

Epinephelus* Bloch, 1793*SERRAN Epin**

Epinephelus Bloch, 1793:11; type species, *Epinephelus marginalis* Bloch, 1793 (= *Epinephelus fasciatus*), designated under the plenary powers of the International Commission on Zoological Nomenclature, Opinion 93.

Synonyms: *Merou* Bonaparte, 1831:167; type species, *Perca gigas* Brünnich by subsequent designation of Jordan, 1919:175. *Cerna* Bonaparte, 1833:puntata 10; type species, *Perca gigas* Brünnich by monotypy. *Cynichthys* Swainson, 1839:168, 201; type species, *C. flavo-purpuratus* (= *Perca flava-purpurea* Bennett = *Epinephelus flavocaeruleus*). *Cernua* Costa, 1849:1 (not available; unjustified emendation of *Cerna* Bonaparte; preoccupied by *Cernua* Fleming, 1828:212 (a genus of percoid fish)). *Hyporthodus* Gill, 1862b:98; type species, *Hyporthodus flavicauda* Gill (= *Epinephelus niveatus*) by monotypy. *Schistorus* Gill, 1862c:236; type species, *Serranus mystacinus* Poey, by monotypy. *Labroperca* Gill, 1862c:236; type species, *Serranus labriformis* Jenyns, by monotypy. *Promicrops* Poey, 1868:287; type species, *Serranus guasa* Poey (= *Epinephelus itajara*) by monotypy; genus attributed to Gill by Poey, but the diagnosis is Poey's. *Priacanthichthys* Day, 1868:193; type species, *Priacanthichthys maderaspatensis* Day (= *Epinephelus latifasciatus*) by monotypy. *Merus* Poey, 1874:39; type species, *Epinephelus marginalis* Bloch (= *Epinephelus fasciatus*); proposed as a replacement name for *Epinephelus* Bloch. *Homalogrystes* Alleyne and Macleay, 1877:268; type species, *Homalogrystes Guntheri* Alleyne and Macleay (= *Epinephelus coioides*) by monotypy. *Itaiara* Vaillant and Bocourt, 1878:70; type species, *Serranus itajara* Lichtenstein, by monotypy. *Hyposerranus* Klunzinger, 1884:3; type species, *Serranus morrhua* Valenciennes, by subsequent designation of Jordan, 1920; proposed as a subgenus of *Serranus*. *Phrynotitan* Gill, 1885:225; type species, *Batrachus gigas* Günther, (= *Epinephelus lanceolatus*) by monotypy. *Garrupa* Jordan in Jordan and Eigenmann, 1890:350, 353; type species, *Serranus nigrinus* Holbrook, by original designation; proposed as a subgenus of *Epinephelus*. *Enneistus* Jordan and Evermann, 1896: 1147; type species, *Bodianus acanthistius* Gilbert, by monotypy; proposed as a subgenus of *Bodianus*. *Stereolepoides* Fowler, 1923:382; type species, *Stereolepoides thompsoni* Fowler (= *Epinephelus lanceolatus*). *Vivero* Jordan and Evermann, 1927:505; type species, *Serranus morio* Valenciennes, by monotypy; proposed as a subgenus of *Epinephelus*. *Serrihastaperca* Fowler, 1944:384; type species, *Serrihastaperca exsul* Fowler, by original designation. *Altiserranus* Whitley, 1947:50; type species, *Serranus jayakari* Boulenger, 1889 (= *Epinephelus multinotatus*) by original designation.

Diagnostic Features: Body elongate, robust (subcylindrical), oblong or deep and compressed; body depth greater than, subequal to or less than head length and contained 2.3 to 3.7 times in standard length, the body width 1.8 to 2.8 in the depth. Head length 2.1 to 2.8 times in standard-length; preorbital depth 6.7 to 15 times in head length: preopercle rounded or angular, the posterior edge serrate, with the serrae at the angle more or less enlarged; a few species with small serrae (mostly covered by skin) on the ventral edge; canines present at front of jaws, but they may be small in some species: no distinctly enlarged canine teeth at midside of lower jaw; teeth present on palatines; maxilla of adults without a distinct bony knob on ventroposterior corner, but there may be an abrupt step or hook-like process (covered by the upper lip) on the distal part of the ventral edge; supramaxilla well developed. Dorsal fin usually with XI spines (X spines in *E. analogus*, *E. exsul*, and *E. nigrinus*, IX in *E. acanthistius*) and 12 to 19 rays, the fin origin above the opercle; length of base of soft-rayed part of dorsal fin not more than base of spinous part; anal fin with III distinct spines and 7 to 10 (very rarely 7 or 10) rays; pectoral fin rounded, the middle rays longest; caudal fin rounded, truncate or concave, with 8 branched rays and 8 to 10 procurrent rays in upper part and 7 branched rays and 7 to 10 procurrent rays in lower part. Scales on body ctenoid or smooth. Supraneural bones 2; dorsal and anal fins without trisegmental pterygiophores; rear edge of first dorsal pterygiophore with or without excavation for tip of second neural spine; epipleural ribs on vertebrae 1 to 10 (except *E. stictus* with epipleurals on only the first 8 vertebrae). The diversity of cranial morphology of the many species assigned to *Epinephelus* makes it difficult to recognize diagnostic cranial characters for the genus. Characters of the larvae (Leis, 1986): pelvic-fin spines with 4 ridges; supraocular ridge with a single strong spine; spines on lower limb of preopercle serrate; posterior 1 or 2 dorsal-fin spines develop first as soft rays and all spines are present in larvae of 13.5 to 16.0 mm: all anal-fin spines are present prior to settlement at a length of 16 to 18 mm standard length.

