Epinephelus chabaudi (Castlenau, 1861) Fig. 271; Pl. XB **SERRAN Epin 43**

Serranus Chabaudi Castlenau, 1861:3 (type locality: Algoa Bay, South Africa).

Synonyms: ***Epinephelus modestus*** Gilchrist and Thompson, 1909:218 (type. locality: Durban [a market specimen probably taken south of Durban]). ***Epinephelus clarkei*** Smith, 1958:123, pl. 1, fig. C (type locality: off mouth of Xora River, Transkei, South Africa).

FAO Names: En - Moustache grouper; **Fr -** Mérou moustache; **Sp -** Mero bigotudo.

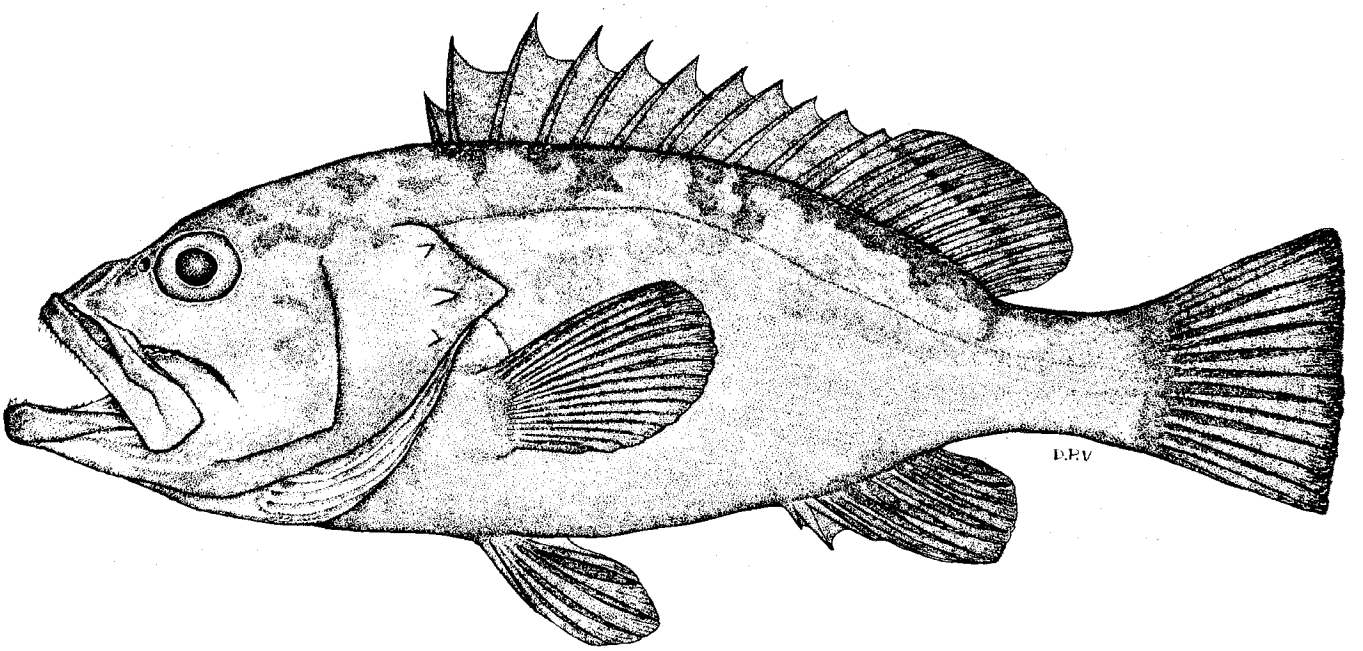

Fig. 271 *Epinephelus chabaudi*
(239 mm standard length)

Diagnostic Features: Body depth contained 2.5 to 2.8 times in standard length (for fish 20 to 56 cm standard length). Head length contained 2.3 to 2.5 times in standard length; interorbital area convex; preopercle angular, the serrae at angle enlarged and on some specimens they continue onto posterior part of lower limb; upper edge of operculum convex; diameter of posterior nostrils 2 to 4 times larger than anterior nostrils; maxilla scaly, reaching to or slightly past vertical at rear edge of eye; midlateral part of lower jaw with 2 rows of teeth in fish 20 to 56 cm standard length and 3 or 4 rows in fish 70 to 90 cm staridard length. Gill rakers 8 or 9 on upper limb, 15 to 17 on lower limb, total 22 to 25. Dorsal fin with XI spines and 13 or 14 rays, the third or fourth spine longest and usually slightly longer than longest ray, the interspinous membranes deeply incised; anal fin with III spines and 9 (rarely 8) rays; pectoral-fin rays 17 to 18; pectoral-fin length contained 1.7 to 2.0 times in standard length; pelvic fins not reaching anus, their length contained 1.9 to 2.4 times in standard length: caudal fin truncate. Lateral-body scales ctenoid; auxiliary scales sparse or absent on body scales; lateral-line scales 61 to 69; lateral-scale series 100 to 114. **Colour:** Fresh specimen, 33 cm standard length: head and body greyish brown, shading to pale purplish grey ventrally, with 3 broad dark bars between dorsal fin and lateral line, continuing faintly below lateral line; broad dark blotch dorsally on caudal peduncle, reaching about halfway to lateral line; nape and dorsal part of head faintly yellowish; prominent dark brown streak along edge of maxillary groove; fins greyish brown, the tips of spinous dorsal-fin membranes dark reddish brown; rays of median and pelvic fins paler than membranes; pectoral-fin rays brown, the membranes pale.Colour of fresh specimens, 88 to 115 cm standard length from deep water off Kenya (Morgans, 1982): rosy slate or chocolate brown; throat and hidden membranes of head pinkish grey; eye nondescript silvery; no bars, spots,blotches, marginal coloured bands, or conspicuous moustache streak.

