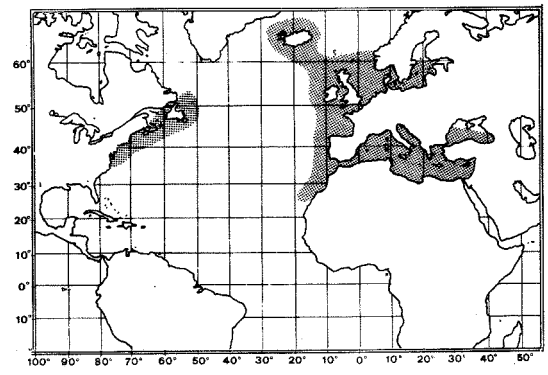
Geographical Distribution : North Atlantic Ocean, including the Baltic Sea; eastern Atlantic including the Mediterranean and the Black seas; and western Atlantic from Labrador to Cape Lookout.



Habitat and Biology : An epipelagic and mesodemersal species, most abundant in cold and temperate shelf areas. Atlantic mackerel school by size. They overwinter in deeper waters but move closer to shore in spring when water temperatures range between 11° and 14°C. Two separate populations with little or no interchange seem to exist in the northwestern and northeastern Atlantic (including the Mediterranean).

In the western population spawning takes place from Cheasapeake Bay to Newfoundland, initiating in the south in spring and progressively extending northward during the summer. Most of the spawning takes place within 10 to 30 miles from shore, but never in low-salinity estuaries. Large fish are the first to arrive at the spawning sites.

The eastern population spawns from March to April in the Mediterranean, from May to June off southern England, northern France and in the North Sea, and from June to July in the Kattegat and Skagerrak.

Fecundity, in a medium-sized female, fluctuates between 200 000 and 450 000 eggs per season and increases with size; spawning occurs in batches. Maturity is attained at an age of 2 or 3 years.

Juvenile Atlantic mackerel feed on zooplankton (fish larvae, small crustaceans, pteropods). As they grow, they are in turn preyed upon by tunas, sharks and dolphins.

Size : Maximum fork length is 50 cm, common to 30 cm. In the population off the US coast, length at first maturity is approximately 34 cm in females and 32 cm in males; in the eastern part of the geographical distribution, maturity may be attained at approximately 30 cm. Females grow bigger than males.

Interest to Fisheries : There are important fisheries for S. scombrus in Fishing Areas 21 (Northwest Atlantic), 27 (Northeast Atlantic), and 37 (Mediterranean and Black Sea). The world catch declined from about 1.1 million metric tons in 1975 to about 610 000 metric tons in 1981 (FAO, 1983). Atlantic mackerel is mainly caught with purse seines, sometimes together with sardines. Surface catches are best when the summer thermocline is not deeper than 15 to 20 meters so as to prevent the mackerel from escaping into deeper water. Other types of gear in use include trolling lines, gillnets, traps, beach seines, and midwater trawls. This species is traded fresh, frozen, smoked and canned.

Local Names : CANADA: Mackerel, Maquereau; DENMARK: Almindelige, Makrel; EGYPT: Scomber; FINLAND: Makrilli; FRANCE: Maquereau commun; GERMAN DM RP: Makrele, Gemeine Makrele; GERMANY FR: Makrele, Gemeine Makrele; GREECE: Scoubri; ICELAND: Makríll; ITALY: Lacerto, Macarello, Sgombro; MALTA: Pizzintun; MONACO: Cugüu; MOROCCO: Kabaila; NETHERLANDS: Gewone makreel, Makreel; NORWAY: Makrell; POLAND: Makrela; PORTUGAL: Cavalla; ROMANIA: Macrou; SPAIN: Caballa; SWEDEN: Makril; TUNISIA: Sqoumri; TURKEY: Uskumru; UK: Atlantic mackerel; USA: Atlantic mackerel; USSR: Atlanticheskaya skumbriya, Skumbriya; YUGOSLAVIA: Skusa.

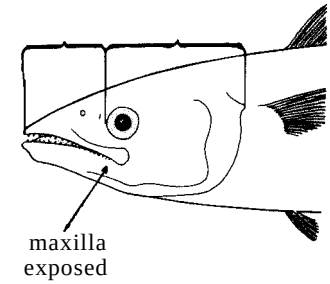
Literature : Sette (1943, 1950); Fischer, ed. (1973, Species Identification Sheets, Mediterranean and Black Sea); Collette (1981, Species Identification Sheets, Eastern Central Atlantic).

Scomberomorus Lacepède, 1801

SCOMBR Scombm

Genus with reference : Scomberomorus Lacepède, 1801:292. Type-species: Scomberomorus plumieri Lacepède, 1801 (= Scomber regalis Bloch, 1793), by monotypy.

Diagnostic Features : Body elongate, strongly compressed. Snout much shorter than rest of head; posterior part of maxilla exposed, reaching to a vertical from hind margin of eye; 5 to 38 sharp, compressed, triangular teeth in upper and lower jaws; patches of fine teeth on palatines and vomer; no teeth on tongue; gillrakers on first arch 1 to 27, 0 to 8 on upper limb, 1 to 21 on lower limb. Two scarcely separated dorsal fins, the first with 12 to 22 spines; the second with 15 to 25 rays followed by 6 to 11 finlets; anal fin with 15 to 28 rays followed by 5 to 12 finlets; interpelvic process small and bifid. Lateral line single, gradually curving down toward caudal peduncle or abruptly



bent down under the first or second dorsal fin. Body entirely covered with small scales, no anterior corselet developed. Swimbladder absent (except in S. sinensis). Vertebrae 16 to 23 precaudal plus 25 to 36 caudal, total 41 to 56. Colour: back dark blue-grey to iridescent blue green; sides silvery to white; spots, bars, lines or other markings present in most species.

Habitat and Biology : The genus Scomberomorus comprises 18 species occurring in coastal waters within the 20°C isotherm in both hemispheres.Their food consists largely of fishes (particularly anchovies and sardines) with smaller quantities of shrimps and squids.

Interest to Fisheries : The world catch of Spanish mackerels fluctuated between about 194 000 metric tons in 1975 and about 253 000 metric tons in 1981 (FAO, 1983). China, India, Indonesia, Korea, Malaysia, Mexico and the Philippines reported highest catches. Scomberomorus are caught with drift (gill) nets, trolling lines, baited hand lines, beach seines, bamboo stake traps, set nets and various other gear, including sport gear, and may be marketed fresh, salted, canned, or processed in other ways. Throughout Latin America and the Caribbean they are commonly prepared as 'cebiche', that is raw meat treated with lime juice and hot peppers. The high quality meat spoils rather quickly if it is not adequately processed.

Literature : Munro (1943); Collette & Russo (1979).

