

Epinephelus drummondhayi Goode and Bean, 1879

Fig. 293; Pl. XIIB,C

SERRAN Epin 14

Epinephelus Drummond-Hayi Goode and Bean, 1879:173 (type locality: southern Florida and Pensacola, Florida).

Synonyms: None.

FAO Names: En - Speckled hind; Fr - Mérou grivelé; Sp - Mero pintaroja.

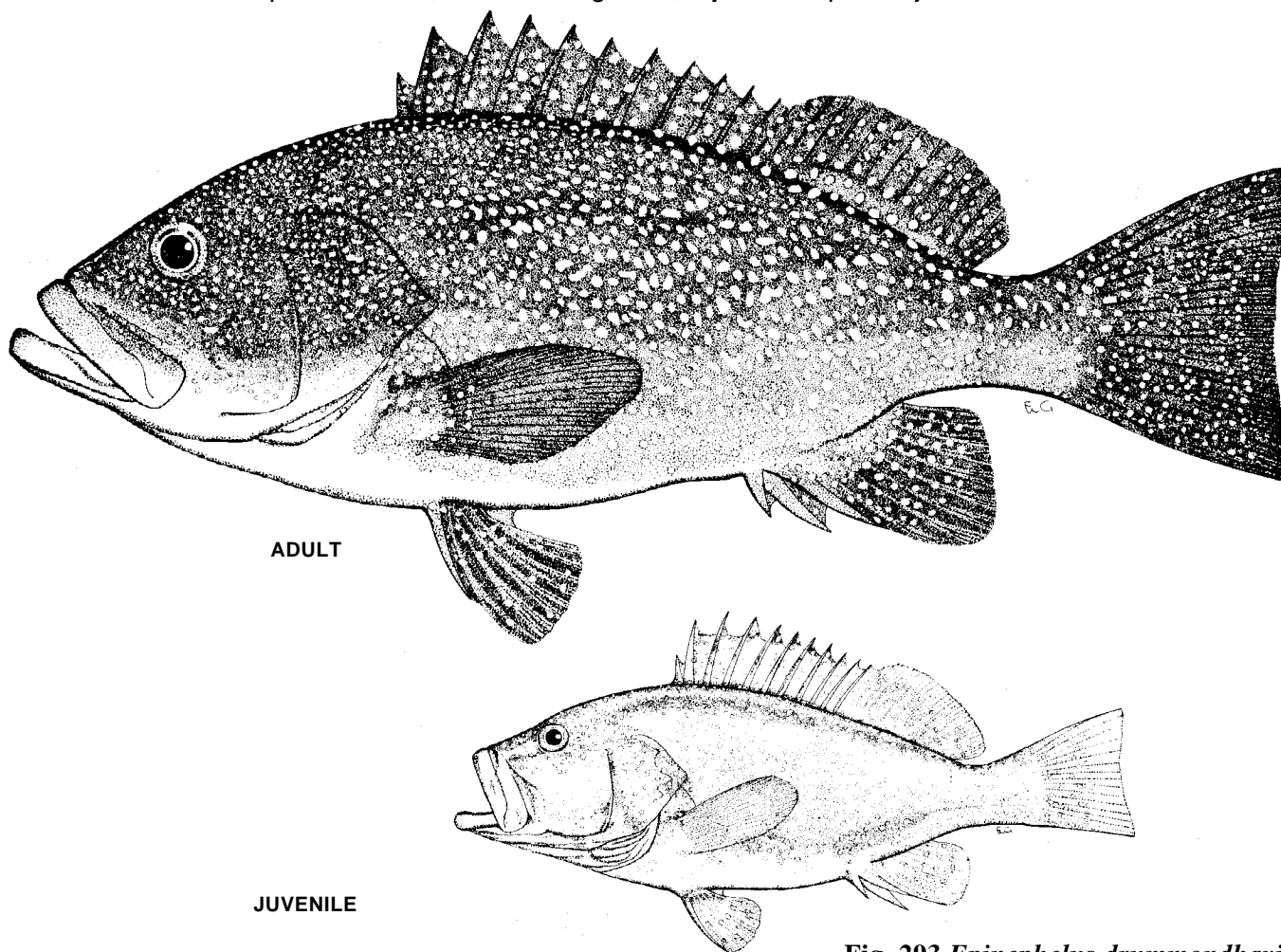


Fig. 293 *Epinephelus drummondhayi*

(adult 400 mm standard length, juvenile about 150 mm total length)

Diagnostic Features: Body depth subequal to head length, depth contained 2.4 to 2.6 times in standard length (for fish 20 to 43 cm standard length). Interorbital area distinctly convex; preopercle evenly serrate, without salient angle; interopercle and subopercle finely serrate, but the serrae covered by skin; nostrils subequal. Gill rakers 9 or 10 on upper limb and 17 or 18 on lower limb, total 26 to 28. Dorsal fin with XI spines and 15 or 16 rays, the membrane incised between the anterior spines; anal fin with III spines and 9 rays; pectoral-fin rays 18; caudal fin truncate or slightly emarginate, the corners acute. Scales strongly ctenoid, with numerous auxiliary scales; lateral-line scales 72 to 76, about 125 lateral-scale series. **Colour:** Adults (greater than 30 cm standard length) dark reddish brown, densely covered with small pearly white spots; pectoral fins yellowish distally. Juveniles (15 to 27 cm standard length) are bright yellow covered with small bluish white spots.