Geographical Distribution: ***E. chabaudi*** is known from the east coast of Africa (from Kenya to Knysna, South Africa, 34º3'S) and the Kerala coast of India; however, there are no records between Kenya and Durban, and none between Kenya and India (Fig. 272). The record from Djibouti (Bouhlei, 1988, identified as ***E. modestus***) is doubtful; the lower figure is a photograph of ***E. summana,*** and the count of 15 dorsal-fin rays is not known for ***E. chabaudi.***

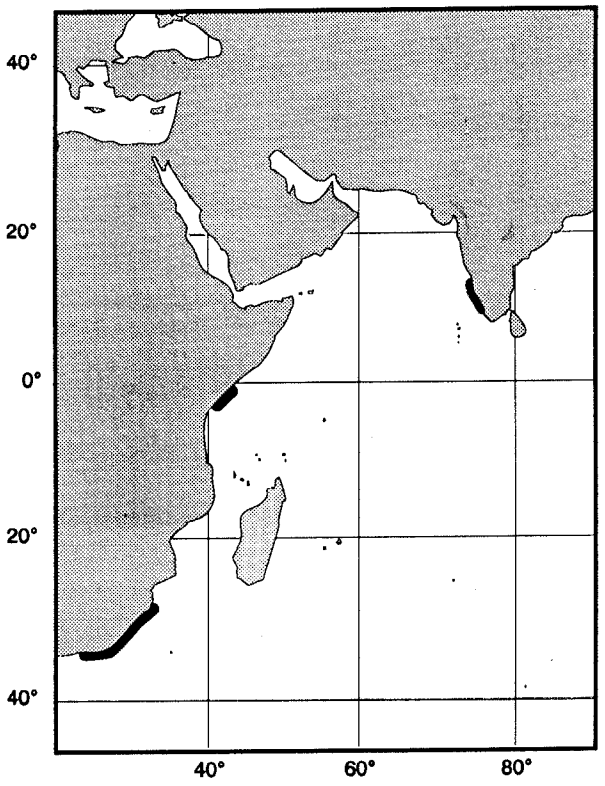

Fig. 272

Habitat and Biology: Along the coast of South Africa, ***E. chabaudi*** occurs on rocky bottom at depths of 9 to at least 55 m, but it is less common than ***E. marginatus;*** and juveniles have not been found in tidepools. Off the coast of Kenya, ***E. chabaudi*** occurs below the major thermocline at depths of 125 to 200 m (Morgans, 1982; Randall and Heemstra, 1991). It is also known only from deep water (250 to 300 m) off the Kerala coast of India (Taiwar and Kacker, 1984). The presence of this species off the coasts of Kenya and India appears to be an example of "tropical submergence" by which temperate species are able to live at tropical latitudes only in the cooler deep-water zone.

Size: Attains, at least 137 cm total length and 40.8 kg (Morgans, 1982).

interest to Fisheries: According to Taiwar and Kacker (1984), ***E. chabaudi*** (identified as ***"Epinephelus modestus"***) is "quite common in the trawl catches off the Keraia coast at a depth of about 250 to 300 m." Probably of some interest to sport and commercial hook-and-line fisheries in Soutti Africa.

Local Names:

Literature: Morgans (1982); Randall and Heemstra (1991).

Remarks: We found 9 anal-fin rays on the holotype of ***E. clarkei,*** not 8 as given by Smith (1958). We also disagree with Smith (1958:125) that "This species is closely related to ***E. morrhua*** Valenciennes, 1833 . ..``. we believe that ***E. chabaudi*** is closely related to ***E. septemfasciatus*** (see remarks of this species). Smith (1958) remarked of ***E. clarkei*** (his "new species"): "This fish is in some ways a surprising discovery, since it is apparently a not uncommon capture on lines in 5 to 30 fathoms off the coast between Bashee and Durban (30º to 33ºS) and must often have appeared among fishes sold in Durban." in fact, this species was previously described by Gilchrist and Thompson (1909, as ***Epinephelus modestus***) based on a specimen from the Durban market! Although we have not examined any specimens from India, the record of Talwar and Kacker (1984, as ***E. modestus***) from the Kerala coast does seem to be ***E. chabaudi.***

Epinephelus chlorocephalus (Valenciennes, 1830) Fig. 273 **SERRAN Epin 65**

Serranus chlorocephalus Valenciennes in Cuv. and Val., 1830:522 (type locality: Tongatapu, Tonga).

Synonyms: None.

FAO Names: En - Tonga grouper; **Fr** - Mérou tonga; **Sp -** Mero Tonga.

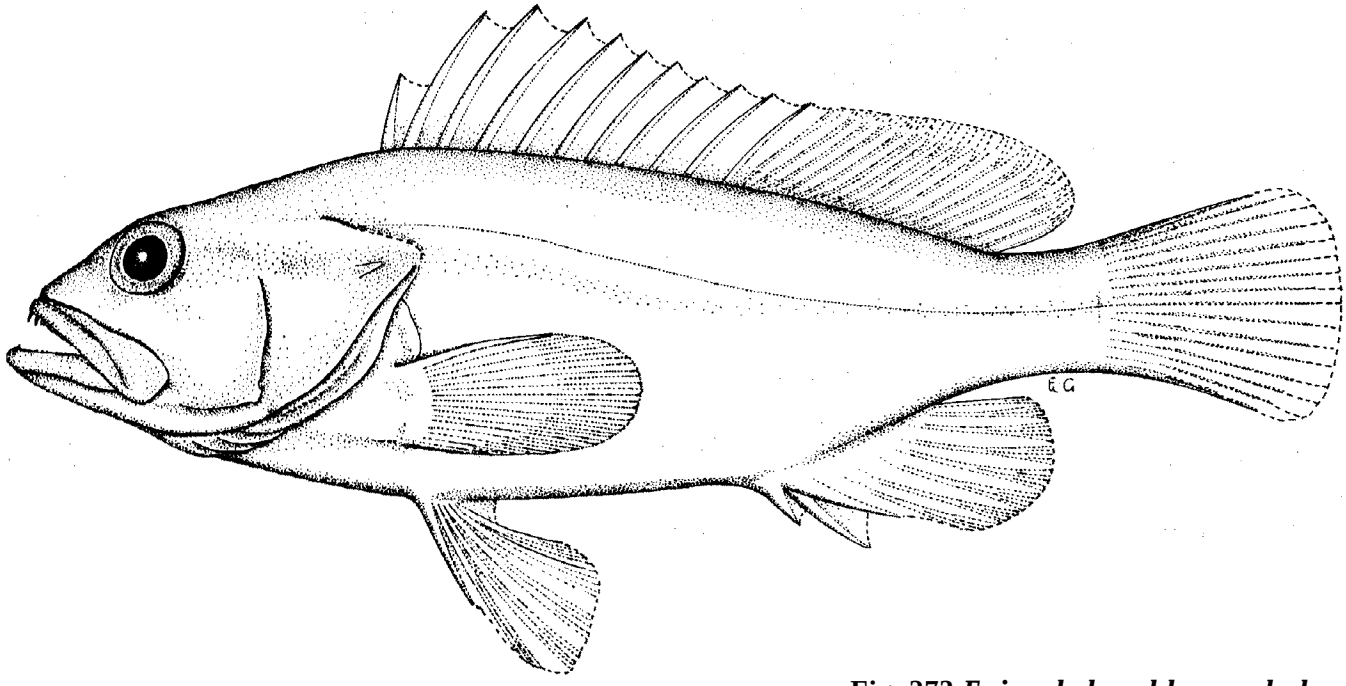

Fig. 273 *Epinephelus chlorocephalus*
(171 mm standard length)

