14a. Head length about 3.2 times in standard length; body depth 4.2 to 4.5 times in standard length; pelvic fin length 1.3 to 1.4 times shorter than pectoral fin length.....***Tongaichthys***

14b. Head length 3.4 to 3.8 times in standard length; body depth 5 to 6 times in standard length; pelvic fin length twice shorter than pectoral fin length.....***Thyrsitops***

15a. Dermal processes on tip of jaws; lateral line fairly straight (Fig. 48); second dorsal-fin rays 19 to 24.....***Nesiarchus***

15b. No dermal processes on tip of jaws; lateral line abruptly curved below posterior part of first dorsal fin (Fig. 49); second dorsal-fin rays 11 to 13.....***Thyrsites***

lateral line fairly straight

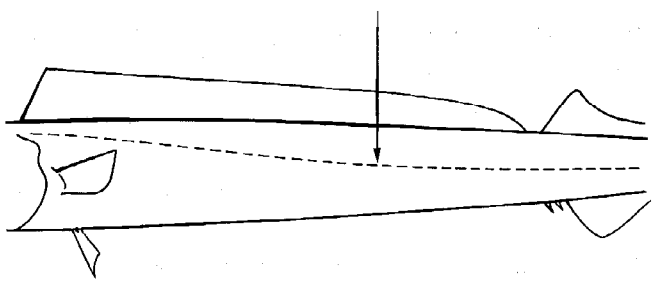


Fig. 48 ***Nesiarchus***

lateral line abruptly curved

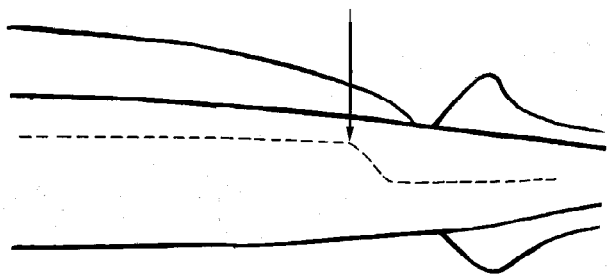


Fig. 49 ***Thyrsites***

2.2.3 Information by species

Diplospinus Maul, 1948

GEMP Dipl

Diplospinus Maul, 1948:42. Type species, ***Diplospinus multistriatus*** Maul, 1948, by monotypy.

Synonyms: None.

Diagnostic Features: See species.

Species: A single species recognized so far, although some meristic characters vary geographically. For example, the total number of vertebrae are 57 to 62 in the North and Central Atlantic and 60 to 64 in the Southern Hemisphere (Mikhailin, 1983). Further taxonomic studies are necessary.

Diplospinus multistriatus Maul, 1948

Fig. 50

GEMP Dipl 1

Diplospinus multistriatus Maul, 1948:42-47, fig. 17 (Madeira, Portugal,from the stomach of *Alepisaurus ferox*).

Synonyms: None.

FAO Names: En - Striped escolar; **Fr** - Escolier rayé; **Sp** - Escolar rayado.

Field Characters: Anus situated midway between tip of snout and tip of caudal fin, distance to first anal-fin spine equal to head length. Anterior part of anal fin very low, nearly without fin membrane.

Diagnostic Features: Body extremely elongate and compressed; its body depth 13 to 18 times in standard length; anus situated midway between tip of snout and tip of caudal fin and in front of first anal-fin spine by a distance equal to head length.Head length contained 6 times in standard length; lower jaw extends anterior to upper jaw; tip of upper jaw with a small conical dermal process; 3 immovable and 3 or 4 movable fang-like teeth anteriorly in upper jaw; no teeth on vomer; no interorbital slits. Second

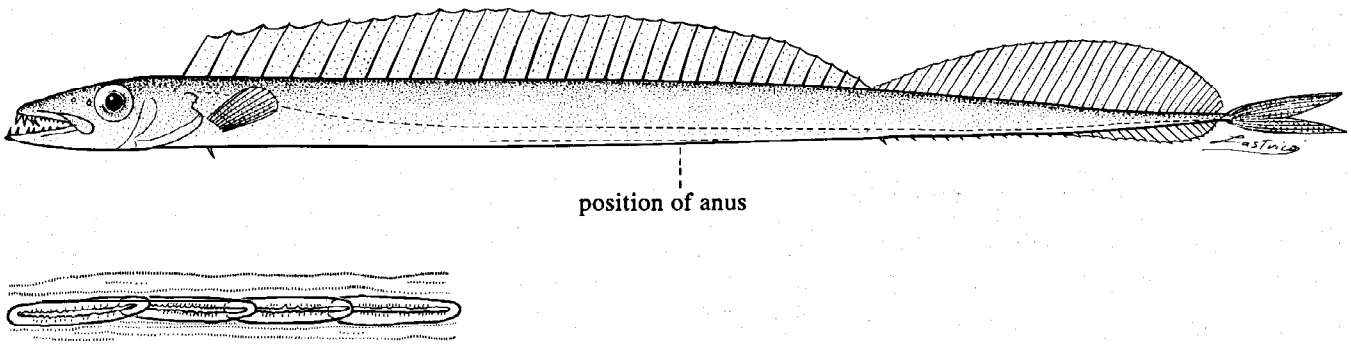


Fig. 50 ***Diplospinus multistriatus***

dorsal-fin base about half the length of first dorsal-fin base, with XXX to XXXVI spines and 35 to 44 soft rays; anal fin with II small free spines in front of 28 to 35 soft rays, the anterior part short with greatly reduced fin membrane; pectoral fins with 11 to 13 soft rays, pelvic fins reduced to a minute spine in adults. A single lateral line, situated closer to ventral profile than dorsal profile posteriorly. Vertebrae total 57 to 64, including 32 to 36 precaudal and 24 to 28 caudal. **Colour**: Silvery with narrow dark dotted lines along body; gill membranes jet-black.

Geographical Distribution: Central water masses of the Atlantic, Indian and Pacific oceans. Rather rare, but relatively abundant in the northern West and southern East Atlantic, and southern East Pacific (Fig. 51).

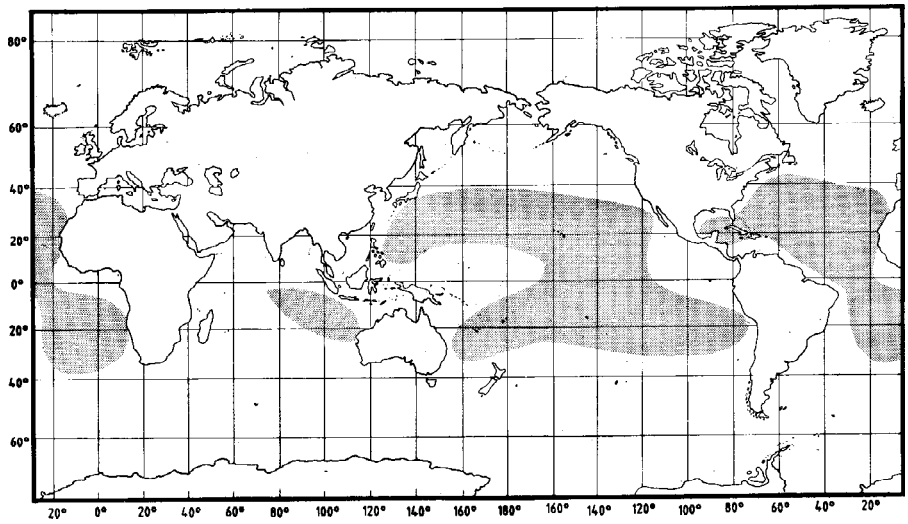


Fig. 51

Habitat and Biology: Mesopelagic, oceanic at depths to about 1 000 m. Migrates upward at night to 100 to 200 m, probably forming schools during daytime. Feeds on crustaceans and small fish. Females mature at about 16 cm. Reproductive throughout the year with fecundity of about 1 200 eggs.

