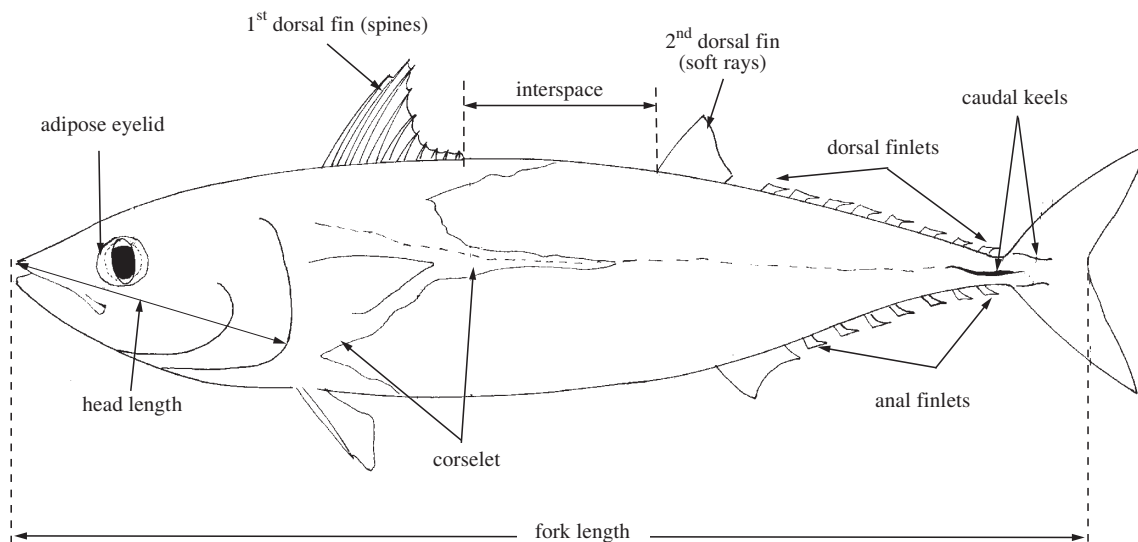


SCOMBRIDAE

Tunas (also, albacore, bonitos, mackerels, seerfishes, and wahoo)

by B.B. Collette

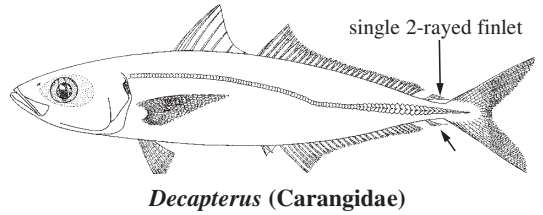
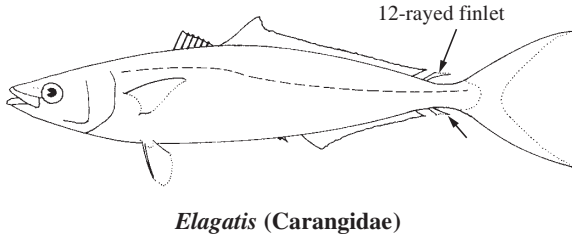
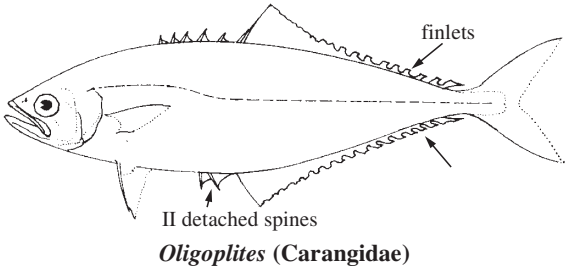
Diagnostic characters: Body elongate and fusiform, moderately compressed in some genera (size from about 45 cm to over 5 m). Snout pointed. Adipose eyelid sometimes present (*Rastrelliger*, *Scomber*). Premaxillae beak-like, free from nasal bones which are separated by ethmoid bone; mouth moderately large; teeth in jaws strong, moderate or weak; no true canines; roof of mouth and tongue may be toothed. Two dorsal fins, the first usually short and separated from second dorsal fin; **finlets present behind dorsal and anal fins; caudal fin deeply forked**, with supporting caudal-fin rays completely covering hypural plate; pectoral fins placed high; pelvic fins moderate or small. **At least 2 small keels on each side of caudal peduncle, a larger keel in between in many species.** Lateral line simple. Body either uniformly covered with small to moderate scales (e.g. *Rastrelliger*, *Scomber*, *Scomberomorus*) or a corselet developed (area behind head and around pectoral fins covered with moderately large, thick scales) and rest of body naked (*Auxis*, *Euthynnus*, *Katsuwonus*) or covered with small scales (*Thunnus*). Vertebrae 31 to 66. **Colour:** various *Scomber* species are usually bluish or greenish above with a pattern of wavy bands on upper sides and silvery below; *Scomberomorus* and *Acanthocybium* are blue-green above and silvery below with dark vertical bars or spots on sides (*Grammatorcynus* is green above, silvery below with dark spots along belly); *Sarda* has 5 to 11 dark oblique stripes on back; *Euthynnus* has a striped pattern on back and several dark spots between pectoral and pelvic fins; *Katsuwonus* has 4 to 6 conspicuous longitudinal stripes on belly; *Auxis* and *Thunnus* are deep blue or black above; most species of *Thunnus* have bright yellow finlets with black borders.



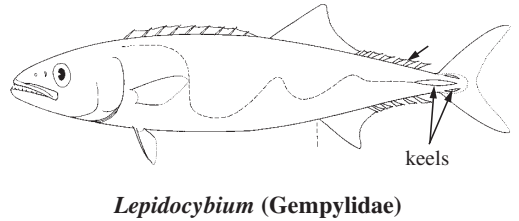
Habitat, biology, and fisheries: A diverse group of pelagic fishes. Some smaller species inhabit coastal waters while the larger ones, especially *Thunnus maccoyii*, *T. obesus*, *T. alalunga*, and *T. tonggol* carry out wide, transoceanic migrations. All scombrids are excellent food fishes and many of them are of significant importance in coastal pelagic or oceanic commercial and sports fisheries.

Similar families occurring in the area

Carangidae: dorsal-fin spines III to VIII (IX to XXVII in Scombridae); II detached spines in front of anal fin; frequently scutes developed along posterior part of lateral line and usually no well-developed finlets (except in *Oligoplites* with a series of dorsal and anal finlets, and *Elagatis* and *Decapterus* with 1 dorsal and 1 anal finlet).

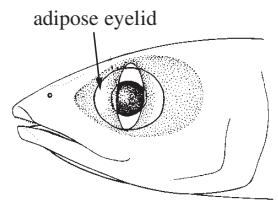
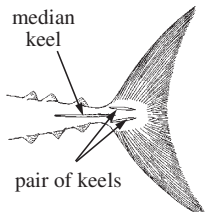
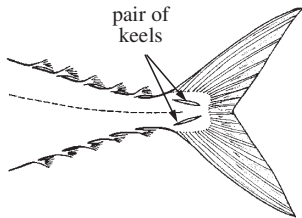


Gempylidae: back usually brown, rarely blue-brown; never with distinct markings on body; no keels on caudal peduncle, except in *Lepidocybium*.



