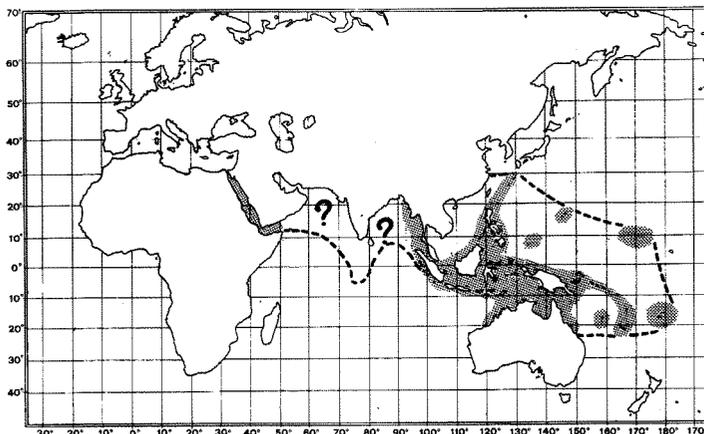


Geographical Distribution : Tropical and subtropical waters of the Indo-West Pacific from the Red Sea east to the Andaman Sea, Java Sea, the Philippines, Ryukyu Islands, Irian Jaya, Papua New Guinea, northern coasts of Australia, Solomon Islands, New Caledonia, Caroline and Marshall Islands, and Fiji.

Habitat and Biology : An epipelagic species that is mostly found in shallow reef waters where it forms large schools. Reports on reproduction are available for the Andaman Sea, the Sulu Sea south of the Philippines, and Fiji. The spawning season in Fiji extends from October through March (Lewis, Chapman & Sesewa, 1983). An ovary weighing 34.4 g (length or weight of the fish not available) contained about 93 000 eggs.



Food includes adults and larvae of crustaceans and fishes, particularly clupeoids like Sardinella and Thrissocles, but also other fishes such as Sphyaena and Balistes.

Size : Maximum size is about 60 cm fork length and 3.5 kg weight. Maturity seems to be attained at a fork length of 40 to 43 cm (Silas, 1963; Lewis, Chapman & Sesewa, 1983).

Interest to Fisheries: Double-lined mackerel is taken incidentally with hand lines off Port Blair, Andaman Islands (Silas, 1963). It is common in the offshore zones of Fiji but is only occasionally seen in Fiji markets (Lewis, Chapman & Sesewa, 1983). The flesh is mild and pleasantly flavoured, but it is necessary to remove the kidney tissue before cooking to avoid the ammonia smell.

Local Names : AUSTRALIA: Double-lined mackerel, Scad mackerel; FIJI: Salala-ni-toga; INDIA: Double-lined mackerel; JAPAN: Nijo-saba; Ryukyu Islands: Kusarah; PACIFIC ISLANDS TRUST TERRITORIES: Palau: Biturchurch, Mokorkor; USSR: Dvukhlinejnaya makrel.

Literature : Silas (1963, species synopsis); Lewis, Chapman & Sesewa (1983, Fiji).

Remark: This species has usually been referred to in the literature under the name G. bicarinatus until two species were distinguished (Collette, in press).

One of the Palauan names for the species, biturchurch, means urine and refers to the ammonia smell given off by these fish if they are boiled without removing the kidney tissue from along the back bone (Johannes, 1981:187).

Gymnosarda Gill, 1862

SCOMBR Gymno

Genus with reference : Gymnosarda Gill, 1862:125. Type-species: Thynnus unicolor Rüppell, 1836, by original designation.

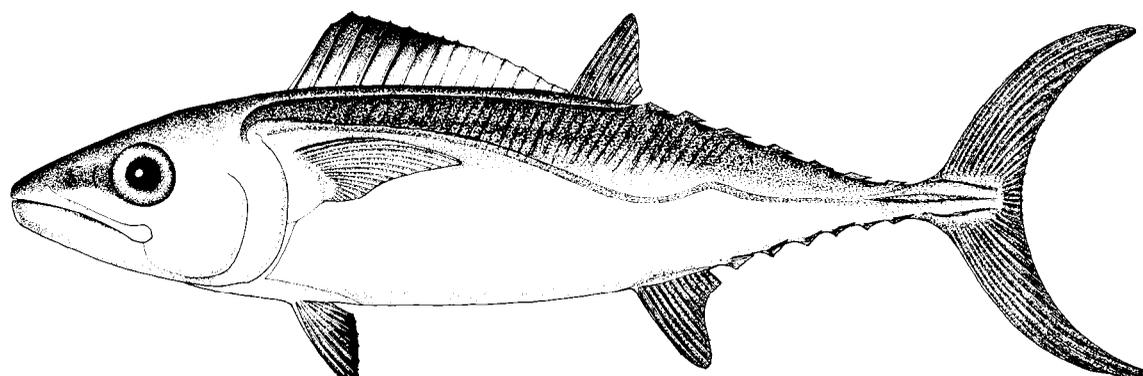
Gymnosarda unicolor (Rüppell, 1838)

SCOMBR Gymno 1

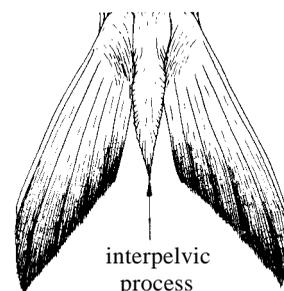
Thynnus (Pelamis) unicolor Rüppell, 1836, Fische des Rothen Meeres:40-41, pl. 12 (fig. 1) (Jeddah, Red Sea).

Synonymy : Pelamys nuda Günther, 1860; Gymnosarda unicolor - Gill, 1862; Gymnosarda nuda - Kishinouye, 1923.