Diagnostic Features: Body depth contained 3.4 times in standard length (1 specimen known, 171 mm standard length). Head length contained 2.6 times in standard length. Head pointed, the interorbital area flat, and the dorsal profile slightly convex; preopercle subangular, with 5 distinctly enlarged serrae at the angle; upper edge of operculum straight; maxilla not reaching past vertical at rear edge of eye; midlateral part of lower jaw with 2 rows of teeth. Gill rakers 8 on upper limb and 15 on lower limb. Dorsal fin with XI spines and 17 rays, the fourth spine longest, its length contained 2.45 times in head length; anal fin with III spines and 8 rays; pectoral fins with 18 rays; pectoral-fin length contained 1.75 times in head length; pelvic fins not reaching anus, their length contained 1.9 times in head length; caudal fin rounded. Lateral-body scales ctenoid; lateral-line scales 52 to 54. Second supraneural bone curved, shaped like the suture needle used by surgeons. **Colour:** (Colour description translated from Valenciennes, who presumably took it from notes of Quoy and Gaimard.) Dorsal part of head and snout green, the cheeks pale green; body greenish with 7 to 8 alternating stripes of greenish brown and yellow-orange; dorsal and anal fins greenish, spotted with reddish brown at base; paired fins light greenish without spots; caudal fin greenish with faint reddish bars. The colour pattern of the holotype is now completely faded.

Geographical Distribution: ***E. chlorocephalus*** is known only from the Tonga Islands (Fig. 274).

Habitat and Biology: Unknown.

Size: The only known specimen is 17 cm standard length.

Interest to Fisheries: None.

Local Names:

Literature: Randall and Heemstra (1991).

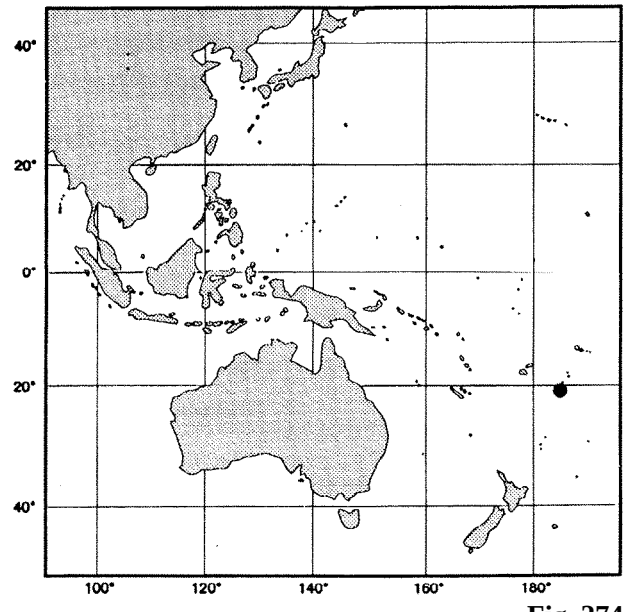

Fig. 274

Remarks: The absence of additional specimens of ***E. chlorocephalus*** is puzzling.

Epinephelus chlorostigma (Valenciennes, 1828) Fig. 275; Pl. XC **SERRAN Epin 29**

Serranus chlorostigma Valenciennes in Cuv. and Val., 1828:352 (type locality: Seychelles).

Synonyms: ***Serranus areolatus japonicus*** Temminck and Schlegel, 1842:8 (type locality: Japan). ***Serranus tauvina*** (non Forsskål): Geoffroy Saint-Hilaire, 1809:pl. 20, fig. 1 (Suez). ***Serranus reevesii*** Richardson, 1846:232 (type locality: Canton, China = Guangzhou; based on a painting by John Reeves). ***Serranus Geoffroyi*** Klunzinger, 1870:675 (footnote; based on ***S. tauvina*** [non Forsskål]: Geoffroy Saint-Hilaire). ***?Serranus celebicus*** var. ***multipunctatus*** Kossman and Räuber, 1877:6 (type locality: Red Sea). ***Serranus assabensis*** Giglioli, 1888:68 (type locality: Assab, Ethiopia).

FAO Names: En - Brownspotted grouper; **Fr** - Mérou pintade; **Sp** - Mero pintado.

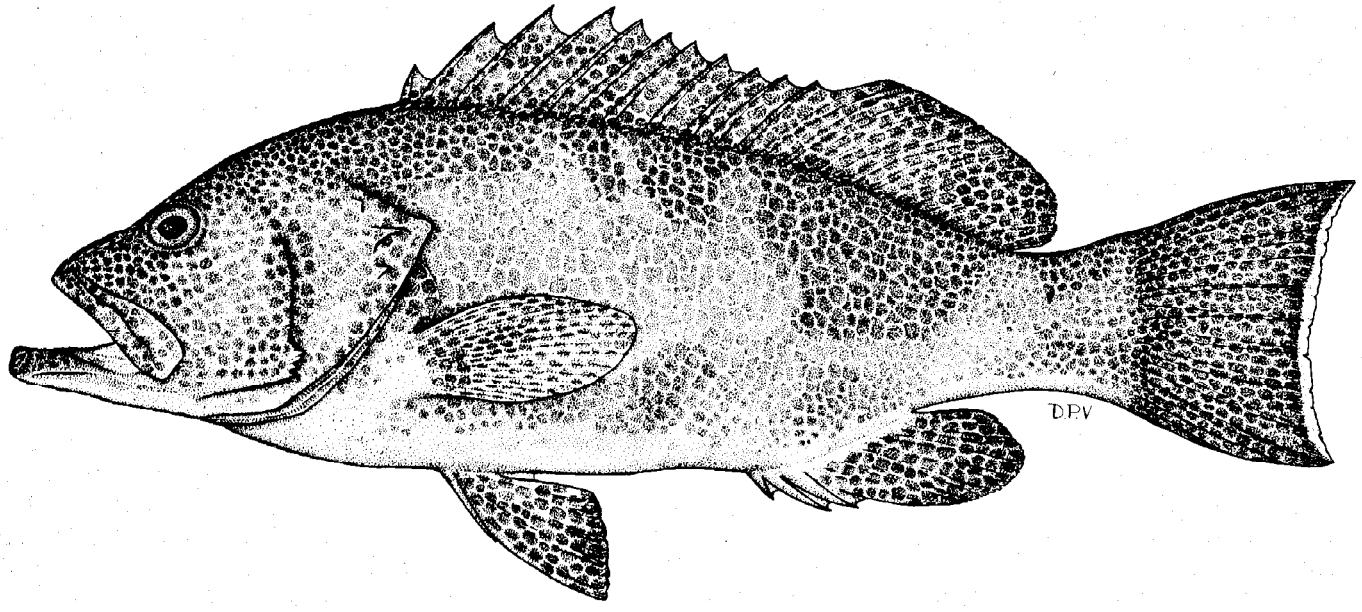

Fig. 275 ***Epinephelus chlorostigma***
(320 mm standard length)

