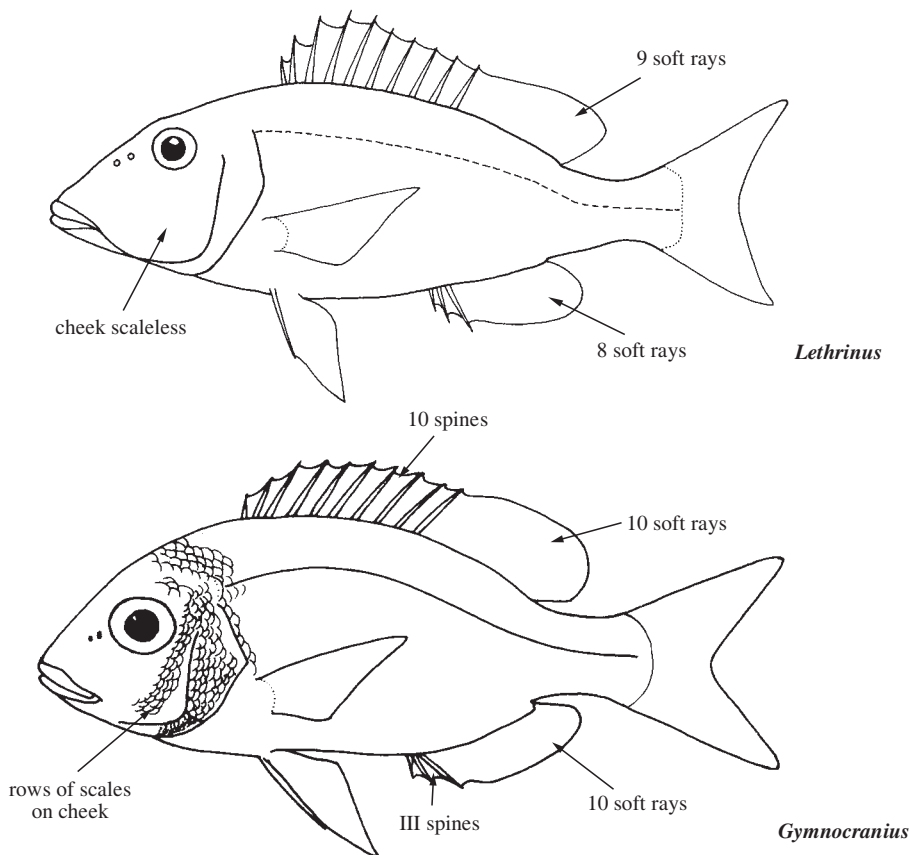


LETHRINIDAE

Emperors (emperor snappers)

by K.E. Carpenter

Diagnostic characters: Perch-like sparoid fishes (size to 100 cm). **Dorsal fin continuous, with X spines and 9 or 10 soft rays; anal fin with III spines and 8 to 10 soft rays;** pectoral fins with 13 to 15 soft rays; pelvic fins thoracic, with I spine and 5 soft rays; caudal fin emarginate or forked, with 7 to 9 procurent caudal-fin rays. Scales finely ctenoid and moderate in size; **cheek naked in *Lethrinus* and scaly in remaining genera.** Mouth small to moderate, terminal; lips often soft and fleshy; upper jaw protrusible, ascending process of premaxilla confluent with articular process, usually longer than or almost equal to alveolar ramus; postmaxillary process absent; palato-premaxillary ligament very well developed; **maxilla mostly concealed below infraorbital bones, not articulating broadly with distal tip of premaxilla,** without a supplementary bone; ethmo-maxillary ligament absent; an outer row of canine teeth in front of both jaws, teeth on sides conical or molar-like; an inner row of villiform teeth anteriorly; **vomer and palatines toothless.** Gill membranes broadly united to one another but separated from isthmus; gills 4, slit behind the fourth present; pseudobranchs present; gill rakers short and knob-like; 4 branchiostegal rays inserting on ceratohyal, the fifth at interspace between ceratohyal and epihyal, the sixth on epihyal; second epibranchial tooth plate present, the third absent. Two openings in pars jugularis; subocular shelf reduced or absent. Three predorsal bones present in the following configuration: first predorsal, first neural spine, second and third predorsal, second neural spine, first pterygiophore supporting the first 2 dorsal-fin spines and second pterygiophore supporting third dorsal-fin spine, third neural spine, third pterygiophore supporting fourth dorsal-fin spine, fourth neural spine; 2 or 3 trisegmental pterygiophores in dorsal and anal fins; 11 epipleural ribs; accessory subpelvic keel absent; postpelvic process well developed. Pyloric caeca few, usually 3. **Colour:** body and head colour silvery, grey, olive, greenish, bluish, tan, brown, or reddish, often with dark blotches or bars; head sometimes with bluish streaks and spots; sometimes bright red markings on or near base of pectoral fins, on pelvic-, anal-, and dorsal-fin membranes near base of fins, on opercular and preopercular margins, and on head, these markings often variable within species; fins clear, pale, bluish, yellowish, or reddish, often blotched, the edge of fins often reddish.

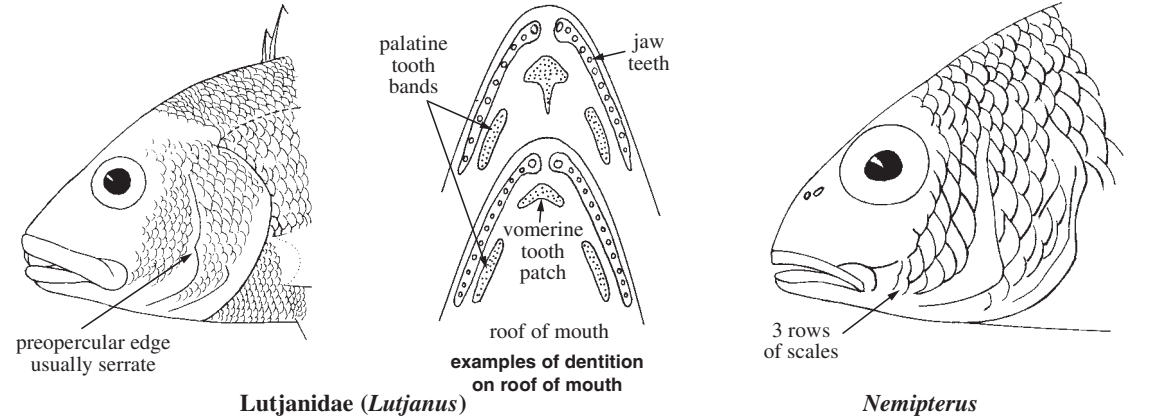


Habitat, biology, and fisheries: Coastal fishes of the tropical Indo-West Pacific and West Africa, often found over sandy bottoms and including seagrass beds, mangrove swamps, coral reefs, and rocky reefs, to depths of 100 m. They usually occur solitary or in small groups and form large aggregations while spawning. The diet consists of echinoderms, crustaceans, molluscs, fishes, and polychaetes. Moderate to significantly important in fisheries; in certain countries, members of this genus are the most important catch by weight. Caught primarily by handline, traps, and trawls. For 1995, the FAO Yearbook of Fishery Statistics reports a total catch of 31 518 t of Lethrinidae from the Western Central Pacific.

