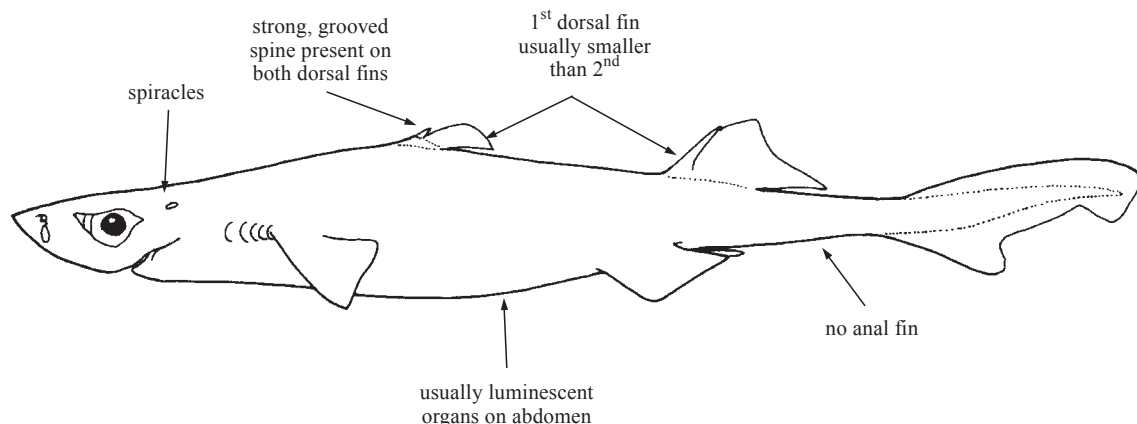


## ETMOPTERIDAE

## Lantern sharks (black dogfishes)

**Diagnostic characters:** Small sharks with cylindrical or slightly compressed bodies, without ridges between pectoral and pelvic fins and without precaudal pits and caudal keels. **Head with 5 gill slits, all anterior to pectoral fins**, the fifth not abruptly longer than the others; **spiracles always present, large and just behind eyes; eyes on sides of head, without nictitating eyelids**. Snout short, flattened or conical, not formed as a rostral saw; no barbels on snout; nostrils fairly wide-spaced, internarial width greater than or subequal to nostril width; mouth short and nearly transverse or arcuate, lips smooth; teeth strong-cusped, not blade-like in upper jaw, upper teeth with slender cusps and cusplets present; lower teeth either similar to uppers (*Centroscyllium*) or compressed, broad, blade-like, imbricated, without cusplets, and much larger than uppers. **Two dorsal fins with a long strong grooved spine present** on their anterior margins; dorsal fins small, angular, and with straight to strongly concave posterior margins; **first dorsal fin usually smaller than second dorsal fin**; origin of first dorsal fin far in front of pelvic-fin origins, well behind pectoral-fin insertions, and over or behind pectoral-fin free rear tips; pelvic fins subequal to or smaller than second dorsal fin; **no anal fin**; caudal fin strongly asymmetrical, with subterminal notch present and with a ventral lobe low or absent. **Colour:** body and fins greyish to blackish brown, **usually with conspicuous black marks and luminescent organs on abdomen, over pelvic-fin bases, on caudal peduncle, and on caudal-fin base.**

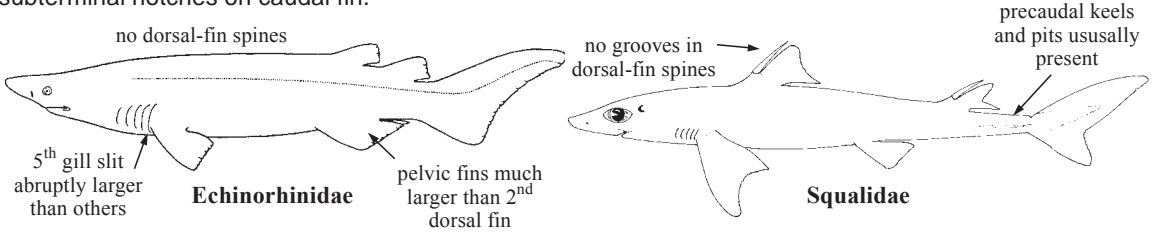


**Habitat, biology, and fisheries:** Mostly occur in deep water near the bottom on the continental and insular slopes between 200 to at least 2 213 m. Some species venture onto the continental shelves up to 70 m and a few species are oceanic, ranging far from land. Circumglobal in most seas, and range from the tropics to high latitudes up to Iceland in the North Atlantic. Some of the species form large schools, and can be among the most abundant deep-water sharks in limited areas. Feed on small bony fishes, cephalopods, crustaceans, and tunicates. Reproduction is ovoviparous, with 6 to 20 young per litter. In the Far East and the eastern Atlantic these sharks are commonly fished with line gear and bottom trawls for human consumption and for their livers, which are extremely large, oily, and have a high squalene content. In Area 31 they may be caught as bycatch in other fisheries but are not known to be utilized.

**Similar families occurring in the area**

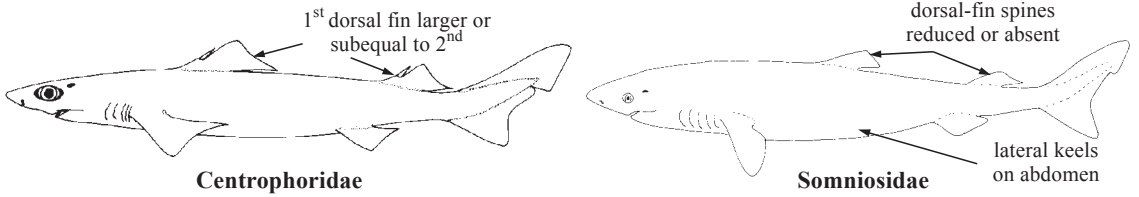
**Echinorhinidae:** body set with sparse, large, plate-like denticles; spiracles small and well behind eyes; fifth pair of gill slits abruptly longer than others; no dorsal-fin spines; first dorsal-fin origin over or posterior to pelvic-fin origins; pelvic fins much larger than second dorsal fin; large sharks, reaching over 2 m long.

**Squalidae:** both upper and lower teeth blade-like, imbricated and without cusplets; precaudal keels and usually precaudal pits present on caudal peduncle; dorsal-fin spines without grooves; second dorsal fin falcate; no subterminal notches on caudal fin.



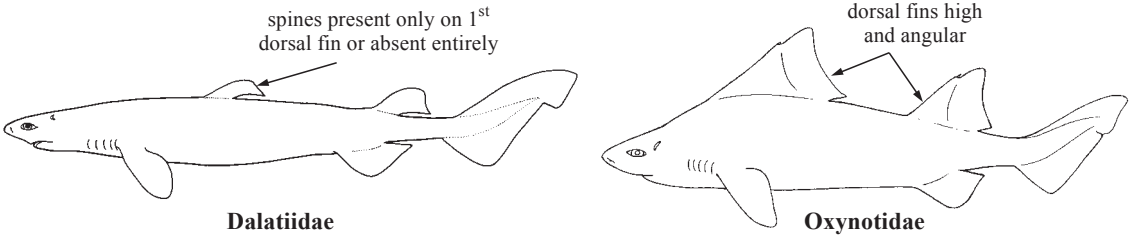
**Centrophoridae:** both upper and lower teeth blade-like, imbricated and without cusplets; first dorsal fin larger than second; first dorsal-fin origin over or just behind pectoral-fin bases.

**Somniosidae:** upper teeth narrow and without cusplets; lateral keels present on abdomen; dorsal-fin spines greatly reduced or absent.



