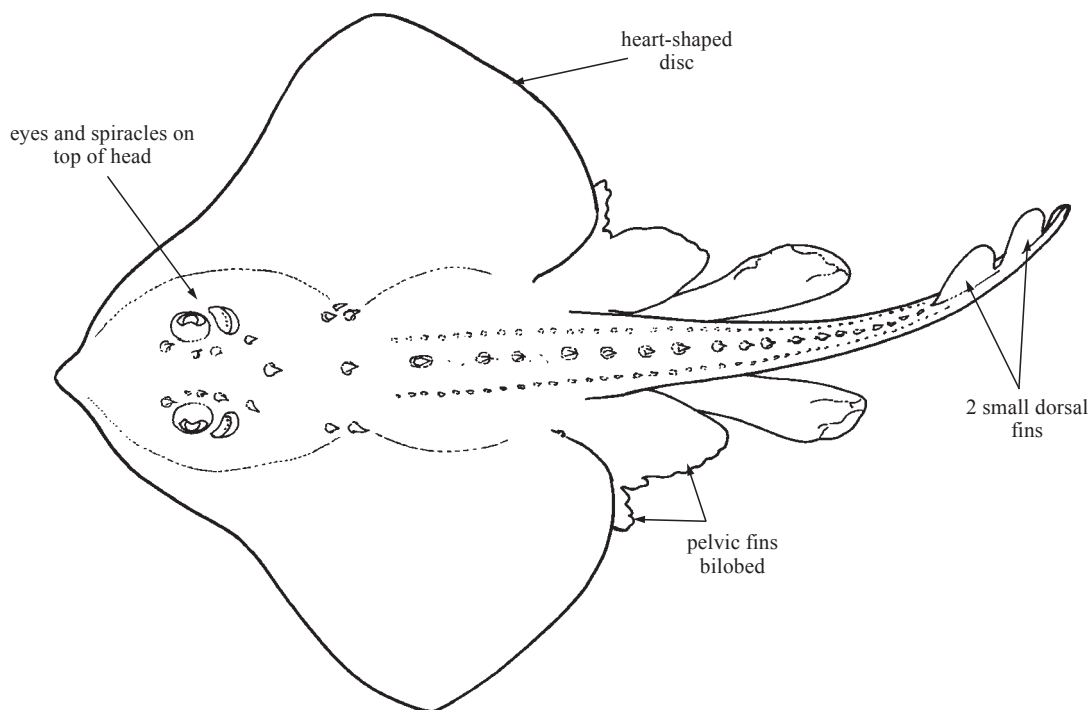


RAJIDAE

Skates

by J.D. McEachran, Texas A & M University, Texas, USA
and M.R. de Carvalho, American Museum of Natural History, New York, USA

Diagnostic characters: Batoid fishes of very small size (20 to 30 cm total length for *Fenestraja*) to moderately large size (more than 200 cm total length for *Bathyraja* and *Dipturus*). Body strongly depressed; **head, trunk, and broadly expanded pectoral fins forming a rhombic or heart-shaped disc**. Pectoral fins fused to sides of head and trunk from tip to about midlength of snout to insertion of pelvic fins. **Tail moderately slender, distinctly demarcated from disc**, with a narrow longitudinal fold along each side; **tail length less than 2 times disc width**. Snout ranging from acutely angled to obtusely rounded. Front of cranium extending as a rostral bar, which is stout to very delicate; anterior pectoral-fin rays either extending to tip of snout (species with delicate rostral bar) or to about 2/3 length of snout (species with stout rostral bar). Eyes and spiracles on top of head, spiracles immediately behind eyes and **with pseudobranchial folds on anterior walls**. Nostrils small and located near front of mouth; **anterior lobes expanded posteriorly as large nasal curtains that are joined to broad transverse isthmus in front of mouth**. Mouth transverse to strongly bowed. Numerous small teeth in bands along jaws, obtuse to pointed and showing sexual dimorphism in many species; placed either in pavement pattern or in parallel rows or in combination of both. Two small dorsal fins far posterior on tail, or rarely one or both dorsal fins absent; caudal fin near tip of tail and consists of narrow fold on dorsal surface of tail, and occasionally present on ventral surface as low fold or ridge. **Pelvic fins bilobed or rarely with single lateral lobe, 2 lobes separated by more or less deep notch along outer margin or anterior lateral lobe completely separate from posterior lobe**. Dorsal surface densely to sparsely covered with denticles and variously covered with small to moderately large thorns; latter usually arranged in patches, or rows, but often in 1 to several distinct regions; at least a median row of thorns along tail (except some *Malacoraja* species); **mature males generally possess alar and alar thorns along the anterior margin of the disc**. Ventral surface smooth or with denticles on snout and along margin of disc, or more or less covered with denticles, and rarely with some thorns. Squamation varies with growth, age, and sexual maturity. **Colour:** dorsal surface ranging from nearly white to brownish black, and often patterned with small to large spots, bars, reticulations, or ocelli or in combinations of these. Ventral surface uniformly dark or light, or mottled with both, or a light centre of the disc is bordered with dark; some species with darkly pigmented sensory pores. Generally deep-water skates plain dark coloured on both sides; shallow-water species are mainly white ventrally and often extremely variegated on dorsal surface. Colour and pattern may vary depending on nature of substrate.

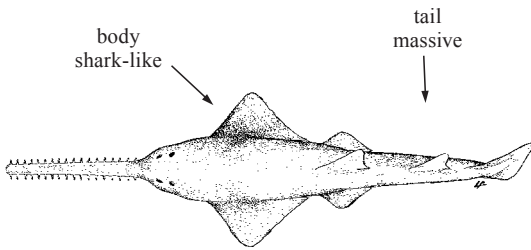


Habitat, biology, and fisheries: Skates are widely distributed in all oceans from the Arctic to the Antarctic and from shallow coastal waters to abyssal depths (3 000 m); they are rare over inner continental and insular shelves in tropical latitudes, and are absent in the vicinity of coral reefs. Species are predominantly marine; some species enter brackish waters, but only a single species enters fresh waters. They are bottom dwellers typically with small ranges but some of the larger species occur over several ocean basins. Skates predominantly feed on a wide variety of bottom- and near bottom-dwelling invertebrates and fishes. All species are oviparous and deposit large fertilized eggs in leathery egg capsules. They are the most diverse of the batoid taxa in number of species, geographical distribution, and depths inhabited. However, not much data concerning the general biology of many species are available. There is a commercial fishery on skates in several parts of the world, but not in the area. Only the wings of skates are used for human consumption in fresh, salted, or smoked form.

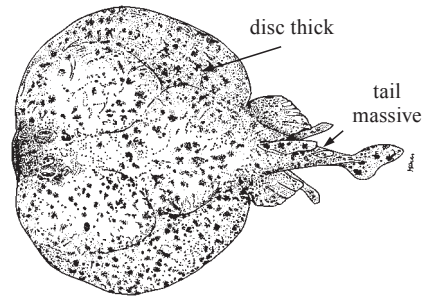
Similar families occurring in the area

Pristidae, Rhinobatidae: body shark-like, tail massive and not distinctly demarcated from body or disc; pectoral fins moderately enlarged.

Torpedinidae: disc thick and with fleshy margins, well-developed electric organs along sides of head; tail massive and not demarcated from disc; no scales on body.



