

10

GUITARFISHES

Family Rhinobatidae

B. Séret, P.R. Last & G.J.P. Naylor

Guitarfishes, otherwise known as shovelnose rays, are small to large rays (some mature at ~50 cm TL whereas others attain 1.7 m TL). They have a flattened wedge- or shovel-shaped disc with a strongly depressed trunk. The snout is often elongate and its tip varies from narrowly pointed to broadly rounded. Eyes and spiracles vary from medium to large, the latter with 1–2 variably developed folds. Nostrils rather short and very oblique with fewer than 68 lamellae. All species lack a nasal curtain, and the anterior nasal flaps are often broad and joined posteriorly to either close to the inner edge of the nostril or slightly within the interspace between the nostrils. Mouth profile is straight. The skin is usually covered with fine denticles (sometimes partly naked), and small thorns and thornlets are variably developed in a row along dorsal mid-line of body, in small patches near eyes, and on shoulder and snout. Long-based pelvic fins are positioned laterally and posteriorly to the disc. Two upright or tilted dorsal fins are well separated, with the first positioned well to slightly behind rear tips of the pelvic fins. The small caudal fin lacks an obvious ventral lobe. Dorsal coloration varies from plain (usually greyish or brownish) to having a strong pattern of lines, bars, spots and/or blotches. The cranium and rostral cartilage are not usually sharply demarcated at their edges with the snout. The undersurface is usually white but a black blotch is often present on the snout. Until recently, the family Rhinobatidae included the giant guitarfishes (Glaucostegidae) and banjo rays (Trygonorrhinidae) but recent molecular analyses have shown that members of these three groups are distinct from each other. Guitarfishes, as defined herein, are provisionally represented by 3 genera (*Acroteriobatus*, *Rhinobatos* and *Pseudobatos*) and 31 valid species. However, based on mitochondrial DNA sequence comparisons, the amphi-American genus (*Pseudobatos*) is strongly divergent from the other genera and may belong within a separate family. Guitarfishes occur in all warm temperate and tropical oceans, inshore to well offshore on continental and insular shelves and slopes, to depths of at least 400 m. None of the species occurs in freshwater. As bottom-dwellers, they usually rest on, or lie partly concealed within soft mud or sandy sediments, rather than swimming actively in midwater. Viviparous (aplacental) producing litters of up to 16 young. They feed mainly on small benthic invertebrates and fishes. Usually too small to be of major significance to the fin trade, but some species are utilised for their high-quality flesh. Typically caught as bycatch of trawl and set-net fisheries.

KEY TO RHINOBATID GENERA

1. Anterior nasal flaps extending well into internasal space, almost joined at mid-line of snout (fig. 1); Eastern Atlantic and Western Indian Oceans *Acroteriobatus* (8 species; fig. 4, pp. 79–86)

Anterior nasal flaps not or only slightly extending into internasal space, their posterior edges well separated and falling well short of snout mid-line (figs 2, 3) 2

2. Anterior nasal flaps moderately developed; their posterior edge extending slightly into internasal space, reaching level above innermost corner of nostril (fig. 2); Eastern Atlantic and Indo–West Pacific *Rhinobatos* (15 species; fig. 5, pp. 95–109)

Anterior nasal flaps short; not or barely extending into internasal space, their posterior edge confined to anterior margins of nostril (fig. 3); amphi-American distribution *Pseudobatos* (8 species; fig. 6, pp. 87–94)