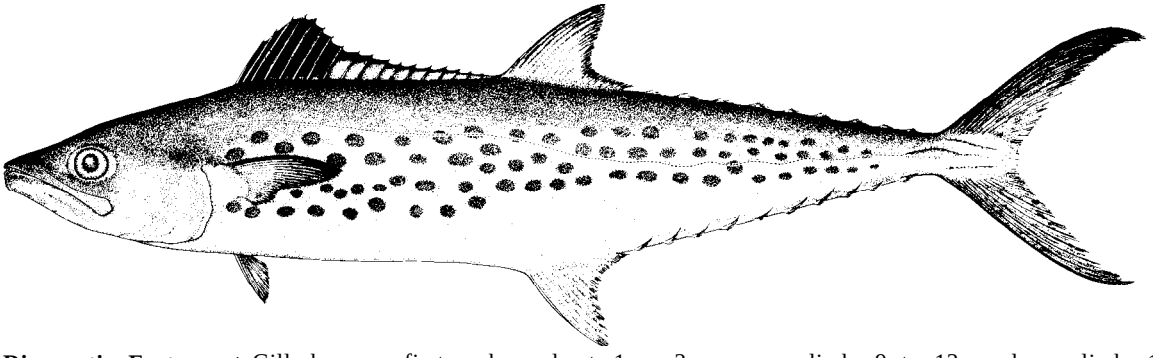
Scomberomorus brasiliensis Collette, Russo & Zavalla-Camin, 1978

SCOMBR Scombm 10

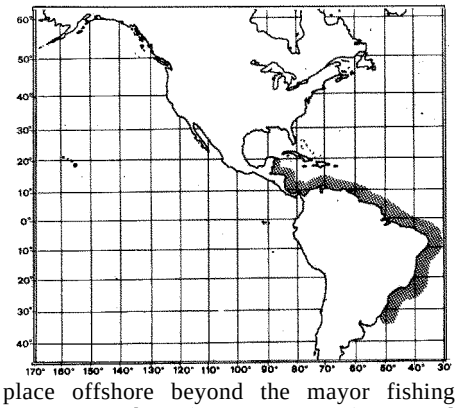
Scomberomorus brasiliensis Collette, Russo & Zavalla-Camin, 1978, Fish.Bull., U.S.; 76(1):274-279 (Belém, Brazil).

Synonymy : None.

FAO Names: En - Serra Spanish mackerel; Fr - Thazard tacheté du sud; Sp - Serra.



Diagnostic Features : Gillrakers on first arch moderate:1 or 3 on upper limb; 9 to 13 on lower limb; 11 to 16 total (usually 13 to 15). First dorsal fin with 17 to 18 spines, rarely 19; second dorsal with 15 to 19 rays, usually 17 or 18, followed by 8 to 10 finlets anal fin with 16 to 20 rays, usually 17 to 19, followed by 7 to 10 finlets, usually 9; pectoral fin rays 21 to 24, usually 22 or 23; pelvic fins relatively short, 3.6 to 5.9% of fork length. Lateral line gradually descending to midline on caudal peduncle.Vertebrae 19 to 21 precaudal plus 27 to 29 caudal, total 47 to 49, usually 48. Intestine with 2 folds and 3 limbs. Colour: sides silvery with several rows of round yellowish bronze (in life) spots; the number of spots increasing with size of fish from about 30 at 20 cm fork length to between 45 and 60 at fork lengths from 50 to 60 cm; first dorsal fin black anteriorly (first 7 spines) and along upper edge of posterior portion, basal portion of posterior membranes white; pectoral fin dusky; pelvic and anal fins light.



Geographical Distribution : Western Atlantic along the Caribbean and Atlantic coasts of Central and South America from Belize to Rio Grande do Sul, Brazil (Collette & Russo, 1979:fig. 8).

Habitat and Biology : An epipelagic, neritic species which seems not to migrate extensively, although off Trinidad some seasonal movement appears to occur.

In the Gulf of Paria, spawning, although occurring throughout the year, peaks from October to April (Sturm, 1978) followed by a post-spawning feeding migration away from Venezuelan waters towards Trinidad, where the species is most abundant from May to September. On the Guyana shelf, ripe fish are encountered in September (Lowe, 1962). Off northeastern Brazil, some spawning takes place offshore beyond the mayor fishing grounds throughout the year, but the main season extends from July to September (Gesteira, 1972). Sexual maturity is reached at an age of 3 or 4 years.

As in other species in the genus, food consists largely of fishes, with smaller quantities of penaeoid shrimps and loliginid cephalopods. The most important food component of 1 020 individuals (ranging between 17.5 and 87.5 cm fork length) from northeastern Brazil was the thread herring (Opisthonema oglinum) (more than 25%), followed by anchovies (Engraulidae), chub and jack mackerels (Carangidae), half-beaks (Hemiramphidae), and grunts (Pomadasyidae) (Menezes, 1970).

Size : Maximum fork length is 125 cm (Costa & Paiva, 1969); off Brazil; 60% of the fish in large samples taken in the period from 1962 and 1968 ranged between 40 and 65 cm; mature fish from this area had a minimum size of 46 cm (Alcantara Filho, 1977), roughly the same as off Trinidad (Sturm, 1978).

Interest to Fisheries : Serra Spanish mackerel is one of the most important commercial marine fishes from northeastern Brazil available throughout the year (Nomura, 1967). Most of the catch previously reported as S. maculatus from Fishing Area 31 by Colombia, Trinidad and Tobago, and Venezuela (4 120 metric tons in 1981), is in fact S. brasiliensis, as is also true for a large proportion of the Brazilian landings of Scomberomorus spp. (estimated at about 2 000 metric tons in 1981) (FAO, 1983). Catches are best in October through December (Costa & Paiva, 1969). Most of the catch is consumed fresh, but in Brazil some is salted (Paiva & Costa, 1966) and some has been canned (Bastos et al., 1973).

Local Names : BRAZIL: Serra; FRENCH GUYANA: Bonite, Maquereau; MARTINIQUE: Thazard franc.

Literature : Nomura (1967, Brazil); Costa & Paiva (1969); Sturm (1978, Trinidad).

Remarks : Literature records for S. maculatus from the Caribbean and Atlantic coasts of Central and South America apply to S. brasiliensis.

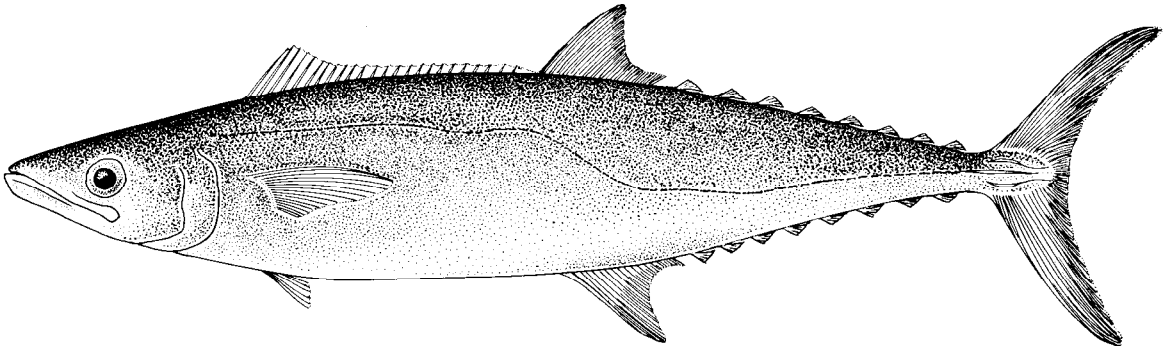
Scomberomorus cavalla (Cuvier, 1829)

SCOMBR Scombm 4

Cybium cavalla Cuvier, 1829, Règne Animal, 2nd ed., 2:200 (based on Marcgrav's Guarapucu from Brazil).

