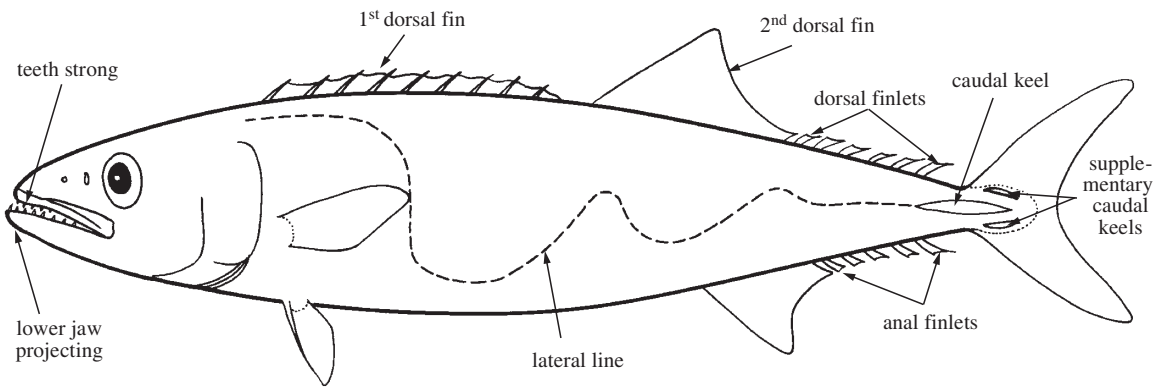
GEMPYLIDAE

Snake mackerels

by I. Nakamura and N.V. Parin

Diagnostic characters: Body elongate and compressed or somewhat fusiform (in *Lepidocybium*, *Ruvettus*, and *Tongaichthys*); size to about 3 m. Mouth large, not protractile, with **strong teeth in jaws, those at front of upper jaw often fang-like**, lower jaw projecting beyond tip of upper jaw. Gill opening wide, left and right branchiostegal membranes not united, free from isthmus. **Two dorsal fins, second (excluding finlets) shorter than first**. Anal fin similar to second dorsal fin in size and shape, or somewhat smaller. Detached finlets often present behind dorsal and anal fins. Caudal fin moderate in size, always forked. No keels on caudal peduncle, except in *Lepidocybium*. Pectoral fins small, shorter than head. **Pelvic fins usually small, often reduced to a single spine with only a few or no soft rays.** Lateral line single or double, ending at caudal-fin base. Scales small or virtually absent, sometimes modified (in *Lepidocybium* and *Ruvettus*). Vertebrae about 35, except in *Gempylus* (about 50) and *Diplospinus* (about 60). **Colour:** back usually brown or dark brown, rarely blue-brown or metalic brown, lower sides and belly silvery, fins usually darker, **no distinct marks or blotches on body.**

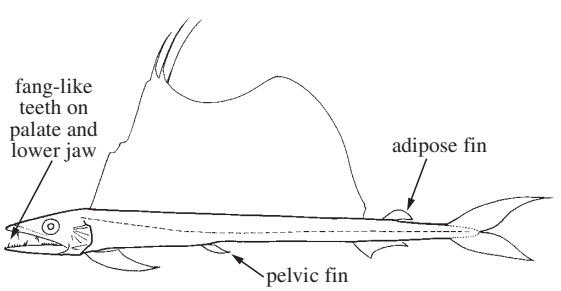


Habitat, biology, and fisheries: Large, fast-swimming, carnivorous fishes inhabiting pelagic or bentho-pelagic waters of tropical and temperate seas throughout the world, usually occurring at depths beyond 150 m, but often migrating to surface at night. Some species, such as *Ruvettus pretiosus*, *Lepidocybium flavobrunneum*, and *Gempylus serpens* are frequently taken as bycatch in longline fisheries.

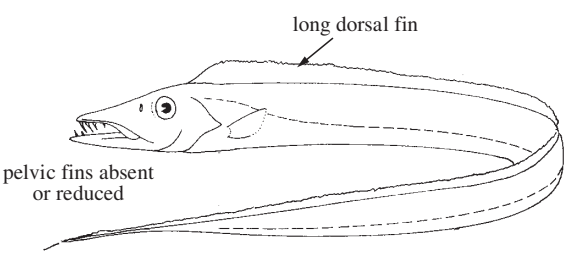
Similar families occuring in the area

Alepisauridae: somewhat similar to elongate gempylids in general appearance, when sail-like dorsal fin is folded back, but easily distinguished by their jelly-like body, a dorsal adipose fin (instead of a rayed second dorsal fin), and insertion of pelvic fins far behind pectoral fins.

Trichiuridae: a single and very long dorsal fin, running almost entirely length of body; no dorsal and anal finlets; caudal fin either very small and forked or body tapering to a point; pelvic fins reduced to a scale-like spine or absent.

