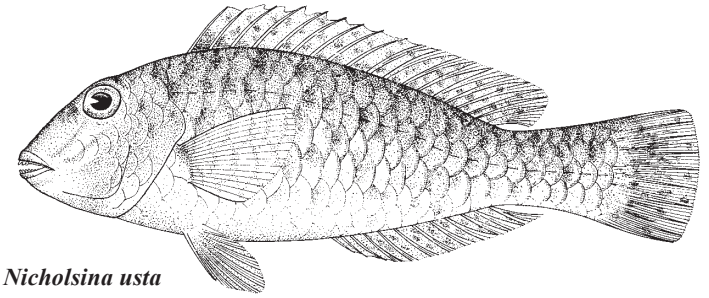
SCARIDAE

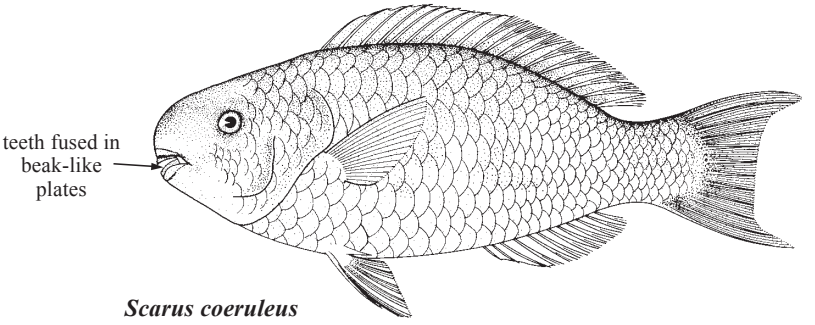
Parrotfishes

by M.W. Westneat, Field Museum of Natural History, Chicago, Illinois, USA (after Randall, 1977)

Diagnostic characters: Parrotfishes range in size from small (8 to 10 cm) to very large individuals nearly 1 m long. Body oblong, moderately compressed, the head generally bluntly rounded anteriorly; **teeth in most species fused to form a pair of beak-like plates in each jaw, some species fused at base with individual teeth clearly visible, others with teeth visible at margins of tooth plates; large and heavy scales in regular rows on the head and body; pharyngeal dentition unique**, the interlocking upper pharyngeals with rows of molariform teeth on a convex surface which bear against the molariform teeth on the concave surface of the lower pharyngeal jaw. A continuous dorsal fin with 9 slender, often flexible spines and 10 soft rays; anal fin with 3 spines and 9 soft rays; caudal fin varying from rounded to lunate, the shape often changing with growth. Scales large, cycloid (smooth to touch), 22 to 24 on lateral line; fins without scales except for a basal row on median fins of most species. **Discontinuous lateral line. Colour:** parrotfishes are often spectacularly colourful, particularly the terminal phase males, with **bright blue, green, and orange patterns on both head and body**. Many species exhibit striking sexual dichromatism and some alter their colours to match the surroundings. Initial-phase fish (only females in some species but either sex for others) are generally less colourful with body brown, reddish, or grey, sometimes with stripes.



Nicholsina usta

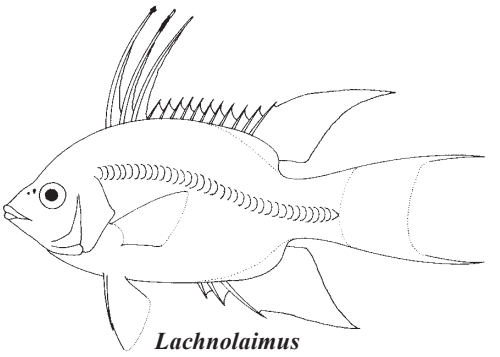


Scarus coeruleus

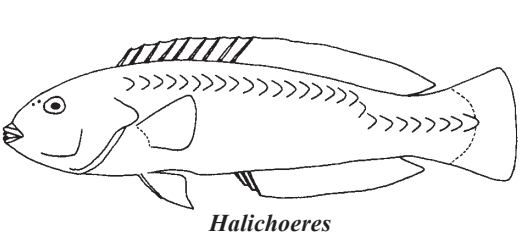
Habitat, biology, and fisheries: Parrotfishes are abundant on coral reefs, where they are often the largest component of the fish biomass. Depth distribution is primarily 1 to 30 m, with some species occurring down to 80 m. Adult scarids are grazing animals, feeding on the close-cropped algal and bacterial mat covering dead corals and rocks, sea grasses, and by crushing bits of coral that may contain invertebrate prey. Juveniles feed on small invertebrates. Parrotfishes feed continuously during the day, often in mixed schools, biting at rocks and corals. They usually scrape some of the coral or ingest sand while feeding and grind this in their pharyngeal mill with the plant food. In pulverizing the coral rock fragments and sand they create substantial quantities of sediment. In many areas they are probably the principal producers of sand. Two types of spawning behaviour have been observed for some scarids. Spawning may take place in an aggregation of initial-phase fish; individual groups of fish dart upward from the aggregation, releasing eggs and sperm at the peak of these upward dashes. The second pattern of reproduction consists of pair-spawning; a terminal male defends a territory from other males, courts females within his territory, and spawns individually with them. At night, some species of *Scarus* are capable of secreting an enveloping cocoon of mucus in which the fish sleeps until daylight. Parrotfishes are caught in traps, nets, and by spear. Due to their abundance, they are commonly marketed for food. *Scarus* species are occasionally found in the aquarium trade. FAO statistics report landings ranging from 99 to 156 t from 1995 to 1999.

