

Cephalopholis panamensis (Steindachner, 1876)

Fig. 99; Pl. IVD

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Serranus panamensis Steindachner, 1876:551, pl. 1, fig. 1 (type locality: Pacific coast of Panama).

Synonyms: *Petrometopon panamensis*, *Epinephelus panamensis*.

FAO Names: En - Pacific graysby; Fr - Coné bande; Sp - Enjambre.

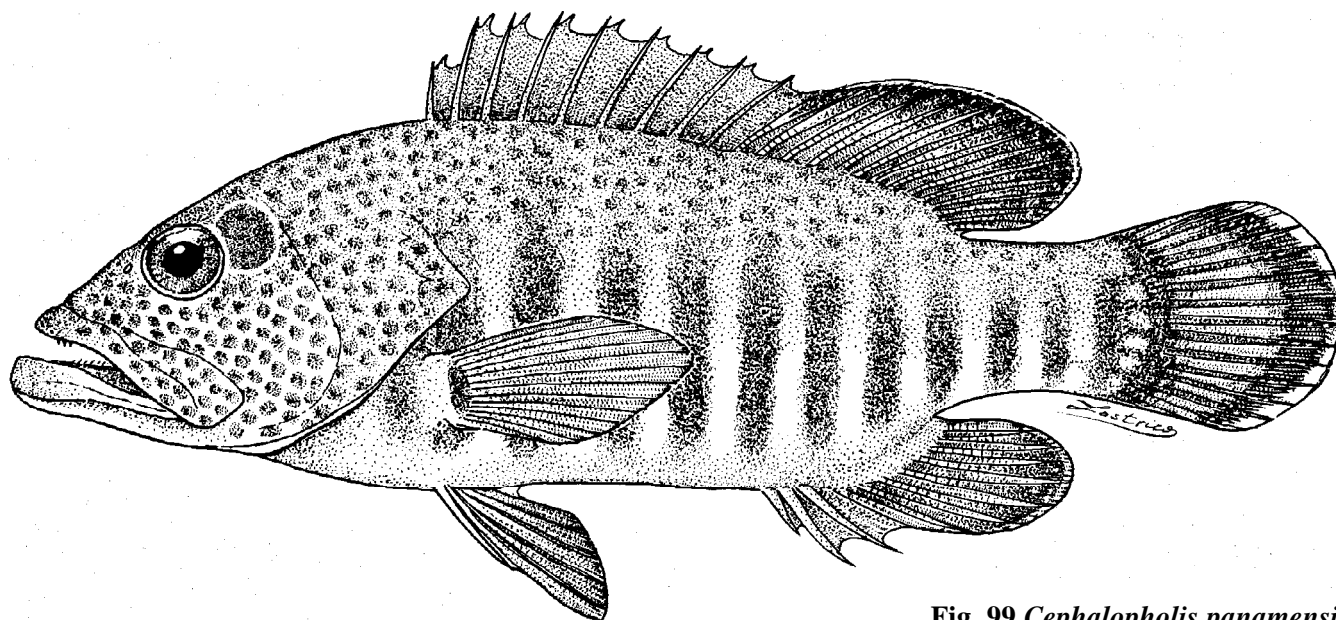


Fig. 99 *Cephalopholis panamensis*
(adult)

Diagnostic Features: Body depth distinctly less than head length, depth contained 2.7 to 2.9 times in standard length (for fish 12 to 21 cm standard length). Head length contained 2.3 to 2.5 times in standard length; preopercle rounded, finely serrate; nostrils subequal. Gill rakers 16 to 19 (total). Dorsal fin with IX spines and 14 or 15 rays, the third spine longest, the membranes incised between the anterior spines; anal fin with III spines and 8 rays; pectoral-fin rays 17 or 18; pectoral fins clearly longer than pelvic fins, pectoral-fin length contained 1.5 to 1.7 times in head length; caudal fin rounded. Lateral-body scales strongly ctenoid; lateral-line scales 48 or 49; lateral-scale series 80 to 83. **Colour:** Head and body dark brownish, the body with 8 to 10 dark bars which are wider and more distinct ventrally; head, including maxilla and upper lip, with close-set reddish orange spots forming a bluish green reticulum; adults with a large dark brown spot immediately behind the eye; median fins edged with blue.

Geographical Distribution: Eastern Pacific from Gulf of California to Ecuador and the Galapagos (Fig. 100).

Habitat and Biology: Prefers coral reefs from shallow water to depths of 76 m. A shy, secretive species common along rocky shores of the Gulf of California.

Size: Maximum total length 30 cm.

Interest to Fisheries: *C. panamensis* is too small to be of commercial importance.

Local Names:

Literature: Smith (1971); Thomson et al. (1979).