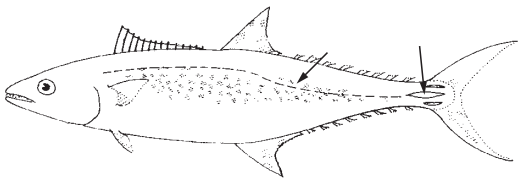


Alepisauridae

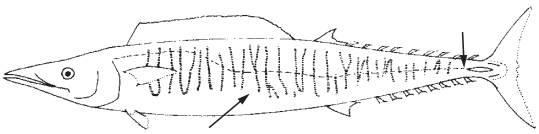


Trichiuridae

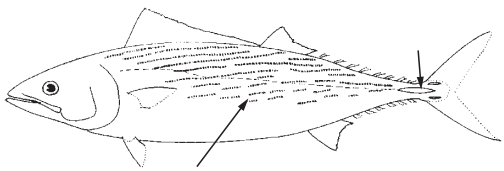
Scombridae: no fangs in jaws; single or more or less single lateral line except *Grammatorcynus*; back blue or blue-grey with bars, spots or other dark markings (back brown, without marking in Gempylidae); caudal keels on caudal peduncle (no keels except *Lepidocybium* in Gempylidae).



***Scomberomorus* sp.**

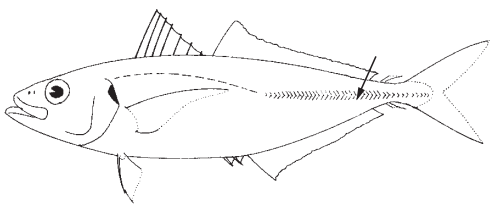


***Acanthocybium* sp.**

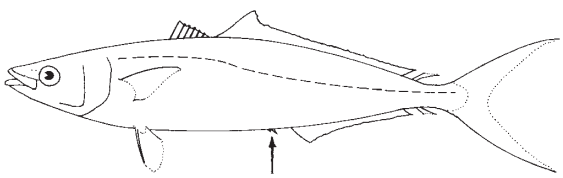


***Sarda* sp.**

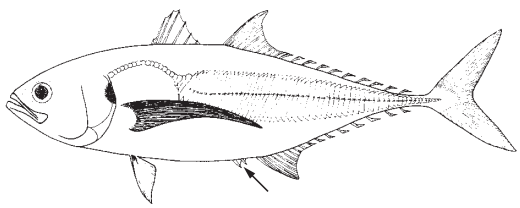
Carangidae: base of first dorsal fin shorter than base of second dorsal fin; II detached spines usually visible in front of anal fin; scutes often present along lateral line; dorsal and anal finlets only present in *Decapterus*, *Elagatis*, and *Megalaspis*; mouth protractile.



***Decapterus* sp.**



***Elagatis* sp.**



***Megalaspis* sp.**

Key to the species of Gempylidae occurring in the area

1a. Dorsal-fin elements more than 60; distance from anus to anal-fin origin much greater than eye diameter, nearly equal to or greater than snout length (Fig. 1) . . ***Diplospinus multistriatus***

1b. Dorsal-fin elements less than 56; distance from anus to anal-fin origin about equal to eye diameter (Fig. 2) . . . . . → ***2***

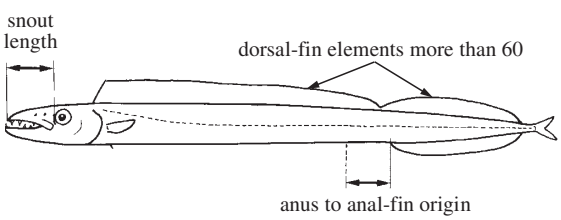


Fig. 1 ***Diplospinus***

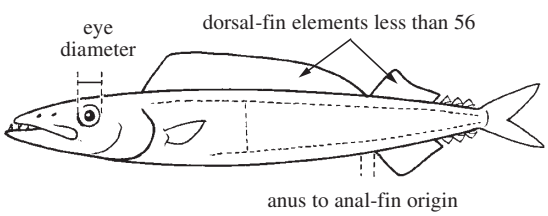


Fig. 2

2a. Caudal peduncle with a prominent keel and 2 small supplemental keels above and below (Fig. 3a); dorsal-fin spines VIII or IX; lateral line single, extremely sinuous (Fig. 3b) . . . . . ***Lepidocybium flavobrunneum***

2b. Caudal peduncle without keels; dorsal-fin spines more than XII; lateral line single, or bifurcated but not sinous (Fig. 4) . . . . . → ***3***

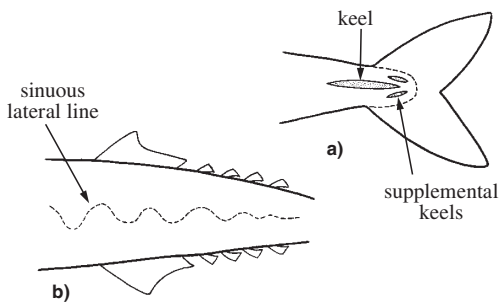


Fig. 3 ***Lepidocybium***

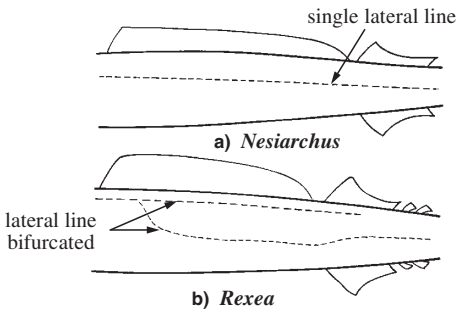


Fig. 4

3a. Skin very rough, scales medium sized, interspersed with spinous bony tubercles (Fig. 5); midventral (abdominal) keel on belly (Fig. 6); lateral line single, obscure . . . . . ***Ruvettus pretiosus***

3b. Skin rather smooth, scales small, not interspersed with spinous bony tubercles; no midventral (abdominal) keel on belly; lateral line single or double, always obvious . . . . . → ***4***

