

FAO SPECIES IDENTIFICATION SHEETS

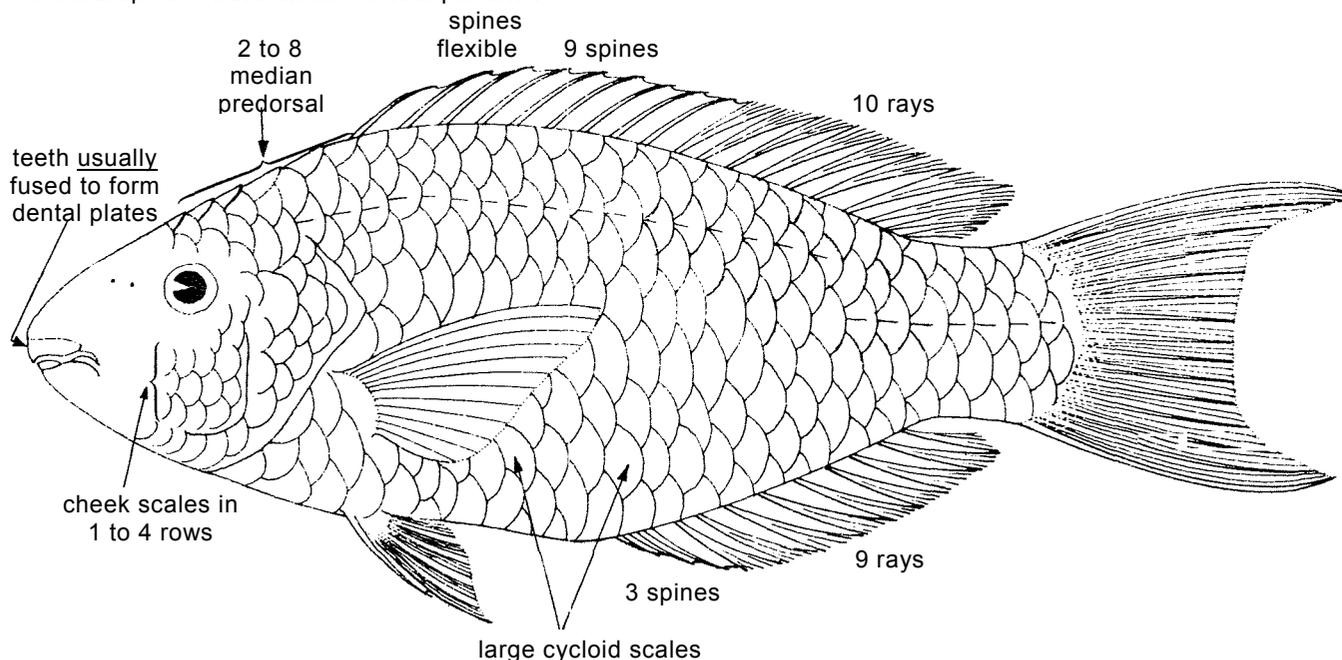
FISHING AREA 51
(W. Indian. Ocean)

SCARIDAE*

Parrotfishes

Body oblong, moderately compressed. Head generally bluntly rounded anteriorly; jaws at most only slightly protrusible; teeth usually fused to form a pair of beak-like plates in each jaw, but a few species (*Calotomus*) have free, imbricate, incisor-like teeth present externally in the upper and lower jaws. Small, isolated, projecting teeth (canines) occur in some species on outer sides of both jaws, or, only on upper jaw; pharyngeal dentition strong, consisting of interdigitating paired upper pharyngeals with rows of molariform teeth on a slightly or strongly convex surface; these teeth bear against the molariform teeth on the surface of the single lower pharyngeal bone. Dorsal fin continuous, with 9 slender, flexible spines and 10 soft rays; anal fin with 3 flexible spines and 9 soft rays; pectoral fins with 2 unbranched rays (the first always rudimentary, the second supporting most of the leading margin of the fin), and 11 to 15 branched rays, caudal fin varying from rounded to lunate, with produced caudal lobes, the shape often changing with growth. Scales, large, cycloid, 22 to 24 on the lateral line; fins without scales except for a basal row on the median fins of most species; 1 to 4 rows of scales on cheek; 2 to 8 median predorsal scales.

