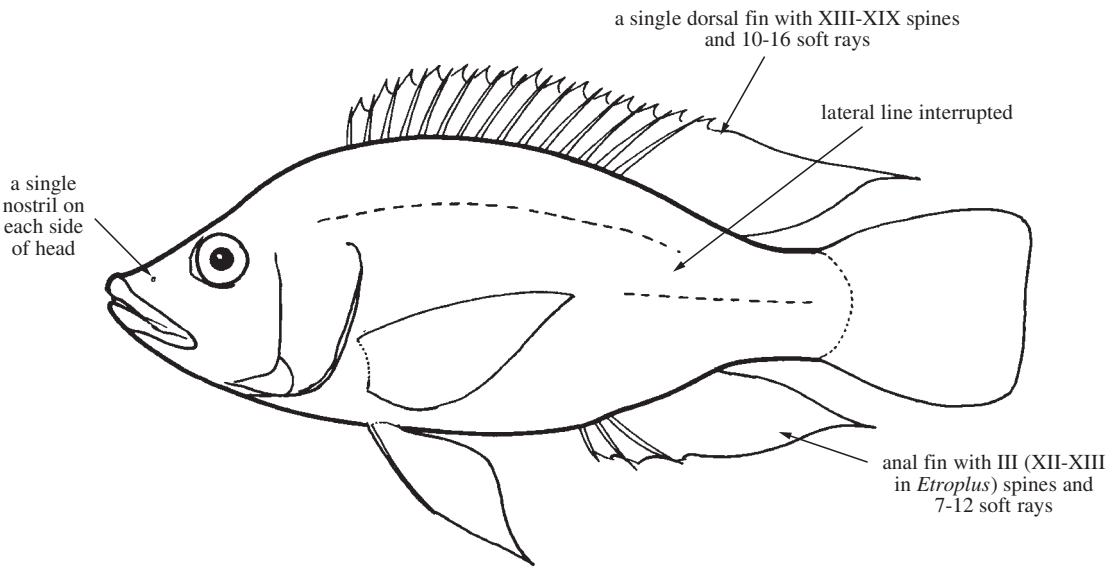
Suborder LABROIDEI

CICHLIDAE

Cichlids

by K.E. Carpenter

Diagnostic characters (for brackish-water tolerant species introduced into the area): Medium-sized (to about 60 cm) fishes with variable body shape, from deep bodied and compressed to perch-like. **Head with a single nostril on each side. A single dorsal fin with XIII to XIX spines and 10 to 16 soft rays; anal fin with III (except XII or XIII in *Etroplus*) spines and 7 to 12 soft rays**; caudal fin typically rounded, truncate, or slightly emarginate (forked in *Etroplus*). **Lateral line interrupted**, with 26 to 40 (except 83 to 102 in *Cichla ocellaris*) scales. **Colour:** highly variable body colour from blue-grey, grey-green, olive green, brownish, blackish, silvery grey, to pale dusky, often with bars or blotches on sides; scales sometimes with individual dark markings; fins sometimes with spots, bars, and blotches, and sometimes bordered with a band of red or pink; males often exhibit distinct breeding coloration.

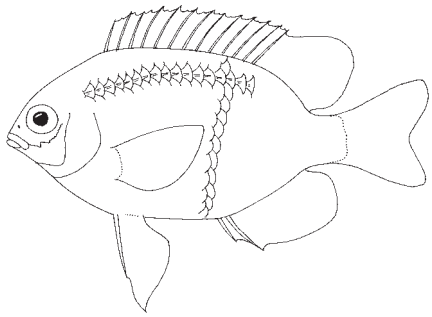


Habitat, biology, and fisheries: Primarily fresh-water fishes that tolerate but generally do not breed and become established in brackish water; exceptions to this in the area are *Etroplus suratensis* which is a brackish-water species that can only tolerate fresh or marine water for short periods and *Oreochromis mossambicus* which is primarily fresh water but can breed and live in brackish water. All cichlids in the area have been introduced and are native to Africa or south Asia. Many species have been introduced into the wild by accidental release of aquaculture or aquarium fish specimens. Of the many cichlids reported to have established wild populations in the area, only 9 species have tolerance to brackish water: *Cichla ocellaris* is native to South America and introduced into Guam; *Etroplus suratensis* is native to India and Sri Lanka and introduced into Sabah, Sarawak, and possibly Indonesia; *Hemichromis bimaculatus* is native to West Africa and established in urban drains of Cairns, Australia; *Oreochromis aureus* is native to Africa and the Middle East and introduced into Fiji, the Philippines, Singapore, and Thailand; *O. mossambicus* is native of East Africa with widespread introductions in the area; *O. niloticus niloticus* is native of East Africa with widespread introductions but mostly established in the wild in freshwater systems; *O. urolepis* is native of East Africa and introduced into Fiji and Malaysia; *Tilapia rendalli* is native to southern and eastern Africa and introduced into Thailand and Papua New Guinea; *T. zilli* is native to Africa and the Middle East and introduced to New Caledonia, Guam, Fiji, the Philippines, Malaysia, and Northern Marianas. *Cichla ocellaris* and *Hemichromis bimaculatus* are predators while the other species are plant and sediment feeders. Breeding in cichlids typically involves pair-formation, nest-building, mouthbrooding, and parental care of young. Cichlids include many very important aquarium and aquaculture species although mostly for fresh-water culture. However, there is limited culture under brackish water conditions. Only *Oreochromis mossambicus* is regularly captured and consumed from small-scale brackish water fisheries.

