

FAO SPECIES IDENTIFICATION SHEETS

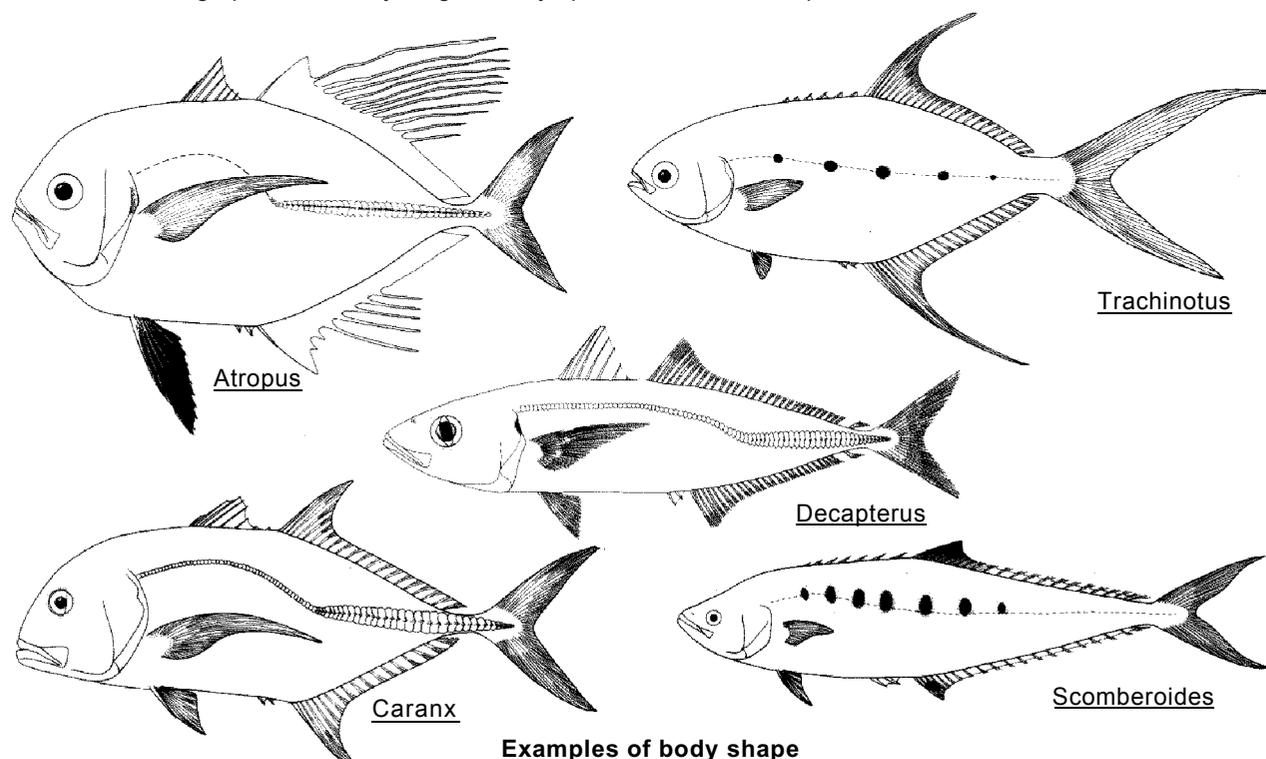
FISHING AREA 51
(W. Indian Ocean)

CARANGIDAE

jacks, trevallies, blugagers, scads, queenfishes, runners, amberjacks, pilotfishes, pampanos, leerfish, etc.

Body extremely variable in shape, ranging from elongate and fusiform to deep and strongly compressed; caudal peduncle of medium width to notably slender, in some species with a moderate lateral keel, bilateral paired keels or dorsal and ventral grooves. Head varying from moderately long and rounded to short, deep and very compressed; snout pointed to blunt; lower jaw protruding to subtended (included); eye small to large, with adipose eyelid negligible to strongly developed; teeth in jaws in rows or bands, either small to minute or an enlarged row of recurved canines present; teeth on roof of mouth (vomer, palatines) or tongue present or absent depending on species or developmental stage; gill openings large, gill membranes not united, free from isthmus; branchiostegal rays 6 to 10 (usually 7); gillrakers moderate in length and number to long and numerous, their number decreasing with growth in some species; opercular bones smooth (but with spines in larvae and small juveniles). Two dorsal fins that are separate in small juveniles, the first of moderate height or very low, with 4 to 8 spines (the spines obsolete or embedded in adults of some species), the second dorsal fin with 1 spine and 18 to 44 soft rays and the anterior lobe scarcely produced to extremely long; anal fin with 2 anterior spines (but 1 spine in *Elagatis* and *Seriolina*) that are separate from rest of fin by a gap (becoming embedded in adults of some species) followed by 1 spine and 15 to 39 soft rays, with the anterior lobe low to elongate; pectoral fins with 1 spine and about 14 to 24 soft rays, either long and falcate or short and pointed or rounded; pelvic fins with 1 spine and 5 soft rays, moderately long in some species to becoming rudimentary in others (absent in *Parastromateus*); caudal fin forked, with the lobes equal in most species. Scales small, sometimes difficult to see, and cycloid (smooth to touch), but strongly lanceolate to needle-like in a few species, usually absent from some areas of head and covering body (but absent on certain body areas in some species) and sometimes extending onto fins; lateral line arched (curved) or elevated anteriorly and straight posteriorly, extending onto caudal fin; scutes (enlarged, thickened, and often pointed scales in lateral line) present and prominent, or reduced in some species and absent in some genera Vertebrae 10 or 11 + 14 to 16 (24 to 26 total, usually 10 + 14).

