

Epinephelus mystacinus (Poey, 1852)

Fig. 367; Pl. XIXE

SERRAN Epin 19

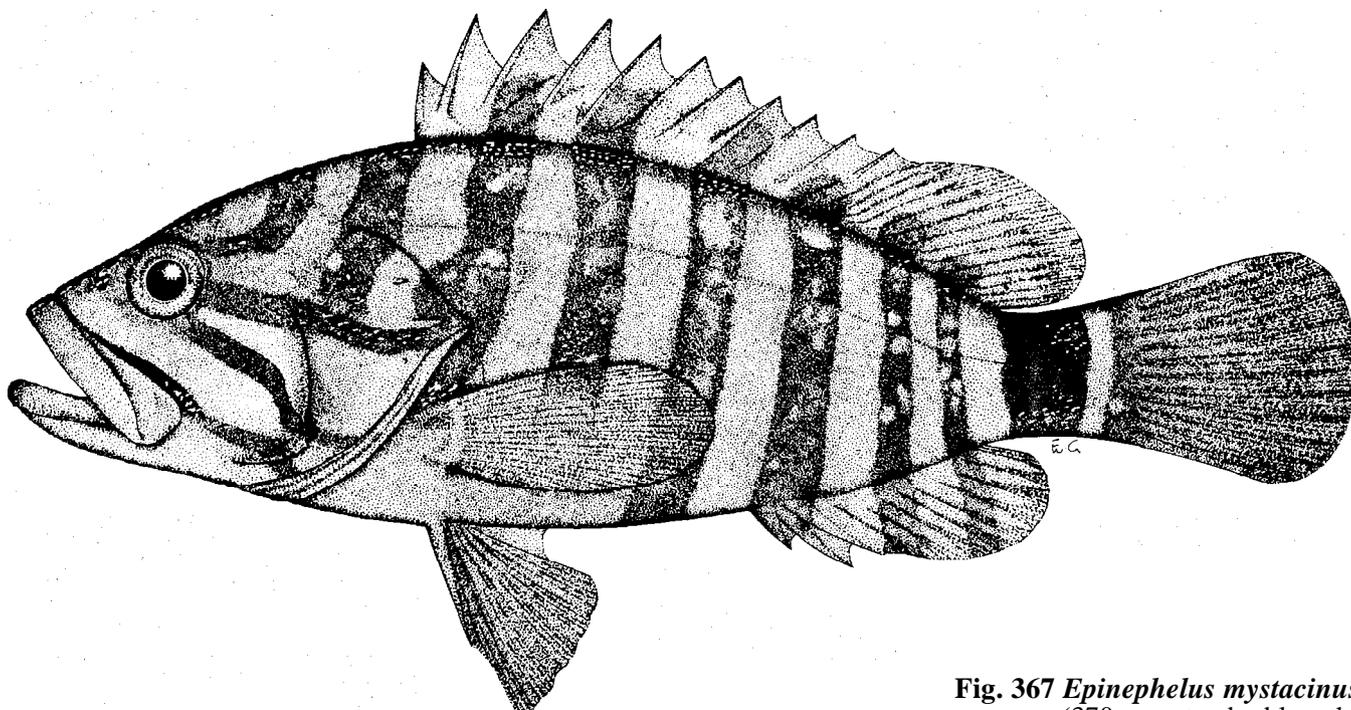
Serranus mystacinus Poey, 1852:52, pl. 10, fig. 1 (type locality: Cuba).**Synonyms:** None.**FAO Names:** En - Misty grouper; Fr - M erou brouillard; Sp - Mero listado.

Fig. 367 *Epinephelus mystacinus*
(370 mm standard length)

Diagnostic Features: Body depth 2.4 to 2.9 times in standard length (for fish 14 to 40 cm standard length). Head length contained 2.3 to 2.5 times in standard length; interorbital area convex: eye diameter greater than interorbital width for fish less than 30 cm standard length, but less than interorbital in fish greater than 40 cm standard length; preopercle corner rounded, with enlarged serrae, the lower edge with 1 or 2 small serrae (usually hidden by skin) just in front of corner; interopercle and subopercle serrate; posterior nostrils greatly enlarged, their diameter 4 or more times that of anterior nostrils. Gill rakers 8 to 10 on upper limb and 14 to 16 on lower limb, total 22 to 26. Dorsal fin with XI spines and 14 or 15 rays, the third spine longest and the membranes distinctly incised between the spines; anal fin with III spines and 9 (rarely 8) rays; pectoral-fin rays 18 or 19; pelvic fins shorter than pectoral fins and inserted slightly in front of lower end of pectoral-fin base; pelvic fins not reaching anus (except on fish less than 16 cm standard length); caudal fin rounded. Body scales distinctly ctenoid, without auxiliary scales; lateral-line scales 58 to 69; lateral-scale series 99 to 112. Pyloric caeca very numerous. **Colour:** Head and body buff, with 8 or 9 dark, subvertical bars on body, the first on nape, the last two (which are darker than other bars) may be fused to form a wide dark band around caudal peduncle; width of dark body bars equal to or less than width of pale interspaces; dark bars faint on large adults. Pelvic fins blackish brown. Prominent blackish brown maxillary streak on cheek along upper edge of maxilla.

Geographical Distribution: Western Atlantic: Bermuda, North Carolina, Florida, Gulf of Mexico, Bahamas, Cuba, Yucatan, Jamaica, Puerto Rico, the Virgin Islands, and the Leeward Islands to Trinidad. Eastern Pacific: Galapagos (Fig. 368).

Habitat and Biology: A deep-water species reported from depths of 100 to 400 m; juveniles occasionally found in water as shallow as 30 m. Like most groupers, it is a generalized carnivore, feeding on fishes, crustaceans, and squids. Virtually nothing is known of the age, growth, or reproduction of this species; females attain at least 100 cm.