Geographical Distribution: Bermuda and the coast of the USA from North Carolina to the Florida Keys and in the northern and eastern Gulf of Mexico (Fig. 294). Reports of speckled hind from Cuba and the Bahamas are unsubstantiated.

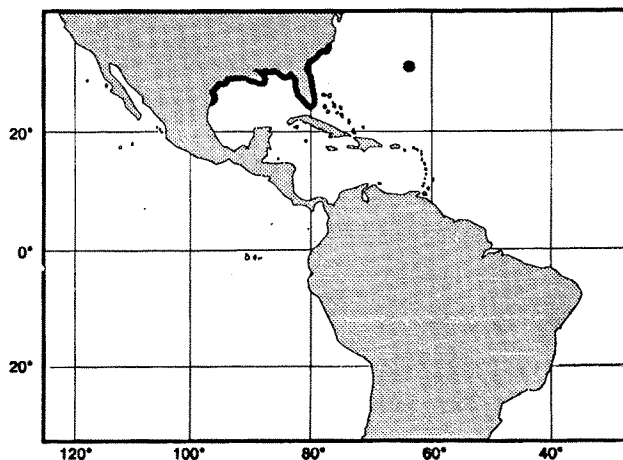


Fig. 294

Habitat and Biology: Adults inhabit offshore rocky bottoms in depths of 25 to 183 m but are most common between 60 and 120 m. Females are mature at 4 or 5 years of age and a total length of 45 to 60 cm. Spawning occurs from July to September, and a large female may produce up to 2 000 000 eggs at one spawning.

Data on age and growth were reported by Matheson and Huntsman (1984): Back calculated total lengths for fish aged 1 to 15 years are respectively 186, 317, 408, 475, 528, 572, 613, 645, 678, 709, 739, 774, 804, 839, and 861 mm: the maximum age attained is at least 25 years, and the largest specimen measured was 110 cm. The weight/length relationship is $W = 1.1 \times 10^{-8} L^{3.073}$ for W in kilogrammes and L (total length) in millimetres. The von Bertalanffy growth equation is $L_t = 967(1 - e^{-0.13(t+1.01)})$. Adults feed on a variety of fishes and invertebrates, including shrimps, crabs, scyllarid lobsters, squid, and octopus.

Size: Maximum total length about 110 cm; maximum weight 30 kg. The IGFA all-tackle record (as of 1990) is 19.23 kg.

Interest to Fisheries: *Epinephelus drummondhayi* is an important species in the recreational and commercial fisheries of the southeastern USA, Mainly caught with hook-and-line, but some might also be taken in traps, trawls, and on bottom-set longlines.

Local Names: USA: Kitty Mitchell, Calico grouper.

Literature: Matheson and Huntsman (1984); Ross (1988); Smith (1971); Bullock and Smith (1991).

Epinephelus epistictus (Temminck and Schlegel, 1842)

Fig. 295; Pl. XIID,E

SERRAN Epin 31

Serranus epistictus Temminck and Schlegel, 1842:8 (type locality: Japan).

Synonyms: *Serranus praeopercularis* Boulenger, 1887:654 (type locality: Muscat, Oman). *Epinephelus stigmogrammacus* Cheng and Yang, 1983:506, figs 1 to 3 (type locality: South China Sea). *Epinephelus* sp. Heemstra and Randall, 1986. Sometimes misidentified as *E. magniscuttis* or *E. heniochus*.

FAO Names: En - Dotted grouper (formerly: Broken-line grouper); Fr - M erou p ale; Sp - Mero p alido