**Dalatiidae:** upper teeth narrow and without cusplets; dorsal-fin spines either present on first dorsal fin only (*Squaliolus*) or absent.

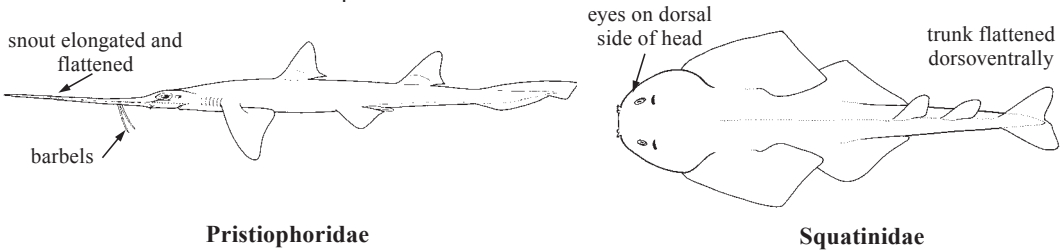
**Oxynotidae:** upper teeth narrow and not imbricated; body high and compressed; conspicuous lateral keels on abdomen; dorsal fins very high and angular; dorsal-fin spines large but buried in the dorsal fins with only the tips exposed.



**Pristiophoridae:** snout elongated into a flattened blade, with lateral teeth; barbels present in front of nostrils.

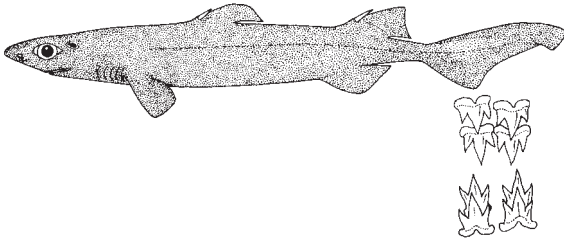
**Squatinae:** trunk much flattened dorsoventrally; eyes on upper side of head; anterior margins of pectoral fins extending forward past gill openings and partly concealing them; pelvic fins also very broad, wing-like.

All other shark families: anal fin present.

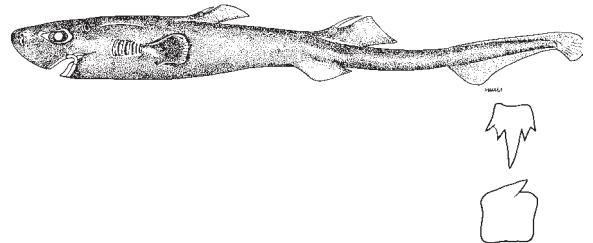


**Key to the species of Etmopteridae occurring in the area**

- 1a. Upper and lower teeth similar, with narrow cusps and cusplets (Fig. 1) . . . . . *Centroscyllium fabricii*
- 1b. Upper and lower teeth dissimilar, with a slender centre cusp and 1 or more cusplets on each side in the upper jaw and compressed and blade-like in the lower jaw . . . . . (*Etmopterus*) → 2

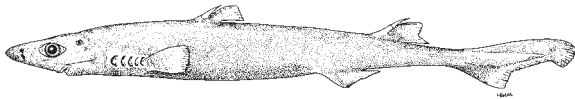


**Fig. 1** *Centroscyllium fabricii* upper and lower teeth

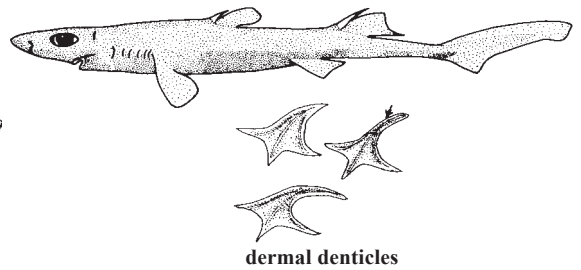


**Fig. 2** *Etmopterus carteri* upper and lower teeth

- 2a. Head semicylindrical, nearly as deep as wide at eyes, snout very short and bluntly rounded; body blackish above and below, photophores diffuse, not concentrated in conspicuous black areas (Fig. 2) . . . . . *Etmopterus carteri*
- 2b. Head and snout flattened, considerably wider than deep at eyes; body either uniform dark above and below or abruptly darker on under surface, photophores concentrated in darker areas on sides and lower surface . . . . . → 3
- 3a. Dermal denticles on sides of body truncated, without cusps (Fig. 3) . . . . . *Etmopterus bigelowi*
- 3b. Dermal denticles on sides of body cuspidate . . . . . → 4



**Fig. 3** *Etmopterus bigelowi*



**Fig. 4** *Etmopterus bullisi*

- 4a. Dermal denticles on sides in regular longitudinal rows (Fig. 4) . . . . . *Etmopterus bullisi*
- 4b. Dermal denticles on sides irregularly situated, not in rows . . . . . → 5

- 5a. Underside of snout virtually naked, almost without denticles (Fig. 5)  
 . . . . . *Etmopterus virens*
- 5b. Underside of snout covered with denticles . . . . . → 6
- 6a. Colour black or grey above and below, without prominent markings, obscure pelvic markings present in some species; first dorsal-fin spine well behind pectoral-fin rear tips . . . . . → 7
- 6b. Colour lighter above and with prominent black markings below; first dorsal-fin spine about opposite to pectoral-fin rear tips . . . . . → 8

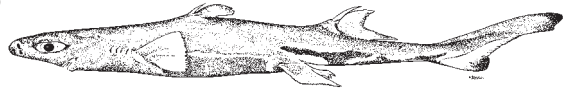


Fig. 5 *Etmopterus virens*

- 7a. Pectoral fins short and broad, anterior and posterior margins with a broad fringe of elongated ceratotrichia that are free of fin web; colour blackish with markings obscure or absent (Fig. 6) . . . . . *Etmopterus schultzi*
- 7b. Pectoral fins more elongate, angular and narrower, anterior and posterior margins with a fringe of elongated ceratotrichia that are mostly connected with fin web; colour greyish to blackish with obscure darker markings visible but not prominent (Fig. 7) . . . *Etmopterus gracilispinis*

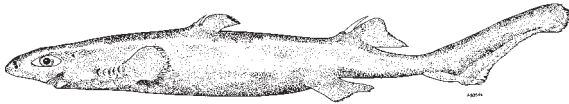


Fig. 6 *Etmopterus schultzi*

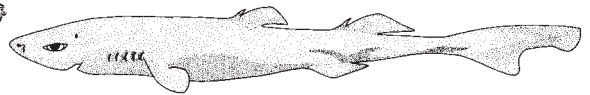


Fig. 7 *Etmopterus gracilispinis*

- 8a. Suprapelvic black marking disjunct, with separate anterior, posterior, and ventral black patches; size larger, adults 260 to 335 mm long (Fig. 8) . . . . . *Etmopterus robinsi*
- 8b. Suprapelvic black marking continuous, anterior, posterior, and ventral patches continuous; size smaller, adults below 300 mm long . . . . . → 9

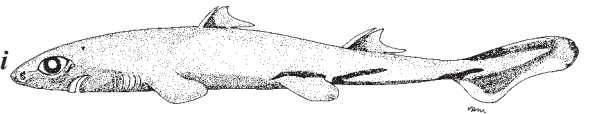


Fig. 8 *Etmopterus robinsi*

- 9a. A mid-dorsal band of white present; size larger, adults 200 to 292 mm long (Fig. 9)  
 . . . . . *Etmopterus hillianus*
- 9b. No mid-dorsal band of white; size smaller, adults about 160 to 212 mm long (Fig. 10)  
 . . . . . *Etmopterus perryi*

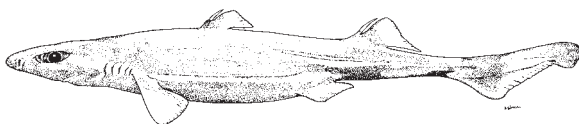












Fig. 9 *Etmopterus hillianus*



Fig. 10 *Etmopterus perryi*

### List of species occurring in the area

The symbol  is given when species accounts are included.