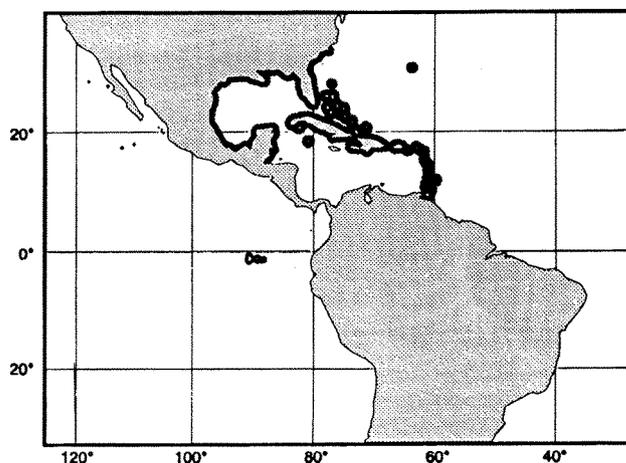


Fig. 368

Size: Attains at least 115 cm total length and over 54 kg.

Interest to Fisheries: *E. mystacinus* is the dominant grouper in the deep-water sport and commercial fisheries of the Virgin Islands. In 1958 this species was reported to be of some commercial importance in Bermuda.

Local Names: USA: Moustache grouper, Convict grouper; VENEZUELA: Cherna del alto.

Literature: Rivas (1964); Robins (1967); Smith (1971); Brownell and Rainey (1971); Acero and Garzon (1983); Thompson and Munro (1983); Johnson and Keener (1984); Bullock and Smith (1991).

Remarks: Johnson and Keener (1984) questioned the locality of Seale's (1940) record of a 40 mm *E. mystacinus* from the Galapagos, because there were no other records of the species from the Pacific. But we have examined a 108 mm juvenile (LACM 44012-2) collected in June 1984 at Isabela Island in the Galapagos by Jack Grove.

Katayama (1975, 1988) reported "*Epinephelus mystacinus*" from Japan, but this was based on misidentification of *E. octofasciatus*, which has more scales (lateral-scale series 114 to 126), the pelvic fins subequal to or longer than the pectoral fins, and the dark body bars wider than the pale interspaces.

E. septemfasciatus of Japan differs from *E. mystacinus* in having the dark body bars wider than the pale interspaces, and the broad dark bar covering the caudal peduncle extends over the last 2 or 3 dorsal-fin rays.

Epinephelus nigritus (Holbrook, 1855)

Fig. 369; Pl. XIXF

SERRAN Epin 20

Serranus nigritus Holbrook, 1855:17, pl. 25, fig. 2 (type locality: Charleston, S.C.).

Synonyms: *Centropristis merus* Poey, 1868:288 (type locality: Cuba).

FAO Names: En - Warsaw grouper; Fr - Mérou varsovie (formerly: Mérou polonaise); Sp - Mero negro.

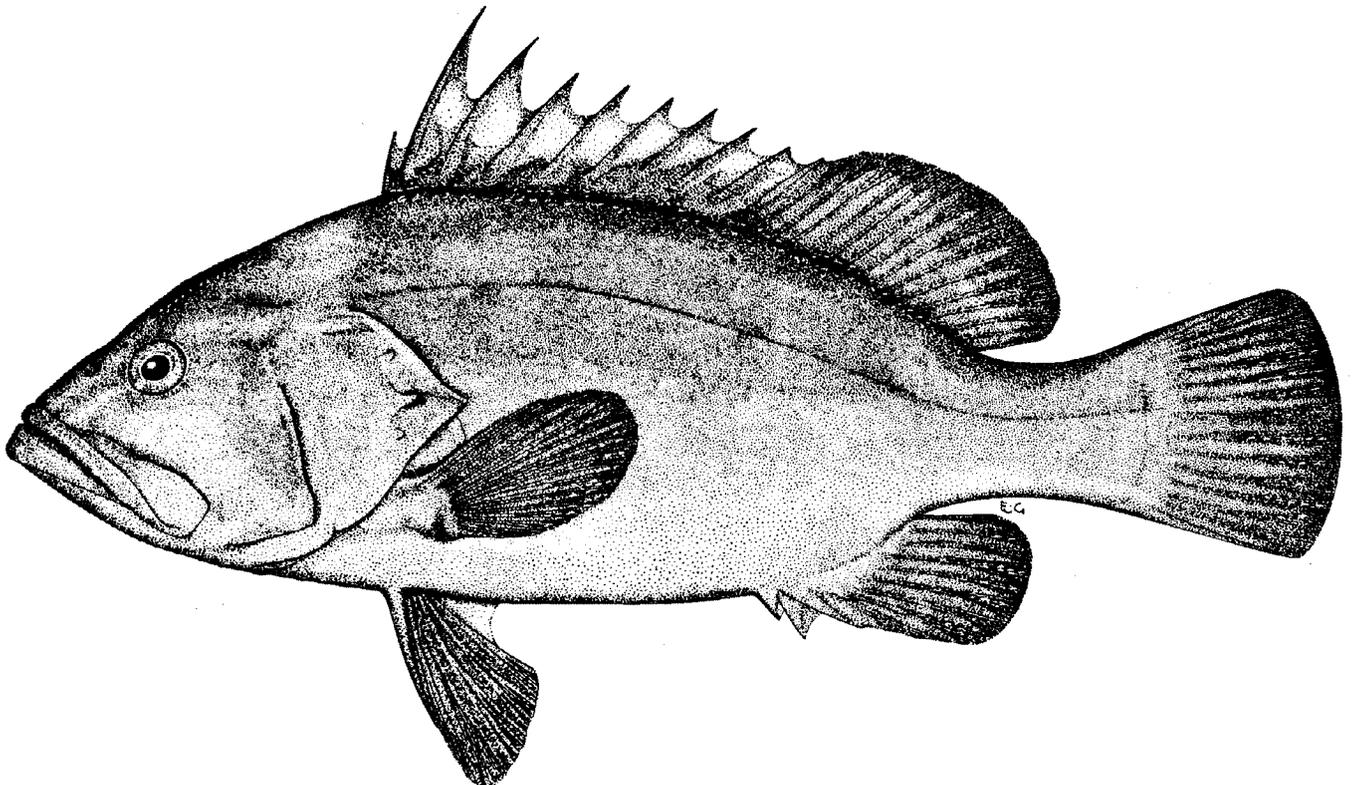


Fig. 369 *Epinephelus nigritus*
(581 mm standard length)