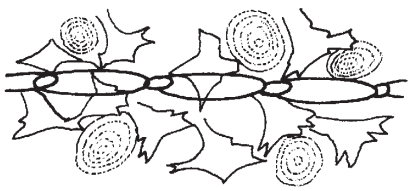


Fig. 5 detail of skin (*Ruvettus*)

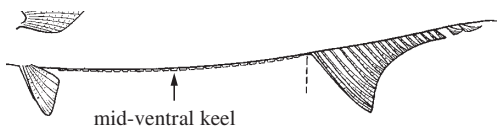


Fig. 6 ventral part of body (*Ruvettus*)

4a. Pelvic fins rudimentary, with I spine and 0 to 4 soft rays, or fins absent . . . . . → ***5***

4b. Pelvic fins well developed, with I spine and 5 soft rays . . . . . → ***12***

5a. Lateral line single . . . . . → ***6***

5b. Lateral line double . . . . . → ***7***

6a. Two free anal-fin spines behind anus, first of them, large, dagger-shaped (Fig. 7); lateral line almost straight (Fig. 8); dorsal-fin spines XX or XXI . . . . . ***Nealotus tripes***

6b. No free anal-fin spines behind anus; lateral line curved abruptly downward anteriorly (Fig. 9); dorsal-fin spines XVII or XVIII . . . . . ***Promethichthys prometheus***

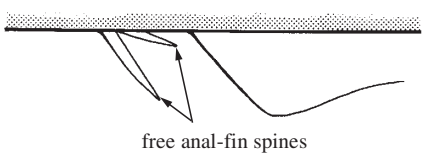


Fig. 7 ***Nealotus***

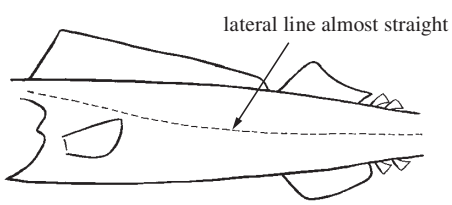


Fig. 8 ***Nealotus***

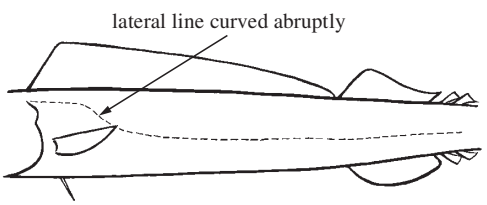


Fig. 9 ***Promethichthys***

7a. Body depth 14.5 to 19 times in standard length; head length 5.5 to 6 times in standard length; dorsal-fin spines XXVI to XXXII; dorsal and anal finlets 5 to 7; both lateral lines originating at one point at upper edge of opercle (Fig. 10) . . . . . ***Gempylus serpens***

7b. Body depth 5 to 8 times in standard length; head length 2.7 to 3.9 times in standard length; dorsal-fin spines XVII to XIX; dorsal and anal finlets 2 or 3; lower lateral line branching off below third to seventh dorsal-fin spines (Fig. 11) . . . . . → ***8***

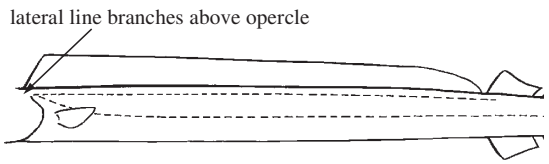


Fig. 10 ***Gempylus***

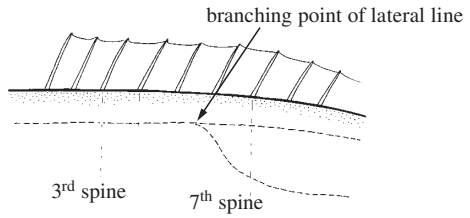


Fig. 11 first dorsal fin

8a. Lateral line very low, running along lower edge of body, anterior branch extends in front of oblique connecting lateral line (Fig. 12) . . . . . ***Rexichthys johnpaxtoni***

8b. Lower lateral line not low, running nearly midbody, without anterior branch (Fig. 13). . . (***Rexea***) → ***9***

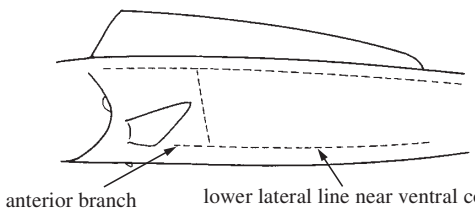


Fig. 12 ***Rexichthys***

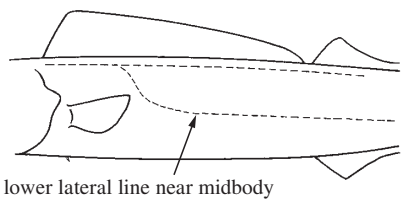


Fig. 13 ***Rexea***

9a. Base of first dorsal fin 2.2 to 2.6 times longer than base of second dorsal fin (including finlets) . . . . . → ***10***

9b. Base of first dorsal fin 2.7 to 3.4 times longer than base of second dorsal fin (including finlets) . . . . . → ***11***

10a. Pelvic fins represented by a small spine at less than about 20 cm standard length and entirely absent at more than that . . . . . ***Rexea prometheoides***

10b. Pelvic fins normally developed with I spine and 2 or 3 soft rays . . . . . ***Rexea solandri***

