

**Geographical Distribution:** Red Sea to Mozambique and east to the Marshall Islands, Samoa, and the Phoenix islands; Japan, Philippines, Indonesia, Australia, Papua New Guinea, and probably all of the islands of the tropical Indian Ocean (Fig. 47).

**Habitat and Biology:** *Anyperodon* is a coral-reef species usually found on protected reefs in depths of 5 to 80 m. Adults are primarily piscivorous. According to Randall and Kuitert (1989) the distinctive blue and gold striped juveniles are mimics of the wrasse, *Haliichoeres purpureescens* (Bloch and Schneider, 1801) and related species with a similar colour pattern. These wrasses feed on micro-invertebrates (much smaller than the food of like-sized *Anyperodon*), and this mimetic association presumably allows *Anyperodon* (in the guise of a harmless wrasse) to approach the small fishes and crustaceans on which it feeds.

**Size:** Maximum total length at least 52 cm.

**Interest to Fisheries:** Often seen in markets but not plentiful enough to be of commercial importance. Caught with hook-and-line, spear, and probably in traps.

**Local Names:** KENYA (Swahili): Chewa, Tewa; PAPUA NEW GUINEA: Balala; PALAU: Choloteachi; SEYCHELLES: Cheval du bois; SINGAPORE: Kerapu; TANZANIA (Swahili): Chewa, Tewa.

**Literature:** Morgans (1982); Randall and Ben-Tuvia (1983); Heemstra and Randall (1984, 1986); Katayama (1988); Allen and Steene (1987); Myers (1989); Winterbottom et al. (1989); Randall and Heemstra (1991).

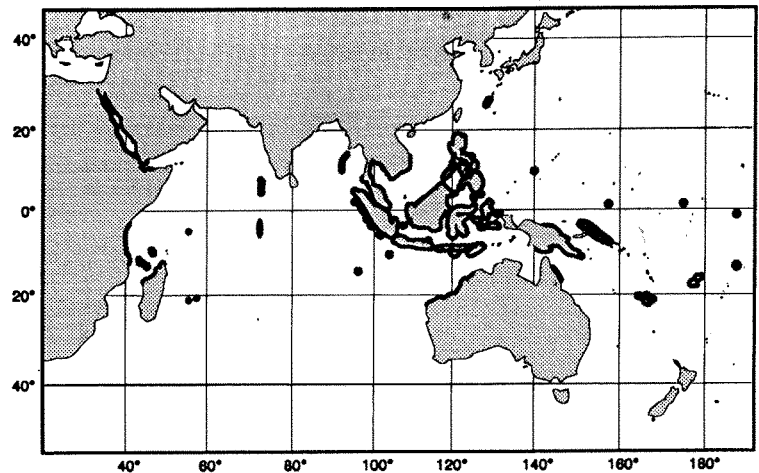


Fig. 47

*Cephalopholis* Bloch and Schneider, 1801

SERRAN Cephal

*Cephalopholis* Bloch and Schneider, 1801:311; type species, *Cephalopholis argus* Bloch and Schneider, 1801 by monotypy).

**Synonyms:** *Enneacentrus* Gill, 1866:105; type species, *Serranus ouatalibi* Valenciennes in Cuv. and Val., 1828 (= *Cephalopholis fulva*) by original designation. *Petrometopon* Gill, 1866:105; type species, *Serranus guttatus* Poey (a subsequent identification apparently based on *Perca guttatus* (non Linnaeus): Btoch, 1792 (= *Cephalopholis cruentata*) by original designation).

**Diagnostic Features:** Body oblong, robust, not strongly compressed, the depth contained 2.0 to 3.2 times in standard length, the body width contained 1.9 to 2.6 times in the depth. Head length contained 2.2 to 3.1 times in standard length. Interorbital area flat to slightly convex; snout distinctly longer than eye diameter; preorbital depth contained 8 to 13 times in head length; preopercle rounded, finely serrate, but without enlarged serrae at the "corner" and no antrorse spines on lower edge; ventral edge of interopercle may be finely serrate posteriorly, but there is no broad indentation; upper edge of operculum distinctly convex; anterior and posterior nostrils subequal; jaws with small canines at the front; teeth present on palatines; maxilla of adults with a distinct bony knob on the ventroposterior corner; supramaxilla well developed. Dorsal fin with IX spines and 13 to 17 rays, the fin origin over rear part of opercle and the fin membranes distinctly incised between the spines; no dorsal-fin spines or rays elongated; anal fin with III spines and 7 to 10 rays; soft dorsal and anal fins rounded; pectoral fins symmetrically rounded, the middle rays longest; caudal fin rounded or convex posteriorly (truncate in *C. polleni*), with 8 branched rays and 6 to 9 procurrent rays in upper part and 7 branched rays and 6 to 9 procurrent rays in lower part. Midlateral-body scales ctenoid. Supraneural bones 2, the posterior one straight or curved posteriorly, much smaller than the first one and situated just anterior to or above tip of second neural spine; dorsal fin with the last 4 to 7 pterygiophores trisegmental; anal fin with 3 to 5 trisegmental pterygiophores; rear edge of first dorsal-fin pterygiophore slightly to deeply excavated for tip of third neural spine; epipleural ribs on vertebrae 1 to 9 (except *C. sonnerati* and *C. igarashiensis* with epipleurals on vertebrae 1 to 10); cranium distinctly narrowed at interorbital region, the least interorbital width subequal to the vomer width and half or less than half of the width at lateral ethmoids; frontals separated anteriorly by the supraethmoid; no median crest on frontals; medial and lateral processes of epiotics subequal; parasphenoid straight or nearly so.