Diagnostic Features: Body depth less than head length, depth contained 2.4 to 2.6 times in standard length (for fish 11 to 58 cm standard length). Head length contained 2.1 to 2.5 times in standard length; interorbital area distinctly convex, wider than eye diameter for fish larger than 15 cm standard length; preopercle angular, but the corner rounded, with slightly enlarged serrae and 1 or 2 small spines on lower edge just in front of corner; interopercle and subopercle smooth; nostrils subequal, or rear nostril slightly larger; maxilla reaches well past eye; adults with 4 or 5 rows of teeth at midside of lower jaw, juveniles with 2 or 3 rows. Gill rakers 9 to 11 on upper limb and 14 to 16 on lower limb, total 23 to 25. Dorsal fin with X spines and 13 to 15 rays, the second spine distinctly longer than the others (in fish greater than 40 cm standard length) and the interspinous membranes deeply incised; anal fin with III spines and 9 rays; pectoral-fin rays 18 or 19; pelvic fins longer than pectoral fins in fish 7 to 58 cm standard length and inserted in front of vertical from lower end of pectoral-fin base; rear margin of caudal fin convex or truncate with rounded corners. Midlateral-body scales distinctly ctenoid, with auxiliary scales in adults; lateral-line scales 62 to 71; lateral-scale series 99 to 107. Pyloric caeca very numerous, in a large dendritic mass. **Colour:** Dark reddish brown or brownish grey to almost black dorsally, dull reddish grey below. Juveniles with yellow caudal fin and a few randomly scattered whitish spots on body; no dark saddle blotch on peduncle.

Geographical Distribution: Western Atlantic from Massachusetts to Gulf of Mexico, Cuba, Trinidad, and Rio de Janeiro (Fig. 370). Reports of *E. nigrinus* from the eastern Pacific (C.L. Smith, 1971) are apparently based on misidentifications of *Epinephelus exsul*. Warsaw grouper seem to be rare in the West Indies, with single records from Cuba, Haiti, and Trinidad; this rarity and their apparent absence from the western Caribbean shelf may be due to the dearth of deep-water fishing in this area.

Habitat and Biology: Adults are usually found on rough, rocky bottom in depths of 55 to 525 m; juveniles are occasionally seen on jetties and shallow-water reefs. Adults feed on a variety of crabs, shrimps, lobsters, and fishes.

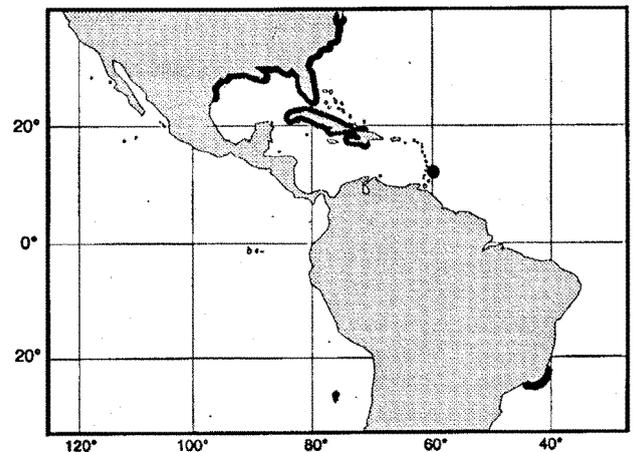


Fig. 370

According to Manooch and Mason (1987), *E. nigrinus* is a long-lived, slow-growing species that may reach an age of 41 years. Average total lengths for fish aged 1, 5, 10, 25 and 41 years are 30, 92, 119, 188 and 233 cm respectively. The von Bertalanffy growth equation is:

$$L_t = 2394(1 - e^{-0.0544(t+3616)})$$

where L_t equals total length in millimetres at age (t) in years.

Size: Maximum total length 230 cm; maximum weight 200 kg. The 1991 edition of *World Record Game Fishes* published by the International Game Fish Association lists the all tackle record for *E. nigrinus* as 198.10 kg for a fish caught off Destin, Florida.

Interest to Fisheries: Because of its large size, the Warsaw grouper is of considerable importance in the sport fishery for bottom fishes, but it contributes less than 1% of the commercial grouper landings on the southeast coast of the U.S. In the 1983-84 commercial fishery on the Florida West coast, Warsaw groupers accounted for about 55 metric tons. The species is also common in the western Gulf of Mexico and southern Caribbean (from Venezuela to French Guiana, but not reported from Venezuela by Cervigón, 1966). It is caught mainly with hook-and-line and bottom longlines.

Local Names: CUBA: Mero de lo alto.

Literature: Rivas (1964) Smith (1971, in part); Johnson and Keener (1984); Manooch (1984); Bullock and Smith (1991).

