Epinephelus tauvina (Forsskål, 1775) Fig. 419; Pl. XXIIID-F **SERRAN Epin 12**

Perca tauvina Forsskål, 1775:39 (type locality: Jeddah, Red Sea).

Synonyms: ***Holocentrus pantherinus*** Lacepède, 1801:pl. 27, fig. 3; 1802:345,389 (type locality: Madagascar). ?***Serranus Jansenii*** Bleeker, 1857b:376 (type locality: Sangi island, Indonesia). ***Serranus Goldiei*** Macleay, 1883a:226 (type locality: Port Moresby, Papua New Guinea). ***Epinephelus elongatus*** Schultz, 1953:331,345, fig. 53, pl. 25C (type locality: Enewetak Atoll, Marshall Islands). ***Epinephelus chewa*** Morgans, 1966:258, 267, pl. 9, fig. D (type locality: Mafia Id, Tanzania).

FAO Names: En - Greasy grouper; **Fr** - Mérou loutre; **Sp** - Mero lutra.

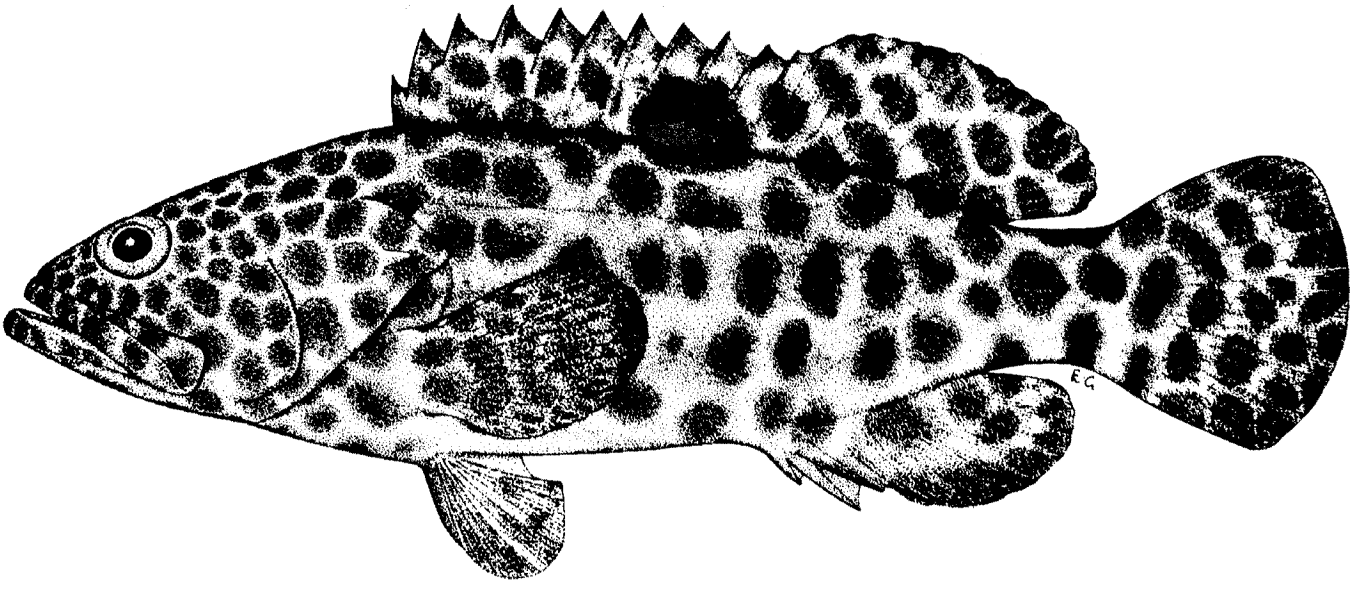

Fig. 419 ***Epinephelus tauvina***
(120 mm standard length)

Diagnostic Features: Body elongate, the depth contained 3.0 to 3.6 times in standard length (for fish 10 to 61 cm standard length), Head large, its length contained 2.1 to 2.4 times in standard length; snout length contained 2.0 to 2.4 times in upper-jaw length; interorbital area narrow, flat to slightly concave, interorbital width contained 6.8 to 8.1 times in head length and 3.1 to 4.0 times in upper-jaw length: preopercle broadly rounded (not angular), serrae at corner of preopercle slightly enlarged; upper edge of operculum almost straight; posterior nostrils distinctly larger than anterior nostrils; maxilla reaching well past eye, the greatest width about twice suborbital depth (least distance from eye to maxilla), maxilla width 6.8 to 8.1 % of standard length; upper-jaw length 21 to 24 % of standard length, midlateral part of lower jaw with 2 to 5 rows of teeth; inner teeth at symphysis of upper jaw are longer than the fixed canines at front of jaw. Gill rakers 8 to 10 on upper limb, 17 to 20 on lower limb; no bony platelets on side of gill arch. Dorsal fin with XI spines and 13 to 16 rays, the third to fifth spines longest, their length contained 3.1 to 4.7 times in head length and distinctly shorter than longest dorsal-fin rays; interspinous dorsal-fin membranes incised: anal fin with III spines and 8 rays; pectoral-fin rays 18 to 19, pectoral-fin length contained 1.7 to 2.4 times and pelvic-fin length contained 2.2 to 2.8 times in head length; caudal fin rounded. Midlateral-body scales ctenoid in juveniles; scales smooth in adults, except for small patch covered by pectoral fin; lateral-line scales 63 to 74; lateral-scale series 95 to 112. Pyloric caeca 16 to 18. **Colour:** Head and body pale greenish grey or brown, covered with roundish dark spots that vary from dull orange-red to dark brown, the centres darker than edges; spots on head progressively smaller anteriorly; a large black blotch (or group of black spots) often visible on body at base of last 4 dorsal-fin spines and extending onto lower part of fin: 5 faint subvertical dark bars may be present on body, 4 below dorsal fin and fifth on peduncle (these bars may be represented by dusky blotches at base of dorsal fin and a dark saddle blotch on peduncle); fins also covered with dark spots, those on pectoral fins becoming smaller and less distinct on distal part of fin; posterior margin of caudal, anal and pectoral fins often with white edge; dark spots on soft dorsal, caudal and anal fins of juveniles are so close set that the pale interspaces form a white reticulum.