Remarks: Lopez Lemus (1988) claims to have found electrophoretic data that indicate *Epinephelus labriformis* is more closely related to *C. panamensis* than to *E. analogus* or *E. acanthistius*. He assumes incorrectly that *C. panamensis* and *E. labriformis* are "subtropical" species with distributions that differ in some way from that of "the most tropical species," *E. acanthistius*. In fact, the distributions of all three species extend from the Gulf of California to Peru. The biogeographic analysis of Lopez Lemus is further confused when he assumes that the *E. analogus* species group "is completely of Indo-Pacific origin" and does not even mention C.L. Smith's (1971) determination that *E. analogus* is most closely related to *E. adscensionis* of the Atlantic

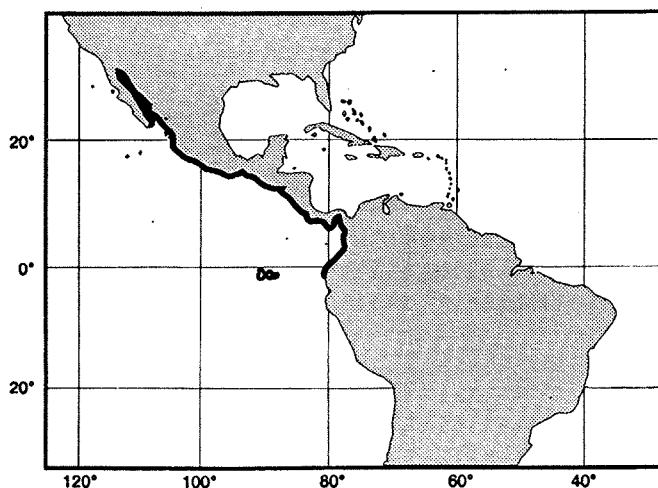


Fig. 100

Ocean. See the Remarks section of the account of *E. labriformis* (below) for further discussion of this electrophoretic work of Lopez Lemus.

Cephalopholis polleni (Bleeker, 1868)

Fig. 101; Pl. IVE

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Epinephelus polleni Bleeker, 1868:336 (type locality: Reunion).

Synonyms: *Plectropoma lineatum* Steindachner in Bliss, 1883:45 (type locality: Mauritius). *Cephalopholis virgatus* Fourmanoir, 1954:214 (type locality: Anjouan, Comoro Islands). *Gracila okinawae* Katayama, 1974:101, fig. 2 (type locality: Naha, Okinawa, Japan).

FAO Names: En - Harlequin hind; Fr - Vielle arlequin; Sp - Cherna arlequin.

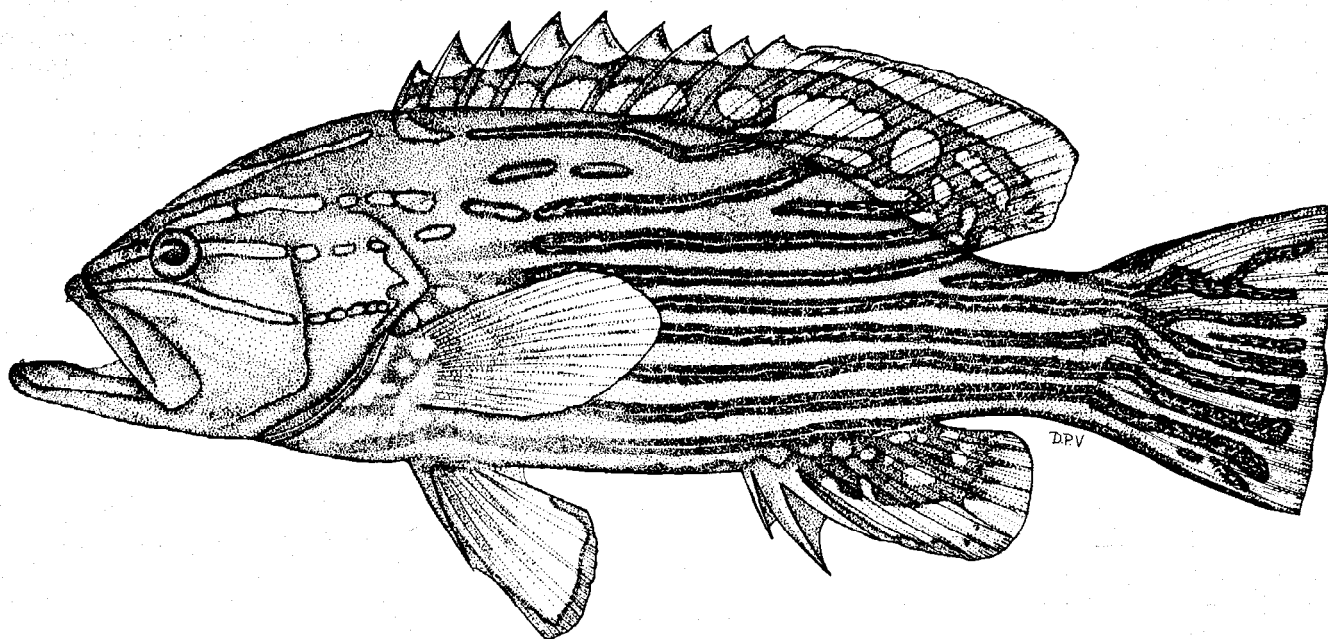


Fig. 101 *Cephalopholis polleni*
(200 mm standard length)