11a. Lateral line bifurcating below middle of interspace between fourth and fifth spine of first dorsal fin or further anterior (Fig. 14) . . . . . ***Rexea antefurcata***

11b. Lateral line bifurcating below fifth spine of first dorsal fin or further posterior (Fig. 15) . . . . . ***Rexea bengalensis***

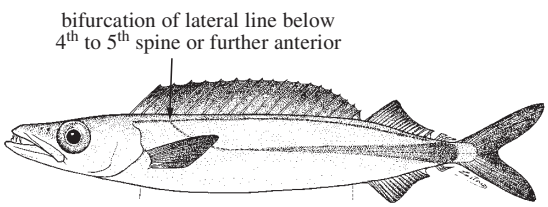


Fig. 14 ***Rexea antefurcata***

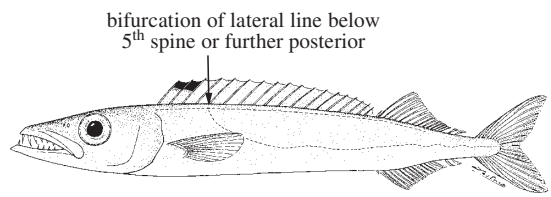


Fig. 15 ***Rexea bengalensis***

12a. Lateral line double . . . . . → ***13***

12b. Lateral line single . . . . . → ***14***

13a. Dorsal-fin spines XVII to XIX; cartilaginous processes on jaws (Fig. 16a); lower lateral line running on midbody (Fig. 16b) . . . . . ***Thyrsitoides marleyi***

13b. Dorsal-fin spines less than XVI; no cartilaginous processes on jaws; lower lateral line running near ventral contour (Fig. 17) . . . . . ***Neoepinnula orientalis***

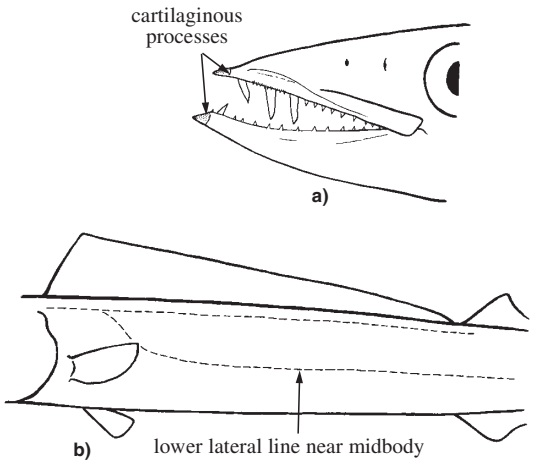


Fig. 16 ***Thyrsitoides***

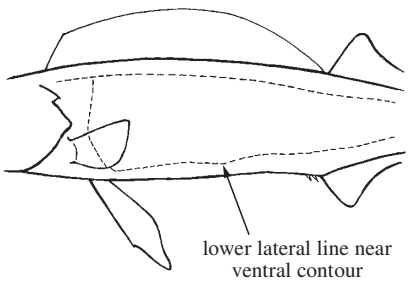


Fig. 17 ***Neoepinnula***

14a. Dorsal-fin spines XVI or XVII; body not elongate, its depth 4.2 to 4.5 times in standard length . . . . . ***Tongaichthys robustus***

14b. Dorsal-fin spines XIX to XXI; body elongate, its depth 10 to 13 times in standard length . . . . . ***Nesiarchus nasutus***

List of species occurring in the area

The symbol is given when species accounts are included.

- *Diplospinus multistriatus* Maul, 1948
- *Gempylus serpens* Cuvier, 1829
- *Lepidocybium flavobrunneum* (Smith, 1849)
- *Nealotus tripes* Johnson, 1865
- *Neoepinnula orientalis* (Gilchrist and von Bonde, 1924)
- *Nesiarchus nasutus* Johnson, 1862
- *Promethichthys prometheus* (Cuvier, 1832)
- *Rexea antefurcata* Parin, 1989
- *Rexea bengalensis* (Alcock, 1894)
- *Rexea prometheoides* (Bleeker, 1856)
- *Rexea solandri* (Cuvier, 1832)
- *Rexichthys johnpaxtoni* Parin and Astakhov, 1987
- *Ruvettus pretiosus* Cocco, 1829
- *Thyrsitoides marleyi* Fowler, 1929
- *Tongaichthys robustus* Nakamura and Fujii, 1983

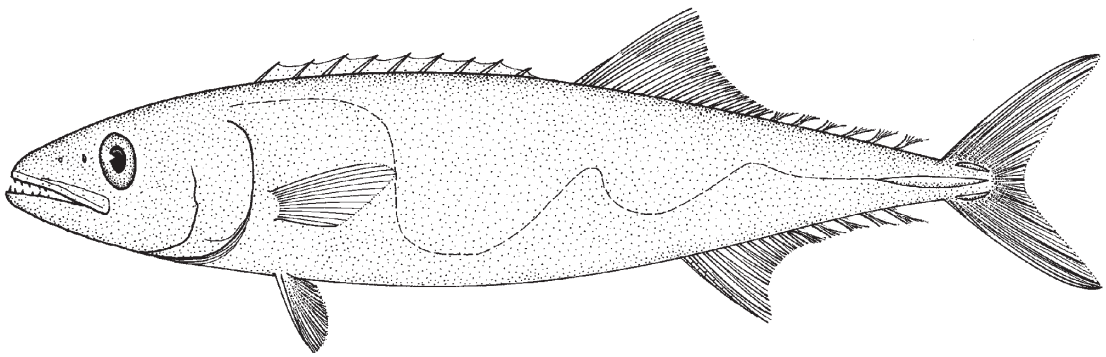
Reference

Nakamura, I. and N. Parin. 1993. FAO species catalogue. Vol. 15. Snake mackerels and cutlassfishes of the world (families Gempylidae and Trichiuridae). An annotated and illustrated catalogue of the snake mackerels, snoeks, escolars, gemfishes, sackfishes, domine, oilfish, cutlassfishes, scabbardfishes, hairtails, and frostfishes known to date. *FAO Fish. Synop.*, (125)15:136 p.