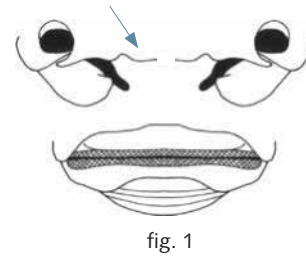


fig. 1

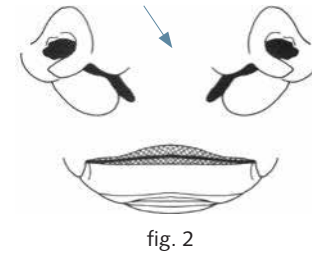


fig. 2

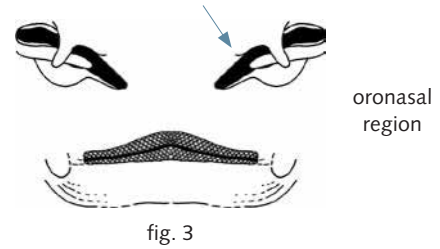


fig. 3

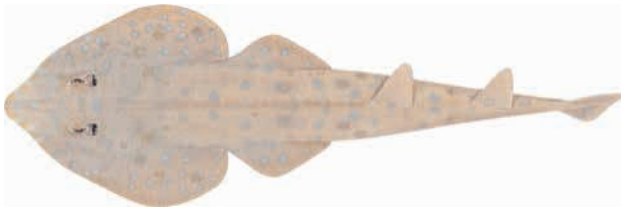


fig. 4

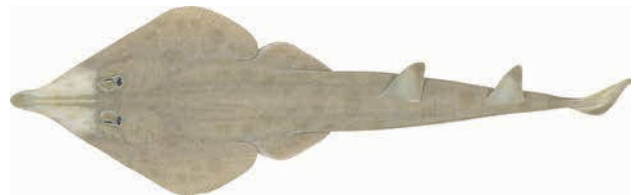


fig. 5



fig. 6

LESSER GUITARFISH

10.1

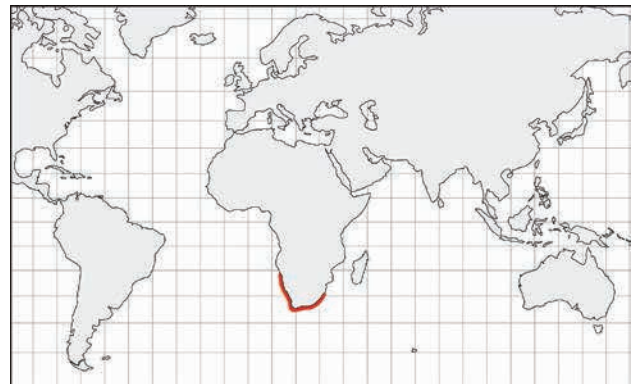
Acroteriobatus annulatus (Müller & Henle, 1841)

LC

IDENTIFICATION. Large guitarfish with a broad, wedge-shaped disc, short bluntly triangular snout, anterior nasal flaps almost joined at snout mid-line, and a dorsal pattern of numerous small blotches resembling eyespots. Disc rather thick, length ~ 1.1 times its width; anterior margins slightly convex, outer corner of pectoral fins broadly rounded to angular. Snout angle $\sim 70^\circ$; eye large, slightly larger than spiracle; orbit length ~ 3.4 in preorbital length, ~ 1.2 in interorbital space. Rostral ridges widely separated with a weak mid-constriction. Spiracle with 2 prominent fleshy folds. Tooth rows in upper jaw 41–45. Nostrils short, oblique, slightly longer than internasal space; anterior nasal flaps greatly developed, their innermost margins extending across most of internasal space. Skin entirely covered in fine denticles; small tubercles around orbits and spiracles; mid-dorsal row of ~ 35 small tubercles. Tail ~ 1.6 times longer than disc; large dorsal fins widely spaced, apices narrowly rounded. Pectoral-fin radials 72–74. Total vertebral centra 190–200.

COLOUR. Dorsal surface light brown with a distinctive pattern of numerous dark spots or small ocelli, each consisting of a central dark spot surrounded by a dark-edged pale ring; markings more or less symmetrically arranged. Ventral surface uniformly white.

SIZE. Apparently reaches 140 cm TL, usually much smaller. Males mature at ~ 59 cm TL and females at 62–65 cm TL, born at ~ 23 cm TL.