Diagnostic Features: Body depth subequal to head length, depth contained 2.7 to 3.1 times in standard length (for fish 9 to 26 cm standard length). Eye diameter subequal to interorbital width and about twice depth of preorbital; preopercle rounded, finely serrate, the lower edge with 1 to 3 broad serrae; subopercle and interopercle finely serrate; maxilla reaches about to vertical at rear edge of eye. Gill rakers 7 or 8 on upper limb, 14 to 17 on lower limb. Dorsal fin with IX spines (with the fin membrane distinctly indented between them) and 14 to 16 rays; anal fin with III spines and 9 (rarely 8) rays; pectoral-fin rays 17 to 19; pectoral fins subequal to pelvic fins, pectoral-fin length contained 1.5 to 1.9 times in head length; caudal fin truncate to slightly emarginate. Lateral-body scales ctenoid, without auxiliary scales; lateral-line scales 66 to 72; lateral-scale series 112 to 135. **Colour:** Adults mostly yellow (greenish or brownish yellow on head and anterodorsally on body in some fish), with 10 to 12 bright blue or violet horizontal stripes on body, the upper 2 or 3 broken into segments and extending posteriorly onto dorsal fin; the stripes running onto peduncle bifurcate and continue onto the caudal fin almost to the rear margin; head with 3 to 6 horizontal blue stripes; dark brown maxillary streak present; pelvic fins yellow with blue stripes. Small juveniles (4 cm standard length) yellowish brown, shading to lavender ventrally and to yellow at base of caudal fin, the yellow continuing as a broad band in each caudal lobe; snout yellow, with a large black spot on each side in front of nostrils. Larger juveniles (10 cm standard length) brownish orange with longitudinal purple stripes on head and body.

Geographical Distribution: *C. polleni* occurs only at oceanic islands of the Indo-Pacific region, from the western Indian Ocean (Comoro Islands, Reunion, Mauritius, Chagos, Maldives) to the central Pacific (Palau and Line Islands); also reported from the Cocos-Keeling Islands, Christmas Island, Indonesia (small islands), Philippines, Okinawa, Guam, and New Britain. It is not known from the Red Sea, Sri Lanka, Australia, larger islands of Indonesia, or New Guinea (Fig. 102).

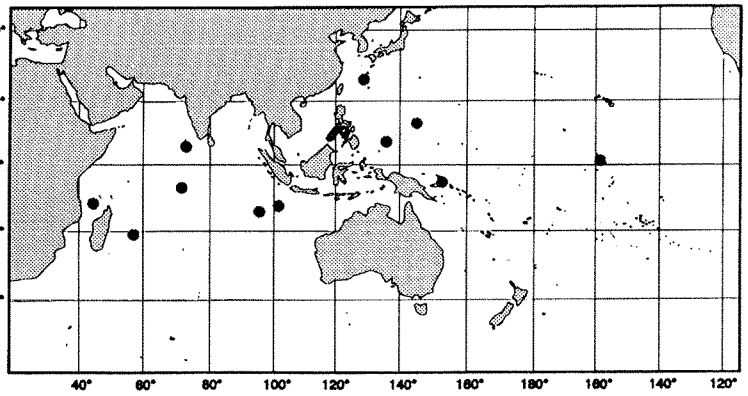


Fig. 102

Habitat and Biology: *C. polleni* is found on coral reefs in clear water on the edge of steep drop-offs: rarely seen in less than 30 m, it has been taken in depths of 120 m and undoubtedly occurs deeper.

Size: Maximum total length 43 cm.

Interest to Fisheries: Probably valuable as an aquarium fish, but the species is apparently too rare and generally too small to be of commercial importance as a food fish. Caught with hook-and-line and in traps.

Local Names: JAPAN: Minamihata; PHILIPPINES: Blue-lined grouper.

Literature: Heemstra and Randall (1984, 1986); Myers (1989); Randall and Heemstra (1991).

Remarks: Smith-Vaniz et al. (1988) have shown that *C. polleni*, which was previously assigned to the genus *Gracila*, is not closely related to *G. albomarginata*, the type species of this monotypic genus. The cranium of *C. polleni* is more similar to that of *C. argus* than to *G. albomarginata*, and it also has more robust dorsal- and anal-fin spines than in *G. albomarginata*. Although Smith-Vaniz et al. (1988) did not find any uniquely derived character that could be used to establish the monophyly of the genus *Cephalopholis*, we provisionally accept their assignment of *C. polleni* to this genus, since it shares with the species of *Cephalopholis* a dorsal-fin spine count of IX, a distinct knob on the ventroposterior corner of the maxilla, and has 3 to 5 trisegmental pterygiophores in the dorsal and anal fins. Furthermore, *C. polleni* lacks the derived characters that distinguish the other grouper genera.

Cephalopholis sexmaculata (Rüppell, 1830)

Fig. 103; Pl. IVF

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Serranus sexmaculatus Rüppell, 1830:107 (type locality: Red Sea).

Synonyms: *Serranus zanana* Valenciennes in Cuv. and Val., 1828:339 (type locality: Mauritius). *Cephalopholis coatesi* Whitley, 1937a: 124, pl. 12 (type locality: off Townsville, Queensland, Australia). *Cephalopholis gibbus* Fourmanoir, 1954:215 (type locality: Mutsumudu, Anjouan, Comoro Islands).