Lepidocybium flavobrunneum (Smith, 1849)

Frequent synonyms / misidentifications: None / None.

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

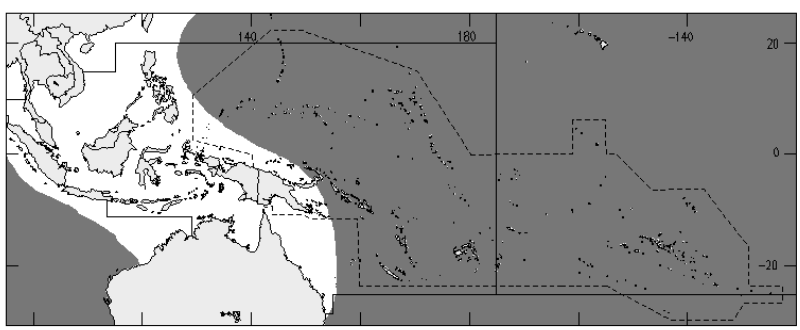


Diagnostic characters: Body moderately elongate, semifusiform and slightly compressed, its depth about 4.1 to 4.3 times in standard length. Head length 3.6 to 3.7 times in standard length. Lower jaw slightly extends anterior to upper jaw, tip of both jaws without cartilaginous process. Two pairs of fangs 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 spines and 12 to 14 soft rays. Caudal fin widely forked, with **a strong median keel flanked by 2 smaller supplementary keels**. Pectoral fins with 15 to 17 soft rays. Pelvic fins well developed, with I spine and 5 soft rays. **Scales moderately small, each surrounded by a network of tubules bearing pores. A single sinuous lateral line**. Vertebrae 16+15=31. **Colour:** body almost uniformly dark brown, becoming almost black with age.

Size: Maximum standard length 150 cm. 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).

Habitat, biology, and fisheries: Epi- and mesopelagic, oceanic, down to depths of 200 m or more. Swims deeper in daytime, often migrates upward at night. Feeds on squids, crustaceans, and fishes (bramids, coryphaenids, scombrids, gempylids, trichiurids, myctophids, trachipterids, and others). No special fishery for this species, but appears as bycatch in tuna longline fishery, caught usually at depths of 100 to 300 m. Flesh very oily, may have purgative properties.

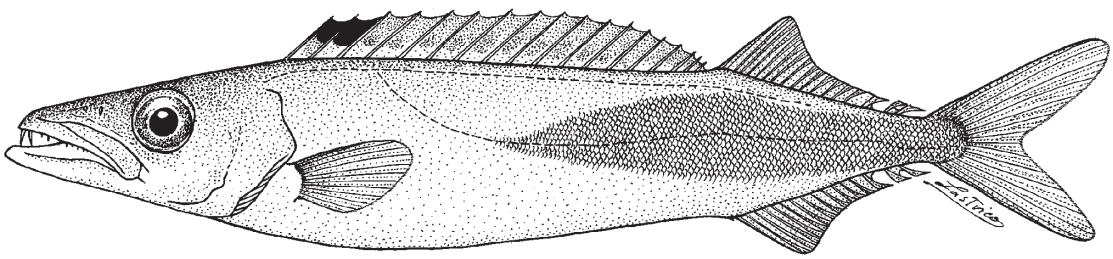
Distribution: Widely distributed in tropical and temperate waters of the world, but probably absent from the northern Indian Ocean and the area from inland seas of Southeast Asia.



Rexea prometheoides (Bleeker, 1856)

Frequent synonyms / misidentification: None / *Rexea solandri* (Cuvier, 1832).

FAO names: En - Royal escolar; **Fr** - Escolier royal; **Sp** - Escolar real.

