycloid on blind side of body; 2 lateral lines on ocular side; midlateral line with 85 to 96 scales; 12 to 14 scales between middle and upper lateral lines; 1 lateral line on blind side. **Colour:** uniformly light sandy brown on ocular side; whitish on blind side. **Inner opercular linings black.**

Size: Maximum to at least 40 cm standard length; common to 30 cm.

Habitat, biology, and fisheries: Inhabits muddy and sandy bottoms in inshore waters between 1 and 80 m; commonly captured between 15 and 25 m; also occurs in estuaries. Feeds predominantly on small benthic invertebrates. Found on trawlable bottoms throughout its range. Quite abundant from Guinea to Senegal. Considered common and abundant throughout its range; caught mainly with bottom trawls, fixed bottom nets and beach seines. May undertake seasonal movements into shallower waters. Separate statistics not reported for this species, but declines in catches have been noted in recent years. Marketed fresh or frozen. Regularly found in local markets and also exported. In southern Senegal, juveniles captured in shrimp fisheries are dried for human consumption.

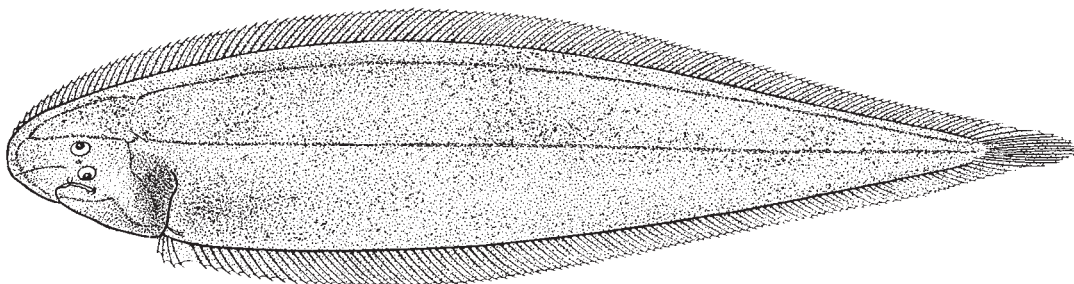
Distribution: Eastern Atlantic; northern Mauritania to Congo Republic.



***Cynoglossus senegalensis* (Kaup, 1858)**

Frequent synonyms / misidentifications: *Cynoglossus goreensis* Steindachner, 1882 / None.

FAO names: **En** – Senegalese tonguesole; **Fr** – Sole-langue sénégalaise; **Sp** – Lengua del Senegal.



Diagnostic characters: Body compressed and elongate. Eyes small; interorbital space broad. Snout bluntly pointed; rostral hook short, extending only to vertical through anterior margin of anterior nostril; maxilla extending slightly beyond vertical through posterior margin of lower eye; angle of mouth extending just posterior to vertical through posterior margin of lower eye, slightly nearer tip of snout than to branchial opening. Dorsal-fin rays 119 to 125 rays; anal-fin rays 93 to 99. **Caudal-fin rays 12. Two pelvic fins present (left fin vestigial with only 1 to 3 small fin rays). Scales ctenoid on ocular side, cycloid on blind side. Two (sometimes 3) lateral lines on ocular side, midlateral line with 89 to 108 scales; 17 or 18 scales between upper and middle lateral lines; 1 lateral line on blind side. Colour:** uniformly dark greenish brown or blackish on ocular side; blind side whitish. Dusky patch present on ocular-side opercle; **inner opercular linings black or darkly pigmented.**

Size: Maximum to about 40 cm standard length; common to 25 cm.

Habitat, biology, and fisheries: Inhabits muddy and sandy bottoms in inshore and estuarine waters between 1 and 110 m; commonly captured between 10 and 40 m. Adults may undertake seasonal movements into shallower waters; juveniles commonly found in shallow estuarine and lagoonal habitats. Growth rates for females are slightly faster than those of males. Feeds predominantly on small benthic invertebrates. Found throughout its range on trawlable bottoms; common and abundant; regularly captured in artisanal fisheries and also exploited by foreign offshore fleets. The most abundant cynoglossid tonguefish in coastal lagoons and estuaries in the tropical Eastern Central Atlantic. Separate statistics not reported for this species; however, significant declines in biomass of this species have occurred during the past 15 years, especially from Guinea to Mauritania. Caught mainly with bottom trawls and fixed bottom nets. Marketed fresh or frozen. Found in local markets and also exported (an important species in the Pusan fish market, Korea, for example).

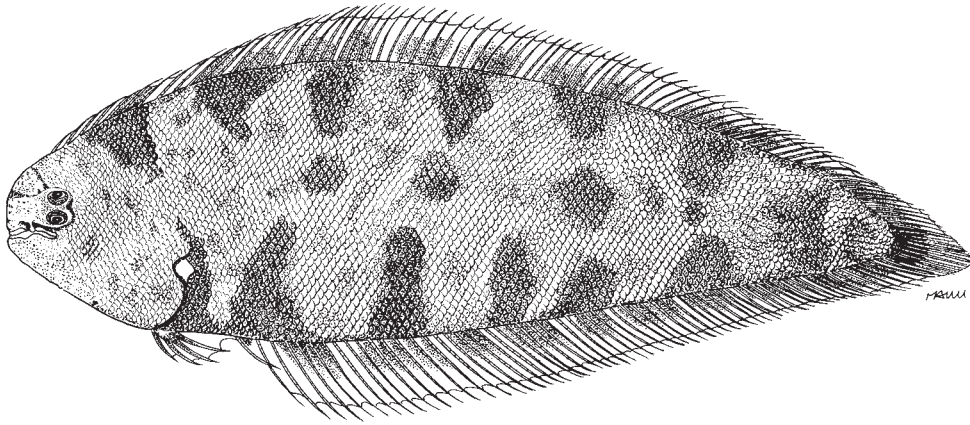
Distribution: Eastern Atlantic; Mauritania to Angola; São Tomé Island.



Symphurus insularis Munroe, Brito and Hernández, 2000

Frequent synonyms / misidentifications: None / *Symphurus nigrescens*; *Symphurus reticulatus*.

FAO names: En – Macaronesian tonguesole; Fr – Plagusie de Macaronesia; Sp – Pelada de Macaronesia.



Diagnostic characters: Body moderately deep; greatest depth in anterior third of body. Lower eye moderate in size. Snout long and pointed. Posterior extension of maxilla reaching point between verticals through anterior margin of pupil and midpoint of lower eye. Teeth well developed on all jaws. **Dorsal-fin rays 80 to 87. Anal-fin rays 66 to 72. No scales on blind sides of dorsal- and anal-fin rays. Caudal-fin rays 12. Longitudinal scale rows 84 to 98. ID pattern usually 1-3-2. Total vertebrae 45 to 48, usually 46 or 47; abdominal vertebrae 3+6. Colour:** ocular side light yellowish or straw-coloured to dark brown, with irregular dark freckles and reticulated pattern of interconnecting white lines; posterior margins of scales darkly outlined; a series of 4 to 6 dark brown, mostly incomplete, relatively wide crossbands originating at bases of dorsal and anal fins interrupted at middle of body; with 1 to 3, dark or diffuse, slightly subspherical spots, arranged in longitudinal row along body midline; and single white spot at about body midpoint. Blind side uniformly yellowish white. Peritoneum unpigmented. Dorsal and anal fins pigmented along basal regions of most fin rays and connecting membranes; with 8 to 11 darker brown blotches and unpigmented areas of about same width throughout fins. Caudal fin with dark brown spot and pigment band on base of fin and with unpigmented distal regions.

Size: Maximum about 8.0 cm standard length.

Habitat, biology, and fisheries: Captured in shallow waters (3 to 23 m) on a variety of substrata consisting of open sand, shells, gravel, areas of algae-covered boulders of various sizes with some interspersed sand patches, and sand patches within seagrass beds (*Cymodocea nodosa*). Commonly observed during night dives. Cryptic behaviour of fish may account for its apparent rarity. A dwarf species with females attaining larger sizes (to 80 mm standard length) than that of males (to 54.3 mm standard length). Females mature at relatively small sizes (46 mm standard length). Little else is known concerning life history of this species. No commercial importance.

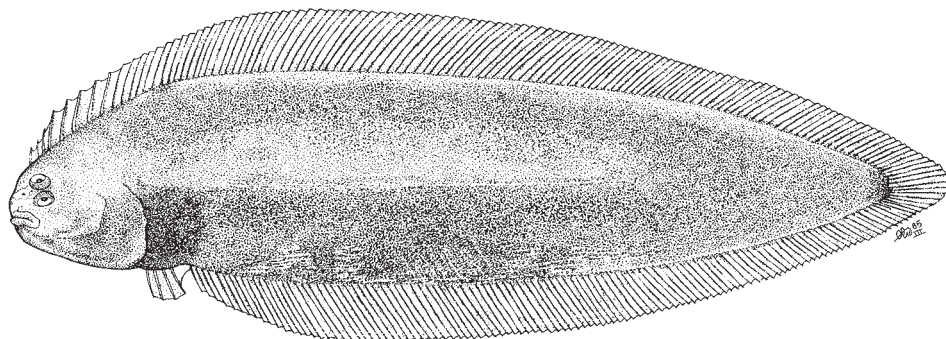
Distribution: Eastern Atlantic; most island groups in Macaronesian subprovince including the Canary Islands, Madeira, and also Ponta Delgada, São Miguel Island, Azores, and Ile de Ngor, Senegal. May also occur at Tarrafal, São Tingo Island, Cape Verde, but additional specimens needed to assess status of this population.



***Symphurus ligulatus* (Cocco, 1844)**

Frequent synonyms / misidentifications: None / *Symphurus vanmelleae*.

FAO names: **En** – Elongate tonguesole; **Fr** – Plagusie longue; **Sp** – Pelada tirrena.



Diagnostic characters: **Body notably slender; of nearly uniform width throughout most of length** with gradual posterior taper. Head short and narrow; head width usually equal to or only slightly greater than head length; upper head lobe slightly wider than lower head lobe. Lower eye moderate; eyes not covered with scales. Snout moderately long, bluntly rounded or squarish; with scaleless area dorsally. Maxilla short; extending posteriorly only to, or slightly posterior to, vertical line through anterior margin of lower eye. Teeth well developed on all jaws. **Lower opercular lobe wider than upper opercular lobe and usually projecting beyond posterior margin of upper opercular lobe.** Dorsal-fin rays 102 to 113. Dorsal-fin origin usually equal with point between verticals through anterior margin of pupil and midpoint of upper eye. Anal-fin rays 90 to 102. **No scales on blind sides of dorsal- and anal-fin rays.** Caudal-fin rays 14. Longitudinal scale rows 115 to 135. ID pattern usually 1-2-2-2-2. Total vertebrae 56 to 61, usually 59 to 60; abdominal vertebrae (3+6). Hypurals usually 5. **Colour:** ocular surface uniformly light brown or yellowish brown, sometimes with overlying speckling of light brown dots, but generally without distinctive markings. Inner linings of both opercles and isthmus lightly pigmented. Blind side uniformly off-white. Anal opening with conspicuous circular ring of black pigment. Peritoneum black. Dorsal- and anal-fin rays light brown along their entire lengths with little if any speckling on fin membranes and generally without any distinctive pigmentation. Proximal third of caudal fin brownish; distal two-thirds of caudal fin usually unpigmented or only faintly pigmented with diffuse speckling of melanophores.

Size: Maximum about 9.0 cm standard length; commonly 5.0 to 8.0 cm standard length.

Habitat, biology, and fisheries: Resident species on the outer continental shelf and upper continental slope on mud bottoms between 200 and 1 025 m, but most often collected between 400 and 700 m. Relative abundance at particular locations compared with its absence in other regions as intensively sampled may indicate this species has strong preferences for particular bottom types. Feeds predominately on isopods, euphausiids, small decapods, polychaetes, bivalves, gastropods, small echinoids, foraminiferans and small fishes. Size at age for a Mediterranean population, with a male to female ratio of 0.46, was estimated as follows: 40 to 50 mm standard length at Age I; 58 to 68 mm standard length at Age II; 70 to 78 mm standard length at Age III; >78 mm standard length at Age IV. Females attain slightly larger sizes (90 to 92 mm standard length) than do males (84 mm standard length), but males mature at smaller sizes (42 to 44 mm standard length) and earlier ages (Age II). Some females are sexually mature at 52 to 54 mm standard length, but 100% maturity does not occur until females reach 58 to 60 mm standard length (approximately Age III). In the Mediterranean Sea, *S. ligulatus* has an extended spawning season from June to November. Metamorphosis and settlement occur at 31 to 40 mm standard length. No commercial importance.

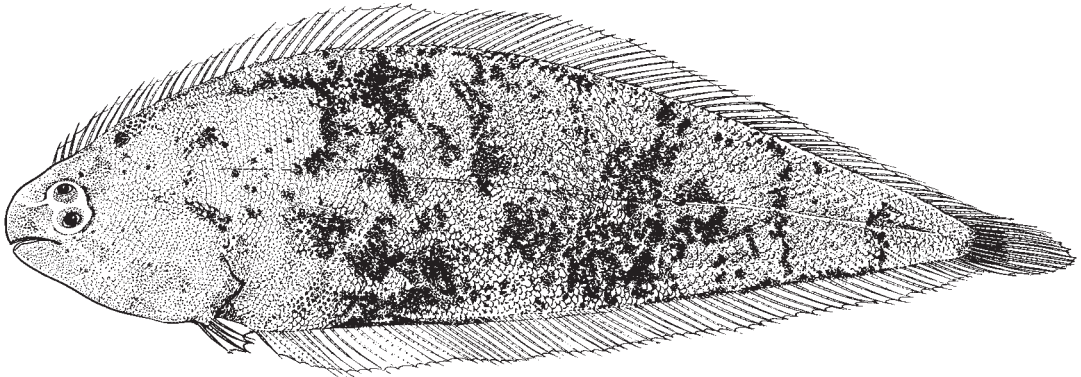
Distribution: Eastern Atlantic; from Morocco to northern Angola. Elsewhere in deepwaters of the western and central Mediterranean Sea.



***Symphurus lubbocki* Munroe, 1990**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Lubbock's tonguesole; Fr – Plagusie de Lubbock; Sp – Pelada de Lubbock.



Diagnostic characters: Body moderately deep; greatest depth in anterior half of body. Head relatively long and narrow. Lower head lobe narrower than upper head lobe. Lower eye relatively large. Snout long, without scales. Posterior extension of maxilla reaching vertical through anterior margin of pupil of lower eye. Teeth present on all jaws. Dorsal-fin origin at vertical through midpoint of upper eye. Dorsal-fin rays 87 to 88. Anal-fin rays 74 to 75. No scales on blind sides of dorsal- and anal-fin rays. Caudal-fin rays 12. Longitudinal scale rows 107 to 109. ID pattern 1-3-2. Total vertebrae 48 to 49; abdominal vertebrae 3+6. **Colour:** ocular surface uniformly cream-coloured with darker areas forming series of variable, mostly incomplete crossbands along body. Posterior one-fifth of body with 2 complete crossbands, with posteriormost band located short distance from caudal-fin origin. Inner linings of opercles and isthmus lightly pigmented. Blind side uniformly cream-coloured to off-white, with black spots internally at junction of epaxial and hypaxial muscles. Peritoneum unpigmented. Fins without obvious pattern of spots or blotches. Caudal fin with narrow pigment stripe at base, remainder of fin unpigmented.

Size: Maximum about 2.8 cm standard length.

Habitat, biology, and fisheries: Known from only 2 females (28.0, 28.3 mm standard length), with partially elongate (maturing) ovaries, collected at Klinka Klub Bay, Ascension Island, on a sandy substratum near rocks at 20 m. Advanced state of development of the ovaries at such small sizes indicates these females belong to a diminutive species of *Symphurus*, perhaps among the smallest of species in the genus. Little else is known concerning the biology of this tonguefish. Of no commercial interest.

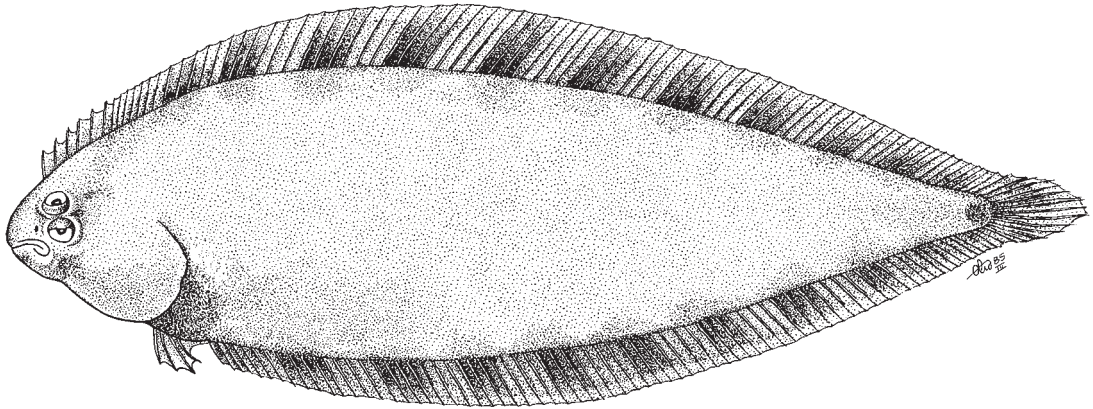
Distribution: Eastern Atlantic; endemic to Ascension Island.



<i>Symphurus nigrescens</i> Rafinesque, 1810
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Frequent synonyms / misidentifications: *Plagusia picta* Costa, 1862 / *Symphurus normani*.

FAO names: En – Spotted tonguesole; Fr – Plagusie sombre; Sp – Pelada.



Diagnostic characters: **Body moderately deep with maximum depth in anterior third of body, and with moderate posterior taper.** Head relatively long and wide; head width greater than head length. Lower head lobe narrower than upper head lobe. **Lower eye moderate to relatively large (12 to 15% head length); eyes not covered with scales.** Snout short, pointed; covered with small ctenoid scales. **Posterior extension of maxilla reaching point between verticals through anterior margin of pupil and anterior margin of lower eye.** Teeth well developed on blind-side jaws and ocular-side dentary; ocular-side premaxilla usually with single row of teeth only on anterior three-fourths of its length. Lower opercular lobe usually wider than upper opercular lobe. **Dorsal-fin rays 82 to 92.** Dorsal-fin origin usually at point between verticals through middle and anterior margin of upper eye. **Anal-fin rays 69 to 79. No scales on blind sides of dorsal- and anal-fin rays. Caudal-fin rays 12. Longitudinal scale rows 72 to 91. ID pattern 1-3-2. Total vertebrae 47 to 51, usually 48 to 50; abdominal vertebrae 3+6. Hypurals 4. Colour:** ocular surface usually light to dark brown, with or without crossbands (occasionally with 4 to 7 dark brown, sharply contrasting, crossbands), and usually with darker, irregular blotches. **Inner linings of opercles usually unpigmented;** occasionally with light speckling of melanophores on inner lining of ocular-side opercle. Ocular side immediately anterior to caudal-fin base with irregular spot of variable intensity. **Blind side uniformly whitish,** occasionally with blotch in caudal region, but **without pepper-dots. Peritoneum black. Dorsal and anal fins usually with well-developed alternating series of small blotches (2 to 5 fin rays wide) and unpigmented areas.** Dorsal fin with black, dermal pigment spots along bases of anteriormost fin rays. Caudal fin lightly pigmented, except for darker scale-covered base.

Size: Maximum 12 cm standard length; commonly to 10 cm standard length.

Habitat, biology, and fisheries: Captured on various substrata over an extensive vertical range (47 to 1 400 m) on the continental shelf and more rarely, upper continental slope. Most frequently collected on soft, muddy-clay on the outer shelf at depths of 90 to 400 m. Shallower (<100 m) and deeper captures (especially below 500 m) usually consist of single specimens. Relatively common off northwest Africa between 279 and 482 m. Feeds on a variety (over 47 prey types) of almost exclusively small, benthic invertebrates including polychaetes, ophiuroids, molluscs and crustaceans. Pronounced seasonal and ontogenetic differences in diets are noted, with ophiuroids constituting a higher percentage of winter diets and polychaetes generally more important in diets during other seasons. Larger fish (> 10 cm) consume more burrowing decapods than do smaller fish. Males and females reach similar sizes. Some females mature at about 46 mm standard length, most mature at sizes larger than 60 mm standard length. Off North Africa, 3 size peaks evident in population, possibly corresponding to three different year classes

(estimated lengths at age ca. 65 mm at Age I, 90 mm at Age II, and 102 mm standard length for Age III). No commercial importance, though sometimes locally abundant. Sometimes appearing in markets combined in catches with other small fishes.

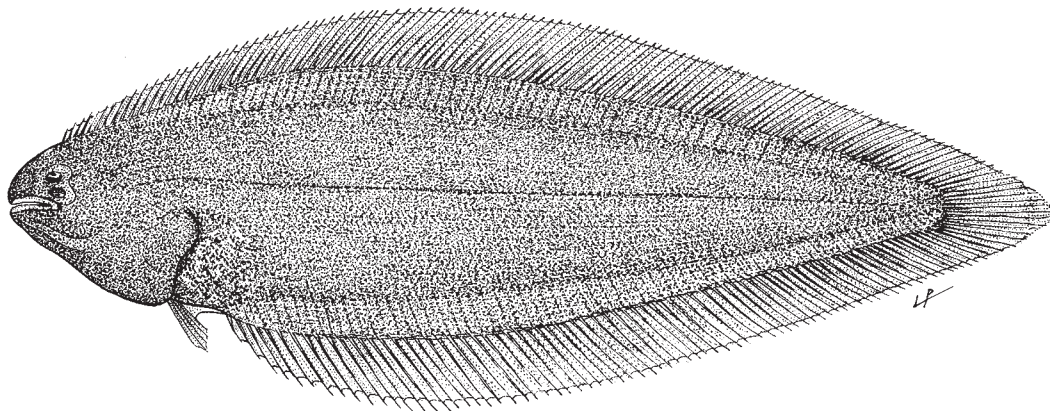
Distribution: Eastern Atlantic; (most common and widespread species of *Symphurus* in this region); from southern Bay of Biscay (rare) to northern Namibia; throughout Mediterranean Sea; common off Portugal and Spain, off northwest African coast and along continental shelf off tropical west Africa from Morocco to Namibia; infrequently reported from Azores; possibly also occurs at St Helena Island.



***Symphurus normani* Chabanaud, 1950**

Frequent synonyms / misidentifications: None / *Symphurus nigrescens*.

FAO names: En – Norman's tonguesole; Fr – Plagusie de Norman; Sp – Pelada de Norman.



Diagnostic characters: Body moderately deep with greatest depth in anterior third of body. Head relatively short and narrow; usually equal to or only slightly larger than head length. Lower head lobe narrower than upper head lobe. Lower opercular lobe wider than upper opercular lobe. **Eyes small, with 1 to 6 small ctenoid scales covering anterior and dorsal surfaces.** Snout short and pointed, covered with small ctenoid scales. **Posterior extension of maxilla reaching point between verticals through posterior margin of pupil and posterior margin of lower eye.** Teeth well developed on all jaws. **Dorsal-fin rays 87 to 92.** Dorsal-fin origin at point between verticals through posterior margin of pupil and rear margin of upper eye. **Anal-fin rays 72 to 77.** **Ocular and blind sides of dorsal- and anal-fin rays with row of 3 to 9, small, ctenoid scales.** **Caudal-fin rays 12.** **Longitudinal scales 99 to 109.** **ID pattern usually 1-3-3.** **Total vertebrae 48 to 50; abdominal vertebrae (3+6).** **Hypurals 4, occasionally 5.** **Colour:** **ocular surface uniformly light tan to reddish brown or greyish, usually without strongly contrasting crossbands, which if present, faint but complete across body to bases of dorsal and anal fins.** Inner lining of ocular-side opercle and isthmus sometimes lightly pigmented. Inner lining of blind-side opercle without noticeable pigment. **Blind side mostly whitish or cream-coloured, with numerous, scattered pepper-dot melanophores, most dense on body region overlying pterygiophores of dorsal and anal fins;** sometimes also with single row of black spots internally on body midline on blind side. **Peritoneum lightly pigmented,** sometimes with scattering of small melanophores on dorsal aspect. **Dorsal and anal fins faintly pigmented along basal half of fin rays, more intense in areas corresponding to banding on body, but without obvious pigmented spots or blotches.** Sometimes with single series of dermal melanophores along bases of anteriormost dorsal-fin rays. Caudal fin with faint crossband.