Similar families occurring in the area

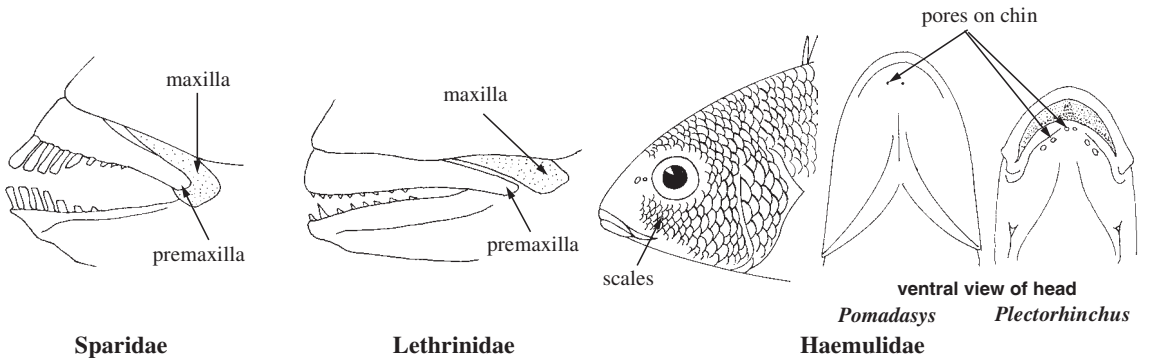
Lutjanidae: teeth usually present on vomer and palatines; cheek always scaly (naked in *Lethrinus* but scaly in other genera of Lethrinidae); preopercular edge usually serrate (typically smooth in Lethrinidae); usually 11 or more soft dorsal-fin rays (9 or 10 in Lethrinidae).

Nemipteridae: anal fin with 7 soft rays (except 8 in *Nemipterus virgatus*); cheek always scaly (naked in *Lethrinus* but scaly in other genera of Lethrinidae); no molar-like teeth in jaws (present in some species of Lethrinidae).



Sparidae: posterior tip of premaxilla overlapping maxilla at hind end of mouth (maxilla overlapping premaxilla in Lethrinidae); more than X dorsal-fin spines (always X in Lethrinidae); cheek always scaly (naked in *Lethrinus* but scaly in the other genera of Lethrinidae).

Haemulidae: scales always present between eye and mouth (absent in that area in Lethrinidae); 2 or more pores present on chin; second anal-fin spine often very strong.



Key to the genera of Lethrinidae

- 1a. Cheek naked (Fig. 1); 9 soft rays in dorsal fin; 8 soft rays in anal fin (Fig. 2) *Lethrinus*
- 1b. Cheek with 3 to 6 vertical rows of scales (Fig. 3); 10 soft rays in dorsal fin; usually 9 or 10 soft rays in anal fin → 2

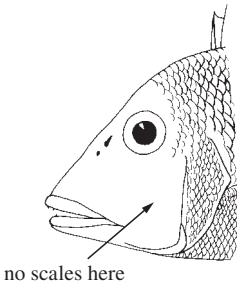


Fig. 1 *Lethrinus*

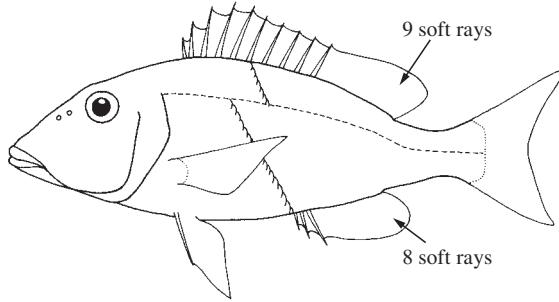


Fig. 2 *Lethrinus*

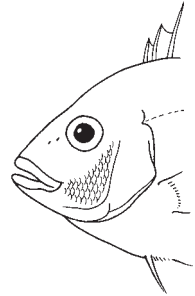


Fig. 3 *Wattisia*

- 2a. Inner surface of pectoral-fin base densely scaled (Fig. 4a); sides of jaws with round, flat molars (Figs 5a and 6) *Monotaxis grandoculis*
- 2b. Inner surface of pectoral-fin base scaleless (Fig. 4b); sides of jaws with canines and villiform teeth (except 1 species, *Gymnocranius euanus*, which has molars) (Fig. 5b) → 3

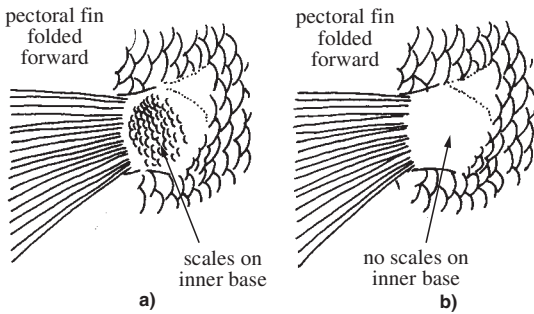


Fig. 4

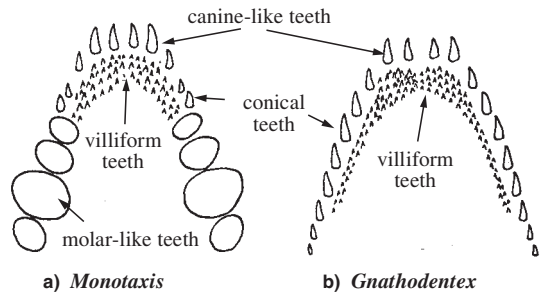


Fig. 5 roof of mouth

- 3a. Outer surface of maxilla smooth *Gymnocranius*
- 3b. Outer surface of maxilla with denticulated ridge (Fig. 7) → 4

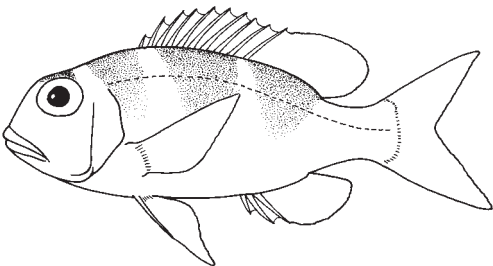
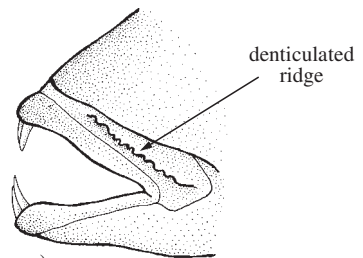


Fig. 6 *Monotaxis grandoculis*



(lateral teeth not shown)

Fig. 7

- 4a. Caudal-fin lobes pointed; anal fin with 8 or 9 soft rays; pectoral fins with 15 rays (Fig. 8) *Gnathodentex aurolineatus*
- 4b. Caudal-fin lobes rounded; anal fin with 10 soft rays; pectoral fins with 14 rays (Fig. 9) *Wattsia mossambica*