**Habitat and Biology:** Most species of *Cephalopholis* are secretive groupers seen hiding in or near coral reefs. Although some species (*C. boenak*, *C. cyanostigma*, *C. formosa*, *C. microprion* and *C. oligosticta*) are often seen in silty areas, most species of *Cephalopholis* prefer clear-water environments, from tidepools out to depths of 200 m.

**Geographical Distribution:** The genus is represented in all three major oceans, including both sides of the Atlantic, but it has not yet been found in the Mediterranean Sea.

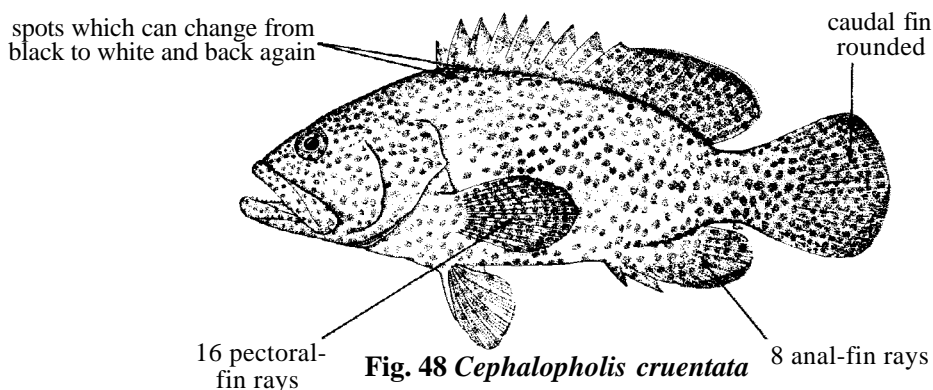
**Interest to Fisheries:** Some species of *Cephalopholis* are abundant in certain areas and undoubtedly represent a significant source of protein for local people; but most species are of little commercial importance, because of their small size.

**Species:** The genus *Cephalopholis* comprises 22 species: two in the western Atlantic (*C. fulva* and *C. cruentata*), two in the eastern Atlantic (*C. nigri* and *C. taeniops*), one in the eastern Pacific (*C. panamensis*), and 17 in the Red Sea plus Indo-Pacific region (*C. aitha*, *C. argus*, *C. aurantia*, *C. boenak*, *C. cyanostigma*, *C. formosa*, *C. hemistiktos*, *C. igarashiensis*, *C. leopardus*, *C. microprion*, *C. miniata*, *C. oligosticta*, *C. polleni*, *C. sexmaculata*, *C. sonnerati*, *C. spiloparaea*, and *C. urodeta*).

**Remarks:** Jordan and Evermann (1905) resurrected the genus *Cephalopholis* from the synonymy of *Epinephelus* (=“*Serranus*”) where it had lain dormant since its original description by Schneider in 1801. *Cephalopholis* was widely used as a valid genus until C.L. Smith (1971) demoted it to subgeneric status, but in subsequent publications (Smith, 1978, 1981) he again recognized *Cephalopholis* as a valid genus. Recognition of *Cephalopholis* as either a genus or subgenus is a moot point, and (as pointed out by Smith-Vaniz et al., 1988) the monophyly of this genus has yet to be demonstrated. Nevertheless, *Cephalopholis* is a convenient taxon that is readily separable from other genera of groupers. Species of *Cephalopholis* have only IX dorsal-fin spines, whereas species of *Alphestes*, *Dermatolepis*, *Mycteroperca*, *Triso*, and *Epinephelus* have XI dorsal-fin spines (except for 3 species of *Epinephelus* which have X dorsal-fin spines and *E. acanthistius* of the eastern Pacific which has only IX dorsal-fin spines). Another useful generic character separating *Cephalopholis* and *Epinephelus* may be the presence of 3 to 6 trisegmental pterygiophores in the dorsal fin of *Cephalopholis* species (radiographs of 21 species examined, including *C. igarashiensis* and *C. polleni*). All of the *Epinephelus* that we have x-rayed (48 spp.) have only bisegmental pterygiophores (the middle piece being fused with the proximal element) supporting the dorsal- and anal-fin rays. Although only a few larvae of each genus are known, Leis (1986) has found that preflexion larvae of at least 6 species of *Cephalopholis* have a ventral series of 15 to 23 small melanophores on the tail. In postflexion larvae, the ventral melanophores are reduced to 1 to 4 and shift to a midlateral position on the peduncle. By contrast, *Epinephelus* preflexion larvae of at least 7 species have a single large ventral melanophore on the tail, and this shifts to the midlateral position on the peduncle in postflexion larvae. Differences between *Cephalopholis* and the other genera with species having IX dorsal-fin spines are discussed under those genera. According to C.L. Smith (1966) the genus *Menephorus* Poey, 1871 (type species, *Serranus dubius* Poey, 1860) was based on a specimen that appears to be a hybrid of *Paranthias furcifer* and *Cephalopholis fulva*. The genera *Uripaeton* Swainson, 1839 and *Phaetonichthys* Bleeker, 1874 were based on the spurious species, *Uripaeton microleptes* Swainson, 1839 and *Serranus phaeton* Valenciennes, 1828 respectively; and these two species are objective synonyms based on the hoax specimen (MNHN 7173) concocted from the body of a *Cephalopholis* and the tail of a cornetfish (*Fistularia*).