Key to the species of Scombridae occurring in the area

- 1a. Two small keels and no large median keel on each side of caudal peduncle (Fig. 1a); 5 dorsal and 5 anal finlets (Fig. 1a); adipose eyelids cover front and rear of eye (Fig. 2) → 2
- 1b. Two small keels and a large median keel between them on each side of caudal peduncle (Fig. 1b); 6 to 10 dorsal and 6 to 10 anal finlets; adipose eyelids absent → 6



a) *Scomber*

b) *Auxis*

Fig. 1

Fig. 2 *Scomber*

- 2a. Vertically zig-zag or wavy lines on back; first anal-fin spine fairly stiff and strong (Fig. 3); teeth present on roof of mouth (*Scomber*) → 3
- 2b. One or 2 horizontal rows of spots on each side of back; first anal-fin spine thin, rudimentary (Fig. 4); no teeth on roof of mouth (*Rastrelliger*) → 4

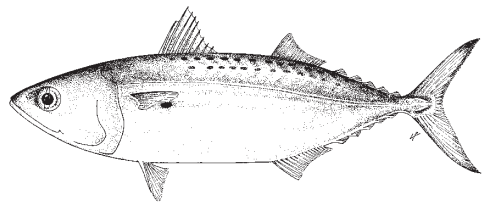
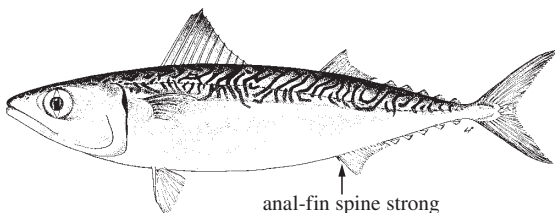


Fig. 3 *Scomber*

Fig. 4 *Rastrelliger kanagaruta*

- 3a. First dorsal-fin spines IX or X; distance from last dorsal-fin spine to origin of second dorsal fin less than distance between first and last spine *Scomber japonicus*
- 3b. First dorsal-fin spines X to XIII; distance from tenth dorsal-fin spine to origin of second dorsal fin greater than distance between first and tenth spine *Scomber australasicus*
- 4a. Gill rakers not visible from side of head when mouth is open, 21 to 26 on lower limb of first gill arch; body moderately slender, its depth at posterior margin of opercle 4.9 to 6 times in fork length *Rastrelliger faughni*
- 4b. Gill rakers visible from side of head when mouth is open, 30 to 48 on lower limb of first gill arch; body moderately deep, its depth at posterior margin of opercle 3.7 to 5.2 times in fork length → 5
- 5a. Body depth at posterior margin of opercle 3.7 to 4.3 times in fork length . . . *Rastrelliger brachysoma*
- 5b. Body depth at posterior margin of opercle 4.3 to 5.2 times in fork length . . . *Rastrelliger kanagurta*
- 6a. Two lateral lines, the lower joining the upper behind pectoral-fin base and at base of caudal fin; interpelvic process (scaly process between pelvic-fin bases) single (Fig. 5) (*Grammatorcynus*) → 7
- 6b. Single (upper) lateral line; interpelvic process single or double → 8
- 7a. Eye small, 3.1 to 4.6% of fork length; total gill rakers on first gill arch 12 to 15 *Grammatorcynus bicarinatus*
- 7b. Eye large, 4.0 to 6.0% of fork length; total gill rakers on first gill arch 18 to 24 *Grammatorcynus bilineatus*
- 8a. Teeth in jaws strong, compressed, almost triangular or knife-like; corselet of scales obscure → 9
- 8b. Teeth in jaws slender, conical, hardly compressed; corselet of scales well developed → 18
- 9a. Snout as long as rest of head (Fig. 6); gill rakers absent; first dorsal fin with XXIII to XXVII spines *Acanthocybium solandri*
- 9b. Snout much shorter than rest of head (Fig. 7); at least 3 gill rakers present; first dorsal fin with XIII to XXII spines (*Scomberomorus*) → 10

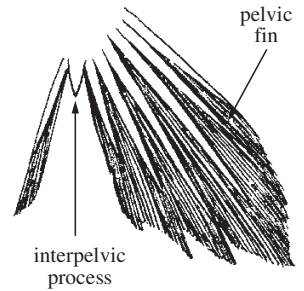


Fig. 5 *Grammatorcynus*

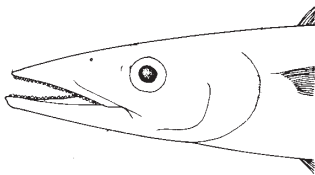


Fig. 6 *Acanthocybium*

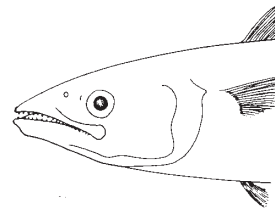


Fig. 7 *Auxis*

- 10a. Lateral line with a deep dip below first or second dorsal fin → 11
- 10b. Lateral line straight or descending gradually backwards → 12
- 11a. Dip in lateral line below first dorsal fin; total gill rakers on first gill arch 10 to 15 *Scomberomorus sinensis*
- 11b. Dip in lateral line below second dorsal fin; total gill rakers on first gill arch 1 to 8 *Scomberomorus commerson*
- 12a. Anal-fin rays 25 to 29; soft dorsal-fin rays 21 to 25 (usually 23 or more); total gill rakers on first gill arch 1 to 4; no spots or bars on body *Scomberomorus multiradiatus*
- 12b. Anal-fin rays 15 to 24; soft dorsal-fin rays 15 to 24; total gill rakers on first gill arch 3 to 18; sides usually with spots or bars → 13

- 13a. Dorsal-fin spines XX to XXII *Scomberomorus munroi*
 13b. Dorsal-fin spines XIII to XVIII → 14
- 14a. Lateral line with many small auxillary branches anteriorly → 15
 14b. Lateral line without auxillary branches anteriorly → 16
- 15a. Dorsal-fin spines XV to XVIII (usually XVI or more); intestine with 2 loops and 3 limbs; head longer, 20.2 to 21.5% of fork length; body depth less, 22.8 to 25.2% of fork length *Scomberomorus guttatus*
 15b. Dorsal-fin spines XIV to XVII (usually XIV or XV); intestine with 4 loops and 5 limbs; head shorter, 19.7 to 20.4% of fork length; body depth greater, 24.4 to 26.7% of fork length *Scomberomorus koreanus*
- 16a. Sides with a series of short straight stripes and few if any spots *Scomberomorus lineolatus*
 16b. Sides without any stripes, spots, or bars usually present → 17
- 17a. Sides with moderately large round, regular spots or blotches; total gill rakers on first gill arch 3 to 9 (usually 7 or fewer) *Scomberomorus queenslandicus*
 17b. Sides with broad cross bars, tending to disappear in adults; total gill rakers on first gill arch 6 to 13 (usually 9 or more) *Scomberomorus semifasciatus*
- 18a. Upper surface of tongue without cartilaginous longitudinal ridges (Fig. 8a) → 19
 18b. Upper surface of tongue with 2 longitudinal ridges (Fig. 8b) → 22
- 19a. Jaw teeth tiny, 40 to 55 on each side of upper and lower jaws; gill rakers fine, numerous, 70 to 80 on first gill arch *Allothunnus fallai*
 19b. Jaw teeth larger, only 10 to 31 on each side of upper and lower jaws; total gill rakers fewer, 8 to 21 on first gill arch → 20
- 20a. Five to 11 narrow, dark longitudinal stripes on upper part of body (Fig. 9); no teeth on tongue *Sarda orientalis*
 20b. Body *either* without stripes *or* with dark spots above lateral line and longitudinal dark stripes below; 2 patches of teeth on tongue → 21

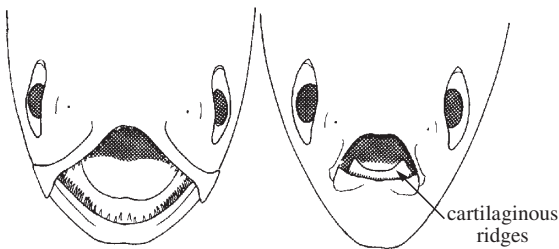
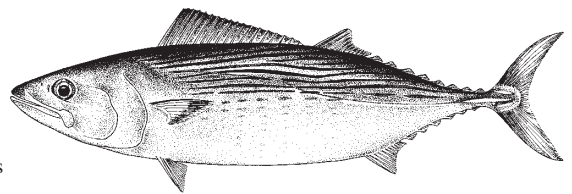
a) *Sarda orientalis*b) *Katsuwonus pelamis*