Colour: darker above (green or blue to blackish) and paler below (silvery to white or yellow-golden), some species almost entirely silvery when alive, others with dark or coloured bars or stripes on head, body or fins, and some able to change patterns; the young of many species with bars or spots.



Examples of body shape

Mostly schooling species (but *Alectis* generally solitary); some species have largely continental distributions and occur primarily in brackish environments (especially young), others such as *Elagatis* and *Naucrates* are pelagic, usually found at or near the surface, mostly in oceanic waters, often far offshore. This is one of the most important families of commercial fishes, and all species are used for food. Reported statistics from fishing area 51 exceeded 50 000 t in 1981, but actual catches are doubtless much higher. Caught commercially with trawls, also with purse seines, traps and on line gear. The larger species of *Trachinotus*, *Seriola* and *Caranx* are highly regarded as sportfish.

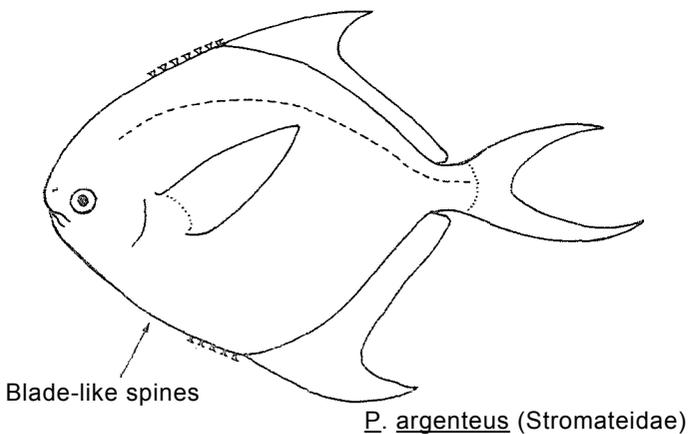
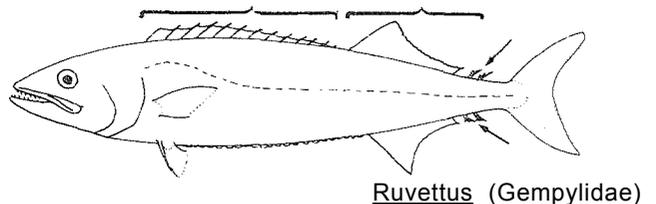
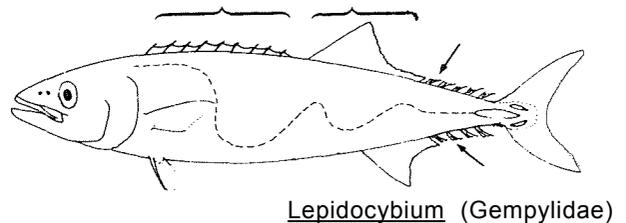
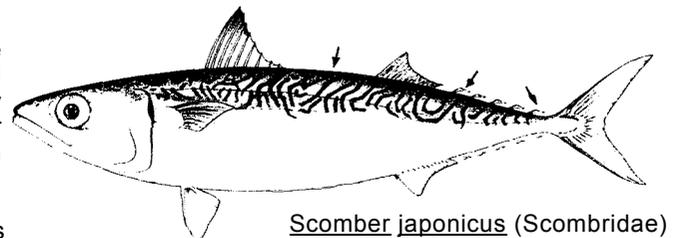
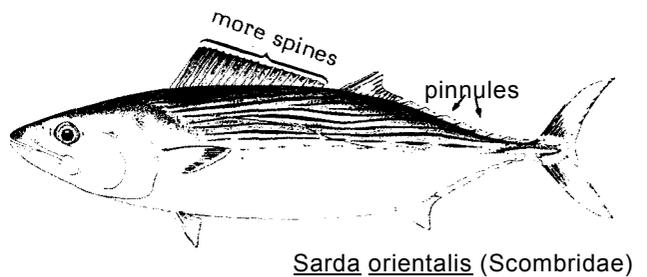
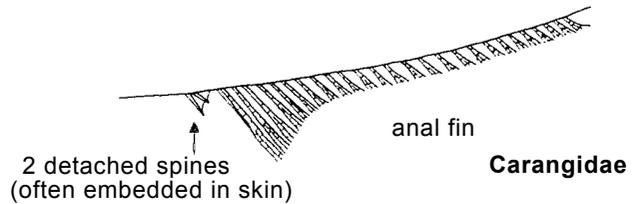
SIMILAR FAMILIES OCCURRING IN THE AREA:

