

Diagnostic Features: Body elongate, robust, the depth contained 2.9 to 3.9 times in standard length (for fish 11 to 62 cm standard length). Head length contained 2.7 to 3.1 times in standard length; snout length contained 2.8 to 3.6 times in head length; suborbital depth contained 5.6 to 10 times in head length; interorbital area flat (rounded at edges of orbits), without scales; preopercle broadly rounded, with 3 large, ventrally-directed spines along lower half; interopercle and subopercle smooth; opercle with 3 flat spines, the upper and lower spines covered by skin; nostrils subequal, set in a shallow groove running forward from eye; midlateral part of upper jaw with 1 to 4 enlarged fixed canines. Lower limb developed gill rakers 4 to 10, gill raker at angle shorter than gill filaments at angle. Dorsal fin with VII or VIII slender spines and 10 to 12 rays, the third or fourth spine longest, its length contained 3.2 to 4.2 times in head length, the longest dorsal-fin ray contained 2.3 to 3.3 times in head length; base of spinous part of dorsal fin subequal to that of soft-rayed part; anal fin with III slender spines and 8 rays, the first 1 or 2 spines embedded and difficult to see in large fish; pectoral-fin rays 16 to 18; pectoral fins subequal to pelvic fins, pectoral-fin length contained 2.1 to 2.4 times in head length; caudal fin emarginate, the caudal concavity contained 5 to 10 times in head length. Lateral-line scales 83 to 97. **Colour:** Two colour forms: the pale black-saddled form is whitish or pale yellowish with 5 dark brown to black, irregular, saddle-like or wedge-shaped bars or blotches on dorsal part of head and body, the first just behind eyes, the second on nape, the third to fifth under dorsal fin; small dark-edged blue spots may be visible on body (mainly posteriorly); fins, caudal peduncle, snout and jaws yellow; black blotch centrally at base of paired fins; small juveniles (7 to 15 cm standard length) with membranes between first and fifth dorsal-fin spines mostly blackish. The dark form is brown, olivaceous, red, or nearly black, the dark bars (as on pale form) are usually faint or absent; numerous, round, dark-edged blue spots (about half pupil diameter) on head, body (except ventrally); soft dorsal, caudal and anal fins, and base of pectoral fins: pectoral fins dark brown distally, the rays darker than membranes, the rear edge white.

Geographical Distribution: Indo-Pacific, from southern Mozambique to the Tuamotus, Austral Islands and Rapa, but not in the Red Sea or Persian Gulf. Except for the east coasts of Africa and Australia, records of *P. laevis* are from insular localities; it ranges from Kenya to Delagoa Bay and is known from most of the islands of the Indian Ocean. In the western Pacific, it occurs from Japan (Ryukyu Islands) to the southern Great Barrier Reef, and is known from most of the islands in the central and western Pacific (Fig. 502). *P. laevis* has not been recorded from the Asian coast or Indonesia.

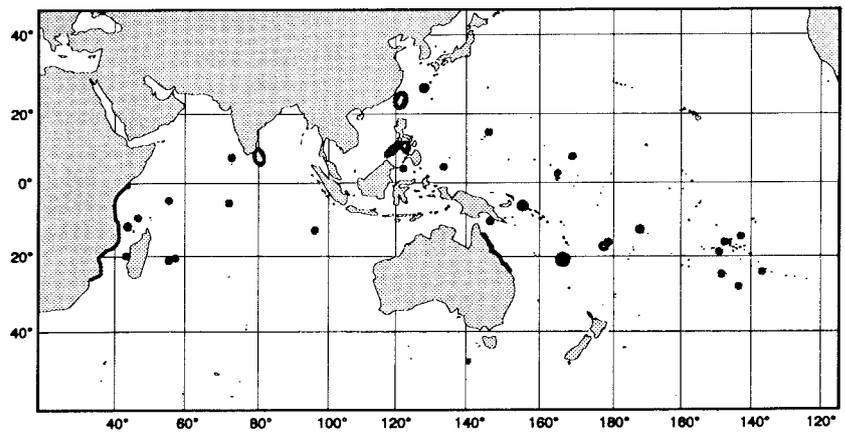


Fig. 502

Habitat and Biology: *P. laevis* is a conspicuous and fairly common species on coral reefs of the Indo-Pacific region at depths of 4 to at least 90 m. A.M. Ayling (quoted in Randall and Hoese, 1986) suggested that the pale black-saddled juveniles may be mimics of the pufferfish *Canthigaster valentini*: "... juveniles of both forms [pale and dark] less than about 20 cm total length normally employ pectoral fin sculling for propulsion, holding the caudal fin distinctly folded and the front section of the spinous dorsal erect. When swimming in this manner, individuals of *P. laevis* less than 12 cm total length look remarkably similar to the puffer fish *Canthigaster valentini* and may be mimicking this species."

It is interesting to note that the pale black-saddled form of *P. laevis* are usually smaller (8 to 57 cm standard length) than the dark reddish brown phase (15 to 100 cm standard length). It is tempting to speculate that these two colour phases represent sexual dichromatism with the smaller (pale phase) being juveniles and females, and the larger dark phase being males. We have no information on sex ratios for the two colour forms, but this hypothesis would agree with a protogynous hermaphroditism type of reproductive system, which seems to be the usual system for groupers and is known for *P. leopardus*. According to Morgans (1982) maturity "seems to occur" at 50 to 52 cm standard length (2.8 to 3.2 kg).