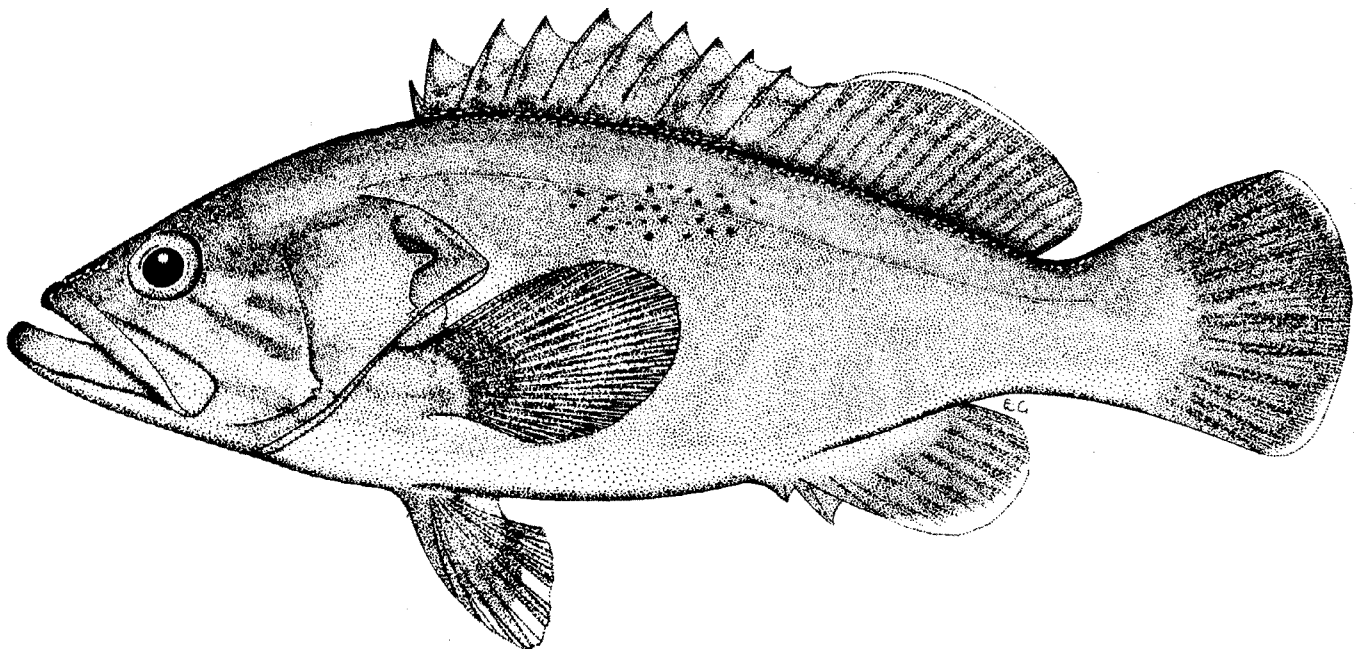


Fig. 295 *Epinephelus epistictus*
(440 mm standard length)

Diagnostic Features: Body depth contained 3.0 to 3.3 times in standard length (for fish 12 to 50 cm standard length). Head length contained 2.2 to 2.5 times in standard length; interorbital area and dorsal head profile slightly convex; preopercle angle produced, with 3 to 5 distinctly enlarged serrae; upper edge

of operculum straight or slightly convex; anterior and posterior nostrils of adults subequal or rear nostrils about twice as large as anterior nostrils; maxilla reaches to, almost to, or slightly past vertical at rear edge of eye; adults with a step or abrupt bend on ventral edge of maxilla; midlateral part of lower jaw with 2 rows of teeth, the inner ones slightly larger. Gill rakers 7 to 10 on upper limb, 15 to 19 on lower limb; length of longest gill raker subequal to longest gill filaments. Dorsal fin with XI spines and 14 or 15 rays, the third or fourth spine longest, usually shorter than longest ray, the interspinous membranes deeply incised; anal fin with III spines and 8 rays; pectoral-fin rays 17 to 19; pectoral-fin length contained 1.6 to 2.1 times in head length; pelvic fins end well short of anus, their length contained 2.0 to 2.6 times in head length: caudal fin slightly to moderately rounded. Lateral-body scales ctenoid, with a few auxiliary scales in adults; lateral-line scales 57 to 70; lateral-scale series 105 to 127. Pyloric caeca 7 to 10. **Colour:** Head and body pale brownish or greenish grey, with conspicuous, small, brownish black spots on dorsolateral part of body, rear part of head, and on median fins; some specimens with faint dark band from eye to end of operculum, another from eye to notch of preopercle, and third a continuation of maxillary streak; pectoral-fin rays brownish, the membranes clear. Juveniles with dark spots on head and body arranged in 3 longitudinal rows. Indian Ocean specimens are usually coloured as follows: Head, body, and fins brown or olive; faint brownish black dots usually visible on dorsolateral part of body and sometimes on postorbital part of head; dark brown maxillary streak present; some specimens with a row of faint dark spots along middle of soft dorsal fin, and a faint pale submarginal band or row of faint pale spots immediately distal to these dark spots; adults from South Africa dark brown, with pale or white edge on soft dorsal, anal, and "corners" of caudal fin. Juveniles with faint dark brown stripe from eye to end of operculum, another darker stripe from lower edge of eye to subopercle and a third continuing from maxillary streak to interopercle; pectoral-fin rays brown or greyish yellow, the membranes clear.

Geographical Distribution: *E. epistictus* is known from continental localities in the tropical Indo-West Pacific region. We examined specimens from the Gulf of Suez, Red Sea, Ethiopia, Zanzibar, Mozambique, South Africa (Natal), Oman, west coast of India, Japan, Taiwan, Hong Kong China (Fujian Province), Viet Nam, Indonesia, Papua New Guinea, and northern Australia. The species has also been reported from Kenya, Korea, and the Ogasawara Islands (Fig. 296).

Habitat and Biology: Rocky and trawlable bottoms in depths of 71 to 290 m. Nothing has been published on the biology of *E. epistictus*.

Size: Maximum size about 80 cm total length (7 kg).

Interest to Fisheries: Probably of some commercial importance, but separate catch statistics are not available for *E. epistictus*. Caught with trawls and handlines.

Local Names: SOUTH AFRICA: Brown rockcod; JAPAN: Komon-hata; HONG KONG: Black-spotted grouper, Huk-dim-paan; AUSTRALIA: Black-spotted rockcod.

Literature: Boulenger (1895:207, pl.5); Randall and Heemstra (1991).