### Key to the Western Atlantic Species of *Cephalopholis*

- 1a. Caudal fin well rounded; anal-fin rays 8; pectoral-fin rays 16; head, body, and fins pale grey, brown, or olive green, covered with orange-brown or reddish spots; 4 distinct spots, which can change rapidly from black to white or back again, on body at base of dorsal fin (Fig. 48, Plate II) (Caribbean, Gulf of Mexico) ..... *C. cruentata*



- 1b. Caudal fin convex posteriorly with sharp corners; anal-fin rays 9; pectoral-fin rays 17 to 19; two small black spots on top of caudal peduncle and another two at tip of lower jaw (Fig. 49, Plates II and III) (Caribbean, Gulf of Mexico, southern Brazil) ..... *C. fulva*

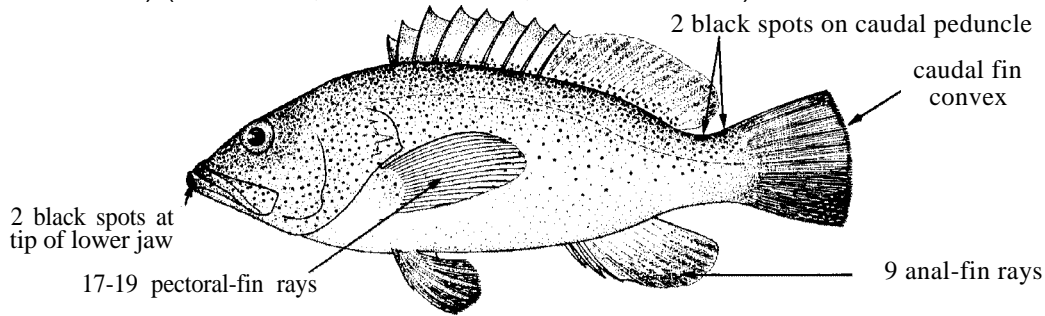


Fig. 49 *Cephalopholis fulva*

**Key to the Eastern Atlantic Species of *Cephalopholis***

- 1a. Body dark brownish, with 3 or 4 indistinct dark bars posteriorly; anal-fin rays 8; lateral-line scales 45 to 50 (Fig. 50) (from Senegal to Angola) ..... *C. nigri*
- 1b. Head, body, and median fins reddish orange, covered with small blue spots: anal-fin rays 9 or 10; lateral-line scales 68 to 72 (Fig. 51, Plate V) (from West Sahara to Angola) .. *C. taeniops*

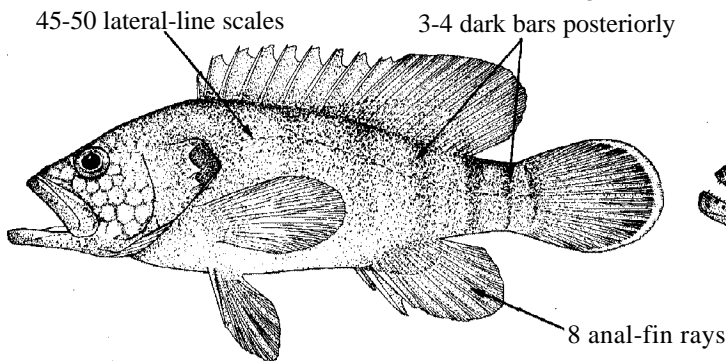


Fig. 50 *Cephalopholis nigri*

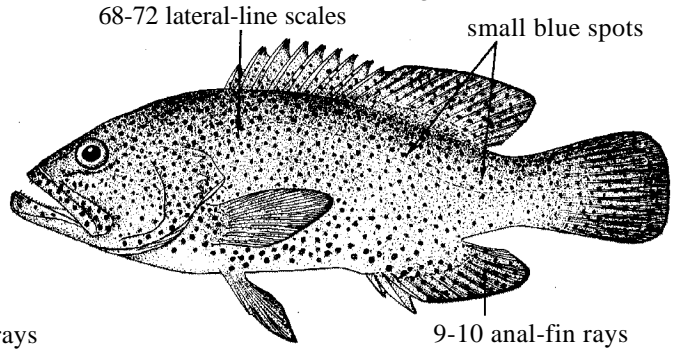


Fig. 51 *Cephalopholis taeniops*

**Key to Indo-Pacific and Red Sea Species of *Cephalopholis*:**

- 1a. Caudal fin truncate to slightly emarginate; head small, 2.7 to 3.15 times in standard length; head and body with alternating stripes of blue and orange-yellow (Fig. 52, Plate IV) (islands of the west-central Pacific and Indian Ocean) ..... *C. polleni*
- 2b. Caudal fin rounded; head length 2.2 to 2.7 times in standard length; colour pattern not of alternating stripes of blue and orange-yellow ..... → 2