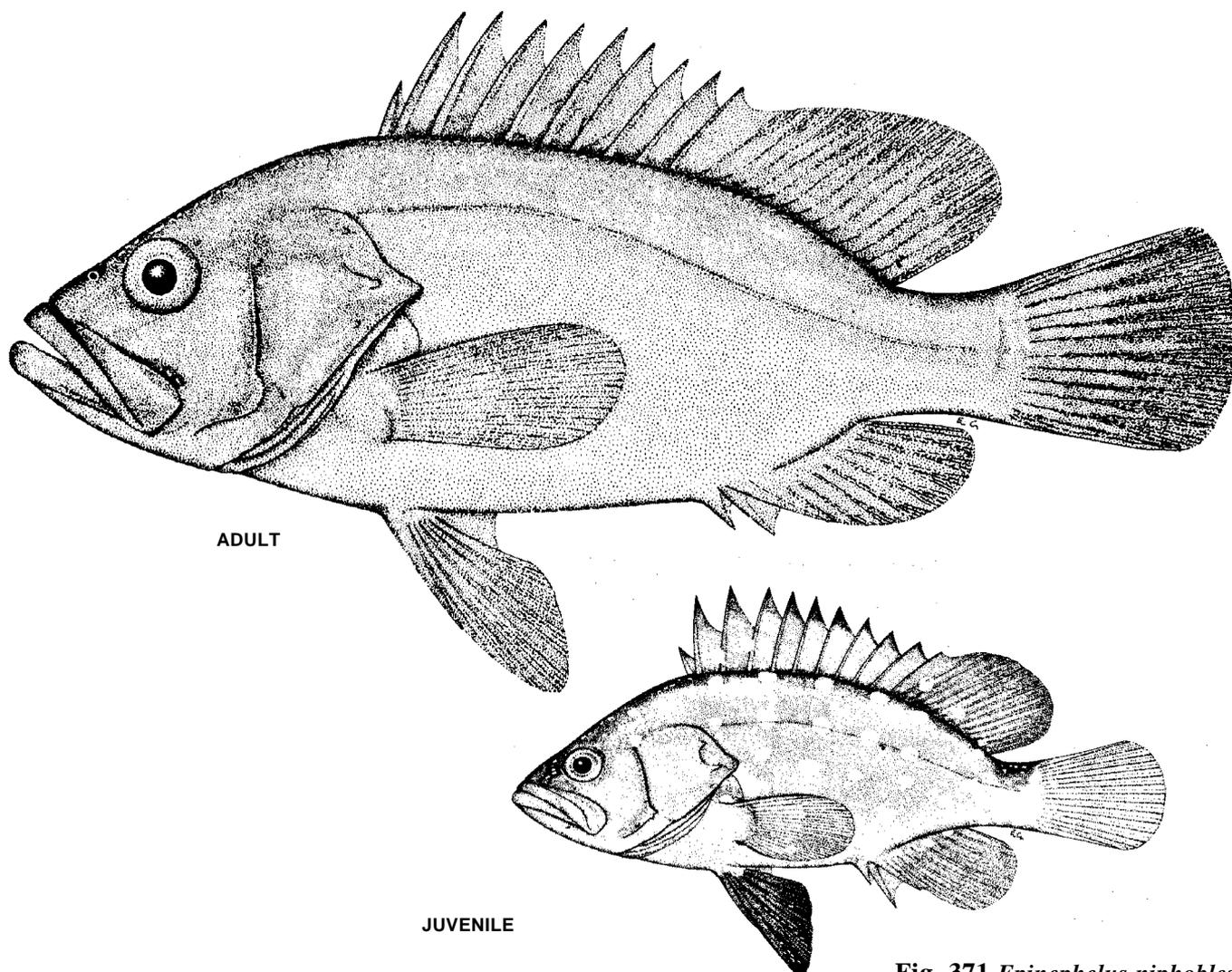
Remarks: *E. nigrinus* was reported from the Eastern Pacific by C.L. Smith (1971), but the eastern Pacific specimens that he listed are a similar species, *E. exsul*, which is known only from the Eastern Pacific. Although we have examined only 6 small juveniles (27 to 109 mm standard length) of *E. exsul*, we believe that this species is distinct from *E. nigrinus*. It differs from *E. nigrinus* in having 8 anal-fin rays, 87 to 92 lateral-scale series, body depth contained 2.3 times in standard length, and pelvic fins equal to or shorter than pectoral fins.

E. nigrinus differs from *E. niveatus* in having X dorsal-fin spines (always XI spines in *E. niveatus*) and in the colour pattern (*E. niveatus* juveniles have the whitish spots in a regular grid-like pattern on the body and a large black saddle blotch on the caudal peduncle).

Epinephelus niphobles Gilbert and Starks, 1897

Fig. 371

SERRAN Epin 64

Epinephelus niphobles Gilbert and Starks in Gilbert, 1897:442 (type locality: Magdalena Bay, Baja California).**Synonyms:** *?Epinephelus peruanus* Chirichigno, 1963:44, fig. 37B (type locality: Puerto Pizarro, Peru).**FAO Names:** En - Star-studded grouper; Fr - Mérou tacheté; Sp - Mero machado.**Fig. 371** *Epinephelus niphobles*

(adult 229 mm standard length, juvenile 60 mm standard length)