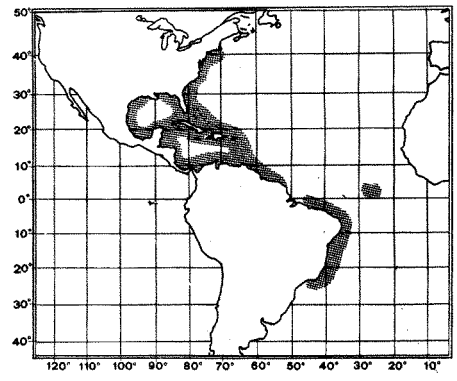
Synonymy: Cybium caballa - Cuvier in Cuvier & Valenciennes, 1831; Cybium immaculatum Cuvier in Cuvier & Valenciennes, 1831; Cybium acervum Cuvier in Cuvier & Valenciennes, 1831; Scomberomorus caballa - Jordan & Gilbert, 1882; Scomberomorus cavalla - Meek & Newland, 1884.

FAO Names : En - King mackerel; Fr - Thazard serra; Sp - Carite lucio.



Diagnostic Features : Gillrakers on first arch moderate: 1 to 3 on upper limb; 6 to 10 on lower limb; 7 to 13 total, usually 9 or 10. First dorsal fin with 12 to 18 spines, usually 15; second dorsal with 15 to 18 rays, followed by 7 to 10 finlets, usually 9;anal fin with 16 to 20 rays, usually 18 or 19, followed by 7 to 10 finlets, usually 8; pectoral fin rays 21 to 23. Lateral line abruptly curving downward below second dorsal fin. Vertebrae 16 or 17 precaudal plus 24 to 26 caudal, total 41 to 43, usually 42. Intestine with 2 folds and 3 limbs. Colour: sides plain silver without bars or spots, juveniles with bronze spots smaller than the pupil of the eye in five or six irregular rows. Adults have no black area on the anterior part of the first dorsal fin as have many species of Scomberomorus.

Geographical Distribution : Western Atlantic from Massachusetts to Rio de Janeiro, Brazil (Collette & Russo, 1979:fig. 9). The coastal area from Florida to Massachusetts is inhabited only during the warm months of the year.



Habitat and Biology : An epipelagic, neritic species, often found in outer reef areas. The larvae are encountered in surface waters of 26.3º to 31.0°C and 26.9 to 35.0°/oo S (McEachran, Finucane & Hall, 1980). King mackerel appear to be present throughout the year off Louisiana and off the state of Ceará in northeastern Brazil. There also seems to be some resident populations in South Florida waters, as fish are available to the recreational fishery all around the year. However, large schools of similar-sized king mackerel are found to migrate over considerable distances along the Atlantic US coast, water temperatures permitting.

Spawning takes place from May through September in the western Gulf of Mexico, particularly in September at depths between 35 and 180 m over the middle and outer continental shelf (McEachran, Finucane & Hall, 1980), peaks in July and August in the northeastern Caribbean (Erdman, 1977), but occurs throughout the year off northeastern Brazil (Ivo, 1972). In Brazil, the fecundity of 63 to 123 cm long females ranges from 345 000 to 2 280 000 eggs (Ivo, 1974).

As in other members of the genus, food consists primarily of fishes with smaller quantities of penaeid shrimps and squids (De Vane, 1978). Clupeids such as Opisthonema, Harengula and Brevoortia are particularly important, even in juveniles of fork lengths between 10 and 31 cm (Naughton & Salomon, 1981). Other fishes commonly preyed upon include jack mackerels (Carangidae), snappers (Lutjanidae), grunts (Pomadasyidae) and half-beaks (Hemiramphidae).

Size : Maximum size is 173 cm fork length and 45 kg weight; common to 70 cm fork length; off northeastern Brazil, length in the catches ranges mostly between 50 and 90 cm. The all-tackle angling record is a 40.8 kg fish with a fork length of 170 cm taken at Key West, Florida, in 1976. In Florida, fork length at first maturity is 73 cm in males and 84 cm in females (Beaumariage, 1973). In Brazil, females mature at about 77 cm (Ivo, 1972).

Interest to Fisheries : King mackerel is an important species for recreational, commercial and artisanal fisheries throughout its range. The catch reported from Fishing Area 31 totalled 7 375 metric tons in 1981 (FAO, 1983), but is probably higher, since part of the additional 1 100 metric tons of unclassified Scomberomorus species is likely to be S. cavalla and since reporting on the considerable recreational catch-is inadequate (Manooch, 1979). It is also suspected that some of the catch reported as S. maculatus by Cuba and the Dominican Republic may in fact be S. cavalla or S. regalis.

In the USA, sport fishing with hook-and-line is carried out from April to December (but mostly in spring and fall) in North Carolina, and all year round (with local seasonal peaks) in Florida. Commercial fisheries operate in the same areas, as well as off Louisiana and Mississippi. Fishing gear include hook-and-line (North Carolina), snapper hooks and line (Mississippi), gillnets (southern Florida and North Carolina), and either trolled lure or small bait in the charter boat industry (Florida). The gillnet fishery has employed power block retrieval since 1963, and aerial spotting is sometimes used (Beaumariage, 1973).

King mackerel is the main Scomberomorus species of interest to the commercial fishery that extends throughout the year off northeastern Brazil (Nomura & Rodrigues, 1967). The major Brazilian fishing grounds are located some 6 to 16 miles off the coastline. Gillnets take mostly 2 to 4 year old fish (88%), whereas trolling lines catch predominantly 4 to 6 year old individuals (Alcantara Filho, 1972). Fishing is also carried out from rafts with hooks baited with thread herring. Most of the catch is generally processed into steaks or sold fresh (Lyles, 1969), but it has also been canned and salted (Bustos et al., 1973; Paiva & Costa, 1966) in northeastern Brazil.

Local Names : BRAZIL: Cavala; CUBA: Serrucho, Sierra; DOMINICAN REPUBLIC: Sierra; FRENCH GUAYANA: Maquereau; GERMAN DM RP: Königsmakrele; ITALY: Sgombro reale; PORTUGAL: Cavala, Cavala inpigem, Cavala verdadeira; PUERTO RICO: Carite; USA: Kingfish, King mackerel; USSR: Korolevskaya makrel; VENEZUELA: Carite lucio, Carite sierra, Rey.