-  *Centroscyllium fabricii* (Reinhardt, 1825).
-  *Etmopterus bigelowi* Shirai and Tachikawa, 1993.
-  *Etmopterus bullisi* Bigelow and Schroeder, 1957.
-  *Etmopterus carteri* Springer and Burgess, 1985.
-  *Etmopterus gracilispinis* Krefft, 1968.
-  *Etmopterus hillianus* (Poey, 1861).
-  *Etmopterus perryi* Springer and Burgess, 1985.
-  *Etmopterus robinsi* Schofield and Burgess, 1997.
-  *Etmopterus schultzi* Bigelow, Schroeder and Springer, 1953.
-  *Etmopterus virens* Bigelow, Schroeder and Springer, 1953.

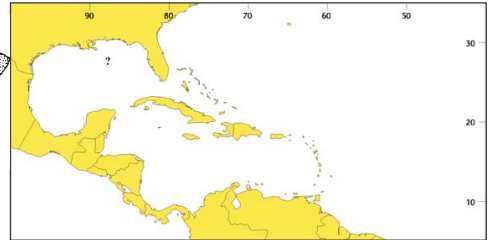
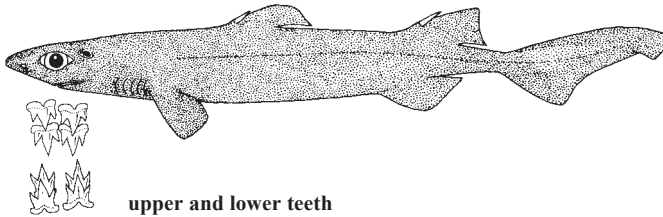
### References

- Bigelow, H.B. and W.C. Schroeder. 1948. Chapter three, Sharks. In *Fishes of the Western North Atlantic. Mem. Sears Fnd. Mar. Res.*, (1)1:56-576.
- Bigelow, H.B. and W.C. Schroeder. 1957. A study of the sharks of the suborder Squaloidea. *Bull. Mus. Comp. Zool. Harvard*, 117:150 p.
- Bigelow, H.B., W.C. Schroeder, and S. Springer. 1953. New and little known sharks from the Atlantic and from the Gulf of Mexico. *Bull. Mus. Comp. Zool. Harvard*, 109: 213-276.
- Compagno, L.J.V. and R. Vergara R. 1978. Squalidae. In *FAO species identification sheets for fisheries purposes. Western Central Atlantic (Fishing Area 31), Volume V*, edited by W. Fischer. Rome, FAO (unpaginated).
- Compagno, L.J.V. 1984. FAO Species Catalogue. Sharks of the World. An annotated and illustrated catalogue of shark species known to date. *FAO Fish. Synop.*, (125)Vol.4,pt.1:250 p.
- McEachran, J.D. and J.D. Fechhelm. 1998. *Fishes of the Gulf of Mexico*, vol. 1, Myxiniformes to Gasterosteiformes. Austin, University of Texas Press, 1112 p.
- Schofield, P.J. and G.H. Burgess. 1997. *Etmopterus robinsi* (Elasmobranchii, Etmopteridae), a new species of deepwater lantern shark from the Caribbean Sea and Western North Atlantic, with a redescription of *Etmopterus hillianus*. *Bull. Mar. Sci.*, 60(3):1060-1073.
- Shirai, S. 1992. *Squalean phylogeny. A new framework of "squaloid" sharks and related taxa*. Sapporo, Hokkaido University Press, 151 p.
- Springer, S. and G.H. Burgess. 1985. Two new dwarf dogsharks (*Etmopterus*, Squalidae), found off the Caribbean coast of Colombia. *Copeia*, 1985(3):584-591.

***Centroscyllium fabricii* (Reinhardt, 1825)?**

**En** - Black dogfish; **Fr** - Aiguillat noir; **Sp** - Tollo negro merga.

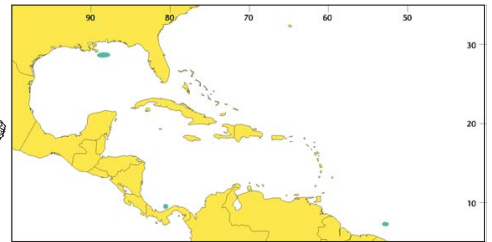
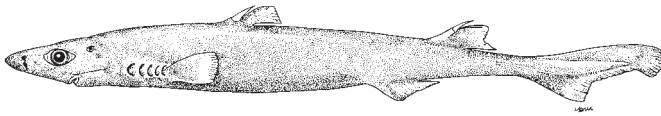
Maximum total length at least 84 cm, may reach 107 cm. A common demersal dogfish of the outermost continental shelves and upper slopes from 180 to about 1 600 m, moving to near the surface in high latitudes. Ovoviviparous, feeds on a wide variety of small crustaceans, cephalopods, small pelagic teleosts, and jellyfish. Limited interest to fisheries, little utilized elsewhere and often a discarded bycatch of deep-water commercial fisheries. In Area 31 possibly off North Carolina and in the Gulf of Mexico; western Atlantic from South Baffin Island and Greenland to Virginia, USA, and off southern Argentina. Wide-ranging in the eastern Atlantic from Iceland to the west coast of South Africa.



***Etmopterus bigelowi* Shirai and Tachikawa, 1993**

**En** - Blurred lanternshark.

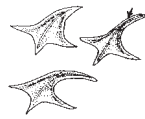
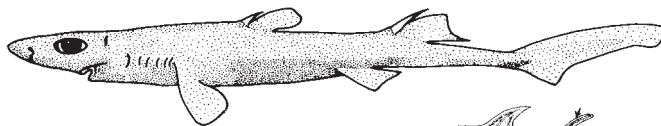
Maximum size to at least 67 cm. Occurs on continental shelves and slopes, island slopes, and submarine ridges from 163 to over 1000 m, also partly epipelagic in the open ocean. Biology little-known, ovoviviparous, eats small fish and squids. In the area, from Gulf of Mexico (Louisiana, USA), Caribbean Sea, also Suriname, Brazil, Uruguay, and Argentina in the western Atlantic; wide-ranging in the eastern Atlantic, southwestern Indian Ocean, western Pacific, and eastern South Pacific. Often confused with *Etmopterus pusillus* (Lowe, 1839), which is currently not known from the western Atlantic but could be recorded there.



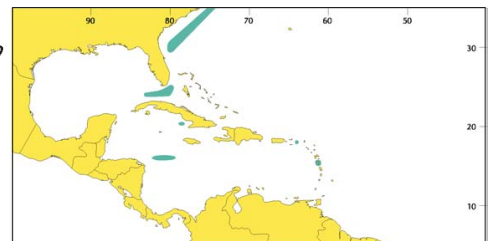
***Etmopterus bullisi* Bigelow and Schroeder, 1957**

**En** - Lined lanternshark; **Fr** - Sagre chien; **Sp** - Tollo lucero rayado.

Maximum size at least 26 cm and probably larger. Occurs on continental slopes at depths of 275 to 824 m, mostly below 350 m. Biology little known. Of no interest to fisheries, probably taken as discarded bycatch of deep-water demersal fisheries. May be largely endemic to Area 31; from North Carolina to Florida (USA), the north and south coasts of Cuba, Caribbean Sea between Jamaica, Nicaragua and Honduras, Caribbean Colombia, and the lesser Antilles east of the Virgin Islands.