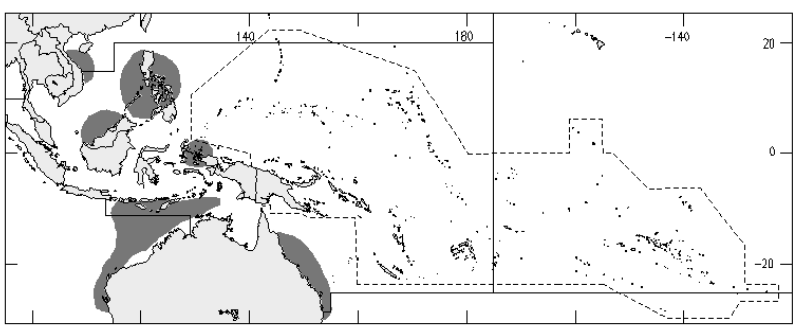


Diagnostic characters: Body moderately elongate and remarkably compressed; body depth 5 to 6 times in standard length, body width 1.8 to 2.8 times in body depth. Head length 3.1 to 3.4 times in standard length. **Interorbital region flattened and shallowly concave.** Eye large, contained about 4.4 times in head length. Anteriorly in upper jaw 5 or 6 fangs and 1 smaller fang anteriorly on each side of lower jaw. Spinescent gill rakers with 2 to 4 cusps. First dorsal fin with XVIII (rarely XIX) spines, second dorsal fin with I spine and 14 to 17 soft rays followed by 2 finlets; base of first dorsal fin 2.2 to 2.5 times longer than base of second dorsal fin. Anal fin with a single free and a single spine and 12 to 15 soft rays followed by 2 finlets. Caudal fin moderate in size, tips of upper and lower lobes round. Pectoral fins with 13 (rarely 12 or 14) soft rays, their length shorter than 1/2 head length. Pelvic fins entirely absent at more than about 20 cm standard length. **Lateral line bifurcated below fourth to fifth spine of first dorsal fin**, upper lateral line reaches middle to end of second dorsal-fin base, lower lateral line midlateral. Most of body naked except **a large lancet-shaped strip of scales extending forward from caudal peduncle to below middle of first dorsal-fin base**. Pyloric caeca 8 (rarely 7). Vertebrae 19+15=34. **Colour:** body greyish with silvery tint, fins hyaline except a black blotch on membranes between first and second dorsal-fin spine, rest of second dorsal fin blackish or grey.

Size: Maximum standard length 40 cm.

Habitat, biology, and fisheries: Meso- and benthopelagic from 135 to 540 m. Feeds on a wide variety of fishes, crustaceans, and cephalopods. No special fishery, taken sometimes by bottom trawls along with other species.

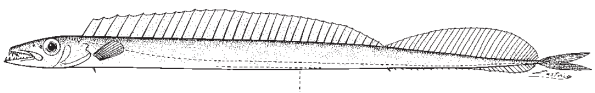
Distribution: Known in the Indo-West Pacific from East Africa to southern Japan and Queensland, Australia.

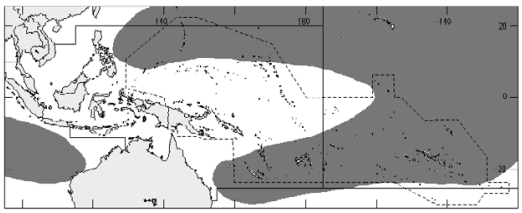


Diplospinus multistriatus Maul, 1948

En - Striped escolar; **Fr** - Escolier raye; **Sp** - Escolar rayado.

Maximum standard length about 33 cm, commonly to 20 cm. Mesopelagic, oceanic at depths to 1 000 m. Migrates upward at night to depths between 100 and 200 m. Feeds on crustaceans and small fishes. No special fishery. Distributed in central water masses of the Atlantic, Indian, and Pacific oceans.

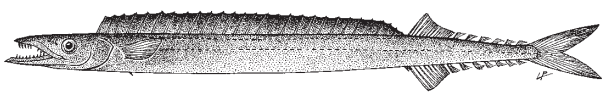


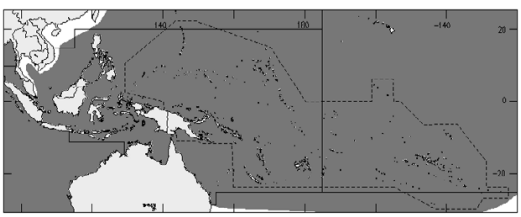


Gempylus serpens Cuvier, 1829

En - Snake mackerel; **Fr** - Escolier serpent; **Sp** - Scolar de canal.

Maximum standard length about 1 m, commonly to 60 cm. Strictly oceanic, epi- and mesopelagic from the surface to depths of 200 m and perhaps deeper. Large fish usually solitary. Adults migrate to surface at night (nyctoepipelagic). Feeds on fishes (myctophids, exocoetids, sauries, scombrids), squids, and crustaceans. No special fishery, occasionally taken as bycatch in tuna longline fisheries. Worldwide in tropical and subtropical oceans.

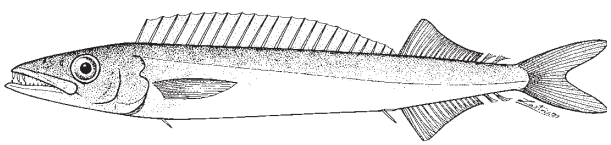


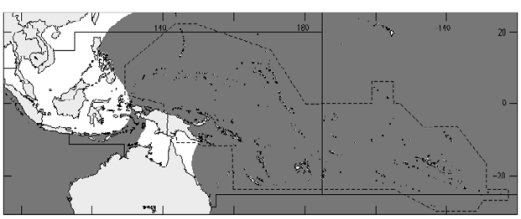


Nealotus tripes Johnson, 1865

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

Maximum standard length about 25 cm, commonly to 15 cm. Oceanic, epi-, or mesopelagic from the surface to a depth of about 600 m. Migrates to the surface at night (nyctoepipelagic). Feeds on myctophids and other small fishes, squids, and crustaceans. Of no importance to fisheries. Distributed in tropical and temperate waters of all oceans.

