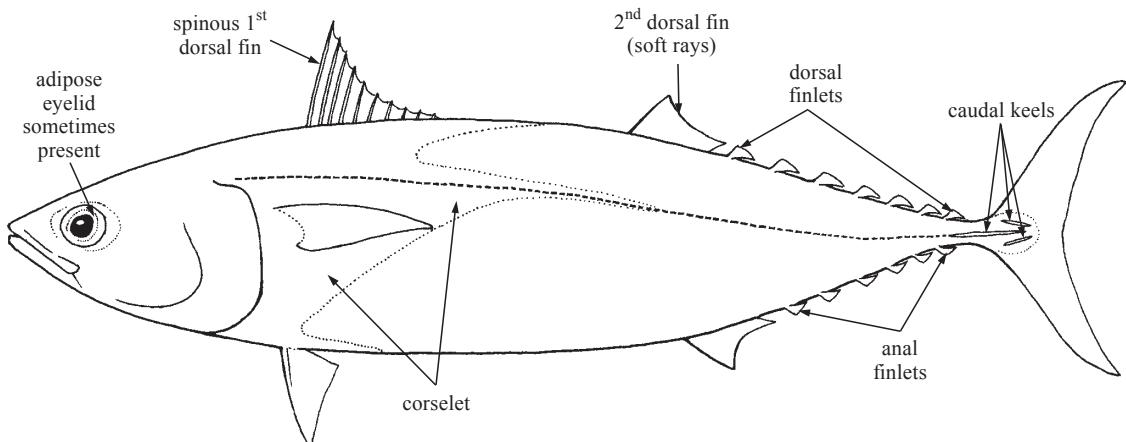


SCOMBRIDAE

Mackerels and tunas

by B.B. Collette, National Marine Fisheries Service, National Museum of Natural History, Washington D.C., USA

Diagnostic characters: Medium to large-sized (to 3 m) with elongate and fusiform body, moderately compressed in some genera. Snout pointed; adipose eyelid sometimes present (*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; palate and tongue may have teeth. Two dorsal fins; anterior fin usually short and separated from posterior fin; **5 to 10 finlets present behind dorsal and anal fins; caudal fin deeply forked** with supporting caudal 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. Vertebrae 31 to 66. Body either uniformly covered with small to moderate scales (e.g. *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*). **Colour:** *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-grey above and silvery below with dark vertical bars or spots on sides. *Sarda* has 5 to 11 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-black above; most species of *Thunnus* have bright yellow finlets with black borders.

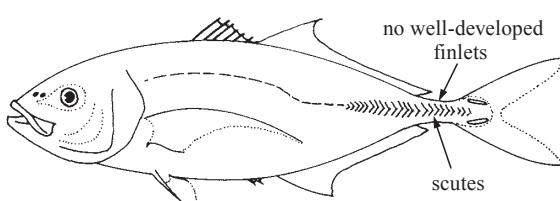


Habitat, biology, and fisheries: A diverse group of pelagic fishes. Some smaller species inhabit coastal waters while the larger ones, especially *Thunnus maccoyii*, *T. obesus*, *T. alalunga*, and *T. tonggol* carry out wide, transoceanic migrations. All scombrids are excellent foodfishes and many of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

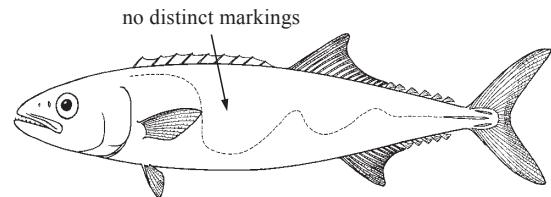
Similar families occurring in the area

Carangidae: dorsal-fin spines 3 to 8 (9 to 27 in Scombridae); scutes frequently developed along posterior part of lateral line and usually no well-developed finlets are present (except in *Oligoplites* with a series of dorsal and anal finlets; *Elagatis* and *Decapterus* with 1 dorsal and 1 anal finlet); carangids also have 2 detached spines in front of anal fin (except in *Elagatis*).

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



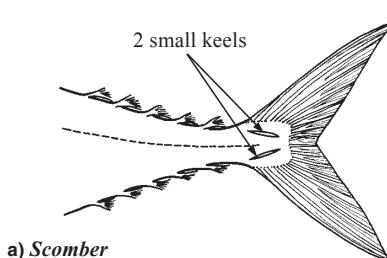
Carangidae



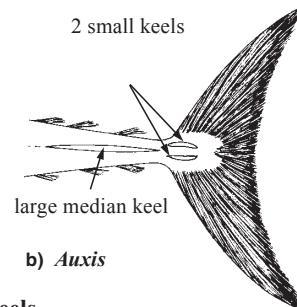
Gempylidae (*Lepidocybium*)

Key to the species of Scombridae occurring in the area

- 1a. Two small keels on either side of caudal peduncle (Fig. 1a); 5 dorsal and 5 anal finlets; adipose eyelids cover front and rear of eye *Scomber colias*
- 1b. Two small keels and a large median keel between them on either side of caudal peduncle (Fig. 1b); 7 to 10 dorsal and 7 to 10 anal finlets; adipose eyelids absent → 2



