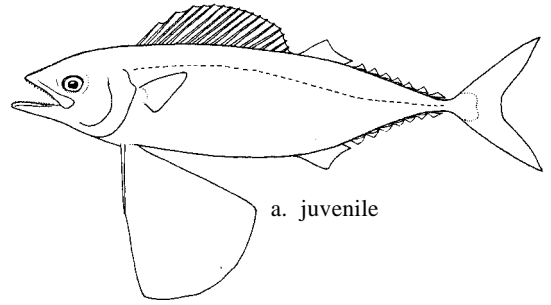


2. SYSTEMATIC CATALOGUE

2.1 Illustrated Key to Genera and Species of Scombridae

1 a. Body covered with large cycloid scales; pelvic fins huge in juveniles (Fig. 19a), proportionally smaller at large sizes (Fig. 19b), depressable into a groove at all size

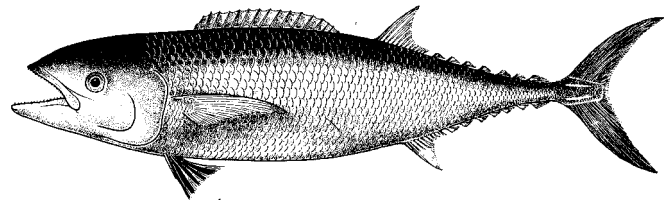
Gasterochisma melampus
Circumglobal in southern temperate waters



a. juvenile

1 b. Body naked or covered with small to moderate-sized scales; pelvic fins small, no groove into which they fit

2 a. Two small keels on either side of caudal peduncle; 5 dorsal and 5 anal finlets (Fig. 20a); adipose eyelids cover front and rear of eye (Fig. 20b)



Gasterochisma melampus

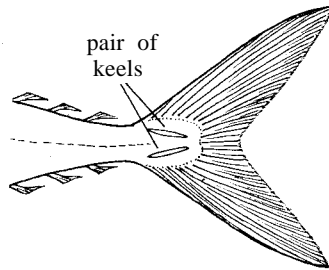
b. adult

Fig. 19

3 a. Entire body covered with moderately large scales; gillrakers very long, longer than gill filaments, plainly visible through open mouth (Fig. 21); no teeth on vomer or palatine bones

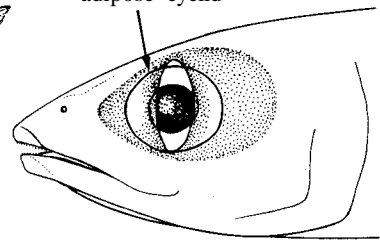
Rastrelliger

4 a. Gillrakers on lower half of first arch 21 to 26; body relatively slender, depth at posterior margin of opercle contained 4.9 to 6 times in fork length (Fig. 22); length of intestine equal to or less than fork length



pair of keels

adipose eyelid



Rastrelliger faughni

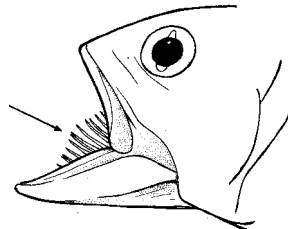
Indo-West Pacific to Fiji

Scomber

Fig. 20

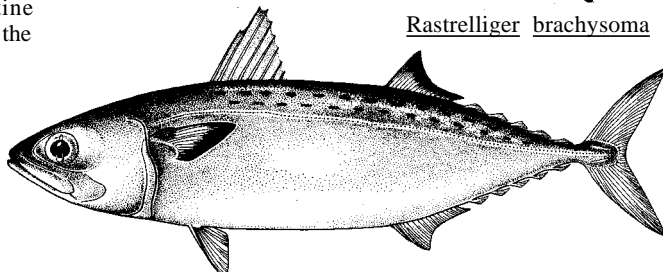
4 b. Gillrakers on lower half of first arch 30 to 48; body relatively deep, depth at posterior margin of opercle contained 3.7 to 5.2 times in fork length (Figs 23, 24); length of intestine 1.4 to 3.6 times the fork length

