

2. SYSTEMATIC CATALOGUE

2.1 Diagnostic Features of the Subfamily Epinephelinae

FAO Names: **En** - Groupers, Hinds, Coralgroupers, Lyretails, Creole-fishes, Mutton hamlets, Spanish flag, Leather bass; **Fr** - Mérous, Vieilles, Vareches, Pavillion, Badèches, Croissant queues; **Sp** - Meros, Chernas, Guasetas, Bandera, Cunas, Indio.

Diagnostic Features: Body robust or somewhat compressed, oblong-oval to rather elongate. Mouth with small, slender, depressible teeth on jaws, vomer and palatines (*Anyperodon* lacks palatine teeth); distinct canine teeth present at front of mouth in some species; no molars or incisiform teeth; maxilla exposed when mouth is closed; supramaxilla well developed (rudimentary or absent in *Paranthias*). A single dorsal fin with VII to XI spines and 10 to 21 rays; anal fin with III spines (inconspicuous in *Plectropomus*) and 7 to 13 rays (the last dorsal- and anal-fin rays usually split to their base but counted as a single ray); caudal fin with 13 to 15 branched rays; pelvic fins with I spine and 5 branched rays; pelvic-fin insertion under or a little behind pectoral-fin base; no scaly process (axillary scale) at base of pelvic fins. Edge of preopercle serrate (serrae reduced in adult *Cephalopholis* and *Plectropomus*; opercle with 3 flat spines (upper and lowermost spines often covered by skin and scales); upper edge of operculum free; gill membranes separate, joined to isthmus far forward, with 7 branchiostegal rays. Anterior and posterior nostrils close together. Lateral line single. Scales small, more than 78 oblique series from upper end of gill opening to caudal-fin base; lateral-line scales separated, inconspicuous, smaller than surrounding scales and mostly covered by them; soft dorsal, anal and caudal fins scaly. Vertebrae 10 precaudal and 14 caudal; first dorsal-fin pterygiophore with one supernumerary fin spine and no separate distal element; supraneural bones 2 (1 in *Plectropomus* and *Saloptia*).

Larva with second dorsal-fin spine and pelvic-fin spines greatly elongate and serrate, a long serrate spine at the angle of the preopercle, and a large melanophore on the caudal peduncle that migrates from the ventral midline to a midlateral position early in development (Fig. 2).

The Subfamily Epinephelinae, as here constituted, comprises 15 genera: *Aethaloperca*, *Alphestes*, *Anyperodon*, *Cephalopholis*, *Cromileptes*, *Dermatolepis*, *Epinephelus*, *Gonioplectrus*, *Gracila*, *Mycteroperca*, *Paranthias*, *Plectropomus*, *Saloptia*, *Triso*, and *Variola*.

2.2 Notes on the Identification of Groupers

Grouper species are identified by their colour pattern and (or) a suite of morphological characters including body shape (Fig. 3), configuration and size of the fins, the shape and relative size of the head and various parts of the head and body; and the number of fin rays, scales and gill rakers. Except in large adults of some species, the colour pattern of most groupers is usually distinctive enough to identify the particular species. But one needs to be aware of the intraspecific variation in colour pattern for each species. Juveniles of some species look completely different from adults of the same species. In species with dark spots, the spots become smaller and more numerous with growth. And the colour pattern can often be altered in a few seconds, depending on the mood of the fish. Many groupers have a “fright” or “stress” pattern of white blotches or bars. Groupers from deep water are usually more reddish than fish of the same species that are caught in shallow water. A few species (e.g. *Mycteroperca rosacea*) have a xanthic colour morph that is bright yellow or orange-yellow. Post-mortem changes in colour pattern can obscure the normal pattern of the live fish. The skin is usually blanched if a fish is in contact with the ground during or immediately after death.

Fin counts are usually done with a bright light shining through the fin, and the count of pectoral-fin rays on those species with fleshy fins is usually easier to, do on the inner (medial) side of the fin. The last dorsal- and anal-fin rays are split to their base but counted as a single ray.