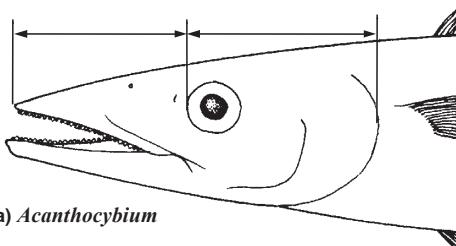
a) *Scomber*



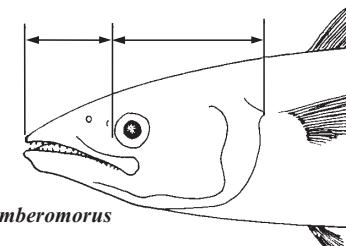
b) *Axis*

Fig. 1 caudal keels

- 2a. Teeth in jaws strong, compressed, almost triangular or knife-like; corselet of scales obscure → 3
- 2b. Teeth in jaws slender, conical, hardly compressed; corselet of scales well developed → 7
- 3a. Snout as long as rest of head (Fig. 2a); no gill rakers; 23 to 27 spines in first dorsal fin; posterior end of maxilla concealed under preorbital bone *Acanthocybium solandri*
- 3b. Snout much shorter than rest of head (Fig. 2b); at least 6 gill rakers on first gill arch; 14 to 19 spines in first dorsal fin; posterior end of maxilla exposed (*Scomberomorus*) → 4



a) *Acanthocybium*



b) *Scomberomorus*

Fig. 2 lateral view of head

- 4a. Lateral line with a deep dip below second dorsal fin; total gill rakers on first arch 7 to 13 *Scomberomorus cavalla*
- 4b. Lateral line straight or descending gradually, without a deep dip below second dorsal fin; total gill rakers on first arch 12 to 18 → 5
- 5a. One long stripe on sides with spots or interrupted lines above and below the stripe *Scomberomorus regalis*
- 5b. Sides with small round spots, orange in life, without any lines or stripes → 6
- 6a. Second dorsal-fin rays 17 to 20, usually 18 or more; total vertebrae 51 to 53 *Scomberomorus maculatus*
- 6b. Second dorsal-fin rays 15 to 19, usually 18 or fewer; total vertebrae 46 to 49 *Scomberomorus brasiliensis*
- 7a. Upper surface of tongue without cartilaginous longitudinal ridges (Fig. 3a); 5 to 10 narrow, longitudinal stripes on upper part of body; 20 to 23 spines in first dorsal fin *Sarda sarda*
- 7b. Upper surface of tongue with 2 longitudinal ridges (Fig. 3b); 9 to 16 spines in first dorsal fin → 8
- 8a. First and second dorsal fins widely separated, the space between them equal to the length of first dorsal-fin base (Fig. 4); 9 to 11 spines in first dorsal fin; interpelvic process single and long, at least as long as longest pelvic fin ray (Fig. 6) (*Axius*) → 9
- 8b. First and second dorsal fins barely separated, at most by eye diameter; 12 to 16 spines in first dorsal fin (Fig. 5); interpelvic process bifid and short, much shorter than pelvic fin rays (Fig. 7) → 10

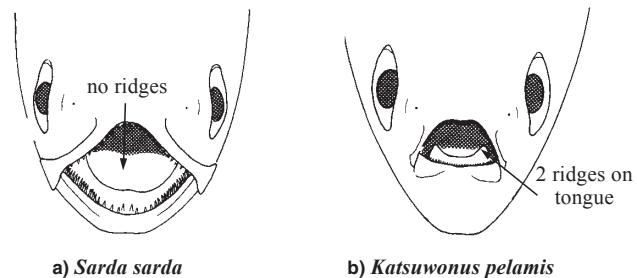


Fig. 3 anterior view of head

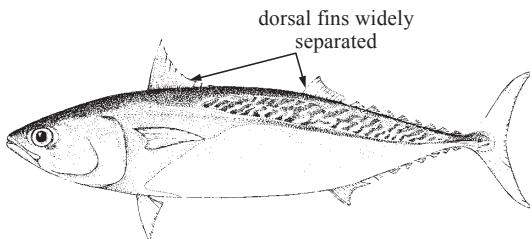
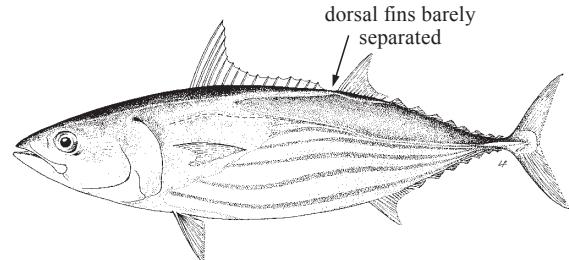
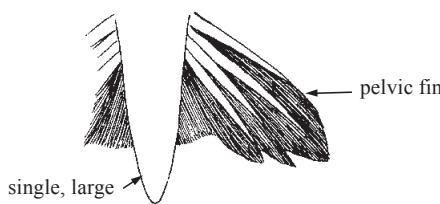
Fig. 4 *Axius*Fig. 5 *Katsuwonus pelamis*

Fig. 6 interpelvic process

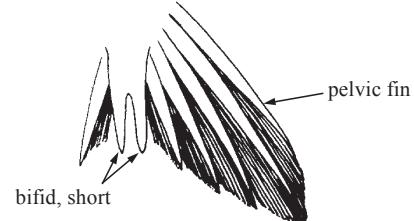
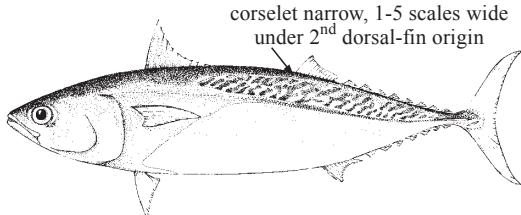
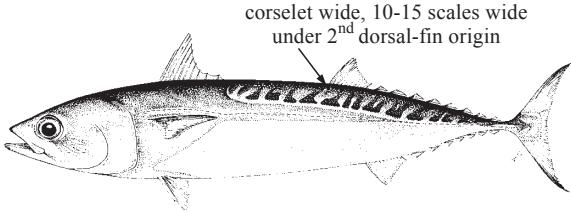
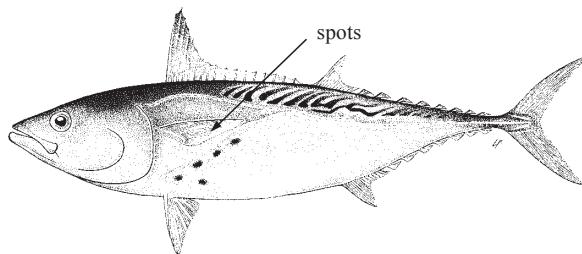
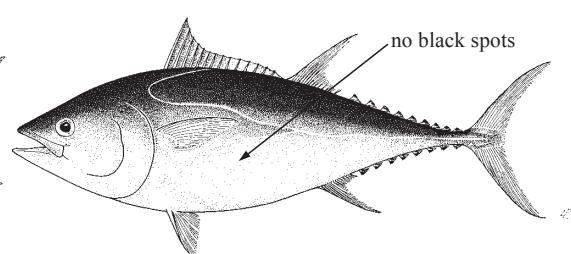