Geographical Distribution: ***E. tauvina*** occurs from the Red Sea to South Africa and eastward to Ducie in the Pitcairn Group, the easternmost atoll of Oceania; in the western Pacific it ranges from Japan to New South Wales and Lord Howe Island. ***E. tauvina*** is more common at islands than along continental shores, but it is also known from continental areas with well-developed coral reefs (e.g., the Gulf of Aqaba). We found no verifiable records or specimens from the Persian Gulf, coast of Asia, the Philippines, Indonesia, northern Australia, and western Australia (Fig. 420). ***E. tauvina*** was reported from the eastern Mediterranean by Ben-Tuvia and Lourie (1969), but Heemstra (1991) determined that this record was based on specimens of ***E. coioides.***

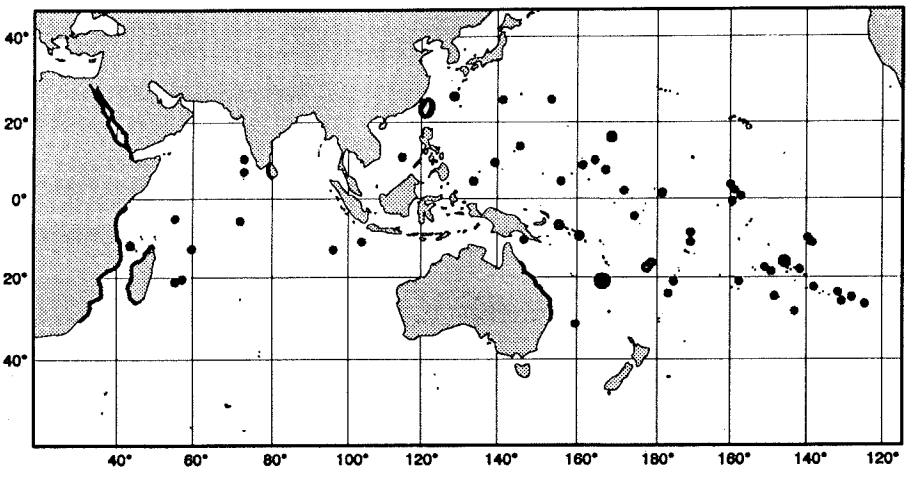

Fig. 420

Habitat and Biology: ***E. tauvina*** prefers clear water areas on coral reefs; juveniles have been taken on reef flats and in tidepools, but adults are found in deeper water (to 50 **m).** Randall (1980a) found that adults from Oceania were almost exclusively piscivorous; only 1 of 19 fish that contained food had eaten a crab. Fishes eaten comprised holocentrids, a mullid and a pomacentrid. Randall and Heemstra (1991) illustrated a newly transformed juvenile of 26 mm standard length which was collected in April 1972 on the outer reef flat at Enewetak Atoll in the Marshall Islands. This specimen has the second dorsal-fin spine elongated and a large serrated spine (half eye diameter in length) at the corner of the preopercle.

Size: Attains 61 cm standard length (75 cm total length). Reports of sizes in excess of 80 cm total length for ***E. tauvina*** are probably based on misidentification of ***E. coioides, E. malabaricus,*** and ***E. lanceolatus.***

Interest to Fisheries: Where it is abundant ***E. tauvina*** is certainly of importance to artisanal fisheries, but separate statistics for this species are not available. Caught with hook-and-line, spear, and in traps. Sold fresh in local markets.

Local Names: EASTER ISLAND: Haroa; REUNION: Vielle loutre; TAHITI: Faroa.

Literature: Most of the literature concerning ***"E. tauvina"*** that was published before 1984 was based on misidentifications of ***E. coioides, E. malabaricus,*** or ***E. lanceolatus.*** Randall and Ben-Tuvia (1983) incorrectly listed ***E. salonotus*** Smith and Smith, 1963 as a synonym of ***E. tauvina;*** this error was corrected by Heemstra and Randall (1984) who recognized ***E. salonotus*** as a synonym of ***E. spilotoceps.*** Randall and Heemstra (1991) have discussed the many misidentifications of ***E. tauvina.***

Remarks: ***E. tauvina*** has often been confused with ***E. coioides*** and ***E. malabaricus;*** differences between these three species are discussed in the account of ***E. malabaricus:***

Juveniles of ***E. tauvina,*** are sometimes mistaken for the various species of the "reticulated groupers": ***E. spilotoceps*** differs from ***E. tauvina*** in having ctenoid body scales; dark spots on head and body closely set, forming a pale reticulum; upper jaw length less than 20% of standard length; and lower gill raker 15 to 17.

E. macrospilos has lateral-line scales 48 to 52, 14 to 17 lower gill rakers, and head length contained 2.3 to 2.6 times in standard length.

E. melanostigma has dark spots on head and body forming a pale reticulum, lateral-body scales ctenoid, and the nostrils are subequal.

E. polyphekadion has the lateral-body scales ctenoid, lateral-line scales 47 to 52, lower gill rakers 15 to 17, pectoral-fin rays 16 to 18, and the ventral parts of head and body covered with small close-set dark spots.

E. fuscoguttatus has the dorsal head profile with an indentation above the eye, body depth contained 2.6 to 2.9 times in standard length, and lateral-line scales 49 to 58.

Differences between ***E. tauvina, E. coioides,*** and ***E. malabaricus*** are given in the account of ***E. malabaricus.***

Epinephelus timorensis Randall and Allen, 1987 | Fig. 421; Pl. XXIVA | **SERRAN Epin 96**

Epinephelus timorensis Randall and Allen, 1987:393, 399, fig. 2 (type locality: Dillon Shoals, Western Australia).

Synonyms: ***Epinephelus*** sp. Wass, 1984:12 (Tutuila, American Samoa).

FAO Names: En - Yellowspotted grouper; **Fr** - Mérou taches jaunes; **Sp -** Mero de pintas amarillas.