Diagnostic Features: Body depth contained 2.3 to 2.7 times in standard length (for fish 14 to 47 cm standard length). Head length contained 2.2 to 2.5 times in standard length; interorbital convex, the width subequal to eye diameter for fish 5 to 22 cm standard length and greater than eye diameter for fish larger than 30 cm standard length; corner of preopercle slightly produced, with enlarged serrae; some specimens with a tiny spine (hidden by skin) on ventral edge of preopercle; upper edge of operculum distinctly convex; posterior nostrils vertically elongate, 2 to 5 times larger than anterior ones; maxilla reaches to or beyond vertical at rear edge of eye; midlateral part of lower jaw with 2 rows of teeth. Gill rakers 8 to 9 on upper limb, 15 to 17 on lower limb, total 23 to 26. Dorsal fin with XI spines, and 13 to 15 rays, the second spine longest in adults, and the membranes deeply incised between the spines; anal fin with III spines and 9 rays; pectoral-fin rays 17 to 21 (mean = 19.1); pelvic-fin origin below or anterior to pectoral-fin base; pectoral fins subequal to pelvic fins, pectoral-fin length contained 1.6 to 2.1 times in head length; caudal fin convex in juveniles, truncate in adults. Midlateral-body scales rough, no auxiliary scales; lateral-line scales 63 to 71; lateral-scale series, 100 to 106. **Colour:** Juveniles (5 to 15 cm) dark reddish brown with white spots in a grid-like pattern of vertical series and horizontal rows on body and dorsal fin; dark saddle blotch usually visible on caudal peduncle; caudal and pectoral fins pale (yellow in life?); anal and pelvic fins dark brown; maxillary groove black. Adults dark brown, without white spots.

Geographical Distribution: *E. niphobles* is an eastern Pacific species known from southern California to Peru (Fig. 372).

Habitat and Biology: According to Thomson et al. (1979: fig. 44, a juvenile identified as “*Epinephelus niveatus*”), “This deep-water grouper is often caught in shrimp trawls in the central Gulf.”

Size: Attains at least 48 cm standard length, probably much larger.

Interest to Fisheries: Apparently too rare to be of commercial interest.

Local Names: USA: Snowy grouper.

Literature: Smith (1971, in part); Chirichigno (1978, misidentified as *E. niveatus*).

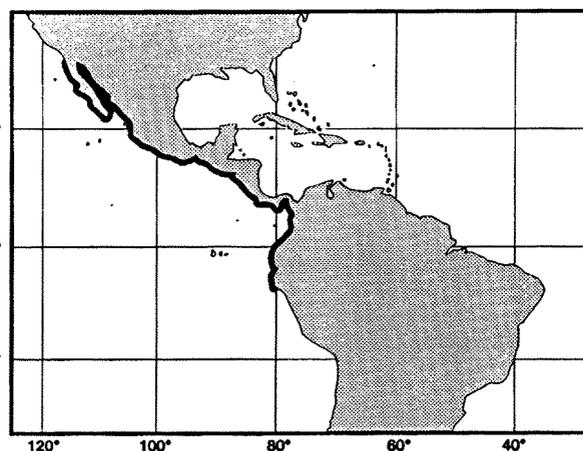


Fig. 372

Remarks: *E. niphobles* is most similar to *E. niveatus* of the western Atlantic and Caribbean. The colour pattern of the juveniles is virtually identical; and the meristic data are the same, except for the pectoral-fin rays (*E. niphobles* with a mode of 19 rays and *E. niveatus* with 18). But direct comparison of like-sized small juveniles (5 to 10 cm standard length) shows noticeable differences in certain morphological characters: *E. niveatus* has a larger eye (eye diameter subequal to snout length and at least 1 mm greater than interorbital width); *E. niphobles* with eye diameter distinctly less than snout length and less than or subequal to interorbital width), pelvic fins distinctly longer than pectoral fins (*E. niphobles* with pelvic fins less than or subequal to pectoral fins), and there is no serrate lobe at the preopercle angle (*E. niphobles* with a small serrate lobe at corner of preopercle).

C.L. Smith (1971) regarded *E. niphobles* as a synonym of *E. niveatus*. Although the morphological differences between *E. niveatus* and *E. niphobles* are slight, we regard these two taxa as distinct species.

We have not examined the types of *E. peruanus* Chirichigno, 1963, but judging from the original description, it appears that her species is a synonym of *E. niphobles*. In the original description of *E. peruanus* the dorsal-fin formula is given 4 times as “XI,14,” and the figure also shows XI dorsal-fin spines; but in her 1978 paper on new additions to the ichthyofauna of Peru, Chirichigno (1978:84) stated that *E. peruanus* differed from *E. niveatus* in having only X dorsal-fin spines! This is presumably a lapse arising from confusion of *E. peruanus* with *E. exsul*.

E. niphobles differs from *E. cifuentesi* in the colour pattern of the juveniles, in having fewer lateral-scale series (100 to 106 versus 131 to 144 in *E. cifuentesi*), and fewer gill rakers (23 to 26 versus 27 to 31 in *E. cifuentesi*).

E. exsul differs in having only X dorsal-fin spines, 8 anal-fin rays, and a different colour pattern (with pale spots faint and scattered randomly over the body).

Epinephelus niveatus (Valenciennes, 1828)

Fig. 373; Pl. XXA

SERRAN Epin 21

Serranus niveatus Valenciennes in Cuv. and Val., 1828:380 (type locality: Brazil).

Synonymy: *Serranus margaritifera* Günther, 1859:131 (type locality: South America [probably Guyana]). *Serranus conspersus* Poey, 1860:139 (type locality: Cuba). *Hyporthodus flavicauda* Gill, 1862b:98 (type locality: Newport, Rhode Island, USA). *Alphestes scholanderi* Walters, 1957:383, fig. 1 (type locality: Bimini, Bahamas).

FAO Names: En - Snowy grouper; Fr - Mérrou neige; Sp - Cherna pintada.

