

SOFTNOSE SKATES

Family Arhynchobatidae

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Softnose skates are small to large rays (adults 28 cm to ~2 m TL) with a flattened body, circular, heart-shaped or rhombic disc, pectoral-fin apices broadly rounded to pointed, and a variably angular and flexible snout, sometimes with a prominent lobe at its tip. The disc and tail are well demarcated from each other; a firm, slender tail varies from being much longer to slightly shorter than the disc. Except for *Pseudoraja*, pelvic fins are notched (often very deeply) with distinct anterior and larger posterior lobes (fin hardly divided in *Sympterygia*). The anterior nasal flaps are expanded to form an incomplete nasal curtain. These flaps usually reach the mouth but their posterior margins are not joined like in some other ray groups, such as the stingrays. Tail with 0–2 (mostly 2) small dorsal fins near its tip. The caudal fin is rudimentary with the lower lobe (when present) smaller than the upper lobe. Skin naked or variably covered with granular dermal denticles, some species with entire ventral surface granular. Thorns usually present on tail, but usually not well developed on dorsal surface of disc; variably located on the orbital, nuchal and scapular regions. Adult males have a patch of non-retractable alar thorns on each pectoral fin, and sometimes more anteriorly positioned malar patches. The family includes at least 104 species, some of which are undescribed, in 13 genera: *Arhynchobatis*, *Atlantoraja*, *Bathyraja*, *Brochiraja*, *Insentiraja*, *Irolita*, *Notoraja*, *Pavoraja*, *Psammobatis*, *Pseudoraja*, *Rhinoraja*, *Rioraja* and *Sympterygia*. Skeletal features, particularly the structure of the clasper cartilages, are important in distinguishing genera and species. These characters are often complex and not user-friendly, but softnose skates have some skeletal features unique to the group that need to be mentioned. The rostral cartilage supporting the snout is either absent or flexible and delicate over most, or all, of its length, and its base barely extends forward beyond the leading margins of the nasal capsules (except in *Notoraja* and *Brochiraja*). The anteriormost part of the pectoral-fin skeleton abuts or nearly abuts the snout tip, and the ventral terminal cartilage of the clasper is spoon-shaped, lacks a sharp lateral edge, and does not form an external component, the shield (see Glossary). Softnose skates occur in all oceans, but are most abundant in polar and cool temperate regions; the poorly resolved, species rich genus *Bathyraja* has two major areas of distribution (i.e. the North Pacific and the SW Atlantic). Softnose skates are mostly confined to the deep-sea, where they are demersal on continental slopes and abyssal plains to more than 3000 m depth; most species are mainly benthic, but some larger and more widespread species are benthopelagic. They are mainly active carnivores, feeding on mobile benthic invertebrates and fishes. All species are oviparous, with females laying their eggs in cases on the seafloor. Egg cases are rectangular and flattened in shape with a tough protective outer coating of keratin and a horny structure at each corner. Most species are of no commercial importance, being caught typically in small quantities as bycatch of deepwater trawl and longline fisheries.

KEY TO ARHYNCHOBATID GENERA

The softnose skates are very difficult to characterise based solely on external features because skeletal structures, particularly those of the claspers, are more important in distinguishing groups. Hence, the key below incorporates some technical characters in order to distinguish between the genera. Couplet 4 is complex and readers may need to consult the Glossary for more information. If a specimen fails to key out correctly, we suggest proceeding again from this point using the alternative option in couplet 4.

1. Pelvic fins with single laterally directed lobe, tip broadly rounded and posterior margin transverse (fig. 1); no dorsal fins (fig. 3); Western Central Atlantic *Pseudoraja* (1 species; fig. 3, p. 464)

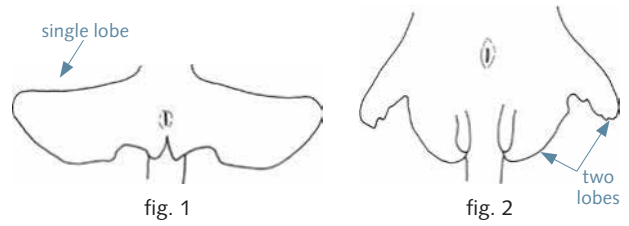
Pelvic fin with anterior and posterior lobes (fig. 2); 1 or 2 dorsal fins (fig. 7) 2

2. Tip of snout rather firm and not pliable; anteriormost extension of pectoral-fin skeleton distinctly separated from tip of snout by semi-translucent area (fig. 4); sensory pores and often canals on ventral surface usually dark-pigmented (fig. 6) 3

Tip of snout pliable; anteriormost extension of pectoral-fin skeleton abutting or nearly abutting tip of snout, not separated from snout by semi-translucent area (fig. 5); sensory pores and often canals on ventral surface usually not dark-pigmented 4

3. Distance from origin of first dorsal fin to tip of tail (when undamaged) as long as or longer than distance from origin of first dorsal fin to tips of posterior lobes of pelvic fins (fig. 7); South-West Atlantic *Rioraja* (1 species; fig. 7, p. 468)

Distance from origin of first dorsal fin to tip of tail considerably shorter than distance from origin of first dorsal fin to tips of posterior lobes of pelvic fins (fig. 8); South-West Atlantic *Atlantoraja* (3 species; fig. 8, pp. 370–372)



pelvic fins (ventral view)



fig. 3

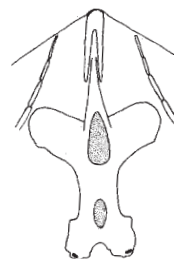


fig. 4

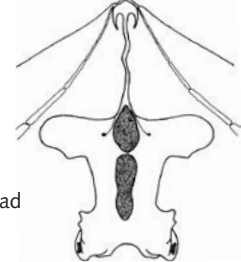


fig. 5

skeleton of head



fig. 6

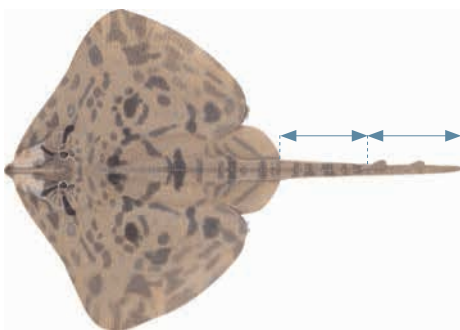


fig. 7

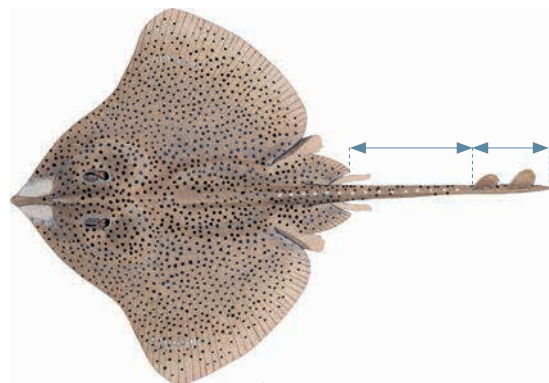


fig. 8

4. Anterior cranial fontanelle extremely broad, circular (fig. 9), spade-shaped (fig. 10) or broadly teardrop-shaped (fig. 12) (press into the skin over the cranium to find edge of fontanelle); length of fontanelle less than 2.5 times its width at its mid-length; fontanelle either not or only slightly (fig. 12) extending onto rostral cartilage (to about level with leading edges of nasal capsule) 5

Anterior cranial fontanelle narrowly teardrop-shaped (fig. 14); length of fontanelle more than 2.5 times its width at its mid-length; fontanelle extending well forward onto rostral cartilage (fig. 14, often well forward of leading edges of nasal capsule), except in *Pavoraja* (which lacks a continuous rostral cartilage, fig. 15) ... 10

5. Single, very small dorsal fin located just anterior to large caudal fin (fig. 11); tail length about 53–55% of total length; South-West Pacific *Arhynchobatis* (1 species; fig. 11, p. 369)

Two small dorsal fins located just anterior to very small caudal fin (fig. 13); tail length usually less than 53% of total length 6

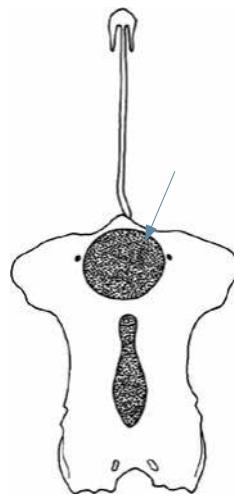


fig. 9

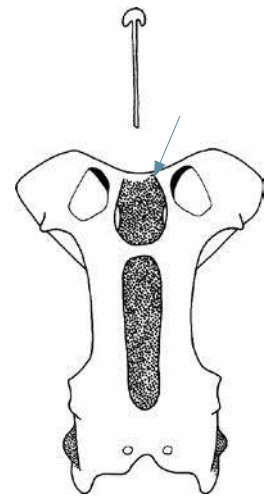


fig. 10

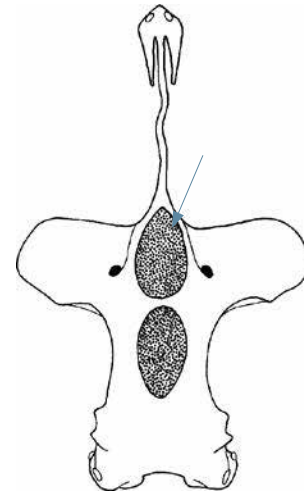


fig. 12

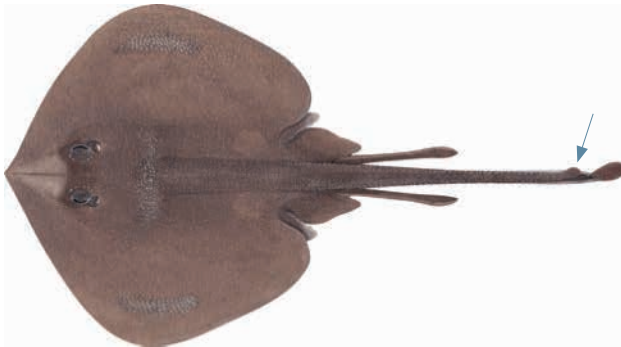


fig. 11



fig. 13

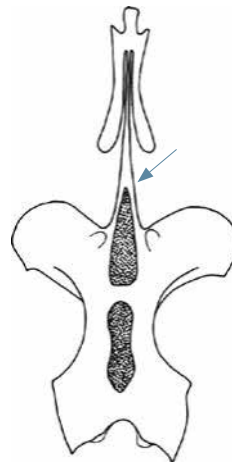


fig. 14

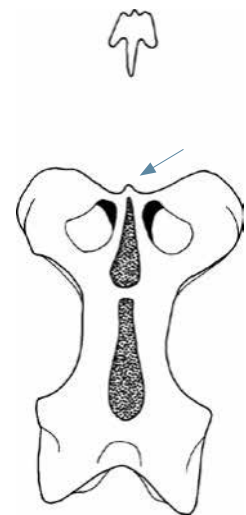


fig. 15

cranium

6. Tip of snout with small fleshy conical or knob-like process (sometimes very small) (fig. 16) 7

Tip of snout without small fleshy process, not as above 8

7. Disc nearly circular (fig. 15); dorsal surface of disc largely smooth, free of denticles; Australia
 *Irolita* (2 species; fig. 13, pp. 437–438)

Disc weakly angular to heart-shaped (fig. 16); dorsal surface of disc partially to largely covered with denticles and prominent thorns; South-East Pacific and South-West Atlantic ... *Psammobatis* (8 species; fig. 16, pp. 456–463)

8. Posterior margin of pelvic fins straight to slightly concave (fig. 18); dorsal surface of disc largely free of denticles and with few thorns (usually confined to orbital rim and nape); South-East Pacific and South-West Atlantic
 *Sympterygia* (4 species; fig. 17, pp. 469–472)

Posterior margin of pelvic fins deeply or noticeably incised (fig. 19); dorsal surface of disc fully or at least partly covered with denticles 9

9. Rostral cartilage segmented at base (fig. 22, usually detectable by touch); tail rather long, length 1.6–1.9 in TL, longer than disc length (fig. 20); North-West Pacific
 *Rhinoraja* (3 species; fig. 20, pp. 465–467)

Rostral cartilage not segmented at base; tail short or moderately elongate, length more than 1.9 in TL, usually equal to or shorter than disc length (fig. 21); cosmopolitan
 *Bathyraja* (55 species; fig. 21, pp. 373–426)

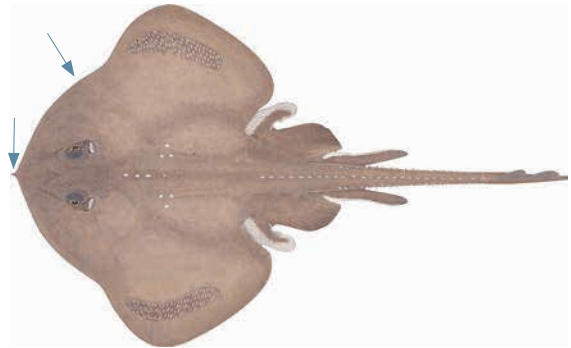


fig. 16



fig. 17



fig. 18

pelvic fins
(ventral view)

fig. 19

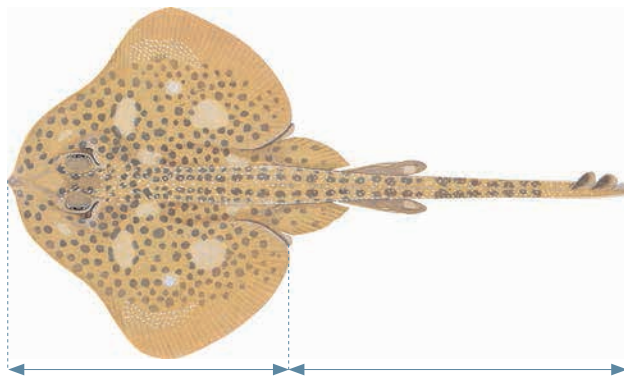


fig. 20

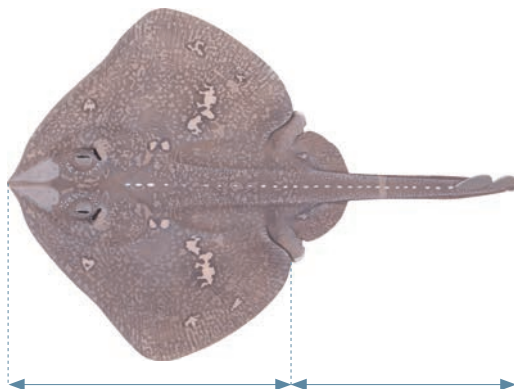


fig. 21

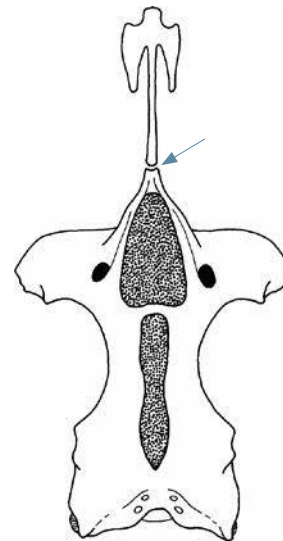


fig. 22

cranium

10. Bifid thorn on middle of snout (sometimes reduced in adults) (fig. 23); South-West Pacific
 *Brochiraja* (8 species; fig. 24, pp. 427–434)

No bifid thorn on snout 11

11. Skin velvety on dorsal surface, and smooth, transparent and loose ventrally; tail extremely elongate, very slender and lacking thorns (fig. 25); Western Pacific and Eastern Indian Oceans
 *Insentiraja* (2 species; fig. 25, pp. 435–436)

Skin not as above; tail short to elongate, not very slender and its upper surface with thorns or thornlets (figs 26, 27) 12

12. Small or very small skates (smaller than 37 cm TL); rostral shaft very short and not continuous (fig. 15); spiracles widely separated, interspiracular width 6.1–7.7% DW (fig. 26); Australia
 *Pavoraja* (6 species; fig. 26, pp. 450–455)

Small to medium-sized skates (adults attaining 37–65 cm TL); rostral shaft continuous, usually narrow (fig. 14); spiracles narrowly separated, interspiracular width 4.8–6.7% DW (fig. 27); Western Pacific and Eastern Indian Oceans
 *Notoraja* (11 species; fig. 27, pp. 439–449)

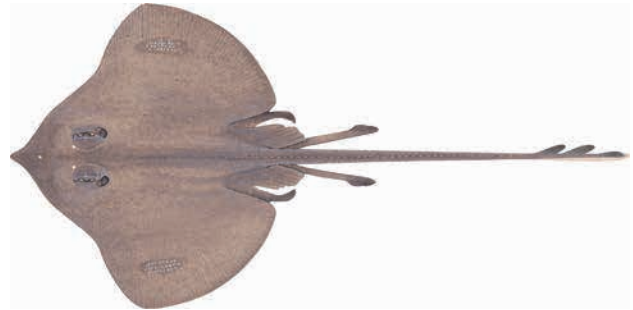
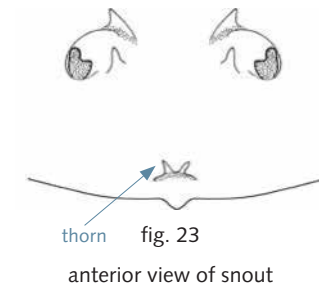


fig. 24

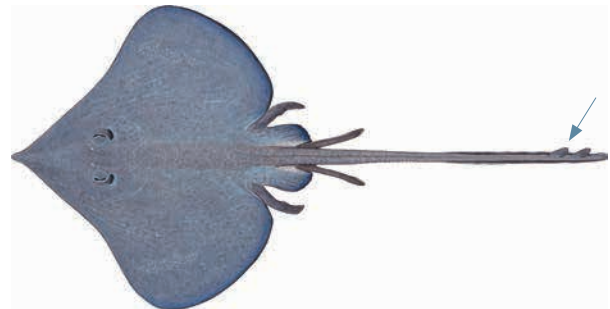


fig. 25

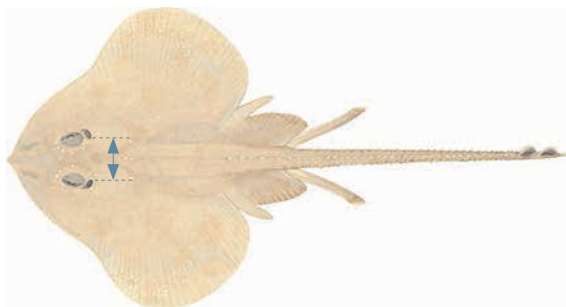


fig. 26

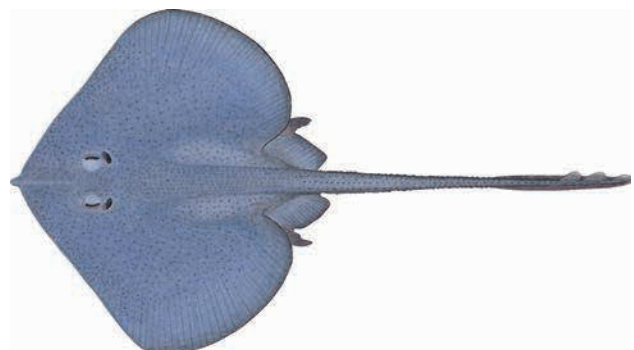
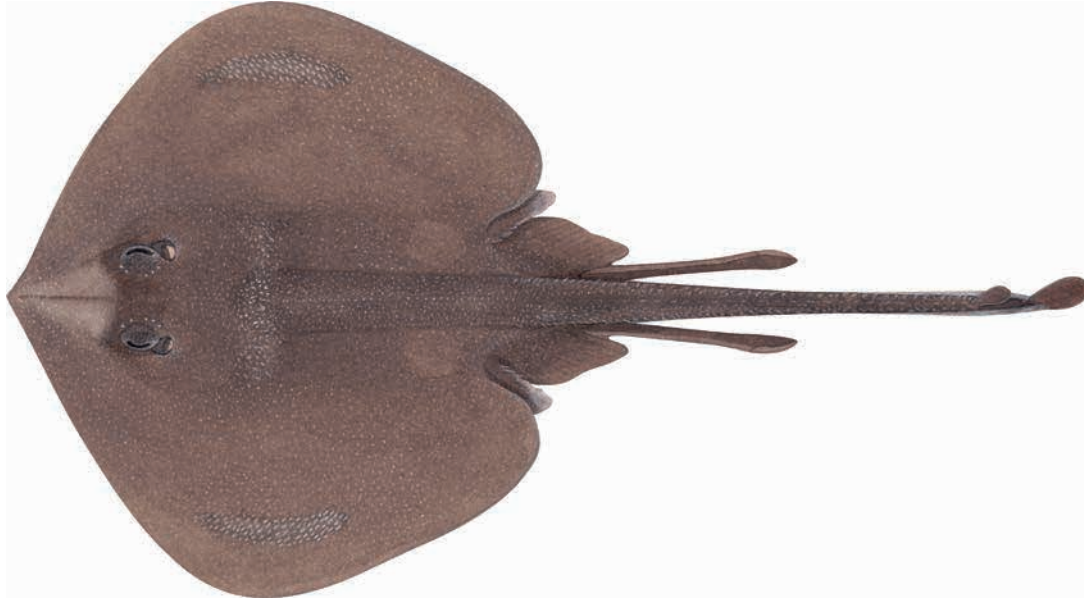


fig. 27

LONGTAIL SKATE

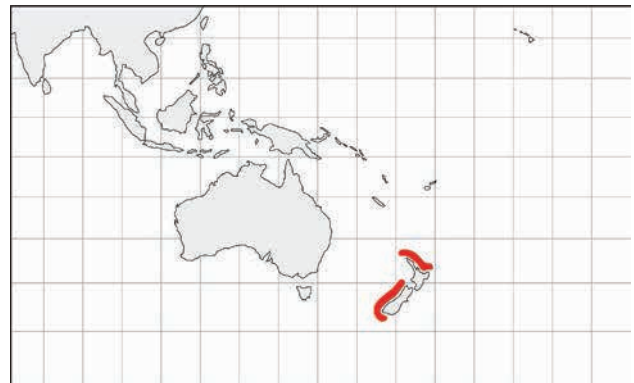
20.1

Arhynchobatis asperrimus Waite, 1909

DD

IDENTIFICATION. Medium-sized skate with an oval to heart-shaped disc covered above with coarse denticles, broad angular snout, orbital and scapular thorn patches well developed in adults, very long slender tail with only 1 dorsal fin and densely covered with short thorns, upper caudal fin enlarged, and usually plain brownish dorsal surface. Disc weakly heart-shaped in adult males, more oval in females and young. Snout flexible, lacking a firm rostral cartilage, its length 3–3.5 times orbit length; interorbital space very narrow, 0.7–0.8 times orbit length. Mouth narrow, nasal flaps very broadly lobed; tooth rows in upper jaw ~30–31. Dorsal disc, tail and fins densely covered in small spiny denticles; clusters of thorns between orbit and spiracle, and a cross-like patch on shoulder in adults; tail thorns typically in 3–5 dense rows separated by smaller thornlets in adults, shape conical in median row; tail and shoulder thorn patches not connected; ventral surface entirely smooth. Tail elongate, undersurface flattened, length 1.2–1.3 times precloacal length; lateral folds well developed, broad near tail tip. Pelvic-fin margin deeply notched. Single dorsal fin tiny, short-based, much smaller than enlarged caudal fin. Predorsal tail vertebrae ~84, abdominal vertebrae ~34, predorsal vertebrae ~118.

COLOUR. Uniformly brownish above, rarely with faint pectoral ocellus. Ventral surface pale, white to weakly translucent; dark blotches may be present on tail.



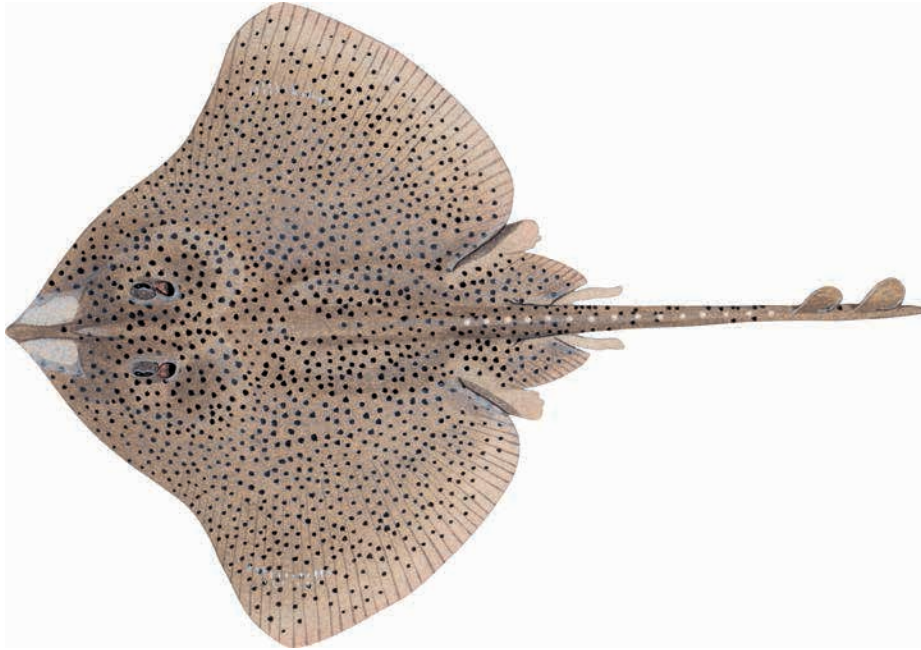
SIZE. Attains ~75 cm TL. Males mature at ~55 cm TL, young hatch at ~11 cm TL.

HABITAT AND BIOLOGY. South-West Pacific, off New Zealand. Demersal on insular shelves and slopes at 55–1095 m depths, but most abundant at 200–500 m. Caught occasionally as trawl bycatch but little known of its biology.

SIMILAR SPECIES. Unique within all skates of the Western Pacific in having a single dorsal fin and a disproportionately large caudal fin.

SPOTBACK SKATE

20.2

Atlantoraja castelnaui (Miranda Ribeiro, 1907)

EN

IDENTIFICATION. Large skate with a rough rhombic disc, snout moderately elongate, small eyes, no orbital thorns, no nuchal or shoulder thorns, single thorn row on tail, densely dark-spotted upper surface, and undersurface of head much darker than posterior disc. Disc anterior margins undulate, deeply concave in adult males; apices narrowly rounded to abruptly angular. Snout pointed, with small lobe at tip, soft and flexible vertically due to delicate rostral cartilage; anterior pectoral radials extending nearly to snout tip. Upper disc completely prickly to touch, entirely covered with coarse denticles; ventral surface entirely smooth. Thorns of median row 15–21, evenly spaced, confined to tail; alar thorn patch of adult male long and narrow, no malar thorns. Tail slender, rounded, barely tapering, length subequal to or slightly longer than precloacal length; lateral folds narrow. Two small rounded dorsal fins, well separated, with up to 4 thorns in interspace; caudal fin short and rather tall; precaudal length exceeding prespiracular length. Pelvic fin weakly notched, posterior lobe large; clasper rather robust, almost reaching first dorsal fin.

COLOUR. Dorsal surface dark brownish to yellowish brown, with strong pattern of small, reddish or blackish, circular spots over disc and pelvic fins. Undersurface of anterior disc greyish, strongly contrasted with largely whitish posterior disc; sensory and mucous pores distinct, white or marked as black dots and streaks.



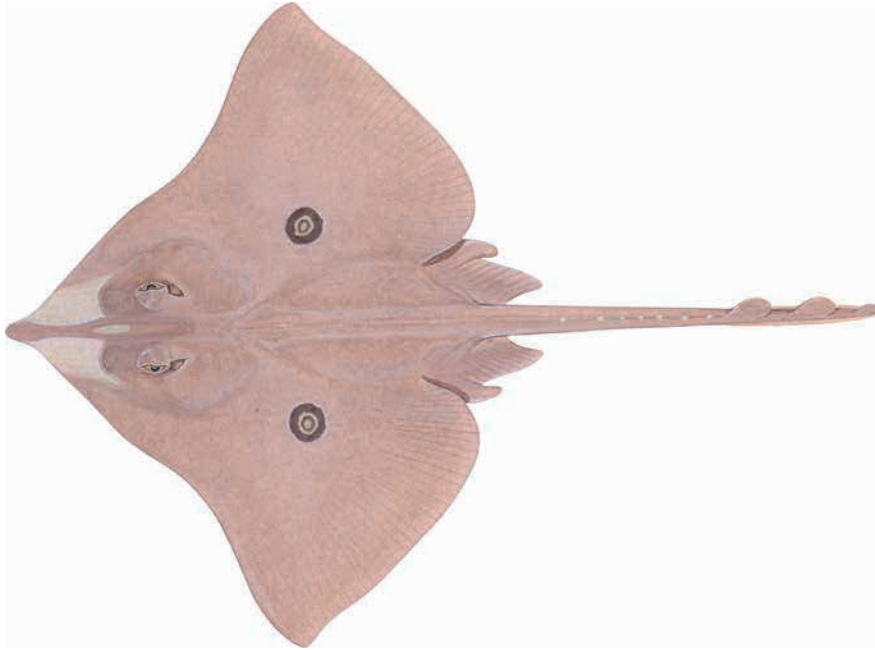
SIZE. Attains ~147 cm TL. Males mature at 91–100 cm TL, females 106–114 cm TL. Egg cases 9–12 cm long, young hatch at ~17 cm TL.

HABITAT AND BIOLOGY. South-West Atlantic; northern Argentina to southern Brazil. Coastal marine from inshore to 220 m depth. Lays egg cases from January to October. Primarily eats fish, but juveniles also feed on cephalopods and echinoderms.

SIMILAR SPECIES. Two sympatric congeners, the Eyespot (20.3) and La Plata (20.4) Skates, are largely smooth on the upper disc and both of these skates usually have large pectoral markings.

EYESPOT SKATE

20.3

Atlantoraja cyclophora (Regan, 1903)

VU

IDENTIFICATION. Medium-sized skate with a smooth rhombic disc, snout moderately elongate, small eyes, no orbital thorns, no nuchal or shoulder thorns, single thorn row on tail, and brownish with large and very dark pectoral ocelli. Disc anterior margins undulate (barely more so in adult males); apices narrowly rounded to abruptly angular. Snout pointed, with small lobe at tip, soft and flexible vertically due to delicate rostral cartilage; anterior pectoral radials extending nearly to snout tip. Upper disc completely smooth, lacking dermal denticles; ventral surface smooth. Thorns of median row 7–10, often reduced in adults and not evenly spaced, confined to tail; alar thorn patch of adult male long and narrow, no malar thorns. Tail very slender, rounded, tapering slightly, length slightly longer than preloacal length; lateral folds narrow. Two narrow, tilted dorsal fins; separated slightly, with 1–3 thorns in interspace; caudal fin short and rather tall; procaudal length about equal to prespiracular length. Pelvic fin notched, posterior lobe slightly larger than anterior lobe; clasper very long and slender, almost reaching first dorsal fin.

COLOUR. Dorsal surface plain pale to medium pinkish brown, with pair of distinct ocellate pectoral markings consisting of 2 black rings of variable thickness. Greyish ventrally; sensory and mucous pores distinctly marked as black dots and streaks.



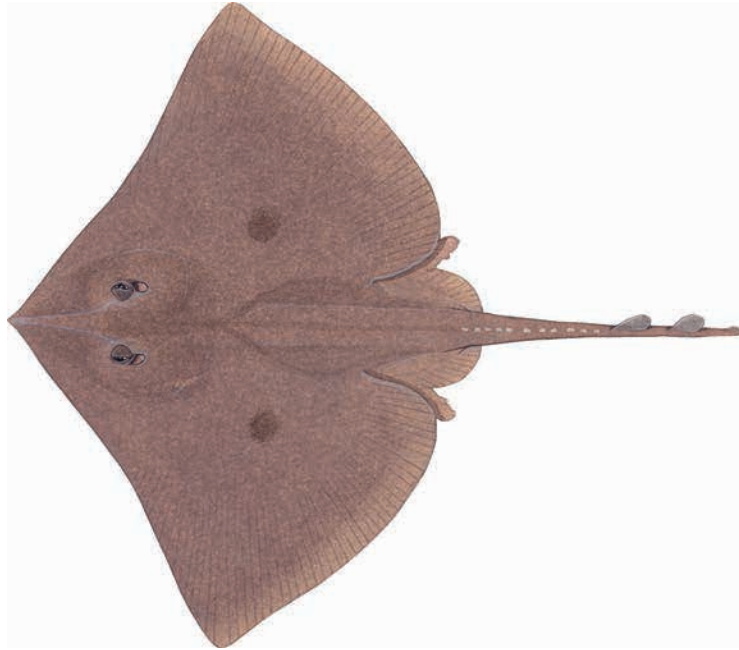
SIZE. Attains ~74 cm TL. Males mature at 45–48 cm TL, females 56–59 cm TL in northern part of distribution (males at ~58 cm TL in southern part). Egg cases 6–7 cm long, young hatch at ~10 cm TL.

HABITAT AND BIOLOGY. South-West Atlantic; northern Argentina to southern Brazil. Coastal marine from inshore to 100 m depth (occasionally to 320 m). Feeds mainly on benthic invertebrates, also small bony fishes as adults.

SIMILAR SPECIES. Of 2 similar sympatric congeners, the Spotback Skate (20.2) has a rough prickly upper disc covered with numerous circular dark spots; the La Plata Skate (20.4) either lacks or has a faint pectoral marking when present.

LA PLATA SKATE

20.4

Atlantoraja platana (Günther, 1880)

VU

IDENTIFICATION. Medium-sized skate with a broad rhombic disc, snout rather short and eyes small, no orbital thorns, smooth skin, no nuchal or shoulder thorns, single thorn row on tail, and upper surface brownish and usually with large darker brown pectoral ocelli. Disc anterior margins weakly undulate (barely more so in adult males); apices narrowly and abruptly angular. Snout pointed, with small lobe at tip, soft and flexible vertically due to delicate rostral cartilage; anterior pectoral radials extending nearly to snout tip. Upper disc completely smooth, lacking dermal denticles; ventral surface smooth. Thorns of median row 11–14, confined to tail, not evenly spaced and often reduced in adults; alar thorn patch of adult male long and narrow, no malar thorns. Tail very slender, rounded, barely tapering; short, length slightly less than precloacal length; lateral folds well developed. Two small, rounded dorsal fins; well separated, with 2–3 thorns in interspace; caudal fin with rather tall upper and lower lobes; precaudal length well exceeding prespiracular length. Pelvic fin strongly notched, posterior lobe barely larger than anterior lobe; clasper very long and slender, almost reaching first dorsal fin.

COLOUR. Upper surface plain pale to medium brown, sometimes with indistinct pattern of pale spots; usually with darker blotch-like pectoral marking (often obscure). Undersurface of disc greyish; mucous and sensory pores marked as black spots and streaks.



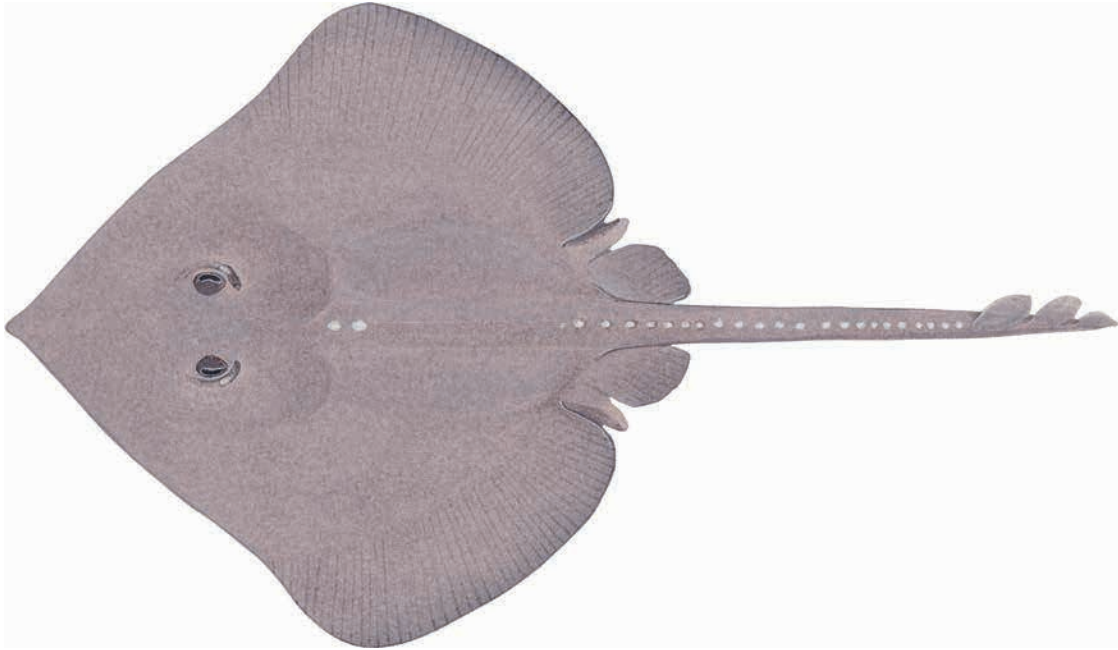
SIZE. Attains ~91 cm TL. Males mature at 62–63 cm TL, females 69–72 cm TL. Egg cases ~7 cm long.

HABITAT AND BIOLOGY. South-West Atlantic; Argentina to southern Brazil. Coastal marine to upper continental slope to 320 m depth (mostly shallower than 100 m). Diet consists of small benthic invertebrates (including small cephalopods) and bony fishes.

SIMILAR SPECIES. Of 2 sympatric congeners, the Spotback Skate (20.2) has a totally prickly upper disc with a pattern of numerous dark spots; the Eyespot Skate (20.3) has a distinctive ocellate pectoral marking consisting of 2 blackish concentric rings.

DEEPSEA SKATE

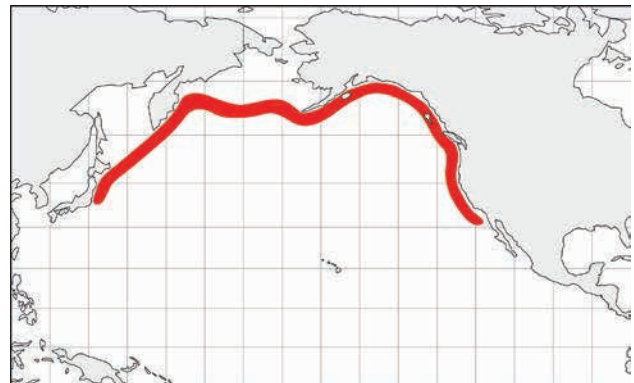
20.5

Bathyraja abyssicola (Gilbert, 1896)

DD

IDENTIFICATION. Large skate with a flabby disc, broad head, long triangular snout, velvety skin on both surfaces with few thorns in adults, and dark on both surfaces. Disc heart-shaped in adults, anterior margins undulate in young, apices broadly rounded. Snout broadly elongate with a small apical lobe; soft and flexible vertically due to very delicate rostral cartilage, 4.6–5.7 times orbit length; interorbital space 1.3–1.6 times orbit length; anterior pectoral radials extending to nearly snout tip. Mouth broad, nasal flaps broadly lobed; tooth rows in upper jaw 30–38. No thorns around orbital rim, or on shoulder and lumbar regions; 1–5 (usually 3) large nuchal thorns, widely disconnected from median row of 22–31 regularly arranged thorns along tail to first dorsal fin. Upper surface of disc velvety to touch, densely covered with fine denticles; undersurface smooth in young, disc becoming velvety in adults. Tail slender, tapering evenly, subequal to precloacal length; 2 low dorsal fins barely separated, usually 1 thorn in interspace, predorsal length usually shorter than snout length; caudal fin long and low. Pelvic fin weakly notched, anterior lobe short, clasper very long and slender. Pectoral-fin radials 84–87. Predorsal vertebrae 114–120; abdominal vertebrae 32–42, predorsal tail vertebrae 67–78.

COLOUR. Upper surface dark greyish brown to brown, spines pale and typically contrasted against skin. Ventral surface dark brown, often with white patches around mouth



and on belly; sensory pores not visible; dorsal and caudal fins uniformly brownish or greyish.

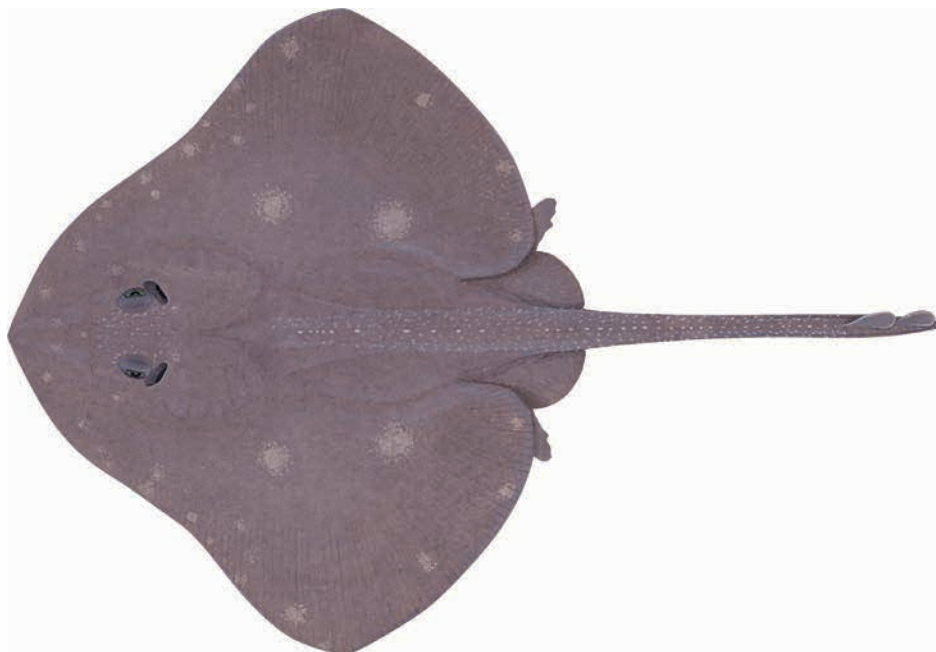
SIZE. Attains ~157 cm TL. Males mature at ~110 cm TL; egg cases ~11 cm long.

HABITAT AND BIOLOGY. North Pacific; Japan to California (USA). Demersal, continental and insular slopes, and abyssal plain, at 360–2905 m depths. Discarded occasional bycatch of local trawl fisheries and biology not well known.

SIMILAR SPECIES. Several other *Bathyraja* skates of the North Pacific are dark all over the body, but none has such a long snout combined with fine prickly skin on both upper and lower surfaces of the disc.

AGUJA SKATE

20.6

Bathyraja aguja (Kendall & Radcliffe, 1912)

DD

IDENTIFICATION. Medium-sized skate with a wide heart-shaped disc, short snout, largely smooth dorsal disc with no thorns forward of or on shoulder girdle, single row of tail thorns extending forward to mid-disc, narrow interorbital space, tail length more than 60% of disc width, and almost uniformly brown on both surfaces. Disc anterior margins increasingly more concave with size; apices more broadly rounded in young. Snout with a short, blunt tip, length 2.3–2.9 times orbit length, interorbital space narrower than orbit length; soft and flexible vertically due to very delicate rostral cartilage; anterior pectoral radials extending to snout tip. Mouth narrow, nasal flaps broadly lobed; tooth rows in upper jaw ~34. Thorns tall and sharp, closely spaced, confined to ~30 in regularly arranged median row from just behind shoulder girdle to first dorsal fin; 1–2 interdorsal thorns. Upper surface of disc with small patches of widely spaced stellate denticles mainly on snout tip, between orbits and along central anterior margins of disc; pair of dense bands of finer prickles extending over lumbar region and along each side of tail, prickles absent beside thorns; undersurface smooth apart from dense band of fine prickles on mid-anterior margins of disc. Tail deep, slender, tapering to apex, equal to or slightly longer than disc length; lateral folds not obvious; 2 narrow dorsal fins separated slightly; caudal fin rudimentary. Pelvic fin with a deep notch, anterior lobe long and slender. Pectoral-fin radials 80–83. Predorsal



vertebrae ~105–107; abdominal vertebrae 30–33, predorsal tail vertebrae 74–75.

COLOUR. Dorsal surface bluish brown, sensory pores black and very obvious. Dusky ventrally, whitish around mouth; sensory pores not visible on undersurface.

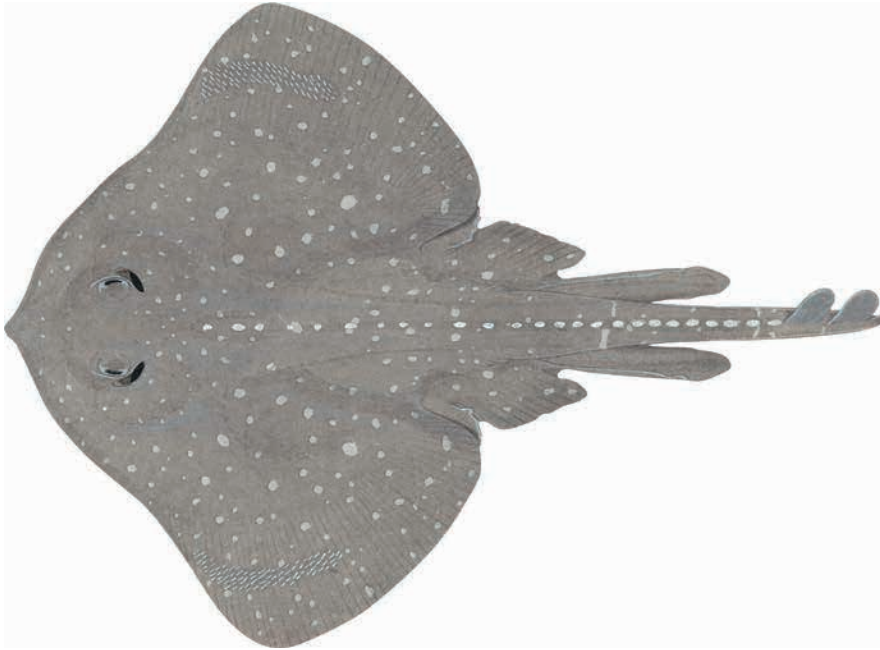
SIZE. Attains at least 48 cm TL; adults unknown, a newborn ~17 cm TL.

HABITAT AND BIOLOGY. South-East Pacific; off northern Peru, probably more widespread. Demersal, upper continental slope to ~980 m depth. Biology unknown.

SIMILAR SPECIES. Occurs together with the larger Peruvian Skate (20.43) but, unlike that species, the Aguja Skate has median thorns on the central disc.

WHITEDOTTED SKATE

20.7

Bathyraja albomaculata (Norman, 1937)

VU

IDENTIFICATION. Medium-sized skate with a largely smooth rhombic disc, short snout, no thorns on upper disc other than median row of large thorns extending from nape to first dorsal fin, and white-spotted colour pattern. Disc with deep concavity beside spiracles in adult males, apices moderately angled to narrowly rounded. Snout bluntly angular, soft and flexible vertically due to very delicate rostral cartilage, and anterior pectoral radials extending nearly to snout tip; length 2–3 times orbit length, interorbital space narrow, equal to or less than orbit length. Mouth narrow, nasal flaps broadly lobed; tooth rows in upper jaw 26–32. No snout, orbital, or shoulder thorns; usually 21–24 whitish thorns in median row on disc and tail. Upper disc largely smooth, except for dermal denticles on snout, at anterior disc margins and in bands flanking median thorn row; undersurface entirely smooth. Tail robust, short, about equal to or shorter than preloacal length; 2 small dorsal fins at rear of tail narrowly separated. Pelvic fin weakly notched, posterior lobe large; clasper slender. Pectoral-fin radials 83–85. Abdominal vertebrae 31–34, predorsal tail vertebrae 76–82.

COLOUR. Dusky to greyish brown with distinctive white-spotted pattern on upper disc and posterior pelvic lobes; spots loosely scattered, circular, with dark blotches between. Undersurface white, tail often with irregular greyish markings.



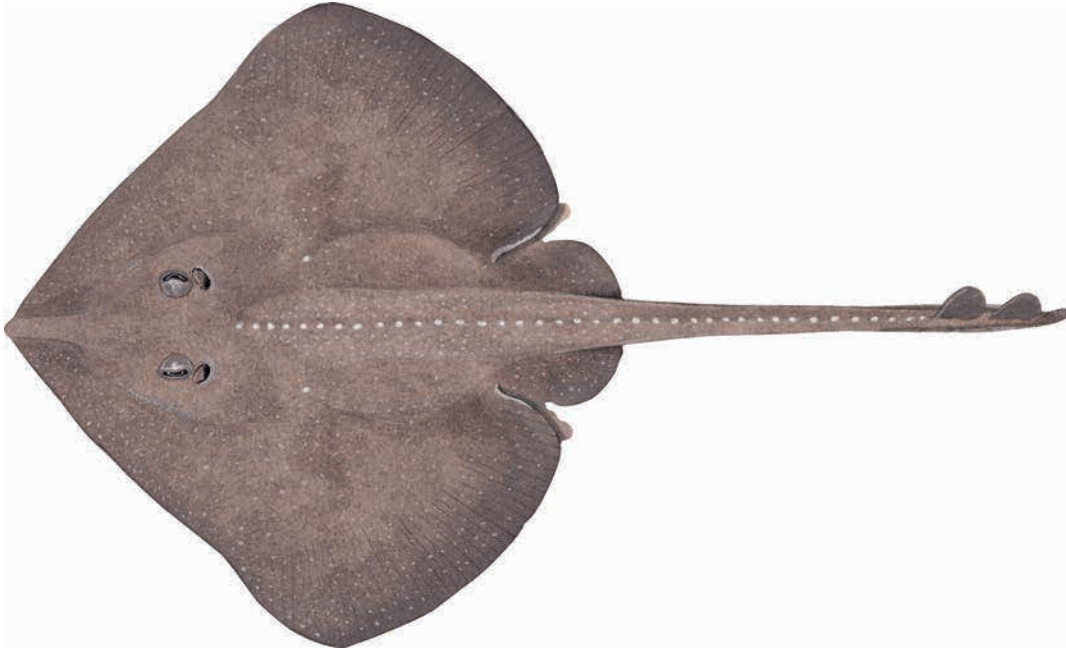
SIZE. Females attain ~100 cm TL, males ~85 cm TL. Males mature at ~63 cm TL, females ~65 cm TL.

HABITAT AND BIOLOGY. South-East Pacific and South-West Atlantic; southern South America, Chile to northern Argentina (including Falkland Islands). Demersal, inshore on continental shelf and upper slope of South America at 55–945 m depths. Diet of young primarily consists of amphipods, large specimens consume mainly polychaetes.

SIMILAR SPECIES. Absence of thorns on the upper disc (other than those of the median row), along with a distinct pattern of white spots on the dorsal surface, distinguishes this skate from all *Bathyraja* in the South-West Atlantic and off Chile.

ALEUTIAN SKATE

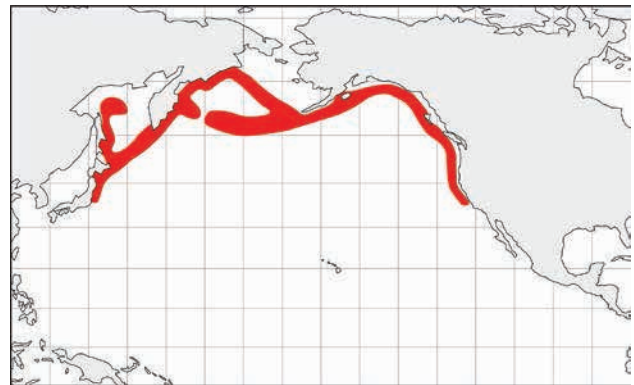
20.8

Bathyraja aleutica (Gilbert, 1896)

LC

IDENTIFICATION. Very large skate with a broad, flabby rhombic disc, very broadly elongate snout (~3/4 of head length), thorns extending along mid-disc from nape onto tail, strong shoulder thorns, and plain coloured above with ventral pattern blotchy. Disc margin straight to undulate anteriorly; apices narrowly rounded. Snout with a blunt tip; soft and flexible vertically due to very delicate rostral cartilage; length 5.3–8.4 times orbit length; interorbital space about twice orbit length; anterior pectoral radials extending to nearly snout tip. Mouth narrow, nasal flaps broadly lobed; tooth rows in upper jaw 31–39. Thorns absent from orbit and snout; 1–2 shoulder thorns on each side; 32–40 well-developed and evenly spaced thorns in median row from nape to dorsal fins. Upper surface and tail uniformly granular in young, denticles of adult males becoming sparse on pelvic fins and mid-pectoral region and those on sides of tail thickened; undersurface with minute prickles in adult, including snout forward of mouth. Tail thickened, subtriangular in cross-section, tapering to apex, shorter than disc length; lateral folds restricted to posterior tail; 2 rather large dorsal fins at rear of tail separated slightly, snout ~1.4 times precaudal length; caudal fin short and tall. Pelvic fins small, anterior lobe short and broad, clasper slender. Abdominal vertebrae 35–38, predorsal tail vertebrae 67–74.

COLOUR. Upper surface plain yellowish, becoming greyish in preservative, dorsal fins similar to disc; ventral surface of



disc white centrally, darker markings around margin of disc and over tail; sensory pores not marked black.

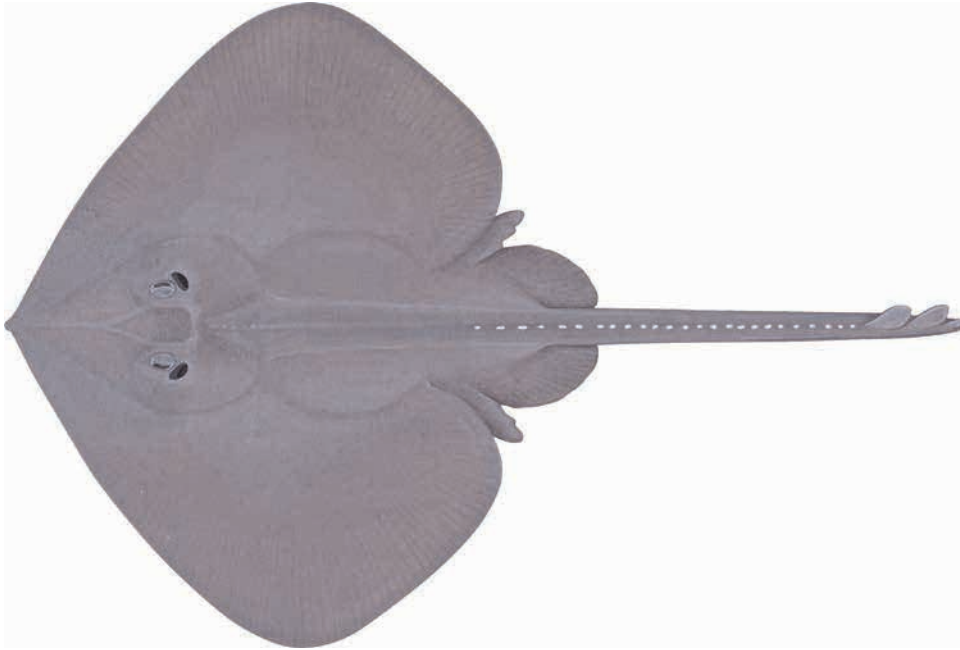
SIZE. Attains ~154 cm TL. Males mature at ~108–116 cm TL. Young hatch at ~12–15 cm TL, egg cases 12–14 cm long.

HABITAT AND BIOLOGY. North Pacific; Japan to California (USA). Demersal, continental and insular shelves and slopes to ~1600 m depth (usually deeper than 250 m). Bycatch of trawl fishery for halibut and rockfishes.

SIMILAR SPECIES. The Dapplebelly Skate (20.97) also has shoulder thorns and a row of median thorns extending from the head to the first dorsal fin, but lacks denticles forward of the mouth, has a shorter snout, and the skin is covered with small, star-shaped denticles.

LITTLE-EYE SKATE

20.9

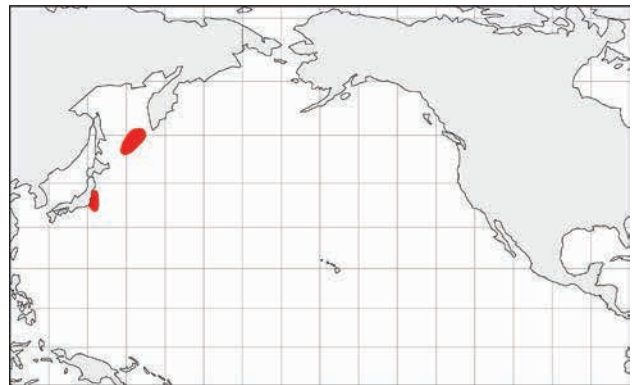
Bathyraja andriashevi Dolganov, 1983

LC

IDENTIFICATION. Large skate with a broad oval disc covered with small spinules, obtuse snout, no thorns on disc, very small eyes, tail exceeding 70% of disc width, and upper surface plainer and darker than undersurface. Disc anterior margins weakly convex; apices broadly rounded. Snout with minute lobe at tip; soft and flexible vertically due to very delicate rostral cartilage; length 7–7.6 times orbit length; interorbital space 1.4–1.7 times orbit length; anterior pectoral radials extending to nearly snout tip. Mouth narrow, nasal flaps broadly lobed; tooth rows in upper jaw ~30. Thorns confined to tail, in row of ~25, evenly spaced. Upper disc and tail covered uniformly with fine spinules; smooth ventrally. Tail thickened, somewhat rounded in cross-section, tapering gradually to tip, slightly longer than precloacal length; lateral folds beginning near pelvic fins; 2 small dorsal fins at rear of tail barely separated; caudal fin minute. Pelvic fin strongly notched, anterior lobe short. Pectoral-fin radials ~91. Predorsal vertebrae ~122; abdominal vertebrae ~43, predorsal tail vertebrae ~79.

COLOUR. Upper surface bluish pink, often with variable-sized greyish spots. Ventral surface white, posterior margins of pectoral and pelvic fins dusky; sensory pores not marked black.