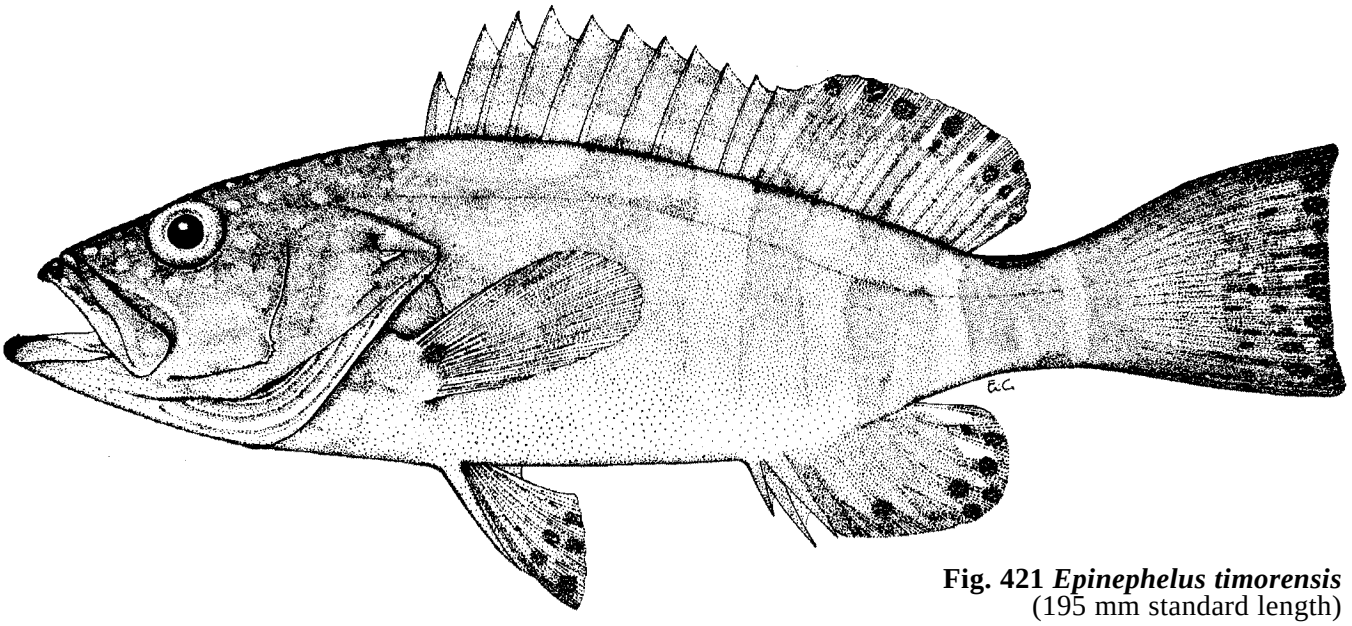

Fig. 421 ***Epinephelus timorensis***
(195 mm standard length)

Diagnostic Features: Body depth contained 2.7 to 3.4 times in standard length (for **fish** 14 to 27 cm standard length). Head length 2.4 to 2.7 times in standard length; interorbital area flat to convex; preopercle corner with 2 to 4 distinctly enlarged serrae; upper edge of operculum straight or nearly so; nostrils small, subequal; maxilla extends to below rear half of eye; midlateral part of lower jaw with 2 rows of teeth. Gill rakers 8 or 9 on upper limb, 14 to 16 on lower limb. Dorsal fin with XI spines and 16 or 17 rays, the fourth spine longest, its length 2.7 to 3.0 times in head length and subequal to longest dorsal-fin rays, the interspinous membranes incised; anal fin with III spines and 8 rays; pectoral-fin rays 17 or 18; pectoral-fin length 1.6 to 1.8 times in head length; pelvic-fin length 1.8 to 2.1 times in head length; caudal fin of adults truncate or emarginate, but slightly rounded in juveniles. Lateral-body scales distinctly ctenoid, with auxiliary scales; lateral-line scales 49 to 53; lateral-scale series 97 to 108. Pyloric caeca 13 or 14. **Colour:** Head and body pale brownish grey; yellow or golden brown spots on head, nape and chest; spots on snout smaller than those on operculum; a row of dark yellowish brown spots along margin of soft dorsal and anal fins and rear edge of caudal fin; caudal fin of 141 mm juvenile covered with close-set dark spots, the pale interspaces forming a white reticulum; adults with 5 faint, irregular, dark bars or series of dark blotches on body, the first 4 bars extending into dorsal fin; pectoral-fin rays pale yellowish, the membranes transparent; pelvic fins streaked with yellowish brown and whitish, with a few yellowish brown spots distally.

Geographical Distribution: The known distribution of ***E. timorensis*** is wide ranging but very sparse: Western Australia, American Samoa (Tutuila), and the Phoenix Islands (Canton Island) (Fig. 422). The apparent rarity of this species is probably a result of its deep-water habitat and the fact that it was only recently described as a new species.

Habitat and Biology: ***E. timorensis*** is known from depths of 73 to 210 m off coral reefs. Nothing has been published on the biology of this rare species.

Size: Attains at least 27 cm standard length (32 cm total length).

Interest to Fisheries: None.

Local Names:

Literature: Randall and Heemstra (1991).

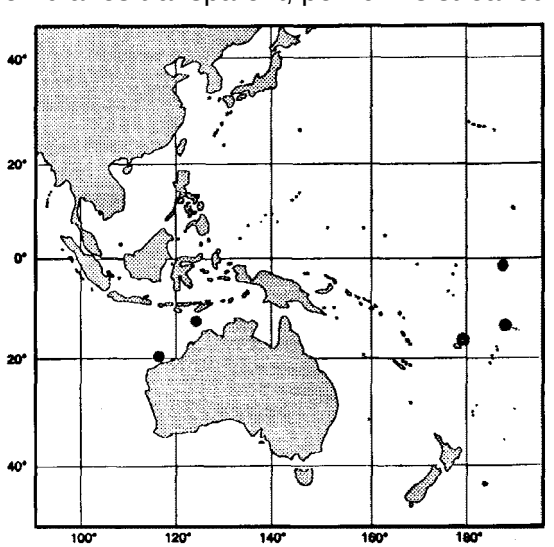

Fig. 422

Remarks: ***E. timorensis*** is vaguely similar to ***E. bleekeri,*** which has the lower two-thirds of the caudal fin dusky or blackish, the orange-yellow spots extend all over the body (except ventrally) and dorsal fin, and more gill rakers (9 to 11 on upper limb and 16 to 18 on lower limb).