Remarks: Specimens of *E. epistictus* from the Indian Ocean usually have fewer lateral-line scales (55 to 66) compared with fish from Japan and Taiwan (65 to 70), but one from Viet Nam and another from Indonesia have counts of 62 and 59. Specimens from the Indian Ocean also have smaller spots than those in the western Pacific and they are usually absent on the median fins.

E. heniochus is similar to *E. epistictus*, but it has fewer lateral-scale series (89 to 100) the dark spots on the body (if present) are faint and smaller than nostrils and the fins are unspotted; also the juveniles do not have 3 longitudinal rows of dark spots on head and body.

The illustration of a juvenile "*Epinephelus epistictus*" by Heemstra and Randall (1984) is of a juvenile *E. latifasciatus*.

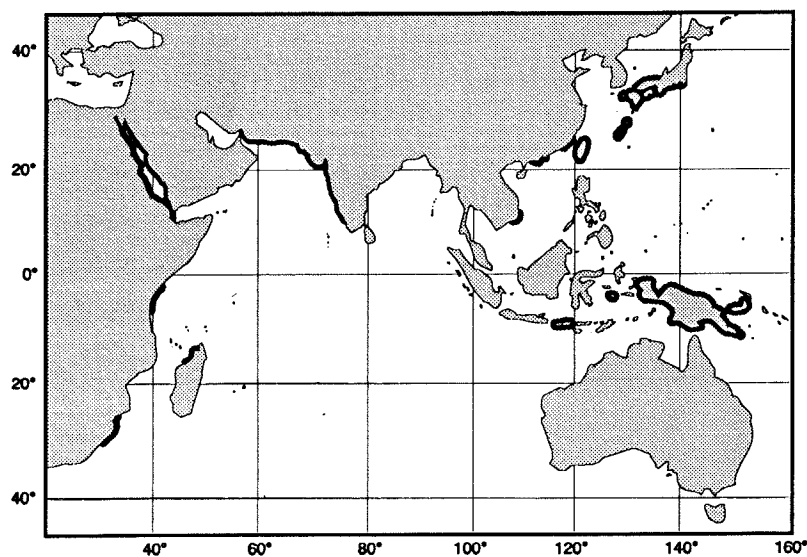


Fig. 296

Epinephelus ergastularius Whitley, 1930

Fig. 297; Pl. XIIF

SERRAN Epin 72

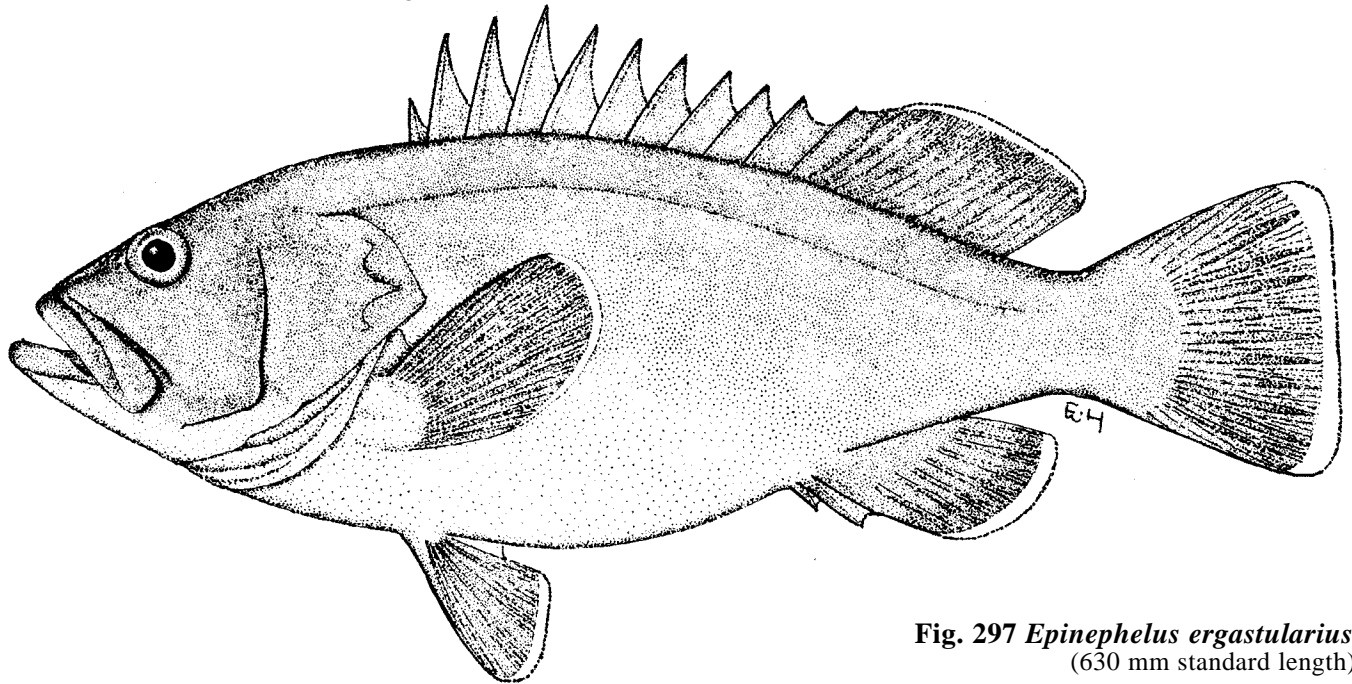
Epinephelus ergastularius Whitley, 1930:119, pl. 14, fig. 1 (type locality: off Long Bay, near Sydney, Australia).**Synonyms:** None.**FAO Names:** **En** - Sevenbar grouper; **Fr** - M erou sept raies; **Sp** - Mero de siete bandas.