SIZE. Adult male reported at 120 cm TL, unconfirmed to 140 cm TL. Egg cases large, 12–13 cm long.

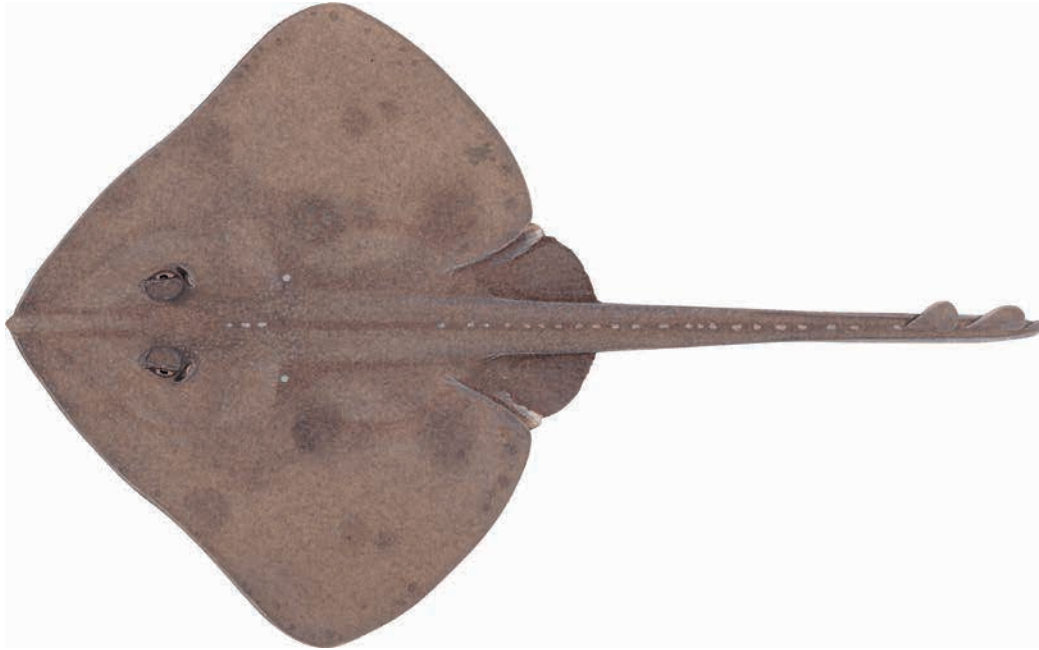


HABITAT AND BIOLOGY. North Pacific; central Japan to Sea of Okhotsk (Russia), but probably much more widely distributed in the North-West Pacific. Demersal, lower continental slope and possibly abyss at 1200–2000 m depths. Lives beyond operating depths of local trawl fisheries and existing specimens caught on deep-sea research voyages. Not well known.

SIMILAR SPECIES. Seldom caught and poorly understood deepwater skate differing subtly from other *Bathyraja* species of the region in the structure of its clasper and eye size (unusually small). More specimens required.

BOTTOM SKATE

20.10

Bathyraja bergi Dolganov, 1983

LC

IDENTIFICATION. Large skate with a rhombic disc, skin granular dorsally, snout broadly elongate (longer than half head length), narrow interorbit, shoulder thorns, median thorns discontinuous from nape to tail, tail longer than 70% of disc width, and disc plain brownish above with paler undersurface. Disc anterior margins undulate, apices narrowly to broadly rounded. Snout with an angular tip, soft and flexible vertically due to very delicate rostral cartilage; length ~4.2–4.6 times orbit length in adults, interorbital space 1.1–1.3 times orbit length; anterior pectoral radials extending to nearly snout tip. Mouth narrow, nasal flaps broadly lobed; tooth rows in upper jaw ~26. Thorns absent from orbit and snout; 0–2 nuchal thorns, single shoulder thorn on each side; 20–24 well-developed thorns in median row on tail before dorsal fins, sometimes with single interdorsal. Upper surface uniformly granular in juveniles (except on anterior pelvic-fin lobe), denticles becoming sparse on mid-pectoral region in adults; undersurface smooth, except at snout tip. Tail stout, tapering to apex, slightly longer than disc length; lateral folds restricted to posterior tail; 2 dorsal fins at rear of tail separated slightly; caudal fin minute. Pelvic fin moderately notched, anterior lobe short and broad, clasper slender. Abdominal vertebrae 33–37, predorsal tail vertebrae 75–81.

COLOUR. Upper surface uniformly dark brown, tips of anterior pelvic lobes white. Ventral surface white, sometimes



darker on pectoral- and pelvic-fin margins, near cloaca and clasper tip; sensory pores not marked black.

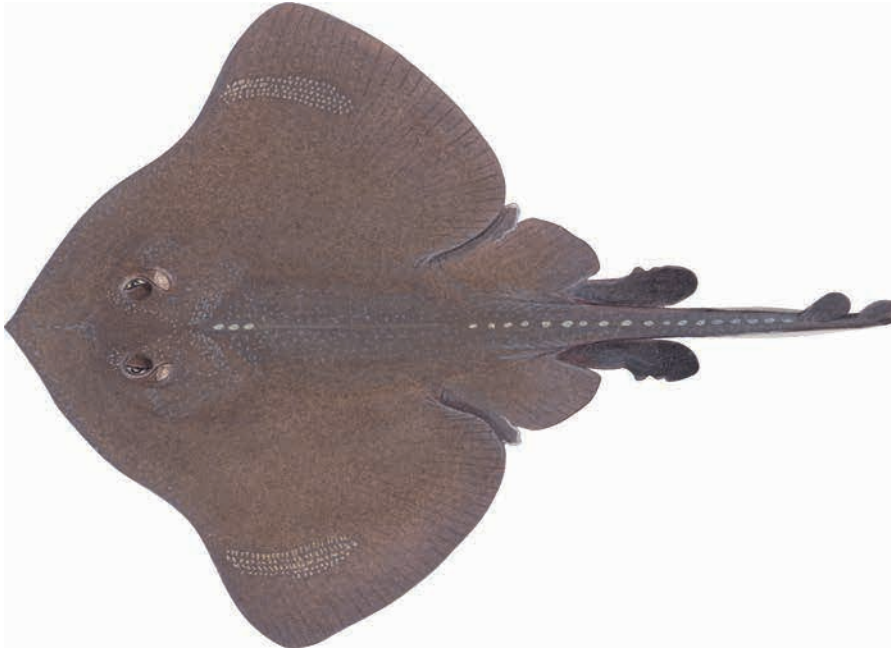
SIZE. Attains ~102 cm TL; egg cases 11–13 cm long.

HABITAT AND BIOLOGY. North Pacific; central Japan to Sea of Okhotsk (Russia). Demersal, outer continental shelves and upper insular slopes at 70–900 m depths.

SIMILAR SPECIES. Within *Bathyraja* of the North-West Pacific, only the Dapplebelly (20.97) and Aleutian (20.8) Skates have 1 or more thorns on each shoulder. However, both of these species also have median thorns extending well forward onto the disc (rather than being confined to the tail).

BROADNOSE SKATE

20.11

Bathyraja brachyurops (Fowler, 1910)

LC

IDENTIFICATION. Medium-sized skate with a weak rhombic disc covered anteriorly with granular denticles, moderately elongate snout, short tail, thorns confined to median row on disc and tail, and disc darker above than below. Disc margin undulate anteriorly, more so in adult males; apices narrowly rounded. Snout broad, bluntly angled, small lobe at tip, soft and flexible vertically due to very delicate rostral cartilage; anterior pectoral radials extending nearly to tip; length ~2.9 times orbit length; interorbital space equal to or a little larger than orbit length. Mouth narrow; tooth rows in upper jaw 23–32. No thorns on upper disc other than 22–26 large thorns in median row from nape to first dorsal fin in young, row interrupted in adults (2–4 on nape and 14–23 from posterior trunk to first dorsal fin). Upper disc largely smooth, except for denticles on head, along anterior disc margins, and in broad band flanking median thorn row; undersurface smooth. Tail firm, short, 0.8–0.9 of preloacal length; 2 small rounded dorsal fins, separated slightly, procaudal length subequal to snout length. Pelvic fin moderately notched, anterior lobe often elongate; clasper with bulbous tip. Pectoral-fin radials 83–88. Abdominal vertebrae 29–37, predorsal tail vertebrae 70–76.

COLOUR. Greyish brown above, plain or with reticulate pattern and mostly with whitish pectoral markings. Ventrally white, tail often with irregular greyish blotches.



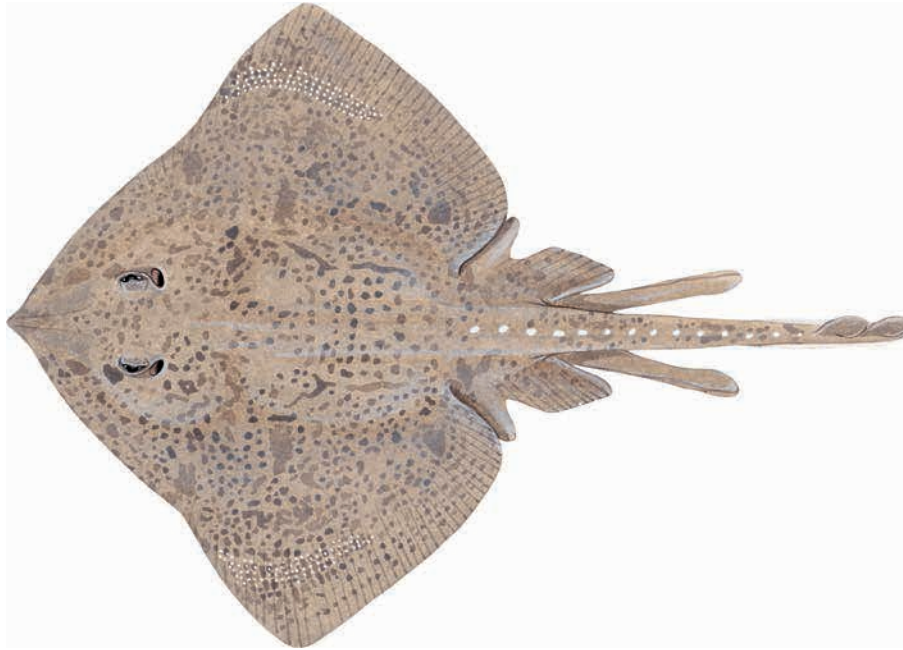
SIZE. Attains ~125 cm TL. Males mature at ~65 cm TL, females ~67 cm TL (based on population off Uruguay). Egg cases 8–9 cm long.

HABITAT AND BIOLOGY. South-East Pacific and South-West Atlantic; Chile to southern Brazil (including Falkland Islands). Demersal, inner continental shelf to upper slope at 30–600 m depths. Diet consists of smaller benthic invertebrates (mainly crustaceans and squids); adults consume largely fishes.

SIMILAR SPECIES. The Whitedotted Skate (20.7) has a distinctive white-spotted colour pattern, and in Cousseau's Skate (20.12) the dorsal fins are joined at their bases and the undersurface of the tail is often darker (almost entirely brown).

COUSSEAU'S SKATE

20.12

Bathyrajaousseauae Díaz de Astarloa & Mabragaña, 2004

NT

IDENTIFICATION. Large skate with a weakly rhombic disc densely covered anteriorly with small denticles, short snout and tail, thorns widely spaced and in continuous median row on disc and tail, and upper disc dark mottled with small ocellate pectoral markings. Disc 1.2–1.4 times length, margin undulate anteriorly, more concave in adult males; apices abruptly angular. Snout broad, bluntly angled, small lobe at tip, soft and flexible vertically due to very delicate rostral cartilage; anterior pectoral radials extending nearly to tip; length 2.8–4.2 times orbit length; interorbital space 1–1.6 times orbit length. Mouth broad; tooth rows in upper jaw 30–33. No thorns on upper disc other than median row of 7–10 on nape and mid-shoulder, and 14–19 from posterior trunk to first dorsal fin. Skin of upper surface largely rough; undersurface smooth. Tail firm, length 0.9–1.2 times precloacal length; 2 small dorsal fins, joined at bases, procaudal length much shorter than snout length. Pelvic fin moderately notched, anterior lobe often elongate; long slender claspers. Pectoral-fin radials 89–92. Abdominal vertebrae 34–38, predorsal tail vertebrae 78–83.

COLOUR. Upper surface greyish brown to yellowish brown, covered with dark speckled pattern; pectoral marking consisting of large whitish blotch encircled with broad dusky margin; tail with varying numbers of pale crossbars or saddles. Ventral surface white; tail regularly with brown spots or almost entirely brown.



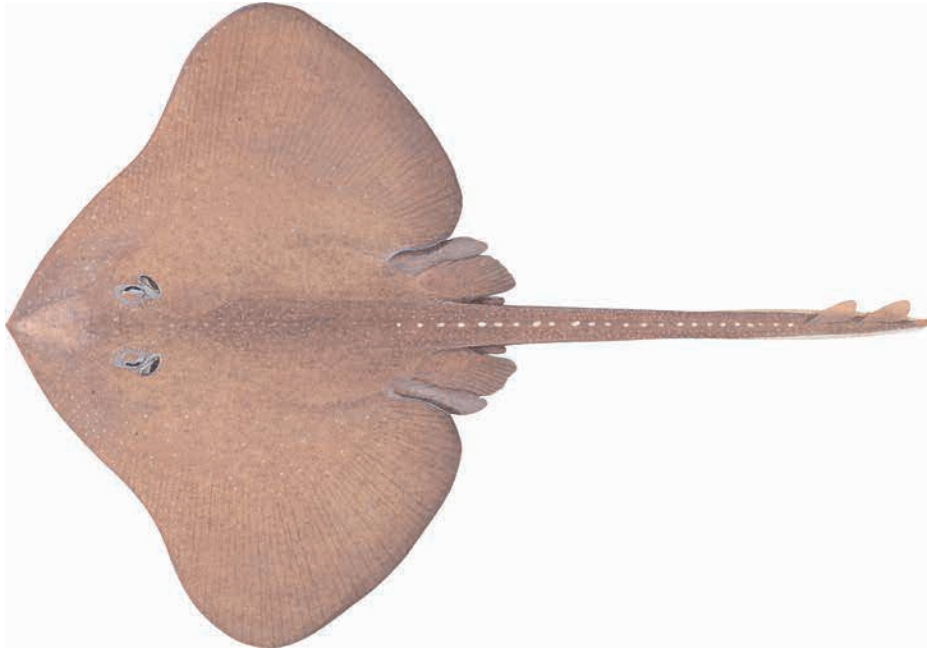
SIZE. Attains at least 122 cm TL (off Falkland Islands). Males mature at ~91 cm TL, females ~98 cm TL.

HABITAT AND BIOLOGY. South-West Atlantic and South-East Pacific; Argentina to southern Chile, including Falkland Islands. Demersal, coastal on mid-continental shelf and slope at 105–1190 m depths. No data available on diet.

SIMILAR SPECIES. The Whitedotted Skate (20.7) has a distinctive white-spotted dorsal colour pattern and lacks a large, blotch-like pectoral marking. The Broadnose Skate (20.11) has the dorsal fins well separated (rather than joined at their bases).

DUSKYPINK SKATE

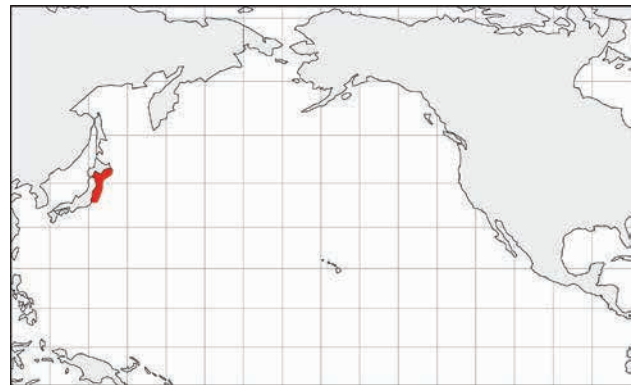
20.13

Bathyraja diplotaenia (Ishiyama, 1952)

LC

IDENTIFICATION. Medium-sized skate with a broadly rhombic disc at all sizes, short and rather broad snout, uniformly granular dorsal disc in young becoming largely naked in adults, no shoulder thorns and nuchal thorns usually absent, long anterior pelvic-fin lobes, and upper surface plain with pale dorsal snout, and undersurface pale. Disc anterior margins weakly undulate; apices broadly rounded. Snout with a minute blunt tip; soft and flexible vertically due to very delicate rostral cartilage; length ~3–4.2 times orbit length; interorbital space slightly larger than orbit length; anterior pectoral radials extending to nearly snout tip. Mouth medium-sized, nasal flaps broadly lobed. Thorns absent from orbit and snout; 0–1 nuchal thorns; 18–28 small thorns in regularly arranged median row on tail before dorsal fins. Upper surface denticle pattern changing greatly with growth; denticles confined to snout, anterior margins of disc, and in narrow band along mid-disc that extends onto tail in adults, broad patch over interorbit; undersurface always smooth apart from snout tip. Tail slender, thickened, longer than precloacal length; lateral folds restricted to posterior tail; 2 small dorsal fins (procaudal length subequal to snout to mid-eye) barely separated; caudal fin short. Pelvic fin with deep notch; clasper rather broad, tip pointed. Abdominal vertebrae 31–37, predorsal tail vertebrae 70–74.

COLOUR. Upper surface uniformly rosy pink to purplish, white on snout forward of eyes and over anterior lobe of



pelvic fin; ventral surface of disc usually white, with greyish blue areas along posterior margins of disc and pelvic fins; sensory pores not marked black.

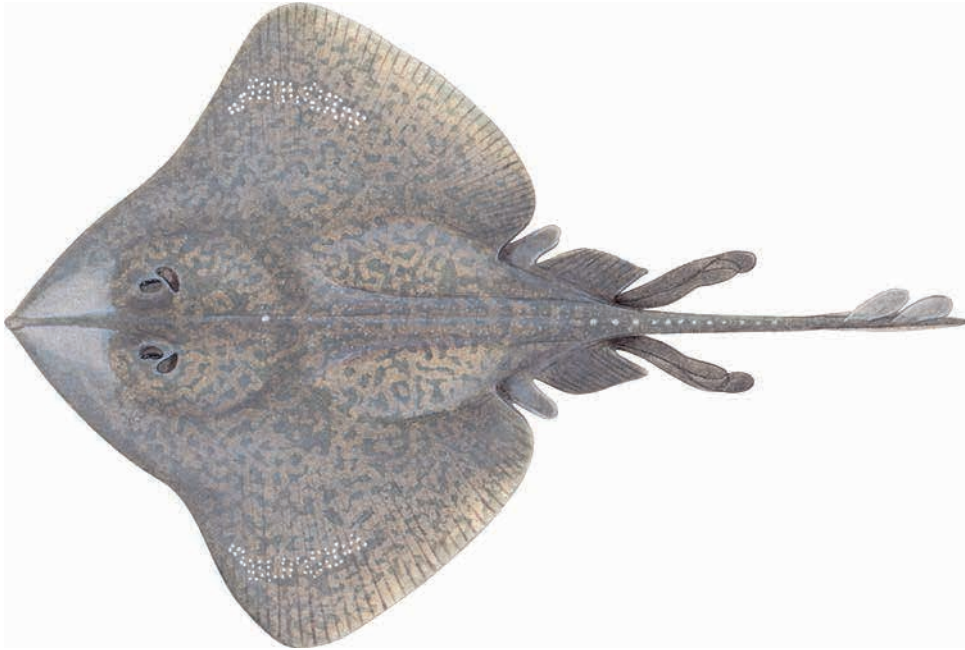
SIZE. Attains ~88 cm TL. Males mature at ~64–69 cm TL, females 67–70 cm TL; egg cases 11–12 cm long.

HABITAT AND BIOLOGY. North-West Pacific; off eastern Japan. Demersal on insular shelf and slope at ~100–1000 m depths. Bycatch of trawl fishery for cods and rockfishes.

SIMILAR SPECIES. Similar in appearance to several other *Bathyraja* from the North-West Pacific but has relatively larger anterior pelvic-fin lobes.

EATON'S SKATE

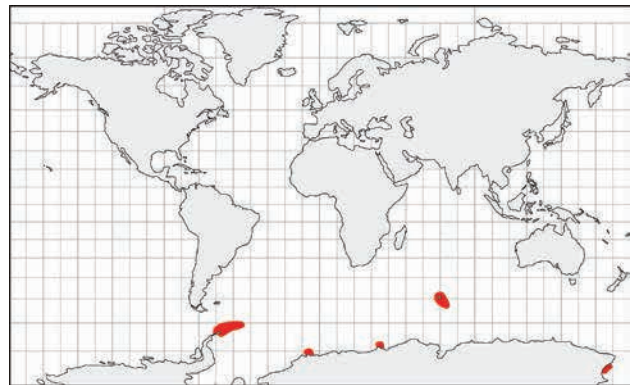
20.14

Bathyraja eatonii (Günther, 1876)

DD

IDENTIFICATION. Large skate with a rhombic disc, broadly triangular snout (longer than half head length), upper disc uniformly granular in young and partly smooth in adults, 1–2 nuchal thorns (often absent in adults), and variably patterned above and paler ventrally. Disc anterior margins undulate, more so in adult males; apices broadly rounded. Snout long with a pointed tip; soft and flexible vertically due to very delicate rostral cartilage; length ~5 times orbit length; interorbital space slightly larger than orbit; anterior pectoral radials extending to nearly snout tip. Mouth narrow, nasal flaps broadly lobed. Thorns absent from orbit, snout and shoulder; 8–18 small thorns in median row on tail before dorsal fins, interdorsal thorn sometimes present. Upper surface of disc and tail uniformly granular in juveniles; denticles sparse on pelvic fin and mid-pectoral region of adults, appearing as a wide median band extending from snout to end of tail; undersurface entirely smooth. Tail thickened, tapering evenly to tip, shorter than disc length in adults; lateral folds extending full length of tail; 2 small dorsal fins at rear of tail separated slightly; caudal fin short. Pelvic fin moderately notched, anterior lobe rather long and broad; claspers stout.

COLOUR. Variable, upper surface plain to marbled, yellowish to greyish brown; undersurface of disc largely white, darker markings often around margin of disc, cloaca and over tail; sensory pores not marked black.



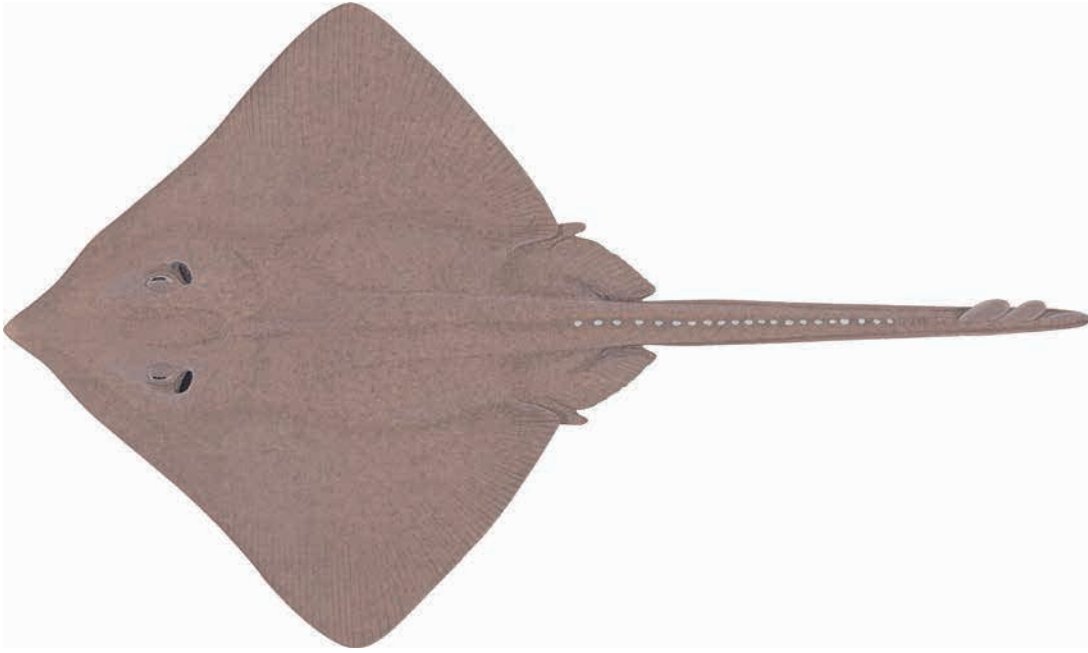
SIZE. Attains ~126 cm TL; egg cases 11–12 cm long.

HABITAT AND BIOLOGY. Southern Ocean; Kerguelen Plateau and widespread off Antarctica. Demersal, on continental and insular shelves and slopes at ~15–1500 m depths. Caught commercially off Kerguelen Island.

SIMILAR SPECIES. Occurs with the Darkbelly Skate (20.32) in the Southern Ocean, but the latter has a largely dark undersurface (rather than being predominantly white) and the median thorn row is continuous from the nape to the first dorsal fin.

CINNAMON SKATE

20.15

Bathyraja fedorovi Dolganov, 1983

LC

IDENTIFICATION. Large skate with an angular rhombic disc, sharply pointed snout, small eyes, granular dorsal disc without thorns, lateral folds extending along full length of tail, and undersurface brownish with white spots. Disc anterior margins straight to weakly undulate anteriorly; apices narrowly rounded. Snout with an angular tip; soft and flexible vertically due to very delicate rostral cartilage; length 5.5–5.8 times orbit length; interorbital space 1.3–1.4 times larger than orbit length; anterior pectoral radials extending nearly to snout tip. Mouth rather broad, nasal flaps broadly lobed; tooth rows in upper jaw 22–23. Thorns confined to mid-line of tail, 22–26 in row along predorsal tail. Skin on upper disc and tail velvety, uniformly covered with small spinules; undersurface entirely smooth, apart from surfaces of lateral folds of tail. Tail thickened, almost rounded in cross-section, tapering to apex, slightly shorter than disc length; 2 small, similar-sized dorsal fins at rear of tail, barely separated; caudal fin low. Pelvic fin mildly notched, anterior lobe short; pectoral-fin radials 71–72. Predorsal vertebrae 93–94; abdominal vertebrae 28–29, predorsal tail vertebrae ~65.

COLOUR. Upper surface uniform cinnamon brown; ventral surface of disc similarly brownish with numerous small white spots; sensory pores not marked black.

SIZE. Possibly attains 150 cm TL, but largest confirmed specimen an adult female (73 cm TL) with two egg cases (~9 cm long).

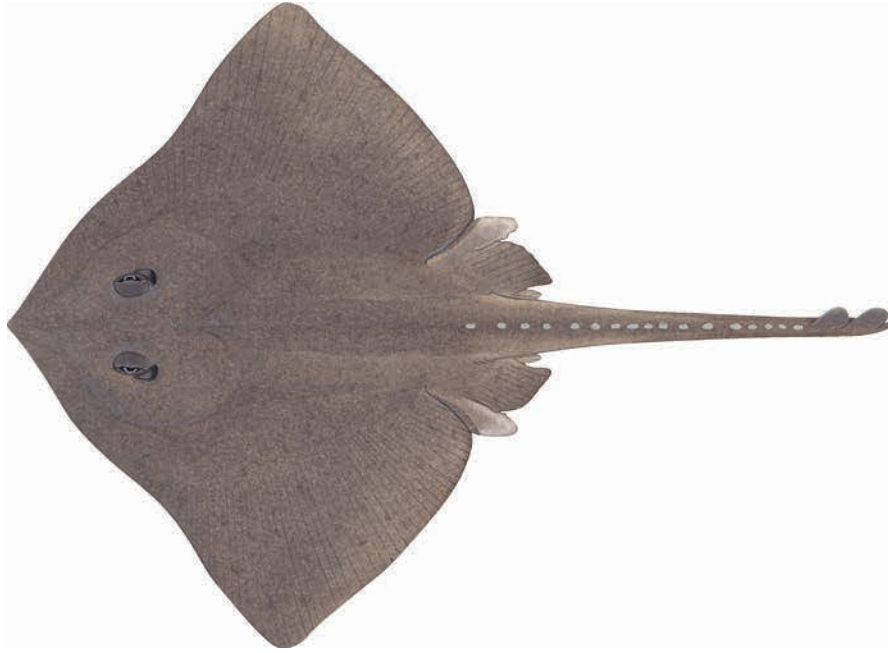


HABITAT AND BIOLOGY. North-West Pacific; Japan to Sea of Okhotsk (Russia). Demersal on continental and insular slopes at 445–2025 m depths (mostly deeper than 800 m); possibly abyssal and more widespread in North Pacific. Less commonly caught in trawls than other *Bathyraja* skates of the region.

SIMILAR SPECIES. Most similar to the Raspback Skate (20.21) in having few thorns on the disc and closely spaced eyes, but the Cinnamon Skate has a more angular snout and characteristic dark, white-spotted ventral surface (rather than whitish with dark edges).

GREYTAIL SKATE

20.16

Bathyraja griseocauda (Norman, 1937)

EN

IDENTIFICATION. Large, heavy-bodied, rough-skinned skate with a broad rhombic disc largely lacking thorns, short snout, and greyish brown above and whitish below. Disc ~1.3 times length, margin undulate anteriorly, more so in adult males; apices narrowly rounded to abruptly angular. Snout broad, bluntly angled, very small lobe at tip, soft and flexible vertically due to very delicate rostral cartilage; anterior pectoral radials extending nearly to tip; length 3.1–3.3 times orbit length; interorbital space 1.3–1.8 times orbit length. Mouth broad; tooth rows in upper jaw 30–35. No large thorns on upper disc (long and narrow alar thorn patch in adult males), only a median row of 15–20 thorns along tail to first dorsal fin. Skin of upper surface rough with dense covering of fine denticles; undersurface smooth. Tail firm, length 0.9–1 times preloacal length; 2 small dorsal fins near rear of tail, narrowly separated, usually without thorn in interspace, procaudal length subequal to snout length. Pelvic fin moderately notched, anterior lobe rather elongate; very long slender claspers. Pectoral-fin radials 85–93. Abdominal vertebrae 32–40, predorsal tail vertebrae 74–80.

COLOUR. Upper surface plain, dark greyish brown; juveniles and half-grown specimens often with black-spotted pattern. Ventral side of disc white, with broad dark rear margins. Ventral tail white at base, always with distinct irregular greyish brown markings posteriorly.



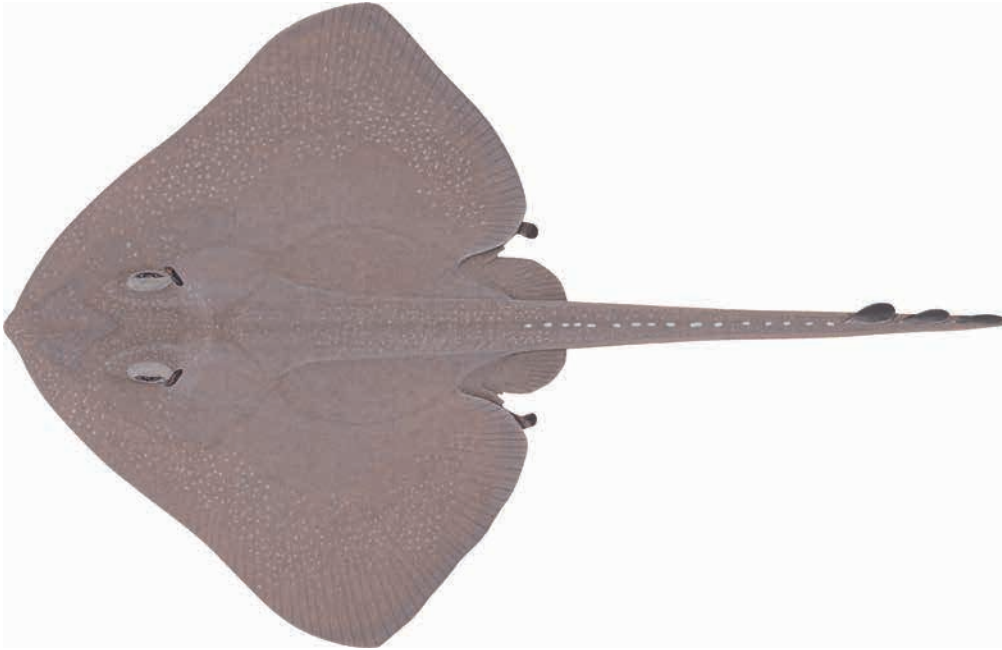
SIZE. Attains ~157 cm TL. Males mature at ~120 cm TL, smallest juvenile 13 cm TL.

HABITAT AND BIOLOGY. South-East Pacific and South-West Atlantic; Chile to southern Uruguay. Demersal, inshore to outer continental shelf and insular slopes at 30–1010 m depths. Diet consists of benthic crustaceans, squids and small fishes; adults feed primarily on fishes.

SIMILAR SPECIES. Species of *Bathyraja* from the region also lacking thorns on the upper disc include the Cuphead Skate (20.45), which has a very narrowly pointed snout, and the Whitemouth Skate (20.46), which is dark-bellied rather than pale. The Spinytail Skate (20.51), which is of similar size and appearance, is a cold temperate North Atlantic counterpart.

WEST AFRICAN SKATE

20.17

Bathyraja hesperaficana Stehmann, 1995

DD

IDENTIFICATION. Large skate with a very broad rhombic disc, short snout, upper disc largely granular but lacking thorns, denticles absent from pectoral centres and posterior disc, single row of tail thorns, tail longer than 80% of disc width, and disc almost uniformly greyish brown on both surfaces. Disc 1.3–1.4 times wider than long, asymmetrical, its widest point much closer to tail than to snout; anterior margins undulate to weakly convex, adult males unknown; apices narrowly and evenly rounded. Snout with minute lobe at tip, length 1.8–2.6 times orbit length, interorbital space subequal to orbit length; soft and flexible vertically due to very delicate rostral cartilage; anterior pectoral radials extending to snout tip. Mouth rather broad, nasal flaps lobed; tooth rows in upper jaw 24–25. Thorns with large bases, evenly spaced, 15–17 in median row on tail. Dorsal denticles coarse and rather dense, confined mainly to head, anterior pectoral-fin margins and in longitudinal band along mid-disc; tail covered with similar prickles but skin smooth beside tail thorns; undersurface uniformly smooth. Tail slender, tapering to apex, ~1.2 times precloacal length; lateral folds weak; dorsal fins low, separated slightly; caudal fin low, long based. Pelvic fin deeply notched, anterior lobe slender and nearly as long as posterior lobe. Pectoral-fin radials ~81. Predorsal vertebrae ~101–107; abdominal vertebrae 34–38, predorsal tail vertebrae 67–69.

COLOUR. Dorsal surface plain greyish brown, darker on central trunk, along disc margin, and on anterior pelvic fin;



dorsal fins black. Similarly greyish brown ventrally, whitish around mouth; sensory pores not marked black.

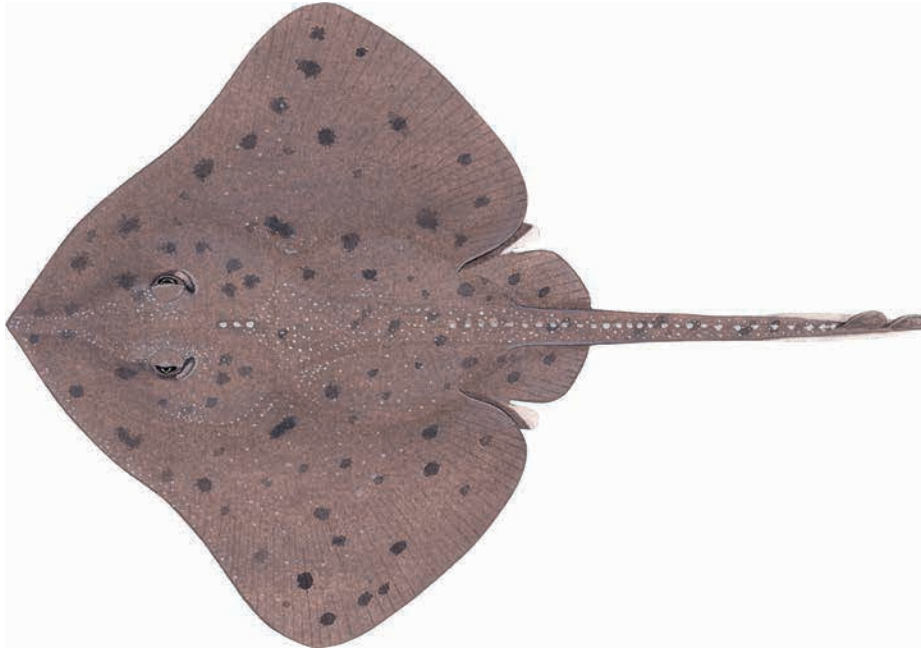
SIZE. Attains ~87 cm TL. Maturity size unknown; egg cases possibly hatch at ~25 cm TL.

HABITAT AND BIOLOGY. Eastern Central Atlantic; Mauritania to Gabon. Demersal on continental slope at 750–980 m depths, but possibly much deeper as egg cases with a full-term embryo taken at 1450–2200 m thought to be this species.

SIMILAR SPECIES. The similar Whitemouth Skate (20.46) has a longer and more pointed snout, and higher vertebral counts.

BERING SKATE

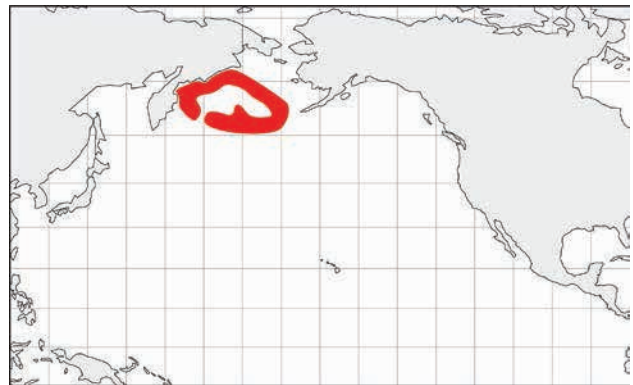
20.18

Bathyraja interrupta (Gill & Townsend, 1897)

LC

IDENTIFICATION. Medium-sized skate with a rhombic disc covered with fine spinules, short snout, 1–2 thorns on each shoulder, nuchal thorn row widely separated from tail thorns, and dorsal surface darker than undersurface. Disc margin undulate anteriorly, more so in adult males, apices narrowly rounded. Snout bluntly angular, soft and flexible vertically due to very delicate rostral cartilage; anterior pectoral radials extending nearly to snout tip; length 3.8–4.9 times orbit length in adult, less in young; interorbital space distinctly concave and subequal to orbit length. Mouth rather small; tooth rows in upper jaw 20–33. No snout or orbital thorns; 3 nuchal thorns and mainly 1 shoulder thorn (second rudimentary when present); median row of 17–30 thorns extending from posterior disc and along tail to dorsal fins. Upper disc uniformly covered with very small embedded spinules; undersurface entirely smooth except for snout tip. Tail slender, subequal to precloacal length; 2 small dorsal fins at rear of tail, separated slightly; lateral folds originating near mid-length of tail. Pelvic fin weakly notched, posterior lobe large; clasper slender. Predorsal vertebrae ~95–102; abdominal vertebrae 29–35, predorsal tail vertebrae 62–69.

COLOUR. Dorsal surface dark brown, sometimes with white mottling in adults; covered with numerous dark specks in young. Undersurface largely white, but dark



along disc margin, around cloaca, tips of pelvic fins, and over tail.

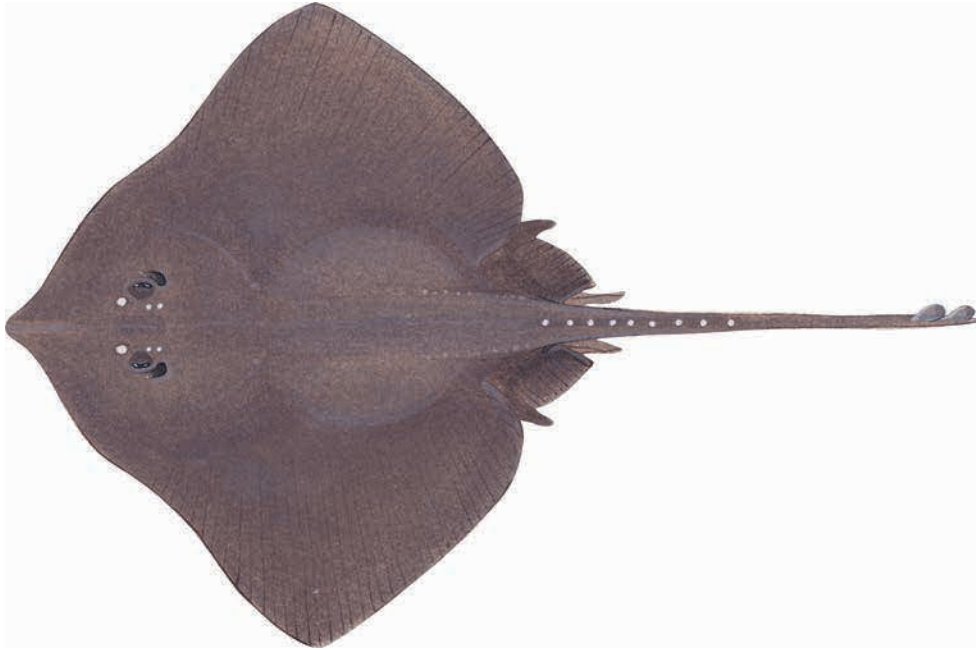
SIZE. Attains at least 87 cm TL. Males mature at ~67 cm TL, females ~70 cm TL; young hatch at ~16 cm TL.

HABITAT AND BIOLOGY. North Pacific; Bering Sea. Probably locally widespread and benthic on mid-continental and insular slopes to 1370 m depth. Biology unknown.

SIMILAR SPECIES. Belongs to a group of Western and Northern Pacific *Bathyraja* skates that have shoulder thorns and are largely or entirely white on the ventral surface.

KERGUELEN SKATE

20.19

Bathyraja irrasa Hureau & Ozouf-Costaz, 1980

NT

IDENTIFICATION. Large skate with a rhombic disc, rather short and broad snout (shorter than half head length), uniformly granular dorsal disc and tail, orbit thorns present but no other thorns on central disc, dark above, and piebald ventrally. Disc anterior margins undulate, more strongly so in adult males; apices broadly rounded. Snout with a bluntly pointed tip; soft and flexible vertically due to very delicate rostral cartilage; length 3.4–4.6 times orbit length; interorbital space 1.1–1.5 times orbit length; anterior pectoral radials extending to nearly snout tip. Mouth narrow, nasal flaps broadly lobed. Thorns on disc confined to orbit and alar patch of adult males; distinct thorn on preorbit, often also smaller mid and postorbital thorns; 9–23 small, widely spaced tail thorns in median row before dorsal fins, becoming smaller or rudimentary on posterior third of tail, interdorsal thorns absent. Upper surface of disc and tail densely covered with coarse spinular denticles, smooth areas around extremity of disc and on parts of pelvic fins; undersurface entirely smooth. Tail slightly depressed, tapering strongly to apex, subequal to disc length; lateral folds extending almost full length of tail; 2 small dorsal fins at rear of tail separated slightly; caudal fin rudimentary. Pelvic fin moderately notched, anterior lobe rather long and thick.

COLOUR. Upper surface plain dark greyish brown, often darker brown on tail and along mid-line of disc.



Undersurface largely dark brown, but white around mouth, over central abdomen, and usually near base and tip of tail; sensory pores not marked black.

SIZE. Attains at least 120 cm TL; egg cases ~11 cm long.

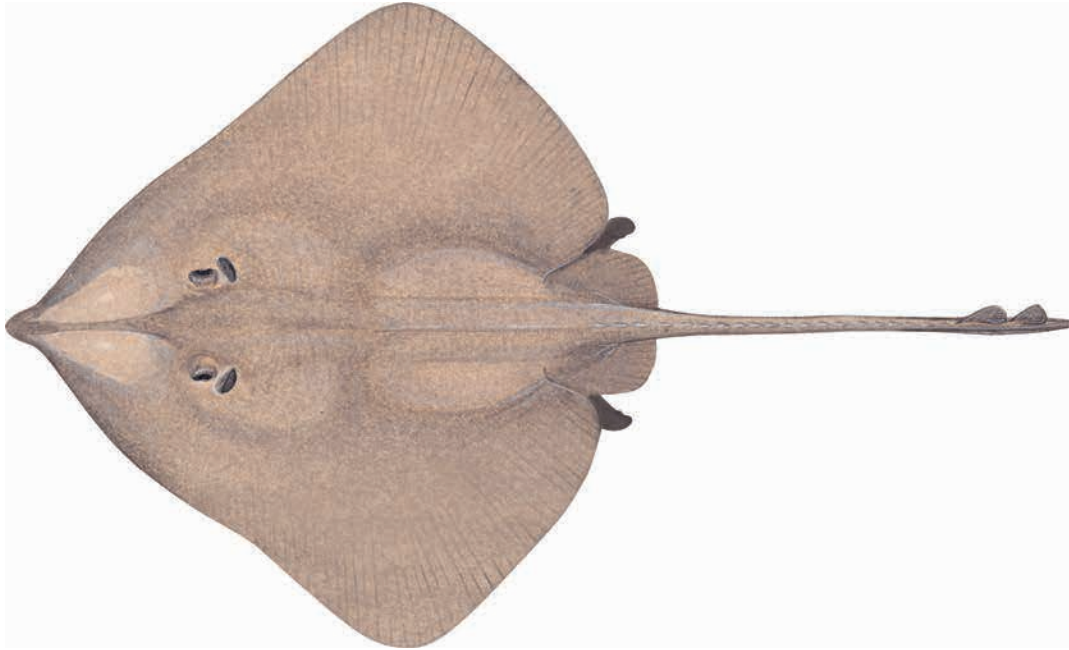
HABITAT AND BIOLOGY. Southern Ocean, possibly endemic to Kerguelen and Heard Islands. Demersal, insular slopes at 300–1220 m depths; egg cases taken at 140 m depth possibly this species. Frequent bycatch of toothfish fishery.

SIMILAR SPECIES. Occurs in the Southern Ocean with another large *Bathyraja*, Eaton's Skate (20.14), which also has a rhombic disc; the Kerguelen Skate has a plainer dorsal disc, and possesses orbital thorns and darker ventral surface.

ABYSSAL SKATE

20.20

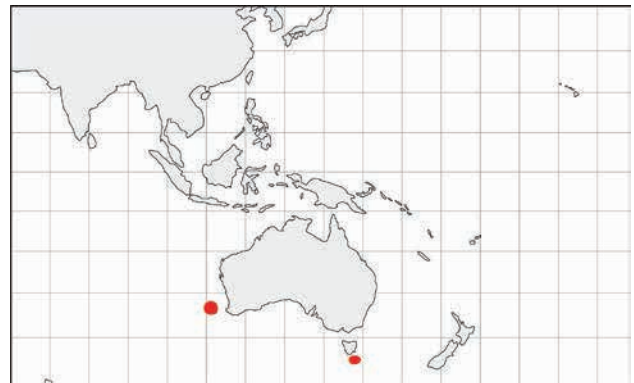
Bathyraja ishiharai Stehmann, 2005



DD

IDENTIFICATION. Large, heavy-bodied skate with a rhombic disc, broad head, moderately elongate snout, skin with sparse coverage of denticles, single thorn row on tail, no thorns on head or central disc, and uniformly darkish on both surfaces. Disc with widest point much closer to end of disc than snout; slightly wider than long; anterior margins undulate in young, becoming concave beside spiracles in adults, apices broadly rounded. Snout broadly triangular in young, relatively shorter in adults with a small pointed tip, length ~3.7–4 times orbit length; interorbital space ~1.1–1.4 times orbit length; soft and flexible vertically due to very delicate rostral cartilage, anterior pectoral radials extending to nearly snout tip. Mouth broad, nasal flaps narrow-lobed; tooth rows in upper jaw 22–29. Thorns in median row on tail 16–18. Upper surface with small patches of coarse denticles near eyes and along disc margin in young, confined to distal half of anterior margins in adult males; undersurface entirely smooth. Tail tapering evenly, length subequal to disc length; lateral folds weak; 2 small dorsal fins separated slightly, usually 1 thorn in interspace; caudal fin low. Pelvic fin notched, anterior lobe short, clasper very long and slender. Pectoral-fin radials ~78. Predorsal vertebrae 94–103; abdominal vertebrae 34–35, predorsal tail vertebrae 59–69.

COLOUR. Upper surface uniformly brownish; anterior pelvic-fin lobes brownish black with pale tips, posterior lobes with dark margin; dorsal and caudal fins dusky



brownish. Ventral surface dark brown with white areas on anterior nasal flaps and gill slits, and around mouth; sensory pores not marked black.

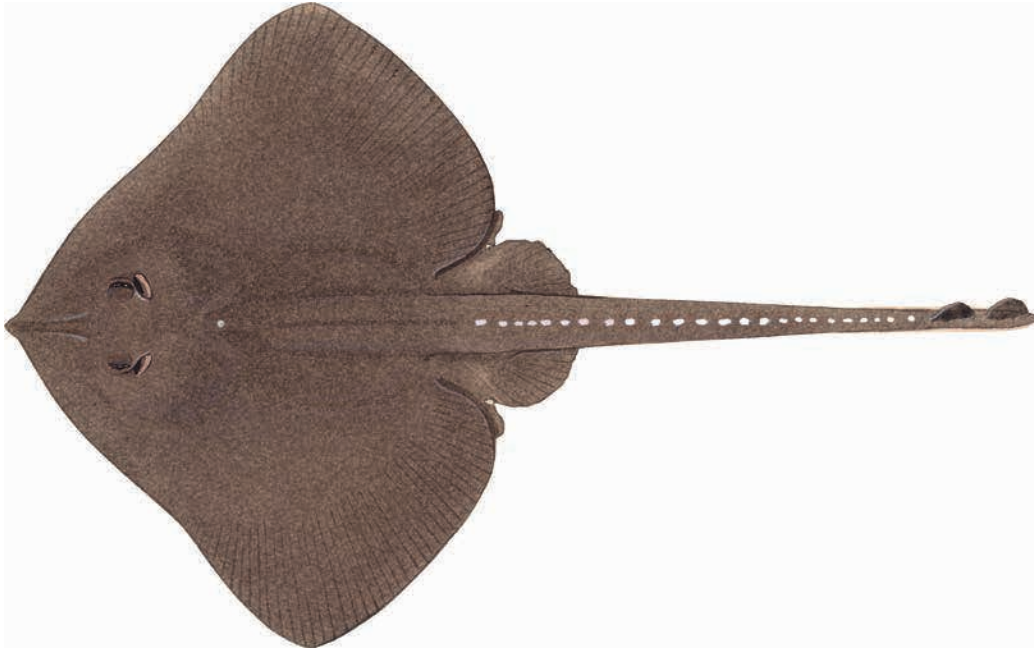
SIZE. Attains at least 123 cm TL.

HABITAT AND BIOLOGY. South-East Indian Ocean and South-West Pacific; Naturaliste Plateau, Tasmania and possibly the Lord Howe Rise (Tasman Sea). Known from three specimens, caught from abyssal depths (2320–2800 m). Possibly also off Tanzania.

SIMILAR SPECIES. Richardson's Skate (20.44) also lacks thorns on the disc, but has more widely spaced eyes and rougher skin on the upper disc.

RASPBACK SKATE

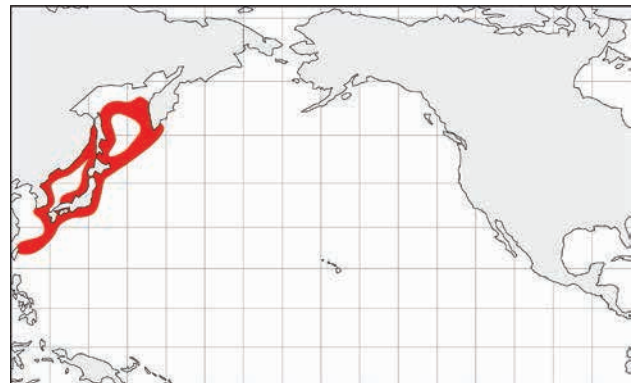
20.21

Bathyraja isotrachys (Günther, 1877)

LC

IDENTIFICATION. Medium-sized to large skate with a rhombic disc, broadly elongate snout (about half head length), granular upper disc, nuchal and shoulder thorns usually present, skin folds confined to posterior tail, and disc darker above than below. Disc anterior margins almost straight anteriorly, with an abrupt concavity just forward of its apex in adult males; apices narrowly rounded. Snout with a blunt tip; soft and flexible vertically due to very delicate rostral cartilage; length ~3.5–4.2 times orbit length; interorbital space slightly larger than orbit length; anterior pectoral radials extending to nearly snout tip. Mouth broad, nasal flaps broadly lobed. Thorns absent from orbit and snout; single shoulder thorn sometimes present; 1–6 nuchal thorns, continuing posteriorly as median row of smaller lumbar thorns only in young; row of mostly 22–26 regularly arranged median thorns along predorsal tail. Skin of upper disc and tail uniformly granular in females and juveniles, denticles minute and becoming sparse on mid-pectoral and gill region in adult males; anterior pelvic lobe and undersurface smooth. Tail thickened, rounded in cross-section, tapering to apex, subequal in length to disc length; 2 small dorsal fins at rear of tail barely separated; caudal fin minute. Pelvic fin moderately notched, anterior lobe broad; clasper slender. Abdominal vertebrae 34–40, predorsal tail vertebrae 73–82.

COLOUR. Upper surface plain yellowish brown, becoming greyish in preservative, dorsal fins similar to disc; ventral



surface of disc white, tail sometimes with dark markings; sensory pores not marked black.

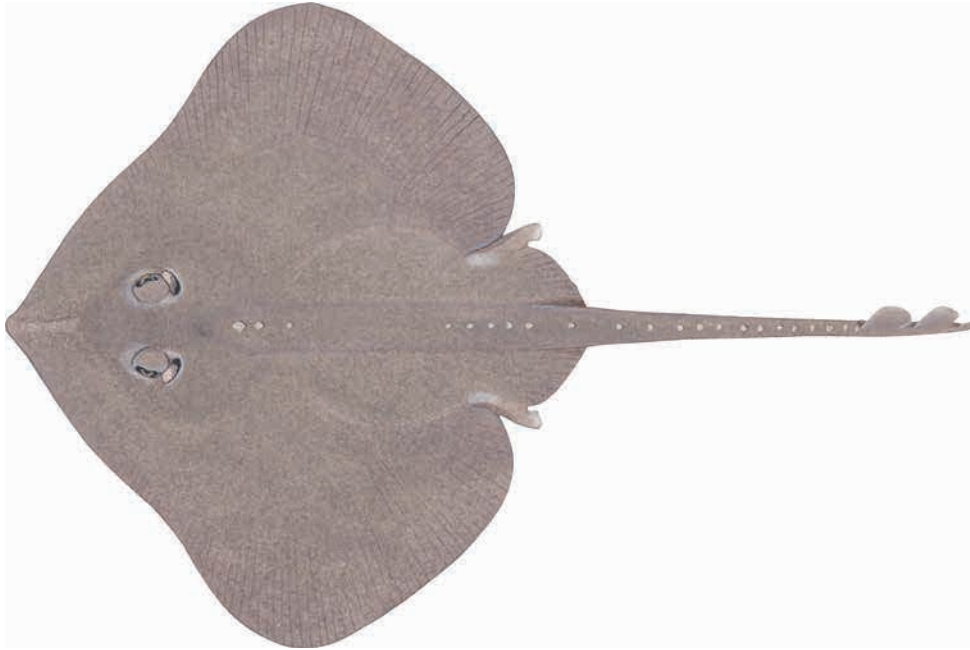
SIZE. Attains at least 93 cm TL; egg cases ~11–13 cm long.

HABITAT AND BIOLOGY. North-West Pacific; Taiwan to Sea of Okhotsk. Demersal, mainly mid-continental and insular slopes at 450–1480 m depths, possibly deeper. Among most common deepwater skates of the Western Pacific.

SIMILAR SPECIES. Most closely resembles the Eremo Skate (20.54) but has a denser coverage of denticles on the dorsal surface and better-developed nape and shoulder thorns.

SANDPAPER SKATE

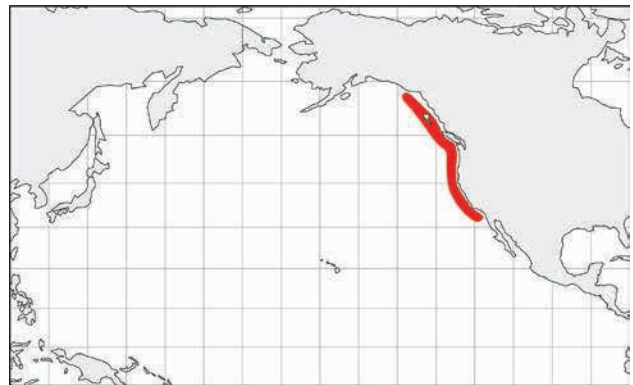
20.22

Bathyraja kincaidii (Garman, 1908)

DD

IDENTIFICATION. Medium-sized skate with a weak rhombic disc covered dorsally with granular denticles, short snout, shoulder thorns present, nuchal thorn row continuous with tail series, and dorsal surface darker than undersurface. Disc margin undulate anteriorly, more concave in adult males, apices narrowly rounded. Snout broad, small lobe at tip, soft and flexible vertically due to very delicate rostral cartilage; anterior pectoral radials extending nearly to tip; length 2.9–3.7 times orbit length; interorbital space 1.3–1.6 times orbit length. Mouth small; tooth rows in upper jaw 20–33. No snout or orbital thorns; median row of ~29 thorns extend continuously along disc and tail or isolated in 3 discrete rows; thorns large-based and low anteriorly, more conical on tail. Upper surface rough, uniformly covered with tall stellate denticles, very dense on tail, some embedded; undersurface entirely smooth. Tail long and slender, ~1.2 times precloacal length; 2 rounded dorsal fins at rear of tail, separated slightly, precaudal length ~14% TL; lateral folds originating near mid-length of tail. Pelvic fin weakly notched, anterior lobe rather enlarged; clasper slender. Predorsal tail vertebrae 64–73.