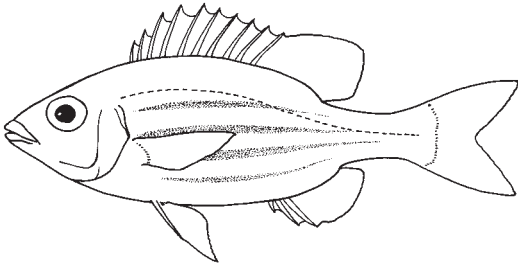


Fig. 8 *Gnathodentex aurolineatus*

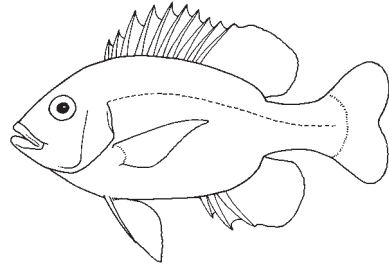


Fig. 9 *Wattsia mossambica*

Key to the species of *Gymnocranius* occurring in the area

- 1a. Caudal fin strongly forked (Fig. 10a), the median rays shorter than eye diameter; lower edge of eye intersected by line from tip of snout to middle of caudal-fin fork (Figs 11 and 12) *Gymnocranius elongatus*
- 1b. Caudal fin moderately forked (Fig. 10b), the median rays about equal to, or longer than, eye diameter; lower edge of eye above line from tip of snout to middle of caudal-fin fork (Fig. 13) → 2

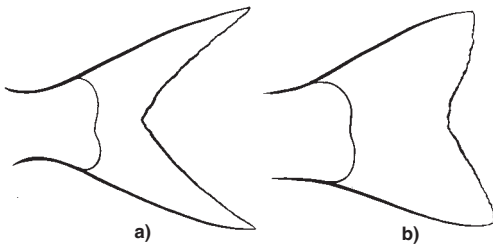


Fig. 10

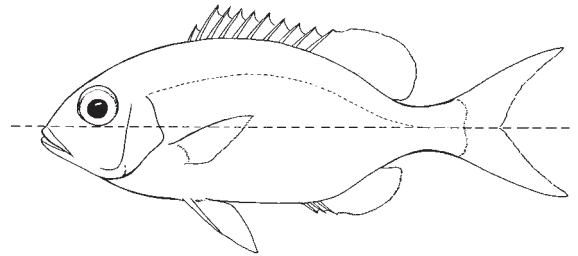


Fig. 11

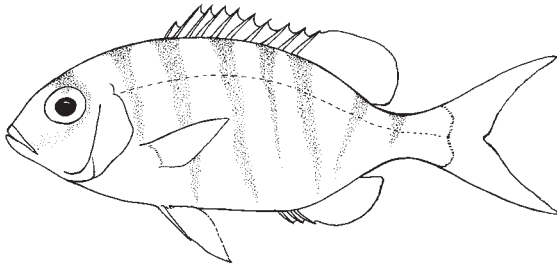


Fig. 12 *Gymnocranius elongatus*

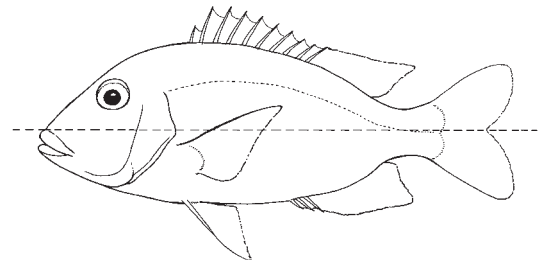


Fig. 13

- 2a. Longitudinal scale rows between lateral line and base of middle dorsal-fin spines 4 ½; molars present on sides of jaws (Figs 14a and 15) *Gymnocranius euanus*
- 2b. Longitudinal scale rows between lateral line and base of middle dorsal-fin spines 5 ½ (Fig. 16); molars absent, usually villiform to conical teeth present on sides of jaws (Fig. 14b) → 3

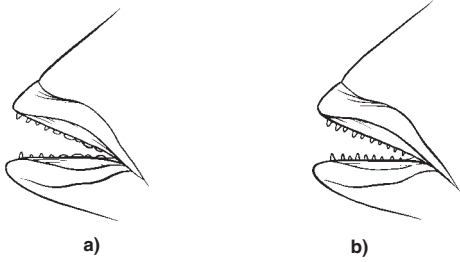


Fig. 14

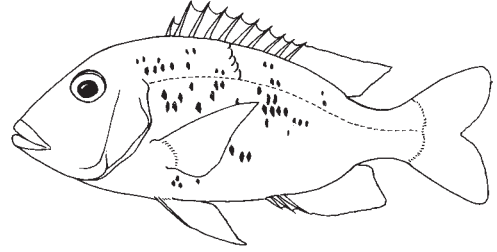


Fig. 15 *Gymnocranius euanus*

- 3a. Head with a prominent diamond-shaped, blackish patch of scales surrounded by a white border above and behind each eye (Fig. 17) *Gymnocranius audleyi*
- 3b. Head without the marking described in 3a → 4

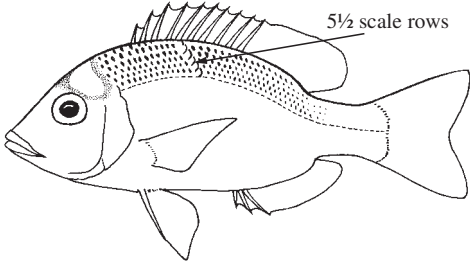


Fig. 16 *Gymnocranius*

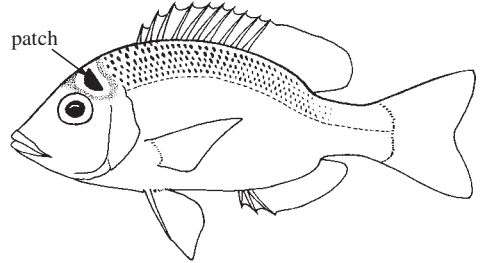


Fig. 17 *Gymnocranius audleyi*

- 4a. Snout with prominent blue-edged yellow band from front of eye to above upper lip (encompassing nostrils); 3 or 4 oblique, blue (brown in preservative) lines across cheek; body moderately deep, the maximum depth about 2.3 to 2.4 times in standard length (Fig. 18) . . . *Gymnocranius frenatus*
- 4b. Snout without the marking described in 4a; cheek may have wavy, blue lines, but they are more or less horizontal rather than oblique; body depth variable, 1.9 to 3 times in standard length → 5

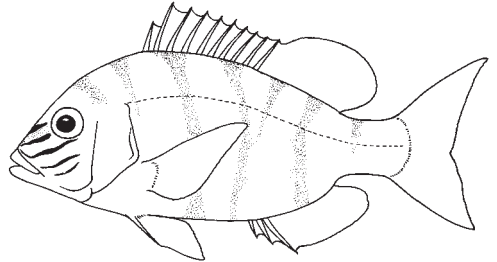


Fig. 18 *Gymnocranius frenatus*

- 5a. Inner edge of caudal-fin fork slightly convex with fin tips blunt (Fig. 19a); live fish with longitudinal rows of dark spots on upper side (Fig. 20) *Gymnocranius* sp.
- 5b. Inner edge of caudal-fin fork straight and fin tips pointed (Fig. 19b); no longitudinal rows of dark spots on upper side → 6

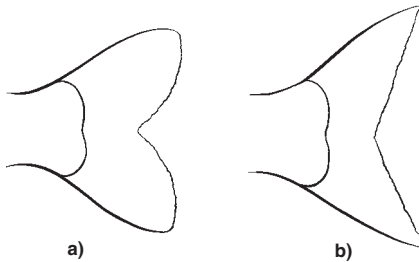


Fig. 19

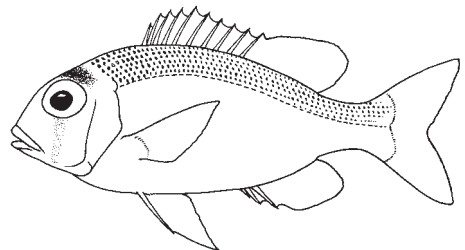


Fig. 20 *Gymnocranius* sp.