Similar families occurring in the area

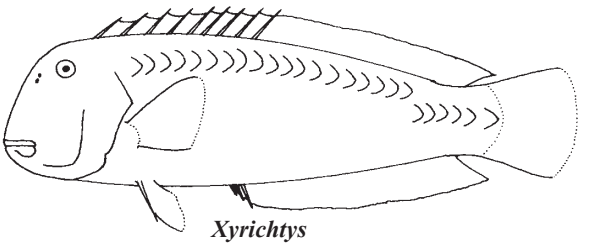
Labridae: the parrotfishes are believed to have evolved from a subgroup within the Labridae. The beak-like plates of the Scaridae, coupled with other features such as the large scales and often bright colours usually preclude their being confused with any other family of fishes. The more basal members of the family, such as *Cryptotomus roseus* and *Nicholsina usta*, in which the teeth are not fully fused into a beak, might be confused with labrid fishes such as species of *Lachnolaimus, Halichoeres*, and *Xyrichtys*.



Lachnolaimus



Halichoeres

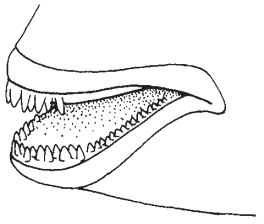


Xyrichtys

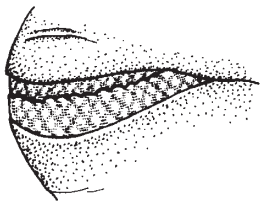
Key to the species of Scaridae occurring in the area

1a. Teeth not fused into beak-like plates but with numerous separate teeth visible on jaw margins (Fig. 1a); body depth contained 3 to 4.6 times in standard length . . . . . → *2*

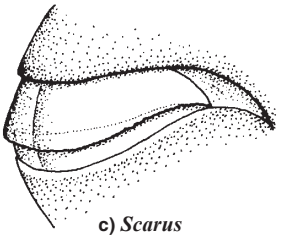
1b. Teeth fused to form beak-like plates, either with teeth visible on the margin (Fig. 1b) or without individual teeth visible (Fig. 1c); body depth contained 2.5 to 3 times in standard length . . . . . → *3*



a) *Nicholsina*



b) *Sparisoma*



c) *Scarus*

Fig. 1 teeth

2a. Slender fish, depth of body 4 to 4.6 times in standard length; no membranous flap on anterior nostril; small-sized adult (not exceeding 10 cm); pale to reddish colour, often with pattern of alternating white/pink and brown/green stripes. . . . . *Cryptotomus roseus*

2b. Depth of body 3 to 3.2 times in standard length; simple membranous flap at posterior edge of anterior nostril; medium-sized adult (reaching at least 29 cm); body mostly green in life . . . . . *Nicholsina usta*

3a. Jaws with overbite (Fig. 1c - front edge of lower jaw inside upper jaw when mouth is closed); median predorsal scales 6 or 7 . . . . . *(Scarus)* → *4*

3b. Jaws with underbite (Fig. 1b - front edge of lower jaw outside upper jaw when mouth is closed); median predorsal scales 4 . . . . . *(Sparisoma)* → *9*

4a. Four rows of scales on cheek below eye (Fig. 2a); females with white stripe or light area on lower body, males with caudal fin blue centrally, orange band in upper and lower lobes; blue bar below eye extending to lower jaw . . . . . ***Scarus vetula***

4b. Three rows of scales on cheek below eye (Fig. 2b) . . . . . → ***5***

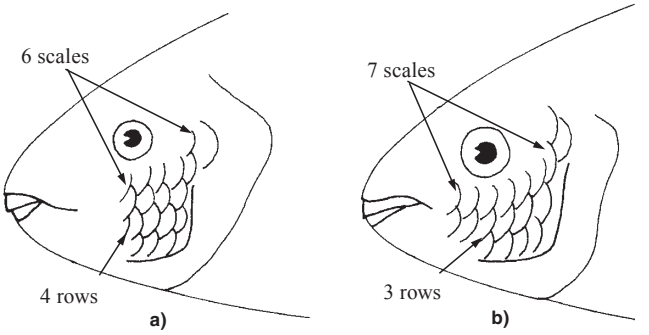


Fig. 2

5a. Median predorsal scales 7; pectoral fin with 2 spines (including very short first element) and 12 soft rays . → ***6***

5b. Median predorsal scales 6; pectoral fin with 2 spines (including very short first element) and 13 or 14 soft rays . . . . . → ***7***