COLOUR. Dorsal surface grey to greyish brown, sometimes with black spots; white pectoral marking and white patch on either side of tail. Ventral surface of disc white; tail often with dark median stripe; sensory pores not black-edged.



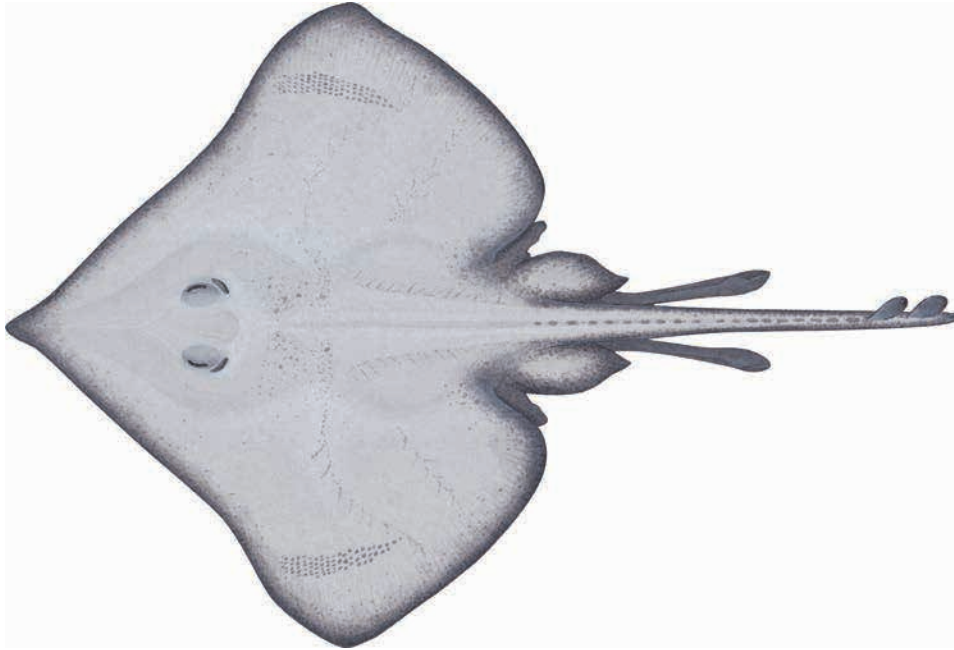
SIZE. Attains at least 63 cm TL (possibly to 86 cm TL). Males mature at ~48 cm TL, females 46–50 cm TL. Egg cases ~6 cm long, young hatch at 12–16 cm TL.

HABITAT AND BIOLOGY. North-East Pacific; California to Alaska. Demersal on continental and insular slopes, commonly at 200–500 m depths, but also collected at 1370 m.

SIMILAR SPECIES. Considered by some ichthyologists to be identical with the Bering Skate (20.18), hence the northern range of the Sandpaper Skate is uncertain due to confusion with this species. Molecular analyses are needed to determine the validity of similar species of *Bathyraja*.

DOMINO SKATE

20.23

Bathyraja leucomelanos Iglésias & Lévy-Hartmann, 2012

NE

IDENTIFICATION. Medium-sized skate with a rhombic disc, triangular snout, upper disc granular and entirely lacking enlarged thorns (apart from alar patch in adult males), eyes rather narrowly separated and mouth small, and largely white dorsally and entirely black below. Disc margin deeply concave behind orbit; apices narrowly rounded. Snout rather broad, pointed, small fleshy lobe at tip; soft and flexible vertically due to very delicate rostral cartilage; length ~6 times orbit length, interorbital space ~1.4 times orbit length; anterior pectoral radials extending nearly to snout tip. Mouth narrower than its distance from disc margin, nasal flaps strongly lobed; tooth rows in upper jaw ~30. Disc without primary thorns, alar patch well developed; ~18 large, regularly spaced thorns in median row on tail before dorsal fins, no interdorsal thorns. Upper surface almost entirely covered with fine denticles; no denticles on anterior lobe of pelvic fin. Tail ~0.9 times precloacal length, slender, tapering to apex, slightly depressed; lateral folds developed only on posterior half of tail; dorsal fins small, tilted, at rear of tail, barely separated, precaudal length ~13% TL; caudal-fin upper lobe developed. Pelvic fin strongly notched, anterior lobe very short in adult male; clasper very long and expanded distally. Pectoral-fin radials ~88. Predorsal vertebrae ~105; abdominal vertebrae ~35, predorsal vertebrae ~70.

COLOUR. Upper surface predominantly white; disc margin, snout tip, spiracle, anterior lobes of pelvic fins,



dorsal fins and claspers black. Ventral surface entirely black, mouth white; sensory pores not marked black.

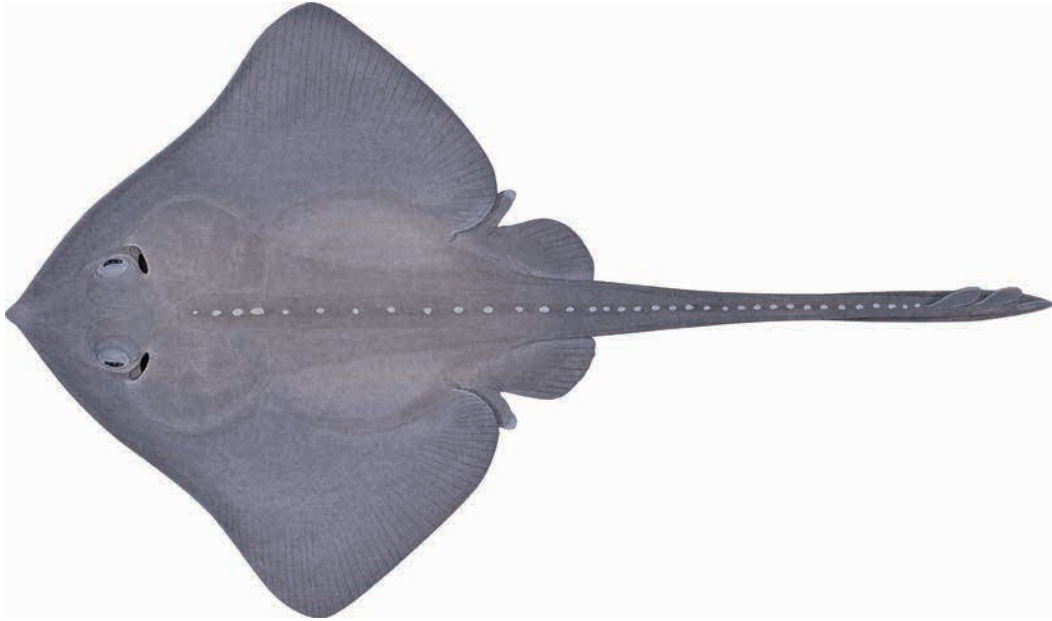
SIZE. Known from a single adult male, 90 cm TL.

HABITAT AND BIOLOGY. South-West Pacific; Coral Sea (off New Caledonia). Probably benthic and more widespread on deep insular slopes of Coral Sea, at 955–1020 m depths. Life history unknown.

SIMILAR SPECIES. No other *Bathyraja* skate in this part of South Pacific occurs so far north. The Pacific Blonde Skate (20.38) from New Zealand is pale on both surfaces and has an almost entirely smooth disc.

COMMANDER SKATE

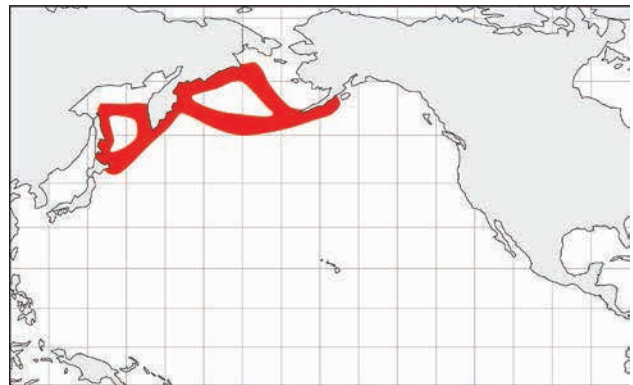
20.24

Bathyraja lindbergi Ishiyama & Ishihara, 1977

LC

IDENTIFICATION. Large skate with a rhombic to heart-shaped disc, short and rather broad snout, no scapular or orbital thorns, denticles concentrated into well-defined band extending along mid-disc and onto tail, continuous row of thorns from nape to dorsal fins, and both surfaces brownish with upper disc darker. Disc anterior margins most undulate in adult males, most deeply concave beside nape; apices narrowly rounded to abruptly angular. Snout tip with small blunt lobe; soft and flexible vertically due to very delicate rostral cartilage; length ~3 times orbit length; interorbital space ~1.5 times orbit length; anterior pectoral radials extending to nearly snout tip. Mouth very broad, nasal flaps broadly lobed; tooth rows in upper jaw 21–29. Thorns 27–39, well-developed and regularly arranged, in continuous median row on disc and tail. Upper surface of disc rough in patches, absent from mid-pectoral fins and anterior lobes of pelvic fins; undersurface entirely smooth. Tail slender, rounded in cross-section, tapering to apex, slightly longer than precloacal length; lateral folds restricted to posterior tail; 2 dorsal fins at rear of tail barely separated; caudal fin low. Pelvic fin with moderate notch, anterior lobe short and broad; clasper rather broad, tip rounded. Predorsal vertebrae mainly 101–102; abdominal vertebrae 29–34, predorsal tail vertebrae 68–72.

COLOUR. Upper surface uniform dark greyish brown, thorns whitish. Ventral surface of disc paler brown, tail darker greyish brown; sensory pores not marked black.



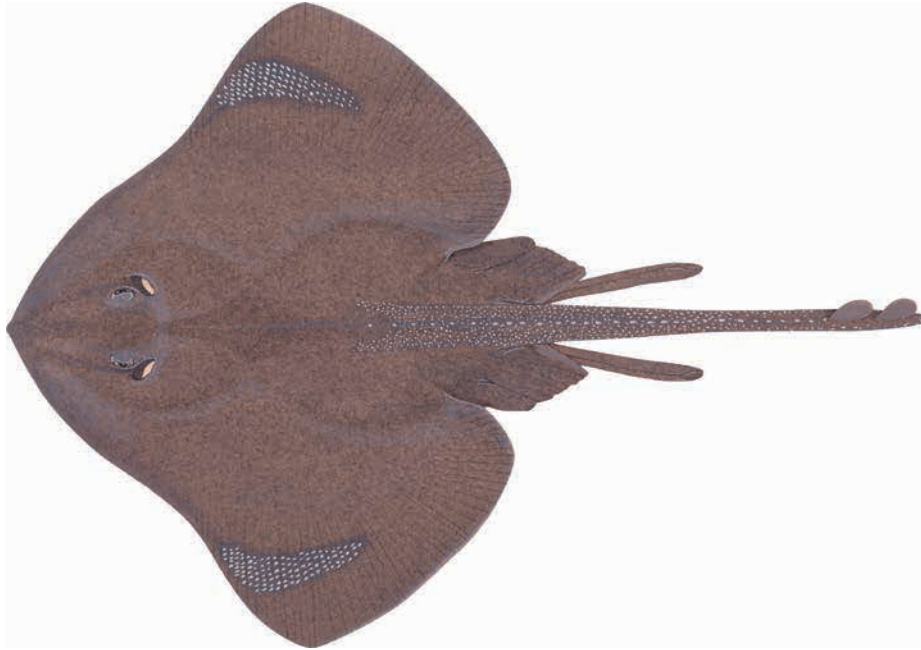
SIZE. Attains at least 102 cm TL, but probably erroneously reported to reach 126 cm TL. Males and females mature at ~80 cm TL.

HABITAT AND BIOLOGY. North Pacific; Arctic rim, northern Japan to Alaska (USA). Demersal on continental and insular shelves and slopes at 125–1195 m depths. Common bycatch of Bering Sea trawl fishery.

SIMILAR SPECIES. A smooth undersurface, no scapular thorns, continuous row of thorns along mid-disc and tail, and brownish upper and lower surfaces, distinguish this species from all other *Bathyraja* skates in the region.

SLIMTAIL SKATE

20.25

Bathyraja longicauda (de Buen, 1959)

DD

IDENTIFICATION. Medium-sized skate with a rhombic disc, skin on its upper surface largely smooth anteriorly, moderately elongate snout, no thorns on head or shoulders but 26–30 small median thorns extending from posterior half of disc to first dorsal fin, tail long in young, both surfaces of disc very dark. Disc ~1.3 times length, margin undulate anteriorly, more so in adult males; apices narrowly or abruptly rounded. Snout broad, bluntly angled, small lobe at tip, soft and flexible vertically due to very delicate rostral cartilage; anterior pectoral radials extending nearly to tip; length 3–3.8 times orbit length; interorbital space 1.2–1.5 times orbit length. Mouth narrow, nasal flaps broadly lobed. Alar thorn patch of adult male long, extending forward to anterior edge of disc. In juveniles, dorsal denticles only on snout, interorbital, along anterior disc margins and on sides of tail; in adult males, confined to well-defined narrow median denticle band originating just posterior to mid-disc and extending along tail; undersurface smooth. Tail firm and slender, length 1–1.3 times preloacal length; 2 small dorsal fins, rounded, well separated, 1–2 thorns in interspace, procaudal length subequal to snout length; caudal fin rudimentary. Pelvic fin moderately notched, anterior lobe small; claspers long and very slender.

COLOUR. Upper surface plain medium brown, with snout tip dusky. Ventral surface similarly dark brown; in young,



snout tip dusky, and light brown blotches near mouth, and on belly, anterior pelvic lobes, and tail.

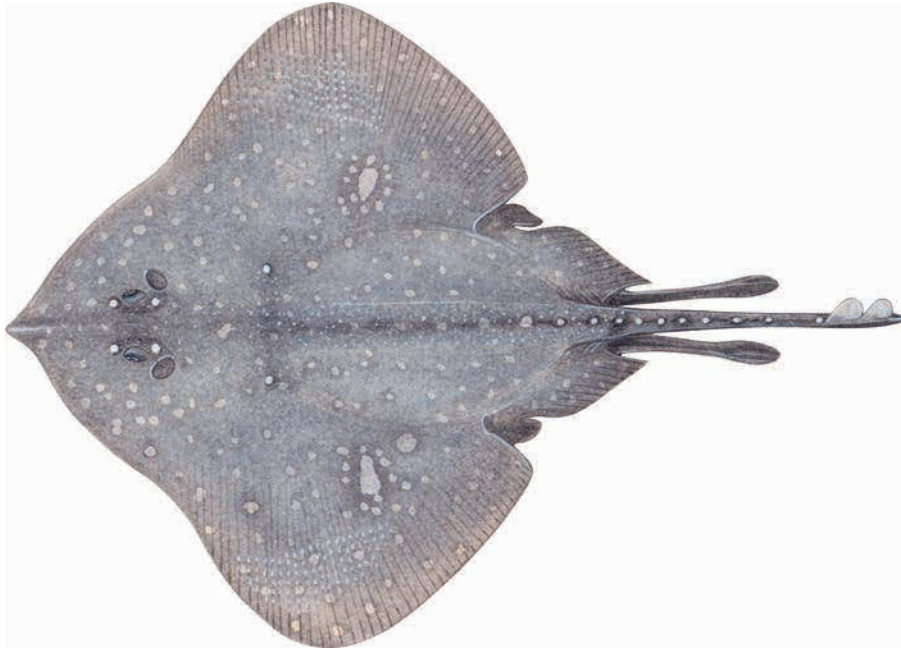
SIZE. Attains ~80 cm TL. Males are mature at 71 cm TL.

HABITAT AND BIOLOGY. South-East Pacific; Peru and central Chile. Demersal, probably more widespread along South American continental slope at ~400–735 m depths. Few specimens known.

SIMILAR SPECIES. The Peruvian Skate (20.43) has largely prickly skin on upper disc, a shorter tail (about as long as body), no interdorsal thorns, and fewer (18–26) thorns in median row of tail.

MCCAIN'S SKATE

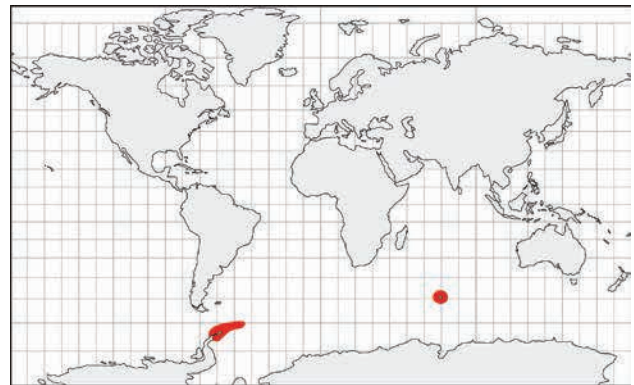
20.26

Bathyraja maccaini Springer, 1971

NT

IDENTIFICATION. Large skate with a moderately short and rather broad snout, uniformly granular dorsal disc in young becoming smoother in adults, large orbital and shoulder thorns, short tail, and pale patterned above with white undersurface. Disc rhombic to heart-shaped in adults, anterior margins weakly undulate, apices broadly rounded. Snout with a small triangular tip; soft and flexible vertically due to very delicate rostral cartilage; length ~4.2 times orbit length; interorbital space 1–1.4 times orbit length; anterior pectoral radials extending to nearly snout tip. Mouth narrow, nasal flaps broadly lobed; tooth rows in upper jaw ~29. Thorns absent from central region of disc; single, large pre-orbital, postorbital and shoulder thorns always present; 9–15 distinct, widely spaced thorns in median row on tail before dorsal fins, interdorsal thorn sometimes present. Upper surface squamation changing with growth; denticles coarse, sparsely scattered along outer margin of disc, over mid-body and on tail; undersurface entirely smooth. Tail shorter than disc in adults; tapering to apex; lateral folds along most of tail; 2 small dorsal fins at rear of tail barely separated; caudal fin short. Pelvic fin with deep notch, anterior lobe moderately elongate; clasper slender, tip rounded. Abdominal vertebrae ~37, predorsal tail vertebrae ~72.

COLOUR. Upper surface dark greyish brown, often with pattern of light spots or blotches that are most obvious in



young; also often with 1 or more pairs of pale pectoral ocelli. Undersurface largely white, often with irregular dark speckling or blotches; sensory pores not marked black.

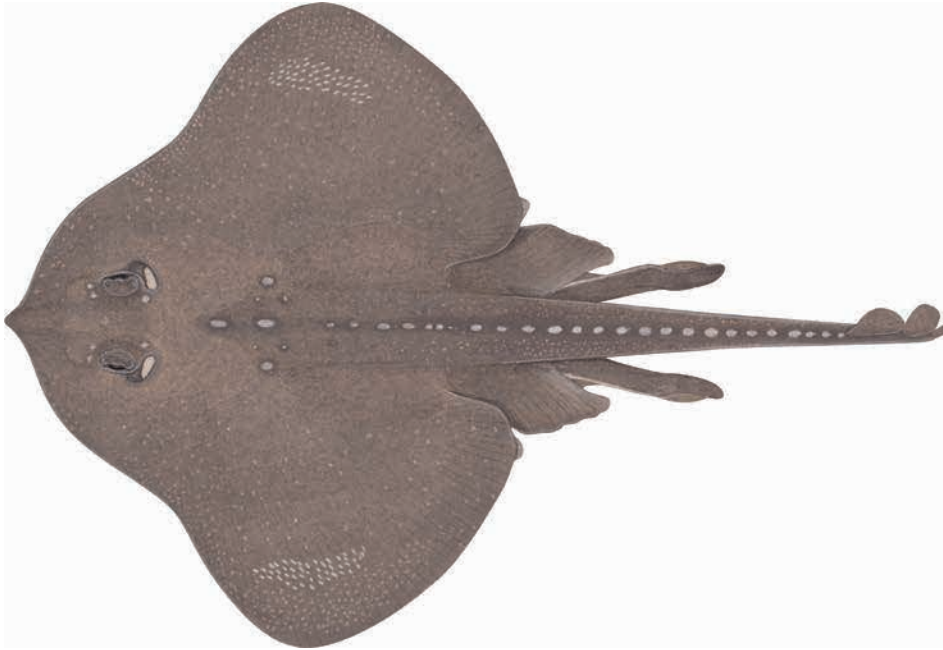
SIZE. Attains ~120 cm TL, males mature at ~94 cm TL.

HABITAT AND BIOLOGY. Southern Ocean; off Antarctica and Kerguelen Island. Demersal on continental and insular shelves and upper slopes to ~500 m depth. Bycatch of trawl and line fisheries for Antarctic icefishes.

SIMILAR SPECIES. McCain's Skate is less spiny than Murray's Skate (20.36), and has prominent thorns around the eye that are absent in Eaton's Skate (20.14).

PATAGONIAN SKATE

20.27

Bathyraja macloviana (Norman, 1937)

NT

IDENTIFICATION. Medium-sized skate with a spiny, heart-shaped disc, very short snout, rather large eyes, nuchal and shoulder thorns, median thorns discontinuous from nuchal region to tail, and disc darker above than below. Disc anterior margins convex beside eyes, apices broadly rounded. Snout length 2.5–3 times orbit length, interorbital space mostly equal to or up to 1.2 times wider than orbit length; small lobe at tip, soft and flexible vertically due to very delicate rostral cartilage; anterior pectoral radials extending nearly to snout tip. Tooth rows in upper jaw 30–36. Upper disc with well-developed thorn pattern consisting of large orbital, nuchal, mid-shoulder and shoulder thorns; median row of 21–29 strong thorns from lumbar region to first dorsal fin; smaller thornlets and rough denticles scattered all over pectoral fins. Undersurface entirely smooth. Tail broad, tapering, about as long as precloacal length; 2 small rounded dorsal fins at rear of tail, separated with a thorn in interspace. Pelvic fin weakly notched, anterior lobe rather elongate; clasper robust. Pectoral-fin radials 76–82. Abdominal vertebrae 31–37, predorsal tail vertebrae 71–77.

COLOUR. Dorsal surface dark brown to greyish, and often with pair of circular pectoral ocelli (pale centre encircled by large dark ring); similar smaller and fainter ocelli all over pectoral and posterior pelvic fins. Underneath largely white, but often with dusky markings on posterior pectoral- and pelvic-fin margins, vent, and tail tip.



SIZE. Attains ~71 cm TL. Off Falkland Islands, males mature at ~50 cm TL, females ~46 cm TL. Egg cases 7–8 cm long.

HABITAT AND BIOLOGY. South-East Pacific and South-West Atlantic; Chile and Argentina. Demersal, inshore on continental shelf to upper slope at 50–515 m depths. Diet consists mainly of benthic polychaetes, and to a lesser extent small crustaceans.

SIMILAR SPECIES. The Magellan Skate (20.29) is largely smooth-skinned on the upper disc (apart from strong thorns on the mid-disc and in row along tail), and has a more complex marbled dorsal coloration.

WHITEBLOTCHED SKATE

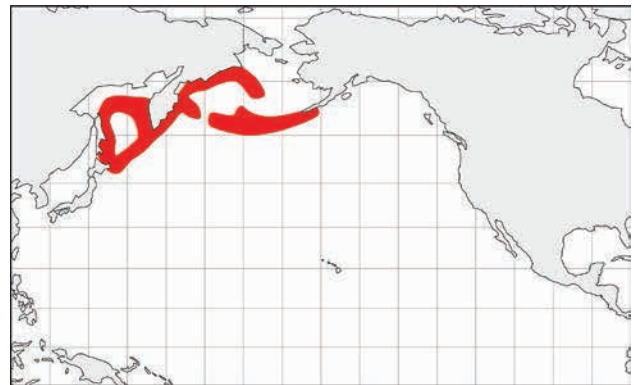
20.28

Bathyraja maculata Ishiyama & Ishihara, 1977

LC

IDENTIFICATION. Large skate with a rhombic disc, short and rather broad snout, denticles in well-defined band extending along mid-disc and onto tail, no scapular or orbital thorns, discontinuous median row of thorns, and white blotches of varying sizes on upper disc. Disc anterior margins undulate, apices narrowly rounded. Snout often with minute lobe at tip; soft and flexible vertically due to very delicate rostral cartilage; length 2.9–3.7 times orbit length; interorbital space 1.3–1.6 times orbit length; anterior pectoral radials extending to nearly snout tip. Mouth broad, nasal flaps narrowly lobed; tooth rows in upper jaw 22–34. Row of 2–5 nuchal thorns and median row of 18–26 tail thorns separated by a gap over belly; thorns large and arranged regularly. Upper surface of disc rough with denticles covering most of disc, absent from snout tip, mid-pectoral fins, and anterior lobes of pelvic fins; undersurface entirely smooth. Tail robust, almost rounded in cross-section, tapering to apex, slightly longer than preloacal length; lateral folds restricted to posterior tail; 2 dorsal fins at rear of tail barely separated; caudal fin developed only on upper surface of tail. Pelvic fin with moderate notch, anterior lobe short and broad; clasper rather broad, tip pointed. Predorsal vertebrae usually 101–104; abdominal vertebrae 31–35, predorsal tail vertebrae 67–75.

COLOUR. Upper surface dark greyish brown, densely mottled with pale blotches. Ventral surface whitish, usually



with dark blotches; tail and outer pectoral and pelvic fins usually dark; sensory pores not marked black.

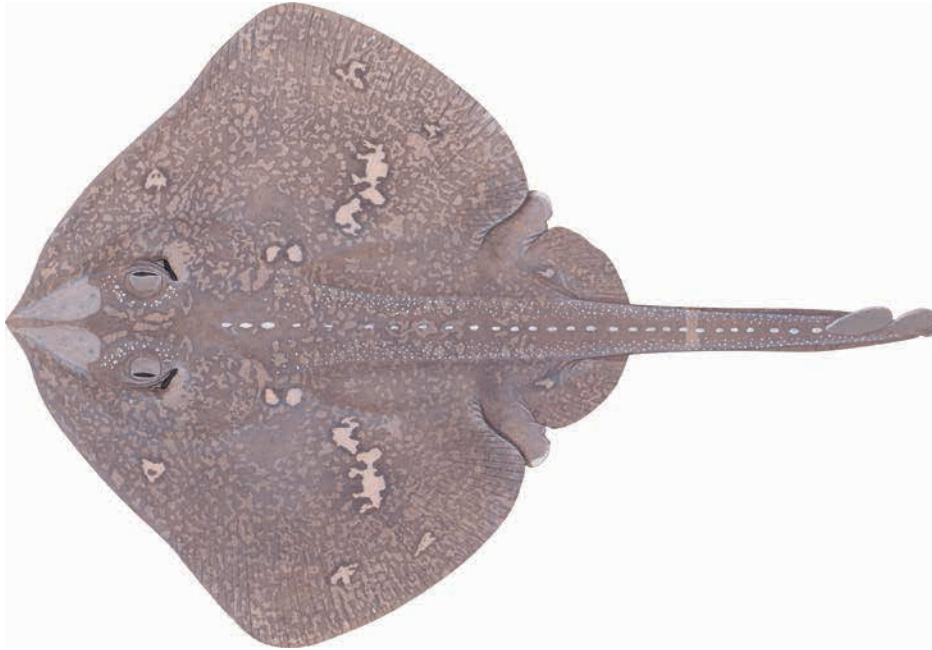
SIZE. Attains ~134 cm TL. Males mature at ~89–96 cm TL, females 94–101 cm TL; egg cases 10–11 cm long.

HABITAT AND BIOLOGY. North Pacific; Arctic rim, northern Japan to Alaska (USA). Demersal on continental and insular shelves and slopes at 75–1195 m depths. Common bycatch of regional trawl fisheries.

SIMILAR SPECIES. Resembles the Duskypurple Skate (20.31), but has a distinctive dorsal pattern of white blotches (rather than being uniformly brownish or bluish grey).

MAGELLAN SKATE

20.29

Bathyraja magellanica (Philippi, 1902)

DD

IDENTIFICATION. Medium-sized skate with a largely smooth, heart-shaped to rhombic disc, short snout, medium-size eyes, complete thorn pattern (orbital, shoulder, and median thorns extending from nuchal region onto tail), and marbled dorsal colour pattern. Disc anterior margins convex, apices broadly rounded. Snout soft and flexible vertically due to very delicate rostral cartilage; anterior pectoral radials extending nearly to its tip; length 2.5–3.5 times orbit length; interorbital space equal to or slightly larger than orbit length. Mouth rather broad, nasal flaps broadly lobed; tooth rows in upper jaw 28–32. Upper disc with complete thorn pattern, with large individual orbital, nape, mid-shoulder and shoulder thorns; also a median row of 26–32 strong thorns from behind shoulder girdle to first dorsal fin. Dorsal disc prickly in juveniles, becoming smooth over pectoral fins in adults; undersurface smooth. Tail broad based, robust, shorter than body length to cloaca; 2 small dorsal fins at extreme rear of tail, bases separated with a thorn in interspace. Pelvic fin weakly notched, posterior lobe enlarged; clasper robust. Pectoral-fin radials 79–90. Abdominal vertebrae 30–36, predorsal tail vertebrae 70–81.

COLOUR. Dorsal surface greyish to greyish brown with marbled pattern of small dark spots and larger pale blotches and streaks; often with large irregularly shaped pectoral markings (dark inner streaks surrounded by dark border); snout pale beside dark rostral cartilage. Undersurface mainly white; dark blotches and spots on tail tip, and along posterior disc and pelvic-fin margins.



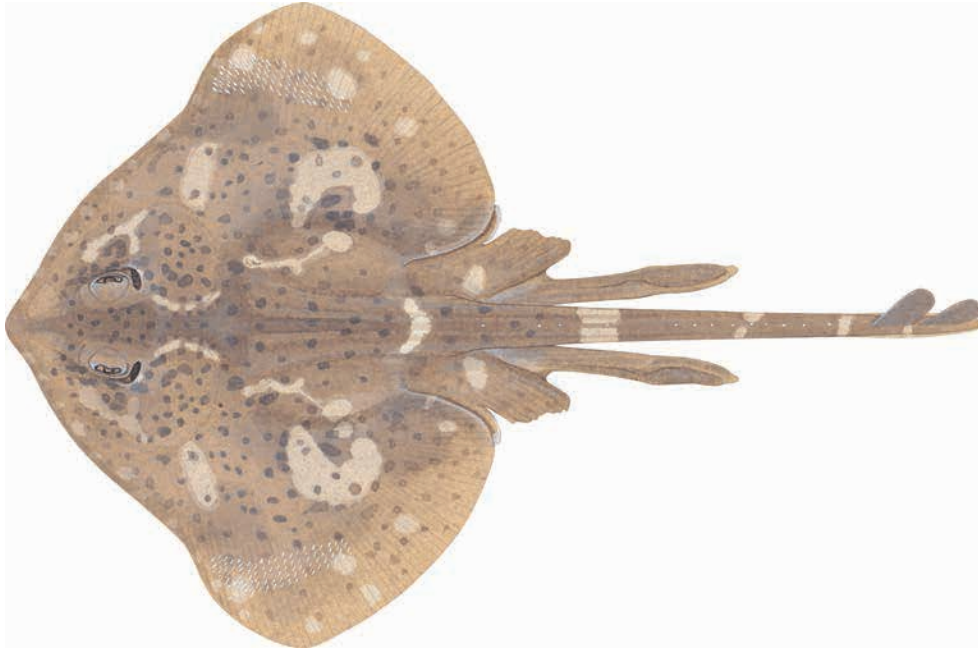
SIZE. Attains ~105 cm TL; matures at ~58 cm TL; smallest juvenile 14 cm TL.

HABITAT AND BIOLOGY. South-East Pacific (off Chile) and South-West Atlantic (Argentina and Falkland Islands). Demersal, on continental shelf from well inshore to 150 m depths, occasionally to 600 m. Diet consists mainly of small crustaceans, also polychaetes and small bony fishes.

SIMILAR SPECIES. Off southern South America, only the Patagonian Skate (20.27) also has a complete pattern of dorsal thorns, but the Magellan Skate's skin is more prickly and thorny and has a less strongly ornamented colour pattern.

PACIFIC BUTTERFLY SKATE

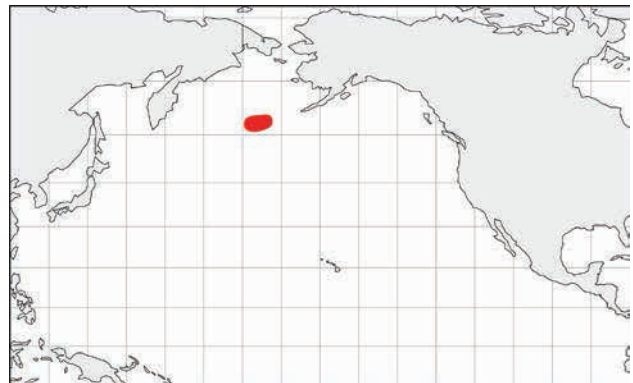
20.30

Bathyraja mariposa Stevenson, Orr, Hoff & McEachran, 2004

DD

IDENTIFICATION. Medium-sized skate with a broad, heart-shaped or rhombic disc densely covered with fine denticles, no thorns on disc, tail thorns weak or obsolete, irregular yellowish pectoral marking, and densely covered above with dark spots and yellowish blotches. Disc 1.2–1.3 times broader than long; anterior margins weakly undulate in females, more so in adult males; apices evenly rounded. Snout rather broad with a minute blunt tip; soft and flexible vertically due to very delicate rostral cartilage; length ~3.2–3.5 times orbit length; interorbital space usually slightly larger than orbit length; anterior pectoral radials extending to nearly snout tip. Mouth broad, nasal flaps lobed; tooth rows in upper jaw 21–31. Up to 15 greatly reduced thorns on mid-line of tail when present (often absent). Upper surface (including centres of pectoral fins) uniformly covered with granular denticles; undersurface uniformly smooth. Tail flattened, tapering to apex, slightly longer than precaudal length; lateral folds restricted to posterior half of tail; 2 small dorsal fins at rear of tail barely separated, procaudal length 11–14% TL; caudal-fin upper lobe well developed. Pelvic fin with a weak notch, anterior lobe short; clasper rather slender, tip narrowly rounded. Pectoral-fin radials 76–80. Predorsal vertebrae ~96–101; abdominal vertebrae 31–34, predorsal tail vertebrae 65–72.

COLOUR. Brownish to greenish brown with many dark brown to black spots and larger yellowish brown blotches over



upper disc and tail; pectoral markings present as large yellowish blotches, edges often indistinct. Ventral surface predominantly white; hind margins of pectoral and pelvic fins dusky; tail with a dark median stripe; sensory pores not visible.

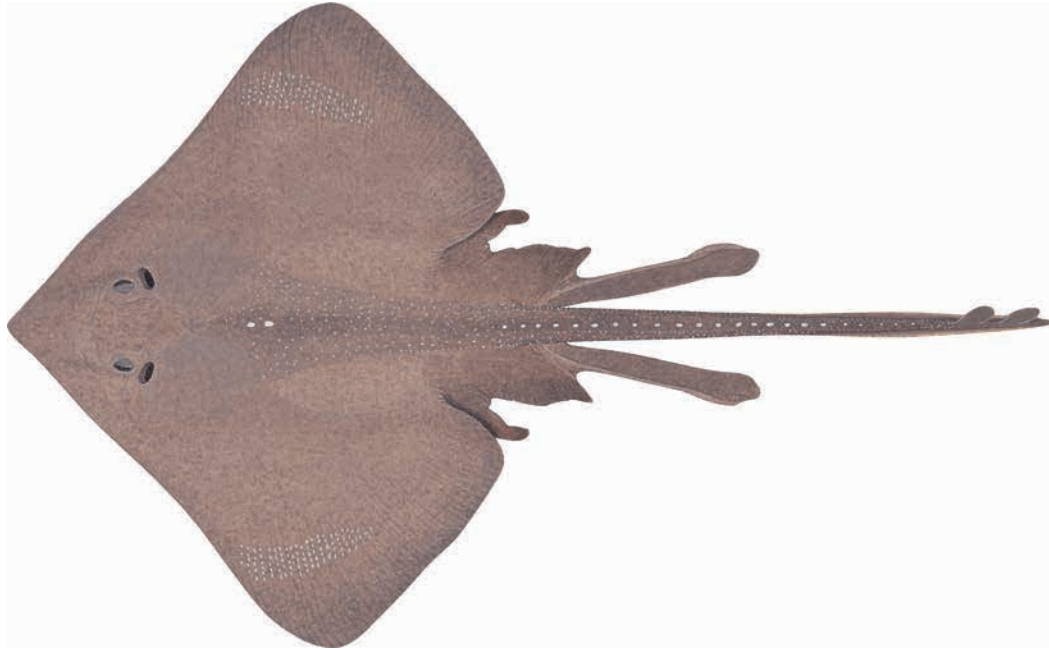
SIZE. Attains at least 76 cm TL. Males mature at ~70 cm TL, females probably larger.

HABITAT AND BIOLOGY. North Pacific; Bering Sea. Demersal on insular shelves and slopes at 90–455 m depths. Life history unknown.

SIMILAR SPECIES. Resembles the Okhotsk Skate (20.58), but has a rougher disc and more complex dorsal colour pattern.

DUSKYPURPLE SKATE

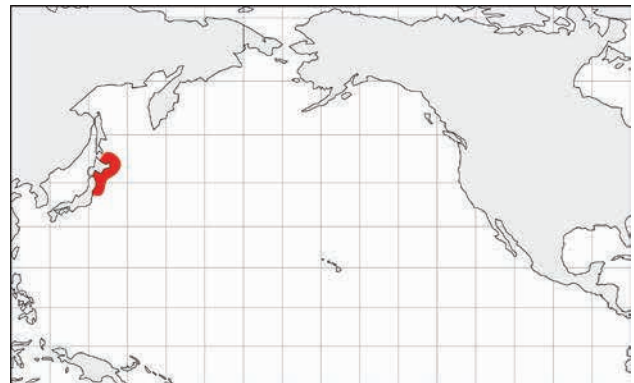
20.31

Bathyraja matsubarai (Ishiyama, 1952)

DD

IDENTIFICATION. Large skate with an oval to rhombic disc, short and rather broad snout, uniformly granular dorsal disc in young (largely naked in adults), 2–5 nuchal thorns indistinct in young (larger and well separated from median series in adults), small and widely separated eyes, and disc reddish brown to purplish above with dark undersurface. Disc anterior margins weakly undulate; apices broadly to narrowly rounded. Snout with small blunt tip; soft and flexible vertically due to very delicate rostral cartilage; length 3.2–3.8 times orbit length; interorbital space up to twice orbit length; anterior pectoral radials extending to nearly snout tip. Mouth very broad, nasal flaps broadly lobed; tooth rows in upper jaw 25–26. Thorns absent from snout, orbits and shoulders; 22–37 well-developed, regularly arranged thorns in median row on posterior disc and tail. Denticles in adult confined to snout, anterior margins of disc, and in narrow band along mid-disc and tail; undersurface entirely smooth. Tail slender, almost rounded in cross-section, tapering to apex, longer than disc length; lateral folds restricted to posterior half of tail; 2 small dorsal fins at rear of tail, barely separated; caudal fin short. Pelvic fin with moderate notch, anterior lobe short and broad; clasper broad, tip rounded. Pectoral-fin radials 75–77. Predorsal vertebrae 101–107; abdominal vertebrae 30–36, predorsal tail vertebrae 71–77.

COLOUR. Upper surface reddish brown to dark purplish, noticeably darker along mid-disc and tail. Ventral surface of



disc uniformly dark, greyish; usually white on mouth and cloaca; sensory pores not marked black.

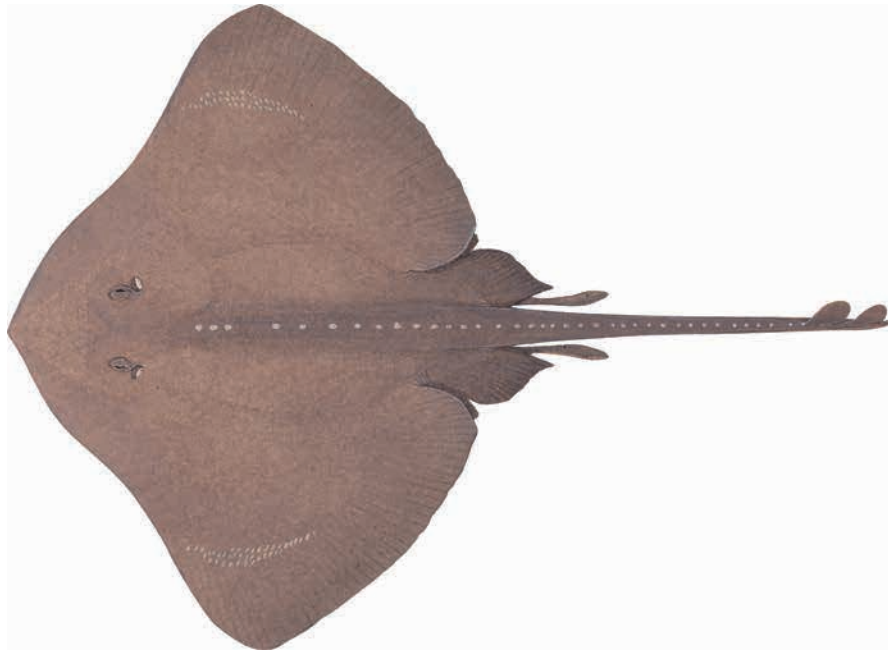
SIZE. Attains ~126 cm TL. Males mature at 82–108 cm TL, females slightly larger; egg cases 9–11 cm long.

HABITAT AND BIOLOGY. North-West Pacific; off eastern Japan, but possibly more wide-ranging. Demersal on insular slopes at ~120–2000 m depths, mainly 550–1300 m. Bycatch of trawl fishery for halibut and rockfishes.

SIMILAR SPECIES. Belongs to a small group of North Pacific skates with a wide interorbital space, and ventral disc smooth and dark. The Whiteblotched Skate (20.28) is similar but is richly covered with white markings (rather than being plain).

DARKBELLY SKATE

20.32

Bathyraja meridionalis Stehmann, 1987

DD

IDENTIFICATION. Large, heavy-bodied skate with a rhombic disc, short snout (slightly longer than half head length), upper disc and tail very spiny, no thorns on head, almost continuous median row from nape to dorsal fins, and both upper and lower surfaces dark. Disc anterior margins undulate, concave in adult males; apices narrowly rounded to bluntly angular. Snout broad with a small bluntly pointed tip; soft and flexible vertically due to very delicate rostral cartilage; length 2.5–4 times orbit length, interorbital space 1.2–1.3 times orbit length; anterior pectoral radials extending to nearly snout tip. Mouth very narrow, nasal flaps broadly lobed; tooth rows in upper jaw 26–32. Snout, orbital and shoulder thorns absent; 1–3 nuchal, 1 mid-scapular, and thorns in median row on posterior disc (5–10) and tail (19–36). Upper disc loosely covered with rough dermal denticles, much more densely set on back of trunk and sides of tail; undersurface entirely smooth (except anterior edges of tail). Tail depressed, tapering evenly to apex, slightly longer than disc; lateral folds extending almost full length of tail; 2 small dorsal fins at rear of tail separated slightly; caudal fin rudimentary. Pelvic fin moderately notched, anterior lobe short. Pectoral-fin radials 90–97. Abdominal vertebrae ~36 (possibly 32–41), predorsal tail vertebrae 78–84.

COLOUR. Plain brown to blackish brown above, thorns milky white; adults often paler than young. Ventrally, dark brown (somewhat paler in adults); oronasal region, gill slits, and tips of anterior pelvic-fin lobes usually whitish.



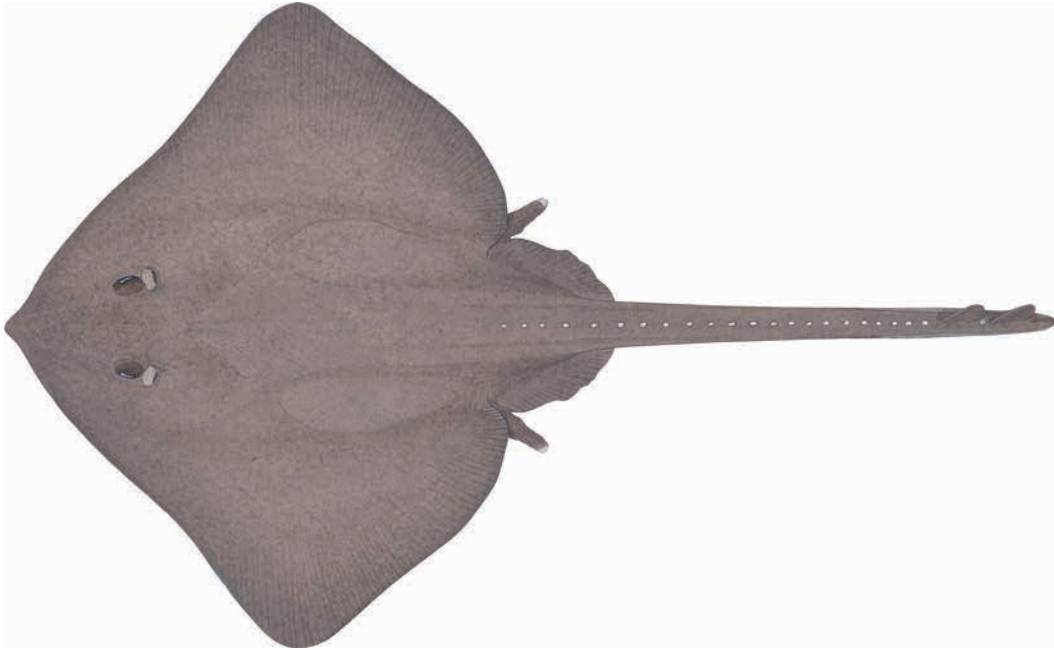
SIZE. Attains ~150 cm TL. Males mature at 132–142 cm TL, females ~140 cm TL.

HABITAT AND BIOLOGY. South-East Pacific and South-West Atlantic; patchy, off southern Chile to Argentina, including South Georgia (probably more widespread in sub-Antarctic). Demersal on continental and insular slopes at ~65–2240 m depths. Adults probably feed on small bony fishes. Regular bycatch when longlining for Patagonian Toothfish at Falkland Islands.

SIMILAR SPECIES. The Multispine (20.35) and Atlantic Butterfly (20.41) Skates are both paler ventrally (never totally dark).

FINESPINE SKATE

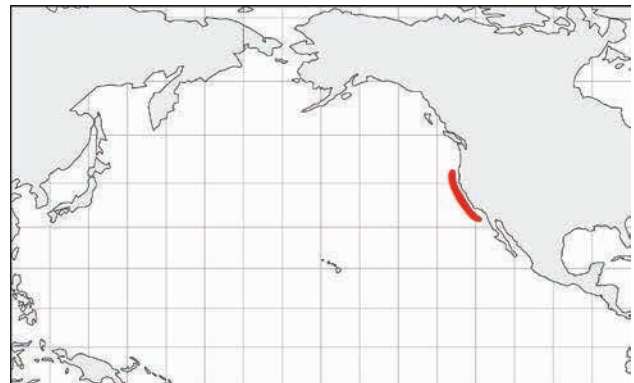
20.33

Bathyraja microtrachys (Osburn & Nichols, 1916)

LC

IDENTIFICATION. Medium-sized skate with an angular rhombic disc, broad snout, skin densely covered with fine prickly denticles, no nuchal or shoulder thorns, no orbital thorns, tail slightly shorter than disc width, brownish above, and undersurface of disc white centrally with broad greyish brown margin. Disc 1.1–1.2 times wider than long; anterior margins almost straight, apices rather broadly rounded. Snout with a blunt fleshy tip, not extended; soft and flexible vertically due to very delicate rostral cartilage; length 3.3–3.8 times orbit length; interorbital space 1.2–1.7 times orbit length; anterior pectoral radials extending to nearly snout tip. Mouth and nasal flaps broad; tooth rows in upper jaw 29–32. Thorns absent from disc; single row of 22–23 evenly spaced, median thorns along predorsal tail, thorns short and conical with broad bases. Upper disc and tail uniformly covered with denticles; undersurface smooth. Tail thickened, slightly depressed, tapering to apex, slightly longer than precloacal length; lateral folds well developed; 2 low dorsal fins at rear of tail usually separated slightly with small interdorsal thorn, procaudal length subequal to snout length; caudal fin low. Pelvic fin deeply notched, anterior lobe shorter than posterior lobe, adult clasper unknown. Predorsal tail vertebrae 69–70.

COLOUR. Dorsal surface uniformly medium brown. Ventral surface white around mouth, central disc and bases of anterior pelvic-fin lobes; tail and outer margin of disc



greyish brown (width of dark band exceeding snout length across pectoral fins); sensory pores not marked black.

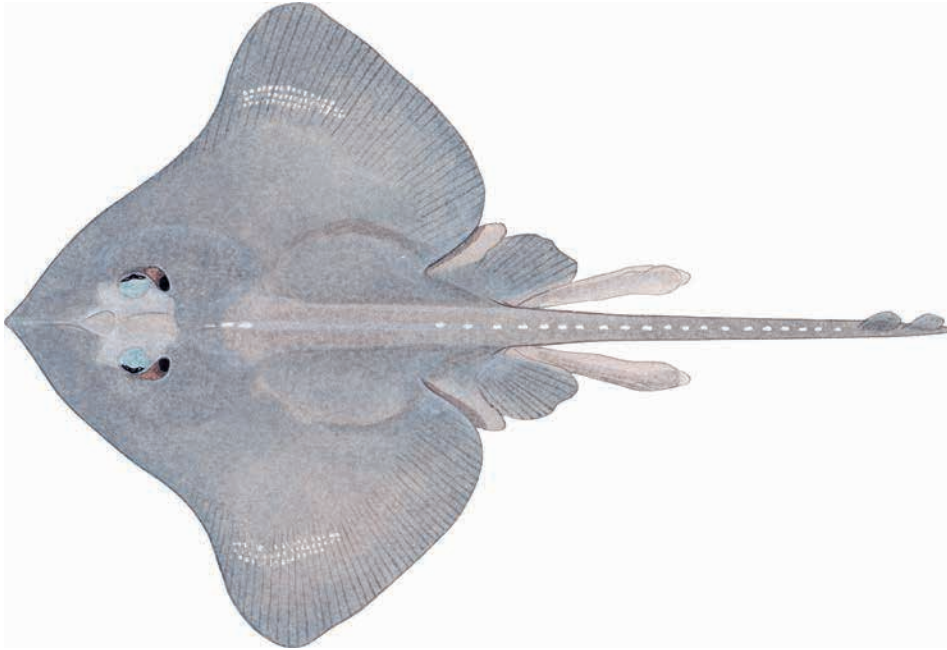
SIZE. Attains at least 70 cm TL. Females mature from ~60 cm TL; young hatch at ~17 cm TL.

HABITAT AND BIOLOGY. North-East Pacific; Washington State to southern California (USA). Demersal and common on lower continental slopes and abyssal plains at 1995–3100 m depths.

SIMILAR SPECIES. Once considered to be identical with the Roughtail Skate (20.55), but a distinctive white ventral band from the snout to the pelvic fins in the Finespine Skate is unique within skates of the North Pacific.

SMALLTHORN SKATE

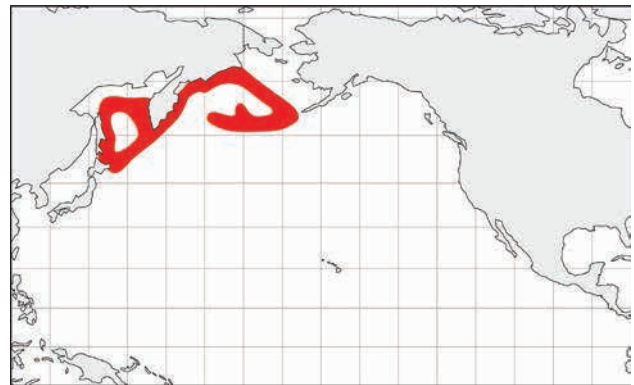
20.34

Bathyraja minispinosa Ishiyama & Ishihara, 1977

LC

IDENTIFICATION. Medium-sized skate with a heart-shaped or rhombic disc, denticles widespread over upper disc in young (smooth patches in adults), no scapular or orbital thorns, median thorn row discontinuous, both surfaces darkish anteriorly, and white mask-like marking on orbital region. Disc anterior margins most undulate in adult males, apices narrowly rounded. Snout soft and flexible vertically due to very delicate rostral cartilage; length 3.5–4.7 times orbit length; interorbital space 1–1.3 times orbit length; anterior pectoral radials extending to nearly snout tip. Mouth broad, nasal flaps distinctly lobed; tooth rows in upper jaw 28–34. Row of 1–4 nuchal thorns and median row of 19–26 tail thorns discontinuous over belly; thorns large, scute-like and evenly spaced. Fine denticles cover most of disc in young; absent from mid-pectoral fins in adult males; undersurface entirely smooth, apart from snout tip. Tail rather robust, rounded in cross-section, tapering to apex, 1.1–1.2 times longer than precloacal length; lateral folds confined to posterior tail; 2 tall dorsal fins, barely separated; caudal fin rudimentary. Pelvic fin with moderate notch, anterior lobe short and broad; clasper rather broad. Pectoral-fin radials ~75. Predorsal vertebrae usually 101–103; abdominal vertebrae 29–34, predorsal tail vertebrae 65–76.

COLOUR. Upper surface dark brown to bluish with prominent white marking around eyes and spiracles. Ventral surface brownish anteriorly; chin, tail and posterior disc



including outer margins of pectoral fins usually white or pale grey; sensory pores not marked black.

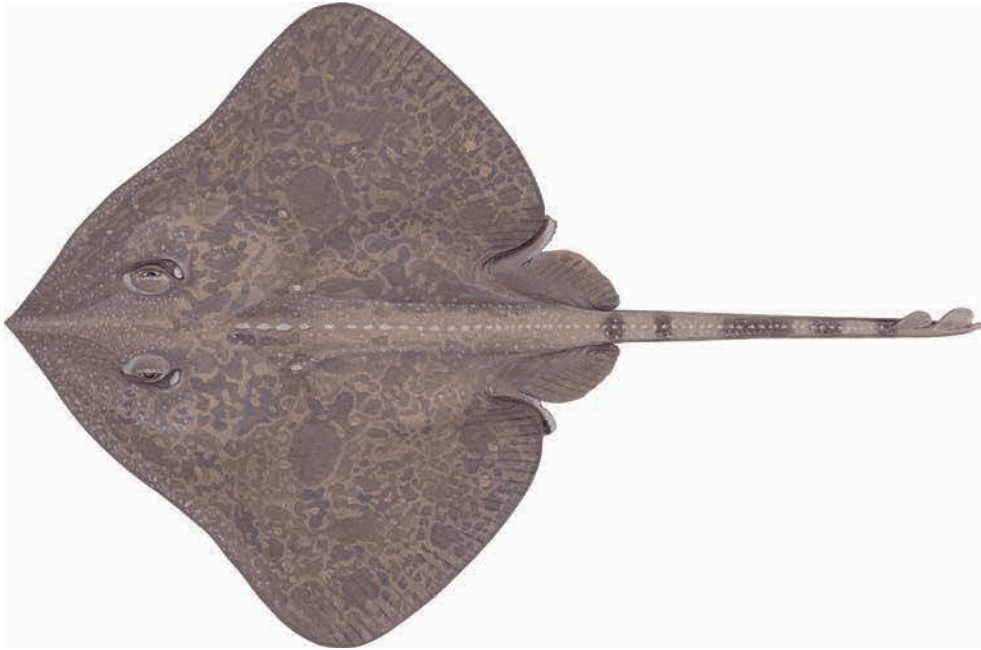
SIZE. Attains ~90 cm TL. Males mature from 64–67 cm TL, females 64–69 cm TL; egg cases 7–8 cm long.

HABITAT AND BIOLOGY. North Pacific; Arctic rim, northern Japan to Alaska (USA). Demersal on sandy or gravelly bottoms of continental and insular shelves and slopes at 150–1420 m depths, mainly in 300–750 m. Feeds on bony fishes, crabs and cephalopods.

SIMILAR SPECIES. A distinctive white marking in the Smallthorn Skate, resembling a mask around the eyes, is unique within the genus.

MULTISPINE SKATE

20.35

Bathyraja multispinis (Norman, 1937)

NT

IDENTIFICATION. Large skate with a broad rhombic disc, rather short snout, small eyes, shoulder thorn, no orbital or rostral thorns, many thorns in median row (exceeding 35) from nape to dorsal fins, and reticulate pattern on dorsal surface. Disc anterior margins undulate, apices narrowly rounded. Snout bluntly angled with small tip, soft and flexible vertically due to very delicate rostral cartilage; anterior pectoral radials extending nearly to snout tip; length ~3.5 times orbit length; interorbital space more than 1.5 times orbit length. Mouth rather broad, nasal flaps broadly lobed; tooth rows in upper jaw 33–34. Upper disc with single shoulder thorn; median row of 36–45 strong thorns from nape to first dorsal fin, 15–17 before tail. Skin largely smooth; scattered denticles on head, anterior and posterior disc margins, and flanking median thorn row on trunk; sides of tail densely prickly; undersurface entirely smooth. Tail broad based, robust, subequal to preloacal length; 2 small dorsal fins at rear of tail narrowly separated, a small thorn in interspace. Pelvic fin weakly notched, posterior lobe large; clasper long, slender. Pectoral-fin radials 92–95. Abdominal vertebrae 35–40, predorsal tail vertebrae 71–86.

COLOUR. Dorsal surface greyish brown, with reticulate pattern of light and dark spots and lines; disc with large dark pectoral ocellus and usually many smaller markings (pale circular spots with dark margins and similar dark markings with pale margins). Undersurface white, often



with dusky markings along posterior disc margins and pelvic fins, at cloaca, and over tail.