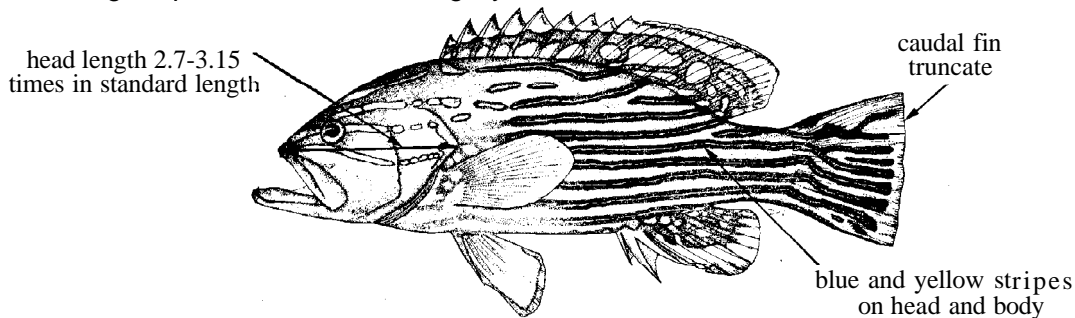
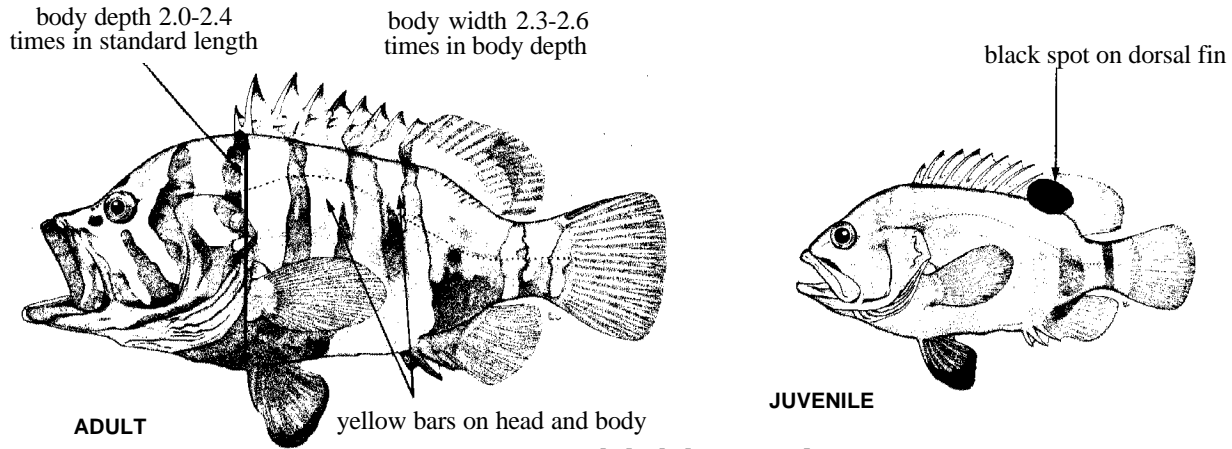


Fig. 52 *Cephalopholis polleni*

**2a.** Body depth 2.0 to 2.4 times in standard length; body width 2.3 to 2.6 times in body depth; head and body red with yellow bars; pelvic-fin tips black; juveniles with large black spot in dorsal fin (Fig. 53, Plate III) (west-central Pacific) ..... *C. igarashiensis*

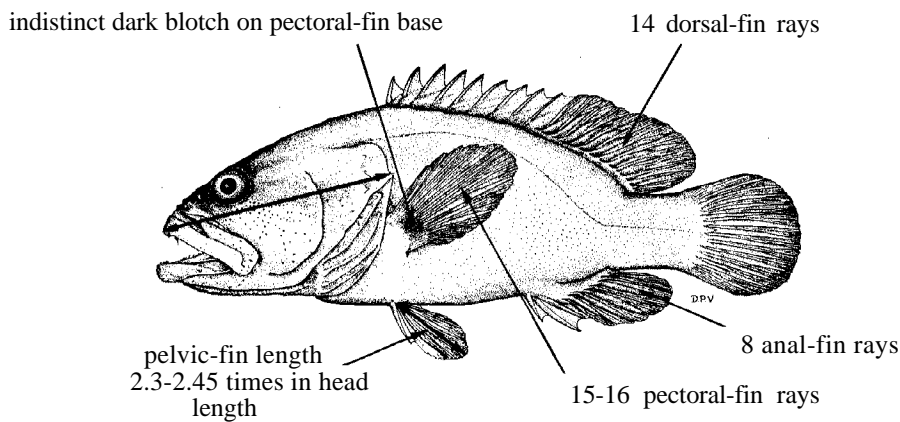
**2b.** Body depth 2.3 to 3.2 times in standard length; body width 1.9 to 2.4 times in body depth; colour not as in 2a ..... → 3



**Fig. 53 *Cephalopholis igarashiensis***

**3a.** Pelvic fins short, 2.3 to 2.45 times in head length; pectoral-fin rays 15 or 16 (rarely 16); dorsal-fin rays 14; anal-fin rays 8; colour generally reddish brown with an indistinct dark blotch basally on pectoral fins (Fig. 54, Plate I) (Indonesia, Philippines, and New Guinea)...*C. aitha*