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



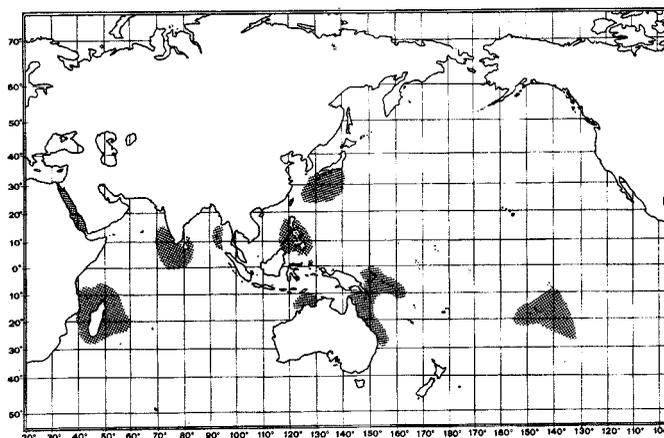
Diagnostic Features : Body elongate and moderately compressed. Mouth fairly large, upper jaw reaching to middle of eye; 14 to 31 large, conical teeth in upper jaw, 10 to 24 in lower jaw; 2 patches of teeth on upper surface of tongue; 11 to 14 gillrakers on first gill arch; laminae of olfactory rosette 48 to 56; interorbital width 32.1 to 40% of head length. Dorsal fins close together, the first with 13 to 15 spines, its margin almost straight, the second followed by 6 or 7 finlets; anal fin with 12 or 13 rays 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 the lateral line, dorsal fin base, and caudal keel; caudal peduncle slender, with a well developed lateral keel between 2 smaller keels on each side. Swimbladder large; spleen visible in ventral view on the right side of the body in the anterior half of the visceral cavity; liver with elongate left and right lobes and a short middle lobe. Vertebrae 19 precaudal plus 19 caudal. Colour: back and upper sides brilliant blue-black, lower sides and belly silvery; no lines, spots or other markings on body; anterior edge of first dorsal fin dark; other fins greyish.



interpelvic process

Geographical Distribution : Tropical Indo-West Pacific (Collette and Chao, 1975:fig. 69) from the Red Sea and East Africa east to Japan, the Philippines, Papua New Guinea, and Australia and out into the islands of Oceania - the Marquesas, Tahiti, Tuamotus, Pitcairn, and Oeno Islands.

Habitat and Biology : An epipelagic species, usually encountered around coral reefs, at water temperatures ranging between 20 and 28 C. Dogtooth tuna are generally solitary, or occur in small schools of six or less individuals. They are voracious predators on small schooling fishes such as scads (Decapterus), Caesio, Naso, Cirrhilabrus, Pterocaesio (Randall, 1980) and squids. In Fiji, spawning occurs over the summer months (Lewis, Chapman & Sesewa, 1983), but little is known about their biology.



Size : Maximum size is about 150 cm fork length and 80 kg weight. The all-tackle angling record is a 131 kg fish with a fork length of 206 cm taken at Kwan-Tall Island, Korea, in 1982. At Ogasawara Islands, sizes of fish commonly taken vary between 100 and 150 cm in length and 20 and 30 kg weight; in Fiji between 65 and 100 cm and 5 to 15 kg. Fork length at first maturity is about 65 cm (Lewis, Chapman & Sesewa, 1983).

Interest to Fisheries : There are no fisheries directed specifically at dogtooth tuna. The species is regularly caught in small numbers during certain seasons at Port Blair, Andaman Islands, the Philippines, outside the reefs off Queensland, and near the Ryukyu and Ogasawara Islands, Japan (Silas, 1963a:898) near offshore reefs in Fiji (Lewis, Chapman & Sesewa, 1983), off Tahiti, Western Samoa and the Marquesas. Hand lines, pole-and-line fishing, and surface trolling are the usual methods of capture. Initial high catches are usually not maintained.

Local Names : AUSTRALIA: Dogtooth tuna; Queensland: Pegtooth tuna; Scaleless tuna, Whiteflesh tuna; FIJI: Yatu-ni-toga; INDIA: Dogtooth tuna; JAPAN: Isomaguro, Tokakin; MALDIVES: Dogtooth tuna, Worhimas (Divehi); PACIFIC ISLANDS TRUST TERRITORIES: Palau: Yassar (Tobi); PITCAIRN ISLAND: Jackass; SEYCHELLES: Thon blanc (juveniles), Thon gros yeux; SOUTH AFRICA: Dogtooth tuna, Hoektand-tuna; TANZANIA: Jodary (Swahili), Tunny; USSR: Gimnosarda, Odnotsvetnaya gimnosarda, Odnotsvetnaya pelamida; YEMEN DEM REP: Moakaba (Arabic).

Literature : Silas (1963a, species synopsis); Collette & Chao (1975); Lewis, Chapman & Sesewa (1983).

Remarks : A moderate ciguatoxic reaction was produced by feeding 6 of 13 large fish from Enewetok Atoll (fork length 55 to 135 cm, weight 3.2 to 35.4 kg) to mongooses (Randall, 1980).

Katsuwonus Kishinouye, 1923

SCOMBR Kats

Genus with reference : Katsuwonus Kishinouye, 1915:21. Type-species: Thynnus pelamis Linnaeus, 1758 by monotypy.

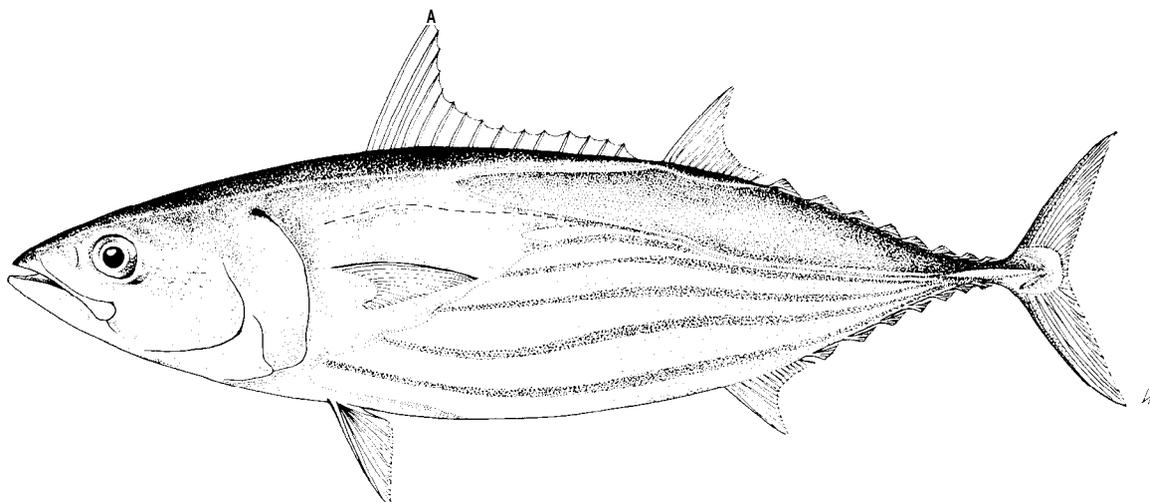
Katsuwonus pelamis (Linnaeus, 1758)