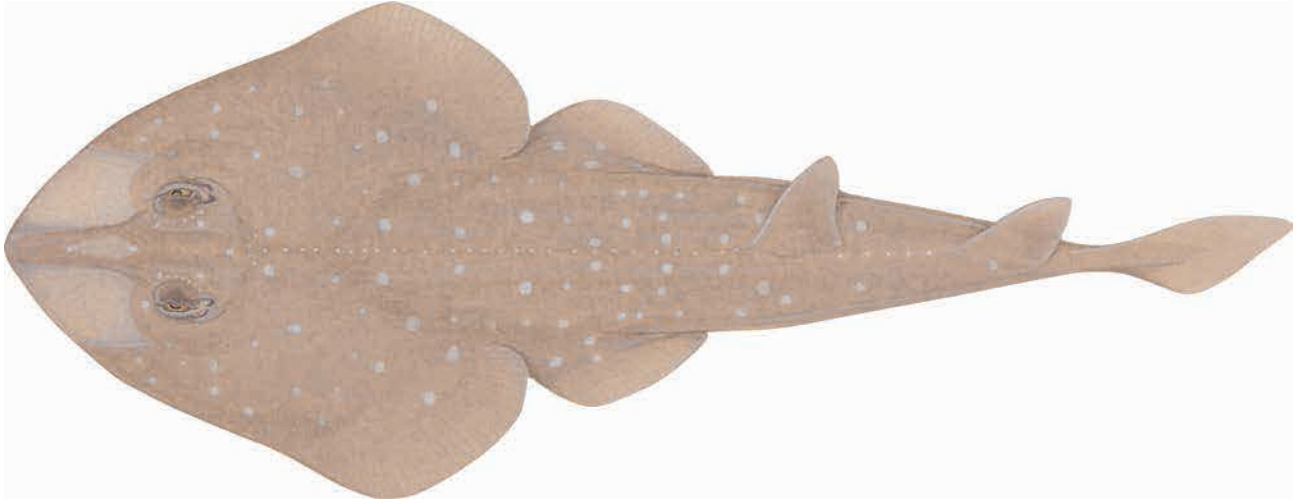


HABITAT AND BIOLOGY. South-East Atlantic and South-West Indian Oceans; Namibia to Natal (South Africa). Benthic, common in shallow waters to at least 75 m depth. Feeds on small benthic invertebrates and small fishes. Produces litters of 2–10 pups.

SIMILAR SPECIES. Specimens from Natal have a dorsal pattern consisting of brown spots whereas those from the South African Cape Province are ocellated. The Speckled Guitarfish (10.4) also has a pattern of eyespots that are blue-grey with a brownish rim.

BLUNTNOSE GUITARFISH

10.2

Acroteriobatus blochii (Müller & Henle, 1841)

LC

IDENTIFICATION. Medium-sized guitarfish with a shovel-shaped disc, short and bluntly pointed snout, anterior nasal flaps extending across internasal space and close together (separated only by a short interspace), single dermal fold on posterior margin of spiracle, and plain brownish dorsally. Disc thin, length 1.1 times disc width; anterior margins slightly convex, outer corner of pectoral fins broadly rounded. Snout angle $\sim 95^\circ$, eyes larger than spiracles; orbit length 2.8–3.1 in preorbital length, 1.1–1.3 in interorbital space. Rostral ridges broadly separated. Spiracle with single fleshy fold. Nostrils large and oblique, length equal to or slightly longer than internasal space; anterior nasal flaps barely separated in internasal space. Skin velvety, entirely covered with minute denticles; ring of small thornlets above orbits but no enlarged thorns; median row of ~ 28 small thornlets from nape to first dorsal fin, ~ 8 in interdorsal space, and ~ 4 on caudal peduncle; all thornlets disappear during growth. Tail 1.6–1.8 times longer than disc; rather large dorsal fins, widely spaced, interspace 2.2–2.3 times base length of first dorsal fin; apices narrowly rounded. Pectoral-fin radials 63–69. Total vertebral centra 173–180.

COLOUR. Dorsal surface uniform brownish in adults; young with a pattern of symmetrical ocelli with a light centre and cloudy dark rim, ocelli gradually disappear with growth. Ventral surface uniformly white.