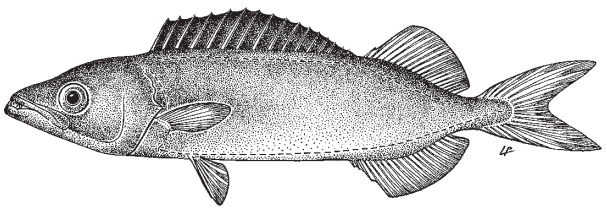


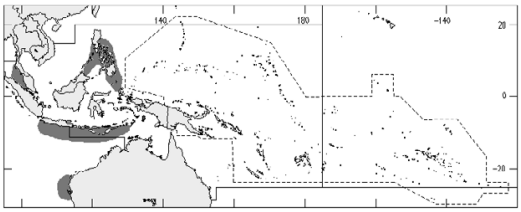


Neoepinnula orientalis (Gilchrist and von Bonde, 1924)

En - Sackfish; **Fr** - Escolier orietal; **Sp** - Escolar oriental.

Maximum standard length 30 cm. Benthopelgic on the upper slopes at depths between 200 and 570 m. Matures at about 15 cm standard length. Feeds on small fishes, crustaceans, and cephalophods. No special fishery. Distributed in the Indian and western Pacific oceans from East Africa to southern Japan and the Philippines.

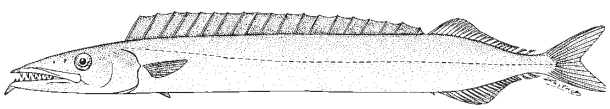


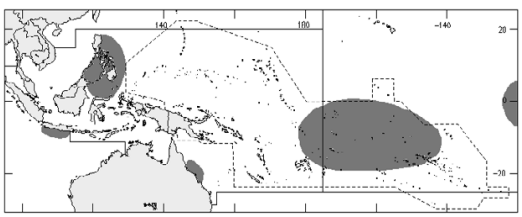


Nesiarchus nasutus Johnson, 1862

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

Maximum standard length 130 cm, commonly between 30 and 80 cm. Adults benthopelagic, dwelling on continental slopes or underwater rises at depths of about 200 to 1 200 m, migrating to midwater at night. Feeds on squids, fishes, and crustaceans. No special fishery. Probably occurs worldwide in tropical and subtropical seas, large-sized strays are found in temperate waters.

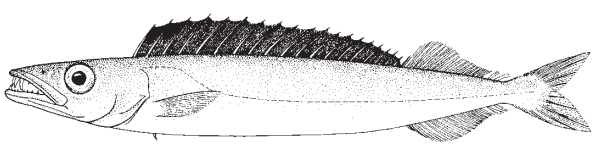


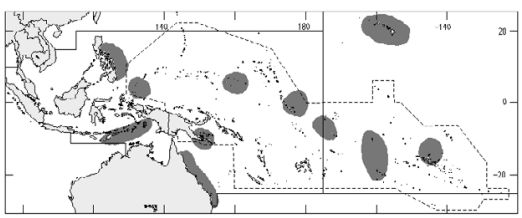


Promethichthys prometheus (Cuvier, 1832)

En - Roudi escolar; **Fr** - Escolier clair; **Sp** - Escolar prometeo.

Maximum standard length 1 m. Benthopelagic at continental slopes, around oceanic islands and submarine rises at depths of 100 to 750 m. Migrates to midwater at night, feeds on fishes, cephalopods, and crustaceans. No special fishery. Distributed in tropical and subtropical waters of all oceans.

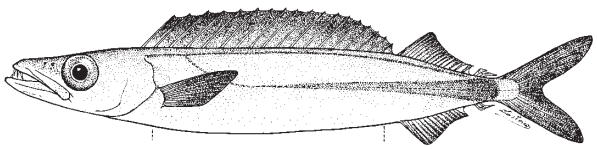


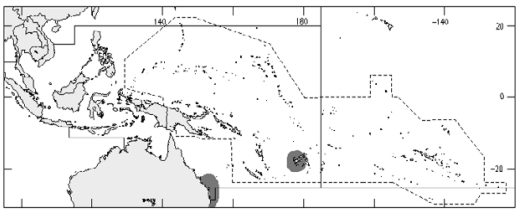


Rexea antefurcata Parin, 1989

En - Longfinned escolar; **Fr** - Escolier longues ailes; **Sp** - Escolar de aleta larga.

Maximum standard length 72.5 cm. Benthopelagic at depths of 126 to 770 m. Probably schooling, migrate to midwater at night. No special importance to fisheries, but appears as a bycatch of deep-water trawl fisheries in New South Wales. Known from the southern West Pacific (eastern Australia, Fiji, New Zealand) and Easter Island in the southern East Pacific.

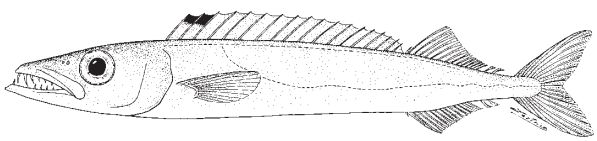


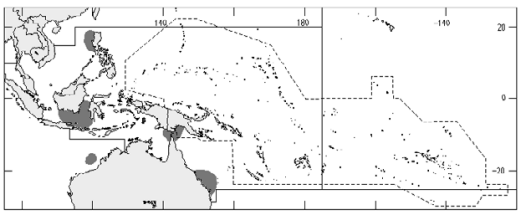


Rexea bengalensis (Alcock, 1894)

En - Bengal escolar; **Fr** - Escolier bengalais; **Sp** - Escolar bengali.