Similar families occurring in the area

Cichlids are easily distinguished from all other families of fishes based on the normal perciform characteristics (e.g. spines in fins and pelvic-fin formula of I spine and 5 soft rays) and the fact that they have a single nostril on each side of the head and an interrupted lateral line. The only other perciforms with these characteristics are damselfishes (Pomacentridae).

Pomacentridae: differ from cichlids in having almost always II anal-fin spines (usually III in cichlids); lateral line most often incomplete, not extending onto caudal peduncle (interrupted in cichlids); caudal fin most typically forked (typically rounded, truncate, or emarginate in cichlids). Pomacentrids are coastal marine fishes only rarely found in brackish water (2 species of over 200 are found in brackish water).



Pomacentridae

Key to the species of Cichlidae occurring in the area

Note: the following key is relevant only to those species of cichlids tolerant of brackish water and currently known to be introduced into the area.

1a. Anal fin with XII or XIII spines (Fig. 1) . . . . . ***Etroplus suratensis***

1b. Anal fin with III spines . . . . . → ***2***

2a. Moderately large conical teeth present in jaws; juveniles without black spot on soft-dorsal fin . . . . . → ***3***

2b. Teeth fine, close set; juveniles with black spot on soft dorsal fin . . . . . → ***4***

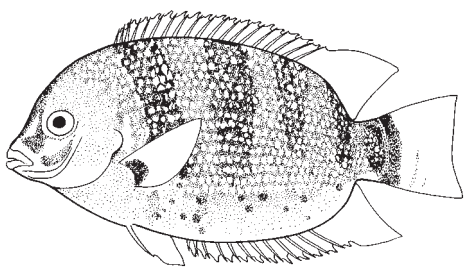


Fig. 1 ***Etroplus suratensis***

3a. Dorsal fin deeply incised, nearly dividing spinous- and soft-rayed portions; a prominent black spot on caudal fin near upper base; around 83 to 102 lateral-line scales (Fig. 2) . . . . . ***Cichla ocellaris***

3b. Dorsal fin continuous although middle dorsal-fin soft rays elongate; no black spot on caudal fin; 26 to 28 lateral-line scales (Fig. 3) . . . . . ***Hemichromis bimaculatus***

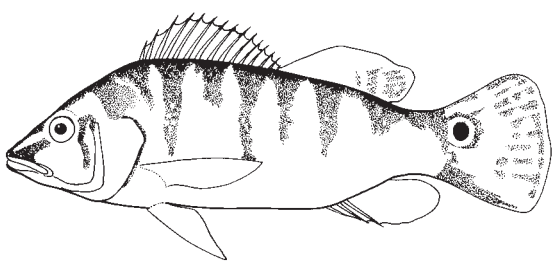


Fig. 2 ***Cichla ocellaris***

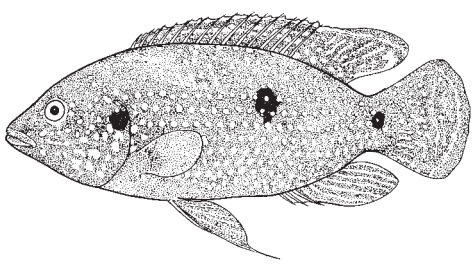


Fig. 3 ***Hemichromis bimaculatus***

4a. First gill arch with 8 to 12 gill rakers on lower limb; dark spot at base of soft dorsal fin in adults and juveniles . . . . . (***Tilapia***) → ***5***

4b. First gill arch with 14 to 28 gill rakers on lower limb; dark spot at base of soft dorsal fin in juveniles only . . . . . (***Oreochromis***) → ***6***

5a. Dorsal fin and upper half of caudal fin with small spots; no bands along flank; bases of scales on flanks dark (Fig. 4) . . . . . ***Tilapia rendalli***

5b. Dorsal fin and upper half of caudal fin without small spots; 1 or more indistinct broad bands along flank; bases of scales on flanks not darkened (Fig. 5). . . . . ***Tilapia zilli***