6a. Usually 7 scales in uppermost series below eye (Fig. 2b); initial phase pale with 2 dark lateral stripes that extend forward to meet on snout; large males with blue band running from gill cover under eye and onto upper lip . . . . . ***Scarus taeniopterus***

6b. Usually 6 scales in the uppermost series below eye; initial phase pale with 2 dark lateral stripes that end near or behind eye; large males with blue band running from gill cover under eye and onto lower lip . . . . . ***Scarus iseri***

7a. Pectoral fin with 2 spines (including very short first element) and 13 soft rays; snout with a distinct hump (in profile) in subadults and adults; adults pale to dark blue, juveniles with 2 lateral dark stripes and yellow area on top of head . . . . . ***Scarus coeruleus***

7b. Pectoral fin with 2 spines (including very short first element) and 14 soft rays; snout without hump . . . . . → ***8***

8a. Gill rakers 51 to 64; 1 scale in lowest cheek row; body mostly orange and green shading to bronze and green in large fish; green pectoral fins and green teeth . . . . . ***Scarus guacamaia***

8b. Gill rakers 12 or 13; usually 2 scales in lower cheek row; dark violet body; light bright blue markings on cheeks and a well-defined light blue 'chin-strap' that is evident as a light marking on preserved material . . . . . ***Scarus coelestinus***

9a. A pronounced black spot at upper base of pectoral fin . . . . . → ***10***

9b. No black spot at upper base of pectoral fin . . . . . → ***11***

10a. Pectoral fin dark except for pale tip; gill rakers 12 to 16; fleshy flap at rim of anterior nostril greatly subdivided; terminal males greenish overall, most fresh specimens have a yellow caudal fin . . . . . ***Sparisoma rubripinne***

10b. Pectoral fin entirely pale, clear in fresh specimens; gill rakers 15 to 20; fleshy flap from rim of anterior nostril usually simple and ribbon-like, sometimes with a fringe around extremity; terminal males mainly green-blue; initial phase mottled reddish . . . . . ***Sparisoma chrysopterum***

11a. Gill rakers 17 to 21; initial-phase fish with a broad white bar basally on caudal fin; 3 rows of white spots on body; terminal males with round yellow spot above rear margin of gill cover . . . . . ***Sparisoma viride***

11b. Gill rakers 10 to 16 . . . . . → ***12***

12a. Single median scale between pelvic fins on ventral surface near pelvic-fin base (Fig. 3a); squarish dark blotch posterior to gill cover above pectoral-fin base . . . . . ***Sparisoma atomarium***

12b. Two midventral scales between pelvic fins on ventral surface near pelvic-fin base (Fig. 3b) . . . . → ***13***

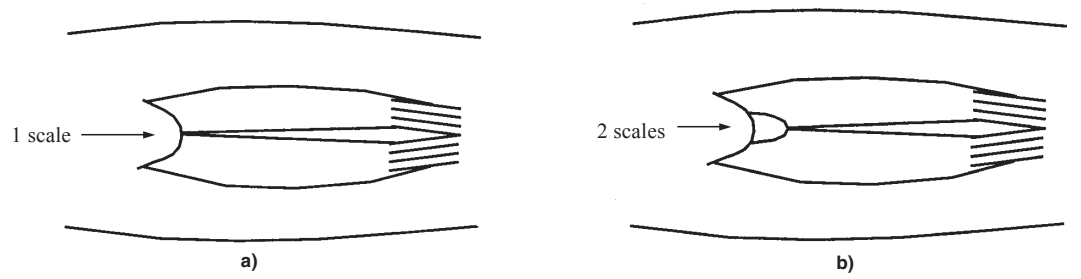


Fig. 3 ventral view of pelvic fins

13a. Saddle-shaped white marking crossing dorsum immediately behind last dorsal ray; horizontally elongate white marking on centre of operculum; females with dorsal, anal, and pelvic fins red; males green with black margin on caudal fin and distinct line of orange colour below eye . . . . . ***Sparisoma aurofrenatum***

13b. Initial phase either striped with narrow dark lines on a lighter background, or mottled and non- descript; terminal male with black margin on caudal fin and blue stripe between mouth and eye . . . . . ***Sparisoma radians***

List of species occurring in the area

The symbol is given when species accounts are included.

Cryptotomus roseus Cope, 1871.

Nicholsina usta (Valenciennes, 1840).

Scarus coelestinus Valenciennes, 1840.
Scarus coeruleus (Bloch, 1786).
Scarus guacamaia Cuvier, 1829.
Scarus iseri (Bloch, 1789).
Scarus taeniopterus Desmarest, 1831.
Scarus vetula Bloch and Schneider, 1801.

Sparisoma atomarium (Poey, 1861).
Sparisoma aurofrenatum (Valenciennes, 1840).
Sparisoma chrysopterum (Bloch and Schneider, 1801).
Sparisoma radians (Valenciennes, 1840).
Sparisoma rubripinne (Valenciennes, 1840).
Sparisoma viride (Bonnaterre, 1788).