SCOMBR Kats 1

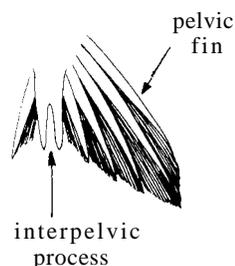
Scomber pelamis Linnaeus, 1758, Systema Naturae, ed. X:297.

Synonymy : Scomber pelamides Lacèpede, 1800; Scomber pelamys - Bloch & Schneider, 1801; Thynnus pelamys - Cuvier, 1817; Thynnus pelamis - Risso, 1826; Thynnus vagans Lesson, 1826; Thinnus pelamis - S.D.W., 1837; Orcynus pelamys - Poey, 1875; Euthynnus pelamys - Jordan & Gilbert, 1882; Gymnosarda pelamis - Dresslar & Fesler, 1889; Orcynus pelamis - Smitt, 1892; Katsuwonus pelamys - Kishinouye, 1915; Katsuwonus pelamis - Kishinouye, 1923; Euthynnus pelamis - Ehrenbaum, 1924; Gymnosarda pelamys - Barnard, 1927.

FAO Names : En - Skipjack tuna; Fr - Bonite à ventre rayé (= Listao); Sp - Listado.

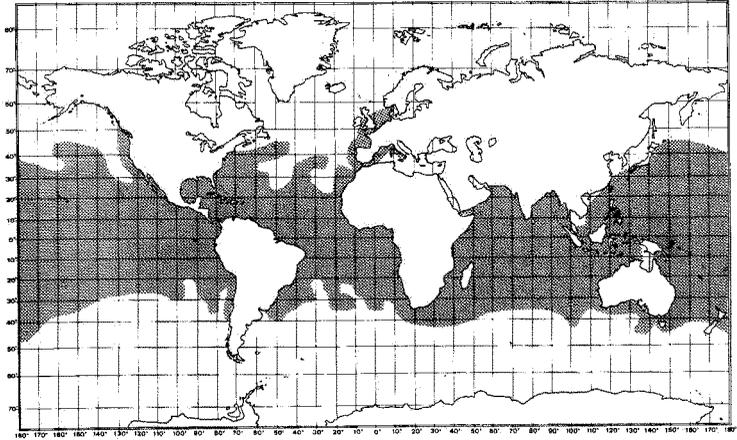


Diagnostic Features : Body fusiform, elongate and rounded. Teeth small and conical, in a single series; gillrakers numerous, 53 to 63 on first gill arch. Two dorsal fins separated by a small interspace (not larger than eye), the first with 14 to 16 spines, the second followed by 7 to 9 finlets; pectoral fins short, with 26 or 27 rays; interpelvic process small and bifid; anal fin followed by 7 or 8 finlets. Body scaleless except for the corselet and lateral line. A strong keel on each side of caudal fin base between 2 smaller keels. Swimbladder absent. Vertebrae 41. 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.



Geographical Distribution : Cosmopolitan in tropical and warm-temperate waters; absent from the Black Sea.

Habitat and Biology : An epipelagic, oceanic species with adults roughly within the 15° C isotherm (overall temperature range of occurrence is 14.7° to 30°C), while larvae are mostly restricted to waters with surface temperatures of at least 25°C. Aggregations of this species tend to be associated with convergences, boundaries between cold and warm water masses (i.e. the polar front), upwelling and other hydrographical discontinuities. Depth distribution ranges from the surface to about 260 m during the day, but is limited to near surface waters at night.



Skipjack tuna spawn in batches throughout the year in equatorial waters, and from spring to early fall in subtropical waters, with the spawning season becoming shorter as distance from the equator increases (see Matsumoto, Skillman & Dizon, in press). Fecundity increases with size but is highly variable, the number of eggs per season in females of 41 to 87 cm fork length ranging between 80 000 and 2 million.

Food items predominantly include fishes, crustaceans and molluscs. Even though Carangidae and Balistidae are part of the diet of skipjack tuna in all oceans, the wide variety of species taken suggest it to be an opportunistic feeder preying on any forage available. The feeding activity peaks in the early morning and in the late afternoon. Cannibalism is common. The principal predators of skipjack are other tunas and billfishes.

It is hypothesized that the skipjack tuna in the eastern central Pacific originate in equatorial waters, and that the pre-recruits (up to 35 cm fork length), split into a northern group migrating to the Baja California fishing grounds, and a southern group entering the central and south American fishing areas. Having remained there for several months, both groups return to the equatorial spawning areas. A similar migration pattern has been observed in the northwestern Pacific. Studies of the local movements of skipjack tuna showed that small fish (under 45 cm fork length) made nightly journeys of 25 to 106 km away from a bank but returned in the morning, while big individuals moved around more independently.

Skipjack tuna exhibit a strong tendency to school in surface waters. Schools are associated with birds, drifting objects, sharks, whales or other tuna species and may show a characteristic behaviour (jumping, feeding, foaming, etc.).

In the absence of reliable age determination methods, estimates of longevity vary at least between 8 and 12 years. A review of the present state of exploitation and potential of stocks is contained in Matsumoto, Skillman & Dizon (in press).

Size : Maximum fork length is about 108 cm corresponding to a weight of 32.5 to 34.5 kg; common to 80 cm fork length and a weight of 8 to 10 kg. The all-tackle angling record is a 18.93 kg fish with a fork length of 99 cm taken in Mauritius in 1982. Fork length at first maturity is about 45 cm.