Epinephelus trimaculatus (Valenciennes, 1828) Fig. 423; Pl. XXIVB **SERRAN Epin 97**

Serranus trimaculatus Valenciennes in Cuv. and Val., 1828:331 (type locality: Japan).

Synonyms: ***Serranus ura*** Valenciennes in Cuv. and Val., 1828:332 (type locality: Japan). ***Serranus Ara*** Temminck and Schlegel, 1842:9 (unjustified emendation of ***Serranus ura*** Valenciennes).

FAO Names: En - Threespot grouper; **Fr -** Mérou trois taches; **Sp** - Mero de tres manchas.

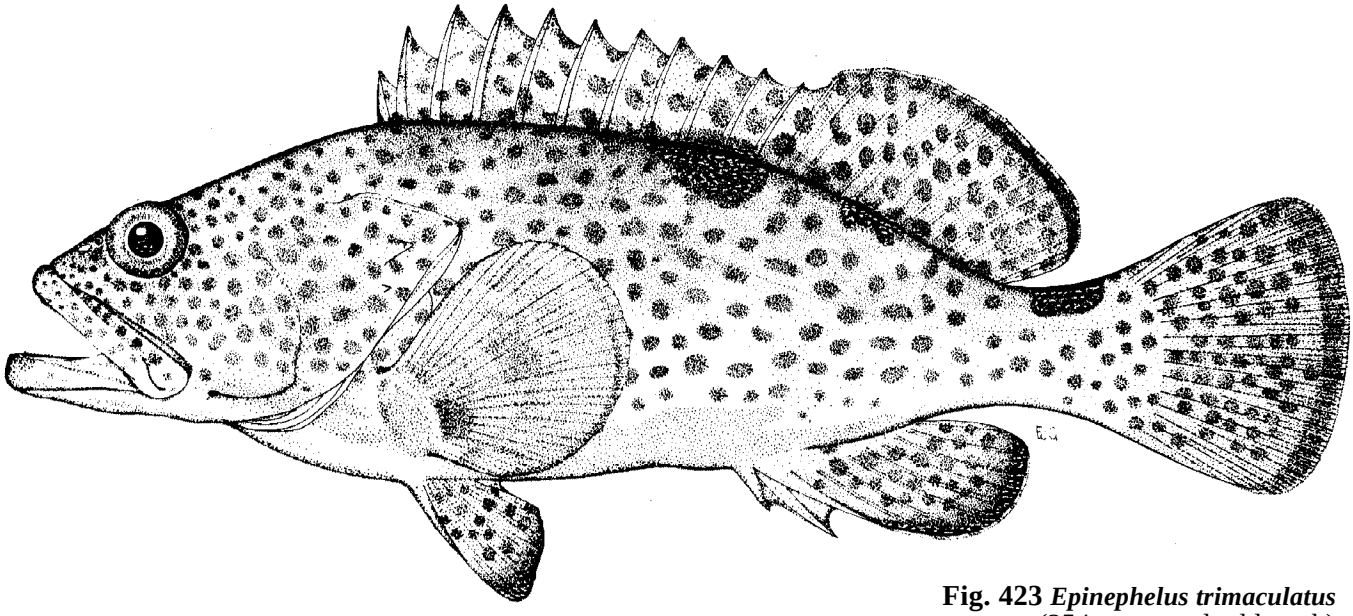

Fig. 423 ***Epinephelus trimaculatus***
(254 mm standard length)

Diagnostic Features: Body depth contained 2.7 to 3.3 times in standard length (for fish 14 to 27 cm standard length). Head length contained 2.4 to 2.6 times in standard length; interorbital area slightly convex; preopercle rounded, the serrae mostly hidden by skin; upper edge of operculum straight; nostrils small, subequal; maxilla reaches to or past 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 to 16 on lower limb. Dorsal fin with XI spines and 16 or 17 rays, the third or fourth spine longest, its length contained 2.7 to 3.5 times in head length and shorter than longest dorsal-fin rays; anal fin with III spines and 8 rays; pectoral-fin rays 17 or 18; pectoral-fin length contained 1.7 to 2.0 times in head length; pelvic fins not reaching anus, their length contained 2.0 to 2.5 times in head length: caudal fin rounded. Midlateral-body scales of adults (28 cm standard length) smooth; juveniles with patch of ctenoid scales on area covered by pectoral-fin tip; lateral-line scales 48 to 52; lateral-scale series 88 to 100. Pyloric caeca 27 to 36. **Colour:** Head and body pale brown, covered (except ventrally) with small red or reddish brown spots; median fins darker, but also covered with dark reddish brown spots and often with a narrow white edge; a black blotch larger than eye on body at base of last 3 dorsal-fin spines, a smaller blotch at base of middle dorsal-fin rays and a third on top of caudal peduncle; paired fins yellowish, with a few small faint orange spots.

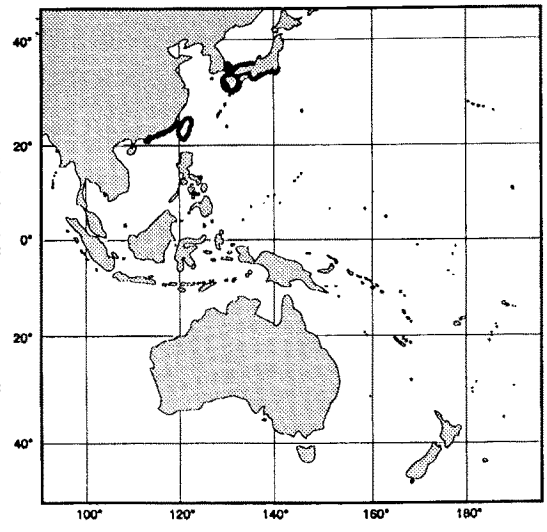

Fig. 424

Geographical Distribution:*E. trimaculatus* is known only from Japan, Korea, Taiwan, and China (Fig. 424). Reports of this species (or ***"Epinephelus fario"***) from the Indian Ocean are apparently based on misidentifications.