Diagnostic Features: Body depth contained 2.8 to 3.3 times in standard length (for fish 12 to 51 cm standard length); body width contained 1.8 to 2.2 times in the depth. Head length contained 2.4 to 2.7 times in standard length; interorbital slightly convex; preopercle angular, with 4 to 7 enlarged serrae at angle; upper edge of operculum straight; posterior nostrils not noticeably larger than anterior nostrils; maxilla reaches about to vertical at rear edge of eye; maxilla scaly, with a low step on posterior part of ventral edge; midlateral part of lower jaw with 2 to 4 rows of teeth, the inner ones about twice the size of outer teeth. Gill rakers 8 to 11 on upper limb, 15 to 18 on lower limb, 23 to 29 total; gill rakers longer than gill filaments. Dorsal fin with XI spines and 16 to 18 rays, the third or fourth spine longest, its length contained 2.4 to 3.2 times in head length, the interspinous membranes slightly to moderately incised; anal fin rounded or angular, with III spines and 8 rays, the third spine longer than second; pectoral-fin rays 17 to 19; pectoral fins usually slightly longer than pelvic fins, pectoral-fin length contained 1.6 to 2.0 times in head length; pelvic-fin length contained 1.8 to 2.3 times in head length; caudal-peduncle depth contained 3.0 to 3.6 times in head length; caudal fin truncate or slightly emarginate. Lateral-body scales ctenoid, with auxiliary scales; lateral-line scales 48 to 53; lateral-scale series 96 to 122. Pyloric caeca 26 to 52. **Colour:** Head, body, and fins with small, irregular, close-set dark brown spots, the ground colour forming a pale network; caudal fin usually with a white line along rear margin; spots on pectoral fins mainly confined to rays.

Geographical Distribution: ***E. chlorostigma*** occurs from the Red Sea and east coast of Africa (south to Natal, South Africa) to the western Pacific (from southern Japan to New Caledonia); confirmed records also include the western Gulf of Aden (Djibouti and Aden), Kenya, Tanzania, Seychelles, Chagos Islands, Maldives, Lakshadweep Islands, Andaman Islands, Nicobar Islands, Viet Nam, China, Hong Kong, Korea, Papua New Guinea, New Ireland, Caroline Islands, American Samoa, and Fiji (Fig. 276). The wide distribution of ***E. chlorostigma*** has some puzzling gaps. There are no verifiable records from the Comoros, the continental shelf between Oman and Cambodia, Indonesia, Philippines, Taiwan, and Australia. Records from the Persian Gulf (Randall et al., 1978; Kuronuma and Abe, 1986) are apparently misidentifications of ***E. polylepis.***

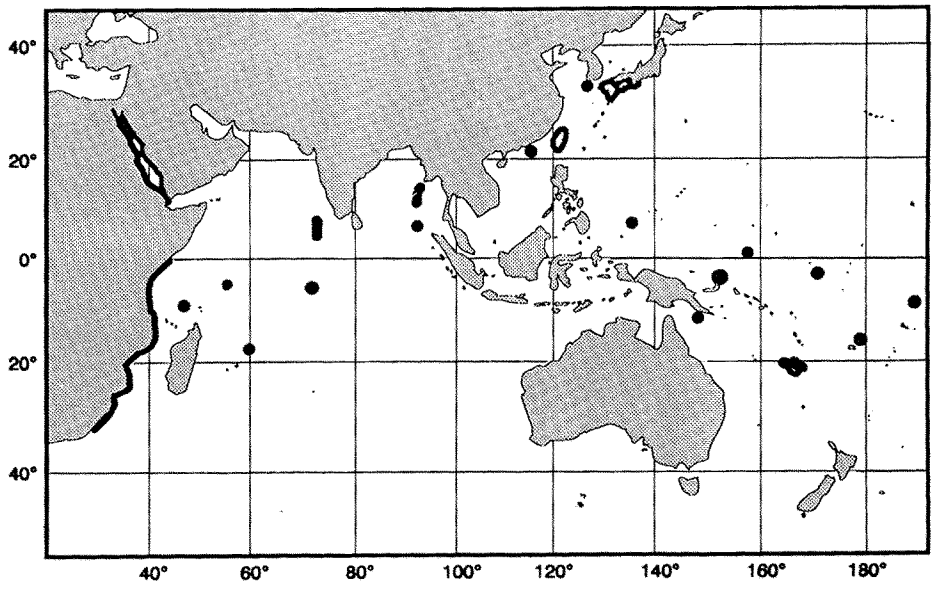

Fig. 276

Habitat and Biology: This species is found on coral reefs and also (in the South China Sea) on mud bottoms. The depth range is 4 to 280 m. According to Morgans (1982), maturity is attained at about 25 cm standard length. ***E. chlorostigma*** feeds on fishes and crustaceans (mainly stomatopods and crabs). Reproduction of ***E. chlorostigma*** at the Seychelles was studied by de Moussac (1986): females are mature at 23 to 29 cm total length, and sexual transition occurs between 35 and 45 cm, but all females do not change sex.

Size: Attains at least 75 cm total length and a weight of 7 kg.

Interest to Fisheries: An excellent food fish. Common in the markets of Singapore and Hong Kong.

Local Names: HONG KONG: Yuen-may-tsee-mah-paan; JAPAN: Hôsekihata; NEW CALEDONIA: Loche pintade; SEYCHELLES: Vieille maconde; SINGAPORE: Kerapu minyak.

Literature: Morgans (1982); Randall and Heemstra (1991).

Remarks: The ***Epinephelus chlorostigma*** species-complex comprises 3 closely-related species that are characterized by their truncate or emarginate caudal fin, colour pattern of small close-set dark brown spots covering all but ventral parts of head and body and all of the fins, preopercle subangular with serrae not much enlarged at the angle, gill arches with numerous small platelets, operculum with a straight upper edge, and 2 rows of teeth on sides of lower jaw. The other two species of this complex, ***E. gabriellae*** and ***E. polylepis,*** were described as new species by Randall and Heemstra (1991). These two species seem to replace ***E. chlorostigma*** in the northwestern Indian Ocean (including the Persian Gulf).

E. gabriellae has fewer dorsal-fin rays (14 or 15), more elongate body (depth contained 3.2 to 3.6 times in standard length), more slender caudal peduncle (peduncle depth contained 3.5 to 3.9 times in head length) and slight differences in colour pattern (margins of soft dorsal and anal fins and upper and lower margins of caudal fin with white edge; pectoral fins spotted only basally).