Interest to Fisheries : Skipjack make up about 40% of the world's total tuna catch and have come to replace yellowfin as the dominant tuna species since a few years. In the period from 1978 to 1981, catches of *K. pelamis* were reported by 43 countries from 15 Fishing Areas. The yearly world catch in this period fluctuated between 697 760 (in 1981) and 796 034 metric tons (in 1978). Nearly half of the annual catch (47-50%) in this period was landed by Japan. Other countries landing over 10 000 metric tons per year were the USA (worldwide), Indonesia, Papua New Guinea, Solomon Islands, and the Philippines (Fishing Area 71), France, Senegal and Spain (Fishing Area 34), the Maldives and Sri Lanka (Fishing Area 51), and Ecuador (Fishing Area 77, particularly in the Gulf of Guayaquil) (FAO, 1983). In the Indian Ocean, skipjack fisheries are not yet well developed, but on the basis of the distribution of hydrographical factors, Sharp (1979) suggests areas of potential exploitation.

Skipjack tuna is taken at the surface, mostly with purse seines and pole-and-line gear but also incidentally by longlines. Other (artisanal) gear include gillnets, traps, harpoons and beach seines. The importance of flotsam or manmade aggregation devices has increased greatly in recent years. Furthermore, supporting exploration techniques such as aerial spotting find increasing application in skipjack fisheries and utilization of remote sensing is being tried experimentally. In the pole-and-line/bait boat fishery, availability of suitable bait-fish presently represents one of the major constraints and hence, efforts to culture bait-fishes are receiving more attention (Kearney & Rivkin, 1981). It appears, however, that bait rearing is hardly feasible on large enough scale to support a major fishery. Skipjack tuna are marketed fresh, frozen and canned. In Japan, they are also dried (Katsuobushi).

Local Names : ADEN (Gulf of): AF muss, Dabub, Hargheiba; ALBANIA: Palamida; ANGOLA: Bonito; AUSTRALIA: Skipjack, Striped tuna, Watermelon; BRAZIL: Bonito de barriga listada, Bonito rajado; BRITISH WEST INDIES: Banjo, Barriole, Oceanic bonito, White bonito; CANADA: Oceanic bonito, Skipjack, Skipjack

tuna, Striped bonito, Thonine à ventre rayé; CHILE: Atún, Barrilete, Cachorreta, Cachureta, Cachurreta; CUBA: Atún, Merma; DENMARK: Bugstribet bonit; EGYPT: Tunna; FRANCE: Bonite, Bonite a ventre rayé, Bonitou, Bounicou, Listao; Tahiti: Auhopu; GERMANY FR: Bauchstreifiger, Echter Bonito; GREECE: Pelamis, Pelamys, Tonina; INDIA: Bonito, Choorā, Yali-phila-mas, Metti, Oceanic skipjack, Varichoora; INDONESIA: Cakalang, Skipjack, Tjakalong, Tjakalong-lelaki, Tjakalong-merah, Tjakalong-perempuan; ISRAEL: Balamida; ITALY: Impiriali, Nzirru, Paamia, Paamitun, Palamatu, Palametto, Palamia, Palamida, Palamitu, Palometta, Tonina de Dalmazia, Tonnetto; JAPAN: Hongatsuo, Katsuo, Katsuwo, Katuwo, Magatsuwo, Mandagatsuwo, Mandara; KENYA: Sehewa (Swahili), Skipjack; KOREA REP: Da-raeng-i, Ga-da-raeng-i, Ga-da-ri, Gang-go-deung-so, Mog-maen-dung-i, So-young-chi, Yeo-da-raeng-i; MADAGASCAR: Bonite, Bonite a ventre rayé, Diodary, M'bassi; MALDIVES: Godhaa (large), Kadumas (small), Skipjack tuna; MEXICO: Barrilete; MONACO: Bonita, Bunita; MOROCCO: L'bakoura, Listao, Listaoune; NETHERLANDS: Gestreepte tonijn; NEW ZEALAND: Bonito, Skipjack, Skipper, Striped bonito, Striped tunny; NORWAY: Bonit; PACIFIC ISLANDS TRUST TERRITORIES Polynesia: Atu, Bonito; PAPUA NEW GUINEA: Tjakalang; PERU: Barrilete; PHILIPPINES: Bankulis, Bonito, Gulyasan, Oceanic bonito, Palawayan, Pundahan, Puyan, Skipjack, Sobad, Striped tuna, Tulingan; POLAND: Bonite; PORTUGAL: Bonito, Bonito de ventre rayado, Gayado, Listado, Sarrajao, Serra; Madeira: Gaiado; ROMANIA: Palamida, Palamida lacherda; SENEGAL: Bonite a ventre rayé (French); Kiri-kiri (Lebou); Listao (French); SOMALIA: Sehewa; SOUTH AFRICA: Bonito, Katunkel, Lesser tunny, Oceanic bonito, Pensstreep-tuna, Skipjack, Skipjack tuna, Watermelon; SPAIN: Atún de altura, Bonita, Bonito de altura, Bonito de ventre rayado, Bonito del sur, Bonitol, Lampo, Listado, Llampua, Palomida, Skipjack; Canary Islands: Bonito; SRI LANKA: Balaya, Bonito, Scorai; SURINAME: Oceanic bonito, White bonito; SWEDEN: Bonit; TAIWAN, PROVINCE OF CHINA: Then chien; TANZANIA: Sehewa. TUNISIA: Bonite, Boussenna, Ghzel; UK: Bonito, Striped bellied bonito, Striped bellied tunny; USA: Arctic bonito, Bonito, Mushroom, Ocean bonito, Oceanic bonito, Oceanic skipjack, Skipjack, Skipjack tuna, Skippy, Striped bonito, Striped tuna, Victor fish, Watermelon; Hawaii: Aku, Aku kinai; USSR: Katsuo, Malyj tunets-bonito, Okeanskij bonito, Polosatyj tunets, Skipdzhek; VENEZUELA: Bonito; YUGOSLAVIA: Tunj prugavac, Trup prugavac.