gillrakers



Rastrelliger brachysoma

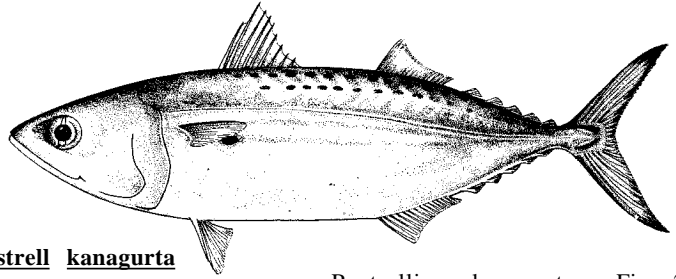
Fig. 21



Rastrelliger faughni

Fig. 22

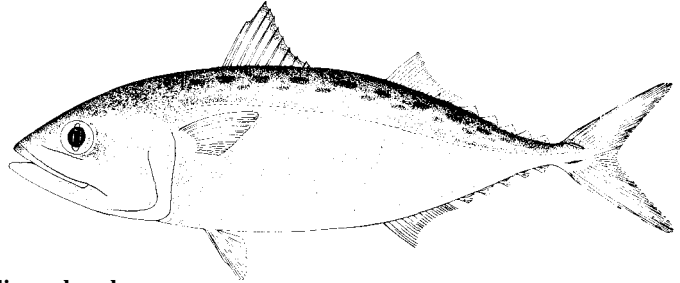
- 5 a. Body depth at posterior margin of opercle contained 4.3 to 5.2 times in fork length (Fig. 23); length of intestine 1.4 to 1.8 times the fork length.....



Rastrell kanagurta
Red Sea, W. Indian Ocean through Indo-West Pacific

Rastrelliger kanagurta Fig. 23

- 5 b. Body depth at posterior margin of opercle contained 3.7 to 4.3 times in fork length (Fig. 24); length of intestine 3.2 to 3.6 times fork length



Rastrelliger brachysoma
Indo-West Pacific

Rastrelliger brachysoma Fig. 24

- 3 b. Entire body covered with small scales; gillrakers shorter than gill filaments, barely visible through open mouth; teeth present on vomer and palatine bones

Scomber

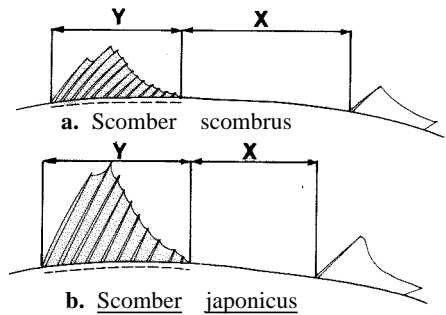
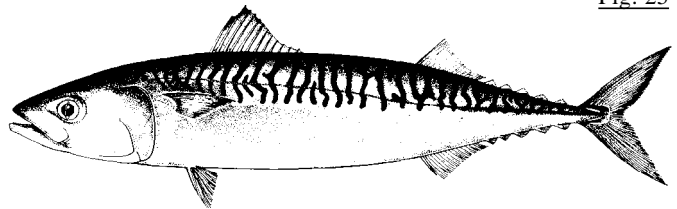


Fig. 25

- 6 a. Space between end of first dorsal fin groove (x) greater than length of groove (y), about 1.5 times as long (Figs 25a,26); swimbladder absent; belly unmarked; 13 precaudal plus 18 caudal vertebrae: 21 to 28 interneural bones under first dorsal fin



Scomber scombrus
N. Atlantic, Mediterranean

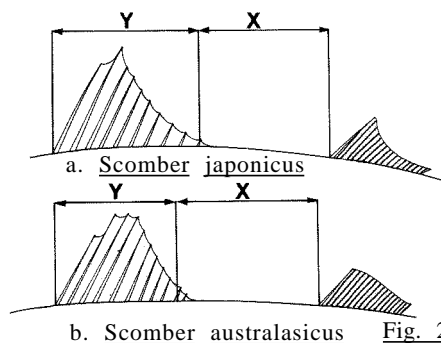
Scomber scombrus Fig. 26

- 6 b. Space between end of first dorsal fin groove (x) about equal to or less than length of groove (y) (Fig. 25b); swimbladder present; belly unmarked or marked by spots or wavy broken lines; 14 precaudal plus 17 caudal vertebrae; 12 to 20 interneural bones under first dorsal fin