References

Randall, J.E. 1983. *Caribbean Reef Fishes*. Third edition. Neptune, New Jersey, T.F.H. Publications, 369 p.

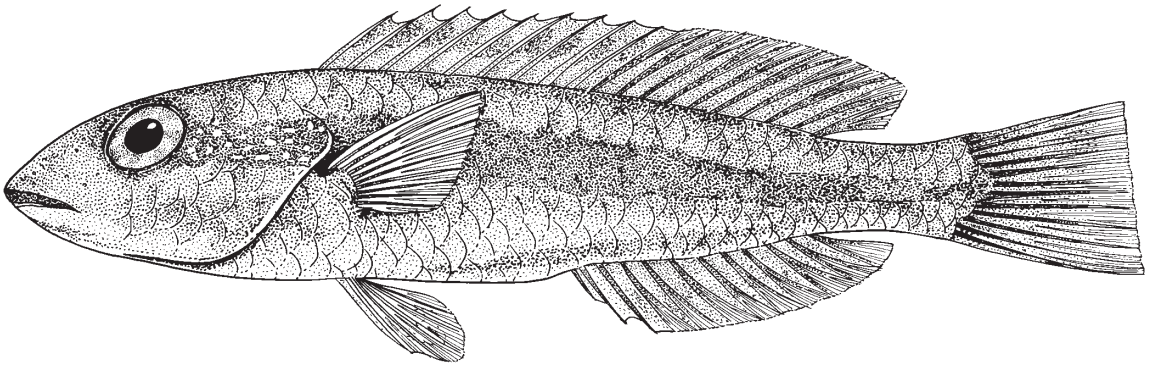
Randall, J.E. 1977. Family Scaridae. In *FAO Species Identification Sheets. Western Central Atlantic (Fishing Area 31)*, edited by W. Fischer. Vol. 4. Rome, FAO (unpaginated).

Bohlke, J.E. and C.C.G. Chaplin. 1993. *Fishes of the Bahamas and Adjacent Tropical Waters*. Second edition. Austin, University of Texas Press, 771 p.

Robins, C.R. and G.C. Ray. 1986. *A Field Guide to Atlantic Coast Fishes of North America.* Boston, Houghton Mifflin, 354 p.

Cryptotomus roseus Cope, 1871 OUR

Frequent synonyms / misidentifications: None / *Nicholsina usta* (Valenciennes, 1840).
FAO names: En - Bluelip parrotfish; **Fr** - Perroquet à lévare bleu; **Sp** - Loro dientón.

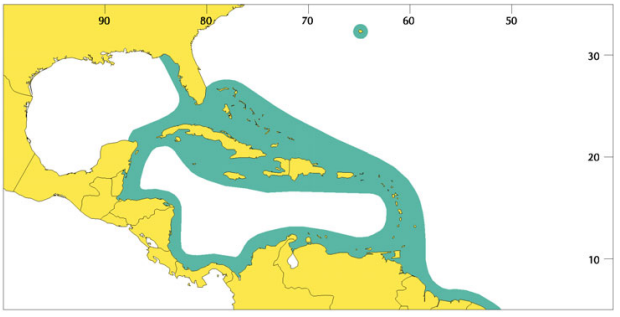


Diagnostic characters: Body elongate, the depth contained 4 to 4.6 times in standard length; snout pointed; **teeth fused only basally, thus not fully coalesced to form dental plates; no dermal cirrus at edge of anterior nostril. Gill rakers 10 or 11**. Caudal fin slightly rounded. Pectoral-fin rays 13. Median predorsal scales 4. **Colour:** variable patterns of yellow-brown to green, often pale without distinct markings or mostly reddish. **Male olive green on back, with small pink dots; pink stripe along side containing a row of green dots**; head green with 2 narrow pink bands beginning at mouth, the upper one running to eye and other to gill cover; **a black spot at upper pectoral-fin base.**

Size: To about 12 cm.

Habitat, biology, and fisheries: Inhabits seagrass beds or sandy areas, usually in very shallow water but has been recorded at depths of over 50 m. Largely herbivorous, feeding on seagrass. This species is not marketed for food or the aquarium trade.