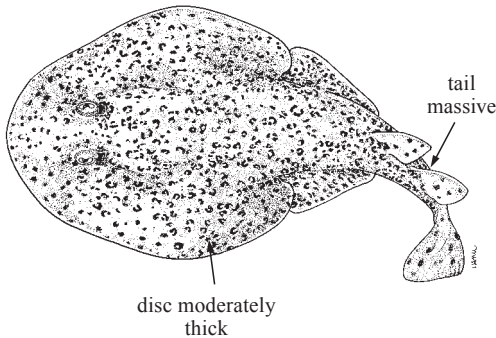
Pristidae



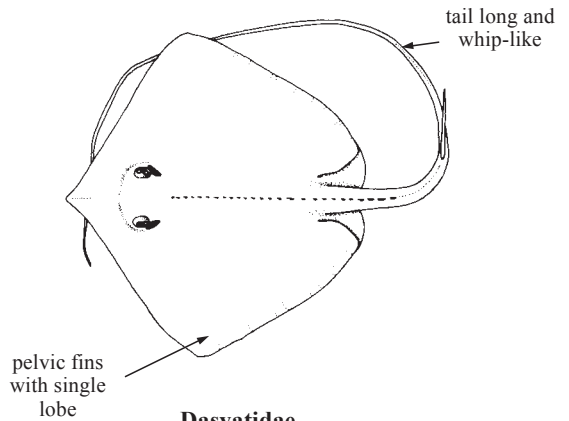
Torpedinidae

Narcinidae: disc moderately thick and with fleshy margins, well-developed electric organs along sides of head; tail massive and not demarcated from disc; no scales on body.

Dasyatidae, Urotrygonidae, Gymnuridae, Myliobatidae, Rhinopteridae, Mobulidae: pelvic fins with single lobe; tail in most species very long and whip-like distally, usually 1 or more greatly enlarged and serrated spine(s) on tail; no pseudobranchial folds in spiracles.



Narcinidae



Dasyatidae

Key to the species of Rajidae occurring in the area

- 1a. Pelvic fins with single laterally directed lobe (Fig. 1a) → 2
- 1b. Pelvic fins with anterior and posterior lobes (Fig. 1b) → 4

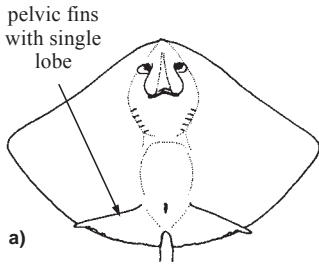


Fig. 1 dorsal view

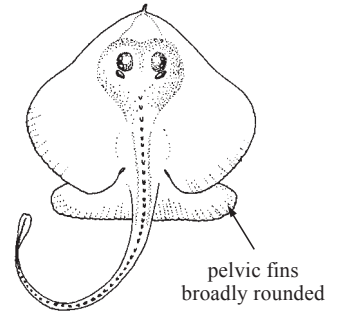
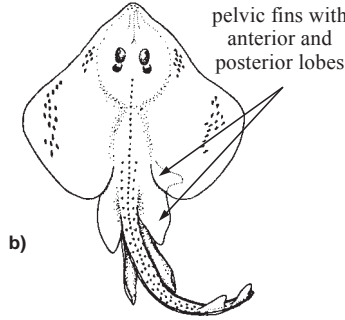


Fig. 2 *Pseudoraja fischeri*

- 2a. Lateral extreme of pelvic fin broadly rounded and posterior margin transverse (Fig. 2) *Pseudoraja fischeri*
- 2b. Lateral extreme of pelvic fin acutely pointed and posterior margin diagonal (Fig. 1a). → 3
- 3a. Dorsal fin rarely present; dorsal surface uniform brown; ventral surface of disc with denticles *Gurgesiella atlantica*
- 3b. Dorsal fin always present; dorsal surface with light or dark blotches; ventral surface of disc without denticles *Gurgesiella dorsalifera*

- 4a. Anterior and posterior lobes of pelvic fin separate, anterior lobe finger-like (Fig. 3a) → 5
- 4b. Anterior and posterior lobes of pelvic fin continuous, connected by series of radials and fin membranes (Fig. 3b) → 11

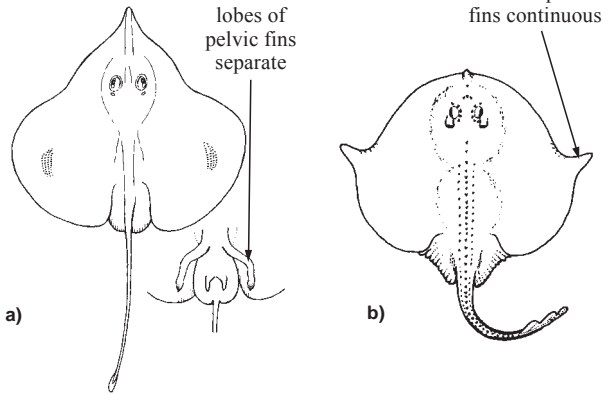


Fig. 3 dorsal view

- 5a. Dorsal fins lacking; preorbital length greater than 15% of total length → 6
- 5b. Two dorsal fins present; preorbital length usually less than 15% of total length → 8

- 6a. Orbit diameter 20 to 25% snout length *Anacanthobatis americanus*
- 6b. Orbit diameter 11 to 14% snout length → 7

- 7a. Distal section of snout laterally expanded into leaf-like structure (Fig. 3a). *Anacanthobatis folirostris*
- 7b. Distal section of snout evenly attenuating to filament and not laterally expanded *Anacanthobatis longirostris*

- 8a. Interspace between dorsal fins at least 50% of first dorsal-fin base *Cruriraja atlantis*
- 8b. Interspace between dorsal fins less than 50% of first dorsal-fin base → 9

- 9a. Nuchal region generally without thorns; anterior margins of dorsal fins black; dorsal surface of disc largely free of fine denticles *Cruriraja poeyi*
- 9b. Nuchal region generally with thorns; anterior margins of dorsal fins and tip of caudal fin brown like remainder of fins; dorsal surface of disc more or less uniformly covered with fine denticles → 10

- 10a. No thorns on disc posterior to nuchal thorns; dorsal surface of tail with single irregular row of thorns; ventral surface of tail covered with denticles in specimens larger than 25 cm total length *Cruriraja rugosa*
- 10b. Scapular thorns present, posterior half of disc with midrow of thorns; ventral surface of tail without denticles; dorsal surface of tail with 2 or more irregular rows of thorns . . . *Cruriraja cadenati*

- 11a. Anterior margin of snout very obtuse (Fig. 4); anterolateral margin of ventral side of disc with band of claw-like denticles → 12
- 11b. Anterior margin of snout acute to moderately obtuse; anterolateral margin of ventral side of disc without band of claw-like denticles → 13

- 12a. Lateral aspect of disc with narrow spatulate-like lobe; anterolateral margin of disc convex; dorsal surface of disc grey with blackish blotches (Fig. 4) *Dactylobatus armatus*
- 12b. Lateral aspect of disc without narrow spatulate-like lobe; anterolateral margin of disc concave; dorsal surface of disc tan, generally with several pairs of prominent white markings outlined with dark pigment *Dactylobatus clarkii*

- 13a. Tip of snout flexible; rostral cartilage distally very slender; anterior pectoral-fin rays extending nearly to tip of snout (Fig. 5a). → 14
- 13b. Tip of snout firm; rostral cartilage moderately stout to stout; anterior pectoral-fin rays distinctly separated from tip of snout (Fig. 5b) → 24

margin of snout obtuse

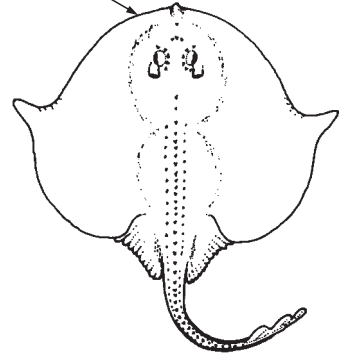
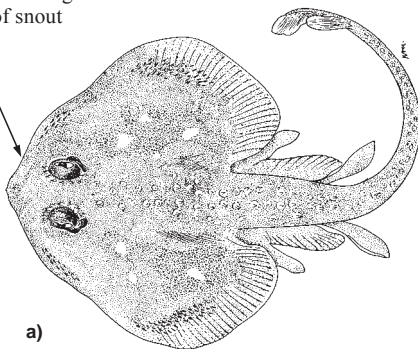