Literature : Jones & Silas (1963, Indian Ocean); Postel (1963, Atlantic); Waldron (1963, Pacific); Fischer, ed. (1973, Species Identification Sheets, Mediterranean and Black Sea); Fischer & Whitehead, eds (1974, Species Identification Sheets, Eastern Indian Ocean/Western Central Pacific); Sharp & Dizon (1978); Forsbergh (1980, Pacific); Collette (1978, Species Identification Sheets, Western Central Atlantic; 1981, Species Identification Sheets, Eastern Central Atlantic); Habib, Clement & Fischer (1981); Matsumoto, Skillman & Dizon (in press, species synopsis).

Remarks : The East African Swahili name "Sehewa" is also in use for Auxis and small Euthynnus species.

Orcynopsis Gill, 1862

SCOMBR Orcy

Genus with reference : Orcynopsis Gill, 1862:125. Type-species : Scomber unicolor Geoffrey St. Hilaire, 1817, by original designation.

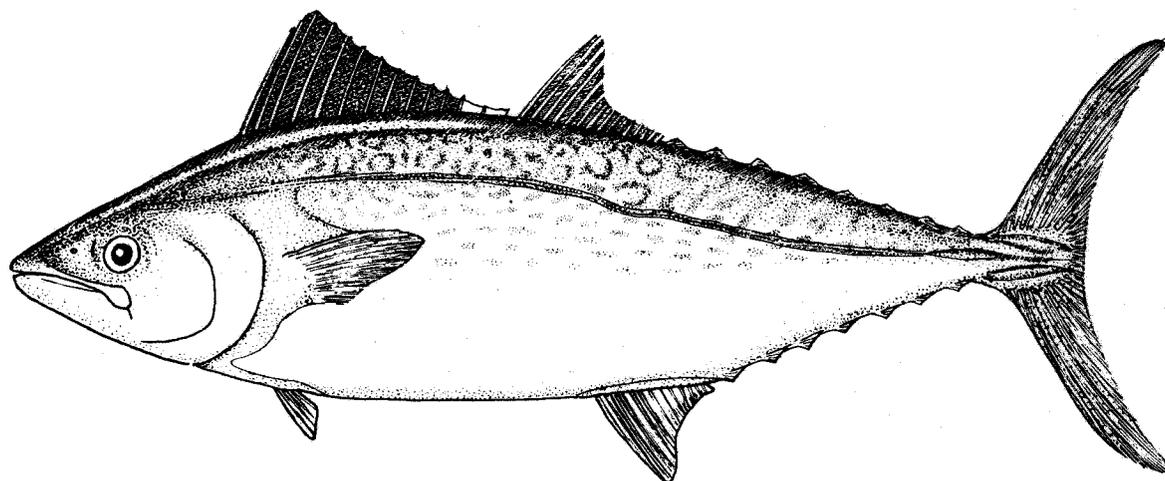
Orcynopsis unicolor (Geoffroy St. Hilaire, 1817)

SCOMBR Orcy 1

Scomber unicolor E. Geoffroy St. Hilaire, 1817, Description Egypte, Hist.Nat., pl. 24 (fig. 6) (Alexandria, Egypt).

Synonymy : Cybiium bonapartii Verany, 1847; Pelamys unicolor - Günther, 1860; Orcynopsis unicolor - Gill, 1862; Thynnus peregrinus - Collett, 1879a; Orcynopsis unicolor - Collett, 1879; Pelamichthys unicolor - Giglioli, 1880; Cybiium veranyi - Giglioli, 1880; Sarda unicolor - Smitt, 1892.

FAO Names : En - Plain bonito; Fr - Palomette; Sp - Tasarte.

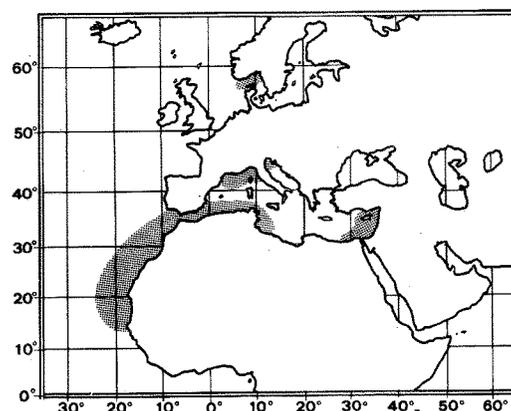


Diagnostic Features : Body relatively short and deep, strongly compressed. Mouth rather large, upper jaw reaching to hind margin of eye; 2 tooth patches on upper surface of tongue; 18 to 27 large conical teeth on upper jaw; 12 to 21 on lower jaw; 12 to 17, usually 14 to 16, gillrakers on first arch; laminae of olfactory rosette 25 to 28; interorbital width 23.9 to 31% of head length. Dorsal fins close together, the first short and high with 12 to 14 spines and almost straight in outline; the second with 12 to 15 rays followed by 7 to 9 finlets; anal fin with 14 to 16 rays followed by 6 to 8 finlets; pectoral fins short with 21 to 23 rays; interpelvic process small and bifid. Body naked behind the well developed corselet except for a band of scales along the bases of the dorsal fins and patches of scales around the bases of the pectoral, pelvic, and anal fins; caudal peduncle slender, with a well developed lateral keel between two 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 17 or 18 precaudal plus 19 to 21 caudal, total 37 to 39. Colour: back blue-black with a faint mottled pattern laterally but no prominent stripes or spots; lower sides silvery; anterior three quarters of first dorsal fin black, second dorsal fin and dorsal finlets dark, some yellow on anal fin.

Geographical Distribution : Eastern Atlantic from Oslo, Norway south to Dakar, Senegal (Collette & Chao, 1975:fig.69), but the range is centered in the southern Mediterranean Sea. Not known from Madeira, the Canaries or the Cape Verde Islands.

Habitat and Biology : An epipelagic, neritic species confined primarily to temperate waters, but juveniles may be encountered in waters of up to 30°C. Small schools of plain bonito cruise at the surface (so that the first dorsal fin stands out of the water like that of sharks), frequently associated with birds.

Plain bonito prey on a variety of mostly small schooling fishes including anchovies (*Engraulis* spp.), sardinellas (*Sardinella* spp.), jacks (*Caranx* spp.), mackerel (*Scoraber* spp.), bogue (*Boops* sp.) and others. Its food spectrum is more restricted than that of *Euthynnus alletteratus* and *Sarda sarda*.