Habitat and Biology: *Epinephelus* species are generally found on coral or rocky reefs, but a few species (e.g., *E. aeneus*, *E. bruneus*, and *E. areolatus*) are commonly taken with trawls over sandy, silty or mud bottoms. Some species occur in deep water (to at least 525 m), but most are found in depths of 10 to 200 m. The two largest species (*E. itajara* and *E. lanceolatus*, which grow to well over 2 metres in length and a weight of over 400 kg) are often found in estuaries and harbours. Most species of *Epinephelus* are epibenthic predators feeding on macro invertebrates (mainly crustaceans) and fishes on or near the bottom. *E. undulosus*, an unusual grouper with long numerous gill rakers, occasionally feeds on pelagic tunicates. The

reproduction of a few species has been studied, and they appear to be protogynous hermaphrodites; but the picture is complicated in some species by the occurrence of males that are much smaller than some females. It may be that not all females change sex, and perhaps some males do not go through a previous female stage.

Geographical Distribution: The genus is represented in tropical and subtropical latitudes of all oceans. Most species are found in the vast Indo-West Pacific region. Eight species occur in the eastern Pacific, eleven species are known from the western Atlantic, and 9 species are found in the eastern Atlantic and Mediterranean. Of the two species that occur in both the eastern Pacific and western Atlantic oceans (*E. itajara* and *E. mystacinus*), only *E. itajara*, with its preference for shallow estuarine conditions, is likely to cross the Central American isthmus via the Panama Canal. Although we did not find any significant morphological differences in specimens of *E. mystacinus* from the two oceans, it would not surprise us if there are significant differences in biochemical features (enzymes, mitochondrial DNA, etc.) of specimens from these two oceans.

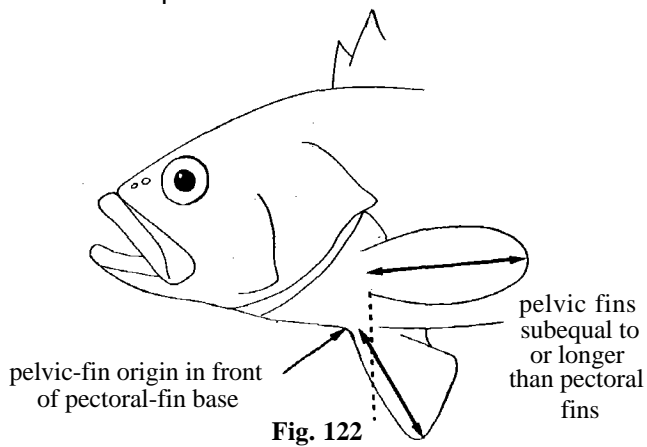
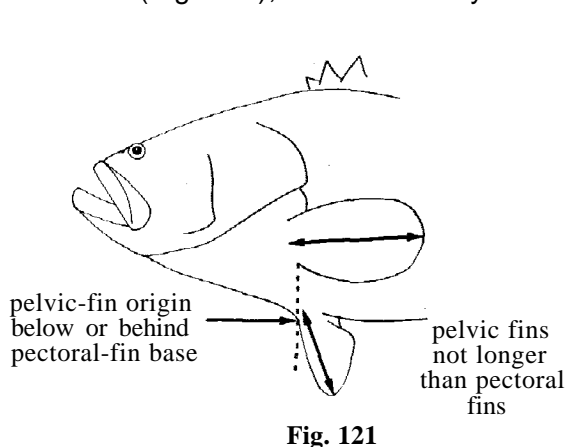
Interest to Fisheries: The species of *Epinephelus* are among the most important commercial fishes in tropical fisheries of the world. They are among the highest priced species in fish markets, and a few species (e.g., *E. coioides* and *E. malabaricus*) are used in aquaculture ventures.

Species: The genus *Epinephelus*, as here defined, comprises some 98 species and is thus the most species genus of serranid fishes. It is well represented in the tropical and subtropical waters of all three major oceans.

Remarks: C.L. Smith (1971) demoted the genus *Promicrops* (comprising *E. itajara* and *E. lanceolatus*) to a subgenus of *Epinephelus*. We agree with this decision and his statement that these two species “are highly specialized and distinctive although their alliance with other species of *Epinephelus* is clear.” We also agree with Smith’s (1971) assignment of the eastern Pacific species *Bodianus acanthistius* Gilbert to the genus *Epinephelus*, rather than to *Cephalopholis*, even though this species has only IX dorsal-fin spines. (See the species account below for further discussion of the affinities of *E. acanthistius*.) We disagree with Smith’s (1971) decision to include the genera *Alphestes*, *Cephalopholis*, and *Dermatolepis* in *Epinephelus*, because it appears that *Epinephelus* (as here recognized) may be more closely related to the genus *Mycteroperca*. The species of both genera have the base of the soft-rayed part of the dorsal fin shorter than or equal to the base of the spinous part, they have only bisegmental pterygiophores supporting the dorsal and anal fins (some trisegmental pterygiophores are present in *Cephalopholis*), and (according to Smith-Vaniz et al., 1988) the scales of *Alphestes* and *Dermatolepis* are different from all other groupers.