FAO Names: En - Sixblotch hind; Fr - Vielle six taches; Sp - Cherna de seis manchas.

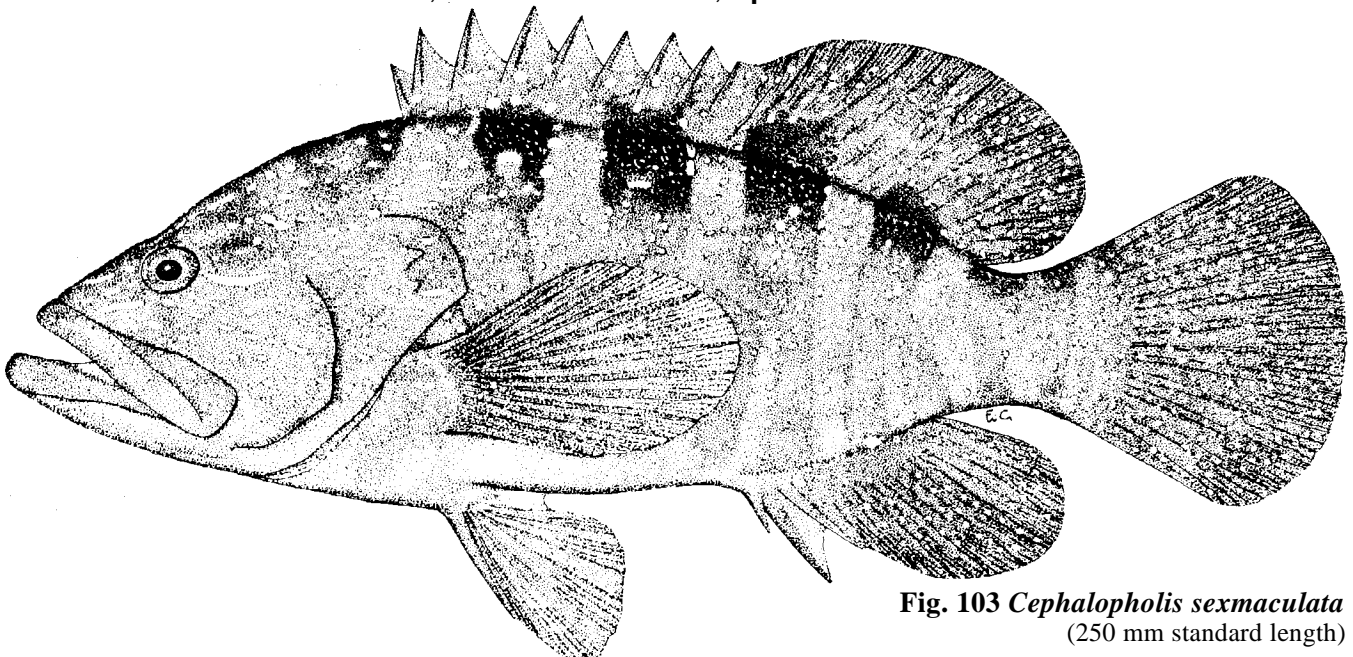


Fig. 103 *Cephalopholis sexmaculata*
(250 mm standard length)

Diagnostic Features: Body depth contained 2.5 to 3.0 times in standard length (for fish 13 to 39 cm standard length). Head length contained 2.3 to 2.5 times in standard length; interorbital area flat to slightly convex; dorsal head profile of large specimens (more than 30 cm standard length) distinctly concave above the eyes; preopercle rounded, finely serrate in young, virtually smooth in large adults, the lower edge fleshy; subopercle and interopercle with a few small serrae mostly hidden by skin; maxilla scaly, reaching past eye. Gill rakers 7 to 9 on upper limb, 14 to 16 on lower limb. Dorsal fin with IX spines (the fin membranes distinctly indented between them) and 14 to 16 rays; anal fin rounded, with III spines and 9 rays; pectoral-fin rays 16 to 18; pectoral fins clearly longer than pelvic fins, pectoral-fin length contained 1.4 to 1.6 times in head length; pelvic-fin length contained 1.9 to 2.2 times in head length; caudal fin well rounded. Lateral-body scales ctenoid, without auxiliary scales (just a few in very large specimens); lateral-line scales 49 to 54; lateral-scale series 95 to 108. **Colour:** Orange-red, with small blue spots sparsely scattered on body but more densely on head and median fins; head also with elongated blue spots and lines; body with 4 dark bars (sometimes very faint) merging dorsally with blackish blotches at base of dorsal fin and extending onto the fin; 2 similar but smaller dark bar/blotches on caudal peduncle; the spaces between the dark body bars sometimes very pale; pectoral fins orange-red.