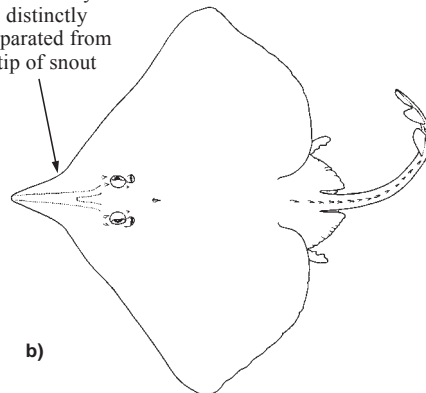
Fig. 4 dorsal view

pectoral rays extending nearly to tip of snout



a)

pectoral rays distinctly separated from tip of snout



b)

Fig. 5 dorsal view

- 14a. Anterior lobe of pelvic fin 65 to 80% of posterior lobe; tail width at base slightly greater than orbit diameter (Fig. 6a) → 15
- 14b. Anterior lobe of pelvic fin 80 to 100% of posterior lobe; tail width at base less than orbit diameter (Fig. 6b) → 19
- 15a. Ventral surface sooty grey to black over central part of disc or over entire disc except for pale areas around mouth, gill slits, and cloaca → 16
- 15b. Ventral surface light tan to yellowish white over central part of disc → 17

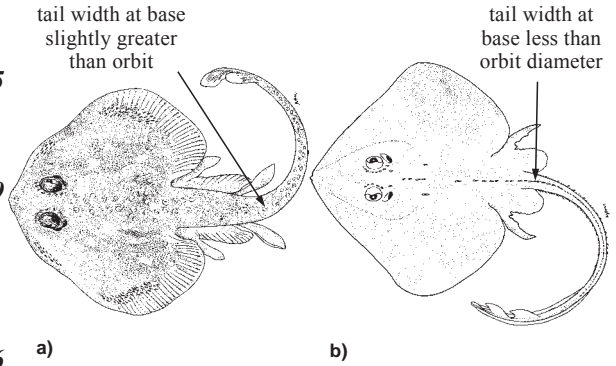


Fig. 6 dorsal view

- 16a. Jaws strongly arched on either side of isthmus; lower jaw with spatulate process, partially to totally overlapping symphysis of upper jaw; upper caudal-fin lobe greater than half height of second dorsal fin; lower caudal-fin lobe present (Fig. 7) *Breviraja nigriventralis*
- 16b. Jaws moderately arched on each side of symphysis; lower jaw without spatulate process; upper caudal-fin lobe less than half height of second dorsal fin; lower caudal-fin lobe absent *Breviraja spinosa*

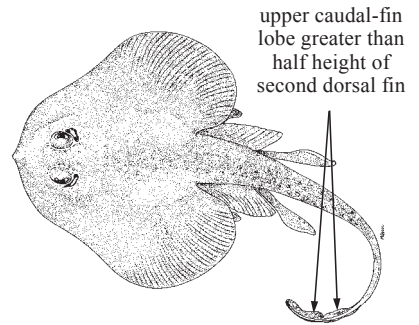


Fig. 7 *Breviraja nigriventralis*

- 17a. Dorsal surface of disc tan with 4 to 8 symmetrically arranged circular white spots; 32 to 40 tooth rows in upper jaw *Breviraja claramaculata*
- 17b. Dorsal surface of disc uniform tan to brown, or brown to tan and mottled with irregularly shaped light and dark spots and blotches; 38 to 48 tooth rows in upper jaw → 18
- 18a. Dorsal surface of disc uniform tan to brown or occasionally mottled with ill-defined light coloured blotches; ventral tip of snout with a dark brown to black blotch; band of 3 rows of small thorns from level of maximum disc width to axil of pelvic fins *Breviraja mouldi*
- 18b. Dorsal surface of disc tan to brown and mottled with irregular darker and lighter spots and blotches; ventral tip of snout without dark blotch; a single row of thorns, at most from level of maximum disc width to axil of pelvic fins *Breviraja colesi*

- 19a. Oronasal pits, located anterior to upper jaw and above nasal curtain, absent → 20
- 19b. Oronasal pits, located anterior to upper jaw and above nasal curtain, present (Fig. 8) *Neoraja carolinensis*
- 20a. Distance between dorsal fins greater than 100% length of first dorsal-fin base; ventral surface of tail covered with dermal denticles *Fenestraja atripinna*
- 20b. Distance between dorsal fins less than 100% of first dorsal-fin base; ventral surface of tail not covered with denticles → 21

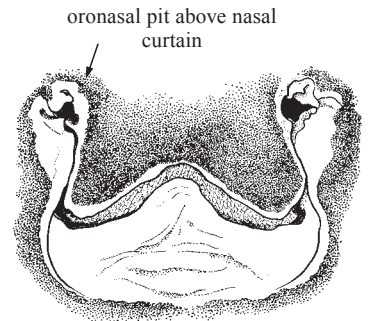


Fig. 8 oronasal pits

- 21a. Band of 3 rows of thorns along midline from maximum disc width to axil of pelvic fins; 3 or 4 distinct rows of thorns along midbelt of tail *Fenestraja sinusmexicanus*
- 21b. Single row of thorns along midline of disc from maximum width to axil of pelvic fins; usually single row of thorns on midbelt of tail → 22

- 22a. Dorsal surface of disc and tail uniform greyish brown *Fenestraja ishiyamai*
- 22b. Dorsal surface of disc with dark markings; tail with dark crossbars → 23

- 23a. Two to 4 thorns on shoulder region of disc; thorns along midline of disc and anterior half of tail relatively large and conspicuous; anterior lobe of pelvic fin as long as posterior lobe *Fenestraja plutonia*

- 23b. Zero to 2 thorns on shoulder region of disc; thorns along midline of disc and anterior half of tail small and inconspicuous; anterior lobe of pectoral fin shorter than posterior lobe *Fenestraja cubensis*

- 24a. Snout moderately elongated to distinctly elongated (Fig. 9a), anterolateral margin of disc concave (line connecting tip of snout to anterior aspect of lateral corner of disc free of disc); ampullar pores on ventral surface of disc generally darkly pigmented → 25

- 24b. Snout generally not elongated (Fig. 9b), anterolateral margin of disc straight to slightly convex (line connecting tip of snout to anterior aspect of lateral corner of disc intersecting disc); ampullar pores on ventral surface of disc not darkly pigmented → 29

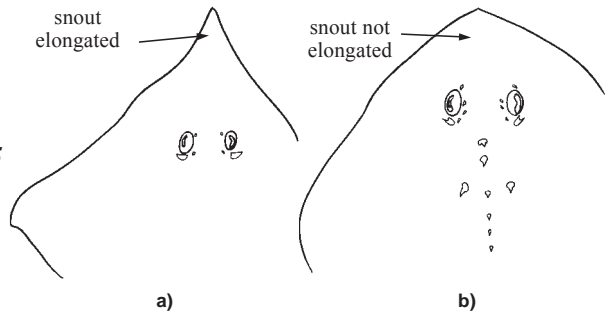


Fig. 9 dorsal view of snout

- 25a. Midbelt of disc without thorns → 26
- 25b. Midbelt of disc with at least single nuchal thorn → 28

- 26a. Tail with 1 row of thorns *Dipturus teevani*
- 26b. Tail with 3 rows of thorns → 27

- 27a. Midline of tail with 31 to 48 thorns; thorns on tail with compressed hook-shaped crowns; distance between dorsal fins shorter than base of first dorsal fin; only 1 thorn between dorsal fins (Fig. 10) *Dipturus oregoni*