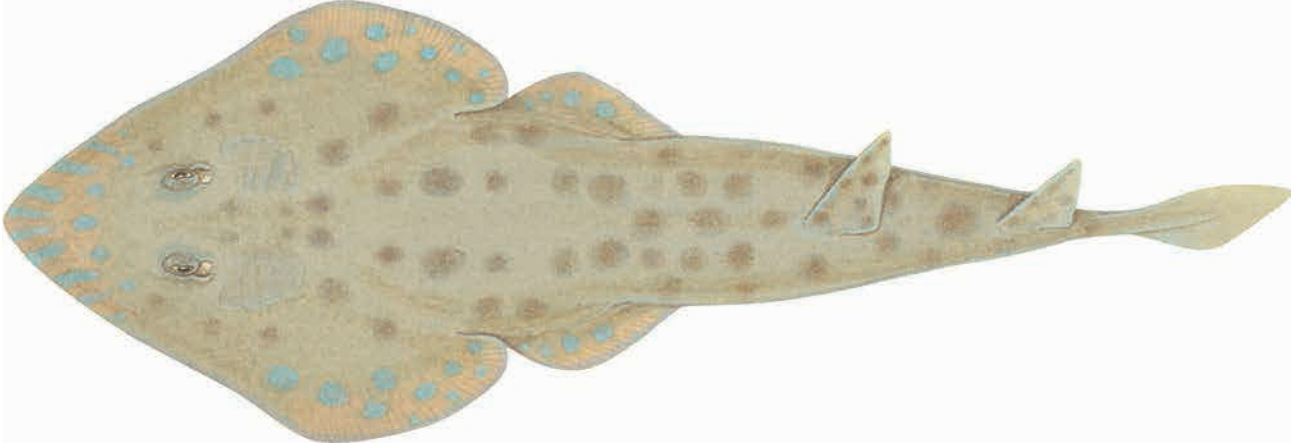
SIZE. Reaches 96 cm TL.

HABITAT AND BIOLOGY. South-East Atlantic; Cape Province (South Africa) to Namibia, common in Walvis Bay. Records from Angola, Senegal and Mauritania are doubtful. Benthic in shallow sandy bays. Biology virtually unknown.

SIMILAR SPECIES. Off southern Africa, the only guitarfish with a short and bluntly rounded snout. A pattern of white ocelli present in juveniles resembles that of the longer-snouted Whitespotted Guitarfish (10.17) from West Africa.

GREYSPOT GUITARFISH

10.3

Acroteriobatus leucospilus (Norman, 1926)

DD

IDENTIFICATION. Large guitarfish with a wedge-shaped disc, short and narrowly triangular snout, anterior nasal flaps extending across internasal space (almost joined), and dorsal surface with a pattern of symmetrical bluish blotches on snout, and pectoral and pelvic-fin margins. Disc rather thick, length ~1.1 times its width; anterior margins weakly undulate, almost straight; outer corner of pectoral fins mostly rounded. Snout angle ~80°; eye larger than spiracles; orbit length ~4.7 in preorbital length, ~1.3 in interorbital space. Rostral ridges narrowly separated for most of their length. Spiracle with 2 fleshy folds, outer more prominent. Tooth rows in upper jaw 42–51. Nostrils large and oblique, length about equal to internasal space; anterior nasal flaps barely separated in internasal space. Skin velvety, entirely covered with minute denticles; no enlarged thorns but ~7 minute thornlets above orbits, 3–4 above spiracle, 1–2 on shoulders; median row of up to 50 minute thornlets from nape to first dorsal fin; all thornlets disappear during growth, no interdorsal thornlets. Tail ~1.6 times longer than disc; large dorsal fins widely spaced, interspace ~2.7 times base length of first dorsal fin; apices narrowly rounded. Pectoral-fin radials 68–72. Total vertebral centra 186–192.

COLOUR. Dorsal surface sandy brown with a number of symmetrically arranged bluish grey blotches on margins of disc and pelvic fins, also a few symmetrically arranged brown blotches on back of trunk; dorsal and caudal fins



faint grey, with brown spots. Ventral surface white, sometimes with a few faint dark spots on snout tip.