Lateral-line scale counts are facilitated with the fish lying on its right side with its head pointing left, a bright light directed at a low angle to the body surface. A jet of compressed air that can be directed through a large hypodermic needle onto the lateral line is also useful.

2.3 Illustrated Key to the Genera of Groupers

- 1a.** Dorsal-fin spines VII to VIII; lower edge of preopercle with 1 to 3 enlarged spines pointing anteroventrally (these spines are usually hidden by skin and scales, but they can easily be detected by running a finger or probe along the preopercle edge; see Figs 16 and 17) → 2
- 1b.** Dorsal-fin spines IX to XI; lower edge of preopercle smooth (except for species of *Alphestes*, which have a large spine at the angle, and a few species of *Epinephelus* with 1 to 4 small spines on the lower edge of preopercle) → 4
- 2a.** Body depth 2.3 to 2.5 times in standard length; lateral-line scales 47 to 49; branched caudal-fin rays 15 (Fig. 17) (western Atlantic) ***Gonioplectrus***
- 2b.** Body depth 2.6 to 3.9 times in standard length; lateral-line scales 70 to 115; branched caudal-fin rays 13 (Indo-Pacific) → 3

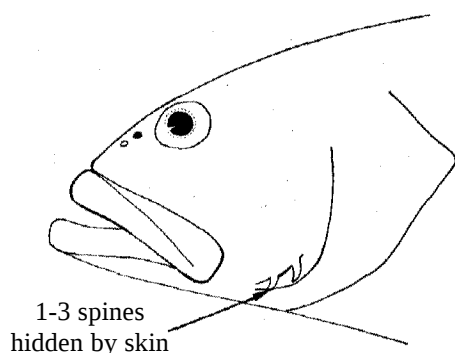


Fig. 16

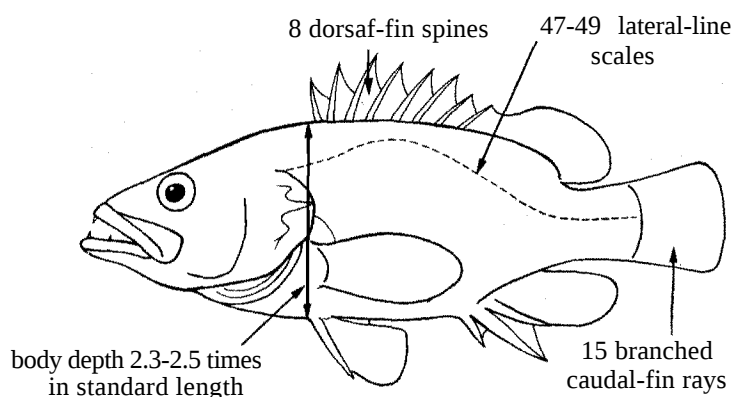


Fig. 17 *Gonioplectrus*

- 3a.** Anal-fin spines strong, all III distinct; preorbital depth 0.2 to 0.5 times orbit diameter; head length 2.5 to 2.6 times in standard length (Fig. 18) (western and central Pacific Ocean) ... ***Saloptia***
- 3b.** Anal-fin spines weak, not apparent without dissection; preorbital depth (of fish 20 to 100 cm standard length) 0.7 to 2.0 times orbit diameter; head length 2.8 to 3.1 times in standard length (Fig. 19) (Indo-Pacific) ***Plectropomus***