- 27b. Midline of tail with 13 to 26 thorns; thorns on tail without compressed and hook-shaped crowns; distance between dorsal fins about equal to length of first dorsal-fin base; 3 to 6 thorns between dorsal fins *Dipturus olseni*

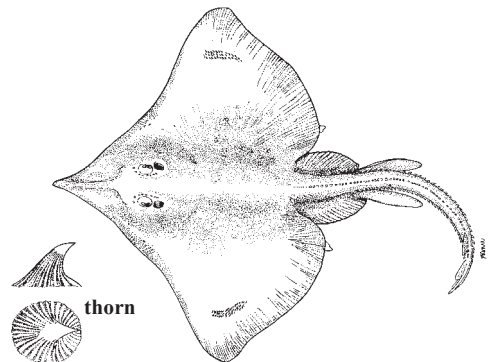


Fig. 10 *Dipturus oregoni*

- 28a.** Midbelt of disc with continuous row of thorns extending from nuchal region to tail . . . *Dipturus garricki*
28b. Nuchal thorn only thorn along midbelt of disc *Dipturus bullisi*
- 29a.** Distal fourth to third of tail without distinct thorns but uniformly covered with denticles
. *Malacoraja senta*
29b. Distal fourth to third of tail with distinct thorns → 30
- 30a.** Midrow thorns on disc very large and with stellate bases; about 10 midrow thorns on tail
between axil of pelvic fins and first dorsal fin *Amblyraja radiata*
30b. Midrow thorns on disc (if present) small to moderate in size and without stellate bases;
more than 15 midrow thorns on tail between axil of pelvic fins and first dorsal fin → 31
- 31a.** Dorsal surface of disc with various colour patterns (ocelli, spots, bars, rosettes); ventral
surface of disc light coloured → 32
31b. Dorsal surface of disc plain coloured; ventral surface of disc as dark or darker than dorsal
side → 39
- 32a.** Dorsal surface of disc with ocellus near base of each pectoral fin → 33
32b. Dorsal surface of disc without ocellus near base of each pectoral fin → 36
- 33a.** Thorns absent along midline of disc between nuchal region and axil of pectoral fins . *Raja bahamensis*
33b. Thorns present along midline of disc between nuchal region and axil of pectoral fins → 34
- 34a.** Disc width greater than 70% total length *Raja cervigoni*
34b. Disc less than 65% total length → 35
- 35a.** Lateral margin of snout distinctly concave; orbit length about 20% preorbital snout length;
no thorns over scapular region of disc *Raja texana*
35b. Lateral margin of snout only slightly concave; orbit length about 33% preorbital snout
length; 1 or more thorns over scapular region of disc *Raja ackleyi*
- 36a.** Dorsal surface of disc with many irregular dark spots and transverse, oblique narrow bars;
several thorns on scapular and nuchal region of disc, but thorns never forming a triangular
patch *Raja eglanteria*
36b. Dorsal surface of disc peppered with small dark and light spots or with spots concentrated
into dark rosettes; thorns on scapular and nuchal region of disc forming triangular patch → 37
- 37a.** Dorsal surface with diffuse to concentrated rosette pattern of dark spots *Leucoraja garmani*
37b. Dorsal surface with dark and pale spots → 38
- 38a.** Dorsal surface sparsely covered with small dark spots; maturity reached between 260 and
302 mm total length *Leucoraja yucatanensis*
38b. Dorsal surface densely covered with dark and pale spots; specimens mature between 350
and 418 mm total length *Leucoraja lentiginosa*
- 39a.** Preorbital snout length about 10% total length; snout obtuse and bluntly rounded . . . *Rajella fuliginea*
39b. Preorbital snout length about 15% total length; snout acutely angled *Rajella purpuriventralis*

List of species occurring in the area

The symbol ♠ is given when species accounts are included.

- ♠ *Anacanthobatis americanus* Bigelow and Schroeder, 1962.
- ♠ *Anacanthobatis folirostris* (Bigelow and Schroeder, 1951).
- ♠ *Anacanthobatis longirostris* Bigelow and Schroeder, 1962.
- ♠ *Amblyraja radiata* (Donovan, 1808).
- ♠ *Breviraja claramaculata* McEachran and Matheson, 1985.
- ♠ *Breviraja colesi* Bigelow and Schroeder, 1948.
- ♠ *Breviraja mouldi* McEachran and Matheson, 1995.
- ♠ *Breviraja nigriventralis* McEachran and Matheson, 1985.
- ♠ *Breviraja spinosa* Bigelow and Schroeder, 1950.
- ♠ *Cruriraja atlantis* Bigelow and Schroeder, 1948.
- ♠ *Cruriraja cadenati* Bigelow and Schroeder, 1962.
- ♠ *Cruriraja poeyi* Bigelow and Schroeder, 1948.
- ♠ *Cruriraja rugosa* Bigelow and Schroeder, 1958.
- ♠ *Dactylobatus armatus* Bean and Weed, 1909.
- ♠ *Dactylobatus clarkii* (Bigelow and Schroeder, 1958).
- ♠ *Dipturus bullisi* (Bigelow and Schroeder, 1962).
- ♠ *Dipturus garricki* (Bigelow and Schroeder, 1958).
- ♠ *Dipturus olseni* (Bigelow and Schroeder, 1951).
- ♠ *Dipturus oregoni* (Bigelow and Schroeder, 1958).
- ♠ *Dipturus teevani* (Bigelow and Schroeder, 1951).
- ♠ *Fenestrija atripinna* (Bigelow and Schroeder, 1950).
- ♠ *Fenestrija cubensis* (Bigelow and Schroeder, 1950).
- ♠ *Fenestrija ishiyamai* (Bigelow and Schroeder, 1962).
- ♠ *Fenestrija plutonia* (Garman, 1881).
- ♠ *Fenestrija sinusmexicanus* (Bigelow and Schroeder, 1950).
- ♠ *Gurgesiella atlantica* (Bigelow and Schroeder, 1962).
- ♠ *Gurgesiella dorsalifera* McEachran and Compagno, 1980.
- ♠ *Leucoraja garmani* (Whitley, 1939).
- ♠ *Leucoraja lentiginosa* (Bigelow and Schroeder, 1951).
- ♠ *Leucoraja yucatanensis* (Bigelow and Schroeder, 1950).
- ♠ *Malacoraja senta* (Garman, 1885).
- ♠ *Neoraja carolinensis* McEachran and Stehmann, 1984.
- ♠ *Pseudoraja fischeri* Bigelow and Schroeder, 1954.
- ♠ *Raja ackleyi* Garman, 1881.
- ♠ *Raja bahamensis* Bigelow and Schroeder, 1965.
- ♠ *Raja cervigoni* Bigelow and Schroeder, 1964.
- ♠ *Raja eglanteria* Bosc, 1800.
- ♠ *Raja texana* Chandler, 1921.
- ♠ *Rajella fuliginea* (Bigelow and Schroeder, 1954).
- ♠ *Rajella purpuriventralis* (Bigelow and Schroeder, 1962).