Randall (1980) and Morgans (1982) reported that *P. laevis* feeds exclusively on fishes. The prey comprises a variety of large reef fishes, including groupers. This diet of large fishes is responsible for the high concentrations of ciguatera toxins found in this species (Randall, 1980).

Size: Attains 100 cm standard length (about 125 cm total length) and a weight of 18 kg.

Interest to Fisheries: Despite the danger of ciguatera poisoning, *P. laevis* is commonly used for food. Caught with hook-and-line, spear, and in fish traps.

Local Names: AUSTRALIA: Coral trout, Chinese footballer, Footballer trout, Tiger trout; JAPAN: Kokuhan-ara; KENYA: Njombo; MICRONESIA: Saddleback grouper, Giant coraltrout; NEW CALEDONIA: Indépendante, Babonne, Saumonée grosse race; PHILIPPINES: Sunong-kabang (Visayan); TAHITI: Tonu; TANZANIA: Njombo.

Literature: Misidentified as *P. maculatus*: Talbot (1959) and Morgans (1982). Randall and Hoese (1986); Myers (1989); Randall et al. (1990); Randall and Heemstra (1991).

Remarks: Leis (1986) gave some descriptive information on the larvae.

Plectropomus leopardus (Lacepède, 1802)

Fig. 503; Pl. XXIXE

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Holocentrus leopardus Lacepède, 1801:332, 367 (no locality given, but the holotype came from the East Indies, probably Indonesia).

Synonyms: *Plectropoma leopardinus* Cuvier in Cuv. and Val., 1828:392, pl. 36 (substitute for *Holocentrus leopardus* Lacepède). *Plectropoma cyanostigma* Bleeker, 1845:525 (*nomen nudum*; listed in synonymy of *Paracanthistius leopardinus*). *Plectropoma maculatum* variety B Bleeker, 1849:40 (Jakarta). *Paracanthistius suji* Tanaka, 1916:415, pl. 112, fig. 3 (type locality: Saigasaki, Japan).

FAO Names: **En** - Leopard coral grouper (formerly: Bluedotted coraltrout); **Fr** - Saumonée léopard (formerly: Mérrou étoiles bleues); **Sp** - Mero celestial.

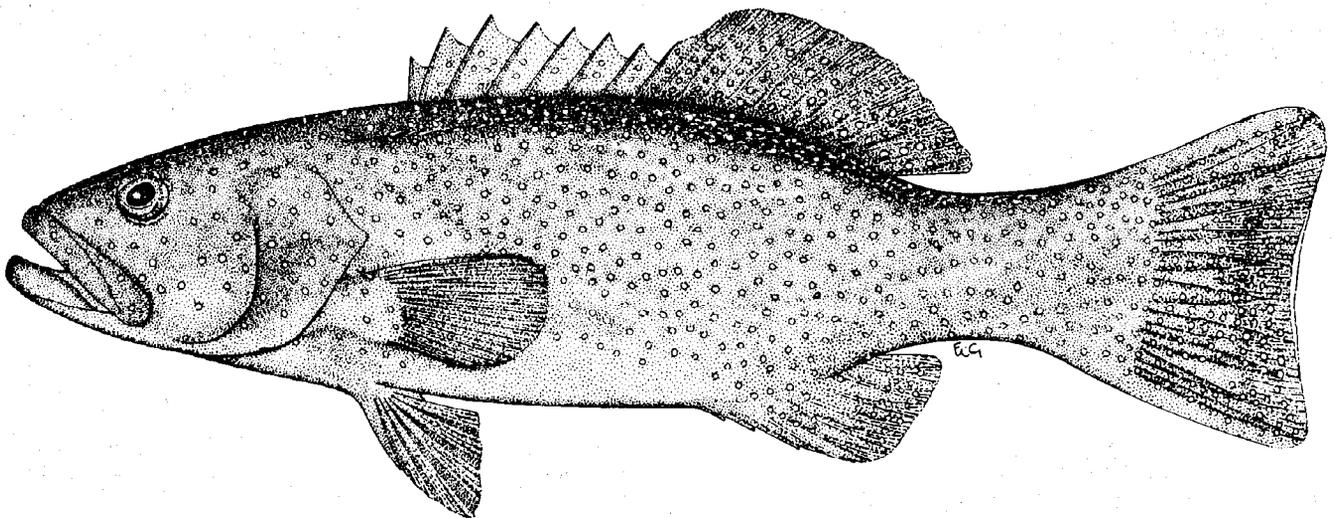


Fig. 503 *Plectropomus leopardus*
(208 mm standard length)

