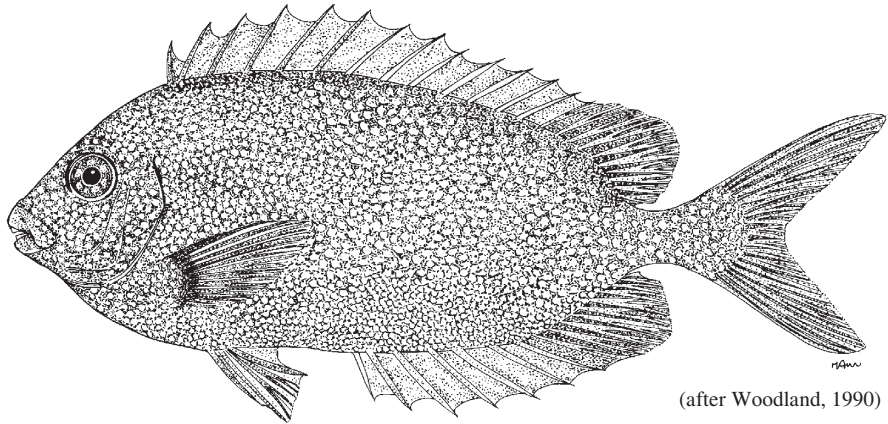


Siganus punctatus (Schneider, 1801)

(Plate XVI, 124 and 125)

Frequent synonyms / misidentifications: *Siganus chrysospilos* (Bleeker, 1852); *Teuthis hexagonata* (Bleeker, 1854) / *Siganus sutor* (Valenciennes, 1835).

FAO names: En - Goldspotted spinefoot.



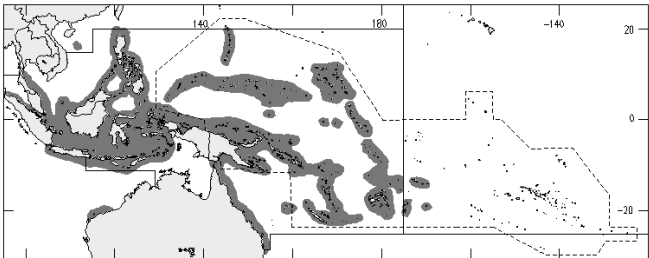
(after Woodland, 1990)

Diagnostic characters: Body deep and compressed, its depth 1.9 to 2.3 times in standard length. Dorsal profile of head virtually a straight line descending at an angle of about 45°, ventral profile slightly concave below chin; up to 13 cm standard length, anterior nostril with a flap reaching half-way to posterior nostril, reducing to a low rim with trace of posterior peak by 15 cm standard length. A forward-directed spine in front of dorsal fin, imbedded in nape; fourth to seventh dorsal-fin spine longest, 1.1 to 1.3 times the last dorsal-fin spine; last anal-fin spine typically longest, occasionally fourth to sixth fractionally longer than last; soft dorsal and anal fins only moderately high, particularly in older fish, longest dorsal-fin ray 1 to 1.2 times the longest dorsal-fin spine; caudal fin emarginate in young (less than 13 cm standard length), gradually changing to deeply forked in old individuals; both caudal-fin lobes broadly rounded at tip, especially the lower lobe. Scales minute; cheeks covered with strong scales; 23 to 27 scale rows between lateral line and bases of leading dorsal-fin spines. **Colour:** in life, background colour in very old fish brown, otherwise pale green or bluish or various shades in between, with golden spots all over head and trunk; spots large (2 to 3 mm diameter), some round to ovoid but usually crowded together to form pentagons, hexagons and the like, creating a “net” pattern. Iris silver, interrupted by 8 to 10 orange spots like the spokes of a wheel. Straddling lateral line at top of gill slit, a deep brown “shoulder” patch, about size of orbit, superimposed on the basic pattern of gold spots; patch distinctly edged with a diffuse white ring in fish smaller than about 10 cm, but ring lost by 20 cm standard length; patch itself is lost in very large fish. Gold pattern on trunk extending along outer faces of the spines of the dorsal and anal fins, also onto soft-rayed portions of these fins in small to medium fish; spots continuing out over caudal fin, become progressively smaller towards trailing edge which in older fish often has a 2 to 3 mm orange margin, as may trailing edge of soft portion of dorsal fin. Pectoral fins hyaline, unspotted. Removed from the water, the spots may darken to a deep brown while the interspaces blanch to paler, so that fish is now pale with dark spots. This reversal in colour intensity is usually only transitory and typically at least some of the gold spots remain paler.

Size: Maximum total length 45 cm, commonly to 30 cm.