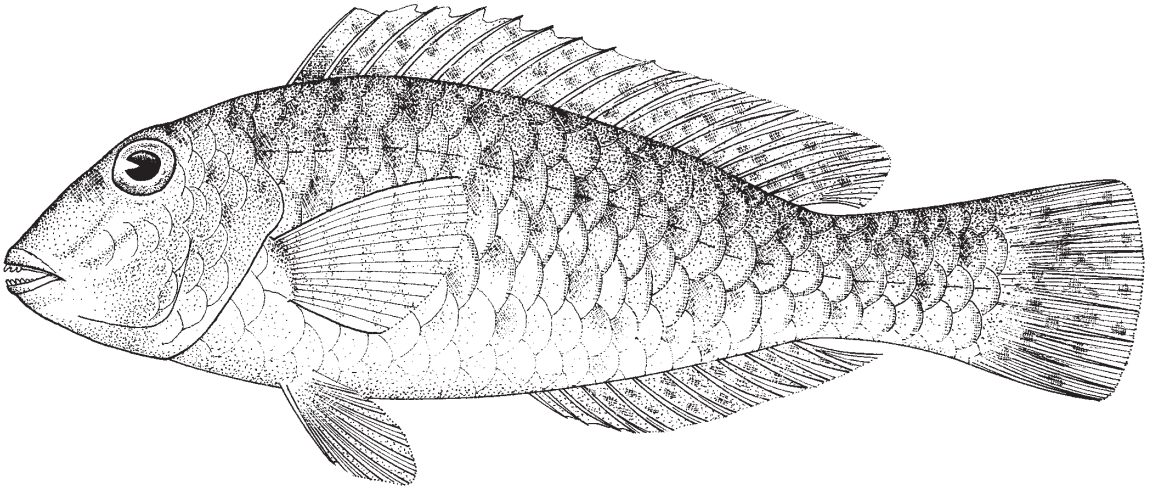
Distribution: Bermuda, Bahamas, Florida and eastern Gulf of Mexico to Brazil, including Central American coast.



Nicholsina usta (Valenciennes, 1840)

Frequent synonyms / misidentifications: None / *Cryptotomus roseus* Cope, 1871.

FAO names: En - Emerald parrotfish; **Fr** - Perroquet émeraude; **Sp** - Loro jabonero.

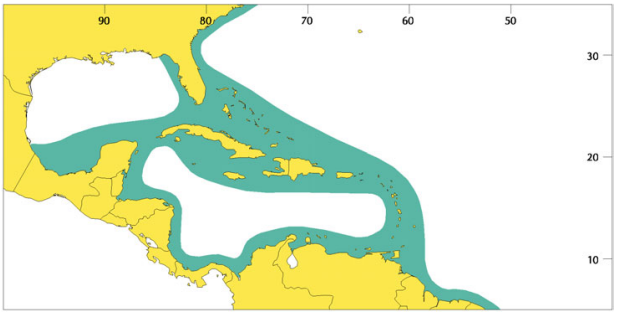


Diagnostic characters: Body somewhat elongate, the depth contained 3 to 3.2 times in standard length. Snout somewhat pointed; **a small dermal cirrus at edge of anterior nostril; teeth fused only basally, thus not fully coalesced to form dental plates. Gill rakers 12 or 13**. Caudal fin slightly rounded; pectoral-fin rays 13. Median predorsal scales 4 or 5; 1 row of scales on cheek. **Colour:** mottled olive green on back, the scales of sides with bluish white centres and reddish edges; head below level of mouth yellow; 2 diagonal narrow red-orange bands on cheek; median fins reddish, dorsal fin with a black blotch at front.

Size: To 30 cm.

Habitat, biology, and fisheries: Inhabits seagrass beds, usually in very shallow water but has been recorded at depths of over 80 m. Largely herbivorous, feeding on seagrass, but probably gains nutrients from small invertebrates as well. This species is not commonly marketed for food.

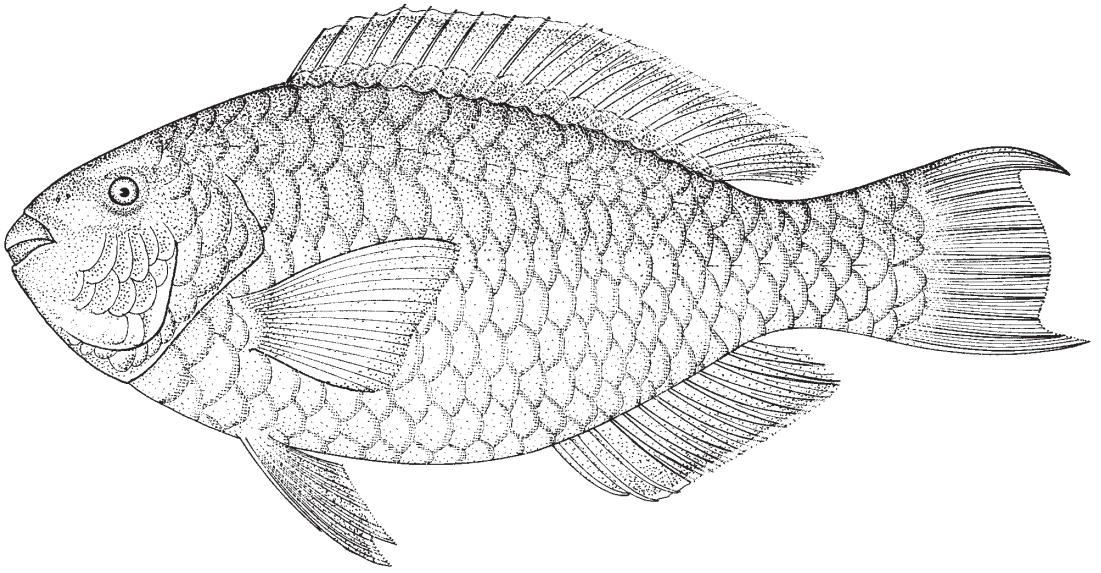
Distribution: From New Jersey to Brazil, including eastern and southern Gulf of Mexico and West Indies. Also occurs in the eastern Atlantic where it is subspecifically distinct.