Size: Maximum about 33 cm standard length (Boltachev, 1986), common to 20 cm.

Interest to Fishery: No special fishery for this species.

Local Names: JAPAN: Hoso-kurotachi.

Literature: Voss (1954); Tucker (1956); Haedrich (1964); Strasburg (1964); Haedrich and Nielsen (1966); Ahlstrom (1971); Fourmanoir (1969, 1971a); Fitch and Gotshall (1972); Legand et al. (1972); Parin and Becker (1972); Evseenko and Serebryakov (1974); Parin et al. (1974, 1977, 1978, 1990a); Karrer (1975); Clarke and Wagner (1976); Mikhailin (1976b, 1983); Gorbunova (1977, 1982); Nakamura (1982a,b, 1984b, 1986c); Boltachev (1986), Parin (1986, 1990c).

Epinnula Poey, 1854

GEMP Epin

Epinnula Poey, 1854:369. Type species, ***Epinnula magistralis*** Poey, 1854, by monotypy.

Synonyms: None.

Diagnostic Features: See species.

Species: A single species recognized so far, but Grey (1953, p. 140) proposed that Atlantic and Japanese specimens differing in number of soft dorsal- and anal- fin rays represent distinct species or subspecies.

Epinnula magistralis Poey, 1854

Fig. 52

GEMP Epin 1

Epinnula magistralis Poey, 1854:369, pl. 32, figs 3-4 (Habana, Cuba).

Synonyms: None.

FAO Names: En - Domine; **Fr -** Escolier maître.; **Sp** - Dómine.

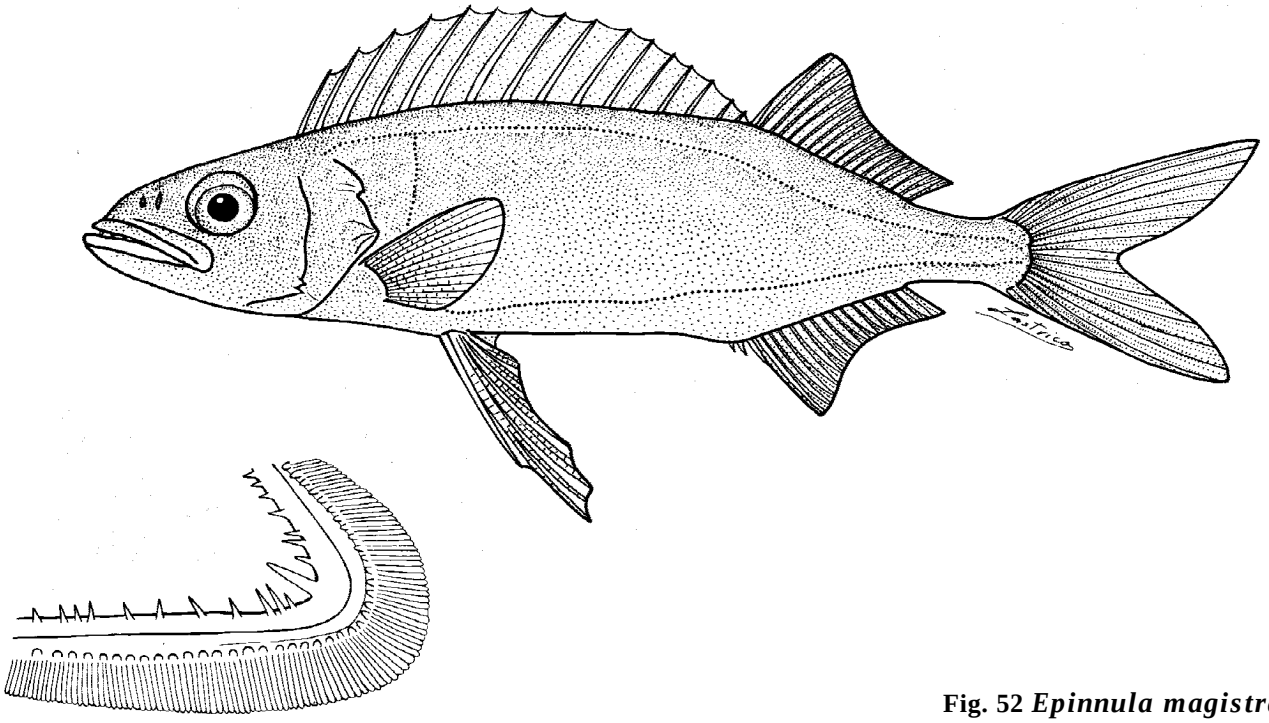


Fig. 52 *Epinnula magistralis*
(after Matsubara and Iwai, 1952)

Field Characters: Lateral line double, the lower branching off under the fifth or sixth dorsal-fin spine. Two small sharp spines on lower angle of preopercle.

Diagnostic Features:Body fairly deep and compressed; its depth 4.1 to 5.6 times in standard length. Head length 3.0 to 4.1 times in standard length; dorsal profile of head slightly elevated in front of anterior nostril, then nearly straight to origin of dorsal fin; two small sharp spines on lower angle of preopercle; mouth large with several fangs, some depressible in upper jaw near tip of snout, and a pair of large canine teeth near tip of lower jaw, exposed outside when mouth closed; lower jaw extends anterior to upper jaw; lateral teeth on jaws conical and widely separated, those of lower jaw larger than those of upper jaw; vomer edentate; uniserial small conical teeth on palatines. First dorsal fin fairly high, with XV or XVI strong and pungent spines, second dorsal fin high anteriorly with 17 to 20 soft rays; anal fin a little smaller than second dorsal fin, with II free and I comprised and 13 to 17 soft rays; pectoral fins short and round in shape, with 15 soft rays; pelvic fins larger than pectoral fins, with I spine and 5 soft rays. Two lateral lines, both starting above upper end of gill opening; the lower branching off under the space between the fifth to sixth dorsal-fin spines, the lower running near ventral contour. Vertebrae total 32, including 16

precaudal and 16 caudal. **Colour:** Body light greyish blue, not paler below; head slightly darker than body: fin membranes of first dorsal and pelvic fins black; basal part of caudal fin dark blue, caudal fin jet-black except for whitish 8 shorter rays near axis of body; rays of pectoral and second dorsal fins spotted with black; anal fin pale black; buccal and branchial cavities pale brown; peritoneum black.

Geographical Distribution: Only known from the Caribbean Sea and southern Japan. One juvenile specimen recently collected in eastern North Indian Ocean (12º27'S, 116º16'E) (Fig. 53).

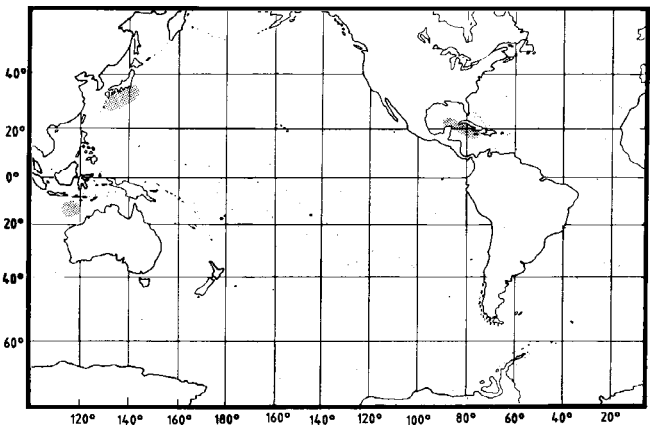


Fig. 53

Habitat and Biology: Probably mesobenthopelagic. Rare species, known from only a few specimens.

Size: The largest collected specimen is 1 m standard length, all others less than 45 cm standard length.

Interest to Fishery: No special fishery for this species.