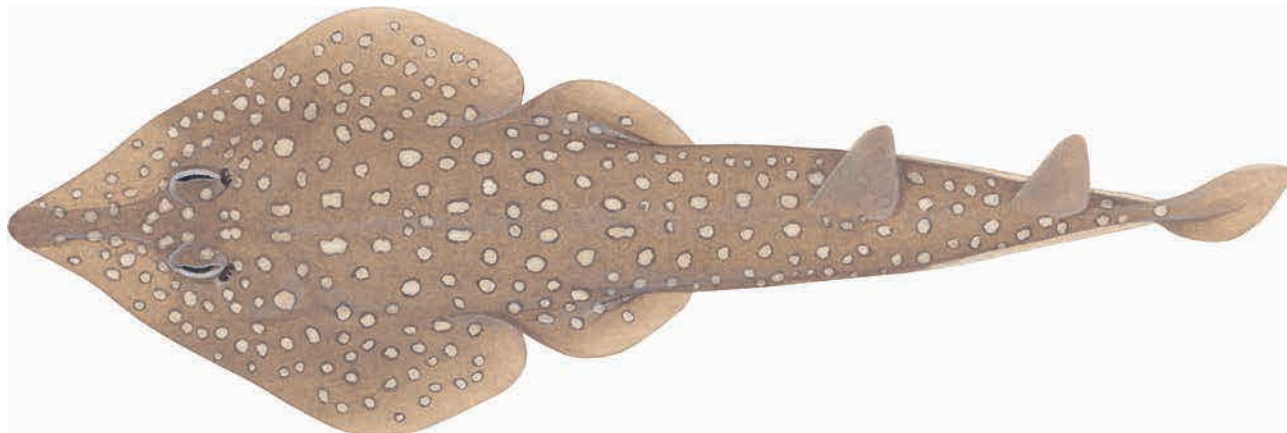
SIZE. Reaches at least 120 cm TL, commonly 92–96 cm TL. Males and females mature at ~56 cm TL; birth size ~25 cm TL.

HABITAT AND BIOLOGY. South-West Indian Ocean; Mozambique to Natal (South Africa). Benthic on the continental shelf, inshore to 100 m depth. Feeds on benthic invertebrates and small bony fishes. Produces litters of 2–9 pups.

SIMILAR SPECIES. Resembles the Stripenose Guitarfish (10.7), but the latter has three brown bands on each side of the snout. Distinguished from the Lesser Guitarfish (10.1) and Speckled Guitarfish (10.4) in having plain bluish blotches that are not dark edged.

SPECKLED GUITARFISH

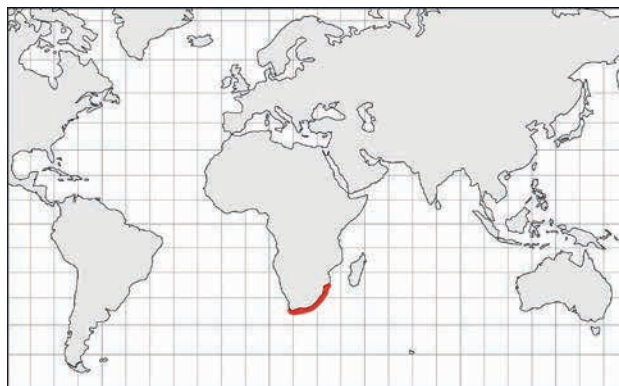
10.4

Acroteriobatus ocellatus (Norman, 1926)

DD

IDENTIFICATION. Medium-sized guitarfish with a wedge-shaped disc, short and narrowly triangular snout, anterior nasal flaps extending across internasal space and barely separated, and dorsal surface with numerous small blue-grey eyespots ringed with dark brown. Disc rather thick, length 1.1 times its width; anterior margins slightly undulate to almost straight, outer corner of pectoral fins mostly rounded. Snout angle $\sim 60^\circ$; eye larger than spiracles; orbit length ~ 4 in preorbital length, 0.9–1.2 times interorbital space. Rostral ridges narrowly separated. Spiracle with 2 prominent fleshy folds. Tooth rows in upper jaw ~ 70 . Nostrils large and oblique, length usually longer than internasal space; anterior nasal flaps barely separated in internasal space. Skin velvety, entirely covered with minute denticles; no enlarged thorns, a rim of minute thornlets above orbits and spiracles, 2 on shoulders, and a median row of minute thornlets from nape to first dorsal fin often present; no interdorsal thornlets. Tail ~ 1.7 times longer than disc; large dorsal fins widely spaced, interspace ~ 3 times base length of first dorsal fin; apices narrowly rounded. Pectoral-fin radials ~ 76 . Total vertebral centra ~ 221 .