Geographical Distribution: Red Sea and Indo-Pacific from South Africa (southern Natal) to French Polynesia. Confirmed records from the Indian Ocean include Kenya, Zanzibar, Comoro Islands, Mauritius, Reunion, Maldives, Chagos Islands, and Christmas Island. The reports by Heemstra and Randall (1984) of *C. sexmaculata* from the Gulf of Oman, Pakistan, India, and Sri Lanka are unsubstantiated; it is absent from the Persian Gulf (Randall et al., 1978; Kuronuma and Abe, 1986) and is not yet known from Lakshadweep Islands (Jones and Kumaran, 1980) and the Seychelles

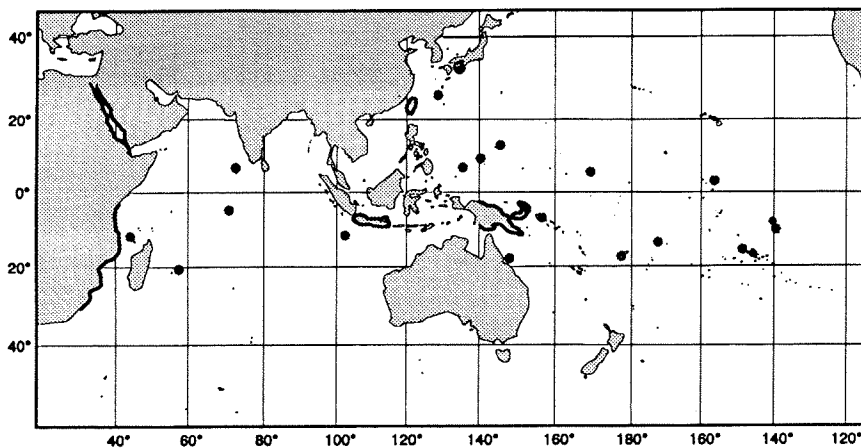


Fig. 104

(Smith and Smith, 1963). In the Pacific Ocean, *C. sexmaculata* is known from Indonesia, South China Sea, Philippines, southern Japan, Palau, Queensland, New Guinea, Solomon Islands, Caroline Islands, Mariana Islands, Marshall Islands, Line Islands, Fiji Islands, Society Islands, and the Marquesas (Fig. 104).

Habitat and Biology: Coral reefs in depths of 10 to 150 m; a secretive species, generally seen hiding in caves and crevices on the outer reef slope. *C. sexmaculata* is active nocturnally in shallow water and diurnally in deeper water (Shpigel and Fishelson, 1989b). Randall and Brock (1960) found that this species (misidentified as *C. miniatus*) feeds mainly on fishes.

Size: Maximum total length at least 48 cm.

Interest to Fisheries: *C. sexmaculata* is of commercial interest to certain local fisheries. Caught with hook-and-line, traps, and spear.

Local Names: AUSTRALIA: Freckled rock cod; COMORO ISLANDS: Bandama (Ajouan); JAPAN: Kokuhanhata; PALAU: Bachungor; SOUTH AFRICA: Six-blotch rockcod; TAHITI: Rari, Tukorokoro.

Literature: Heemstra and Randall (1984, 1986); Myers (1989); Randall and Heemstra (1991).

Remarks: The species described as *Serranus zanana* by Valenciennes (1828) was recently found to be a senior synonym of *C. sexmaculata*, but it was not used as a valid species name for the past 150 years. Consequently, the International Commission on Zoological Nomenclature (1987: Opinion 1439) has rejected *Serranus zanana* in favour of the widely used *C. sexmaculata*.

Cephalopholis sonnerati (Valenciennes, 1828)

Fig. 105; Pl. VA-C

SERRAN Cephal 3

Serranus sonnerati Valenciennes in Cuv. and Val., 1828:299 (type locality: Pondicherry, India).

Synonyms: *Serranus zanarella* Valenciennes in Cuv. and Val., 1828:304 (type locality: Fort Dauphine, Madagascar). *Epinephelus janthinopterus* Bleeker, 1874:40 (type locality: Ujung Pandang, Sulawesi, Indonesia). *Serranus unicolor* Lienard in Bleeker and Pollen, 1875:89 (based on "Mérrou Unicolore" Lienard, 1839:31, Mauritius). *Cephalopholis purpureus* Fourmanoir, 1966:221, fig. 3 (type locality: Nha Trang, Viet Nam). Often misidentified as "*Cephalopholis aurantius*" or *C. formosanus*.

FAO Names: En - Tomato hind; Fr - Vielle ananas; Sp - Cherna piña.