Local Names: CUBA: Dómine; JAPAN: Aosumiyaki.

Literature: Kamohara (1938); Matsubara and Iwai (1952); Grey (1953); Duarte-Bello (1959); Nakamura (1984b); Parin and Kotlyar (1991).

Gempylus Cuvier, 1829

GEMP Gemp I

Gempylus Cuvier, 1829:200. Type species, ***Gempylus serpens*** Cuvier, 1829, by monotypy.

Synonyms: ***Acinacea*** Bory de Saint-Vincent, 1804 (nomen oblitum). ***Lemnisoma*** Lesson, 1831. ***Zyphothyca*** Swainson, 1839. ***Leucoscombrus*** Van der Hoeven, 1855.

Diagnostic Features: See species.

Species: A single species recognized so far, but populations in the Atlantic and the Indo-Pacific differ significantly in number of vertebrae and first dorsal-fin spines: vertebrae 51 to 55 versus 48 to 50, first dorsal fin with XXX to XXXII (rarely XXIX) versus XXVI to XXX spines, respectively (Parin and Becker, 1972; Parin et al., 1978; Collette et al., 1984). Therefore, these populations may represent distinct species.

Gempylus serpens Cuvier, 1829

Fig. 54

GEMP Gemp 1

Gempylus serpens Cuvier, 1829:200 (Tropic of Cancer).

Synonyms: ***Acinacea notha*** Bory de Saint-Vincent, 1804 (nomen oblitum). ***Lemnisoma thyrsitoides*** Lesson, 1831. ***Gempylus coluber*** Cuvier in Cuv. and Val., 1831. ***Gempylus ophidianus*** Poey, 1860.

FAO Names: En - Snake mackerel; **Fr** - Escolier serpent; **Sp** - Escolar de canal.

Field Characters: Two lateral lines, originating at one point, near upper edge of opercle. Dorsal and anal finlets 5 to 7.

Diagnostic Features: Body greatly elongate and strongly compressed, its depth 15 to 18 times in standard length. Head length 5.5 to 6 times in standard length; lower jaw extends anterior to upper jaw; tips of both jaws with dermal processes; 3 immovable and 0 to 3 movable fangs anteriorly in upper jaw; no fangs in lower jaw; vomer edentate. First dorsal-fin with XXVI to XXXII spines, its base very long, second dorsal fin with a minute spine and 11 to 14 soft rays followed by 5 or 6 finlets; anal fin with II free

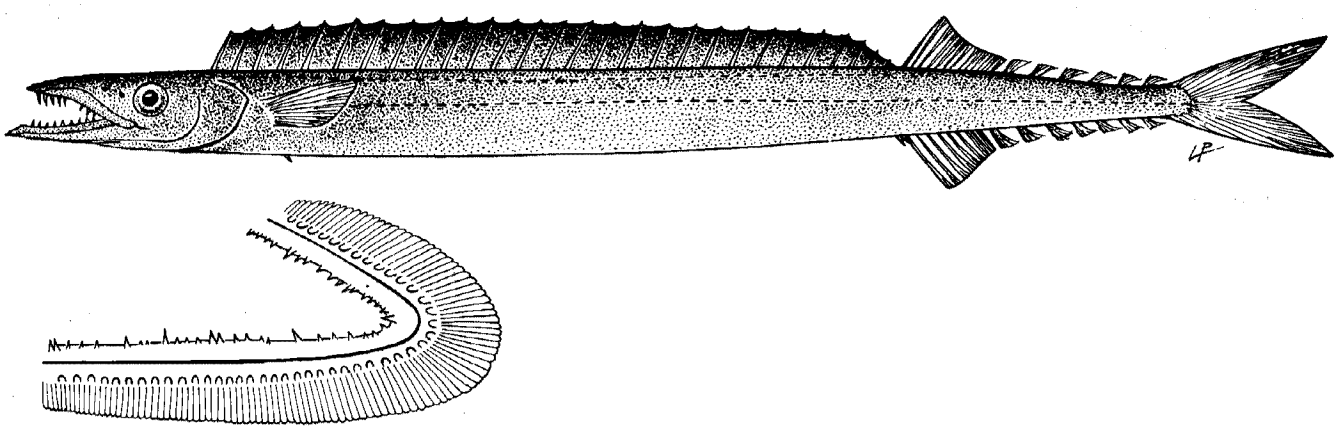


Fig. 54 ***Gempylus serpens***

and I comprised spine and 10 to 12 soft rays followed by 6 or 7 finlets; pectoral fins with 12 to 15 soft rays; pelvic fins reduced to I spine and 3 or 4 soft rays. Two lateral lines, both originating below first spine of dorsal fin, the upper follows dorsal contour of body to end of first dorsal-fin base, the lower descends gradually posterior to about tip of pectoral fin and runs midlaterally. Scales absent except on posterior part of body. Vertebrae total 48 to 55, including 24 to 29 precaudal and 23 to 26 caudal. **Colour:** Body uniformly dark brown; all fins dark brown with somewhat darker margins.

Geographical Distribution: Worldwide in tropical and subtropical seas, adults also often caught in temperate waters. Specimens caught on the Atlantic side of South Africa (33º08'16º 47'E at 700 m) (Parin and Golovan, 1976) probably strayed from the Indian Ocean (Fig. 55).

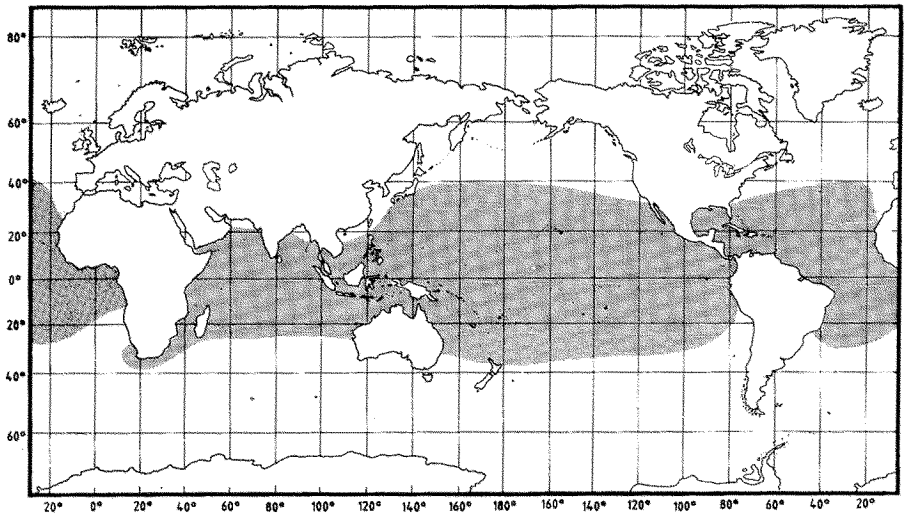


Fig. 55

Habitat and Biology: Strictly oceanic, epi- and mesopelagic from surface to depths of 200 m and perhaps deeper. Usually solitary. Rather common. Adults migrate to surface at night (nyctoepipelagic); larvae and juveniles stay near surface only during the day. Feeds on fishes (myctophids, exocoetids, sauries, scombrids), squid and crustaceans. Males mature at 43 cm standard length, females at 50 cm. Spawns in tropical. waters throughout the year, Fecundity of about 300 thousand to 1 million eggs.

Size: Maximum about 1 m standard length, common to 60 cm.

Interest to Fisheries: No special fishery for this species, but appears sometimes as bycatch in the tuna longline fishery.

Local Names: CANADA: Snake mackerel; FRANCE: Escolier serpent; JAPAN: Kurotachi-kamasu; RUSSIA: Zmeinaya makrel; SOUTH AFRICA: Slangmakriel; UK: Snake mackerel; USA: Snake mackerel: VIETNAM: Ca thu ran.