Distinguished from all similar families in having the first 2 anal-fin spines detached from rest of fin (caution: these spines sometimes partially or completely embedded in large adults of several genera, especially *Seriola*, *Alectis* and *Caranx*. However, they can be found, without much difficulty by dissection). The presence of enlarged, thickened scutes in the straight part of lateral line in some genera easily distinguishes them from other families. Additional distinguishing characters of similar families (especially to those carangid genera lacking scutes on the lateral line), are the following:

Scombridae: dorsal-fin spines 9 to 27 (4 to 8 in Carangidae); no scutes developed along the posterior part of the lateral line and series of finlets present behind dorsal and anal fins (*Scomberoides*, the only carangid that lacks scutes and at the same time has a series of finlets, is further distinguished by having 2 detached, depressible spines in front of anal fin).

Stromateidae (*Pampus argenteus*); 5 blade-like anal-fin spines not detached from fin (1 or 2 detached anal-fin spines in carangids; (caution: these spines may be embedded in large individuals); pelvic fins minute or absent in adults (readily apparent in carangids, except in adults of *Parastromateus*).

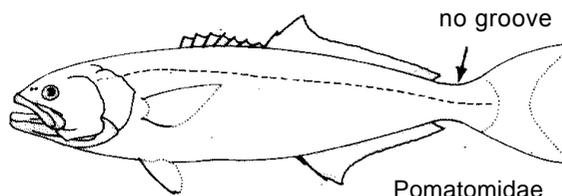
Gempylidae (especially *Lepidocybium* and *Ruvettus* species): base of first dorsal fin longer than that of second excluding finlets (equal or shorter than second in Carangidae); a series of dorsal and anal finlets present in *Lepidocybium* and *Ruvettus*.



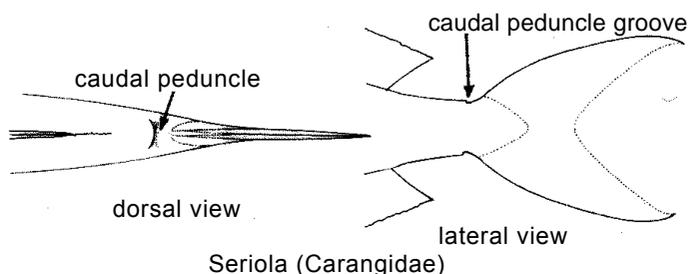
Pomatomidae: both jaws with a series of strong compressed teeth; no grooves on caudal peduncle (present in *Seriola* which is superficially similar).

Rachycentridae: head broad and depressed, lower jaw projecting; body more slender; first dorsal fin with 8 or 9 short, free spines, each depressible in a groove, a single weak spine in anal fin.

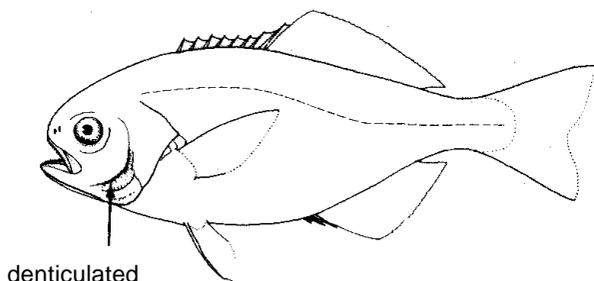
Centrolophidae, particularly the genus *Hyperoglyphe*: 3 anal fin spines not detached from fin; margin of preopercle usually moderately denticulate (smooth in Carangidae); jaw teeth all conical, simple caudal fin not deeply forked.



Pomatomidae

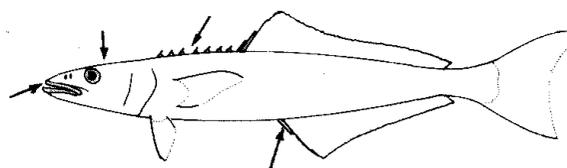


Seriola (Carangidae)



denticulated

Hyperoglyphe (Centrolophidae)



1 spine

Rachycentridae

NOTE TO USERS

Fin-spines: The 2 detached anterior anal-fin spines and the spines of the first dorsal fin (especially the first 1 or 2) frequently become completely embedded in the skin in large individuals of many carangids (all spines of the first dorsal fin become embedded in *Alectis* and *Parastromateus* at a relatively small size). Even in those genera with a relatively high spinous dorsal fin, the first spine is usually small and closely appressed to the second spine and thus can easily be overlooked.