Key to Western Atlantic Species of *Epinephelus*

- 1a. Dorsal-fin rays 14 to 18; anal-fin rays 8 to 10; pelvic-fin origin below or behind lower end of pectoral-fin base (Fig. 121); pelvic fins not longer than pectoral fins (usually less than 90% of pectoral-fin length); red spots present or absent on head and body → 2
- 1b. Dorsal-fin rays 13 to 15; anal-fin rays 9; pelvic-fin origin in front of lower end of pectoral-fin base; pelvic fins (of fish 10 to 50 cm standard length) subequal to or longer than pectoral fins (Fig. 122); head and body not covered with dark red spots. → 8



- 2a. Anal-fin rays 8 to 10; rear margin of caudal fin truncate or concave → 3
- 2b. Anal-fin rays 8; caudal fin convex or rounded → 4

3a. Dorsal-fin membranes distinctly notched between the spines, the third or fourth spine longest; head, body and median fins covered with small white spots (Fig. 123, Plate XIII) (southern coast of USA, Bermuda) *E. drummondhayi*

3b. Dorsal-fin membranes not notched between the spines, the second spine longest; head and body dark reddish brown, usually with irregular pale spots and blotches; black dots on snout and cheek (Fig. 124, Plate XIX) (Caribbean, Gulf of Mexico, Bermuda, southern Brazil). ... *E. morio*

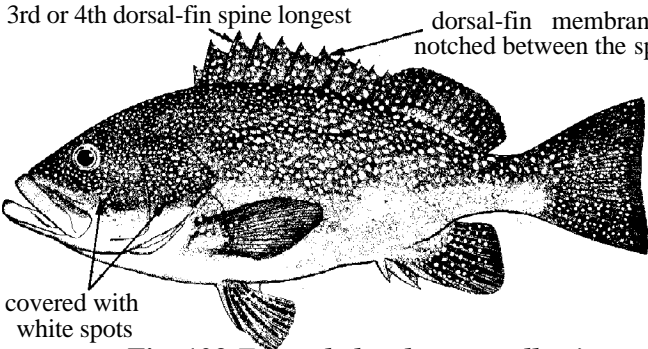


Fig. 123 *Epinephelus drummondhayi*

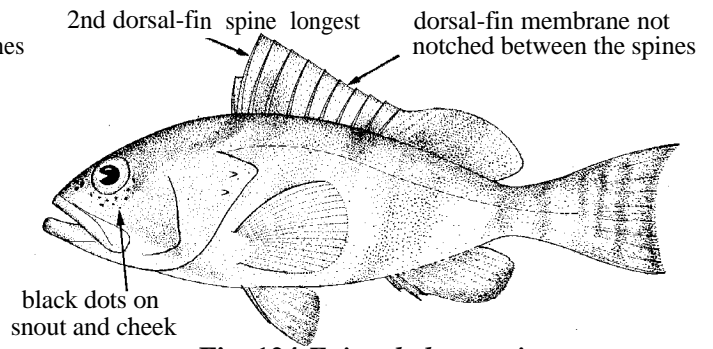


Fig. 124 *Epinephelus morio*

4a. Third to 11 th dorsal-fin spines subequal and distinctly shorter than dorsal-fin rays; greatest body width equals half or more of body depth (Fig. 125, Plate XVI) (from Florida to southern Brazil, including Gulf of Mexico and Caribbean) *E. itajara*

4b. Third or fourth dorsal-fin spine longest, longer than anterior dorsal-fin rays; body width distinctly less than half the depth → 5

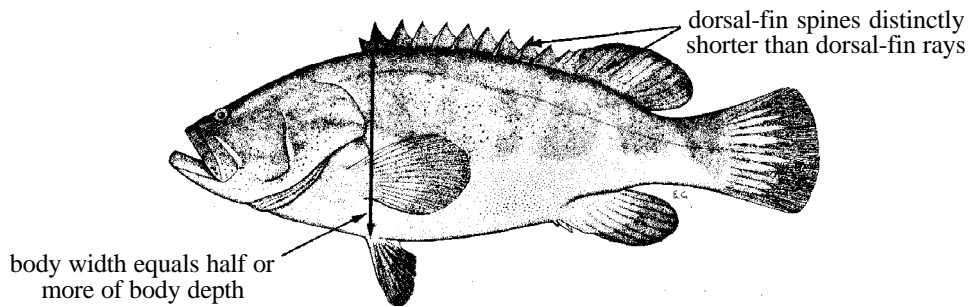


Fig. 125 *Epinephelus itajara*

5a. Head and body covered with dark orange-brown or dark red spots. → 6

5b. No dark orange-brown or dark red spots → 7

6a. Black saddle blotch on peduncle and 3 to 5 dark blotches at base of dorsal fin; no blackish margin on soft-rayed part of dorsal fin; pectoral-fin rays 18 to 20 (Fig. 126, Plate VII) (from Massachusetts to southern Brazil, including Gulf of Mexico and Caribbean) *E. adscensionis*