Literature: Matsubara and Iwai (1952); Grey (1953); Voss (1954); Jones (1960); Sebastian and Vedavyasa Rao (1963); Parin (1967, 1976b, 1986); Ahlstrom (1971); Fourmanoir (1969, 1971a); Legand et al.

(1972); Parin and Becker (1972); Parin et al. (1974, 1977, 1978, 1990a); Belyanina (1975, 1982); Clarke and Wagner (1976); Parin and Golovan (1976); Gorbunova (1977, 1982); Nakamura (1977, 1984a,b, 1986b,c); Kukuev (1982); Fujii (1983); Gloerfelt-Tarp and Kaiola (1984); Machida (1985); Parin (1986, 1990c).

Lepidocybium Gill, 1862

GEMP Lepid

Lepidocybium Gill, 1862:125. Type species, ***Cybium flavobrunneum*** Smith, 1849, by original designation (also monotypic).

Synonyms: ***Xenogramma*** Waite, 1904. ***Diplogonurus*** Noronha, 1926. ***Lepidosarda*** Kishinouye, 1926.

Diagnostic Features: See species.

Species: A single species recognized so far.

Lepidocybium flavobrunneum (Smith, 1849)

Fig. 56

GEMP Lepid 1

Cybium flavo-brunneum Smith 1849, pt. 20 (Cape of Good Hope, Africa).

Synonyms: ***Xenogramma carinatum*** Waite, 1904. ***Diplogonurus maderensis*** Noronha, 1926. ***Lepidosarda retigramma*** Kishinouye, 1926.

FAO Names: En - Escolar; **Fr** - Escolier noir; **Sp** - Escolar negro.

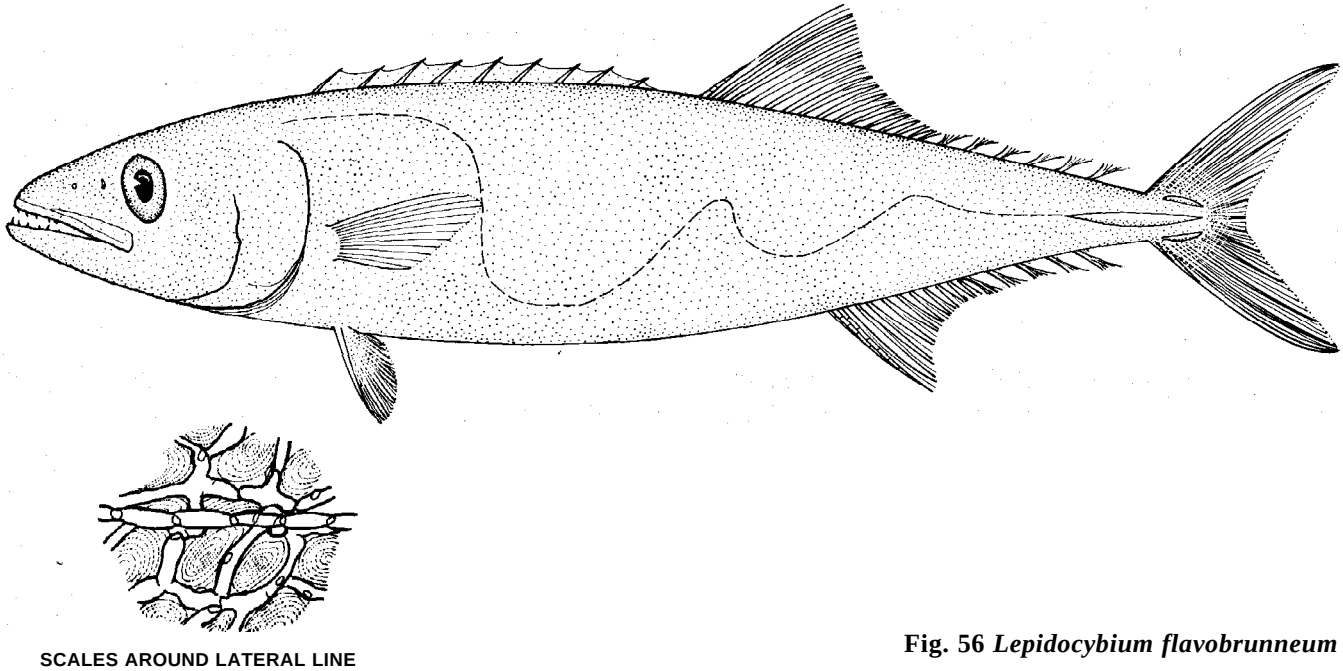


Fig. 56 ***Lepidocybium flavobrunneum***

Field Characters: First dorsal fin very low. Caudal peduncle with a prominent keel flanked with 2 small supplementary keels, one above and one below. A single, sinuous lateral line.

Diagnostid Features: Body semifusiform and slightly compressed; its depth about 4.1 to 4.3 times in standard length. Head length 3.6 to 3.7 times in standard length: lower jaw slightly extends anterior to upper jaw; tip of both jaws without dermal processes; two pairs of fangs anteriorly in upper jaw; vomer and palatines each with uniserial small teeth. First dorsal fin very low with VIII or IX spines, well separated from second dorsal fin which has 16 to 18 soft rays followed by 4 to 6 finlets; anal fin with I or II comprised spines and 12 to 14 soft rays; pectoral fins with 15 to 17 soft rays; pelvic fins well developed, with I spine and 5 soft rays; caudal fin wide but rather small, with a strong median keel flanked by 2 smaller supplementary keels, one on each side of the median keel. A single sinuous lateral line. Scales rather small, each surrounded by a network of tubules bearing pores. Vertebrae total 31, including 16 precaudal and 15 caudal. **Colour**: Body almost uniformly dark brown, becoming almost. black with age.

Geographical Distribution: Widely distributed in tropical and temperate seas of the world, but probably absent from the northern Indian Ocean (Fig. **57).**

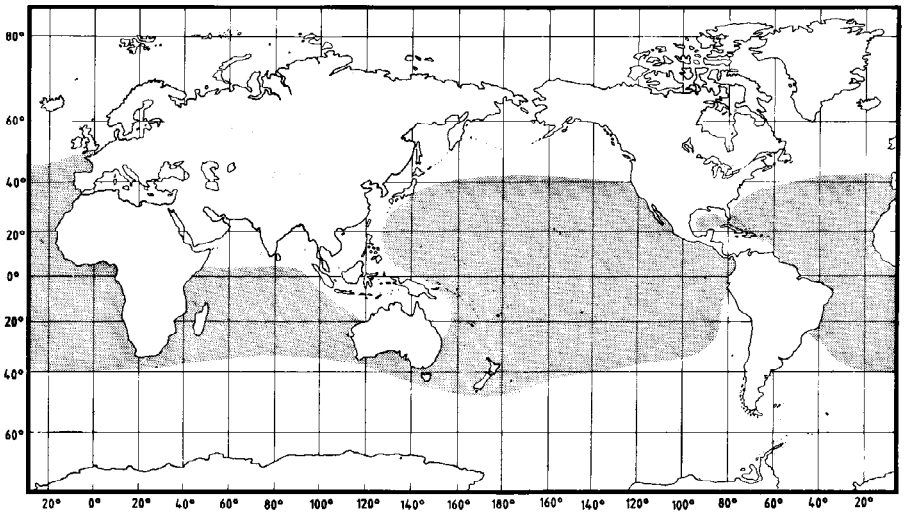


Fig. 57

Habitat and Biology: Mostly over the continental slope, down to 200 m and more. Often migrates upward at night. Feeds on squid, fishes (bramids, coryphaenids, scombrids, trachipterids, etc.) and crustaceans. Weighs 6.5 kg at 77 cm standard length (89 cm total length) and 13 kg at 91 cm standard length (105 cm total length).

Size: Maximum about 200 cm standard length, common to 150 cm.