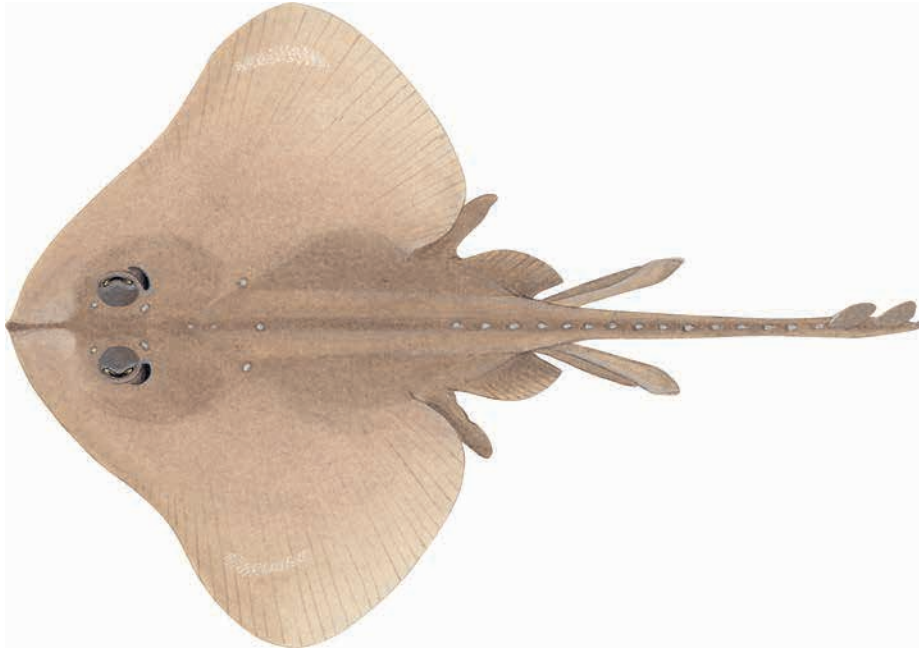
SIZE. Attains ~126 cm TL; matures at ~97 cm TL.

HABITAT AND BIOLOGY. South-East Pacific and South-West Atlantic; from southern Chile to Brazil, including Falkland Islands. Demersal on continental and insular shelves and slopes at 70–740 m depths. Feeds largely on crustaceans and fishes.

SIMILAR SPECIES. The Darkbelly (20.32) and Atlantic Butterfly (20.41) Skates, which lack shoulder thorns and a reticulate colour pattern (both plain coloured), are much darker on the ventral surface than the Multispine Skate.

MURRAY'S SKATE

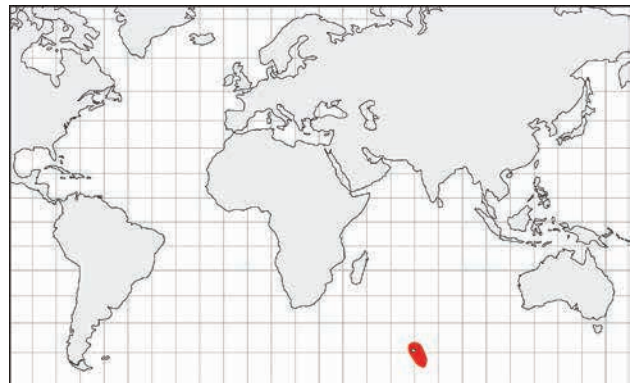
20.36

Bathyraja murrayi (Günther, 1880)

NT

IDENTIFICATION. Medium-sized skate with a broad rhombic disc, rather short snout, large eyes, shoulder and nuchal thorns, usually 2 orbital thorns, median thorns discontinuous between nuchal region and tail, and subtle spotted dorsal coloration. Disc anterior margins undulate, without a deep concavity; apices rather narrowly rounded; snout bluntly angled with small apical tip, soft and flexible vertically due to very delicate rostral cartilage; anterior pectoral radials extending nearly to snout tip; length ~2.2 times orbit length; interorbital space subequal to orbit length. Mouth rather narrow, nasal flaps broadly lobed. Upper disc usually with a single shoulder thorn, 2–4 nuchal thorns; median row of up to 26 thorns on tail (often lost with age), fewer in adults than young. Coarse star-shaped dermal denticles scattered over dorsal disc in young and females, surface largely smooth on pelvic fins and over central half of disc in adult males; undersurface entirely smooth. Tail moderately robust, subequal to preloacal length in adults but longer in juveniles; 2 small dorsal fins at rear of tail, barely separated; lateral folds extending along entire tail. Pelvic fin weakly notched, posterior lobe large; clasper long and slender.

COLOUR. Dorsal surface variable, plain brownish or with diffuse light and dark spots and/or reticulations; adults usually with a large, prominent yellowish ocellus on each side in adults. Undersurface usually entirely white, but



sometimes disc with dusky edges and blotches, and a dark tail.

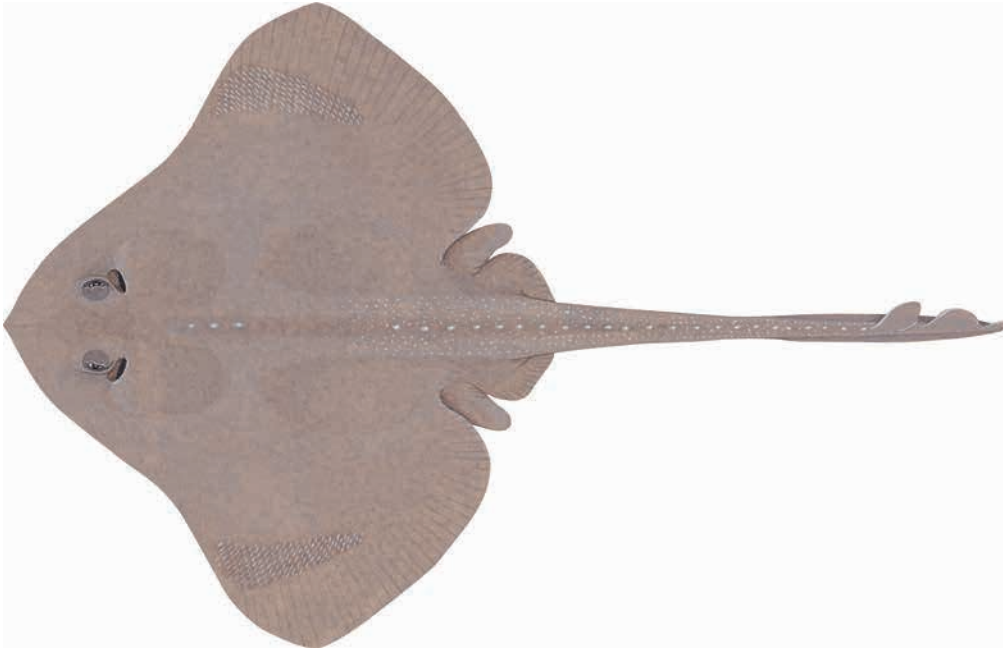
SIZE. Attains ~60 cm TL; matures at ~45 cm TL.

HABITAT AND BIOLOGY. Southern Ocean; off Kerguelen and Heard Islands. Demersal on insular shelves and slopes at 20–800 m depths. Little known, but caught as bycatch of trawl fishery for Antarctic toothfish and icefishes.

SIMILAR SPECIES. Distinctive skate and common at Kerguelen and Heard Islands; appears to belong to a species complex. Differs from Eaton's Skate (20.14) and McCain's Skate (20.26) in having a much rougher upper disc, covered with coarse spinules and thornlets.

NOTORO SKATE

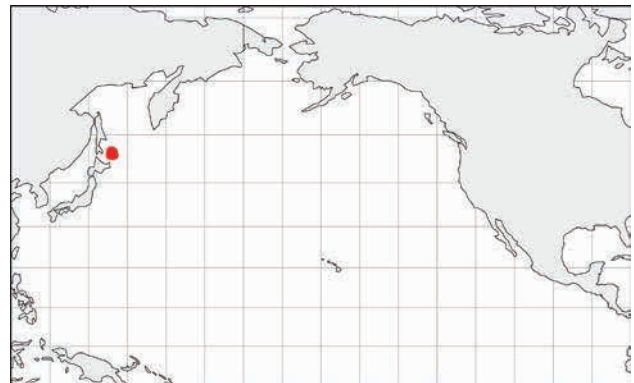
20.37

Bathyraja notoroensis Ishiyama & Ishihara, 1977

NE

IDENTIFICATION. Large skate with a broad rhombic disc, short and rather broad snout, granular dorsal disc with mid-pectoral fins naked, 2–5 large nuchal thorns well separated from lumbar series in adults, small and widely separated eyes, and disc greyish brown above with dark undersurface. Disc anterior margins weakly undulate; apices narrowly rounded. Snout with small blunt tip; soft and flexible vertically due to very delicate rostral cartilage; length 3.2–3.8 times orbit length; interorbital space almost twice orbit length; anterior pectoral radials extending to nearly snout tip. Mouth very broad, nasal flaps broadly lobed; tooth rows in upper jaw 18–30. Thorns absent from snout, orbit and shoulder; 24–30 well-developed, regularly arranged thorns in median row on posterior disc and tail. Denticles in adults covering disc, but absent on snout tip, anterior pelvic-fin lobes and mid-pectoral fins; well-defined narrow band extending along mid-disc and tail; undersurface entirely smooth. Tail slender, almost rounded in cross-section, tapering to apex, longer than disc length; lateral folds restricted to posterior half of tail; 2 small dorsal fins at rear of tail, barely separated; caudal fin short. Pelvic fin with moderate notch, anterior lobe short and broad; clasper short and broad, tip rounded. Predorsal vertebrae 110; abdominal vertebrae 38.

COLOUR. Upper surface uniformly greyish brown. Ventral surface of disc dark, greyish but paler than upper surface;



chin, cloaca and tip of anterior pelvic-fin lobes white; sensory pores whitish.

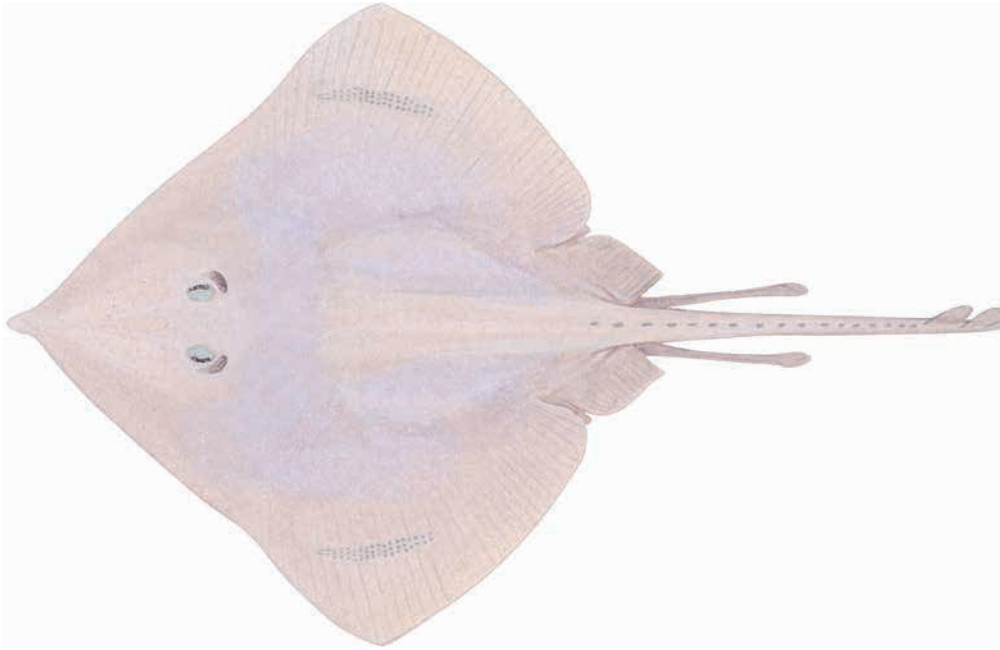
SIZE. Attains ~104 cm TL. Males and females mature at ~55 cm TL.

HABITAT AND BIOLOGY. North-West Pacific; off northern Japan. Demersal, known from insular slopes at ~600 m depths. Poorly known.

SIMILAR SPECIES. Very similar to the Duskypurple Skate (20.31), which has a more reddish brown disc (rather than greyish brown) and a longer clasper. The Notoro Skate's validity needs to be confirmed as it is most likely a synonym of that species.

PACIFIC BLONDE SKATE

20.38

Bathyraja pacifica Last, Stewart & Séret, 2016

NE

IDENTIFICATION. Large skate with a smooth and extremely flattened, angular rhombic disc, broadly triangular snout, eyes narrowly separated, mouth small, no denticles or thorns (apart from median row on tail and alar patch in adult males), and coloration uniformly white above and below. Disc anterior margins straight, then weakly concave behind orbit; apices narrowly rounded. Snout pointed, small fleshy lobe at tip; soft and flexible vertically due to very delicate rostral cartilage; length ~ 7.1 times orbit length, interorbital space ~ 1.8 times orbit length; anterior pectoral radials extending nearly to snout tip. Mouth much narrower than its distance from disc margin, nasal flaps strongly lobed; tooth rows in upper jaw ~ 29 . Disc lacking thorns, alar patch well developed; ~ 16 large, regularly spaced thorns in median row on tail before dorsal fins, no interdorsal thorns. Upper surface almost entirely smooth, lacking noticeable denticles; undersurface entirely naked. Tail rather short, ~ 0.8 times precloacal length, slender, tapering to apex, fleshy; lateral folds well developed (particularly so at rear); dorsal fins small, rounded, bases joined; located near tip of tail, precaudal length $\sim 9\%$ TL; caudal-fin upper lobe rudimentary. Pelvic fins small, notched, anterior lobe very short in adult male; clasper very long and expanded distally. Pectoral-fin radials ~ 84 . Predorsal vertebrae ~ 105 ; abdominal vertebrae ~ 34 , predorsal tail vertebrae ~ 71 .

COLOUR. Upper surface uniformly white (becoming pinkish after capture). Ventral surface also entirely white; sensory pores not marked black.



SIZE. Known from a single adult male, 122 cm TL.

HABITAT AND BIOLOGY. South-West Pacific; west Norfolk Ridge, off New Zealand, and possibly further south. Demersal on deep insular slopes at ~ 1760 – 1790 m depths. Life history unknown.

SIMILAR SPECIES. Occurs in northern part of the South-West Pacific with the similarly shaped Domino Skate (20.23). Both species have a pale dorsal surface, but the Domino Skate is uniformly black ventrally (rather than white).

PALLID SKATE

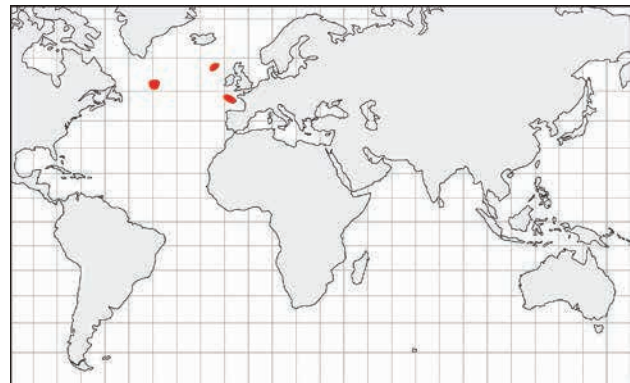
20.39

Bathyraja pallida (Forster, 1967)

LC

IDENTIFICATION. Very large skate with a thickened rhombic disc, broadly elongate snout, skin of upper disc largely smooth and entirely lacking thorns, tail much shorter than disc in adults, and disc uniformly pale dorsally and darker brown underneath. Disc with very thick trunk; margin undulate anteriorly, more concave in adult males; apices bluntly angular. Snout pointed, soft and flexible vertically due to very delicate rostral cartilage; length ~4–6 times orbit length and about half head length, interorbital space 1.5–2.5 times orbit length; anterior pectoral radials extending to nearly snout tip. Mouth broad, nasal flaps broadly lobed; tooth rows in upper jaw 24–31. No thorns on central disc or near orbit; 16–21 blunt thorns in median row on tail before dorsal fins, interdorsal thorn usually present. Upper surface largely smooth, denticles confined to a narrow patch on central anterior margins of disc, and covering most of dorsal tail; undersurface entirely smooth, apart from a few loosely scattered denticles on tail. Tail broad based but tapering quickly to apex, firm, almost rounded in cross-section; lateral folds weak; 2 small dorsal fins at rear of tail separated slightly; caudal fin short in adults, longer in young. Pelvic fin weakly notched, anterior lobe very short; clasper very long and slender.

COLOUR. Upper surface plain pale greyish or white. Ventral surface brownish, often with white blotches along its mid-line; sensory pores not marked black.



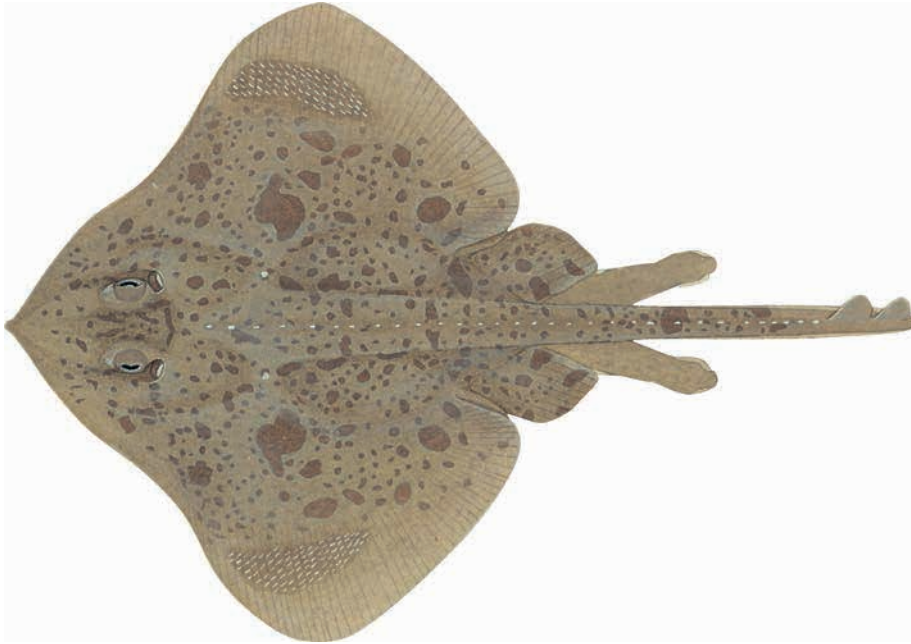
SIZE. Attains at least 162 cm TL. Males exceeding 144 cm TL were mature; egg cases ~30 cm long.

HABITAT AND BIOLOGY. North Atlantic; mid-Atlantic Ridge to France, patchy. Probably benthic from lower continental and insular slopes to abyss at 1870–3280 m depths and beyond. Adults feed mainly on squids and small bony fishes, juveniles on crustaceans and polychaetes.

SIMILAR SPECIES. The Spinytail Skate (20.51) occurs further north in the Atlantic Ocean and differs from the Pallid Skate in having a rougher dorsal disc surface, more tail thorns, and a paler undersurface. Disc shape also resembles the more widely distributed Richardson's Skate (20.44).

PANTHER SKATE

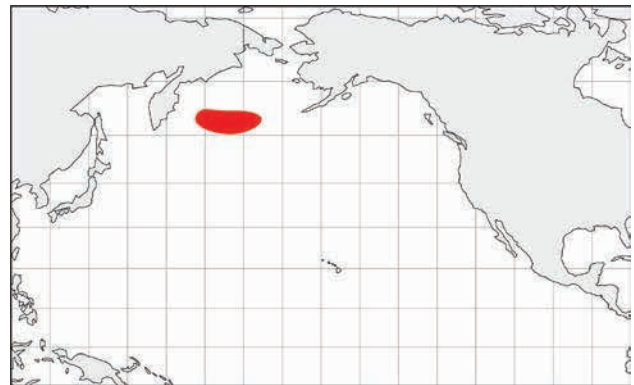
20.40

Bathyraja panthera Orr, Stevenson, Hoff, Spies & McEachran, 2011

LC

IDENTIFICATION. Large, heavy-bodied skate with broad rhombic disc, short snout, 1–2 shoulder thorns, continuous row of median thorns from nape onto tail, denticle band on mid-disc obvious and continuing along sides of tail, lateral folds originating near tail base, and variably vermiculated with black spots and yellowish blotches. Disc 1.2–1.3 times wider than long; anterior margins undulate in females and young, more so in adult males; apices rather broadly rounded. Snout with minute lobe at tip; soft and flexible vertically due to very delicate rostral cartilage; length 2.2–4.9 times orbit length; interorbital space 0.6–1.3 times orbit length; anterior pectoral radials extending to nearly snout tip. Mouth rather small, nasal flaps broadly lobed; tooth rows in upper jaw 24–31. Thorns on upper disc well developed; 31–42 in median row from nuchal region to first dorsal fin. Dorsal denticles confined mainly to orbital region, anterior disc margins and longitudinal band on mid-disc; tail covered with small prickles laterally, but skin smooth beside tail thorns; undersurface uniformly smooth. Tail moderately elongate, flattened, tapering to apex; small dorsal fins, procaudal length 9–15% TL; caudal-fin upper lobe rather well developed. Pelvic fin with moderate notch, anterior lobe moderately elongate; clasper robust. Pectoral-fin radials 82–90. Predorsal vertebrae 118–129; abdominal vertebrae 35–40, predorsal tail vertebrae 81–94.

COLOUR. Upper surface yellowish to greenish brown, variably vermiculated and pectoral markings not well-



defined; males pale with dark markings, females darker with yellowish spots, streaks and blotches. Ventral surface white, dusky patches often around cloaca and along tail mid-line; sensory pores not marked black.

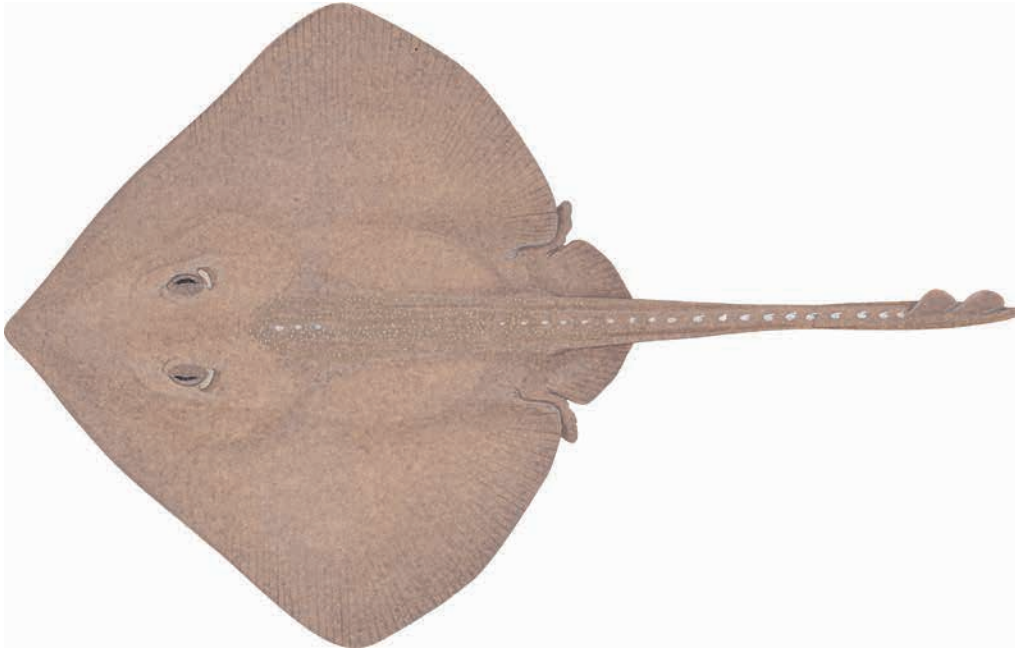
SIZE. Attains ~139 cm TL; egg cases 11–13 cm long.

HABITAT AND BIOLOGY. North Pacific; Bering Sea, off western Aleutian Islands and Petrel Bank (Alaska). Demersal on insular shelves and upper slopes at 50–260 m depths, possibly deeper to 395 m.

SIMILAR SPECIES. Belongs to a small group of similar northern Pacific deepwater skates that includes the Alaska (20.42), Hokkaido (20.48) and Golden (20.49) Skates.

ATLANTIC BUTTERFLY SKATE

20.41

Bathyraja papilionifera Stehmann, 1985

DD

IDENTIFICATION. Large, heavy-bodied skate with an angular rhombic disc, moderately elongate snout, single discontinuous row of median thorns from nape to tail (but no other thorns), and plain brownish above and sometimes white-spotted. Disc ~1.1 times length; anterior margins almost straight, apices narrowly rounded to abruptly angular. Snout bluntly angled with short and broad lobe at tip; soft and flexible vertically due to very delicate rostral cartilage; anterior pectoral radials extending nearly to tip; length 3.5–4.5 times orbit length; interorbital space 1–1.2 times orbit length. Mouth rather narrow; tooth rows in upper jaw 28–38. Thorn present on each shoulder of small juveniles, otherwise with only 3–4 large median thorns on nape and mid-shoulder of disc; median row of 20–22 strong and evenly spaced thorns on tail before first dorsal fin. Skin of upper surface with coarse dermal denticles on head, along disc margins, on back of trunk and sides of tail; undersurface smooth. Tail firm, length subequal to precloacal length; 2 small dorsal fins near rear of tail, narrowly separated, usually with thorn in interspace, procaudal length shorter than 3/4 snout length. Pelvic fin moderately notched, anterior lobe large. Pectoral-fin radials 88–89. Abdominal vertebrae 31–39, predorsal tail vertebrae 71–79.

COLOUR. Upper surface plain brownish or with small faint pale spots on disc when half-grown. Ventrally, whitish centrally; outer corners and posterior margins of disc, and



pelvic-fin margins, broadly dark-edged; tail dark with white tip; young with large butterfly-shaped blotch near cloaca.

SIZE. Attains ~150 cm TL. Males and females mature at ~130 and ~122 cm TL respectively.

HABITAT AND BIOLOGY. South-West Atlantic; Uruguay to southern Argentina, including Falkland Islands (possibly also southern Chile). Demersal on upper and mid-continental and insular slopes at 635–1615 m depths. Bycatch of toothfish fishery.

SIMILAR SPECIES. The Multispine Skate (20.35) has a more uniformly pale undersurface, and the Darkbelly Skate (20.32) is darker ventrally and has a continuous median thorn row extending from the nape to the first dorsal fin.

ALASKA SKATE

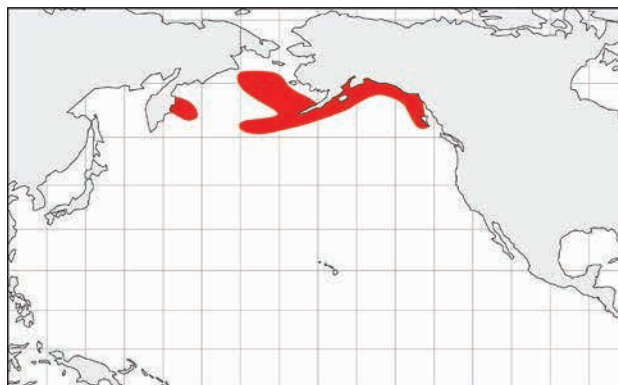
20.42

Bathyraja parmifera (Bean, 1881)

LC

IDENTIFICATION. Large, heavy-bodied skate with a broad rhombic disc, short snout, 1–3 well-developed shoulder thorns, median thorn row usually discontinuous, denticle band on mid-disc wide and extending along sides of tail, lateral folds originating near tail base, and uniformly brown dorsally. Disc 1.1–1.3 times wider than long; anterior margins distinctly undulate in both females and adult males; apices rather narrowly rounded. Snout with minute lobe at tip; soft and flexible vertically due to very delicate rostral cartilage; length 2.8–5.9 times orbit length; interorbital space 0.6–1.1 times orbit length; anterior pectoral radials extending to nearly snout tip. Mouth rather small, nasal flaps broadly lobed; tooth rows in upper jaw 22–33. Median thorns prominent, 19–36 from nape to first dorsal fin. Dorsal denticles large, widely spaced, confined mainly to orbital region, anterior pectoral-fin margins and median band; sides of tail covered with similar prickles but skin smooth beside tail thorns; undersurface uniformly smooth. Tail length 0.8–1.2 times precloacal length; flattened slightly, tapering to apex; small upright dorsal fins, precaudal length 9–14% TL; caudal fin small. Pelvic fin moderately notched, anterior lobe moderately elongate; clasper rather robust. Pectoral-fin radials 81–89. Predorsal vertebrae 118–128; abdominal vertebrae 32–40, predorsal tail vertebrae 82–89.

COLOUR. Upper surface almost uniformly dark brown, often with vague blackish spots and yellow-blotched



pectoral marking. Ventral surface white, usually with dusky patches around mouth, gill slits, cloaca and on tail; sensory pores not marked black.

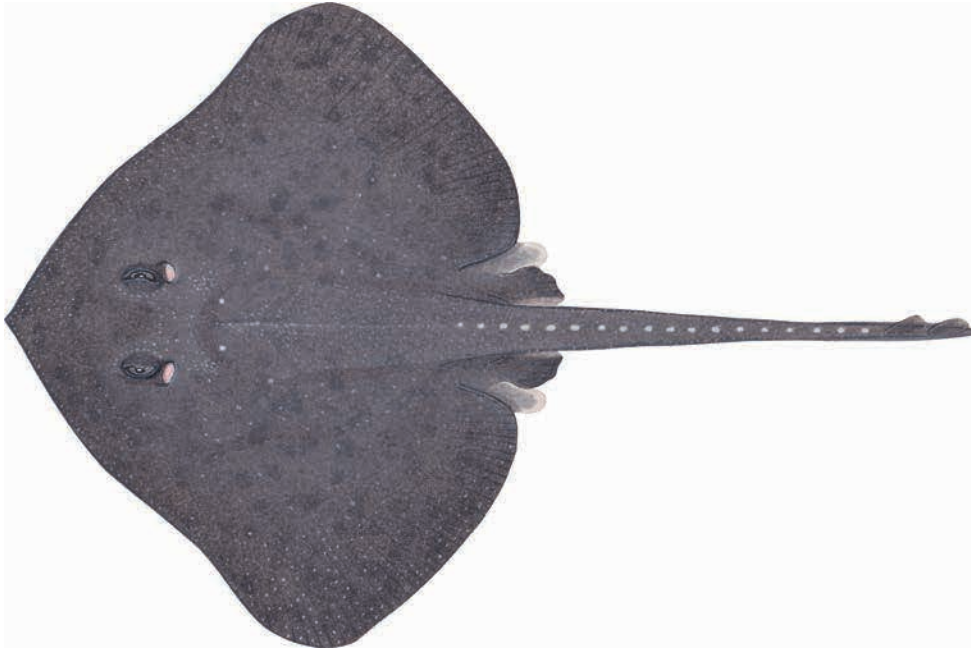
SIZE. Attains at least 115 cm TL, but reported to 135 cm TL. Matures at 80–95 cm TL; egg cases 11–15 cm long.

HABITAT AND BIOLOGY. North Pacific; Arctic rim, Bering Sea to Alaska (USA). Demersal, mainly on insular and continental shelves and slopes at 15–400 m depths. Most common skate in eastern Bering Sea.

SIMILAR SPECIES. The very similar Hokkaido Skate (20.48) and the Alaska Skate may be two forms of the same species. The Hokkaido Skate appears to have less widely separated dorsal fins, and more thorns and vertebrae.

PERUVIAN SKATE

20.43

Bathyraja peruana McEachran & Miyake, 1984

DD

IDENTIFICATION. Large, heavy-bodied skate with a broad rhombic disc, moderately short snout, small eyes, thorns absent from disc (apart from alar thorns of adult male), and plain dark brown or greyish above and below. Disc 1.2–1.3 times length; anterior margins straight or weakly undulate, apices narrowly or abruptly rounded. Snout broad, bluntly angled, small lobe at tip, soft and flexible vertically due to very delicate rostral cartilage; anterior pectoral radials extending nearly to tip; length ~2.6–2.7 times orbit length; interorbital space subequal to orbit length. Mouth rather narrow; tooth rows in upper jaw 33–36. No thorns on upper disc; confined to median row on tail; 18–26 evenly spaced thorns before first dorsal fin. Skin of upper disc and tail covered with fine denticles; more densely set on head, anterior disc margins, and along back of trunk and sides of tail (sparse on disc over central pectoral fins); smooth ventrally. Tail slender, firm, slightly longer than precloacal length; 2 small dorsal fins narrowly separated, without thorn in interspace, located at rear of tail (procaudal length short, subequal to snout length). Pelvic fin notched, anterior lobe broad and short. Caudal fin minute. Pectoral-fin radials 77–82. Predorsal vertebrae 101–106; abdominal vertebrae 33–35, predorsal tail vertebrae 67–73.

COLOUR. Dorsal surface usually plain dark brownish (sometimes greyish), thorns white; young with light and dark speckles and blotches. Ventral surface similarly dark brown; mouth white.



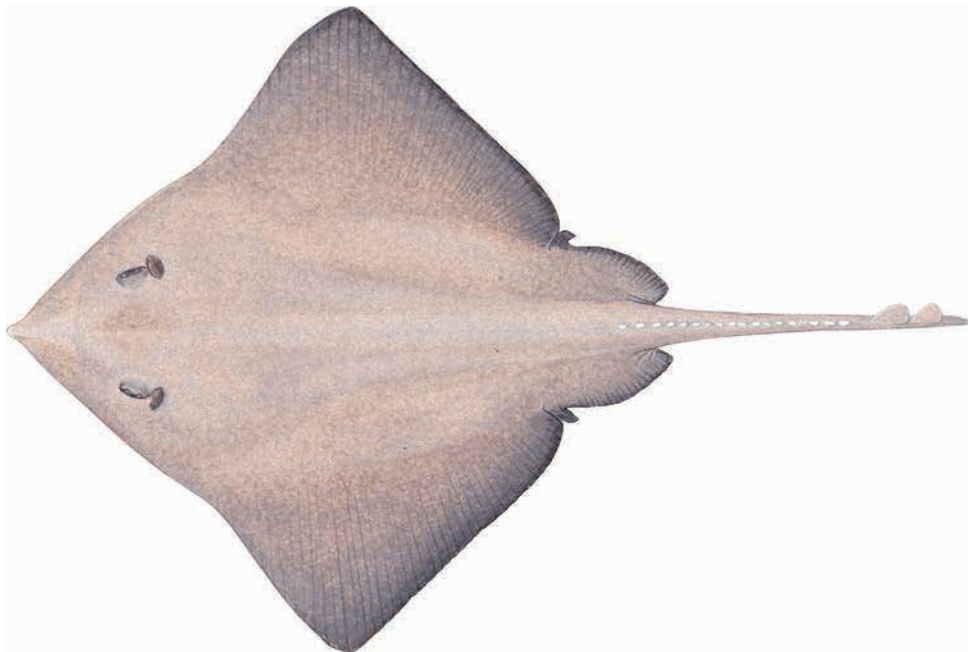
SIZE. Attains at least 105 cm TL, supposedly mature at this size.

HABITAT AND BIOLOGY. South-East Pacific; off Ecuador, Peru and northern Chile. Demersal on South American continental slope at 245–1060 m depths, mainly deeper than 600 m. Egg cases unknown and no data on diet.

SIMILAR SPECIES. The Whitebelly Skate (20.98) is largely smooth on the upper disc but the median thorn row extends forward onto the disc. Other deepwater species of *Bathyraja* from the Eastern Pacific have prickly ventral surfaces, but compared to members of this genus from the North Pacific are not well known.

RICHARDSON'S SKATE

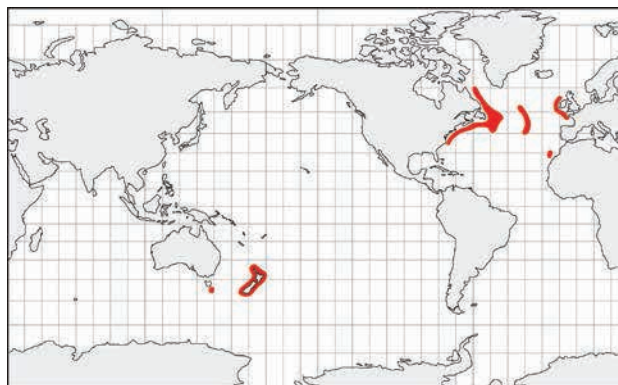
20.44

Bathyraja richardsoni (Garrick, 1961)

LC

IDENTIFICATION. Very large, heavy-bodied skate with a rhombic disc, broadly elongate snout (almost half head length), granular upper disc entirely lacking thorns, eyes very widely separated and mouth extremely broad, tail much shorter than disc, and uniformly greyish brown on both surfaces. Disc trunk very thick; margin deeply concave behind spiracles in adult males; apices bluntly angular. Snout pointed and fleshy, soft and flexible vertically due to very delicate rostral cartilage; length 4.5–4.8 times orbit length, interorbital space ~2.9–3.1 times orbit length; eyes positioned relatively close to edge of disc; anterior pectoral radials obscure near snout tip. Mouth large, nasal flaps weakly lobed; tooth rows in upper jaw 21–39. No thorns on central disc or near orbit; 15–20 blunt thorns in median row on tail before dorsal fins, no interdorsal thorns. Upper surface almost entirely covered with coarse denticles; undersurface variably granular, denticles mostly present on snout, abdomen and tail. Tail very short and slender, tapering to apex, almost rounded in cross-section; lateral folds narrow; 2 small dorsal fins at rear of tail barely separated; caudal fin minute. Pelvic fin weakly notched, anterior lobe very short; clasper very long and bulbous distally. Pectoral-fin radials 81–88. Abdominal vertebrae 34–39, predorsal tail vertebrae 64–71.

COLOUR. Upper surface plain, pale to dark greyish brown. Ventral surface similar, but with white areas on mid-disc, in pelvic region and over tail; sensory pores not marked black.



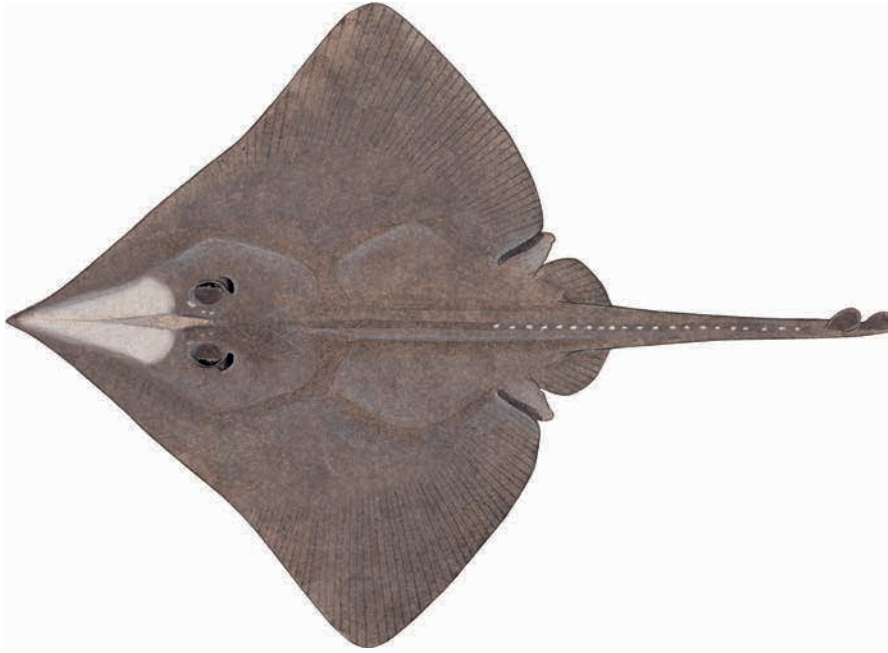
SIZE. Attains at least 175 cm TL. Males mature by 157 cm TL. Egg cases ~20 cm long; young hatch at 18–25 cm TL.

HABITAT AND BIOLOGY. North Atlantic and South Pacific, but probably cosmopolitan. Benthopelagic on continental and insular slopes, submarine rises and abyssal plains at 500–3055 m depths. Feeds mainly on crustaceans and bony fishes.

SIMILAR SPECIES. A robust, largely thornless disc, with very widely separated eyes located near the disc margin, distinguish this species from all other *Bathyraja* skates, apart from Cristina's Skate (20.56) from the Western Indian Ocean.

CUPHEAD SKATE

20.45

Bathyraja scaphiops (Norman, 1937)

NT

IDENTIFICATION. Medium-sized skate with an angular rhombic disc, elongate and rather broadly pointed snout (longer than half head length), median thorns confined to tail, and upper surface brownish and darker than lower surface. Disc width ~1.2 times length; anterior margins undulate, more so in adult males; apices bluntly angular. Snout tip pointed; soft and flexible vertically due to very delicate rostral cartilage; length 3.4–5 times orbit length, interorbital space 0.8–1 times orbit length; anterior pectoral radials extending to nearly snout tip. Mouth rather narrow, nasal flaps broadly lobed; tooth rows in upper jaw 30–34. No thorns on disc; tail with single median row of 13–21 evenly spaced thorns; small interdorsal thorn. Denticles confined to anterior disc margins and outer corners; broad band on mid-disc extends along sides of tail; undersurface smooth. Tail depressed, tapering evenly to apex, slightly shorter than precloacal length; lateral folds extend almost full length of tail; 2 small dorsal fins separated slightly, procaudal length shorter than snout length; caudal fin very small. Pelvic fin notched, anterior lobe short; claspers very slender. Pectoral-fin radials 89–91. Abdominal vertebrae 31–34, predorsal tail vertebrae 70–71.

COLOUR. Upper surface reddish brown to greyish brown; often with indistinct pale spots and white pectoral marking in adults; snout transparent with delicate rostral cartilage clearly visible. Undersurface mainly white; undersurface of tail and outer disc often with brown spots and blotches.



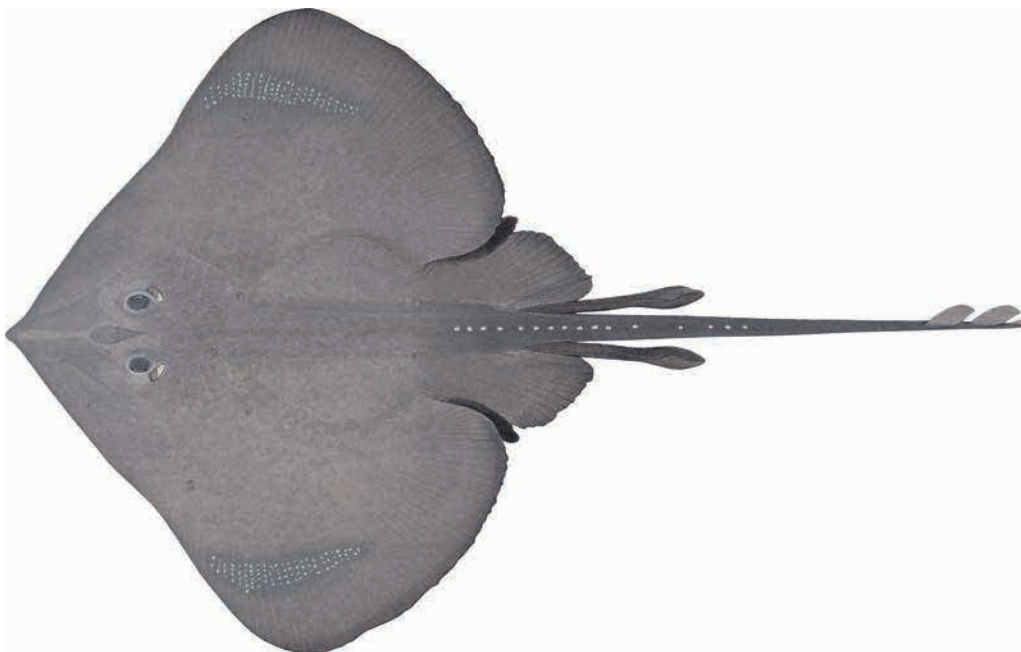
SIZE. Attains ~117 cm TL. Males mature at ~74 cm TL, smallest known specimen 21 cm TL.

HABITAT AND BIOLOGY. South-West Atlantic; southern Brazil to Patagonian Argentina, including Falkland Islands. Demersal on continental and insular shelves and slopes at 30–925 m depths; most abundant over the central shelf at 105–160 m depths. Feeds on small crustaceans when young, adults mainly on fishes.

SIMILAR SPECIES. No other *Bathyraja* species in the South-West Atlantic has such a long and markedly pointed snout. Long-snouted *Zearaja* skates have radials of the pectoral-fin skeleton falling well short of the snout tip and their rostral cartilages are broad and stiff.

WHITEMOUTH SKATE

20.46

Bathyraja schroederi (Kreffft, 1968)

DD

IDENTIFICATION. Large skate with a broad rhombic disc, broad and blunt snout (about half head length), thorns confined to short median row on tail (ending well before first dorsal fin), and greyish upper surface as dark as or paler than undersurface. Disc width ~ 1.3 times length; anterior margins weakly undulate; apices broadly rounded. Snout moderately short, blunt at tip; soft and flexible vertically due to very delicate rostral cartilage; length ~ 4.3 times orbit length, interorbital space ~ 1.6 times orbit length; anterior pectoral radials extending to nearly snout tip. Mouth rather narrow, nasal flaps broadly lobed; tooth rows in upper jaw 21–32. No thorns on upper disc; short median row of small thorns on tail (12–14 in juveniles, 19–30 in adults), row ending well before first dorsal fin (no interdorsal thorn). Dorsal denticles extensive in juveniles, becoming confined to disc margins, mid-disc and tail in adults; undersurface smooth (prickles on tail edges in young). Tail slender, very narrow posteriorly, distinctly longer than precloacal length; lateral folds extending almost full length of tail; 2 small dorsal fins narrowly separated; caudal fin small. Pelvic fin notched, anterior lobe short, claspers very slender with bulbous tips. Pectoral-fin radials 81–102. Abdominal vertebrae 30–42, predorsal tail vertebrae 75–87.

COLOUR. Upper surface plain greyish to greyish brown, blackish brown in small young; anterior pelvic-fin lobe



black. Ventrally brownish black and paler around mouth, gill slits, cloaca and tips of anterior pelvic lobes.

SIZE. Attains ~ 130 cm TL; a male 113 cm TL was mature.

HABITAT AND BIOLOGY. South-East Pacific and South-West Atlantic; patchy, Chile, Uruguay, Falkland Islands, and possibly Brazil. Demersal on continental and insular slope and abyssal plain at 800–2380 m depths.

SIMILAR SPECIES. The Darkbelly Skate (20.32) has prominent median thorns that extend from the nape to the first dorsal fin; other *Bathyraja* in the South-West Atlantic have a totally or largely white undersurface.

NARROWNOSE SKATE

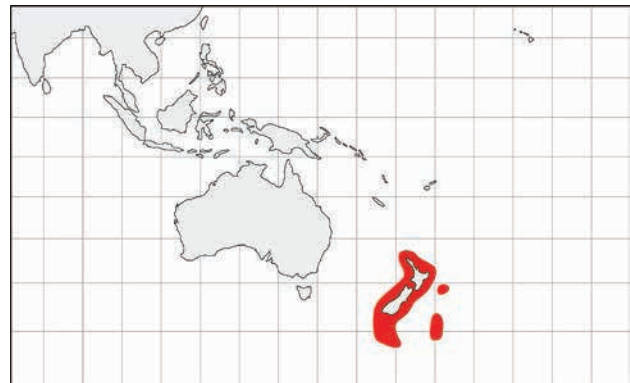
20.47

Bathyraja shuntovi Dolganov, 1985

DD

IDENTIFICATION. Large, thin-bodied skate with a broad rhombic disc, very long triangular snout, narrow mouth and interorbital space, short tail, smooth skin in adults, and largely pale on both upper and lower surfaces. Disc firm, rhombic; anterior margins initially straight then deeply concave near its apex, apices narrowly rounded. Snout very acute, delicate and flexible vertically due to very thin rostral cartilage; length up to 10 times orbit length in adults; interorbital space ~0.9–1.3 times orbit length; anterior pectoral radials extending nearly to snout tip. Mouth small, nasal flaps narrowly lobed; tooth rows in upper jaw ~34. No thorns on disc apart from narrow alar thorn patches in adult males; median row of 19–23 very small thorns along tail to first dorsal fin. Upper surface of disc sparsely covered with denticles in young; skin becoming entirely smooth in adults. Tail tapering evenly, shorter than disc length; 2 small dorsal fins at rear of tail barely separated; caudal fin minute. Pelvic fins small, very strongly notched, anterior lobe narrow; clasper long and slender. Pectoral-fin radials ~91. Predorsal vertebrae ~114; abdominal vertebrae ~35, predorsal tail vertebrae ~79.

COLOUR. Upper surface pale greyish pink, greyish or greyish blue; translucent to white on central snout, eyes blue; anterior pelvic-fin lobe and clasper dark. Ventral surface of disc largely whitish or pale pink; tail, and outer edges of pectoral and pelvic fins brownish, often dark;



sensory pores not black-edged; dorsal and caudal fins greyish.

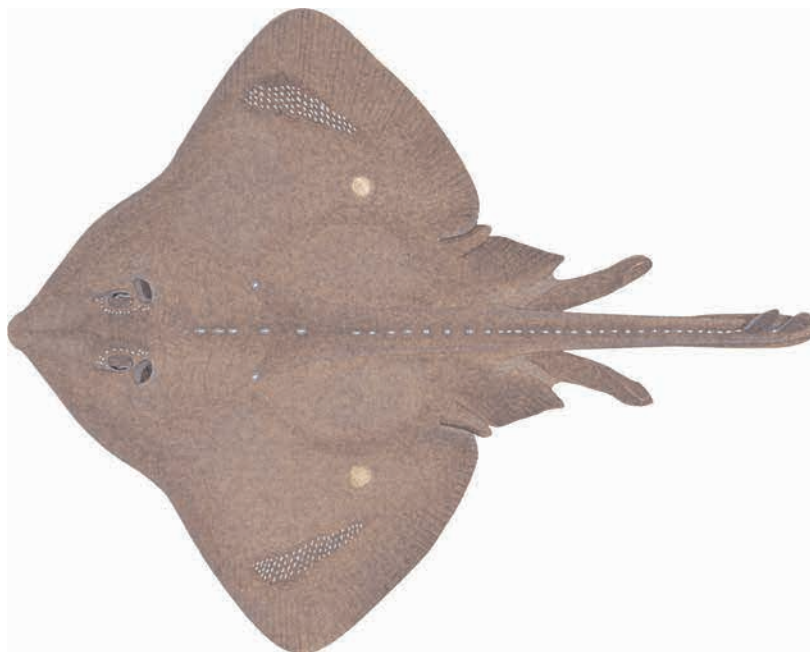
SIZE. Attains ~140 cm TL (possibly to 175 cm TL). Males mature at ~92 cm TL.

HABITAT AND BIOLOGY. South-West Pacific; off New Zealand. Demersal on insular slopes at 300–1485 m depths, usually deeper than 1000 m. Life history little known. Discarded bycatch of local trawl fisheries.

SIMILAR SPECIES. A distinctive body shape with a greatly elongated and pointed, triangular snout distinguishes this species from other *Bathyraja* of the region.

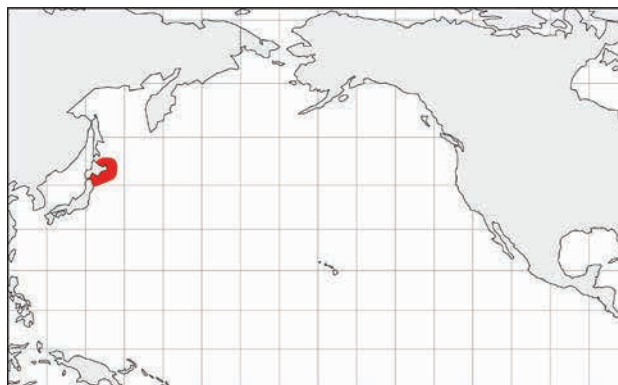
HOKKAIDO SKATE

20.48

Bathyraja simoterus (Ishiyama, 1967)

NE

IDENTIFICATION. Large skate with a broad rhombic disc, short tail with lateral folds originating near its base, usually 2 shoulder thorns, nuchal thorns continuous with median row on disc and tail, central disc largely smooth with weak median denticle band, and upper surface usually plain brownish. Disc 1.1–1.4 times wider than long, its widest point slightly closer to tail than to snout; becoming more heart-shaped with anterior margins deeply concave in adult males; apices rounded. Snout rather elongate, tip broad and blunt; soft and flexible vertically due to very delicate rostral cartilage; length 2.6–3.5 times orbit length; interorbital space subequal to orbit length; anterior pectoral radials extending to nearly snout tip. Mouth rather narrow, nasal flaps broadly lobed; tooth rows in upper jaw 23–28. Thorns large, absent from orbit and snout; outermost shoulder thorn larger than innermost thorn; 33–38 thorns in median row from nuchal region to dorsal fins. Upper disc with denticles confined mainly to orbital rim, disc margin and in weak band over lumbar region; sides of tail covered with small prickles but smooth beside tail thorns; undersurface uniformly smooth. Tail length 0.8–0.9 times precloacal length; flattened slightly, tapering to apex; small dorsal fins near tail tip, procaudal length 9–11% TL; caudal fin minute. Pelvic fin notched, anterior lobe short and broad; clasper robust, tip broadly rounded. Pectoral-fin radials ~85. Predorsal vertebrae ~131; abdominal vertebrae 39–41, predorsal tail vertebrae ~90.



COLOUR. Upper surface mainly uniformly brown, often with yellowish markings; ventral surface white, usually with dusky patches around cloaca and on tail; sensory pores not marked black.

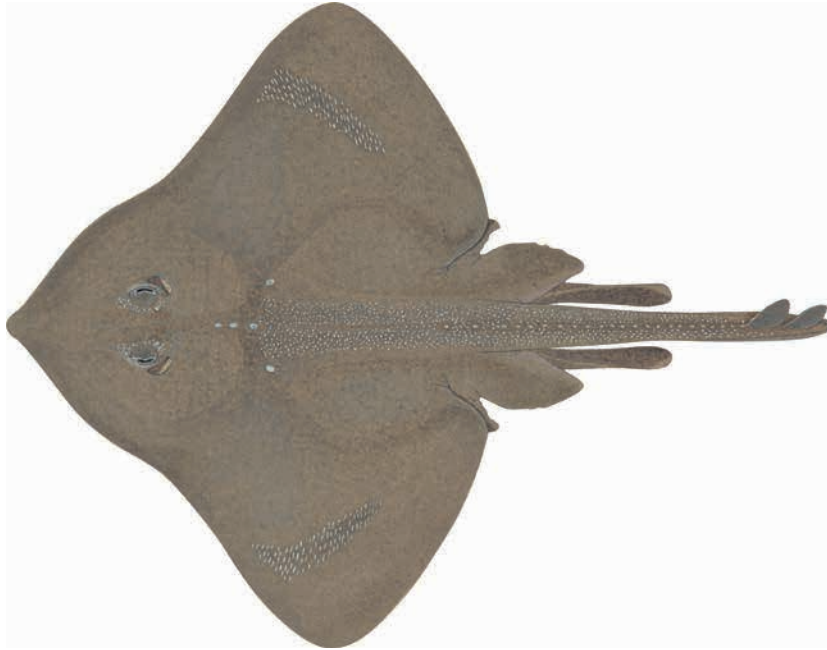
SIZE. Attains ~101 cm TL. Males mature at ~94 cm TL; egg cases ~12 cm long.

HABITAT AND BIOLOGY. North-West Pacific; off eastern Japan. Demersal on insular shelf and slope at 95–540 m depths. Biology unknown.

SIMILAR SPECIES. May be identical to the Alaska Skate (20.42), but provisionally retained as a distinct species as their ranges appear to be widely disjunct.

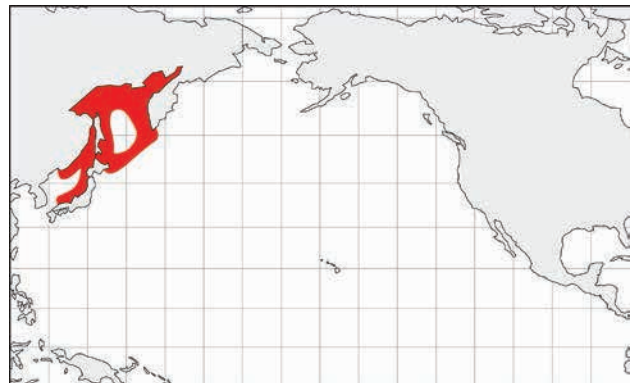
GOLDEN SKATE

20.49

Bathyraja smirnovi (Soldatov & Pavlenko, 1915)

LC

IDENTIFICATION. Large, heavy-bodied skate with a broad rhombic disc, short tail with lateral folds originating near its base; 1–2 well-developed shoulder thorns, median thorns discontinuous from nape to tail, narrow band of fine denticles on mid-disc extend along sides of tail, and a plain brownish dorsal coloration. Disc 1.2–1.4 times wider than long, its widest point much closer to tail than to snout; anterior margins weakly undulate in females, more concave in adult males; apices narrowly rounded to bluntly angular. Snout broad, moderately elongate; soft and flexible vertically due to very delicate rostral cartilage; length 2.8–4.1 times orbit length; interorbital space 0.7–1.1 times orbit in adults; anterior pectoral radials extending to nearly snout tip. Mouth narrow, nasal flaps broadly lobed; tooth rows in upper jaw 18–29. Thornlets present above orbit, on snout and along anterior margins of disc; 2–4 large nuchal thorns well separated from 20–34 regularly spaced tail thorns. Upper surface covered with fine denticles, becoming smooth over mid-pectoral fins in adults; undersurface uniformly smooth. Tail length 0.7–1.1 times precloacal length; flattened slightly, tapering evenly to its tip; small dorsal fins located near tail tip, procaudal length 8–13% TL; caudal fin minute. Pelvic fin weakly notched; clasper rather broad, tip rounded. Pectoral-fin radials 82–92. Predorsal vertebrae ~118–127; abdominal vertebrae 31–38, predorsal tail vertebrae 83–96.



COLOUR. Upper surface uniformly golden to dark brown; ventral surface white with dusky patches on cloaca and tail; sensory pores not marked black.