6b. No black, saddle on peduncle; no dark blotches at base of dorsal fin; soft dorsal fin with blackish margin; pectoral-fin rays 16 to 18 (Fig. 127, Plate XV) (from North Carolina to Venezuela, including Gulf of Mexico and Caribbean). *E. guttatus*

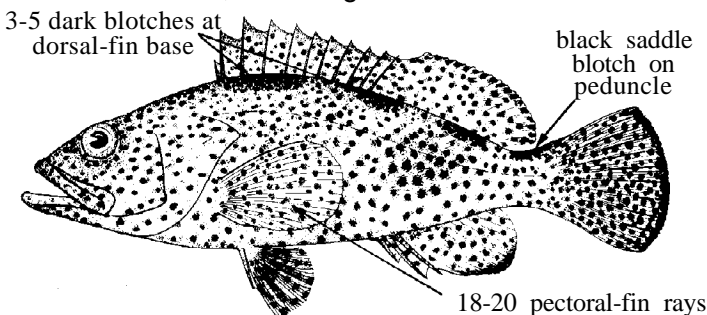


Fig. 126 *Epinephelus adscensionis*

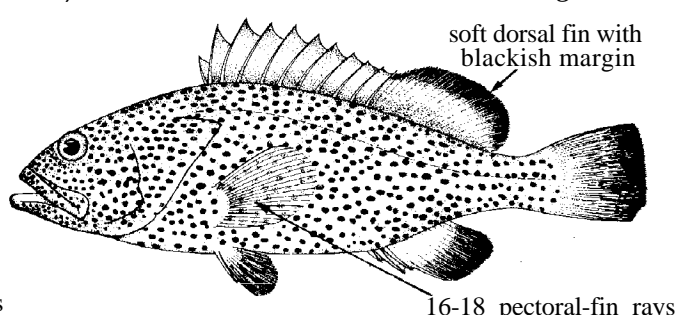


Fig. 127 *Epinephelus guttatus*

- 7a. Head and body pale, with irregular dark bars or bands (but colour can change from almost white to uniform dark brown in a few minutes); black saddle blotch on peduncle; black dots below and behind eye; dark tuning-fork mark between the eyes; lateral-line scales about 50 (Fig. 128, Plate XXIII) (Bahamas, Bermuda, Caribbean, southern Brazil)..... *E. striatus*
- 7b. Head and body brownish, usually with irregular pale spots or blotches; no dark saddle on peduncle or dark marks on top of head; lateral-line scales 62 to 73 (Fig. 129, Plate XVII) (southern Brazil)

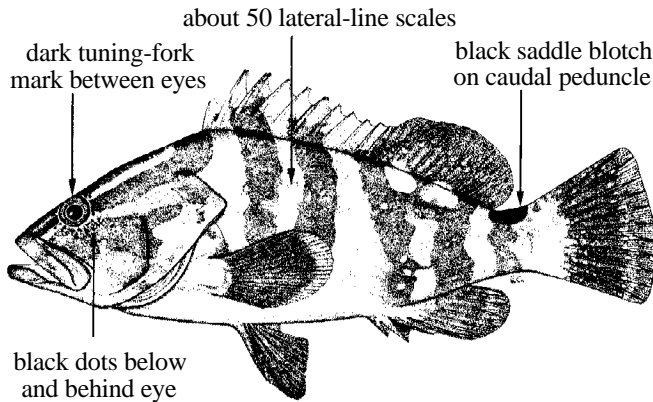


Fig. 128 *Epinephelus striatus*

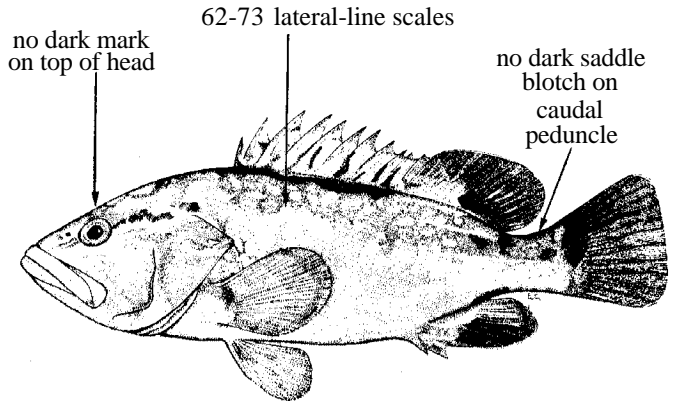


Fig. 129 *Epinephelus marginatus*

- 8a. Dorsal-fin spines X, the second spine longest; no dark bar or saddle blotch on caudal peduncle (Fig. 130, Plate XIX) (southern coast of USA, Cuba, Trinidad, Rio de Janeiro) *E. nigritus*
- 8b. Dorsal-fin spines XI, the second, third or fourth spine longest; juveniles (less than 20 cm standard length) with a black bar or saddle blotch on caudal peduncle → 9
- 9a. Body brownish, with 8 or 9 subvertical dark bars (last 2 may be fused into a wide band on caudal peduncle) (Fig. 131, Plate XIX) (Gulf of Mexico, West Indies)
- 9b. No dark vertical bars on body. → 10