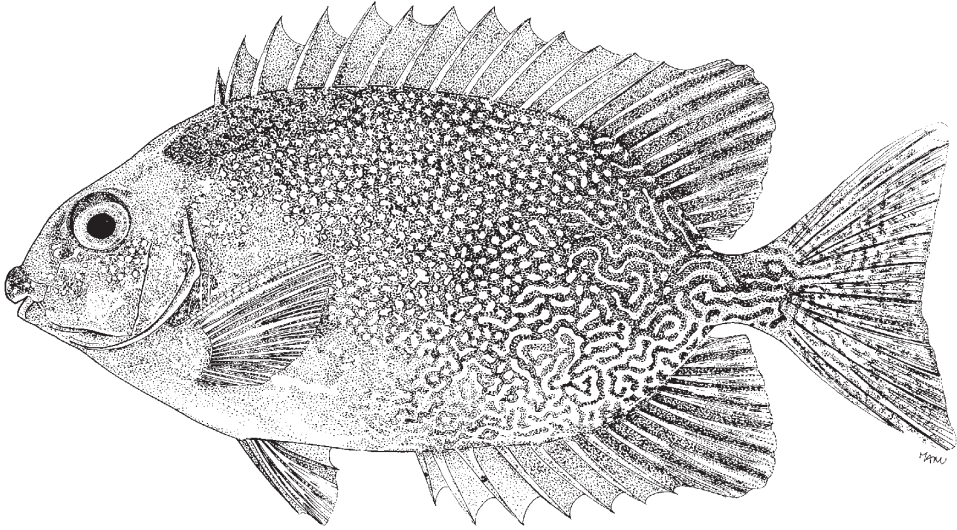
Habitat, biology, and fisheries: Inhabits shallow coastal waters; juveniles and subadults to 3 m in the shallower parts of coral reefs, older fish in deeper water often along the face of the drop-off at the reef edge, and occasionally trawled away from coral reefs to 50 m. Young live in schools of up to about 50 fish with pairing commencing as small as 15 cm, but fish may still be schooling at 22 cm standard length; older fish live in pairs. Feeds on benthic algae. Mainly caught in traps or by spearing; marketed fresh.

Distribution: Throughout most of the western Pacific, from Cocos (Keeling) Islands and west coast of Western Australia eastward to Samoa and Niue, and north to Ryukyu Islands.



Siganus randalli Woodland, 1990

(Plate XVI, 126)

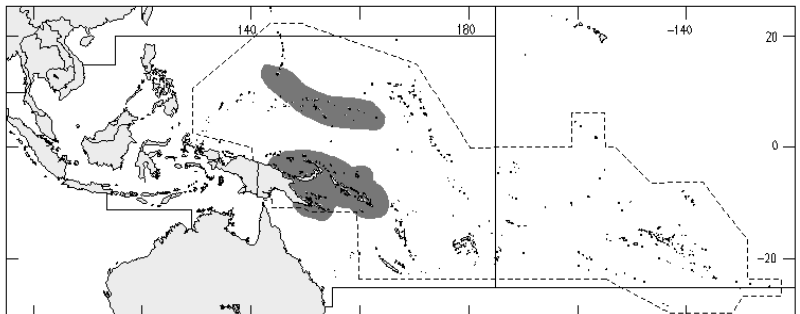
Frequent synonyms / misidentifications: None / None.**FAO names:** En - Variegated spinefoot.

Diagnostic characters: Body deep and compressed, its depth 2 to 2.2 times in standard length. Dorsal profile of head slightly concave above orbit; snout convex, deep and blunt; anterior nostril with a low rim bearing a minute pointed peak posteriorly. A forward-directed spine in front of dorsal fin, imbedded in nape; longest dorsal-fin spine the last in individuals longer than 12.5 cm standard length, but in smaller specimens fifth to seventh dorsal-fin spine marginally longer than the last; **last anal-fin spine longest**, 1.8 to 2 times the length of the first; soft parts of dorsal and anal fins high, particularly the dorsal fin where the longest ray is about 1.4 to 1.6 times the longest dorsal-fin spine; caudal fin emarginate. Scales minute; cheeks covered with prominent scales; 19 to 22 scale rows between lateral line and bases of leading dorsal-fin spines. **Colour:** bronze, spotted with pale blue on head and anterior part of the body; spots replaced by pale blue vermiculating lines on posterior part of body behind a line drawn from base of last dorsal-fin spine to base of first anal-fin spine; spots smallest on nape (0.5 mm), graduating to 1 to 1.5 mm on cheek and 2 to 2.5 mm on midside, distances between spots slightly less than spot diameters. **Spinous part of dorsal fin deep bronze, soft portion of fin bronze basally to bluish distally; anal fin bronze with bluish tips to soft rays; caudal fin blue, marked with bronze vermiculations which break up into spots and short lines on distal half; pectoral fins hyaline with blue rays; pelvic fins deep bronze.**

Size: Maximum total length at least 30 cm, commonly to 25 cm.