Size: Maximum approximately 8.0 cm standard length; commonly 5.0 to 7.0 cm standard length.

Habitat, biology, and fisheries: Inhabits a relatively narrow depth range (22 to 100 m) on mud and sand bottoms on the inner continental shelf. Males and females reach similar sizes. Females mature at about 65 mm standard length. Little else is known concerning the life history of this species. Infrequently collected, but may have high abundance in suitable habitat. No commercial importance.

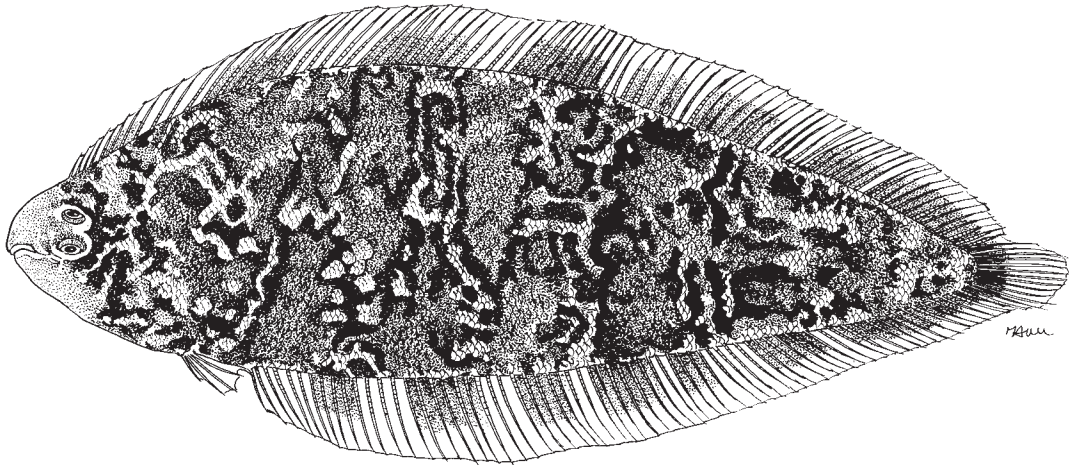
Distribution: Eastern Atlantic; off equatorial west Africa, from southern Senegal (approximately 12°N) to northern Namibia.



Symphurus reticulatus Munroe, 1990

Frequent synonyms / misidentifications: None / *Symphurus nigrescens*.

FAO names: En – Reticulated tonguefish; Fr – Plagusie réticulée; Sp – Pelada de reticulada.



Diagnostic characters: Body relatively deep; greatest depth in anterior third of body, with rapid posterior taper. Head relatively short, wider than long. Lower head lobe much narrower than upper head lobe. Lower eye relatively large; anterior parts of eyes partially covered with small scales. Snout moderately long; with small ctenoid scales. Posterior extension of maxilla reaching point between verticals through anterior margin of pupil and midpoint of lower eye. Teeth well developed on blind-side jaws and ocular-side dentary; ocular-side premaxilla with single row of slender teeth on anterior one-half (sometimes complete surface) of its length. **Dorsal-fin rays 88 to 89.** Dorsal-fin origin at point between verticals through anterior margin and midpoint of upper eye. **Anal-fin rays 74 to 75.** **No scales on blind sides of dorsal- and anal-fin rays.** Caudal-fin rays 12. Longitudinal scale rows 101 to 109. ID pattern 1-3-2. Total vertebrae 48 to 49; abdominal vertebrae 3+6. **Colour:** ocular surface generally dark chocolate brown with eight yellowish to olive-coloured crossbands. First 4 bands interconnected, forming series of alternating X- and Y-shaped marks across entire ocular side of body. Inner linings of opercles and isthmus unpigmented. **Blind side uniformly yellowish green, without scattered pepper-dots** and with series of black internal melanophores extending along axial skeleton at junction of epaxial and hypaxial muscles (axial pigmentation occasionally present also on ocular side). **Peritoneum unpigmented. Dorsal and anal fins with series of eight, dark brown blotches alternating with unpigmented areas. Blotches present only on basal half of fin rays; distal halves of fin rays unpigmented. Caudal fin with dark brown, vertical line on fin base, but remainder of fin unpigmented.**

Size: Maximum approximately 6.0 cm standard length.

Habitat, biology, and fisheries: A colourful, diminutive species collected between 5 and 45 m on bottom types consisting of sand, broken shells, stones, and gravel. Not often collected. Males and females attain similar sizes; the largest female (59.9 mm standard length) is mature with elongate ovaries containing developing ova. Little else is known concerning the biology of this species. No commercial importance.

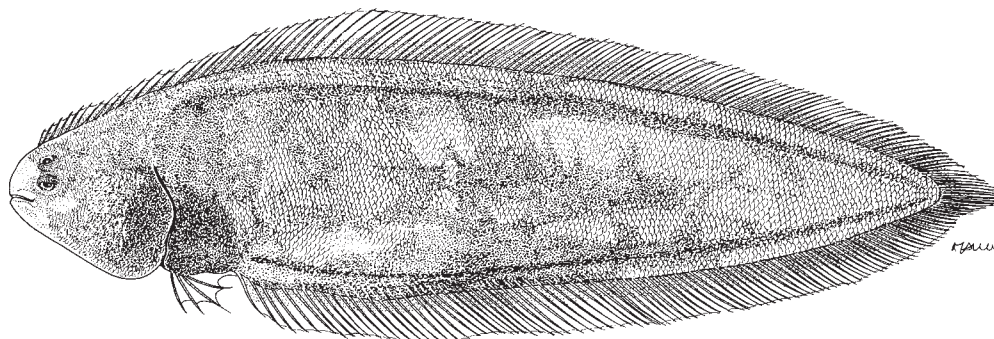
Distribution: Eastern Atlantic; endemic at St Helena Island.



***Symphurus vanmelleae* Chabanaud, 1952**

Frequent synonyms / misidentifications: *Symphurus vanmellae* (misspelling) / *Symphurus ligulatus*.

FAO names: **En** – Vanmelle's tonguefish; **Fr** – Plagusie de Vanmelle; **Sp** – Pelada de Vanmelle.



Diagnostic characters: **Body elongate with gradual posterior taper.** Head relatively short, slightly less than body depth; head narrow, usually only equal to or slightly less than head length; lower head lobe nearly equal to upper head lobe. Ocular-side opercular lobes nearly equal in width. Lower eye moderate. Snout moderately long, covered with small ctenoid scales. Posterior extension of maxilla usually reaching point between verticals through anterior margin of pupil and midpoint of lower eye. Teeth well developed on all jaws. **Dorsal-fin rays 101 to 108.** Dorsal-fin origin usually reaching point between verticals through anterior and midpoint of upper eye. **Anal-fin rays 86 to 93. No scales on blind sides of dorsal- and anal-fin rays. Caudal-fin rays 12. Longitudinal scale rows 107 to 124. ID pattern usually 1-2-2-1-2 or 1-2-2-2-1. Total vertebrae 56 to 59, usually 56 to 58; abdominal vertebrae 10, rarely 11 (3+7 to 8). Hypurals usually 5.** **Colour:** ocular surface uniformly dark brown to greyish blue without obvious pattern of spots or crossbands, but with pigment underlying scales forming longitudinal streaks beginning on head immediately above eyes and continuing along body to caudal-fin base. A black longitudinal line evident along horizontal septum. Pterygiophore regions of dorsal and anal fins demarcated from main trunk myomeres by obvious longitudinal black lines. Pterygiophore regions dark brown or bluish grey, darker than trunk colour. Snout unpigmented. **Inner linings of opercles, both sides of isthmus, and inner lining of mouth black.** Tongue unpigmented. **Blind side uniformly dull whitish,** occasionally with diffuse yellowish brown marks. **Peritoneum black. Anal opening usually unpigmented** (some specimens with dark ring surrounding base of anal sphincter). Proximal halves of dorsal- and anal-fin rays with dark brown or greyish blue pigment; distal halves of dorsal- and anal-fin rays unpigmented. Caudal-fin rays dusky, without obvious spots or blotches.

Size: Maximum 12.0 cm standard length; commonly 6.0 to 10.0 cm standard length.

Habitat, biology, and fisheries: A bathyal species inhabiting mud bottoms off equatorial west Africa at 250 to 1 000 m (usually >300 m) on the outer shelf and continental slope. Sexes reach similar sizes. Females 73 to 118 mm standard length are mature. Not commonly collected in any abundance. The largest collection (30 specimens) occurred at one of the deepest captures for the species (925 m). Little else is known concerning the life history of this species. No commercial importance.

Distribution: Eastern Atlantic; outer continental shelf and upper continental slope off equatorial west Africa from approximately 2°N to 12°S. A specimen (not examined) captured off Cape Juby (ca. 28°N) between 420 and 700 m may also be this species. Interrupted geographic distribution may reflect discontinuous distribution of habitat preferred by species, or possibly reflects inadequate sampling at appropriate depths (>300 m) on the continental slope throughout region off equatorial Africa where this species lives.



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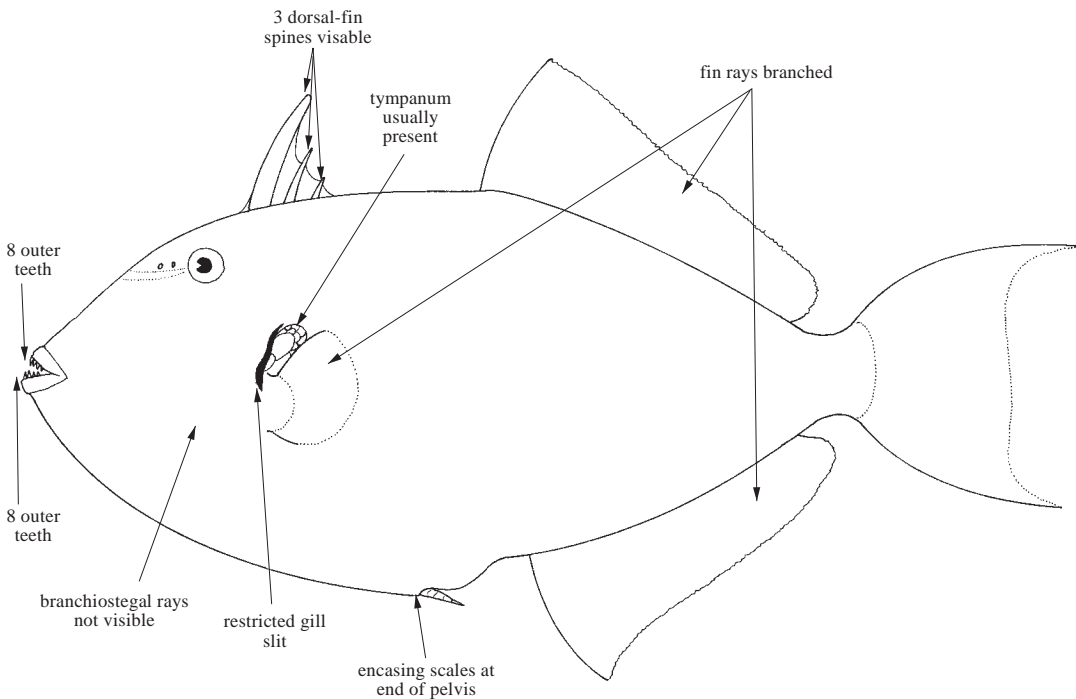
Order TETRAODONTIFORMES

BALISTIDAE

Triggerfishes (durgons)

by K. Matsuura, National Museum of Nature and Science, Tsukuba, Japan

Diagnostic characters: Small or medium-sized fishes, usually less than 40 cm, with deep, moderately compressed body encased with very thick tough skin with large rectilinear scale plates easily discernible as individual units; scales above pectoral-fin base usually enlarged and slightly separated, forming a flexible tympanum. **Gill opening a relatively short vertical to oblique slit in front of pectoral-fin base; branchiostegal rays hidden beneath the skin;** mouth small and usually more or less terminal; **teeth heavy, 8 in an outer series in the upper jaw and 8 in the lower jaw. Three dorsal-fin spines, second spine more than half the length of first; first spine capable of being locked in an upright position of erection by second; most dorsal-, anal- and pectoral-fin rays branched;** pelvic fins and spines rudimentary or absent, represented by a series of 4 pairs of enlarged scales encasing the end of pelvis. Lateral line inconspicuous. **Colour:** variable, sometimes black or drab brown, grey or greenish, but often with strikingly marked and vivid patterns.

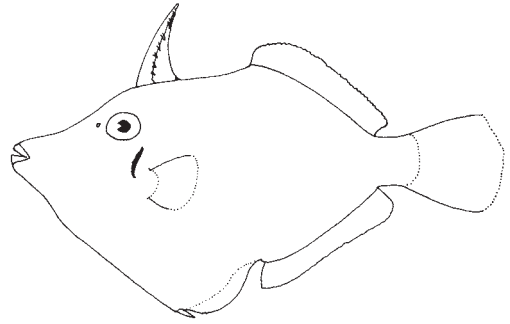


Habitat, biology, and fisheries: Most triggerfishes are solitary, ranging in depth down to about 90 m, with some species being found primarily in pelagic open water and others primarily benthic around rocky and coral reefs. They feed on bottom invertebrates, often hard-shelled, or on zooplankton, with their small mouths typically armed with large and relatively heavy incisor-like teeth. Highly valued as food in many handline fisheries, although sometimes collected as bycatch in commercial bottom trawls; on rare occasions the flesh has been considered toxic.

Remarks: The Monacanthidae are sometimes included within the Balistidae.

Similar families occurring in the area

Monacanthidae: 2 dorsal-fin spines, only the first of which is especially large and prominent; body more laterally compressed; fewer and less massive teeth in jaws; scales shagreen-like, with the individual basal plates small and not readily distinguishable from one another to the unaided eye.



Monacanthidae

Key to the species of Balistidae occurring in the area

- 1a. Scales above pectoral-fin base and just behind gill slit not enlarged and not especially well separate, not forming a flexible tympanum → 2
- 1b. Scales above pectoral-fin base and just behind gill slit much enlarged and partially separate, forming a flexible tympanum (Fig. 1) → 3

- 2a. Dorsal-fin rays 23 to 25; anal-fin rays 20 to 22; pectoral-fin rays 13 to 15; body depth 36 to 45% standard length in specimens larger than 15 cm standard length . ***Canthidermis maculata***
- 2b. Dorsal-fin rays 25 to 28 (usually 26 or 27); anal-fin rays 23 to 25; pectoral-fin rays 15 or 16; body depth 47 to 63% standard length in specimens larger than 15 cm standard length ***Canthidermis sufflamen***

- 3a. Teeth notched, uneven, of distinctly increasing length toward the middle teeth (Fig. 2a); scales of posterior body without keels forming longitudinal ridges; body greyish to bluish green, but never distinctly black, and no pale stripe along the bases of the soft dorsal and anal fins → 4
- 3b. Teeth not notched, at least in larger juveniles and adults, with relatively even distal edges, not of distinctly increasing length toward the middle teeth (Fig. 2b); scales of posterior body with keels at the centre forming longitudinal ridges; body blackish with a pale bluish stripe along the bases of the soft dorsal and anal fins ***Melichthys niger***

- 4a. Body with numerous blue or dark spots; 3 or 4 anterior rays of second (soft) dorsal fin filamentous ***Balistes punctatus***
- 4b. No blue or dark spots on body; third and fourth rays of second (soft) dorsal fin not filamentous → 5

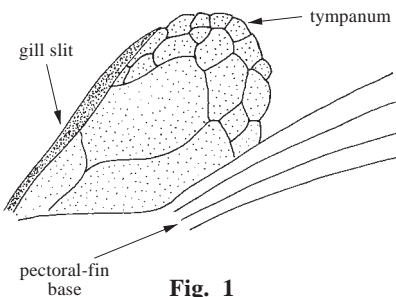


Fig. 1

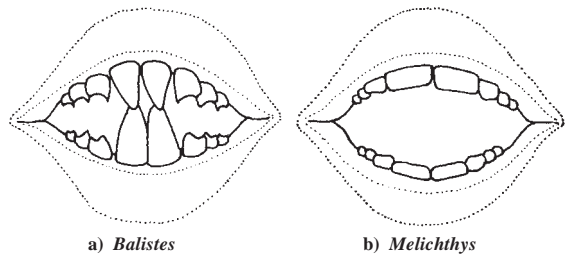
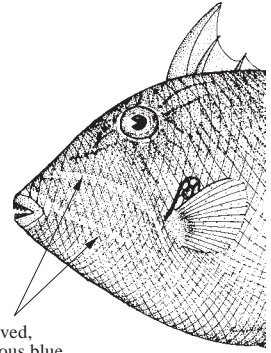


Fig. 2 teeth


- 5a. Two curved, conspicuous blue lines on cheek from above mouth to below the region in front of pectoral-fin base (Fig. 3); dorsal-fin rays 29 to 31 (usually 30); anal-fin rays 27 or 28 *Balistes vetula*
- 5b. No conspicuous blue or dark lines or bands on head; dorsal-fin rays 26 to 29 (usually 27 or 28); anal-fin rays 23 to 26 (usually 24 or 25) . . . *Balistes capriscus*








2 curved,
conspicuous blue
lines on cheek

Fig. 3 *Balistes vetula*

List of species occurring in the area

The symbol  is given when species accounts are included.

-  *Balistes capriscus* Gmelin, 1789.
-  *Balistes punctatus* Gmelin, 1788.
-  *Balistes vetula* Linnaeus, 1758.
-  *Canthidermis maculata* (Bloch, 1786).
- Canthidermis sufflamen* (Mitchill, 1815).
-  *Melichthys niger* (Bloch, 1786).

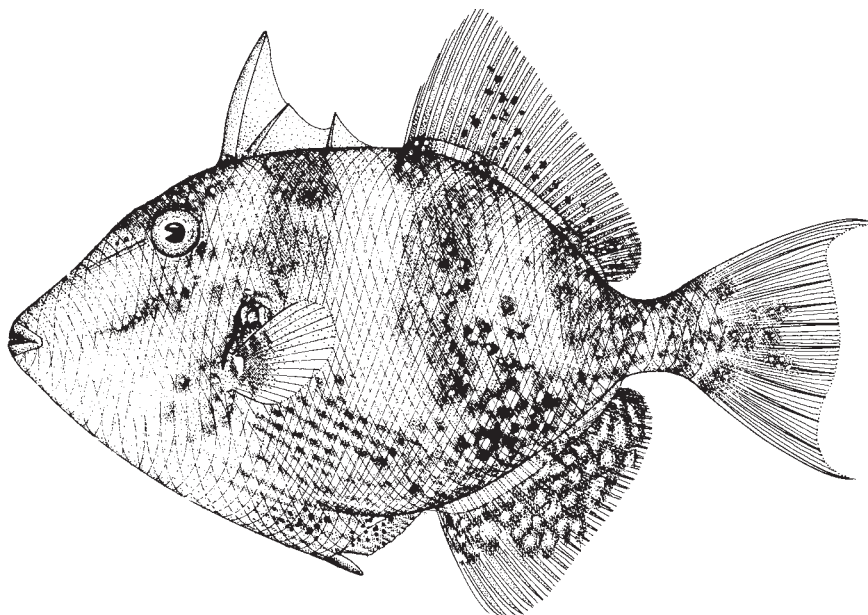
Reference

- Böhlke, J. E. & Chaplin, C.C.G.** 1968. *Fishes of the Bahamas and adjacent tropical waters*. ANSP, Philadelphia. 771 pp., 36 pls.
- Moore, D.** 1967. Triggerfishes (Balistidae) of the western Atlantic. *Bulletin of Marine Science*, 17(3): 689--22.

Balistes capriscus Gmelin, 1789

Frequent synonyms / misidentifications: *Balistes carolinensis* Gmelin, 1789 / None.

FAO names: En – Grey triggerfish; Fr – Baliste cabri; Sp – Pejepuerco blanco.



Diagnostic characters: Mouth terminal; **teeth notched**. A small groove in the skin from in front of eye to below low nasal apparatus. Dorsal fin with 3 spines and 27 to 29 soft rays. Anal fin with 23 to 26 soft rays. Caudal-fin rays slightly prolonged above and below. **Scales enlarged above pectoral-fin base and just behind gill slit to form a flexible tympanum; scales of body without prominent keels** not forming longitudinal ridges. **Colour:** generally greyish with green overtones and about 3 darker blotches or irregular bars across the back; chin lighter; small bluish to purplish spots on upper body, with lighter spots on lower body, sometimes larger and forming short irregular lines; soft dorsal and anal fins with spots, tending to form rows.

Size: Maximum to about 30 cm; commonly to 20 cm.

Habitat, biology, and fisheries: Found in shallow water down to about 50 m depth. Nothing definite is known about the areas occupied by this species, but like *B. vetula*, it seems to occur in coral reef environments including shallow sandy or grassy areas as well as rocky bottoms. Feeds on bottom-living invertebrates. Caught incidentally throughout its range, but apparently not very abundant. Taken in bottom trawls, in traps, and on handlines. The flesh is of excellent quality. Consumed mostly fresh. Separate statistics are not reported for this species.

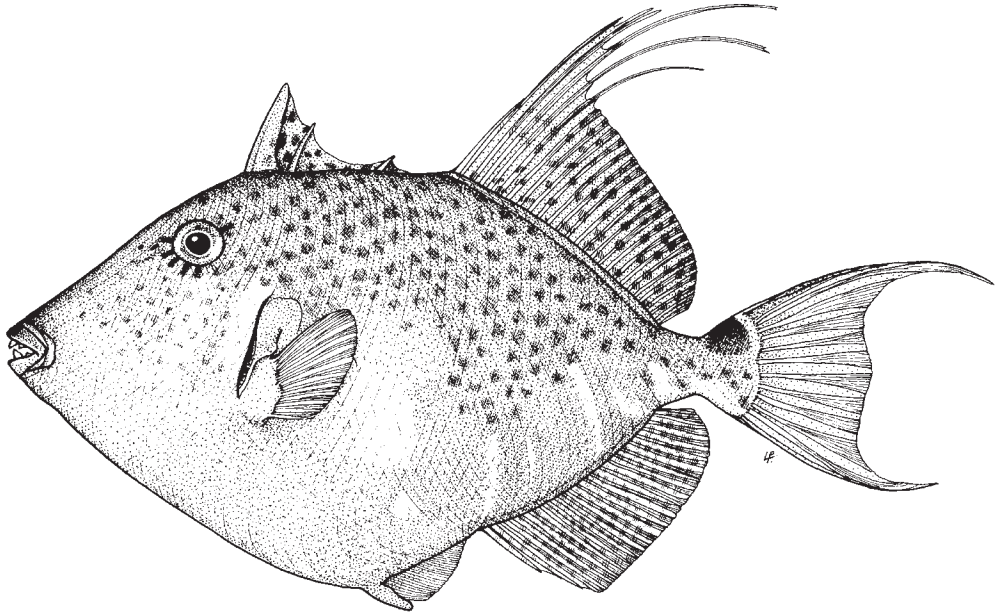
Distribution: Both sides of the tropical and temperate Atlantic; in the eastern Atlantic, from the Straits of Gibraltar to Moçâmedes, Angola including Madeira and the Canary and Cape Verde islands, northward extending into the Mediterranean and along the Atlantic coasts of Europe up to England; in the western Atlantic, from Nova Scotia to Argentina, including the Caribbean (rare) and Gulf of Mexico.