Diagnostic Features: Body elongate, robust, the depth contained 2.9 to 3.9 times in standard length (for fish 12 to 50 cm standard length). Head length contained 2.7 to 3.1 times in standard length; snout length contained 2.8 to 3.6 times in head length; suborbital depth contained 5.6 to 10 times in head length; interorbital area flat (rounded at edges of orbits), without scales; preopercle broadly rounded, with 3 large, ventrally-directed spines along lower half; interopercle and subopercle smooth; opercle with 3 flat spines, the upper and lower spines covered by skin; nostrils subequal for fish less than 40 cm standard length (at larger sizes, the rear nostrils may be enlarged); midlateral part of upper jaw with 1 to 4 enlarged fixed canines. Lower limb developed gill rakers 6 to 10, gill raker at angle longer than gill filaments at angle. Dorsal fin with VII or VIII slender spines and 10 to 12 rays, the third or fourth spine longest, its length contained 3.2 to 4.2 times in head length, the longest dorsal-fin ray contained 2.2 to 2.7 times in head length; base of spinous part of dorsal fin subequal to that of soft-rayed part; anal fin with III slender spines and 8 rays, the first 1 or 2 spines embedded and difficult to see in large fish; pectoral-fin rays 15 to 17; pectoral fins subequal to pelvic fins, pectoral-fin length contained 1.9 to 2.2 times in head length; caudal fin emarginate, the caudal concavity contained 5 to 12 times in head length. Lateral-line scales 89 to 99. **Colour:** Olivaceous to reddish brown, orange-red or red, with numerous small (nostril sized and usually dark-edged) blue spots on head and body (except ventrally) and median fins; more than 10 spots on cheek (below and behind eye to rear edge of preopercle; blue ring (dark brown in alcohol) on edge of orbit (sometimes broken into segments);

pectoral fins reddish or hvaline with darker rays: an indistinct dark band at rear margin of caudal fin, with a white line usually visible along middle of rear edge of the fin.

Geographical Distribution: Western Pacific, from southern Japan to Australia (Queensland and Western Australia) and eastward to the Caroline Islands and Fiji. We have also examined specimens from Hong Kong, Viet Nam, Philippines, Indonesia, Palau Islands, Papua New Guinea, and New Caledonia (Fig. 504).

Habitat and Biology: *P. leopardus* occurs on coral reefs of the Indo-Pacific region at depths of 3 to 100 m. Goeden (1978) studied age, growth and biology of *P. leopardus* from the Great Barrier Reef. Annual growth increments and age were determined from modal separation of length-frequency distributions. The largest fish (modal standard length of 50 cm) were estimated to be 5 years old. The species was found to be a protogynous hermaphrodite, based on histological evidence and the size versus sex distribution. The smallest mature female was 21 cm standard length (age 2) and the largest 47 cm (age 4); the smallest mature male was 30 cm (age 3) and the largest male was 54 cm. Spawning occurred in late November and early December. A 4-year old fish was estimated to

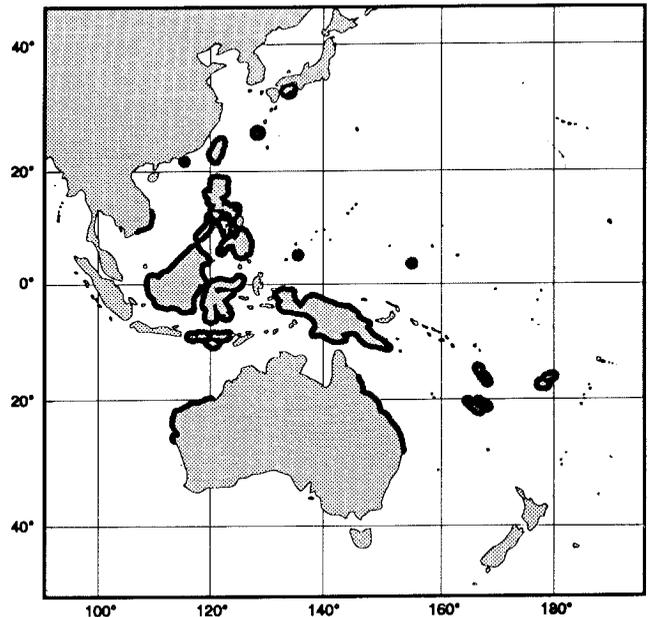


Fig. 504

contain 457 900 eggs. Goeden (1978) also described courtship behaviour of 2 males with 12 females: 1 or more hovering females were approached from behind by a larger male which changed from dark brown to pale brown or brownish white, while the margins of median fins remained conspicuously dark; as the male came close to the female, it began flicking its dorsal and pelvic fins, which elicited a mild lateral display from the female and the male then rolled onto its side and shook from side to side as its abdomen passed near the female. This procedure took about 15 seconds and was repeated 5 times; no release of milt or eggs was observed.

Goeden (1978) also found that *P. leopardus* feeds throughout the day and is inactive at night; 96% of the prey comprised fish. Small juveniles (6 to 20 cm standard length) included a few benthic crustaceans in their diet, but adults feed only on fishes, primarily atherinid and scarid fishes.

Size: Attains 57 cm standard length (about 70 cm total length).

Interest to Fisheries: *P. leopardus* is a popular food fish and sometimes causes ciguatera. Caught with hook-and-line, spear, traps, and trawls.

Local Names: AUSTRALIA: Coral trout; JAPAN: Suji-ara; MICRONESIA: Leopard coral trout; NEW CALEDONIA: Saumonée leopard; PHILIPPINES: Suno (Visayan), Mambo (Cuyonin); SAMOA: Ata'ata-utu; SINGAPORE: Kerap bara; TAHITI: Tonu.

Literature: Often misidentified as *P. maculatus*: Fourmanoir and Laboute (1976); Min et al. (1982); Randall and Hoese (1986); Randall and Heemstra (1991).