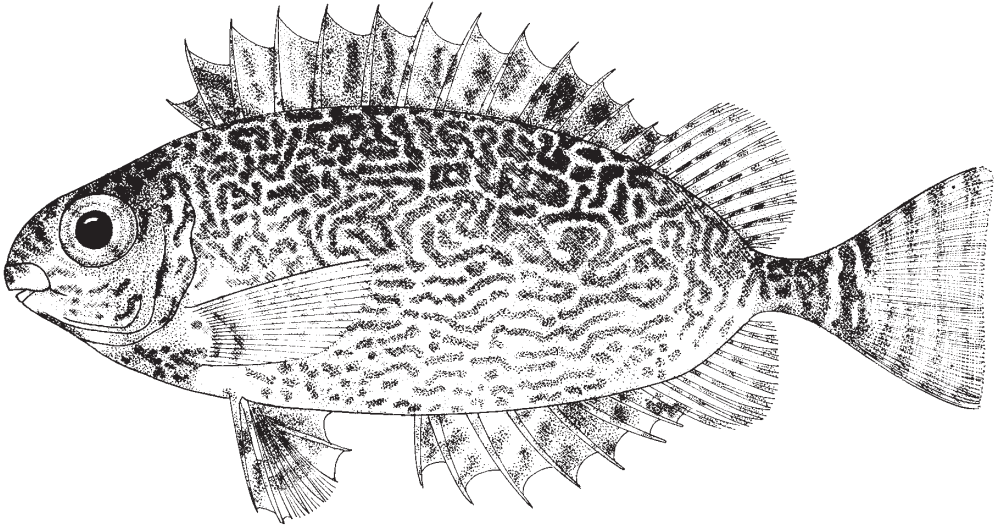
Habitat, biology, and fisheries: Adults on and around coral reefs on bottoms of sand or coral rubble, down to at least 15 m; habitat of small juveniles uncertain but may live in rivers. Adults live in schools of 10 to 20 or more and feed on algae growing on compacted pavement areas. Fished with spearguns. Aquaculture potential being investigated in Guam.

Distribution: Presently recorded only from Guam, Pohnpei, Kosrae, Solomon Islands, and northern coast of Papua New Guinea.



Siganus spinus (Linnaeus, 1758)

(Plate XVII, 127)

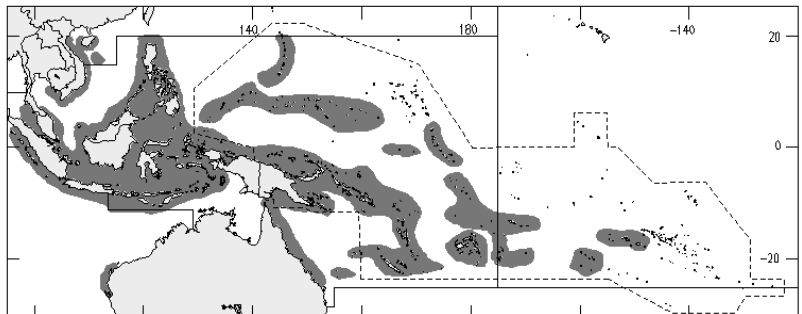
Frequent synonyms / misidentifications: None / None.**FAO names:** En - Little spinefoot; Fr - Petit sigan; Sp - Siganito.

Diagnostic characters: Body deep and compressed, fairly slender, its depth 2.3 to 2.8 times in standard length. Profile of head concave above eye, snout convex and blunt; anterior nostril with a long flap extending at least two-thirds of the way to posterior nostril. A forward-directed spine in front of dorsal fin; fourth to seventh dorsal-fin spine longest, 1.6 to 2 times the length of the last dorsal-fin spine; third or fourth anal-fin spine longest, 1.2 to 1.5 times the length of the last anal-fin spine; soft parts of dorsal and anal fins of moderate length, longest dorsal-fin ray subequal to longest dorsal-fin spine; caudal fin emarginate in juveniles, truncate in adults. Scales minute; cheeks covered with fine scales; 14 to 18 scale rows between lateral line and bases of leading dorsal-fin spines. **Colour:** head and body covered with a pearly blue to pale cream labyrinth on a brown to greyish brown background, the pale lines 1/4 to 1/2 breadth of the dark interspaces; upper part of pattern vermiculate, lower part consisting of more or less horizontal wavy lines. **Pattern on body extending onto pelvic fins and spinous parts of dorsal and anal fins;** dorsal- and anal-fin rays with 2 or 3 dark bands, membranes hyaline; **prominent pale bar across base of caudal fin;** 4 more pale bars on caudal fin, but often indistinct except on outer rays; pectoral fins hyaline.

Size: Maximum total length about 23 cm, commonly to 18 cm.