- 7 a. First dorsal fin spines 9 or 10; distance from last dorsal spine to origin of second dorsal fin (x) less than distance between first and last spine (y) (Figs 27a,28); 12 to 15 interneural bones under first dorsal fin

Scomber japonicus

NE. and NW. Pacific to Philippines, Hawaii, E.C. and SE. Pacific, Mediterranean and Black seas, E. and W. Atlantic, Red and Arabian seas

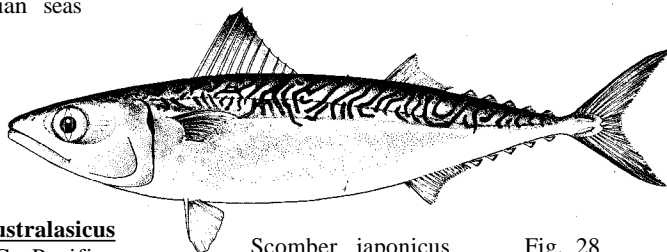


b. Scomber australasicus Fig. 27

- 7 b. First dorsal fin spines 10 to 13; distance from tenth dorsal spine to origin of second dorsal fin (x) greater than distance between first to tenth spine (y) (Figs 27b, 29); 15 to 20 interneural bones under first dorsal fin

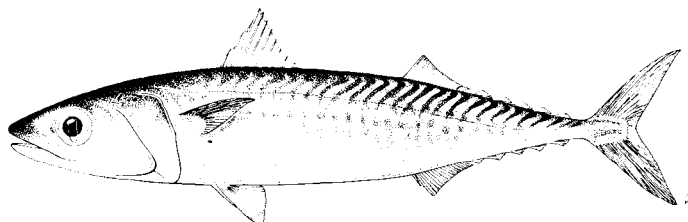
Scomber australasicus

NW. and W.C. Pacific, Hawaii, Socorro Isl., off Mexico, Southern Australia and New Zealand



Scomber japonicus Fig. 28

- 2 b. Two small keels and a large median keel between them on either side of caudal peduncle (Fig. 30); 7 to 10 dorsal and 6 to 10 anal finlets; adipose eyelids absent



Scomber australasicus Fig.29

- 8 a. Two lateral lines, the lower joining the upper behind the pectoral fin base and at the caudal fin base; interpelvic process single and small (Fig. 33a); vertebrae 31

Grammatorcynus

- 9 a. Eye small (3 to 4% of fork length); 14 or 15 gillrakers on first gill arch (Fig. 31)..

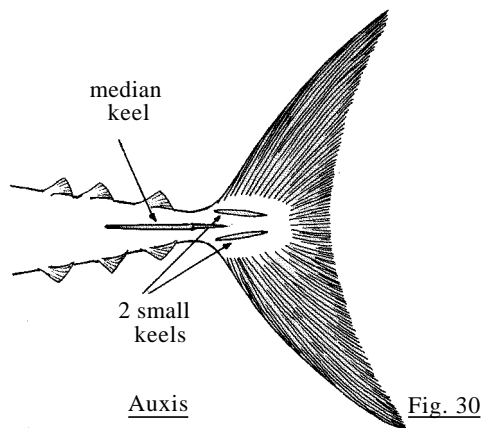
Grammatorcynus bicarinatus

N., NE. and NW. coasts of Australia and southern Papua New Guinea

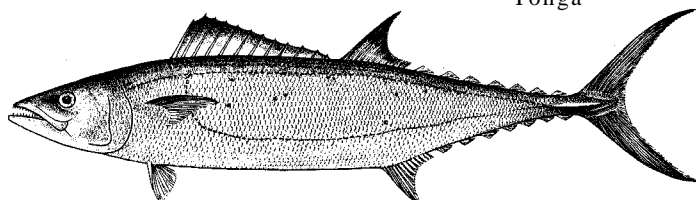
- 9 b. Eye large (7 to 9% of fork length); 19 to 24 gillrakers on first gill arch (Fig. 32)..