Remarks: Leis (1986) described and illustrated the development of the larvae and a newly settled juvenile of 20 mm standard length.

Plectropomus maculatus (Bloch, 1790)

Fig. 505; Pl. XXIXF

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Bodianus maculatus Bloch, 1790:48, pl. 228 (type locality given as Japan, but probably an error for Java).

Synonyms: None.

FAO Names: **En** - Spotted coralgroupers (formerly: Spotted coraltrout); **Fr** - Vielle Saint-Silac; **Sp** - Mero con pintas (formerly: Mero de coral).

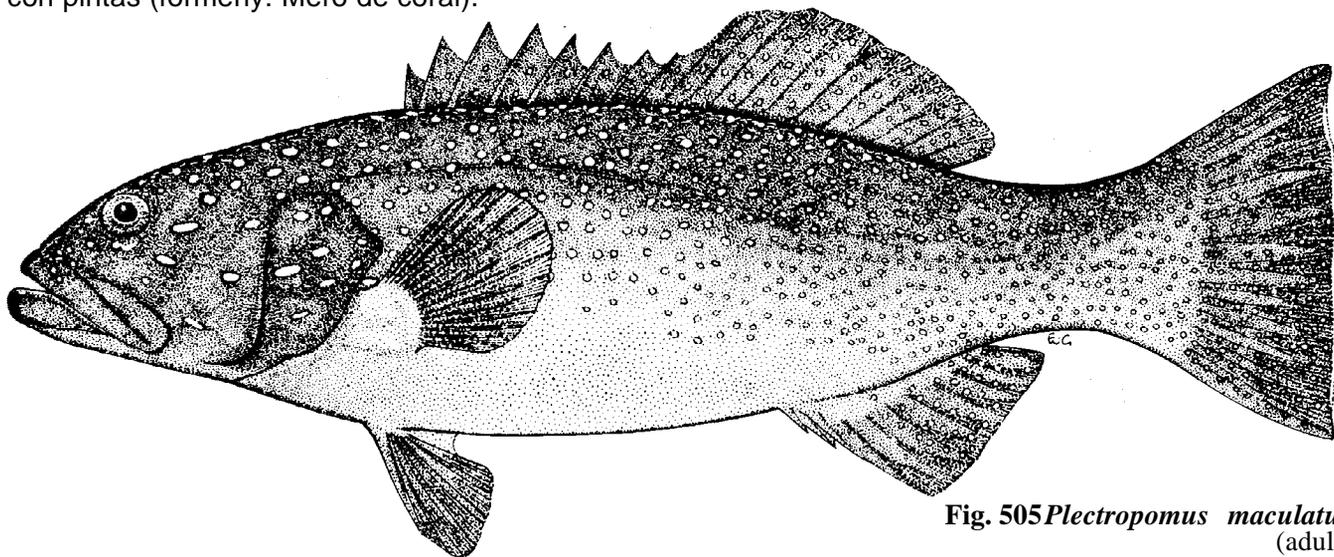


Fig. 505 *Plectropomus maculatus* (adult)

Diagnostic Features: Body elongate, robust, the depth contained 2.9 to 3.9 times in standard length (for fish 15 to 48 cm standard length). Head length contained 2.7 to 3.1 times in standard length; snout length contained 2.8 to 3.6 times in head length; suborbital depth contained 5.6 to 10 times in head length; interorbital area flat (rounded at edges of orbits), without scales; preopercle broadly rounded, with 3 large, ventrally-directed spines along lower half; interopercle and subopercle smooth; opercle with 3 flat spines, the upper and lower spines covered by skin; nostrils subequal, set in a shallow groove running forward from eye; midlateral part of upper jaw with .1 to 4 enlarged fixed canines. Developed gill rakers on lower limb 6 to 9, gill raker at angle distinctly longer than gill filaments at angle. Dorsal fin with VII or VIII slender spines and 10 to 12 rays, the third or fourth spine longest, its length contained 3.2 to 4.2 times in head length, the longest dorsal-fin ray contained 2.2 to 2.5 times in head length; base of spinous part of dorsal fin subequal to that of soft-rayed part; anal fin with III slender spines and 8 rays, the first 1 or 2 spines embedded and difficult to see in large fish; pectoral-fin rays 15 to 17; pectoral fins subequal to pelvic fins, pectoral-fin length contained 1.7 to 2.2 times in head length; caudal fin emarginate, the caudal concavity contained 5 to 10 times in head length. Lateral-line scales 83 to 97. **Colour:** Head, body, and median fins greenish grey, brown, red, or orange-red, with dark-edged blue spots; spots on head and anterior part of body about half pupil diameter or larger (and many are oval or horizontally elongated), becoming much smaller, more uniformly round, and more numerous on rear part of body and on fins; few spots on head, 3 to 7 on cheeks (below and behind eye to rear edge of preopercle); no blue spots on ventral parts of head and body; usually a single blue spot on pectoral-fin base and another in axil; no blue spots on pelvic fins; rear margin of caudal fin with a white edge.

Geographical Distribution: *P. maculatus* is known only from the western tropical Pacific: Thailand, Singapore, Philippines, Indonesia, Papua New Guinea, Solomon Islands, and Australia (Western Australia to southern Queensland) (Fig. 506). *P. maculatus* was formerly listed for the western Indian Ocean (Heemstra and Randall, 1984) due to a misidentification of *P. pessuliferus*.