Colour: most species are very colourful, and many exhibit striking sexual dichromatism. Most species have 2 distinct adult colour phases (although a few appear to be monochromatic as adults). The relationship between colour phase and sex is complex, as many species of the family have been shown to be protogynous hermaphrodites (individuals maturing first as females, then sexually transforming into males). This sexual transformation is usually accompanied by a change in colour phase. This basic pattern is further complicated, in some species, by the presence of primary males (i.e., non-sex changing individuals) which may also change colour phase as they grow. In species where 2 adult colour phases are known, the first is termed "INITIAL PHASE", the second, "TERMINAL PHASE". Initial phases may thus be male or female, while terminal phases are invariably male. Initial phase fish are rather drably coloured, with browns and greys usually predominating. Colour patterns of terminal phase fish are complex, with predominantly green, blue and pink hues. For field identification of parrotfish species reliance must usually be placed on colour patterns, as few meristic characters are of value. In addition, juvenile fish of several species have distinct colour patterns.



* Family description refers to Western Indian Ocean representatives only

** The counts given in the species accounts refer to branched rays only

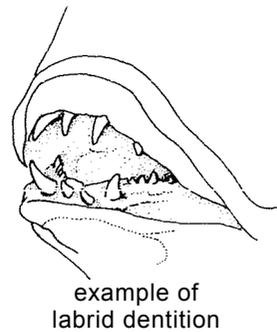
Parrotfishes are inhabitants of inshore areas, often abundant on coral reefs where they usually represent one of the largest components of fish biomass. Some species are also found in lagoons, creeks and seagrass beds associated with reef areas. These fishes are benthic grazers, rasping the algal coating from rocks, dead coral and compacted sand with their beak-like plates. They also ingest a considerable amount of substrate along with their food, and this is ground, with the plant material, by the pharyngeal dentition to a fine paste. Some species graze heavily on sea grasses. Few parrotfishes feed on live coral, although some large species may utilize this food source heavily. Many species are territorial and remain within the one area for long periods and defend this area against conspecifics; others school as mobile groups, while yet others are solitary roving foragers. Two types of spawning behaviour have been observed in scarids; one takes 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 (each group is believed to consist of a single female and numerous males). The second pattern of reproduction consists of pair spawning; a terminal phase fish pairs with an initial phase female, and they also spawn at the peak of an upward rush.

Although parrotfishes are not of significant commercial importance, they make up an important part of reef-associated artisanal fisheries and are commonly found in local fish markets. They are mainly caught in traps, but some are netted or speared. Their flesh is soft and does not keep well, thus the fish are usually eaten fresh.

The species of Scaridae have been much confused in taxonomic literature and as a result of this, the distributions of many are poorly known.

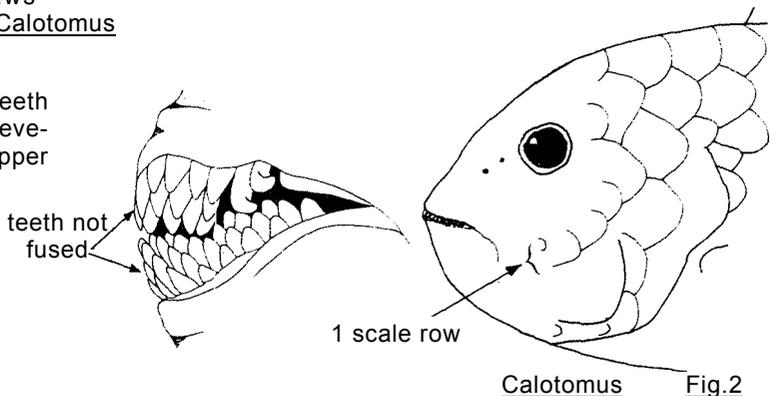
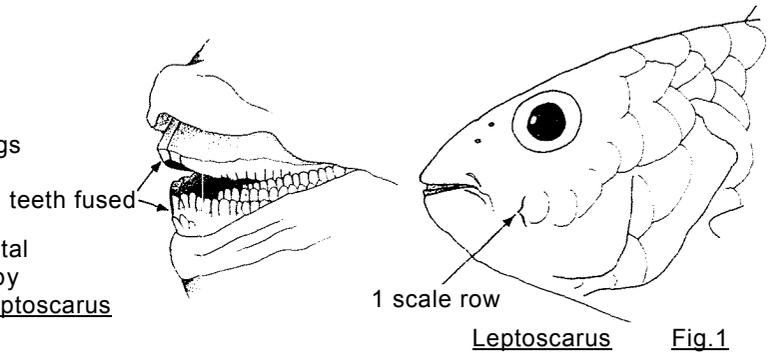
SIMILAR FAMILIES OCCURRING IN THE AREA:

None. The beak-like plates of most of the Scaridae, in addition to features such as large smooth scales and often bright colours usually preclude parrotfishes being confused with any other fish family. Only members of the genus Calotomus in which the teeth are not fused, might be confused with some wrasses (Labridae) but in the latter family, the teeth are usually well separated in the jaws and the mouth is clearly protrusible.