Scarus coelestinus Valenciennes, 1840

Frequent synonyms / misidentifications: None / *Scarus coeruleus* (Bloch, 1786).

FAO names: En - Midnight parrotfish; **Fr** - Perroquet noir; **Sp** - Loro negro.

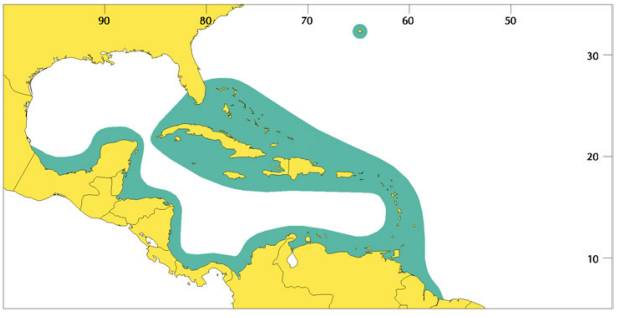


Diagnostic characters: Body moderately deep, depth contained 2.5 to 2.7 times in standard length. **Teeth fused to form a pair of beak-like plates in each jaw, upper plates slightly overlapping lower when mouth closed. Gill rakers 12 or 13**. Caudal fin slightly rounded in juveniles, double emarginate in medium-sized fish, the lobes very elongate in large adults; pectoral-fin rays 16. **Median predorsal scales 6**; 3 rows of scales on cheek, the lower usually consisting of 2 scales. **Colour:** blackish, centres of scales broadly bright blue; scaled portion of head blackish except a band of blue across interorbital space; unscaled parts of head bright blue; fins blackish with blue margins, dental plates blue-green. No apparent difference in colour with sex.

Size: Maximum size to about 75 cm, common to 50 cm.

Habitat, biology, and fisheries: Inhabits coral reefs, generally in depths less than 20 m. Absent from areas without suitable hard substratum for shelter and its benthic algal food. Largely herbivorous, biting coral and scraping algal mat from reef surfaces. This species is caught mainly in traps, occasionally by spearing, and is occasionally marketed for food.

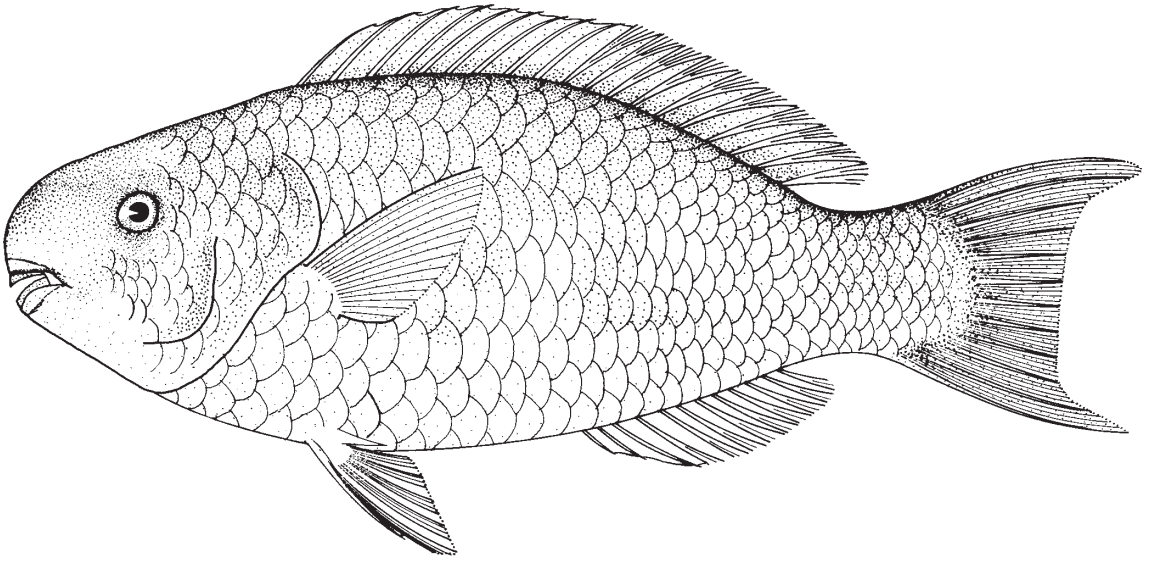
Distribution: Southern Florida, eastern and southern Gulf of Mexico, Bermuda, and Bahamas to Brazil.



Scarus coeruleus (Bloch, 1786) USU

Frequent synonyms / misidentifications: None / *Scarus coelestinus* Valenciennes, 1840.

FAO names: En - Blue parrotfish; **Fr** - Perroquet bleu; **Sp** - Loro azul.