Fig. 297 *Epinephelus ergastularius*
(630 mm standard length)

Diagnostic Features: body depth contained 2.6 to 2.9 times in standard length (for fish 19 to 89 cm standard length). Head length contained 2.4 to 2.6 times in standard length; interorbital area and dorsal head profile slightly convex; preopercle subangular, finely serrate, the serrae on the rounded corner not enlarged and the ventral edge with 1 to 4 small serrae; upper edge of operculum almost straight; posterior nostrils 2 to 4 times larger than anterior nostrils; maxilla reaches to or almost to vertical at rear edge of eye; midlateral part of lower jaw with 2 rows of teeth. Gill rakers 7 to 9 on upper limb, 14 or 15 on lower limb; sides of gill arch with small bony tooth plates. Dorsal fin with XI spines and 14 or 15 rays, the third spine usually longest, its length contained 2.6 to 3.2 times in head length and subequal to length of longest ray, the interspinous membranes deeply incised; anal fin with III spines and 9 or 10 rays; pectoral-fin rays 18 or 19; pectoral-fin length contained 1.7 to 2.4 times in head length; pelvic fins distinctly shorter than pectoral fins; caudal fin slightly rounded in juveniles, truncate to slightly emarginate in adults. Lateral-body scales ctenoid; no auxiliary scales; lateral-line scales 63 to 70; lateral-scale series 103 to 116. **Colour:** Body of juveniles brown, with 7 broad dark bars, the last covering most of caudal peduncle, its upper half black; prominent black maxillary streak; median and pelvic fins dark brown; pectoral fins brown. Adults pinkish grey, with no trace of dark bars; fins darker than body and with white margins (except along spinous part of dorsal fin).

Geographical Distribution: *E. ergastularius* is known only from the east coast of Australia between 18° and 36°S (Fig. 298).

Habitat and Biology: Adults are caught in depths of 108 to 370 m; juveniles are found in 15 to 128 m.

Size: Attains at least 157 cm total length and a weight of 66 kg.

Interest to Fisheries: Commonly caught with hook-and-line off the coast of New South Wales.

Local Names: AUSTRALIA: Banded rockcod.

Literature: Randall et al. (1993); Randall and Heemstra (1991).

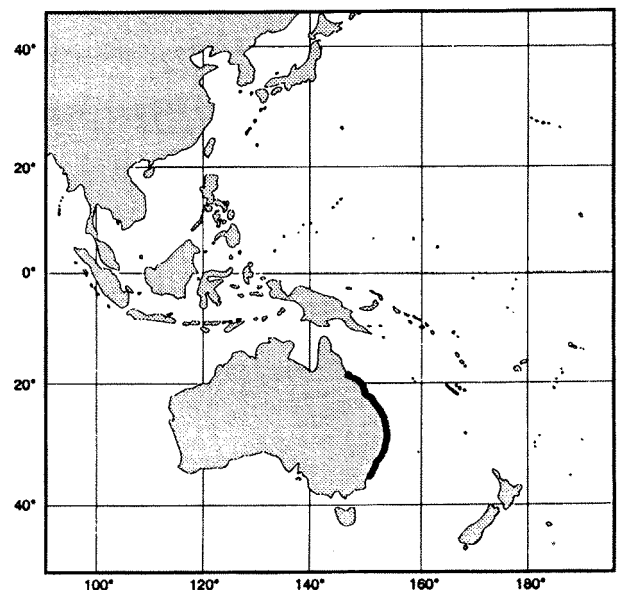


Fig. 298

Remarks: *E. ergastularius* is closely related to *E. septemfasciatus* (which is known only from Japan, Korea, and China) and *E. octofasciatus* (known from South Africa to New Zealand). These two species have a convex caudal fin in adults, and apparently lack the fine dermal ridges that are present on the body of *E. ergastularius* at the base of the dorsal fin; also, the pale margins on the fins are poorly developed or absent in these other two species. Juveniles can be distinguished by the spacing of the dark brown bars on the body: on *E. ergastularis* the pale space separating the second and third dark bars and that between the fourth and fifth bars is distinctly narrower than the interspaces between the third and fourth or fifth and sixth bars; on *E. octofasciatus* all the pale interspaces are about the same width, and on *E. septemfasciatus* the pale interspaces are about the same width, except for that between the fifth and sixth dark bars, which is distinctly narrower than the others.

Epinephelus erythrurus (Valenciennes, 1828)

Fig. 299; Pl. XIII A

SERRAN Epin 73

Serranus erythrurus Valenciennes in Cuv. and Val., 1828:320 (type locality: Malabardia).

Synonyms: *Epinephelus Townsendi* Boulenger, 1898:133 (type locality: Karachi, Pakistan) .