Habitat and Biology: *P. maculatus* is common on coastal reefs of Queensland and Indonesia. Depths of capture for this species are 5 to 50 m.

Size: Attains 100 cm standard length (about 125 cm total length) and a weight of 25 kg.

Interest to Fisheries: *P. maculatus* is commonly used for food. Caught with hook-and-line, spear, and in trawls.

Local Names: AUSTRALIA: Coral cod, Leopard fish, Coral trout, Leopard trout; MALAYSIA: Keapu bara; PAPUA NEW GUINEA: Bogi; SINGAPORE: Kerapu sonoh, J'in hou.

Literature: Kyushin et al. (1982); Min et al. (1982); Randall and Hoese (1986); Randall and Heemstra (1991).

Remarks: Leis (1986) described and illustrated the larvae and a 40 mm juvenile.

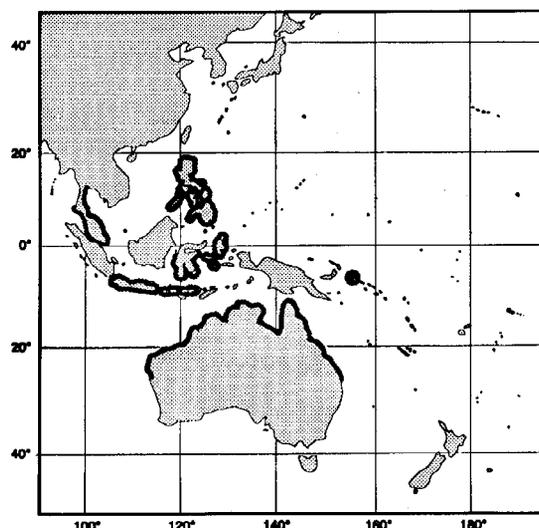


Fig. 506

Plectropomus oligacanthus Bleeker, 1854

Fig. 507; Pl. XXXA

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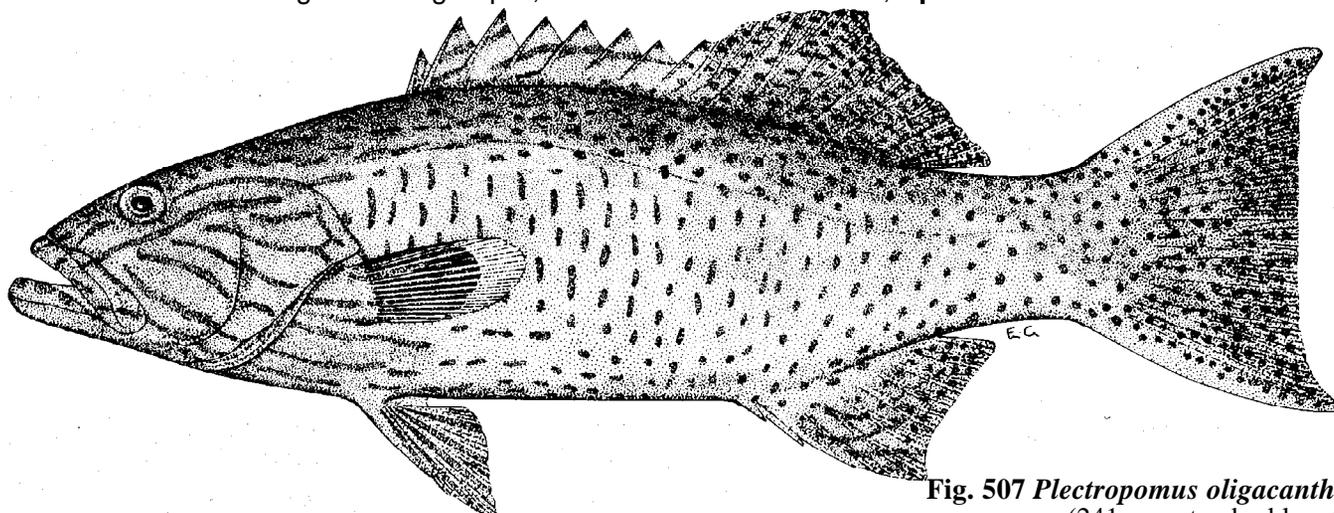
Plectropoma oligacanthus Bleeker, 1854:422 (type locality: Jakarta, Indonesia).**Synonyms:** *Plectropoma variegatum* Castelnau, 18757 (type locality: Cape York, Australia).**FAO Names:** En - Highfin coralgrouper; Fr - M erou-loche cacatois; Sp - Mero vela.