Literature : Nomura & Rodrigues (1967, Brazil); Menezes (1969, food, Brazil); Alcantara Filho (1972a); Beaumariage (1973, Florida); Berrien & Finan (1977); Collette (1978, Species Identification Sheets, Western Central Atlantic); Manooch, Nakamura & Hall (1978, bibliography); Trent et al. (1981, southeastern USA); Ximenes, Menezes & Fonteles-Filho (1981, length-weight relationship, Brazil).

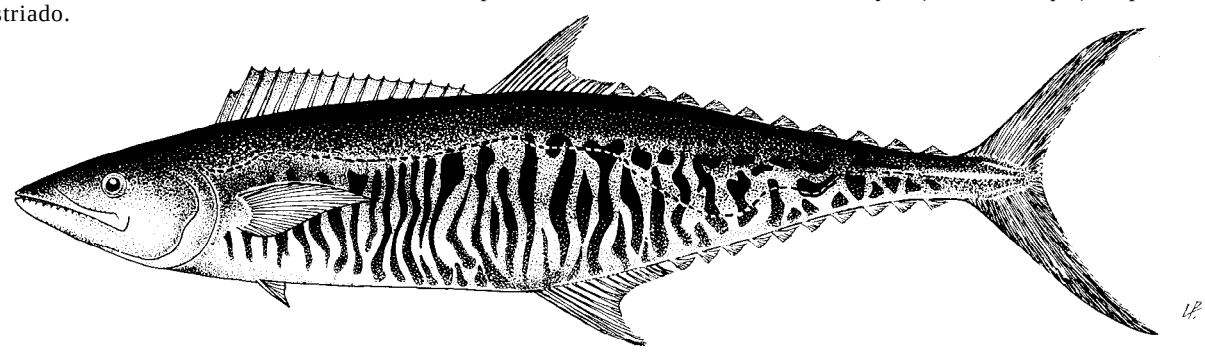
Scomberomorus commerson (Lacepède, 1800)

SCOMBR Scombm 1

Scomber commerson Lacepède, 1800, Histoire Naturelle des Poissons, 1:598, 600-603, pl. 20 (fig. 1) (based on a figure from Commerson's manuscripts).

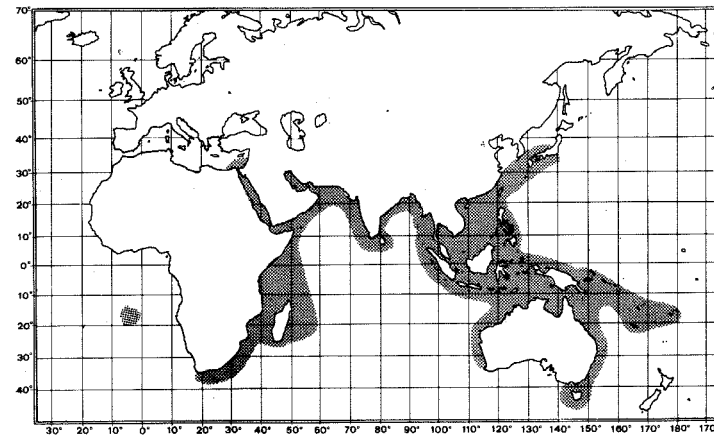
Synonymy : Scomber commersonii - Shaw, 1803; Scomber maculosus Shaw, 1803; Cybium commersonii - Cuvier, 1829; Cybium konam Bleeker, 1851a; Scomberomorus commersoni - Jordan & Seale, 1906; Cybium multifasciatum Kishinouye, 1915.

FAO Names : En - Narrow-barred Spanish mackerel; Fr - Thazard rayé (Indo-Pacifique); Sp - Carite estriado.



Diagnostic Features : Gillrakers on first arch few: 0 to 2 on upper limb; 1 to 8 on lower limb; 1 to 8 total. First dorsal fin with 15 to 18 spines, usually 16 or 17; second dorsal with 15 to 20 rays, usually 17 or 18, followed by 8 to 10 finlets; anal fin with 16 to 21 rays, usually 18 or 19 followed by 7 to 12 finlets, usually 9 or 10; pectoral fin rays 21 to 24. Lateral line abruptly bent downward below end of second dorsal fin. Vertebrae 19 or 20 precaudal plus 23 to 27 caudal, total 42 to 46. Intestine with 2 folds and 3 limbs. Colour: sides silvery grey marked with transverse vertical bars of a darker grey; bars narrow and slightly wavy, sometimes breaking up into spots ventrally; bars number 40 to 50 in adults but are usually fewer than 20 in juveniles up to 45 cm fork length; cheeks and lower jaw silvery white; first dorsal fin bright blue rapidly fading to blackish blue; pectoral fin light grey turning to blackish blue; caudal fin lobes, second dorsal, anal, and dorsal and anal finlets pale greyish white turning to dark grey. Juveniles have the anterior membranes of the first dorsal jet black contrasting with pure white posteriorly.

Geographical Distribution : Widespread throughout the Indo-West Pacific from South Africa and the Red Sea east through the Indo-Australian Archipelago to Australia and Fiji and north to China and Japan (Collette & Russo, 1979:fig. 9). A recent immigrant to the eastern Mediterranean Sea by way of the Suez Canal.



Habitat and Biology : An epipelagic, neritic species known to undertake lengthy longshore migrations (Lewis, 1981), but permanently resident populations also seem to exist. Migrations extend along the entire east coast of Queensland (McPherson, 1981). The migration route in the Gulf of Thailand has been mapped by Tongyai (1970).

Depending on temperature regime, the spawning season may be more or less extended. In east Africa it extends from October to July, off Madagascar from December to February, in the coastal waters off Madras State from May to July (Chacko, Thomas & Pillay, 1968), off Taiwan Island in spring, off Papua New Guinea from July to December (Lewis, Smith & Kearney, 1974), on the Great Barrier Reef from October to December (Munro, 1947), and around Fiji from October to February with peaks in December and January (Lewis, Chapman & Sesewa, 1983).

Like other species of the genus, S. commerson feeds primarily on small fish, particularly anchovies such as Anchoviella and Stolephorus, and clupleids such as Sardinella (Chacko, Thomas & Pillay, 1968; Prado, 1970; Mergeron, 1970; van der Elst, 1981). Other prey include small carangids, slipmouths (Leiognathus), squids (i.e. Loligo) and penaeoid shrimps. Feeding apparently takes place day and night.

Size : Maximum fork length is about 220 cm, common to 90 cm. The all-tackle angling record is a 44.9 kg fish taken off Scottburgh, Natal, South Africa, in 1982. The smallest mature males and females had fork lengths between 65 and 70 cm respectively (Lewis, Chapman & Sesewa, 1983).