References

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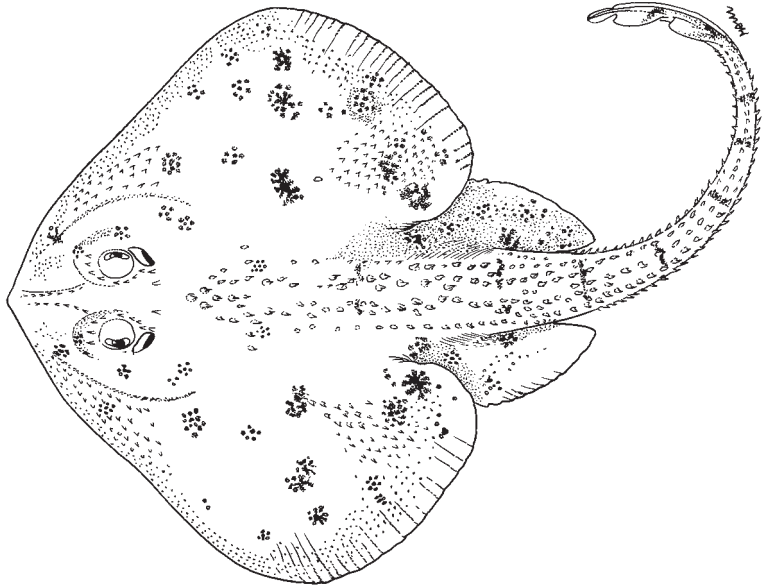
Leucoraja garmani (Whitley, 1939)

JFG

Frequent synonyms / misidentifications: *Raja garmani* Whitley, 1939 / *Leucoraja lentiginosa* (Bigelow and Schroeder, 1951).

FAO names: En - Rosette skate; Fr - Raie rosette; Sp - Raya germán.

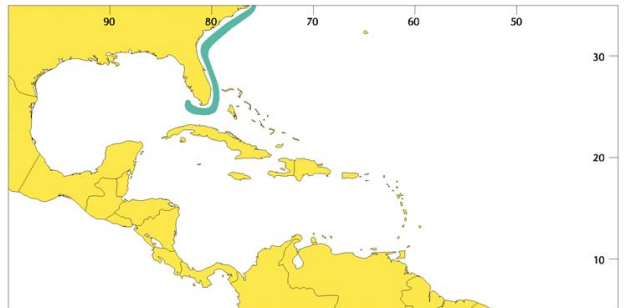
Diagnostic characters: Disc heart-shaped, about 1.2 to 1.3 times as broad as long; snout little projecting, anterior angle of snout 110 to 120°; anterolateral margin of disc straight in young to moderately concave opposite spiracles in adults; outer and posterior corners of disc broadly rounded. Snout moderately short, preorbital length 9 to 10% of total length. Mouth arched, teeth arranged in 44 to 52 rows in upper jaw. **Pectoral radials extending to about 3/4 length of snout. Anterior pelvic-fin lobe connected to posterior lobe by membrane and 48 to 56% of length of posterior lobe.** Tail 59 to 61% of total length; lateral tail folds narrow and extending from tip of posterior lobe of pelvic fin to near tip of tail; dorsal fins of similar shape and size, and separated by a space less than length of base of first dorsal fin. Denticles in broad band along anterior margin of disc; thorns along lateral margins of rostrum, in crescent-shaped arc along inner margin of orbits and spiracles, and **arranged in a triangular patch over the nuchal and scapular areas**; 1 to 3 rows of thorns lateral to midline of disc and to midrow thorns on tail; midrow thorns present on disc only in juveniles. Precaudal vertebrae 22 to 25, predorsal caudal vertebrae 58 to 64, and pectoral radials 61 to 67. **Colour: dorsal surface pale buff to brown with dark spots concentrated to form rosette patterns. Dark spots on upper surface of tail concentrated to form bars.** Ventral surface white to yellow, occasionally with greyish brown blotches on disc and tail.



Size: Maximum to 44 cm total length and 26 cm disc width; **common to 40 cm total length in the area**; north of Cape Hatteras maturity occurs between 33 and 44 cm total length, and south of Cape Hatteras maturity occurs between 25 and 34 cm total length.

Habitat, biology, and fisheries: This species is benthic on soft bottoms along the outer continental shelf and upper slope, between 37 and 366 m at temperatures between 6 and 21°C, but is common between 60 and 366 m at 9 to 20°C. Food consists of decapod crustaceans and to a lesser extent epibenthic copepods, amphipods, polychaetes, squids, and ray-finned fishes. Species consists of 2 subspecies located north of Cape Hatteras, North Carolina (*Leucoraja garmani virginica*) and between Cape Hatteras and Dry Tortugas, Florida (*Leucoraja garmani garmani*). It is exploited incidentally along the southeastern coast of the USA. Separate statistics are not reported for this species. Caught mainly with bottom trawls and bottom longlines. Marketed fresh and salted; also used for bait.

Distribution: From Cape Cod, Massachusetts, to the Florida Keys, Florida.

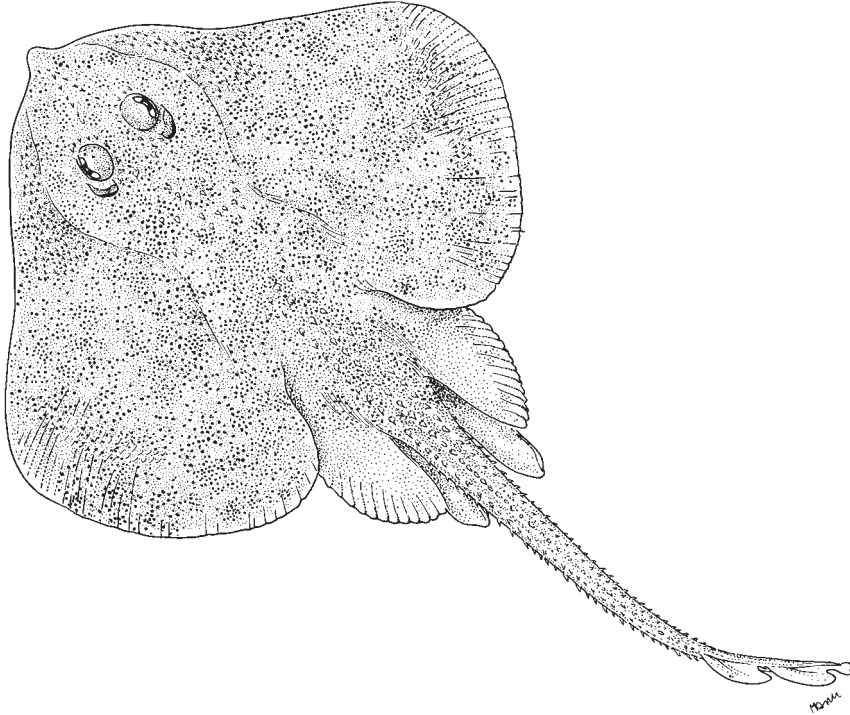


Leucoraja lentiginosa (Bigelow and Schroeder, 1951)

JFS

Frequent synonyms / misidentifications: *Raja lentiginosa* Bigelow and Schroeder, 1951 / *Leucoraja garmani* (Whitley, 1939).

FAO names: En - Freckled skate.

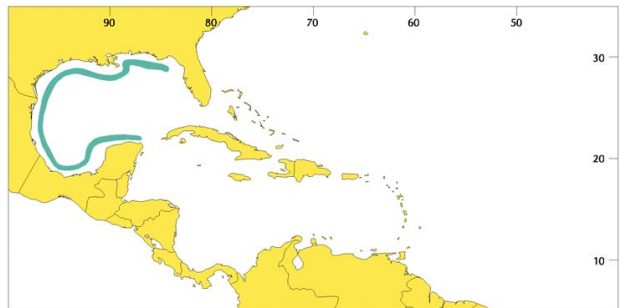


Diagnostic characters: Disc heart-shaped, about 1.2 to 1.3 times as broad as long; snout little projecting, anterior angle of snout 110 to 120°; anterolateral margin of disc straight in young to moderately concave opposite spiracles in adults; outer and posterior corners of disc broadly rounded. Snout moderately short, preorbital length is 8.5 to 9.7% total length. Mouth arched, teeth arranged in 47 to 54 rows in upper jaw. **Pectoral radials extend to about 3/4 snout length. Anterior pelvic-fin lobe connected to posterior lobe by membrane and distinctly shorter than posterior lobe.** Tail is 59 to 61% total length; lateral tail fold narrow and extending from tip of posterior lobe of pelvic fin to near tip of tail; dorsal fins of similar shape and size and separated by space less than length of base of first dorsal fin. Denticles in broad band along anterior margin of disc; thorns along lateral margins of rostrum, in crescent-shaped arc along inner margin of orbits and spiracles and **arranged in triangular patch over nuchal and scapular areas**; 1 to 3 rows of thorns lateral to midline of disc and to midrow thorns on tail; midrow thorns present on disc only in juveniles. Precaudal vertebrae 21 to 27, and predorsal caudal vertebrae 59 to 65, and pectoral radials 63 to 68. **Colour: dorsal surface pale buff to brown and freckled with scattered pale and dark spots.** Ventral surface white to yellow, occasionally with greyish brown blotches on disc and tail.