Breast squamation: many species of *Carangoides*, *Caranx* and *Uraspis* have the breast only partially scaled, and the pattern of breast squamation is an important character used to distinguish species. The pattern of breast squamation is sometimes difficult to observe in fresh specimens; observation is facilitated by gently scraping the breast with a knife to remove mucous and allowing the breast to partially dry, hastened by blowing air on the area.

Gillraker counts: In species with relatively numerous gillrakers (e.g., *Decapterus* and *Trachurus*) great care must be taken not to overlook rakers at either end of the gill arch. It is suggested that a small knife be used to free the upper limb of the gill arch where it joins the skull. With a little practice this can be done without leaving any stub with rakers attached. Once this has been accomplished, the gillrakers are much easier to see. In some genera (e.g., *Caranx* and *Seriola*) the number of developed rakers decreases with growth with a concomitant increase in the number of rudiments (tubercles or short rakers with the diameter of their bases greater than their height). When rudimentary rakers are included in the gillraker counts, and large specimens are being examined, it is very important that all of the tubercles are counted. In all cases the raker in the angle of the gill arch is included in the count of lower limb rakers.

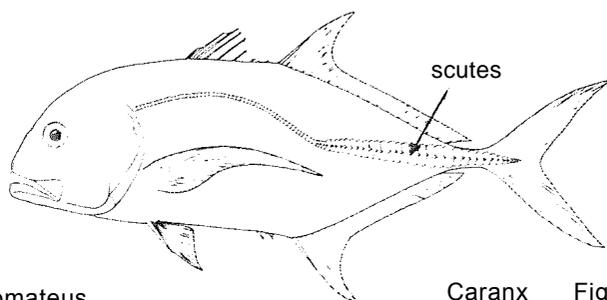
Lateral-line scutes : In many carangids, size and configuration of the scales and scutes on the lateral line is variable and there may be a gradual transition from one type to another. Scutes are here defined as modified scales that either have their posterior margin with a small to moderate projecting spine or the scale has a raised horizontal ridge and ends in an apex not exceeding a 90° angle. All scutes should be counted, including those extending onto the caudal-fin base.

In order to observe and accurately count the lateral-line scales and scutes, good lighting and some magnification is recommended. In some species it may also be necessary to remove small body scales that tend to overgrow or otherwise obscure the lateral line.

Measurements : The curved part of the lateral line is measured as a chord of the arch extending from the upper edge of the opercle to its junction with the straight part. The straight part of the lateral line is measured from its junction with the curved part to its termination on the caudal-fin base (end of the last scuce). In cases where the junction of the curved and straight parts is very gradual, the curved part is considered to begin with the scale or scuce that has 3/4 of its height above the central axis of the straight part.

KEY TO GENERA OCCURRING IN THE AREA:

1a. Posterior straight part of lateral line with hardened scutes; in adults, pectoral fins long and falcate, in most genera longer than head (Fig.1) (about equal to head length in Selar and Trachurus, and shorter than head length in some Decapterus spp.)

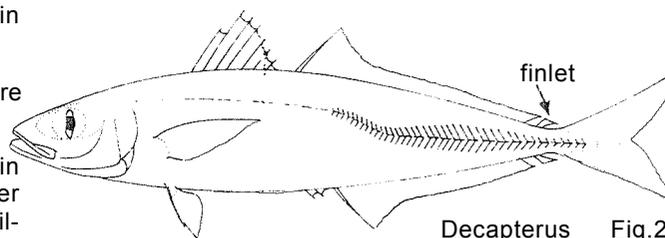


Caranx Fig.1

2a. Pelvic fins (if present, absent in specimens larger than about 10 cm fork length) positioned distinctly anterior to a vertical line through pectoral fin base Parastromateus

2b. Pelvic fins (always present) not positioned distinctly anterior to a vertical through pectoral fin base

3a. Second dorsal and anal fins with one or more distinct finlets (Fig.2)