E. polylepis has smaller, more numerous scales (lateral-line 65 to 72, lateral-scale series 126 to 137) and a more rounded anal fin in adults (second or third spine longest, its length contained 2.1 to 2.5 times in head length).

Epinephelus cifuentesi Lavenberg and Grove, sp.nov. Fig. 277 **SERRAN Epin 61**

Epinephelus cifuentesi Lavenberg and Grove, sp. nov. (type locality: off Punta Judas, Puntarenas Province, Costa Rica).

Holotype: LACM 44418-1, 354 mm standard length; Costa Rica, off Punta Judas, Puntarenas Province; benthic trawl, depth 135 m; 28 October 1985; H. Araya-Umana, collector; M/V Gallo Pinto, Captain Antonio Lopez-Morales.

Paratypes: CAS 39423, 31.5 mm standard length; Galapagos, Santa Cruz Island, Academy Bay; 1962. CAS-SU 37462, 73 mm standard length; lsla del Coco, off lsla Nuez; trawl, depth 55 to 90 m; 13 January 1938; R/V *Velero* III, sta. 773-38. UCR 720-5, 148 mm standard length; lsla del Coco, 0.8 mi NNW Pta. Gissler, 5º33'N, 87º04'W; depth 9 m; trawl, depth 110 m; 3 April 1972; R/V *Searcher*. UCR 1978-1,237 mm standard length; Costa Rica, Puntarenas Province, Playa Hermosa, south of Jaco, 9º30'N, 84º39'W; 15 November 1987; R/V *Fridtjof Nansen,* sta. 931, 932. UCR 1666-2, 241 mm standard length; Costa Rica, Playas del Coco; hook-and-line; November, 1983; H. Araya, collector. UCR 1819-1, 285 mm standard length; Costa Rica, Puntarenas Province, off Playa Naranjo; benthic trawl, depth 120 m; 28 October 1985; H. Araya, collector; M/V *Gallo Pinto***.** UCR 2017-1, 5 (322-588 mm standard length); Costa Rica, off Quepos. AMNH 55725, 398 mm standard length; Galapagos, North Seymour Island; Tito Rodriguez P., collector; 8 October 1982. LACM 35469-25, 501 mm standard length; Costa Rica, lsla del Coco, Wafer Bay.

Synonyms: None.

FAO Names: En - Olive grouper; **Fr** - Mérou poule; **Sp -** Gallina.

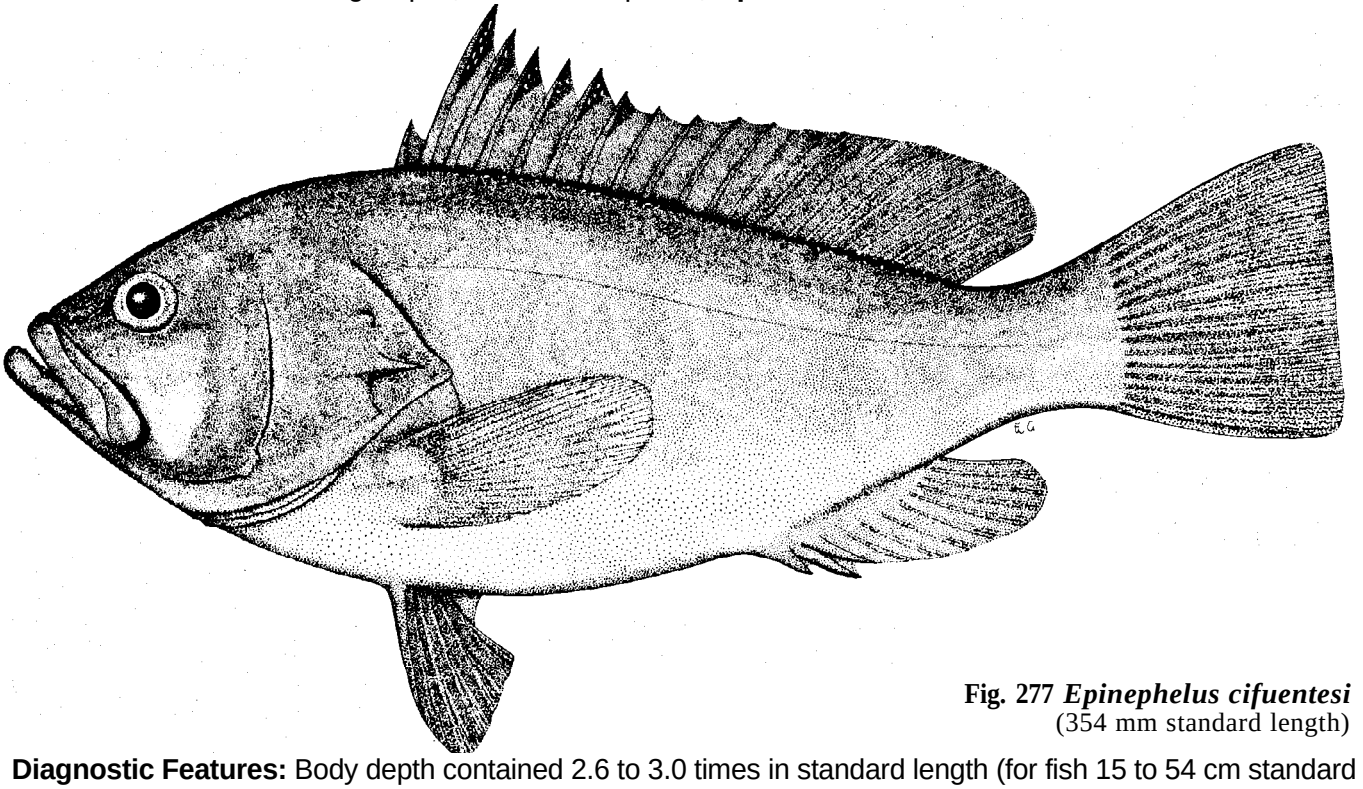

Fig. 277 ***Epinephelus cifuentesi***
(354 mm standard length)

Diagnostic Features: Body depth contained 2.6 to 3.0 times in standard length (for fish 15 to 54 cm standard length). Head length contained 2.5 to 2.8 times in standard length; interorbital area convex, the width greater than eye diameter for fish larger than 23 cm standard length; preopercle subangular, the serrae at angle slightly enlarged; upper edge of operculum slightly convex; nostrils subequal or rear nostril slightly larger; maxilla reaches past vertical through centre of eye; two rows of teeth at midside of lower jaw. Gill rakers 9 to 11 on upper limb, 17 to 20 on lower limb, total 27 to 31. Dorsal fin with XI spines and 14 to 16 rays, the second spine longest and the interspinous membranes distinctly incised; anal fin with III spines and 9 rays; pectoral-fin rays 17 to 19, the fin length contained 1.7 to 1.9 times in head length: pelvic-fin length contained 2.0 to 2.3 times in head length, pelvic-fin origin slightly in front of lower end of pectoral-fin base; caudal fin truncate with rounded corners in adults, convex in juveniles. Midlateral-body scales distinctly ctenoid, with auxiliary scales in large adults; lateral-line scales 71 to 76; lateral-scale series 131 to 144. **Colour:** When fresh, body and head pale brown, with a distinct greenish sheen on body; lips, tip of lower jaw, and dorsal part of head darker. Fins brown, generally darker than body, with a blue-green sheen, particularly evident on pectoral fins, which are cream coloured distally; pelvic fins pale brown with dusky membranes; dorsal fin dusky distally in fish 57 to 61 cm total length, the margin between first to fifth spines nearly black in fish 33 to 43 cm total length. Anal fin dusky distally with white edge (in fish 33 to 62 cm total length). Juveniles (15 cm standard length) have no distinctive markings except for a dark maxillary groove.