Fig. 507 *Plectropomus oligacanthus*
(241 mm standard length)

Diagnostic Features: Body elongate, robust, the depth contained 2.9 to 3.9 times in standard length (for fish 16 to 51 cm standard length). Head length contained 2.7 to 3.1 times in standard length; snout length contained 2.8 to 3.6 times in head length; suborbital depth contained 3.3 to 7.2 times in head length; interorbital area flat (rounded at edges of orbits), without scales; preopercle broadly rounded, with 3 large ventrally-directed spines along lower half; interopercle and subopercle smooth; opercle with 3 flat spines, the upper and lower spines covered by skin; midlateral part of upper jaw with 1 to 4 enlarged fixed canines. Developed gill rakers on lower limb 7 to 9, gill raker at angle subequal to gill filaments at angle. Dorsal fin with VII or VIII slender spines and 10 to 12 rays, the third or fourth spine longest, its length contained 3.2 to 4.2 times in head length; base of spinous part of dorsal fin subequal to that of soft-rayed part; anal fin with III slender spines and 8 rays, the first 1 or 2 spines embedded and difficult see in large fish; soft dorsal and anal fins pointed anteriorly, the second to fourth dorsal- and anal-fin rays elongated, their length contained 1.5 to 2.1 times in head length; pectoral-fin rays 14 to 16; pectoral fins shorter than pelvic fins, pectoral-fin length contained 2.1 to 2.4 times in head length; caudal fin emarginate, the caudal concavity contained 3 to 7 times in head length. Lateral-line scales 86 to 96. **Colour:** Head, body, and fins reddish brown to red, with horizontal to oblique blue lines on rear of head and anterodorsally on body; vertical blue lines (or dashes) anteriorly on side of body (at least in adults), and numerous blue spots elsewhere on body and on caudal fin; dorsal and anal fins with blue lines and spots; pectoral fins pale yellowish, with basal two-thirds of rays dark brown and a few blue lines at base of fin; pelvic fins with brownish red rays and blue membranes.

Geographical Distribution: Western Pacific Ocean: Philippines, Indonesia, New Guinea, northeastern Australia (Cape York to northern Great Barrier Reef), Belau, Truk, Caroline Islands, Marshall Islands, and the Solomon Islands (Fig. 508).

Habitat and Biology: Coral reefs in 4 to 40 m. Very little has been published on the biology of this rare species. According to Schroeder (1980) "Groups of two or three often forage together for rock- and sand living crustaceans and fishes."

Size: Attains 75 cm total length.

Interest to Fisheries: *P. oligacanthus* is well known in the Philippines, but it seems to be rare elsewhere. It is of minor importance in artisanal fisheries, and it has been implicated in cases of ciguatera fish poisonings. Caught with hook-and-line, spear, and in traps.

Local Names: MICRONESIA: Blue-lined coral trout; PHILIPPINES: Vermiculate coral trout, Lapu-lapung pula, Sunong pula, Mambo.

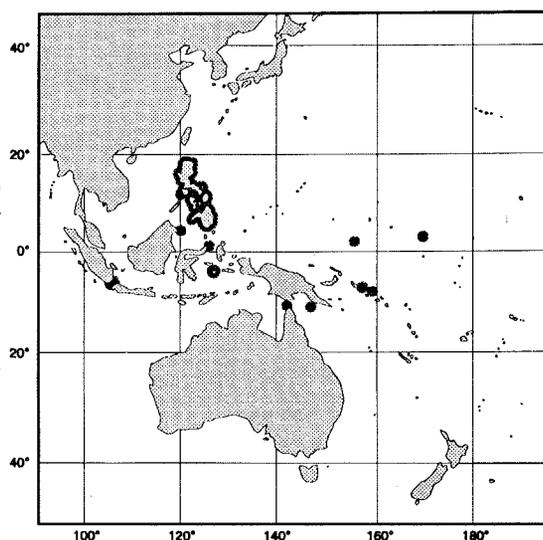


Fig. 508

Literature: Randall and Hoese (1986); Randall and Heemstra (1991).

Remarks: *P. oligacanthus* is the most distinctive and rarest species of the genus *Plectropomus*.

Plectropomus pessuliferus Fowler, 1904

Fig. 509; Pl. XXXB,C

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Plectropoma pessuliferum Fowler, 1904:520, pl. 17, upper fig. (type locality: Padang, Sumatra).

Synonyms: *Perca miniata* variety C Forsskål, 1775:42 (Red Sea). *Plectropoma maculatum* variety D Playfair and Gunther, 1867:13 (Zanzibar). *Plectropoma maculatum* variety A (in part) Boulenger, 1895:161 (Zanzibar).

FAO Names: En - Roving coralgroupers; Fr - Mérou-loche vagabonde; Sp - Mero errante.