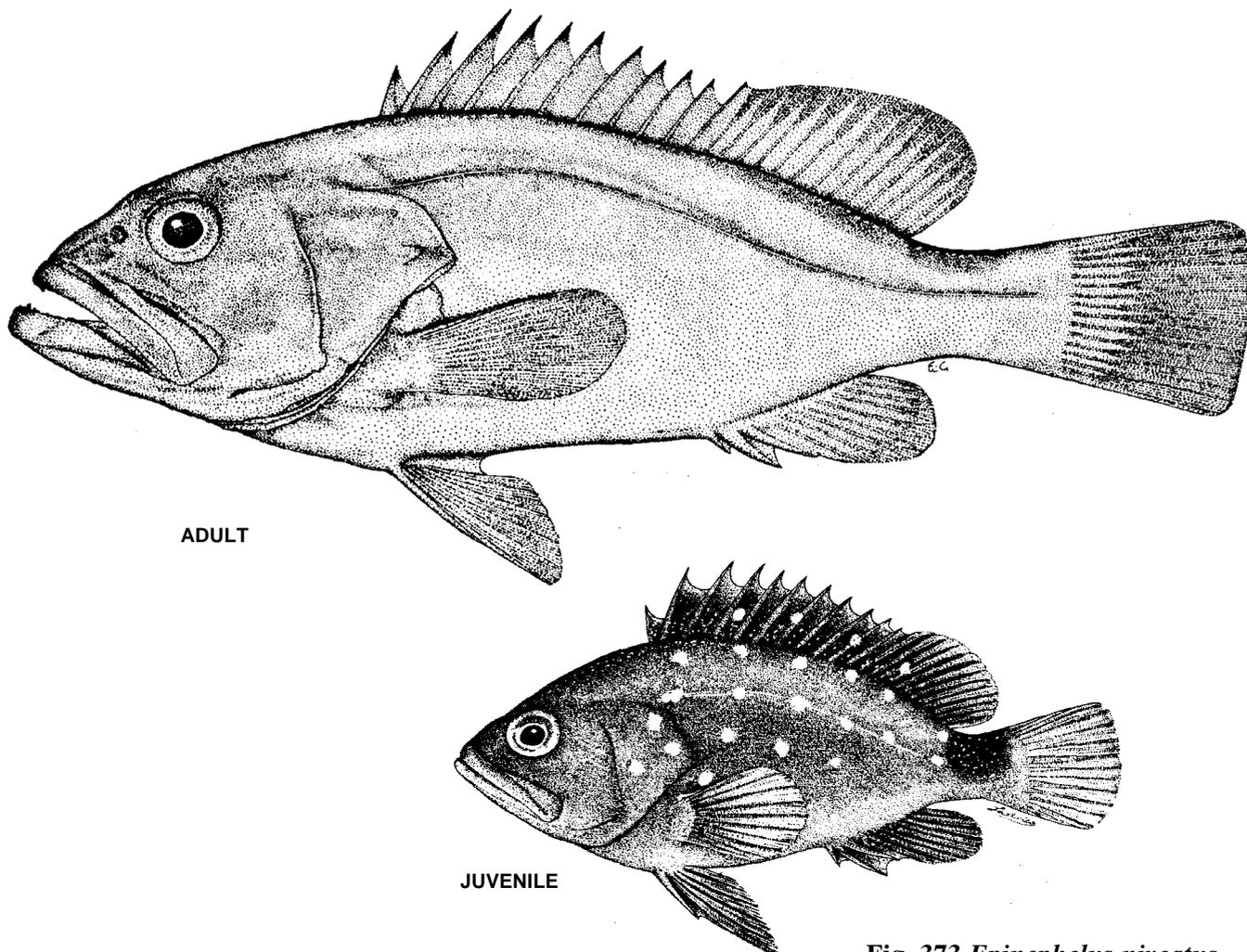


Fig. 373 *Epinephelus niveatus*

(adult 383 mm standard length, juvenile 88 mm standard length)

Diagnostic Features: Body depth contained 2.4 to 2.8 times in standard length (for fish 10 to 38 cm standard length), 2.8 to 3.1 times for fish 75 to 93 cm standard length. Head length contained 2.2 to 2.4 times in standard length (for fish 10 to 38 cm standard length), 2.4 to 2.6 times for fish 75 to 93 cm standard length; interorbital convex, the width less than or subequal to eye diameter in fish 10 to 20 cm standard length; in fish 30 to 93 cm standard length, the interorbital width is 1.1 to 1.9 times eye diameter; preopercle with enlarged serrae at the angle; often a tiny antrorse spine, covered with skin, on lower edge just in front of the angle; upper edge of operculum distinctly convex; rear nostrils 2 to 5 times larger than front ones. Gill rakers 7 to 10 on upper limb, 15 to 17 on lower limb, total 22 to 26. Dorsal fin with XI spines and 13 to 15 rays, the second or third spine longest, the membranes deeply incised between the spines; anal fin with III spines and 9 rays; juveniles with pelvic fins longer than pectoral fins; in fish 40 to 60 cm standard length, the pectoral and pelvic fins are about equal, and in large adults (over 60 cm standard length), the pectoral fins are slightly longer than the pelvic fins; pelvic-fin origin anterior to pectoral-fin base; pectoral-fin rays 17 to 19 (3:17, 63:18, 1:19); rear margin of caudal fin convex in juveniles (less than 30 cm standard length), straight or concave in adults. Midlateral-body scales rough; lateral-line scales 64 to 73; lateral-scale series 102 to 128. Pyloric caeca numerous. **Colour:** Adults dark brown, the spinous dorsal-fin margin black (except in large adults). The live colour of the holotype of *Alphestes scholanderi*, 76 cm standard length, was described as "... coppery gold with about 18 narrow, wavy, vertical, dark bands on the sides, a broad dark band across the lower part of the opercle and another across the preopercle." (Walters, 1957). Juveniles dark brown with conspicuous white spots in about 11 vertical series and 5 or 6 longitudinal rows, usually extending onto head and dorsal fin (white spots visible on fish 6 to 40 cm standard length); caudal and pectoral fins pale yellow; a black saddle blotch on caudal peduncle reaching below lateral line.

Geographical Distribution: Western Atlantic from Massachusetts to the Gulf of Mexico, Bermuda, the Caribbean, and southern Brazil (Fig. 374).