6a. Body comparatively deep, its depth about 1.9 to 2.2 (occasionally 2.3) times in standard length; no blue spots or wavy blue lines on cheek; usually with several irregular dark bars on sides and dark subocular bar (Fig. 21) *Gymnocranius griseus*

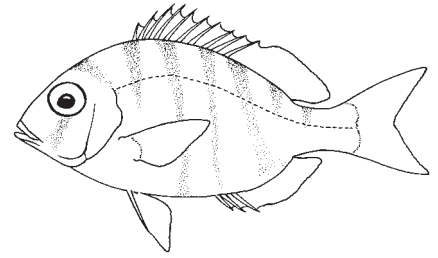


Fig. 21 *Gymnocranius griseus*

6b. Body comparatively slender, its depth about 2.3 to 3 times in standard length; side of snout and cheek often with vertically elongate spots (Fig. 22) or wavy longitudinal blue lines (Fig. 23) in fresh specimens longer than 20 to 25 cm standard length; smaller specimens may have irregular dark bars on side and dark subocular bar as in 6a → 7

7a. Body depth about 2.6 to 3 times in standard length; cheek often with vertically elongate blue spots in fresh specimens (Fig. 22) *Gymnocranius microdon*

7b. Body depth about 2.3 to 2.5 (occasionally 2.6) times in standard length; juveniles below about 200 mm standard length frequently with dark bar under eye and 5 or 6 irregular dark bars across side of body; adults with wavy, blue lines on snout and cheek increasing in number with growth (Fig. 23) *Gymnocranius grandoculis*

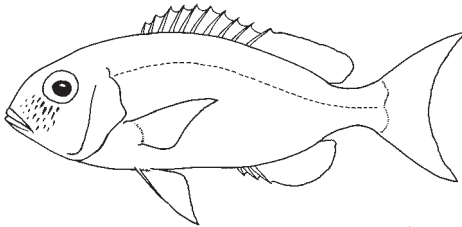


Fig. 22 *Gymnocranius microdon*

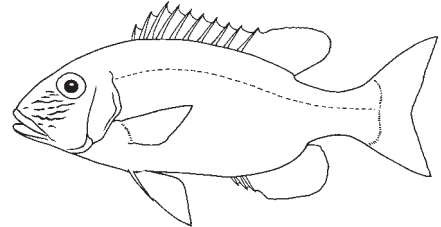


Fig. 23 *Gymnocranius grandoculis*

Key to the species of *Lethrinus* occurring in the area

Remarks on key characters: 2 of the most useful characters in differentiating species of *Lethrinus* are the presence or absence of scales in the axil of the pectoral fins and, the number of scale rows above the lateral line to the middle spines of the dorsal fin. These characters are relatively constant for most species of *Lethrinus* but in a few species they vary. Because of this, some previous keys have tended to de-emphasize the use of these characters. After examining the variation of these characters in many specimens, however, I found that the advantages of using them far outweighs the disadvantages of their variation. The strategy to tolerate this variation has been to have species occur more than once in the key and to add redundant diagnostic characters. Despite this strategy, the identification of preserved specimens of species of *Lethrinus*, especially juveniles, can still be a formidable task.

1a. Second dorsal-fin spine distinctly longer than other dorsal-fin spines (Fig. 24); a pair of canines in front of lower jaw substantially curved outward (Fig. 25a) *Lethrinus genivittatus*

1b. Third, fourth, or fifth dorsal-fin spine the longest; canines in front of lower jaw almost straight or curved outward slightly (Fig. 25b) → 2

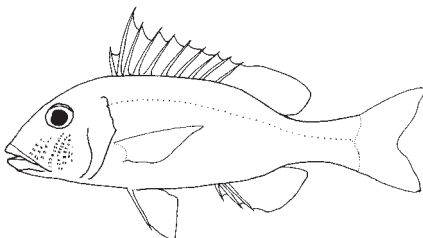


Fig. 24 *Lethrinus genivittatus*

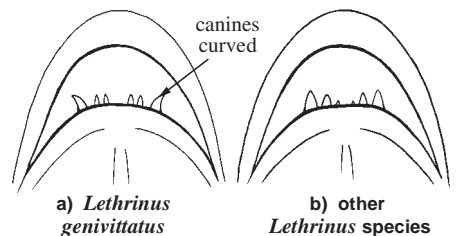


Fig. 25 anterior view of canines in lower jaw (teeth in upper jaw not shown)

- 2a. Inner surface of pectoral-fin base without scales (Fig. 26a) → 3
- 2b. Inner surface of pectoral-fin base covered mostly or partially with scales (Fig. 26b), sometimes with only a fraction of lower part of inner base covered → 17

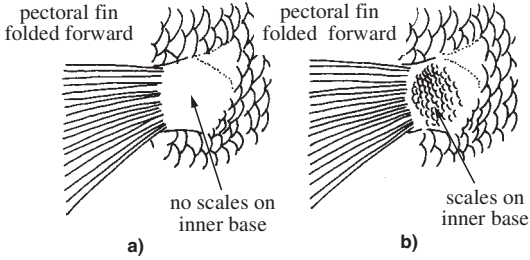


Fig. 26 inner surface of pectoral fin

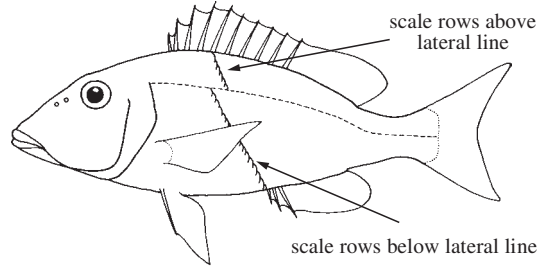
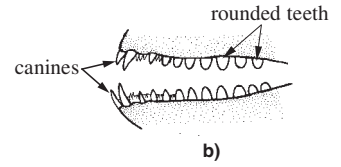
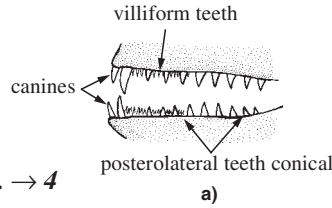


Fig. 27 scale counts above and below lateral line (do not include lateral-line scale or scale on ventral median)

- 3a. Longitudinal scale rows between lateral line and base of middle dorsal-fin spines 4 1/2 (Fig. 27); lateral teeth in jaws conical (Fig. 28a) → 4



- 3b. Longitudinal scale rows between lateral line and base of middle dorsal-fin spines 5 1/2 (Fig. 29); lateral teeth in jaws conical, rounded, molars, or molars with a tubercle (Fig. 28a-d) → 15

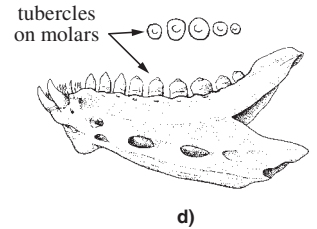
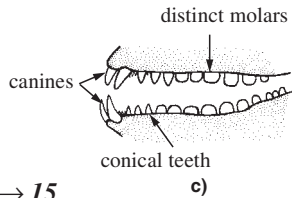


