



## Taxonomy Identification of Pigfacebreams

Pigface breams belong to the family Lethrinidae. They are tropical marine perciforms found entirely in the Indo-Pacific, except one species that occurs only in the eastern Atlantic. They belong to the suborder Percoidei, a diverse group containing many families whose relationships are poorly understood. Lethrinids are included under the superfamily Sparoidea, which also contains the families Sparidae (porgies), Centracanthidae and Nemipteridae (threadfin bream). Among percoids, sparoids appear most closely related to the Lutjanoidea (includes the snappers or Lutjanidae and, fusiliers or Caesionidae) and the Haemuloidea (includes the grunts or Haemulidae and Inermiidae). There has been much confusion concerning the familial allocation of the genera and species amongst these groups.

Pigface breams or emperor breams are mostly reef fishes but their preferred habitat is sandy or rubble substrate. The reefs which they frequent can be shallow, coralline reefs or deep, rocky reefs. One species frequents the outer edges of the continental shelf and is caught to depths of 200 m. Lethrinids can be solitary or schooling and do not appear to be territorial. They often form large aggregations while spawning

Lethrinids are bottom-feeding, carnivorous, coastal fishes, ranging primarily on or near reefs. They generally possess large, strong jaws and food preference is correlated with the type of lateral jaw teeth and to a certain extent, the length and angle of the snout found in a particular species. For example, the humpnose big-eye bream, *Monotaxis grandoculis*, has large, well-developed molars, and a short, blunt snout. It consumes molluscs, sea urchins and other hard-shell invertebrates. At the other extreme, the longface emperor, *Lethrinus olivaceus*, has conical lateral teeth, and an elongate, gradually sloping snout. It feeds mainly on fishes and crustaceans. Between these extremes, species exhibit many intermediate lateral teeth types, from molar through rounded to conical, and snout shape also varies widely. Diet concomitantly varies between the extremes from primarily hard-shell invertebrates, to soft-shell invertebrates,



to fishes, with combinations of these food items found in many species. There is also a great deal of selectivity for particular food items.

The problems previously encountered in identification of lethrinids are primarily due to the fact that many of the characters traditionally used to differentiate fishes are relatively constant among certain species of lethrinids. When they are live or still fresh, colour can be very helpful for species determination. Body colours and markings also add to the confusion because they can change substantially according to the time of day, the emotional state of the fish, geographic locality, and state of freshness. Despite these problems, previous researchers have contributed to our understanding of the taxonomy of lethrinids and have revealed a number of characters that help differentiate species. For example, Sato (1978) found that the pattern of dark pigment cells, or melanophores, on the membranes of the pelvic fin, help differentiate some species which were previously difficult to separate.