***Balistes punctatus* Gmelin, 1789**

Frequent synonyms / misidentifications: *Balistes forcipatus* Gmelin, 1789 / None.

FAO names: En – Bluespotted triggerfish; Fr – Baliste à taches bleues; Sp – Pejeperco moteado.



Diagnostic characters: Mouth terminal; **teeth notched**. A small groove in the skin from in front of eye to below low nasal apparatus. Dorsal fin with 3 spines and 27 to 30 soft rays; **3 or 4 anterior rays filamentous anterior**. Anal fin with 24 to 26 soft rays. Caudal-fin rays of adults prolonged above and below. **Scales enlarged above pectoral-fin base and just behind gill slit to form a flexible tympanum; scales of body without prominent keels** not forming longitudinal ridges. **Colour:** generally greyish with a regular pattern of large round blue or green spots covering most of the body behind eye. About 5 faint light lines radiating from front lower margin of eye.

Size: Maximum to at least to 45 cm (unconfirmed reports quote 60 cm); common to 20 cm.

Habitat, biology, and fisheries: Inhabits coastal waters. Apparently of growing importance in recent years. Separate statistics are not reported for this species. Taken with bottom trawls, in traps, fixed bottom nets and on handlines. Consumed mostly fresh, dried-salted and smoked. The flesh is excellent. Also used for fishmeal and oil by offshore fishing fleets.

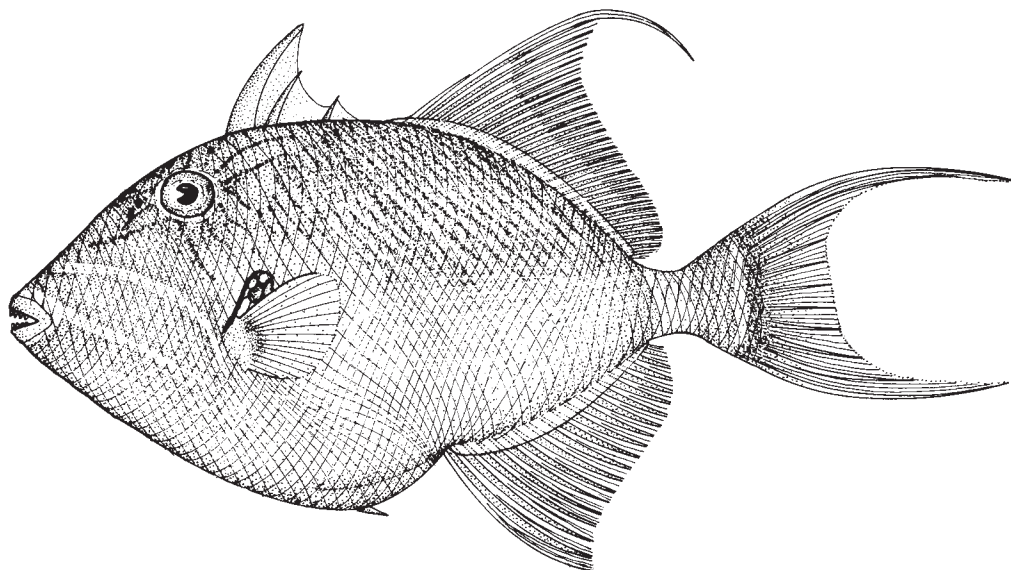
Distribution: Confined to the eastern Atlantic, along the African coast from southern Morocco to Moçâmedes (Angola) and around Madeira, the Canary and Cape Verde islands.



Balistes vetula Linnaeus, 1758

Frequent synonyms / misidentifications: None / None.

FAO names: **En** – Queen triggerfish; **Fr** – Baliste royale; **Sp** – Pejeperco cachuo.



Diagnostic characters: Mouth terminal; **teeth notched**. A small groove in the skin from in front of eye to below low nasal apparatus. Dorsal fin with 3 spines and 29 to 31 (usually 30) soft rays. Anal fin with 26 to 28 soft rays. Caudal-fin rays of adults greatly prolonged above and below. **Scales enlarged above pectoral-fin base and just behind gill slit to form a flexible tympanum; scales of body without prominent keels**, not forming longitudinal ridges. **Colour:** generally yellowish grey to bluish green, or brownish, with lower regions more yellowish orange; bluish lines outlined with yellow radiating from eyes; a wide bluish band around caudal peduncle; 2 obliquely curved bright blue bands from above mouth to below and in front of pectoral-fin base.

Size: Maximum to about 50 cm; commonly to 30 cm.

Habitat, biology, and fisheries: Adults are found near the bottom on most coral reef environments ranging from shallow sandy or grassy areas to the upper slope of the reef (to about 100 m depth). Feeds mainly on bottom-living invertebrates with a strong preference for echinoids, especially *Diadema antillarum*. Caught with lines, traps and bottom trawls. Marketed mostly fresh. An excellent foodfish, but occasionally reported to have caused slight intoxication. Separate statistics are not reported for this species.

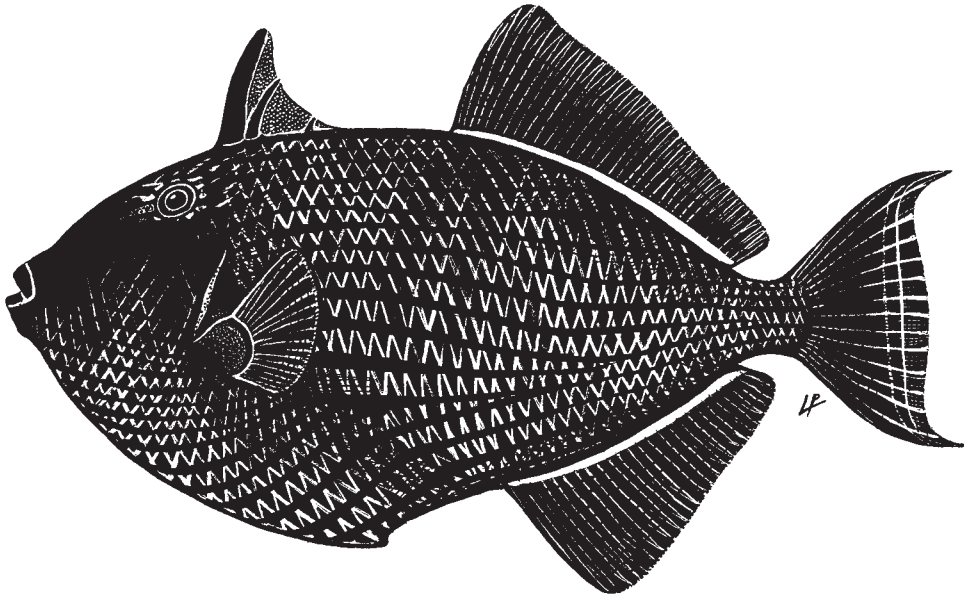
Distribution: Both sides of the tropical and temperate Atlantic; in the eastern Atlantic from the Straits of Gibraltar to Angola, including Madeira, the Canary, Cape Verde and Ascension islands, northward extending along the Atlantic coast of Europe to England; in the western Atlantic, from Massachusetts to Brazil, including the Caribbean (common on reefs) and Gulf of Mexico.



Melichthys niger (Bloch, 1786)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Black triggerfish (AFS: Black durgon); Fr – Baliste noir; Sp – Calafate negro.



Diagnostic characters: Mouth terminal or only very slightly supraterminal; **teeth with relatively even, straight edges, not notched**, except in young juveniles in which notches are not yet worn down. A small groove in the skin from in front of eye to below low nasal apparatus. Dorsal fin with 3 spines and 32 to 34 soft rays; only first 2 dorsal-fin spines readily apparent, third spine smaller and scarcely protruding above dorsal profile when fin is erected. Anal fin with 28 to 31 soft rays. Caudal-fin rays slightly prolonged above and below. **Scales enlarged above the pectoral-fin base and just behind gill slit to form a flexible tympanum; scales of posterior body with prominent keels, forming longitudinal ridges.** **Colour:** generally black with greenish overtones; pale blue bands along bases of soft dorsal and anal fins; ephemeral orangish red overcasting tending to outline scale plates, especially on head in a rhombical pattern.

Size: Maximum to about 50 cm; commonly to 30 cm.

Habitat, biology, and fisheries: Found in shallow water and coral outer reefs down to about 30 m. Feeds on a great variety of plants and (mainly large planktonic) invertebrates, but seems to favour plants, grazing off the substrate and nibbling at the surface. Caught in traps, bottom trawls and on lines. Caught throughout its range, but especially on oceanic islands where it may be locally abundant. Consumed mostly fresh. A good foodfish. Separate statistics are not reported for this species.

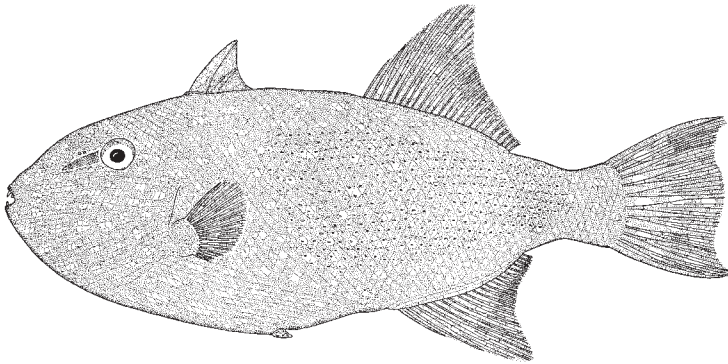
Distribution: Both sides of the tropical Atlantic; in the eastern Atlantic, from Gulf of Guinea, Ascension islands, and St Helena; in the western Atlantic, from south Florida and the Bahamas to Brazil, including the Caribbean and Bermuda, but absent from the Gulf of Mexico; most often found in insular regions and outer reef areas.



Canthidermis maculata (Bloch, 1786)

En – Rough triggerfish; **Fr** – Baliste rude; **Sp** – Calafate áspero.

Maximum size to 50 cm; commonly to 40 cm. Epipelagic, often associated with drifting objects. Marketed fresh; taken by longlines. Circumglobal, temperate and tropical seas.

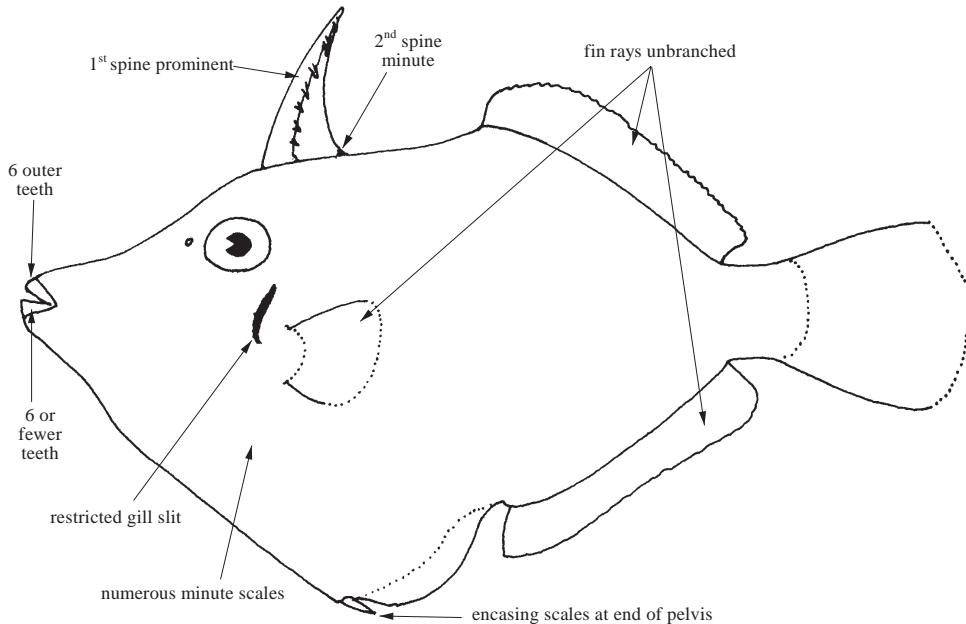


MONACANTHIDAE

Filefishes (leatherjackets)

by K. Matsuura, National Museum of Nature and Science, Tsukuba, Japan

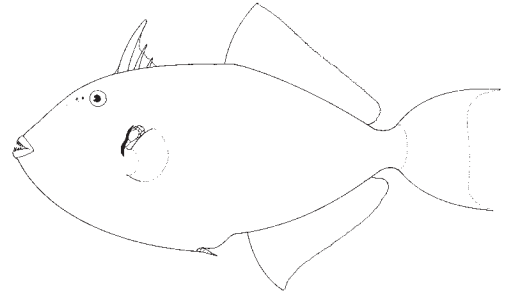
Diagnostic characters: Small or medium-sized fishes, usually less than 20 cm (but up to 50 cm for some species of *Aluterus*), with **deep, highly compressed bodies covered by thin but rough or shagreen-like skin with innumerable minute scales not individually easily discernible to the unaided eye.** Mouth small and usually more or less terminal or slightly supraterminal; **teeth only moderately heavy, 6 in an outer series in upper jaw and 6 or fewer in the lower.** Gill opening a relatively short, vertical to oblique slit in front of pectoral-fin base, **branchiostegal rays hidden beneath the skin.** **Two (sometimes 1) dorsal-fin spines, second spine not more than one-third the length of first;** first spine usually capable of being locked in an upright position of erection by the second; **dorsal-, anal- and pectoral-fin rays unbranched;** **pelvic fin and spines rudimentary or absent, represented by a series of 3 or fewer pairs of enlarged scales encasing end of pelvis, or segments of indeterminate number, or entirely absent.** Scales above pectoral-fin base unmodified, not forming a tympanum. Lateral line inconspicuous or only slightly apparent. **Colour:** variable, drab brown, grey, or greenish, but often with strikingly marked and vivid patterns.



Habitat, biology, and fisheries: Filefishes range in depth down to about 90 m. They are primarily benthic species living around coral and rocky reefs or on sand and mud bottoms and seagrass beds. They feed on a large variety of benthic invertebrates, including sponges, algae, and plants, with their small mouth typically armed with moderate-sized nipping teeth. Only large individuals of some filefish species are consumed, but many are collected as trashfish in commercial bottom trawls.

Similar families occurring in the area

Balistidae: 3 dorsal-fin spines; no large, obvious pelvic-fin spines; teeth usually incisor-like and more massive, 8 in an outer series in each jaw; scales larger, rectilinear and easily recognized as individual units, without numerous upright spinules, and tough but not shagreen-like.



Balistidae

Key to the species of Monacanthidae occurring in the area

- 1a. Pelvic fin absent and without any obvious enlarged encasing scales (a rudimentary encasing scale sometimes present, but difficult to see with the unaided eye and not at end of pelvis) (Fig. 1) → 2
- 1b. Pelvic fin present as a rudiment at end of pelvis, mostly obscured from external view by a series of enlarged scales encasing it, appearing as a spinous process in the midline at end of pelvis (Fig. 2). → 5

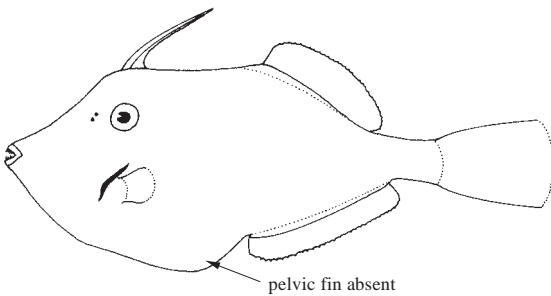


Fig. 1 *Aluterus*

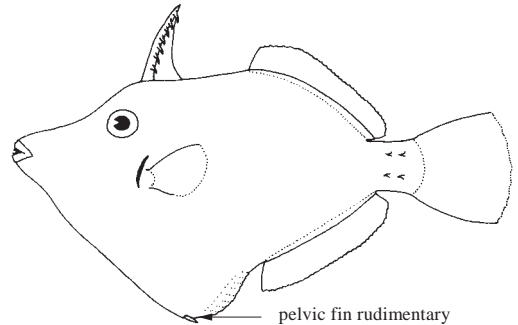


Fig. 2 *Stephanolepis*

- 2a. Dorsal-fin rays 32 to 41; anal-fin rays 35 to 44; pectoral-fin rays modally 12 and 13 → 3
- 2b. Dorsal-fin rays 43 to 50; anal-fin rays 46 to 52; pectoral-fin rays modally 14 → 4
- 3a. Dorsal-fin rays 32 to 39 (modally 36 and 37); anal-fin rays 35 to 41 (modally 38 and 39); coloration of fresh specimens with few to many orange spots ***Aluterus schoepfi***
- 3b. Dorsal-fin rays 36 to 41 (modally 38 and 39); anal-fin rays 36 to 44 (modally 41 and 42); colour markings of fresh specimens bluish purple ***Aluterus heudelotii***
- 4a. Caudal peduncle longer than deep; caudal fin relatively short, 18 to 26% standard length ***Aluterus monoceros***
- 4b. Caudal peduncle deeper than long; caudal fin relatively long, 33 to 61% standard length ***Aluterus scriptus***

- 5a. Region of back just behind dorsal spines without a deep groove to receive first dorsal-fin spine when it is not erected; enlarged encasing scales at end of pelvis flexible dorsoventrally; first dorsal spine over posterior part of eye (Fig. 3)
 ***Stephanolepis hispidus***
- 5b. Region of back just behind dorsal spines with a deep groove to partially receive unerected dorsal-fin spines; enlarged encasing scales at end of pelvis fixed, not flexible dorsoventrally; first dorsal-fin spine over anterior part of eye (Fig. 4) ***Cantherhines pullus***

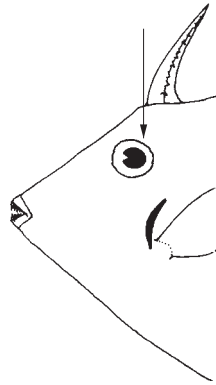









Fig. 3 *Stephanolepis*



Fig. 4 *Cantherhines*

List of species occurring in the area

The symbol  is given when species accounts are included.

-  *Aluterus heudelotii* Hollard, 1855.
-  *Aluterus monoceros* (Linnaeus, 1758).
-  *Aluterus schoepfii* (Walbaum, 1792).
-  *Aluterus scriptus* (Osbeck, 1765).
-  *Cantherhines pullus* (Ranzani, 1842).
-  *Stephanolepis hispidus* (Linnaeus, 1766).

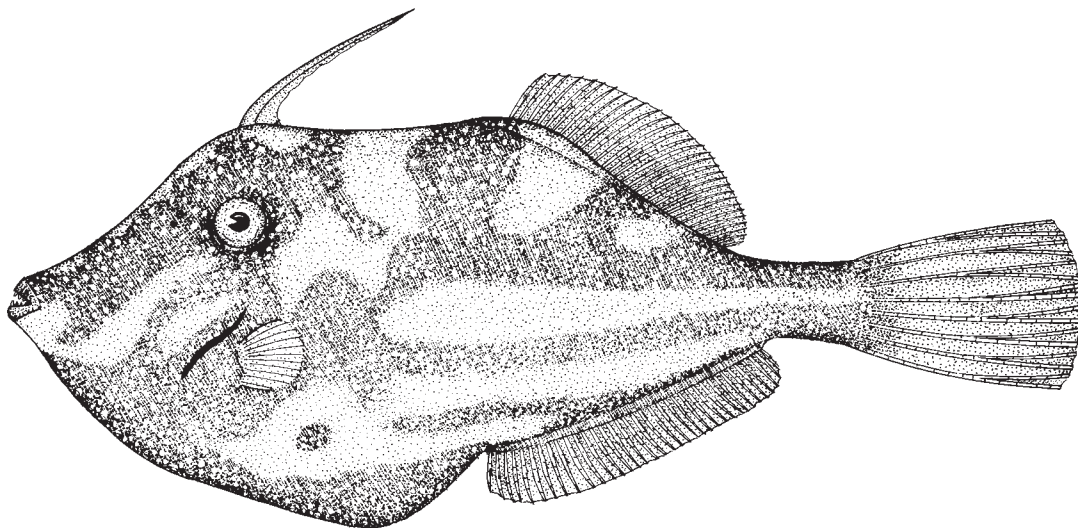
References

Berry, F. H. & Vogele, L.E. 1961. Filefishes (Monacanthidae) of the western North Atlantic. *Fisheries Bulletin*, 61: 61–109.

Aluterus schoepfii (Walbaum, 1792)

Frequent synonyms / misidentifications: *Aluterus punctatus* Agassiz, 1831 / None.

FAO names: En – Orange filefish; Fr – Bourse orange; Sp – Lija naranja.



Diagnostic characters: Body deep and greatly compressed. Region of back behind dorsal-fin spines without a concavity, either flat or rounded. Mouth slightly supraterminal; teeth notched. Dorsal fin with 2 spines and 32 to 39 soft rays; only the first dorsal-fin spine prominent, relatively weak and slender, the second spine not easily seen externally; the first spine originating over the middle to back of the eye and capable of being locked in an upright erect position by the second. Anal fin with 35 to 41 soft rays. No enlarged encasing scales representing the remains of a rudimentary pelvic fin. Scales of caudal peduncle unmodified, not forming retrorse spines. **Colour:** generally greyish (sometimes metallic grey) to brownish with large irregular pale blotches, with both the head and body covered with numerous small orangish to yellowish spots.

Size: Maximum to 60 cm; commonly to 40 cm.

Habitat, biology, and fisheries: Usually found over bottoms of seagrass, sand, or mud in shallow water down to about 50 m. Feeds on a variety of plants, including algae and seagrasses, usually grazing off the bottom but sometimes also nibbling at the surface. Taken as bycatch in trawl and trap fisheries throughout its range, especially in shrimp trawls in the northern Gulf of Mexico. Caught with bottom trawls and traps. Generally considered as trashfish, rarely consumed. Separate statistics are not reported for this species.

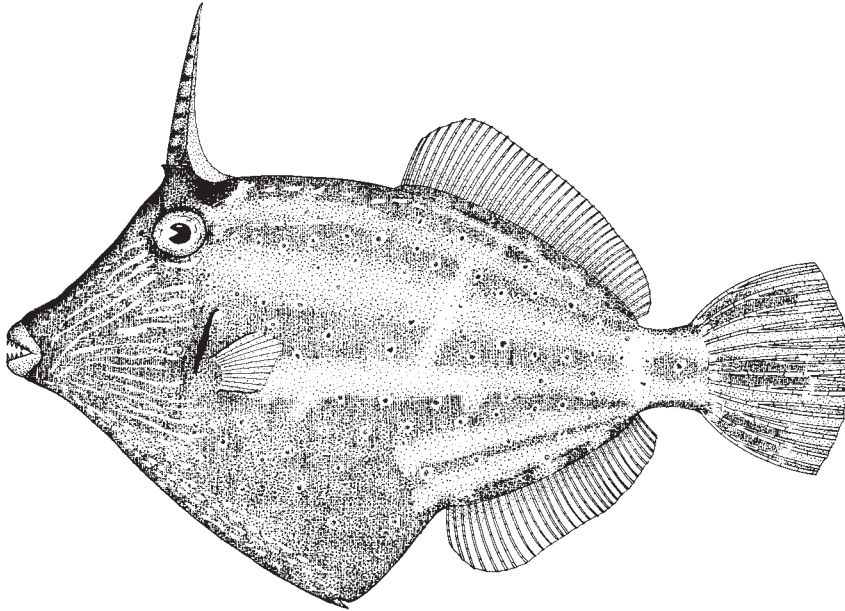
Distribution: In the eastern Atlantic, from Cape Blanco (Mauritania) to Angola; in the western Atlantic from Nova Scotia to Brazil, including Bermuda, the Gulf of Mexico, and the Caribbean, but rare in the latter.