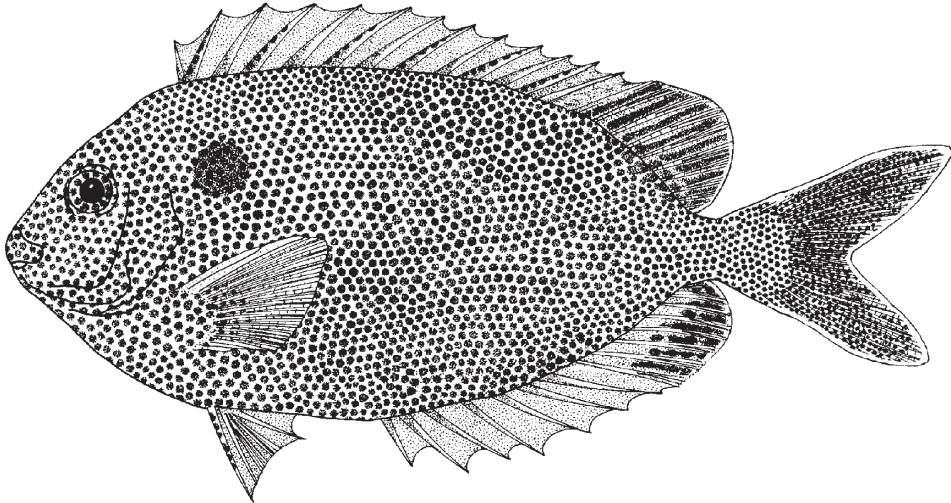
Habitat, biology, and fisheries: Adults inhabit shallow coral-reef flats in small schools of usually less than 10 individuals. The early post-larval stages are pelagic, schooling at the surface away from the reefs. At about 45 mm total length these juveniles migrate - in often immense numbers - onto the reef flats on certain days during the last phase of the moon. Initially, they browse on fine textured, e.g. filamentous algae, switching to coarser algae with increasing size. Adults and older juveniles nearly always present in small numbers in those markets which are supplied by fishers using set traps or spears. "Runs" of migrating juveniles often fished heavily, e.g. combined catch (with *Siganus argenteus* prejuveniles) of 16 t in one season at Guam. Fry eaten fresh, pickled in brine, or made into fish paste.

Distribution: After *S. argenteus*, this is the second most widely distributed siganid: from southern India to the Society Islands, south to New Caledonia and north to southern Honshu.



Siganus stellatus Forsskål, 1775

(Plate XVII, 128)

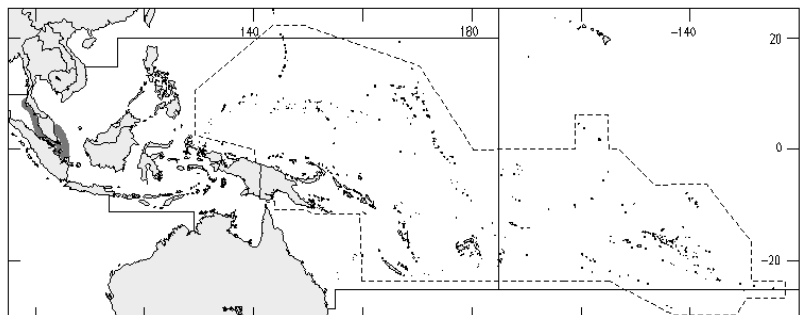
Frequent synonyms / misidentifications: None / None.**FAO names:** En - Brownspeckled spinefoot; Fr - Sigan marguerite; Sp - Sigano margarita.

Diagnostic characters: Body deep and compressed, its depth 2 to 2.3 times in standard length. Dorsal profile of head virtually a straight line descending at an angle of about 45°, ventral profile slightly concave below chin; juveniles with a long triangular flap on anterior nostril, reduced to a low rim in adults. A forward-directed spine in front of dorsal fin; fourth to sixth dorsal-fin spine longest, 1.1 to 1.3 times the length of last dorsal-fin spine; last anal-fin spine usually longest, occasionally third to sixth fractionally longer than last; soft dorsal and anal fins only moderately high, longest dorsal-fin ray 1 to 1.2 times the longest dorsal-fin spine; **caudal fin emarginate in young, gradually changing to deeply forked in old individuals; both caudal-fin lobes usually broadly rounded at tips**, but upper lobe sometimes acutely pointed. Scales minute; cheeks covered with strong scales; 23 to 28 scale rows between lateral line and bases of leading dorsal-fin spines. **Colour:** in life, greyish green with brown spots all over head and trunk. Spotted pattern extending onto all fins, including basal portion of pectoral-fin rays; **spots large (2 to 3 mm diameter) and crowded on trunk, producing a hexagonal or net pattern**, reducing to pin-head size toward the trailing edge of caudal fin. **Iris silver, interrupted by 10 brown spots like the spokes of a wheel.** (In specimens from the Red Sea, the spots decline in size toward the nape, creating a large green oval patch about the leading spines of the dorsal fin.) Perimeter of caudal fin and trailing edges of soft parts of dorsal and anal fins, yellow. A dark patch of about size of orbit present at origin of lateral line. After death, the spots become very dark brown and the intermediate areas pale to dark lilac; trailing edges of caudal fin and soft parts of dorsal and anal fins orange.

Size: Maximum total length about 40 cm, commonly to 35 cm.