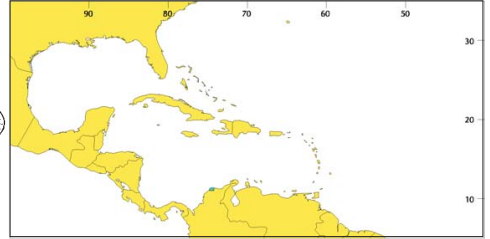
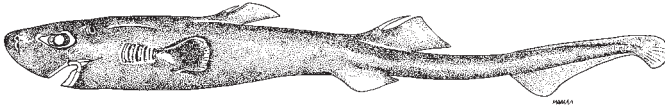


dermal denticles

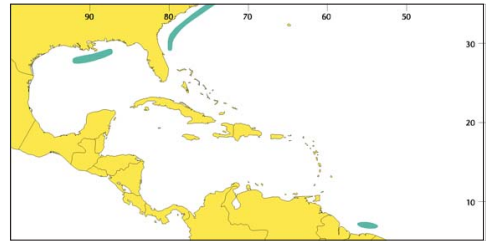
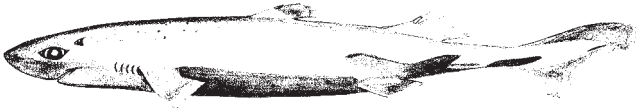


***Etmopterus carteri*** Springer and Burgess, 1985**En** - Cylindrical lanternshark.

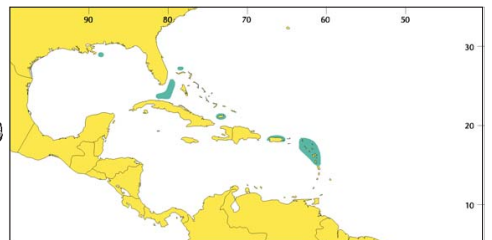
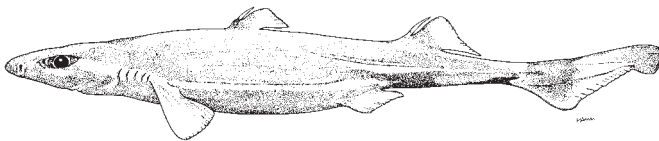
Maximum size 21 cm. Occurs on upper continental slopes at depths of 283 to 356 m. Biology little known. Of no interest to fisheries. Only known from Area 31 off the Caribbean coast of Colombia.

***Etmopterus gracilispinis*** Krefft, 1968**En** - Broadbanded lanternshark; **Fr** - Sagre rubané; **Sp** - Tollo lucero bandoneado.

Maximum size at least 33 cm. Occurs on outer continental shelves and upper to middle slopes at depths of 100 to 1000 m, also epipelagic at depths of 70 to 480 m over water 2 240 m deep. Biology little known. Of no interest to fisheries, probably taken as discarded bycatch of deep-water demersal fisheries. Western Atlantic from the USA from New Jersey to Florida, also the Gulf of Mexico from Florida to Louisiana, Suriname, southern Brazil, Uruguay, and Argentina. Also eastern Atlantic and southwestern Indian Ocean off South Africa.

***Etmopterus hillianus*** (Poey, 1861)**En** - Caribbean lanternshark; **Fr** - Sagre antillais; **Sp** - Tollo lucero antillano.

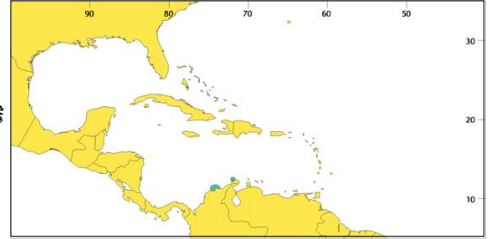
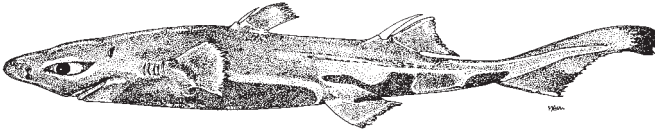
Maximum size at least 28 cm. Occurs on upper slopes at depths of 311 to 695 m. Biology little known. Interest to fisheries limited, caught off Cuba. Western North Atlantic from Virginia to southern Florida (USA), Bahamas, Cuba, Bermuda, Hispanola, and northern Lesser Antilles, not known from western or southern Caribbean.



***Etmopterus perryi* Springer and Burgess, 1985**

**En** - Dwarf lanternshark.

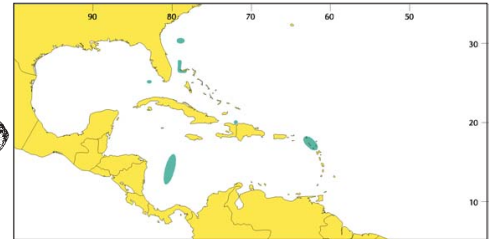
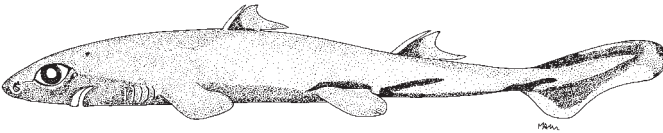
Maximum size about 21 cm. Occurs on upper continental slopes at depths of 283 to 375 m. Biology little known. Of no interest to fisheries. Only known from Area 31 off the Caribbean coast of Colombia.



***Etmopterus robinsi* Schofield and Burgess, 1997**

**En** - West Indian lanternshark.

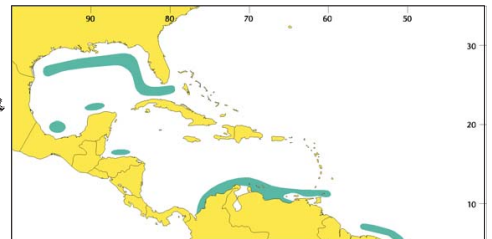
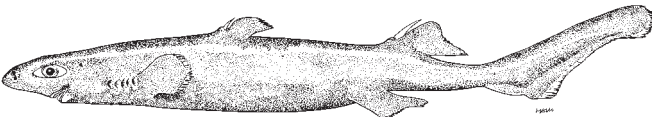
Maximum size at least 34 cm. Occurs on upper slopes at depths of 412 to 787 m. Biology little known. Of no interest to fisheries at present. Western North Atlantic from northeastern Florida (USA), straits of Florida, northern Cuba and southwards in the southern Caribbean Sea to off Nicaragua, and in the West Indies off Hispanola and the northern Lesser Antilles.



***Etmopterus schultzi* Bigelow, Schroeder, and Springer, 1953**

**En** - Fringefin lanternshark; **Fr** - Sagre à nageoires frangées; **Sp** - Tollo lucero franjeado.

Maximum size about 30 cm. Occurs on upper and middle slopes at depths of 220 to 915 m. Biology little known. Of no interest to fisheries at present, possibly caught as discarded bycatch of demersal fisheries. Western North Atlantic, northern Gulf of Mexico (Texas to Florida), Florida Straits between Cuba and Florida, Mexico, Honduras, Colombia, Venezuela, Trinidad and Tobago, Suriname, French Guiana.