***Cantherhines pullus* (Ranzani, 1842)**

Frequent synonyms / misidentifications: None / None.

FAO names: **En** – Orangespotted filefish; **Fr** – Bourse pintade; **Sp** – Lija pintada.



Diagnostic characters: Body deep and compressed. Region of back behind dorsal-fin spines with a deep groove to partially receive unerected spines. Mouth terminal; teeth notched. Dorsal fin with 2 spines and 33 to 36 soft rays; only the first dorsal-fin spine prominent, relatively strong and stout, second spine not easily seen externally; first spine originating over front of eye and capable of being locked in an upright erect position by the second. Anal fin with 29 to 32 soft rays. Caudal fin rounded. Scales of caudal peduncle either unmodified (females) or with enlarged spinules forming a patch of setae, but not retrorse spines. Enlarged encasing scales at end of pelvis surrounding a rudimentary pelvic fin, the encasing scales fixed, not flexible. **Colour:** generally brownish, with paler longitudinal bands on body and orangish spots with brownish centres, often also whitish spots; a particularly prominent white spot on top of caudal peduncle just behind soft dorsal-fin base, and a smaller but similar spot on caudal peduncle below, the 2 spots sometimes connected by a pale bar; yellowish lines on head converging toward snout.

Size: Maximum to 20 cm; commonly to 12 cm.

Habitat, biology, and fisheries: Found in shallow water and around coral and rocky reefs down to about 50 m depth. The young are pelagic and highly important food items in the diet of large predaceous fishes such as tunas and billfishes. Feeds on a variety of attached benthic plants and invertebrates, including algae, sponges, tunicates, and bryozoans. Caught incidentally in traps throughout its range. Generally considered as trashfish, rarely consumed. Separate statistics are not reported for this species.

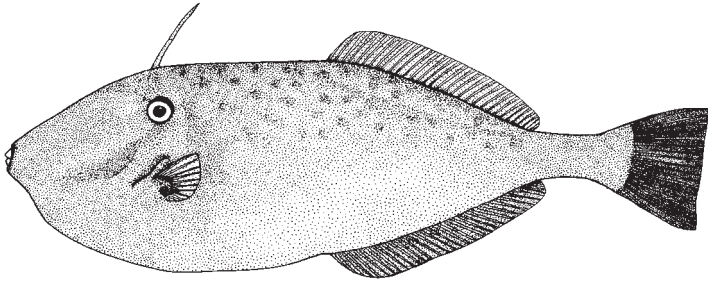
Distribution: Both sides of the tropical and temperate Atlantic; in the eastern Atlantic from Gulf of Guinea; in the western Atlantic from Massachusetts to Brazil, including Bermuda, the Gulf of Mexico, and the Caribbean.



***Aluterus monoceros* (Linnaeus, 1758)**

En – Unicorn leatherjacket filefish; **Fr** – Bourse loulou; **Sp** – Lija barbuda.

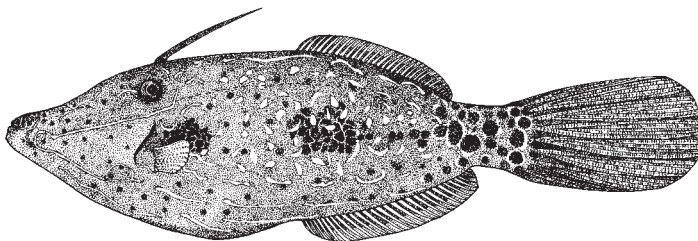
Maximum size to 55 cm; commonly to 40 cm. Found on the continental shelf down to 150 m. Feeds on bottom-living organisms. A good foodfish; marketed fresh. Caught mainly with bottom trawls. West coast of tropical Africa. All tropical and temperate coastal waters.



***Aluterus scriptus* (Osbeck, 1765)**

En – Scribbled leatherjacket filefish; **Fr** – Bourse écriture; **Sp** – Lija trompa.

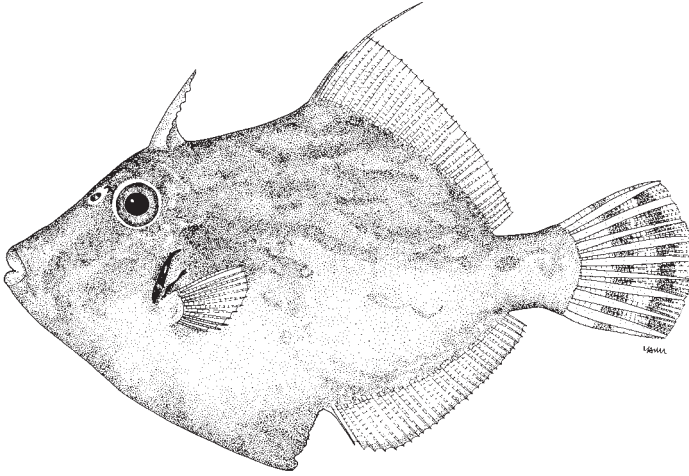
Maximum size to 80 cm; commonly to 70 cm. Occasionally found in lagoons or on outer reef slopes down to 20 m. Feeds on wide variety of bottom-living organisms, including algae, seagrasses, hydrozoans, gorgonians, colonial anemones, and tunicates. Caught incidentally in traps. Considered as trashfish. Cape Verde Islands, Ascension Island and Mauritania through the Gulf of Guinea. All tropical waters.



***Stephanolepis hispidus* (Linnaeus, 1766)**

En – Planehead filefish; **Sp** – Lija áspera.

Maximum size to 18 cm; commonly to 15 cm. Found in seagrass beds or over sandy or muddy bottoms from shallow water down to about 80 m; juveniles are associated with floating seaweeds. Caught incidentally in traps and bottom trawls. Both sides of the Atlantic; in the eastern Atlantic, from Canary Islands to Angola.

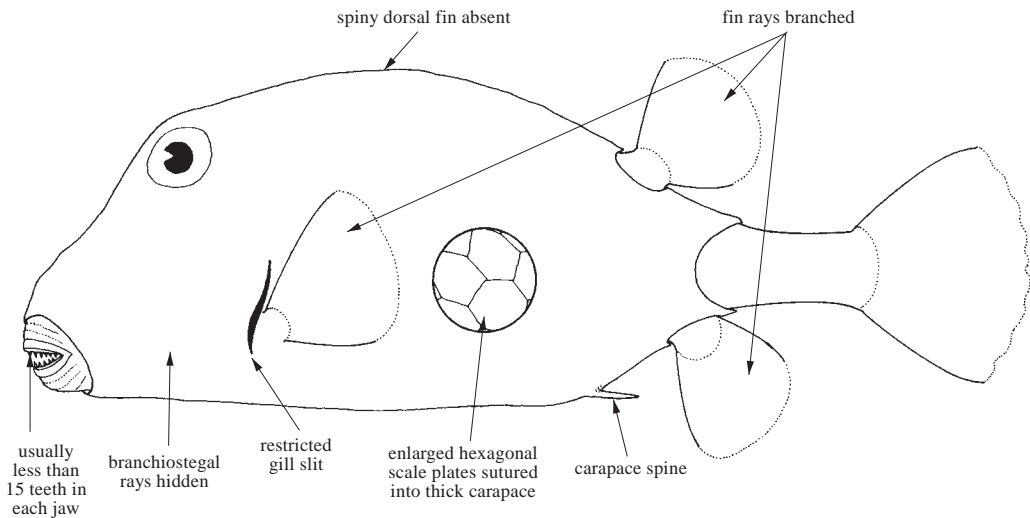


OSTRACIIDAE

Boxfishes (trunkfishes, cowfishes)

by K. Matsuura, National Museum of Nature and Science, Tsukuba, Japan

Diagnostic characters: Small fishes, never more than about 45 cm, with wide **body nearly completely enclosed in a carapace or cuirass formed of enlarged, thickened scale plates, usually hexagonal in shape and firmly sutured to one another** (less so on cheek to allow for breathing movements). **The carapace has openings for the mouth, eyes, gill slits, and fins, and for the flexible caudal peduncle; it is either triangular (flat on bottom and sharp-crested above) or rectangular (only some Indo-Pacific species) in shape, although sometimes relatively pentangular.** Mouth small, terminal, with fleshy lips; **teeth moderate, conical, usually less than 15 in each jaw.** **Gill openings relatively short, vertical to oblique slits in front of pectoral-fin bases, branchiostegal rays hidden beneath the skin.** Spiny dorsal fin absent; most dorsal-, anal- and pectoral-fin rays branched; pelvic fins absent. All Atlantic species of boxfishes with 10 soft rays in dorsal and anal fins. **Scale-plates often with surface granulations and sometimes prolonged into prominent carapace spines around eye or along the ventrolateral or dorsal surfaces of the body;** scales above pectoral-fin base like the scales of rest of body. Lateral line inconspicuous. **Colour:** variable, with general ground colours ranging from grey to bluish and greenish or, to yellowish and brown, usually with darker or lighter lines, bars, spots, reticulations, or symmetrical patterns such as hexagons.



Habitat, biology, and fisheries: Slow-swimming benthic-dwelling fishes occurring around rocky and coral reefs and on open sand bottoms and seagrass beds down to about 90 m depth. They feed on a variety of benthic invertebrates, with their small mouths in fleshy lips typically armed with moderate-sized conical teeth. Caught in traps and considered excellent eating, although some species have been reported to have toxic skin (ostracitoxin) on occasion, and can secrete a substance that is highly toxic to other fishes and to itself in enclosed areas such as holding tanks.


Similar families occurring in the area


No other family of fishes has a wide body nearly completely encased in a carapace or cuirass formed of enlarged, thickened, usually hexagonal plates sutured to one another.


Key to the species of Ostraciidae occurring in the area

- 1a. A median spine on back *Acanthostracion notacanthus*
 1b. No median spine on back *Acanthostracion guineensis*

List of species occurring in the area

The symbol  is given when species accounts are included.

 *Acanthostracion guineensis* (Bleeker, 1865).

 *Acanthostracion notacanthus* (Bleeker, 1863).

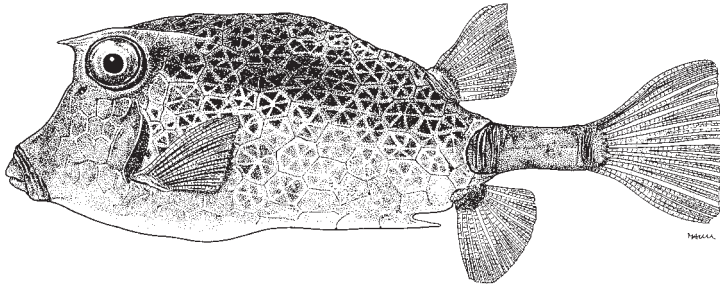
Reference

- Tyler, J.C.** 1965. The trunkfish genus *Acanthostracion* (Ostraciotidae, Plectognathi) in the western Atlantic: two species rather than one. *Proceedings of the Academy of Natural Sciences of Philadelphia*, 117(1): 1–18.

***Acanthostracion guineensis* (Bleeker, 1865)**

En – Yellow cowfish.

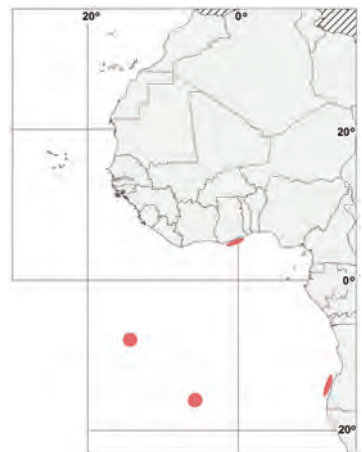
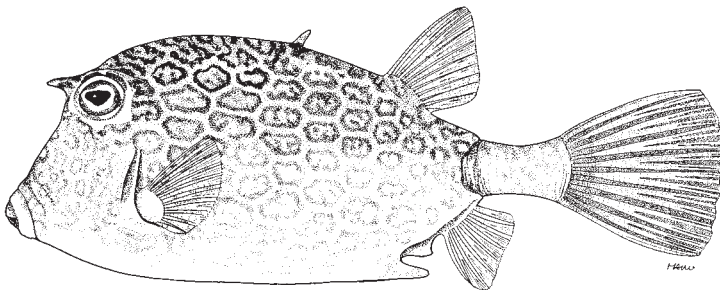
Maximum size to 25 cm. Found in coral reefs. Caught incidentally with traps. Separate statistics are not reported for this species. Confined to the eastern Atlantic from Guinea to Gabon.



***Acanthostracion notacanthus* (Bleeker, 1863)**

En – Island cowfish.

Maximum size to 30 cm. Found in coral reefs. Caught incidentally with traps. Separate statistics are not reported for this species. Confined to the eastern Atlantic from the Azores, Ascension, St Helena, occasionally along coasts of Ghana and Angola.

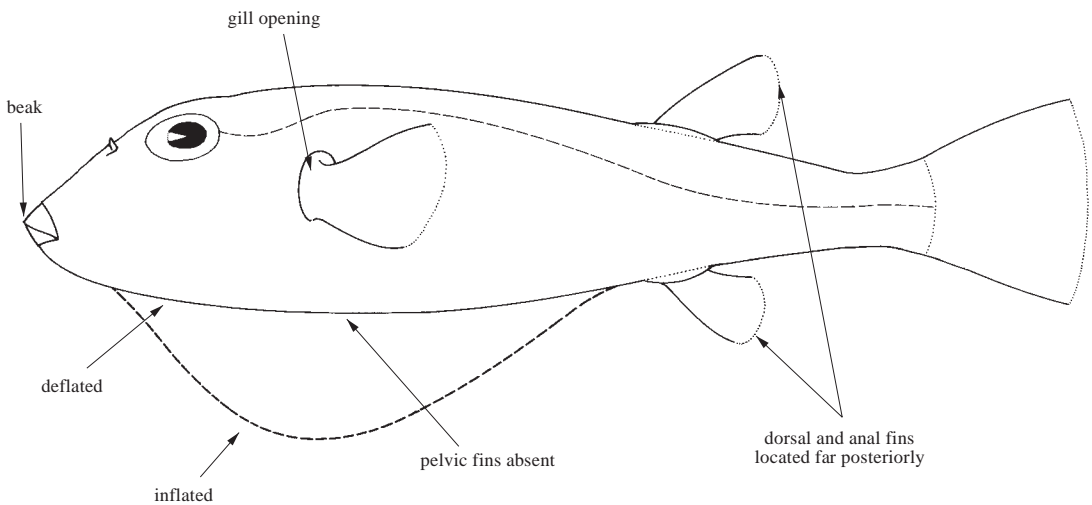


TETRAODONTIDAE

Puffers

by K. Matsuura, National Museum of Nature and Science, Tsukuba, Japan

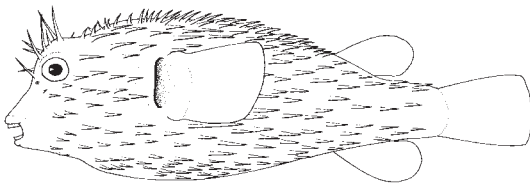
Diagnostic characters: Small to moderate-sized fishes, most species less than 30 cm, with a heavy blunt body capable of rapid inflation by intake of water (or air). Head large and blunt; jaws modified to form a **beak of 4 heavy, powerful teeth, 2 above and 2 below**; gill openings without distinct opercular cover, appearing as simple slits anterior to the pectoral fin; eyes located high on head. **Dorsal and anal fins located far posteriorly bearing no spines, but 7 to 15 soft rays**; caudal fin usually truncate to slightly rounded; **pelvic fins absent**. Typical scales absent, but most species are partially covered with tiny prickles or spinules, and many species have small fleshy tabs or lappets on the dorsal and/or lateral surfaces. **Colour:** most species are mottled, variegated, or barred on the upper and lateral surfaces, often with spots of various sizes and colours; ventral surfaces are almost always unpigmented.



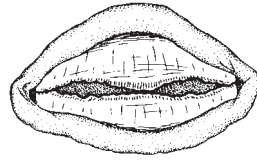
Habitat, biology, and fisheries: Inhabits tropical and temperate seas, most frequently in shallow nearshore waters, sometimes entering more brackish or fresh-water habitats. Usually alone or in small, disorganized groups. Their capacity to inflate themselves like balloons probably prevents them from being swallowed by most potential predators. At least some species are able to bury in the bottom. They propel themselves through the water by a fan-like flapping of their dorsal and anal fins. All species are carnivorous. The flesh of many species is reportedly of excellent flavour and is consumed locally in many areas, especially Japan. However, many species are toxic (tetradotoxin) and their consumption has caused serious (sometimes lethal) poisoning. The occurrence of the toxin is more prevalent in certain species, but may vary by season or sexual condition, and its presence is uncertain for many species. It is concentrated in the internal organs, especially liver and gonads, but can contaminate the flesh during careless cleaning of the fish. Although most species (except the northern puffer) are not commercially sought, all species of the family are included here because of their relative abundance and possible occurrence of the toxin.

Similar families occurring in the area

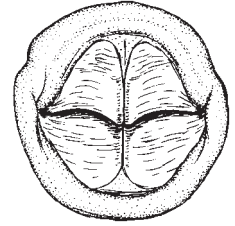
Diodontidae: only 1 family, the porcupine fishes, is similar to the pufferfishes; they are distinguished by having a single (unsutured) tooth in each jaw, and very large spines covering the body.



Diodontidae



**Diodontidae
(tooth plates)**



**Tetraodontidae
(tooth plates)**

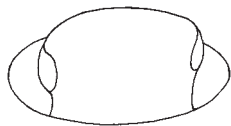
Key to the species of Tetraodontidae occurring in the area

Note: Several characters not typically found in other fishes are important in identifying the species of puffers. One is the presence or absence of lappets, which are small fleshy tabs found in various localities on the body. They are most easily seen when specimens are immersed in fluid. Most often they are tan or flesh coloured, and most prominent on the flanks. However, they may also occur as a single dark or black pair, located mid-dorsally. 'Prickles' are very small spinules located at various areas of the body. They are sometimes imbedded in the skin, thus not always easily visible, but their presence and pattern can be diagnostic.

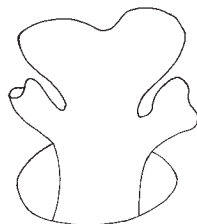
- 1a. Body laterally compressed; back behind eye distinctly keeled ***Canthigaster supramacula***
- 1b. Body round in cross section; back behind eye not keeled → **2**

- 2a. Nasal papilla a simple tube perforated by a pair of openings (Fig. 1); medial portions of body never encased in a bony corselet of irregularly shaped plates → **3**
- 2b. Nasal papilla not a simple tube, but expanded to 2 lateral and 1 posterior flap (Fig. 2); in specimens more than 22 cm, irregularly shaped plates (bases of prickles and dermal spines) encase dorsal and lateral body surface between pectoral and dorsal fins in a bony corselet ***Ehippion guttifer***

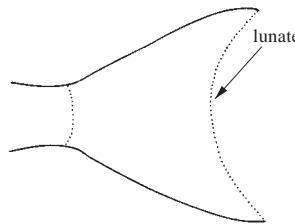
- 3a. Dorsal-fin rays 13 to 15; caudal distinctly lunate (Fig. 3) → **4**
- 3b. Dorsal-fin rays 7 to 10; caudal rounded, truncate, or with dorsal and ventral rays only slightly produced (Fig. 4) → **5**



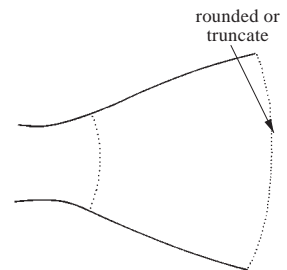
**Fig. 1 nasal papilla
(*Lagocephalus*)**



**Fig. 2 nasal papillae
(*Ehippion*)**




**Fig. 3 caudal fin
(*Lagocephalus*)**



**Fig. 4 caudal fin
(*Sphoeroides*)**

- 4a. Pectoral-fin rays usually 13 to 16; in subadults and adults (over about 20 cm), dark blue or black spots on anterior and medial regions of belly and laterally near pectoral-fin base; in adults, lower caudal-fin lobe longer than upper; lower third of pectoral fin white ***Lagocephalus lagocephalus***
- 4b. Pectoral-fin rays usually 17 or 18; never any spots laterally or ventrally; in adults, upper caudal-fin lobe longer than lower; pectoral fin uniformly dusky or with lower few rays dark ***Lagocephalus laevigatus***
- 5a. Body entirely smooth, prickles or lappets totally lacking; pigmentation mostly uniform, except usually a few dark spots on flanks ***Sphoeroides pachygaster***
- 5b. Body with prickles (prickles often not exposed, but present beneath tiny pores in the integument); a single pair of lappets on the back about half the distance from the posterior margin of the orbits to the dorsal-fin origin ***Sphoeroides marmoratus***


List of species occurring in the area

The symbol  is given when species accounts are included.

Canthigaster supramacula Moura and Castro, 2002

 *Ephippion guttifer* (Bennett, 1831).

 *Lagocephalus laevigatus* (Linnaeus, 1766).

 *Lagocephalus lagocephalus* (Linnaeus, 1758).

 *Sphoeroides marmoratus* (Lowe, 1838).

 *Sphoeroides pachygaster* (Müller and Troschel, 1848).

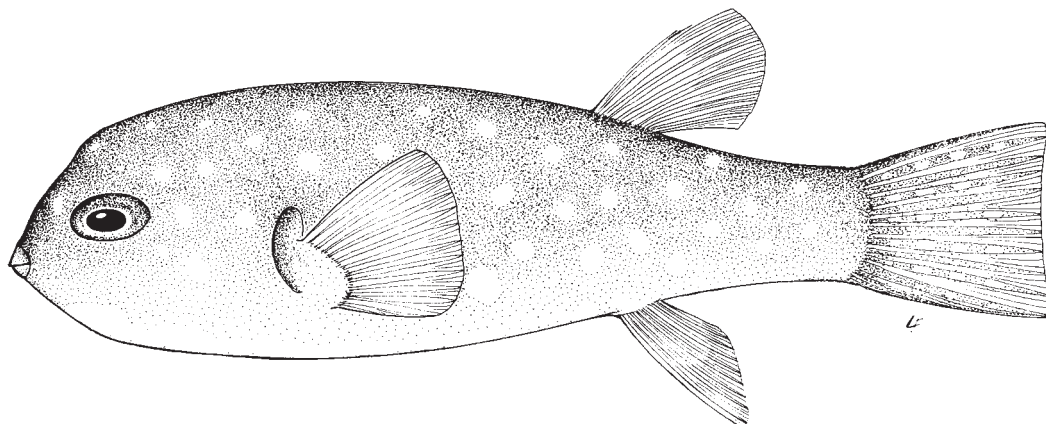
Reference

Shipp, R.L. 1974. The pufferfishes (Tetraodontidae) of the Atlantic Ocean. *Publications of the Gulf Coast Research Laboratory Museum*, 41: 162 p.

***Ehippion guttifer* (Bennett, 1831)**

Frequent synonyms / misidentifications: *Hemiconiatus guttifer* (Bennett, 1831) / None.

FAO names: En – Prickly puffer; Fr – Compère à points blancs; Sp – Tamboril de tierra.



Diagnostic characters: A blunt-headed fish with heavy jaws forming a beak of 2 teeth in each of the upper and lower jaws. Dorsal and anal fins set far back, near caudal fin, **the dorsal usually with 10 soft rays (no spines), the anal usually with 9 soft rays (no spines)**; caudal fin emarginate in juveniles and subadults, lunate in older specimens. Prickles (small spinules) present ventrally to near the anus; on dorsal and lateral surfaces of the trunk, in adults, **prickles are present and much modified with enlarged, bony bases that form a carapace of scute-like plates**. **Colour:** basal pigmentation of upper flanks and back a rich brown with a slight maroon tinge, the basal colour fading laterally to the unpigmented belly. **Pigmented surfaces covered with discrete white spots**, about a third to a fourth of the eye diameter.