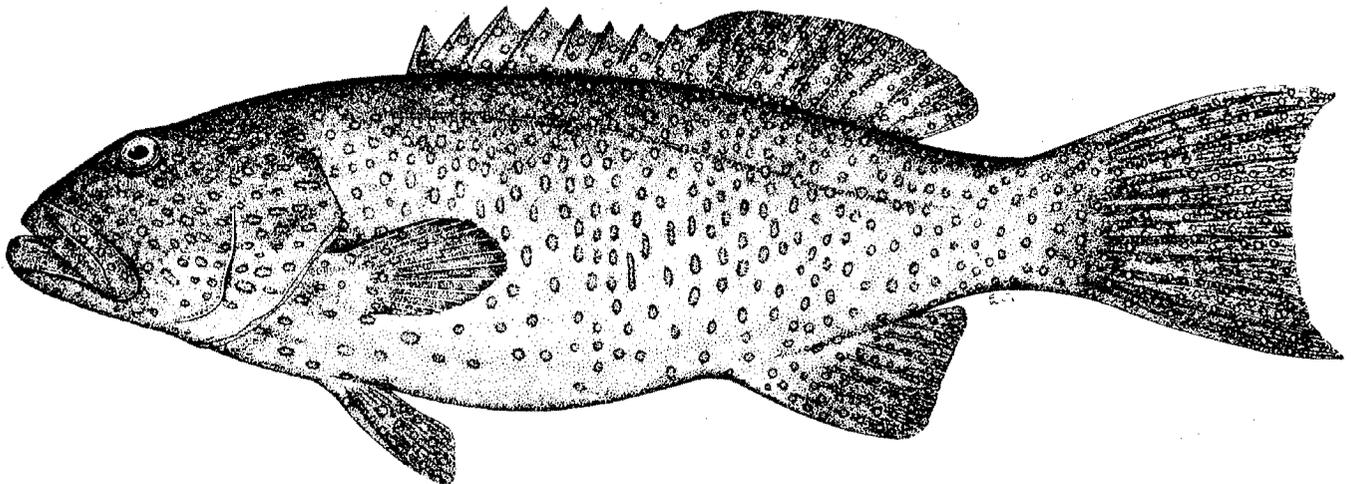


Fig. 509 *Plectropomus pessuliferus*
(480 mm standard length)

Diagnostic Features: Body elongate, robust, the depth contained 2.9 to 3.9 times in standard length (for fish 15 to 63 cm standard length). Head length contained 2.7 to 3.1 times in standard length; snout length contained 2.8 to 3.6 times in head length; suborbital depth contained 5.6 to 10 times in head length; interorbital area flat (rounded at edges of orbits), without scales; preopercle broadly rounded, with 3 large, ventrally-directed spines along lower half; interopercle and subopercle smooth; opercle with 3 flat spines, the upper and lower spines covered by skin; nostrils set in a shallow groove running forward from eye; nostrils subequal for fish less than about 30 cm standard length, the posterior nostrils often enlarged in larger fish; midlateral part of lower jaw with 1 to 4 enlarged fixed canines. Developed gill rakers on lower limb 7 to 10, the gill raker at angle shorter than gill filaments at angle. Dorsal fin with VII or VIII slender spines and 10 to 12 rays, the third or fourth spine longest, its length contained 3.2 to 4.2 times in head length, the longest ray contained 2.3 to 3.0 times in head length; base of spinous part of dorsal fin subequal to that of soft-rayed part; anal fin with III slender spines and 8 rays, the first 1 or 2 spines embedded and difficult to see in large fish; pectoral-fin rays 15 or 16; pectoral fins subequal to pelvic fins, pectoral-fin length contained 1.9 to 2.3 times in head length; caudal fin emarginate (truncate in juveniles), the caudal concavity contained 4.6 to 6.2 times in head length. Lateral-line scales 85 to 104. Pyloric caeca 3, large and finger-like.

Colour: Head, body, and fins brown to orange-red, with numerous small dark-edged blue spots; some spots on head and sides of body of adults are elongated (those on body usually vertically elongate); spots few or absent on ventral part of body; edge of orbit often blue (may be broken into segments).

Geographical Distribution: Red Sea, Zanzibar, Maldives, St. Brandon's Shoals, Sri Lanka, Chagos, Nazareth Bank, Sumatra, and Fiji (Fig. 510).

Habitat and Biology: *P. pessuliferus* occurs on or near coral reefs at depths of 25 to 147 m.

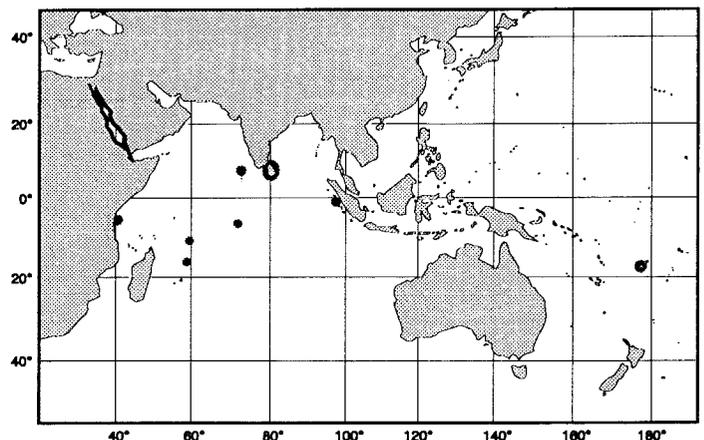


Fig. 510

Size: Attains 120 cm total length in the Red Sea, and at least 63 cm total length in other parts of the Indo-Pacific region.

Interest to Fisheries: A popular food fish on the Arabian coast of the Red Sea. Caught with hook-and-line, spear, and in trawls.

Local Names: SAUDI ARABIA: Nagil.

Literature: Often misidentified as *P. maculatus*: Kyushin et al. (1977); Wray (1979); Pilosof and Fishelson (1981); Randall (1983); Randall and Ben-Tuvia (1983, in part); Schmid and Vine (1985).

Remarks: Randall and Hoese (1986) recognized two subspecies: *P. pessuliferus marisrubri* Randall and Hoese (1986) in the Red Sea, and *P. pessuliferus pessuliferus* from the rest of the Indo-Pacific region. The Red Sea subspecies has more numerous blue spots on the cheek (30 to 50 behind and below centre of eye to edge of preopercle, versus 5 to 12 blue spots on cheek of the nominate subspecies); and the pectoral-fin rays of *P. p. marisrubri* are dark brown, becoming abruptly pale distally, whereas the pectoral-fin rays are uniformly pale on the other subspecies.