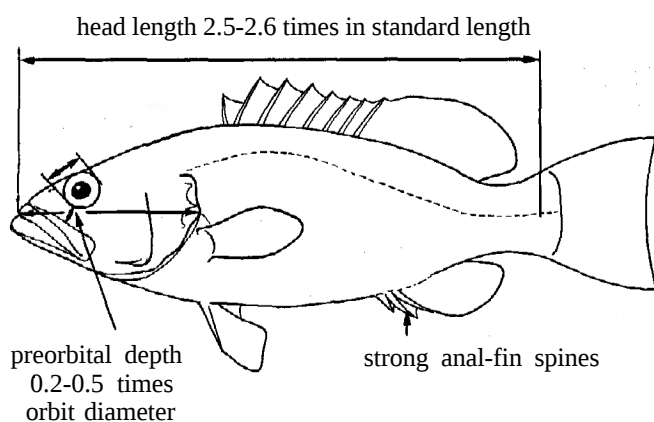


Fig. 18 *Saloptia*

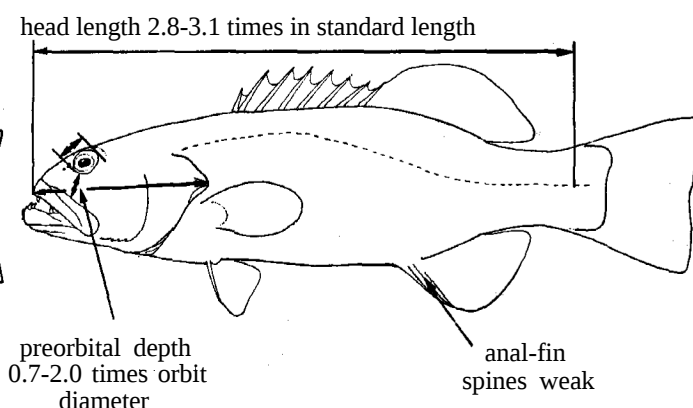
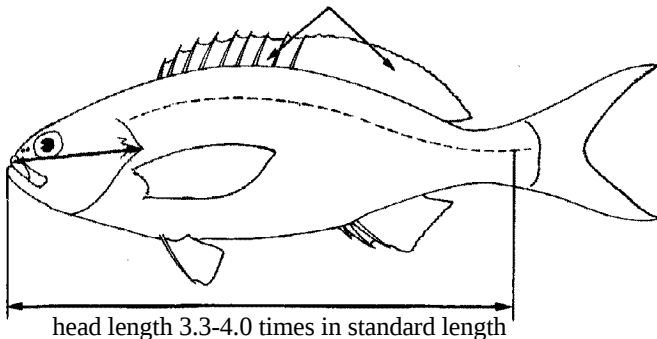
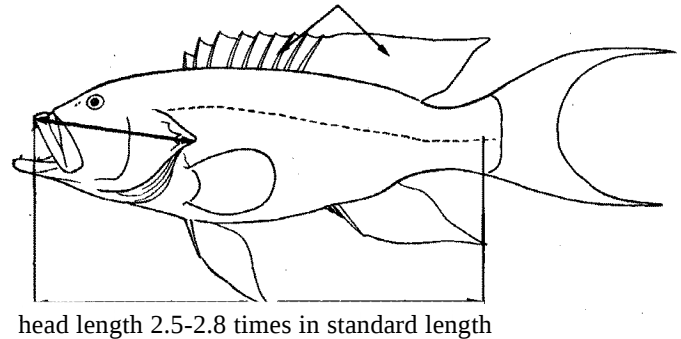