FAO Names: En - Cloudy grouper; Fr - M erou nebuleux; Sp - Mero nublado.

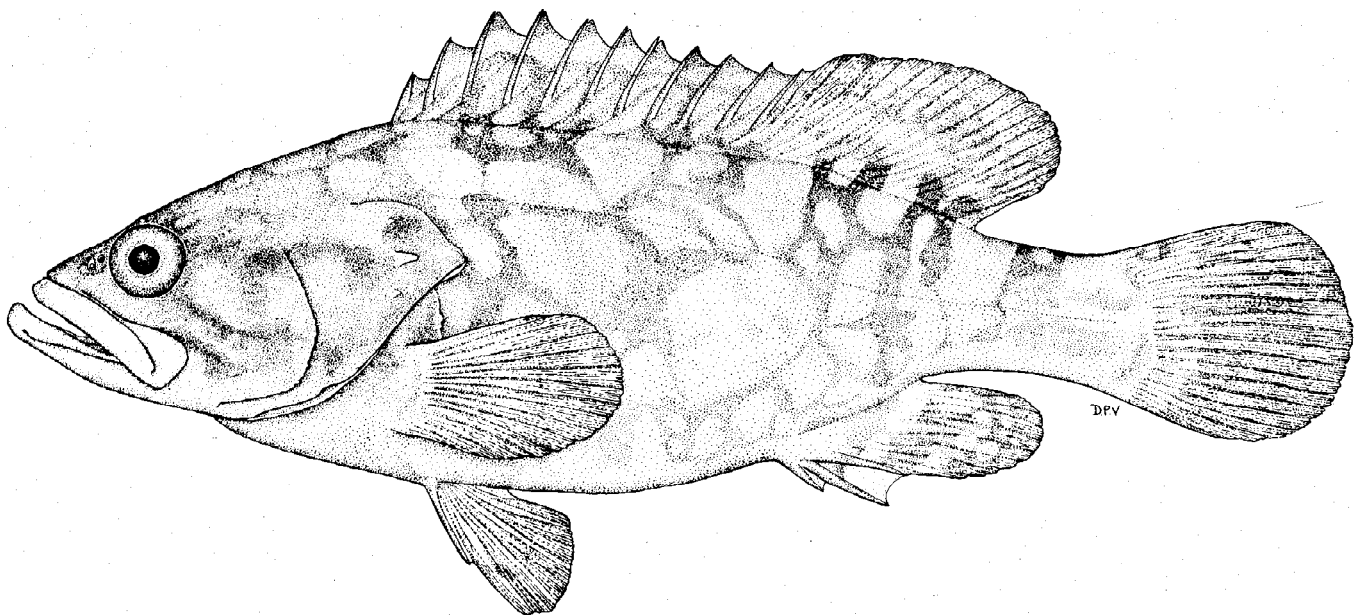


Fig. 299 *Epinephelus erythrurus*
(176 mm standard length)

Diagnostic Features: Body depth contained 2.8 to 3.2 times in standard length (for fish 11 to 28 cm standard length). Head length contained 2.4 to 2.7 times in standard length; interorbital area flat, the dorsal head profile almost straight; preopercle rounded, finely serrate, the lower serrae slightly enlarged; upper edge of operculum straight, except for bend at upper end; posterior nostrils about twice size of anterior nostrils; maxilla reaches to or beyond vertical at rear edge of eye; midlateral part of lower jaw with 2 or 3 rows of teeth; canines at front of jaws inconspicuous. Gill rakers 8 or 9 on upper limb, 14 to 17 on lower limb; gill rakers shorter than gill filaments. Dorsal fin with XI spines and 15 to 17 rays, the third to ninth spines subequal, the longest contained 3.0 to 3.75 times in head length and distinctly shorter than longest ray; interspinous membranes of dorsal fin not incised or moderately incised; anal fin with III spines and 8 rays; pectoral fins with 17 to 19 rays; pectoral-fin length contained 1.7 to 2.2 times in head length; pelvic fins not reaching anus, their length contained 2.3 to 2.5 times in head length; caudal fin well rounded. Lateral-body scales distinctly ctenoid, with auxiliary scales; lateral-line scales 53 to 62; lateral-scale series 92 to 107. Pyloric caeca about 6. **Colour:** Olive to reddish brown, usually with irregular pale spots and blotches that join randomly to form an irregular dark reticulum of the background colour; 3 dark streaks across operculum, first (broadest and darkest) from eye to lower edge of opercular flap, second from lower edge of eye to subopercle, and third (faintest) from dark maxillary streak to lower edge of preopercle; median and pelvic fins mottled; pectoral fins uniform. Some specimens, especially the larger ones, nearly uniform brown or with the pale blotches on body only faintly visible.

Geographical Distribution: *E. erythrurus* is known from Pakistan, India, Laccadive (Lakshadweep) Islands, Sri Lanka, Gulf of Thailand, Indonesia, Singapore, and Borneo (Fig. 300).

Habitat and Biology: Harbours and estuaries with muddy or silty-sand bottoms. Nothing has been published on the biology of *E. erythrurus*. We examined a fish of 163 mm standard length with ripe ova.

Size: Maximum size about 43 cm total length.