Habitat and Biology: Adults occur well offshore on rocky bottoms at depths of 30 to 525 m but are most common between 100 and 200 m. Juveniles may be found inshore and are often reported from the northeastern coast of the U.S. Most females are mature by age 4 or 5 (40 to 50 cm total length); as expected for a protogynous species, males less than 6 years old (55 to 60 cm) were not found, and 40% of all fish 8 years or older (70 cm) were males; spawning occurs off the Florida Keys from April to July (Moore and Labisky, 1984). The maximum age attained is at least 27 years. Age and growth parameters of this relatively unexploited population in the lower Florida Keys were reported by Moore and Labisky (1984):

$W = 2.45 \times 10^{-8} L^{2.93}$ with weight (W) in kg and total length (L) in millimetres.

$L_t = 1320(1 - e^{-0.087(t-1.013)})$, where total length (L_t) is in millimetres and age (t) is in years.

Adults feed mainly on fishes, gastropods, cephalopods, and brachyuran crustaceans.

Larvae of 5.5 to 10.3 mm standard length were described and illustrated by Presley (1970). Johnson and Keener (1984) illustrated the second dorsal- and pelvic-fin spines of 8.7 and 13.1 mm larvae identified as "*Epinephelus niveatus/flavolimbatus*."

Size: Maximum total length about 120 cm; maximum weight 30 kg.

Interest to Fisheries: Commercially important stocks occur off the southeast coast of the U.S. (North Carolina to Georgia), Florida west coast, lower Florida Keys, Honduras/Nicaraguan shelf, and off Panama, Colombia, and Venezuela. Caught with hook-and-line, bottom longlines, and with traps.

Local Names: BRAZIL: Cherne; CUBA: Cherna manchada; VENEZUELA: Cherna pintada.

Literature: Smith (1971); Matheson and Huntsman (1984); Moore and Labisky (1984); Bullock and Smith (1991).

Remarks: C.L. Smith (1971) synonymized the eastern Pacific species *E. niphobles* with *E. niveatus*. See Remarks section of *E. niphobles* for a discussion of our reasons for recognizing these taxa as separate species. *E. niveatus* was compared with *E. flavolimbatus* in the account of the latter species.

The type locality of *Serranus margaritifer* Gunther is probably Guyana, as the type was presented to the British Museum by Sir R. Schomburgk, who collected fishes in the Orinoco River and along the coast of Guyana (Schomburgk, 1841). The original illustration of *S. margaritifer*, which was cited in the text of Günther's (1859) *Catalogue* as "Plate 9, fig. b," was actually published 36 years later by Boulenger (1895:pl. 3, fig. B).

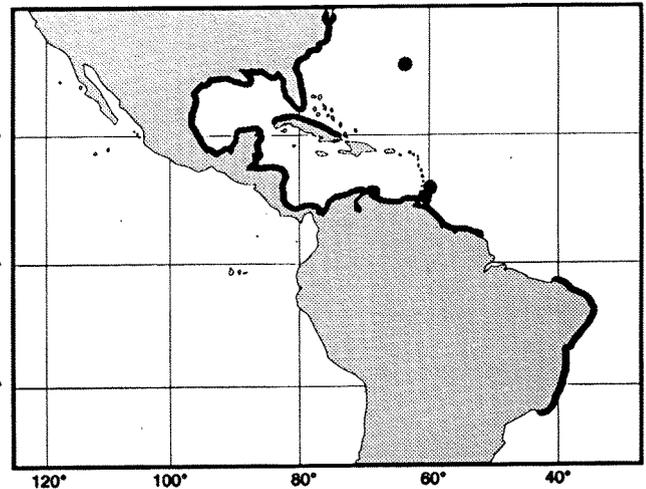


Fig. 374

Epinephelus octofasciatus Griffin, 1926

Fig. 375; Pl. XXB

SERRAN Epin 53

Epinephelus octofasciatus Griffin, 1926:540, pl. 95 (type locality: Arid Island, Great Barrier Island, New Zealand).

Synonyms: *Epinephelus compressus* Postel, Fourmanoir and Guézé, 1963:364, fig. 8 (type locality: Réunion). *Epinephelus mystacinus* (non Poey): Katayama, 1975, 1988. Often misidentified as *E. septemfasciatus*.

FAO Names: **En** - Eightbar grouper; **Fr** - M rou huit raies; **Sp** - Mero de ocho bandas.