Size: Maximum to 44 cm total length and 25 cm disc width; common to 40 cm total length.

Habitat, biology, and fisheries: This species is benthic on soft bottoms along the outer continental shelf and upper slope, between 53 and 588 m at 11 to 21° C but is common between 60 and 366 m at 9 to 20° C.

Distribution: Throughout the Gulf of Mexico from northwestern Florida to Yucatán.



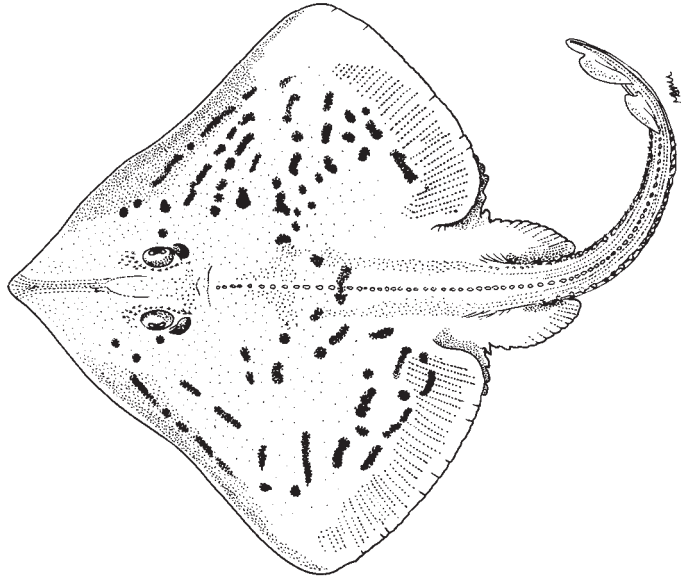
***Raja eglanteria* Bosc, 1800**

JFE

Frequent synonyms / misidentifications: None / None.

FAO names: En - Clearnose skate; Fr - Raie blanc nez; Sp - Raya hialina.

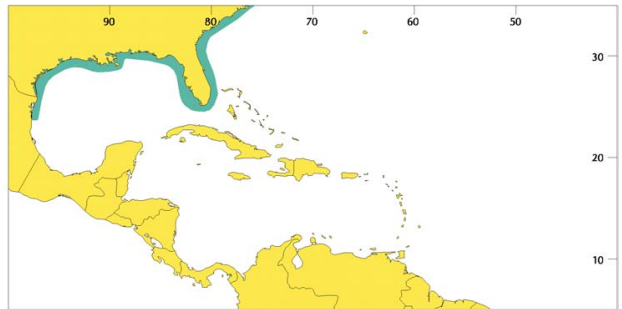
Diagnostic characters: Disc rhombic, about 1.2 to 1.3 times as broad as long; snout moderately projecting; anterior angle of snout 90 to 110°; anterolateral margin of disc straight to slightly concave opposite spiracles; outer corners of disc abruptly rounded; posterior corners of disc broadly rounded. Snout moderately long, preorbital length 14 to 15% total length. Mouth straight to slightly arched; teeth arranged in 46 to 54 rows in upper jaw. Pectoral-fin radials extend slightly anterior to midlength of snout. Anterior pelvic-fin lobe connected to posterior lobe by membrane, and **anterior lobe about 50% length of posterior lobe. Tail about 50% total length**, lateral tail fold well developed and extending from tip of posterior lobe of pelvic fins to near tip of tail; dorsal fins of similar shape and size and separated by space equal to about 1/4 length of base of first dorsal fin. Denticles in band along anterior margin of disc and over much of remainder of disc; thorns in crescent-shaped arc along inner margin of orbits and spiracles; **continuous row of thorns from nuchal region to first dorsal fin; 1 to 5 scapular thorns, not arranged with nuchal thorns in triangular patch; lateral and often parallel row of thorns on each side of tail**; 1 or 2 thorns between dorsal fins. Precaudal vertebrae number 33 to 35, predorsal caudal vertebrae number 56 to 59, pectoral-fin radials number 81 to 82. **Colour: upper dorsal surface light brown with dark brown to black spots and bars**; area on either side of snout semitransparent; ventral surface white. Individuals from the southern part of the range blunter snouts, a less distinct colour pattern, and mature at a smaller size than those from the northern part of the range and may represent a separate species.



Size: Maximum to 79 cm total length and 52 cm width; common to about 70 cm total length in area.

Habitat, biology, and fisheries: This species occurs from the shore zone to 119 m at temperatures from 5 to 27° C but it is most common between the shore and 111 m at 15 to 25° C in area. Occasionally found in estuaries but not in fresh water. Food consists mainly of decapod crustaceans, bivalves, polychaetes, squids, and ray-finned fishes. Exploited in the southeastern USA, but separate statistics are not reported for this species. Caught mainly with bottom trawls. Marketed fresh and salted; also used for bait.

Distribution: Western Atlantic coast of USA from Massachusetts and occasionally from Gulf of Maine, bordering Florida and throughout northern Gulf of Mexico to northern Tamaulipas state, Mexico.



Raja texana Chandler, 1921

JAF

Frequent synonyms / misidentifications: None / None**FAO names** En - Roundel skate; Fr - Raie tourteau; Sp - Raya tejana.**Diagnostic characters:**

Disc rhombic, about 1.2 to 1.3 times as broad as long; snout moderately projecting; anterior angle of snout 85 to 106°; anterolateral margin of disc moderately to strongly concave opposite spiracles; outer corners of disc abruptly rounded; posterior corners of disc broadly rounded. Snout moderately long, preorbital length is 14 to 18% total length. Mouth gently to strongly arched; teeth arranged in 44 to 48 rows. Pectoral radials extending to midlength of snout. Anterior pelvic-fin lobe connected to posterior lobe and **anterior lobe 67 to 72% length of posterior lobe.**

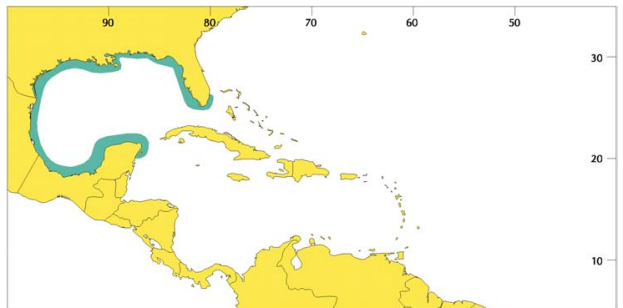
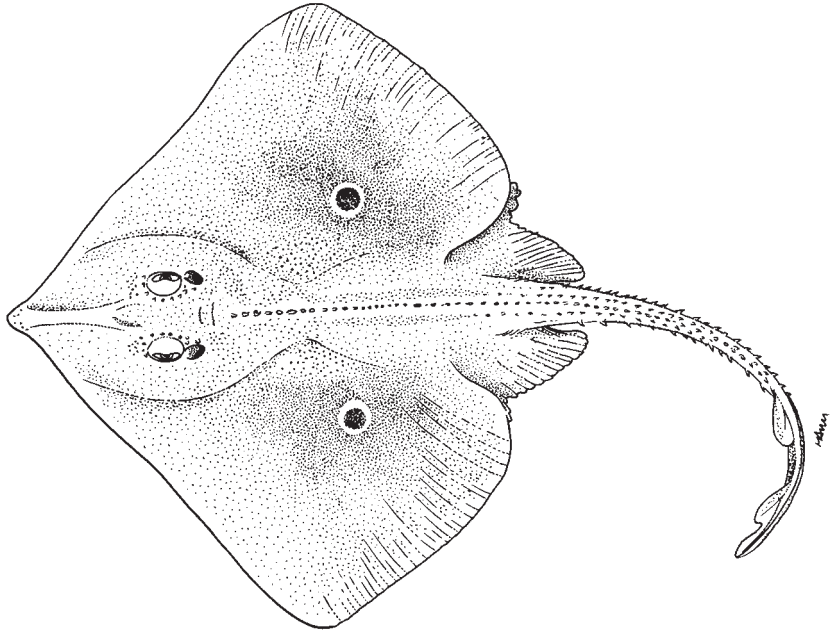
Tail about 55% total length; lateral tail fold narrow and extending from tip of posterior lobe of pelvic fins to near tip of tail; dorsal