Fig. 7 interpelvic process

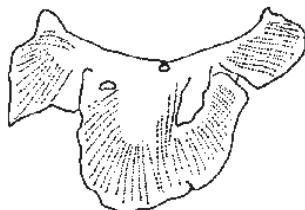
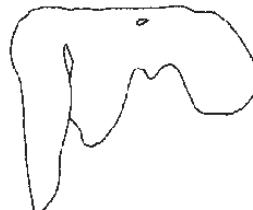
- 9a. Posterior extension of corselet narrow, only 1 to 5 scales wide under origin of second dorsal fin (Fig. 8); pectoral fin extends posteriorly beyond a vertical with the anterior margin of the dorsal scaleless area *Auxis thazard thazard*
- 9b. Posterior extension of corselet much wider, usually 10 to 15 scales wide under origin of second dorsal fin (Fig. 9); pectoral fin does not extend posteriorly as far as a vertical with anterior margin of dorsal scaleless area. *Auxis rochei rochei*

Fig. 8 *Auxis thazard thazard*Fig. 9 *Auxis rochei rochei*

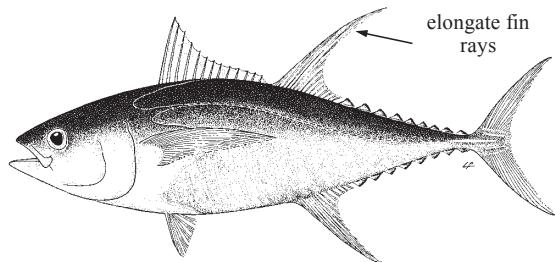
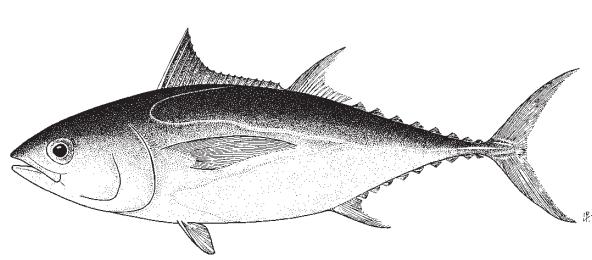
- 10a. Three to 5 prominent dark longitudinal stripes on belly (Fig. 5); gill rakers 53 to 63 on first arch. *Katsuwonus pelamis*
- 10b. No dark longitudinal stripes on belly; gill rakers 19 to 45 on first arch. → 11
- 11a. Body naked behind corselet of enlarged and thickened scales; black spots usually present between pectoral- and pelvic-fin bases (Fig. 10); 26 or 27 pectoral-fin rays *Euthynnus alletteratus*
- 11b. Body covered with very small scales behind corselet; no black spots on body (Fig. 11); 30 to 36 pectoral-fin rays (*Thunnus*) → 12

Fig. 10 *Euthynnus alletteratus*Fig. 11 *Thunnus thynnus*

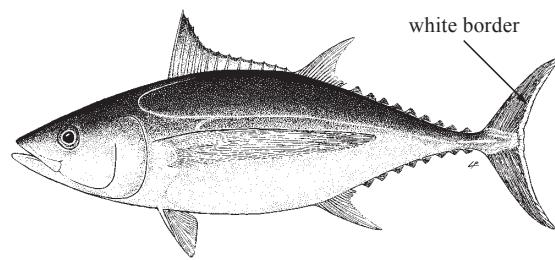
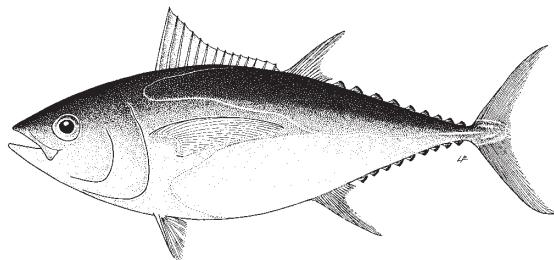
- 12a. Ventral surface of liver covered with prominent striations; central lobe of liver equal to or longer than left and right lobes (Fig. 12) → 13
- 12b. Ventral surface of liver without striations; right lobe of liver much longer than left or central lobes (Fig. 13) → 14

Fig. 12 *Thunnus alalunga* (liver)Fig. 13 *Thunnus albacares* (liver)

- 13a.** Total gill rakers on first arch 31 to 43; pectoral fins short, less than 80% of head length, 16.8 to 21.7% of fork length (Fig. 11) *Thunnus thynnus*
- 13b.** Total gill rakers on first arch 23 to 31; pectoral fins moderate to long, more than 80% of head length → 15
- 14a.** Total gill rakers on first arch 26 to 34, usually 27 or more; second dorsal and anal fins of larger individuals (120 cm fork length and longer) elongate, more than 20% of fork length (Fig. 14) *Thunnus albacares*
- 14b.** Total gill rakers on first arch 19 to 28, usually 26 or fewer; second dorsal and anal fins never greatly elongate, less than 20% of fork length at all sizes (Fig. 15) *Thunnus atlanticus*

Fig. 14 *Thunnus albacares*Fig. 15 *Thunnus atlanticus*

- 15a.** Caudal fin with a narrow white posterior border (Fig. 16); 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*
- 15b.** Caudal fin without white posterior border (Fig. 17); pectoral fins short or moderate in length, reaching end of second dorsal-fin base (except in small individuals); greatest body depth about middle of body, near middle of first dorsal fin. *Thunnus obesus*

Fig. 16 *Thunnus alalunga*Fig. 17 *Thunnus obesus*

List of species occurring in the area

The symbol  is given when species accounts are included.