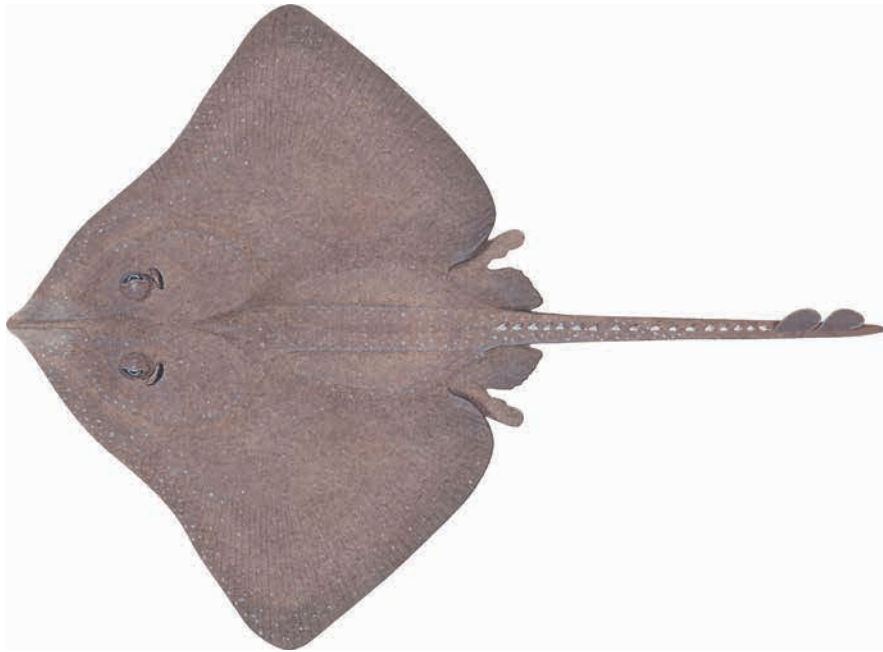
SIZE. Attains ~116 cm TL. Males and females mature at ~100 and ~92 cm TL respectively. Egg cases 12–15 cm long; young hatch at ~22 cm TL.

HABITAT AND BIOLOGY. North-West Pacific; Sea of Japan and Sea of Okhotsk (Russia). Demersal, continental and insular shelves and slopes at 100–1125 m depths. Feeds mostly on crustaceans, octopuses and small bony fishes.

SIMILAR SPECIES. Differs from the co-occurring Hokkaido Skate (20.48) in having a discontinuous row of denticles between the nape and tail.

SOFTNOSE SKATE

20.50

Bathyraja smithii (Müller & Henle, 1841)

DD

IDENTIFICATION. Large skate with a broad rhombic disc, moderately elongate snout, upper surface largely rough apart from central and posterior disc, disc thorns present in young but absent in adults, tail shorter than 60% of disc width and with thorns in closely packed single row, and disc uniformly greyish brown above and paler below. Disc 1.3–1.4 times wider than long, its widest point slightly closer to tail than to snout; anterior margins undulate, more so in adult males; apices narrowly rounded. Snout with small lobe at tip, length 2.8–3.7 times orbit length, interorbital space 1.5–1.9 times orbit length in adults; soft and flexible vertically due to very delicate rostral cartilage; anterior pectoral radials extending to snout tip. Mouth rather broad, nasal flaps lobed; tooth rows in upper jaw 23–28. Tail thorns sharp, evenly spaced, 14–19 in median row in adults. Dorsal denticles coarse, loosely set anteriorly and in well-defined longitudinal band along mid-disc; undersurface entirely smooth. Tail slender, tapering to apex, usually slightly shorter than preclacal length; lateral folds narrow, originating near middle of tail; dorsal fins low, separated slightly, procaudal length subequal to snout length; caudal fin low, long based. Pelvic fin deeply notched. Pectoral-fin radials usually 82–90. Predorsal vertebrae 104–107; abdominal vertebrae 32–37, predorsal tail vertebrae 67–74.

COLOUR. Dorsal surface uniformly pale greyish to chocolate brown. Undersurface largely white; disc anterior margins black, and posterior margins and cloaca broadly



and sharply marked dark brown; tail brownish black; sensory pores not black.

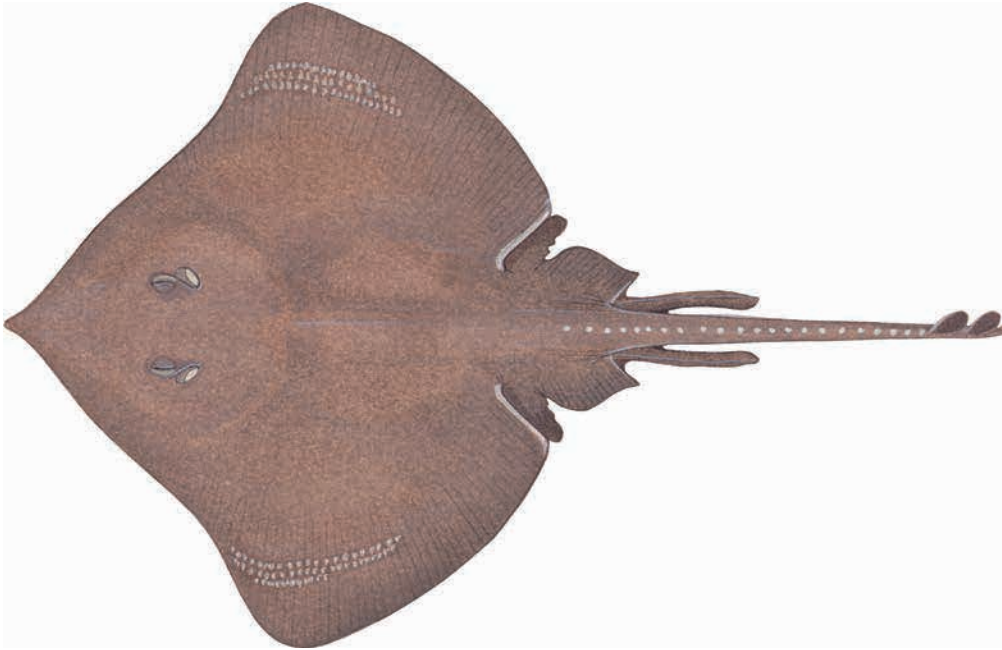
SIZE. Attains ~120 cm TL. Males mature at ~95–97 cm TL, females at ~80–90 cm TL. Smallest known specimen 13 cm TL.

HABITAT AND BIOLOGY. South-East Atlantic; Namibia to South Africa, possibly also in South-West Indian Ocean. Demersal on continental slope at 250–1040 m depths. Feeds on bony fishes, prawns, octopuses and squids.

SIMILAR SPECIES. Cristina's Skate (20.56), also from the continental slope off southern Africa, has a more elongate, triangular snout, more widely separated eyes, and a darker ventral surface.

SPINYTAIL SKATE

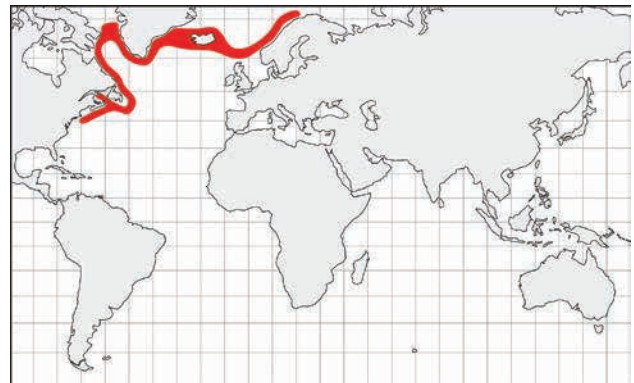
20.51

Bathyraja spinicauda (Jensen, 1914)

NT

IDENTIFICATION. Very large, heavy-bodied skate with a rhombic disc, broadly elongate snout (length slightly longer than half head length), upper disc entirely granular but lacking thorns (apart from alar patches in adult males), tail shorter than precloacal length in adults, and plain greyish dorsally and whitish below. Disc width ~1.2 times length, trunk thick; margin undulate anteriorly; apices bluntly angular to narrowly rounded. Snout pointed, soft and flexible vertically due to very delicate rostral cartilage; length 4.3–4.4 times orbit length, interorbital space 1.2–1.3 times orbit length; anterior pectoral radials extending to nearly snout tip. Mouth broad, nasal flaps broadly lobed; tooth rows in upper jaw ~33. No thorns on central disc or near orbit; 21–26 blunt thorns in median row on tail before dorsal fins, interdorsal thorn usually present. Upper surface densely covered with coarse denticles; undersurface entirely smooth, apart from a few loosely scattered denticles on tail. Tail narrow, tapering to apex, almost rounded in cross-section; lateral folds prominent; 2 small dorsal fins at rear of tail separated slightly (procaudal length much less than snout length); caudal fin rudimentary. Pelvic fin weakly notched, anterior lobe very short; clasper long and slender.

COLOUR. Upper surface plain greyish to greyish brown; 2–4 bands on tail in small juveniles. Ventral surface white, often with dusky posterior disc and pelvic-fin margins, and dusky blotches near tail base.



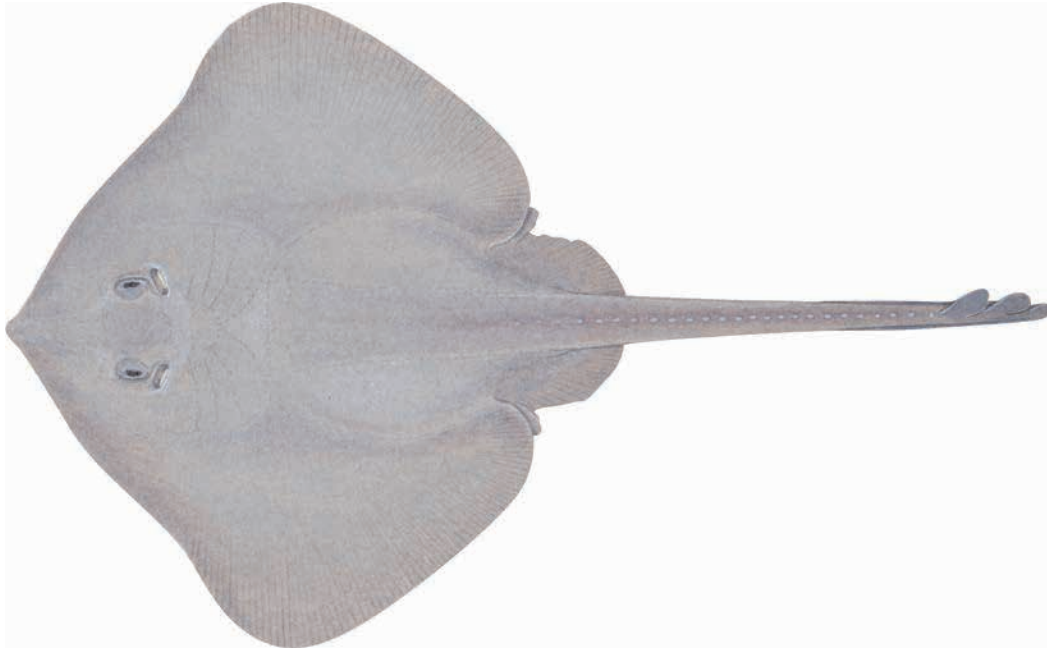
SIZE. Attains ~182 cm TL. Egg cases ~13 cm long, young hatch at ~21 cm TL.

HABITAT AND BIOLOGY. North Atlantic; Rhode Island (USA) to Norway. Demersal on continental and insular shelves and slopes at 140–1650 m depths, primarily on mid-continental slope deeper than 400 m. Adults feed mainly on fishes, juveniles on small invertebrates. Bycatch of bottom trawl and longline fisheries.

SIMILAR SPECIES. Similar to the Pallid Skate (20.39), which also occurs in the North Atlantic. The Spinytail Skate has a rougher upper surface, usually more tail thorns, and a paler undersurface.

PACIFIC WHITE SKATE

20.52

Bathyraja spinosissima (Beebe & Tee-Van, 1941)

LC

IDENTIFICATION. Large skate with a broad rhombic disc covered above and below with small prickly denticles, snout moderately elongate, eyes small, tail long, no thorns on disc other than alar thorn patches of adult males, and both surfaces pale. Disc ~1.2 times longer than wide; anterior margins undulate, apices broad to narrowly rounded. Snout bluntly angular with small apical lobe at tip, flexible vertically due to delicate rostral cartilage; anterior pectoral radials extending nearly to snout tip; length ~3.8 times orbit length; interorbital space ~1.9 times orbit length. Mouth broad; tooth rows in upper jaw ~34. Disc typically lacking thorns; 23–29 thorns in single median row on tail, thorns small and evenly spaced; no interdorsal thorn. Both disc surfaces rough to touch. Tail slender, longer than precloacal length; 2 tall and rather upright dorsal fins at rear of tail, separated slightly (procaudal length subequal to snout length); lateral folds originating near mid-length of tail; caudal fin elongate. Pelvic fins strongly notched; anterior lobe short and posterior lobe large; claspers long and very slender. Predorsal vertebrae ~82.

COLOUR. Dorsal surface pale greyish white in adults, young sometimes slate grey or brownish. Undersurface also entirely pale, outer disc margin sometimes dusky; sensory pores not dark-edged.



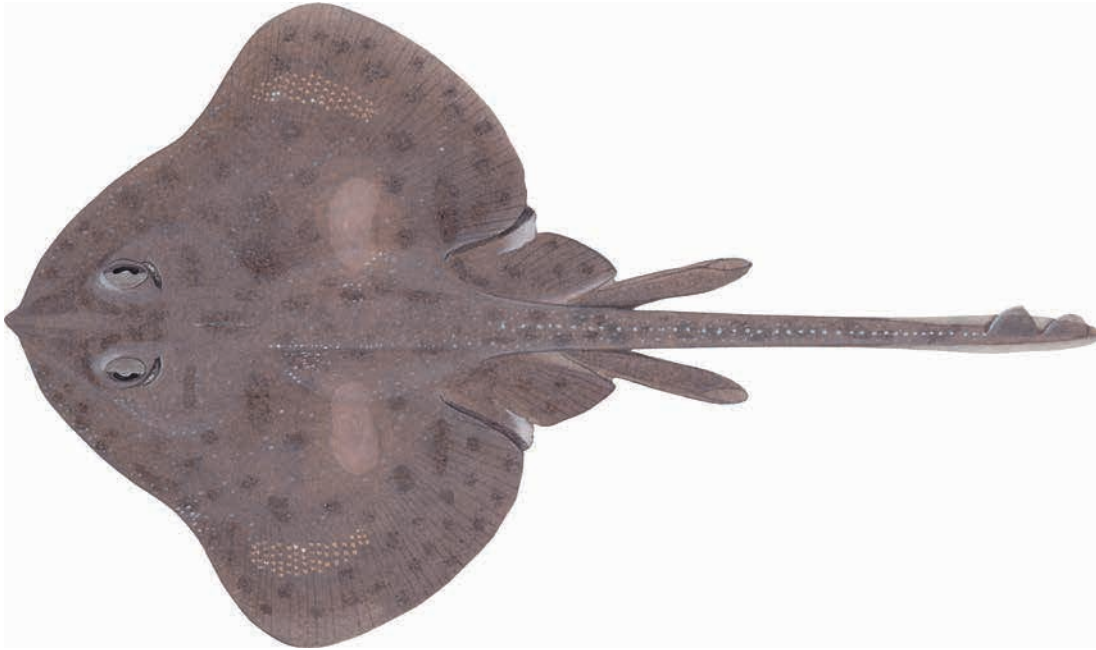
SIZE. Attains at least 150 cm TL, possibly to 203 cm TL. Maturity size unknown; young hatch at ~26 cm TL.

HABITAT AND BIOLOGY. North Pacific; Oregon (USA) to Ecuador, reports from Galapagos Islands and Sea of Okhotsk probably incorrect. Benthopelagic on continental slopes and abyssal plains at 800–2940 m depths. Feeds on benthic fishes. Rarely encountered, with fewer than 10 individuals reported.

SIMILAR SPECIES. In the North-East Pacific, resembles the Roughtail Skate (20.55) in lacking thorns on the nape and shoulder.

MUD SKATE

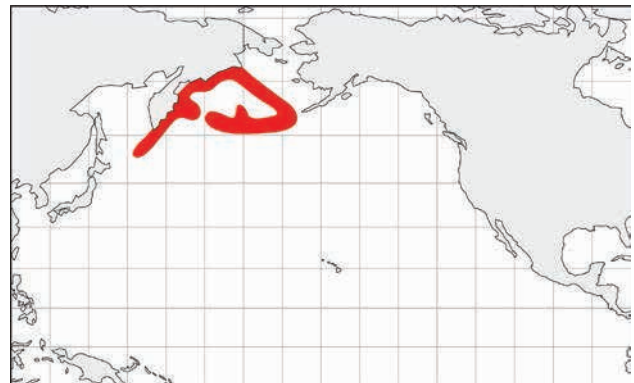
20.53

Bathyraja taranetzi (Dolganov, 1983)

LC

IDENTIFICATION. Medium-sized skate with a rhombic to heart-shaped disc, rough skin, short snout, large eyes, no thorns on disc, thorns in median tail row small, blotchy dorsally with large white pectoral marking, and white ventrally. Disc anterior margins undulate; apices rather narrowly rounded; snout rounded with a prominent apical tip, soft and flexible vertically due to very delicate rostral cartilage; anterior pectoral radials extending nearly to snout tip; length 3–3.2 times orbit length, interorbital space 1.1–1.3 times orbit length. Mouth narrow, nasal flaps broadly lobed; tooth rows in upper jaw 29–30. Thorns absent on disc, apart from broad alar series of adult male; thorns of median row on tail small, extending in regular row to first dorsal fin. Dermal denticles coarse, covering most of dorsal surface but less dense in central pectoral region of adult male; undersurface entirely smooth. Tail long and moderately slender, exceeding precloacal length; dorsal fins low, at rear of tail, joined or barely separated, predorsal length subequal to snout length; lateral folds short, extending along posterior half of tail. Pelvic fin notched, anterior lobe broad, shorter than posterior lobe; clasper slender, flattened slightly. Pectoral-fin radials 75–77. Predorsal vertebrae ~100–106; abdominal vertebrae 30–32, predorsal tail vertebrae 70–74.

COLOUR. Dorsal surface of disc brownish, usually with scattered darker blotches and a large white blotch near centre of each pectoral fin; inner margin of orbit white. Undersurface white anteriorly; hind margins of disc and pelvic fins, and part of tail dusky.



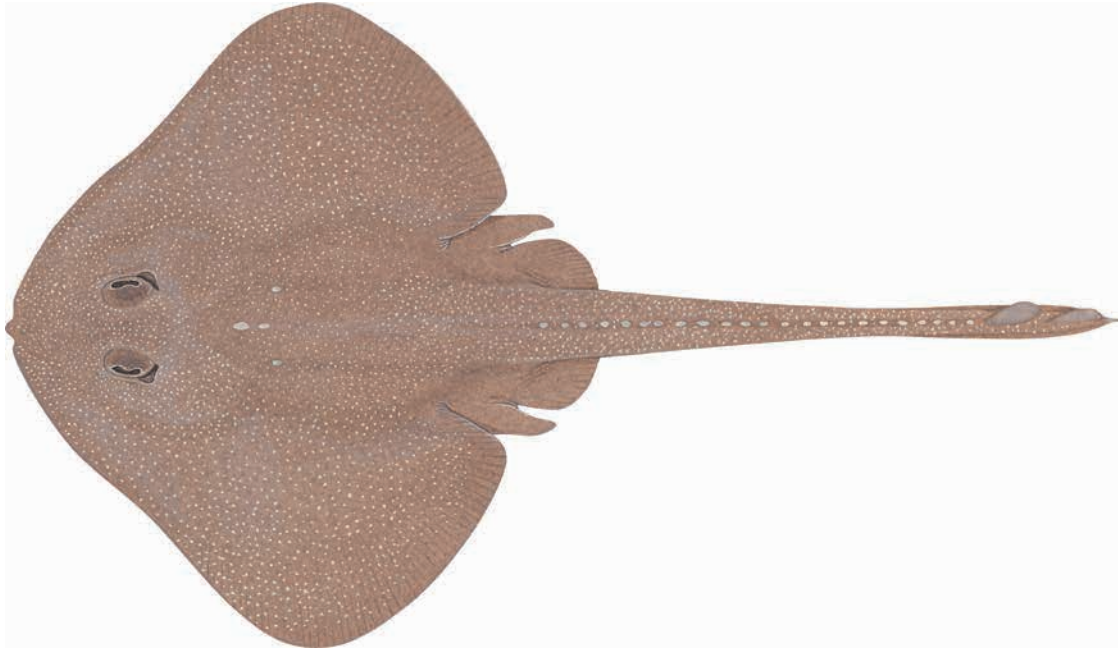
SIZE. Attains ~77 cm TL. Males mature at 53–66 cm TL, females 61–66 cm TL.

HABITAT AND BIOLOGY. North Pacific; Sea of Okhotsk to Alaska (USA). Demersal on rough bottoms of continental and insular shelves and slopes at 15–1055 m depths, most common at 250–500 m. Feeds on crustaceans, worms and small fishes.

SIMILAR SPECIES. Almost certainly more closely related to members of the genus *Rhinoraja* than *Bathyraja*, and may need to be reassigned to *Rhinoraja* after completion of a more detailed investigation of the group. Most closely resembles the Whitebelly Skate (20.98) but lacks thorns on the nape.

EREMO SKATE

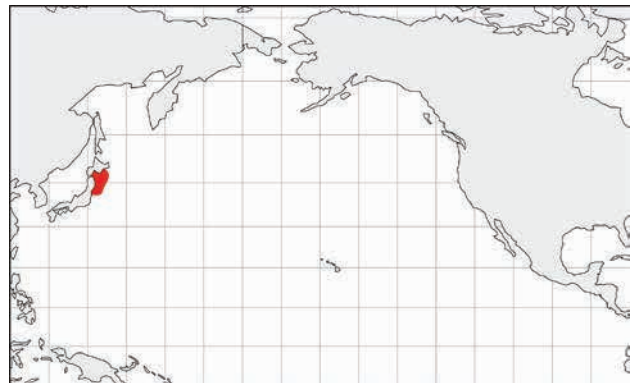
20.54

Bathyraja trachouros (Ishiyama, 1958)

LC

IDENTIFICATION. Large skate with a rounded to heart-shaped disc, broad snout (length about half head length), rough prickly skin on dorsal surface, small shoulder thorns present, 0–4 nuchal thorns (usually absent), tail longer than 70% of disc width, and disc darker above than below. Disc width 1.2–1.3 times length; anterior margins almost straight, undulate in adult males; apices narrowly to broadly rounded. Snout with blunt tip; soft and flexible vertically due to very delicate rostral cartilage; length ~4.1–4.5 times orbit length; interorbital space slightly larger than orbit; anterior pectoral radials extending to nearly snout tip. Mouth rather broad, nasal flaps broadly lobed. Thorns absent from orbit and snout; small shoulder thorn on each side; 0–4 feeble nuchal thorns, not continuing as row of lumbar thorns even in young; row of mostly 18–23 evenly spaced median thorns along predorsal tail. Upper disc and tail uniformly granular in females and juveniles, denticles thickened and becoming sparse on mid-pectoral region in adult males; anterior pelvic lobe and under-surface smooth. Tail thickened, rounded in cross-section, tapering to apex, subequal to disc length; lateral folds restricted to posterior tail; 2 small dorsal fins at rear of tail barely separated; caudal fin minute. Pelvic fin moderately notched, anterior lobe short and broad, clasper robust. Abdominal vertebrae 32–36, predorsal tail vertebrae 71–76.

COLOUR. Upper surface plain yellowish brown, becoming greyish in preservative, dorsal fins similar to disc; ventral



surface of disc white, tail and cloacal region sometimes dusky; sensory pores not marked black.

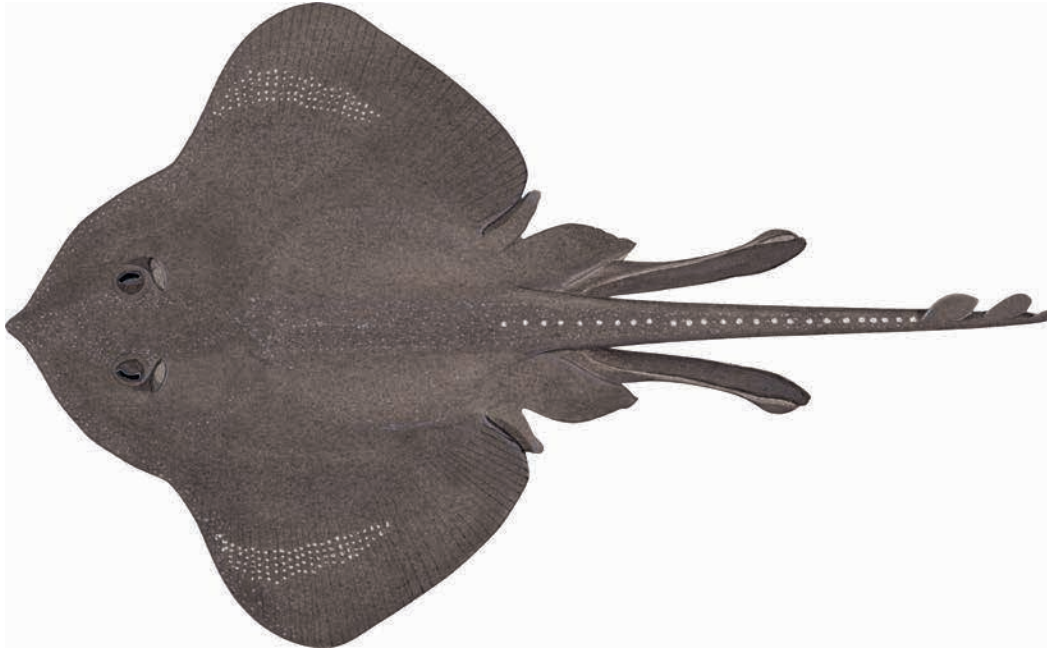
SIZE. Attains ~102 cm TL. Matures at ~88 cm TL; egg cases 11–13 cm long.

HABITAT AND BIOLOGY. North-West Pacific; off eastern Japan. Demersal on insular shelf and slope at 100–800 m depths. Bycatch of trawl fishery for cod and rockfish. Life history largely unknown.

SIMILAR SPECIES. Differs from the superficially similar Whitebelly Skate (20.98) in having fewer thorns and finer denticles, as well as aspects of its clasper. The Eremo Skate also has a proportionally shorter tail.

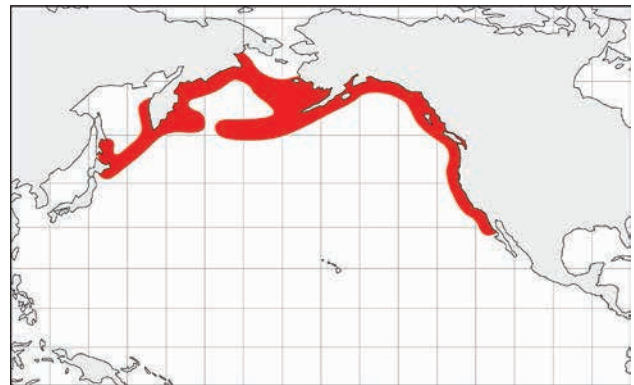
ROUGHTAIL SKATE

20.55

Bathyraja trachura (Gilbert, 1892)

LC

IDENTIFICATION. Medium-sized to large skate with a broad rhombic to heart-shaped disc, broad snout (~0.6 of head length), skin mostly smooth in adults, no orbital thorns, no nuchal or shoulder thorns, tail ~3/4 disc width, and very dark above and almost as dark below. Disc 1.2–1.3 times wider than long, anterior margins undulate, double concave in adult males; apices narrowly rounded. Snout with a blunt tip, apex extended slightly; soft and flexible vertically due to very delicate rostral cartilage; length 3.1–3.8 times orbit length; interorbital space 1.4–1.8 times orbit length; anterior pectoral radials extending to nearly snout tip. Mouth and nasal flaps broad; tooth rows in upper jaw 26–35. Thorns absent from disc, apart from long, wide alar patch in adult males; row of mostly 14–21 evenly spaced median thorns along predorsal tail, thorns short with broad bases. Upper disc smooth in adult males, except around its margin and over abdomen, females with broader coverage of prickles; tail densely covered with similar prickles; pelvic fins and undersurface smooth. Tail thickened, round to slightly depressed in cross-section, tapering to apex, subequal to disc length; lateral folds mostly narrow; 2 large dorsal fins joined or barely separated, procaudal length subequal to snout length; caudal fin short-based, tall. Pelvic fin deeply notched, anterior lobe only slightly shorter than posterior lobe, clasper long and robust. Abdominal vertebrae 32–37, predorsal tail vertebrae 62–66.



COLOUR. Dorsal surface reddish brown to greyish black. Ventral surface similarly dark, sometimes slightly paler than dorsal surface; sensory pores not marked black.

SIZE. Attains ~94 cm TL. Males mature at ~75 cm TL, females 74–84 cm TL; young hatch at 9–16 cm TL.

HABITAT AND BIOLOGY. North Pacific; northern Japan to California (USA). Demersal on continental and insular shelves and slopes at 90–2900 m depths. Bycatch of trawl fisheries and of no commercial value.

SIMILAR SPECIES. The Deepsea Skate (20.5) is similarly dark on both surfaces, but has a much longer snout and more thorns along the mid-line of the disc.

CRISTINA'S SKATE

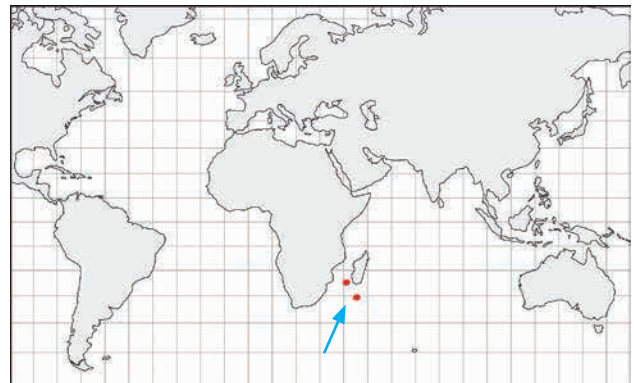
20.56

Bathyraja tunae Stehmann, 2005

DD

IDENTIFICATION. Large, heavy-bodied skate with a rhombic disc, broadly elongate snout (length about half head length), upper disc granular and entirely lacking thorns, eyes widely separated, mouth extremely broad, tail much shorter than disc, and uniformly dark greyish on both surfaces. Disc margin deeply concave behind spiracles; apices bluntly angular. Snout pointed and fleshy, soft and flexible vertically due to very delicate rostral cartilage; length 2.4–3.8 times orbit length, interorbital space 1.1–1.5 times orbit length; eyes positioned relatively close to edge of disc; anterior pectoral radials reaching near snout tip. Mouth large, nasal flaps weakly lobed; tooth rows in upper jaw 30–32. No thorns on central disc or near orbit; 19 thorns in median row on tail before dorsal fins, no interdorsal thorns. Upper surface almost entirely covered with fine denticles; undersurface smooth. Tail very short and slender (precaudal length 1.2–1.4 times tail length), tapering to apex, almost triangular in cross-section; lateral folds narrow; 2 small dorsal fins barely separated, precaudal length slightly less than snout length; caudal fin very low. Pelvic fin weakly notched, anterior lobe very short. Pectoral-fin radials ~86–89. Predorsal vertebrae 110–115; abdominal vertebrae 40–44, predorsal tail vertebrae 70–71.

COLOUR. Upper surface plain dark greyish brown, anterior pelvic-fin lobes blackish. Ventral surface slightly darker greyish brown than dorsal surface; sensory pores not marked black.



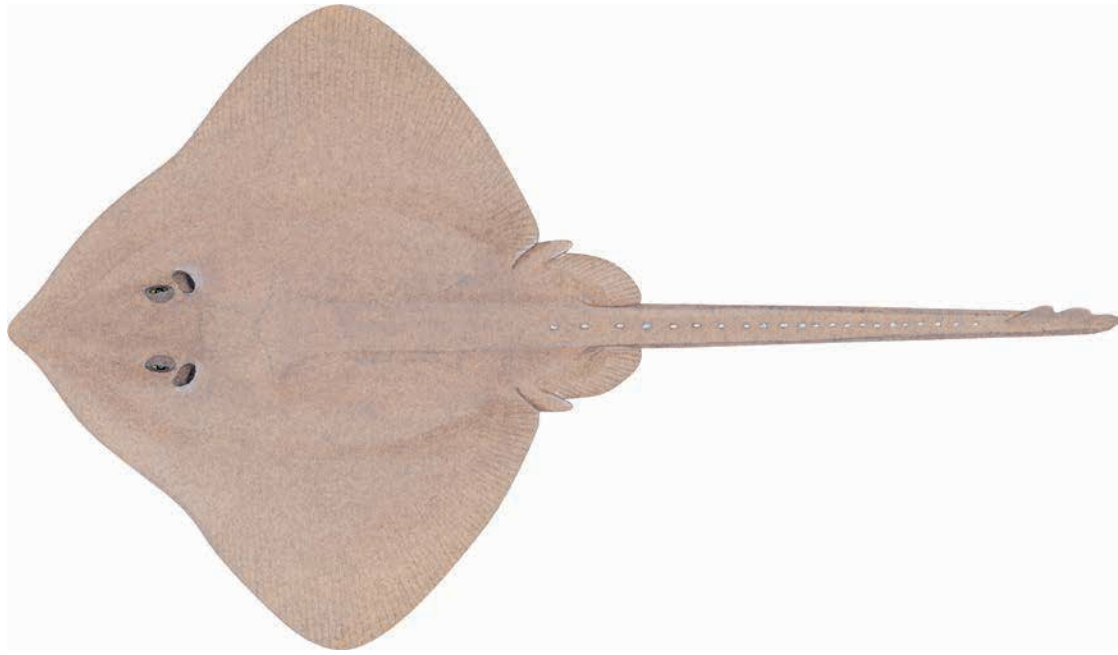
SIZE. Attains at least 97 cm TL; female holotype adolescent at this size.

HABITAT AND BIOLOGY. South-West Indian Ocean; off Mozambique and Madagascar. Probably benthopelagic on deep continental and insular slopes and abyssal plains at 1700–2240 m depths.

SIMILAR SPECIES. Relationship to another abyssal species, Richardson's Skate (20.44), needs to be reassessed as the species are very similar in body form and occur at similar latitudes in the Southern Hemisphere. The snout length is more than twice the interorbital width (rather than 1.2–1.3 times in Richardson's Skate).

CREAMBACK SKATE

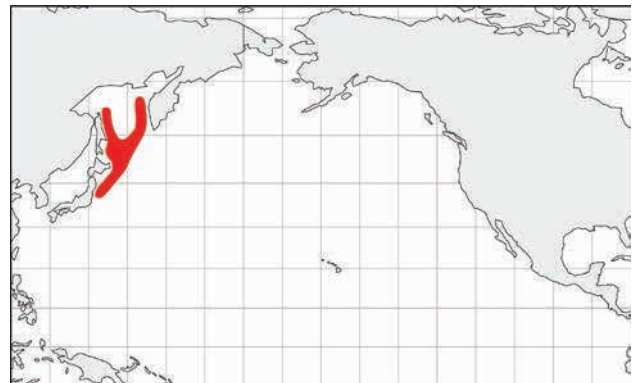
20.57

Bathyraja tzinovskii Dolganov, 1983

LC

IDENTIFICATION. Large skate with a rhombic disc, sharply pointed snout, small eyes, skin spiny and upper disc without thorns, lateral folds extending along entire length of tail, and both surfaces pale without white spots. Disc ~1.2 times wider than long, anterior margins weakly undulate anteriorly; apices narrowly rounded. Snout tip with small lobe; soft and flexible vertically due to very delicate rostral cartilage; length ~4.7 times orbit length; interorbital space up to 1.7 times orbit length; anterior pectoral radials extending nearly to snout tip. Mouth rather broad, nasal flaps broadly lobed; tooth rows in upper jaw ~28. Thorns confined to mid-line of tail, 22 rather large, evenly spaced thorns in row along predorsal tail. Skin on upper disc and tail velvety, uniformly covered with small spinules (no naked patches); undersurface entirely smooth, including lateral folds of tail. Tail thickened, rounded in cross-section, tapering to apex, slightly longer than disc length; 2 small dorsal fins at rear of tail, first larger, bases barely separated; caudal fin rudimentary. Pelvic fin mildly notched, anterior lobe short. Pectoral-fin radials ~72. Predorsal vertebrae ~99; abdominal vertebrae ~30, predorsal tail vertebrae ~69.

COLOUR. Upper surface of disc uniform pale creamish white. Ventral surface uniformly white; sensory pores not marked black.



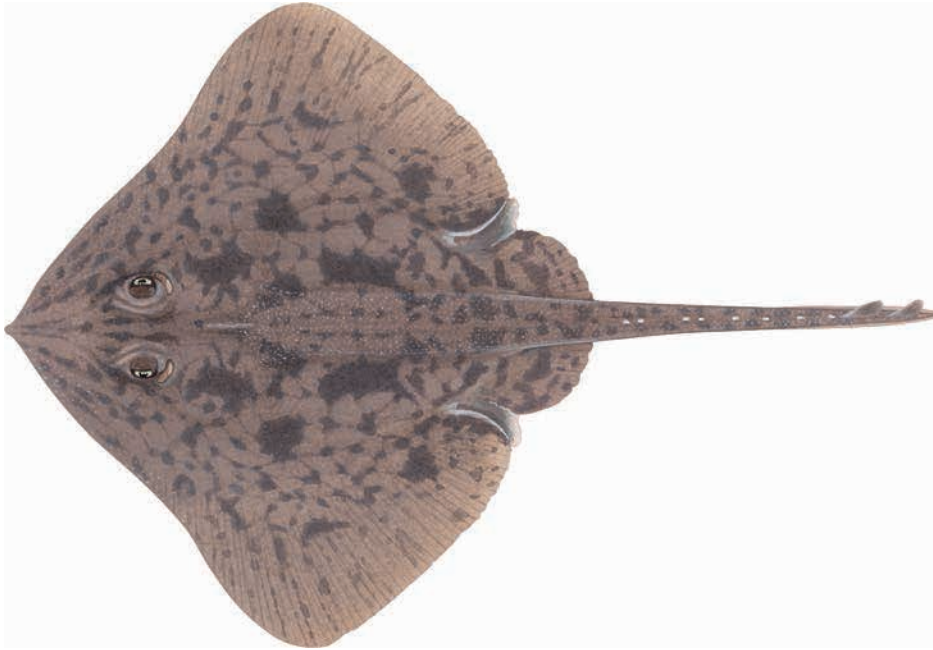
SIZE. Attains at least 94 cm TL; egg cases ~9 cm long.

HABITAT AND BIOLOGY. North-West Pacific; eastern Japan to Sea of Okhotsk (Russia). Demersal on lower continental and insular slopes and abyssal plain at 1775–2500 m depths; possibly more widespread in Northern Pacific near the bottom in very deep habitats.

SIMILAR SPECIES. Most similar to the Cinnamon Skate (20.15), but has a less angular disc, relatively larger eyes and is paler bodied. Another North-West Pacific species of the genus *Bathyraja*, the Raspback Skate (20.21), has much shorter lateral folds and the central part of each pectoral fin is not evenly covered with denticles in adults.

OKHOTSK SKATE

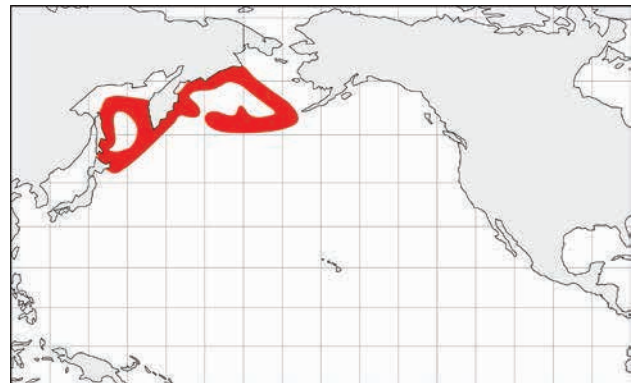
20.58

Bathyraja violacea (Suvorov, 1935)

DD

IDENTIFICATION. Large skate with a thin, flabby rhombic disc, short snout, granular dorsal disc with broad median band in adults, no thorns on disc, very small tail thorns arranged in irregular median row, short anterior pelvic-fin lobes, and strongly variegated colour pattern. Disc angular, ~1.1 times wider than long; anterior margins weakly undulate in females, more so in adult males; apices narrowly rounded. Snout broad with minute lobe at tip; soft and flexible vertically due to very delicate rostral cartilage; length ~3.4–3.9 times orbit length; interorbital space slightly larger than orbit length; anterior pectoral radials extending to nearly snout tip. Mouth rather narrow, nasal flaps broadly lobed. No thorns on orbit, snout, nape and shoulder; 8–15 weak thorns in median row on tail before first dorsal fin. Upper surface always covered with denticles, less dense over gills and bases of pectoral and pelvic fins in adults; undersurface uniformly smooth. Tail flattened, tapering to apex, slightly longer than disc; lateral folds prominent on posterior tail; 2 small dorsal fins barely separated, procaudal length subequal to snout length; caudal fin minute. Pelvic fin with weak notch; clasper rather broad, tip narrowly rounded. Pectoral-fin radials 73–76. Predorsal vertebrae 98–102; abdominal vertebrae 28–33, predorsal tail vertebrae 66–70.

COLOUR. Upper surface pale greyish brown to brown, usually covered with well-defined darker brown blotches



and mottling. Ventral surface of disc white, apart from dark patches around cloaca and on tail; sensory pores not marked black.

SIZE. Attains ~107 cm TL. Males mature at 54–73 cm TL, females 61–76 cm TL; egg cases ~13 cm long.

HABITAT AND BIOLOGY. North Pacific; northern Japan, across to Alaska (USA). Demersal on continental and insular shelves and slopes at 25–1110 m depths. Feeds mostly on crustaceans, cephalopods and bony fishes.

SIMILAR SPECIES. Resembles the Dusky Pink Skate (20.13), but its anterior pelvic-fin lobes are proportionally much shorter compared to the posterior lobes.

ENIGMA SKATE

20.59

Brochiraja aenigma Last & McEachran, 2006

DD

IDENTIFICATION. Small skate with a broad subcircular disc covered with closely set granular denticles on upper surface, skin smooth below, no thorns on disc, tail very long and very slender, and largely brownish in coloration on both surfaces. Disc ~1.4 times broader than long; apex broadly rounded. Snout moderately elongate, flexible, rostral cartilage feeble, lobe at tip minute. Eye large, length ~2.4 in snout length, ~1.1 times interorbital space. Mouth arched slightly, nasal flaps broadly lobed, dermal fringe developed; tooth rows in upper jaw ~30. Dorsal denticles very short, regularly spaced on disc, sparse on pelvic, dorsal and anal fins; absent ventrally. No thorns on disc, including possibly snout thorns; thorns probably present in alar region of adult males; tail with row of small long-based thorns interspersed with fine denticles. Tail very narrow based, tapering gently, length ~1.7 times precloacal length; lateral folds probably weak. Pelvic-fin margin deeply notched. Dorsal fins short and low, barely separated, procaudal length slightly longer than snout length; caudal-fin upper lobe subequal to length of second dorsal-fin base. Pectoral-fin radials ~73–74. Predorsal tail vertebrae ~89, abdominal vertebrae ~26, predorsal vertebrae ~115.

COLOUR. Brownish above (in preservative) with faint darker mottling; tips of anterior pelvic-fin lobes black. Ventral surface brownish to greyish with white areas around



mouth and on gill slits; chin area dark; lacking rows of pale-edged sensory pores.

SIZE. Attains at least 44 cm TL for females; adult size unknown.

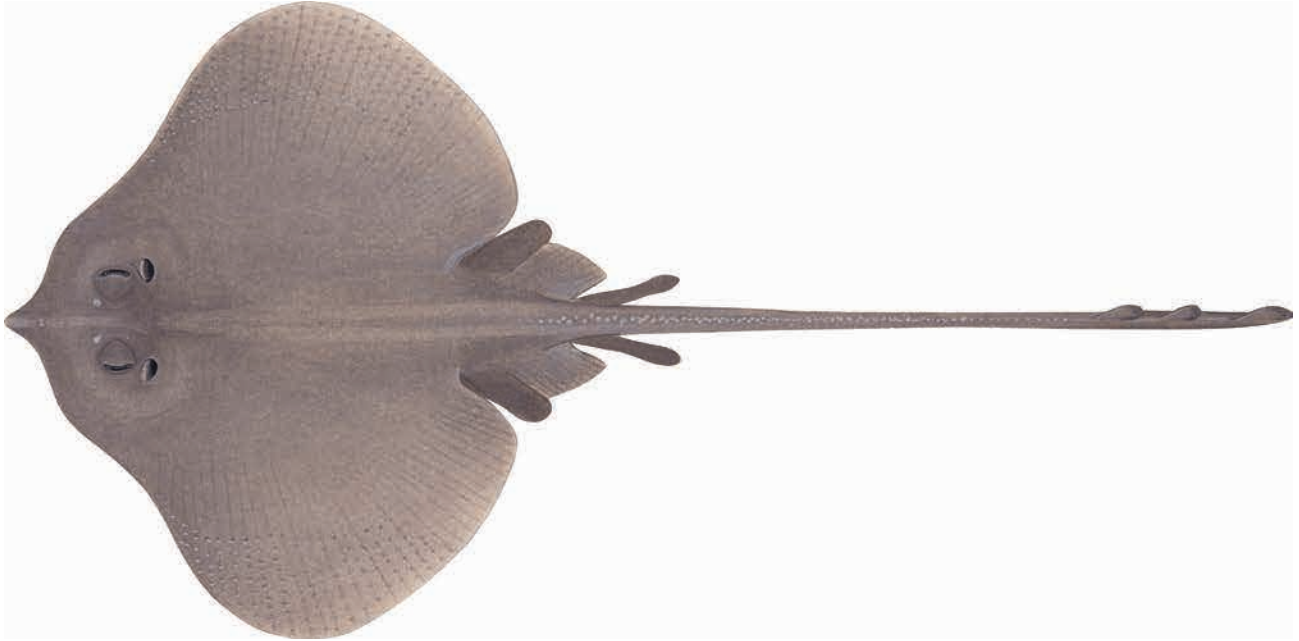
HABITAT AND BIOLOGY. South-West Pacific; Wanganella Bank, off northern New Zealand. Demersal at 420–435 m depths, presumably narrow-ranging on deep offshore banks of the Tasman Sea. Life history unknown.

SIMILAR SPECIES. Known from a single individual and preserved in poor condition. This unusual skate has a very long and slender tail, and unusually high meristic counts.

WHITELIP SKATE

20.60

Brochiraja albilabiata Last & McEachran, 2006



DD

IDENTIFICATION. Medium-sized skate with an oval to heart-shaped disc, largely smooth skin, single thorn before each eye, v-shaped thorn on snout, very long slender tail, and all surfaces of body bluish with white-edged mouth. Disc most curvaceous in adults, ~1.2 times broader than long; apex broadly rounded. Snout rather short, flexible, lacking firm rostral cartilage, with distinct fleshy lobe at tip. Eye large, length 2.5–2.7 in snout length, 1.1–1.2 times interorbital space. Mouth arched slightly, nasal flaps broadly lobed, dermal fringe weak; tooth rows in upper jaw 45–60. Dorsal denticles very short and dense, confined mainly to back and sides of tail; entirely smooth ventrally. Preorbital and rostral thorns broad based, latter much closer to snout tip than eye; alar and malar thorns forming large patch; thorns on tail small, in a staggered median row. Tail oval, tapering gently, length 1.6–1.7 times precloacal length; lateral folds well developed. Pelvic-fin margin deeply notched. Dorsal fins short, well separated, procaudal length about equal to prepiracular length; caudal-fin upper lobe much longer than second dorsal-fin base. Pectoral-fin radials 68–70. Predorsal tail vertebrae 79–83, abdominal vertebrae 26–27, predorsal vertebrae 106–110.

COLOUR. Plain greyish blue above, interorbit and anterior pelvic fin brownish. Ventral surface darker, uniform bluish



black with dark brown hues; mouth white-edged and strongly contrasted against blackish nasal flaps and beard-like patch on chin; no rows of white sensory pores.

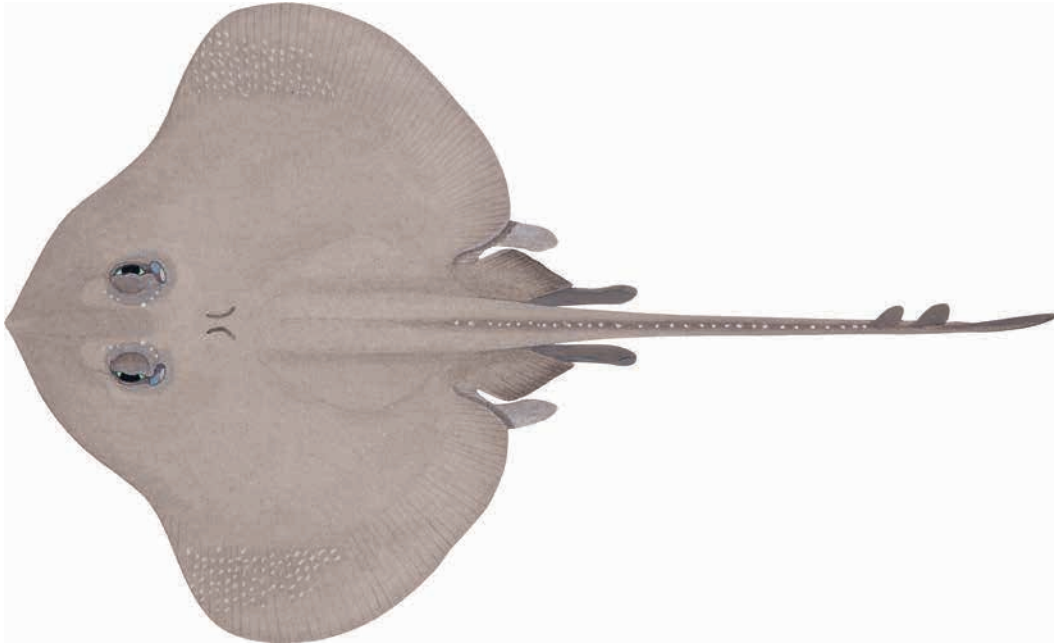
SIZE. Attains at least 65 cm TL; maturity size unknown (largest male still immature at ~51 cm TL).

HABITAT AND BIOLOGY. South-West Pacific; off northern New Zealand. Demersal along insular slope at 900–1005 m depths. Nothing known of its life history.

SIMILAR SPECIES. Formerly confused with the Smooth Deepsea Skate (20.61) and other similar species. The Whitelip Skate has a longer and more densely prickled tail.

SMOOTH DEEPSEA SKATE

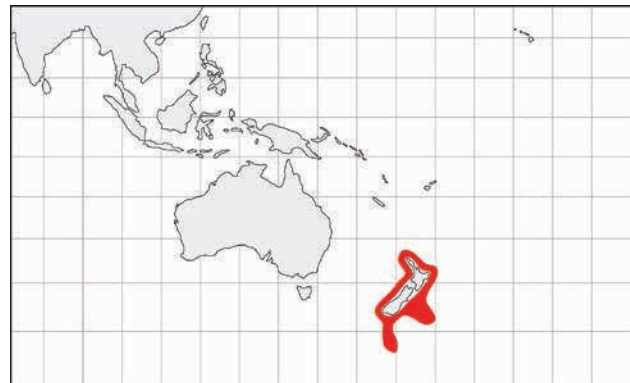
20.61

Brochiraja asperula (Garrick & Paul, 1974)

DD

IDENTIFICATION. Medium-sized skate with an oval to heart-shaped disc, largely smooth skin, thorns before and after eye, v-shaped thorn on snout, long slender tail, and whitish to greyish brown above and darker ventrally. Disc most curvaceous in adults, 1.2–1.3 times broader than long; apex broadly rounded. Snout rather short, flexible, lacking firm rostral cartilage, with distinct fleshy lobe at tip. Eye large, length 2.4–2.8 in snout length, 1.2–1.5 times interorbital space. Mouth arched slightly, nasal flaps broadly lobed, dermal fringe weak; tooth rows in upper jaw 49–66. Dorsal denticles short, in broad median band on back and extending onto tail; entirely smooth ventrally. Single thorn on preorbit, up to 4 thorns posteriorly around eye; rostral thorn broad based, slightly forward of mid-snout; alar thorn patch well developed in adult males; tail thorns in regular median row, shorter lateral rows sometimes present. Tail oval, tapering gently, length 1.3–1.4 times precloacal length; lateral folds well developed posteriorly. Pelvic-fin margin deeply notched. Dorsal fins short, well separated, procaudal length slightly exceeding prespiracular length; caudal-fin upper lobe slightly longer than second dorsal-fin base. Pectoral-fin radials 66–71. Predorsal tail vertebrae 65–70, abdominal vertebrae 26–28, predorsal vertebrae 91–97.

COLOUR. Variable, plain whitish, greyish, brownish or purplish above, without distinct bluish hues. Ventral surface always darker, varying from greyish to brownish, and



darkest on snout and around mouth; no rows of white sensory pores.

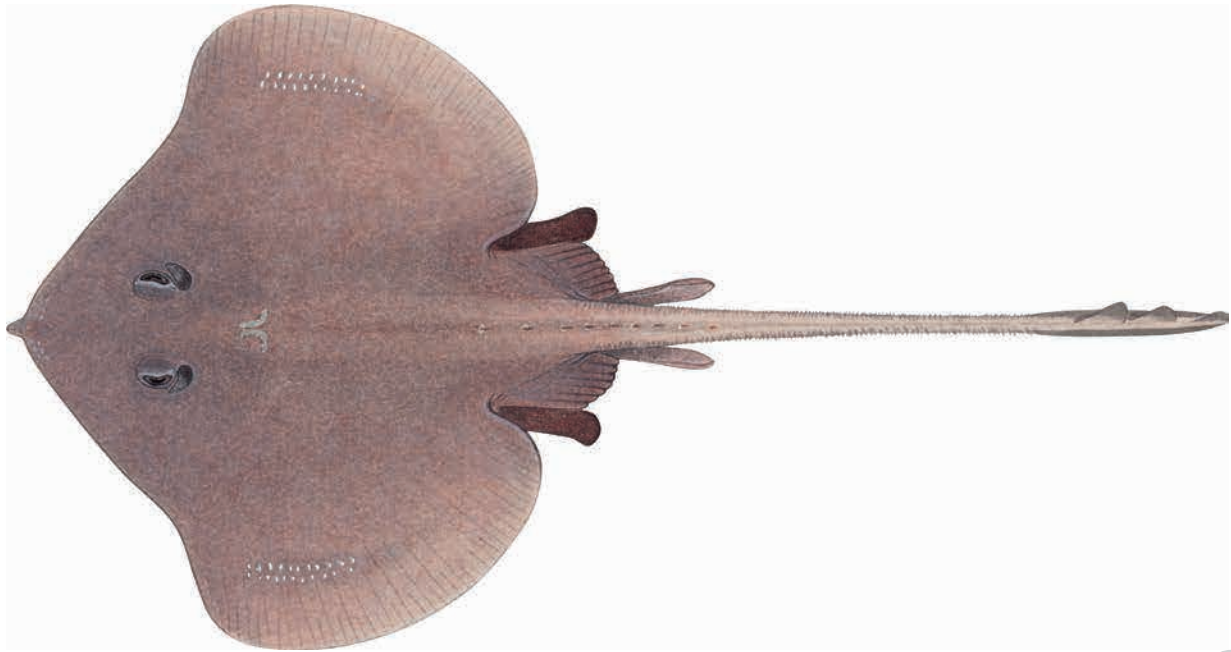
SIZE. Attains at least 78 cm TL; males mature at ~51 cm TL.

HABITAT AND BIOLOGY. South-West Pacific; off New Zealand. Demersal along insular slopes to depths of ~1150 m, but typically in 300–600 m. Nothing known of its life history.

SIMILAR SPECIES. Members of this genus typically have a single thorn with divergent spiny tips (appears v-shaped) on the snout that is usually most prominent in young. Several species occur on deep plateaus and along the insular slopes surrounding New Zealand.

EUREKA SKATE

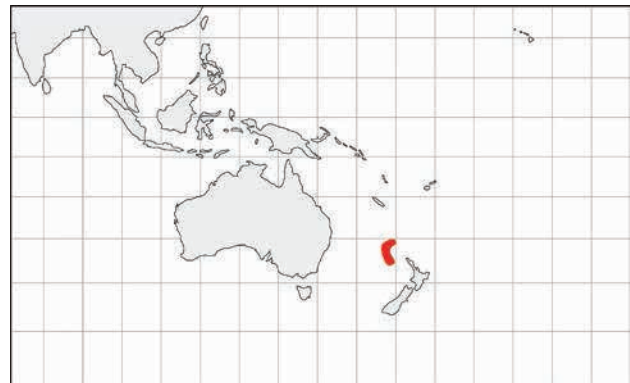
20.62

Brochiraja heuresa Last & Séret, 2012

NE

IDENTIFICATION. Small skate with a broadly oval to weakly heart-shaped disc, skin velvety on dorsal surface, 1–2 orbital thorns, small v-shaped thorn on snout, long tail, and bluish pink above and reddish brown ventrally. Disc less curvaceous in young, 1.1–1.2 times broader than long; apex broadly rounded. Snout medium-size, flexible, only basal part of rostral cartilage firm, with small lobe at tip. Eye rather large, orbit length 2.7–3.4 in snout length, 0.9–1.1 times interorbital space. Mouth arched slightly, nasal flaps broadly lobed, dermal fringe weak; tooth rows in upper jaw 30–42. Dorsal denticles small, closely set; disc smooth ventrally, tail usually rough near its base. Thorns weak, confined to snout, orbits, tail, and alar region of mature males; rostral thorn often rudimentary, slightly forward of mid-snout; preorbital thorn minute, postorbital thorn sometimes present; alar patch broad; thorns on mid-line of tail barely larger than adjacent denticles. Tail rather slender, tapering towards tip, length 1.2–1.3 times precloacal length; lateral skin folds very well developed posteriorly. Pelvic-fin margin deeply notched, anterior lobe fleshy. Dorsal fins short, barely separated, procaudal length slightly less than prespiracular length; caudal-fin upper lobe subequal to second dorsal-fin base. Pectoral-fin radials 58–63. Predorsal tail vertebrae 65–76, abdominal vertebrae 22–26, predorsal vertebrae 88–100.