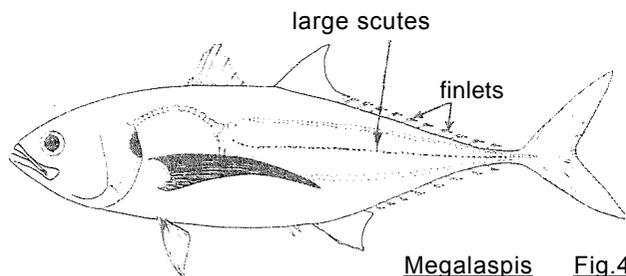


Decapterus Fig.2

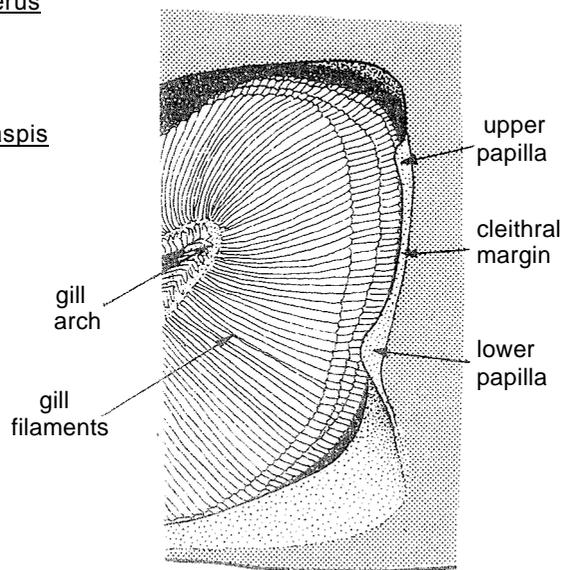
4a. A single detached terminal finlet in dorsal and anal fins (Fig.2)*; shoulder girdle (cleithrum) margin with 2 papillae, the lower papilla the larger (Fig.3); maximum scute height smaller than eye diameter Decapterus

4b. Posterior soft dorsal- and anal-fin rays consisting of detached finlets; shoulder girdle margin smooth; maximum scute height larger than eye diameter (Fig.4) .. Megalaspis

3b. Second dorsal and anal fins without finlets



Megalaspis Fig.4

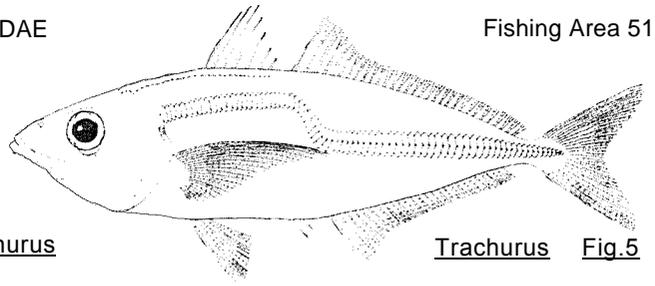


gill chamber exposed after lifting opercle

Decapterus Fig.3

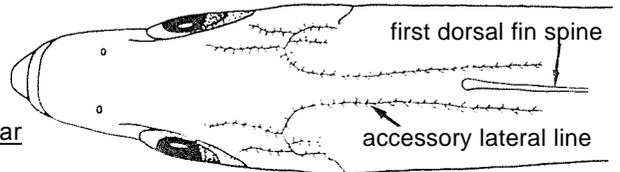
* Terminal dorsal- and anal-fin rays finlet-like in Atule, but unlike Decapterus there is a membranous connection with penultimate ray and the shoulder girdle (cleithrum) margin is smooth

5a. Pored scales in curved lateral line scute-like, expanded dorsoventrally (Fig.5) (caution: in large fish may be obscured by overgrowth of smaller scales); dorsal accessory lateral line normally extends posteriorly at least to below third dorsal-fin spine, usually farther posteriorly (Fig.6) Trachurus



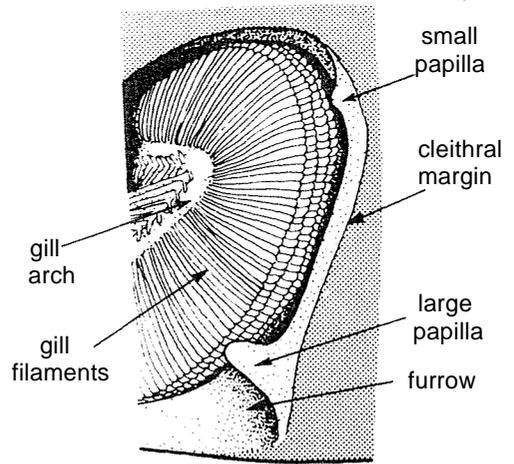
Trachurus Fig.5

5b. No enlarged scute-like scales in curved lateral line; dorsal accessory lateral line terminating before origin of dorsal fin



Trachurus Fig.6

6a. Shoulder girdle (cleithrum) margin with a furrow ventrally, a large papilla immediately above it and a smaller papilla near upper edge (Fig.7) Selar



gill chamber after lifting opercle
Selar Fig.7

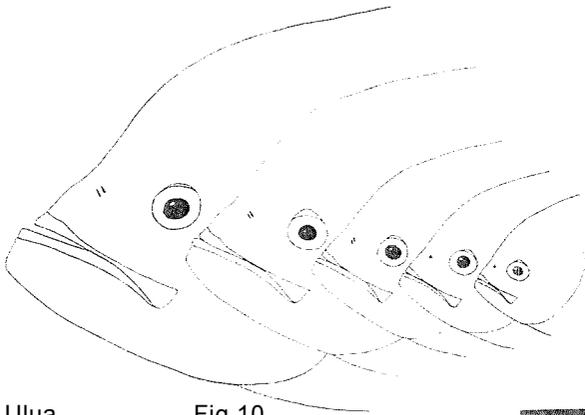
6b. Shoulder girdle margin smooth

7a. body superficially naked, scales minute and embedded where present; in smaller fish, anterior soft rays of dorsal and anal fins filamentous (Fig.8) Alectis