-  *Acanthocybium solandri* (Cuvier, 1832).
-  *Auxis rochei rochei* (Risso, 1810).
-  *Auxis thazard thazard* (Lacepède, 1800).
-  *Euthynnus alletteratus* (Rafinesque, 1810).
-  *Katsuwonus pelamis* (Linnaeus, 1758).
-  *Sarda sarda* (Bloch, 1793).
-  *Scomber colias* Gmelin, 1789.
-  *Scomberomorus brasiliensis* Collette, Russo and Zavala-Camin, 1978.
-  *Scomberomorus cavalla* (Cuvier, 1829).
-  *Scomberomorus maculatus* (Mitchill, 1815).
-  *Scomberomorus regalis* (Bloch, 1793).
-  *Thunnus alalunga* (Bonnaterre, 1788).
-  *Thunnus albacares* (Bonnaterre, 1788).
-  *Thunnus atlanticus* (Lesson, 1831).
-  *Thunnus obesus* (Lowe, 1839).
-  *Thunnus thynnus* (Linnaeus, 1758).

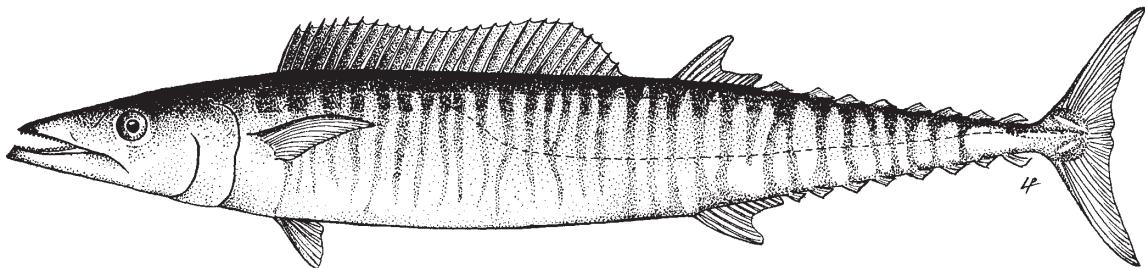
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Acanthocybium solandri (Cuvier, 1832)

WAH

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

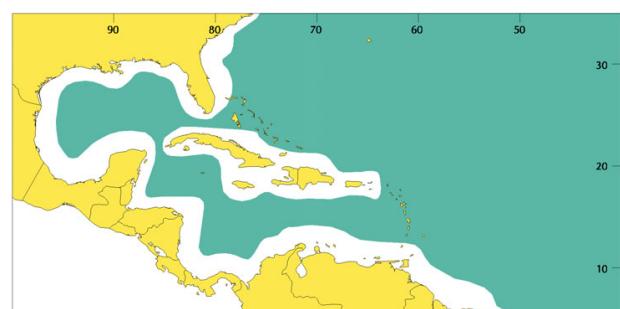


Diagnostic characters: Body very elongate, fusiform and only slightly laterally compressed. Snout about as long as rest of head. Gill rakers absent, posterior part of maxilla completely concealed under preorbital bone. Two dorsal fins, the first with 23 to 27 spines; 9 dorsal and anal finlets; 2 small flaps (interpelvic processes) between pelvic fins. **Colour:** back iridescent bluish green; **numerous dark vertical bars on sides** that extend to below lateral line.

Size: Maximum to 210 cm fork length. The IGFA all-tackle game fish record is 71.89 kg for a fish caught in Baja California in 1996.

Habitat, biology, and fisheries: An offshore epipelagic species. Piscivorous, preying on pelagic fishes such as scombrids, flyingfishes, herrings, scads, and lanternfishes, and on squids. Spawning seems to extend over a long period of the year. Fecundity is high, 6 million eggs were estimated for a 131 cm female. An excellent foodfish, greatly appreciated wherever it occurs. Primarily a sportsfish on light to heavy tackle, surface trolling with spoon, feather lure, strip bait, or flyingfish or halfbeak. Landings recorded in Area 31 between 1995 and 1999 ranged from 1 011 to 1 352 t per year.

Distribution: A cosmopolitan species. Present throughout the Caribbean area, especially along the north coast of western Cuba where it is abundant during winter. May be migratory occurring in the Gulf Stream, especially in the Straits of Florida.

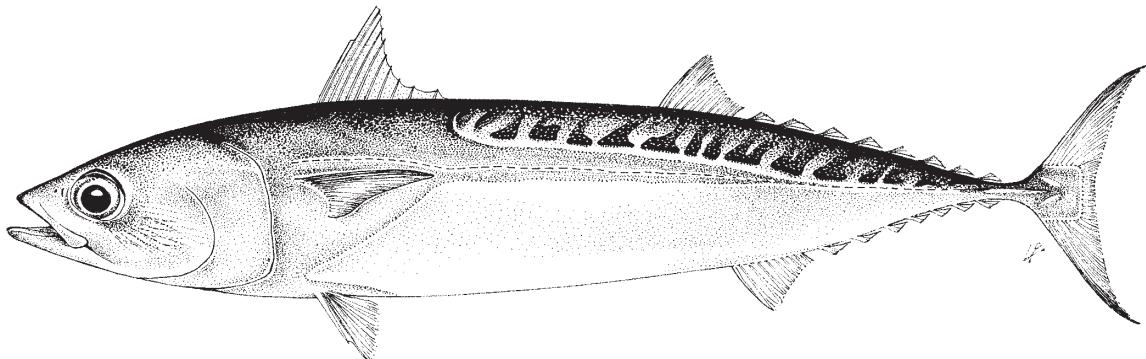


Auxis rochei rochei (Risso, 1810)

BLT

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

FAO names: **En** - Bullet tuna (AFS: Bullet mackerel); **Fr** - Bonitou; **Sp** - Melvera.