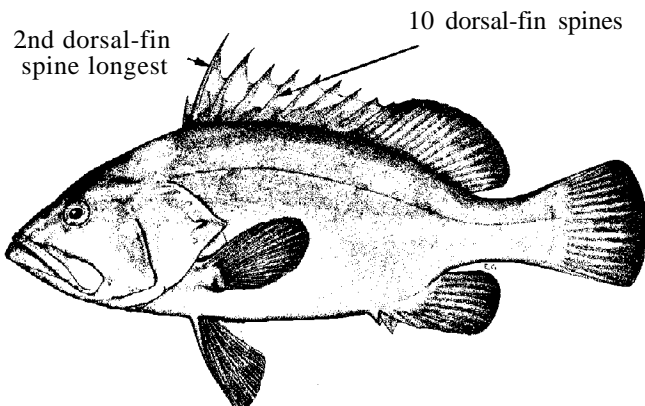


Fig. 130 *Epinephelus nigritus*

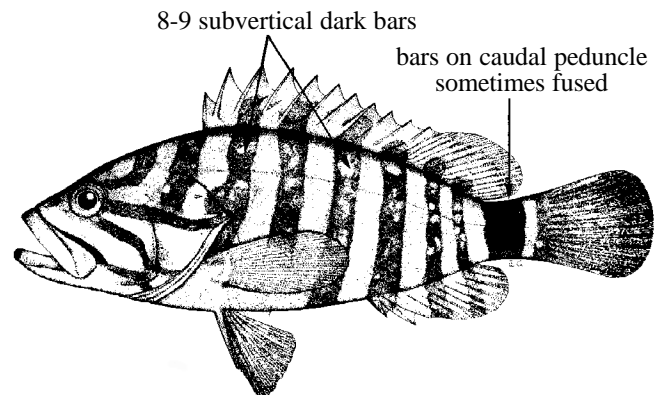
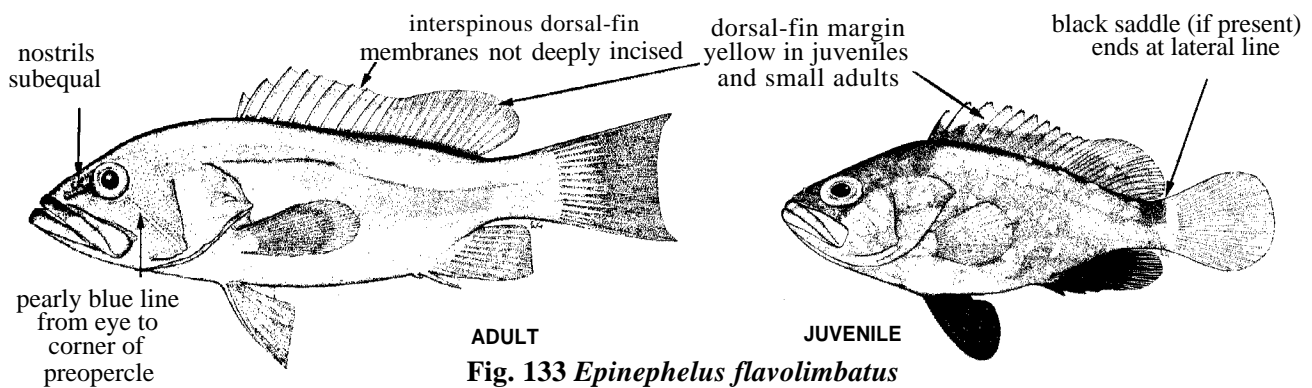
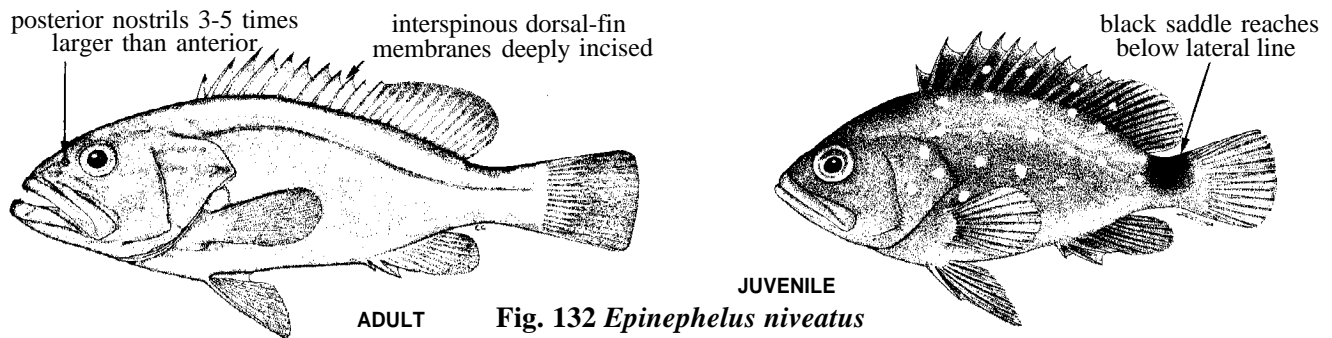