Grammatorcynus bilineatus

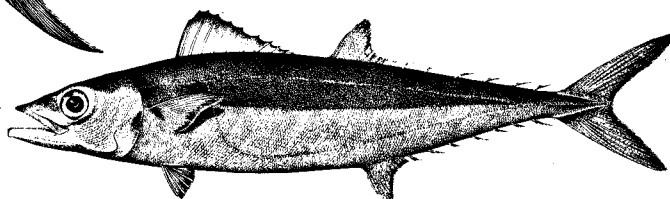
Red Sea, Indo-West Pacific to Marshall Isl. and south to Fiji and Tonga



Auxis Fig. 30



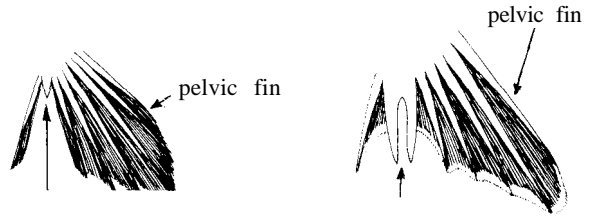
Grammatorcynus bicarinatus Fig.31



Grammatorcynus bilineatus Fig. 32

8 b. One lateral line; interpelvic process single or double (Fig. 33a,b); vertebrae 41 to 64

10 a. Teeth in jaws strong, compressed, almost triangular or knife-like; corselet of scales obscure



a.
interpelvic
process single

b.
interpelvic
process double

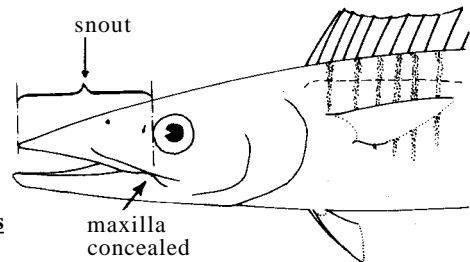
Fig. 33

11 a. Snout as long as rest of head; no gillrakers; 23 to 27 spines in first dorsal fin; posterior end of maxilla concealed under preorbital bone (Figs 34a,35); vertebrae 62 to 64

Acanthocybium solandri
Worldwide in tropical and subtropical waters

11 b. Snout much shorter than rest of head; gillrakers on first arch 1 to 27; 12 to 22 spines in first dorsal fin; posterior end of maxilla exposed (Fig. 34b) vertebrae 41 to 56

Scomberomorus

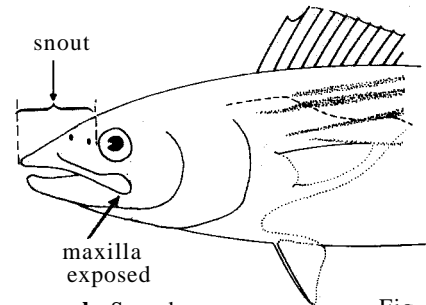


a. Acanthocybium solandri

12 a. Lateral line with a deep dip below first or second dorsal fin (Figs 36,37,38); vertebrae 40 to 46

13 a. Dip in lateral line below first dorsal fin (Fig. 36); total gillrakers on first arch 12 to 15; caudal vertebrae 21 or 22

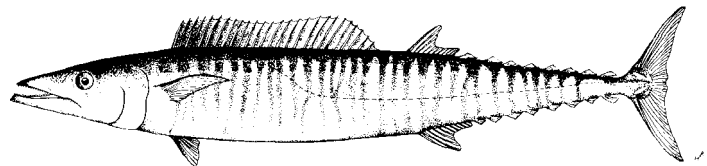
Scomberomorus sinensis
W.C. Pacific to Japan



b. Scomberomorus

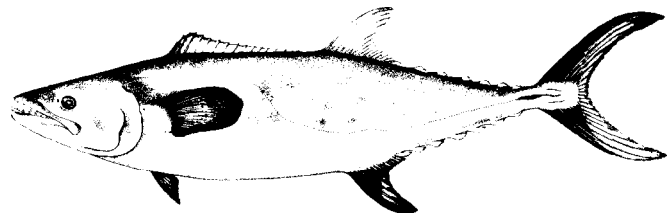
Fig. 34

13 b. Dip in lateral line below second dorsal fin (Figs 37, 38); total gillrakers on first arch 2 to 13; caudal vertebrae 23 to 27