Fig. 28 types of teeth

- 4a. Body comparatively deep, its depth 2.2 to 2.75 times in standard length; head length usually distinctly less than body depth, sometimes head length almost equal to body depth → 5
- 4b. Body comparatively slender, its depth 2.8 to 3.9 times in standard length; head length almost always distinctly greater than body depth, head length rarely almost equal to body depth → 6

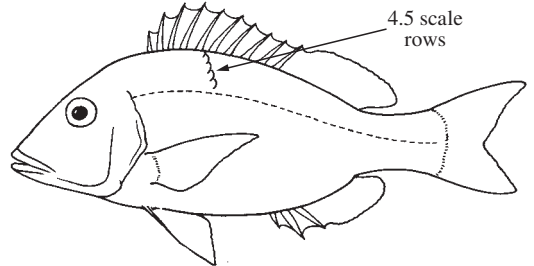


Fig. 29 scale count above lateral line

- 5a. Third dorsal-fin spine usually the longest; snout length (measured without lip) 0.9 to 1 times in cheek height (Fig. 30); in life, red markings around eye (Fig. 31) *Lethrinus miniatus*
- 5b. Fourth dorsal-fin spine usually the longest; snout length (measured without lip) usually 0.8 to 0.9 times in cheek height (Fig. 30); in life, blue markings around eye (Fig. 32) *Lethrinus haematopterus* (reported thus far only from Hong Kong and Taiwan Province of China, although it may eventually be recorded from the area)

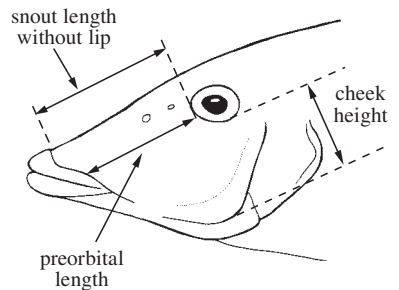


Fig. 30 measurement of cheek height (lowermost point on orbit to furthest point on angle of preopercle) and snout (without lip)

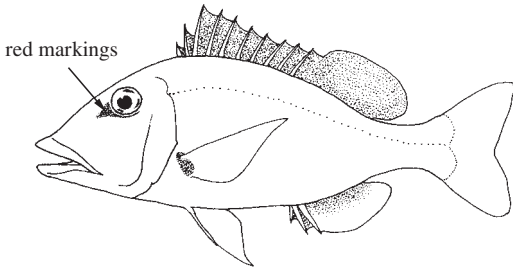


Fig. 31 *Lethrinus miniatus*

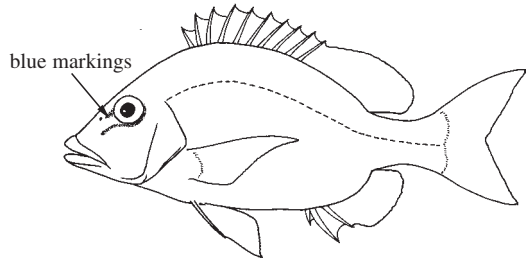


Fig. 32 *Lethrinus haematopterus*

- 6a. Prominent scaleless patch above base of pectoral fins, bright red in life (Fig. 33) *Lethrinus conchyliaetus*
- 6b. No prominent scaleless patch above base of pectoral fins → 7
- 7a. Interorbital area distinctly or slightly concave (Fig. 34a) → 8
- 7b. Interorbital area nearly flat or convex (Fig. 34b, c) → 9

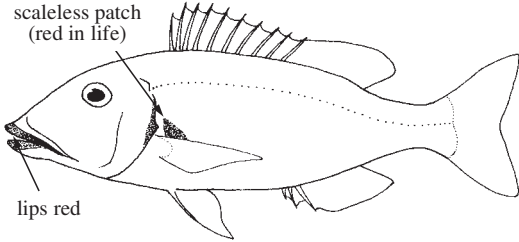


Fig. 33 *Lethrinus conchyliaetus*

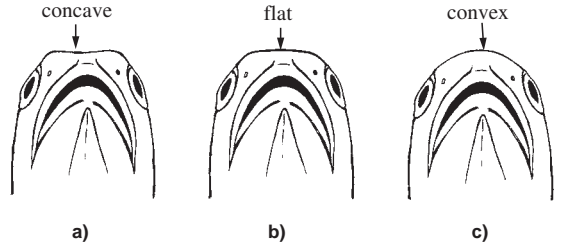


Fig. 34 anterior view of head showing shape of interorbital region

- 8a. Membrane between innermost rays of pelvic fins covered with melanophores (Fig. 35a); 5 to 8 scales in supratemporal patch (Fig. 36); in life, lips yellowish and a red spot on upper base of pectoral fins (Fig. 36) *Lethrinus xanthochilus*
- 8b. Membrane between innermost rays of pelvic fins not mostly covered with melanophores (Fig. 35b); 7 to 10 scales in supratemporal patch; in life, lips, upper base of pectoral fins, upper edge of opercle, sometimes posterior edge of preopercle, and sometimes an indistinct band on snout, reddish (Fig. 37) *Lethrinus reticulatus*

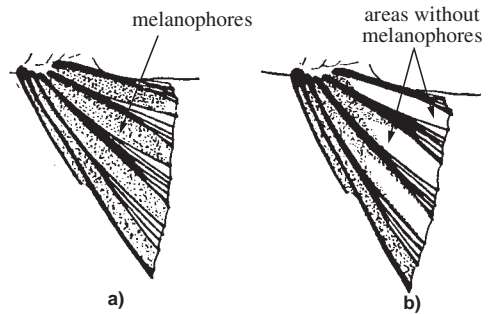


Fig. 35 pelvic fin

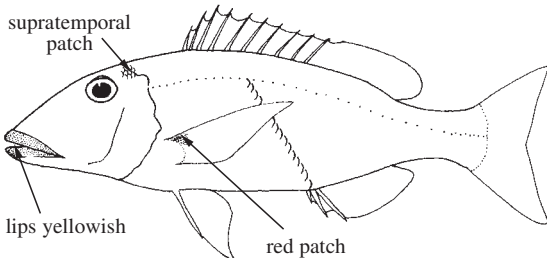


Fig. 36 *Lethrinus xanthochilus*

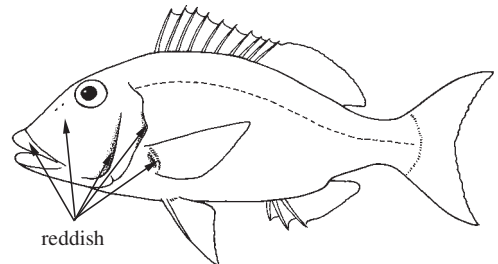


Fig. 37 *Lethrinus reticulatus*

- 9a. Scale rows in transverse series below lateral line 13 or 14 (Fig. 38); posterior nostril a vertical slit, often closer to anterior nostril than to orbit; body very slender, its depth 3.2 to 3.9 times in standard length (Fig. 38) *Lethrinus variegatus*
- 9b. Scale rows in transverse series below lateral line 15 to 17; posterior nostril a longitudinal slit closer to orbit than to anterior nostril, or about half-way between anterior nostril and orbit; body depth 2.8 to 3.4 times in standard length →10