COLOUR. Uniform bluish pink above, anterior pelvic-fin lobe reddish brown. Ventral surface of disc largely reddish



brown, mouth white; tail brownish and white; sensory pores white, well defined.

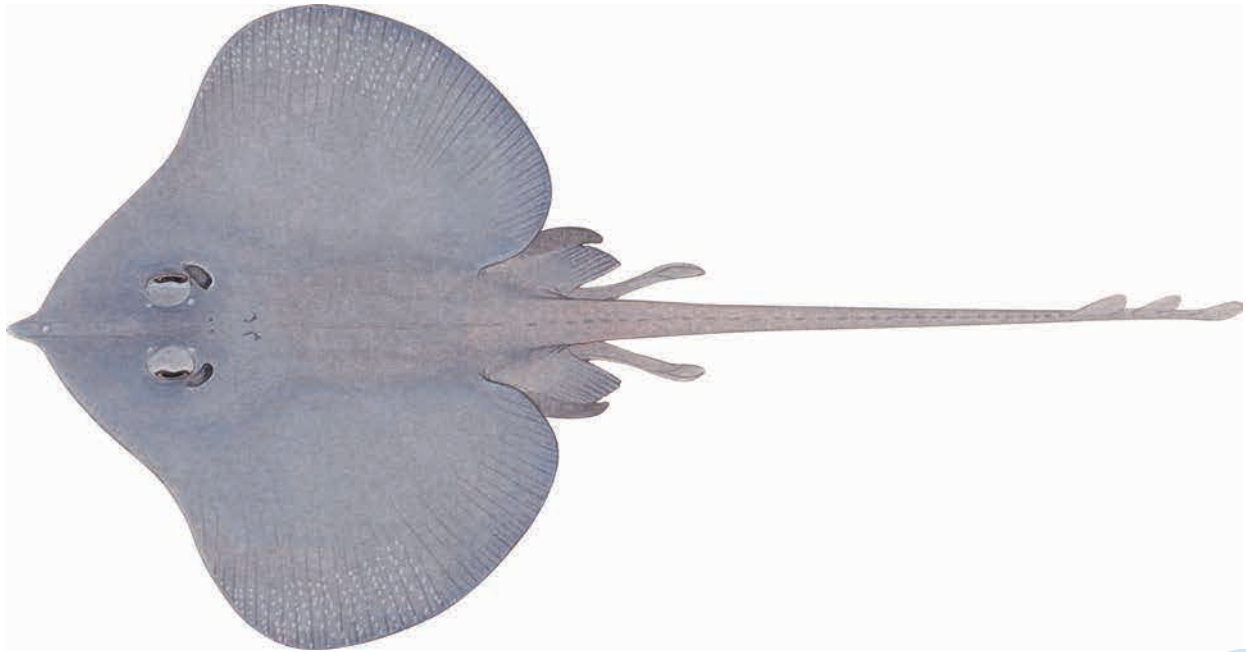
SIZE. Adult males to at least 38 cm TL; maturity size probably similar as several males still adolescent at 36 cm TL.

HABITAT AND BIOLOGY. South-West Pacific; northern Tasman Sea. Demersal on deep-sea banks and insular slopes at 870–1350 m depths. Life history unknown.

SIMILAR SPECIES. Superficially similar in appearance to the very rare and sympatric Enigma Skate (20.59), but differs markedly in dimensions and counts.

BLUE DEEPSEA SKATE

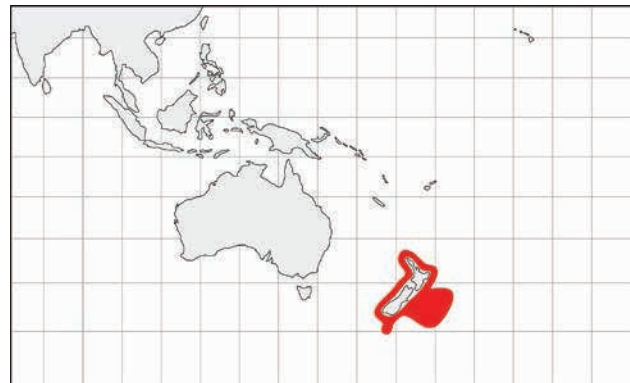
20.63

Brochiraja leviveneta Last & McEachran, 2006

DD

IDENTIFICATION. Medium-sized skate with a strongly heart-shaped disc in adults, largely smooth skin, 2 orbital thorns, large v-shaped thorn on snout, long slender tail, and bluish above and darker bluish brown ventrally. Disc less curvaceous in young, only slightly broader than long; apex broadly rounded. Snout medium-size, flexible, lacking firm rostral cartilage, with broad-based lobe at tip. Eye large, length 2.6–3.4 in snout length, 1.2–1.6 times interorbital space. Mouth arched slightly, nasal flaps broadly lobed, dermal fringe weak; tooth rows in upper jaw 32–43. Dorsal denticles very short, confined to narrow median band on back and extending onto sides of tail; entirely smooth ventrally. Thorns on disc confined to mid-snout, orbit and malar and alar regions of mature males; single broad-based thorn on preorbit, one on postorbit; rostral thorn broad based, close to snout apex; 2 malar patches, alar and posterior malar patches joined; tail thorns in regular median row. Tail oval, tapering gradually, length 1.3–1.5 times preloacal length; lateral folds well developed posteriorly. Pelvic-fin margin deeply notched. Dorsal fins short, almost connected, procaudal length slightly shorter than prespiracular length; caudal-fin upper lobe much longer than second dorsal-fin base. Pectoral-fin radials 64–69. Predorsal tail vertebrae 70–75, abdominal vertebrae 24–27, predorsal vertebrae 95–100.

COLOUR. Pale to medium greyish blue above, usually darker on head and around outer disc; anterior pelvic-fin lobe much darker than posterior lobe; dorsal fins bluish with



white bases. Ventral surface of disc dark bluish brown with bluish black border; tail greyish blue with white tip; white sensory pores strongly demarcated.

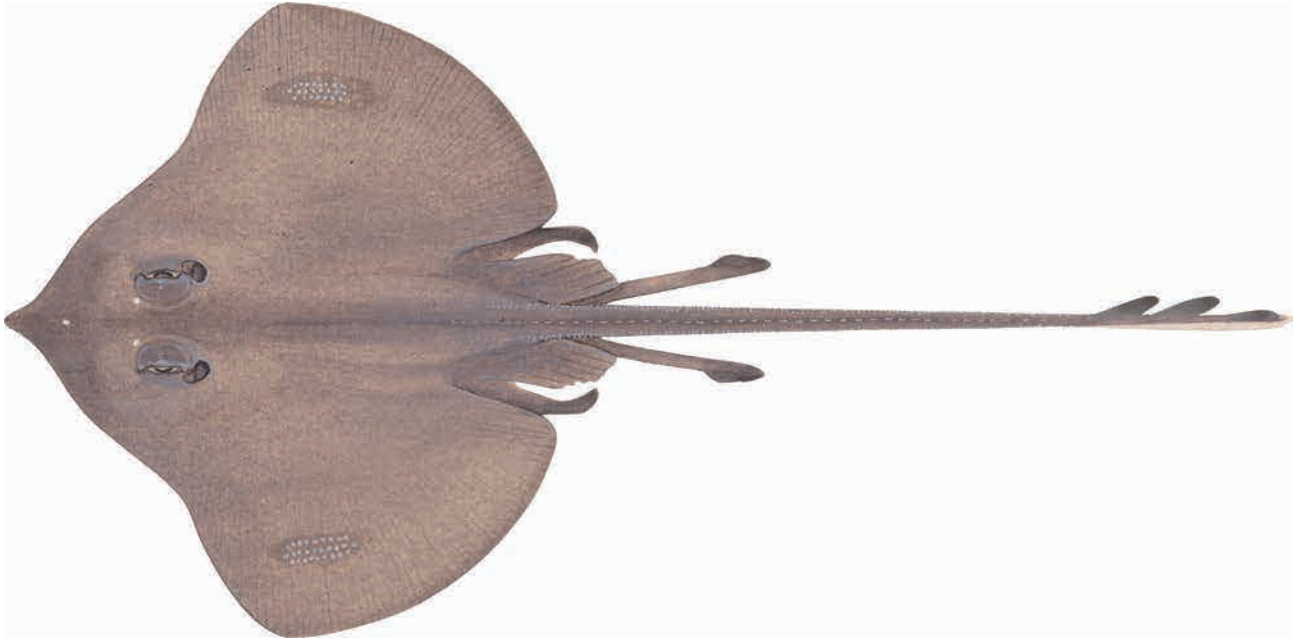
SIZE. Attains at least 51 cm TL; males mature at ~43 cm TL.

HABITAT AND BIOLOGY. South-West Pacific; off New Zealand. Demersal on insular slopes and plateaus at 300–1200 m depths, but typically in 900–1100 m. Little known of its life history.

SIMILAR SPECIES. Distinctive smooth-skinned member of this genus distinguished from the Whitelip (20.60) and Smooth Deepsea (20.61) Skates by its coloration, more angular disc and the presence of 2 malar thorn patches on each side in males.

SMALL DEEPSEA SKATE

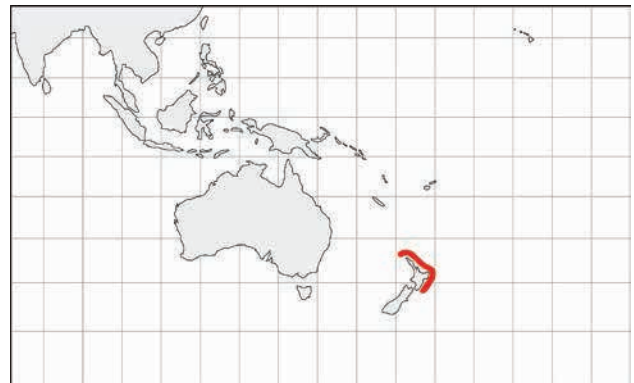
20.64

Brochiraja microspinifera Last & McEachran, 2006

DD

IDENTIFICATION. Small skate with a weak heart-shaped disc in adults, skin rough on dorsal surface, 1 orbital thorn, small v-shaped thorn on snout, moderately elongate tail, and both surfaces of disc dark brownish. Disc less curvaceous in young, 1.1–1.2 times broader than long; apex broadly rounded. Snout medium-size, flexible, only basal part of rostral cartilage firm, with broad-based lobe at tip. Eye rather large, length 2.1–2.8 in snout length, 1.1–1.6 times interorbital space. Mouth arched slightly, nasal flaps broadly lobed, dermal fringe weak; tooth rows in upper jaw 33–37. Dorsal denticles small, rather widely and irregularly spaced, sometimes partly embedded; band of larger denticles extending along sides of tail; entirely smooth ventrally. Thorns confined to posterior mid-disc, tail, snout, preorbit, and alar regions of mature males; single broad-based thorn on preorbit, absent from postorbit; rostral thorn closer to orbit than snout apex; no separate malar patch, alar patch small; tail thorns in regular median row. Tail narrow based, tapering gradually, length 1.2–1.4 times precloacal length; lateral folds well developed posteriorly. Pelvic-fin margin deeply notched. Dorsal fins short, barely separated, procaudal length usually longer than prespiracular length; caudal-fin upper lobe longer than second dorsal-fin base. Pectoral-fin radials 58–63. Predorsal tail vertebrae 59–64, abdominal vertebrae 22–25, predorsal vertebrae 81–88.

COLOUR. Medium to dark brown above; often with blackish peppery spots, some parts including snout tip and



fins slightly darker. Ventral surface uniformly dark brown or mottled; white sensory pores usually demarcated.

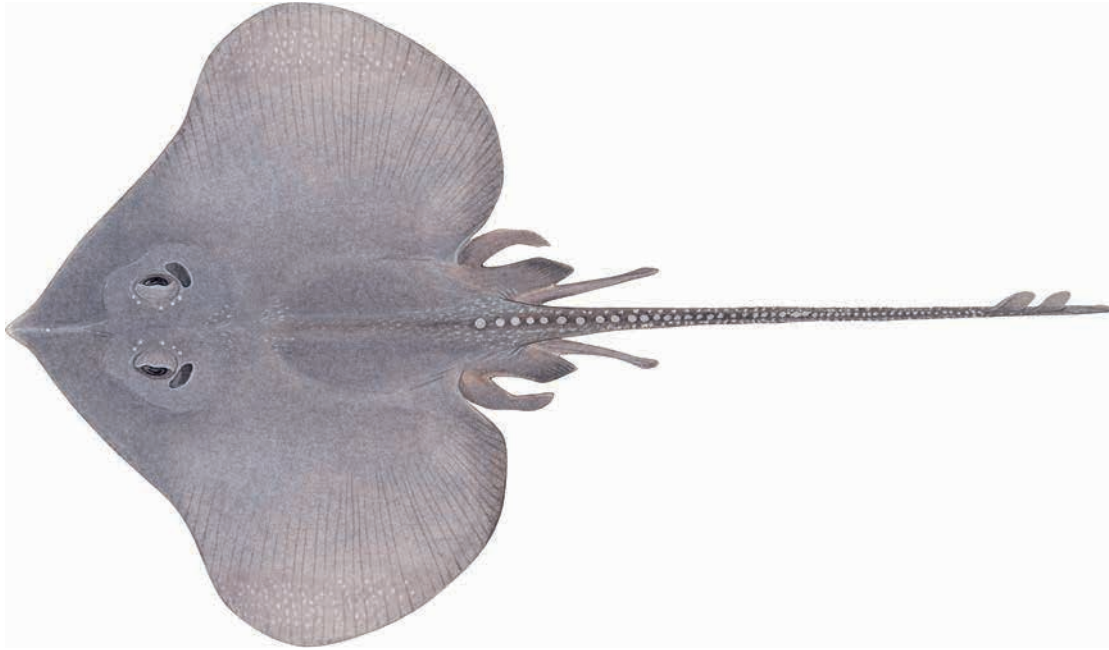
SIZE. Attains at least 33 cm TL; males mature at ~27 cm TL.

HABITAT AND BIOLOGY. South-West Pacific; off North Island of New Zealand. Demersal on insular slope at 600–1200 m depths. Nothing known of its life history.

SIMILAR SPECIES. Smallest member of this genus, distinguished from the rough-skinned Spiny Deepsea Skate (20.65) by its darker coloration, lower vertebral count, and smaller alar thorn patches in adult males.

SPINY DEEPSEA SKATE

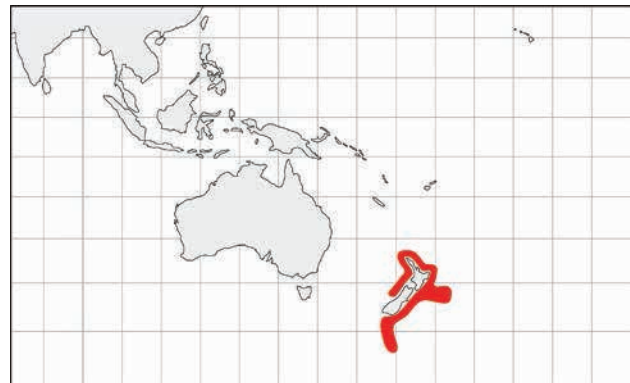
20.65

Brochiraja spinifera (Garrick & Paul, 1974)

DD

IDENTIFICATION. Medium-sized skate with a broad heart-shaped disc, skin rough on dorsal surface, rosette of orbital thorns, v-shaped thorn on snout, moderately elongate tail, and upper surface paler than ventral surface. Disc less curvaceous in young, 1.1–1.3 times broader than long; apex broadly rounded. Snout medium-size, flexible, only basal part of rostral cartilage firm, with broad-based lobe at tip. Eye large, length 2.5–2.9 in snout length, 1.3–1.5 times interorbital space. Mouth arched slightly, nasal flaps broadly lobed, dermal fringe weak; tooth rows in upper jaw 47–65. Dorsal denticles small, closely set, covering disc and tail including dorsal and caudal fins; disc smooth ventrally, tail usually rough near its base. Thorns confined to snout, orbit, posterior disc, tail, scapular region of large females, and alar region of mature males; rostral thorn small, slightly forward of mid-snout; 5–11 thorns beside orbit; no obvious malar patch, alar patch large; tail thorns in multiple irregular rows. Tail slender, very narrow towards tip, length 1.4 times precloacal length; lateral folds short, well developed posteriorly. Pelvic-fin margin deeply notched. Dorsal fins short, separated slightly, procaudal length typically subequal to prespiracular length; caudal-fin upper lobe longer than second dorsal-fin base. Predorsal tail vertebrae 74–79, abdominal vertebrae 24–27, predorsal vertebrae 98–105.

COLOUR. Uniform bluish grey to greyish brown above; rarely whitish or with irregular blackish blotches; anterior



pelvic-fin lobes and tail fins usually bluish black. Ventral surface dark; head usually dark grey to black, rest of disc paler grey or brown, tail greyish to white; sensory pores greyish.

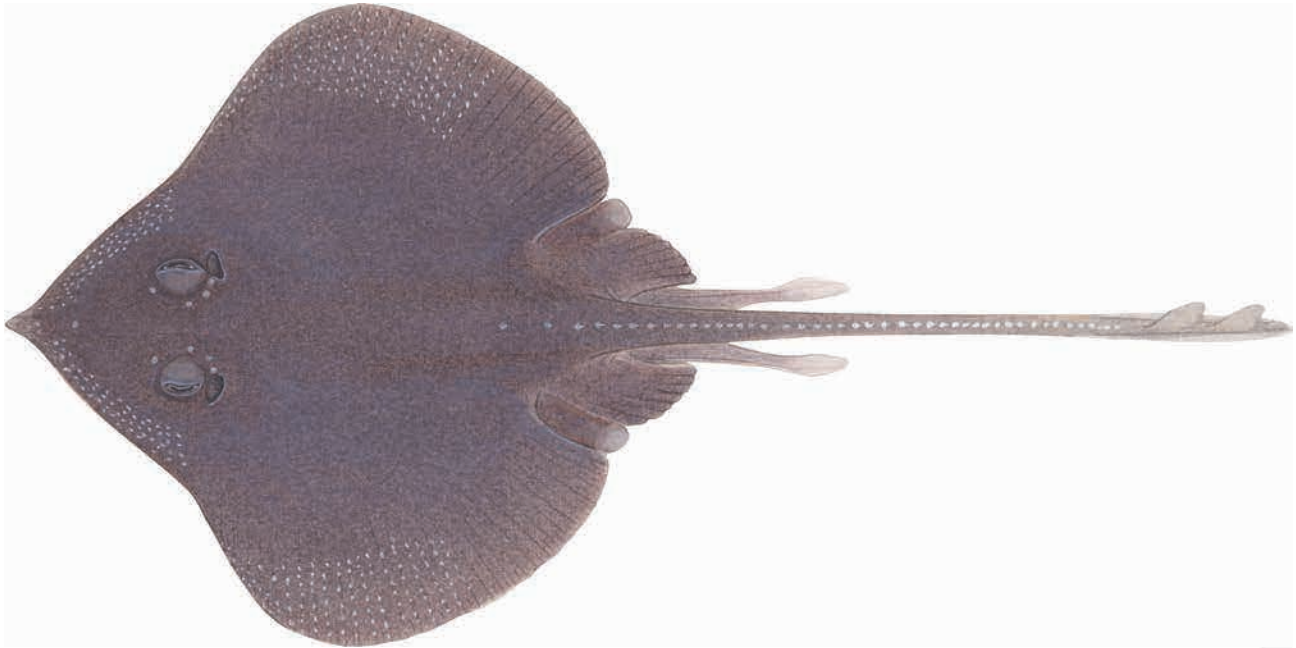
SIZE. Attains ~84 cm TL; males mature from ~61 cm TL.

HABITAT AND BIOLOGY. South-West Pacific; off New Zealand. Demersal and widespread on insular shelves and slopes at 125–1500 m depths, primarily in 400–800 m. Caught as bycatch in the Orange Roughy (*Hoplostethus atlanticus*) fishery.

SIMILAR SPECIES. Exists as several colour forms that are geographically separated and may constitute separate species.

RIBBONTAIL SKATE

20.66

Brochiraja vittacauda Last & Séret, 2012

NE

IDENTIFICATION. Medium-sized skate with a suboval to heart-shaped disc, 2–4 orbital thorns, small v-shaped thorn on snout, skin largely smooth on dorsal surface, long tail with very broad skin folds, skin bluish to reddish brown above, and darker bluish brown below. Disc probably less curvaceous in young, 1–1.1 times broader than long; apex broadly rounded. Snout medium-size, flexible, basal part of rostral cartilage firm, with small lobe at tip. Eye large, length 2.8–3.1 in snout length, 1.1–1.2 times interorbital space. Mouth arched slightly, nasal flaps broadly lobed, dermal fringe weak; tooth rows in upper jaw 40–44. Dorsal denticles minute, confined to narrow median band extending along disc and onto tail; entirely smooth ventrally. Thorns confined to mid-snout, orbits, mid-line of tail, and well-developed alar and malar patches in adult males; rostral thorn forward on snout; malar thorns in 2 patches, anteriormost forward of orbit; alar patch well developed; thorns on tail enlarged slightly, in regular row on mid-line. Tail rather slender, tapering towards tip, length 1.4–1.6 times precloacal length; lateral folds very well developed. Pelvic-fin margin deeply notched, anterior lobe fleshy. Dorsal fins low, separated slightly, precaudal length equal to or slightly greater than snout length; caudal-fin upper lobe subequal to second dorsal-fin base. Pectoral-fin radials ~76–77. Predorsal tail vertebrae 84–86, abdominal vertebrae ~28, predorsal vertebrae 112–114.



COLOUR. Disc largely violet above; outer disc, pelvic fins and tail reddish brown. Ventral surface of disc slightly darker, bluish brown; tips of tail and anterior pelvic-fin lobes white; white sensory pores well defined.

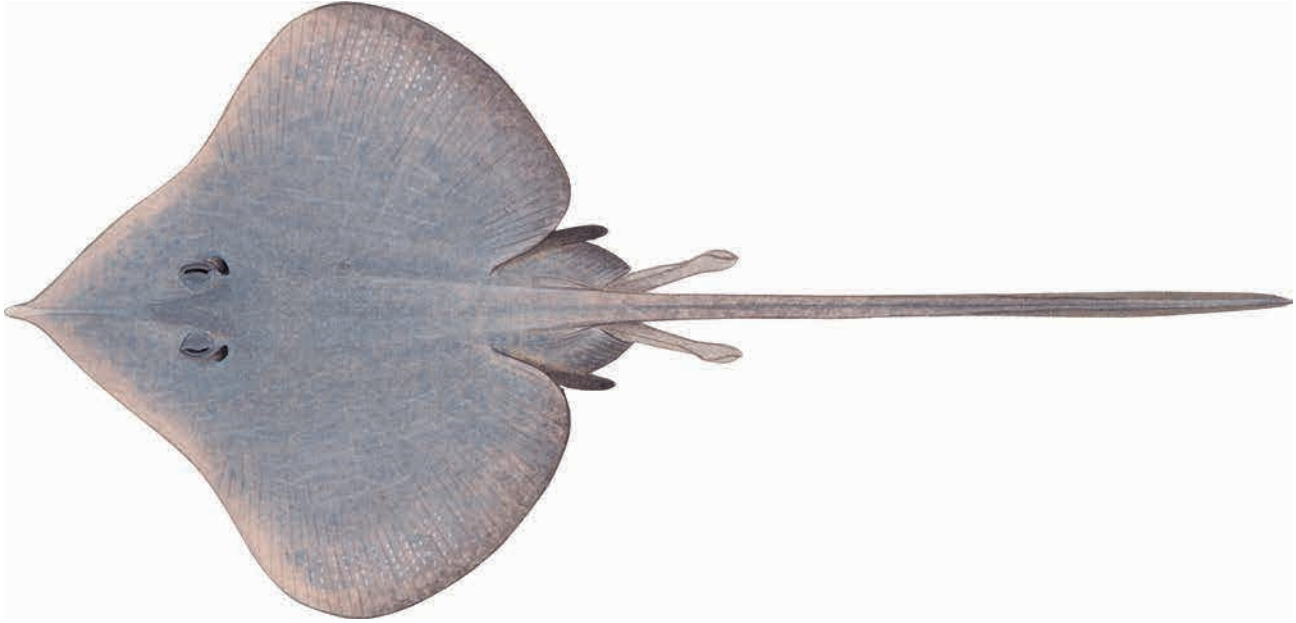
SIZE. Attains at least 72 cm TL.

HABITAT AND BIOLOGY. South-West Pacific; northern Tasman Sea. Demersal on deep-sea banks and insular slopes at 630–975 m depths. Only known from 2 individuals.

SIMILAR SPECIES. Occurs with the Enigma Skate (20.59) on the West Norfolk Ridge, but is probably larger in size, and can be distinguished by a less granular disc and better-developed thorn patches around the eyes.

EASTERN LOOSESKIN SKATE

20.67

Insentiraja laxipella Yearsley & Last, 1992

DD

IDENTIFICATION. Medium-sized skate with a subcircular to weakly heart-shaped disc and very long tail, skin velvety and flabby over upper surface of disc and tail, typically lacking thorns, no dorsal fins, and uniformly pale blue above. Disc heart-shaped in adult males, more circular in females and young, apices broadly rounded, broader than long. Snout flexible, with a fleshy lobe at tip, lacking a firm rostral cartilage; moderately elongate in adults, its length 3.7–5.3 times orbit length; orbit small, 1–1.3 in interorbital space. Mouth rather wide, nasal flaps broadly lobed; tooth rows in upper jaw 32–39. Dorsal disc and tail uniformly covered with fine denticles; all thorns absent apart from alar patch in adult males; skin on ventral surface loose and entirely smooth. Tail very slender, mostly circular in cross-section, its length 1.2–1.4 times precloacal length; lateral folds well developed, widening toward tail tip. Pelvic-fin margin deeply notched, anterior lobes long. Dorsal fins absent, caudal fin obscure. Pectoral-fin radials 64–66. Abdominal vertebrae 24–26, total tail vertebrae (to tail tip) 94–95.

COLOUR. Uniformly pale bluish above, paler anteriorly on disc; anterior lobe of pelvic fin darker, greyish brown; tail with white patches; caudal fin and lateral folds bluish black. Undersurface with skin almost transparent, revealing light and dark areas beneath; tail white to greyish blue.



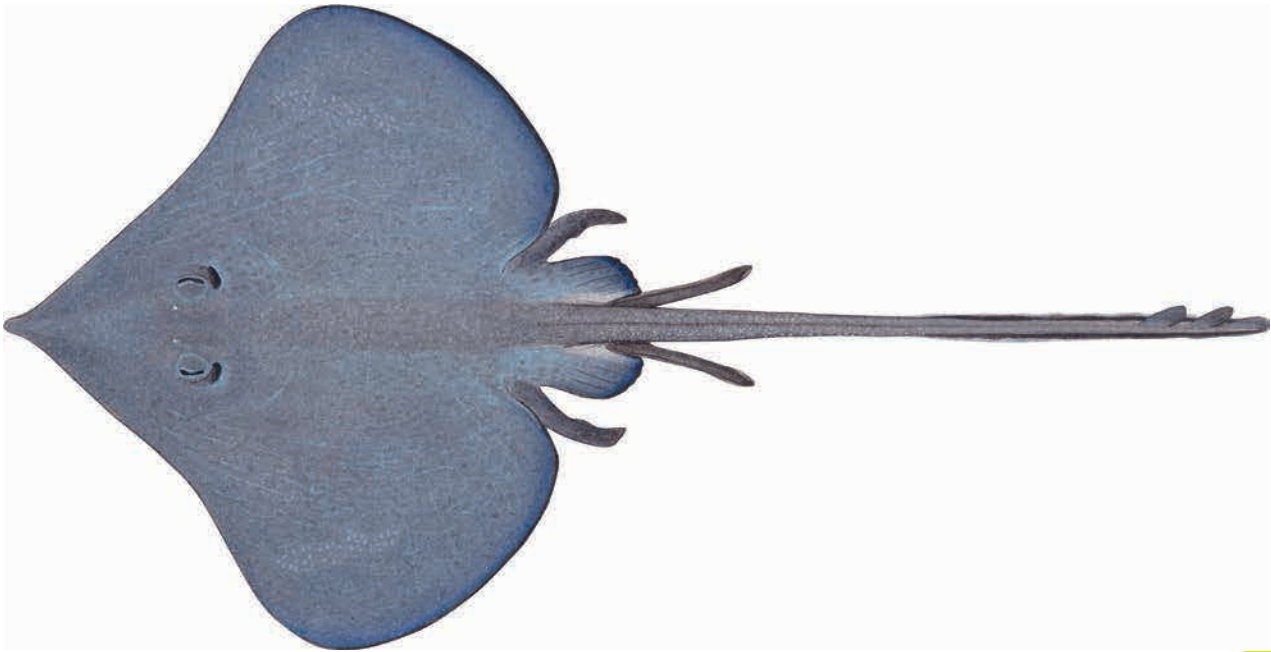
SIZE. Largest known specimen a 57 cm TL adult male.

HABITAT AND BIOLOGY. South-West Pacific; Coral Sea off north-eastern Australia. Demersal on continental and insular slopes at ~800–880 m depths. Known from very few specimens and nothing known of its biology.

SIMILAR SPECIES. Resembles the Western Looseskin Skate (20.68) in general appearance, but is distinguishable from this species, and all other softnose skates in the Australasian region, in lacking dorsal fins on the tail; the Longtail Skate (20.1) from New Zealand seas has a single dorsal fin.

WESTERN LOOSESKIN SKATE

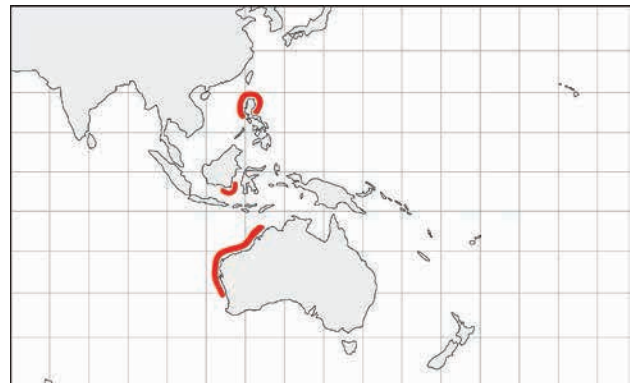
20.68

Insentiraja subtilispinosa (Stehmann, 1989)

LC

IDENTIFICATION. Medium-sized skate with a subcircular to weakly heart-shaped disc and very long tail, skin velvety and flabby over upper surface of disc and tail, pair of orbital thorns present but no other thorns on disc or tail, 2 posteriorly positioned dorsal fins, and dark bluish above. Disc heart-shaped in adult males, more circular in females and young, apices broadly rounded, broader than long. Snout flexible, with a fleshy lobe at tip, lacking a firm rostral cartilage; moderately elongate in adults, its length 3.7–4.9 times orbit length; orbit small, length 1–1.1 in interorbital space. Mouth rather wide, nasal flaps broadly lobed; tooth rows in upper jaw 40–47. Dorsal disc and tail uniformly covered with fine denticles; single preorbital thorn, thorns absent from all other regions apart from alar patch in adult males; skin on ventral surface loose and entirely smooth. Tail very slender, mostly circular in cross-section, its length 1.4–1.6 times precloacal length; lateral folds well developed, widening toward tail tip. Pelvic-fin margin deeply notched, anterior lobes long. Dorsal fins small, situated close together; caudal fin low. Claspers long, very slender. Pectoral-fin radials 57–64. Predorsal vertebrae 98–107, abdominal vertebrae 23–27, predorsal tail vertebrae 74–83.

COLOUR. Medium to dark blue above, often with irregular white flecks; anterior margins of disc and snout tip not paler than remainder of disc; tail and anterior pelvic-fin lobe bluish brown; dorsal and caudal fins bluish black; lateral



folds black. Claspers dark above, usually paler below. Skin of ventral surface almost transparent; bluish brown beneath, darkest on outer disc; tail pale.

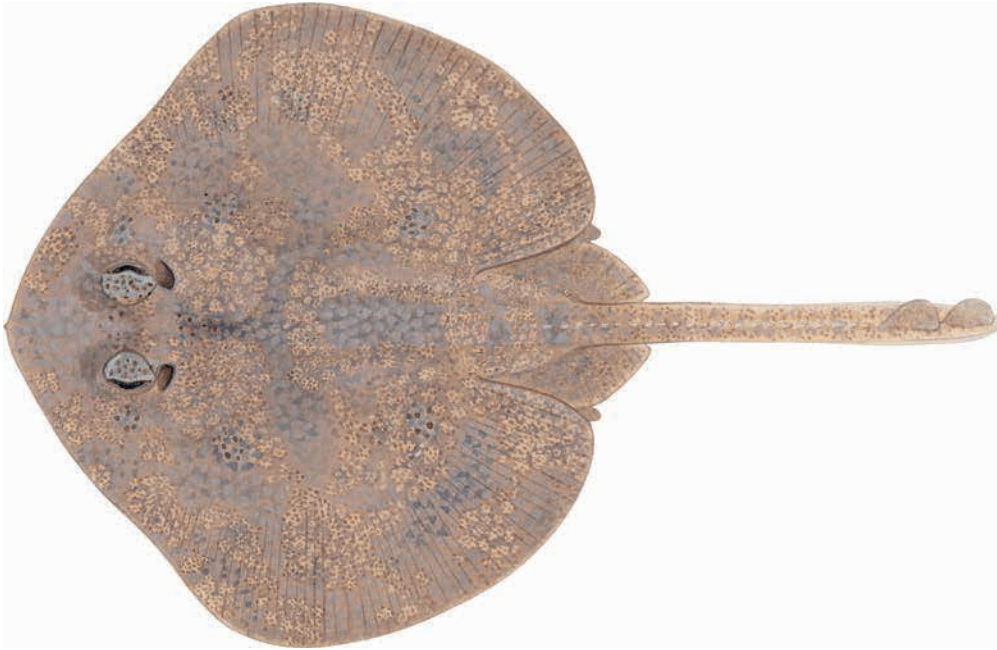
SIZE. Attains at least 57 cm TL; males mature at ~50 cm TL.

HABITAT AND BIOLOGY. Western Pacific and Eastern Indian Ocean; subtropical Western Australia to Philippines. Demersal, with patchy distribution on continental and insular slopes at 320–1460 m depths, generally in 900–1110 m depth interval. Little known of its biology.

SIMILAR SPECIES. Most similar to the Eastern Looseskin Skate (20.67), but distinguishable from this species in having a darker body colour and retaining both dorsal fins. Populations differ subtly in morphology across its range.

SOUTHERN ROUND SKATE

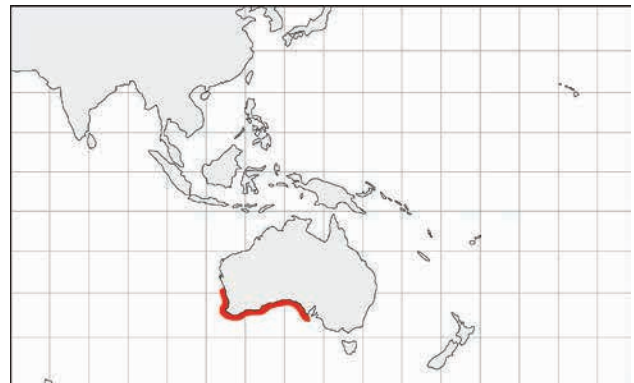
20.69

Irolita waitii (McCulloch, 1911)

LC

IDENTIFICATION. Medium-sized skate with a smooth subcircular disc, rather short tail, few orbital thorns, dense coverage of white pores on ventral surface and clusters of fine bluish spots dorsally. Disc almost circular, slightly broader than long. Snout very short, broad, flexible, lacking a firm rostral cartilage, with fleshy lobe at tip, its length 2.3–3 times orbit length; interorbital space 1.1–1.5 times orbit length. Mouth broad, nasal flaps broadly lobed, lacking a dermal fringe; tooth rows in upper jaw 41–51. Both surfaces of disc and tail without granular denticles; no nuchal or malar thorns, usually with single thorn before and after eye; alar thorns in narrow band; tail thorns short, usually in 3 rows on dorsal mid-line. Tail very depressed, barely tapering, its length ~0.9–1 times precloacal length; lateral folds very well developed. Pelvic-fin margin deeply incised. Dorsal fins small, upright, separated slightly, at tip of tail; caudal fin minute. Pectoral-fin radials 101–105. Predorsal vertebrae 103–112, abdominal vertebrae 39–43, predorsal tail vertebrae 62–69.

COLOUR. Pale yellowish to brown above with clusters of small blue spots mixed with similar aggregations of small brownish spots; bluish spots forming eye-sized ocelli on disc; pale with brownish peppering on orbit; skin folds pale; clasper pale with brown peppering dorsally; dorsal fins brownish. Undersurface greyish to black, often darker on head; sensory pores white.



SIZE. Attains ~52 cm TL; males mature at ~46 cm TL.

HABITAT AND BIOLOGY. South-East Indian Ocean; off south-western Australia. Demersal on mid- and outer continental shelf at 50–200 m depths. Caught occasionally as bycatch and typically discarded. Nothing known of its biology.

SIMILAR SPECIES. Similar to the Western Round Skate (20.70), but has a shorter tail, usually has orbital thorns (otherwise absent), and has a more complex pattern of blue spots and ocelli on the dorsal disc.

WESTERN ROUND SKATE

20.70

Irolita westraliensis Last & Gledhill, 2008

DD

IDENTIFICATION. Small skate with a smooth subcircular disc, rather long tail, usually lacking orbital thorns, dense coverage of greyish pores on ventral surface and widely spaced bluish spots dorsally. Disc almost circular, becoming weakly heart-shaped in adult males; slightly broader than long. Snout very short, broad, flexible, lacking a firm rostral cartilage, with minute fleshy lobe at tip, its length 1.9–3.1 times orbit length; interorbital space 1.1–1.3 times orbit length. Mouth broad, nasal flaps broadly lobed, lacking a dermal fringe; tooth rows in upper jaw 39–47. Both surfaces of disc and tail without granular denticles; no nuchal or malar thorns, orbital thorns rarely present; alar thorns in narrow band; tail thorns enlarged, 3–5 irregular rows. Tail slender, almost oval in cross-section, tapering slightly, its length ~1–1.2 times pre-cloacal length; lateral folds not really well developed. Pelvic-fin margin deeply incised. Dorsal fins small, tilted, separated slightly, near tip of tail; caudal fin minute. Pectoral-fin radials 87–94. Predorsal vertebrae 97–103, abdominal vertebrae 35–39, predorsal tail vertebrae 59–64.

COLOUR. Brownish with widely spaced bluish spots (not arranged in distinct clusters) of varying sizes above, some enlarged beside eye, on back and just in advance of pectoral-fin insertion; usually with a single dark brown spot on eye membrane; 3–4 brownish bands on tail; dorsal fins brownish; clasper brownish above, pale below. Undersurface



greyish green to dark brown; sensory pores with greyish centres.

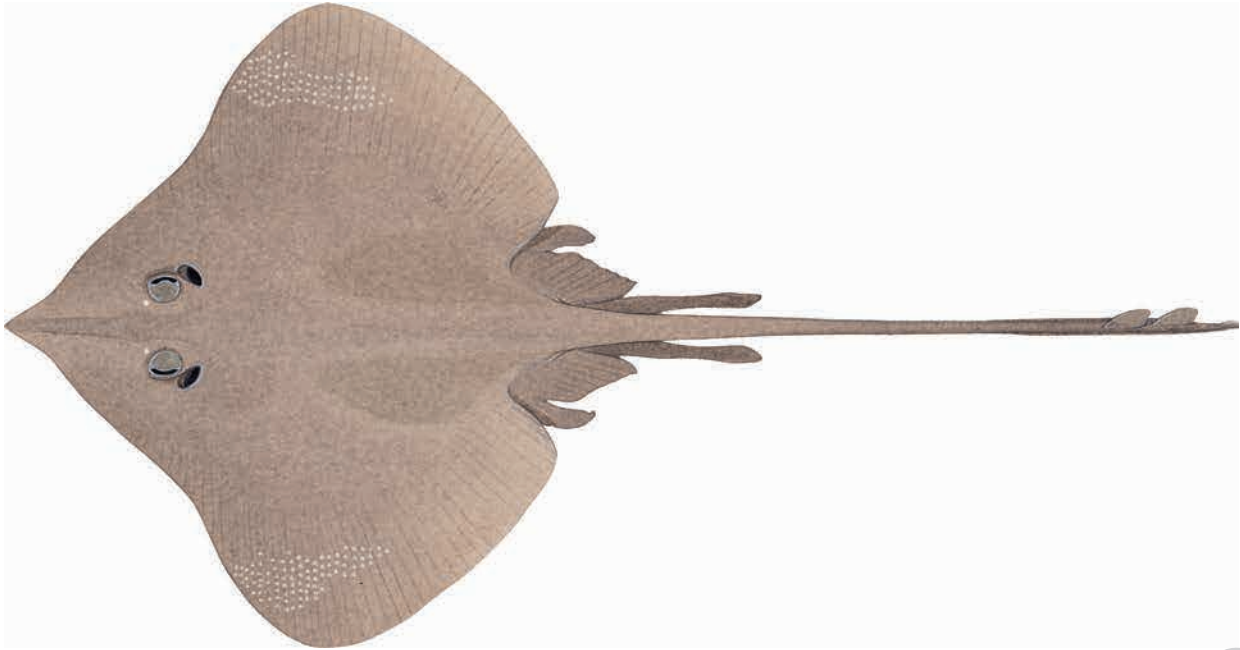
SIZE. Attains ~43 cm TL; males mature at ~35 cm TL.

HABITAT AND BIOLOGY. South-East Indian Ocean; off central Western Australia. Demersal on outer continental shelf at 140–210 m depths. Caught rarely and discarded as bycatch. Life history unknown.

SIMILAR SPECIES. Similar to the Southern Round Skate (20.69), but has a longer tail, usually lacks orbital thorns, and has a simpler pattern of larger and more widely spaced bluish spots on the dorsal disc.

ALIS' VELVET SKATE

20.71

Notoraja alisae Séret & Last, 2012

NE

IDENTIFICATION. Medium-sized skate with a velvety, heart-shaped disc in adults, long slender tail, single thorn before each eye but no other enlarged thorns on head or tail, and plain greyish brown coloration on both surfaces of disc. Disc somewhat rounded in young, becoming more curvaceous in adults, broader than long; apex broadly rounded. Snout moderately elongate, flexible, lacking firm rostral cartilage, with distinct fleshy lobe at tip. Eye rather large, orbit length 2.6–3.1 in snout length, 1.1–1.4 times interorbital space. Mouth medium-sized, arched, nasal flaps broadly lobed, lacking dermal fringe; tooth rows in upper jaw 34–45. Both surfaces of disc and tail densely covered with fine bristle-like denticles giving skin a velvety feel. Preorbital thorn rudimentary; alar and malar patches joined, thorns small. Tail narrow-based, oval in cross-section, tapering gently to its tip, length 1.4–1.6 times precloacal length; lateral folds confined to posterior half of tail, wide near tail tip. Pelvic-fin margins deeply notched. Dorsal fins short and rather tall, separated slightly, procaudal length about equal to snout length; caudal-fin upper lobe longer than second dorsal-fin base. Pectoral-fin radials 61–64. Predorsal vertebrae 72–82, abdominal vertebrae 24–25, predorsal tail vertebrae 96–107.

COLOUR. Plain pale greyish brown to dark grey above. Ventral surface similarly greyish or slightly paler; sensory pores white, most pronounced in dark specimens.



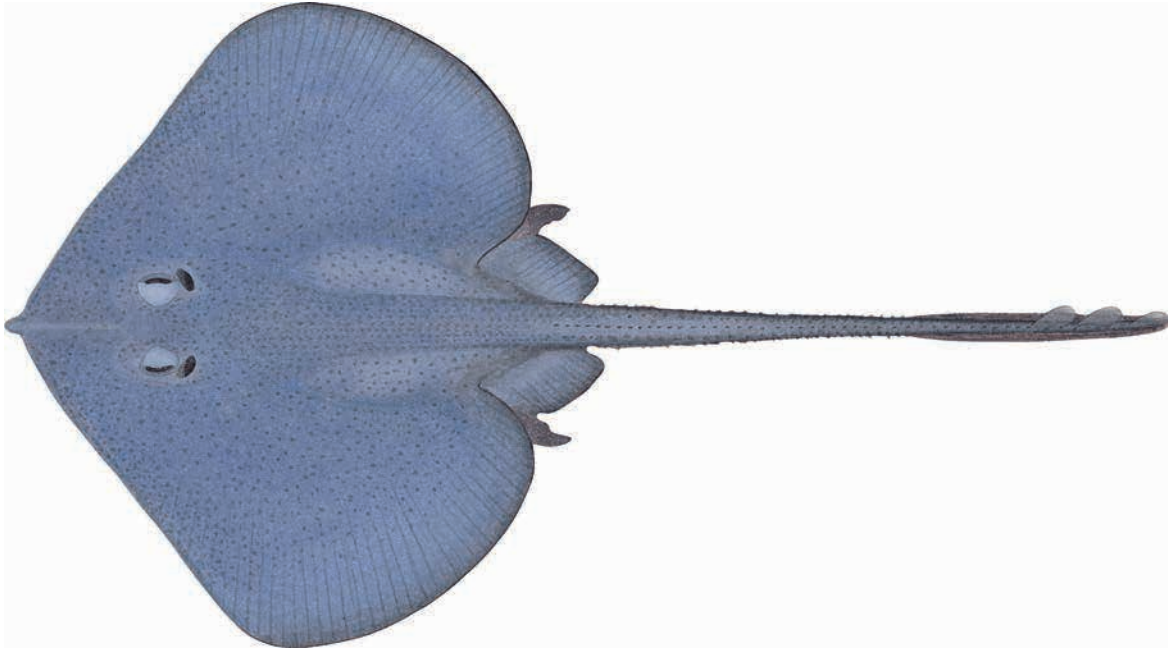
SIZE. Attains at least 55 cm TL; males mature at ~46 cm TL.

HABITAT AND BIOLOGY. South-West Pacific; New Zealand to Vanuatu. Demersal on insular slopes, probably mainly on hard bottoms, at 870–1050 m depths. Caught rarely and nothing known of its life history.

SIMILAR SPECIES. Belongs to a group of Western Pacific skates, also known as 'velcro skates' or 'velvet skates', because of the velvety nature of their skin. Members of the group are also similar in appearance, differing subtly in morphology and counts.

BLUE SKATE

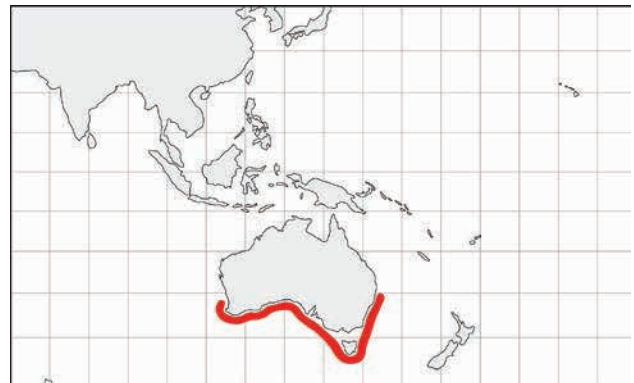
20.72

Notoraja azurea McEachran & Last, 2008

LC

IDENTIFICATION. Medium-sized skate with a velvety, heart-shaped disc, long slender tail, single small preorbital and postorbital thorns, 2 irregular rows of thorns on anterior half of tail and median row on posterior half of tail, and greyish blue dorsally and greyish brown ventrally. Disc more subcircular in females and juveniles, 1.1–1.2 times broader than long; anterior margins strongly undulate in males, outer corners broadly rounded. Snout moderately elongate, flexible, lacking firm rostral cartilage; tip with prominent fleshy process. Eye moderately large, orbit length 3.3–4.2 in snout length, 1.3–1.4 times interorbital space. Mouth rather narrow, slightly arched; nasal flaps broadly lobed, its posterior margin smooth; tooth rows in upper jaw 32–43. Juveniles covered uniformly with fine bristle-like dermal denticles, giving skin a velvety feel; adults largely smooth, except along disc margins and dorsal mid-line; ventral surface smooth. Tail long and very slender, oval in cross-section, tapering gently to its tip; length 1.2–1.4 times precloacal length; lateral folds well developed. Pelvic-fin margins deeply notched. Dorsal fins rather short and moderately tall, usually separated slightly, caudal-fin upper lobe distinctly longer than second dorsal-fin base. Pectoral-fin radials 66–69. Predorsal vertebrae 76–79, trunk vertebrae 25–27, predorsal tail vertebrae 103–104.

COLOUR. Dorsal surface plain greyish blue to dark blue, sometimes with fine dark spots. Ventral surface medium



brown centrally, dark bluish black along margins, frequently pale around gill slits and mouth; sensory pores sometimes pale.

SIZE. Attains at least 65 cm TL. Males mature at ~53 cm TL; young hatch at ~20 cm TL.

HABITAT AND BIOLOGY. South-West Pacific and South-East Indian Ocean; off southern Australia. Benthic on continental slope at 765–1440 m depths. Caught occasionally by deep-sea trawlers but biology unknown.

SIMILAR SPECIES. Resembles the Blotched Skate (20.80), also from southern Australia, but their colour patterns are clearly distinct (plain bluish *vs.* mottled dorsally in the Blotched Skate).

FIJIAN VELVET SKATE

20.73

Notoraja fijiensis Séret & Last, 2012

NE

IDENTIFICATION. Small to medium-sized skate with a velvety, heart-shaped disc, long tail, small thorn before each eye but no other enlarged thorns on head or tail, and pale yellowish brown above and paler ventrally. Disc probably rounded in young, becoming more curvaceous in adults, broader than long; apex broadly rounded. Snout moderately elongate, flexible, lacking firm rostral cartilage, with small triangular lobe at tip. Eye rather large, orbit length 2.5–3.3 in snout length, 1.2–1.4 times interorbital space. Mouth rather small, arched slightly, nasal flaps with weak lobes, lacking dermal fringe; tooth rows in upper jaw 32–38. Both surfaces of disc and tail densely covered with fine bristle-like denticles giving skin a velvety feel. Preorbital thorn conspicuous; form of alar and malar patches unknown; slightly enlarged denticles on tail but no thorns. Tail narrow-based, oval in cross-section, tapering gently to its tip, length 1.3–1.4 times precloacal length; lateral folds confined to posterior half of tail, not expanded near tail tip. Pelvic-fin margins very deeply notched. Dorsal fins flag like, rather tall, barely separated, procaudal length about equal to snout length; caudal-fin upper lobe much longer than second dorsal-fin base. Pectoral-fin radials 64–66. Predorsal vertebrae 77–81, abdominal vertebrae 25, predorsal tail vertebrae 102–106.

COLOUR. Plain pale yellowish brown, outer margin of disc paler; dorsal and caudal fins and mid-line of tail dusky. Ventral surface uniformly creamy white.



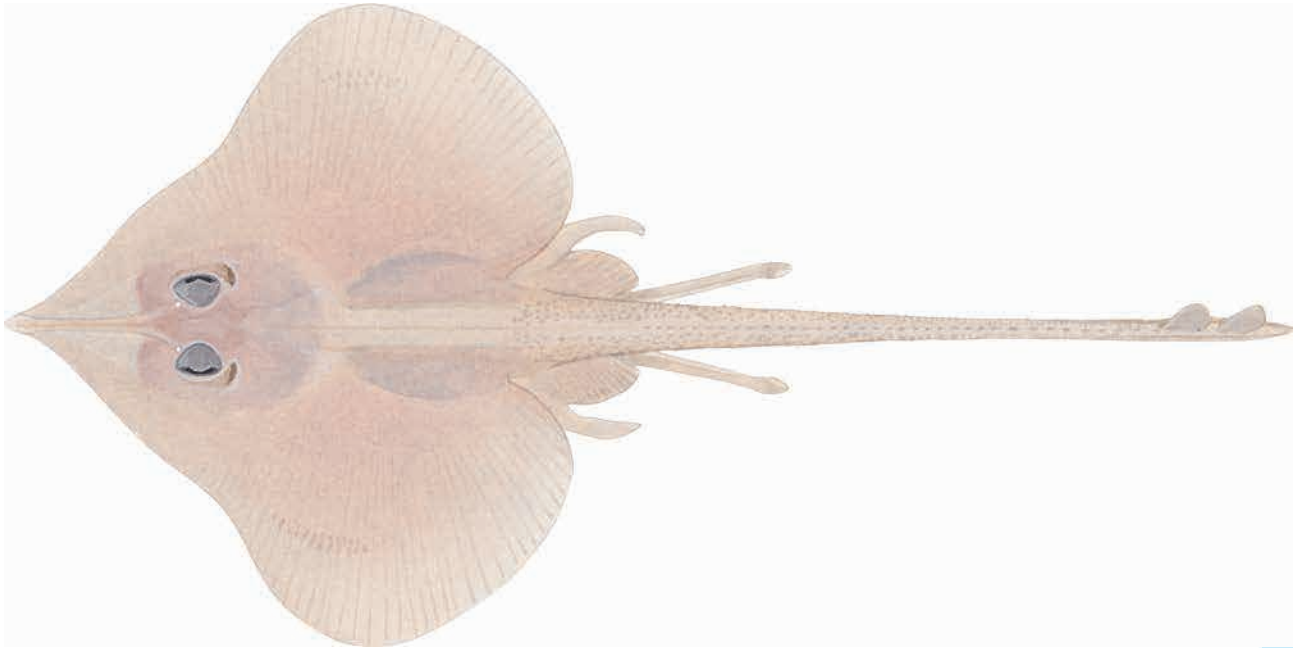
SIZE. Attains at least 40 cm TL; a male was immature at 31 cm TL.

HABITAT AND BIOLOGY. South-West Pacific; endemic to Fiji. Demersal on nearby insular slopes at 565–700 m depths. Nothing known of its life history.

SIMILAR SPECIES. A velcro skate distinguished from the similar Alis' Velvet Skate (20.71) from oceanic ridges to the west, by its more conspicuous preorbital thorns, paler coloration above, darker dorsal fins, and being white ventrally (rather than greyish).

AUSTRALIAN GHOST SKATE

20.74

Notoraja hirticauda Last & McEachran, 2006

DD

IDENTIFICATION. Small skate with a velvety, heart-shaped disc in adults, long slender tail prickly ventrally, single small preorbital thorn, but no other enlarged thorns on head or tail, and pale on both surfaces of disc. Disc heart-shaped in adult males, subcircular in juveniles, 1.1–1.2 times broader than long; anterior margins strongly undulate in adult males, outer corner broadly rounded. Snout moderately elongate, flexible, lacking firm rostral cartilage, with fleshy and flattened lobe at tip. Eye small to moderate, orbit length 2.3–4.2 in snout length, 1.1–1.3 times interorbital space. Mouth rather narrow, slightly arched, nasal flaps broadly lobed, posterior margin smooth; tooth rows in upper jaw 32–39. Dorsal surface of disc and tail covered with fine bristle-like denticles giving skin a velvety feel; denticles in irregular rows on tail; ventral surface of disc smooth, ventral surface of tail mostly prickly. Tail long and very slender, narrow-based, oval in cross-section, tapering gently to its tip, length 1.4–1.5 times precloacal length; lateral folds indistinct. Pelvic-fin margins deeply notched. Dorsal fins very small, lanceolate, close together; caudal-fin upper lobe low, longer than second dorsal-fin base. Pectoral-fin radials 61–66. Predorsal vertebrae 71–76, trunk vertebrae 24–27, predorsal tail vertebrae 95–102.

COLOUR. Dorsal surface uniformly pale. Ventral surface white or translucent; sensory pores not pigmented.



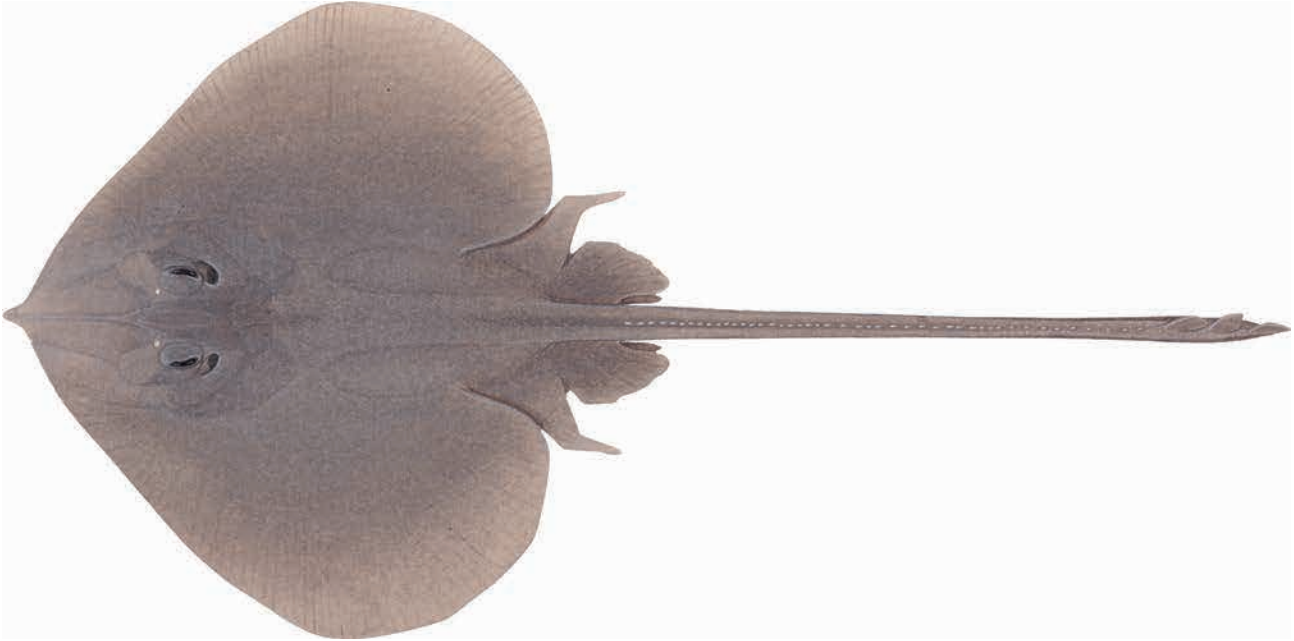
SIZE. Attains at least 45 cm TL.