Maximum standard length 20 cm. Benthopelagic at depths of 143 to 820 m. No special fishery. Distributed in the Indian and western Pacifc oceans from East Africa to southern Japan and northeastern Australia.

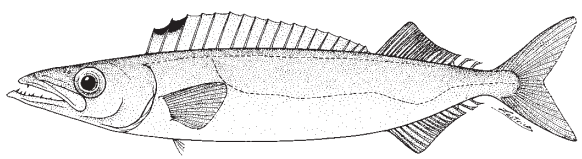


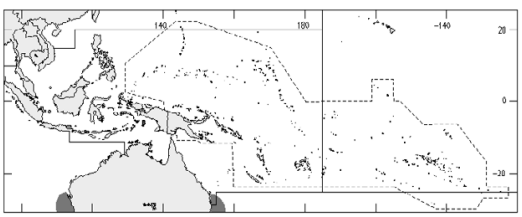


Rexea solandri (Cuvier, 1832)

En - Silver gemfish; **Fr** - Escolier tifiati; **Sp** - Escolar plateado.

Maximum standard length about 1.1 m, maximum weight about 8 kg. Benthopelagic on continental slope from depths of 100 to 800 m. Important commercial fish species in Australia and New Zealand. Known from off southern half of Australia and off New Zealand.

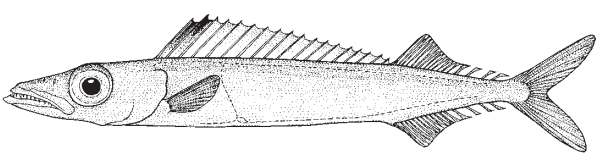


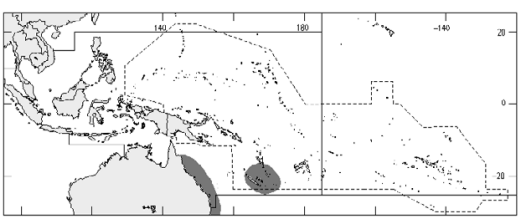


Rexichthys johnpaxtoni Parin and Astakhov, 1987

En - Paxton's escolar; **Fr** - Escolier becune; **Sp** - Escolar de Paxton.

Maximum known standard length 22 cm. Adults probably benthopelagic at depths of 400 to 470 m while juveniles are pelagic at 270 to 470 m. Of no importance to fisheries. Known from the east coast of Australia and off New Caledonia.

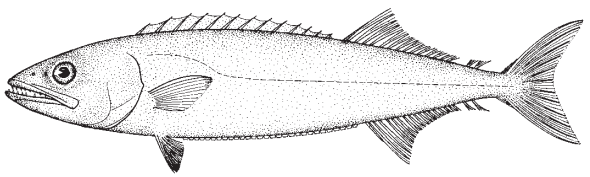


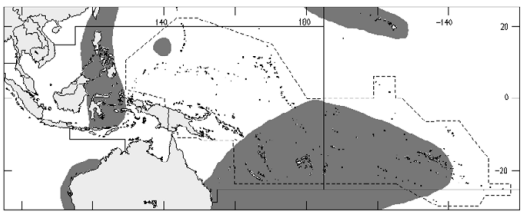


Ruvettus pretiosus Cocco, 1829

En - Oilfish; **Fr** - Rouvet; **Sp** - Escolar clavo.

Maximum total length 2 m, commonly to 150 cm standard length. Oceanic, benthopelagic on continental slope and sea rises at depths of 200 to 700 m. Usually solitary or in pairs near the sea bottom. Feeds on fishes, squids, and crustaceans. No special fishery for this species, except target fishing in the southern Central Pacific where the peculiar wooden “Palu” or *Ruvettus* hook is used to catch this species. Appears as bycatch in the tuna longline fishery, caught usually at depths of 200 to 400 m. Widely distributed in tropical and temperate waters of the world.

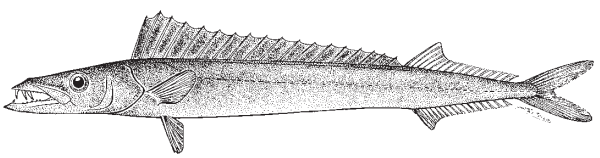


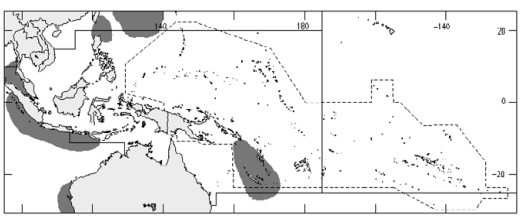


Thyrsitoides marleyi Fowler, 1929

En - Black snoek; **Fr** - Escolier gracile; **Sp** - Sierra gracil.

Maximum standard length 150 cm, commonly to 100 cm. Mesobenthopelagic, down to depths of 400 m or more. Usually on slopes of islands and seamounts, often found close to the surface at night. No special fishery, infrequently appears as bycatch in tuna long-line fisheries. Distributed in tropical Indian and western Pacific oceans from East Africa to southern Japan, New Caledonia, and western Australia.





Tongaichthys robustus Nakamura and Fujii, 1983

En - Tonga escolar; **Fr** - Escolier tonga; **Sp** - Escolar de Tonga.

Maximum standard length about 30 cm. Probably mesopelagic or mesobenthopelagic, caught at depths of about 300 m. No special fishery. Known from Queensland, Fiji, and Tonga Islands.