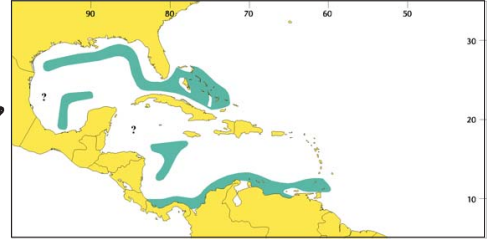
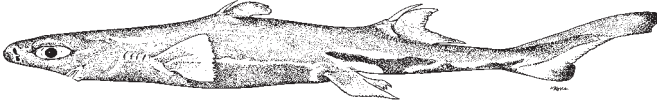




***Etmopterus virens*** Bigelow, Schroeder, and Springer, 1953

**En** - Green lanternshark; **Fr** - Sagre vert; **Sp** - Tollo lucero verde.

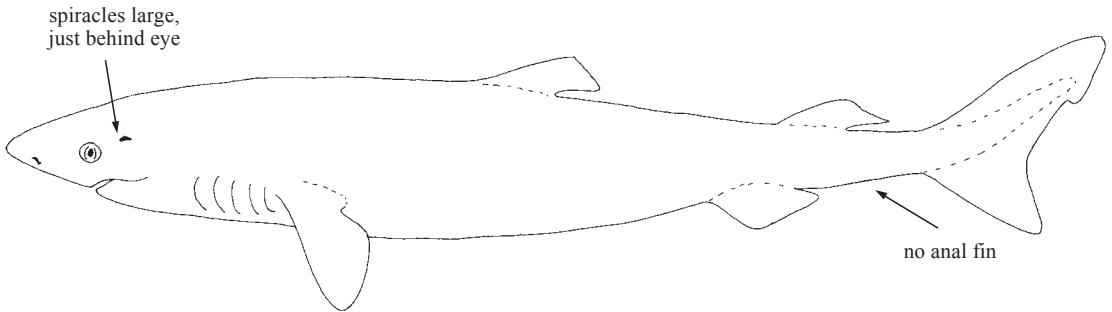
Maximum size about 26 cm. Occurs on outer shelves and upper and middle slopes at depths of 196 to 915 m, mostly below 350 m. Biology little known, probably occurs in schools; eats cephalopods. Of no interest to fisheries at present, possibly caught as discarded bycatch of demersal fisheries. Western North Atlantic, northern Gulf of Mexico (Texas to Florida), Bahamas, Cuba, Caribbean Sea between Honduras and Jamaica, Honduras, Nicaragua, Panama, Colombia, Venezuela, and Trinidad and Tobago.



## SOMNIOSIDAE

### Sleeper sharks

**Diagnostic characters:** Small to gigantic sharks, with cylindrical or slightly compressed bodies, with ridges between pectoral and pelvic fins and without precaudal pits and caudal keels. **Head with 5 gill slits, all anterior to pectoral fins**, the fifth not abruptly longer than the others; **eyes on sides of head, without nictitating eyelids**. Snout short to moderately elongated, broad, flattened, not formed as a rostral saw; no barbels on snout; nostrils wide-spaced, internarial width greater than nostril width; mouth short and nearly transverse, lips smooth; teeth dissimilar in both jaws, upper teeth narrow, needle-shaped, not imbricated, and without cusplets; lower teeth strong-cusped, blade-like, imbricated, and without cusplets. **Spiracles always present, large and just behind eyes**. **Two dorsal fins with or without spines on their anterior margins, when present spines grooved, usually small, and on both dorsal fins**; dorsal fins large, angular, broad, and with convex to weakly concave posterior margins; first dorsal fin variably slightly larger, subequal to, or slightly smaller in area to second; origin of first dorsal fin far in front of pelvic-fin origins, anterior, over, or slightly posterior to pectoral-fin free rear tips; **no anal fin**; caudal fin strongly asymmetrical, with subterminal notch present and with a lower lobe varying from virtually absent to strong; pelvic fins subequal to or larger than second dorsal. Dermal denticles close-set, not greatly enlarged and plate-like. **Colour:** body and fins greyish to blackish brown, without conspicuous black marks and luminescent organs.

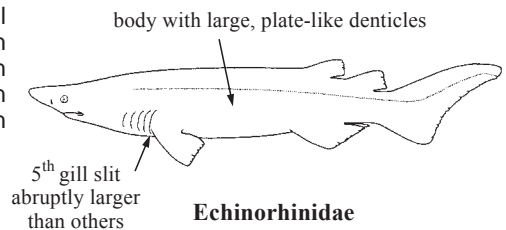


**Habitat, biology, and fisheries:** Sleeper sharks mostly occur near the bottom on the continental and insular slopes between 200 to at least 3 675 m; some species are apparently oceanic. In high latitudes members of the genus *Somniosus* occur on the continental shelves to the intertidal. Circumglobal in most seas, and range from the tropics to high latitudes up to the Arctic and Antarctic oceans. Feed on bony fishes, other chondrichthyans, cephalopods and other molluscs, crustaceans, seals, whale meat, carrion, sea birds, echinoderms, and jellyfish; at least one species takes chunks of meat out of living marine mammals and bony fishes. Reproduction is ovoviviparous, with 4 to 59 young per litter. In the Far East and the eastern Atlantic these sharks are fished with line gear and bottom trawls for human consumption and for their livers, which are extremely large, oily, and have a high squalene content.

**Remarks:** The arrangement of genera and species adopted here follows the forthcoming revision of the FAO shark catalog (Compagno, 1984) by the present author. There may be an additional, undescribed species of *Scymnodon* or possibly *Zameus* in the area (S. Springer, *pers. comm.*), from the Gulf of Mexico.

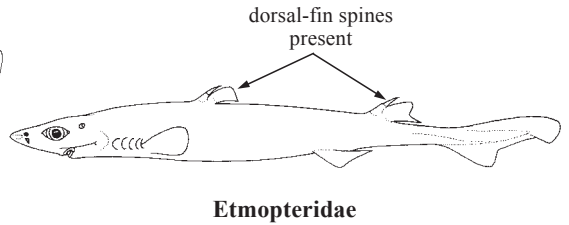
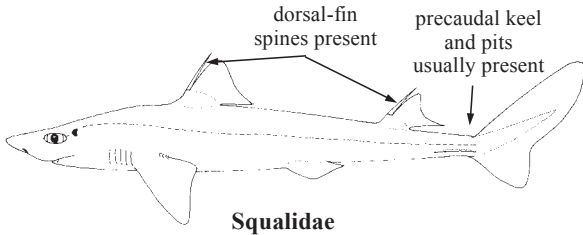
### Similar families occurring in the area

**Echinorhinidae:** body set with sparse, large, plate-like denticles; spiracles small and well behind eyes; fifth pair of gill slits abruptly longer than others; mouth broadly rounded; teeth not imbricated, upper teeth nearly as large as lowers, with cusplets present in large juveniles and adults; first dorsal-fin origin over or posterior to pelvic-fin origins; pelvic fins much larger than second dorsal fin.



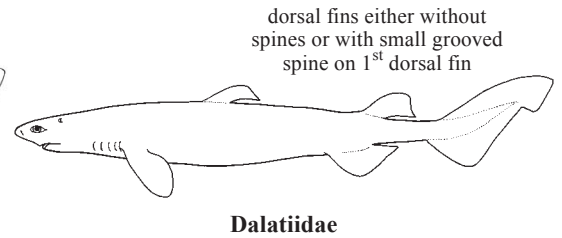
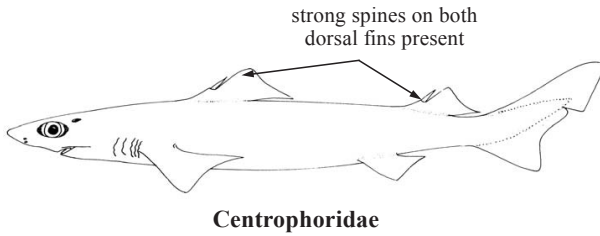
**Squalidae:** upper teeth nearly as large as lowers; precaudal keels and usually precaudal pits present; dorsal-fin spines very strong and without grooves, second dorsal fin falcate; no subterminal notches on caudal fin.