fins of similar shape and size, and separated by space equal to 1/3 to 1/2 the length of base of first dorsal fin. Upper surface of disc smooth except for thorns in arc along inner margin of orbits and spiracles, **in linear series from nuchal region to first dorsal fin** and alar thorns in males; **those on midlength of disc very small; 1 lateral and 1 parallel row of thorns on tail.** Precaudal vertebrae number 30 to 33, predorsal caudal vertebrae number 48 to 51, and pectoral radials number 76 to 80. **Colour: dorsal surface brown with a round ocellar spot on basal section of pectoral fin; ocellus is dark brown to black surrounded by a yellow ring;** area on either side of snout semitransparent. Lower surface white. Young specimens often with light spots and blotches scattered over dorsal aspect of disc.

Size: Maximum size 53.7 cm total length, 33.3 cm width; common up to 47.5 cm total length.

Habitat, biology, and fisheries: This species occurs on the continental shelf on soft bottoms from 15 to 110 m at temperatures from 14 to 28°C but it is most common inshore of 91 m at 16 to 25°C. Food consists largely of decapod crustaceans and to a lesser extent other benthic invertebrates and ray-fined fishes. Exploited in the northern Gulf of Mexico, west of the Mississippi River. Separate statistics are not reported for this species. Caught mainly with bottom trawls. Marketed fresh and salted; also used for bait.

Distribution: Predominantly throughout Gulf of Mexico (also in southeastern Florida) from Florida to just east of Cape Catoche, Quintana Roo (Mexico).

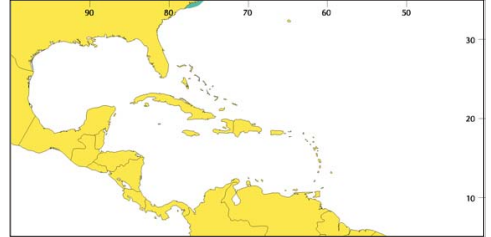
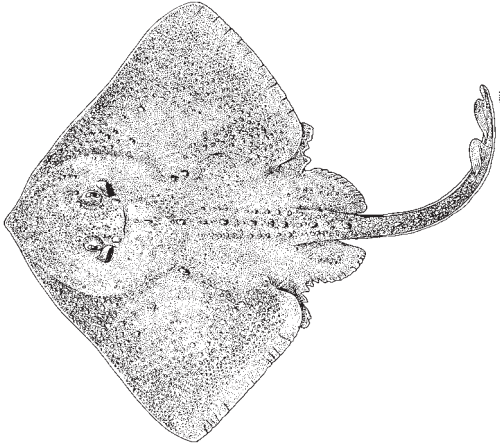


Amblyraja radiata (Donovan, 1808)

RJR

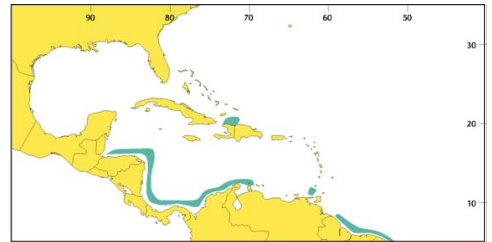
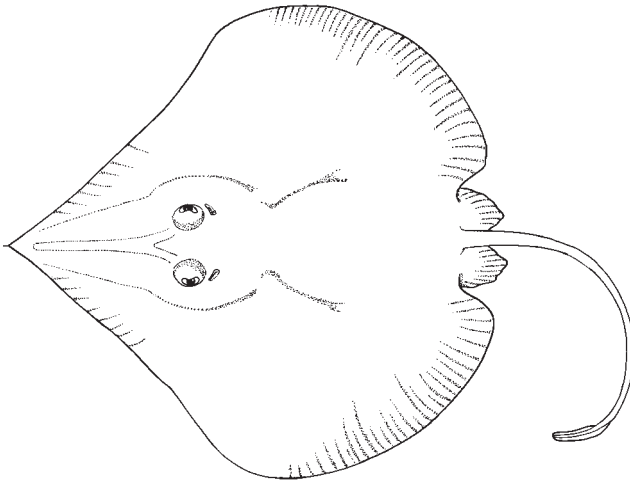
En - Starry skate (AFS: Thorny skate); **Fr** - Raie radiée (AFS: Raie épineuse); **Sp** - Raya radiante.

Maximum size 102 cm total length; males mature between 54 and 85 cm total length. Benthic along continental shelf and slope between 18 and 896 m but limited to narrow band along midslope in southern part of range. Recorded from Hudson Bay and Greenland to off South Carolina. Rare south of Cape Hatteras. Dorsal surface uniform brown or brown with darker mottling; ventral surface white, often with sooty blotches.

***Anacanthobatis americanus*** Bigelow and Schroeder, 1962

En - American spineless skate.

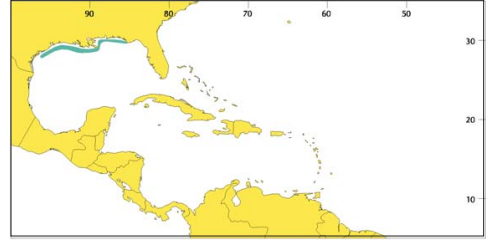
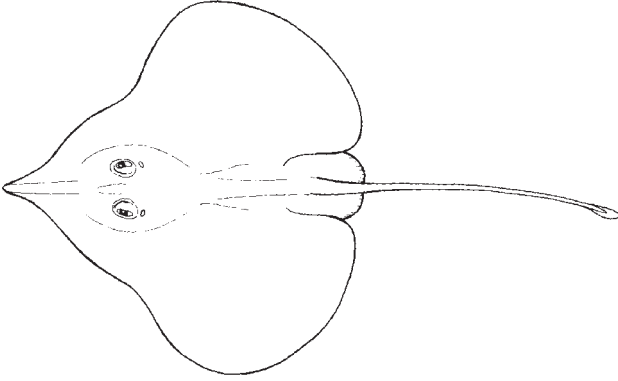
Maximum size 38 cm total length; males mature by at least 32 cm total length. Benthic along slope between 183 and 915 m. Recorded from Hispaniola, Caribbean coast of Central America, and northern coast of South America. Dorsal surface greyish brown, ventral surface generally greyish white with a dark brown mottled region between mouth and scapular area. Snout relatively short and attenuating as fine filament.



***Anacanthobatis folirostris* (Bigelow and Schroeder, 1951)**

En - Leafsnout spineless skate.