Size: Maximum to about 80 cm; common over 40 cm.

Habitat, biology, and fisheries: Shallow coastal and estuarine waters. Separate statistics are not reported for this species. Caught with bottom trawls, beach seines, trammel nets and on hook-and-line. Marketed fresh, dried-salted and smoked in many countries, not allowed for sale in others (i.e. Côte d'Ivoire).

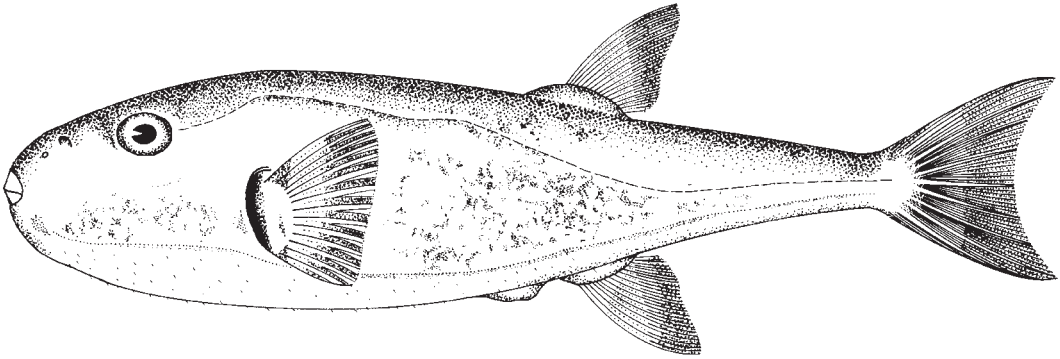
Distribution: In the eastern Atlantic, from the Straits of Gibraltar to Angola, including offlying islands, northward extending to Portugal.



Lagocephalus laevigatus (Linnaeus, 1766)

Frequent synonyms / misidentifications: *Lagocephalus pachycephalus* (Ranzani, 1839) / *Lagocephalus lagocephalus*.

FAO names: **En** – Smooth puffer; **Fr** – Compère lisse; **Sp** – Tamboril mondeque.



Diagnostic characters: A blunt-headed fish with heavy jaws forming a beak of 2 teeth in both upper and lower jaws. Dorsal and anal fins set far back near caudal fin, the **dorsal fin usually with 13 or 14 soft rays** (no spines), **the anal fin usually with 12 or 13 soft rays** (no spines); **caudal fin distinctly concave, in adults its upper lobe longer than lower lobe**; pelvic fins absent. Prickles covering much of the belly, usually absent on the back; **no lappets on head or body**. **Colour:** upper side a uniform grey or greenish grey, **sides mostly silver**, belly white. Juveniles and subadults have a few dark bars on upper side.

Size: Maximum to about 100 cm; common to 60 cm.

Habitat, biology, and fisheries: Inhabits inshore and nearshore areas to about 60 m depth, over sand and mud bottoms; usually found alone or in small, loose aggregations. Caught mainly on hook-and-line and on longlines; much feared by fisherman because of its predation on longline catch and destruction of gear by its powerful teeth. Marketed fresh. Although not sought commercially at present, the flesh is of good quality and is often consumed by the coastal populations after skinning it. Toxicity status unknown, but there are no reports of it being toxic. Large sizes and wide distribution make this species a possible candidate for eventual commercial utilization.

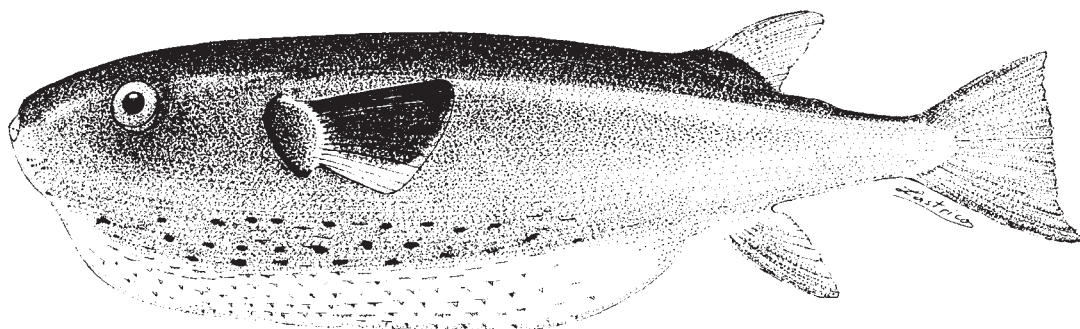
Distribution: Within the area, from the Straits of Gibraltar to Angola, including offlying islands; northward extending to Portugal. Elsewhere in the western Atlantic, from New England to Argentina.



***Lagocephalus lagocephalus* (Linnaeus, 1758)**

Frequent synonyms / misidentifications: None / *Lagocephalus laevigatus*.

FAO names: En – Oceanic puffer; Fr – Compère océanique; Sp – Tamboril liebre.

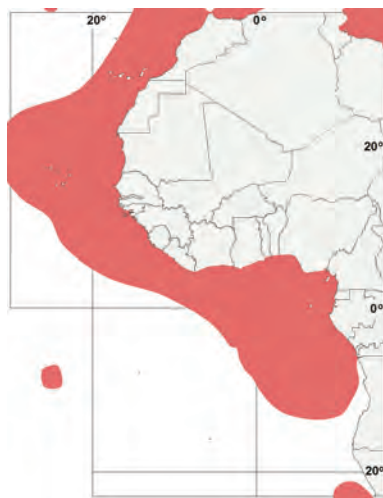


Diagnostic characters: A blunt-headed pufferfish with heavy jaws forming a beak of 2 teeth in both upper and lower jaws. Fins falcate, dorsal fin with **13 to 15 soft rays**, anal fin with **11 to 13 soft rays**, and pectoral fins with **13 to 16 rays**. Lower caudal lobe longer than upper lobe. Prickles present on belly only. **No lappets on head or body.** **Colour:** adults (over 30 cm) dark green or blue dorsally, white ventrally, with distinct dark spots around pectoral-fin base, extending to ventral surface. **Juveniles** with about 9 evenly spaced bars dorsally. Pectoral fin dark above, with lower third distinctly lighter.

Size: Reaches at least 60 cm; common to 40 cm.

Habitat, biology, and fisheries: This is an oceanic, pelagic puffer, found at depths to at least 1 000 m; rarely found near shore. It is a forage species for larger pelagics. There is no known fishery, and the species may be toxic.

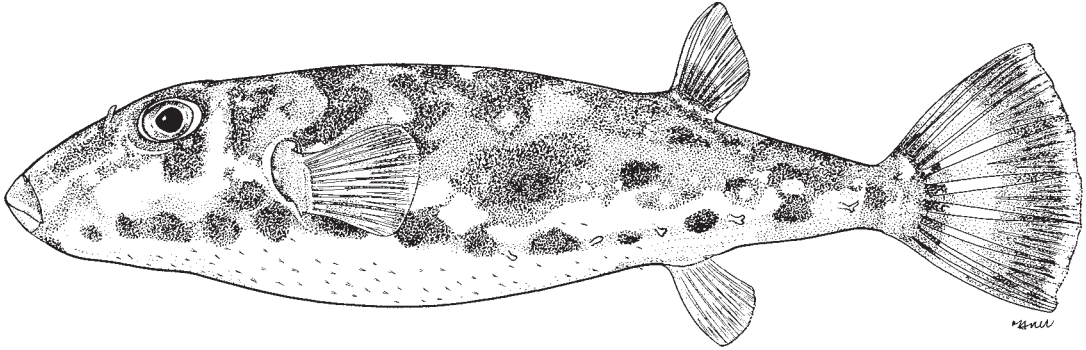
Distribution: This is a circumglobal species occurring in all tropical and temperate oceans and the Mediterranean Sea.



***Sphoeroides marmoratus* (Lowe, 1838)**

Frequent synonyms / misidentifications: None / *Sphoeroides spengleri* (Bloch, 1785).

FAO names: En – Guinean puffer; Fr – Compère de Guinée; Sp – Tamboril de Guinea.



Diagnostic characters: Body with a single pair of black lappets on the back about half the distance from the posterior margin of the orbits to the dorsal-fin origin. Dorsal and anal fins set far back near caudal fin. Dorsal fin usually with 8 (rarely 9) soft rays, anal fin usually with 7 (rarely 6) soft rays. **Colour:** dorsal side of body brown or grey with some large black spots, belly white; ventral sides bordered with an even row of 11 to 14 sharply defined round dark spots; caudal fin with a black or very dark bar at its base and another at its posterior margin.

Size: Reaches about 17 cm, common to 12 cm.

Habitat, biology, and fisheries: Inhabits inshore and nearshore areas to about 100 m depth.

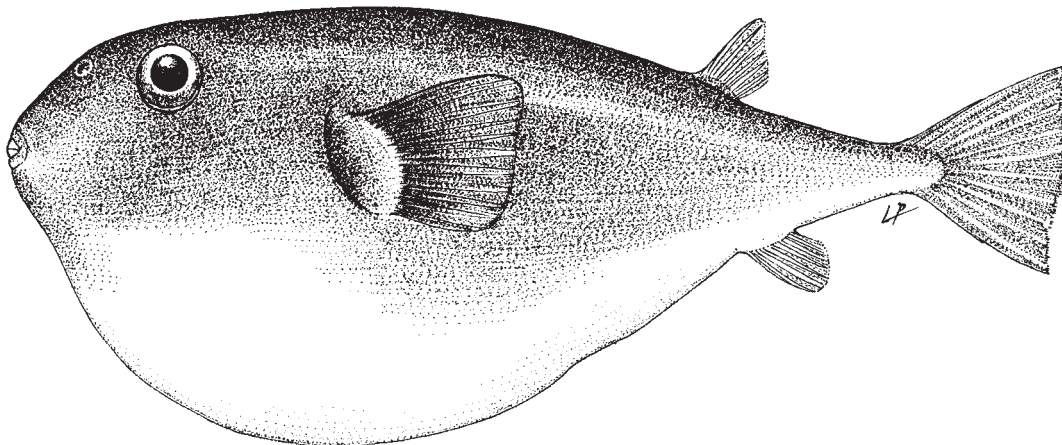
Distribution: From Madeira to Angola.



***Sphoeroides pachygaster* (Müller and Troschel, 1848)**

Frequent synonyms / misidentifications: None / None.

FAO names: En – Blunthead puffer; Fr – Compère émoussé; Sp – Tamboril ñato.



Diagnostic characters: A pufferfish with an extremely blunt head, with heavy jaws forming a beak of two teeth in both upper and lower jaws. **Body totally devoid of prickles and lappets.** Dorsal and anal fins set far back near caudal fin. **Dorsal fin usually with 9 soft rays, anal fin with 8 or 9 soft rays.** **Colour:** uniform brown or grey on dorsal and lateral surfaces, fading ventrally to a totally unpigmented ventral surface.

Size: Reaches about 25 cm, common to 20 cm.

Habitat, biology, and fisheries: This is a deepwater (to 400 m) species at central latitudes, although it may be taken at shallower depths in more temperate regions. Little is known of its natural history, and no known fishery exists for the species.

Distribution: Found in all oceans of central and temperate latitudes.

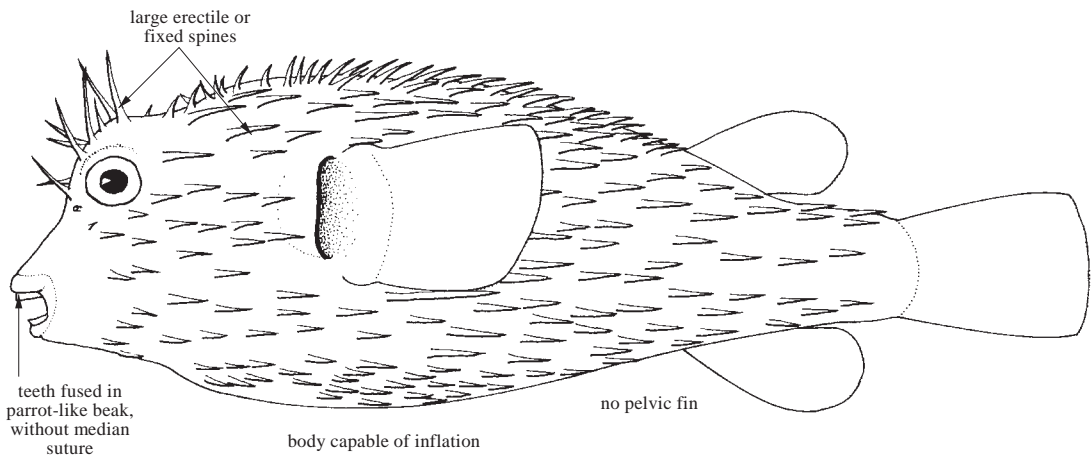


DIODONTIDAE

Porcupine fishes (burrfishes, spiny puffers)

by J.M. Leis, Australian Museum, Sydney, and Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, Australia

Diagnostic characters: Small to medium-sized fishes to 1 m in length, commonly 20-50 cm. **Body wide and capable of great inflation, covered with massive spines which may be quite long;** spines with large bases, or roots, under the skin; long spines usually erectile and 2-rooted, short spines fixed in erect position by their 3-rooted bases. Head broad and blunt; gill opening a relatively small, vertical slit immediately before pectoral-fin base; nasal organ usually in small tentacles located in front of large eyes; mouth large, wide and terminal, **teeth fused to form a strong, beak-like crushing structure without a median suture dividing the upper and lower jaws into left and right halves.** Dorsal and anal fins without spines, set far back on body, and like caudal fin, generally rounded; most fin rays branched; bases of fins often thick and fleshy; **no pelvic fins.** Lateral line inconspicuous. No normal scales. **Colour:** background colour light tan to brown, but grey not uncommon; usually overlain with dark brown to black spots, bars and/or blotches; green overtones and yellowish spots may also be present. Undamaged spines covered with skin that continues colour pattern. Belly white, often with yellow overtone. A pelagic species is deep blue dorsally, and pelagic juveniles of other species may also be blue, but pelagic juveniles of some *Chilomycterus* species are yellow with dark, ring-shaped markings.



Habitat, biology, and fisheries: Most species are benthic around coral or rocky reefs, but some frequent sea grass beds and sand or mud bottoms to 100 m, and one species plus the juveniles of others are pelagic. They feed on hard-shelled benthic invertebrates that are crushed with powerful jaws. They inflate when disturbed and present a potential predator with a large, very spiny ball. Most or all spawn pelagic eggs and pass through a pelagic juvenile phase. Juveniles are commonly preyed upon by large, pelagic predators such as tunas and billfishes. The pelagic species may school, but the others are not known to school. Not normally eaten except perhaps as fish meal, but often collected as bycatch in bottom trawls. Sometimes inflated and dried to be sold as curios. Thought to be poisonous, but some species eaten in Asia and the Pacific islands without ill effects.

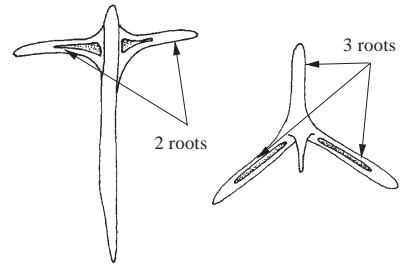
Remarks: This family is under study and nomenclatorial changes may be made, particularly in the allocation of species to genera, but it is unlikely additional species will be recorded in the area. Many literature records are misidentifications and require careful checking.

Similar families occurring in the area

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

Key to the species of Diodontidae occurring in the area

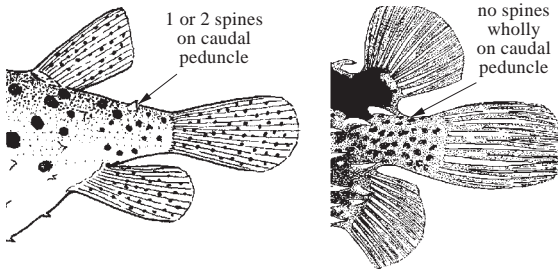
- 1a. All body spines erectile and 2-rooted (Fig. 1a) (except a few around gill opening or dorsal-fin base; there may be a short anterior extension of the spine shaft that resembles a short, third root) (*Diodon*) → 4
- 1b. Body spines fixed in an erect position and with 3 or 4 roots (Fig. 1b) (*Chilomycterus*) → 2



a) *Diodon* b) *Chilomycterus*

Fig. 1 body spines

- 2a. One or 2 small spines wholly on the dorsal surface of caudal peduncle (Fig. 2a); normally 10 caudal-fin rays; nasal organ of adults an open, ridged cup; adults with fins spotted, but no blotches on back; on top of head some spines with 4 roots; no fleshy tentacles on body (Fig. 3) . . . *Chilomycterus reticulatus*
- 2b. No spines wholly on the caudal peduncle (Fig. 2b); normally 9 caudal-fin rays; nasal organ of adults a short hollow tentacle with 2 openings; fins of adults usually without spots, but blotches present on back near pectoral fins and at base of dorsal fin; all spines with 3 roots; fleshy tentacles present over eye or laterally on trunk and head → 3



a) *Chilomycterus reticulatus* b) *Chilomycterus antennatus*

Fig. 2 lateral view of caudal region

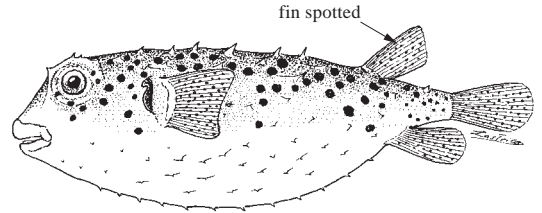


Fig. 3 *Chilomycterus reticulatus*

- 3a. A large (about equal to 1 eye diameter) tentacle above eye; colour pattern dominated by large blotches with small spots scattered on back and sides, on fins only basally, except on most or all of caudal fin from 10 to 15 cm standard length, and on other fins from 20 cm (Fig. 4) *Chilomycterus antennatus*
(presence in area doubtful, see species account)
- 3b. Tentacles above eyes absent or small; no small spots on fins or on back and sides, but irregular, wavy lines present on sides of head and trunk (Fig. 5)
. *Chilomycterus spinosus mauretanicus*

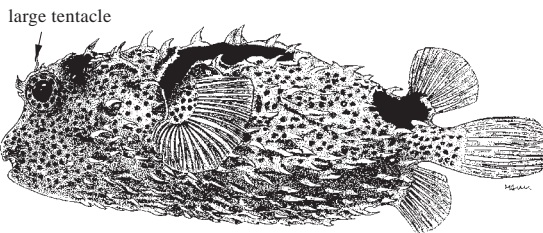


Fig. 4 *Chilomycterus antennatus*

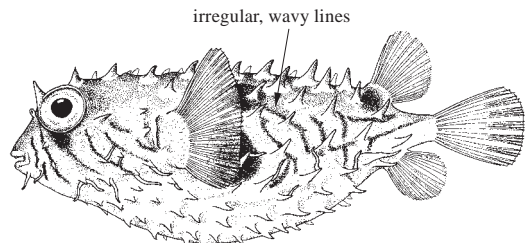


Fig. 5 *Chilomycterus spinosus mauretanicus*

- 4a. No spines wholly on caudal peduncle (Fig. 2b); body with several large, dark dorsal blotches; no small, dark spots on fins; 12 to 15 spines from lower jaw to anus ***Diodon holocanthus***
- 4b. One or more small spines wholly on the dorsal surface of caudal peduncle (Fig. 2a); body without large dorsal blotches; all fins (anal sometimes excepted) heavily spotted; 10 to 19 spines from lower jaw to anus → 5

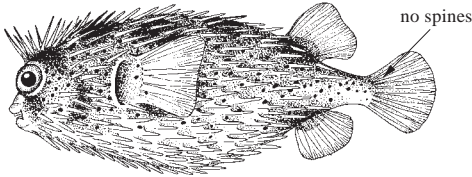


Fig. 6 *Diodon holocanthus*

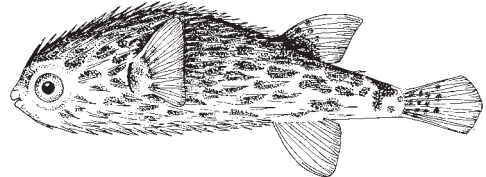


Fig. 7 *Diodon eydouxi*

- 5a. Pectoral-fin rays 19 to 22; anal-fin rays 16 to 18; dorsal and anal fins somewhat pointed in adults; relatively streamlined, head width of adults 3.3 to 4.0 times in standard length; 10 to 14 spines from lower jaw to anus; a wholly pelagic species coloured dark blue dorsally (Fig. 7) ***Diodon eydouxi***

- 5b. Pectoral-fin rays 22 to 25 (rarely 21); anal-fin rays 14 to 16; dorsal and anal fins rounded in adults; relatively robust, head width of adults 2.4 to 3.3 times in standard length; 14 to 19 spines from lower jaw to anus; juveniles (up to 20 cm) pelagic, adults demersal and coloured tan to brown (Fig. 8) ***Diodon hystrix***

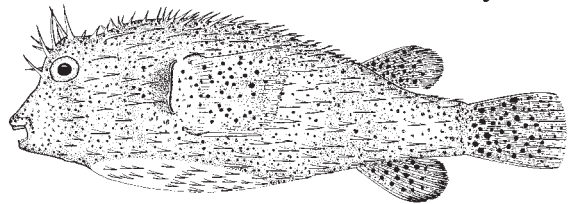









Fig. 8 *Diodon hystrix*

List of species occurring in the area

The symbol  is given when species accounts are included.

-  *Chilomycterus antennatus* (Cuvier, 1816).
-  *Chilomycterus reticulatus* (Linnaeus, 1758) [= *C. atringa* or *atinga* (Linnaeus 1758) as interpreted by many authors].
-  *Chilomycterus spinosus mauretanicus* (Le Danois, 1954).
-  *Diodon eydouxi* Brissout de Barneville, 1846.
-  *Diodon holocanthus* Linnaeus, 1758.
-  *Diodon hystrix* Linnaeus, 1758.

References

Leis, J.M. 1978. Systematics and zoogeography of the porcupine-fishes (*Diodon*, Diodontidae, Tetraodontiformes) with comments on egg and larval development. *U.S. Fishery Bulletin*, 76(3): 535–567.

Leis, J.M. 1986. Diodontidae. *In* *Smith's sea fishes*, edited by M.M. Smith and P.C. Heemstra. Johannesburg. McMillian South Africa, p 903–907.

Leis, J.M. 2003. Diodontidae. *In* *The living marine resources of the western central Atlantic*. Volume 3, edited by K.E. Carpenter. Rome, FAO, pp. 2007–2013.

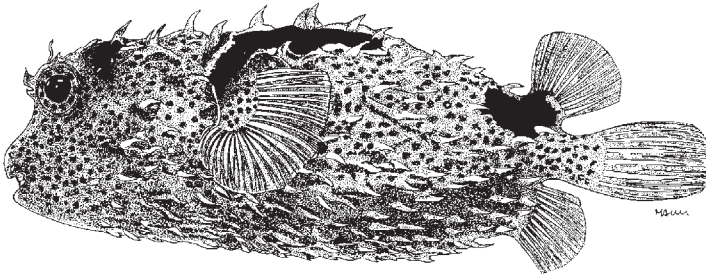
Leis, J.M. 2006. Nomenclature and distribution of the species of the porcupinefish family Diodontidae (Pisces, Teleostei). *Memoirs of Museum Victoria*, 63: 77–90.

Seret, B. & Opic, P. 1981. *Poissons de mer de l'ouest Africain tropical*. ORSTOM, Paris, 416 p.

***Chilomycterus antennatus* (Cuvier 1816)**

En – Bridled burrfish.