**Etmopteridae:** cusplets present on upper teeth; second dorsal fin larger than first and more or less falcate; usually with conspicuous black markings and luminescent organs; species smaller, adults usually do not reach 70 cm.



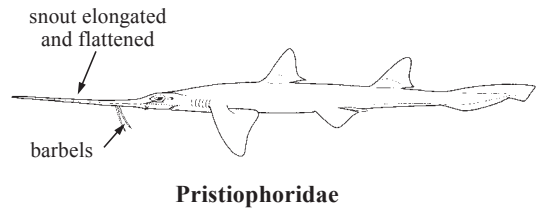
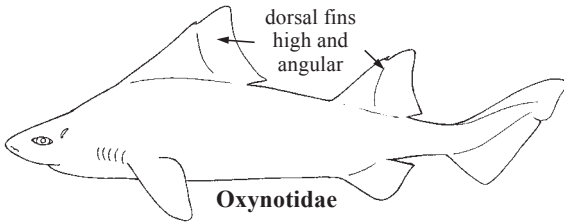
**Centrophoridae:** upper teeth broader and imbricated; no lateral keels on abdomen; origin of first dorsal fin in front of pectoral-fin free rear tips; dorsal-fin spines strong.

**Dalatiidae:** head narrower, conical; nostrils close together; dorsal-fin spines absent or present on first dorsal fin only (*Squaliolus*).

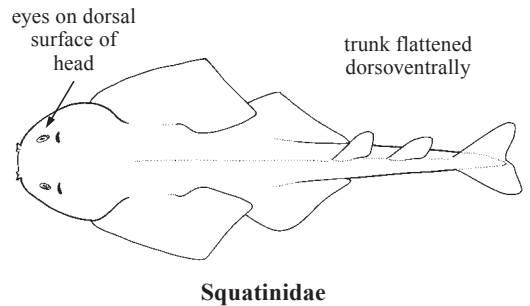


**Oxynotidae:** lips fringed; body high and compressed; dorsal fins very high and angular, dorsal-fin spines large but buried in the dorsal fins with only the tips exposed.

**Pristiophoridae:** snout elongated into a flattened blade with lateral teeth; barbels present in front of nostrils.

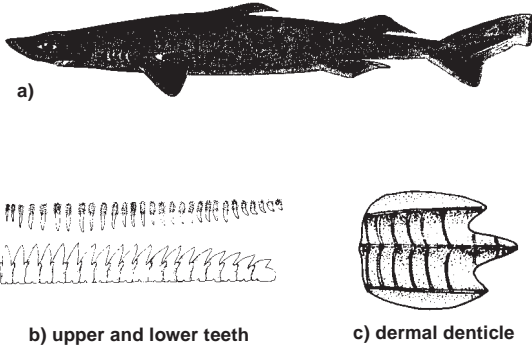


**Squatinae:** trunk much flattened dorsoventrally eyes on upper side of head; anterior margins of pectoral fins extending forward past gill openings and partly concealing them; pelvic fins also very broad, wing-like.

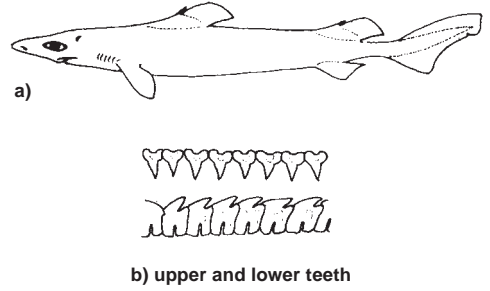


**Key to the species of Somniosidae occurring in the area**

- 1a. Interdorsal space shorter than head (Fig. 1a); pectoral fins elongate, almost as long as caudal fin; lower teeth with high cusps (Fig. 1b); denticles from sides of body, in adults, with a median ridge extending the length of the crown, lateral ridges, and short transverse ridges (Fig. 1c) . . . . . *Zameus squamulosus*
- 1b. Interdorsal space longer than head; pectoral fins short, much less than caudal-fin length; lower teeth with relatively low cusps (Fig. 2a); denticles from sides of body in adults either without ridges or with short medial and lateral ones on the posterior surface of crown, behind an anterior concavity (Fig. 2b) . . . . . (*Centroscymnus*) → 2

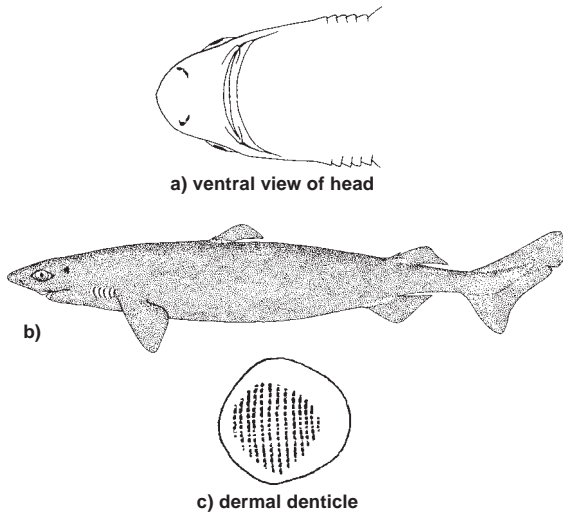


**Fig. 1** *Zameus squamulosus*

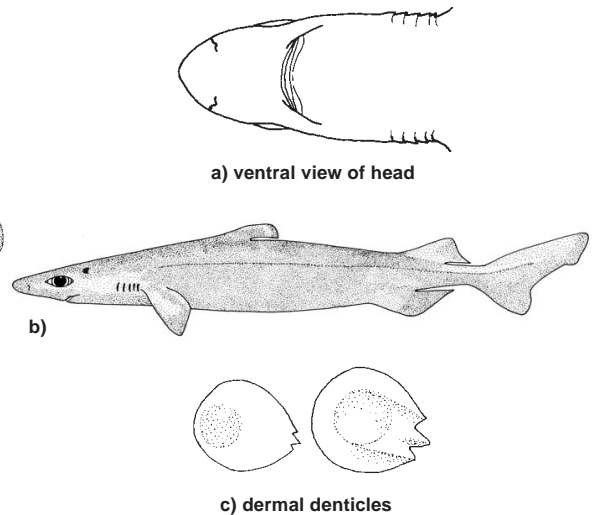


**Fig. 2** *Centroscymnus*

- 2a. Snout shorter, length in front of mouth less than distance from mouth to first gill slit (Fig. 3a); distance from fin spine to free rear tip about equal in both dorsal fins (Fig. 3b); denticles of adults without cusps and ridges (Fig. 3c) . . . . . *Centroscymnus coelolepis*
- 2b. Snout longer, length in front of mouth greater than distance from mouth to first gill slit (Fig. 4a); distance from fin spine to free rear tip greater in second dorsal fin than in first (Fig. 4b); denticles of adults with short posterior cusps and ridges (Fig. 4c) . . . . . *Centroscymnus owstonii*



**Fig. 3** *Centroscymnus coelolepis*



**Fig. 4** *Centroscymnus owstonii*

**List of species occurring in the area**

The symbol  is given when species accounts are included.

 *Centroscymnus coelolepis* Barbosa du Bocage and Brito Capello, 1864.