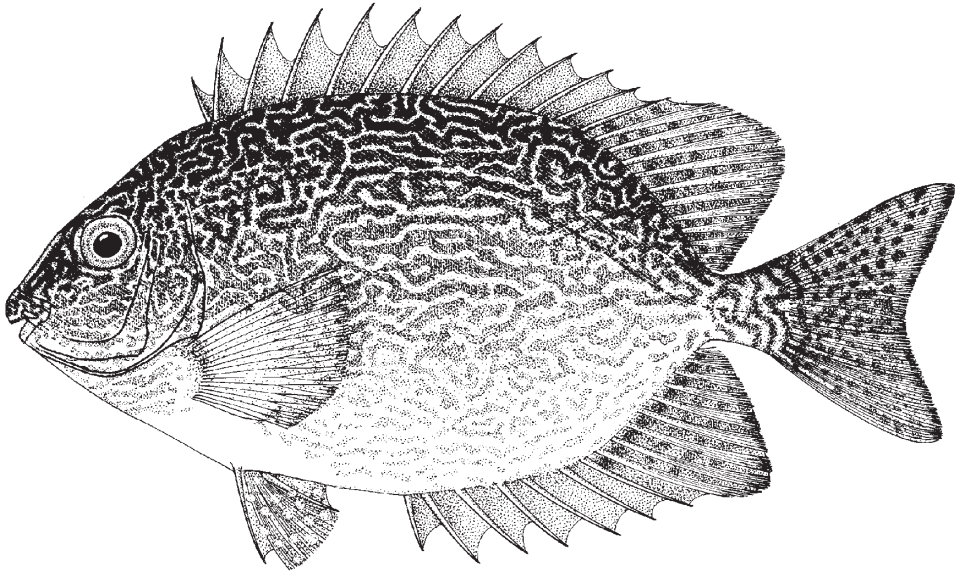
Habitat, biology, and fisheries: Inhabits shallow coastal areas to depths of at least 10 m. Commonly found on coral reefs where closely associated with the coral, but juveniles of less than 10 cm standard length found in creeks bordered by mangroves in some localities. Juveniles and subadults live in schools, adults in pairs. Adults feed from bottom on seaweeds. Caught in set traps and by spearing.

Distribution: From East Africa and the Red Sea through southern India to Andaman Sea area; probably barely enters the fishing area but landed in city markets in the area by boats operating along Indian Ocean coasts of Peninsular Malaysia.



Siganus vermiculatus (Valenciennes, 1835)

(Plate XVII, 129)

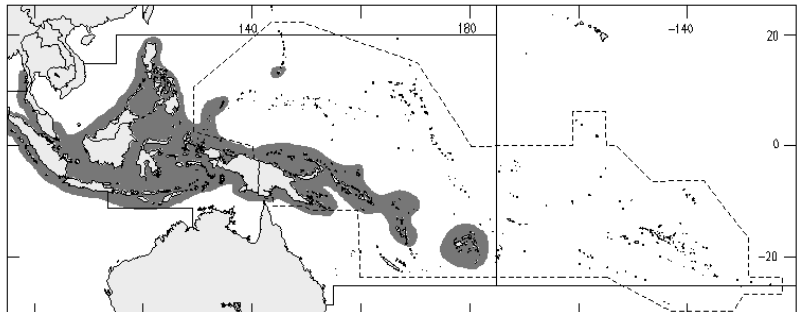
Frequent synonyms / misidentifications: None / None.**FAO names:** En - Vermiculated spinefoot; Fr - Sigan vermicelle; Sp - Sigano vermiculado.

Diagnostic characters: Body deep and compressed, its depth 1.9 to 2.2 times in standard length. Nape convex, slightly concave above orbit; snout convex, deep and blunt; anterior nostril with a flange which is slightly broadened posteriorly. A forward-directed spine in front of dorsal fin, but imbedded in nape; last dorsal-fin spine longest in individuals longer than 10 cm standard length, and fourth to eighth spine longest in smaller fish; **last anal-fin spine longest**, about 1.8 times the length of the first; soft parts of dorsal and anal fins high, particularly dorsal fin in which the longest ray is 1.3 to 1.7 times the longest dorsal-fin spine; **caudal fin emarginate**. Scales minute; cheeks covered with prominent scales; 17 to 26 scale rows between lateral line and bases of leading dorsal-fin spines. **Colour:** head and body totally covered with a vermiculate pattern, the darker coloured areas brownish, the paler ones bluish above grading to silvery below; darker lines much broader than paler ones on nape and head, about equal in breadth posteriorly; darker lines on head brownish yellow or golden yellow; lines on cheeks blue; **dark spots present on soft parts of dorsal and anal fins, arranged in rows, the proximal row prominent, other parts of these fins dusky; dark lines breaking into spots on caudal fin, spots arranged in 4 vertical rows;** pectoral fins hyaline; pelvic fins dusky, the outer spine and ray tinged with brown or golden yellow.

Size: Maximum total length about 45 cm, commonly to 30 cm.