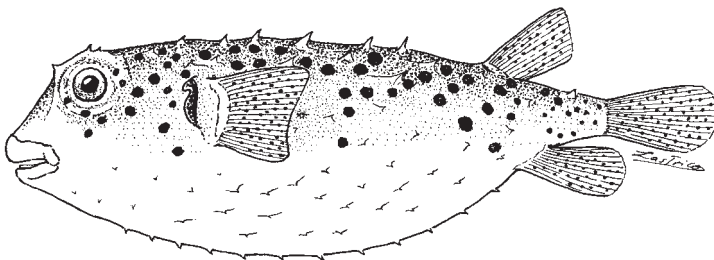
No spines wholly on caudal peduncle; a single large tentacle over each eye; 3 or 4 large blotches on back and sides with many small black spots between blotches. Small spots onto base of all fins from about 5 cm standard length, and onto most or all of caudal fin from 10 to 15 cm, and onto other fins from 20 cm. Maximum standard length about 25 cm. Young pelagic to about 1 to 3 cm standard length, and recruit into seagrass beds. Adults in sea grasses and reefs to depths of 25 m. Solitary; feeds on hard-shelled invertebrates. Not usually marketed. Eastern central Atlantic presence requires confirmation. A fish from Senegal identified as *Chilomycterus atinga* illustrated by Seret and Opic (1981: p. 391) appears to be *C. antennatus*, but no specimens from eastern central Atlantic are available.



***Chilomycterus reticulatus* (Linnaeus, 1758)**

En – Spotfin burrfish.

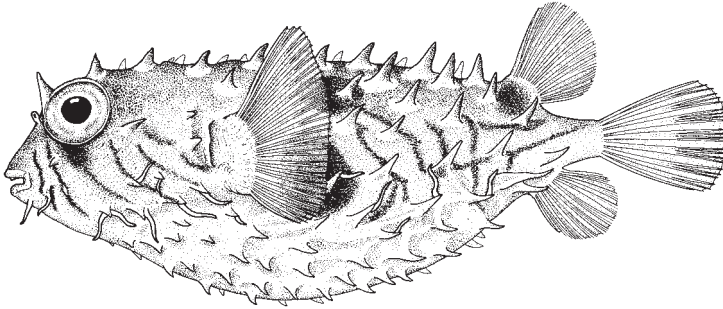
Small spine dorsally on caudal peduncle; no tentacles over eyes; no large blotches, but small spots present on at least dorsal, caudal and pectoral fins. Maximum standard length about 75 cm. Young pelagic to about 20 cm standard length, adults on reefs and soft bottoms to depths of 100 m: may occur deeper in tropics. Solitary; feeds on hard-shelled invertebrates. Not usually marketed. Circumtropical and subtropical, but occurrences patchy. Within eastern central Atlantic from Cape Blanc, Mauritania to Angola, and perhaps Namibia. *Chilomycterus atringa* (sometimes spelled *atinga*) (Linnaeus, 1758) is often used for *C. reticulatus* (Linnaeus, 1758). However, *atinga* is not unequivocally identifiable from the original description or its citations, whereas *reticulatus* is clearly identifiable from publications cited by Linnaeus (Leis, 2006).



***Chilomycterus spinosus mauretanicus* (Le Danois, 1954)**

En – Guinean burrfish; **Fr** – Porc-épic de Guinée; **Sp** – Puercoespín de Guinea.

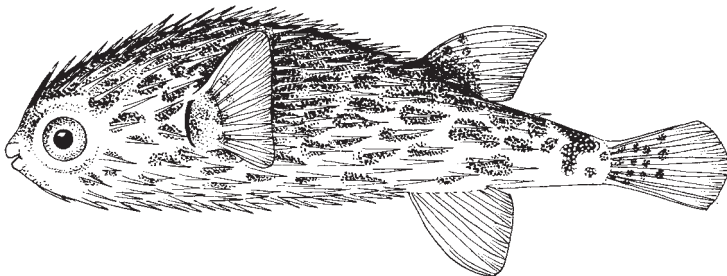
No spines wholly on caudal peduncle; supraocular tentacles absent or much smaller than eye; small, fleshy tentacles laterally on head and trunk; 3 large blotches on back and sides, but no small black spots interspersed; irregular, wavy, diagonal lines on sides of head and trunk; no spots on fins. Maximum standard length about 25 cm. Young unknown; habitat sand and mud bottoms to about 100 m. Feeds on hard-shelled invertebrates. Not usually marketed. Eastern central Atlantic endemic, Canary Islands to Angola, and perhaps Namibia. Subspecies, *C. spinosus spinosus* (Linnaeus), in western Atlantic.



***Diodon eydouxii* Brisout de Barneville, 1846**

En – Pelagic porcupinefish.

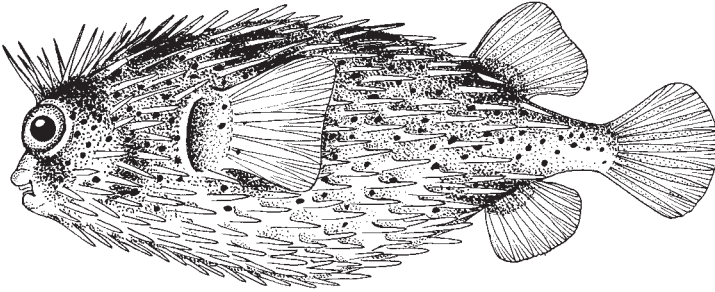
Relatively slender with pointed dorsal and anal fins, and a small spine dorsally wholly on the caudal peduncle. Blue dorsally. Maximum standard length about 25 cm. A pelagic, oceanic, surface, schooling species. Feeds on larger zooplankton and fish larvae. Not marketed. Circumtropical, pelagic, and probably throughout the eastern central Atlantic area in oceanic waters, but confirmed occurrences only on the periphery of the area.



***Diodon holocanthus* Linnaeus, 1758**

En – Longspined porcupinefish; **Fr** – Porc-épic ballon; **Sp** – Pejerizo balón.

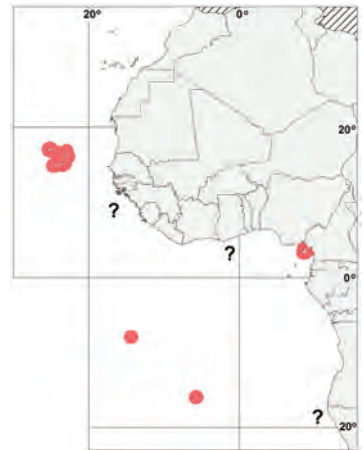
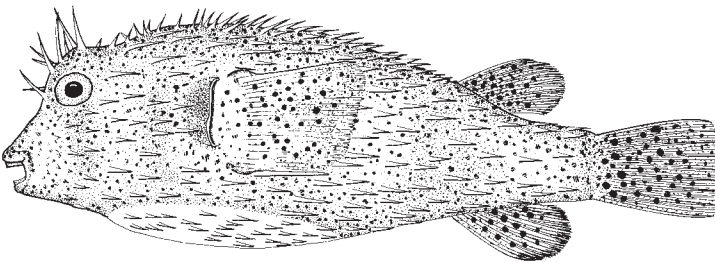
Robust, with rounded dorsal and anal fins, and no spines wholly on the caudal peduncle. Light background colour with large dark blotches on back and sides and many small dark spots on body, not extending onto anything other than the base of the fins. Maximum standard length about 30 cm. Juveniles pelagic to about 6 to 9 cm; larger fish found in a variety of benthic habitats from shallow reefs to open, soft bottoms to at least 100 m. Usually solitary, a nocturnal fish feeding on hard-shelled invertebrates. Not usually marketed. Circumtropical. In eastern central Atlantic, from Liberia to northern Angola, perhaps from Cape Verde Islands to Namibia.



***Diodon hystrix* Linnaeus, 1758**

En – Spot-fin porcupinefish; **Fr** – Porc-épic boubou; **Sp** – Pejerizo común.

Moderately robust, with rounded dorsal and anal fins, and 1 or 2 spines wholly on the caudal peduncle dorsally. Usually lacks large dorsal blotches, but has small dark spots on body that extend to cover most of the fins. Maximum standard length to about 75 cm. Juveniles pelagic to about 20 cm; larger fish on reefs to at least 50 m. Usually solitary, a nocturnal fish feeding on hard-shelled invertebrates. Not usually marketed. Circumtropical. In eastern central Atlantic records from Cameroon and Bioko, Ascension, St Helena, and Cape Verde islands, but perhaps to Namibia.



MOLIDAE

Molas (ocean sunfishes, headfishes)

by K. Matsuura, National Museum of Nature and Science, Tsukuba, Japan

Diagnostic characters: Large fishes reaching 3.5 m in length; **body short and deep or slightly elongate, strongly compressed, truncate, and without caudal peduncle or normal caudal fin.** Mouth small and usually terminal; teeth fused into a beak in each jaw without a median suture. Gill opening a short vertical slit in front of pectoral-fin base, branchiostegal rays hidden beneath the skin. **Dorsal and anal fins similar in shape, positioned far back on body; the posterior portions of each fin more or less continuous with the abbreviated pseudo-caudal fin;** both fins with only 15 to 19 soft rays; **pseudo-caudal fin reduced to a leathery fold with a scalloped trailing margin, immediately posterior to the bases of dorsal and anal fins;** pectoral fins small, located midside; **pelvic fins absent.** Skin of body leathery and thick, scales small, but basal plates in contact and close-fitting, sometimes hexagonal in shape. **Colour:** grey to dark bluish grey on back, grey-brown or brownish green on sides, with silvery reflections and dusky below, sides sometimes with small pale spots.

Habitat, biology, and fisheries: Molas are pelagic fishes, occurring in warm and tropical seas. They are frequently seen swimming lazily, or idling at the surface, occasionally partially on their side. They feed on jelly fishes, medusae, algae, brittle stars, larval eels, and sometimes larger fishes. Young fishes are observed along coastal areas, making schools; they feed on bottom invertebrates. Not generally used as food fish. Only 3 species known throughout the world.

Similar families occurring in the area

No other fish family has the peculiar truncated-shaped body lacking caudal peduncle and normal caudal fin.

Key to the species of Molidae occurring in the area

- 1a. Body depth 1 to 1.5 times in length; lips normal; body with small, round scales; large fishes, reaching 1 m or more in length → 2
- 1b. Body depth 2 times or nearly so in length; lips funnel-like, forming a vertical slit when closed; body with adjoining scales frequently hexagonal in shape; smaller fishes, less than 80 cm in length (Fig. 1) *Ranzania laevis*

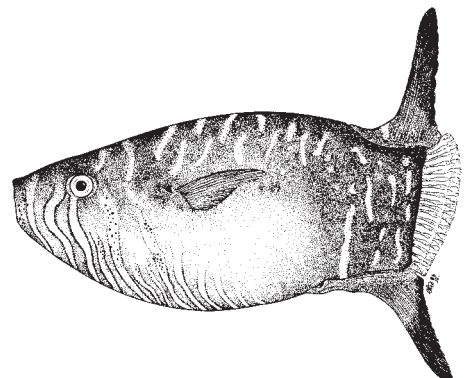
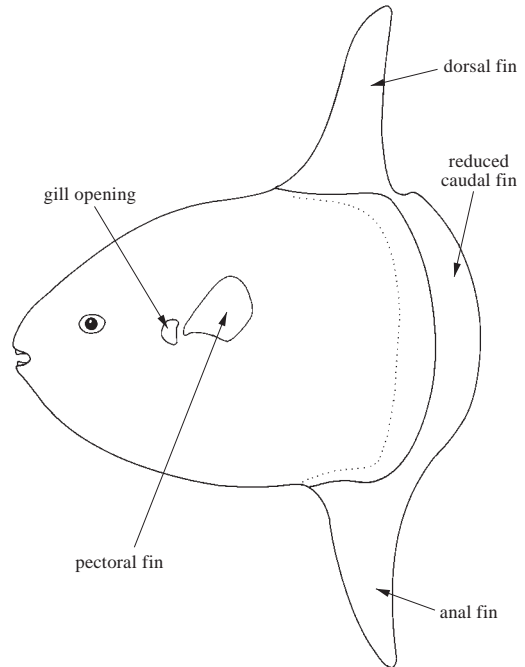


Fig. 1 *Ranzania laevis*

- 2a. Body depth usually equal to length; pseudo-caudal fin without posterior projection or tip (Fig. 2) ***Mola mola***
- 2b. Body depth about 1.5 times in length; midpart of pseudo-caudal fin posteriorly projected (Fig. 3) ***Masturus lanceolatus***

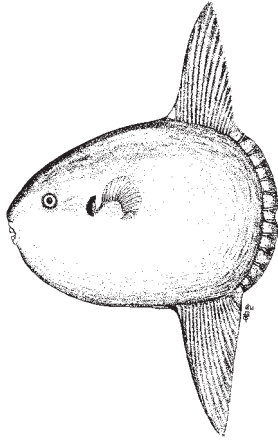


Fig. 2 *Mola mola*

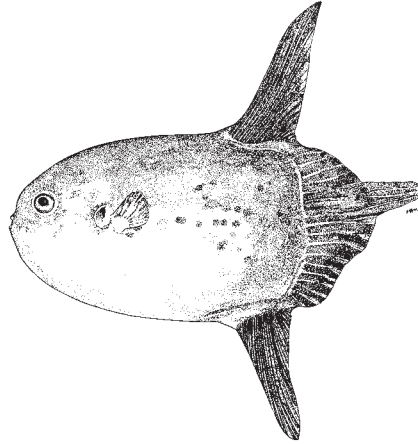


Fig. 3 *Masturus lanceolatus*

List of species occurring in the area

Masturus lanceolatus (Liénard, 1840). To 2 m. The Azores to South Africa in E Atlantic, worldwide in temperate and tropical waters.

Mola mola (Linnaeus, 1758). To 3.5 m. Scandinavia to South Africa in E Atlantic, worldwide in temperate and tropical waters.

Ranzania laevis (Pennant, 1776). To 80 cm. England to South Africa in E Atlantic, worldwide in tropics.

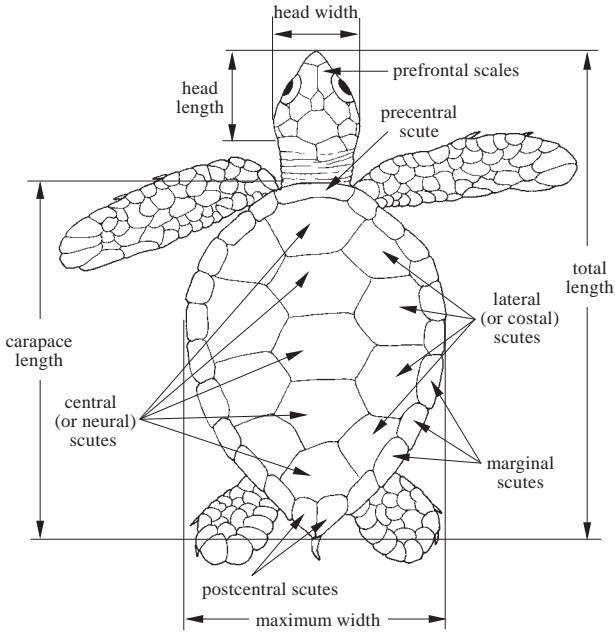
Reference

Fraser-Brunner, A. 1951. The ocean sunfishes (family Molidae). *Bulletin of the British Museum of Natural History (Zoology)*, 1(6): 89–121.

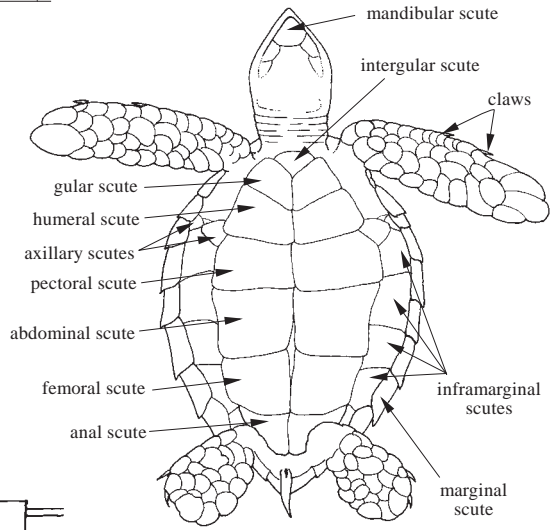
SEA TURTLES

by Juan A. Camiñas, Centro Oceanográfico de Málaga, Instituto Español de Oceanografía, Spain

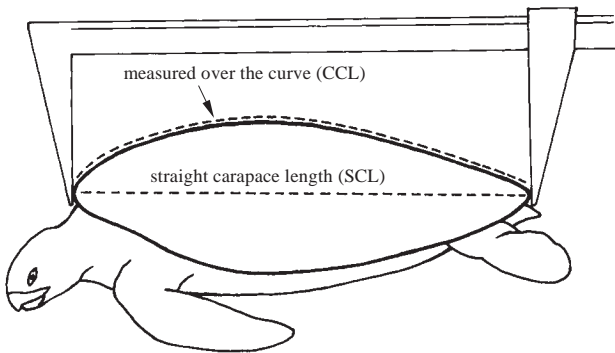
TECHNICAL TERMS AND MEASUREMENTS



**dorsal view of a juvenile sea turtle
(family Cheloniidae)**



**ventral view of a juvenile sea turtle
(family Cheloniidae)**



**measurements of carapace length
(see notes under 'General Remarks')**

GENERAL REMARKS

Sea turtles are essential organisms in marine and coastal ecosystems in all temperate and tropical regions. Their life cycles include different phases at sea and on land, the last depending on gender because after mating at sea only females are capable of going on land to lay eggs. The greatest part of the life cycle occurs at sea, near the coast or offshore. This portion of the life cycle is not well known in most species. For many turtle stocks, it is unknown what happens after hatching and neonate entry into the sea. This is a period referred to as the lost years. Most species have a pelagic migratory stage extending from 5 to 20 or more years before reaching sexual maturity. This delay in sexual maturity determines the high number of eggs produced by a single female, the success in the hatchlings and the contribution of juveniles and subadults to the population, which is very important for maintaining the number of reproducing individuals.

Sea turtles are large to huge marine reptiles with adults averaging about 45 kg in the ridleys (*Lepidochelys kempii*, *L. olivacea*) and 500 kg in the leatherback (*Dermochelys coriacea*). The identifying feature is the hard shell encasing the entire body. This shell is formed by a dorsal and a ventral part joined laterally, and consists of a layer of bones underneath and a horny layer on the outside arranged in a geometrical pattern of scutes in the majority of sea turtle species (family Cheloniidae), but is covered by leathery skin in the leatherback turtle, the only member of the family Dermochelyidae. The dorsal part of the shell, the carapace, is joined at the sides to the ventral part or plastron, which is notched at the front and rear ends where 2 pairs of limbs emerge from the shell. A powerful head with a strong, horny beak is permanently outside the shell; none of the species either herbivorous or carnivorous have true teeth, even though tooth-like projections may be present on the jaws. The front limbs of sea turtles are paddle-shaped like flippers and are used for swimming whereas the rear limbs are shorter and useful for the equilibrium during translation and are the extremities used to open and cover with sand the nests after laying the eggs inside.

Overall size in sea turtles is usually given as carapace length. Measurements over the carapace curve (CCL) in adults are 3 to 4 cm larger than straight carapace length (SCL, see figure). In addition, both straight and curved carapace lengths may be measured in several ways. Because the precentral scute may be concave and because there is a distinct notch between the postcentral scutes in the Cheloniidae, measurements may be taken from the furthest point on the front margin of the carapace to the furthest part on the hind margin (tip to tip), or from the nearest point on the front margin to the notch in the rear margin (notch to notch) or any combination of these. Available data often do not indicate in which way the measurements were done, and in those cases the information must be used as a reference of relative value, bearing in mind that such records could be biased by up to 4%. Because of their presence on the nesting beaches, female sizes are more often reported than those of males.

Sea turtles occur in all tropical and warm-temperate oceans. The majority of species inhabit shallow waters along coasts and around islands, but most are highly migratory during juvenile and adult stages and are found in the open sea in surface and deeper waters. They are swift swimmers and some are said to attain speeds of about 35 km per hour. Unlike freshwater turtles they move forward by simultaneous action of the front flippers. Reproducing females are compelled to return in regular intervals (from 1 to 3 years depending of the species) to the coast during the nesting season (several months) when they lay their eggs in a nest dug into the sand away from the surf zone. After a relatively long incubation period (usually from 45 days to two and a half months) the hatchlings emerge from the nest (mostly at night) and run to the sea. Very little is known about their movements and fate before they attain sexual maturity. The majority of sea turtles are predominantly carnivorous, but some species are omnivorous or even herbivorous.

Nesting is performed on sandy beaches, just above the high tide mark; the clutch of around 100 eggs is buried in the sand and left unattended. Migrations, which are linked to an ability to orient and navigate accurately across large expanses of seemingly featureless ocean, occur in large groups or 'flotillas', with simultaneous arrival at rookeries or nesting beaches ('arribazones') are commonly observed in some species. Usually, these arrivals have fortnightly or almost monthly periodicity, and each female may come to nest 2 to 5 times per season. It is assumed that the synchronized nest-building arrivals are an adaptive response to predation on both adults and eggs and are favourable for survival of the hatchlings which will emerge from several nests at the same time, thus making it easier for at least some of the young to escape from predators while running to the sea. All Atlantic species have a pelagic-oceanic existence period that may last from a few months in some hawksbills (*Eretmochelys imbricata*) to 12 years or more in some loggerheads (*Caretta caretta*). Leatherbacks may use pelagic-oceanic habitats throughout their lives.

Marine turtles are highly vulnerable to predation. Raccoons, coyotes, dogs, pigs, monkeys, ghost crabs, fly maggots, ants, and beetles principally eat the eggs; also fungal and bacterial infections are common. The hatchlings, just before erupting from the nest can be attacked by ants, mites, and fly maggots, and mammals may open the nests. When the hatchlings emerge from the nest and move to the sea, mammals, birds, and ghost crabs attack them. In the water, predation continues by birds at the surface and fishes in the water column. Sharks and other fishes feed on juvenile sea turtles. The worst enemy of adult sea turtles are sharks, particularly the tiger shark (*Galeocerdo cuvier*).

Since ancient times turtles have been highly esteemed as food for man. Both the flesh and eggs of most of the species are of delicate taste and historically much of the production has been exported frozen or canned for the preparation of turtle soup, calipees, and other delicacies. Other uses include the extraction of oil from turtle fat, the processing of tortoise-shell and leather industries and as meal or fertilizer. Many turtles are captured directly on the nesting beaches by turning the females onto their backs; at sea they are caught by tangle nets, gillnets, seines, trawl nets, traps and harpoons.

All marine turtle species are part of the incidental capture in some fishery. In fact, several types of fishing gears have an impact on marine turtles such as the shrimp fishery using bottom trawls and tuna and billfishes fisheries using surface longlines and drifting gillnets. Ghost fishing by lost fishing gear also has a major impact on the marine turtle population. In the coastal areas and the continental shelf marine turtles interact with different fisheries during the resting, nesting, mating, feeding or migrating stages of their life cycle. In some areas, these incidental captures represent a major concern for the protection of the stocks. Results of various studies demonstrate that the direct and indirect interactions between marine turtles and fisheries are significant, but that the extent of the interaction, and their ecological, economic and social consequences are still poorly known and understood.

All sea turtle species are in need of protection from unmanaged exploitation. Because sea turtles grow slowly, mature at late ages (12 to 50 years), and have long life spans (ca. 30 to 100 years) they have low intrinsic rates of increase and cannot withstand heavy rates of exploitation. They are especially vulnerable on land during their nesting period. Egg harvesting is now totally or partially banned in nearly all countries with nesting beaches. Because of the severe depletion of the majority of wild sea turtle populations, all species of marine turtles are classified threatened and in danger of extinction and are included in the Appendix I of the 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). They also appear on the Red List of threatened species of the International Union for the Conservation of Nature (IUCN). In spite of several protection measures, marine turtles are subjected to exploitation for their meat, shell, eggs and calipee, in parts of the world by subsistence economies. Marine turtles are also subject to other threats that need to be investigated such as marine pollution, degradation or elimination of foraging habitat, refugia and nesting habitat, diseases and parasites, poaching, marina and dock development, international trade, agricultural and industrial pollution, tourism activities and public works, oil and gas exploration and development (oil spills), power plant entrapment, military exercises, maritime traffic, recreational fisheries, underwater explosions, offshore artificial lighting, natural predation (of eggs, hatchling, juvenile or adult), etc.