Fig. 8

Fig. 9 *Sarda*

- 21a. Body with dark spots above lateral line and dark longitudinal stripes below; first dorsal-fin spines XVI to XVIII; jaw teeth small and conical; interpelvic process small and bifid . *Cybiosarda elegans*
 21b. Body without a prominent pattern of stripes or spots; first dorsal-fin spines XIII to XV; jaw teeth very large and conspicuous; interpelvic process large and single . . *Gymnosarda unicolor*
- 22a. First and second dorsal fins widely separated, the space between them at least equal to length of first dorsal-fin base (Fig. 10); first dorsal-fin spines X to XII; interpelvic process single and large, longer than longest pelvic-fin rays (Fig. 10) (*Auxis*) → 23
 22b. First and second dorsal fins barely separated, at most by space equal to eye diameter (Figs 11 to 13); first dorsal-fin spines XII to XVI; interpelvic process bifid and short, shorter than shortest pelvic-fin ray (Fig. 11) → 24

- 23a. Posterior extension of corselet narrow, only 1 to 5 scales wide under origin of second dorsal fin; dorsal naked area extends anterior to tips of pectoral fins; gill rakers 36 to 42 on first gill arch *Auxis thazard thazard*
- 23b. Posterior extension of corselet wide, usually 10 to 15 scales wide under origin of second dorsal fin; dorsal naked area does not extend anterior to tips of pectoral fins; gill rakers 43 to 48 on first gill arch *Auxis rochei rochei*
- 24a. Four to six prominent dark longitudinal stripes on belly (Fig. 11); total gill rakers on first gill arch 53 to 63 *Katsuwonus pelamis*
- 24b. No dark longitudinal stripes on belly; total gill rakers on first gill arch 19 to 45 → 25

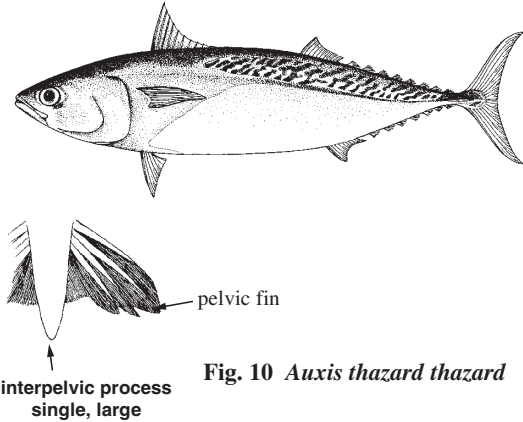


Fig. 10 *Auxis thazard thazard*

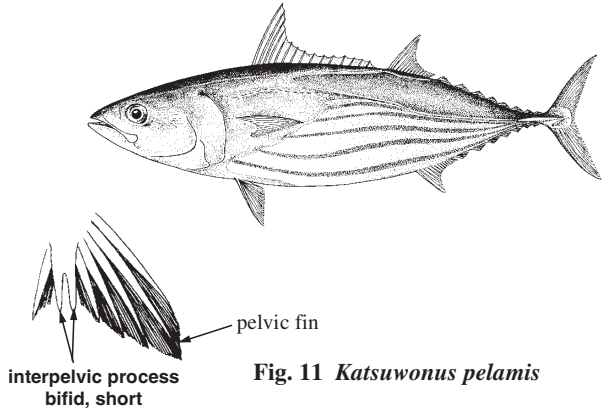


Fig. 11 *Katsuwonus pelamis*

- 25a. Body naked behind corselet of enlarged and thickened scales; several black spots usually present between pectoral- and pelvic-fin bases (Fig. 12); pectoral-fin rays 25 to 29 . . . *Euthynnus affinis*
- 25b. Body covered with very small scales behind corselet; no black spots on body (Fig. 13); pectoral-fin rays 30 to 36 (*Thunnus*) → 26

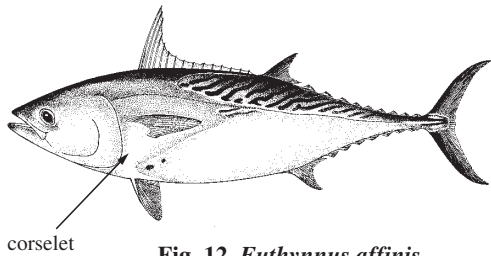


Fig. 12 *Euthynnus affinis*

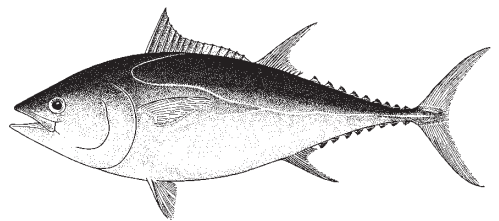


Fig. 13 *Thunnus*

- 26a. Ventral surface of liver with prominent striations, centre lobe of liver equal to or longer than left and right lobes (Fig. 14) → 27
- 26b. Ventral surface of liver without prominent striations, right lobe of liver much longer than left or central lobes (Fig. 15) → 29

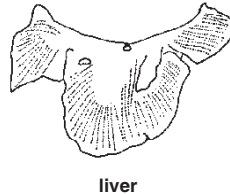


Fig. 14 *Thunnus alalunga*

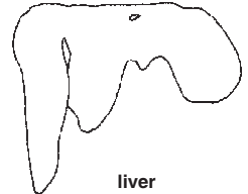



Fig. 15 *Thunnus albacares*

- 27a. Total gill rakers on first gill arch 31 to 43; pectoral fins short, less than 80% of head length *Thunnus maccoyii*
- 27b. Total gill rakers on first gill arch 23 to 31; pectoral fins moderate or long, greater than 80% of head length → 28

- 28a.** Caudal fin with a narrow white posterior border; pectoral fins very long, reaching well past end of second dorsal-fin base; greatest body depth at or slightly before level of second dorsal fin. *Thunnus alalunga*
- 28b.** Caudal fin without white posterior border; pectoral fins short or moderate in length, not reaching end of second dorsal-fin base; greatest body depth at middle of body. . . . *Thunnus obesus*
- 29a.** Total gill rakers on first gill arch 26 to 34 (usually 27 or more); second dorsal and anal fins of larger individuals (120 cm fork length or longer) frequently elongate, more than 20% of fork length; maximum size 195 cm fork length. *Thunnus albacares*
- 29b.** Total gill rakers on first gill arch 19 to 27 (usually 26, or fewer); second dorsal and anal fins never greatly elongate, less than 20% of fork length at all sizes; maximum size 130 cm fork length. *Thunnus tonggol*

List of species occurring in the area

The symbol  is given when species accounts are included.