KEY TO GENERA OCCURRING IN THE AREA:

- 1a. One row of scales on cheek below eye (Figs 1,2); teeth fused or not fused
- 2a. Teeth fused to form beak-like dental plates; upper dental plates enclosed by lower jaw with mouth closed (Fig.1)....Leptoscarus
- 2b. Teeth not fused; upper and lower jaws directly opposed (Fig.2) Calotomus
- 1b. Two to four horizontal rows of cheek scales; teeth fused; dental plates finely to robustly developed, lower dental plates enclosed by upper dental plates with mouth closed



3a. Entire surface of dental plates rough (individual teeth composing the plates visible) (Fig.3a); hind nostril large (Figs 4,5)

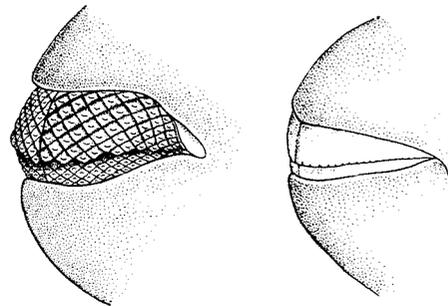
4a. Three rows of cheek scales, plus up to 2 scales imbedded on preopercular flange, no hump on forehead (Fig.4); 12 or 13 branched pectoral fins; caudal fin lunate ... Cetoscarus

4b. Two rows of cheek scales, plus up to 2 scales imbedded on the preopercular flange; a pronounced hump on forehead, enlarging with age (Fig.5); 13 or 14 branched pectoral fin rays; caudal fin rounded centrally (lobes may be slightly produced) Bolbometopon

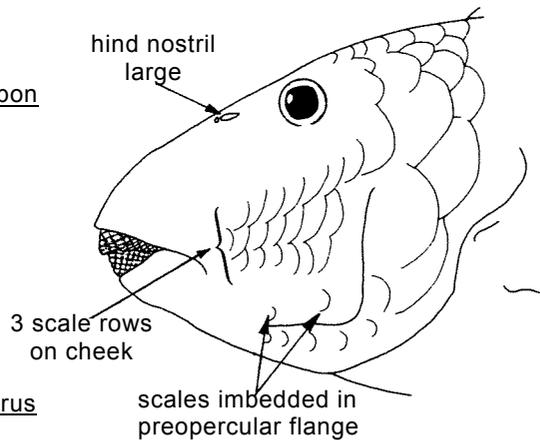
3b. Teeth composing dental plates discernable only at margins of dental plates (Fig.3b); hind nostril small (except in S. ghobban) (Figs 6,7)

5a. Cheek scales small, in 3 or 4 rows, in a nearly isolated subtriangular patch; dental plates not broad, their height usually 1.5 to 2 times in orbit diameter (Fig.6) Hipposcarus

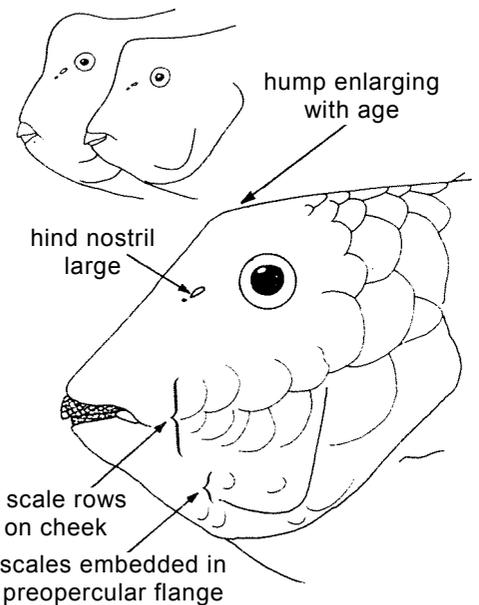
5b. Cheek scales not small, in 2 or 3 rows and not in a isolated patch; dental plates broad, their height usually greater than orbit diameter (Fig.7)..... Scarus



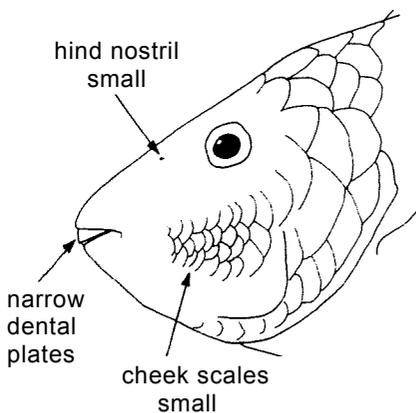
a) dental plates rough b) dental plates smooth Fig.3