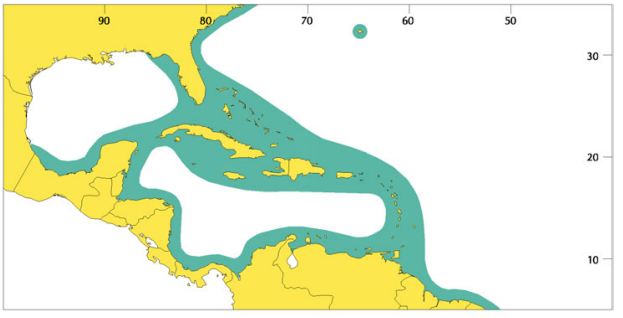


Diagnostic characters: Body moderately deep, depth contained 2.6 to 3 times in standard length. Forehead of large adults (perhaps only males) with a prominent convexity, the profile rising vertically above mouth. **Teeth fused to form a pair of beak-like plates in each jaw, upper dental plates slightly overlapping lower when mouth closed. Gill rakers 31 to 50**. Caudal fin truncate in small fish, the lobes becoming progressively longer with growth; pectoral-fin rays 14 or 15. **Median predorsal scales 6**; 3 rows of scales on cheek, the lower usually consisting of 2 scales. **Colour:** small to medium-sized individuals light blue, basal part of scales pink; upper part of head yellow; a transverse band of pink on chin; margins of fins blue. Large adults deep blue or green-blue with a broad grey region on cheek.

Size: Maximum size to 90 cm, common to 35 cm.

Habitat, biology, and fisheries: Inhabits coral reefs, generally in depths less than 20 m depth. Absent from areas without suitable hard substratum for shelter and its benthic algal food. Largely herbivorous, biting at coral and scraping algal mat from reef surfaces. This species is caught mainly in traps, occasionally by spearing, and is occasionally marketed for food.

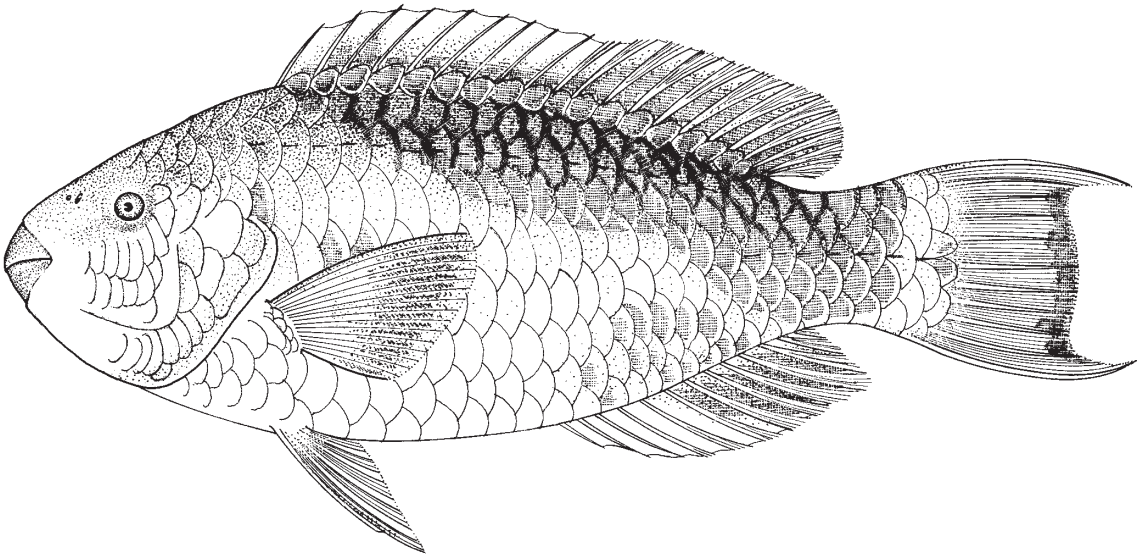
Distribution: From Maryland (USA) to Rio de Janeiro, including Bermuda, eastern Gulf of Mexico, and the West Indies.



Scarus guacamaia Cuvier, 1829

Frequent synonyms / misidentifications: None / *Scarus coelestinus* Valenciennes, 1840.

FAO names: En - Rainbow parrotfish; **Fr** - Perroquet arc-en-ciel; **Sp** - Loro guacamayo.