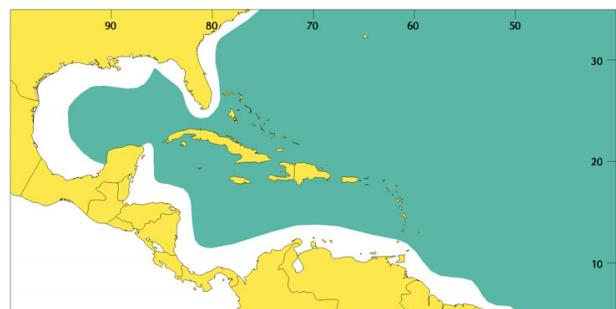


Diagnostic characters: Body robust, elongate, and rounded. Two dorsal fins separated by a large interspace (at least equal to length of first dorsal-fin base), the second fin followed by 8 finlets; pectoral fins short, not reaching vertical line from anterior margin of scaleless area above corselet; **a large, single-pointed flap (interpelvic process) between pelvic fins**; anal fin followed by 7 finlets. 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 the head; **a pattern of 15 or more fairly broad, nearly vertical dark bars in the scaleless area**; belly white; pectoral and pelvic fins purple, their inner sides black.

Size: Maximum to 40 cm fork length, commonly to 35 cm.

Habitat, biology, and fisheries: Adults have been taken largely in inshore waters and near islands. Feeds on small fishes, especially clupeoids; also on crustaceans, especially megalops larvae and larval stomatopods, and on squids. Caught with purse seines, lift nets, traps, pole-and-line, and by trolling. Landings of *Auxis* species in Area 31 between 1995 and 1999 ranged from 1 524 to 3 053 t per year. Presumably both species are represented in the catch.

Distribution: A cosmopolitan warm-water species that occurs sporadically throughout the Western Central Atlantic. Until recently, only one species was recognized in this area, so exact distribution of the 2 species (*A. rochei* and *A. thazard*) is not well known. *A. rochei* appears the more common of the two. Replaced by *Auxis rochei eudorax* in the eastern Pacific.

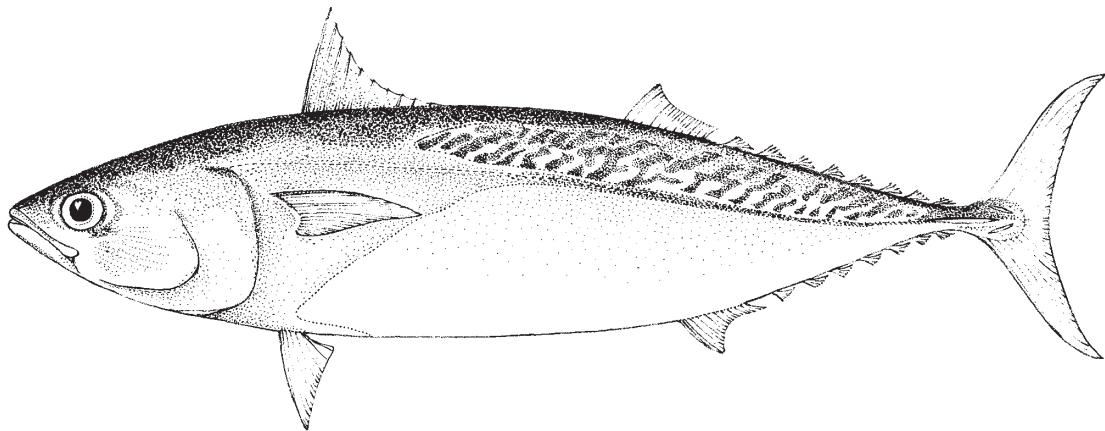


Auxis thazard thazard (Lacepède, 1800)

FRI

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

FAO names: En - Frigate tuna (AFS: Frigate mackerel); Fr - Auxide; Sp - Melva.

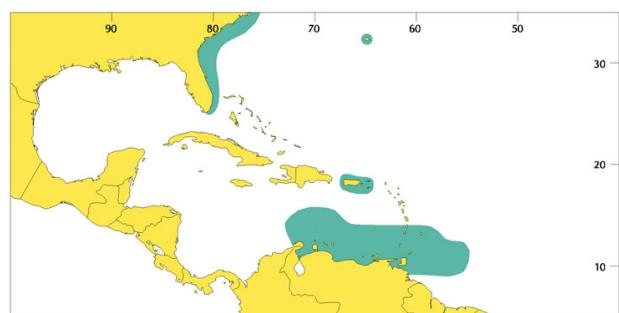


Diagnostic characters: Body robust, elongate, and rounded. Two dorsal fins, the first with 10 to 12 spines, separated from the second by a large interspace (at least equal to length of first dorsal-fin base), the second fin followed by 8 finlets; pectoral fins short but reaching past vertical line from anterior margin of scaleless area above corselet; **a large single-pointed flap (interpelvic process) between pelvic fins**; anal fin followed by 7 finlets. 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 the scaleless area above lateral line**; belly white; pectoral and pelvic fins purple, their inner sides black.

Size: Maximum to 50 cm fork length, commonly to 40 cm (larger than *A. rochei*). The IGFA all-tackle game fish record is 1.72 kg for a fish caught in Australia in 1998.