Interest to Fisheries : This species is taken throughout its range by commercial, artisanal, and recreational fisheries. There are important fisheries in three Fishing Areas: 51, 57 and 71. The world catch increased from 55 452 metric tons in 1978 to 72 281 metric tons in 1981 (FAO, 1983). The five countries with the largest reported catch in this period were Indonesia, Philippines, Sri Lanka, Democratic Yemen, and Pakistan. Approximately 1 000 tons a year are landed in Queensland, Australia (McPherson, 1981), while the 1982 catch in Fiji probably exceeded 300 tons (Lewis, Chapman & Sesewa, 1983). There is also an important drift-net (gillnet) fishery in India but the catch is not identified to species in the statistics. In Thailand and Malaysia drift nets also seem to be the most important gear deployed to catch this species. Other gear include shore seines in Taiwan (Province of China) and India; trolling lines on Taiwan Island, in Malaysia and in east Africa, where it is a priced market fish, and handlines (bett-tok) baited with mackerel or squid (Rastrelliger and Loligo) and trolling lines (bett-laak) with spoons in the Gulf of Thailand (Tongyai, 1970). In Samoa it is sold fresh and canned.

The fishing seasons change according to differential availability of fish as a function of variation in hydrographical conditions and weather conditions for fishing. They peak from August to September on the Great Barrier Reef, in spring off the island of Taiwan, in the dry season between October and April/May off Kampuchea and in the Gulf of Thailand, in March/April, June/July, and December in northeastern India, from September to April in southeastern India, and in February/March, and October to December off the southwestern coast of India, south of Bombay. It is marketed fresh, on ice, or salted and dried.

Local Names : AUSTRALIA: Narrowbarred mackerel, Doggie, Kingfish, Snook; BANGLADESH: Champa, Matia; FIJI: Walu; GERMANY FR: Spanische Makrele; INDIA: Ah-ku-lah (Tamil), Ayakora, Chumbum (Malayalam), King seer, Konam (Tamil), Konema (Tellugu), Mah-wu-leachi (Tarnil), Yellari (Tellugu); INDONESIA: Tenggirri; JAPAN: Yokoshimasawara; KENYA: Nguru, Nguru-mtwane (Swahili); MADAGASCAR: Angoho, Lamatra; PACIFIC ISLANDS TRUST TERRITORIES: Palau: Ngelngal; PHILIPPINES: Maladyong, Tangigi, Tanguigue, Tanigi; SOMALIA: Nguru, Nguru-mtwane (Swahili); SOUTH AFRICA: Katonkel, King mackerel; SRI LANKA: Barred Spanish mackerel, Konam (Tarnil), Striped seer; TANZANIA: Nguru, Nguru-mtwane (Swahili); THAILAND: Insi, Thu insi; USSR: Dairek, Ispanskaya makrel, Korolevskaya pyatnistaya makrel, Poperechnopolosataya pelamida, Sierra, Uzkopolosaya makrel.

Literature : Prado (1970, Madagascar); Tongyai (1970, Thailand); Fischer & Whitehead, eds (1974, Species Identification Sheets, Eastern Indian Ocean/Western Central Pacific); Devaray (1977, 1982, India); McPherson (1981, Australia); Lewis, Chapman & Sesewa (1983).

Remarks : A lipid-soluble toxin, similar to ciguatoxin has been found in the flesh of S. commerson caught between 24° and 26°S on the east coast of Queensland (Lewis & Endean, 1983). At least 78 toxic individuals, resulting in 217 poisonings, came from this area.

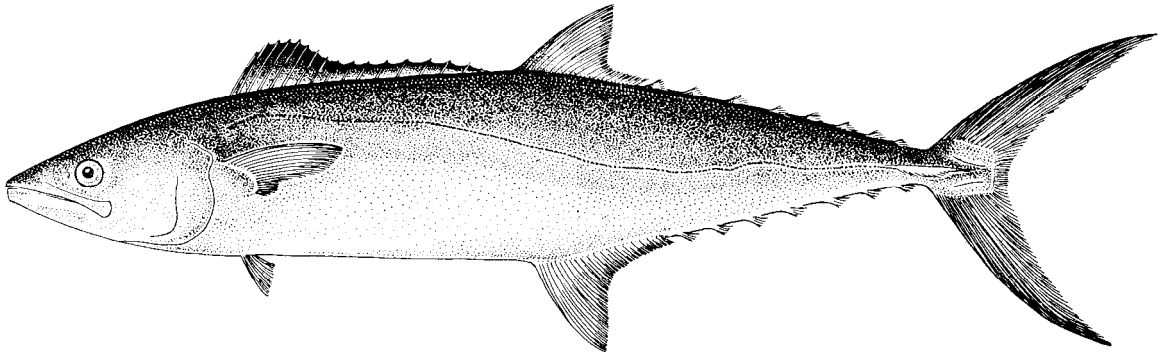
Scomberomorus concolor (Lockington, 1879)

SCOMBR Scombm 8

Chriomitra concolor Lockington, 1879:134-136 (Monterey Bay, California).

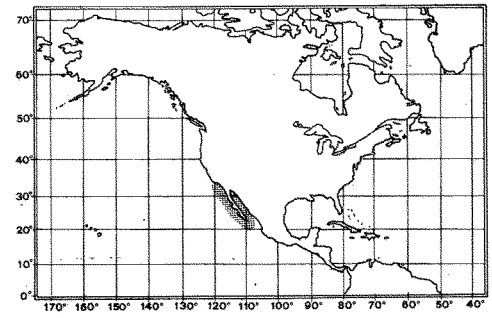
Synonymy : Scomberomorus concolor - Jordan & Gilbert, 1882.

FAO Names : En - Monterey Spanish mackerel; Fr - Thazard de Monterey; Sp - Carite de Monterey.



Diagnostic Features : Gillrakers on first arch many: 4 to 8 on upper limb; 15 to 21 on lower limb; 21 to 27 total. First dorsal fin with 15 to 18 spines, usually 17; second dorsal with 16 to 20 rays, usually 18 or 19, followed by 6 to 9 finlets, usually 8; anal fins with 19 to 23 rays, usually 20; followed by 6 to 8 finlets; pectoral fin rays few 19 to 22, usually 21. Lateral line gradually curving down toward caudal peduncle. Vertebrae 18 to 20 precaudal plus 27 to 29 caudal, total 46 to 48, usually 19 plus 28 total 47. Intestine with 2 folds and 3 limbs. Colour: males steel blue on back, silvery on sides and below, without streaks or spots. Females darker, with two alternate series of brown spots (gold in life) on sides.

Geographical Distribution : Eastern subtropical Pacific (Collette & Russo, 1979:fig. 8), now confined to the northern Gulf of California temperate waters.



Habitat and Biology : An epipelagic, neritic species. It is now extinct outside the Gulf of California. Its biology is almost completely unknown.

Size : Maximum size is about 76 cm fork length and 3.6 kg.

Interest to Fisheries: Monterey Spanish mackerel was taken in commercial quantities in the 1870's and 1880's. There is a substantial gillnet fishery for this species in the northwestern Gulf of California estuaries and marshes.This fishery operates on a relict of the original population.