Fig. 19 *Plectropomus*

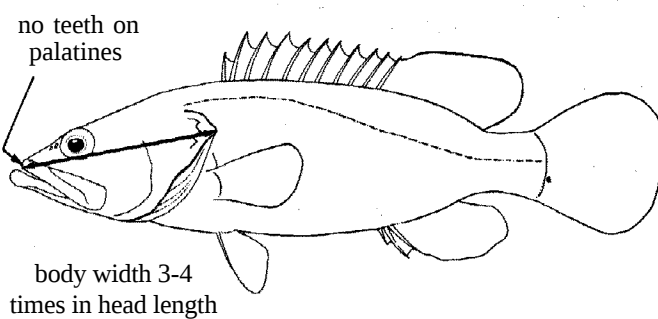
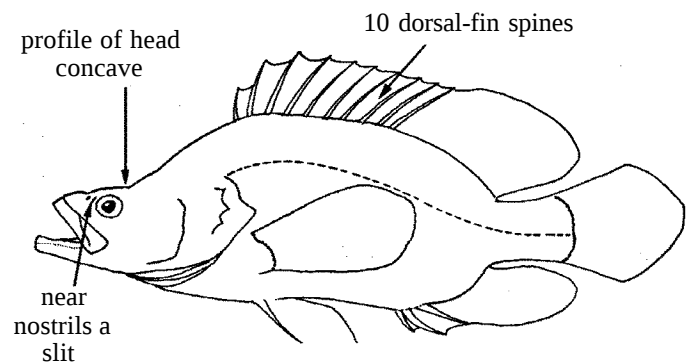
- 4a.** Caudal fin deeply lunate or forked; dorsal-fin spines IX → 5
- 4b.** Caudal fin rounded, truncate or concave; dorsal-fin spines IX to XI → 6

- 5a. Head small, its length 3.3 to 4.0 times in standard length; dorsal fin with IX spines and 17 to 21 rays (Fig. 20) (Atlantic and eastern Pacific oceans) **Paranthias**
- 5b. Head length 2.5 to 2.8 times in standard length; dorsal fin with IX spines and 13 or 14 rays (Fig. 21) (Indo-Pacific) **Variola**
 dorsal fin with 9 spines and 17- 21 rays dorsal fin with 9 spines and 13-14 rays

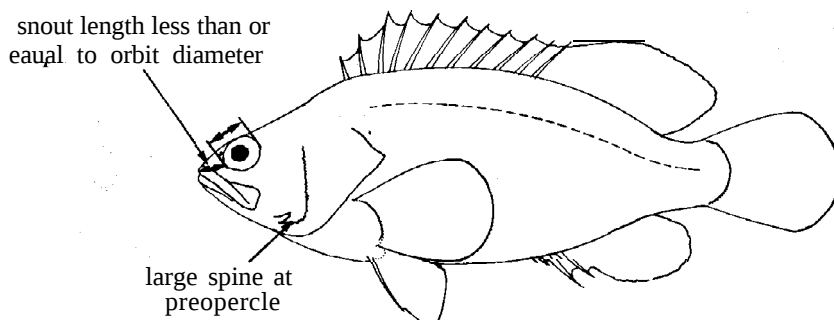
Fig. 20 **Paranthias**Fig. 21 **Variola**

- 6a. No teeth on palatines; head and body elongate and markedly compressed, the body width 11 to 15% of standard length and contained 3 to 4 times in head length (Fig. 22) (Indo-Pacific) **Anyperodon**
- 6b. Palatines with teeth; body compressed in some species, but its width contained less than 3 times in head length → 7

- 7a. Dorsal profile of head markedly concave; dorsal-fin spines X; rear nostrils in adults a long vertical slit (Fig. 23) (Pacific and eastern Indian Ocean) **Cromileptes**
- 7b. Dorsal profile of head straight, convex or slightly concave; dorsal-fin spines IX or XI (rarely X); rear nostrils round or oblong → 8

Fig. 22 **Anyperodon**Fig. 23 **Cromileptes**

- 8a. Large antrorse spine at corner of preopercle (covered by skin); snout short, less than or equal to orbit diameter (Fig. 24) (eastern Pacific and western Atlantic) **Alphestes**
- 8b. No large antrorse spine on corner of preopercle (but there may be a few enlarged, ventrally directed serrae there); snout longer than orbit diameter → 9

Fig. 24 **Alphestes**

- 9a.** Pectoral fins distinctly asymmetric, the fifth or sixth ray longest (Fig. 25); dorsal fin with IX spines and 17 or 18 rays; caudal fin truncate (Fig. 26) (Indo-Pacific) ***Aethaloperca***
- 9b.** Pectoral fins symmetric or nearly so, the middle rays longest (Fig. 25); dorsal fin with IX to XI spines and 12 to 21 rays; caudal fin rounded, truncate or emarginate → 10