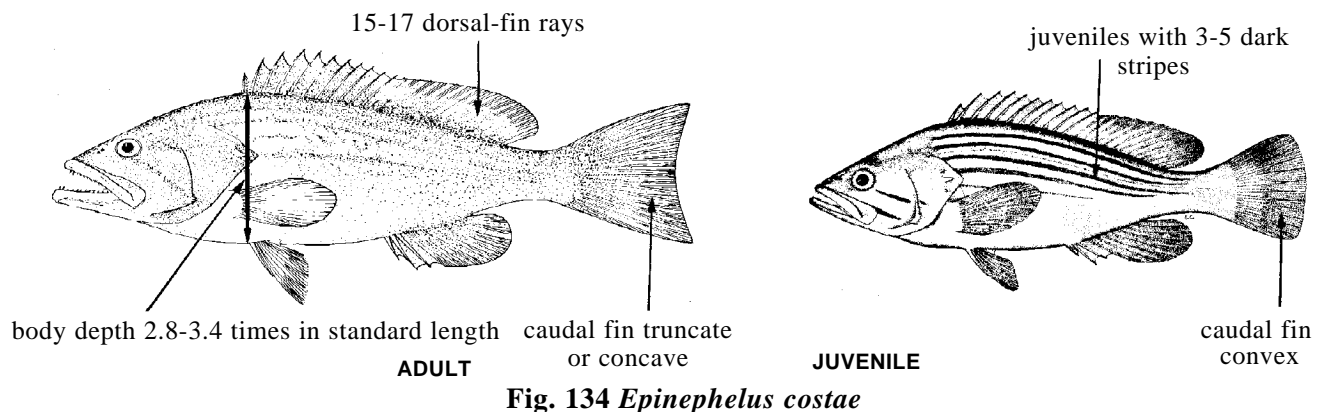
Fig. 131 *Epinephelus mystacinus*

- 10a.** Posterior nostrils 3 to 5 times larger than anterior nostrils (except in fish less than 15 cm standard length); interspinous dorsal-fin membranes deeply incised, their margin black; no blue line from eye to preopercle; black saddle on caudal peduncle of juveniles reaches below lateral line (Fig. 132, Plate XX) (Massachusetts to southern Brazil, Gulf of Mexico, Caribbean, Bermuda) *E. niveatus*
- 10b.** Nostrils subequal; interspinous dorsal-fin membranes not deeply incised, their margin yellow or yellowish green in juveniles and small adults; a pearly blue line from eye to corner of preopercle; black saddle on caudal peduncle not reaching below lateral line (Fig. 133, Plate XIV) (North Carolina to southern Brazil, Gulf of Mexico, Caribbean) *E. flavolimbatus*



Key to Eastern Atlantic and Mediterranean Species of *Epinephelus*

- 1a.** Dorsal-fin rays 15 to 17; caudal fin truncate to concave (convex in specimen less than 15 cm standard length); body depth 2.8 to 3.4 times in standard length; no dark spots or dark bars on body; juveniles with 3 to 5 dark longitudinal stripes on dorsal part of body (Fig. 134, Plate XI) (eastern Atlantic and Mediterranean) *E. costae*
- 1b.** Dorsal-fin rays 13 to 18; body without dark stripes → 2



- 2a. Dorsal-fin rays 13 or 14; anal-fin rays 8; caudal fin truncate; body dark reddish brown to greyish violet; juveniles with 2 oblique dark lines running down and backwards from eye (Fig. 135) (eastern Atlantic and Mediterranean) *E. caninus*
- 2b. Dorsal-fin rays 14 to 18; anal-fin rays 7 to 9; caudal fin rounded, convex or truncate → 3