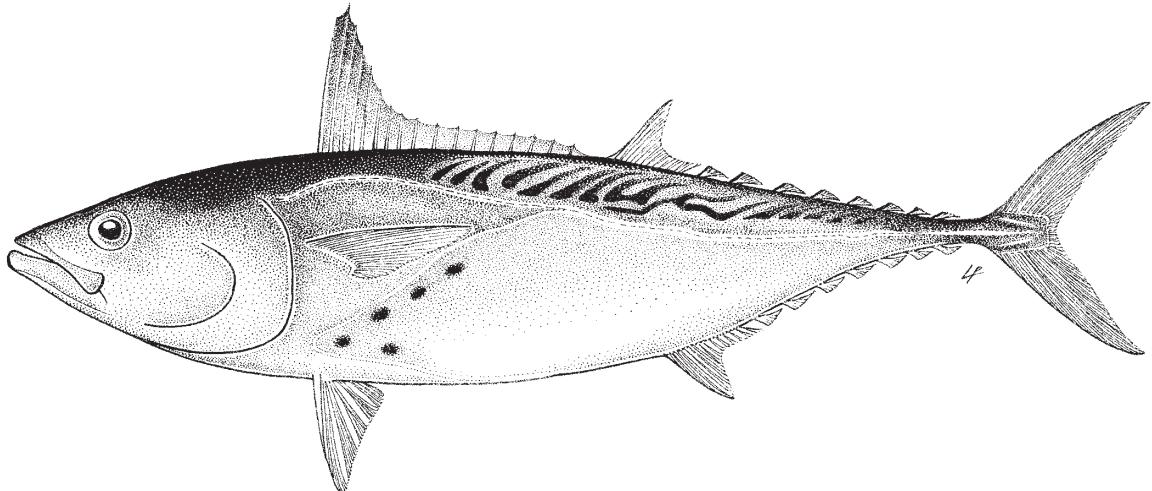
Habitat, biology, and fisheries: Caught with beach seines, drift nets, purse seines, and by trolling. Marketed fresh; possibly also frozen. Landings of *Auxis* species in Area 31 between 1995 and 1999 ranged from 1 524 to 3 053 t per year. Presumably, the catch consists of both species.

Distribution: A cosmopolitan warm-water species that occurs sporadically throughout the Western Central Atlantic. Until recently, only 1 species, currently known as *A. rochei*, was recognized in the western Atlantic so the exact distribution of the two species is not well known. Definitely reported from the USA coast from North Carolina to Florida, Bermuda, Puerto Rico, Martinique, and from west of St. Vincent, off Caracas, at Trinidad, and around Margarita Island, eastern Venezuela. Replaced by *Auxis thazard brachydorax* in the eastern Pacific.



***Euthynnus alletteratus* (Rafinesque, 1810)**

LTA

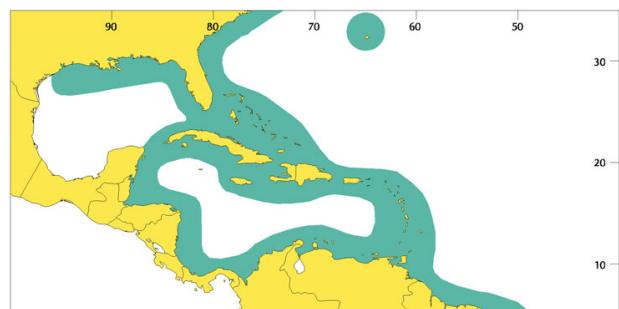
Frequent synonyms / misidentifications: None / None.**FAO names:** En - Little tunny; Fr - Thonine commune; Sp - Bacoreta.

Diagnostic characters: A large fish, body robust and fusiform. Two dorsal fins separated by a narrow space (not wider than eye diameter); **anterior spines in dorsal fin much higher than those midway**, giving the fin a strongly concave outline; second dorsal fin much lower than first, followed by 8 finlets; pectoral fins short; 2 flaps (interpelvic processes) between pelvic fins; anal fin followed by 7 finlets. Body naked, except for the corselet and lateral line. Caudal peduncle bearing on either side a prominent central keel between 2 small keels at bases of caudal-fin lobes. **Colour:** back dark blue with a complicated striped pattern not extending forward beyond middle of first dorsal fin; lower sides and belly silvery white; several characteristic dark spots between pelvic and pectoral fins (not always very conspicuous).

Size: Maximum to 100 cm fork length, commonly to 75 cm, and about 6 kg weight. The IGFA all-tackle game fish record is 15.95 kg for a fish caught in Algeria in 1988.

Habitat, biology, and fisheries: Found in surface waters, mainly on the continental shelf. Less migratory than *Katsuwonus pelamis* or other tunas; usually found in coastal areas with swift currents, near shoals and offshore islands. Feeds mainly on small fishes such as clupeoids and other pelagic species, as well as on fish larvae, squids, and crustaceans. At times, schools can be located by the presence of diving birds that are also feeding on the smaller fishes. Caught throughout the year in Bermuda, Florida, and parts of the Caribbean. In open waters it is fished with purse seines and trolling lines; juveniles are also taken with beach seines. Because of its abundance in inshore waters it is a popular sportfish on light tackle, commonly taken by trolling feather jigs, spoons, or strip bait. It is also popular and very effective as a live bait for sailfish. Marketed mainly fresh, also canned. The total catch reported from Area 31 between 1995 and 1999 ranged from 1 674 to 3 010 t taken mainly by Venezuela.

Distribution: Widespread in the area, from New England south to Victoria Island, Brazil, including Bermuda. Also found in the eastern Atlantic and Mediterranean.