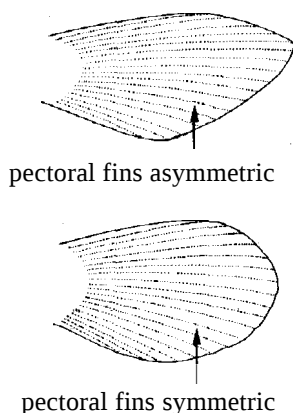
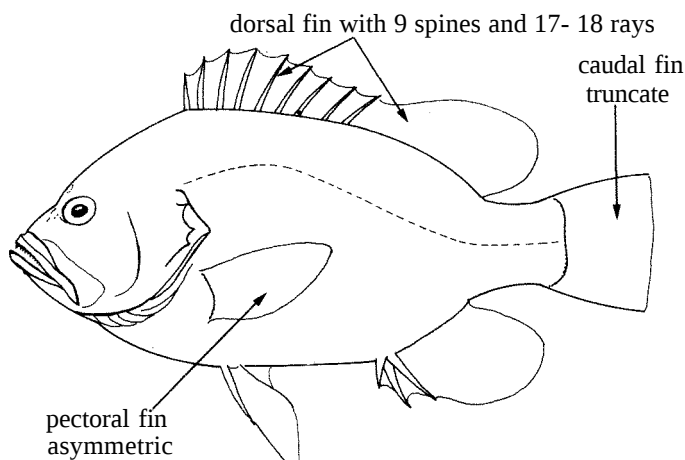
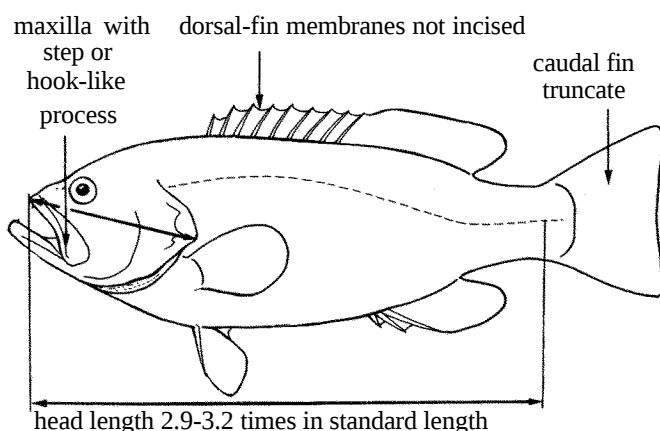
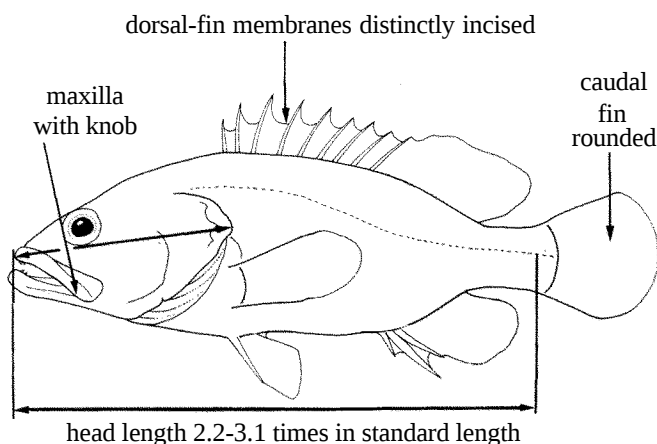


Fig. 25

Fig. 26 *Aethaloperca*

- 10a.** Dorsal-fin spines IX → 11
- 10b.** Dorsal-fin spines X or XI (IX in one eastern Pacific species) → 12