Habitat and Biology: According to Chan (1968), juveniles are common in tidepools and in shallow clear water around rocks and coral reefs. Adults are found in deeper water.

Size: Attains 40 cm standard length (50 cm total length).

Interest to Fisheries: ***E. trimaculatus*** is an important food fish in Japan and Hong Kong. Kuo et al. (1988) induced sex reversal and artificial spawning in ***"Epinephelus fario."*** Caught with vertical longlines and handlines.

Local Names: HONG KONG: Black-saddled grouper, Huk-dim-hung-paan; JAPAN: Nominokuchi.

Literature: Randall and Heemstra (1991).

Remarks: Several recent authors have used the name ***Epinephelus fario*** (Thunberg, 1793b) for this species, but Bauchot et al. (1984) regarded Thunberg's original description and figure of ***Perca fario*** as unidentifiable, and there is no type specimen.

Epinephelus trophis Randall and Allen, 1987 | Fig. 425 | **SERRAN Epin 98**

Epinephelus trophis Randall and Allen, 1987:402, fig. 3 (type locality: Dillon Shoals, Western Australia).

Synonyms: None.

FAO Names: En - Plump grouper; **Fr** - Mérou rondelet; **Sp** - Mero rollizo:

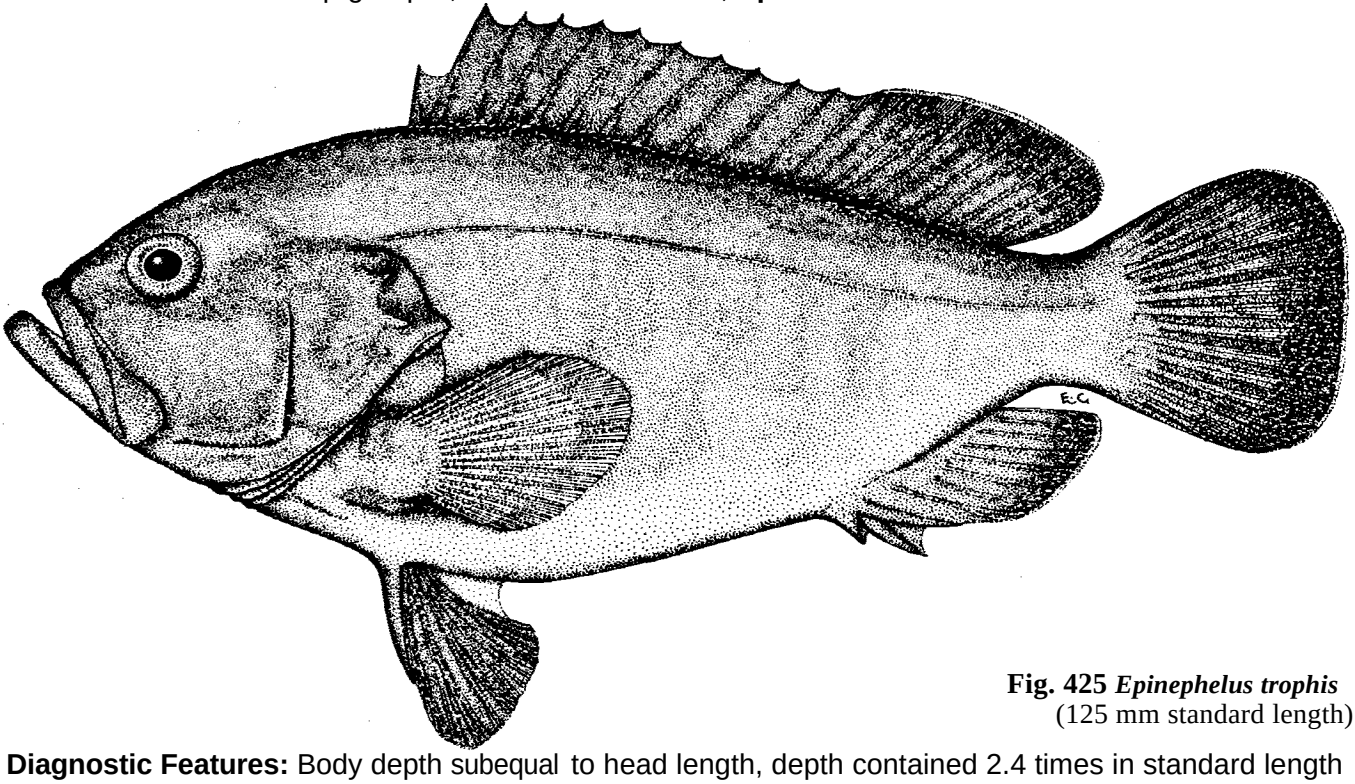

Fig. 425 ***Epinephelus trophis***
(125 mm standard length)

Diagnostic Features: Body depth subequal to head length, depth contained 2.4 times in standard length (2 fish of 104 and 126 mm standard length). Interorbital area convex; preopercle corner with 2 or 3 enlarged serrae; upper edge of operculum convex; nostrils small, subequal; maxilla reaches vertical at rear edge of orbit; midlateral part of lower jaw with 2 rows of teeth. Gill rakers 10 on upper limb, 15 or 16 on lower limb. Dorsal fin with XI spines and 16 or 17 rays, the fourth spine longest, its length contained 2.8 to 2.9 times in head length and shorter than longest dorsal-fin rays, the interspinous membranes slightly incised; anal fin with III spines and 8 rays; pectoral-fin rays 17 or 18; pelvic fins not reaching anus; pectoral fins subequal to pelvic fins, pectoral-fin length contained 1.3 to 2.0 times in head length; caudal fin convex. Lateral-body scales otenoid; no auxiliary scales; lateral-line scales 67 to 69; lateral-scale series 143 to 145. **Colour:** Head, body, and median fins dark charcoal grey; pectoral fins pale; pelvic fins blackish.