- 10a. Snout long, its length (measured without lip) 0.7 to 0.8 times in cheek height (Fig. 30); 3 dark streaks radiating forward from eye on snout usually visible (Fig. 39); inner surface of pectoral-fin surface never red in life *Lethrinus microdon*
- 10b. Snout length (measured without lip) 0.8 to 0.9 times in cheek height (Fig. 30); 3 distinct dark streaks radiating from eye not usually apparent, but if they are apparent, inner surface of pectoral-fin base is red in life → 11

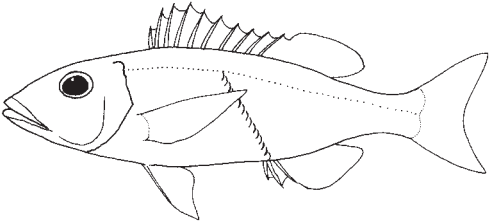


Fig. 38 *Lethrinus variegatus*

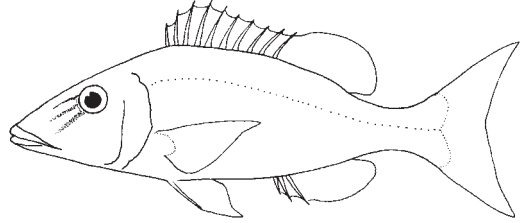


Fig. 39 *Lethrinus microdon*

- 11a. Area on snout directly in front of eye with a distinct hump, snout profile concave (Fig. 40) *Lethrinus sp. 1*
- 11b. Area on snout in front of eye without a distinct hump, profile of snout nearly straight or concave → 12

- 12a. Membranes between inner rays of pelvic fins mostly covered with melanophores, or with a limited part of innermost ray not covered by melanophores (Figs 35a and 41) . . . *Lethrinus amboinensis*
- 12b. Membranes between pelvic-fin rays closest to body without a dense covering of melanophores (Fig. 35b)

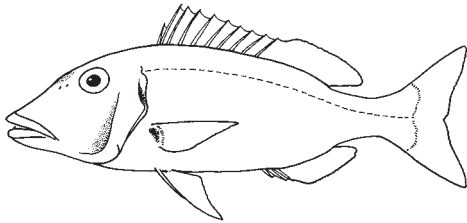


Fig. 40 *Lethrinus sp. 1*

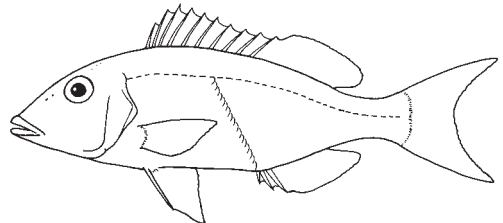


Fig. 41 *Lethrinus amboinensis*

- 13a. Wide scaleless area on upper posterior margin of opercle (Fig. 42a); 7 to 10 scales in supratemporal patch (Fig. 43) *Lethrinus rubrioperculatus*
- 13b. Upper posterior margin of opercle without wide scaleless area (Fig 42b); 4 to 8 scales in supratemporal patch → 14

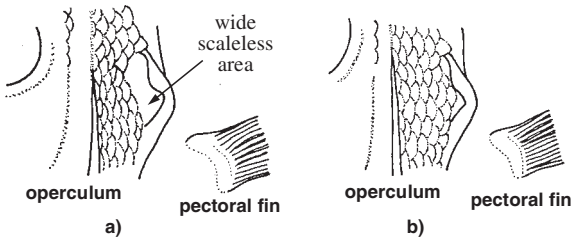


Fig. 42 posterior margin of opercle

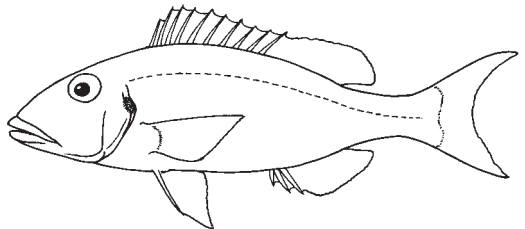


Fig. 43 *Lethrinus rubrioperculatus*

- 14a. A large irregular black blotch on sides, bordering under lateral line and below soft-rayed portion of dorsal fin (Fig. 44) *Lethrinus semicinctus*
- 14b. No large black blotch on side (Fig. 45) *Lethrinus* sp. 2

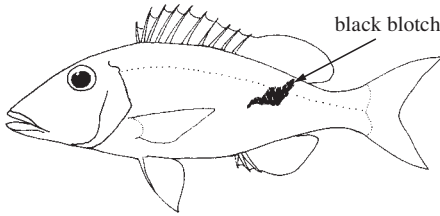


Fig. 44 *Lethrinus semicinctus*

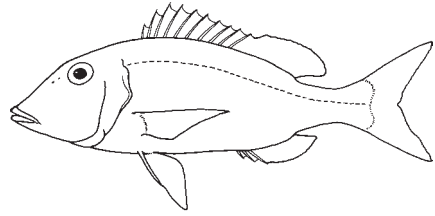


Fig. 45 *Lethrinus* sp. 2

- 15a. Snout long, its length (measured without lip) 0.6 to 0.8 times in cheek height (Fig. 30); body relatively slender, its depth 2.8 to 3.4 times in standard length (for specimens over 10 cm standard length) (Fig. 46) *Lethrinus olivaceus*

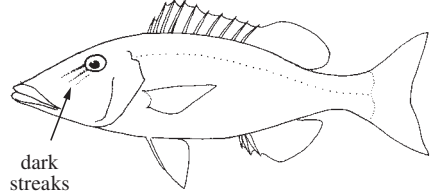


Fig. 46 *Lethrinus olivaceus*

- 15b. Snout length (measured without lip) 0.8 to 1 times in cheek height (Fig. 30); body depth 2.3 to 2.9 times in standard length → 16

- 16a. In adults, lateral teeth in jaws with molars, molars with tubercles, or broadly rounded (Fig. 28 b-d); body depth 2.5 to 2.9 times in standard length; posterior margin of opercle red and base of pectoral fins often red in life (Fig. 47) *Lethrinus lentjan*
(widespread throughout the area)

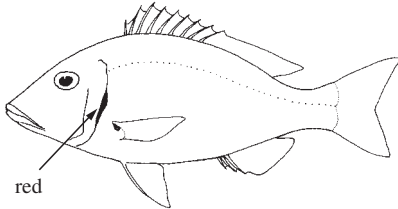


Fig. 47 *Lethrinus lentjan*

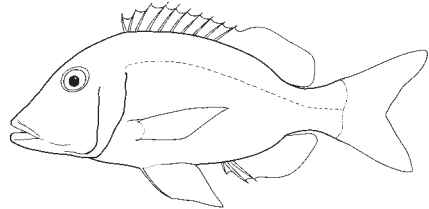


Fig. 48 *Lethrinus* sp. 3

- 16b. In adults, lateral teeth in jaws conical (Fig. 28a); body depth 2.25 to 2.6 times in standard length; without red markings in life (Fig. 48) *Lethrinus* sp. 3
(restricted to northwestern Australia)