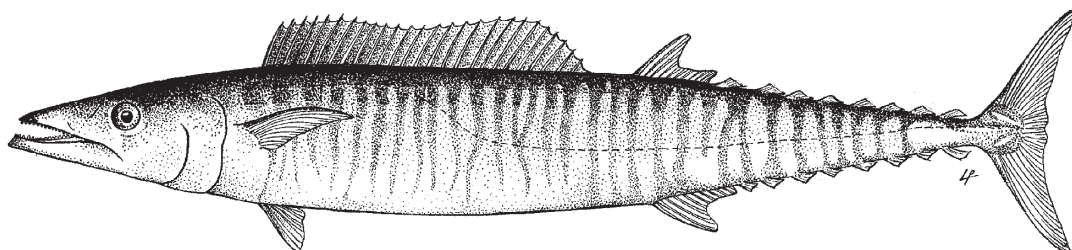
-  *Acanthocybium solandri* (Cuvier, 1831)
-  *Allothunnus fallai* Serventy, 1948
-  *Auxis rochei rochei* (Risso, 1810)
-  *Auxis thazard thazard* (Lacepède, 1800)
-  *Cybiosarda elegans* (Whitley, 1935)
-  *Euthynnus affinis* (Cantor, 1849)
-  *Grammatorcynus bicarinatus* (Quoy and Gaimard, 1824)
-  *Grammatorcynus bilineatus* (Rüppell, 1836)
-  *Gymnosarda unicolor* (Rüppell, 1838)
-  *Katsuwonus pelamis* (Linnaeus, 1758)
-  *Rastrelliger brachysoma* (Bleeker, 1851)
-  *Rastrelliger faughni* Matsui, 1967)
-  *Rastrelliger kanagurta* (Cuvier, 1817)
-  *Sarda orientalis* (Temminck and Schlegel, 1844)
-  *Scomber australasicus* Cuvier, 1831
-  *Scomber japonicus* Houttuyn, 1782
-  *Scomberomorus commerson* (Lacepède, 1800)
-  *Scomberomorus guttatus* (Bloch and Schneider, 1801)
-  *Scomberomorus koreanus* (Kishinouye, 1915)
-  *Scomberomorus lineolatus* (Cuvier, 1831)
-  *Scomberomorus multiradiatus* Munro, 1964
-  *Scomberomorus munroi* Collette and Russo, 1980
-  *Scomberomorus queenslandicus* Munro, 1943
-  *Scomberomorus semifasciatus* (Macleay, 1884)
-  *Scomberomorus sinensis* Lacepède, 1800
-  *Thunnus alalunga* (Bonnaterre, 1788)
-  *Thunnus albacares* (Bonnaterre, 1788)
-  *Thunnus maccoyii* (Castelnau, 1872)
-  *Thunnus obesus* (Lowe, 1839)
-  *Thunnus tonggol* (Bleeker, 1851)

References

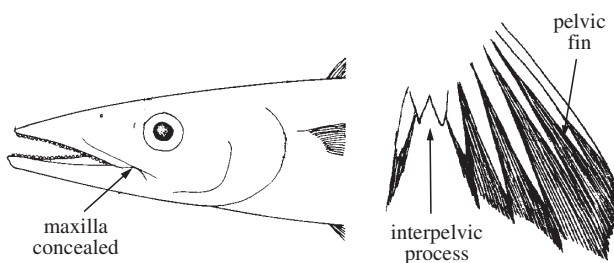
- Collette, B.B. 1999. Mackerels, molecules, and morphology. In *Proc. 5th Indo-Pac. Fish Conf. (Nouméa, 3-8 Nov. 1977)*, edited by B. Séret and J.-Y. Sire. Paris, Soc. Fr. Ichtyol., pp. 149-164.
- Collette, B.B. and C.E. Nauen. 1983. FAO species catalogue. Vol. 2. Scombrids of the world. An annotated and illustrated catalogue of tunas, mackerels, bonitos and related species known to date. *FAO Fish. Synop.*, (125)2:137 p.

Acanthocybium solandri (Cuvier, 1831)

WAH

Frequent synonyms / misidentifications: None / None.**FAO names:** En - Wahoo; Fr - Thazard-batard; Sp - Peto.

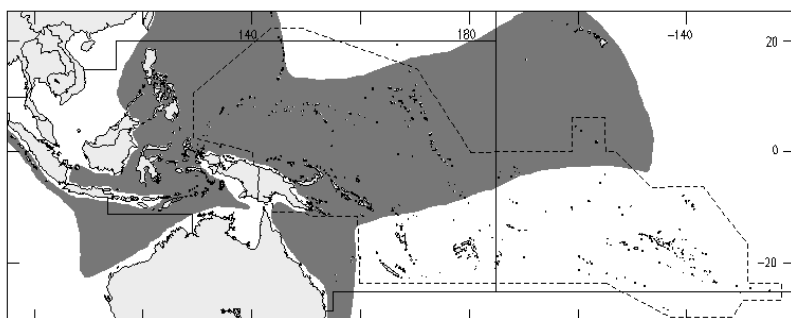
Diagnostic characters: Body very elongate, fusiform and only slightly laterally compressed. Mouth large with strong teeth closely set in a single series, **teeth triangular, compressed, and finely serrate; snout about as long as rest of head. Posterior part of maxilla completely concealed under lacrimal bone. Gill rakers absent.** Two dorsal fins, the first with XXIII to XXVII spines; 7 to 10 dorsal and anal finlets; 2 small flaps (interpelvic process) between pelvic fins. **Colour:** back iridescent bluish green; **numerous dark vertical bars on sides** which extend to below lateral line.



Size: Maximum fork length 210 cm; maximum weight 83 kg.

Habitat, biology, and fisheries: A pelagic species, frequently taken well offshore. Feeds on fishes and squids. Primarily a sportfish on light to heavy tackle, surface trolling with spoon, feather lure, strip bait, or flying fish or halfbeak. Marketed mostly fresh; the flesh is of very good quality. From 1990 to 1995, the FAO Yearbook of Fishery Statistics reports a range of yearly catch of 129 to 667 t of *Acanthocybium solandri* from the area (Fiji, Guam, Marianas).

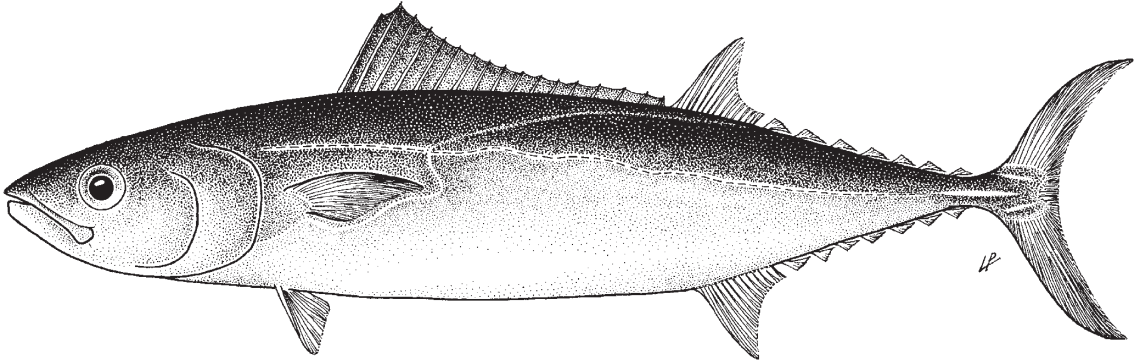
Distribution: A cosmopolitan warm-water species usually found well offshore.



Allothunnus fallai Serventy, 1948

Frequent synonyms / misidentifications: None / None.

FAO names: En - Slender tuna; Fr - Thon elegant; Sp - Atún lanzon.

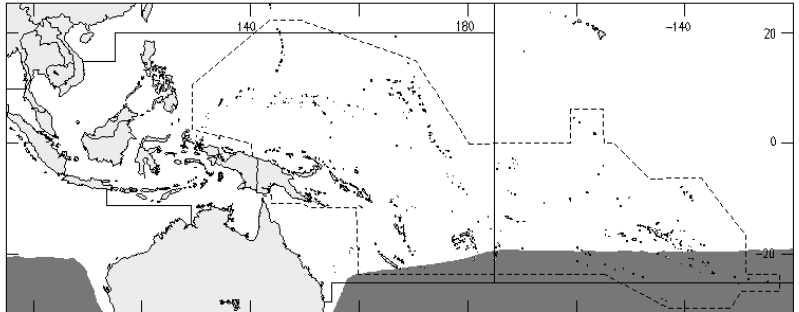


Diagnostic characters: Body robust, elongate and rounded. Teeth very small and conical, 40 to 55 on each side of upper and lower jaws. **Total gill rakers on first gill arch 70 to 80** (more than in any other scombrid species). Dorsal fins close together, the first with XV to XVIII spines, the second with 12 or 13 soft rays, followed by 6 to 8 finlets; **anal fin with 13 or 14 soft rays followed by 6 or 7 finlets**; pectoral fins with 24 to 26 rays; interpelvic process small and bifid. **Body naked ventrally behind the long anterior corselet; dorsal half of body to lateral line covered with small scales**; caudal peduncle slender with a well developed lateral keel between the 2 smaller keels on each side. Swimbladder absent. Vertebrae 20+19=39. **Colour:** back uniformly dark blue; lower sides and belly silvery white.