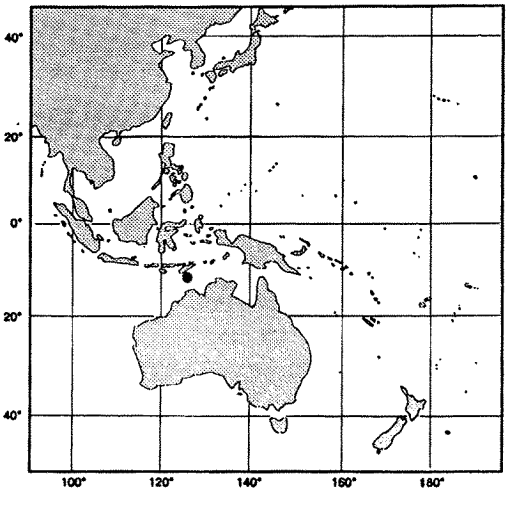

Fig. 426

Geographical Distribution: Known only from Dillon Shoals in the Timor Sea off Western Australia (Fig. 426).

Habitat and Biology: The only two specimens known were collected from the base of a drilling rig at a depth of 130 m.

Size: The largest of the two known specimens is 126 mm standard length (15 cm total length).

Interest to Fisheries: None.

Local Names:

Literature: Randall and Allen (1987).

Remarks: ***E. trophis*** is very similar to ***E. flavocaeruleus.*** The interspinous dorsal-fin membranes are not (or only slightly) incised and the meristic and morphometric data are virtually the same for both species. Comparing 3 small (112, 127, and 145 mm standard length) ***E. flavocaeruleus*** with the 105 and 126 mm type specimens of ***E. trophis,*** it appears that the caudal fin is more truncate in ***E. flavocaeruleus*** (although it is convex when spread open in the 112 mm fish), the caudal peduncle is slightly longer (length 17 to 20% of standard length versus 16% of standard length in ***E. trophis***) and the pelvic fins reach to or within 3 mm of the anus (8 mm from anus in the 126 mm ***E. trophis***). Of course these minor differences may be an artefact of the small number of specimens that are available for comparison. ***E. trophis*** and ***E. flavocaeruleus*** differ notably in colour; juveniles of ***E. flavocaeruleus*** have the fins and jaws bright yellow. If colour pattern is the only significant difference between these two species, ***E. trophis*** may represent a Western Australian subspecies of ***E. flavocaeruleus,*** which is not known from Australia.

Epinephelus tuamotuensis Fourmanoir, 1971 Fig. 427; Pl. XXIVC **SERRAN Epin 99**

Epinephelus tuamotuensis Fourmanoir, 1971:127, fig. 1 (type locality: Rangiroa, Tuamotu Archipelago).

Synonyms: None.

FAO Names: En - Reticulate grouper; **Fr** - Mérou réseau; **Sp** - Mero reticular.

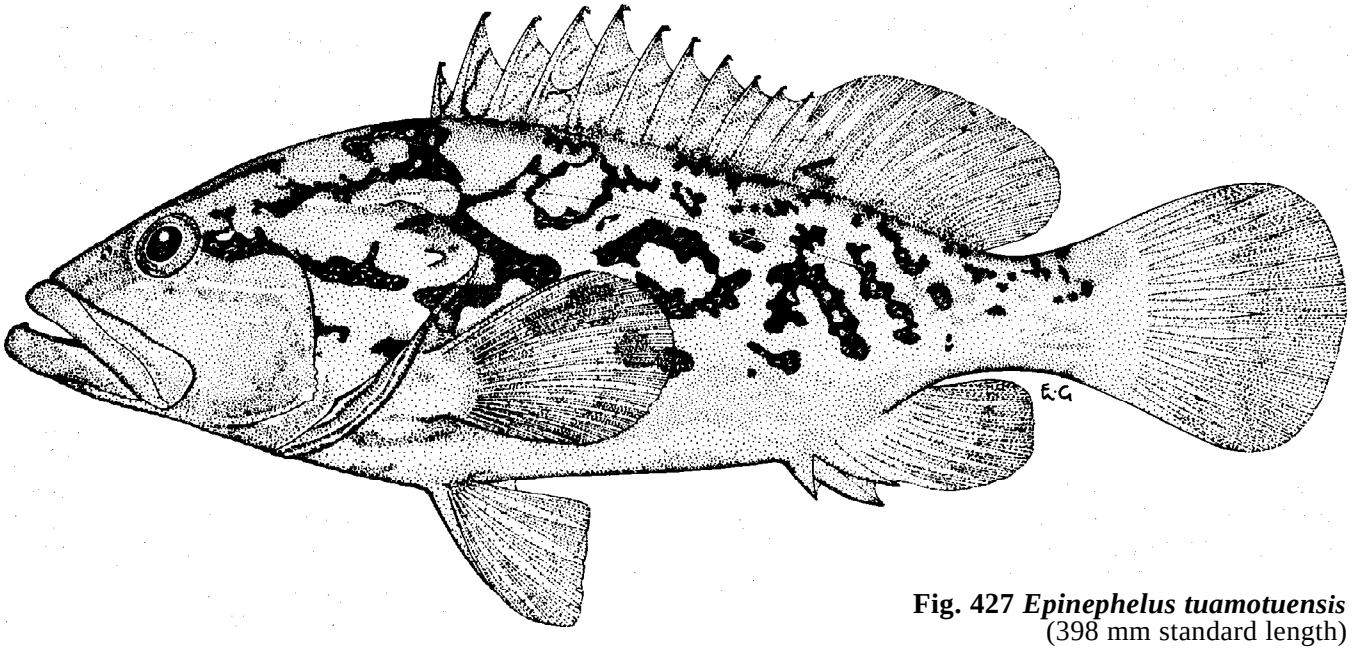

Fig. 427 *Epinephelus tuamotuensis*
(398 mm standard length)