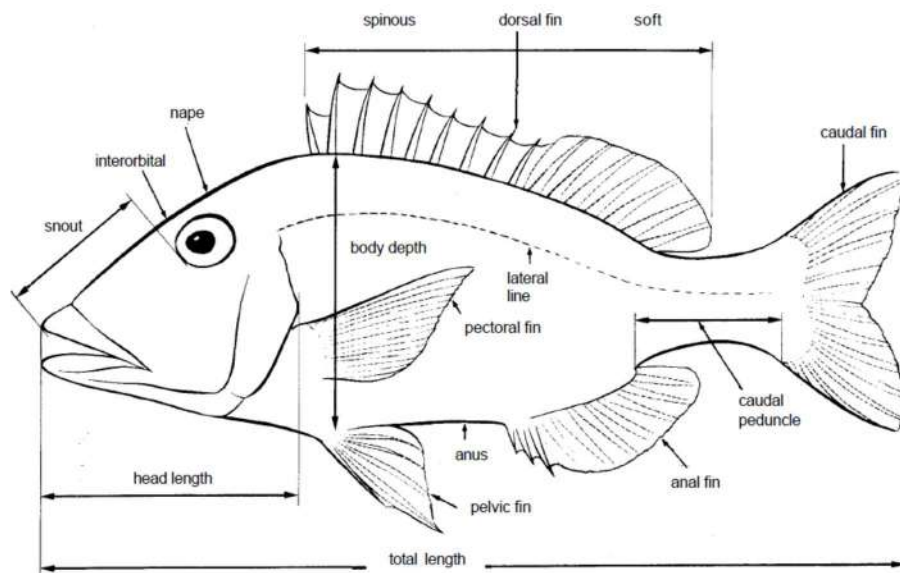
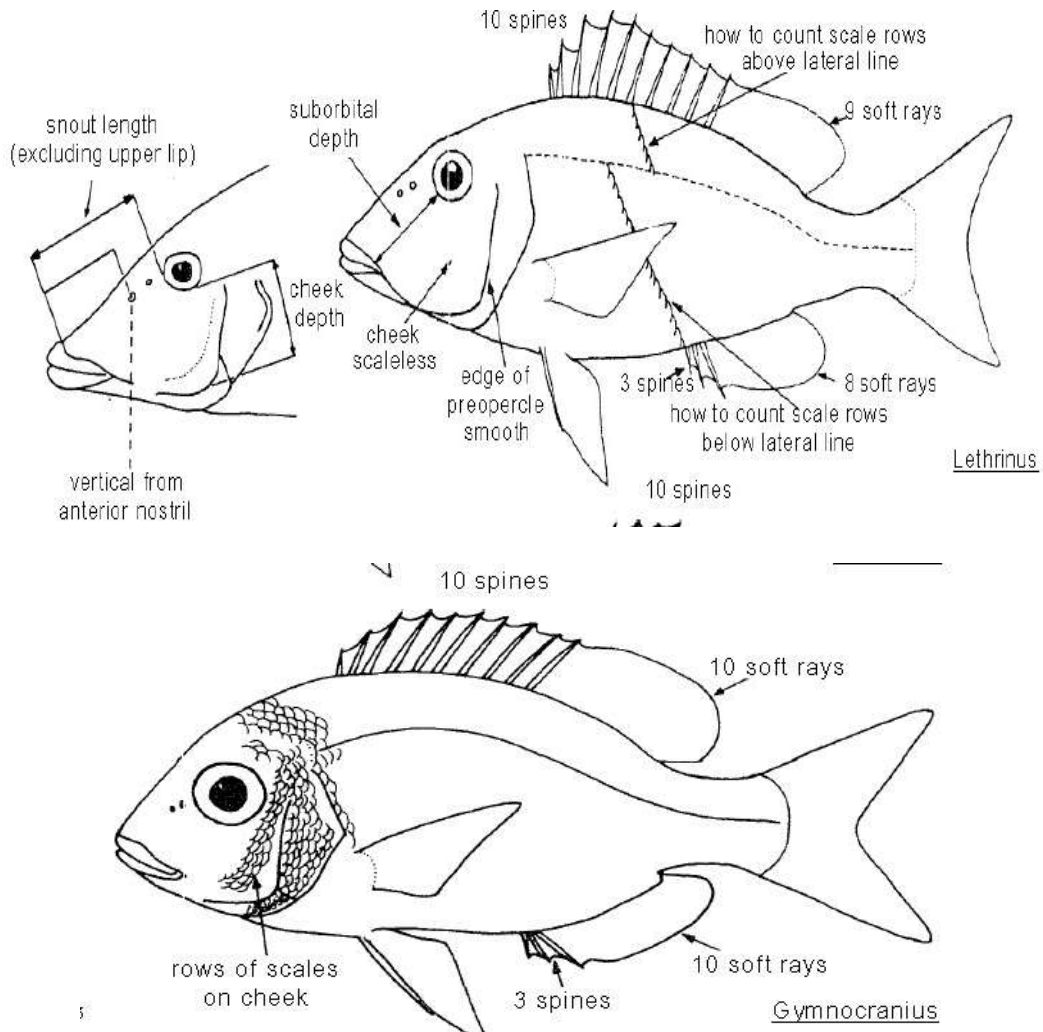


Fig. 1. External morphology measurements of Lethrinids

### General characteristics of Lethrinidae

- Perch-like fishes with a large head: lips often thick and fleshy; maxilla concealed, without supplementary bone, mostly slipping below infraorbital bones, but overlapping the premaxilla anteriorly;
- A single, continuous dorsal fin with 10 spines and 9 or 10 branched (soft) rays,
- Cheeks, upper surface of head and preorbital area scaleless in *Lethrinus*, but scales present on cheek in the other genera.