Interest to Fisheries: No special fishery for this species, but appears as bycatch in the tuna longline fishery, caught usually at depths from 100 to 300 m. In eastern tropical Atlantic an average of 0.17 to 0.20 fish per 1 000 hooks (Maksimov, 1970).

Local Names: CANADA: Escolar; FRANCE: Escolier noir; JAPAN: Aburasoko-mutsu; SPAIN: Escolar negro, Escolar (Canary Islands); RUSSIA: Eskolar; USA: Escolar.

Literature: Munro (1949); Schultz and Springer (1956); Bartlett and Backus (1962); Merrett (1968); Fourmanoir (1969, 1970, 1971 b); Maksimov (1970); Legand et al. (1972); Belyanina (1975); Parin (1976b, 1986, 1990c); Gorbunova (1977); Nakamura (1977, 1981, 1984b, 1986b,c); Fitch and Schultz (1978); Paulin and Habib (1980); Kukuev (1982); Fujii (1983); Gloerfelt-Tarp and Kailola (1984); Machida (1985); Shcherbachev et al. (1986); Golovan and Pakhorukov (1988); Parin et al. (1990b).

Nealotus Johnson, 1865

GEMP Neal

Nealotus Johnson, 1865:434. Type species, ***Nealotus tripes*** Johnson, 1865, by monotypy.

Synonyms: ***Machaerope*** Ogilby, 1899.

Diagnostic: Features: See species.

Species: A single species recognized so far.

Nealotus tripes Johnson, 1865

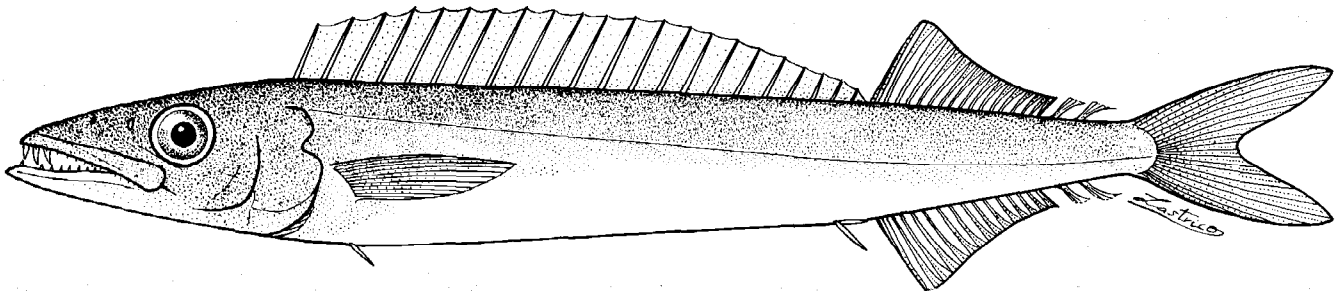
Fig. 58

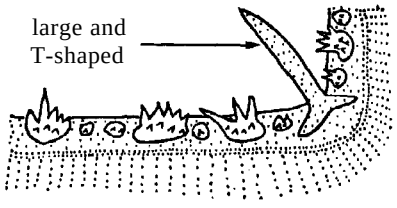
GEMP Neal 1

Nealotus tripes Johnson, 1865:434 (Madeira, Portugal).

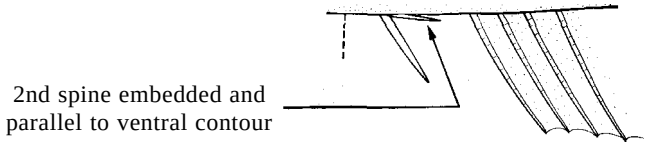
Synonyms: ***Machaerope Latispinus*** Ogilby, 1899.

FAO Names: En - Black snake mackerel; **Fr** - Escolier reptile; **Sp** - Escolar oscuro.





FIRST GILL ARCH



DETAIL OF ANAL RN

Fig. 58 ***Nealotus tripes***

Field Characters: Anal fin with a large dagger-shaped first spine followed by a second smaller spine almost entirely embedded and parallel to ventral contour just in front of the soft rays. A single lateral line, fairly straight and oblique.

Diagnostic Features: Body elongate'and compressed; its body depth about 7 to 9 times in standard length. Head length 4 times in standard length; upper profile of head nearly straight from tip of snout to origin of dorsal fin; lower jaw extends anterior to upper jaw; tip of both jaws without dermal processes; 3 immovable and 0 to 3 movable fangs anteriorly in upper jaw; 1 fang anteriorly on each side of lower jaw; vomer edentate. Gill raker at angle of first arch T-shaped and larger than others. Dorsal fin with XX or XXI spines and 16 to 19 soft rays followed by 2 finlets; anal fin with I dagger-shaped spine and I smaller free spine parallel to ventral contour in front of 15 to 19 soft rays followed by 2 finlets; pectoral fins with 13 or 14 soft rays; pelvic fins reduced to I small spine. A single, fairly straight lateral line. Large scales, easily deciduous. Vertebrae total 36 to 38, including 21 or 22 precaudal and 15 or 16 caudal. **Colour:** Body blackish brown; dorsal and anal fins pale brown; buccal and branchial cavities and peritoneum black.

Geographical Distribution: Tropical and temperate waters of Atlantic, Indian and Pacific oceans. The southernmost Indian Ocean occurrence (28º08'S, 49º06'E) based on an unpublished record (R/V VITYAZ-II, station 2781) (Fig. 59).

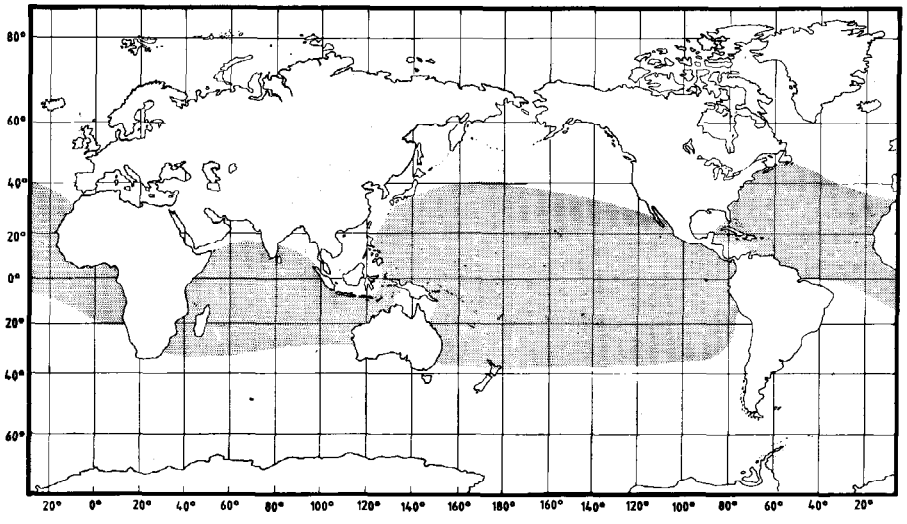


Fig. 59

Habitat and Biology: Oceanic, epi- to mesopelagic from surface to about 600 m depth. Migrates to surface at night (nyctoepipelagic). Feeds on myctophids and other small fishes, squid and crustaceans. Matures at about 15 cm standard length.

Size: Maximum about 25 cm standard length, common to 15 cm.

Interest to Fisheries: No special fishery for this species.

Local Names: CANADA: Black snake mackerel; JAPAN: Fuurai-kamasu; RUSSIA: Nealot; USA: Black snake mackerel.