 *Centroscymnus owstonii* Garman, 1906.

 *Zameus squamulosus* (Günther, 1877).

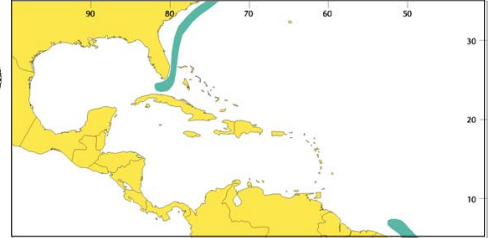
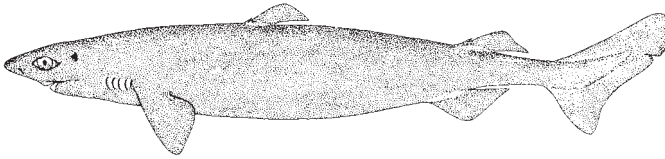
**References**

- Bigelow, H.B. and W.C. Schroeder. 1948. Chapter three, Sharks. In *Fishes of the Western North Atlantic. Mem. Sears Found. Mar. Res.*, (1)1:56-576.
- Bigelow, H.B. and W.C. Schroeder. 1957. A study of the sharks of the suborder Squaloidea. *Bull. Mus. Comp. Zool. Harvard*, 117:1-150.
- Compagno, L.J.V. and R. Vergara R. 1978. Squalidae. In *FAO species identification sheets for fisheries purposes. Western Central Atlantic, (Fishing Area 31) Volume V*, edited by W. Fischer. Rome, FAO, 10 pp.
- Compagno, L.J.V. 1984. FAO Species Catalogue. Vol. 4, Sharks of the World. An annotated and illustrated catalogue of shark species known to date. *FAO Fish. Synop.*, (125)Vol.4,pt.1:250 p.
- McEachran, J.D. and J.D. Fechhelm. 1998. *Fishes of the Gulf of Mexico, vol. 1, Myxiniiformes to Gasterosteiformes*. Austin, University of Texas Press, 1112 p.
- Shirai, S. 1992. *Squalean phylogeny. A new framework of "squaloid" sharks and related taxa*. Sapporo, Hokkaido University Press, 151 p.
- Taniuchi, T. and J.A.F. Garrick. 1986. A new species of *Scymnodalatias* from the Southern Oceans, and comments on other squaliform sharks. *Japanese J. Ichthyol.*, 33(2):119-134.
- Yano, K. and S. Tanaka. 1984. Review of the deep sea squaloid genus *Scymnodon* of Japan, with a description of a new species. *Japanese J. Ichthyol.*, 30(4):341-360.

***Centroscymnus coelolepis*** Barbaros du Bocage and Brito Capello, 1864

**En** - Portugese dogfish (AFS: Portugese shark); **Fr** - Pailona commun; **Sp** - Pailona.

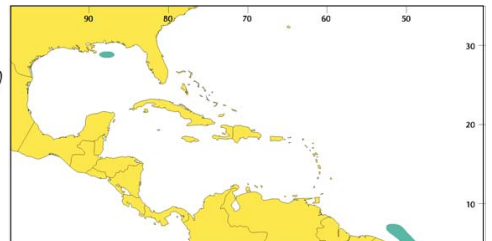
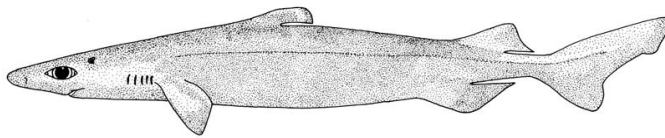
Maximum total length at least 114 cm. Demersal on outer continental shelves, slopes, rises, and seamounts in depths of 160 to 3 675 m, mostly below 600 m. Without interest to fisheries in the area but fished elsewhere with bottom trawls, fixed deep-water nets, and line gear for fish meal and human consumption. Western Atlantic from Grand Banks and Newfoundland, Canada to USA (Massachusetts to Florida), Florida Straits between Florida and Cuba, and off French Guiana. Wide-ranging in the eastern Atlantic, western Mediterranean Sea, Indian Ocean, and western Pacific.



***Centroscymnus owstonii*** Garman, 1906

**En** - Roughskin dogfish; **Fr** - Pailona rapeux; **Sp** - Sapata lija.

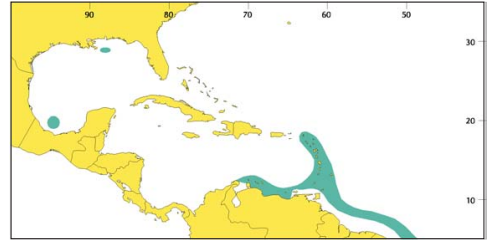
Maximum total length at least 82 cm, presumably to about 1 m. Demersal or pelagic near continental slopes and seamounts in depths of 500 to 1 459 m. Without interest to fisheries in the area, fished elsewhere. Western Atlantic from northern Gulf of Mexico off USA (Alabama), French Guiana; also Uruguay. Wide-ranging in the eastern Atlantic, western Pacific, and eastern South Pacific. S. Springer (pers. comm.) recorded *C. owstoni* from the Gulf of Mexico, which otherwise has been reported in the Pacific. The western Atlantic species has also been identified as *Centroscymnus cryptacanthus* Regan, 1906, which otherwise occurs in the eastern Atlantic. Examination of western and eastern Atlantic, New Zealand, Australian, and Japanese material referred to both of these species suggests that they comprise a single species, and that *Centroscymnus cryptacanthus* is a junior synonym of *C. owstoni*.



***Zameus squamulosus*** (Günther, 1877)

**En** - Velvet dogfish; **Fr** - Squale-grogneur velouté; **Sp** - Bruja terciopelo.

Maximum total length at least 84 cm. Demersal or pelagic near continental slopes and seamounts in depths of 550 to 2 000 m. Without interest to fisheries in the area but utilized elsewhere. Western Atlantic from Gulf of Mexico and Caribbean, including USA (Alabama, Mississippi), Mexico, Venezuela, Suriname, Guyana, French Guiana, and the Lesser Antilles east of the Virgin Islands; also southern Brazil. Wide-ranging in the eastern Atlantic, Indian Ocean, and western Pacific. Atlantic representatives of this species were often placed in *Scymnodon obscurus* (as in Compagno and Vergara, 1978), but *S. obscurus* is a junior synonym of *Z. squamulosus* (Yano and Tanaka, 1984). This species is often placed in the genus *Scymnodon* but was transferred to *Zameus* by Taniuchi and Garrick (1986).



**OXYNOTIDAE****Rough sharks**

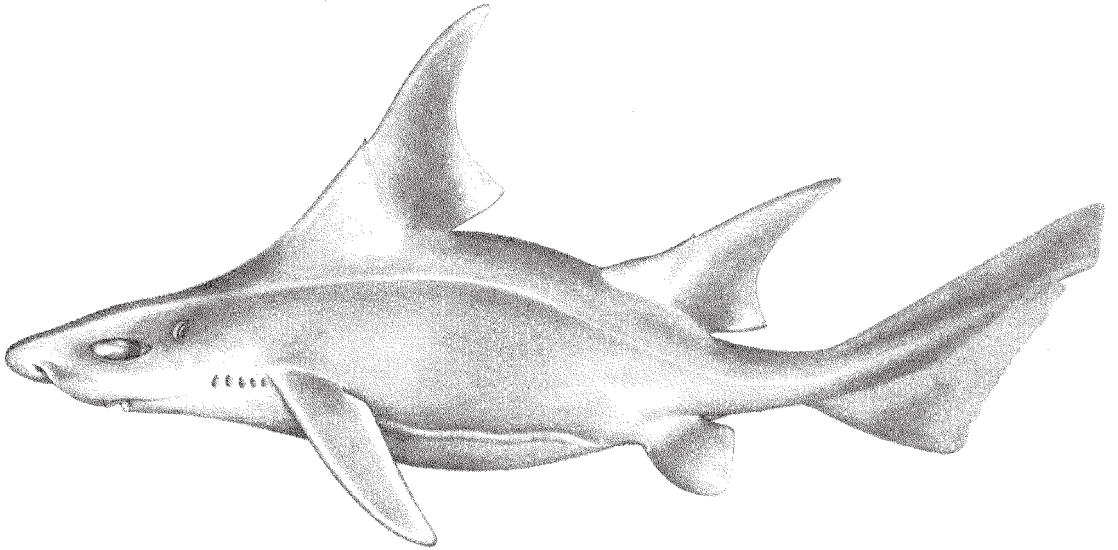
A single species occurring in the area.