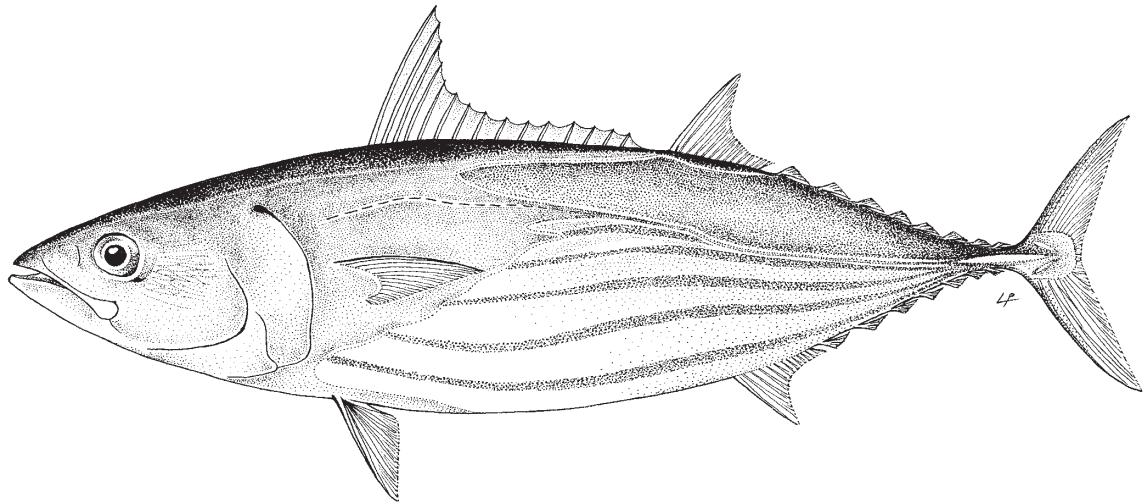


***Katsuwonus pelamis* (Linnaeus, 1758)**

SKJ

Frequent synonyms / misidentifications: *Euthynnus pelamis* (Linnaeus, 1758) / None.

FAO names: En - Skipjack tuna; Fr - Listao; Sp - Listado.

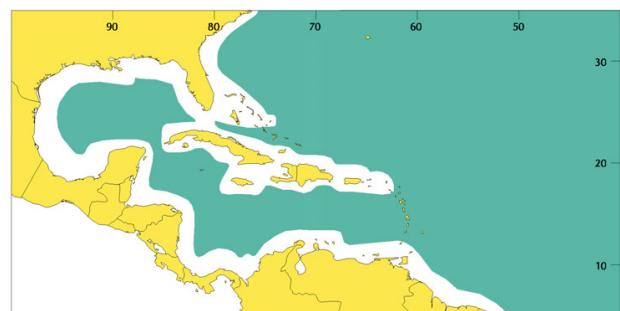


Diagnostic characters: Body fusiform, elongate, and rounded. **Gill rakers numerous, 53 to 63 on first arch.** Two dorsal fins separated by a small interspace (not larger than eye), the first with 14 to 16 spines, the second followed by 7 to 9 finlets; pectoral fins short with 26 or 27 rays; 2 flaps (interpelvic processes) between pelvic fins; anal fin followed by 7 or 8 finlets. Body scaleless except for the corselet and lateral line. A strong keel on each side of base of caudal fin between 2 smaller keels. **Colour:** back dark purplish blue, **lower sides and belly silvery, with 4 to 6 very conspicuous longitudinal dark bands** which in live specimens may appear as discontinuous lines of dark blotches.

Size: Maximum to 100 cm fork length, commonly to 80 cm. The IGFA all-tackle game fish record is 20.54 kg for a fish caught in Baja California in 1996.

Habitat, biology, and fisheries: Occurs in large schools in deep coastal and oceanic waters, generally above the thermocline. Commonly found in mixed schools with blackfin tuna, *Thunnus atlanticus*. Feeds on fishes, cephalopods, and crustaceans. Caught mainly by pole-and-line; also with purse seines. Also an important game fish usually taken by trolling on light tackle using plugs, spoons, feathers, or strip bait. Marketed canned or frozen. The total reported catch from Area 31 between 1995 and 1999 ranged from 4 185 to 5 829 t. The Cuban fishery is directed at both *K. pelamis* and *Thunnus atlanticus* and the catch of *K. pelamis* also includes some *T. atlanticus*.

Distribution: Cosmopolitan in tropical and subtropical seas. Common throughout the tropical western Atlantic; north to Cape Cod in the summer, and south to Argentina.

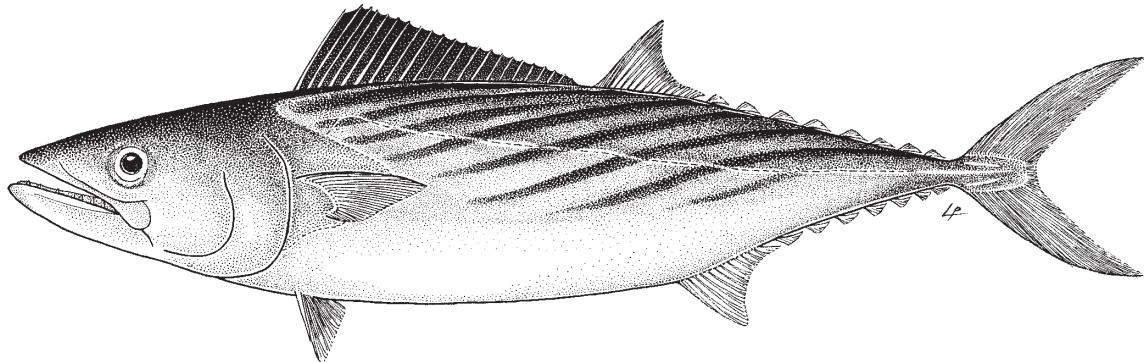


Sarda sarda (Bloch, 1793)

BON

Frequent synonyms / misidentifications: None / None.

FAO names: En - Atlantic bonito; Fr - Bonite à dos rayé; Sp - Bonito del Atlántico.