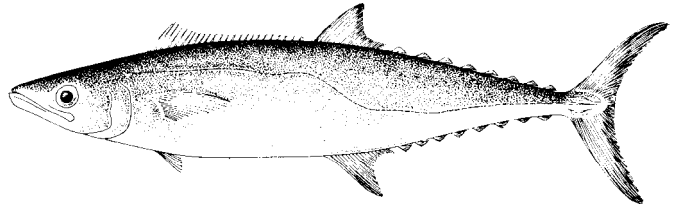
Acanthocybium solandri

Fig. 35



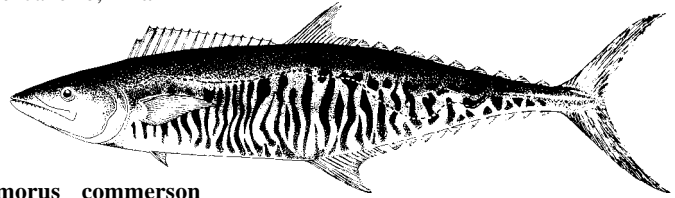
Scomberomorus sinensis

Fig. 36



14 a. Total gillrakers on first arch 7 to 13; precaudal vertebrae 16 or 17 (Fig. 37) Scomberomorus cavalla
W.C. Atlantic south to Rio de Janeiro, Brazil

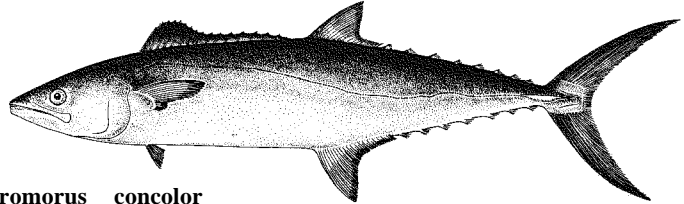
Scomberomorus cavalla Fig. 37



14 b. Total gillrakers on first arch 3 to 8; precaudal vertebrae 19 or 20 (Fig. 38) Scomberomorus commerson
Red Sea, W. Indian Ocean through Indo-West Pacific

Scomberomorus commerson Fig. 38

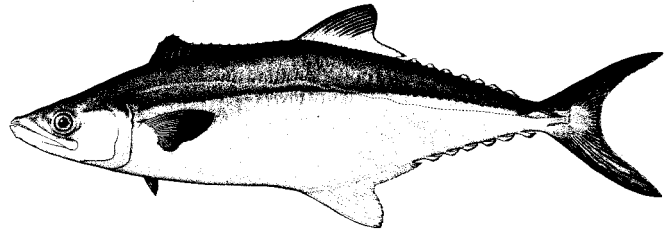
12 b. Lateral line straight or descending gradually backwards; vertebrae 44 to 56



15 a. Total gillrakers on first arch 21 to 27; no spots or bars on body (Fig. 39) Scomberomorus concolor
Baja California

Scomberomorus multiradiatus Fig. 39

15 b. Total gillrakers on first arch 1 to 18; spots, bars, or other markings usually present on sides of fish, except in S. multiradiatus



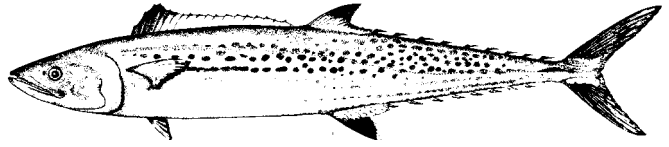
16 a. Anal fin rays 25 to 29; second dorsal fin rays 21 to 25, usually 23 or more; gillrakers on first arch 1 to 4; total vertebrae 54 to 56; no pattern on body (Fig. 40) Scomberomorus multiradiatus
Papua New Guinea

Scomberomorus multiradiatus Fig. 40

16 b. Anal fin rays 15 to 24; second dorsal fin rays 15 to 24; total gillrakers on first arch 3 to 18; total vertebrae 44 to 53; sides usually with spots or other markings