Interest to Fisheries: This species is of minor commercial importance. Caught with trawls, hook-and-line, and traps.

Local Names:

Literature: Randall and Heemstra (1991).

Remarks: The painting identified as *Epinephelus nebulosus* in Bleeker's (1875-77) *Atlas* (Vol. 8, pl. 339, fig. 3) is undoubtedly *E. erythrurus*, but the holotype of *Serranus nebulosus* Valenciennes, 1828 appears to be a specimen of *E. coioides*.

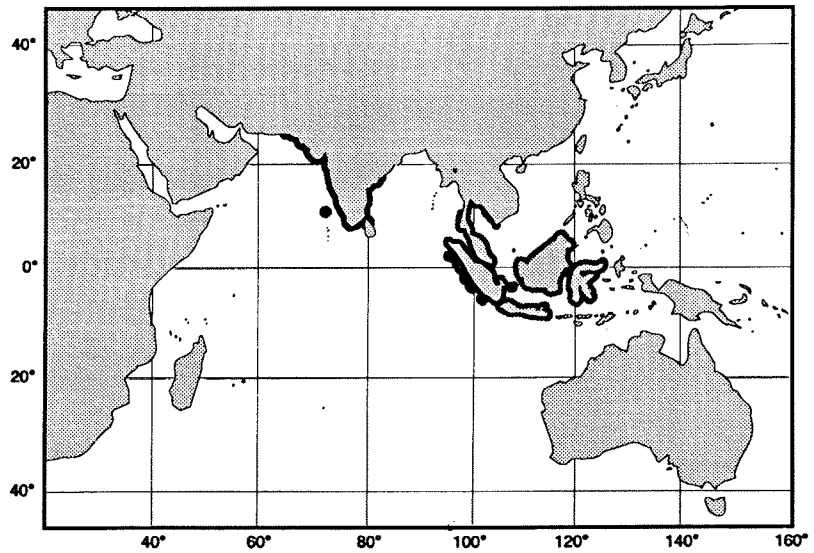


Fig. 300

Epinephelus exsul (Fowler, 1944)

Fig. 301

SERRAN Epin 62

Serrihastaperca exsul Fowler, 1944:385, figs 182 and 183 (type locality: eastern Pacific about 20 miles south of Mazatlan, Mexico).

Synonyms: None.

FAO Names: En - Tenspine grouper; Fr - Mérou dix épines; Sp - Mero diez espinas.

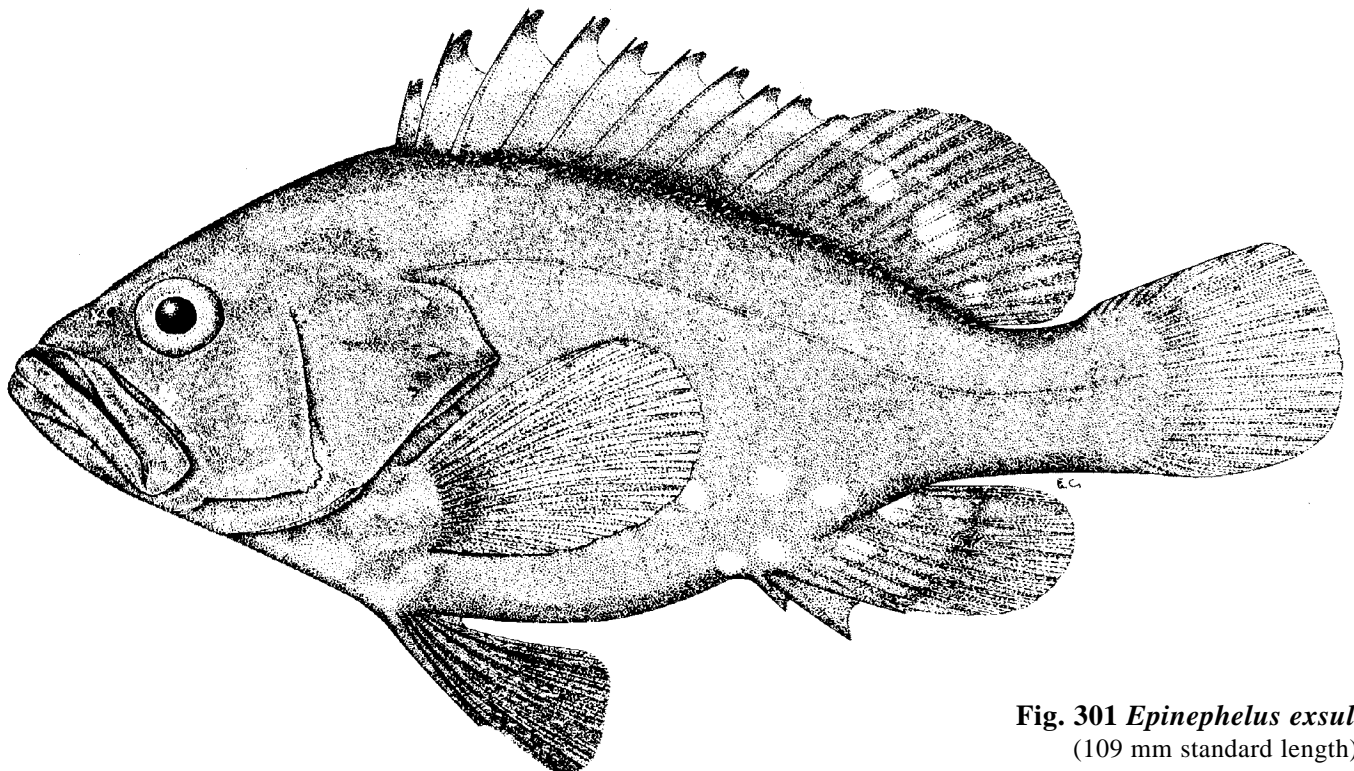


Fig. 301 *Epinephelus exsul*
(109 mm standard length)