- 17a. A large black blotch bordering below lateral line and centred on posterior tip of pectoral fins, usually persistent in preserved specimens (Fig. 49); usually 13 or 14 scale rows in lower series around caudal peduncle (Fig. 50); (longitudinal scale rows between lateral line and base of fifth dorsal-fin spine usually 5 ½, sometimes 4 ½ scales) (Fig. 50) . *Lethrinus harak*
- 17b. No dark blotch below lateral line; usually 15 scale rows in lower series around caudal peduncle (except in *L. atkinsoni* which also has 13 or 14 of these scale rows but can be distinguished from *L. harak* in always having 4 ½ longitudinal scale rows between lateral line and base of fifth dorsal-fin spine, whereas *L. harak* usually has 5 ½, but sometimes 4 ½, longitudinal scale rows between lateral line and base of fifth dorsal-fin spine) → 18

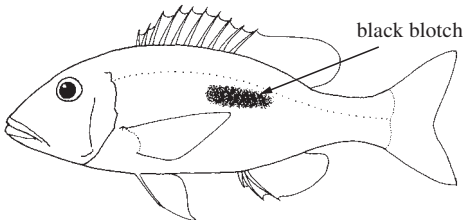


Fig. 49 *Lethrinus harak*

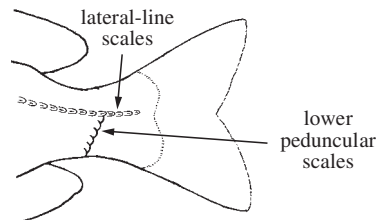


Fig. 50 scale counts on caudal peduncle
(lower circumpeduncular scale count includes lateral-line scales on both sides)

- 18a. Longitudinal scale rows between lateral line and base of fifth dorsal-fin spine $4 \frac{1}{2}$ (Fig. 27) → 19
- 18b. Longitudinal scale rows between lateral line and base of fifth dorsal-fin spine $5 \frac{1}{2}$ (Fig. 29) → 22

- 19a. The third, fourth, or fifth anal-fin ray usually the longest, much longer than length of base of soft portion of anal fin; length of longest anal-fin ray 0.8 to 1.1 times in length of entire anal fin (Fig. 51) → 20
- 19b. The first or second anal-fin ray usually the longest, shorter than, approximately equal to, or slightly longer than length of soft portion of anal fin; length of longest anal-fin ray 1.1 to 1.8 times in length of base of entire anal fin (Fig. 51) → 21

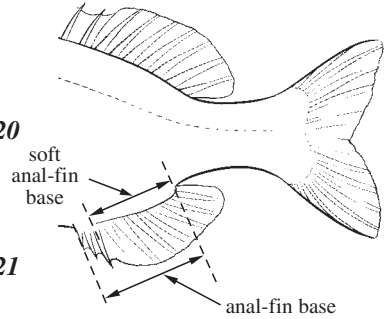


Fig. 51 length of soft anal-fin base and entire anal-fin base

- 20a. Lateral teeth in jaws conical or rounded (Fig. 28a, b); lateral-line scales 46 to 48; membranes between inner rays of pelvic fins usually with densely distributed melanophores; small orange spots on head often visible in life (Fig. 52) *Lethrinus erythracanthus*
- 20b. Lateral teeth in jaws usually with distinct molars (Fig. 28c); lateral-line scales 44 to 46; membranes between inner rays of pelvic fins usually not densely populated with melanophores; 2 light bars on caudal peduncle often visible (Fig. 53) *Lethrinus erythropterus*

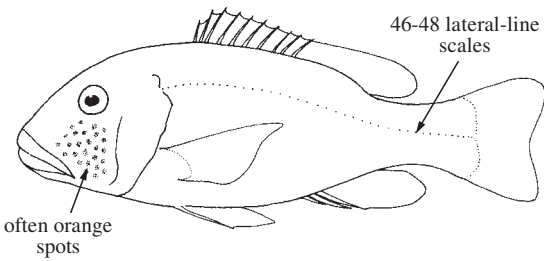


Fig. 52 *Lethrinus erythracanthus*

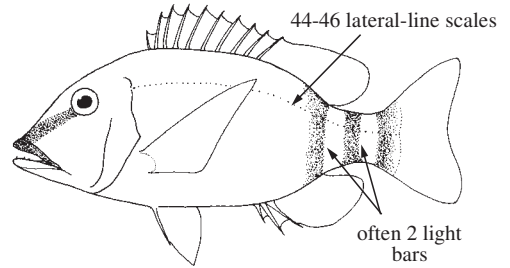


Fig. 53 *Lethrinus erythropterus*

- 21a. Angle of anterior snout relative to line of upper jaw 52 to 62° (Fig. 54); lateral teeth in jaws conical (Fig. 28a); in life, a bright red spot on outer base of pectoral fins (Fig. 55) *Lethrinus miniatus*
- 21b. Angle of anterior snout relative to line of upper jaw 65 to 80° (Fig. 54); lateral teeth in jaws rounded or molars (Fig. 28b,c); no red spot on outer base of pectoral fins (Fig. 56) *Lethrinus atkinsoni*

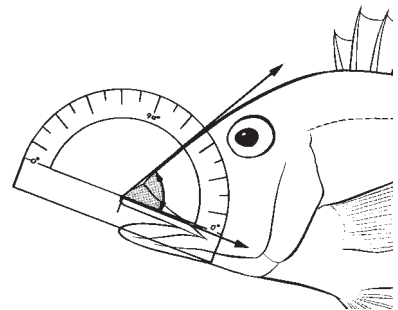


Fig. 54 angle of snout relative to upper jaw

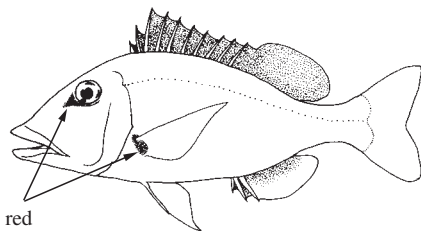


Fig. 55 *Lethrinus miniatus*

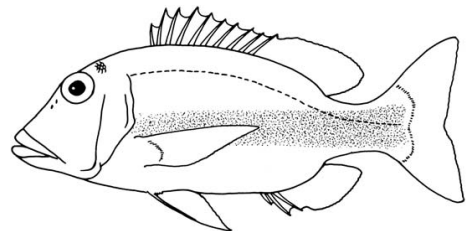


Fig. 56 *Lethrinus atkinsoni*

- 22a. Melanophores covering most of pelvic-fin membranes, including near inner rays (Fig. 35a); in life, blue spots and/or streaks radiating forward from eye (Fig. 57) . *Lethrinus nebulosus*
- 22b. Melanophores absent from large portions of membranes between inner rays of pelvic fins (Fig. 35b) → 23

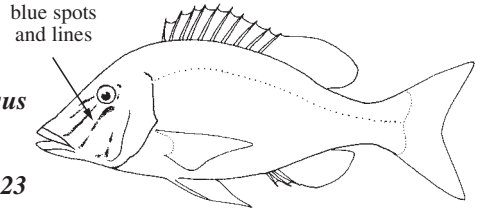


Fig. 57 *Lethrinus nebulosus*

- 23a. Maxilla with a knob (Figs 58a and 59a); angle of anterior snout relative to line of upper jaw 50 to 60° (Fig. 54) (Fig. 59b) *Lethrinus obsoletus*
- 23b. Maxilla smooth or with a ridge (Fig. 57b, c); angle of anterior snout relative to line of the upper jaw 59 to 73° (Fig. 54) → 24