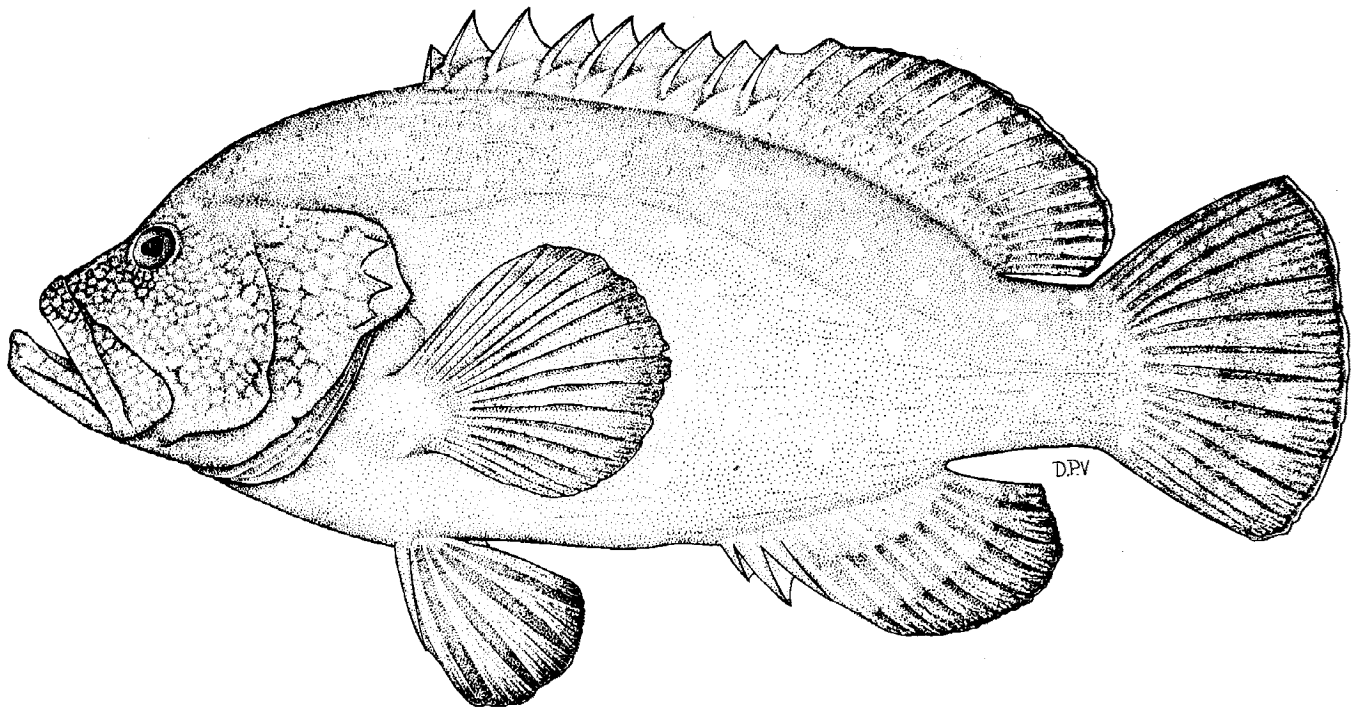


Fig. 105 *Cephalopholis sonnerati*
(300 mm standard length)

Diagnostic Features: Body depth greater than or subequal to head length, depth contained 2.3 to 2.8 times in standard length (for fish 9 to 41 cm standard length). Head length contained 2.5 to 2.7 times in standard length; dorsal head profile of adults straight to concave, the nape distinctly convex; interorbital area flat to slightly convex; preopercle rounded, finely serrate, with a shallow notch just above the "corner," the lower edge serrate or irregular with broad spinules, usually exposed; subopercle and interopercle finely serrate; maxilla reaches past eye. Gill rakers 7 to 9 on upper limb, 14 to 16 on lower limb. Dorsal fin with IX spines and 14 to 16 rays, the membranes distinctly indented between the spines; anal fin with III spines and 9 rays; pectoral fins with 18 to 20 rays; pectoral fins subequal to pelvic fins, pectoral-fin length contained 1.5 to 1.7 times in head length for fish 9 to 30 cm standard length (in fish larger than 30 cm standard length, the pelvic fins are longer than the pectoral fins); pelvic fins reaching or extending beyond anus; caudal fin rounded. Lateral-body scales ctenoid; lateral-line scales 66 to 80; lateral-scale series 115 to 134. **Colour:** Adults from the Indian Ocean with orange-red to reddish brown body, often with scattered small whitish or purple spots; purple network on head, maxilla, and lips; pectoral fins orange distally; membranes of soft dorsal, caudal, anal, and pelvic fins dusky; dorsal-fin rays orange distally; pelvic-fin tips blackish. Adults from the Pacific Ocean generally pale reddish to yellowish brown, covered with small brownish red or dark brown spots. Juveniles dark reddish brown to nearly black, the rear margin of the caudal fin and sometimes the pectoral fins whitish. A juvenile about 10 cm total length photographed in 30 m at Mauritius shows yellow spots on the head, scattered blackish spots (which could be quickly changed to pale greenish) on the body and oblique white stripes on the caudal fin somewhat like *C. urodeta*. Larger juveniles are brownish orange with scattered pale greenish spots on the body and a black spot between the upper and middle opercular spines.

Geographical Distribution: Indo-Pacific from the east coast of Africa (from Socotra to Durban) to the Line Islands in the central Pacific; in the western Pacific, *C. sonnerati* ranges from southern Japan to southern Queensland. It is known from both continental and insular localities, including most of the islands in the tropical Indian and Pacific Oceans, but it has not been reported from the Red Sea or Persian Gulf. And it was not found at the Chagos Archipelago, despite an intensive survey there (Winterbottom et al., 1989) (Fig. 106).