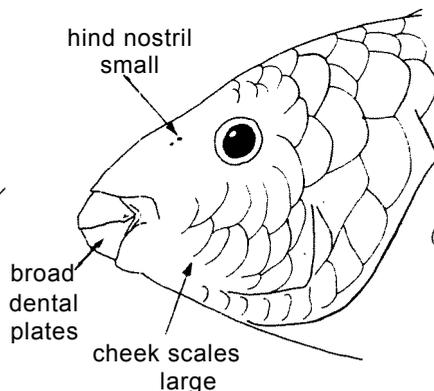
Cetoscarus Fig.4



Bolbometopon Fig.5



Hipposcarus Fig.6



Scarus Fig.7

Cetoscarus Fig.4

LIST OF SPECIES OCCURRING IN THE AREA:

Code numbers are given for those species for which Identification Sheets are included

<u>Bolbometopon muricatum</u> (Valenciennes, 1840)	SCAR Bolb 1
<u>Calotamus carolinus</u> (Valenciennes, 1840)	SCAR Cal 1
<u>Calotomus spinidens</u> (Quay & Gaimard, 1824)	SCAR Cal 2
<u>Calotomus viridescens</u> (Rüppell, 1828)	SCAR Cal 3
<u>Cetoscarus bicolor</u> (Rüppell, 1828)	SCAR Cet 1
<u>Hipposcarus harid</u> (Forsskål, 1775)	SCAR Hip 1
<u>Leptoscarus vaijensis</u> (Quoy & Gaimard, 1824)	SCAR Lep 1
<u>Scarus arabicus</u> (Steindachner, 1902)	SCAR Scar 8
<u>Scarus atrilunula</u> Randall & Bruce, 1983	SCAR Scar 9
<u>Scarus caudofasciatus</u> (Günther, 1862)	SCAR Scar 10
<u>Scarus collana</u> Rüppell, 1835	SCAR Scar 11
<u>Scarus cyanescens</u> Valenciennes, 1840	SCAR Scar 12
<u>Scarus enneacanthus</u> Lacepède, 1802	SCAR Scar 13
<u>Scarus falcipinnis</u> (Playfair, 1867)	SCAR Scar 14
<u>Scarus ferrugineus</u> Forsskål, 1775	SCAR Scar 15
<u>Scarus festivus</u> Valenciennes, 1840	SCAR Scar 16
<u>Scarus frenatus</u> Lacepède, 1807	SCAR Scar 17
<u>Scarus fuscopurpureus</u> (Klunzinger, 1871)	SCAR Scar 18
<u>Scarus genazonatus</u> Randall & Bruce, 1983	SCAR Scar
<u>Scarus ghobban</u> Forsskål, 1775	SCAR Scar 20
<u>Scarus gibbus</u> Rüppell, 1828	SCAR Scar 21
<u>Scarus globiceps</u> Valenciennes, 1840	SCAR Scar 22
* <u>Scarus japonensis</u> (Bloch, 1789)	SCAR Scar 23
<u>Scarus niger</u> Forsskål, 1775	SCAR Scar 24
** <u>Scarus oedema</u> (Snyder, 1909)	
<u>Scarus persicus</u> Randall & Bruce, 1983	SCAR Scar 25
<u>Scarus prasiognathos</u> Valenciennes, 1840	SCAR Scar 26
<u>Scarus psittacus</u> Forsskål, 1775	SCAR Scar 27
** <u>Scarus quoyi</u> Valenciennes, 1840	
** <u>Scarus rivulatus</u> Valenciennes, 1840	
<u>Scarus rubroviolaceus</u> Bleeker, 1847	SCAR Scar 28
<u>Scarus russelii</u> Valenciennes, 1840	SCAR Scar 29
<u>Scarus scaber</u> Valenciennes, 1840	SCAR Scar 30
<u>Scarus sordidus</u> Forsskål, 1775	SCAR Scar 31
<u>Scarus tricolor</u> Bleeker, 1847	SCAR Scar 32
<u>Scarus viridifucatus</u> (Smith, 1956)	SCAR Scar 33

Prepared by R.W. Bruce, British Museum (Natural History), London, UK and J.E. Randall, Bishop Museum, Honolulu, Hawaii, USA

Black and white species illustrations prepared from colour slides on plates I and VIII provided by J.E. Randall

*Scarus japonensis is the correct name for what Randall & Bruce (1983, Ichthyological Bulletin No. 47) termed Scarus capistratoides. Scarus japonensis cited by Randall & Nelson (1979, Copeia (2):206-127 should now be recorded as S. pyrrhurus Jordan & Seale, 1906), a species not known from the Western Indian Ocean

These species may penetrate the Western Indian Ocean only as far as Sri Lanka and the Gulf of Mannar. Verification is required of their presence in the area