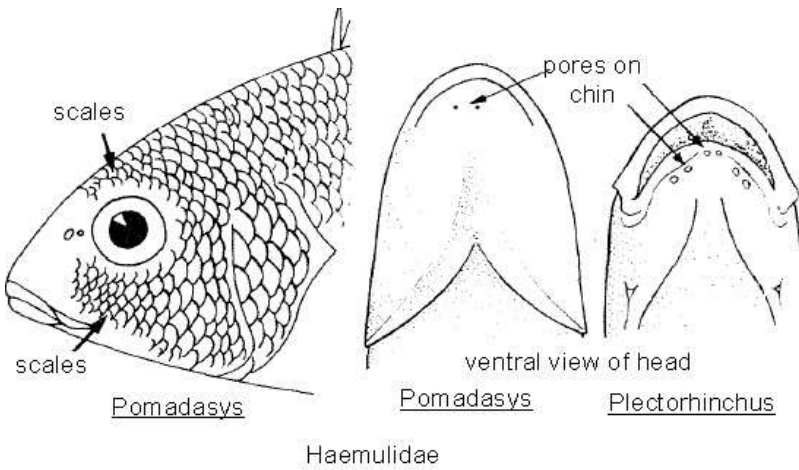
### Similar families existing in the area

#### Lutjanidae (Lutjanus)

- cheek always scaled (naked in Lethrinus)
- a preopercular notch and an interopercular knob often present;

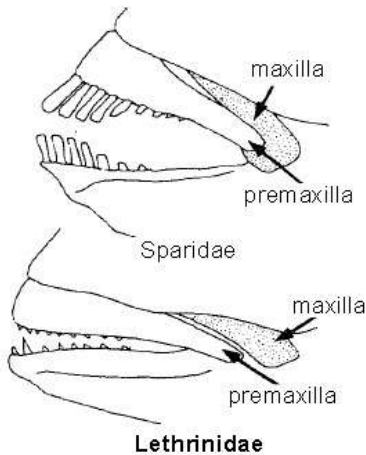
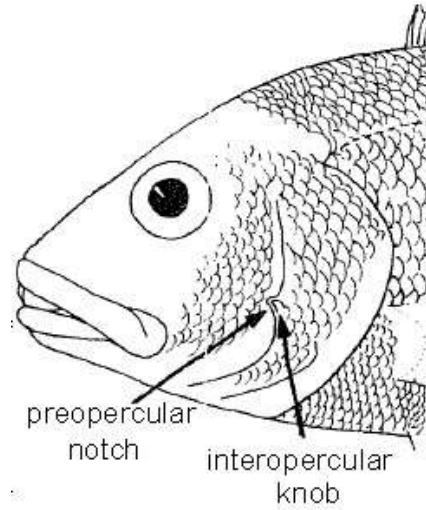
#### Haemulidae

- scales always present between eye and
- mouth (absent in that area in Lethrinidae); 2 or
- more pores present on chin;



**Sparidae:**

- posterior tip of premaxilla overlapping
- maxilla at hind end of mouth (maxilla overlapping)
- premaxilla in Lethrinidae); usually more
- than 10 dorsal fin spines



**Key to the identification of major species of lethrinidae**

1a. Cheek with 4 to 6 vertical rows of scales; 10 soft rays in dorsal fin; 9 or 10 soft rays in anal fin

2a. 9 soft rays in anal fin

Profile of head in front of eye strongly convex (Fig.2); pectoral fin with 14 soft rays, inner surface of pectoral fin base scaled. No longitudinal stripes on body ----- *Monotaxis grandoculis*

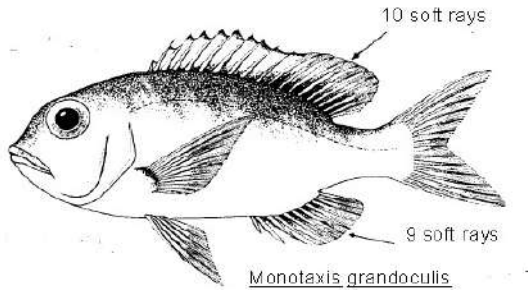


Fig. 2. *Monotaxis grandoculis* (Photo courtesy <http://www.fishbase.org>.)