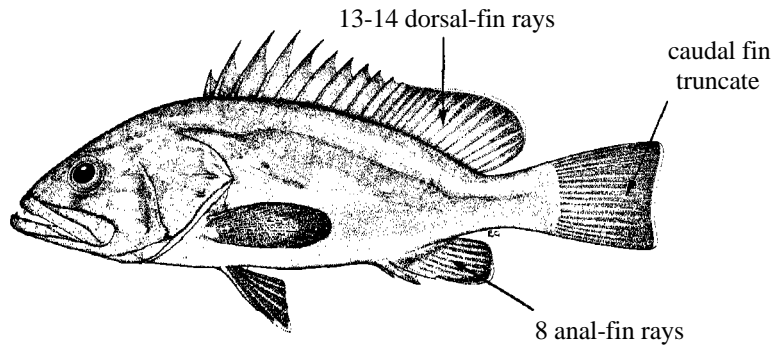
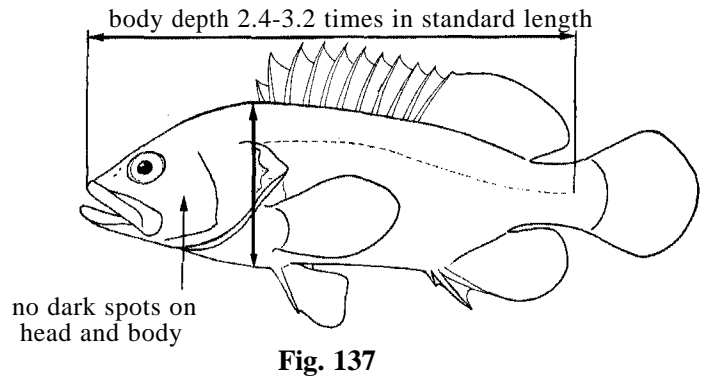
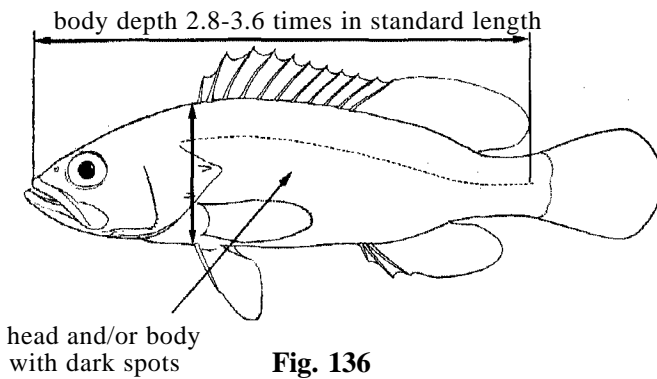
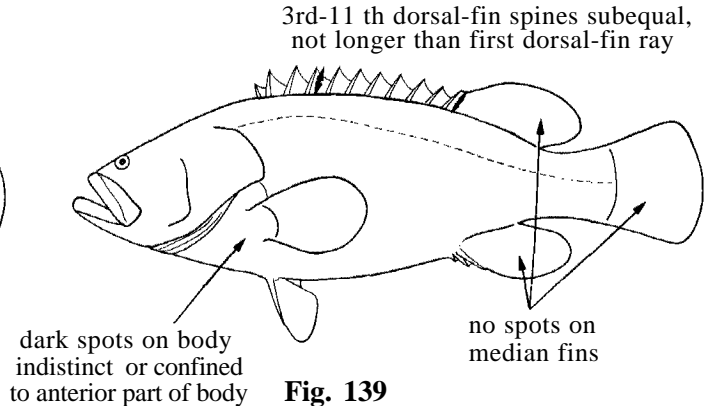
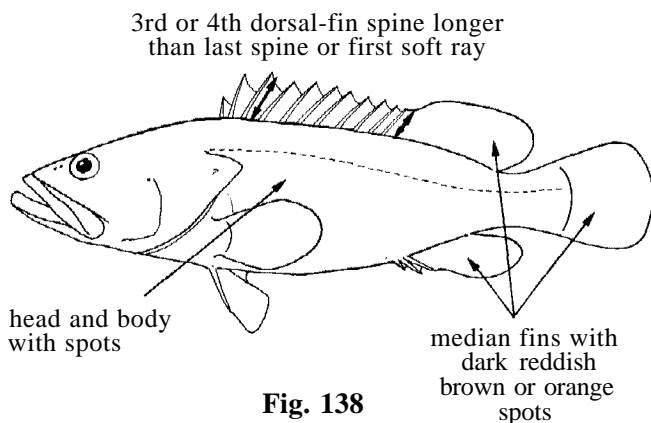


Fig. 135 *Epinephelus caninus*

- 3a. Body depth 2.8 to 3.6 times in standard length; head and/or body with dark spots (may be faint or absent in fish more than 40 cm standard length) (Fig. 136) → 4
- 3b. Body depth 2.4 to 3.2 times in standard length; no dark spots on head or body (Fig. 137). → 7



- 4a. Head, body, and median fins covered with dark reddish brown or orange spots; third or fourth dorsal-fin spine longer than last spine or first dorsal-fin ray (Fig. 138) → 5
- 4b. Dark spots on body are either indistinct or confined to anterior part of body; no small dark spots on median fins; 3rd to 11 th dorsal-fin spines subequal and not longer than first dorsal-fin ray (Fig. 139) → 6



5a. Dorsal-fin rays 16 to 18; dark brown saddle blotch on caudal peduncle; spots on head and body reddish brown; 16 to 19 gill rakers on lower limb (Fig. 140, Plate VII) (Ascension and St. Helena Islands, São Tomé) *E. adscensionis*

5b. Dorsal-fin rays 14 to 16; no dark saddle blotch on peduncle; spots on head and body brownish orange in life; lower gill rakers 14 to 17 (Fig. 141, Plate X) (Israel) *E. coioides*