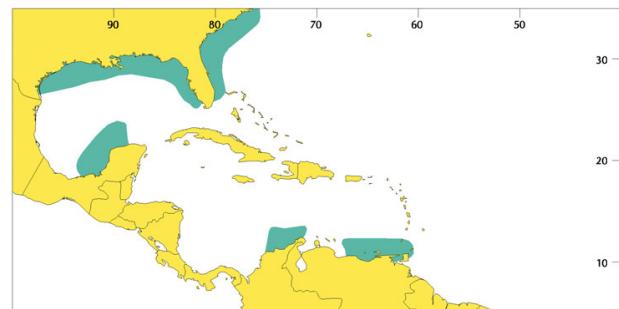


Diagnostic characters: A small, relatively narrow-bodied tuna. Mouth moderately wide, upper jaw reaching to hind margin of eye or beyond; 16 to 22 gill rakers on first arch. **Dorsal fins close together, the first very long, with 20 to 23 spines and straight or only slightly concave in outline;** 7 to 9 dorsal and 6 to 8 anal finlets; pectoral fins short; pelvic fins separated by 2 flaps (interpelvic processes). Lateral line conspicuously wavy. Body entirely covered with scales that are minute except on the well-developed corselet; caudal peduncle slender, with a well-developed lateral keel between 2 smaller keels on each side. **Colour: back and upper sides steel-blue, with 5 to 11 dark slightly oblique stripes running forward and downward;** lower sides and belly silvery.

Size: Maximum to 85 cm fork length and 5 kg weight, commonly to 50 cm and about 2 kg weight. The IGFA all-tackle game fish record is 8.30 kg for a fish caught in the Azores in 1953.

Habitat, biology, and fisheries: A pelagic migratory species often schooling near the surface in inshore waters. Feeds mostly on fishes, particularly small clupeoids, gadoids, and mackerels. In coastal waters it is caught mostly with gill nets and purse seines, while trolling lines are more often used offshore. Marketed mainly fresh and canned. The reported catch from Area 31 between 1995 and 1999 ranged from 3 472 to 4 926 t.

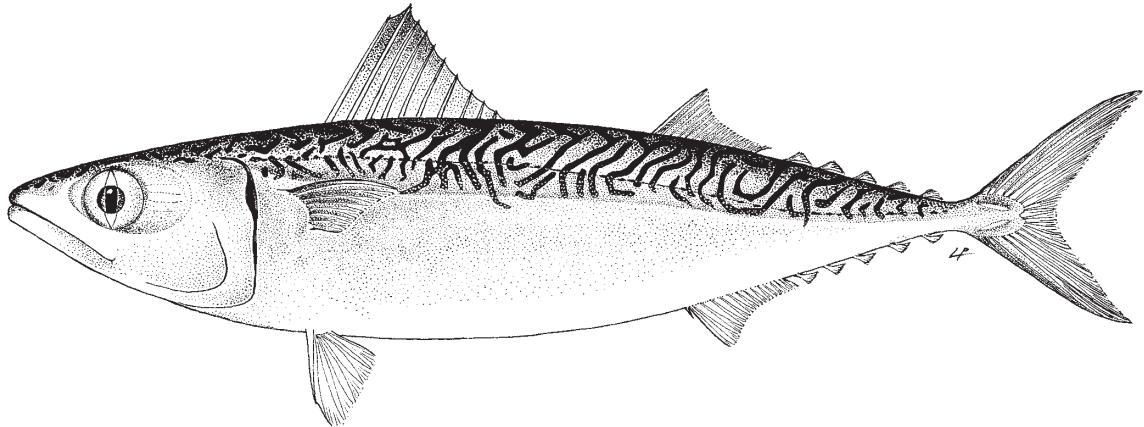
Distribution: Occurs along the tropical and temperate coasts of the Atlantic Ocean, including the Gulf of Mexico, Mediterranean and Black seas. Its usual northern limit in the western North Atlantic is Cape Ann, Massachusetts, but there are records north to the outer coast of Nova Scotia. Common along the east coast of the USA but becomes uncommon around Miami and the Florida Keys. There are several records from the Gulf of Mexico. Apparently absent from most of the Caribbean Sea but recorded from Colombia and the Gulf of Cariaço, Venezuela. Records become more common south of the Amazon.



***Scomber colias* Gmelin, 1789**

Frequent synonyms / misidentifications: *Pneumatophorus colias* (Gmelin, 1788); *Scomber japonicus* Houttuyn, 1782 / None.

FAO names: En - Atlantic chub mackerel; Fr - Maquereau blanc; Sp - Estornino del Atlántico.



Diagnostic characters: Body elongate and rounded, snout pointed, caudal peduncle slim. **Front and hind margins of eye covered by adipose eyelids.** Two widely separated dorsal fins (interspace at least equal to length of first dorsal-fin base), the first with 8 to 10 spines; **5 dorsal and 5 anal finlets;** a single small flap (interpelvic process) between pelvic fins. Scales behind head and around pectoral fins larger and more conspicuous than those covering rest of body, but no well-developed corselet. Two small keels on each side of caudal peduncle (at base of caudal-fin lobes), but no central keel between them. Swimbladder present. **Colour:** back steel-blue crossed by faint wavy lines; **lower sides and belly silvery-yellow with numerous dusky rounded blotches.**

Size: Maximum to 50 cm fork length, commonly to 30 cm. The IGFA all-tackle game fish record for the closely-related *S. japonicus* is 2.17 kg for a fish caught at Guadalupe Island, Mexico in 1986.

Habitat, biology, and fisheries: A schooling pelagic species occurring mostly in coastal waters. Feeds on small pelagic fishes such as anchovy, pilchard, sardinella, sprat, silversides, and also pelagic invertebrates. Caught with purse seines, often together with sardines, sometimes using light trolling lines, gill nets, traps, beach seines and midwater trawls. Marketed fresh, frozen, smoked, salted, and occasionally also canned. The catch reported from Area 31 between 1995 and 1999 ranged from 379 to 771 t.

Distribution: Inhabits the warm-water belt of the Atlantic Ocean and adjacent seas. In the western Atlantic from Nova Scotia south to Argentina. Uncommon in the Gulf of Mexico and Caribbean Sea but reported from the Florida Keys, northern Cuba, and off the coast of Venezuela.

Remarks: Based on morphological and molecular data, the Atlantic chub mackerel is now considered distinct from the Indo-Pacific chub mackerel, *Scomber japonicus* Houttuyn, 1782.