Profile of head in front of eye slightly convex or straight; pectoral fin with 15 soft rays; inner surface of pectoral fin base scaleless . yellow longitudinal stripes on body (Fig. 3)

..... *Gnathodentex aureolineatus*

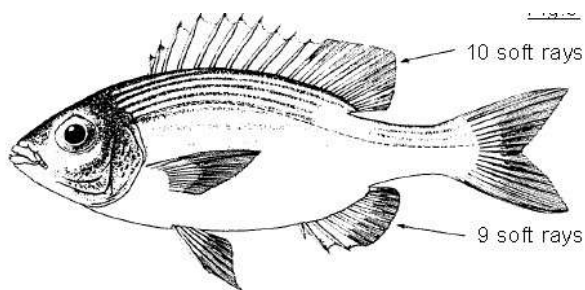
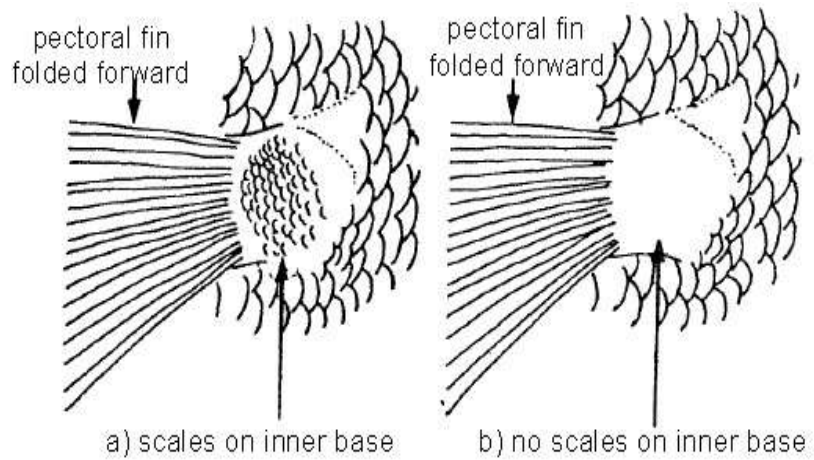


Fig. 3. *Gnathodentex aureolineatus* (Photo courtesy Randall, 1997)



2b. 10 soft rays in anal fin

4a. Maxilla with a strong denticulated longitudinal ridge. caudal fin lobes rounded; body 2.2 times or less in standard length (Fig. 4) ..... *Wattisia mossambica*

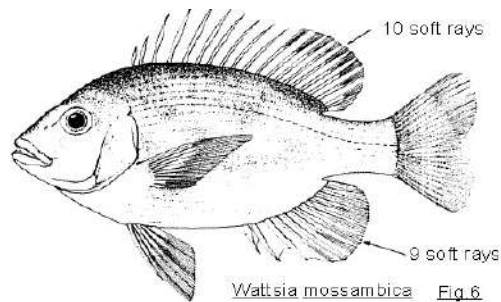
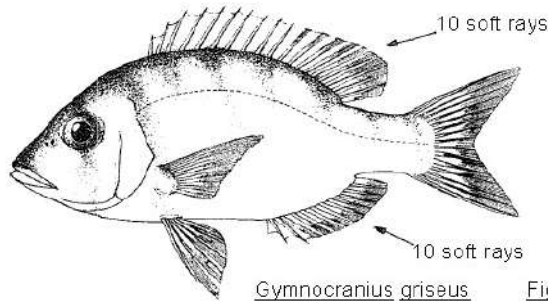
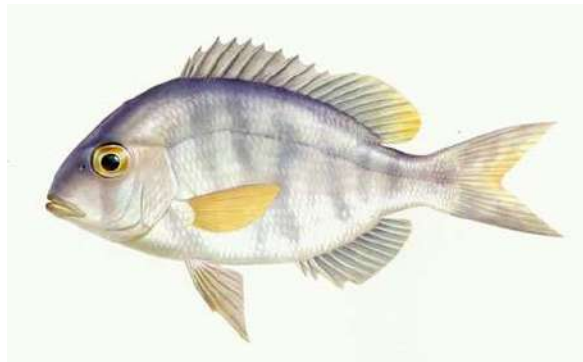


Fig. 4. *Wattisia mossambica* (Photo courtesy Randall, 1997)

4b. Maxilla surface smooth; caudal fin lobes pointed; body not as deep, 2.3 to 2.8 times in standard length (adults) 5a. Anal-fin base 2.1 to 2.5 times longer than longest soft anal-fin ray; no wavy blue lines on cheek, snout or opercle (Fig.5) ..... *Gymnocranius griseus*



*Gymnocranius griseus* Fig 7

Fig.5. *Gymnocranius griseus* (Photo courtesy <http://www.fishbase.org>.)