Size: Maximum length about 96 cm, commonly to 86 cm.

Habitat, biology, and fisheries: An epipelagic, oceanic species. Feeds on zooplankton, particularly euphausiid crustaceans, and to a minor extent on squids and small fishes. Caught incidentally on longline gear. Marketed mostly fresh.

Distribution: Throughout the southern part of the area, cosmopolitan between 20° and 50°S.

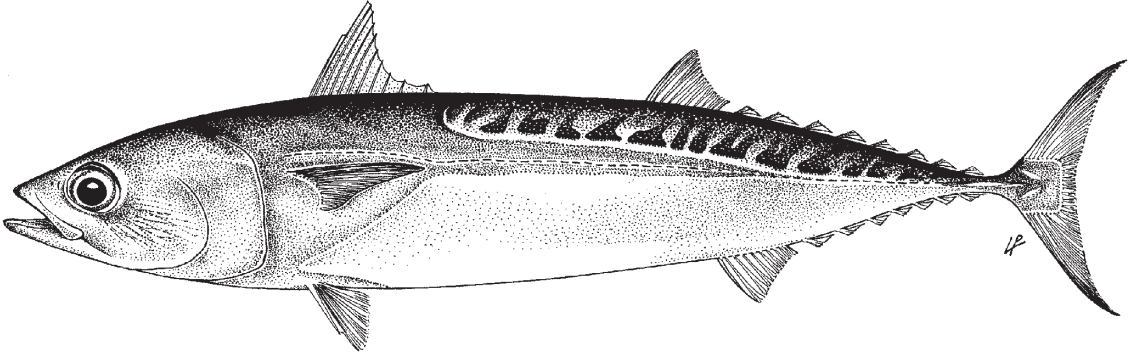


Auxis rochei rochei (Risso, 1810)

FRZ

Frequent synonyms / misidentifications: *Auxis thynnoides* Bleeker, 1855; *A. maru* Kishinouye, 1915 / *Auxis thazard* (Lacepède, 1800).

FAO names: En - Bullet tuna; Fr - Bonitou (= Auxide, Fishing Area 31); Sp - Melvera.

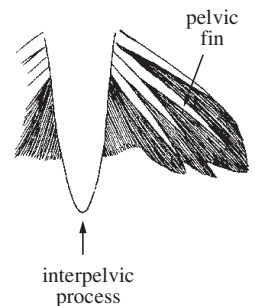
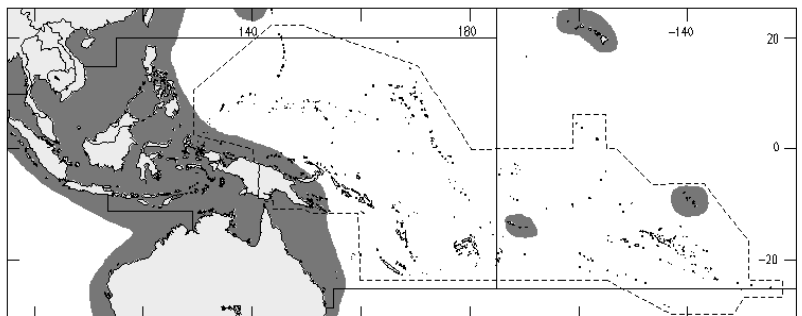


Diagnostic characters: Body robust, elongate and rounded. Teeth small and conical, in a single series. **Total gill rakers on first gill arch usually 43 to 48.** Two dorsal fins, the **first dorsal fin with X to XII tall spines, separated by a large interspace** (at least equal to length of first dorsal-fin base), **second dorsal fin followed by 8 finlets; anal fin followed by 7 finlets; pectoral fins short, not reaching vertical line from anterior margin of scaleless area above corselet; a large, single-pointed flap (interpelvic process) between pelvic fins.** **Body naked except for corselet, which is well developed in its posterior part (more than 6 scales wide under second dorsal-fin origin).** A strong central keel on each side of caudal-fin base between 2 smaller keels. **Colour:** back bluish, turning to deep purple or almost black on head; **scaleless area with pattern of 15 or more fairly broad, nearly vertical dark bars;** belly white; pectoral and pelvic fins purple, their inner sides black.

Size: Maximum fork length 40 cm, commonly to 35 cm (smaller than *Auxis thazard*).

Habitat, biology, and fisheries: Feeds on small fishes, especially clupeoids; also on squids and crustaceans, and especially crab and stomatopod larvae. No specific fishery exists; caught with other species. Caught with purse seines, shore seines, lift nets, pole-and-line, and by trolling. Marketed fresh and frozen. From 1990 to 1995, the FAO Yearbook of Fishery Statistics reports a range of yearly catch of 108 812 to 160 242 t of *A. rochei* (together with *A. thazard*) from the Western Central Pacific.

Distribution: A cosmopolitan warm-water species that occurs sporadically throughout the area from Japan to southern Australia. Some records of *A. thazard thazard* are probably attributable to *A. rochei rochei*. Replaced in the eastern Pacific by *A. rochei eudorax* Collette and Aadland, 1996.

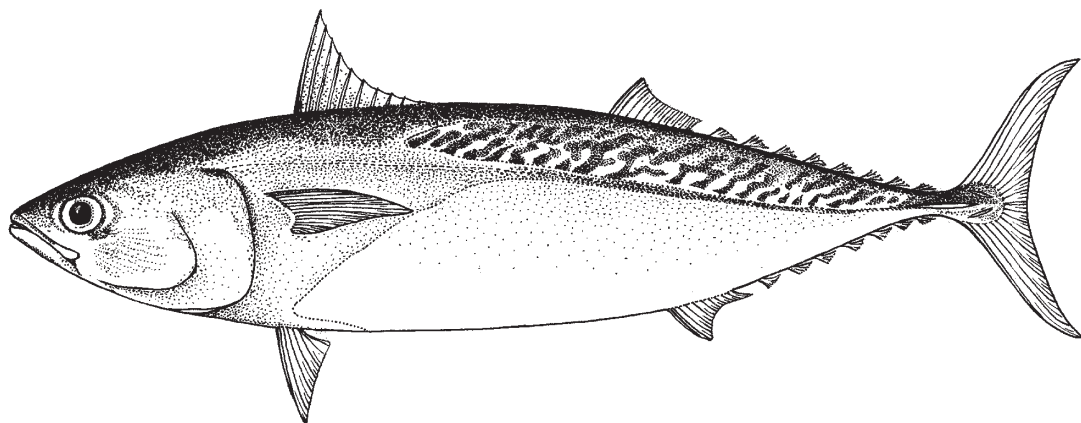


Auxis thazard thazard (Lacepède, 1800)

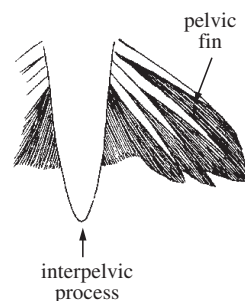
FRZ

Frequent synonyms / misidentifications: *Auxis tapeinosoma* Bleeker, 1854; *A. hira* Kishinouye, 1915 / None.

FAO names: En - Frigate tuna; Fr - Auxide; Sp - Melva.