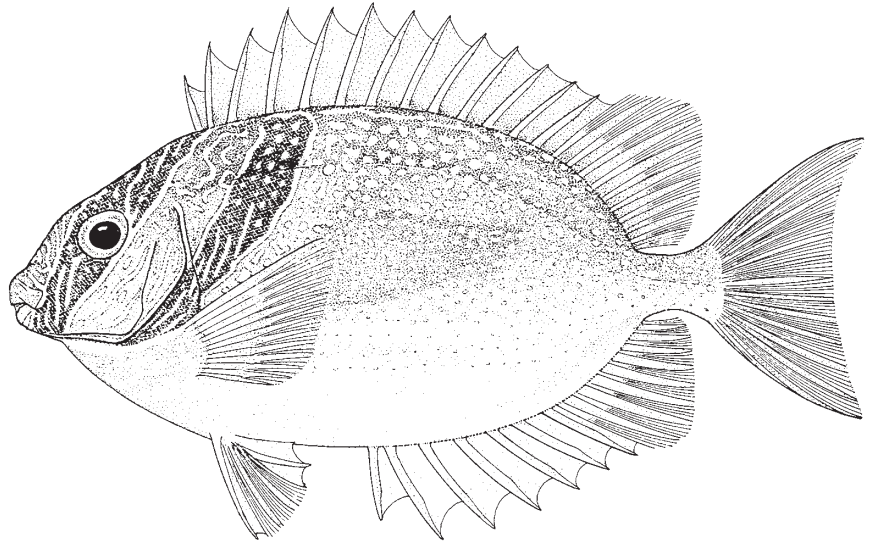
Habitat, biology, and fisheries: An estuary dependent species, also found in brackish lagoons. Juveniles and adults live in small schools (about 20 fish). Adults congregate in summer in inshore areas in groups of several hundred to spawn: spawning is by pairs; sticky eggs laid on bottom; larvae planktonic; postlarvae found up to 25 km offshore; fry and juveniles in creeks among mangroves. Feeds on algae growing on seagrasses, mangrove roots, and rocks. Caught with nets and fixed traps. Flesh is of very high quality and commands premium prices.

Distribution: From southern India to Fiji; in the northern part of the area, positive records for Palau and Guam, but others for Pohnpei and Ebon Island (Marshall Islands) probably due to misidentifying *Siganus spinus*.



Siganus virgatus* (Valenciennes, 1835)*(Plate XVII, 130)****Frequent synonyms / misidentifications:** None / None.**FAO names:** En - Doublebarred spinefoot; Fr - Sigan à deux bandes; Sp - Sigano de dos bandas.**Diagnostic characters:**

Body deep and compressed, its depth 1.8 to 2.3 times in standard length. Dorsal profile of head convex; anterior nostril with a high flange, a little higher and pointed posteriorly. A forward-directed spine in front of dorsal fin, imbedded in nape; fifth to seventh dorsal-fin spine longest, 1.2 to 1.4 times the length of last dorsal-fin spine; third or fourth anal-fin spine typically longest, only a little longer than last anal-fin spine which is infrequently the same length; soft parts of dorsal and

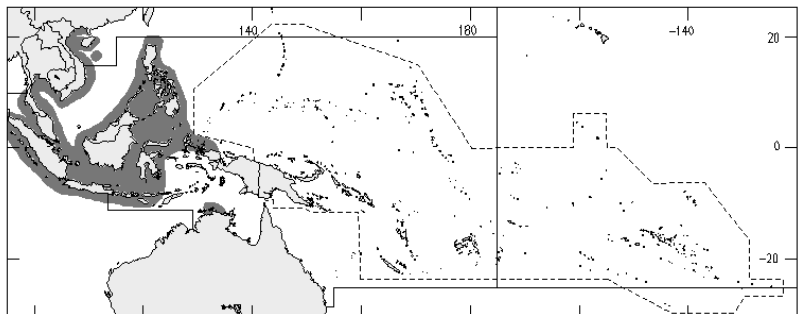


anal fins moderately high, longest dorsal-fin ray 1 to 1.3 times the longest dorsal-fin spine; **caudal fin emarginate in juveniles to moderately forked in adults.** Scales minute; **cheek scalation variable, ranging from a few scattered scales to almost fully scaly, but scales usually confined to posterior part of cheek;** 19 to 27 scale rows between lateral line and bases of leading dorsal-fin spines. **Colour:** a **seal brown band running from nape through eye to chin ("ocular"),** another from base of fourth to sixth dorsal-fin spines to base of pectoral fins ("shoulder"). **Shoulder band contains small blue spots** of which a few may sometimes be elongated into short lines, residual area orange-brown; **ocular band below eye containing blue spots.** Area between 2 bands lemon yellow, with meandering blue lines breaking up into blue spots on cheek. Snout orange; about 10 blue lines running transversely across nape and snout; upper lip yellow, with 2 or 3 transverse blue lines. A pale lemon yellow band immediately behind shoulder band, and narrower than it. **This band and the area between ocular and shoulder bands flashing silvery in life.** Sides of trunk lemon yellow above to silvery below with rosy flush on midsides. **Posterior to shoulder band, sides variously marked with small blue ocelli and short blue lines,** sometimes covering most of upper sides, sometimes confined to small area just behind shoulder band; 4 ephemeral, yellow lines from base of pectoral fins across thorax. Dorsal-fin spines orange, some with a blue streak, in a dusky orange membrane; soft part of dorsal fin and caudal fin yellow; spinous part of anal fin dusky and silver; anal-fin rays orange, membrane bluish; pelvic fins silvery; pectoral fins hyaline.

Size: Maximum total length about 33 cm, commonly 20 cm.