HABITAT AND BIOLOGY. Eastern Indian Ocean; off Western Australia (Shark Bay to Monte Bello Islands). Demersal on continental slope at 500–760 m depths. Biology unknown.

SIMILAR SPECIES. Resembles the Pale Skate (20.78) because both sides of the disc are pale. However, the Pale Skate, which occurs in the Pacific Ocean (off Queensland, Australia), has 1–3 irregular rows of tail thorns (*vs.* no thorn rows) and the tail is smooth ventrally (*vs.* prickly).

STRANGE SKATE

20.75

Notoraja inusitata Séret & Last, 2012

NE

IDENTIFICATION. Medium-sized skate with a heart-shaped disc with only upper surface velvety, long tail, small thorn before each eye and row of small thorns on tail, and disc darker above than below. Disc weakly undulate, broader than long; apex broadly rounded. Snout rather long, flexible, with very flexible rostral cartilage and prominent triangular lobe at tip. Eye small, orbit length ~3.7 in snout length, subequal to interorbital space. Mouth rather narrow, jaws weakly arched, long nasal flaps with widely separated lobes, coarsely fringed; tooth rows in upper jaw ~41. Upper surface of disc densely covered with fine bristle-like denticles giving skin a velvety feel; ventral surface of disc smooth, most of tail covered with denticles. Preorbital thorn conspicuous, no other thorns on head; ~45 similar thorns in irregular row on tail; form of alar and malar patches unknown. Tail narrow-based, oval in cross-section, slightly expanded near dorsal fins, length ~1.4 times precloacal length; lateral folds extending over full length of tail, expanded slightly near tail tip. Pelvic-fin margins deeply notched, anterior lobe about equal to posterior lobe. Dorsal fins short, tall, well separated, procaudal length much shorter than snout length; caudal-fin upper lobe low, longer than second dorsal-fin base. Pectoral-fin radials ~74. Predorsal vertebrae ~81, abdominal vertebrae ~27, predorsal tail vertebrae ~108.



COLOUR. Dorsal surface uniformly pale greyish brown; orbits, margins of dorsal and caudal fins, and tail folds darker. Ventral surface white to partly translucent.

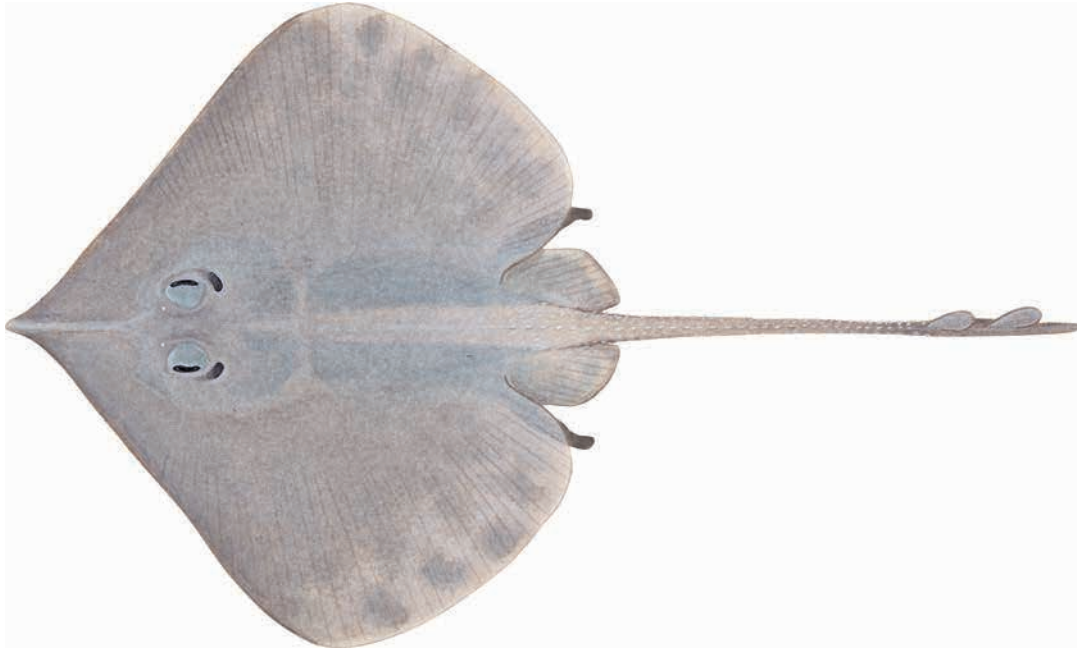
SIZE. Only known specimen a 44 cm TL juvenile male.

HABITAT AND BIOLOGY. South-West Pacific; possibly endemic to Vanuatu. Demersal on nearby insular slopes at 805–845 m depths.

SIMILAR SPECIES. Like the Pale Skate (20.78) from the Oceania region it has velvety skin on the upper surface of the disc but is smooth ventrally.

BROKEN RIDGE SKATE

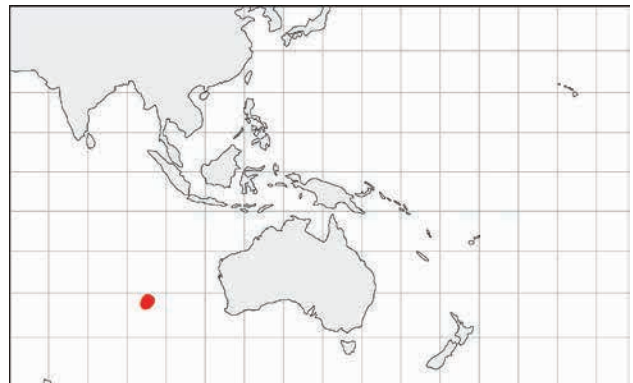
20.76

Notoraja lira McEachran & Last, 2008

LC

IDENTIFICATION. Small skate with a velvety, heart-shaped disc, moderately long, but extremely slender tail, single small preorbital thorn, regular row of thorns on back of disc and 2 irregular rows on tail, and pale bluish with whitish areas on both surfaces of disc. Disc ~1.1 times broader than long; anterior margins undulate, outer corners broadly rounded. Snout prominent, flexible, lacking firm rostral cartilage, with distinct fleshy and flattened process at tip. Eye moderate, orbit length ~4.2 in snout length, ~1.2 times interorbital space. Mouth rather narrow, slightly arched, nasal flaps broadly lobed, posterior margin coarsely fringed; tooth rows in upper jaw 36. Dorsal surface of disc with broad bands of dermal denticles along anterior margins of disc and on cranium, ventral surface smooth. Tail extremely slender and tapering, narrow-based, slightly depressed, convex ventrally, length ~1.2 times precloacal length; lateral folds confined to posterior half of tail. Pelvic-fin margins deeply notched. Dorsal fins similar in shape and size, lanceolate, separated at base; caudal-fin upper lobe separated by short interspace from and distinctly longer than second dorsal-fin base. Pectoral-fin radials 62–63. Predorsal vertebrae ~70, trunk vertebrae ~24, predorsal tail vertebrae ~94.

COLOUR. Dorsal surface pale greyish blue, semi-translucent, with pale cloudy areas on posterior disc margins. Ventral surface similar to dorsal surface, mainly



pale greyish blue, with whitish areas around mouth, on snout, pelvic anterior lobes, pectoral posterior margins, cloaca and tail.

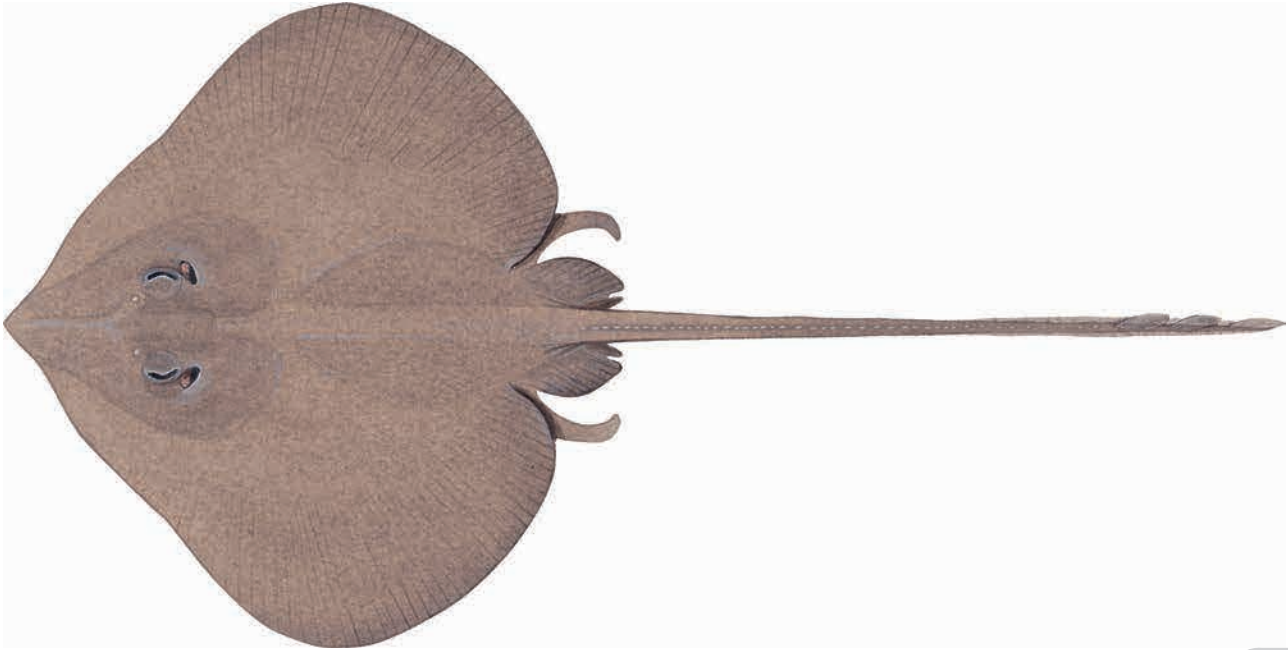
SIZE. Only known from a juvenile male 42 cm TL.

HABITAT AND BIOLOGY. South-East Indian Ocean; Broken Ridge. Demersal, possibly on hard bottoms at ~1050 m depth. Probably more widespread on this submarine ridge and those adjacent. Biology unknown.

SIMILAR SPECIES. Rarely caught skate, known from a single juvenile specimen; the combined pale greyish blue coloration on both surfaces of the disc, and a moderately long and extremely slender tail, are distinctive.

LONGLOBE VELVET SKATE

20.77

Notoraja longiventralis Séret & Last, 2012

NE

IDENTIFICATION. Medium-sized skate with a velvety, heart-shaped disc, very long and slender tail, rudimentary thorn before each eye but no other enlarged thorns on head or tail, and upper and lower disc similarly dark. Disc weakly undulate anteriorly, probably more so in adults, broader than long; apex broadly rounded. Snout moderately elongate, flexible, lacking firm rostral cartilage, with small triangular lobe at tip. Eye rather small, orbit length 2.6–3.3 in snout length, 1.1–1.2 times interorbital space. Mouth rather broad, arched slightly, nasal flaps with widely separated lobes, lacking dermal fringe; tooth rows in upper jaw ~38. Both surfaces of disc and tail densely covered with fine bristle-like denticles giving skin a velvety feel. Preorbital thorn obscure; form of alar and malar patches unknown; thorns on tail rudimentary. Tail very narrow-based, oval in cross-section, very thin towards its tip, length 1.5–1.6 times precloacal length; lateral folds confined to posterior half of tail, not greatly expanded near tail tip. Pelvic-fin margins very deeply notched, anterior lobe much longer than posterior lobe. Dorsal fins small, flag like, tall, well separated, procaudal length longer than snout length; caudal-fin upper lobe tall, much longer than second dorsal-fin base. Pectoral-fin radials 64–65. Predorsal vertebrae 72–79, abdominal vertebrae 26–27, predorsal tail vertebrae 98–106.

COLOUR. Dorsal and ventral surfaces both dark purplish grey; faint white spots scattered over pores along the anterior margins of ventral disc.



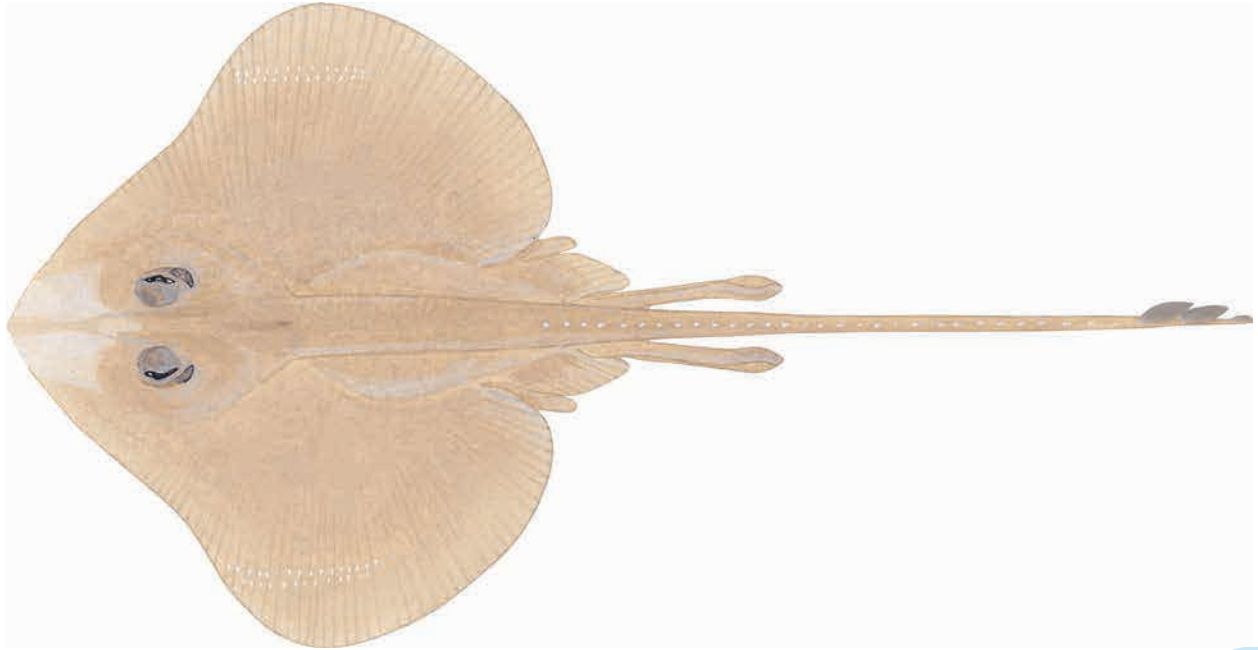
SIZE. Attains at least 43 cm TL; young hatch at ~17 cm TL.

HABITAT AND BIOLOGY. South-West Pacific; Fiji and Vanuatu. Demersal on mid-insular slopes at 660–955 m depths. Known from few specimens and nothing known of its life history.

SIMILAR SPECIES. Largely similar to other velvet skates, but differs mainly in its coloration and unusually long and pointed anterior pelvic-fin lobes.

PALE SKATE

20.78

Notoraja ochroderma McEachran & Last, 1994

DD

IDENTIFICATION. Small skate with a velvety, heart-shaped disc, long slender tail, no thorn on head and disc, except alar thorns in adult males, 2–3 rows of small thorns on tail, and plain pale yellowish, almost translucent, on both surfaces of disc. Disc ~1.2 times broader than long; anterior margins undulate, outer corners broadly rounded. Snout short with firm rostral cartilage, with short fleshy lobe and flexible at its tip. Eye moderate-sized, orbit length 3.3–3.9 in snout length, 0.8–1.2 in interorbital space. Mouth rather broad, arched, nasal flaps broadly lobed, posterior margin smooth; tooth rows in upper jaw 44–49. Dorsal surface of disc and tail densely covered with fine bristle-like denticles giving skin a velvety feel; entire ventral surface smooth. Tail narrow-based, oval in cross-section, tapering gently to its tip, length 1.3 times precloacal length; lateral folds indistinct. Pelvic-fin margins deeply notched. Dorsal fins small, lanceolate, connected or slightly separated at base, caudal-fin upper lobe very low, barely distinguishable, connected to second dorsal-fin base. Pectoral-fin radials 75–84. Predorsal vertebrae 72–82, trunk vertebrae 30–32, predorsal tail vertebrae 117–119.

COLOUR. Dorsal surface plain pale yellow, margins almost translucent. Ventral surface pale, translucent; pores not pigmented. Tail with dark band through base of second dorsal fin.



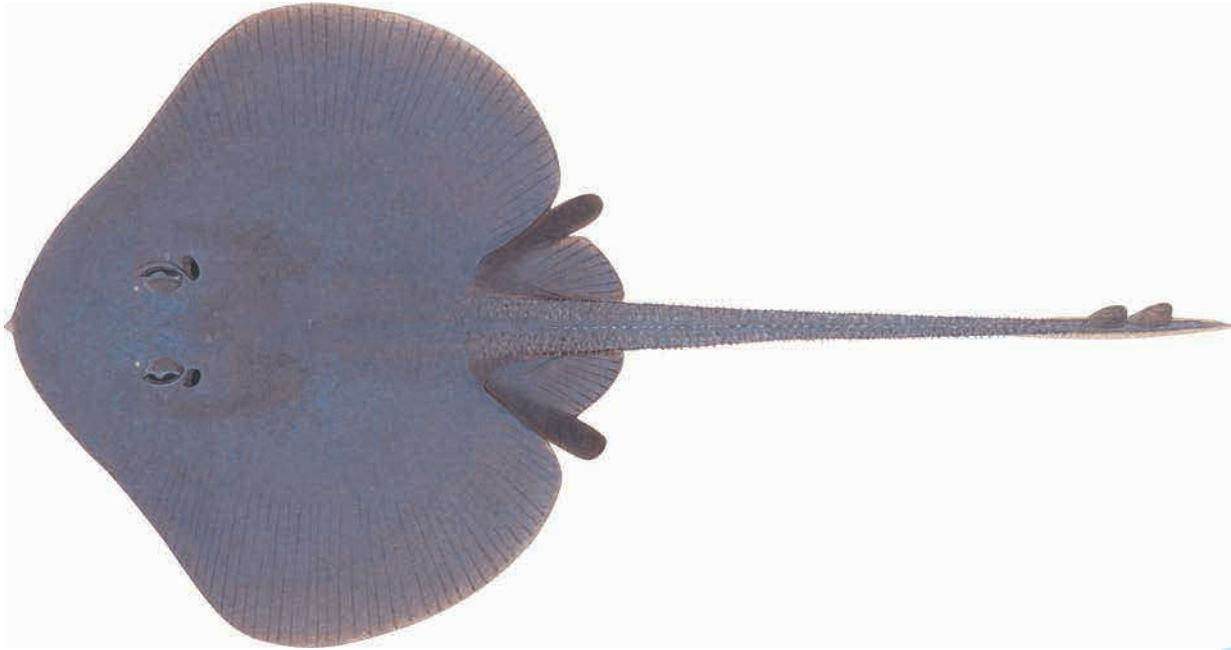
SIZE. Attains at least 37 cm TL; males mature at ~35 cm TL.

HABITAT AND BIOLOGY. South-West Pacific; off north-eastern Australia. Demersal on continental slope at 350–445 m depths. Biology unknown.

SIMILAR SPECIES. Resembles the Australian Ghost Skate (20.74) as both species have plain pale dorsal and ventral surfaces. However, the Ghost Skate, which occurs off Western Australia, has a velvety tail lacking thorns and its tail undersurface is prickly.

SAPPHIRE SKATE

20.79

Notoraja sapphira Séret & Last, 2009

DD

IDENTIFICATION. Small skate with a velvety, heart-shaped disc in adult males, long slender tail, very small pre-orbital thorn, no other thorns on head or disc, dorsal surface rich blue and ventral surface brownish black. Disc ~1.1 times broader than long; anterior margins undulate in adult males, regularly convex in females, outer corners broadly rounded. Snout moderately elongate, flexible, lacking firm rostral cartilage, with short triangular fleshy projection at tip. Eye moderate-sized, orbit length 2.6–3.9 in snout length, 0.8–1.3 in interorbital space. Mouth rather narrow, slightly arched, nasal flaps broadly lobed, posterior margin coarsely fringed; tooth rows in upper jaw 29–36. Dorsal surface largely free of dermal denticles, prickly on mid-dorsal trunk and on tail; mid-dorsal thorn row on tail hardly distinct from the rest of dense prickles pattern; ventral surface of disc and tail smooth. Tail narrow-based, depressed over length, slightly convex ventrally, tapering posteriorly, very slender near tip, length 1.3–1.4 times preloacal length; lateral folds extending almost along whole tail length. Pelvic-fin margins deeply notched. Dorsal fins short and moderately tall, somewhat lanceolate, generally separated slightly at base; caudal-fin upper lobe well developed, separated from and distinctly longer than second dorsal-fin base. Pectoral-fin radials 67–70. Predorsal vertebrae 70–74, trunk vertebrae 23–25, predorsal tail vertebrae 126–134.

COLOUR. Dorsal surface plain rich blue, outer margins of disc narrowly dark-edged. Ventral surface dark brown or



brownish black, outer margins darker; whitish areas around mouth corners, nasal lobes and cloaca.

SIZE. Attains at least 41 cm TL; smallest mature male 36 cm TL.

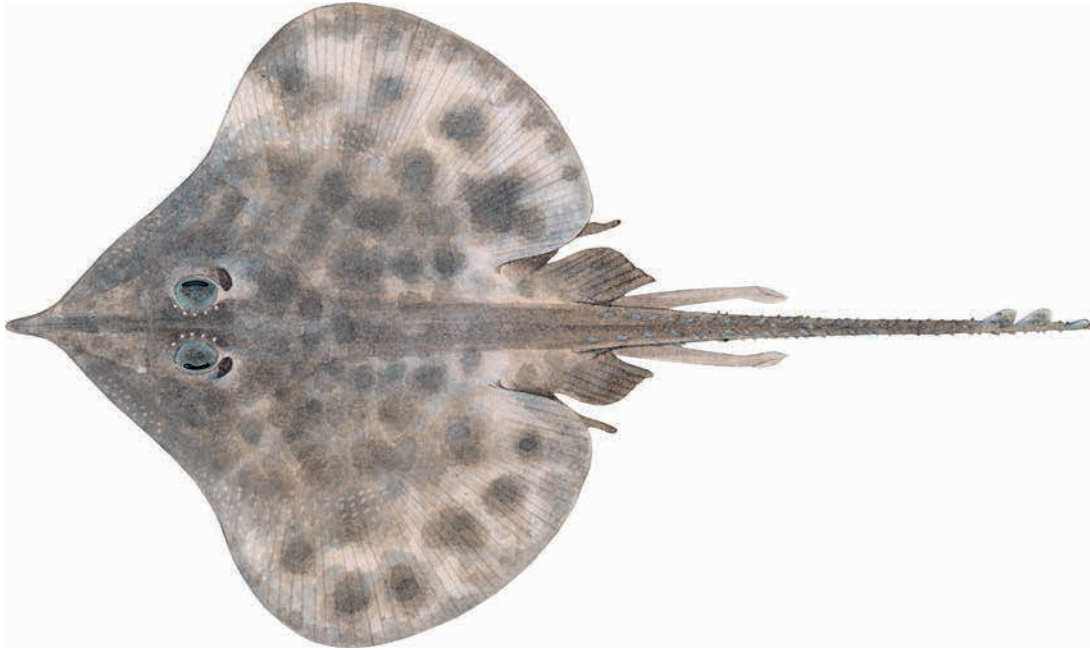
HABITAT AND BIOLOGY. South-West Pacific; New Zealand to New Caledonia (Coral and Tasman Seas). Demersal on mid-insular slopes along Norfolk Ridge, at 1195–1315 m depths. Biology unknown.

SIMILAR SPECIES. Resembles the Blue Skate (20.72) from southern Australia in its striking blue dorsal coloration. The Blue Skate has small, dark flecks scattered over the disc, only 1 postorbital thorn, and the tail thorns are larger and arranged in rows.

BLOTCHED SKATE

20.80

Notoraja sticta McEachran & Last, 2008



LC

IDENTIFICATION. Medium-sized skate with a velvety, heart-shaped disc in adult males, long slender tail, small preorbital and postorbital thorns, but no other enlarged thorns on head or disc, and large greyish brown blotches on both surfaces of disc. Disc 1.1–1.2 times broader than long; anterior margins undulate, mostly concave in adult males, convex in females; outer corners very broadly rounded. Snout moderately elongate, flexible, lacking firm rostral cartilage, with distinct fleshy lobe at tip. Eye moderate-sized, orbit length 2.6–3.1 in snout length, ~1.3 times interorbital space. Mouth rather broad, arched, nasal flaps broadly lobed, posterior margin smooth; tooth rows in upper jaw 32–41. Dorsal surface mostly smooth, dermal denticles on anterior head in females; ventral surface smooth. Tail with several regular rows of thorns, but almost without denticles. Tail narrow-based, oval to slightly depressed in cross-section, tapering gently to its tip, length ~1.2 times preloacal length; lateral folds well developed posteriorly. Pelvic-fin margins deeply notched. Dorsal fins small, lanceolate, close together; caudal-fin upper lobe low and separated from second dorsal-fin base. Pectoral-fin radials 65–68. Predorsal vertebrae 72–82, trunk vertebrae 25–27, predorsal tail vertebrae 97–101.

COLOUR. Dorsal surface white with large, greyish brown blotches, often concentrated on central disc. Ventral surface



similar to dorsal surface, with blotches covering more of disc. Tail pale dorsally, dark ventrally.

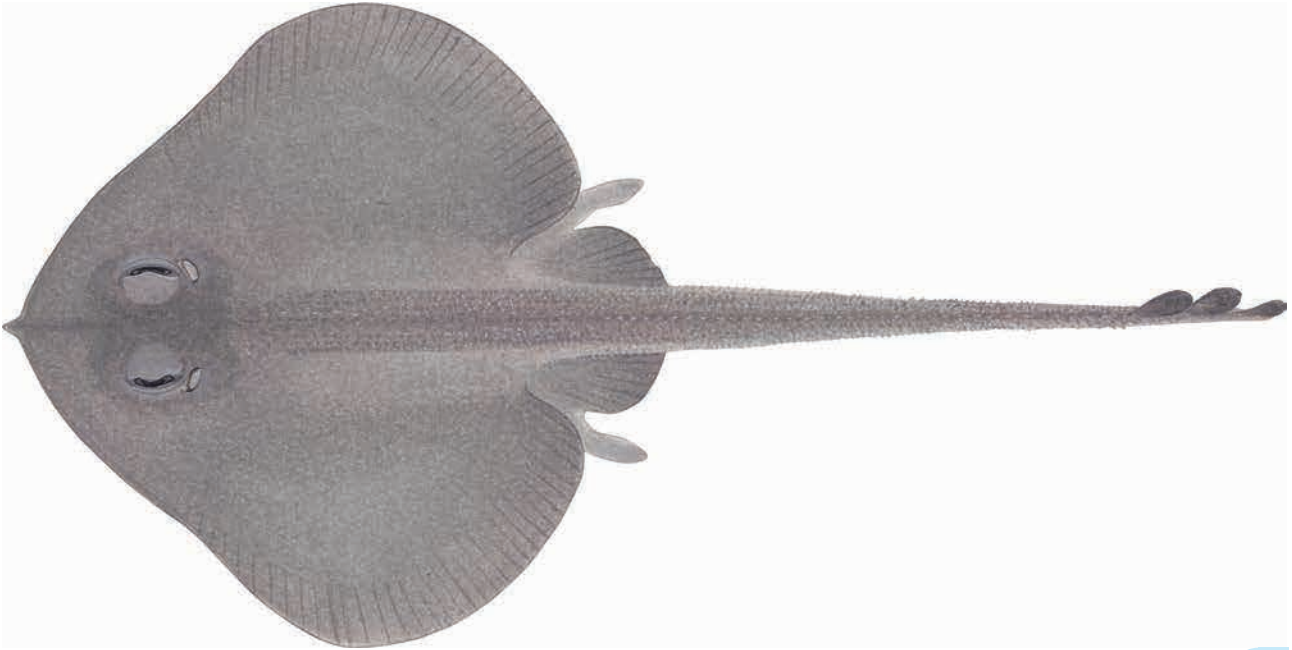
SIZE. Attains at least 63 cm TL; males mature at ~52 cm TL.

HABITAT AND BIOLOGY. South-East Indian Ocean; Great Australian Bight (off southern Australia). Demersal on continental slope at 820–1200 m depths. Rarely caught and few individuals exist in museum collections. Biology unknown.

SIMILAR SPECIES. The only Australian *Notoraja* skate with a distinctive dark, mottled colour pattern on both surfaces of the disc. May occur in deeper parts of the Great Australian Bight.

LEADHUE SKATE

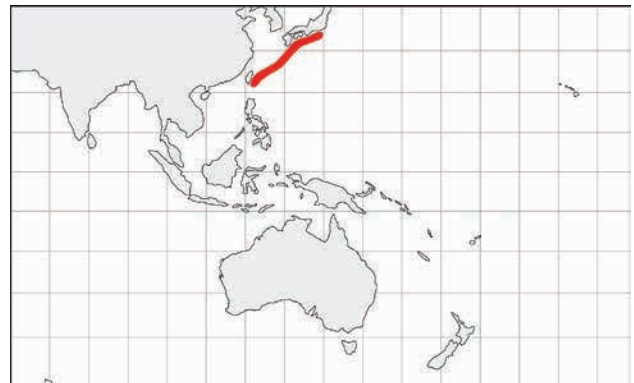
20.81

Notoraja tobitukai (Hiyama, 1940)

DD

IDENTIFICATION. Small skate with a rough, heart-shaped disc, long tail, no thorns on head or along mid-disc, and plain dorsal coloration. Disc rounded in young, becoming more undulate in adults, barely broader than long (~1.05 times longer); apex broadly rounded. Snout moderately elongate, flexible, lacking firm rostral cartilage, with small fleshy lobe at tip. Eye large, orbit length ~2.8–2.9 in snout length, 1.3–1.5 times interorbital space. Mouth rather broad, nasal flaps broadly lobed, lacking obvious dermal fringe; tooth rows in upper jaw 35–40. Upper disc and tail uniformly covered with spiny denticles, long and sparse on disc; ventral surface of disc smooth, tail with short spiny denticles. Alar thorns in adult male and up to 7 irregular dense rows of prickly thornlets on tail, no other thorns on body. Tail slender, oval in cross-section, tapering gently to its tip, its length ~1.2 times precloacal length; lateral folds most prominent on posterior tail. Pelvic-fin margins very deeply notched, anterior lobe often as long as posterior lobe. Dorsal fins small, tilted, separated slightly or bases joined, procaudal length almost equal to preoral length; caudal-fin upper lobe rather well developed. Pectoral-fin radials 60–63. Predorsal vertebrae 84–90, abdominal vertebrae 24–26, predorsal tail vertebrae 60–64.

COLOUR. Uniform greyish blue or greyish brown above, caudal and dorsal fins darker. Undersurface largely greyish and somewhat mottled; belly and mouth usually paler.



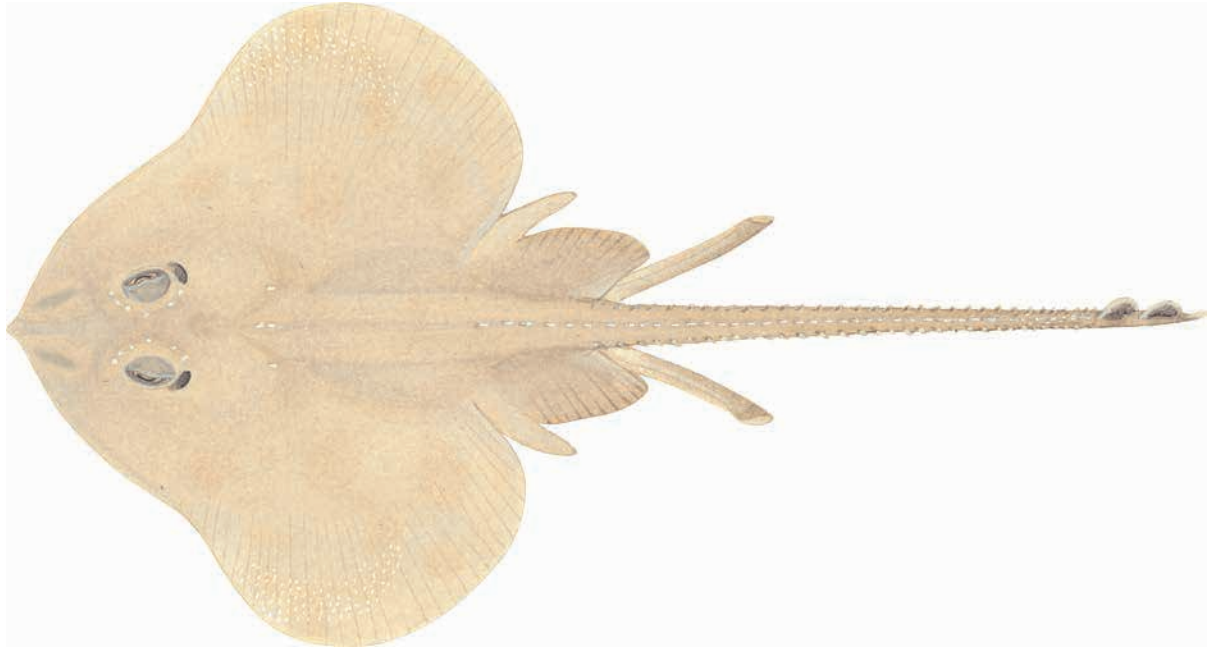
SIZE. Attains at least ~51 cm TL; males still immature at 31 cm TL.

HABITAT AND BIOLOGY. North-West Pacific; Taiwan to southern Japan. Demersal on continental and insular slopes, at 60–1015 m depths. Although considered rare in Japanese seas, caught often in deep water off Taiwan. Little known of its life history.

SIMILAR SPECIES. Two forms of this skate exist in the North-West Pacific, based on molecular data. However, morphological differences distinguishing these forms have not yet been found.

ALLEN'S SKATE

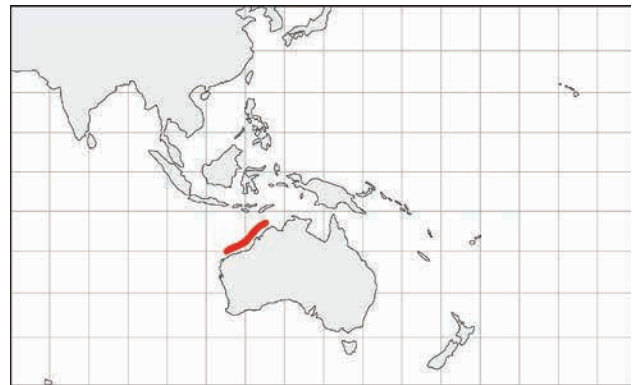
20.82

Pavoraja alleni McEachran & Fechhelm, 1982

LC

IDENTIFICATION. Small skate with a circular to heart-shaped disc covered above with granular denticles, short snout, nuchal and orbital thorns present, long slender tail with thorns before first dorsal fin absent or much smaller than those anteriorly, and largely yellowish brown, sometimes with faint dusky blotches. Disc heart-shaped in adult males, more circular in females and young. Snout very flexible, lacking a continuous rostral cartilage, its length 2–3.3 times orbit length; interorbital space narrow, 1.1–1.6 in orbit length. Mouth narrow, nasal flaps broadly lobed; tooth rows in upper jaw 33–40. Dorsal disc and tail uniformly granular (only anterior lobe of pelvic fin naked); 1–6 nuchal thorns, 2–8 orbital thorns, adults with 1–4 prominent scapular thorns, malar thorn patch small, small alar thorns usually in 1–3 rows; tail thorns long, in 3 rows, lateral rows usually absent in juveniles; ventral surface entirely smooth. Tail elongate and slightly depressed, its length ~1.1–1.3 times precloacal length; lateral folds widening toward tail tip. Pelvic-fin margin very deeply concave. Dorsal fins small, low, separated by a base length or less; caudal fin low. Pectoral-fin radials 64–66. Predorsal tail vertebrae 73–79, abdominal vertebrae 25–26.

COLOUR. Uniformly yellowish to pale brown above in adults, usually with a scattering of large, darker brownish blotches (appearing as narrow bands on tail) in young; dorsal fins dusky, caudal fin pale to dusky, lateral folds dark



posteriorly. Ventral surface off-white or greyish brown; outer edge of disc not conspicuously darker.

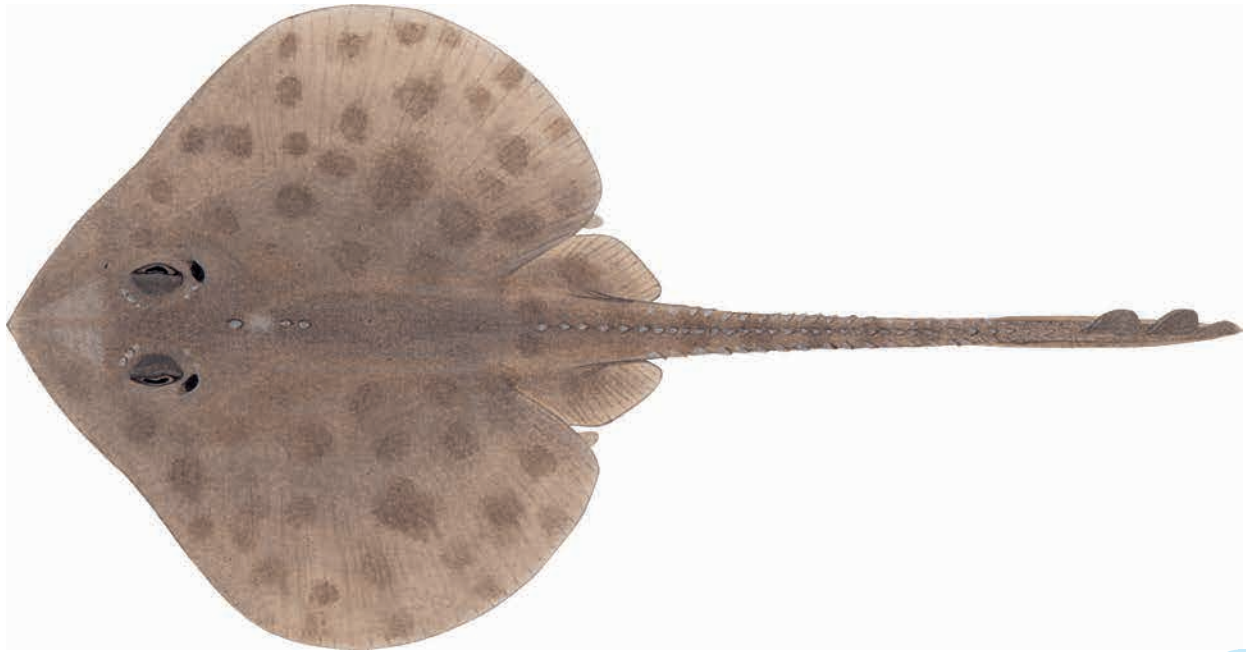
SIZE. Attains ~35 cm TL. Males mature at 29–32 cm TL; young hatch at ~11 cm TL.

HABITAT AND BIOLOGY. Eastern Indian Ocean; off north-western Australia. Demersal on upper continental slope at 305–460 m depths. Caught commonly as bycatch and discarded. Nothing known of its biology.

SIMILAR SPECIES. Similar to the Australian Sandy Skate (20.83), which has a more southerly distribution in Australian seas. Two morphologically distinguishable forms occur off Western Australia.

AUSTRALIAN SANDY SKATE

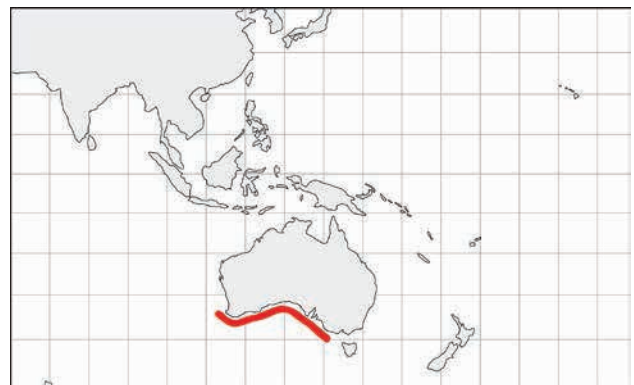
20.83

Pavoraja arenaria Last, Mallick & Yearsley, 2008

DD

IDENTIFICATION. Small skate with a circular to heart-shaped disc covered above with granular denticles, short snout, nuchal and orbital thorns present, long slender tail with thorns before first dorsal fin similar in size to those anteriorly, and uniformly yellowish dorsal coloration. Disc heart-shaped in adult males, more circular in females and young. Snout very flexible, lacking a continuous rostral cartilage, its length 2.2–3.1 times orbit length; interorbital space narrow, 1.4–1.7 in orbit length. Mouth narrow, nasal flaps broadly lobed; tooth rows in upper jaw 33–42. Dorsal disc and tail uniformly granular (only anterior lobe of pelvic fin naked); 2–3 small nuchal thorns, 1–2 thorns above front and back of orbit, no scapular thorns, very small malar thorns, small alar thorns usually in 1 row; tail thorns long, in 3 widely spaced rows; ventral surface entirely smooth. Tail variably elongate and slightly depressed, its length ~0.8–1.3 times precloacal length; lateral skin fold widening toward tail tip. Pelvic-fin margin very deeply concave. Dorsal fins small, low, about a base length apart; caudal fin small. Pectoral-fin radials 73–77. Predorsal tail vertebrae 65–72, abdominal vertebrae 26–29.

COLOUR. Uniformly pale yellowish to pinkish above, anterior lobes of pelvic fins, median region of snout, and pored prenuchal area slightly paler; dorsal and caudal fins



dusky. Ventral surface uniformly white, outer corners of disc and apical part of tail often greyish.

SIZE. Attains at least 34 cm TL; males mature at ~29–33 cm TL.

HABITAT AND BIOLOGY. South-East Indian Ocean; off southern Australia. Demersal on outer continental shelf and upper slope at 190–710 m depths, but more typically in 300–400 m. Nothing known of its life history.

SIMILAR SPECIES. Similar to Allen's Skate (20.82), but it has more pectoral-fin radials, and thorns preceding the first dorsal fin are typical of those on the rest of the tail rather than reduced or missing.

MOSAIC SKATE

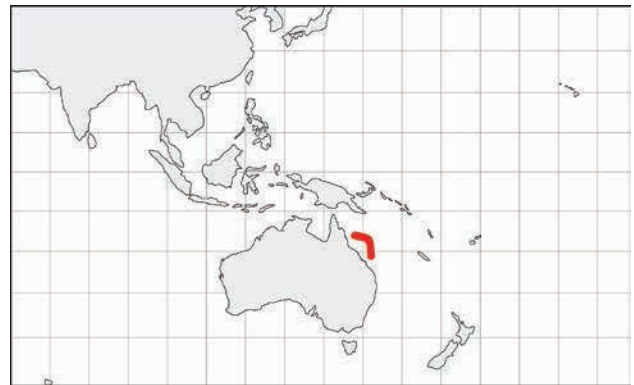
20.84

Pavoraja mosaica Last, Mallick & Yearsley, 2008

LC

IDENTIFICATION. Very small skate with a circular to heart-shaped disc covered above with granular denticles, short snout, inconspicuous orbital thorns, no nuchal thorns, long slender tail, and distinctive pattern of fine reticulations and spots on dorsal surface. Disc heart-shaped in adult males, more circular in females and young. Snout very flexible, lacking a continuous rostral cartilage, its length 2.8–3.1 times orbit length, interorbital space narrow, 1.3–1.7 in orbit length. Mouth narrow, nasal flaps broadly lobed; tooth rows in upper jaw 37–47. Dorsal disc and tail uniformly granular (only anterior lobe of pelvic fin naked); 1–3 very small preorbital thorns, 0–2 at postorbit; no nuchal or scapular thorns; small malar thorns, small alar thorns in 2–3 rows; tail thorns small, usually in 3 rows, lateral rows missing in young; ventral surface entirely smooth. Tail elongate and slightly depressed, its length ~0.9–1.1 times precloacal length; lateral folds well developed posteriorly. Pelvic-fin margin very deeply concave. Dorsal fins very small, low, connected at base; caudal fin small. Pectoral-fin radials 71–74. Predorsal tail vertebrae 72–76, abdominal vertebrae 29–31.

COLOUR. Dorsal surface pale with a dense pattern of fine darker brownish reticulations and spots, preorbital snout and posterior margin paler than rest of disc; dorsal fins light brown with pale margins; caudal fin and anterior lobe of



pelvic fin pale. Ventral surface usually uniformly white, outer margins of disc sometimes greyish.

SIZE. Attains ~28 cm TL; smallest mature male 27 cm TL, and smallest postnatal juvenile 8 cm TL.

HABITAT AND BIOLOGY. South-West Pacific; off Queensland (Australia). Demersal on continental slope at 300–490 m depths. Life history unknown.

SIMILAR SPECIES. Belongs to a group of small Australian deepwater skates, but no other member of the genus has such a strikingly beautiful coloration.

PEACOCK SKATE

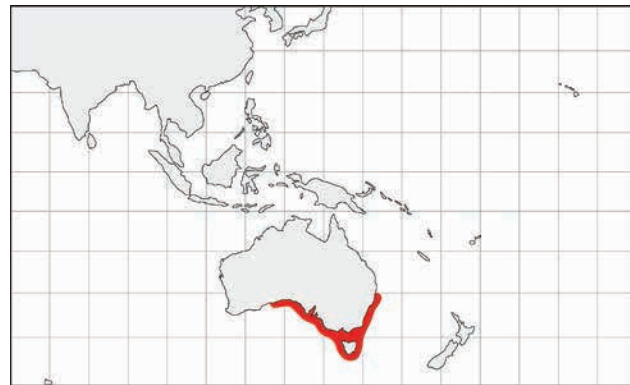
20.85

Pavoraja nitida (Günther, 1880)

LC

IDENTIFICATION. Small skate with a circular to heart-shaped disc covered above in granular denticles, short snout, nuchal and orbital thorns present, and a brownish dorsal surface with clusters of white spots. Disc heart-shaped in adult males, more circular in females and young. Snout very flexible, lacking a continuous rostral cartilage, its length ~1.8–2.4 times orbit length; interorbital space ~1.5–1.8 in orbit length. Mouth narrow, nasal flaps broadly lobed; tooth rows in upper jaw 32–35. Dorsal disc and tail uniformly granular (only anterior lobe of pelvic fin naked); 1–5 nuchal thorns; orbital thorns enlarged, 2–3 at both front and back of orbit; scapular thorns sometimes present; tail thorns rather large, in 3 main rows (additional lateral rows sometimes near tail base); malar thorn patch extending well forward on disc; ventral surface entirely smooth. Tail elongate and slightly depressed, its length ~0.9–1.2 times precloacal length; lateral folds widening toward tail tip. Pelvic-fin margin very deeply concave. Dorsal fins small, low, less than a base length apart; caudal fin small. Pectoral-fin radials 70–74. Predorsal tail vertebrae 62–70, abdominal vertebrae 26–30.

COLOUR. Upper surface medium to dark brown with poorly defined clusters of small whitish spots; ventral surface usually uniformly white, sometimes with greyish outer corners of disc; no dark-edged pores, dorsal and caudal fins yellowish or brownish.



SIZE. Attains at least 37 cm TL. Both sexes mature at ~30–33 cm TL; young hatch at ~8 cm TL.

HABITAT AND BIOLOGY. South-West Pacific and South-East Indian Ocean; South Australia to New South Wales (Australia). Demersal along mid-continental shelf and upper slope at 30–450 m depths. Biology not well known. Discarded bycatch of local trawl fisheries.

SIMILAR SPECIES. Most similar to a tropical Australian relative, the False Peacock Skate (20.86), which has white spots that are not arranged in well-defined clusters and more vertebrae.

FALSE PEACOCK SKATE

20.86

Pavoraja pseudonitida Last, Mallick & Yearsley, 2008

LC

IDENTIFICATION. Small skate with a circular to heart-shaped disc covered above in granular denticles, rather short snout, nuchal and orbital thorns present, and a pattern of randomly arranged white spots rather than spots forming distinct clusters. Disc heart-shaped in adult males, more circular in females and young. Snout very flexible, lacking a continuous rostral cartilage, its length ~ 2.3 – 3.1 times orbit length; interorbital space ~ 1.4 – 2 in orbit length. Mouth narrow, nasal flaps broadly lobed; tooth rows in upper jaw 38–46. Dorsal disc and tail uniformly granular (only anterior lobe of pelvic fin naked); 0–5 nuchal thorns but typically 2–3 in adults; 3–10 large orbital thorns forming rosette in adults; scapular thorns rarely present; tail thorns rather large, in 3 widely spaced rows decreasing in size and density posteriorly; malar thorn patch very extensive; ventral surface entirely smooth. Tail elongate and slightly depressed, its length ~ 0.9 – 1.3 times precloacal length; lateral folds widening toward tail tip. Pelvic-fin margin very deeply concave. Dorsal fins small, low, interspace narrow but fins rarely connected; caudal fin low. Pectoral-fin radials usually 72–75. Predorsal tail vertebrae 76–81, abdominal vertebrae 26–30.

COLOUR. Yellowish above, usually densely covered with small, regularly spaced and non-clustered white spots; dorsal fins mostly pale anteriorly, dark posteriorly; caudal



fin paler than dorsal fins. Ventral surface usually uniformly white.

SIZE. Attains at least 37 cm TL; smallest mature male 32 cm TL.

HABITAT AND BIOLOGY. South-West Pacific; off Queensland (Australia). Demersal on upper continental slope at 210–510 m depths. Biology unknown.

SIMILAR SPECIES. Shares a similar body shape and white-spotted pattern with another member of the genus *Pavoraja*, a cold-water species, the Peacock Skate (20.85), but unlike this species its spots are not arranged in distinctive clusters.

DUSKY SKATE

20.87

Pavoraja umbrosa Last, Mallick & Yearsley, 2008

LC

IDENTIFICATION. Small skate with a circular to heart-shaped disc covered above with granular denticles, short snout, nuchal and orbital thorns present, long slender tail, and uniform greyish dorsal coloration. Disc heart-shaped in adult males, more circular in females and young. Snout very flexible, lacking a continuous rostral cartilage, its length 2.1–2.6 times orbit length; interorbital space 1.6–2 in orbit length. Mouth narrow, nasal flaps broadly lobed; tooth rows in upper jaw 36–42. Dorsal disc and tail uniformly granular (only anterior lobe of pelvic fin naked); 3–4 prominent nuchal thorns; 2–4 large preorbital and 1–4 postorbital thorns; no scapular thorns; malar thorn patch extending well forward of 1–3 rows of small alar thorns; tail thorns rather large, in 3 widely spaced rows, poorly developed near dorsal fins; ventral surface entirely smooth. Tail long, narrow and slightly depressed, its length ~1–1.3 times precloacal length; lateral folds well developed posteriorly. Pelvic-fin margin very deeply concave. Dorsal fins small, low, barely connected; caudal fin small. Pectoral-fin radials 68–71. Predorsal tail vertebrae 74–83, abdominal vertebrae 27–30.

COLOUR. Plain greyish to greyish brown above, occasionally with weak mottling or diffuse dark brown blotches; dorsal fins generally dusky, caudal fin pale. Ventral surface usually pale, frequently dusky on central and outer corners of disc.



SIZE. Attains ~37 cm TL. Males mature at ~32–35 cm TL, smallest juvenile 8 cm TL.

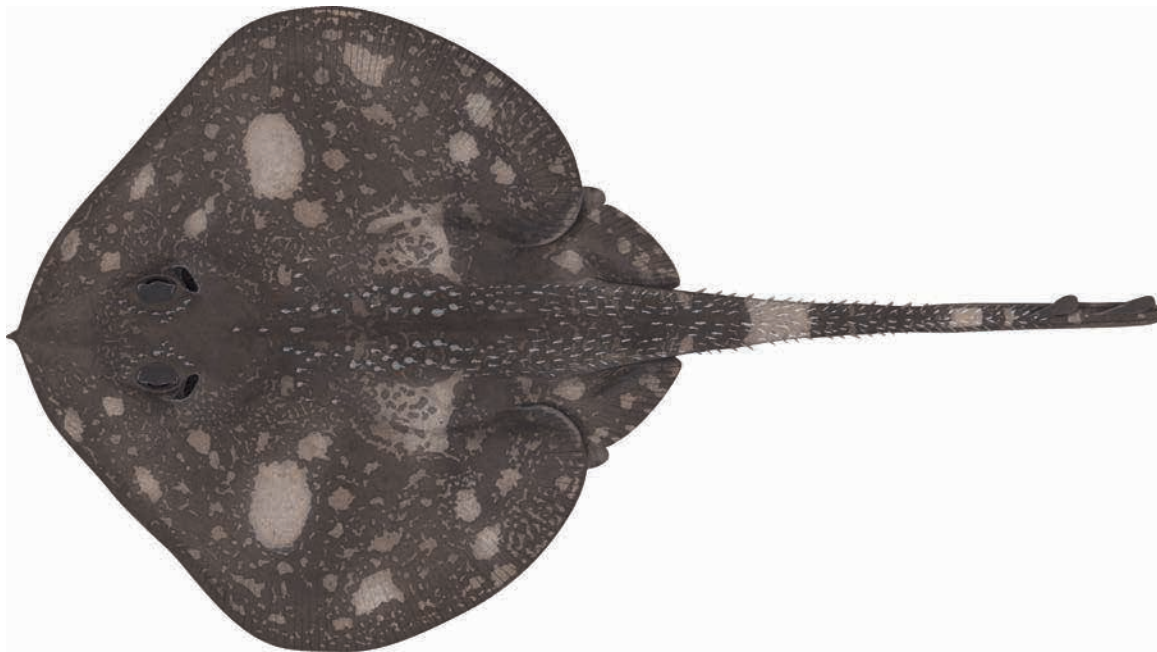
HABITAT AND BIOLOGY. South-West Pacific; off New South Wales (eastern Australia). Demersal on upper continental slope at 360–730 m depths. Biology not well known. Discarded bycatch of local trawl fisheries.

SIMILAR SPECIES. Similar to the Australian Sandy Skate (20.83), but has fewer pectoral-fin radials, its upper surface is greyish rather than yellowish, and tail thorns preceding the first dorsal fin are typically less well developed.

BLOTCHED SANDSKATE

20.88

Psammobatis bergi Marini, 1932



LC

IDENTIFICATION. Medium-sized skate with a rounded to weakly heart-shaped disc, snout short and flexible anteriorly due to very delicate rostral cartilage, nasal folds large and fringed, skin rough, and strong dorsal pattern of blotches and reticulations. Disc almost circular, becoming weakly heart-shaped in adult males, 1.1–1.2 times broader than long; apex broadly rounded. Snout soft, tip blunt and sometimes with small filament at tip; length 2.5–2.8 times orbit length, interorbital space 1.1–1.3 in orbit length. Mouth narrow, nasal flaps very broadly lobed, strongly fringed; tooth rows in upper jaw 39–46. Upper disc rough with scattered, coarse denticles in juveniles, becoming denser on anterior half of disc and trunk in adults; undersurface smooth. Thorns forming rosette on orbit and triangular patch over nape-shoulder region; alar thorns in long narrow band; median row of thorns from nape to first dorsal fin (sometimes interrupted on anterior trunk in adults); tail with 2–4 parallel irregular rows. Tail depressed and rather broad, barely tapering, its length 1.1–1.4 times precloacal length; lateral folds narrow. Pelvic-fin margin deeply incised. Dorsal fins small, tilted, confluent, near tip of tail; caudal fin minute. Pectoral-fin radials ~68. Predorsal tail vertebrae 59–61.

COLOUR. Dorsal surface medium to dark brown, dappled with pattern of pale blotches, reticulations, spots and irregular bars; tail with alternating light and dark saddles



and blotches. Ventral surface entirely white; no dark-edged pores.

SIZE. Attains ~61 cm total length. Males mature at 39–50 cm TL, females 36–46 cm TL; egg cases ~4 cm long.

HABITAT AND BIOLOGY. South-West Atlantic; southern Brazil to northern Argentina. Demersal on inner continental shelf at 10–80 m depth. Diet consists mainly of crustaceans, but also polychaetes and small bony fishes.

SIMILAR SPECIES. No other member of the genus *Psammobatis* has a complex dorsal colour pattern, consisting of pale spots, reticulations, blotches, bars and saddles, on a dark upper surface.