Literature: Matsubara and Iwai (1952); Strasburg (1964); Backus et al. (1965); Haedrich and Nielsen (1966); Mago (1970); Ahlstrom (1971); Fourmanoir (1969, 1971a); Legand et al. (1972); Parin and Becker (1972); Belyanina (1975, 1982); Parin et al. (1973, 1977, 1978, 1981, 1990a); Clarke and Wagner (1976); Parin and Golovan (1976); Gorbunova (1977, 1982); Nakamura and Paxton (1977); Kukuev (1982); Nakamura (1982b, 1984b); Fujii (1983); Machida (1985); Shcherbachev et al. (1986); Parin (1986, 1990c); Paulin et al. (1989).

Neoepinnula Matsubara and Iwai, 1952

GEMP Neo

Neoepinnula Matusbara and Iwai, 1952:193-1 94. Type species, ***Epinnula orientalis*** Gilchrist and von Bonde, 1924, by original designation (also monotypic).

Synonyms: None.

Field Characters: Body moderately deep (depth less than 5 times in standard length). Two lateral lines, originating above upper angle of gill opening, the lower descends along margin of gill opening, then follows ventral contour of body. Pelvic fins normally developed, No dorsal or anal finlets.

Diagnostic Features: Body moderately deep and compressed. Lower jaw slightly extends anterior to upper jaw; tip of both jaws without dermal processes; no spines at angle of preopercle; jaw dentition includes anterior fangs and slightly compressed lateral teeth; one small tooth on each side of vomer; uniserial small teeth on palatines. Gill rakers on first arch with a single cusp and many small spines; angular raker long, with 2 longitudinal series of minute spines, triple-rooted. First dorsal fin with XVI spines, second dorsal fin with I spine and 16 to 20 soft rays; anal fin with II free and I comprised spine and 17 to 20 soft rays; pelvic fins well developed, its length about 3 times in head length, with I spine and 5 soft rays; pectoral fins with 13 to 16 soft rays. Two lateral lines, both originate above upper angle of gill opening, the upper follows dorsal contour of body to caudal peduncle, the lower descends downward along margin of gill opening, rounds pectoral base and follows ventral contour of body to end of anal-fin base and gradually ascends to middle of caudal-fin base. Body entirely covered with small deciduous scales. Vertebrae total 32, including 16 precaudal and 16 caudal; no epineurals or epipleurals. **Colour:** Body silvery or greenish brown; buccal and branchial cavities pale to black; first dorsal fin blackish.

Biology, Habitat and Distribution: Benthopelagic, dwelling at upper slope at 180 to 570 m depth. Known from tropical waters of the West Atlantic, Indian and West Pacific.

Interest to Fisheries: None.

Remarks: Two species are known.

Key to Species of *Neoepinnula:*

1a. Interorbital space narrower than diameter of eye; pectoral fins with 15 or 16 soft rays; dorsal fin inserted above upper angle of gill opening; buccal and branchial cavities pale or dusky..... ***N. americana***

1b. Interorbital space wider than diameter of eye; pectoral fins with 13 or 14 (rarely 15) soft rays; dorsal fin inserted behind upper angle of gill opening; buccal and branchial cavities usually black..... ***N. orientalis***

Neoepinnula americana (Grey, 1953) Fig. 60 **GEMP Neo 2**

Epinnula orientalis americanus Grey, 1953:137 (Gulf of Mexico: 29º20'N, 87º42'W).

Synonyms: None.

FAO Names: En - American sackfish; **Fr -** Escolier americain; **Sp** - Escolar americano.

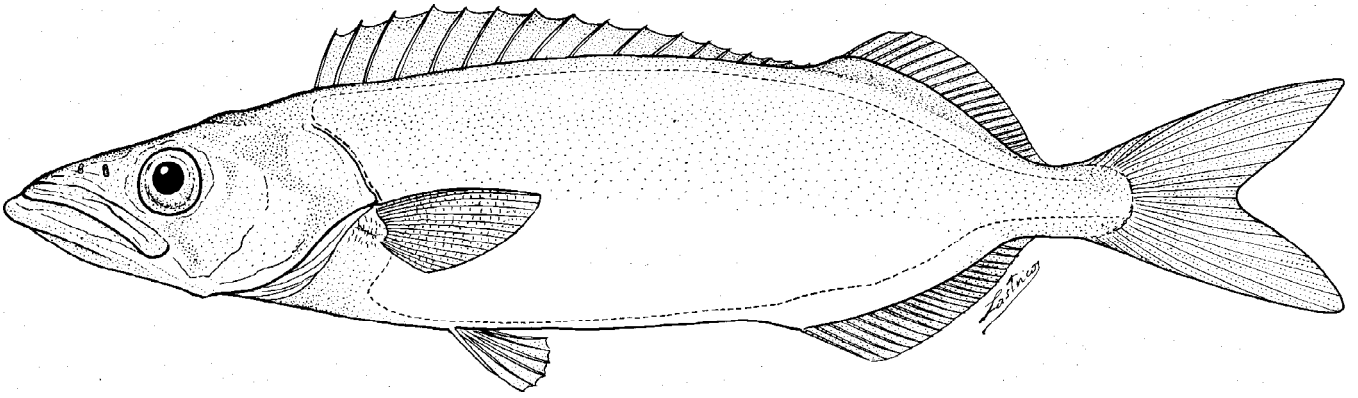


Fig. 60 ***Neoepinnula americana***
(after Grey, 1959)

Field Characters: Dorsal-fin insertion above angle of gill opening. Lining of buccal and branchial cavities pale.

Diagnostic Features: Body moderately deep, its depth 4.2 to 4.7 times in standard length. Head length 3.2 to 3.4 times in standard length; interorbital space 1.1 to 1.3 times in eye diameter; anteriorly in upper jaw 3 to 6 fangs and 1 fang anteriorly on each side of lower jaw. First dorsal fin inserted above or slightly behind margin of preopercle, with XVI spines and second dorsal fin with I spine and 17 to 20 soft rays; anal fin with II free and I comprised spine and 17 to 20 soft rays; pectoral fins with 15 or 16 soft rays: pelvic fins with I spine and 5 soft rays, inserted beneath middle of pectoral fin. Two lateral lines, both originate above upper angle of gill opening (sometimes the lower lateral line branches off from second or third tubular scale of the upper lateral line).

Colour: Sides of body silvery, back brown; first dorsal fin blackish, second dorsal fin black anteriorly; buccal cavity pale, and branchial cavity pale to dusky.

Geographical Distribution: Known only from the West Atlantic (Gulf of Mexico, Yucatan Channel, Caribbean Sea off Venezuela, and off Suriname) (Fig. 61).

Habitat and Biology: Benthopelagic, from depths of 184 to 457 m.

Size: Maximum 22 cm standard length.

Interest to Fisheries: No special fishery for this species.

Local Names: JAPAN: Tachikamasu.

Literature: Mead (1951); Grey (1959, 1960); Cervigón (1966); Gorbunova (1982); Fujii (1983).