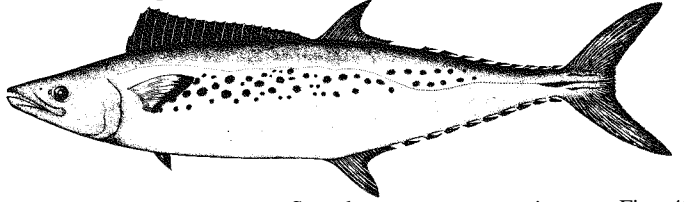
17 a. Dorsal fin spines 19 to 22

18 a. First dorsal fin black between first and 5th to 7th spine, white posteriorly (Fig. 41); intestine straight with no folds; total vertebrae 48 to 50



Scomberomorus niphonius Scomberomorus niphonius Fig. 41
Korea, Japan

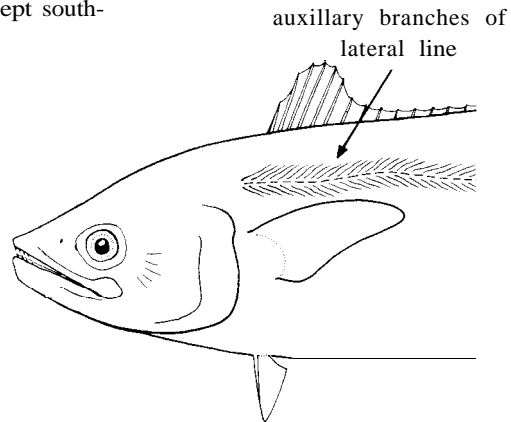
18 b. First dorsal fin black to or almost to posterior end (Fig. 42); intestine with 2 loops and 3 limbs; total vertebrae 50 to 52



Scomberomorus munroi Scomberomorus munroi Fig. 42
Australia except southern coast

17 b. Dorsal fin spines 13 to 19, usually 18 or fewer

19 a. Lateral line with many small auxiliary branches anteriorly (Fig. 43)



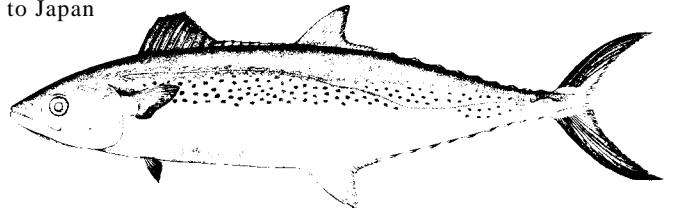
Scomberomorus koreanus Fig. 43

20 a. Dorsal fin spines 15 to 18, usually 16 or more; intestine with 2 loops and 3 limbs; total vertebrae 47 to 52, usually 50 or 51; head longer, 20.2 to 21.5% of fork length; body depth less, 22.8 to 25.2% of fork length (Fig. 44)

Scomberomorus guttatus
Arabian Sea, Indo-West Pacific to Japan

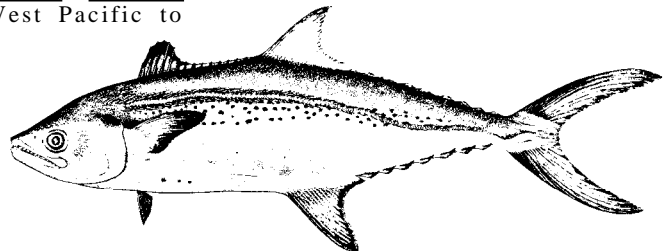
20 b. Dorsal fin spines 14 to 17, usually 14 or 15; intestine with 4 loops and 5 limbs; total vertebrae 46 or 47, usually 46; head shorter, 19.7 to 20.4% of fork length; body depth greater, 24.4 to 26.7% of fork length (Fig. 45)