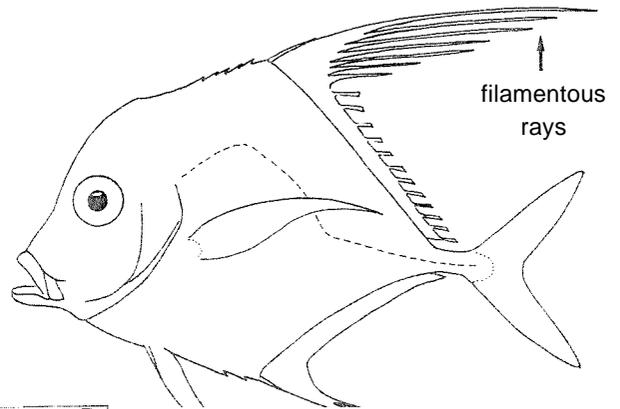
7b. Small scales present over most of body; in smaller fish, anterior soft rays of dorsal and anal fins not filamentous

8a. Gillrakers extremely long, and project into the mouth along side of tongue (Fig.9); lower limb gillrakers on first arch 51 to 61; lower jaw becoming prominent in large adults, with the angle of "chin" projecting beyond upper jaw (Fig.10) Ulua

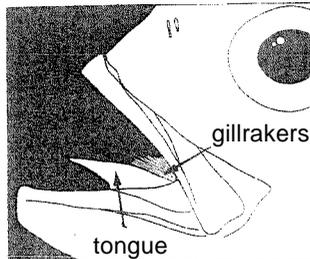
8b. Gillrakers of normal length and shape; lower limb gillrakers on first arch 39 or fewer; shape of lower jaw not as above



Ulua Fig.10



Alectis Fig.8



Ulua Fig.9

9a. Tongue, roof and floor of mouth white, the rest dark (Fig.11); anal-fin spines reduced or reabsorbed Uraspis

9b. Lining of mouth not distinctly white or dark; anal-fin spines normal and movable

10a. Belly with a deep median groove, accommodating pelvic fins, anus and anal-fin spines (Fig.12); pelvic fins conspicuously long and black, tip of appressed fins extending almost to base of anal fin Atropus

10b. Belly without median groove; pelvic fins not conspicuously long and black

11a. Upper jaw without teeth

12a. Lower jaw with a series of minute teeth; a prominent black opercular spot encroaching on shoulder; adipose eyelid well developed posteriorly Selaroides

12b. Lower jaw with a few feeble teeth in young (smaller than 10 cm fork length), absent in adults; no black opercular spot; adipose eyelid poorly developed Gnathanodon

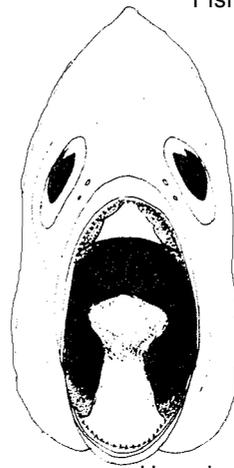
11b. Upper jaw with 1 or 2 rows or a band of minute teeth (caution: teeth difficult to detect in some Carangoides)

13a. Fleshy adipose eyelid completely covering eye except for a vertical slit centred on pupil (Fig.13a); terminal ray of dorsal and anal fins finlet-like, a little more separated from other rays but not detached, and about twice length of penultimate ray Atule

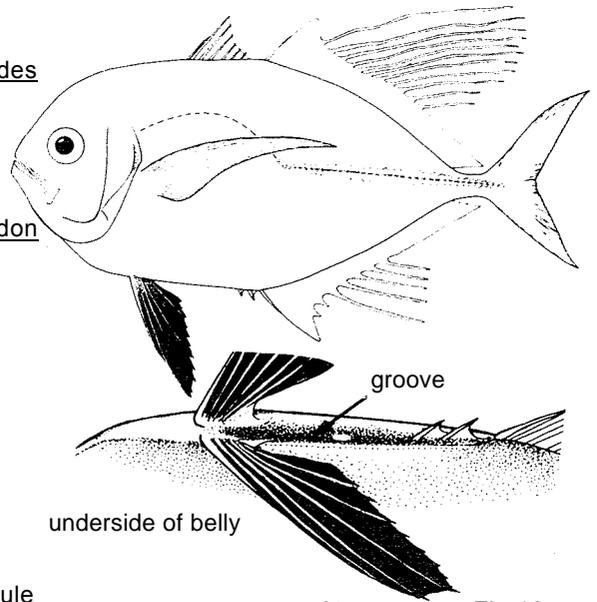
13b. Fleshy adipose eyelid, if present, not developed as above; terminal ray of dorsal and anal fins not finlet-like (except terminal ray length 1.5 times the length of penultimate ray in large Alepes djedaba)