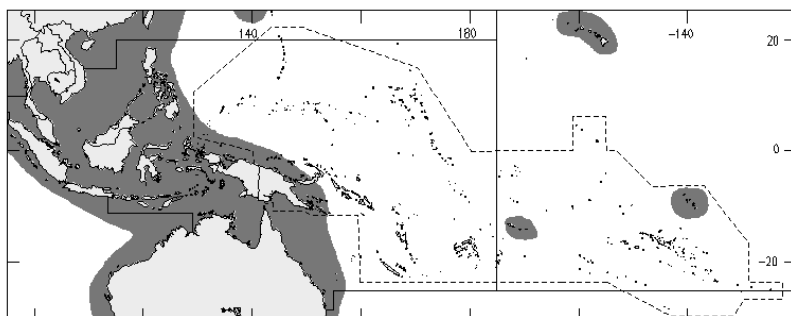
Diagnostic characters: Body robust, elongate and rounded. Teeth small and conical, in a single series. **Total gill rakers on first gill arch 36 to 42.** Two dorsal fins, the **first dorsal fin with X to XII spines, separated from the second by a large interspace** (at least equal to length of first dorsal-fin base), **second dorsal fin followed by 8 finlets; anal fin followed by 7 finlets; pectoral fins short, but reaching past vertical line from anterior margin of scaleless area above corselet; a large single-pointed flap (interpelvic process) between pelvic fins.** Body naked except for the corselet, which is well developed and narrow in its posterior part (no more than 5 scales wide under second dorsal-fin origin). A strong central keel on each side of caudal-fin base between 2 smaller keels. **Colour:** back bluish, turning to deep purple or almost black on the head; **a pattern of 15 or more narrow, oblique to nearly horizontal, dark wavy lines in scaleless area** above lateral line; belly white; pectoral and pelvic fins purple, their inner sides black.



Size: Maximum fork length 50 cm, commonly to 40 cm (larger than *Auxis rochei*).

Habitat, biology, and fisheries: Feeds on small fishes, especially clupeoids, squids, and planktonic crustaceans such as crab (megalops) and stomatopod larvae. Caught with beach seines, shore seines, drift nets, purse seines, hook-and-line, and by trolling. Marketed fresh; possibly also frozen. From 1990 to 1995, the FAO Yearbook of Fishery Statistics reports a range of yearly catch of 108 812 to 160 242 t of *A. thazard* (together with *A. rochei*) from the Western Central Pacific.

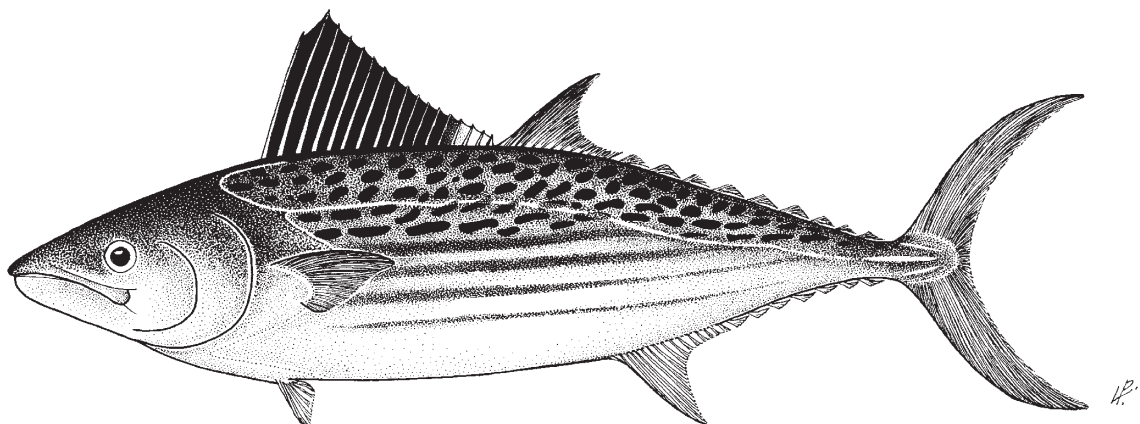
Distribution: A cosmopolitan warm-water species known throughout most of the area, although some records may be attributable to *A. rochei rochei*. Reported from southern Japan south to southern Australia. Replaced in the eastern Pacific by *A. thazard eurydorax* Collette and Aaland, 1996.



Cybiosarda elegans (Whitley, 1935)

Frequent synonymys / misidentifications: *Gymnosarda elegans* (Whitley, 1935) / None.

FAO names: **En** - Leaping bonito; **Fr** - Bonite à dos tacheté; **Sp** - Bonito saltador.

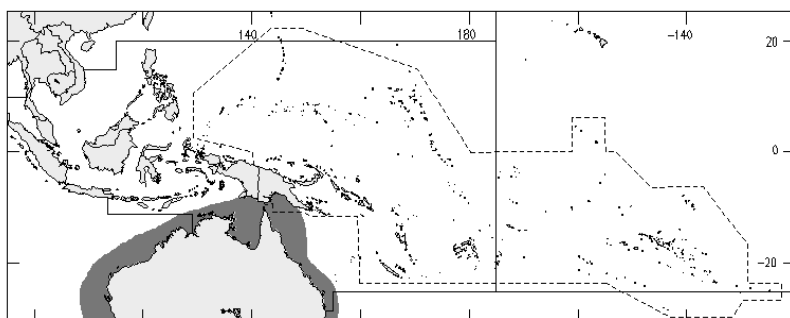


Diagnostic characters: Body moderately short and deep, strongly compressed. Mouth moderately large, upper jaw reaching to hind margin of eye; **2 tooth patches on upper surface of tongue**; 13 to 22 large, conical teeth on upper jaw, 10 to 17 on lower jaw. Total gill rakers on first gill arch 12 to 15. Laminae of olfactory rosette 28 to 33; interorbital width 23.9 to 31% of head length. Dorsal fins close together, the first high anteriorly, with XVI to XVIII spines; the second with 17 to 19 soft rays followed by 8 to 10 finlets; anal fin with 15 to 17 soft rays followed by 6 or 7 finlets; pectoral fins short with 22 to 24 rays; interpelvic process small and bifid. Body mostly naked behind the well-developed corselet except for a band of scales along bases of dorsal and anal fins and patches of scales around bases of the pectoral and pelvic fins; caudal peduncle slender, with a well-developed lateral keel between 2 smaller keels on each side. Swimbladder absent, spleen not visible in ventral view, concealed under liver; liver with an elongate right lobe and a short left lobe which tends to fuse with the middle lobe. Vertebrae 22-24 + 23-26 = 47-48. **Colour:** belly light with several stripes reminiscent of those of the skipjack tuna, *Katsuwonus pelamis*; back deep blue covered with elongate black spots; **first dorsal fin jet black anteriorly, white in the few last posterior membranes**; anal and second dorsal fins yellow.

Size: Commonly between 35 and 45 cm fork length; maximum weight about 2 kg.

Habitat, biology, and fisheries: An epipelagic, neritic species forming schools of several hundred individuals. No information is available on its biology. The leaping bonito lacks commercial importance in Queensland but is taken as bait for snappers by commercial fishermen, and for marlins and sharks by sport fishermen. The meat is white and dry; suitable for human consumption, particularly when smoked or served steamed with moderately flavoured white sauce.

Distribution: Restricted to the northern three-quarters of Australia plus the southern coast of Papua New Guinea.