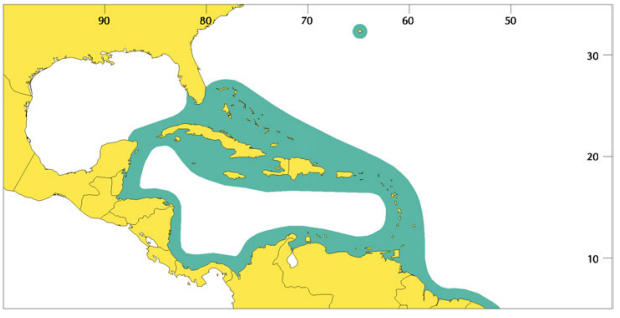


Diagnostic characters: Body moderately deep, depth contained 2.5 to 2.8 times in standard length. **Teeth fused to form a pair of beak-like plates in each jaw, upper dental plates slightly overlapping lower when mouth closed; teeth blue-green. Gill rakers 51 to 64**. Caudal fin slightly rounded in juveniles, double emarginate in medium-sized fish, the lobes very elongate in large adults; pectoral-fin rays 16. **Median predorsal scales 6**; 3 rows of scales on cheek, the lower usually consisting of 1 scale. **Colour: body scales broadly light green in the centre**, narrowly light brownish orange on edges; **scaled part of head orange-brown with short green lines around eyes**; chest and unscaled part of head dull orange; fins dull orange with a broad streak of green extending into membranes from fin bases; margin of median fins blue; **dental plates blue-green**. In larger fish the colours are deeper and brighter, the green of the scales restricted mainly to dorsal and posterior part of the body. There seems to be no important difference in colour of the 2 sexes.

Size: Maximum size to 90 cm, common to 35 cm.

Habitat, biology, and fisheries: Inhabits coral reefs. Known to have a home cave to which it retires at night; makes use of the sun as an aid to locating the cave. The young are common in mangrove areas. Largely herbivorous, biting at coral and scraping algal mat from reef surfaces. Caught mainly in traps, occasionally by spearing, and is occasionally marketed for food.

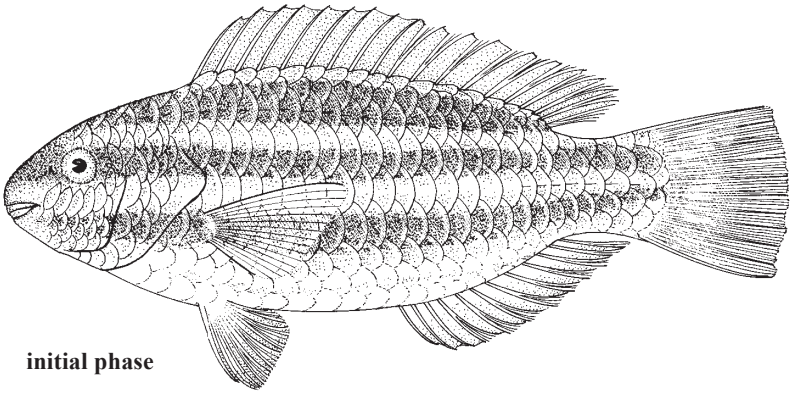
Distribution: Bermuda and South Florida, Bahamas, West Indies, and eastern Gulf of Mexico down South American coast to Argentina.



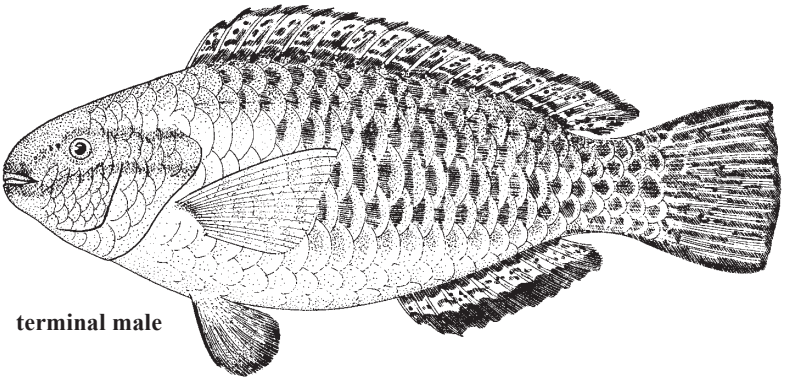
Scarus iseri (Bloch, 1789) USS

Frequent synonyms / misidentifications: *Scarus croicensis* (Bloch, 1790) / *Scarus taeniopterus* Desmarest, 1831.

FAO names: En - Striped parrotfish.



initial phase



terminal male

Diagnostic characters: Body moderately deep, depth contained 2.6 to 2.9 times in standard length. **Teeth fused to form a pair of beak-like plates in each jaw, upper dental plates slightly overlapping lower when mouth closed. Outer gill rakers 40 to 51, inner rakers 62 to 78**. Caudal fin truncate to slightly rounded; pectoral-fin rays 13 or 14. **Median predorsal scales 7, rarely 8**; 3 rows of scales on cheek, 5 to 7 scales in first row. **Colour: initial-phase fish with 3 dark brown stripes alternating with whitish, the first along back and the lowermost passing through pectoral-fin base; upper part of snout yellowish. Terminal males blue-green and orange**, the chest and head pink below a green band at lower edge of eye; a broad diffuse pink stripe on body above pectoral fins; median fins with blue borders, the broad central parts orange with linear blue markings.

Size: Maximum size to 27 cm.

Habitat, biology, and fisheries: Inhabits coral reefs where it is very common. Largely herbivorous, moving in feeding groups to nip bits of algal mat from reef surfaces. This species is caught in traps and nets, and is found in the aquarium trade.

Distribution: Southern Florida, Bermuda, the Bahamas, and throughout the Caribbean and eastern Gulf of Mexico. It may stray northward to Massachusetts and southward to Brazil.