In the Mediterranean, the spawning season extends from July to September while off Senegal it initiates already in May. A female weighing 5 or 6 kg may carry some 500 to 600 000 eggs which are spawned in portions.

Size : Maximum size is 130 cm fork length and 13.1 kg weight; common to 90 cm and 4 to 5 kg. Females grow larger than males. Maturity is reached at about 70 to 80 cm fork length.

Interest to Fisheries : There seems to be no fishery directed at this species. It is taken incidentally in Tunisia, Morocco, Mauritania, and Senegal; the estimated world catch from 1978 to 1981 fluctuated between 501 (in 1979) and 1 068 metric tons (in 1981) (FAO, 1983). The major fishing gear is pole-and-line, but it is also caught with purse seines. Plain bonito is marketed canned or frozen.

Local Names : ALGERIA: Bonite plate, Palomète; DENMARK: Ustribet Pelamide; FRANCE: Palomète; GERMANY FR: Ungestreifter Pelamide; ITALY: Palamita bianca; Sicily: Palamitu; MALTA: Blamto; MAURITANIA: Tasarte; MOROCCO: Palomette; NETHERLANDS: Boniter; PORTUGAL: Palometa; SENEGAL: *Palomette* (French); Sipun (Lebou and Oouloff); SPAIN: Tasarte; SWEDEN: Ostrimmad pelamid; TUNISIA: Qalaqt; USSR: Odnotsvetnyj bonito, Odnotsvetnyj tunets, Palometa.

Literature : Postel (1956); Fischer, ed. (1973, Species Identification Sheets, Mediterranean and Black Sea); Collette & Chao (1975); Trade & Postel (1955); Collette (1981, Species Identification Sheets, Eastern Central Atlantic).

Rastrelliger Jordan & Starks, 1908

SCOMBR Rast

Genus with reference : Rastrelliger Jordan & Starks in Jordan & Dickerson, 1908:607. Type-species: Scomber brachysoma Bleeker, 1850, by original designation.

Diagnostic Features : Body elongate, slightly compressed. Snout pointed; front and hind margins of eye covered by an adipose eyelid; teeth in upper and lower jaws small and conical; teeth absent from vomer and palatine bones (on roof of mouth); gillrakers 21 to 48 on lower limb of first arch. Two widely separated dorsal fins (interspace at least equal to length of first dorsal fin base), the first with 8 to 11 spines, second dorsal and anal fins with 12 rays; anal spine rudimentary; 5 dorsal and 5 anal finlets; interpelvic process small and single; pectoral fin short, with 19 or 20 rays. 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. Vertebrae 13 precaudal plus 18 caudal, total 31; first interhaemal bone anterior to haemal spine of 14th vertebra. Last branchiostegal ray forming wide plate. Colour: back blue-green with 2 rows of small, dark spots on sides of dorsal fin bases, no vertically zig-zag or wavy lines as are present in Scomber; sides and belly silvery, sometimes with several narrow horizontal stripes.

Habitat and Biology : The genus comprises three epipelagic, neritic species occurring in areas where surface temperatures do not fall below 17° C, forming schools of equally sized individuals. Even though there is much overlap in the geographical distribution of the species, food competition is reduced by the selection of different, complementary plankton fractions. Predators include sharks, seerfishes, ribbonfishes, tunas and dolphins.

Interest to Fisheries : The world catch of Rastrelliger increased from 286 000 metric tons in 1975 to about 367 000 in 1981 (FAO, 1983). Countries scoring highest landings were Indonesia, Thailand, India, Malaysia and the Philippines taking mackerels with purse seines, encircling gillnets, lift nets, fish corrals and bamboo stake traps. The fish are marketed fresh, frozen, canned, dried salted and smoked.

Literature : Matsui (1967).

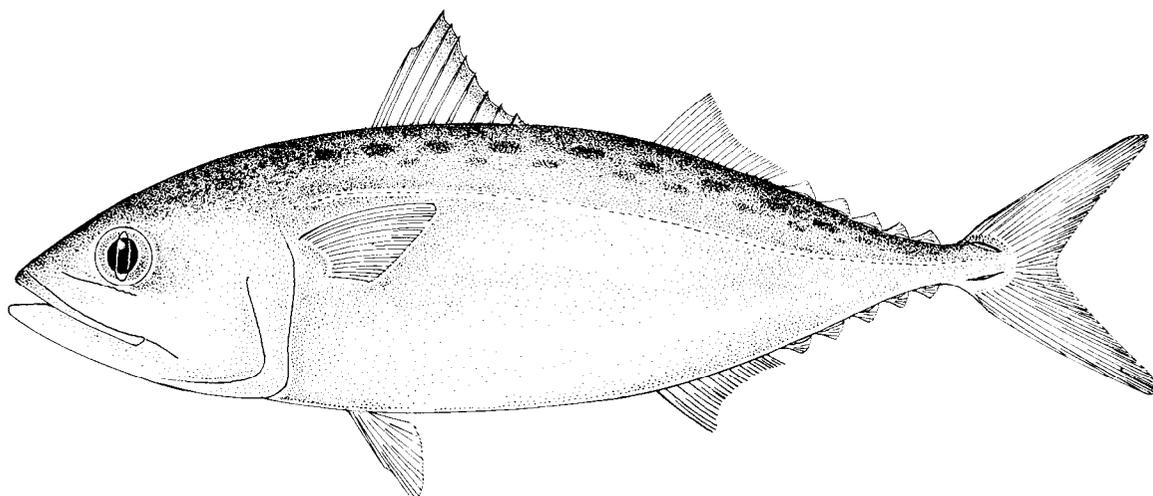
Rastrelliger brachysoma (Bleeker, 1851)

SCOMBR Rast 1

Scomber brachysoma Bleeker, 1851a, Nat.Tijdschr.Ned.-Ind., 1:356 (Batavia).

Synonymy : Scomber neglectus Kampen, 1907; Rastrelliger brachysoma - Jordan & Dickerson, 1908; Rastrelliger neglectus - Beaufort, 1951.

FAO Names : En - Short mackerel; Fr - Maquereau trapu; Sp - Caballa rechoncha.