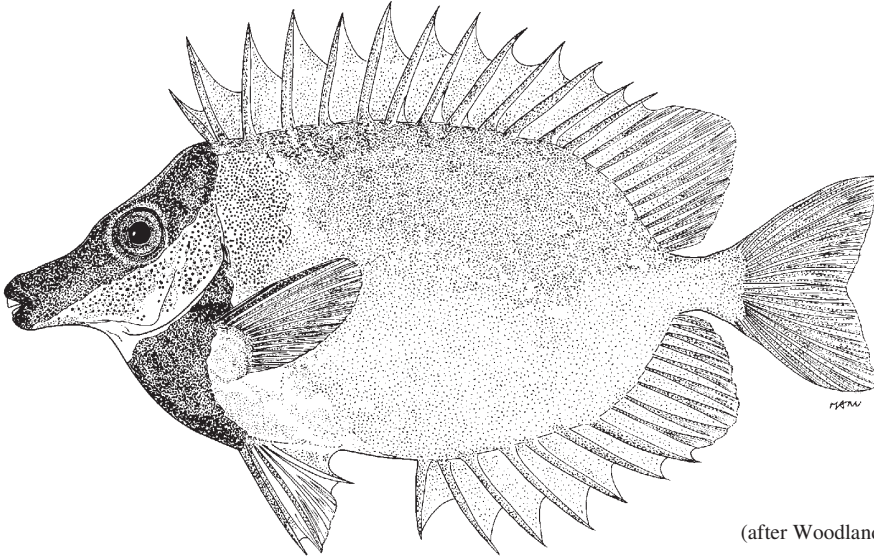
Habitat, biology, and fisheries: Inhabits shallow coastal waters, around both hard coral reefs and areas of sand with patches of rock and soft coral. Tolerates murky waters and reported to enter even fresh water. Larger juveniles and adults live in pairs; feeds on benthic seaweeds. Caught by spearing and with set nets and traps. Regularly present in small numbers in markets supplied from reef areas.

Distribution: Mainly confined to continental shelf areas of Asia; southern India, Sri Lanka, Andaman Islands, Southeast Asia, to Ryukyu Islands in the north; only isolated records for Irian Jaya and the Northern Territory, suggesting it may be rare in this area.



Siganus vulpinus (Schlegel and Müller, 1848)

(Plate XVII, 131)

Frequent synonyms / misidentifications: *Lo vulpinus* (Schlegel and Müller, 1848) / None.**FAO names:** En - Common foxface.

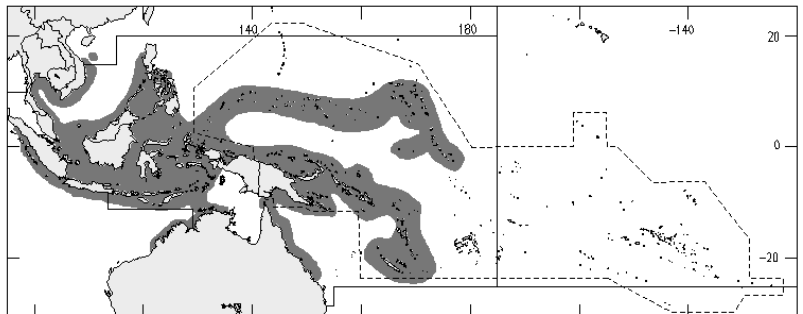
(after Woodland, 1990)

Diagnostic characters: Body deep and compressed, its depth 1.9 to 2.4 times in standard length. Profile of head descending at an angle of about 45° to level of eye, concave before eyes and especially concave behind chin, creating a tubulate snout. A forward-directed spine in front of dorsal fin, imbedded in nape; third to eighth dorsal-fin spine longest, all of which subequal, and slightly longer than (1.1 to 1.3 times) last dorsal-fin spine; soft parts of dorsal and anal fins high, longest dorsal-fin ray 1 to 1.2 times the length of longest dorsal-fin spine; **caudal fin only slightly incised**. Scales minute; cheek scalation variable, usually covered with prominent scales but sometimes scales confined to triangular area between angle of mouth and bottom of eye; 16 to 20 scale rows between lateral line and bases of leading dorsal-fin spines. **Colour:** sides of trunk behind a line from base of third dorsal-fin spine to anus plain yellow, thorax deep chocolate brown, a bar of the same colour from base of leading spine of dorsal fin across eye to and including both lips; midline of head usually with a narrow white blaze which may contain a vertical streak of yellow between the eyes; rest of head and isthmus white, as is that part of sides anterior to the yellow area which, like the cheeks, is stippled with pinhead-sized, pale brown dots. Dorsal, anal, and caudal fins yellow; upper 2 rays of pectoral fins chocolate, rest hyaline; outer spine and ray of pelvic fin chocolate, rest of fin white. **Upper sides of trunk of market specimens sometimes with a brownish patch, especially prominent beneath posterior of spinous part of dorsal fin, but edge of brown patch diffuse not sharp as in *Siganus unimaculatus*.**

Size: Maximum total length 25 cm, commonly to 20 cm.

Habitat, biology, and fisheries: Lives on coral reefs close to the bottom especially where coral growth is most luxurious. Small juveniles live in large schools on shallow reef flats, but by 10 cm standard length fish have started to live in pairs. Pairs of adults live in deeper water such as the faces of the drop-off outside the reef crest, to depths of around 5 m. Feeds on seaweeds growing on dead bases of corals. Caught by spearing, or for the aquarium trade. Appears regularly in markets in small numbers amongst mixed catches of reef species.

Distribution: From Indonesia to New Caledonia in the south-western Pacific, and throughout Micronesia to as far east as Kiribati.