**3b.** Pelvic-fin length 1.5 to 2.35 times in head length; pectoral-fin rays 15 to 20 (rarely 15); dorsal-fin rays 14 to 17; anal-fin rays 8 to 10; colour not as in 3a ..... → 4



**Fig. 54 *Cephalopolis aitha***

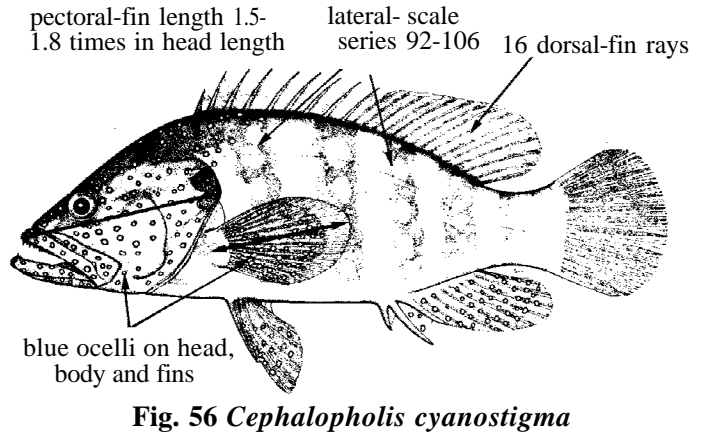
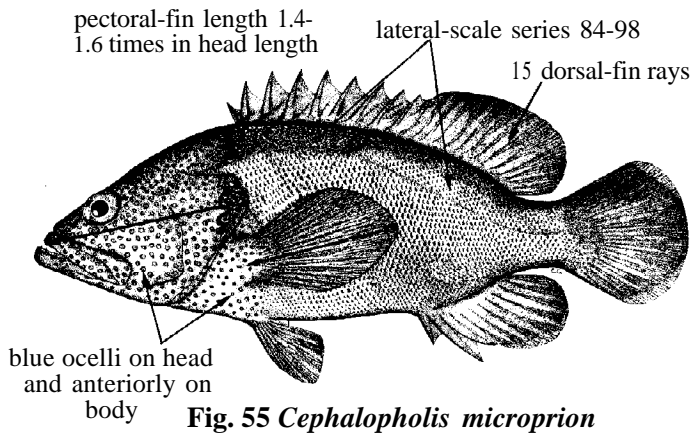
**4a.** Anal-fin rays usually 8; colour generally brown to dark brown ..... → 5

**4b.** Anal-fin rays 9 (rarely 10); colour generally red, orange or yellow (except *C. argus* and some *C. urodeta* or *C. sonnerati*) ..... → 8

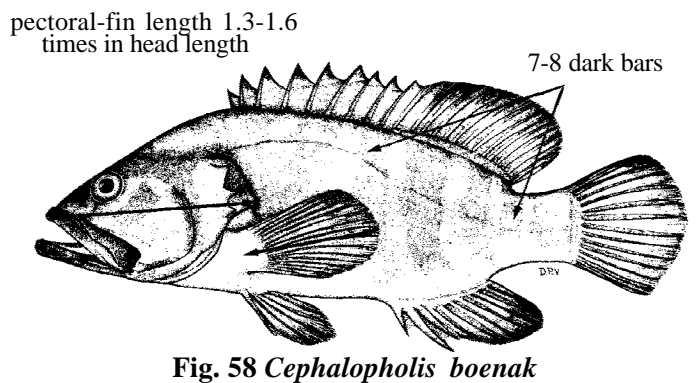
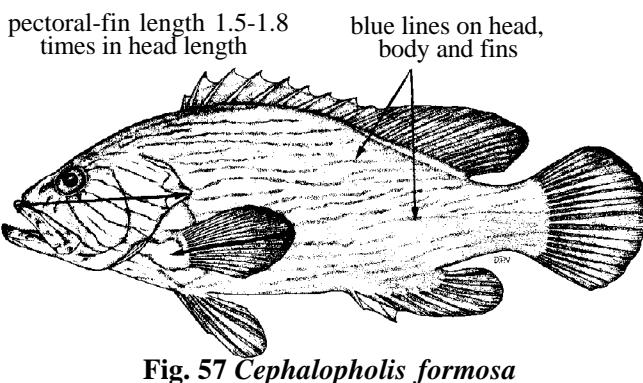
**5a.** Small dark spots or dark-edged pale blue spots on head and/or body (except juveniles of *C. cyanostigma*, which are dark brown with bright yellow median fins) ..... → 6