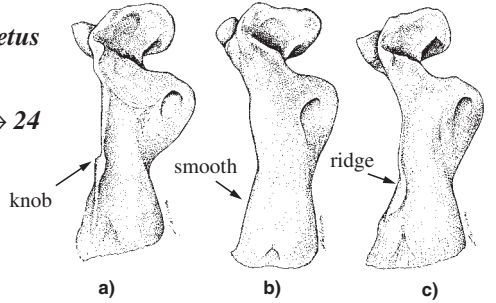


Fig. 58 outer surface of left maxilla

- 24a. Snout relatively short and blunt, the preorbital 1.3 to 1.4 times in cheek height (Fig. 30); angle of anterior snout relative to upper jaw line 64° to 73° (Fig. 54); posterior edge of preopercle and opercle red in life; profile of head in front of eye usually convex (Fig. 60) *Lethrinus ornatus*

- 24b. Snout relatively pointed, the preorbital 1 to 1.3 times in cheek height (Fig. 30); angle of anterior snout relative to upper jaw line 59° to 70° (Fig. 54); posterior edge of preopercle not red, but edge of opercle and base of pectoral fins sometimes red in *L. lentjan*; profile of head in front of eye approximately straight → 25

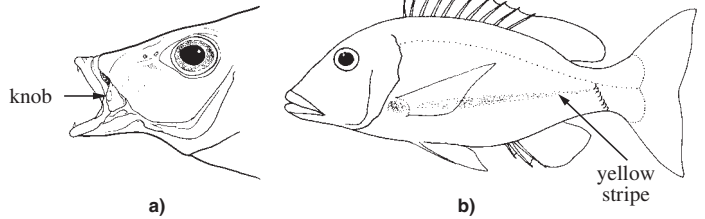


Fig. 59 *Lethrinus obsoletus*

- 25a. In adults, lateral teeth in jaws broadly rounded and sometimes with a pointed cusp, molars, or molars with a tubercle (Fig. 28b-d); body depth 2.5 to 2.9 times in standard length; 15 or 16 scale rows between origin of anal fin and lateral line; in life, posterior margin of opercle and sometimes outer base of pectoral fins red (Fig. 61) *Lethrinus lentjan* (widely distributed in the area)

- 25b. Lateral teeth in jaws conical; body depth 2.3 to 2.6 times in standard length; 16 or 17 scale rows between origin of anal fin and lateral line; no red markings on body → 26 (restricted to Australia, southeastern Indonesia, Papua New Guinea, the Solomons, and New Caledonia)

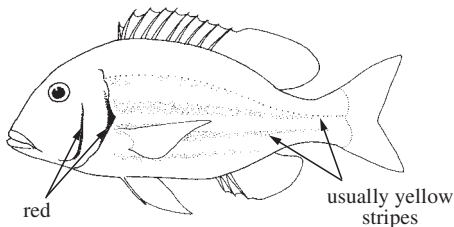


Fig. 60 *Lethrinus ornatus*

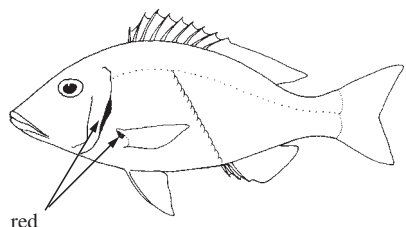


Fig. 61 *Lethrinus lentjan*

- 26a.** Centres of scales on upper sides anteriorly with distinct black marking; inner base of pectoral fins usually more than half covered with scales (Figs 62a and 63) . . . *Lethrinus laticaudis* (northern Australia, southeastern Indonesia, Papua New Guinea, the Solomons, and New Caledonia)
- 26b.** Centres of scales on upper sides without distinct black marking, often pearly; inner base of pectoral fins usually less than half covered with scales (Figs 62b and 48) *Lethrinus* sp. 3 (restricted to northwestern Australia)

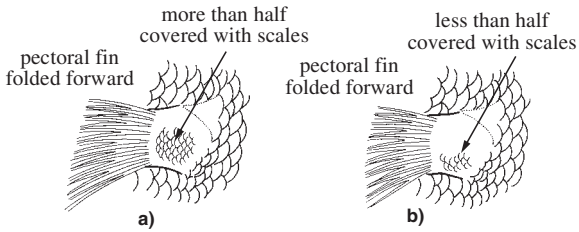


Fig. 62 inner surface of pectoral fin

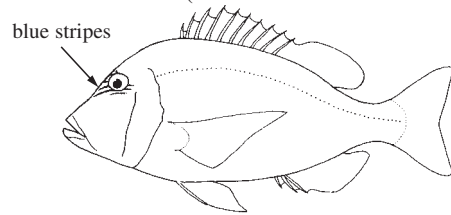



Fig. 63 *Lethrinus laticaudis*

List of species occurring in the area

The symbol  is given when species accounts are included.

-  *Gnathodentex aurolineatus* (Lacepède, 1802)
-  *Gymnocranius audleyi* Ogilby, 1916
-  *Gymnocranius elongatus* Senta, 1973
-  *Gymnocranius euanus* Günther, 1879
-  *Gymnocranius frenatus* Bleeker, 1873
-  *Gymnocranius grandoculis* (Valenciennes, 1830)
-  *Gymnocranius griseus* (Schlegel, 1844)
-  *Gymnocranius microdon* (Bleeker, 1851)
-  *Gymnocranius* sp.
-  *Lethrinus amboinensis* Bleeker, 1854
-  *Lethrinus atkinsoni* Seale, 1910
-  *Lethrinus conchyliatus* Smith, 1959
-  *Lethrinus erythracanthus* Valenciennes, 1830
-  *Lethrinus erythropterus* Valenciennes, 1830
-  *Lethrinus genivittatus* Valenciennes, 1830
- ? *Lethrinus haematopterus* Temminck and Schlegel, 1844^{1/}
-  *Lethrinus harak* (Forsskål, 1775)
-  *Lethrinus laticaudis* Alleyne and Macleay, 1877
-  *Lethrinus lentjan* (Lacepède, 1802)
-  *Lethrinus microdon* Valenciennes, 1830
-  *Lethrinus miniatus* (Schneider, 1801)
-  *Lethrinus nebulosus* (Forsskål, 1775)
-  *Lethrinus obsoletus* (Forsskål, 1775)
-  *Lethrinus olivaceus* Valenciennes, 1830
-  *Lethrinus ornatus* Valenciennes, 1830
-  *Lethrinus reticulatus* Valenciennes, 1830
-  *Lethrinus rubrioperculatus* Sato, 1978
-  *Lethrinus semicinctus* Valenciennes, 1830
-  *Lethrinus* sp. 1
-  *Lethrinus* sp. 2
-  *Lethrinus* sp. 3
-  *Lethrinus variegatus* Valenciennes, 1830
-  *Lethrinus xanthochilus* Klunzinger, 1870
-  *Monotaxis grandoculis* (Forsskål, 1775)
-  *Wattsia mossambica* (Smith, 1957)

Reference

Carpenter, K.C. and G.R. Allen. 1989. Emperor fishes and large-eye breams of the world (family Lethrinidae). An annotated and illustrated catalogue of lethrinid species known to date. *FAO Fish. Synop.*, (125)Vol. 9:118 p.

^{1/} Not yet reported from the area; reported from Hong Kong and Taiwan Province of China.