Geographical Distribution: Eastern Pacific: Galapagos Islands, Isla del Coco, and off Costa Rica. Probably also occurs off Mexico (see below) (Fig. 278).

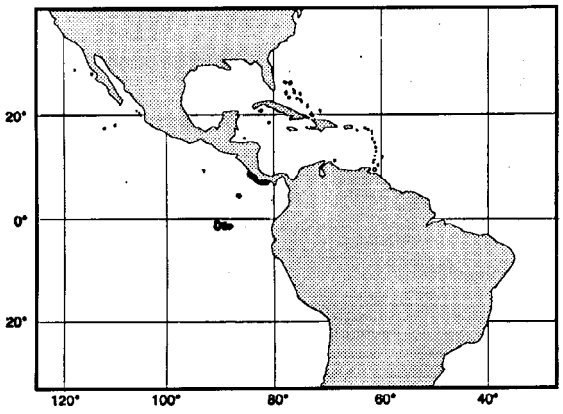

Fig. 278

Habitat and Biology: ***E. cifuentesi*** is known from depths of 40 to at least 120 m.

Size: In the Galapagos, this species grows to a length of about 100 cm total length.

Interest to Fisheries: ***E. cifuentesi*** is of great importance in the fishery at the Galapagos Islands (Reck, 1986), where they are caught mainly at the northern islands (hence the local name "norteño"). Caught with hook-and-line and in trawls.

Local Names: ECUADOR: Norteño (Galapagos); MEXICO: Gallina.

Remarks: The description of this new species is taken from the unpublished manuscript of R.J. Lavenberg and J. Grove. Unfortunately, the publication of this manuscript has been delayed, and we have included the species here because of its importance in the commercial fishery of the Galapagos. The species name is in honour of Sr. Miguel Cifuentes, former Intendente of the Galapagos National Park in appreciation of his assistance in the field work at the Galapagos Islands. Although ***E. cifuentesi*** has only now been described and given a scientific name, it has been known to fishermen at the Galapagos for many years, and it is one of the most important commercial species there.

E. cifuentesi is readily distinguished from other eastern Pacific species of ***Epinephelus.*** It is most similar to ***E. niphobles,*** from which it differs in lacking the enlarged posterior nostrils, in having more lateral-scale series (100 to 106 in ***E. niphobles***) and more gill rakers (23 to 26 in ***E. niphobles***), and in the colour pattern of juveniles. ***E. exsul,*** differs from ***E. cifuentesi*** in having a dorsal fin with X spines and 13 or 14 rays, anal-fin rays 8, a larger head (head length 2.2 to 2.3 in standard length), greater body depth (the depth 2.3 in standard length), and lower scale counts (lateral line 64 to 68, lateral-scale series 87 to 92).

On page 200 of the *Catalogo de Peces Marinos Mexicanos* published by the Mexican Instituto Nacional de Pesca in 1976 is a photograph of a 236 mm total length fish identified as "Gallina (***Epinephelus*** sp.)". This fish appears to be ***E. cifuentesi;*** the second dorsal-fin spine is the longest, and the fin counts (taken from the photograph) are XI spines and 16 rays in the dorsal fin, III spines and 9 rays in the anal fin.

Epinephelus coioides (Hamilton, 1822) Fig. 279; Pl. XD **SERRAN Epin 67**

Bola? coioides Hamilton, 1822:82 (type locality: Ganges estuaries, India).

Synonyms: ***Serranus nebulosus*** Valenciennes in Cuv. and Val., 1828:313 (type locality: unknown). ***Serranus suillus*** Valenciennes in Cuv. and Val., 1828:335 (type locality: Coromandel coast of India). ***Homalogrystes Guntheri*** Alleyne and Macleay, 1877:269, pl. 6, fig. 3 (type locality: Katow, New Guinea).

FAO Names: En - Orange-spotted grouper; **Fr** - Mérou taches oranges; **Sp** - Mero de pintas naranjas.

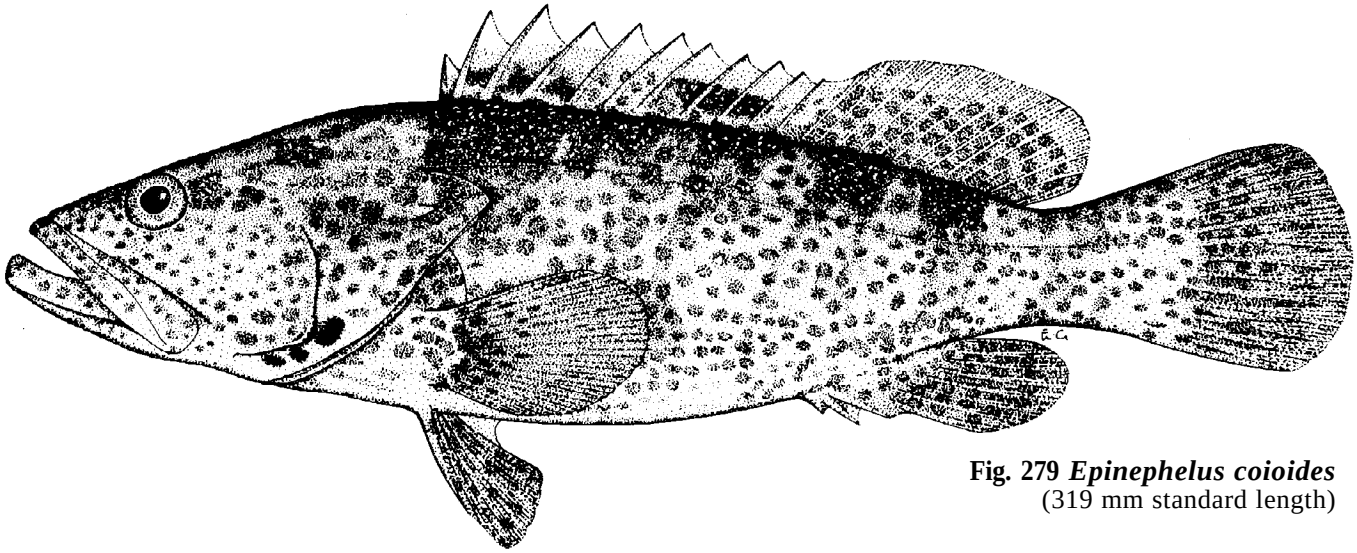

Fig. 279 *Epinephelus coioides*
(319 mm standard length)