**5b.** Nos mall dark spots or blue ocelli on head or body ..... → 7

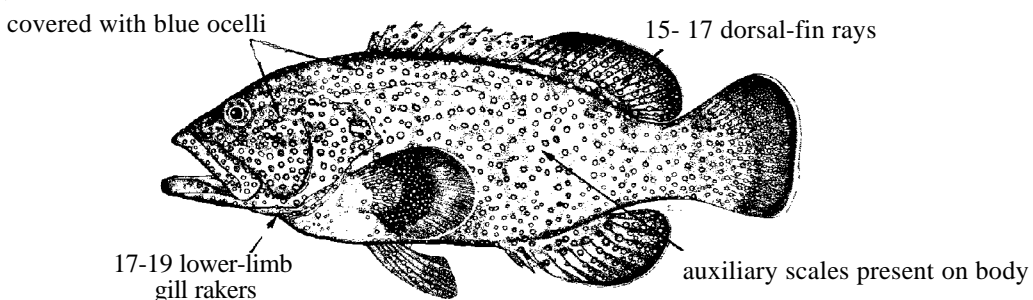
- 6a. Dorsal-fin rays usually 15; lateral-scale series 84 to 98; pectoral-fin length contained 1.4 to 1.6 times in head length; dark-edged blue spots only on head and anteriorly on body (Fig. 55, Plate III) (Andaman Sea, Philippines, and Indonesia to New Caledonia and Great Barrier Reef) ..... *C. micropriion*
- 6b. Dorsal-fin rays usually 16; lateral-scale series 92 to 106; pectoral-fin length 1.5 to 1.8 times in head length; blue ocelli on head, body, and basally on median fins (Fig. 56, Plate II) (Andaman Sea, Gulf of Thailand, Indonesia, Philippines, northern Australia, and New Britain) ..... *C. cyanostigma*



- 7a. Pectoral fins short, their length contained 1.5 to 1.8 times in head length; colour generally brown or yellowish brown, with dark blue lines on head, body and fins (Fig. 57, Plate II) (west coast of India to western Pacific) ..... *C. formosa*
- 7b. Pectoral fins 1.3 to 1.6 in head length; body brown, usually with 7 or 8 dark bars; no blue lines on head or body; fins dark brown, with a pale blue line at corners of caudal (Fig. 58, Plate II) (Indo-West Pacific) ..... *C. boenak*



- 8a. Dorsal-fin rays 15 to 17; lower-limb gill rakers 17 to 19; auxiliary scales present on body; colour dark brown, covered with small dark-edged blue ocelli; 5 or 6 pale bars often visible on rear half of body (Fig. 59, Plate I) (Red Sea and Indo-Pacific) ..... *C. argus*
- 8b. Dorsal-fin rays usually 14 or 15; lower-limb gill rakers 13 to 16; no auxiliary scales on body scales; colour not as in 8a ..... → 9



- 9a. Ventral edge of preopercle serrate; colour orange-red in life with widely scattered pale blue spots on body and fins and elongate spots or short lines on head (Fig. 60, Plate IV) (Red Sea) ..... *C. oligosticta*
- 9b. Ventral edge of preopercle smooth and usually covered by skin (except *C. sonnerati* with a few serrae posteriorly); colour not as in 9a ..... → 10

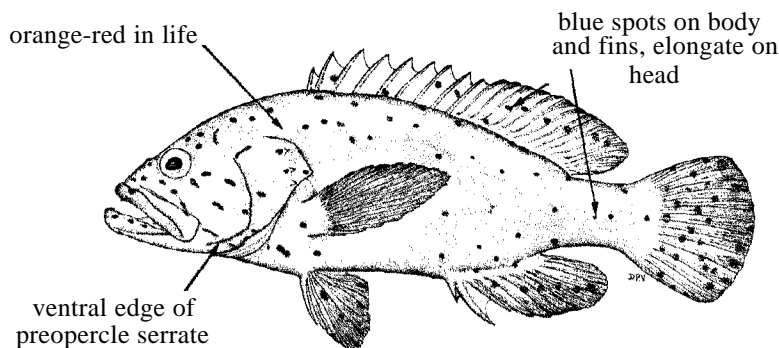


Fig. 60 *Cephalopholis oligosticta*

- 10a. Lateral-line scales 66 to 80; lateral-scale series 115 to 134; pectoral-fin rays 18 to 20; body depth 2.3 to 2.8 times in standard length; colour generally red to reddish brown (juveniles and some adults may be dark purple or brown) with widely scattered whitish blotches (Indian Ocean) or generally brownish, covered with small dark red to reddish brown spots and irregular white blotches (Pacific) (Fig. 61, Plate V) (tropical Indian Ocean and Pacific) ..... *C. sonnerati*
- 10b. Lateral-line scales 45 to 68; lateral-scale series 79 to 121; pectoral-fin rays 16 to 19; body depth 2.6 to 3.5 times in standard length; colour not as in 10a ..... → 11

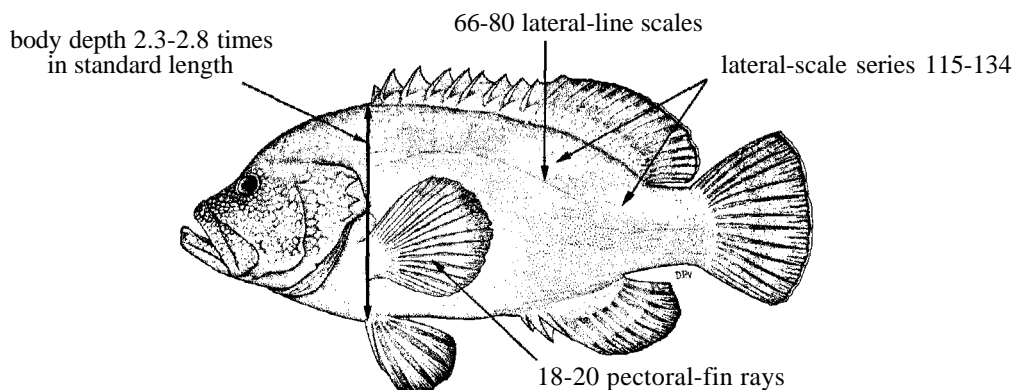


Fig. 61 *Cephalopholis sonnerati*

- 11a. Lateral-line scales 54 to 68; caudal fin blackish red, the corners broadly red, each set off by an oblique white stripe; pectoral fins red, shading to orange-yellow distally (Pacific); or caudal and pectoral fins uniformly blackish (Indian Ocean) (Fig. 62, Plate V and VI) ..... *C. urodeta*
- 11b. Lateral-line scales 45 to 56; colour not as in 11 a ..... → 12