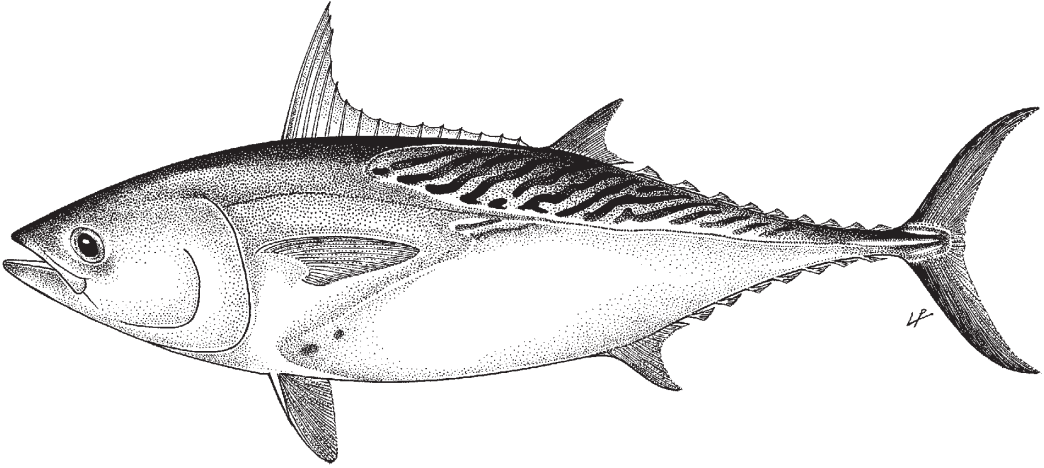


Euthynnus affinis (Cantor, 1849)

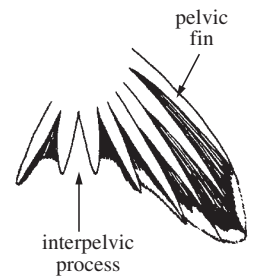
KAW

Frequent synonyms / misidentifications: *Euthynnus yaito* Kishinouye, 1915 / None.

FAO names: **En** - Kawakawa; **Fr** - Thonine orientale; **Sp** - Bacoreta oriental.



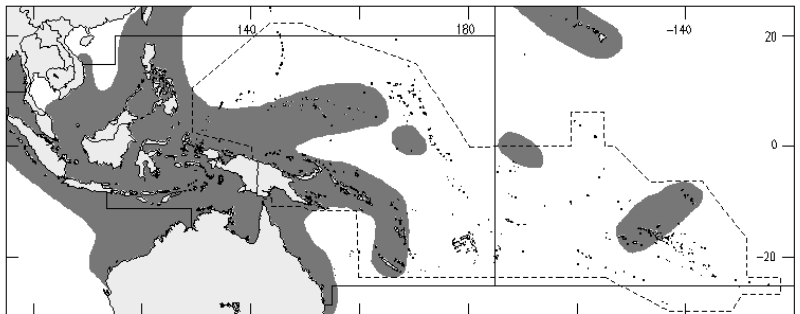
Diagnostic characters: A medium-sized fish with a robust, elongate and fusiform body. Teeth small and conical, in a single series. Total gill rakers 29 to 34 on first gill arch. Two dorsal fins, the first with XI to XIV spines; **both dorsal fins separated by only a narrow interspace** (not wider than eye), anterior spines of first fin much higher than those midway, giving fin a strongly concave outline; second dorsal fin much lower than first and followed by 8 to 10 finlets; **anal fin followed by 6 to 8 finlets**; pectoral fins short; never reaching interspace between dorsal fins; **2 flaps** (interpelvic process) **between pelvic fins**. A very slender caudal peduncle with a prominent lateral keel between 2 small keels at base of caudal fin. **Body naked except for corselet and lateral line.** **Colour:** back dark blue with a complicated striped pattern which does not extend forward beyond middle of first dorsal fin; lower sides and belly silvery white; **several characteristic dark spots between pelvic and pectoral fins** (which, however, may not always be present).



Size: Maximum fork length about 100 cm, commonly to 60 cm.

Habitat, biology, and fisheries: Found in coastal waters and around offshore islands. Schools with other similar-sized scombrids. Feeds on small fishes, especially clupeoids and atherinids; also on squids, crustaceans, and zooplankton. Caught in multispecies fisheries, mainly by surface trolling; also with gill nets. Marketed fresh, frozen, and canned; also dried, salted, and smoked. From 1990 to 1995, the FAO Yearbook of Fishery Statistics reports a range of yearly catch of 90 987 to 111 996 t of *Euthynnus affinis* from the Western Central Pacific.

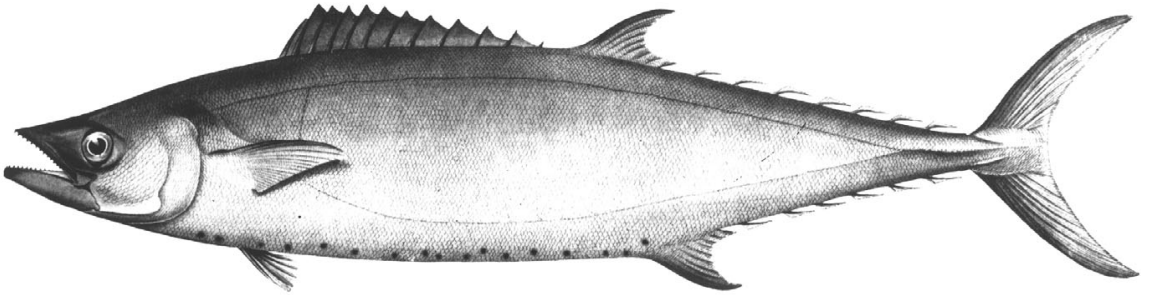
Distribution: Widespread along coasts of the entire area.



Grammatorcynus bicarinatus (Quoy and Gaimard, 1824)

Frequent synonyms / misidentifications: None / *Grammatorcynus bilineatus* (Rüppell, 1836).

FAO names: En - Shark mackerel; Fr - Thazard requin; Sp - Carite cazón.



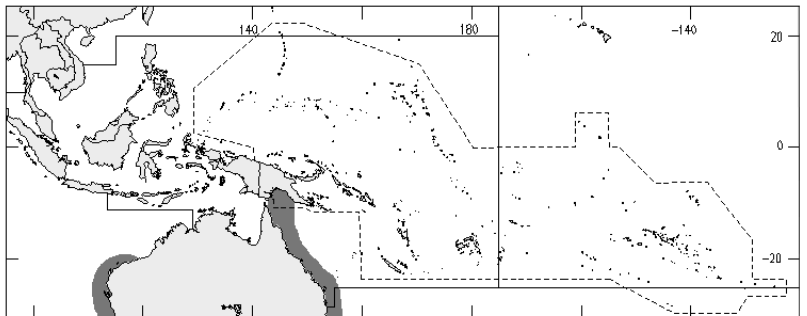
92.5 cm fork length, New South Wales

Diagnostic characters: Body elongate, slightly compressed. **Eye small, 3.1 to 4.6% of fork length.** Teeth slender and conical; **rectangular patch of sharp teeth on tongue.** **Total gill rakers on first gill arch 14 or 15.** Two dorsal fins separated by small interspace, the first with XII spines; second dorsal fin and anal fin followed by 6 or 7 finlets; pectoral fins short with 21 to 24 rays; **a small single flap (interpelvic) process between pelvic fins.** **Two lateral lines**, the lower joining the upper behind pectoral-fin base and at caudal-fin base. **Body covered with moderately small scales;** no anterior corselet; caudal peduncle slender with a well-developed lateral keel between the 2 smaller ones on each side. **Colour: frequently has small dark spots along ventral surface of body.**

Size: Maximum fork length 110 cm; maximum weight 13.5 kg.

Habitat, biology, and fisheries: Forms dense concentrations near individual bays and reefs in Barrier-Reef waters. With the rising tide, they move into shallow water over the reef flats, feeding on schools of clupeoid fishes that concentrate there. The name shark mackerel comes from the ammonia-like smell noticed upon cleaning them. This odour can be masked by brushing the fillets with lemon juice prior to cooking.