Diagnostic: Features: Body depth contained 2.7 to 2.9 times in standard length (for fish 11 to 32 cm standard length). Head length contained 2.2 to 2.4 times in standard length: interorbital area convex; preopercle subangular, with 3 or 4 distinctly enlarged serrae at the angle; upper edge of operculum straight or nearly so; posterior nostrils larger than anterior ones; maxilla reaches almost to or slightly past vertical at rear edge of eye: midlateral part of lower jaw with 2 rows of teeth, the inner teeth larger; canine teeth at front of jaws well developed. Gill rakers 9 to 11 on upper limb, 16 or 17 on lower limb. Dorsal fin with XI spines and 15 rays, the fourth or fifth spine longest, its length contained 3.0 to 3.3 times in head length and almost equal to longest dorsal-fin ray; interspinous dorsal-fin membranes deeply incised; anal fin with III spines and 8 rays; pectoral-fin rays 17, the fins not fleshy; pectoral-fin length contained 1.9 to 2.1 times in head length; pelvic fins not reaching anus, their length contained 2.2 to 2.4 times in head length; caudal fin rounded. Lateral-body scales ctenoid; a few auxiliary scales on adults (40 cm standard length); lateral-line scales 60

to 64; lateral-scale series 143 to 145. **Colour:** Pale yellowish brown with an irregular coarse reticulum of dark brown on body and rear part of head (some sections of the network are broken, and there may be small pale spots with the dark bands); fins unmarked.

Geographical Distribution: ***E. tuamotuensis*** is known only from the Tuamotu Islands, Society Islands, Pitcairn Group, and Rapa (Fig. 428).

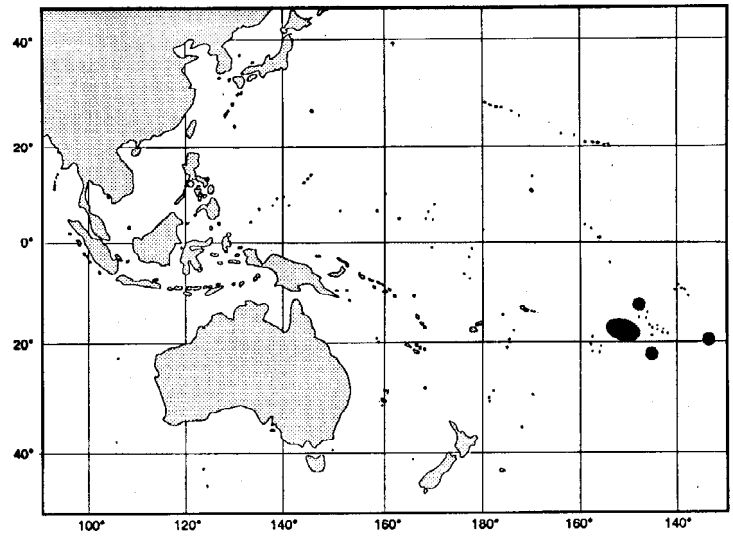

Fig. 428

Habitat and Biology: This grouper occurs on the outer slope of coral reefs in depths of 120 to 250 m. Fourmanoir (1971) found ophichthid eels (*Leiuranus phoenixensis*) in the stomachs of his type specimens.

Size: Attains at least 66 cm standard length.

Interest to Fisheries: Probably of some importance in artisanal fisheries, but not commonly caught because of its preference for deep water.

Local Names: EASTER ISLAND: Kito, Matuvi; TUAMOTU ISLANDS: Snakeskin seabass.

Literature: Bagnis et al. (1972, misidentified as ***E. morrhua***); Randall and Heemstra (1991).

Remarks: ***E. tuamotuensis*** is a member of the ***E. morrhua*** species-complex, which also includes ***E. poecilonotus*** and ***E. radiatus.*** These 4 species are often misidentified, and we can find no meristic or morphological characters that will separate them. These deep-water groupers are characterized by having the body depth less than head length, 2 to 5 distinctly enlarged serrae at corner of preopercle, 2 rows of teeth at sides of lower jaw, dorsal-fin rays 13 to 15, pectoral fins not fleshy, pelvic-fin length contained 2.0 to 2.8 times in head length, lateral-line scales 54 to 66, and the colour pattern dominated by curving dark bands or longitudinal series of dark spots. The other 3 species of this ***E. morrhua*** species-complex are ***E.poecilonotus, E. radiatus*** and ***E. tuamotuensis.*** These 4 species have often been confused, and we can find no meristic or morphological characters that will distinguish them.

E. morrhua has dark bands running from the head up to the dorsal fin and another dark band (more or less continuous) from head to caudal peduncle; it also often has small dark spots in the pale areas between the dark bands.

Juveniles of ***E. poecilonotus*** have a large dark brown or black saddle blotch on body at base of spinous dorsal fin; this blotch is isolated from other dark bands on the body and extends over front half of spinous dorsal fin; in adults this blotch breaks up into small dark spots, as do the dark bands on the body, and in large adults most of the dark spots and bands have disappeared; juveniles with a dark band from eye to lower opercular spine, continued as a dark curving midlateral stripe or series of spots to a dark saddle blotch on peduncle. On adults, the triangular interspinous dorsal-fin margins are, brownish yellow or gold.

Juveniles of ***E. radiatus*** have 5 irregular, solid, dark brown bands (with age only the edges remain dark) that run down and forward from dorsal edge of body, the first from nape to eye, the second from base of middle dorsal-fin spines to upper end of gill opening, the third and fourth dark bands from anterior and posterior dorsal-fin rays, both branching as they pass ventrally: and the last dark band on caudal peduncle; with growth, the dark bands break into spots and disappear ventrally on adults; soft dorsal fin and dorsal part of caudal fin densely spotted.

Epinephelus tukula Morgans, 1959 | Fig. 429; Pl. XXIVD | **SERRAN Epin 56**

Epinephelus tukula Morgans, 1959:651, pl. 17, pl. 19 (type locality: Mafia Island, Tanzania).

Synonyms: ***Serranus dispar*** variety A Playfair in Playfair and Gunther, 1867:7, pl. 1, fig. 2 (type locality: Seychelles).

FAO Names: En - Potato grouper; **Fr** - Mérou patate; **Sp -** Mero patata.