Scomberomorus koreanus
Indo-West Pacific to Japan



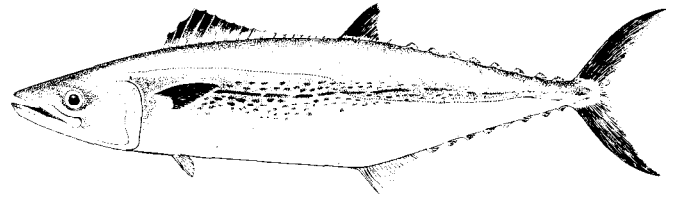
Scomberomorus guttatus Fig. 44

19 b. Lateral line without auxiliary branches or with only a few anteriorly



Scomberomorus koreanus Fig. 45

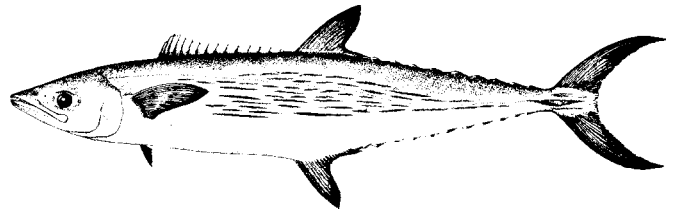
21 a. Sides with spots and at least one stripe, the stripes may be short, wavy or interrupted (Figs 46,47,48)



22 a. One long stripe on sides with spots or interrupted lines above and below the stripe (Fig. 46); total vertebrae 47 or 48, usually 48; total gillrakers on first arch 12 to 18, usually 15 or 16

Scomberomorus regalis Fig. 46
to W.C. Atlantic

22 b. Sides with several short stripes; total vertebrae 44 to 47; usually 46; total gillrakers on first arch 9 to 15, usually 14 or fewer

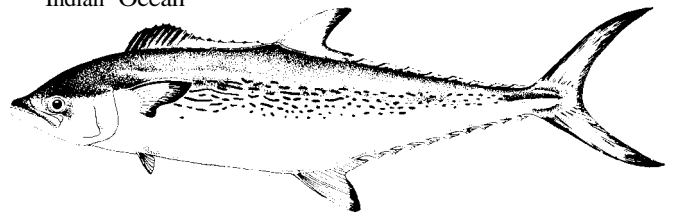


23 a. Sides with a series of short straight stripes and few if any spots (Fig. 47); total gillrakers on first arch usually 11 or fewer; second dorsal fin rays 15 to 19, rarely 21 or 22, usually 18 or fewer

Scomberomorus lineolatus Fig. 47

Scomberomorus lineolatus
Indian Ocean

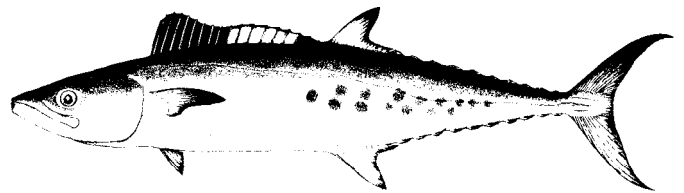
23 b. Sides with a series of short wavy markings plus many small spots (Fig. 48); total gillrakers on first arch usually 12 or more; second dorsal fin rays 19 to 21, usually 20 or more



Scomberomorus plurilineatus Scomberomorus plurilineatus Fig. 48
SE. Africa

21 b. Side without any stripes, spots usually present

24 a. Sides with bars or large spots, mostly larger than diameter of eye



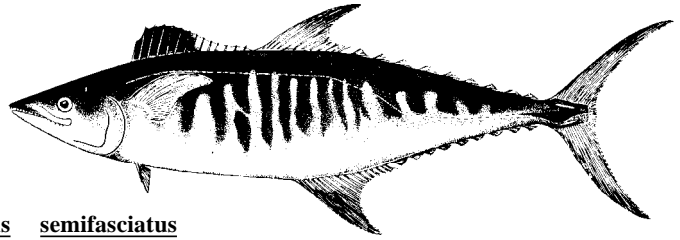
25 a. Sides with relatively large round, regular spots or blotches (Fig. 49); total gillrakers on first arch 3 to 9, usually 7 or fewer

Scomberomorus queenslandicus Fig. 49

Scomberomorus queenslandicus
Around Australia except southern and SW coasts

25 b. Sides either with bars or with irregular, vertically elongate spots; total gillrakers on first arch 6 to 15, usually 9 or more