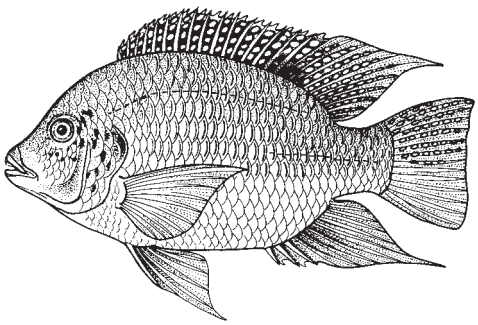


Fig. 4 ***Tilapia rendalli***

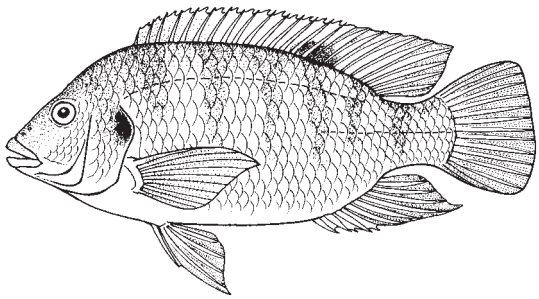


Fig. 5 ***Tilapia zilli***

6a. Lower limb of first gill arch with 14 to 20 (modally 17 or 18) gill rakers; caudal fin without distinct dark narrow bars (Fig. 6) . . . . . ***Oreochromis mossambicus***

6b. Lower limb of first gill arch with 18 to 28 (modally greater than 20) gill rakers; caudal fin with or without distinct narrow bars . . . . . → *7*

7a. Caudal fin without prominent narrow dark bars, with a broad pink distal margin (Fig. 7) . . . . . ***Oreochromis aureus***

7b. Caudal fin with distinct narrow dark bars, without a broad pink distal margin . . . . . → *8*

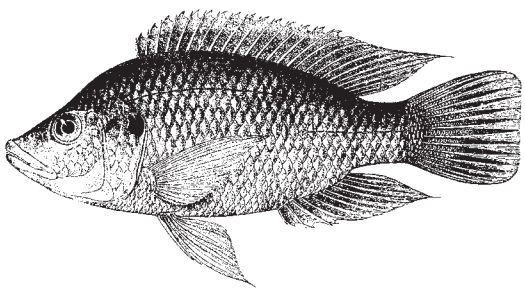


Fig. 6 ***Oreochromis mossambicus***

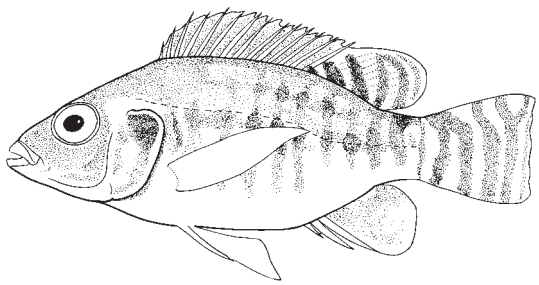


Fig. 7 ***Oreochromis aureus***

8a. Caudal fin mostly covered with narrow dark bars; sides without distinct marking or with dark bars (Fig. 8) . . . . . ***Oreochromis niloticus***

8b. Caudal fin with narrow dark bars on base and upper half; sides with 2 to 4 dark blotches (Fig. 9) . . . . . ***Oreochromis urolepis***

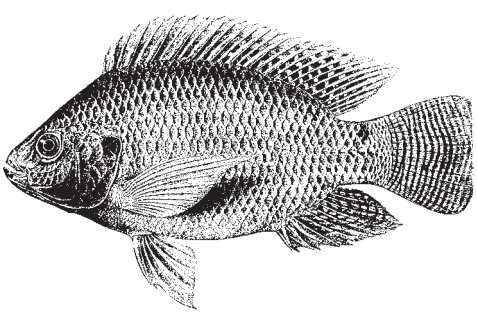


Fig. 8 ***Oreochromis niloticus***

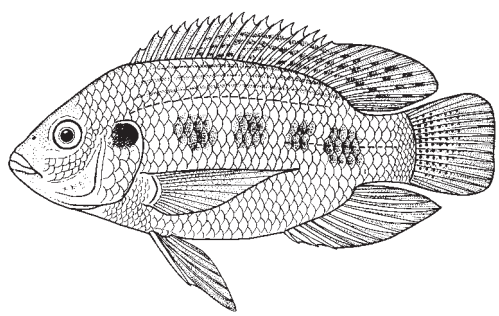


Fig. 9 ***Oreochromis urolepis***

List of species occurring in the area

All species tolerant to brackish water that have been introduced into the area are listed below. A single species, *Oreochromis mossambicus*, has become well established in brackish water environments on a broad scale in the area.

Cichla ocellaris Bloch and Schneider, 1801

Etroplus suratensis (Bloch, 1790)

Hemichromis bimaculatus Gill, 1862

Oreochromis aureus (Steindachner, 1864)
Oreochromis mossambicus (Peters, 1852)
Oreochromis niloticus niloticus (Linnaeus, 1758)
Oreochromis urolepis honorum (Trewavas, 1966)
Oreochromis urolepis urolepis (Norman, 1922)

Tilapia rendalli (Boulenger, 1897)
Tilapia zilli (Gervais, 1848)

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