COLOUR. Dorsal surface brownish with numerous small ocelli consisting of a bluish grey centre surrounded by a dark brownish rim. Ventral surface creamy white.



SIZE. Reaches at least 81 cm TL (specimen was an adult male).

HABITAT AND BIOLOGY. South-West Indian Ocean; Mozambique to Natal (South Africa). Benthic inshore on outer continental shelf at depths of 60–185 m. Life history unknown.

SIMILAR SPECIES. Resembles the Lesser Guitarfish (10.1); in the latter the ocelli are dark edged with their centres either brownish or consisting of a dark spot surrounded by a pale ring.

OMAN GUITARFISH

10.5

Acroteriobatus omanensis Last, Henderson & Naylor, 2016

NE

IDENTIFICATION. Small guitarfish with a wedge-shaped disc, moderately elongate and narrowly triangular snout, anterior nasal flaps extending well across internasal space and barely separated, and dorsal surface with dense pattern of white ocelli. Disc rather thin, length 1.3–1.4 times its width; anterior margins undulate, moderately concave before snout tip, outer corner of pectoral fins broadly rounded. Snout angle $\sim 64^\circ$; eye large, much larger than spiracles; orbit length 3.1–3.7 in preorbital length, 1.1–1.4 in interorbital space. Rostral ridges well separated at their base. Spiracle with 2 fleshy folds, inner fold rudimentary. Nostrils rather large and oblique, length 1.2–1.3 times internasal space; anterior nasal flaps barely separated. Skin velvety, entirely covered with minute denticles; no thorns or thornlets, some barely enlarged denticles on preorbit and in median row between nape and first dorsal fin. Tail 1.3–1.4 times longer than disc; tall dorsal fins widely spaced, interspace 2.7–3.2 times base length of first dorsal fin; apices angular to narrowly rounded. Pectoral-fin radials 67–72. Total vertebral centra 185–188.

COLOUR. Dorsal surface brownish with numerous small symmetrically arranged ocelli consisting of a white centre surrounded by a dark brownish rim. Ventral surface uniformly whitish, sometimes with dark blotch at snout tip.



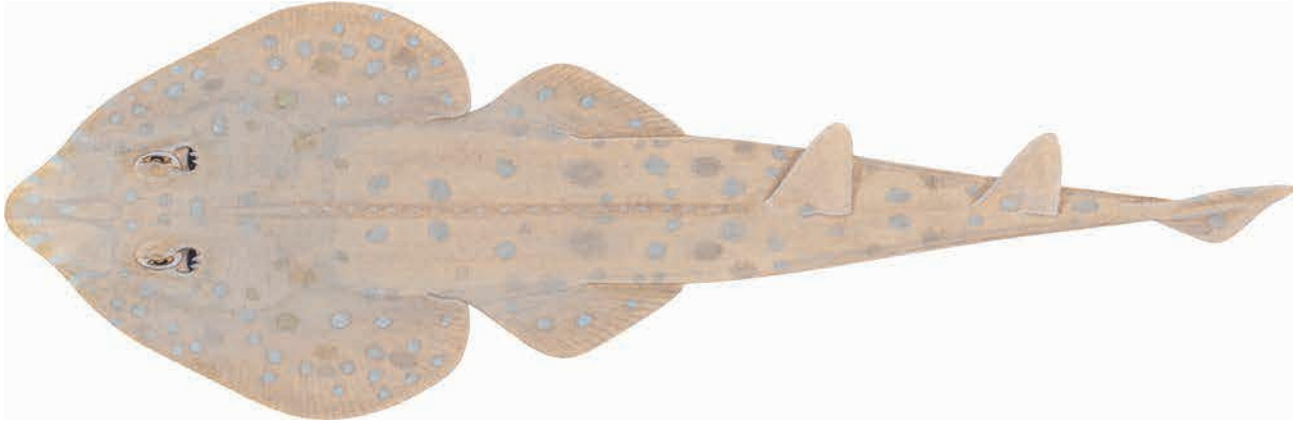
SIZE. Reaches at least 60 cm TL; maturity size unknown but a 50 cm TL male was mature.