1b. Cheek naked; 9 soft rays in dorsal fin; 8 soft rays in anal fin  
 6a. Snout and head elongate; body depth less than head length, inner surface of pectoral fin base scaleless,

7a. Upper margin of eye almost on dorsal profile; interorbital space concave, flat or only slightly convex

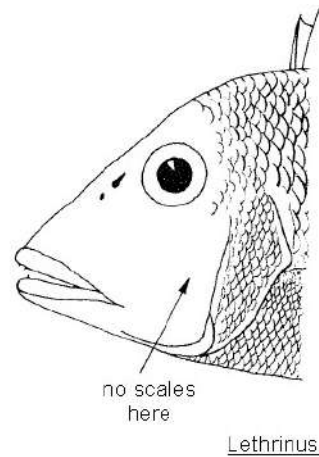
8a. No red coloration to opercle or pectoral fin base

9a. Posterior nostrils much closer to anterior nostril than to anterior margins of eye..... *Lethrinus variegatus*

9b. Posterior nostril about halfway between anterior nostril and anterior margin of eye ..... *Lethrinus semicinctus*

8b. Bright red coloration to opercle and/or pectoral fin base

10a. One or 2 red spots on pectoral fin base; opercular margin red (Fig.6) ..... *Lethrinus xanthochilus*



*Lethrinus*

Fig. 6. *Lethrinus xanthochilus* (Photo courtesy FAO, 1989)

10b. No red spot on pectoral fin base; a conspicuous red spot on opercular edge (Fig.7) ..... *Lethrinus rubrioperculatus*

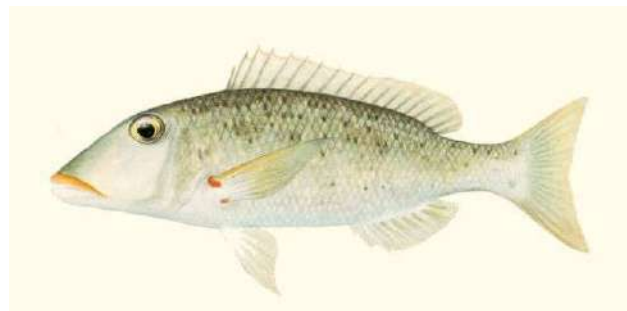




Fig.7. Spotcheek emperor *Lethrinus rubrioperculatus*

7b. Upper margin of eye well separated from dorsal profile; interorbital space moderately to strongly convex

11a. No red coloration present; oblique bluish lines from eye to snout tip, and a few broken streaks connecting eyes on top of head (Fig. 8)..... *Lethrinus microdon* (*L elongatus*)



Fig. 8. Smalltooth emperor, *Lethrinus microdon* (*L elongatus*) (Photo courtesy Randall, 1997)

11b. Red coloration present on lips, pectoral fin base or opercular edge

12a. A single, bright red blotch above pectoral fin base; opercular edge and pectoral fin, base also red; lips large and bright red; profile of snout concave, snout bulbous (Fig. 9) ..... *Lethrinus conchyliatus*



Fig. 9. Redaxil emperor, *Lethrinus conchyliatus* (Photo courtesy FAO, 1989)

12b. No red coloration on and above pectoral fins base or opercular edge; a red line sometimes present above and below lips; often 2 or 3 blackish streaks radiating from eye; profile of snout straight..... *Lethrinus elongatus* (*L microdon*)



**6b. Snout not elongate; body depth greater than head length**

13a. A characteristic series of bright blue lines radiating across cheek from eye; centres of scales with white spots; often longitudinal yellowish streaks on body (Fig.10) .. .. *Lethrinus nebulosus*

13b. No blue radiating lines on head 14a. A persistent, oblong blotch present on sides, usually encircled with a golden rim (Fig.11)



Fig. 10. Spangled emperor, *Lethrinus nebulosus* (Photo courtesy Randall, 1997)