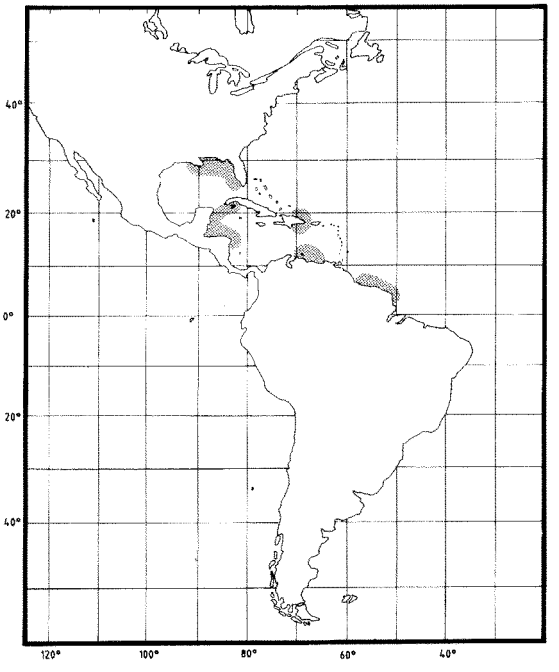


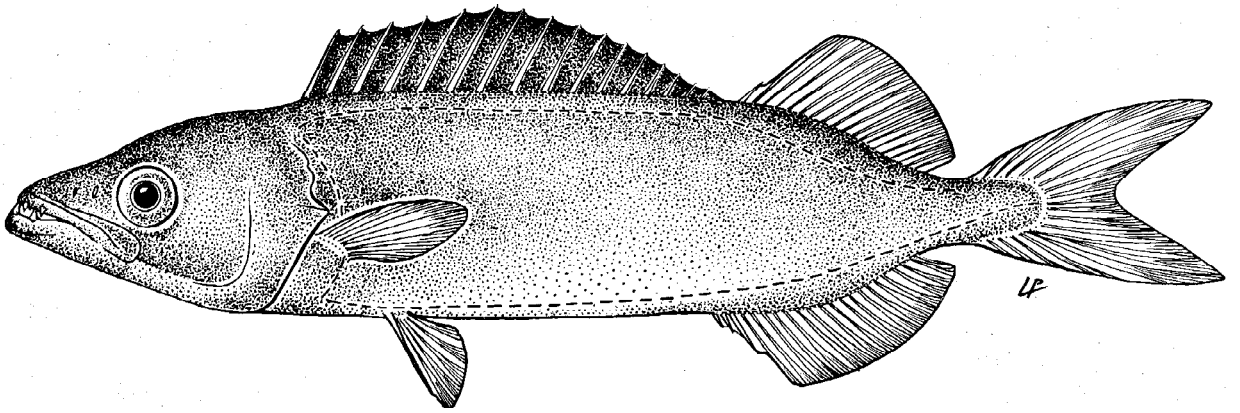
Fig. 61

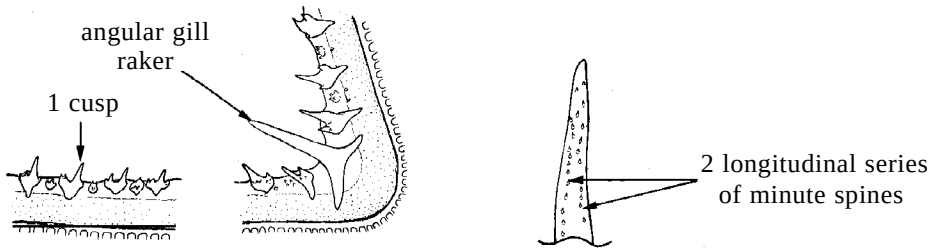
Neoepinnula orientalis (Gilchrist and von Bonde, 1924) Fig. 62 **GEMP Neo 1**

Epinnula orientalis Gilchrist and von Bonde, 1924:15, pl. 4, fig. 1 (southeast Africa).

Synonyms: ***Epinnula orientalis pacifica*** Grey, 1953.

FAO Names: En - Sackfish; **Fr** - Escolier oriental; **Sp** - Escolar oriental.





FIRST GILL ARCH ANGULAR GILL RAKER

Fig. 62 ***Neoepinnula orientalis***

Field Characters: Dorsal fin inserted behind angle of gill opening. Lining of buccal and branchial cavities usually black.

Diagnostic Features: Body moderately deep, its depth 3.9 to 4.2 times in standard length. Head length 3.1 to 3.5 times in standard length; interorbital space 0.7 to 0.9.times in eye diameter; anteriorly in upper jaw 3 immovable and 1 to 3 movable fangs and 1 fang anteriorly on each side of lower jaw. First dorsal fin inserted above insertion of pectoral-fin base with XVI spines, second dorsal fin with I spine and 17 to 20 soft rays; anal fin with II free and I comprised spine and 17 to 19 soft rays; pectoral fins with 13 or 14 (rarely 15) soft rays; pelvic fins with I spine and 5 soft rays, inserted beneath or behind middle of pectoral fin. Two lateral lines, both originate above upper angle of gill opening. Pyloric caeca usually 8. **Colour**: Body greenish brown to dark brown; first dorsal fin blackish, membranes between anterior 3 or 4 spines pigmented more intensively; buccal and branchial cavities usually black.

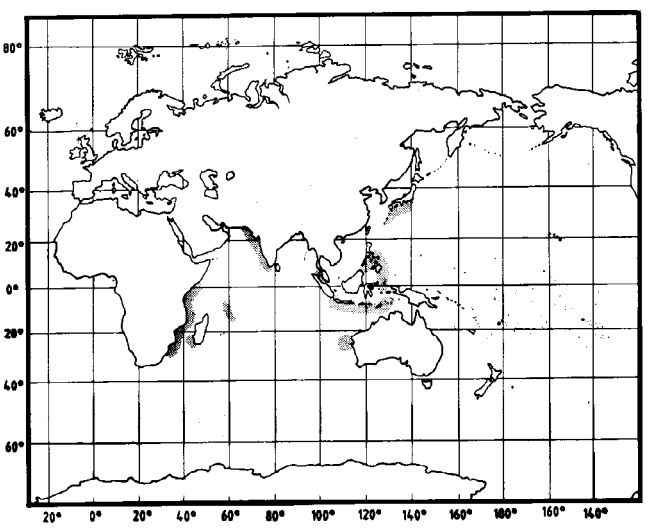


Fig. 63

Geographical Distribution: Indo-West Pacific species recorded from off East Africa (Natal to Kenya), Saya de Malha Bank, Arabian Sea; eastern North Indian Ocean, Flores, Banda, Arafura Sea, Sulawesi and Sulu Seas, off Riu-Kiu and southern Japan (Fig. 63).

Habitat and Biology: Benthopelagic on upper slope between 200 and 570 m. Matures at about 15 cm standard length, feeds on small fish, crustaceans and cephalopods.

Size: Maximum 30 cm standard length.

Interest to Fisheries: No special fishery for this species.

Local Names: JAPAN: Touyou-kamasu, Sokosumiyaki; RUSSIA: Vostochnaya epinula.

Literature: Barnard (1925, 1927); Kamohara (1938); Smith (1949); Matsubara and lwai (1958); Narayana Rao (1965); Parin and Becker (1972); Parin (1976b); Gorbunova (1977, 1982); Parin et al. (1977); Nishikawa and Nakamura (1978); Fourmanoir (1981); Belyanina (1982); Gloerfelt-Tarp and Kailola (1984); Nakamura (1984a,b, 1986c); Machida (1985); Shcherbachev (1987).

Nesiarchus Johnson, 1862

GEMP Nes

Nesiarchus Johnson, 1862:173. Type species, ***Nesiarchus nasutus*** Johnson, 1862, by monotypy.

Synonyms: ***Escolar*** Jordan and Evermann in Goode and Bean, 1896. ***Bipinnula*** Jordan and Evermann, 1896.

Diagnostic Features: See species.

Species: A single species recognized so far.

Nesiarchus nasutus Johnson, 1862

Fig. 64

GEMP Nes 1

Nesiarchus nasutus Johnson, 1862:173 (Madeira, Portugal).

Synonyms: ***Prometheus paradoxus*** Capello, 1867. ***Thyrsitops violaceus*** Bean, 1887.

FAO Names: **En** - Black gemfish; **Fr** - Escolier long nez; **Sp** - Escolar narigudo.