Although they are of minor importance as a target for fisheries, sea turtles are an important group in the western Africa countries and in the eastern Atlantic waters. The six species reported from Morocco to Namibia are distributed in different habitats including nesting beaches, feeding grounds, mating areas and migratory corridors. The species observed are leatherback (*Dermochelys coriacea*), loggerhead (*Caretta caretta*), green turtle (*Chelonia mydas*), hawksbill (*Eretmochelys imbricata*), olive ridley (*Lepidochelys olivacea*) and Kemp's ridley (*Lepidochelys kempii*). There have been reported the aforementioned six of the Atlantic species, but even more loggerhead individuals from the Mediterranean and from the western Atlantic stocks. The northern part of the eastern central Atlantic region represents the convergence of the Mediterranean, Lusitanian and Mauritanian eco-regions which are important areas for marine turtle conservation. Tagged leatherback, Kemp's ridley, green and hawksbill turtles from Central and South American stocks have been reported in the eastern central Atlantic African waters. Data reported during the last several years indicate that the region includes important nesting areas and even the most important worldwide nesting areas for leatherback, green and loggerhead turtles. In conclusion the eastern central Africa countries and contiguous waters are highly relevant for sea turtle conservation although surveys of the coasts are very difficult as a result of financial and logistic difficulties, political instability, civil wars and other conflicts.

KEY TO THE GENERA AND SPECIES OF SEA TURTLES OCCURRING IN THE AREA
(after Márquez, R.M., 1990)

1a. Body without horny scutes, covered by leathery skin (small scales present only in hatchlings); carapace with 5 dorsal longitudinal ridges and 2 ridges that form the margins (Fig. 1a); upper jaw with a pair of frontal cusps (Fig. 1b); choanae open in 2 separate apertures on anterior half of roof of mouth; patches of papillary projections arranged in rows on roof of mouth and in throat (Fig. 2a); flippers without visible claws **Dermochelyidae**

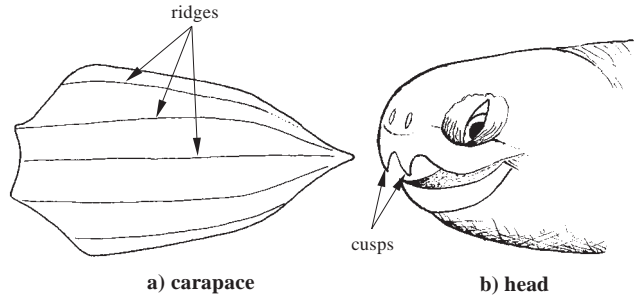


Fig. 1 *Dermochelys coriacea*

(a single species, *Dermochelys coriacea*, in the family)

1b. Carapace and plastron covered with scutes; scales present on head and flippers; choanae open in a single aperture on rear half of roof of mouth (Fig. 2b); papillary projections absent in mouth but present in throat; flippers with 1 or 2 developed claws . . . (**Cheloniidae**) → 2

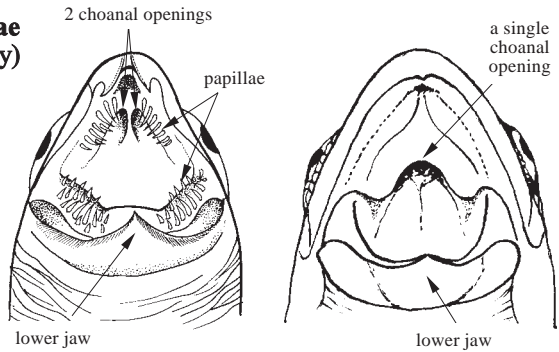


Fig. 2 ventral view of head (mouth open)

2a. Carapace with 4 lateral scutes on each side, the first pair not in contact with the precentral scute (Fig. 3a, b) . . → 3

2b. Carapace with 5 lateral scutes or more on each side, the first pair in contact with the precentral scute (Fig. 3c, d) → 4

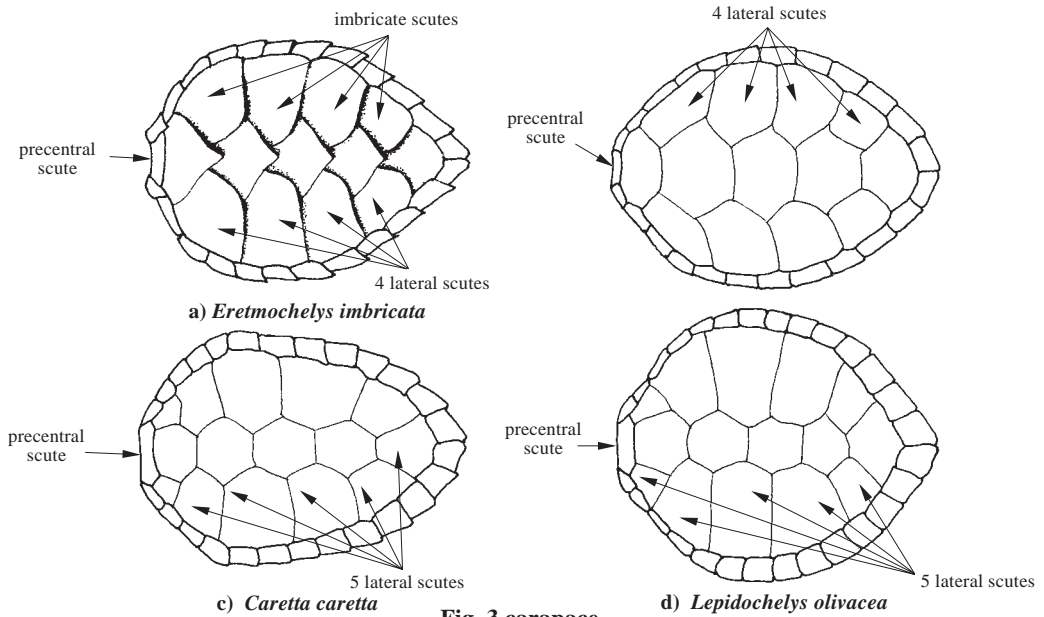


Fig. 3 carapace

- 3a. Carapace elliptical, covered by imbricate scutes (Fig. 3a) except in very old individuals; head narrow, with 2 pairs of prefrontal scales (Fig. 4a); jaw hawk-like, not serrated (Fig. 4a); flippers usually with 2 evident claws ***Eretmochelys imbricata***
- 3b. Carapace nearly oval, with no imbricate scutes (Fig. 3b); head blunt (short snout), the preorbital distance clearly smaller than orbital length (Fig. 4b); a single pair of prefrontal scales, usually 4 postorbital scales (Fig. 4b); lower jaw serrated (Fig. 4b); flippers usually with only 1 distinct claw ***Chelonia mydas***

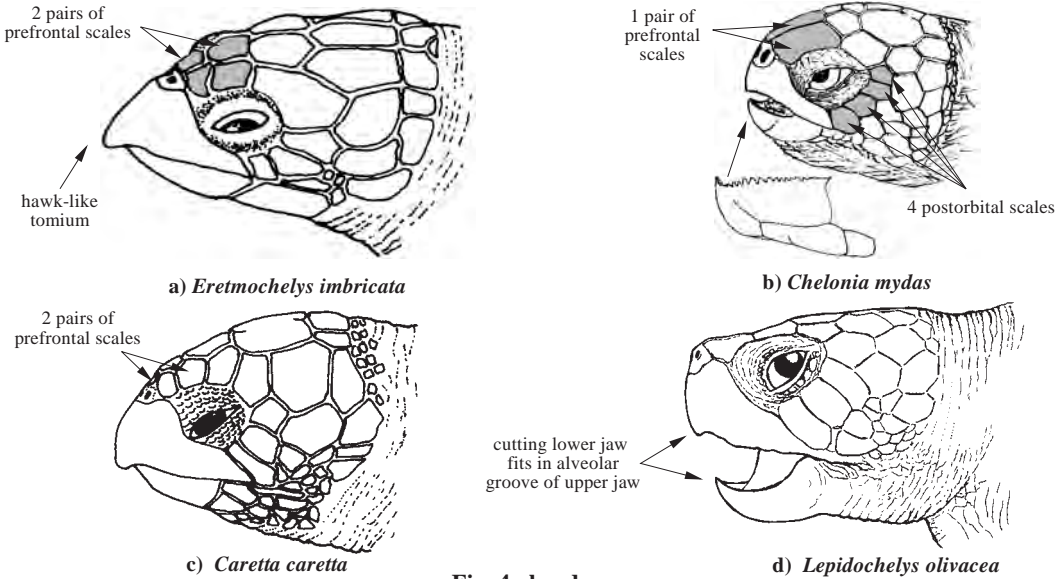


Fig. 4 head

- 4a. Carapace cardiform, its length always greater than its width (Fig. 3c); plastron usually with 3 pairs of inframarginal scutes, generally without pores (Fig. 5a); carapace scutes thick and rough to touch; head comparatively large, with a heavy and strong jaw lacking an internal alveolar rim (Fig. 4c); body colour usually reddish brown or yellowish brown ***Caretta caretta***
- 4b. Carapace nearly round, its length similar to the width (Fig. 3d); plastron usually with 4 pairs of pored inframarginal scutes (Fig. 5b); lateral scutes are often in 5 or more pairs; carapace scutes smooth to touch; head moderately small, with a cutting jaw provided with an internal alveolar rim (Fig. 4d); fore flippers robust and thick, each with 2 visible claws on anterior margin; rear flippers with 2 or 3 claws; body colour grey, olive, or olive yellowish → 5

3 inframarginal scutes, without pores 4 inframarginal scutes, each with a pore

- 5a. Five pairs of lateral scutes, carapace grey or greyish olive, plastron white ***Lepidochelys kempii***
- 5b. Usually 6 or more pairs of lateral scutes, carapace olive, olive brown, plastron creamy yellow ***Lepidochelys olivacea***

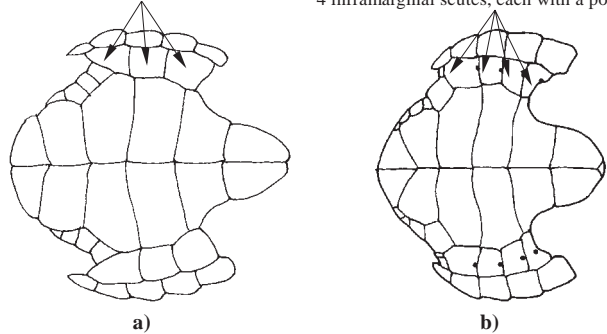








Fig. 5 plastron

LIST OF SPECIES OCCURRING IN THE AREA

The symbol  is given when species accounts are included.

CHELONIIDAE

-  *Caretta caretta* (Linnaeus, 1758).
 *Chelonia mydas* (Linnaeus, 1758).
 *Eretmochelys imbricata* (Linnaeus, 1766).
 *Lepidochelys kempii* (Garman, 1880).
 *Lepidochelys olivacea* (Eschscholtz, 1829).

DERMOCHELYIDAE

-  *Dermochelys coriacea* (Vandelli, 1761).

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Class REPTILIA

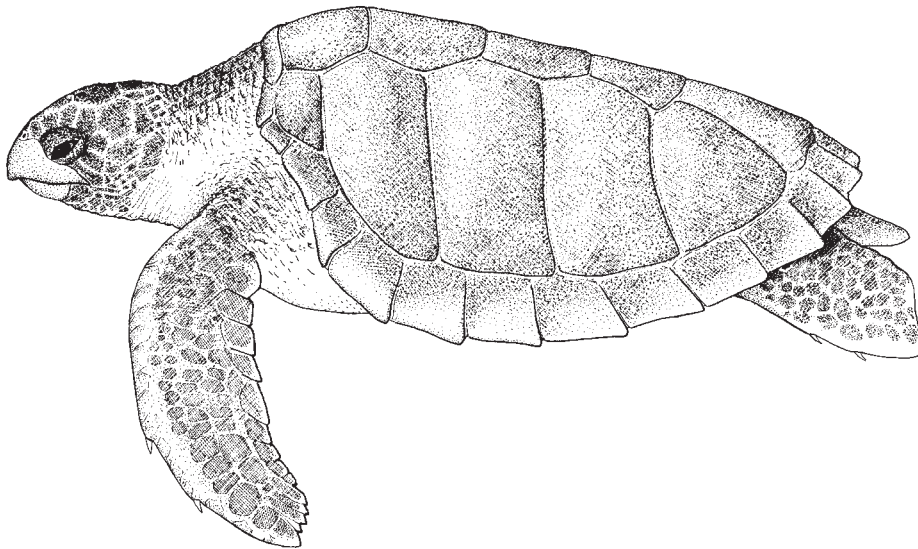
Order TESTUDINES

CHELONIIDAE

Caretta caretta (Linnaeus, 1758)

Frequent synonyms / misidentifications: None / *Chelonia mydas*; *Lepidochelys olivacea*.

FAO names: En – Loggerhead turtle; Fr – Caouane; Sp – Caguama.



Diagnostic characters: Carapace of adults heart-shaped in dorsal view, its width about 76 to 86% of its length. Head large, broad and subtriangular, 23 to 8% carapace length, with 2 pairs of prefrontal scales, and commonly 1 interfrontal. Horny beak very strong, thicker than in other sea turtles. Scutes of carapace thin, but hard and very rough, commonly covered with barnacles and other epibionts; 5 pairs of lateral scutes (anterior one touching precentral scute), 5 centrals (neurals), and commonly 12 or 13 pairs of marginals, including postcentral or pygal scute. Three pairs of inframarginal scutes underneath bridge of plastron, rarely with pores. Fore flippers robust and thick, each with 2 visible claws on anterior margin; rear flipper with 2 or 3 claws. Hatchlings and juvenile turtles with blunt spines on carapace scutes, forming 3 longitudinal keels that disappear during juvenile stage. **Colour:** adults distinct reddish brown dorsally with yellow ventrally; hatchlings dark brown dorsally, with flippers pale brown marginally and underneath, plastron usually much paler.

Size: Mature females with mean carapace length (straight carapace length) of 77.1 cm in Cape Verde, the most important nesting population in western Africa. Mean weight near 67 kg in the same population.

Habitat, biology, and fisheries: Inhabiting temperate and warm waters, the nesting areas are situated from 10° to 25° N along coasts of Morocco, Mauritania, Cape Verde Archipelago and Senegal. No reliable recent information of nesting in other countries exists. Nesting in Angola is most likely very infrequent. Immature and juvenile turtles are very common in northern Macaronesia which are linked by the north Atlantic gyre to populations in the United States of America, Mexico and Brazil. The northern region is also part of the distribution area of juveniles and adult loggerheads passing through the Gibraltar strait to the Mediterranean and vice versa. Females mature at about 63 cm straight carapace length. Nesting activity extends from June to July until late October in Cape Verde. Females deposit 60 to 137 eggs, 32 to

42 mm in diameter and re-nest in about 14 day intervals, depending on location. Individuals may nest from 1 to 6 times in a season and remigration may take place every 2 to 6 years. After an incubation period of about 45 to 76 days, the hatchlings move to the sea, disappearing from the nesting area. Genetic studies demonstrate the existence of several populations with distinct origins between immature America-Macaronesian, females nesting in Cape Verde Archipelago and individuals observed in the south of the region from the Indian Ocean populations. The loggerhead is classified as vulnerable by the IUCN (2015) and international trade is prohibited by CITES. Incidental captures of subadults with different gears are common in the northern Macaronesian waters. There is no industrial exploitation of loggerheads but local people and the artisanal fishermen appreciate both the eggs and meat and capture some turtles on the reproduction beaches. Direct exploitation of nesting females and their clutches by local people is reported in Cape Verde, reducing the number of nesting females.

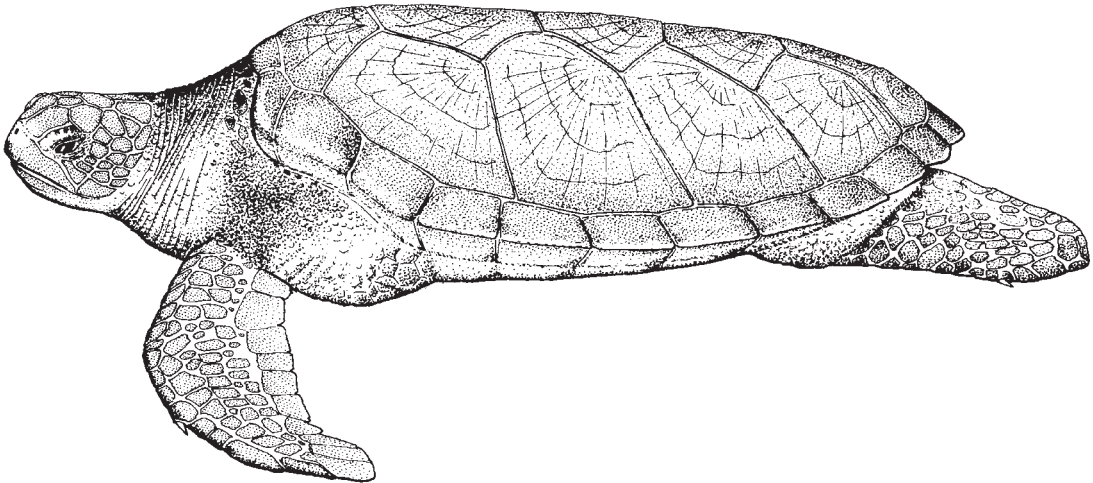
Distribution: Recorded from the Gibraltar strait to Cape Town in South Africa. Loggerheads are commonly distributed through subtropical and warm-temperate waters, with a regular presence of juveniles in the northern Macaronesian islands, Azores and Madeira, and adults in the southern Macaronesian islands with the most important west African reproduction area in Cape Verde. Loggerheads are regularly distributed along the coasts of northwestern Africa extending south through the Gulf of Guinea. Nesting areas are concentrated in Cape Verde with an estimated nesting population around 2 000 females in Boa Vista and Sal Islands, representing one of the largest reproductive stocks in the Atlantic and in the world. Other minor nesting areas include southern Morocco, Mauritania, Senegal, Congo and São Tomé and Príncipe islands. Loggerheads are known to be highly migratory. Juveniles tagged in southeastern United States, Mexico and Brazil have been recovered in the Azores, Madeira and Canary Islands. Captures of individually tagged loggerheads have documented movements from the Azores and Canary Islands to the northwest Atlantic.



Chelonia mydas (Linnaeus, 1758)

Frequent synonyms / misidentifications: None / *Caretta caretta*; *Lepidochelys olivacea*.

FAO names: En – Green turtle; Fr – Tortue verte; Sp – Tortuga verde.



Diagnostic characters: Body generally depressed in adults; **carapace oval in dorsal view, its width about 88% of its length.** Head small and blunt, around 20% carapace length; **1 pair of elongate prefrontal scales between orbits.** **Lower jaw with sharply serrated cutting rim** corresponding with strong ridges on inner surface of upper jaw. Scutes of carapace thin, smooth, and flexible when removed; **4 pairs of lateral scutes (foremost one not touching precentral scute)**, 5 central scutes (low-keeled in small juveniles but median keel absent in larger juveniles and adults), and usually 12 pairs of marginal scutes. Ventral scutes also smooth and rather thin; 4 pairs of inframarginal, 6 pairs of central plastral, usually 1 intergular, and sometimes 1 interanal scute. **Each flipper with a single visible claw.** **Colour:** upper side pale to very dark brown **varying to brilliant combinations of yellow, brown, and greenish tones, forming radiated stripes, or abundantly splattered with dark blotches.** In juveniles, scales of head and upper side of flippers fringed by a narrow, clear, yellowish margin. Hatchlings dark brown to nearly black on upper side, carapace and rear edges of flippers with white margin, lower side white.

Size: In the area, nesting females with maximum carapace length (straight carapace length) 105 cm; maximum weight 140 kg; common to 80 kg.

Habitat, biology, and fisheries: The optimum habitat is shoal waters, with abundant sea grass where adult feeding occurs. Juveniles feed on animals until their recruitment to coastal areas with abundant sea grass. Developmental areas are reported throughout the waters off northwest Africa notably among the sea grasses of the Banc d'Arguin National Park in Mauritania, Maio and Boa Vista islands in Cape Verde, coastal Senegal, and several areas in the Gulf of Guinea. Nesting occurs at night in tropical and subtropical waters from May to October, mostly during the rainy season. In São Tomé the reproduction season extends from October to January-February. Females mature at 20 to 50 years, deposit 110 to 140 eggs and reneat at 12 to 14 day intervals. Individual females may nest 1 to 5 times in a season and remigration occurs every 2 to 4 years. Egg incubation takes 48 to 70 days, and the hatchlings enter the sea, remaining pelagic for 2 to 4 years. Migratory analysis in the Gulf of Guinea has shown that post nesting dispersal from Bioko includes important feeding grounds in other countries where mixing with turtles from other nesting populations may occur. Ascension Island populations were found to contribute a large proportion of the individuals in mixed African stocks. Classified by the IUCN as endangered, and protected from international trade by CITES, green turtle harvest continues throughout the region for human consumption and subsistence in coastal populations and by artisanal fishermen. Capture has been observed in Cape Verde, Banc d'Arguin, Senegal, Guinea-Bissau and Sierra Leona where the meat

and eggs are appreciated for consumption. Green turtles are also harvested from incidental captures in most countries and reported in Ghana, Togo, Cameroon, islands of Equatorial Guinea, Guinea Bissau, São Tomé and Príncipe, Gabon and Congo. The licensed trawling fleet from several countries fishing for shrimp represent an important threat in the region, where TEDs (turtle excluder devices) are not used. Exploitation of eggs from nesting beaches occurs throughout the region.

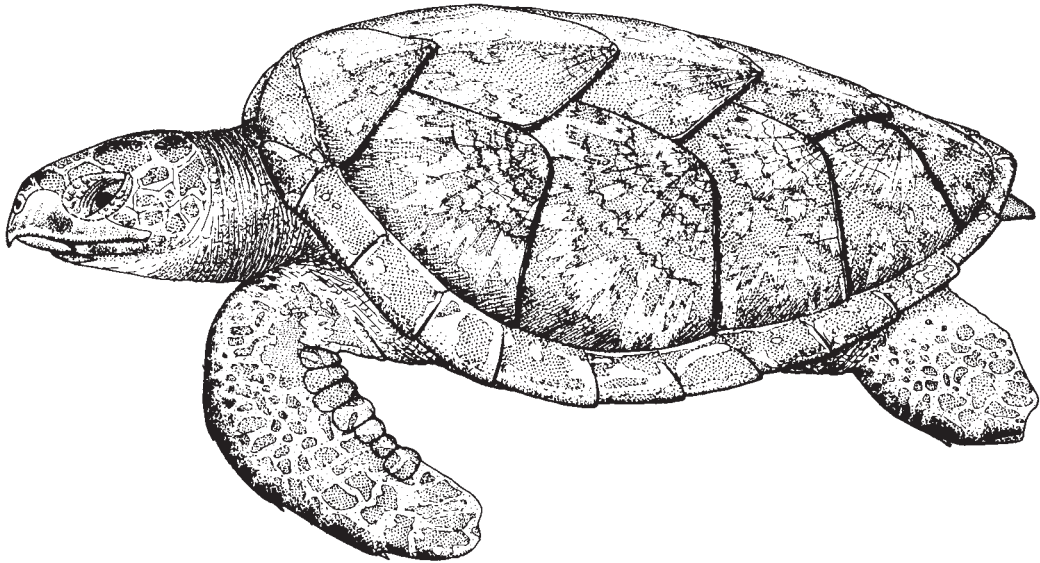
Distribution: Found throughout coastal areas in west Africa with few observed in the north Macaronesian islands and the Gibraltar Strait. Green turtles are the most common species in western Africa with the broadest distribution. Individuals tagged in Brazil have been collected in Guinean waters, recording transatlantic migrations and indicating interchange between populations from South America and Africa. The Bijagos Archipelago in the Gulf of Guinea welcomes around 2 000 females of the species each year from June to October, the largest reproductive colony in western Africa. Nestings have also been observed in Senegal, Sierra Leona, and sporadically in Cameroon and Angola. Large zones exist on the south of Bioko Island (Equatorial Guinea) where nesting occurs from August to April with a maximum in January. Immature individuals are present in the waters surrounding São Tomé and Príncipe, Côte d'Ivoire, Corisco Bay, shared by Gabon and Equatorial Guinea, where the existence of exceptional sea grasses represents one of the major feeding grounds of adult green turtles in the eastern central Atlantic.