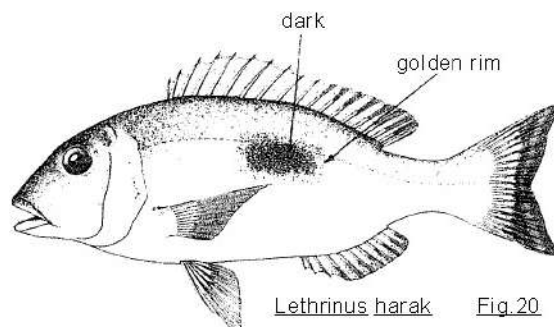


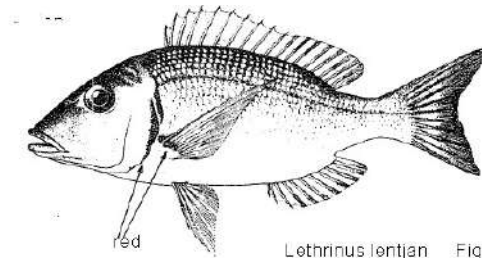
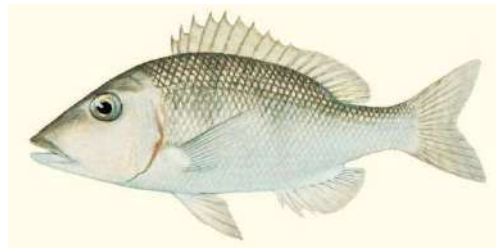
Fig. 11. Thumbprint emperor, *Lethrinus harak* (Photo courtesy Randall, 1997)

14b. No obvious large dark blotch present on sides of body

15a. Small orange spots on sides of head (Fig.12) .....*Lethrinus kallopterus* (*Lethrinus erythracanthus*)



Fig. 12. Orange-spotted emperor, *Lethrinus kallopterus* (Photo courtesy Randall, 1997)  
 15b. No orange spots on head 18a. red spot on opercular margin and on pectoral fin base; no conspicuous yellow stripes on body (Fig. 13) ..... *Lethrinus lentjan*

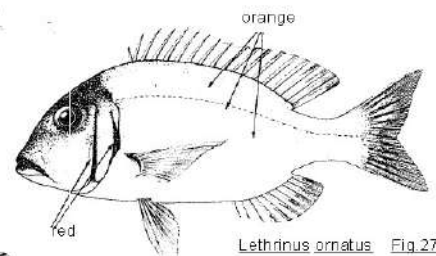


*Lethrinus lentjan* Fig.25

Fig. 13. *Lethrinus lentjan* (Photo courtesy FAO, 1989)

17b. Snout length (excluding upper lip) equal to, or less than cheek depth (Fig.24b)

19a. Several prominent bright orange stripes present on body; opercular and preopercular margins bright red (Fig.14) ..... *Lethrinus ornatus*



*Lethrinus ornatus* Fig.27

Fig. 14. Ornate emperor, *Lethrinus ornatus* (Photo courtesy Randall, 1997)

19b. No bright orange stripes on body; no red colour on preopercle

20a. Six scale rows between lateral line and median dorsal fin spines ..... *Lethrinus mahsenoides* (*L. lentjan*)

20b. Less than 6 scale rows between lateral line and median dorsal fin spines; opercular margin not red

21a. Four scale rows between lateral line and median dorsal fin, spines (excluding the very small scales at base of dorsal fin) (Fig.15)..... *Lethrinus mahsena*



Fig. 15. Sky emperor *Lethrinus mahsena* (Photo courtesy FAO, 1989)

21b. Five scale rows between lateral line and median dorsal fin spires (excluding the very small scales at base of dorsal fin) (Fig. 16) ..... *Lethrinus crocineus*

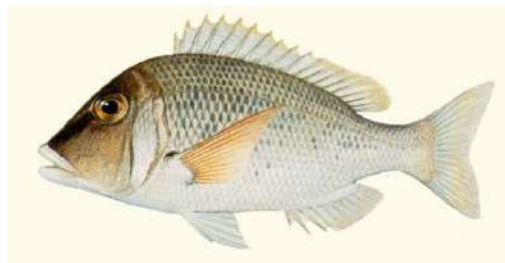


Fig.16 . Yellowtail emperor, *Lethrinus crocineus* (Photo courtesy FAO, 1989)