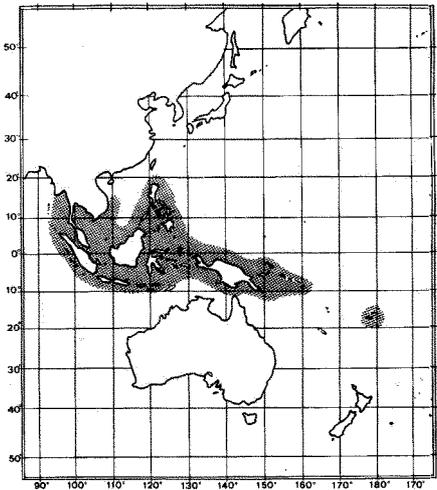
Diagnostic Features : Body very deep, its depth at margin of gill cover 3.7 to 4.3 times in fork length; head equal to or less than body depth. Maxilla covered by lacrimal bone but extending nearly to end of lacrimal; gillrakers very long, visible when mouth is opened, 30 to 48 on lower limb of first gill arch; numerous bristles on longest gillraker, about 150 on one side in specimens of 12.7 cm, 210 in specimens of 16 cm, and 240 at 19 cm fork length. Intestine very long, 3.2 to 3.6 times fork length. Colour: spinous dorsal fin yellowish with a black edge, pectoral and pelvic fins dusky, other fins yellowish.

Geographical Distribution : Central Indo-West Pacific from the Andaman Sea east to Thailand, Indonesia, Papua New Guinea, Philippines, Solomon Islands, and Fiji.

Habitat and Biology : An epipelagic, neritic species that tolerates slightly reduced salinities in estuarine habitats and occurs in areas where surface temperatures range between 20° and 30°C. It schools by size. Batch-spawning is believed to extend from March through September. The short mackerel feeds chiefly on microzooplankton with a high phytoplankton component.

Size : Maximum fork length is 34.5 cm, common from 15 to 20 cm; length at first maturity is about 16 cm.

Interest to Fisheries : Catches of this species are usually either recorded as Rastrelliger spp. or are combined with R. kanagurta. It is the most important commercial species of mackerel in the Philippines, caught the year round with native purse seines (italakop) and fish corrals (ibaklad) in Manila Bay (Manacop, 1958) and by dynamiting. In India, it is fished with a variety of gear such as gillnets, seines, and cast and drift nets operated from boats with out-riggers and from dugout canoes. The catch in the



Philippines fluctuated between 25 183 metric tons in 1978 and 18 962 metric tons in 1981 (FAO, 1983).

Local Names : INDIA: Andaman Islands: Bangadi (Hindi), Chappata; INDONESIA: Kembung perempuan; KAMPUCHEA: Cá bao ma, Plathu; MALAYSIA: Kembong; PHILIPPINES: Aguma-a (Bikol, Visayan), Asa-asa (Pampango), Hasa-hasa (Tagalog, Visayan Banton) Chub mackerel, Kabalyas (Bikol, Tagalog), Linchay (Tagalog), Luman (Kuyano, Tagbanwa), Masangi (Tagalog), Short-bodied mackerel, Tulay (Tagalog); SINGAPORE: Kembong; SOUTH AFRICA: Soeklig-makriel, Spotlight mackerel; USSR: Tropjcheskaya skumbriya; VIET NAM: Cá bao ma, Plathu.

Literature : Manacop (1958); Jones & Silas (1964); Jones & Rosa Jr. (1967); Fischer & Whitehead, eds (1974, Species Identification Sheets, Eastern Indian Ocean/Western Central Pacific).

Remarks : Some common names listed for this species may also or exclusively be in use for R. faughni.

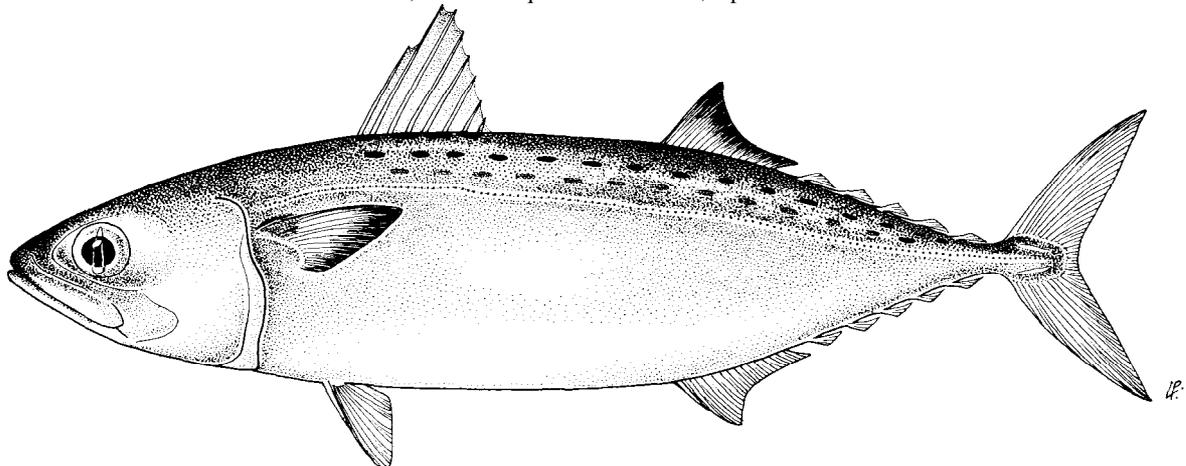
Rastrelliger faughni Matsui, 1967

SCOMBR Rast 2

Rastrelliger faughni Matsui, 1967, Copeia, 1967(1):74-77, fig. 1 (Ulugan Bay, Philippines).

Synonymy : None.

FAO Names : En - Island mackerel; Fr - Maquereau des Iles; Sp - Caballa isleña.



Diagnostic Features : Body slim, its depth at margin of gill cover 4.9 to 6.0 times in fork length; head longer than body depth. Maxilla covered by lacrimal bone extending only 3/4 the length of the lacrimal. Gillrakers shorter than snout; when mouth is opened wide, gillrakers do not extend far into mouth; 21 to 26 rakers on lower limb of first gill arch; few bristles on longest gillraker, 30 to 55 on one side. Intestine short, less or about equal to fork length. Colour: belly yellowish silver; 2 to 6 large spots at base of first dorsal fin, visible from above; two faint stripes at level of lateral line in some specimens; a black blotch behind pectoral fin base; outer margin of dorsal and pectoral fins dark.