Local Names: MEXICO: Sierra; USA: Gulf sierra; USSR: Kalifornijskaya korolevskaya makrel.

Literature : Fitch & Flechsig (1949).

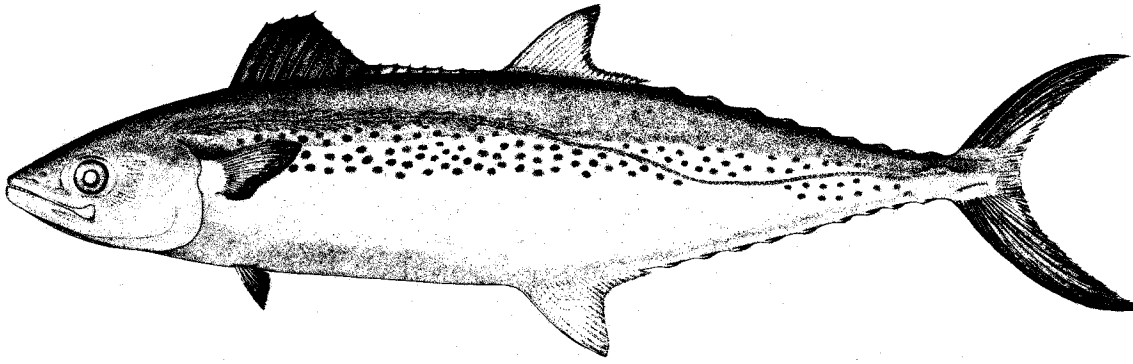
Scomberomorus guttatus (Bloch & Schneider, 1801)

SCOMBR Scombm 3

Scomber guttatus Bloch & Schneider, 1801, Systema Ichthyologiae:23-24, pl. 5 (Tranquebar, India).

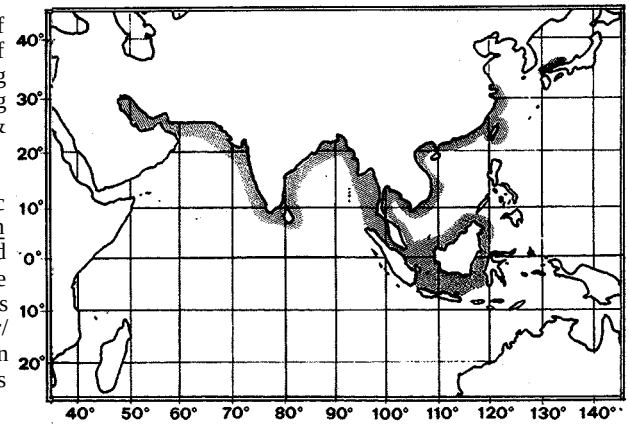
Synonymy : Scomber leopardus Shaw, 1803; Cybium guttatum - Cuvier, 1829; Cybium interruptum Cuvier in Cuvier & Valenciennes, 1831; Cybium kuhlii Cuvier in Cuvier & Valenciennes, 1831; Cybium crockewitii Bleeker, 1851; Scomberomorus guttatus - Fowler, 1905; Scomberomorus guttatum - Malpas, 1926 Scomberomorus kuhlii - Chevey, 1934; Scomberomorus crockewiti - Beaufort, 1951; Indocybium guttatum - Munro, 1955; Scomberomorus guttatus guttatus - Silas, 1964.

FAO Names: En - Indo-Pacific king mackerel; Fr - Thazard ponctué (Indo-Pacifique); Sp - Carite de1 Indo-PacIfico.



Diagnostic Features : Depth of body less than in S. koreanus (22.8 to 25.2% vs 24.4 to 26.7% of fork length). Head larger than in S. koreanus (20.2 to 21.5% vs 19.7 to 20.4% of fork length). Gillrakers on first arch moderate: 1 or 2 on upper limb; 7 to 12 on lower limb; 8 to 14 total. First dorsal fin with 15 to 18 spines, usually 16 or more; second dorsal with 18 to 24 rays, usually 20 to 22, followed by 7 to 10 finlets; anal fin with 19 to 23 rays; followed by 7 to 10 finlets, usually 8; pectoral fin rays few, 20 to 23, modally 21. Lateral line with many fine auxiliary branches extending dorsally and ventrally in anterior third, gradually curving down toward caudal peduncle. Vertebrae 19 to 22 precaudal plus 28 to 31 caudal, total 47 to 52, usually 50 or 51. Intestine with 2 folds and 3 limbs. Colour: sides silvery white with several longitudinal rows of round dark brownish spots (smaller than eye diameter) scattered in about 3 irregular rows along lateral line. First dorsal fin membrane black (up to the 8th spine) white posteriorly, with the distal margin black; pectoral, second dorsal and caudal fins dark brown; pelvic and anal fins silvery white.

Geographical Distribution : Along the shores of continental Indo-West Pacific from Wakasa Bay, Sea of Japan (Nakamura & Nakamura, 1982) and Hong Kong south to the Gulf of Thailand and west to the Gulf lying between the Arabian peninsula and Iran (Collette & Russo, 1979:fig. 10).



Habitat and Biology : An epipelagic, neritic species believed to be less migratory than S. commerson that may be encountered in turbid waters with reduced salinity. Movements in the Gulf of Thailand might be deduced from seasonal changes in peak fishing months along the coast of Thailand. These peaks are November/ December in eastern Thailand, late December/January in the northern part of the Gulf and January-March in its western part (Tongyai, 1970).

Based on occurrence of ripe females and size of maturing eggs, spawning probably occurs from April to July around Rameswaram Island between India and Sri Lanka (Krishnamoorthi, 1958). Ripe females (32.5 to 46.5 cm fork length) are taken in May in Thai waters.

As with other species of Somberomorus, the food of Indo-Pacific king mackerel consists primarily of fishes. Juveniles in India feed mainly on teleosts, particularly clupeoids such as Anchoviella (Venkataraman, 1961; Kumaran, 1964; Rao, 1964). Adults also prey mainly on fishes with small quantities of crustaceans and squids (Thailand - Tongyai, 1970, India - Rao, 1964). Anchovies are particularly important: Stolephorus in Singapore Straits (Tham, 1950, 1953), Anchoviella in Waltair, India (Rao, 1964).

Size : Maximum fork length is 76 cm. Size at first maturity ranges between 48 and 52 cm total length in southern India, and about 40 cm total length in Thailand

Interest to Fisheries : There are commercial and artisanal fisheries for S. guttatus in Kampuchea (Merçeron, 1970), Thailand (Tongyai, 1971), Malaysia (Pathansali,1968), and India, particularly in the lower Sundarbans, West Bengal (Banerjee & Chakrabarty, 1972), around Madras (Vijayaraghavan, 1955), the Gulf of Mannar-Palk Bay area (Krishnamoorthi, 1957), and Malwan, south of Bombay (Kaikini, 1961). These fisheries may be operational throughout the year, but with peaks that differ from region to region in correlation with differential abundance of Indo-Pacific king mackerel.