Eretmochelys imbricata (Linnaeus, 1766)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Hawksbill turtle; Fr – Tortue caret; Sp – Tortuga Carey.



Diagnostic characters: Carapace length of adults **cardiform or elliptical**, its width 70 to 79% of its total length. Head medium-sized, narrow, with pointed beak, the head length 21 to 33% of straight carapace length, with **2 pairs of prefrontal scales and 3 or 4 postorbital scales; jaw not serrated on cutting edge, but hooked at tip. Scutes strongly imbricated at maturity**, but overlapping character frequently lost in older animals. **Carapace with 5 central, 4 pairs of lateral (the first not touching the precentral scute), 11 pairs of marginal, plus 1 pair of postcentral or pigal scutes.** Ventrally, 5 pairs of scutes, plus 1 or 2 intergular, and sometimes 1 small interanal scute; each plastron bridge covered by 4 poreless inframarginal scutes. **Rear and fore flippers each with 2 claws on anterior border.** Hatchlings and juveniles with 3 keels of spines along carapace, disappearing with growth. Juveniles with scutes of carapace indented on rear third of carapace margin. **Colour:** pattern variable, scales of head with creamy or yellow margins; dorsal carapace with amber ground colour, and brown, red, black, and yellow spots or stripes, usually arranged in a fan-like pattern; ventrally, scutes rather thin and amber-coloured juveniles with brown spots in rear part of each scute); dorsal sides of head and flippers darker and less variable. Hatchlings more homogenous in colour, mostly brown, with paler blotches on scutes of rear part of carapace, and also with small pale spots on “tip” of each scute along the 2 keels of the plastron.

Size: Mean carapace length (straight carapace length) of adult females 53 to 114 cm (worldwide), but reportedly highly variable; weight of adult females around 36 to 77 kg. Nesting females curved carapace length in Equatorial Guinea measured between 72 and 91 cm.

Habitat, biology, and fisheries: Distributed throughout the area including offshore islands, its occurrence is rather spotty and uncommon. Absent in the northernmost area from the Gibraltar Strait to Mauritania. A relatively small turtle, the shell has thick overlapping plates. Inhabits coastal waters including lagoons with muddy and coralline bottoms and mangroves. Mating is reported to take place in August and nesting from August to April with peaks depending on the nesting areas; the incubation period ranges from 45 to 60 days. Eggs are white, spherical, 3.5 to 4 cm in diameter and coloured dark brown. Juveniles can be observed along the rocky coast of Côte d'Ivoire, Sierra Leona and Cameroon, where they are commonly reported. Hawksbills are omnivorous and include sponges, crustaceans, molluscs,

seaweeds and sea grasses in their diets. Hawksbill turtles are listed as critically endangered by IUCN. They are also listed on Appendix 1 of CITES. *E. imbricata* is subject to exploitation for its meat in the majority of the countries where it is present. The species suffers exploitation from local fishermen who use special nets, harpoons and underwater guns to capture them in Corisco Bay and sell them in the markets of big cities such as Libreville (Gabon) and Bata (Equatorial Guinea). Marketed fresh in some countries, the most important product obtained from this species is the tortoise shell, or carey, which is widely used in marketable and traditional artisanal works and to make ornamental objects.

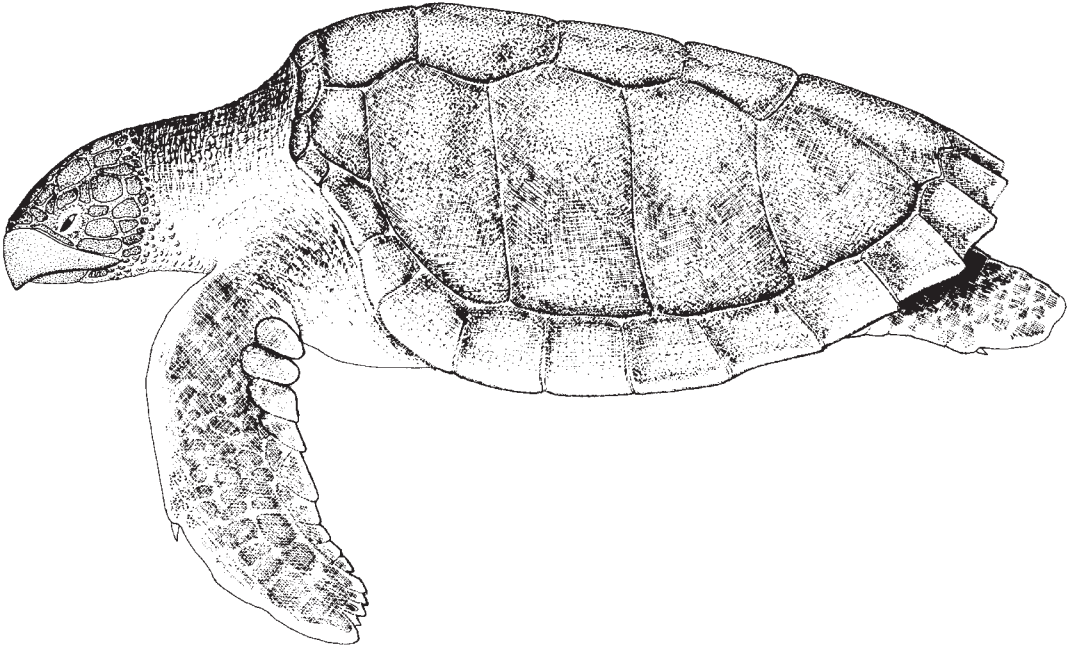
Distribution: The northern limit of hawksbill distribution in the western Africa is situated between Mauritania and Cape Verde. The southern limit appears to be near Congo. An occasional visitor to Macaronesian waters, the species is present in the Canary Islands only by accident. Juveniles have been sighted near the various islands of Cape Verde, in particular near Boa Vista island. No recent proof of its presence in Morocco and Western Sahara, but they may nest in Senegal and Gambia. In Gulf of Guinea waters, it has been estimated that 100 to 200 females nest each year between April and August in the Bijagos archipelago. In Bioko Island (Equatorial Guinea) nesting occurs in low numbers from December to April with a peak in January. A female with eggs in her body was captured in Cameroon. Nests in Corisco Bay islands, São Tomé and neighbouring islands are reported. Juveniles and male adults are also observed year-round in São Tome waters and nests are known in several shoreline locations in Gabon. This species has not been reported in Congo or Angola. The geographic regions where the species nests with some consistency are: the southern portion of the northwest African coast and the western portion of the Gulf of Guinea. The limited development of coral reefs in western Africa, due to the existence of upwelling areas affecting the water temperature creating an unfavourable environment for their extension, could explain the apparent absence of hawksbills in large portions of the western Africa coast.



***Lepidochelys kempii* (Garman, 1880)**

Frequent synonyms / misidentifications: None / *Caretta caretta*.

FAO names: En – Kemp's ridley turtle; Fr – Tortue de Kemp; Sp – Tortuga lora.



Diagnostic characters: Carapace of adults nearly round (width of carapace about 95% of its length). Hatchlings have longer carapace, width about 84% of total length (straight carapace length), and larger head, about 41% of carapace length. **Head moderately small with 2 pairs of prefrontal scales.** Carapace with 5 central, 5 pairs of lateral, and 12 pairs of marginal scutes; bridge area with 4 scutes, each with a pore. Usually only 1 visible claw on fore flippers, hatchlings show 1 or 2 claws on rear flippers. **Colour:** upper body of adults predominantly olive-grey dorsally, white or pale yellowish underside. The upper side of hatchlings is dark grey to black, but this changes significantly with age, and after 10 months the plastron is nearly white. Some individuals display white margins on flippers and greenish tones in the axillary region.

Size: Together with its congener, *Lepidochelys olivacea*, Kemp's ridley is the smallest of all sea turtles with a body mass of <50 kg. Mean carapace length (straight carapace length) of adults, 52 to 78 cm; weight of adult females 22 to 48 kg.

Habitat, biology, and fisheries: This species prefers shallow waters and is associated with the subtropical mangrove shoreline, where it is often found on shrimp grounds. No nesting is reported in the area. Kemp's ridleys are mostly carnivorous, feeding on several different kinds of crabs, shrimps, jellyfish and fishes. IUCN classifies this species as critically endangered, and it is protected from international trade by CITES. The population appears to be rebounding slowly with complete protection on the nesting beaches. Exploitation of this species is incidental, and most of the specimens taken are juveniles. Taken in shrimp trawls.

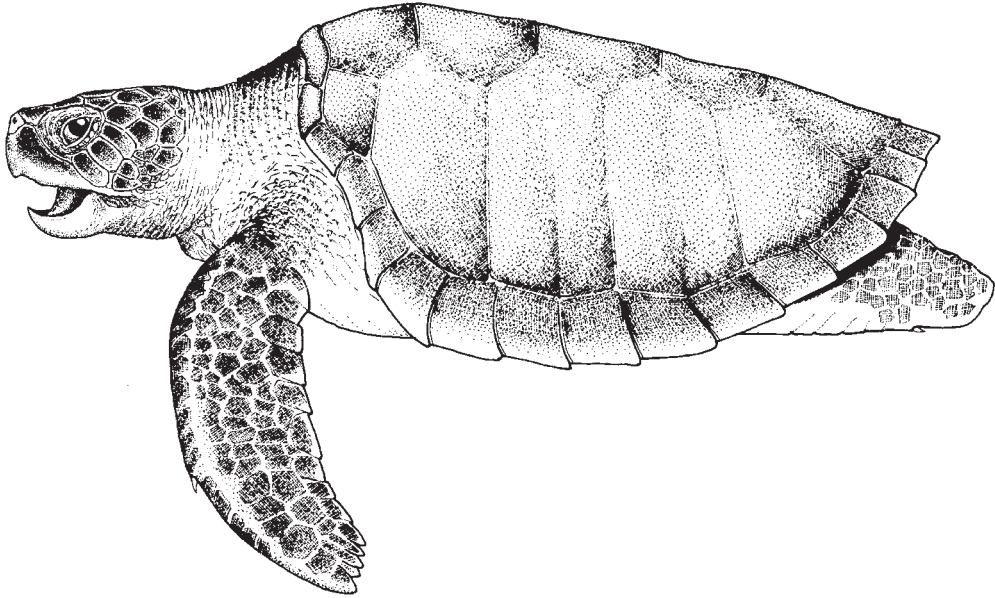
Distribution: The normal distribution of adults is in the Gulf of Mexico. Nesting of Kemp's ridley occurs mostly on one small stretch of the Tamaulipas coast (Mexico) near Rancho Nuevo, a second small nesting colony is being established at Padre Island, Texas, USA. The occasional presence in the northwestern African waters may be explained by assuming a migration from the Gulf of Mexico through the Florida Strait into the Atlantic, where they may travel with the currents to Europe. Uncommon in African waters; observed only in the Azores and Madeira (usually immature individuals) and possibly the Moroccan coast. There are no records of the species in the Gulf of Guinea or the southcentral Atlantic Ocean. A certain degree of sympatry with *Lepidochelys olivacea* is possible in Macaronesian and northwest Africa waters.



***Lepidochelys olivacea* (Eschscholtz, 1829)**

Frequent synonyms / misidentifications: None / *Caretta caretta*; *Chelonia mydas*.

FAO names: En – Olive ridley turtle; Fr – Tortue olivâtre; Sp – Tortuga golfina.



Diagnostic characters: Carapace of adults nearly round, upturned on lateral margins, flat on top, its width 93% of its length. Head subtriangular, moderate size, averaging 22.4% of straight carapace length. Head with 2 pairs of prefrontal scales. Carapace with 5 central scutes, 5 to 9 (usually 6 to 8) pairs of laterals (first pair always in touch with precentral scute), and 12 pairs of marginal scutes. Plastral bridges with 4 pairs of inframarginal scutes, each perforated by a pore toward its hind margin. Fore flippers with 1 or 2 visible claws on anterior border, and sometimes another small claw on distal part; rear flippers also with 2 claws. As in other turtle species, males have larger and more strongly curved claws, as well as a longer tail. **Colour:** adults plain olive grey above and creamy or whitish, with pale grey margins underneath. Hatchlings, black, grey dorsally, and white underneath.

Size: Adult carapace length (straight-line distance): maximum to 76 cm, common to 72 cm. Weight: maximum to 52 kg, common to 45 kg.

Habitat, biology, and fisheries: Within the area, the species nests on the coast of nearly all countries from 10°N (Guinea Bissau) to 10°S (Angola). Also occurs on the Atlantic coast of South America from eastern Venezuela to Brazil. Found in shallow coastal waters and in the estuaries remaining in the bottom as well as in the open sea forming “flotillas”. Little is known of the pelagic stage in juvenile olive ridleys. The nesting season extends from August to April (depending of the area); eggs are white, spherical, about 3.9 cm in diameter and 33 g in weight; hatchlings emerge after an incubation period ranging from 45 to 65 days (depending upon the latitude) and immediately enter the sea. Hatchling carapace length is about 4 cm; shell with 3 longitudinal ridges above and 2 below. Apparently taken in small numbers in nesting areas; at sea, caught incidentally by shrimp trawlers. The flesh and eggs are marketed locally and used traditionally for food. Shells are frequently sold in markets and used to make ornamental objects. Classified by the IUCN as vulnerable (downgraded from endangered in 2008) and protected from international trade by CITES, olive ridleys continue to be harvested locally.

Distribution: The species is absent from the Azores archipelago although its presence in Cape Verde is confirmed by the discovery of 4 adult carapaces on the coast of Boa Vista Island and recent occurrences in the islands of alive animals from unknown origin. Nesting by the species in Senegal cannot be excluded. The most important nesting areas are found on the coasts of Guinea Bissau's Bijagos Archipelago, Ghana, continental Equatorial Guinea and Bioko Island, São Tomé, southern Cameroon, Gabon, Congo and Angola, with weak nesting frequency on Sierra Leona, Liberia, Côte d'Ivoire, Benin, and Zaire. Individuals frequent Togo, Nigeria and Benin waters where they are frequently captured by fishermen. The most important nesting sites in the Gulf of Guinea are Ghana, south of Bioko Island and the entire Congolese shoreline. Rich in marine invertebrates, the sedimentary waters of the Cameroon Estuary are possible feeding grounds and development areas for the species.



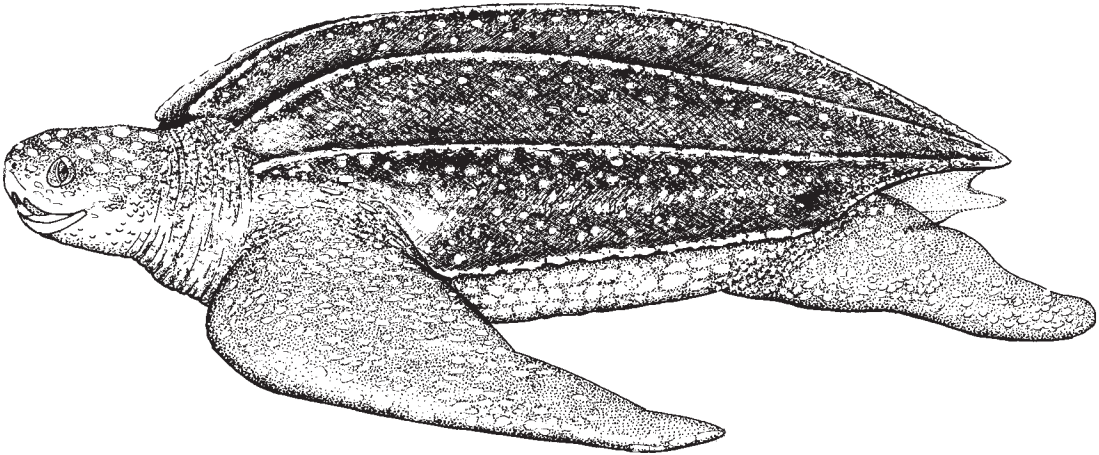
DERMOCHELYIDAE

A single species in this family.

Dermochelys coriacea (Vandelli, 1761)

Frequent synonyms / misidentifications: None / None.

FAO names: **En** – Leatherback turtle; **Fr** – Tortue luth; **Sp** – Tortuga laúd.



Diagnostic characters: Head in adults small round, and scaleless, 17 to 22% carapace length, ending in a horny beak with a **well defined cusp at each side of upper jaw and a central cusp on lower jaw** (beak W-shaped when viewed from the front). Part of the mouth cavity and throat are covered with rows of posteriorly directed, spine-like papillae. Body depressed and covered by a smooth horny skin **lacking lamellae or scutes. Carapace reduced, without scutes, formed by a mosaic of small, polygonal osteodermic pieces**, supported by a thick matrix of cartilaginous, oily dermal tissue, **with 5 dorsal and 2 more forming the margins and 5 ventral longitudinal keels**; dorsal keels converging posteriorly in blunt end, above tail. **Body covered with scales in small juveniles, but absent in larger juveniles and adults, which are covered by a rubber-like, leathery skin.** Flippers very large, without claws in adults although may be present in hatchlings. In adults, fore flippers usually equal to or exceeding 1/2 carapace length. Males distinguished from females by longer tail and narrower and less deep body. **Colour:** In adults the upper side is dark brown to almost black; pinkish blotches on neck, shoulders, and groin, becoming more intense outside water; increasing in number on the ventral and caudal areas and very dense beneath body and flippers, the ventral side becoming mainly whitish; females have a pink area on top of head. Hatchlings and juveniles with more distinct white blotches, clearly arranged along keels.

Size: Carapace length (curved carapace length) maximum up to 200 cm; common to 140 to 180 cm. The largest leatherback on record (from Wales) weighed 916 kg; common to 150 kg.

Habitat, biology, and fisheries: Leatherbacks are the largest living turtles and range as far as the Arctic. Observed near the coast, but predominantly pelagic and highly migratory, and usually found in the open sea. The average carapace length for adults is 1.5 m and weight ranges from 200 to 700 kg, although the largest was recorded stranded in Wales in 1988, a male of 916 kg and 2.6 m length. The nesting period extends from September to February and peaks in December and January. Age at sexual maturity in females has been estimated in 13 to 14 years. The incubation period ranges from 60 to 70 days. Eggs are white, spherical, about 5.5 cm in diameter. Leatherback turtles feed on jellyfish, comb jellies and pelagic tunicates. Leatherbacks are regarded as vulnerable (2013) by the IUCN and are listed under Appendix 1 of CITES. Leatherbacks are caught with tangle nets and harpoons, incidentally entangled in pelagic and

bottom gillnets, longlines, fish traps, buoy anchor lines and other ropes, cables and trawlers. The meat is not commonly consumed but used for oil production; the eggs are collected for food and marketing. Pelagic trawl bycatches could carry a higher mortality.

Distribution: Circumglobal with nesting concentrated in tropical areas. *D. coriacea* is the turtle with the largest geographic distribution throughout the Atlantic African waters from the Gibraltar Strait to the Cape of Good Hope extending northward along the Atlantic European coasts and to the Mediterranean Sea. Nesting areas are reported in Guinea Bissau, Sierra Leone, Liberia, Côte d'Ivoire, Ghana, Benin, Cameroon, Bioko Island, São Tomé and Príncipe and Angola, with a centre zone covering approximately 4° of latitude from Gabon to the Congo. Nesting in Gabon between Mayumba and the southern border represent the most important sites of eastern Africa and worldwide. Individuals tagged at South American nesting sites have been sighted in Macaronesian waters; a female tagged on Suriname (Indian Ocean) was recaptured in Ghana. This recapture shows the existence of a relationship between the western Atlantic and other remote stocks. Recent captures of four juveniles with curve carapace length from 14 to 21 cm in São Tomé Island is significant because developmental areas for this species are unknown worldwide.



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Italics : Synonyms, misidentifications and subspecies (double entry by genera and species)

ROMAN : Family names

ROMAN : Scientific names of divisions, classes, subclasses, orders, suborders and subfamilies

Roman : FAO names

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<i>koelreuteri</i> , <i>Periophthalmus</i>	2843	Lengua de Ghana	3036
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<i>Kyphosus sectator</i>	2682	Lenguadillo africano	3029
L		Lenguado	2987
<i>labrax</i> , <i>Dicentrarchus</i>	2353	Lenguado común	3027
<i>labrax</i> , <i>Morone</i>	2353	Lenguado de arena	3024
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<i>Labrus bergylta</i>	2750	Lenguado lusitanico	3016
<i>Labrus bimaculatus</i>	2751	Lenguado negra	3008
<i>Labrus mixtus</i>	2751	Lenguado ocelado	2986
<i>lactea</i> , <i>Bathysolea</i>	3007	Lenguado paté	2999
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<i>Laeops mertensi</i>	2992	Lenguado portugués	3012
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<i>laterna</i> , <i>Arnoglossus</i>	2982	<i>Lichia</i>	2454
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<i>lineatus</i> , <i>Diplodus sargus</i>	2599	<i>Lutjanus dentatus</i>	2540 -2541
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<i>lineatus</i> , <i>Trachinus</i>	2776	<i>Lutjanus eutactus</i>	2540
<i>lineolatus</i> , <i>Trachinus</i>	2777	<i>Lutjanus fulgens</i>	2542
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Pámpano terayo	2508	<i>Pegusa kleini</i>	3028
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<i>Paracaristius nudarcus</i>	2523	Pelada de Norman	3045
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This multivolume field guide covers the species of interest to fisheries of the major resource groups exploited in the Eastern Central Atlantic. The area of coverage includes FAO fishing area 34 and part of 47. The marine resource groups included are bivalves, gastropods, chitons, cephalopods, stomatopods, shrimps, lobsters, crabs, hagfishes, sharks, batoid fishes, chimaeras, bony fishes and sea turtles. The introductory chapter outlines the environmental, ecological, and biogeographical factors influencing the marine biota, and the basic components of the fisheries in the Eastern Central Atlantic. Within the field guide, the sections on the resource groups are arranged phylogenetically according to higher taxonomic levels such as class, order, and family. Each resource group is introduced by general remarks on the group, an illustrated section on technical terms and measurements, and a key or guide to orders or families. Each family generally has an account summarizing family diagnostic characters, biological and fisheries information, notes on similar families occurring in the area, a key to species, a checklist of species, and a short list of relevant literature. Families that are less important to fisheries include an abbreviated family account and no detailed species information. Species in the important families are treated in detail (arranged alphabetically by genus and species) and include the species name, frequent synonyms and names of similar species, an illustration, FAO common name(s), diagnostic characters, biology and fisheries information, notes on geographical distribution, and a distribution map. For less important species, abbreviated accounts are used. Generally this includes the species name, FAO common name(s), an illustration, a distribution map, and notes on biology, fisheries, and distribution. Each volume concludes with its own index of scientific and common names.



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