- 11a.** Caudal fin truncate; head small, its length 2.9 to 3.2 times in standard length; distal part of maxilla of adults with a prominent step or hook-like process on lower edge (usually hidden by upper lip); dorsal-fin membranes not incised between the spines (Fig. 27) (Indo-Pacific) ... ***Gracila***
- 11b.** Caudal fin more or less rounded (truncate in *C. polleni*); head length 2.2 to 3.1 times in standard length; maxilla of adults with a knob or protuberance at lower rear corner (usually hidden by upper lip); dorsal-fin membranes distinctly incised between the spines (Fig. 28) (all 3 oceans) ***Cephalopholis***

Fig. 27 *Gracila*Fig. 28 *Cephalopholis*

12a. Body deep and compressed, the depth distinctly greater than head length and contained 2.1 to 2.7 times in standard length; dorsal fin with XI spines and 18 to 21 rays (Fig. 29)..... →13

12b. Body elongate, robust, to deep and compressed, the depth 2.3 to 4.1 times in standard length, usually less than head length; dorsal fin with IX to XI spines and 12 to 19 rays (Fig.30) → 14
 dorsal fin with 11 spines and 18-21 rays dorsal fin with 9-11 spines and 12-19 rays

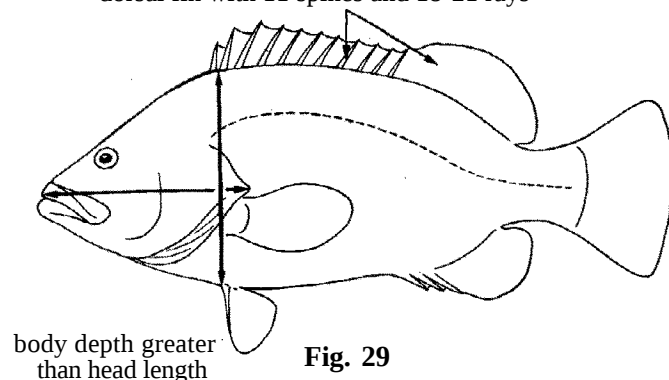


Fig. 29

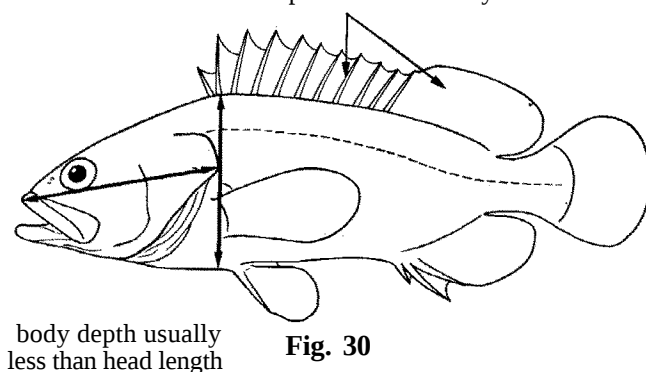
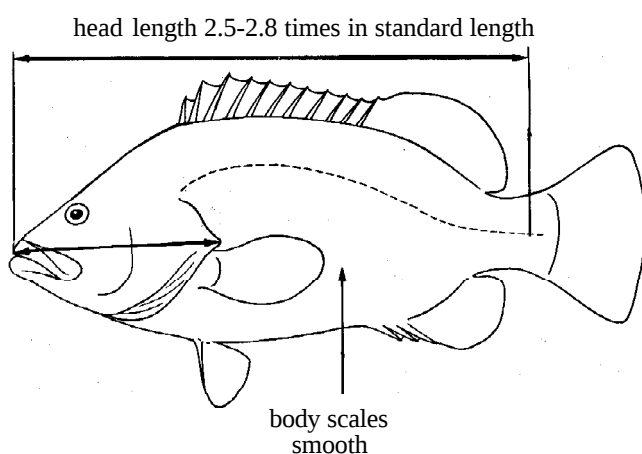
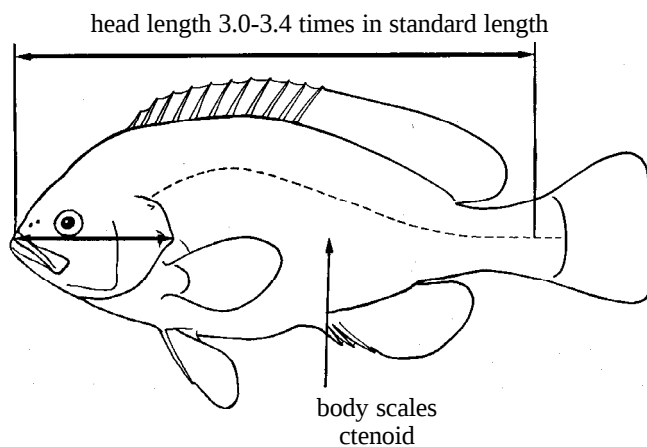