P. pessuliferus differs from *P. maculatus* in having the longest gill rakers shorter than the longest gill filaments, some spots on body vertically elongate, and pelvic fins with blue spots.

Plectropomus punctatus Quoy and Gaimard, 1824

Fig. 511; Pls XXXD-F, XXXIA

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Plectropoma punctatum Quoy and Gaimard, 1824:318, pl. 45, fig. 1 (type locality: Mauritius).

Synonyms: *Plectropoma maculatum* variety G Playfair and Gunther, 1867:14 (Seychelles); *Plectropoma maculatum* variety E Boulenger, 1895:162 (specimen described by Playfair and Gunther, 1867). *Plectropomus* sp. Fourmanoir, 1954:216, (Mayotte, Comoro Islands); Kyushin et al. (1977:188, species no. 86, 616 mm fish at top of page). *Plectropomus marmoratus* Talbot, 1959:751, pl. 21 (type locality: Zanzibar).

FAO Names: **En** - Marbled coral grouper (formerly: Mottled coral trout); **Fr** - Mérou pointille; **Sp** - Mero pecoso.

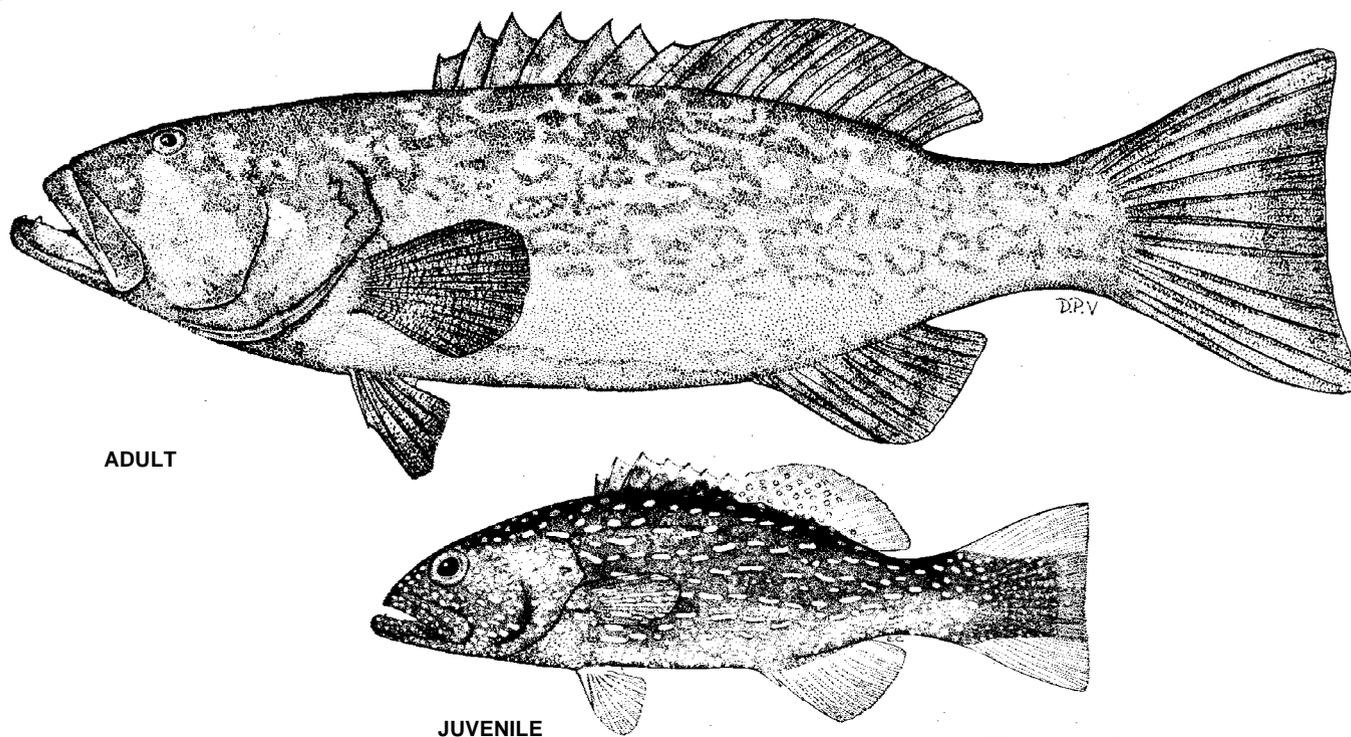


Fig. 511 *Plectropomus punctatus*

(adult 900 mm standard length, juvenile about 80 mm standard length)

Diagnostic Features: Body elongate, robust, the depth contained 2.9 to 3.9 times in standard length (for fish 15 to 61 cm standard length). Head length contained 2.7 to 3.1 times in standard length; snout length contained 2.8 to 3.6 times in head length; suborbital depth contained 5.6 to 10 times in head length; interorbital area flat (rounded at edges of orbits), without scales; preopercle broadly rounded, with 3 large, ventrally-directed spines along lower half; interopercle and subopercle smooth; opercle with 3 flat spines, the upper and lower spines covered by skin; nostrils set in a shallow groove in front of eye; rear nostrils