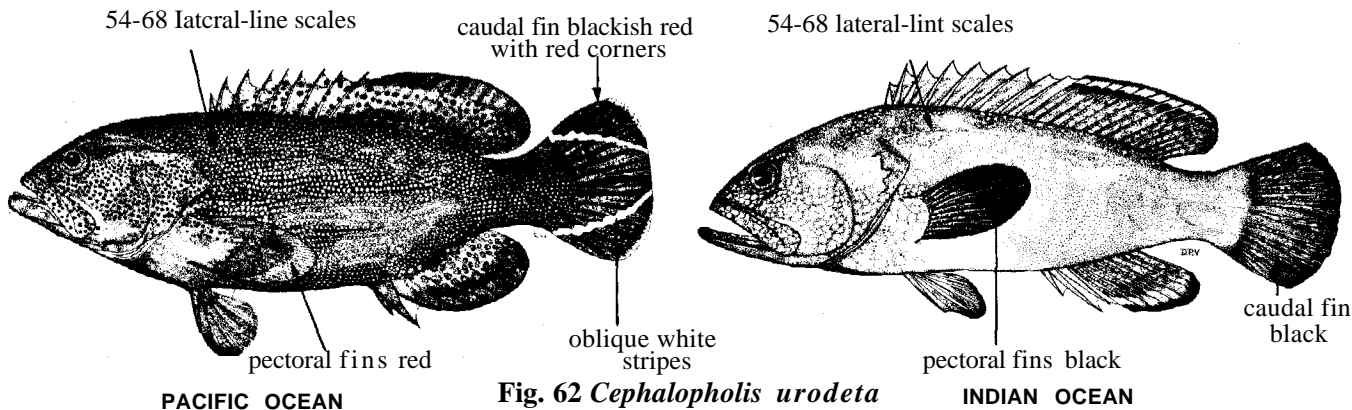


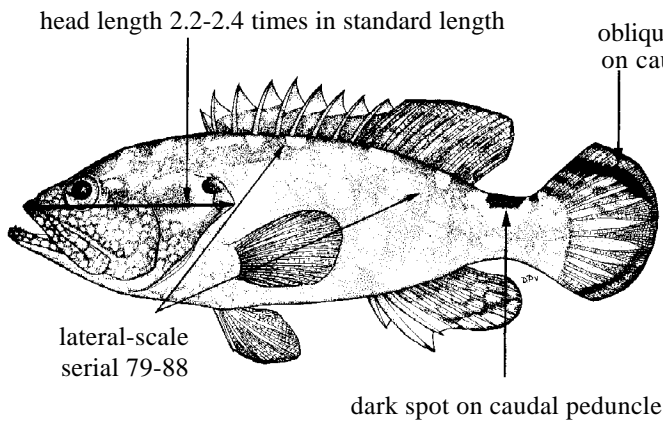
Fig. 62 *Cephalopholis urodeta*

**12a.** Lateral-scale series 79 to 88; head length 2.2 to 2.4 times in standard length; dark brown saddle spot on caudal peduncle, followed by a smaller spot; oblique dark streak on caudal fin (Fig. 63, Plate III) (Indo-Pacific) ..... *C. leopardus*

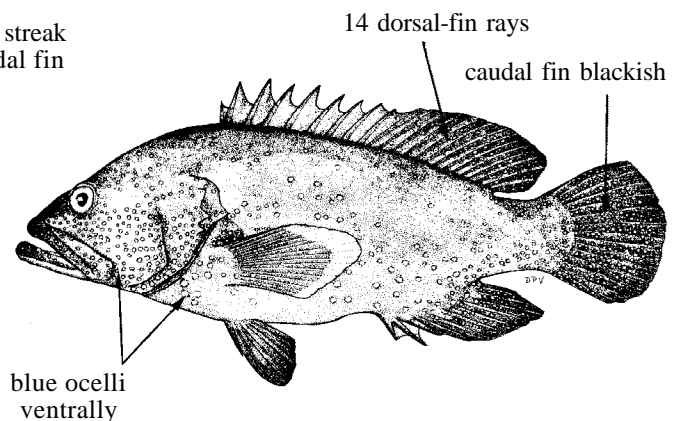
**12b.** Lateral-scale series 90 to 121; head length 2.3 to 2.6 times in standard length; colour not as in 12a ..... **13**

**13a.** Dorsal-fin rays usually 14; caudal fin and rear part of dorsal and anal fins blackish; numerous small blue ocelli on lower part of head and body, but few dorsally (Fig. 64, Plate III) (Red Sea to Persian Gulf and Pakistan) ..... *C. hemistiktos*