S. guttatus is one of principal species in the drift net seerfish fishery in India but the catch is not identified to species in the statistics. Indonesia reported between 4 047 and 4 639 metric tons per year in the period from 1978 to 1981 in Fishing Areas 57/71. At the same time vessels from Taiwan (Province of China) caught between 10 838 and 14 699 tons in Area 61 (FAO, 1983).

The primary gear in most areas appears to be the drift gillnet, but the species is also taken in bamboo stake traps and with hand lines in Thailand (Tongyai, 1970), and by trolling or with hook-and-line in India and Malaysia (Jones, 1968; Rao, 1964; Pathansali, 1968). It is utilized fresh or salted in most areas (Kampuchea - Merçeron, 1970; Thailand - Tongyai, 1971; India - Jones, 1968). Although less abundant than the Indian mackerels (Rastrelliger spp.), S. guttatus is highly esteemed for food and commands a higher price in Thailand and India (Tongyai, 1966; Pathansali, 1968).

Local Names : AUSTRALIA: Spotted Spanish mackerel; BANGLADESH: Bijram; BURMA: Nga-bu-zin; INDIA: Aya-kora (Malayalam), Jhavar, Seela, Spotted seer, Vanjiram (Tarnil), Varimeen (Malayalam); INDONESIA: Ajong-ajong, Tandang, Tengiri; IRAN: Ghobad, Sheer; JAPAN: Taiwansawara; MADAGASCAR: Razandamatra; SRI LANKA: Spotted Spanish mackerel; THAILAND: Insi; UK: Indo-Pacific Spanish mackerel; USSR: Indijskaya makrel, Pyatnistaya ispanskaya makrel, Pyatnistaya pelamida; VIET NAM: Cá thu cham.

Literature : Kishinouye (1923, Japan); Fischer & Whitehead, eds. (1974, Species Identification Sheets, Eastern Indian Ocean/Western Central Pacific); Devaraj (1977, 1982, India).

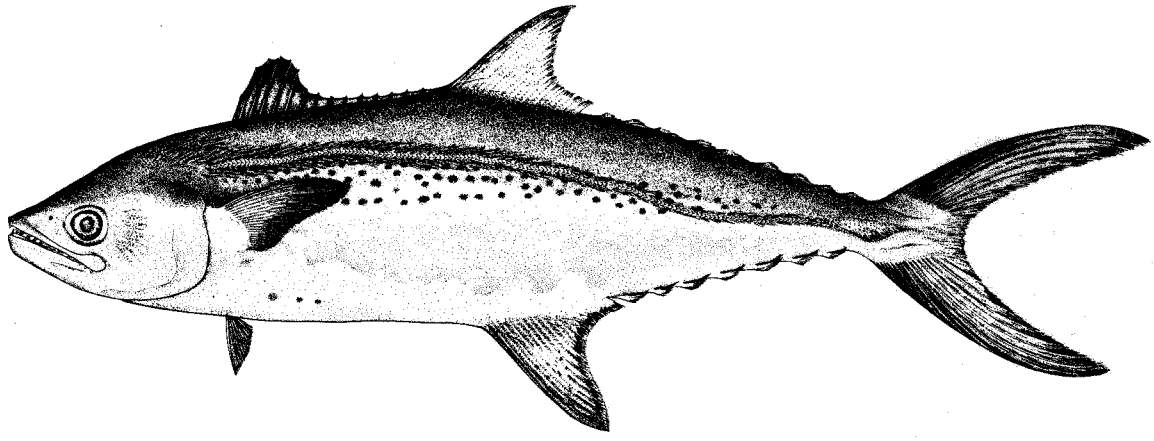
Scomberomorus koreanus (Kishinouye, 1915)

SCOMBR Scombm 11

Cybium koreanum Kishinouye, 1915:11, pl 1 (fig. 6) (Korea)

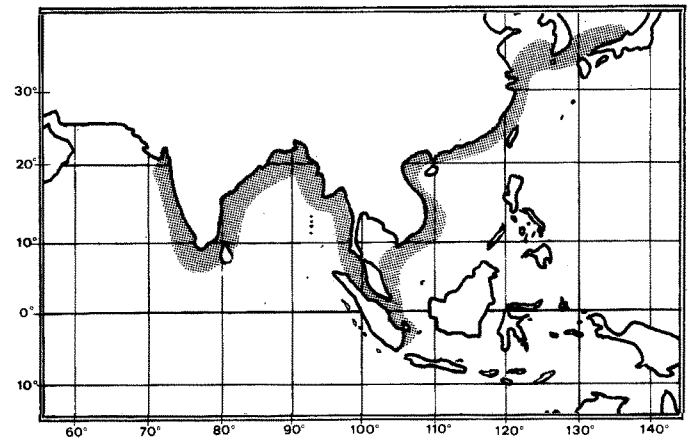
Synonymy : Sawara koreanum - Soldatov & Lindberg, 1930; Scomberomorus koreanus - Munro, 1943; Scomberomorus guttatus koreanus - Silas, 1964a.

FAO Names : En - Korean seerfish; Fr - Thazard coréen; Sp - Carite coreano.



Diagnostic Features : Depth of body greater than in S. guttatus (24.4 to 26.7% vs 22.8 to 25.2% of fork length). Head shorter than in S. guttatus (19.7 to 20.4% vs 20.2 to 21.5% fork of length). Gillrakers on first arch moderate: 1 or 2 on upper limb; 9 to 12 on lower limb; 11 to 15 total. First dorsal fin with 14 to 17 spines, usually 15 or fewer; second dorsal with 20 to 24 rays, followed by 7 to 9 finlets; anal fin with 20 to 24 rays, usually 22 or 23 followed by 7 to 9 finlets; pectoral fin rays 20 to 24, modally 22. Lateral line with many fine auxiliary branches extending dorsally and ventrally in anterior third, gradually curving down toward caudal peduncle. Vertebrae 20 precaudal plus 26 or 27 caudal, total 46 or 47, usually 46. Intestine with 4 folds and 5 limbs. Colour: sides silvery white with several longitudinal rows of round dark brownish spots (smaller than eye diameter) rather sparsely scattered along lateral median line; first dorsal fin membrane black; pectoral, second dorsal and caudal fins dark brown; pelvic and anal fins silvery white.

Geographical Distribution : Continental Indo-West Pacific from Wakasa Bay, Sea of Japan (Nakamura & Nakamura, 1982), and China south to Singapore and Sumatra and west to Bombay, India (Collette & Russo 1979:fig. 10).



Habitat and Biology : Little is known on the biology of this epipelagic, neritic species. Kishinouye (1923) reported that it spawns in July at the mouth of the Daidoko, Korea and that it feeds on sardines, anchovies and shrimps.

Size : Maximum size is 150 cm. fork length and 15 kg weight; common to 60 cm. Sexual maturity is reached at about 75 cm fork length and a weight of 2.25 kg.