HABITAT AND BIOLOGY. Northern Indian Ocean; off Oman. Probably benthic on inner continental shelf. Life history unknown.

SIMILAR SPECIES. The Salalah Guitarfish (10.6) occurs in the same region but has a more bluntly rounded snout and fewer and large bluish eyespots on the upper disc. Other members of the genus differ in body shape and/or dorsal coloration.

SALALAH GUITARFISH

10.6

Acroteriobatus salalah (Randall & Compagno, 1995)

DD

IDENTIFICATION. Small to medium-sized guitarfish with a heart-shaped disc, very broad triangular snout, anterior nasal flaps barely separated in internasal space, weakly convex mouth, no enlarged thorns on body, and upper surface with dark-edged, pale bluish eyespots. Disc rather thin, length ~1.1 times its width; anterior margins of snout concave, outer corner of pectoral fins broadly rounded. Snout short, angle ~88°, tip broadly rounded; orbit length 3.3–3.6 in preorbital length, slightly shorter than interorbital space. Rostral ridges well separated. Outer fold of spiracle distinctly larger than inner fold. Tooth rows in upper jaw ~69. Nostrils rather narrow with ~41 nasal lamellae, width 1.1–1.2 times internasal width; oblique with a suboval anterior aperture; anterior nasal flaps almost joined, their interspace almost a third of internasal width. Skin velvety, entirely covered with minute denticles; additional clusters of slightly enlarged denticles around and between eyes, on each shoulder, and along mid-line of disc and tail. Tail 1.5–1.6 times longer than disc; dorsal fins rather widely spaced, interspace 2.8–3 times base length of first dorsal fin; apices narrowly rounded. Pectoral-fin radials ~67. Total vertebral centra ~179.

COLOUR. Dorsal surface yellowish brown with dense pattern of faint bluish spots; spots dark edged, rather regularly spaced, their diameter ~5–7 mm in adults; rostral cartilage not strongly contrasted with rest of snout. Ventral surface white, semi-translucent, and sometimes with dark



blotch on snout. Dorsal fins yellowish brown, often faintly blotched.

SIZE. To at least 78 cm TL. Males mature at ~62 cm TL; born at ~18 cm TL.

HABITAT AND BIOLOGY. Western Indian Ocean; Oman to Pakistan (Arabian Sea). Demersal inshore on inner continental shelf. Produces litters of 1–6 pups.

SIMILAR SPECIES. The Bluntnose Guitarfish (10.2), which occurs in the South-West Indian Ocean, also has a similar heart-shaped disc, but has a single spiracular fold (rather than 2) and lacks enlarged denticles that are obvious on the interorbit of the Salah Guitarfish.

STRIPENOSE GUITARFISH

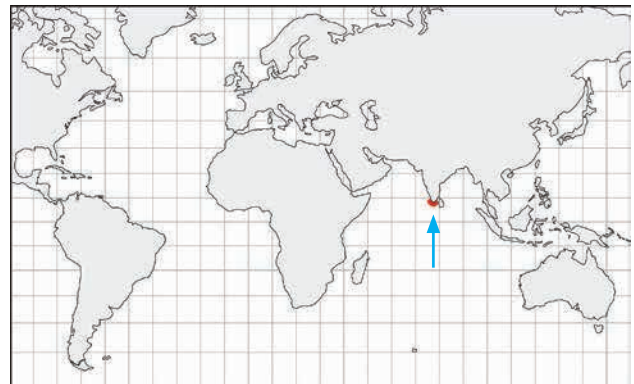
10.7

Acroteriobatus variegatus (Nair & Lal Mohan, 1973)