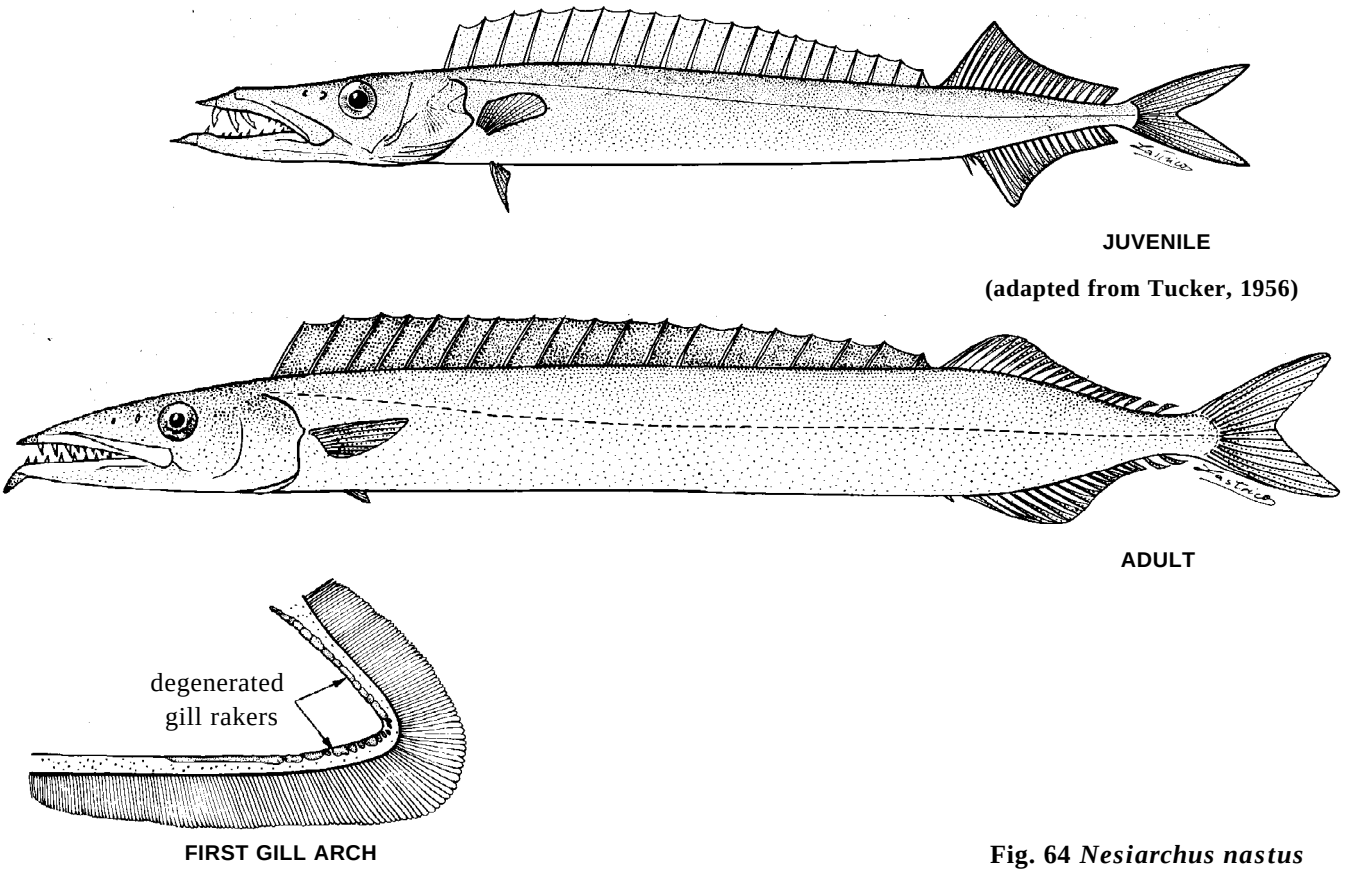


Fig. 64 ***Nesiarchus nastus***

Field Characters: Dermal processes on tips of both jaws well developed. A single and fairly straight lateral line. Snout fairly long. Gill rakers degenerated.

Diagnostic Features: Body fairly elongate and strongly compressed; its depth 10 to 13 times in standard length. Head length 4.2 to 4.6 times in standard length; lower jaw strongly extends anterior to upper jaw; a conical cartilaginous (or dermal) process at tip of each jaw, lower larger than upper; 3 immovable and 0 to 3 movable fangs anteriorly in upper jaw; 1 fang anteriorly on each side of lower jaw; vomer edentate. Gill rakers degenerated. First dorsal fin with XIX to XXI spines, its base long, second dorsal fin with I spine and 19 to 24 soft rays, its base short; anal fin a little smaller than second dorsal fin, with II comprised spines and 18 to 21 soft rays; pectoral fins short, with 12 to 14 soft rays; pelvic fins small, shorter than pectoral fins with I small spine and 5 soft rays. A single fairly straight lateral line, inserted above angle of opercle, gradually sloping posteriorly and runs midlateral above anal fin and caudal peduncle. Vertebrae total 34 to 36, including 20 to 22 precaudal and 14 caudal. **Colour:** Body dark brown with violet tint; fin membranes black; margin of anus black.

Geographical Distribution: Probably worldwide in tropical and subtropical seas except in eastern Pacific and northern Indian oceans. Large-sized strays in cold-temperate waters off Iceland, Norway, northern Japan and southern New Zealand (Fig. 65).

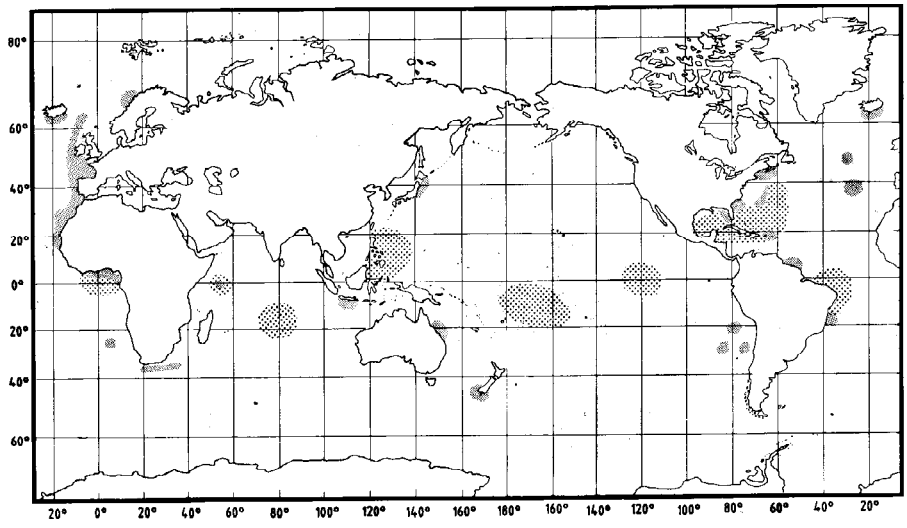


Fig. 65

Habitat and Biology: Adults bentho- to mesopelagic, dwelling on the continental slope or underwater rises at about 200 to 1 200 m, migrate to midwater at night. Larvae and juveniles epi- to mesopelagic, rather common in oceanic ichthyoplankton, only found in the tropics.Feeds on squid, fish and crustaceans. Reproductive throughout the year in warm waters.

Size: Maximum 130 cm standard length, common 30 to 80 cm.

Interest to Fisheries: No special fishery for this species.

Local Names: JAPAN: Hashinaga-kurotachi; PORTUGAL: Peixe espada preto, Peixe coelho de natura (Madeira); RUSSIA: Neziarkh; SPAIN: Pez espada picudo (Canary Islands).

Literature: Grey (1953); Tucker (1956); Fourmanoir (1969, 1979); Wheeler (1969); Legand et al. (1972); Parin and Becker (1972); Quero (1973); Parin (1976b, 1986, 1990c); Parin et al. (1974, 1976, 1978); Nakamura et al. (1981, 1983); Belyanina (1982); Gorbunova (1977, 1982); Fujii (1983); Nakamura (1984b); Konovalenko and Parin (1985); Parin and Prutko (1985); Becker and Evseenko (1986); Shcherbachev et al. (1986); Paulin et al. (1989).