Interest to Fisheries : Korean seerfish is usually not distinguished from other species of seerfishes, but makes up an important part of the drift net fishery in Palk Bay and the Gulf of Mannar between southwestern India and Sri Lanka (Devaraj, 1976).

India reported unspecified catches of Scomberomorus ranging between 17 780 metric tons in 1978 and 25 900 metric tons in 1981 (FAO, 1983), part of which was S. koreanus.

Local Names : CHINA: Compressed mackerel, Korean mackerel; JAPAN: Hirasawara; USSR: Avstralijskaya korolevskaya makrel; Korejskaya makrel; VIET NAM: Cá thu Trieu-tiên.

Literature : Kishinouye (1923, Japan); Devaraj (1976, 1977, India).

Remarks : Devaraj (1976) has recently shown that S. koreanus is a valid species, distinct from S. guttatus.

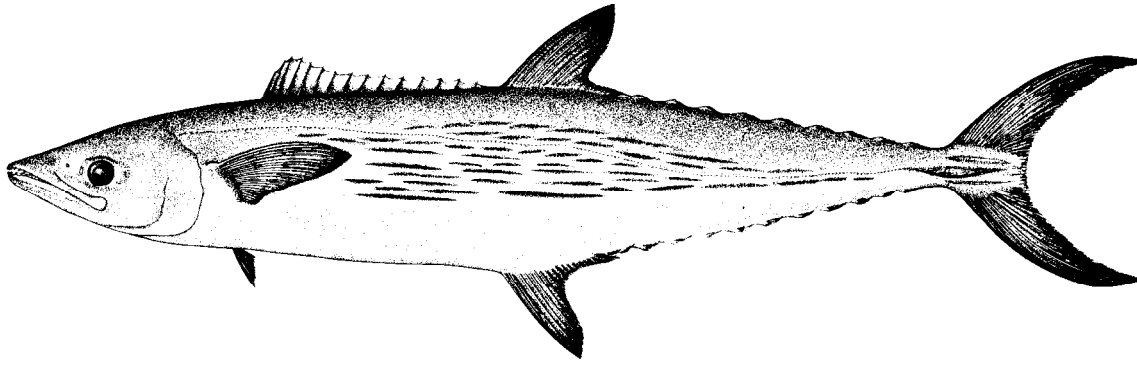
Scomberomorus lineolatus (Cuvier, 1831)

SCOMBR Scombm 2

Cybium lineolatum Cuvier in Cuvier & Valenciennes, 1831, Histoire Naturelle des Poissons, 8:170-172 (Malabar , India).

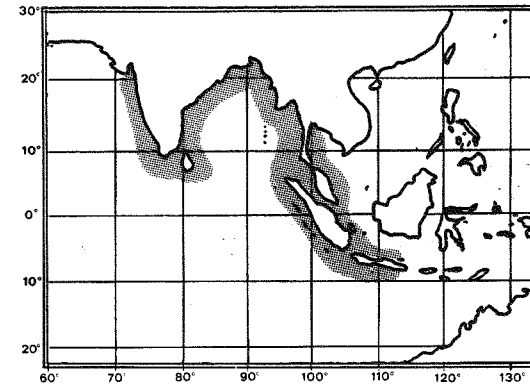
Synonymy : Scomberomorus lineolatus - Munro, 1943; Indocybium lineolatum - Munro, 1955.

FAO Names : En - Streaked seerfish; Fr - Thazard cirrus; Sp - Carite rayado.



Diagnostic Features : Gillrakers on first arch moderate: 1 or 2 on upper limb; 6 to 11 on lower limb, usually 8 to 10; 7 to 13 total. First dorsal fin with 15 to 18 spines, usually 16 or 17; second dorsal with 15 to 19 rays, rarely 21 or 22, usually 17 or 18, followed by 7 to 10 finlets, usually 9; anal fin with 17 to 22 rays, usually 20, followed by 7 to 10 finlets; pectoral fins covered with scales; pectoral fin rays 20 to 24, modally 23. Lateral line without auxiliary branches anteriorly, running almost straight below second dorsal finlet, then slightly bent downward toward keel of caudal peduncle (which is very wide). Vertebrae 18 to 20 precaudal plus 25 to 28 caudal, total 44 to 46. Intestine with 2 folds and 3 limbs. Colour: sides silvery marked with series of irregular, horizontal, narrow black lines and few if any spots first dorsal fin black anteriorly, white posteriorly.

Geographical Distribution : Indo-West Pacific from the Gulf of Thailand and Java west to Bombay, India (Collette & RUSSO, 1979: fig. 11).



Habitat and Biology : The biology of this epipelagic, neritic species is poorly known. Unlike S. commerson and S. guttatus it is not encountered in very turbid waters or much reduced salinity. From single records, the reproductive season is deduced to be in fall including October off southern India. (Malpas 1926), and in winter (including January) in the south-eastern Gulf of Bengal (Tongyai, 1966b). Juveniles in India are found to feed on teleosts (Venkataraman, 1961; Rao, 1964).

Size : Maximum fork length is 80 cm.

Interest to Fisheries : There are small fisheries for S. lineolatus in the waters around Thailand, Malaysia, and India. It is taken from October to November along the Thai coast of the Indian Ocean (Tongyai, 19701, but is less abundant than either S. commerson or S. guttatus in both this area and the Gulf of Thailand (Tongyai, 1970). Streaked seerfish is fished along both coasts of Peninsular Malaysia; along the west coast from November to February in the north and March to July in the south, and on the east coast from February to March and August to November. Fishing is mainly by gillnets, but on the east coast hand lines and trolling lines are also important (Pathansali 1968). In India, there is an important coastal fishery for the three species of seerfishes that are much in demand, both fresh and salt-cured, although they form a smaller proportion of the catch in India than mackerels (Rastrelliger spp.). S. lineolatus is the least common of these seerfishes. Small individuals, up to 50 cm, are taken, together with S. commerson and S. guttatus, from May to September in gillnets 5 to 12 miles off Tuticorin in the Gulf of Mannay India. Gillnets, hook-and-line, and trolling lines are the most important gear types in India (Silas, 1968). Scomberomorus spp. are highly esteemed foodfishes in Thailand and are consumed as spicy fish-balls or high quality salted fish. A monthly average of approximately 100 metric tons, fresh or salted, is consumed in Bangkok alone (Tongyai 1966a).

Local Names : INDIA: Streaked seer; SOUTH AFRICA: Queen mackerel, Spikkel-katonkel; SRI LANKA: Streaked Spanish mackerel; THAILAND: Pla in-see; USSR: Makrel kanadi.

Literature : Fischer & Whitehead, eds (1974, Species Identification Sheets, Eastern Indian Ocean/Western Central Pacific); Devaraj (1977, 1982, India).

Remarks : The east African population referred to as S. lineolatus is a distinct species, S. plurilineatus. The Thai vernacular name, pla in-see, applies for all species of the genus.