ZIPPER SANDSKATE

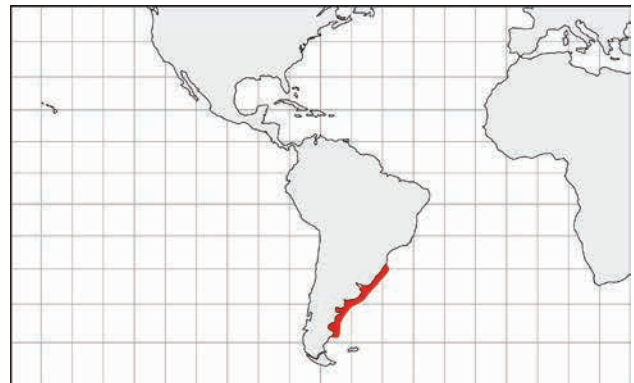
20.89

Psammobatis extenta (Garman, 1913)

LC

IDENTIFICATION. Small skate with a heart-shaped disc, snout short and flexible anteriorly due to very delicate rostral cartilage, nasal folds large and fringed, skin rough, and dorsal surface usually with fine spots and reticulations. Disc width 1.1–1.3 times length; anterior margins undulate, apex broadly rounded. Snout soft, broad, tip bluntly rounded, usually with minute filament at tip; length usually 2–3.1 times orbit length, interorbital space 0.6–1 times orbit length. Mouth narrow, nasal flaps very broadly lobed, strongly fringed; tooth rows in upper jaw 34–50. Upper disc uniformly granular, anterior and posterior edges of disc and posterior lobes of pelvic fin covered with long thornlets in adults; uniquely within genus, clasper tip of mature males set with denticles; undersurface smooth. Thornes forming dense rosette on orbit rim and distinct triangular patch over nape-shoulder region; irregular median row of ~50 thorns from nape to first dorsal fin (number increasing with growth); tail with irregular parallel dorsolateral rows. Tail depressed and rather slender, tapering gradually, its length 1.3–1.5 times precloacal length; lateral folds narrow. Pelvic-fin margin deeply incised. Dorsal fins small, low, confluent or separated slightly with 0–3 interdorsal thorns, near tip of tail; caudal fin short, upper caudal lobe rather well developed. Pectoral-fin radials ~61–66. Predorsal tail vertebrae 52–62.

COLOUR. Dorsal disc reddish brown to greyish brown, with indistinct pale blotches and dense pattern of tiny dark spots and reticulations; spots usually forming faint rosettes



and weak pectoral markings sometimes present. Ventral surface entirely whitish; no dark-edged pores.

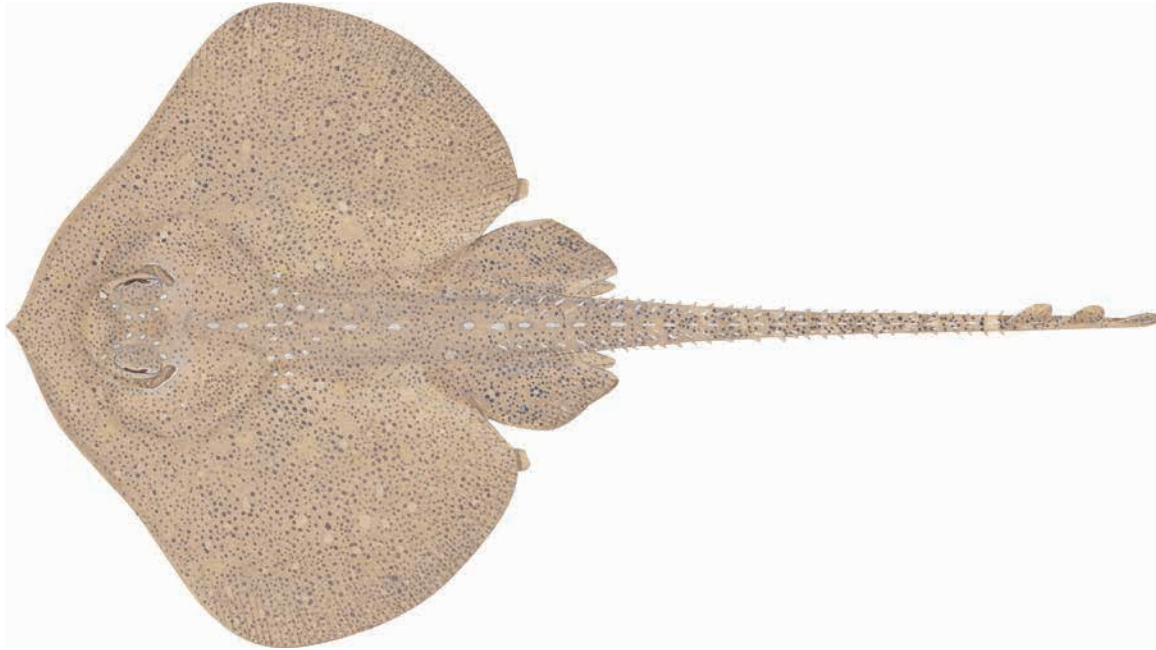
SIZE. Attains ~35 cm in both sexes. Males mature at ~26–27 cm TL, females 24–26 cm TL. Young hatch at ~6 cm TL; egg cases ~3 cm long.

HABITAT AND BIOLOGY. South-West Atlantic; southern Brazil to Patagonia (southern Argentina). Demersal on continental shelf at 15–160 m depths. Reproduces probably all year round. Diet consists mainly of crustaceans, and occasionally small quantities of polychaetes and cnidarians.

SIMILAR SPECIES. Similar to the Spade Sand Skate (20.94), but with denticles bordering the clasper groove, different colour and thorn patterns, fewer upper-jaw tooth rows, and more predorsal tail vertebrae.

FRECKLE SANDSKATE

20.90

Psammobatis lentiginosa McEachran, 1983

DD

IDENTIFICATION. Medium-sized skate with a weakly rhombic to heart-shaped disc, snout short and flexible anteriorly due to very delicate rostral cartilage, nasal folds large and fringed, skin largely rough, and dorsal surface with numerous scattered black spots. Disc width ~1.1–1.2 times length; anterior margins undulate, apex broadly rounded. Snout soft, tip blunt and rarely with small filament at tip; length 1.8–3.1 times orbit length, interorbital space 0.7–0.9 times orbit length. Mouth narrow, nasal flaps very broadly lobed, strongly fringed; tooth rows in upper jaw 35–49. Upper disc more or less evenly covered with denticles in juveniles; adults with pectoral centres largely smooth, and coarse denticles or small thornlets on anterior and posterior disc margins, and in band on mid-disc; undersurface smooth. Thorns forming rosette on orbit and triangular patch over nape-shoulder region; median row of thorns extend from anterior trunk to first dorsal fin, flanked by 1 (juveniles) or up to 3 parallel thorn rows in adults. Tail rather slender, tapering strongly, its length 1.3–1.6 times precloacal length; lateral folds narrow. Pelvic-fin margin deeply incised. Dorsal fins small, low, confluent or separated slightly, fins located near tip of tail; upper caudal lobe rather well developed. Pectoral-fin radials ~67. Predorsal tail vertebrae 63–70.

COLOUR. Upper surface medium to pale brown, with numerous scattered blackish spots (often clustered in circles with brownish centres). Undersurface white, sometimes



with irregular brown blotches on disc margins, pelvic fins and tail; no dark-edged pores.

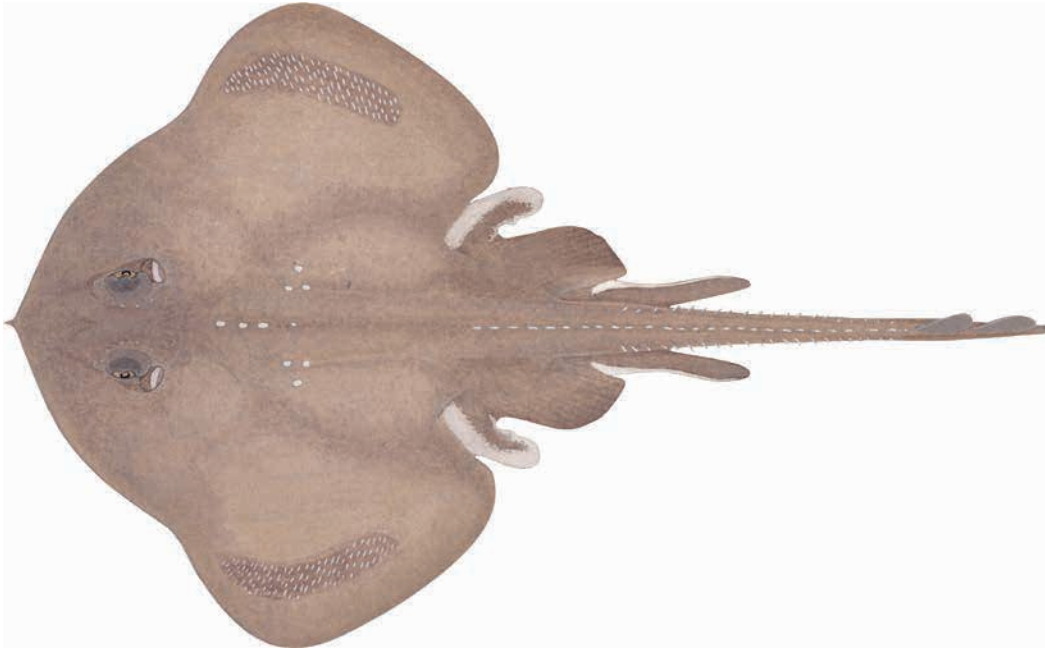
SIZE. Attains ~55 cm TL. Both sexes mature at ~30–34 cm TL; egg cases ~4 cm long.

HABITAT AND BIOLOGY. South-West Atlantic; southern Brazil to Argentina. Demersal on continental shelf at 30–170 m depths; more common in northern sector. Diet consists primarily of crustaceans and polychaetes; small cephalopods and fishes consumed occasionally.

SIMILAR SPECIES. Most closely resembles the smaller Spade Sand skate (20.94), which has an indistinct dorsal colour pattern and more tooth rows in the upper jaw (exceeding 50 rows).

SHORTFIN SANDSKATE

20.91

Psammobatis normani McEachran, 1983

DD

IDENTIFICATION. Medium-sized skate with a heart-shaped disc, snout short and flexible anteriorly due to very delicate rostral cartilage, nasal folds large and fringed, skin largely smooth in adults, and dorsal surface plain or with small dark spots. Disc width ~1.1–1.2 times length; anterior margins strongly undulate, apex broadly rounded. Snout soft, tip blunt, obtuse and often with small filament at tip; length 1.9–2.9 times orbit length, interorbital space 0.9–1.1 times orbit length. Mouth rather broad, nasal flaps very broadly lobed, strongly fringed; tooth rows in upper jaw 33–44. Upper disc sparsely covered with denticles in juveniles; adults largely smooth, with fine denticles only along anterior disc margin and its mid-line; undersurface entirely smooth. Thorns forming rosette on orbit and not forming obvious triangular patch over nape-shoulder region (4–5 nuchal and suprascapular thorns, and 3 on each shoulder); 3–5 rows of tail thorns in adults, median row extends from posterior trunk to first dorsal fin. Tail rather slender, tapering slightly, its length 1–1.2 times preloacal length; lateral folds narrow. Pelvic-fin margin deeply incised. Dorsal fins small, low, mostly separated slightly, fins located near tip of tail; caudal fin very low and short. Pectoral-fin radials ~67. Predorsal tail vertebrae 52–58.

COLOUR. Upper surface colour uniformly brownish, with or without small, indistinct dark spots on disc and pelvic fins; undersurface uniformly white; no dark-edged pores.



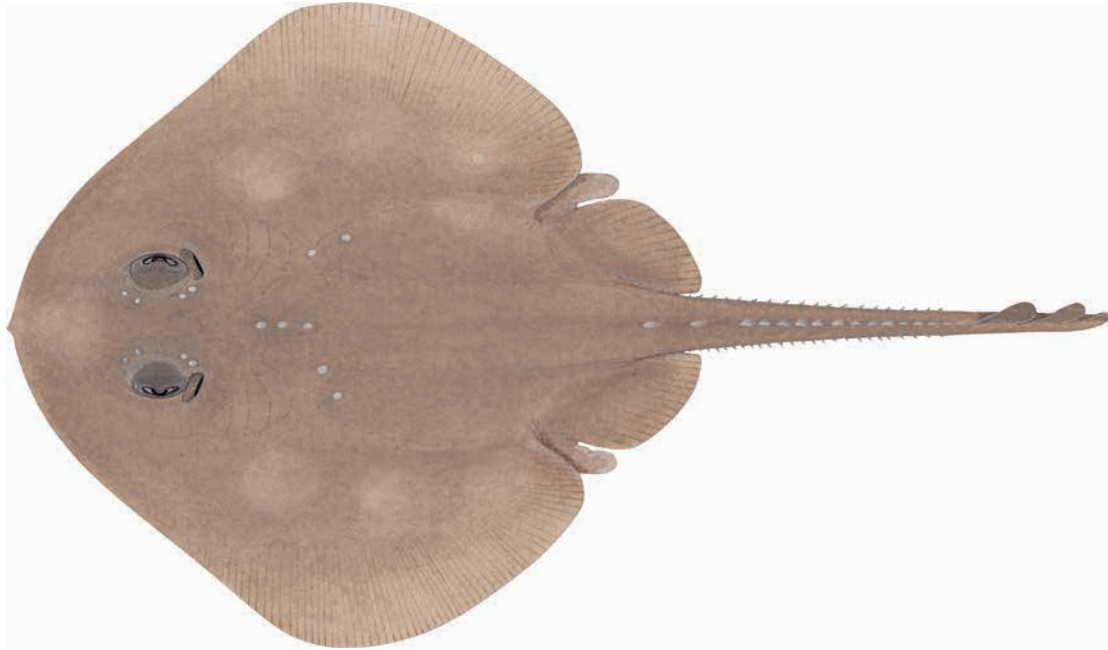
SIZE. Attains ~58 cm TL. Males mature at 41–56 cm TL, females 39–51 cm TL. Egg cases 4–5 cm long.

HABITAT AND BIOLOGY. South-West Atlantic and South-East Pacific; Uruguay to Argentina, also off southern Chile. Demersal on continental and insular shelves and upper slopes at 30–360 m depths. Diet consists mainly of crustaceans and polychaetes.

SIMILAR SPECIES. Resembles the Raspthorn Sandskate (20.95), but differs in clasper morphology, body shape ratios, upper caudal-fin lobe less well developed, and no obvious triangular thorn patch on the nape-shoulder region.

SMALLTAIL SANDSKATE

20.92

Psammobatis parvacauda McEachran, 1983

DD

IDENTIFICATION. Small skate with a weak heart-shaped disc, snout short and flexible anteriorly due to very delicate rostral cartilage, nasal folds large and fringed, rather short tail, skin largely smooth in adults, and dorsal surface brownish with faint pale blotches. Disc width ~1.1–1.2 times length; anterior margins weakly undulate, apex broadly rounded. Snout soft, tip blunt, obtuse and no filament at tip; length 1.6–2.3 times orbit length, interorbital space 0.7–0.9 times orbit length. Eyes very large, orbit length 5.6–6.7% of TL. Mouth rather small, nasal flaps broadly lobed, fringed; tooth rows in upper jaw ~37–38. Upper disc largely smooth, with denticles only along anterior and posterior disc margins and on mid-disc; undersurface entirely smooth. Thorns not forming rosette on orbit and not forming obvious triangular patch over nape-shoulder region (3 nuchal, 2 suprascapular, and 2 thorns on each shoulder); 3 irregular rows of tail thorns in adults; median tail row extends from tail base to first dorsal fin, lateral thorns much smaller than median thorns. Tail rather slender and short, tapering strongly, its length ~0.9–1 times precloacal length; lateral folds narrow. Pelvic-fin margin deeply incised. Dorsal fins small, low, joined at bases, fins very near tip of tail; caudal fin very short, upper lobe moderately well developed. Pectoral-fin radials ~70–71. Predorsal tail vertebrae 51–58.



COLOUR. Dorsal surface brownish, with pattern of small faint whitish blotches. Undersurface whitish; no dark-edged pores.

SIZE. At least 36 cm TL (based on one non-type specimen).

HABITAT AND BIOLOGY. South-West Atlantic; off Falkland Islands and northern Argentina. Demersal on outer continental and insular shelves at 120–130 m depths. No information on life history available.

SIMILAR SPECIES. Very poorly known and its distinction from some sandskates has been questioned. However, based on its relatively large eyes, compared to other members of the genus, we provisionally consider it to be valid.

SMALLTHORN SANDSKATE

20.93

Psammobatis rudis Günther, 1870

DD

IDENTIFICATION. Medium-sized skate with a heart-shaped disc, snout short and flexible anteriorly with delicate rostral cartilage, nasal folds large and fringed, and dorsal surface usually with strong pattern of blotches and spots. Disc width ~1.1–1.2 times length; anterior margins undulate in adult males, apex broadly rounded. Snout soft, tip blunt, obtuse and often with small filament at tip; length 2.4–3.3 times orbit length, interorbital space 1–1.1 times orbit length. Mouth narrow, nasal flaps long and broadly lobed, strongly fringed; tooth rows in upper jaw 31–37. Upper disc more or less evenly covered with coarse denticles in young; in adults, pectoral centres become smooth and mid-disc and anterior and posterior disc margins become rougher, with coarser denticles and small thornlets; undersurface smooth. Thorns forming rosette on orbit, several on nape and 1 on each shoulder; irregular median row of small thorns in shallow groove from mid-disc to first dorsal fin, no parallel rows on tail. Tail slender, tapering slightly, its length 1.1–1.2 times preloacal length; lateral folds narrow. Pelvic fins large, margins deeply incised. Dorsal fins small, upright, bases usually joined, fins located near tip of tail; caudal fin very low and short. Pectoral-fin radials ~71. Predorsal tail vertebrae 54–57.

COLOUR. Dorsal surface coloration highly variable, usually brownish with symmetrical pattern of pale cloudy blotches and small spots (often also with darker blotches and spots); pectoral markings weak; adult males often with black snout.



Undersurface white with dusky posterior disc margins; no dark-edged pores.

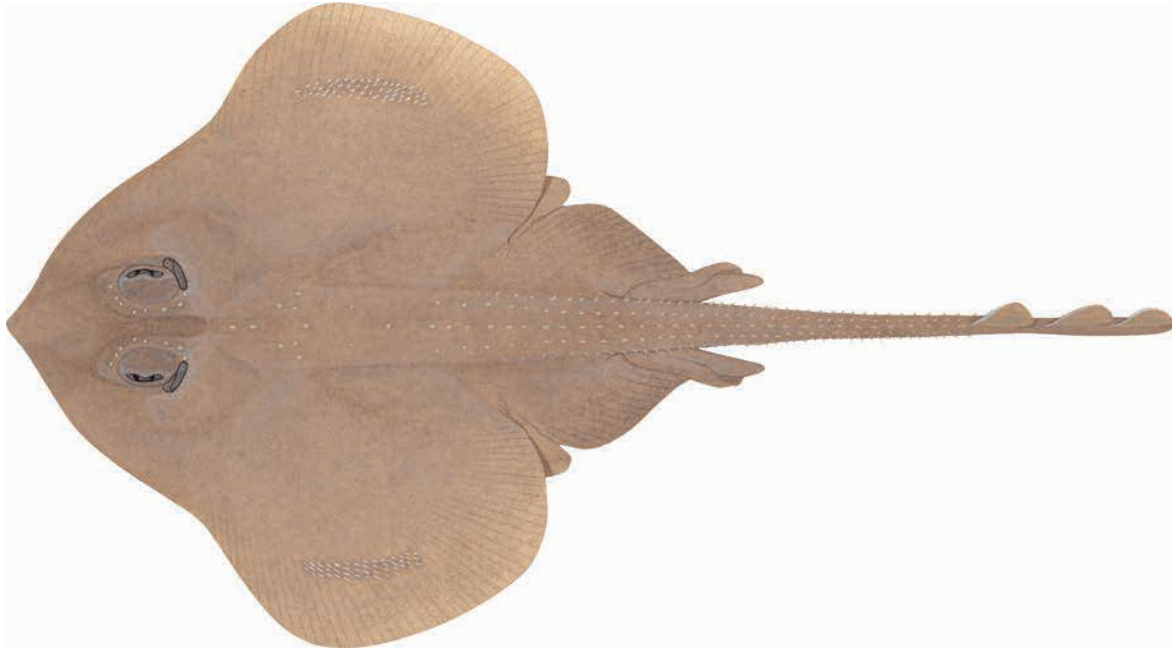
SIZE. Attains ~53 cm TL. Both sexes mature at ~36–46 cm TL; egg cases ~5 cm long.

HABITAT AND BIOLOGY. South-West Atlantic and South-East Pacific; Uruguay to southern Chile. Demersal on continental shelf and upper slope at 30–475 m depths. Diet consists mainly of crustaceans, and rarely polychaetes, molluscs and small fishes.

SIMILAR SPECIES. The Raspthorn Sand Skate (20.95) has finer denticles and larger tail thorns distributed in more rows.

SPADE SANDSKATE

20.94

Psammobatis rutrum Jordan, 1891

DD

IDENTIFICATION. Small skate with a weakly heart-shaped disc, snout rather short and flexible anteriorly with delicate rostral cartilage, nasal folds large and fringed, and brownish dorsal surface covered with darker pattern of fine spots and reticulations. Disc width ~1.2 times length; anterior margins more undulate in adult males, apex broadly rounded. Snout soft, tip blunt, obtuse and usually with small filament at tip; length 2.4–3.3 times orbit length, interorbital space 1–1.1 times orbit length. Mouth narrow, nasal flaps broadly lobed, strongly fringed; tooth rows in upper jaw 43–66, usually more than 50. Upper disc more or less evenly covered with fine denticles in young; in adults, pectoral centres become smooth and denticles concentrated on mid-disc and anterior and posterior disc margins; undersurface smooth. Thorns forming rosette on orbit and obvious triangular patch over nape-shoulder region; up to 5 median rows of small thorns from nape to first dorsal fin. Tail slender, tapering slightly, rather long, its length 1.2–1.4 times preloacal length; lateral folds narrow. Pelvic fins large, margins deeply incised. Dorsal fins small, low, not connected, fins located near tip of tail; upper caudal lobe well developed. Pectoral-fin radials ~67. Predorsal tail vertebrae 48–51.

COLOUR. Upper surface plain brownish or covered with fine brownish or blackish spots forming dense pattern of reticulations and small ocellate markings. Undersurface uniformly white; no dark-edged pores.



SIZE. Attains ~32 cm TL. Males mature at ~24–26 cm TL; egg cases very small, ~3 cm long.

HABITAT AND BIOLOGY. South-West Atlantic; southern Brazil to Argentina. Demersal on inner continental shelf at 30–150 m depths. Biology little known, diet probably consists primarily of small crustaceans and polychaetes.

SIMILAR SPECIES. Another very small species, the Zipper Sandskate (20.89), has a pricklier dorsal disc, fewer than 50 tooth rows in the upper jaw, and numerous dark and light spots arranged in clusters on the upper surface.

RASPTHORN SANDSKATE

20.95

Psammobatis scobina (Philippi, 1857)

DD

IDENTIFICATION. Medium-sized skate with a heart-shaped disc, snout rather short and flexible anteriorly with delicate rostral cartilage, nasal folds large and fringed, and brownish dorsal surface often covered irregularly with paler and/or darker spots. Disc very broad, width 1.2–1.4 times length; anterior margins strongly undulate in adult males, apex broadly rounded. Snout soft, tip blunt, obtuse and usually with minute filament at tip; length 2.1–2.6 times orbit length, interorbital space 0.8–1.1 times orbit length. Mouth rather broad, nasal flaps broadly lobed, strongly fringed; tooth rows in upper jaw 33–47. Upper disc more or less evenly covered with fine denticles in young; in adults largely smooth, denticles confined to anterior half and mid-disc; undersurface smooth. Thorns forming more or less complete rosette on orbit but without obvious triangular patch over nape-shoulder region; usually 1 parallel row of small thorns on each side of disc mid-line; tail with median row of ~20 thorns and 2–4 irregular parallel rows in adults. Tail slender, tapering slightly, rather long, its length 1.1–1.3 times precloacal length; lateral folds narrow. Pelvic fins large, margins deeply incised. Dorsal fins small, low, bases joined or narrowly separated, fins located near tip of tail; caudal fin very low and short. Pectoral-fin radials ~66. Predorsal tail vertebrae 53–59.

COLOUR. Dorsal surface uniformly brown, with or without small light or dark spots scattered over disc. Undersurface whitish; no dark-edged pores.



SIZE. Attains ~50 cm TL. Matures at ~43–49 cm TL; egg cases ~5 cm long.

HABITAT AND BIOLOGY. South-East Pacific; Chile and possibly off Patagonia. Demersal on continental shelf and slope at 30–450 m depths. Diet unknown, but probably consists of crustaceans, polychaetes, molluscs and small fishes.

SIMILAR SPECIES. The Smallthorn Sand Skate (20.93) has much coarser dorsal denticles and smaller median thorns that lie in a detectable groove.

FANFIN SKATE

20.96

Pseudoraja fischeri Bigelow & Schroeder, 1954

DD

IDENTIFICATION. Medium-sized, rather unusual skate with a heart-shaped disc, extremely large pelvic fins comprised of single laterally directed lobe, very long tail with enlarged caudal fin, no dorsal fins, and largely plain pale upper and lower surfaces of disc. Disc width ~ 1.2 times length; anterior margins concave beside eye; apices broadly rounded. Snout with filamentous tip; soft and flexible vertically due to very delicate rostral cartilage; length 1.8–2.1 times orbit length, interorbital space 0.6–0.7 times orbit length; anterior pectoral-fin radials extending nearly to snout tip. Mouth narrow, nasal flaps very long and broadly lobed; tooth rows in upper jaw 28–30. Skin entirely granular on upper surface, apart from pelvic fins; undersurface of disc entirely smooth except posterior tail covered with granular denticles. Orbit with ~ 4 large recurved thorns, not forming a rosette; ~ 3 nuchal and ~ 2 shoulder thorns; ~ 26 – 32 thorns in median row on trunk and tail, regularly spaced, upright; smaller thornlets along lateral margins of tail. Tail slender, slightly depressed, tapering to apex, length 1.3–1.6 times precloacal length; lateral folds confined to posterior third of tail; caudal-fin enlarged, clearly longer than orbit, upper lobe only slightly longer than lower lobe. Pelvic fins greatly enlarged, almost equal to ventral head length; apices broadly rounded, posterior margins transverse; clasper of male unknown. Pectoral-fin radials 84–85. Vertebrae to tail tip 100–106; abdominal vertebrae 35–38, total tail vertebrae 69–74.



COLOUR. Dorsal surface pale brown to grey, with scattering of spots; dark pores on disc margin, beside spiracles and on nuchal region. Undersurface greyish with white mouth; rows of dark pores on head.

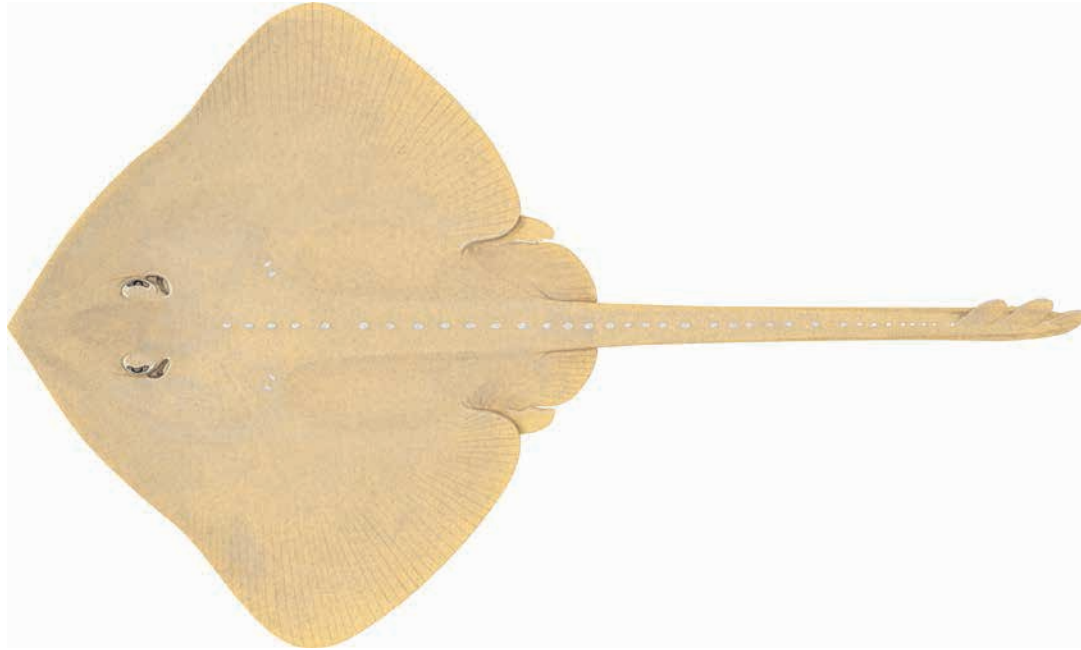
SIZE. Attains at least 58 cm TL.

HABITAT AND BIOLOGY. Western Central Atlantic; Florida to Panama, including Caribbean islands. Demersal on continental and insular slopes at 410–575 m depths. Little known and no adult males observed.

SIMILAR SPECIES. No other skate has very broad, single-lobed pelvic fins and a very elongate tail lacking dorsal fins.

DAPPLEBELLY SKATE

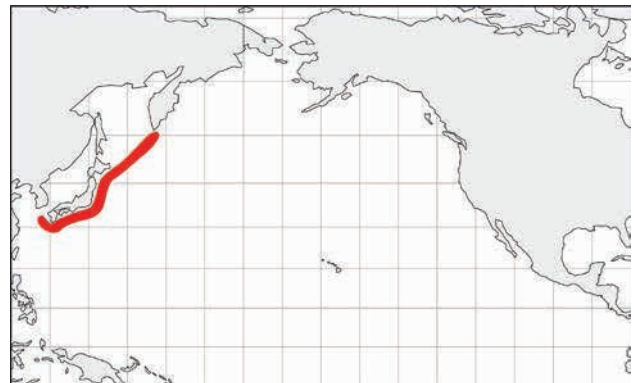
20.97

Rhinoraja kujiensis (Tanaka, 1916)

LC

IDENTIFICATION. Large heavy-bodied skate with a rhombic disc, skin on upper surface granular, very short snout, median thorns extending from nuchal region onto tail, 2 strong thorns on each shoulder, and plain coloured above with blotchy ventral pattern. Disc anterior margins straight to undulate anteriorly, apices narrowly rounded. Snout broad with a rounded tip; soft and flexible vertically due to very delicate rostral cartilage; length ~2.3–4.5 times orbit length in adults; interorbital space narrower than orbit in young, slightly broader than orbit in adults; anterior pectoral radials extending to nearly snout tip. Mouth rather small, nasal flaps broadly lobed. Thorns absent from orbit and snout; 32–45 strong thorns in median row on disc and tail before dorsal fins. Upper surface of disc and tail covered with star-shaped denticles, more obviously concentrated along mid-line in adults; under-surface smooth. Tail thickened, dome-shaped in cross-section, tapering to apex, slightly longer than disc length; lateral folds restricted to posterior tail; 2 small dorsal fins at rear of tail barely separated; caudal fin short. Pelvic fin weakly notched, posterior lobe somewhat enlarged, much longer than anterior lobe; clasper slender. Abdominal vertebrae 33–38, predorsal tail vertebrae 76–83.

COLOUR. Upper surface plain yellowish, becoming greyish in preservative, dorsal fins similar to disc; ventral surface of



disc mainly white, often with darker blotches near gills and on tail; sensory pores not marked black.

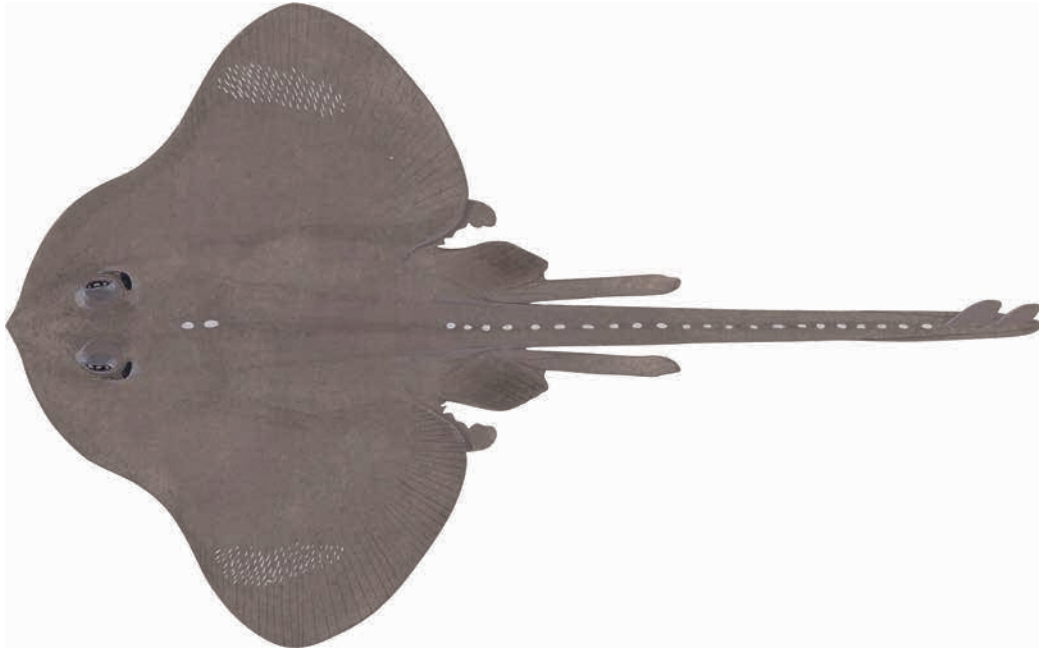
SIZE. Attains at least 104 cm TL; egg cases ~11 cm long.

HABITAT AND BIOLOGY. North-West Pacific; eastern Japan to Sea of Okhotsk (Russia). Demersal on upper and mid-continental and insular slopes at depths of 450–1000 m or more. Bycatch of trawl fishery for cod and rockfishes.

SIMILAR SPECIES. Aspects of squamation are similar to the Aleutian Skate (20.8), but the Dapplebelly Skate has a much shorter snout and differs subtly in morphology and meristics.

WHITEBELLY SKATE

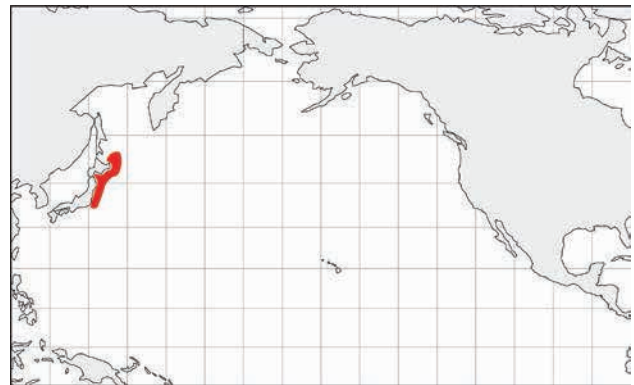
20.98

Rhinoraja longicauda Ishiyama, 1952

LC

IDENTIFICATION. Medium-sized, heavy-bodied skate with a broadly heart-shaped disc, very short snout, long tail, rather large eyes, granular dorsal disc, no shoulder thorns, median thorn row not continuous between nuchal region and posterior disc, and faint spotted pattern above. Disc anterior margins undulate anteriorly with deep concavity beside spiracle; apices broadly rounded. Snout with narrow pointed tip; soft and flexible vertically due to very delicate rostral cartilage; length 1.9–2.9 times orbit length in adults; interorbital space narrower than orbit length; anterior pectoral radials extending to nearly snout tip. Nasal flaps broadly lobed. Thorns absent from orbit, snout and shoulder; 1–4 (mostly 3) nuchal thorns; 18–23 strong, regularly spaced thorns in median row on posterior disc and tail before dorsal fins. Upper surface of disc and tail covered with both large and small denticles, generally denser through middle of disc than on pectoral fin adjacent; undersurface smooth. Tail thickened, dome-shaped in cross-section, tapering to apex, considerably longer than disc length; lateral folds confined to posterior tail; 2 very small dorsal fins together near tail tip; caudal fin rudimentary. Pelvic fin strongly notched, posterior lobe large, clasper slender. Abdominal vertebrae 30–32, predorsal tail vertebrae 74–80.

COLOUR. Upper surface greyish purple, covered with dense pattern of darker brownish spots, a white patch at



front of each orbit; becoming plain greyish brown in preservative; ventral surface of disc mainly white, often with darker markings along disc margin, and near cloaca and tail base; sensory pores not marked black.

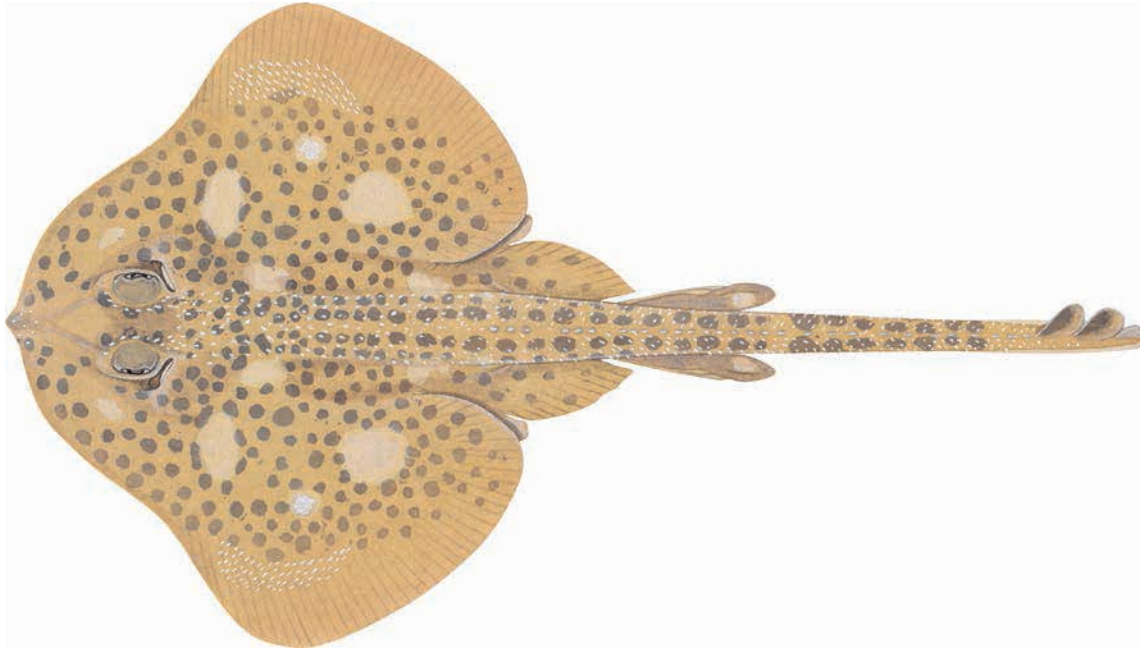
SIZE. Attains ~69 cm TL. Males smaller, to ~62 cm TL; egg cases ~6–7 cm long.

HABITAT AND BIOLOGY. North-West Pacific; off eastern Japan. Demersal on upper insular slopes at 300–1000 m depths. Caught as bycatch of trawl fishery for cod and rockfishes.

SIMILAR SPECIES. Similar to Oda's Skate (20.99), but has a more broadly heart-shaped disc and fewer vertebrae.

ODA'S SKATE

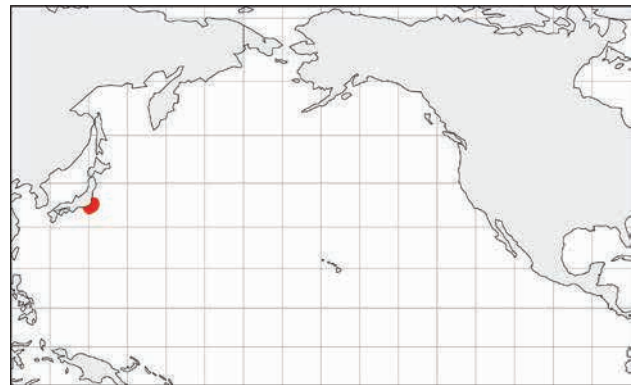
20.99

Rhinoraja odai Ishiyama, 1958

LC

IDENTIFICATION. Small to medium-sized skate with a subcircular to heart-shaped disc, short snout, very large eyes, long tail, dorsal disc granular with central band of enlarged denticles, no thorns on disc, and a complex pattern of dark spots and white blotches dorsally. Disc heart-shaped in adult males (more subcircular in young); anterior margins undulate anteriorly with deep concavity beside spiracle in adult males; apices broadly rounded. Snout with narrow pointed tip; soft and flexible vertically due to very delicate rostral cartilage; length ~2.2–2.4 times orbit length; interorbital space narrower than orbit; anterior pectoral radials extending to nearly snout tip. Mouth broad, nasal flaps lobed. Thorns absent from disc; 8–21 small, irregularly spaced thorns in median row on tail before dorsal fins. Entire upper surface and fins (except most of pelvic fins) covered with denticles; in young, denticles enlarged slightly over middle of disc; adult males with broad band of much larger thornlets from orbital region to anterior tail; undersurface smooth, without denticles. Tail rather stout, depressed, tapering to apex, considerably longer than disc length; lateral folds weak, restricted to posterior tail; 2 small dorsal fins together near tail tip (procaudal length short, subequal to snout length); caudal fin rudimentary. Pelvic fin strongly notched, posterior lobe large, clasper slender. Abdominal vertebrae 33–36, predorsal tail vertebrae 85–91.

COLOUR. Upper surface yellowish to brownish with strong pattern of darker brown spots (similar to size of pupil) and



several white pectoral ocelli. Ventral surface white, often with dusky markings on tail; sensory pores not marked black.

SIZE. Attains at least 60 cm TL. Males mature at ~48 cm TL; egg cases ~6 cm long.

HABITAT AND BIOLOGY. North-West Pacific; off eastern Japan. Demersal on continental slope at 300–870 m depths. Narrow-ranging and endemic to Japan.

SIMILAR SPECIES. Resembles the Whitebelly Skate (20.98) from Japanese seas, but lacks prominent nuchal thorns and has more complex dorsal markings.

RIO SKATE

20.100

Rioraja agassizi (Müller & Henle, 1841)

VU

IDENTIFICATION. Medium-sized skate with a rhombic disc, broad and moderately elongate snout, smooth skin, very small eyes, dorsal fins well forward on tail, and upper disc brownish and usually with faint pectoral markings. Disc 1.2 times wider than long, anterior margins undulate (more so in adult males); apices abruptly angular. Snout obtuse, blunt, small triangular lobe at tip; rostral cartilage rigid though narrow, snout not flexible vertically; length 4.4–5.9 times orbit length, interorbital space 1.7–2.5 times orbit length; anterior pectoral radials falling well short of snout tip. Mouth of moderate width, nasal flaps broadly lobed and expanded. Upper and lower surfaces without denticles. Orbit with 3 thorns (1 on preorbit, postorbit and beside spiracle); 21–57 small thorns in single row from nape to first dorsal fin (often reduced on trunk); no malar thorns. Tail very slender (length ~1.1 times precloacal length), tapering evenly, with lateral folds along entire length. Two small, upright dorsal fins, well separated (procaudal length up to twice length of snout); postdorsal tail very long and fleshy, lacking obvious caudal fin. Pelvic fin moderately notched; clasper slender with pointed tip.

COLOUR. Upper surface pale to medium brownish; pectoral marking a dark brown blotch (often encircled by paler ring); disc weakly marbled with usually faint dark spots and blotches; narrow dark bands on tail, most



pronounced near dorsal fins. Undersurface white; sensory and mucous pores marked with black streaks and spots.

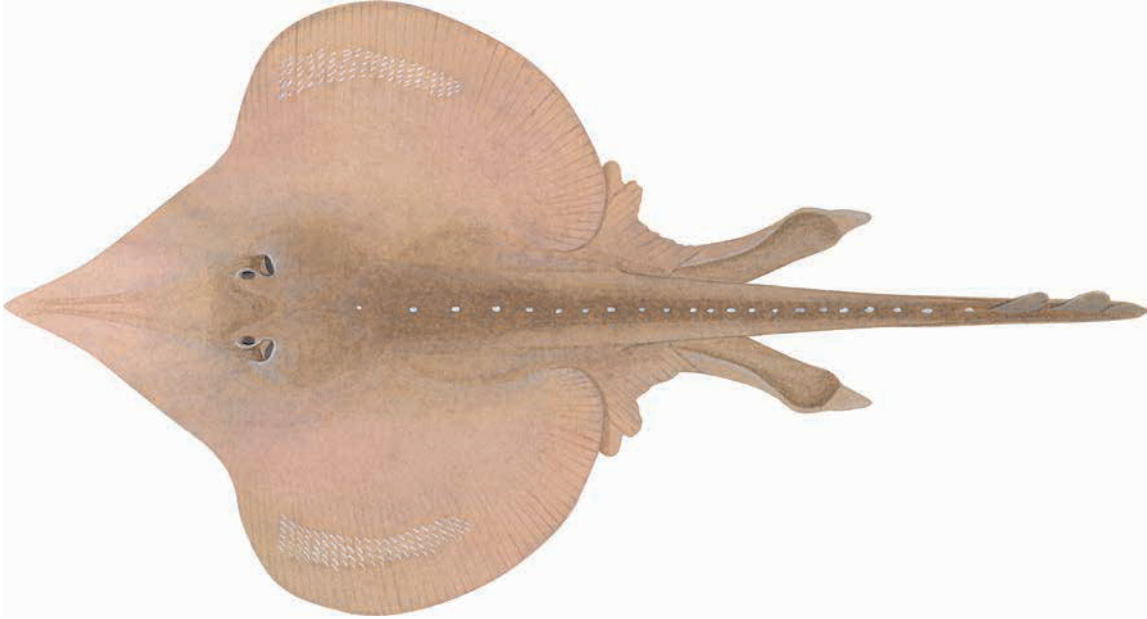
SIZE. Attains ~71 cm TL. Males mature at 42–52 cm TL, females 50–58 cm TL; egg cases 4–6 cm long.

HABITAT AND BIOLOGY. South-West Atlantic; Brazil to northern Argentina. Demersal on continental shelf and upper slope at 5–600 m depths. Reproduces throughout year. Diet consists mainly of small crustaceans, but also small bony fishes.

SIMILAR SPECIES. No other South-West Atlantic skate has such a long procaudal tail lacking an obvious upper caudal-fin lobe and with very widely separated dorsal fins.

BIGNOSE FANSKATE

20.101

Sympterygia acuta Garman, 1877

VU

IDENTIFICATION. Small skate with a heart-shaped disc, very long and narrowly pointed snout, largely smooth skin, very small eyes, outer margin of pelvic fins only weakly indented, and plain brownish dorsal surface. Disc usually longer than wide, anterior margins deeply concave beside spiracles (more so in adult males); apices broadly rounded. Snout greatly extended, triangular, tip narrowly rounded; soft and flexible vertically due to very delicate rostral cartilage, length more than 10 times orbit length; interorbital space ~3 times orbit length; anterior pectoral radials extending to nearly snout tip. Mouth narrow, nasal flaps broadly lobed; tooth rows in upper jaw 31–38. No thorns on shoulders, around eyes or in malar region; ~21 thorns in single row from nape to first dorsal fin. Upper surface smooth, except for densely prickled anterior disc margins, and sides of tail from hind disc onward. Ventral surface smooth, except for snout and prickly anterior disc margins. Tail broad based, tapering evenly, slightly shorter than disc; 2 small dorsal fins at rear of tail, barely separated; clasper very broad. Caudal fin long and low. Pelvic fin weakly notched, lobes not clearly separated when fin spread wide; clasper robust with pointed tip. Pectoral-fin radials ~72. Predorsal vertebrae ~90, abdominal vertebrae ~29, predorsal tail vertebrae ~61.

COLOUR. Upper disc plain, light to medium brown with rostral triangle translucent; thorns whitish. Ventrally largely white, with darker disc margins and dark brown blotches on tail.



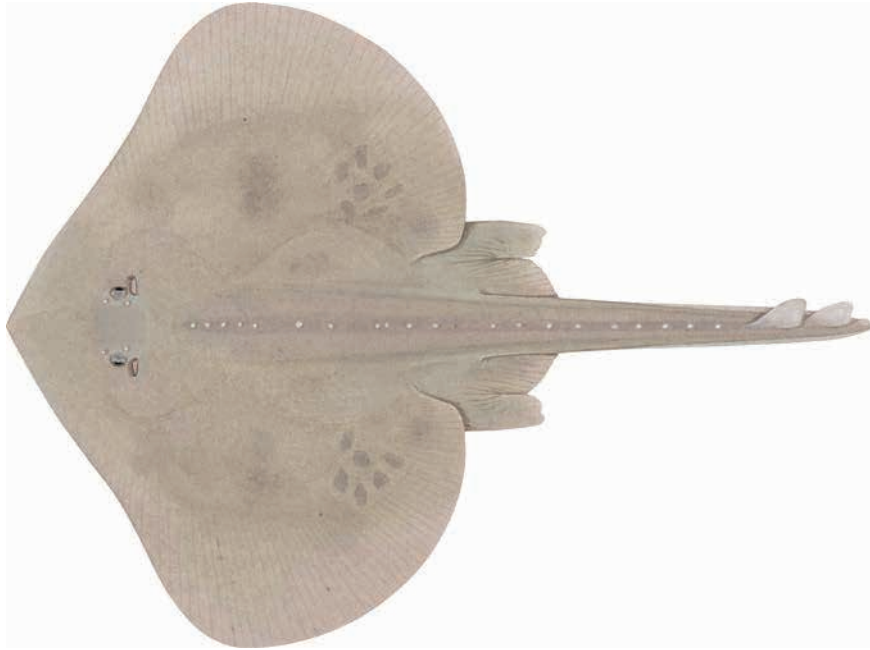
SIZE. Attains ~62 cm TL; matures at ~45–48 cm TL. Egg cases small, ~5 cm long; young hatch at ~8 cm TL.

HABITAT AND BIOLOGY. South-West Atlantic; northern Argentina to Brazil. Demersal inshore on sandy habitats in surf zone, to depths of ~190 m. Females deposit egg cases throughout year (often in clusters attached to surf-aggregated debris), with a peak in winter. Diet consists of polychaetes, shrimps, and also small molluscs and bony fishes.

SIMILAR SPECIES. A South-West Atlantic relative, the Smallnose Fanskate (20.102), has a shorter snout and richer dorsal colour pattern.

SMALLNOSE FANSKATE

20.102

Sympterygia bonapartii Müller & Henle, 1841

DD

IDENTIFICATION. Medium-sized skate with a very broad heart-shaped disc, rather short and broad snout, largely smooth skin, very small eyes, outer margin of pelvic fins straight or barely indented (when expanded), and pale brownish and usually with groups of darker spots on dorsal surface. Disc width 1.4 or more times length, anterior margins almost straight; apices broadly rounded. Snout bluntly angular, tip triangular; soft and flexible vertically due to very delicate rostral cartilage, length 3.8–5.2 times orbit length; interorbital space 1.3–2.2 times orbit length; anterior pectoral radials extending to nearly snout tip. Mouth narrow, nasal flaps broadly lobed; tooth rows in upper jaw ~35. Single preorbital and postorbital thorns; row of 2–6 median thorns on nape, continuous along disc to tail (or discontinuous on mid-disc); ~14 thorns on mid-line of tail; 1 interdorsal thorn; no thorns on shoulders or in malar region. Upper disc largely smooth, except for prickly anterior margins and head; ventral surface smooth. Tail short and firm, slightly longer than precloacal length; narrow-based (width similar to interorbital space); 2 small dorsal fins near tip of tail, narrowly separated. Caudal fin low. Pelvic fins weakly notched. Pectoral-fin radials ~81. Predorsal vertebrae ~94, abdominal vertebrae ~35, predorsal tail vertebrae ~60.

COLOUR. Dorsal surface of disc brownish, mostly pale, with variable pattern of darker brown blotches; often with pale spots and lines forming reticulate pattern; snout tip



usually with black blotch. Undersurface white, with black blotch on snout tip and tail tip.

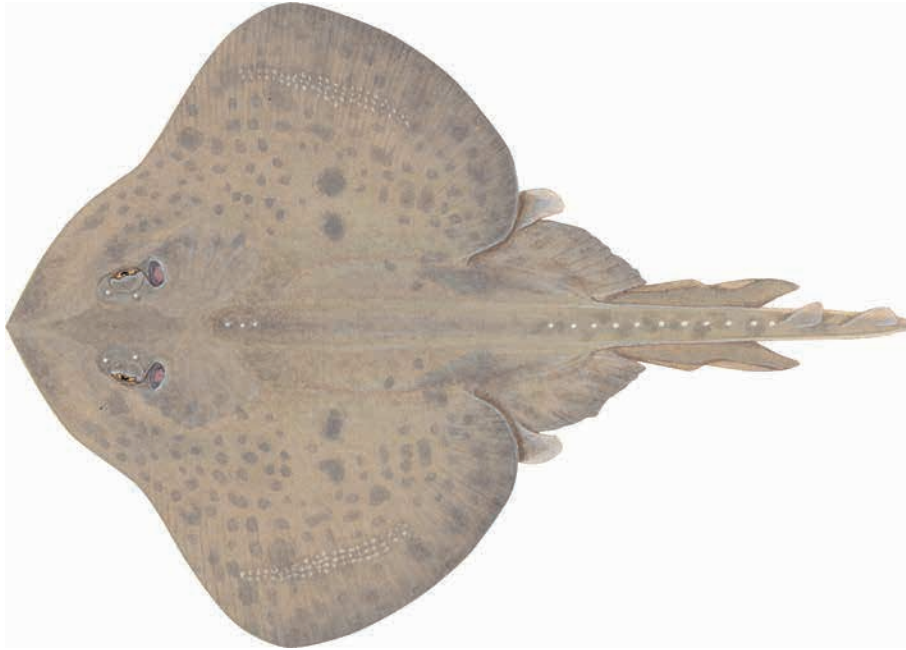
SIZE. Attains ~88 cm TL; matures at ~58–60 cm TL.

HABITAT AND BIOLOGY. South-West Atlantic (Patagonia to southern Brazil) and South-East Pacific (Strait of Magellan). Demersal, coastal and inner continental shelf (usually shallower than 100 m), occasionally to 500 m depths. Diet consists mainly of decapod crustaceans, and small bony fishes when adult.

SIMILAR SPECIES. Occurs in the South-West Atlantic with the Bignose Fanskate (20.101), which has a much more elongated and narrowly pointed snout.

SHORTTAIL FANSKATE

20.103

Sympterygia brevicaudata (Cope, 1877)

DD

IDENTIFICATION. Medium-sized skate with a broad heart-shaped to weakly rhombic disc, short and broad snout, largely smooth skin, small eyes, outer margin of pelvic fins weakly indented (when expanded), and dorsal surface brownish and covered with dense pattern of darker blotches (often faint). Disc width ~1.2 times length, anterior margins undulate; apices narrowly rounded. Snout rounded, soft and flexible vertically due to very delicate rostral cartilage, length 2.4–2.9 times orbit length; interorbital space 1.2–2 times orbit length; anterior pectoral radials extending to nearly snout tip. Mouth broad, nasal flaps broadly lobed; tooth rows in upper jaw ~31–39. Usually single preorbital and postorbital thorns; median row of thorns discontinuous on mid-disc; 10–17 thorns on posterior trunk and mid-line of tail; 1 interdorsal thorn; no thorns on shoulders or in malar region. Both surfaces of disc largely naked apart from scattered denticles. Tail short and firm, slightly longer than precloacal length in adults; narrow-based (width much narrower than interorbital space); 2 well-developed dorsal fins near tip of tail, narrowly separated; clasper slender with pointed tip, reaching to near base of first dorsal fin. Caudal fin minute. Pelvic fins weakly notched. Pectoral-fin radials 70–75. Predorsal vertebrae ~78, abdominal vertebrae 28–33, predorsal tail vertebrae 45–51.

COLOUR. Dorsal surface yellowish brown to greyish brown, usually with faint pattern of dark and/or light



blotches; dark markings cloudy (similar size to pupil) and sometimes indistinct. Undersurface white.

SIZE. Attains ~55 cm TL; males mature at 35–40 cm TL.

HABITAT AND BIOLOGY. South-East Pacific; Ecuador to southern Chile. Demersal, coastal inshore and on inner continental shelf to ~100 m depths. Diet consists of small benthic crustaceans and polychaete worms.

SIMILAR SPECIES. The Filetail Fanskate (20.104), which occurs with the Shorttail Fanskate in the South-East Pacific, has the dorsal fins connected at their bases and lacks thorns on the upper disc.

FILETAIL FANSKATE

20.104

Sympterygia lima (Poeypig, 1835)

DD

IDENTIFICATION. Medium-sized skate with a broad heart-shaped and thornless disc, broad snout, small eyes, outer margin of pelvic fins noticeably concave (when expanded), dorsal fins joined at bases, and dorsal surface uniformly brownish or with faint blotchy pattern. Disc width 1.2–1.3 times length, anterior margins undulate; apices narrowly rounded. Snout short, rounded, tip bluntly angular, soft and flexible vertically due to very delicate rostral cartilage, length 3.1–4 times orbit length; interorbital space 1.4–2.3 times orbit length; anterior pectoral radials extending to nearly snout tip. Mouth narrow, nasal flaps broadly lobed; tooth rows in upper jaw ~37. No thorns on disc; ~10 thorns in single row on tail. Skin largely naked; dorsal surface with scattered denticles on head and along disc mid-line. Tail short and firm, subequal to precloacal length; narrow-based (width similar to interorbital space); 2 small dorsal fins forward of tip of tail, bases joined; clasper slender with pointed tip, reaching to near base of second dorsal fin. Caudal fin short. Pelvic fins weakly notched and lobes not clearly separated when fin spread wide. Pectoral-fin radials ~68. Predorsal vertebrae ~79, abdominal vertebrae ~30, predorsal tail vertebrae ~49.

COLOUR. Greyish brown above, uniform or with darker and lighter blotches; often with random circular black spots on disc and pelvic fins; snout beside rostral cartilage pale,



translucent; tail usually with broad dark and light crossbars and few dark spots. Undersurface whitish.

SIZE. Attains ~65 cm TL. Males mature at ~45 cm TL, females at ~51 cm TL.

HABITAT AND BIOLOGY. South-East Pacific; off Chile. Demersal, coastal inshore and on inner continental shelf to 80 m depths. Feeds on small benthic crustaceans and polychaete worms.

SIMILAR SPECIES. The Shorttail Fanskate (20.103), which also occurs in the South-East Pacific, has thorns on the upper disc, and the dorsal fins are separate (not joined at their bases) with a thorn in the intervening space.

Last P.R., Stehmann M.F.W., Séret Bernard, Weigmann S.

Softnos skates : family Arhynchobatidae.

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