**13b.** Dorsal-fin rays usually 15; median fins not blackish; small blue spots, if present, uniformly distributed on head and body ..... **→ 14**



**Fig. 63** *Cephalopholis leopardus*



**Fig. 64** *Cephalopholis hemistiktos*

**14a.** Head, body, and fins covered with small blue ocelli ..... **→ 15**

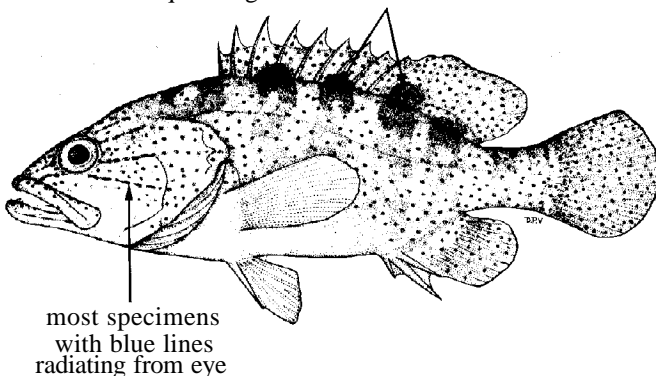
**14b.** No blue spots on head, body, or fins ..... **→ 16**

**15a.** Body with 4 or 5 quadrangular dark brown or black blotches along base of dorsal fin, another faint blotch on nape and 2 smaller ones on peduncle (blotches sometimes merging with dark red vertical bars); most specimens with dark-edged blue lines radiating from eyes (Fig. 65, Plate IV) (Red Sea and Indo-Pacific) ..... *C. sexmaculata*

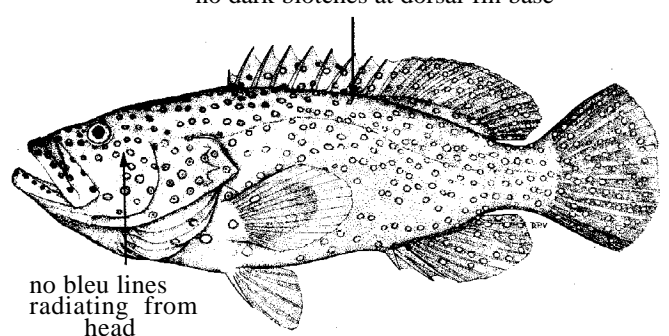
**15b.** No dark blotches dorsally on body; no blue lines radiating from eyes (Fig. 66, Plate IV) (Red Sea and Indo-Pacific) ..... *C. miniata*

4-5 quadrangular dark blotches at dorsal-fin base

no dark blotches at dorsal-fin base

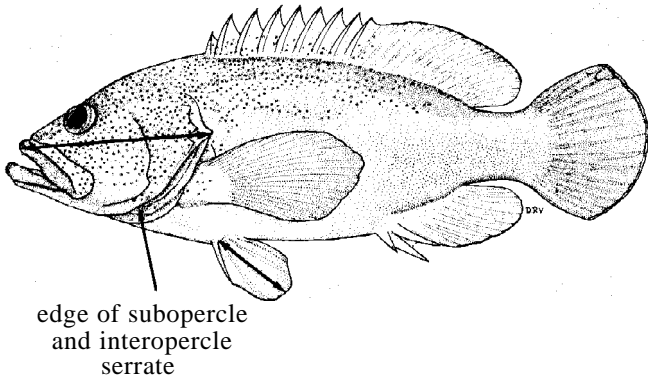


**Fig. 65** *Cephalopholis sexmaculata*

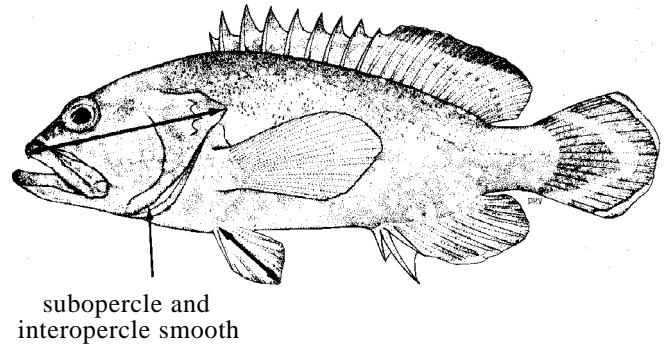


**Fig. 66** *Cephalopholis miniata*

- 16a.** Edge of subopercle and interopercle distinctly serrate; pelvic fins usually reaching anus, pelvic-fin length 1.6 to 2.0 times in head length; colour generally orange-yellow to orange-red or golden, with red to orange dots on head and dorsally on body (Fig. 67, Plate I) (Indo-Pacific) ..... *C. aurantia*
- 16b.** Subopercle and interopercle usually smooth (rarely with a few small serrae); pelvic fins not reaching anus, pelvic-fin length 1.9 to 2.2 times in head length; colour reddish orange, mottled with dark red or brownish red (Fig. 68, Plate V) (Indo-Pacific) ..... *C. spiloparaea*
- pelvic-fin length 1.6-2.0 times in head length                      pelvic-fin length 1.9-2.2 times in head length



**Fig. 67** *Cephalopholis aurantia*



**Fig. 68** *Cephalopholis spiloparaea*