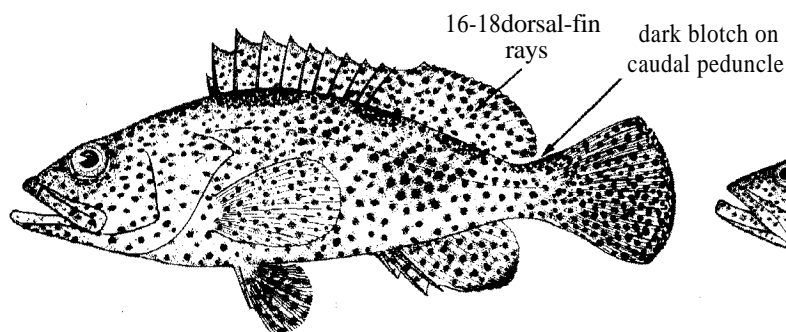


Fig. 140 *Epinephelus adscensionis*

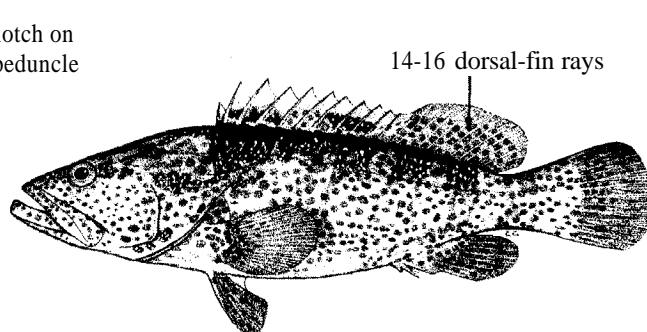


Fig. 141 *Epinephelus coioides*

6a. Two oblique black-edged pale blue or white stripes across cheek and operculum; no dark spots on head; lower gill rakers 15 to 17; interorbital width subequal to eye diameter on fish of 18 to 25 cm standard length; preopercle with 3 to 6 large spines at the angle (Fig. 142, Plate VII) (southern Mediterranean and west coast of Africa) *E. aeneus*

6b. Head with dark spots (in juveniles) but no blue stripes; lower gill rakers 13 to 15; interorbital width distinctly greater than eye on fish of 18 to 25 cm standard length; preopercle rounded, finely serrate (Fig. 143, Plate XVI) (tropical western Africa). *E. itajara*

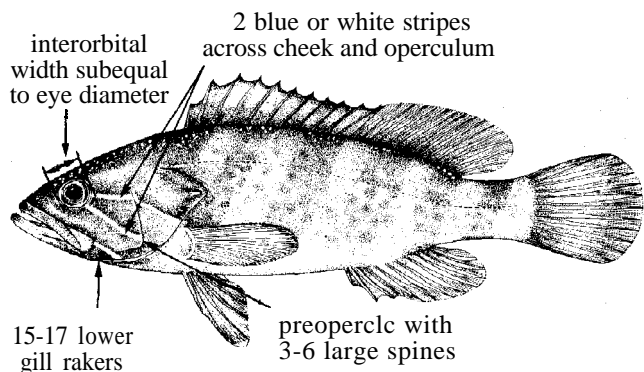


Fig. 142 *Epinephelus aeneus*

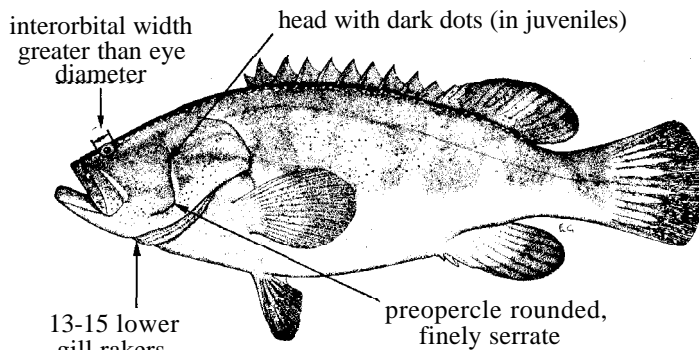


Fig. 143 *Epinephelus itajara*

7a. Anal-fin rays 9; pectoral-fin rays 19 to 21; body depth 2.4 to 2.7 times in standard length; pelvic-fin length subequal to pectoral-fin length, pelvic fins reaching to or beyond anus in fish of 13 to 30 cm standard length (Fig. 144, Plate XV) (eastern Mediterranean to southern Angola) *E. haifensis*

7b. Anal-fin rays 8; pectoral-fin rays 17 to 19; body depth 2.6 to 3.2 times in standard length; pelvic-fin length distinctly shorter than pectoral-fin length, pelvic fins falling well short of anus → 8

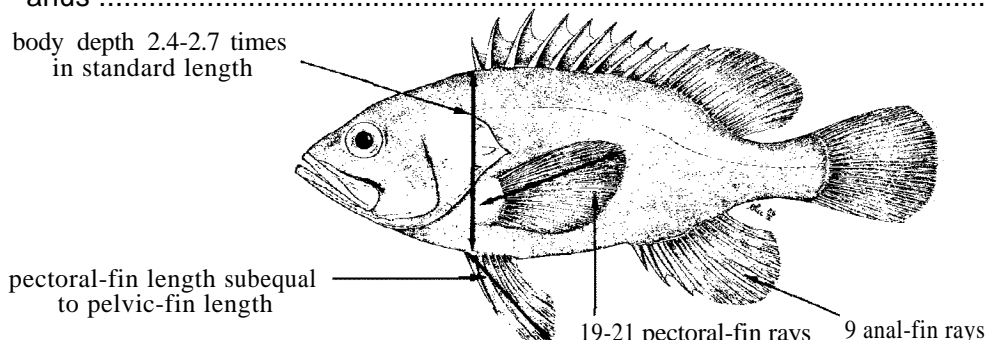


Fig. 144 *Epinephelus haifensis*