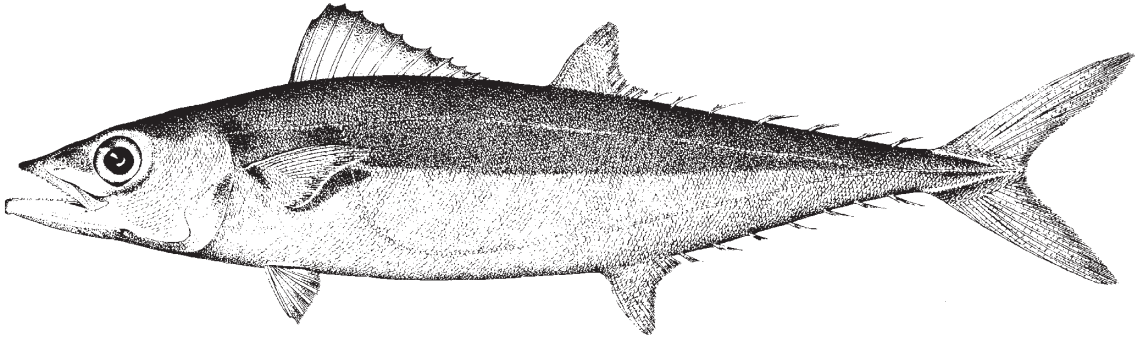
Distribution: Found over coastal reefs of Australia with occasional stragglers south to 30° on both east and west coasts.



Grammatorcynus bilineatus (Rüppell, 1836)

Frequent synonyms / misidentifications: *Nesogrammus piersoni* Evermann and Seale, 1907 / None.

FAO names: **En** - Doublelined mackerel; **Fr** - Thazard-kusara; **Sp** - Carite cazón pintado.



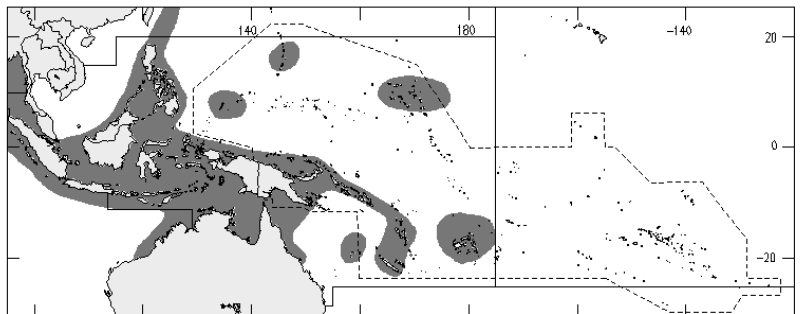
37.2 cm fork length, Philippines

Diagnostic characters: Body elongate, slightly compressed. **Eye large, 4.0 to 6.0% of fork length.** Teeth slender and conical; **rectangular patch of sharp teeth on tongue.** **Total gill rakers on first gill arch 18 to 24.** Two dorsal fins separated by small interspace, the first with XI to XIII spines; second dorsal fin and anal fin followed by 6 or 7 finlets; pectoral fins short, with 22 to 26 rays; **a small single flap (interpelvic) process between pelvic fins.** **Two lateral lines**, the lower joining the upper behind pectoral-fin base and at caudal-fin base. **Body covered with moderately small scales;** no anterior corselet; caudal peduncle slender with a well-developed lateral keel between the 2 smaller ones on each side. **Colour:** back and upper sides metallic blue-green; lower sides and **belly silvery white without black spots.** Juveniles with 2 rows of indistinct blotches under upper lateral line.

Size: Maximum fork length 100 cm, commonly to 40 cm. Mature by 40 cm fork length.

Habitat, biology, and fisheries: Found mainly around coral reefs. Forms large schools. Feeds on fishes and crustaceans. Caught mainly by pole-and-line. Marketed fresh, frozen, and canned. The ammonia-like smell of the flesh can be masked by brushing with lemon juice prior to cooking.

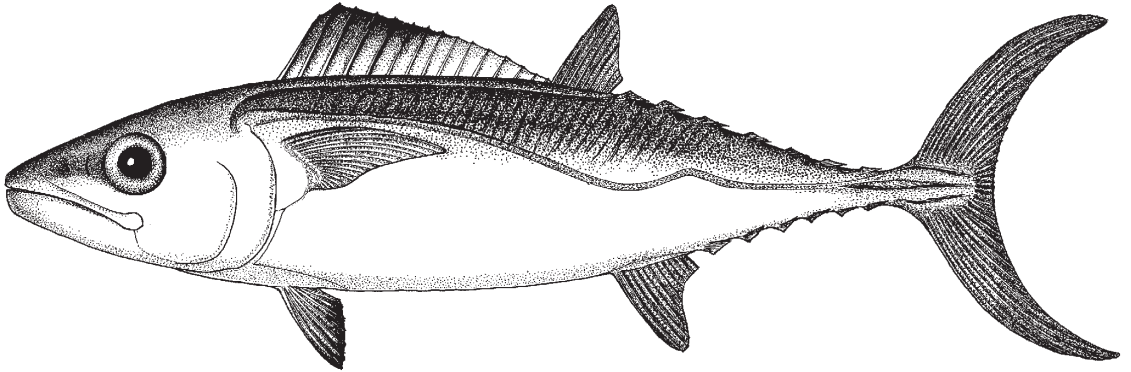
Distribution: Widespread near coral reefs in the tropical and subtropical Indo-West Pacific. Reported from Indonesia, western and eastern coasts of Australia, Java Sea, Papua New Guinea, Celebes, north to the Philippines, South China Sea, and Ryukyu Islands east to the Solomon Islands, New Caledonia, Caroline Islands, Marshall Islands, Marianas Islands, Fiji, Tonga, and the Tokelau Islands.



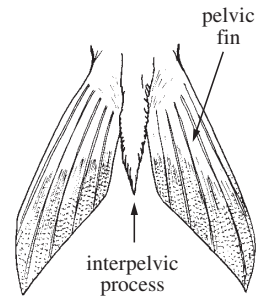
Gymnosarda unicolor (Rüppell, 1838)

Frequent synonyms / misidentifications: *Gymnosarda nuda* Günther, 1860 / None.

FAO names: **En** - Dogtooth tuna; **Fr** - Bonite à gros yeux; **Sp** - Casarte ojón.



Diagnostic characters: Body elongate and moderately compressed. Mouth fairly large, upper jaw reaching to middle of eye; **14 to 31 large, conical teeth on upper jaw, 10 to 24 on lower jaw; 2 patches of teeth on upper surface of tongue.** Total gill rakers on first gill arch 11 to 14. Dorsal fins close together, **first dorsal fin long, with XIII to XV spines**, its border almost straight, the second followed by 6 or 7 finlets; anal fin followed by 6 finlets; pectoral fins with 25 to 28 rays; **interpelvic process large and single.** Lateral line strongly undulating. Body naked posterior to corselet except for lateral line, dorsal-fin base, and caudal keel; caudal peduncle slender, with a well-developed lateral keel between 2 smaller keels on each side. **Colour:** back and upper sides brilliant blue-black, lower sides and belly silvery; **no lines, spots or other markings on body;** anterior tip of first dorsal fin dark; other fins greyish.



Size: Maximum fork length 110 cm, commonly to 80 cm.

Habitat, biology, and fisheries: An offshore species found mainly around coral reefs. Usually solitary. Feeds mostly on small schooling fishes and squids. Caught mainly by pole-and-line. Marketed canned and frozen.

Distribution: A tropical Indo-West Pacific species; recorded from southern Japan, the Philippines, Papua New Guinea, and Australia out into the islands of Oceania, Tahiti, Tuamotus, Marquesas, and Pitcairn islands.