Diagnostic Features: Body elongate, the depth contained 2.9 to 3.7 times in standard length (for fish 10 to 78 cm standard length); body width contained 1.4 to 2.0 times in the depth. Head length contained 2.3 to 2.6 times in standard length; snout length contained 1.8 to 1.9 times in upper-jaw length; interorbital flat or slightly convex, interorbital width contained 5.0 to 6.2 times in head length and 2.1 to 3.2 times in upper-jaw length; preopercle subangular, with enlarged serrae at the angle and a broad shallow notch just above the angle; upper edge of operculum straight or somewhat convex; nostrils subequal; maxilla reaches to or slightly past a vertical at rear edge of eye, maxilla width 4.2 to 5.5% of standard length; upper-jaw length 17 to 20% of standard length, midlateral part of lower jaw with 2 or 3 rows of subequal teeth. Gill rakers 8 to 10 on upper limb, 14 to 17 on lower limb, 23 to 26 total; adults with small bony platelets on lateral side of first gill arch. Dorsal fin with XI spines and 14 to 16 rays, the third or fourth spine longest, in length 2.9 to 4.0 times in head length, the interspinous membranes distinctly incised; anal fin with III spines and 8 rays, the third spine usually longer than the second; the fin margin rounded; pectoral-fin length contained 1.6 to 2.2 times in head length; pectoral-fin rays 18 to 20; pelvic-fin length contained 1.9 to 2.7 times in head length; caudal fin rounded. Lateral-body scales ctenoid, with minute auxiliary scales; lateral-line scales 58 to 65; lateral-line tubes of anterior scales branched in adults; lateral-scale series 100 to 118. Pyloric caeca numerous (about 50 to 60). **Colour:** Head and body tan dorsally, shading to whitish ventrally; numerous small brownish orange or reddish brown spots on head, body, and median fins; body with 5 faint, irregular, oblique, dark bars which bifurcate ventrally; first dark bar below anterior dorsal-fin spines, last bar on caudal peduncle; 2 dark spots on interopercle and another 1 or 2 at junction of sub- and interopercles. Orange spots turn brown on exposure to air and become fainter (more diffuse) in preservative.

Geographical Distribution: ***E. coioides*** occurs from the Red Sea south to at least Durban and east to the western Pacific, where it ranges from the Ryukyu Islands to Australia and eastwards to Palau and Fiji. Other localities include the Persian Gulf, India, Réunion, Mauritius, Ahdaman Islands, Singapore, Hong Kong, Taiwan, and the Philippines (Fig. 280).

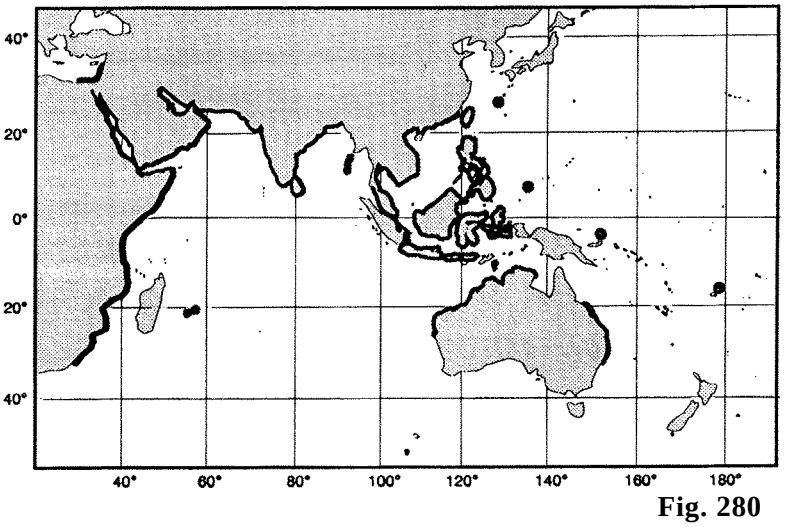

Fig. 280

Ben-Tuvia and Lourie (1969) reported a 420 mm specimen of ***"Epinephelus tauvina"*** from the Mediterranean coast of Israel. Without further discussion of this fish, Randall and Ben-Tuvia (1983) changed this identification to ***"E. malabaricus"*** (Note: the account of ***E. malabaricus*** in this paper is a composite of ***E. coioides*** and ***E. malabaricus).*** In the original description of this specimen, Ben-Tuvia and Lourie (1969:246) state "Head and body covered with bright orange spots more or less regularly dispersed ..." which would rule out ***E. malabaricus.*** In addition to the colour pattern, the meristic and morphometric data given by Ben-Tuvia and Lourie also fit ***E. coioides*** better than ***E. tauvina.*** Their specimen, now deposited at the Hebrew University in Jerusalem, was reexamined by P.C. Heemstra and identified as ***E. coioides.*** Thanks to Dr Adam Ben-Tuvia, we recently examined a 221 mm specimen of ***E. coioides*** that was collected in Haifa Bay in October 1981.

Habitat and Biology: ***E. coioides*** is known from continental shores and large islands. It is often found in estuaries, and is also taken offshore to depths of 100 m. Reported stomach contents include fishes, shrimps, crabs and 1 adult cuttlefish (Sepia sp.). Age, growth and reproduction were studied by Mathews et al. (1986) in the Persian Gulf, where ***E. coioides*** (misidentified as ***"Epinephelus tauvina",*** which does not occur there) has been used in aquaculture trials. The major spawning period is from March to June. Females are mature at 25 to 30 cm total length (2 or 3 years old), and sexual transition occurs as a length of 55 to 75 cm. Fecundity estimates were 850 186 ova for a fish of 35 cm and 2 904 912 ova for one of 62 cm. The eggs are pelagic, and the best survival of larvae was attained at a temperature of 30°C and salinity of 39‰

Size: Attains at least 95 cm total length.