Diagnostic Features: Body depth contained 2.3 times in standard length (2 fish of 104 and 109 mm standard length). Head length contained 2.2 to 2.3 in standard length; interorbital area convex; preopercle angular, with the serrae at the angle enlarged and with or without a few small serrae on lower edge; interopercle and subopercle smooth; rear nostrils larger than front ones and shaped like an inverted tear drop; maxilla reaches vertical at rear edge of eye. Gill rakers 8 to 10 on upper limb and 14 to 17 on lower limb, total 24 to 27. Dorsal fin with X spines and 13 or 14 rays, the interspinous membranes distinctly indented; anal fin with III spines and 8 rays; pectoral-fin rays 18 to 20; pelvic fins subequal to pectoral fins, pelvic-fin length contained 1.6 to 1.8 times in head length, the pelvic-fin origin anterior to pectoral-fin base; caudal fin rounded. Midlateral-body scales weakly ctenoid; lateral-line scales 64 to 68; lateral-scale series 87 to 92. **Colour:** In alcohol, juveniles with head and body brown, dorsal and anal fins darker; faint pale spots randomly scattered over body and dorsal and anal fins; pectoral fins and distal two-thirds of caudal fin paler than body; pelvic fins dark brown; black moustache streak present.

Geographical Distribution: Eastern Pacific from the Gulf of California to Panama (Fig. 302).

Habitat and Biology: The only information we have is that one of the juveniles we examined (SIO 65-164-35A from off Oaxaca, Mexico) came from a depth of 55 m.

Size: Known only from juveniles.

Interest to Fisheries: This species is apparently too rare to be of commercial interest.

Local Names:

Literature: C.L. Smith (1971, specimens from the eastern Pacific listed under "*Epinephelus nigrinus*", but data from these specimens were not incorporated in Smith's diagnosis or tables).

Remarks: Heemstra (1974) decided that the post-larva described as *Serrihastaperca exsul* by Fowler (1944) from the Pacific coast of Mexico was "probably a species of *Epinephelus*," but commented that "The troublesome part of this hypothesis is that *S. exsul* does not fit very well with any of the known eastern Pacific species of *Epinephelus*." This holotype has a dorsal fin with X spines and 13 rays, anal fin with III spines and 8 rays, and pectoral fins with 19 rays. The fin counts of the 5 juveniles that we recently received on loan from the Scripps Institution of Oceanography agree with those of the holotype, except for having one more dorsal-fin ray. A range of 13 or 14 dorsal-fin rays is certainly within the bounds of intraspecific variation for grouper species; and in view of the agreement in other features, we regard these specimens (the 5 juveniles and the post-larval holotype) as conspecific.

E. exsul differs from all other eastern Pacific species of *Epinephelus* (except *E. analogus*) in having X dorsal-fin spines. It differs from *E. analogus* in having fewer dorsal-fin rays (16 to 18 in *E. analogus*), greater body depth (depth contained 2.6 to 3.0 times in standard length for *E. analogus*), and very different colour pattern. *E. nigrinus* of the western Atlantic differs in having 9 anal-fin rays, lateral-scale series 99 to 111, body depth contained 2.4 to 2.7 times in standard length, and pelvic fins longer than the pectoral fins.

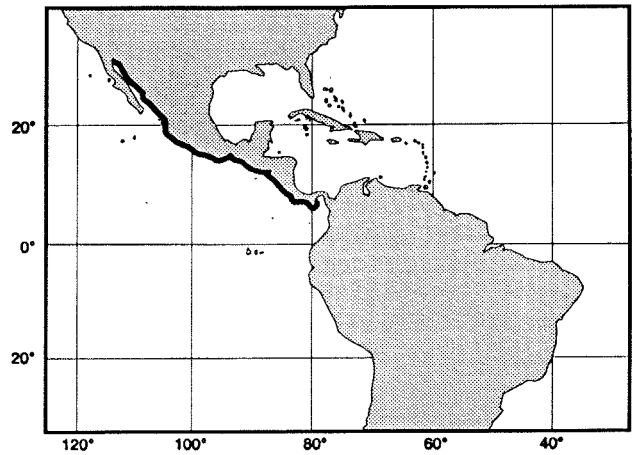


Fig. 302

Epinephelus fasciatomiculatus (Peters, 1866)

Fig. 303; Pl. XIII B

SERRAN Epin 75

Serranus fasciatomiculatus Peters, 1866: 111 (type locality: Nagasaki, Japan).

Synonyms: Often misspelt as *Epinephelus fasciatomiculatus*.