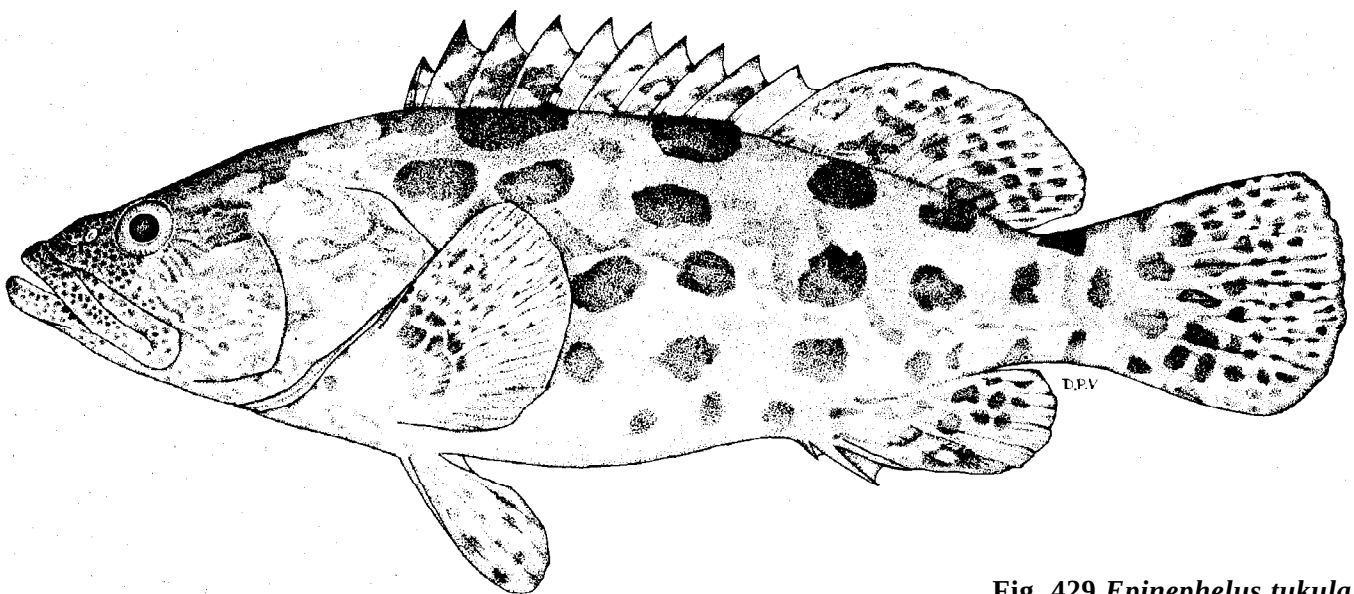

Fig. 429 *Epinephelus tukula*
(320 mm standard length)

Diagnostic Features: Body depth contained 2.9 to 3.5 times in standard length (for fish 12 to 41 cm standard length). Head length contained 2.3 to 2.6 times in standard length; interorbital area slightly convex; the dorsal head profile straight; preopercle rounded or subangular, the serrae at corner slightly enlarged; upper edge of operculum almost straight; nostrils subequal; maxilla reaches to or beyond vertical at rear edge of eye; midlateral part of lower jaw with 2 to 6 rows of teeth. Gill rakers 8 to 10 on upper limb, 15 to 18 on lower limb. Dorsal fin with XI spines and 14 or 15 rays, the third or fourth spine longest, its length contained 3.1 to 3.8 times in head length and distinctly shorter than longest dorsal-fin rays; interspinous dorsal-fin membranes distinctly incised; anal fin with III spines and 8 rays; pectoral-fin rays 18 to 20; pectoral-fin length contained 1.6 to 2.1 times in head length: pelvic fins usually not reaching anus, their length contained 1.9 to 2.4 times in head length; caudal fin rounded. Lateral-body scales ctenoid, with auxiliary scales in adults; lateral-line scales 62 to 70; lateral-scale series 113 to 130. **Colour:** Body pale brownish grey with several dark brown to black widely-spaced blotches, mostly larger than eye and varying in shape from round to oval or dumbbell-shaped; head with smaller dark brown spots and streaks (many radiating from eye, especially posteriorly); dark spots on fins, smaller distally. Large adults may be nearly black.

Geographical Distribution: ***E. tukula*** occurs from the western Indian Ocean and Red Sea to the western Pacific. It is known from Egypt, Djibouti, Kenya, Tanzania, Mozambique, South Africa (Natal), Seychelles, southern Oman, Pakistan, India, Japan (Okinawa and Honshu), Taiwan, South China Sea (Paracel Islands), Western Australia, and Queensland (Fig. 430). This species does not occur in the Persian Gulf, and there are no records for Madagascar, Reunion, Mauritius, Maldives, Laccadives, Sri Lanka, Andaman Islands, Christmas Island (Indian Ocean), Indonesia, the Philippines, and New Guinea.

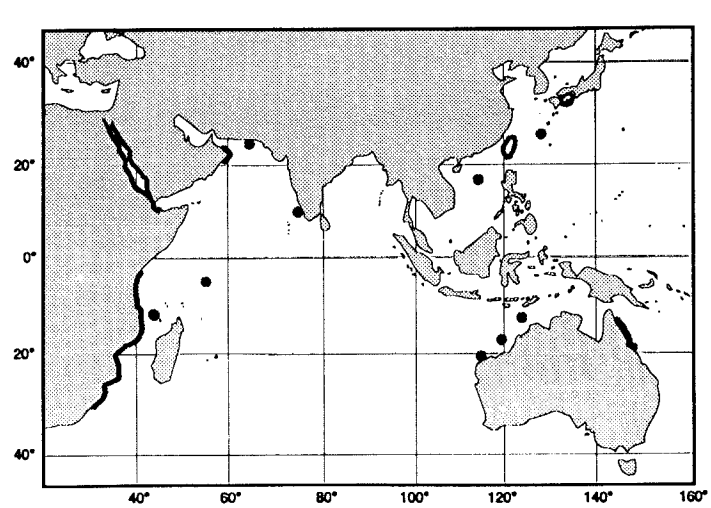

Fig. 430

Habitat and Biology: ***E. tukula*** is a coral-reef species; juveniles may be found in tidepools, and adults occur in depths of 10 to 150 m. Morgans (1959) estimated that maturity occurs at 90 cm