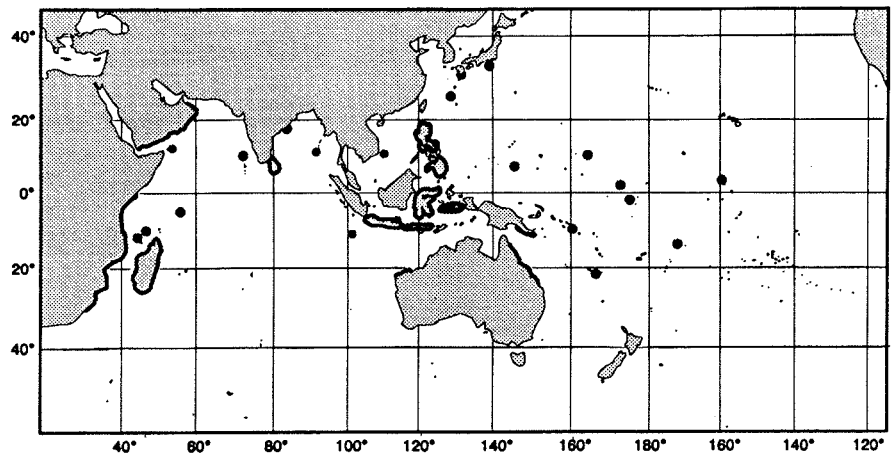


Fig.106

Habitat and Biology: *C. sonnerati*

is a coral reef species usually caught in depths of 30 to 100 m, but at Madagascar it occurs in depths of 10 to 20 m. It feeds on fishes and crustaceans. According to Morgans (1982), females mature at about 28 cm standard length and males at about 34 cm.

Size: Maximum total length recorded for *C. sonnerati* is 57 cm.

Interest to Fisheries: This common and widespread species is of commercial importance throughout most of its range. It is caught with hook-and-line and in traps.

Local Names: INDIA: Bontoo (Telugu), Siggapu-cullawah (Tamil), Ryfana (Minicoy), Chencheerachammam (Lakshadweep Islands); MADAGASCAR: Alovo; MOZAMBIQUE: Garoupa, Xisumba, Guitongue.

Literature: Harmelin-Vivien and Bouchon (1976); Randall (1986); Randall and Heemstra (1991).

Remarks: Allen (1985: fig. 122) published an underwater photograph (labelled "*Epinephelus multinotatus*") of what appears to be an unusually coloured specimen of *C. sonnerati* from the North West Cape of Western Australia. The ground colour is brownish, the head, body, and most of the fins covered with small dark brown spots; several large, irregular whitish blotches on the body and posteriorly on the head, those on the body aligned in 5 or 6 vertical or slightly oblique series, the last two on the caudal peduncle; a few scattered white spots on the body and more densely on the median fins. Judging from the differences in colour patterns of *C. sonnerati* in the Indian and Pacific Oceans, there are some genetic differences in the populations of these two areas; but we have not been able to find any morphological differences in specimens from these two areas.

Cephalopholis spiloparaea (Valenciennes, 1828)

Fig. 107; Pl. VD

SERRAN Cephal 8

Serranus spiloparaeus Valenciennes in Cuv. and Val., 1828:338 (type locality unknown, but the holotype was collected by Commerson, hence probably Indian Ocean).

Synonyms: None. But often misidentified as *C. analis* (e.g., Heemstra and Randall, 1984; Randall, 1986) or *C. aurantia* (e.g., Russell, 1983; Katayama, 1988; Masuda and Allen, 1987).

FAO Names: En - Strawberry hind; Fr - Vielle fraise; Sp - Cherna frutillera.