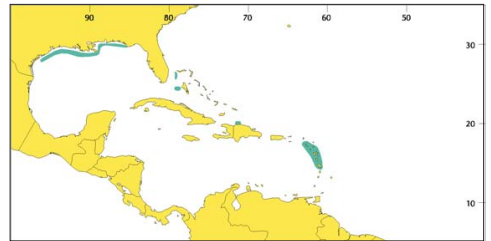
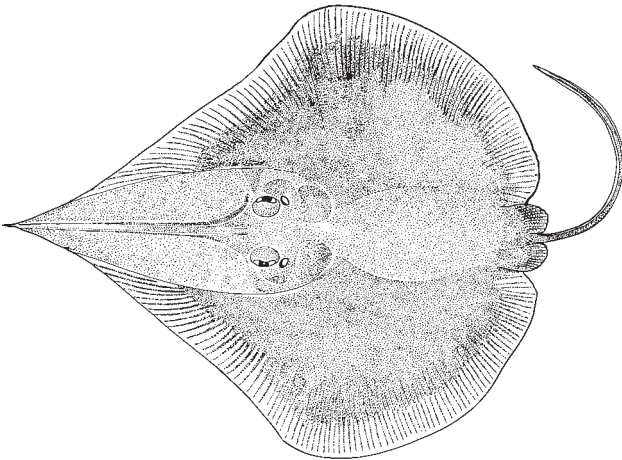
Maximum size 58 cm total length for males and 62 mm total length for females. Benthic along upper slope, between 300 and 512 m. Recorded (as *Springeria folirostris*) from northern Gulf of Mexico. Dorsal surface ash grey; ventral surface pale grey. Snout very long and laterally expanded into leaf-like structure.



***Anacanthobatis longirostris* Bigelow and Schroeder, 1962**

En - Longsnout spineless skate.

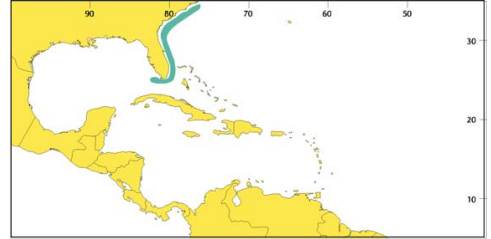
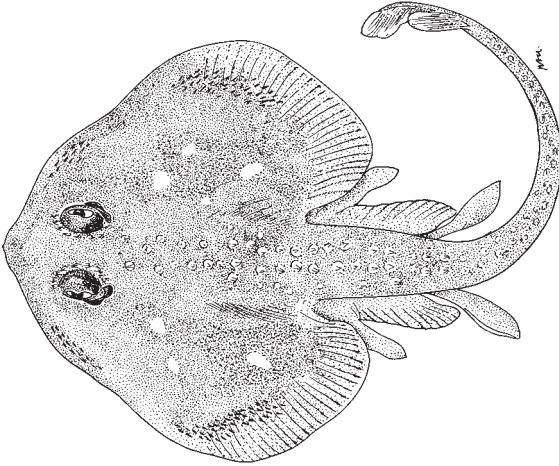
Maximum size 75 cm total length. Benthic along slope, between 520 and 1 052 m. Recorded from northern Gulf of Mexico, Bahamas, Hispaniola, and Lesser Antilles. Dorsal surface purplish grey dorsally; ventral surface light grey, anterior snout region blackish. Snout very long and attenuating as fine filament.



***Breviraja claramaculata* McEachran and Matheson, 1985**

En - Lightspotted shortskate.

Maximum size 29 cm total length. Benthic along slope, between 293 and 896 m. Recorded from South Carolina to Florida Keys. Dorsal surface tan with symmetrically arranged white spots surrounded by darker brown blotches; ventral surface white with tan disc margin. Three rows of small thorns along midline of posterior half of disc.

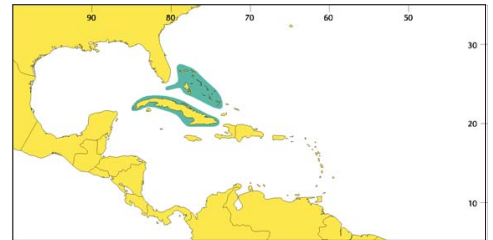
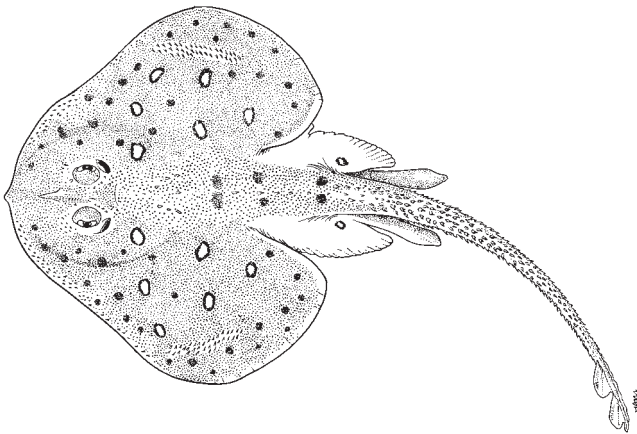


***Breviraja colesi* Bigelow and Schroeder, 1948**

BVO

En - Sheathsnout shortskate.

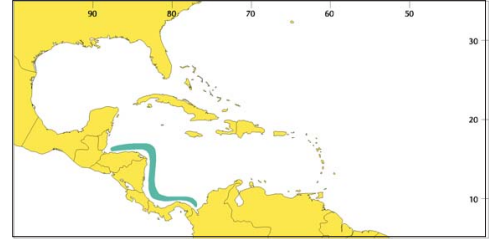
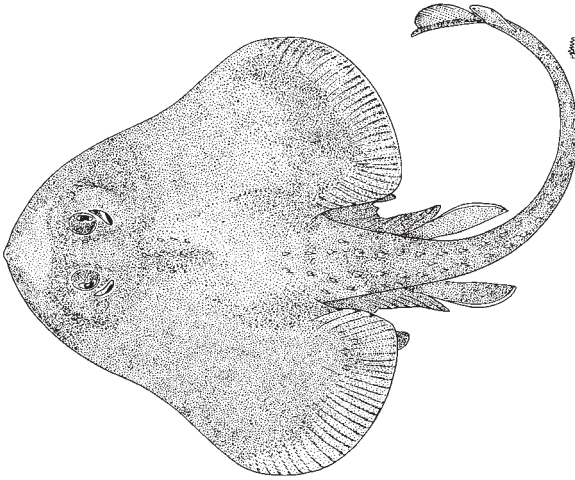
Maximum size 40 cm total length; males mature at 32 cm total length. Benthic along upper slope, between 220 and 415 m. Recorded from east coast of Florida, Bahamas, and Cuba. Dorsal surface pale brown, with scattered dark brown blotches and spots, and with eye-sized whitish spots surrounded by dark brown; ventral surface white to yellowish. Single, often incomplete, row of thorns along posterior half of disc.



***Breviraja mouldi* McEachran and Matheson, 1995**

En - Mould's shortskate.

Maximum size 41 cm total length. Benthic along continental slope, between 353 to 776 m. Recorded from Honduras to Panama. Dorsal surface uniformly tan with indistinct brown blotches on dorsal and caudal fins; ventral surface pale tan with lateral aspect of disc slightly darker. Three rows of small thorns along midline of posterior half of disc.

***Breviraja nigriventralis* McEachran and Matheson, 1985**

En - Blackbelly shortskate.

Maximum size 44 cm total length. Benthic along the lower slope, between 549 and 776 m. Recorded from northern South America, from Panama to French Guiana. Dorsal surface tanish grey to blackish grey, with black dorsal and caudal fins; ventral surface black except for lighter grey rostral area, centre of abdomen, anterior to pectoral-fin axils and posterior disc margin. Three rows of small thorns along midline of posterior half of disc and lower jaw with spatula-like process partially overlapping symphysis of upper jaw.