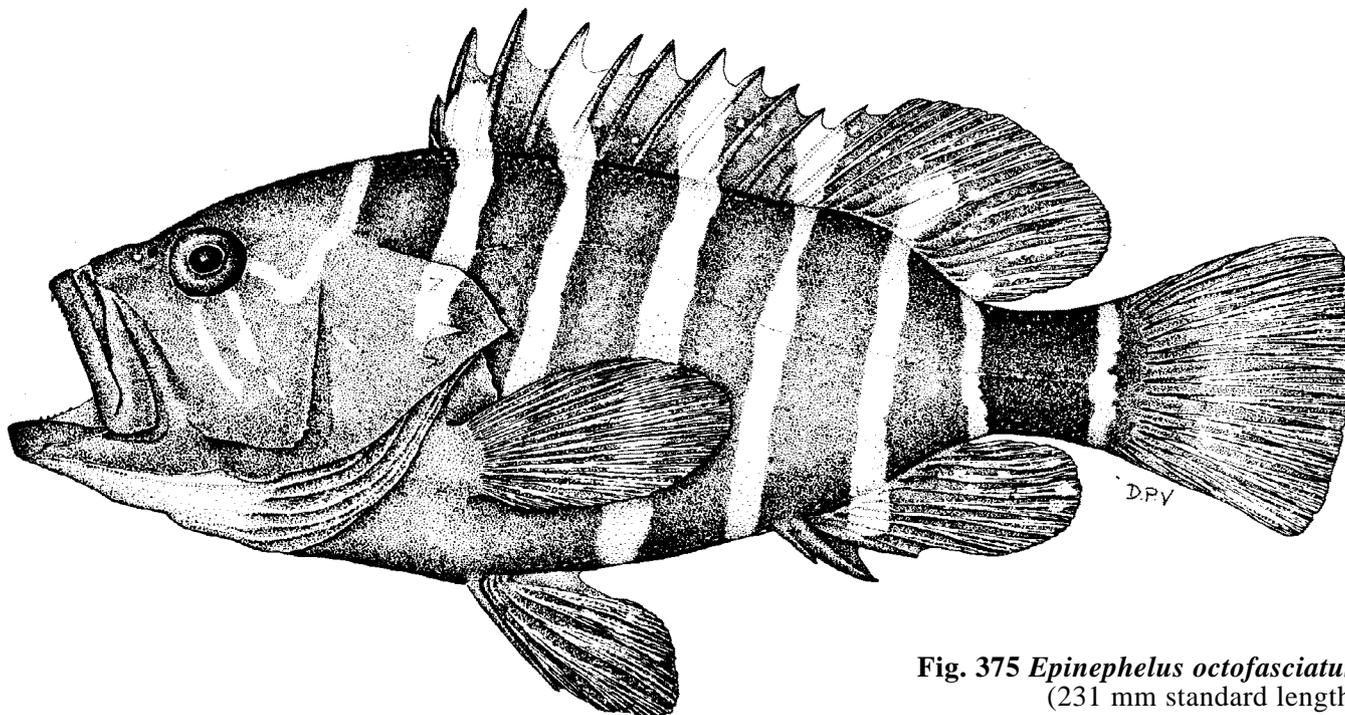


Fig. 375 *Epinephelus octofasciatus*
(231 mm standard length)

Diagnostic Features: Body depth contained 2.2 to 2.7 times in standard length (for fish 10 to 47 cm standard length). Head length contained 2.4 to 2.5 times in standard length; interorbital distinctly convex, the dorsal head profile also convex; preopercle angular, the serrae at angle enlarged; lower edge of preopercle with 0 to 3 small spines anterior to angle; lower edge of subopercle and rear edge of interopercle distinctly serrate; upper edge of operculum convex; diameter of posterior nostrils 2 or 3 times that of anterior nostrils but not more than distance from rear nostril to edge of orbit; maxilla reaches to below rear half of eye; no distinct step on lower edge of maxilla: midlateral part of lower jaw with 2 rows of teeth. Gill rakers 7 to 9 on upper limb, 15 to 17 on lower limb. Dorsal fin with XI spines and 14 or 15 rays, the interspinous membranes deeply incised, the third or fourth spine longest, its length contained 2.5 to 2.9 times in head length and subequal to longest dorsal-fin rays; anal fin with III spines and 9 rays; pectoral-fin rays 18 or 19; pelvic fins subequal to or larger than pectoral fins, pectoral-fin length contained 1.8 to 2.0 times in head length; caudal-peduncle depth contained 0.9 to 1.3 times in its length; caudal fin rounded. Lateral-body scales ctenoid, with a few auxiliaries; lateral-line scales 65 to 71; lateral-scale series 114 to 126. Pyloric caeca very numerous, in 3 or 4 dendritic bundles with more than 80 terminal branches. **Colour:** Body buff with 8 broad dark brown bars, first on nape, second at dorsal-fin origin and covering first 2 dorsal spines, seventh bar broader than sixth and extending from base of middle 5 to 7 dorsal-fin rays to rear half of anal-fin base, 2 pale interspaces below soft dorsal fin, last bar covering most of caudal peduncle and base of last 2 or 3 dorsal-fin rays; pelvic fins and distal half of soft dorsal and anal fins blackish brown; faint dark brown band from eye to middle opercle spine; blackish maxillary streak present; some specimens with narrow white margin at corners of caudal fin, lower edge of anal fin and anterior two-thirds of edge of soft dorsal fin. Gill rakers and gill arches covered with minute melanophores.

Geographical Distribution: Indo-West Pacific from South Africa to Japan, Australia and New Zealand; except for Japan, China and Korea (Fig. 376), most distribution records for "*E. septemfasciatus*" are probably based on *E. octofasciatus*.

Habitat and Biology: Probably rocky reefs. Postel et al., (1963) reported *E. octofasciatus* (as "*E. compressus*") from depths of 150 to 300 m in the Mascarene Islands.

Size: Attains at least 80 cm total length (12 kg).

Interest to Fisheries: The apparent rarity of *E. octofasciatus* may be due to its preference for relatively deep water. Caught with hook-and-line and on vertical longlines.

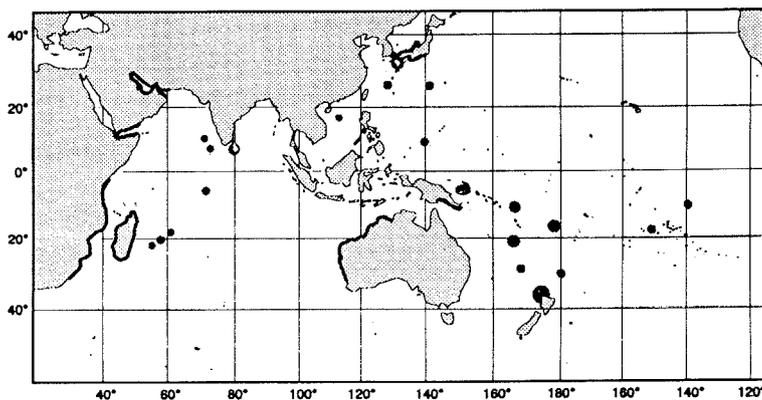


Fig. 376