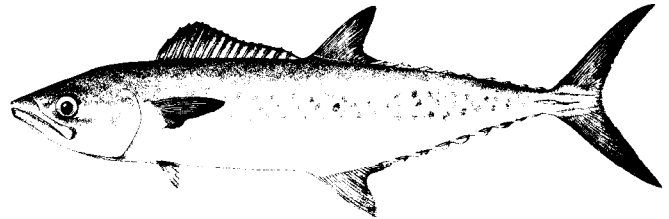
26 a. First dorsal fin spines 13 to 15; second dorsal rays 19 to 22, usually 20 or more; total gillrakers on first arch 6 to 13, usually 11 or fewer; total vertebrae 44 to 46, usually 45; sides with broad cross bars (Fig. 50) tending to disappear in adults....



Scomberomorus semifasciatus
N. and NE. Australia

Scomberomorus semifasciatus Fig. 50

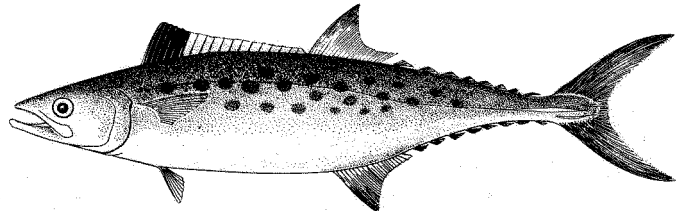
26 b. First dorsal fin spines 15 to 18, usually 16 or more; second dorsal rays 16 to 19, usually 17; total gillrakers on first arch 12 to 15; total vertebrae 46 or 47, usually 46; sides with irregular, elongate spots tending to form narrow cross bars in large adults (Fig. 51)



Scomberomorus tritor
E.C. Atlantic

Scomberomorus tritor Fig. 51

24 b. Sides with small round spots, at most about the diameter of eye, orange-coloured in life

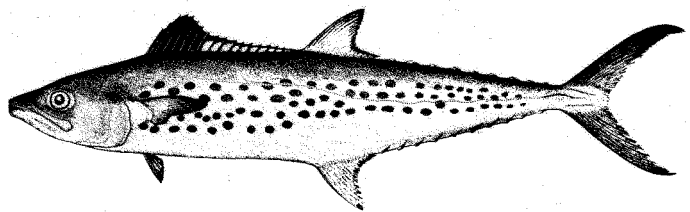


27 a. Total vertebrae 51 to 53; second dorsal fin rays 17 to 20, usually 18 or more (Fig. 52)

Scomberomorus maculatus
WC. Atlantic to Cape Cod

Scomberomorus maculatus Fig. 52

27 b. Total vertebrae 46 to 49; second dorsal fin rays 15 to 19, usually 18 or fewer



28 a. Pectoral fin rays 21 to 24, mostly 22 or 23; pelvic fin short, 3.6 to 5.9% of fork length (Fig. 53)

Scomberomorus brasiliensis
W.C. and SW. Atlantic

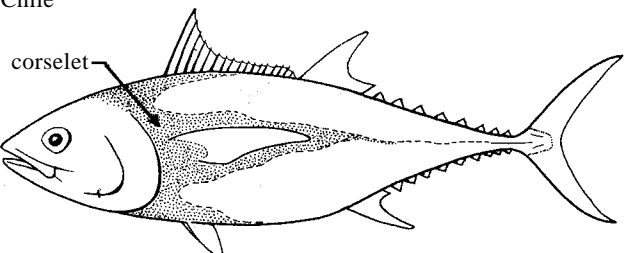
Scomberomorus brasiliensis Fig. 53

28 b. Pectoral fin rays 20 to 24, modally 21; pelvic fin longer, 4.7 to 6.4% of fork length (Fig. 54) ...

Scomberomorus sierra
E.C. Pacific South to northern Chile

Scomberomorus sierra Fig. 54

10 b. Teeth in jaws slender, conical, hardly compressed; corselet of scales well developed (Fig. 55)



29 a. Upper surface of tongue without cartilaginous longitudinal ridges (Fig. 64a)

Thunnus sp. Fig. 55