*Oxynotus caribbaeus* Cervigón, 1961

OXC

**Frequent synonyms / misidentifications:** None / None.

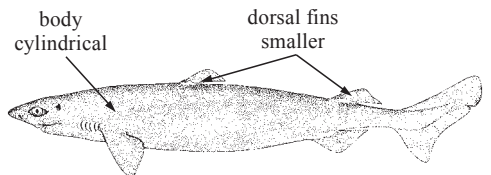
**FAO names:** En - Caribbean roughshark; Fr - Centrine antillaise; Sp - Tiburón ojimoto.



**Diagnostic characters:** A small shark. **Body strongly compressed, very high, and triangular in cross section**, with a horizontal ridge between pectoral-fin and pelvic-fin bases on each side. Denticles on body large, skin rough. Head with 5 minute gill slits, the last in front of pectoral-fin origins; nostrils close-spaced, internarial width less than nostril width, without barbels or nasoral grooves; snout moderately long, flattened; **mouth very small, transverse, and with large papillose lips**, well behind snout tip and beneath eyes; lower teeth very few, moderately large, flat, narrow, blade-like, serrated, imbricated, and with triangular cusps, upper teeth very small, not blade-like, and with narrow, needle-like cusps; very short papillose gill rakers present on internal gill slits. **Two large, broad-based, triangular dorsal fins, each with a large fin spine mostly concealed within dorsal fin, the first dorsal fin with its origin extending far forward over gill openings; pectoral fins narrow and elongated; anal fin absent;** caudal fin much less than half the total length, asymmetrical, with a subterminal notch and a weak lower lobe. No keels or precaudal pits on caudal peduncle. **Colour:** dark grey or brownish above, lighter below, with light and dark blotches, no conspicuous black marks or luminescent organs.

**Similar families occurring in the area**

Squalidae, Centrophoridae, Somniosidae, Etmopteridae, and Dalatiidae: body more cylindrical, dorsal fins smaller, lower, and not sail-like, first dorsal fin not extending over gill openings, pectoral fins broader and more paddle-shaped.

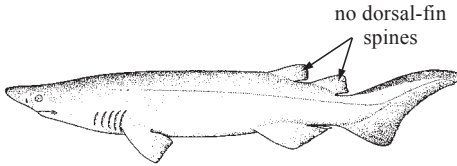


**Dalatiidae**

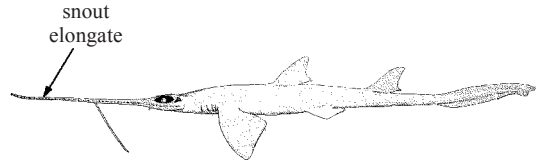


Echinorhinidae: body set with sparse, large, plate-like denticles; spiracles small and well behind eyes; fifth pair of gill slits abruptly longer than others; mouth broadly rounded; teeth not imbricated, upper teeth nearly as large as lower teeth, with cusplets present in large juveniles and adults; no dorsal-fin spines; first dorsal-fin origin over or posterior to pelvic-fin origin; pelvic fins much larger than second dorsal fin.

Pristiophoridae: snout elongated into a flattened blade with lateral teeth; barbels present in front of nostrils.



Echinorhinidae



Pristiophoridae

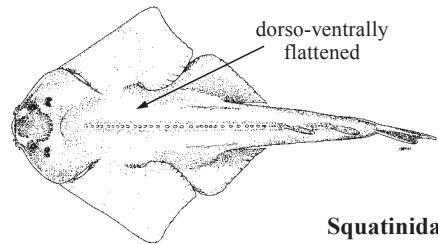
Squatinae: trunk much flattened dorso-ventrally; eyes on upper side of head; anterior margins of pectoral fins extending forward past gill openings and partly concealing them; pelvic fins also very broad, wing-like.

All other shark families: anal fin present.

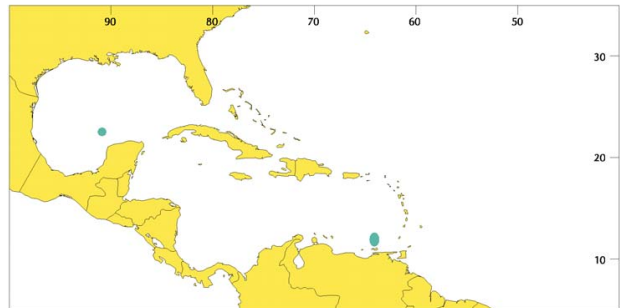
**Size:** Maximum total length about 49 cm.

**Habitat, biology, and fisheries:** Bottomliving on the continental slopes in water about 402 to 457 m deep. Biology essentially unknown. Not fished commercially, but possibly discarded bycatch of offshore demersal fishing fleets.

**Distribution:** So far only reported in the area from off Venezuela and Mexico.



Squatinae



## References

- Bigelow, H.B. and W.C. Schroeder. 1957. A study of the sharks of the suborder Squaloidea. *Bull. Mus. Comp. Zool. Harvard*, 117:1-150.
- Carpenter, J.S. 1966. Capture of immature *Oxynotus caribbaeus* Cervigon from the type locality. *Copeia*, (1966):356-357.
- Cervigón, M.F. 1961. Una nueva especie de *Oxynotus* de la costas de Venezuela. *Cont. Fund. La Salle Cien. Nat. Set. Invest. Mar. Margarita*, (3):3-10.
- Cadenat, J. and J. Blache. 1981. Requins de Méditerranée et d'Atlantique (plus particulièrement de la Côte Occidentale d'Afrique). Ed. OSTROM, *Faune Tropicale*, (21):330 p.
- Compagno, L.J.V. 1978. Oxynotidae. In *FAO species identification sheets for fisheries purposes. Western Central Atlantic, (Fishing Area 31)*, edited by W. Fischer. Vol. 5. Rome, FAO (unpaginated).
- Compagno, L.J.V. 1984. FAO Species Catalogue. Vol. 4, Sharks of the World. An annotated and illustrated catalogue of shark species known to date. *FAO Fisheries Synopsis*, (125)Vol.4,Pt.1 (noncarcharhinoids):1-250.
- Pérez, H.E. and L.H. Campos. 1995. Nuevos registros de tiburones en México. *Rev. Soc. Mex. Hist. Nat.*, 46:113-120.
- Shirai, S. 1992. *Squalean phylogeny. A new framework of "squaloid" sharks and related taxa*. Hokkaido University Press, Sapporo, 151 p.
- Yano, K. and M. Murofushi. 1985. A new prickly dogfish, *Oxynotus japonicus*, from Japan. *Japan. J. Ichthyol.*, 32(2):129-135.