Interest to Fisheries: ***E. coioides*** is of considerable economic importance. It is a common and expensive fish in the markets of the Persian Gulf, India, Singapore, Hong Kong, and Taiwan. According to Morgans (1983) ***E. coioides*** (misidentified as ***"E. tauvina")*** is the major component of the trap fishery off Kuwait. Because it is esteemed as a food fish and also readily available, it has been the subject of much recent research in aquaculture. Unfortunately, this species is misidentified as ***"Epinephelus tauvina"*** or ***"Epinephelus malabaricus***" in the aquaculture and fisheries literature. ***E. coioides*** and ***E. malabaricus*** were not distin-

guished in most aquaculture work, and both species are cultured in Singapore and Taiwan. It is often kept alive at restaurants in Hong Kong and Taiwan. Caught with hook-and-line, traps, trawls, and with lift nets.

Local Names: HONG KONG: Fah-paan, Estuary grouper; JAPAN: Chairomaruhata; KUWAIT: Hamoor; SINGAPORE: Chi hou.

Literature: Heemstra (1991); Randall and Heemstra (1991). Misidentified as ***E. tauvina:*** Chan (1968); Tan and Tan (1974); Kuronuma and Abe (1972, 1986); Randall et al. (1978); Tan et al. (1982:22, upper figure); Grant (1982). Misidentified as ***E. malabaricus:*** Morgans (1966, 1982); Kyushin et al. (1977, 1982); Sainsbury et al. (1985). Identified as ***E. suillus:*** Heemstra and Randall (1986); Masuda and Allen (1987); Katayama (1988); Allen and Swainston (1988); Doi et al. (1991).

Remarks: As implied by the numerous misidentifications mentioned above, ***E. coioides*** is often mistaken for ***E. malabaricus*** and ***E. tauvina.*** The colour patterns of all 3 species are similar, but the dark spots of ***E. malabaricus*** are smaller, blackish brown (not reddish brown or brownish orange, as on ***E. coioides*****),** and remain distinct in preservative; ***E. malabaricus*** also has irregular white spots on the head and body (no white spots on ***E. coioides***). ***E. tauvina*** often has a black blotch (larger than eye) on body at base of last 4 dorsal-fin spines and extending onto lower part of fin, and juveniles have the dark spots on the median fins so close set that the intervening pale spaces appear as a pale reticulum; ***E. tauvina*** also has a longer jaw (upper jaw length 21 to 24% of standard length, versus 17 to 20% in ***E. coioides*****),** usually more gill rakers (17 to 20 on lower limb, versus 14 to 17 in ***E. coioides*****),** and no small bony platelets on lateral side of first gill arch. A table of comparison for these 3 species is given in the account of ***E. malabaricus.***

Epinephelus corallicola (Valenciennes, 1828) Fig. 281; Pl. XE,F **SERRAN Epin 68**

Serranus corallicola Valenciennes in Cuv. and Val., 1828:336 (type locality: Java).

Synonyms: ***Serranus altivelioides*** Bleeker, 1849:38 (type locality: Jakarta).

FAO Names: En - Coral grouper; **Fr** - Mérou corail; **Sp** - Mero de coral.

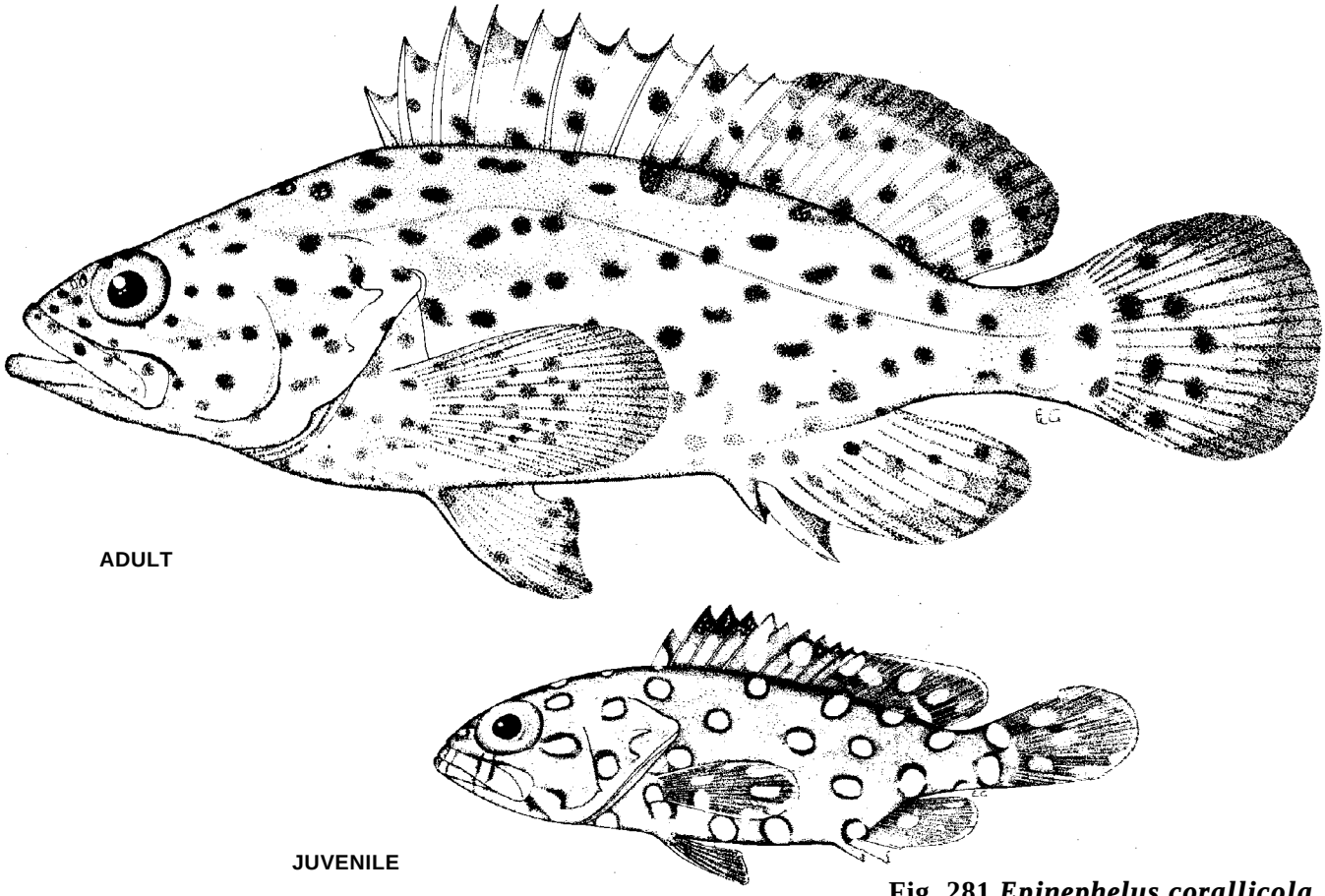

Fig. 281 *Epinephelus corallicola*
(adult 133 mm standard length, juvenile 33 mm standard length)

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