Geographical Distribution : Central part of the Indo-West Pacific from Taiwan Island, south through the Philippines and New Britain and east to Fiji (new record), west through Indonesia, Thailand and Malaysia, to India at least as far as Madras.

Habitat and Biology : Island mackerel, like all species of the genus Rastrelliger, is epipelagic, neritic, occurring in waters where surface temperatures do not fall below 17°C. It feeds on the largest zooplankton organisms, thus complementing the planktonic food spectrum of the other two Rastrelliger species.

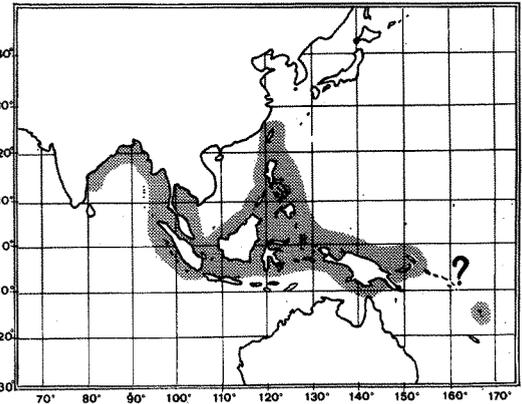
Size : Maximum size is at least 20 cm fork length and 0.75 kg in weight.

Interest to Fisheries : Separate statistics are not reported for Island mackerel, but it is taken along with other species of Rastrelliger off Taiwan Island, the Philippines, Indonesia, and Malaysia. In the Philippines it is taken in commercial quantities by fish corrals (ibaklad), bag nets and round seines (sapiao) (Manacop, 1958:84).

Local Names : INDONESIA: Kembang; PHILIPPINES: Chub mackerel; USSR: Avstralijskaya tropjcheskaya skumbraya.

Literature : Manacop (1958) as Scomber australasicus; Matsui (1967); Fischer & Whitehead, eds (1974, Species Identification Sheets, Eastern Indian/Western Central Pacific).

Remarks : Prior to its description in 1967, several authors (such as Beaufort, 1951, and Manacop, 1958) used the name Scomber australasicus for this species. For this reason, some of the local names here given for the other two species of Rastrelliger and for Scomber australasicus may apply to R. faughni in some localities.



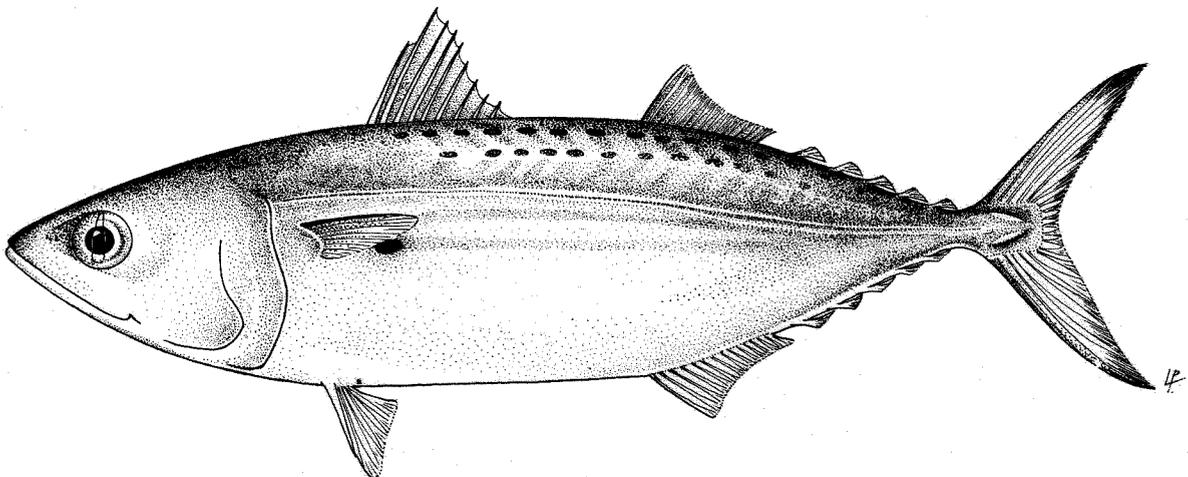
Rastrelliger kanagurta (Cuvier, 1817)

SCOMBR Rast 3

Scomber kanagurta Cuvier, 1817, Règne Animal, 2:313 (based on Russell's pl. 136, India).

Synonymy : Scomber loo Lesson, 1829; Scomber canagurta - Cuvier, 1829; Scomber chrysozonus Rüppell, 1836; Scomber microlepidotus Rüppell, 1836; Scomber moluccensis Bleeker, 1856; Scomber reani Day, 1870; Scomber lepturus Agassiz, 1874; Rastrelliger kanagurta - Jordan & Dickerson, 1908; Rastrelliger microlepidotus - Jordan & Dickerson, 1908; Rastrelliger loo - Jordan & Dickerson, 1908; Rastrelliger chrysozonus - Kishinouye, 1915; Rastrelliger serventyi Whitley, 1944.

FAO Names : En - Indian mackerel; Fr - Maquereau des Indes; Sp - Caballa de la India.



Diagnostic Features : Body moderately deep, its depth at margin of gill cover 4.3 to 5.2 times in fork length; head longer than body depth. Maxilla partly concealed, covered by the lacrimal bone, but extending to about hind margin of eye; gillrakers very long, visible when mouth is opened, 30 to 46 on lower limb of first arch; a moderate number of bristles on longest gillraker, 105 on one side in specimens of 12.7 cm, 140 in specimens of 16 cm, and 160 in specimens of 19 cm fork length. Intestine 1.4 to 1.8 times fork length. Colour: narrow dark longitudinal bands on upper part of body (golden in fresh specimens) and a black spot on body near lower margin of pectoral fin; dorsal fins yellowish with black tips, caudal and pectoral fins yellowish; other fins dusky.