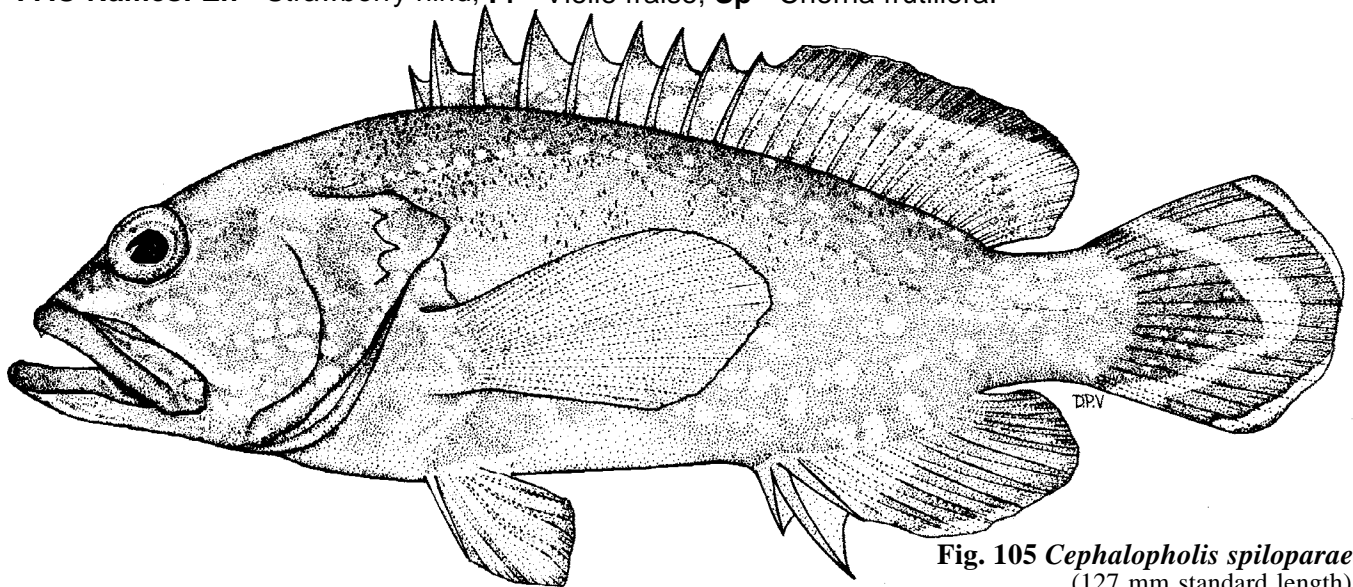


Fig. 105 *Cephalopholis spiloparaea*
(127 mm standard length)

Diagnostic Features: Body depth distinctly less than head length, depth contained 2.6 to 3.2 times in standard length (for fish 9 to 17 cm standard length), Head length contained 2.3 to 2.5 times in standard length; eye large, its diameter about twice depth of preorbital; interorbital area flat; preopercle rounded, very finely serrate, with a shallow notch, the lower edge fleshy; subopercle and interopercle smooth or with minute serrae; maxilla scaly, reaching to or well beyond vertical at rear edge of eye. Gill rakers 7 to 9 on upper limb, 14 to 16 on lower limb. Dorsal fin with IX spines and 14 to 16 rays; anal fin with III spines and 9 rays; pectoral-fin rays 17 to 19, rarely 19; pectoral fins clearly longer than pelvic fins, pectoral-fin length contained 1.3 to 1.6 times in head length; pelvic fins not reaching anus, their length contained 1.9 to 2.2 times in head length; caudal fin rounded. Lateral-body scales ctenoid, without auxiliary scales; lateral-line scales 47 to 53; lateral-scale series 84 to 103. **Colour:** Pale reddish orange, mottled and blotched with dark red or brownish red; faint pale spots usually present on head, body, and median fins; caudal fin usually coloured like the body (but distinctly yellowish in some fish from the Comoro Islands) and with a bluish white submarginal band at corners of fin, becoming narrow and marginal (or even disappearing) at centre of fin; ventral margin of soft portion of anal fin (and to lesser extent the dorsal fin) bluish, usually persisting as dusky in preserved specimens; some fish with about 8 faint dark saddle blotches at base of dorsal fin and another on front of caudal peduncle,

Geographical Distribution: Indo-Pacific from Pinda, Mozambique (15°S) to French Polynesia and the Pitcairn Group; in the western Pacific, *C. spiloparaea* ranges from the Ryukyu Islands of Japan to Heron Island at the southern end of the Great Barrier Reef. Except for the specimens collected at Pinda, this species is known only from insular localities (Fig. 108).

Habitat and Biology: Perhaps the most common species of grouper on Indo-Pacific coral reefs below 40 m; specimens have been collected in depths of 15 to 108 m. It appears that nothing is known of the biology of this species.

Size: Maximum total length 22 cm.

Interest to Fisheries: Because of its small size and relatively deep habitat, this grouper is of little commercial importance.

Local Names: JAPAN: Akahana.

Literature: Heemstra and Randall (1986); Myers (1989); Randall and Heemstra (1991).

Remarks: *C. spiloparaea* is similar to *C. aurantia* and has often been misidentified as *C. aurantia* (or as *C. analis*, a junior synonym of *C. aurantia*). These two species differ in colour (*C. aurantia* is generally orange-yellow or golden, with red to orange dots on head and dorsally on body), and the pelvic fins of *C. aurantia* are longer, usually reaching the anus, their length 1.6 to 2.0 times in head length.

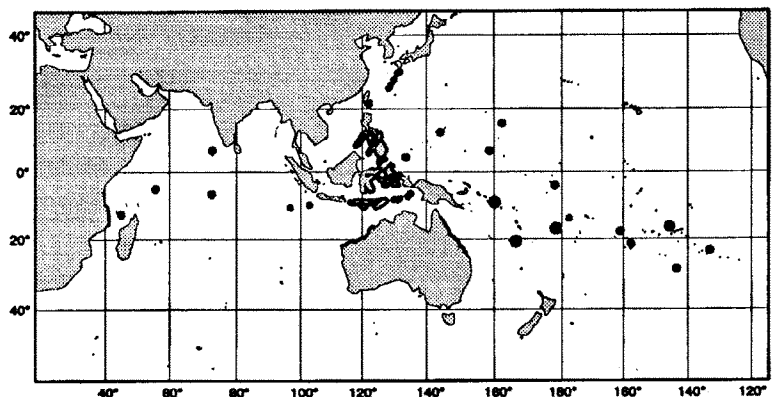


Fig. 108