14a. Both jaws with a single row of numerous, comblike teeth; adipose eyelid well developed on posterior half of eye only (Fig.13b)..... Alepes

14b. Dentition not as above; adipose eyelid, if present, variously developed



Uraspis Fig.11



Atropus Fig.12

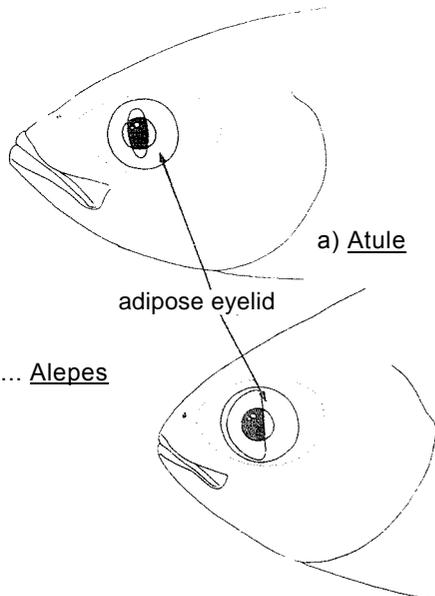


Fig.13

15a. Upper jaw anteriorly with two irregular rows of short conical teeth, posteriorly inner surface of jaw paved with blunt teeth (Fig.14a); snout shorter than eye diameter "Caranx"

15b. Dentition not as above; snout usually equal or longer than eye diameter

16a. Upper jaw with an outer series of moderate to strong canines and an inner band of fine teeth (Fig.14b); lower jaw with a single row of teeth Caranx

16b. Dentition not as above

17a. Both jaws with a band of teeth, at least anteriorly; breast naked ventrally (most species) to completely scaled Carangoides

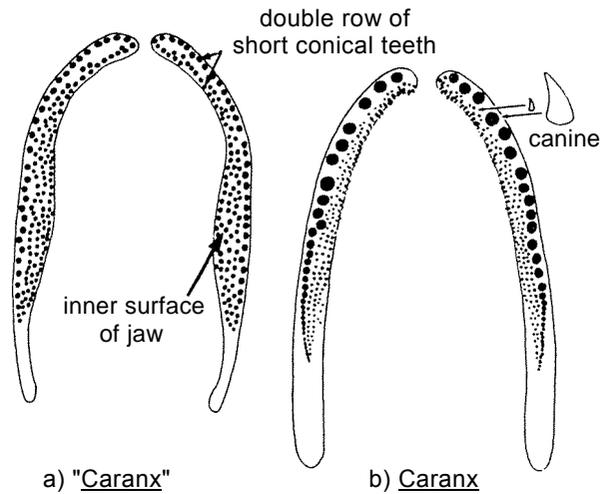
17b. Both jaws with single series of short, conical teeth (upper jaw sometimes with an inner row of conical teeth anteriorly) (Fig.14c); breast completely scaled ..Pseudocaranx

1b. No scutes in lateral line (only pored scales, not enlarged); pectoral fins relatively short, shorter than head (ca. 50 to 90 percent of head length)

18a. Bases of soft dorsal and anal fins unequal in length, anal-fin base shorter and only about 45 to 70 percent of dorsal-fin base length (Fig. 15); caudal-peduncle grooves present, dorsally and ventrally (Fig.16)

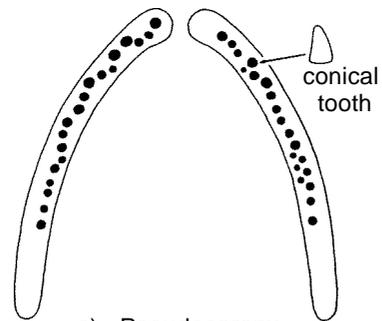
19a. Terminal 2-rayed finlet present in dorsal and anal fins (Fig.17); upper jaw ending distinctly before eye (to below anterior margin of eye in young)..... Elagatis

19b. No finlets in dorsal and anal fins; upper jaw ending below anterior margin of eye to posterior margin of eye



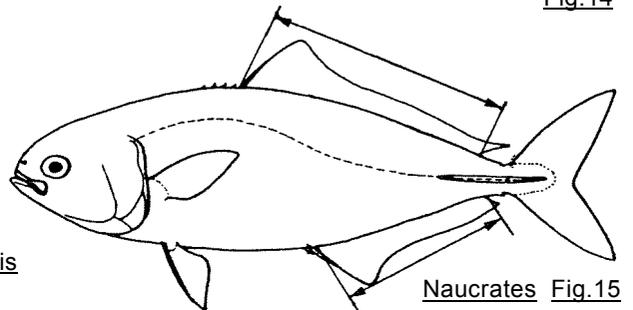
a) "Caranx"

b) Caranx



c) Pseudocaranx

ventral view of teeth in upper jaw; teeth on roof of mouth (vomer and palatines) not shown Fig.14