Fig. 30

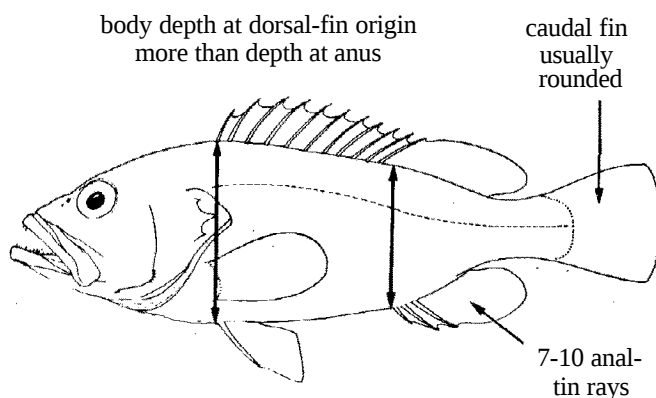
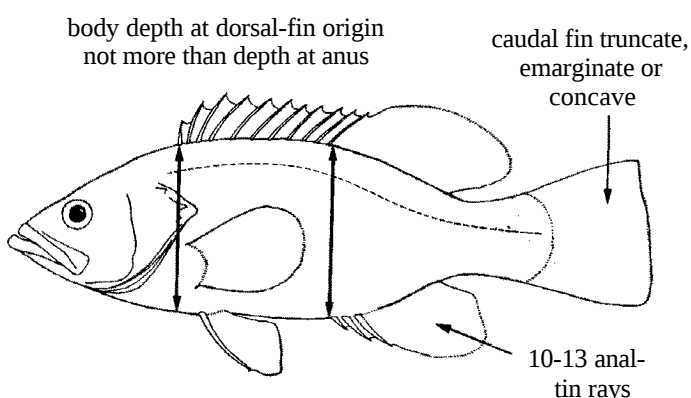
13a. Body scales smooth; head length 2.5 to 2.8 times in standard length (Fig. 31) (eastern Pacific, western Atlantic and western Indian Ocean) *Dermatolepis*

13b. Body scales ctenoid; head length 3.0 to 3.4 times in standard length (Fig. 32) (western Pacific and eastern Indian Ocean) *Triso*

Fig. 31 *Dermatolepis*Fig. 32 *Triso*

14a. Anal-fin rays 7 to 10 (rarely 10); body depth at dorsal-fin origin usually more than depth at anus; caudal fin usually rounded (truncate in some species, but rarely emarginate or concave) (Fig. 33) (all 3 oceans) *Epinephelus*

14b. Anal-fin rays 10 to 13; body depth at dorsal-fin origin not more than depth at anus; caudal fin truncate, emarginate or concave (Fig. 34) (Atlantic and eastern Pacific Ocean) *Mycteroperca*

Fig. 33 *Epinephelus*Fig. 34 *Mycteroperca*