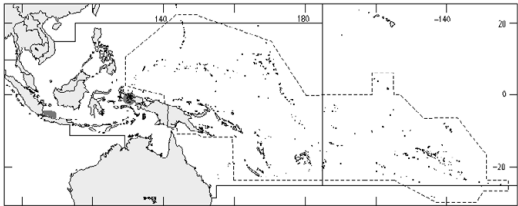
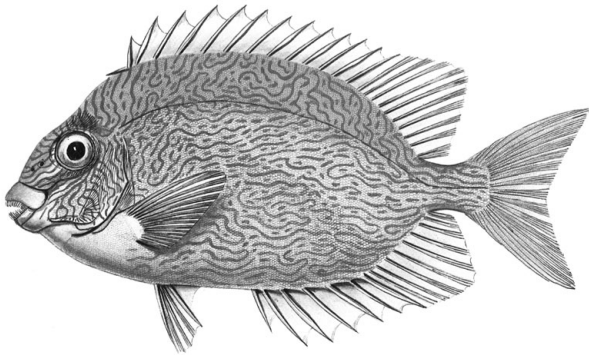


Siganus labyrinthodes (Bleeker, 1853)

(Plate XV, 119)

En - Labyrinth spinefoot.

Maximum total length at least 25 cm. Coastal; probably a schooling species around coral reefs. Herbivorous dentition. Either rare or not being recorded separately from similar species. In Indonesia known from Java and the Moluccas, but perhaps more widespread (e.g. Palawan; Pohnpei?).



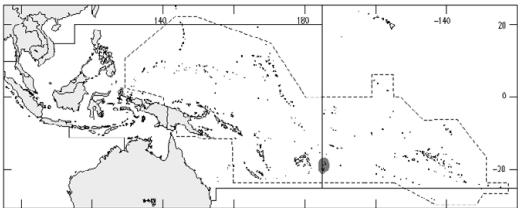
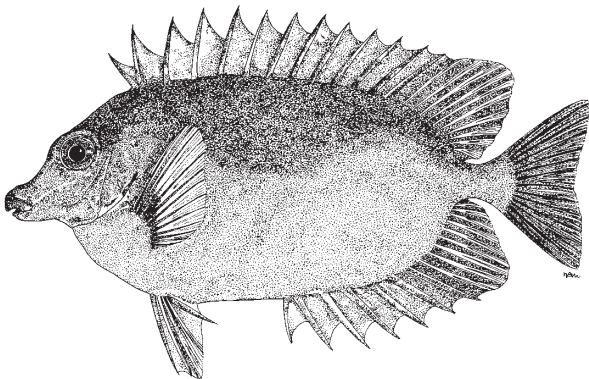
(from Bleeker, 1983)

Siganus niger Woodland, 1990

(Plate XVI, 121)

En - Black foxface.

Maximum total length about 22 cm. On drop-off of coral reefs, typically to around 5 m but descending to 15 m. Subadults and adults in pairs, juveniles probably school; feeds on seaweeds. Speared, marketed fresh; too drab for aquarium trade. Endemic to Tonga; common only in northernmost island group, Vavau.

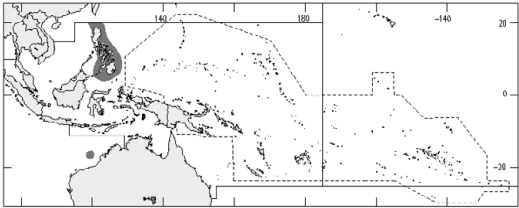
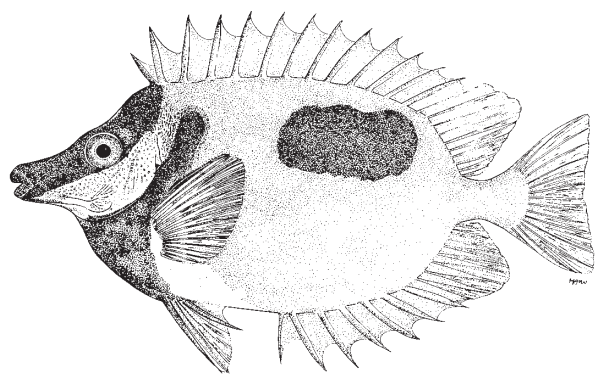


Siganus unimaculatus (Evermann and Seale, 1907)

(Plate XVII, 132)

En - Blotched foxface.

Maximum total length about 22 cm. On coral reefs to depths of about 5 m. Small juveniles in schools of up to a few hundred fish, larger juveniles and adults in pairs; feeds on seaweeds. Speared or caught in drive-in nets; marketed fresh or through aquarium trade. Ryukyu Islands and Philippines, also North West Shelf, Western Australia.



(after Woodland, 1990)

Siganus uspi Gawel and Woodland, 1974

(Plate XVII, 133)

En - Bicolored foxface.

Maximum total length about 25 cm. On coral reefs to depths of about 5 m. Small juveniles in schools, larger fish in pairs; feeds on seaweeds. Mainly caught in drive-in nets for aquarium trade. Endemic to Fiji, with strays recorded from New Caledonia.