Naucrates Fig.15

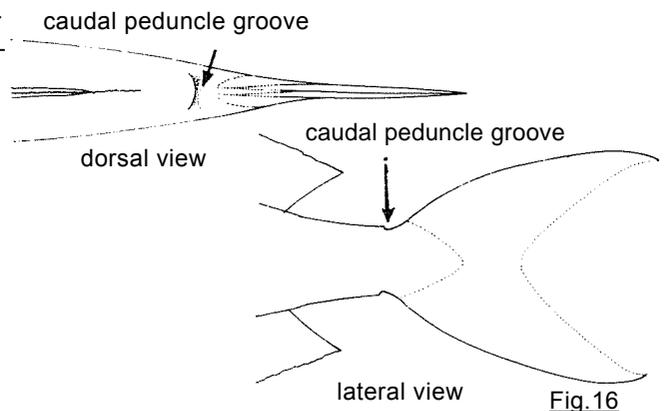
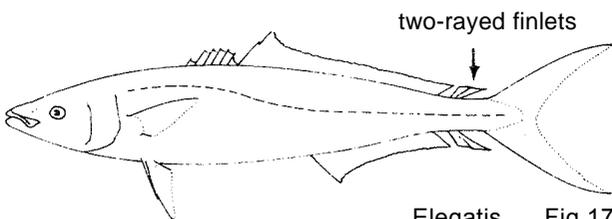


Fig.16



Elagatis Fig.17

20a. Upper jaw broadly rounded at end and terminating below posterior margin of eye (Fig.18a); gillrakers on first arch mostly consisting of rudiments, 4 to 10 total elements Seriolina

20b. Upper jaw truncate or slightly rounded at end and terminating below about anterior margin of eye to middle of eye (Figs.18b,c); gillrakers on first arch mostly well developed, 11 to 29 total elements

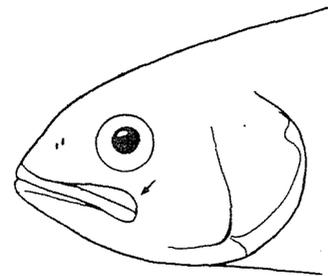
21a. First dorsal-fin spines 4 or 5; soft rays in anal fin 15 to 17; cutaneous keel laterally on caudal peduncle well developed (Fig.19)... Naucrates

21b. First dorsal-fin spines 7 or 8 (caution: anterior spines may become completely embedded in large individuals); soft rays in anal fin 18 to 22; cutaneous keel on caudal peduncle absent to moderately developed (S. lalandi)..... Seriola

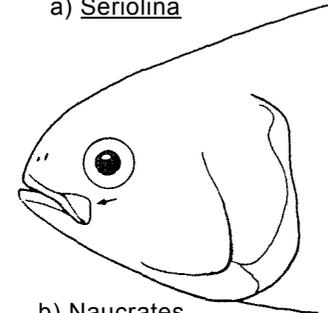
18b. Base of soft anal fin as long as, or only slightly shorter than, base of dorsal fin (Figs.20-22); no caudal peduncle grooves

22a. Posterior soft dorsal- and anal-fin rays consisting of semi-detached finlets (Fig. 20) distal 1/4 to 1/2 of rays not connected by interradiation membrane (unattached portion of rays increasing with growth); upper lip joined to snout at midline by a bridge of skin (frenum), except crossed by a shallow groove in very young..... Scomberoides

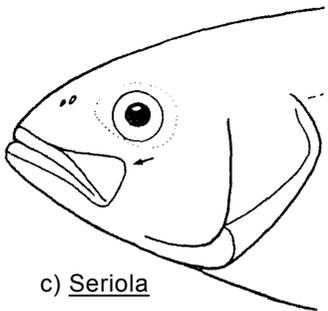
22b. Posterior soft dorsal- and anal-fin rays not consisting of semi-detached finlets; upper lip separated from snout at midline by a continuous deep groove



a) Seriolina

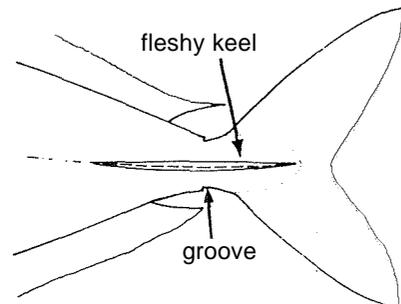


b) Naucrates

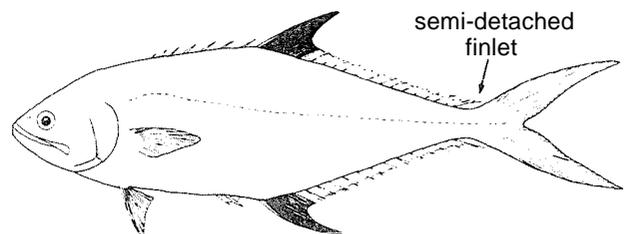


c) Seriola

Fig.18



Naucrates Fig.19



Scomberoides Fig.20