DD

IDENTIFICATION. Small to medium-sized guitarfish with a wedge-shaped disc, triangular snout, anterior nasal flaps barely separated in internasal space, weakly convex mouth, distinct row of thorns on mid-line of body, and upper surface brownish with bluish markings on snout and along hind margins of disc. Disc rather thin, length ~1.3 times its width; anterior margins of snout almost straight, outer corner of pectoral fins broadly rounded. Snout moderately elongate, angle ~65°, tip bluntly pointed; orbit length 4–4.3 in preorbital length, slightly larger than interorbital space. Rostral ridges well separated. Outer fold of spiracle distinctly larger than inner fold. Nostrils rather narrow, width 1.1–1.3 times internasal width; oblique with a suboval anterior aperture; anterior nasal flaps almost joined, their interspace less than 2/3 of internasal width. Skin velvety, entirely covered with minute denticles; lacking thorns but rows of enlarged denticles near eye and spiracle, along mid-line of body, and on shoulder; denticles on interorbit not obviously larger than those adjacent. Tail 1.4–1.6 times longer than disc; dorsal fins small, rather widely spaced, interspace 2.7–2.9 times base length of first dorsal fin; apices narrowly rounded to pointed.

COLOUR. Dorsal surface uniformly rich yellowish brown with dense coverage of pale blotches; snout pale translucent to bluish with short golden bars and spots; rear margins of disc and pelvic fins golden with a few bluish lines. Ventral surface white, semi-translucent or white on snout and around posterior margin of disc; blotch sometimes present



at snout tip in juveniles and sometimes adults. Dorsal fins yellowish brown.

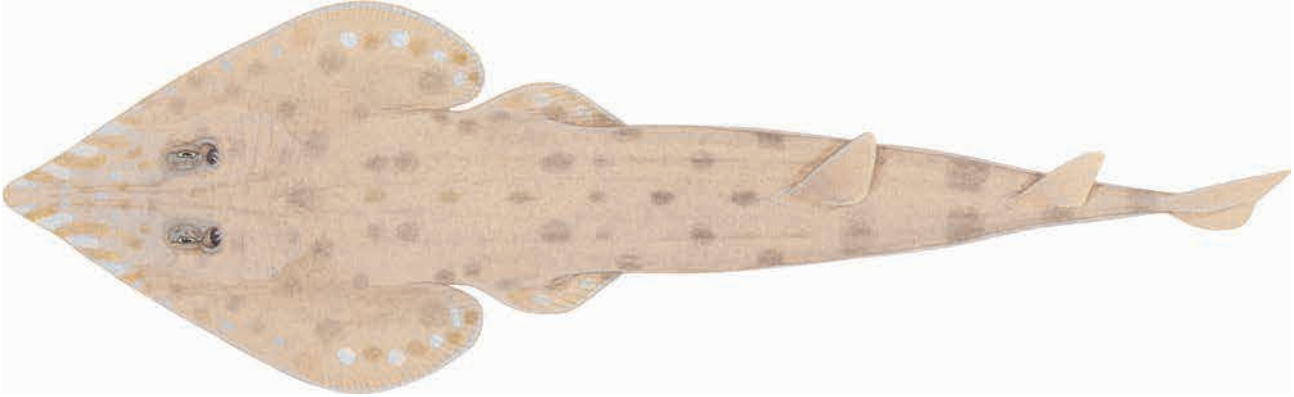
SIZE. To at least 75 cm TL; males mature at ~58 cm TL, females by 62 cm TL; born at 18–20 cm TL.

HABITAT AND BIOLOGY. Northern Indian Ocean; endemic to southern India. Demersal, primarily inshore on continental shelf at mainly 10–40 m depths. Reports from upper slope to 366 m are probably erroneous. Produces litters of up to 6 pups.

SIMILAR SPECIES. Very similar to the Zanzibar Guitarfish (10.8). Subtle differences exist in the mitochondrial DNA of these forms but no morphological features distinguishing them have been found. More research is needed to determine their validity.

ZANZIBAR GUITARFISH

10.8

Acroteriobatus zanzibarensis (Norman, 1926)

NT

IDENTIFICATION. Small to medium-sized guitarfish with a wedge-shaped disc, triangular snout, anterior nasal flaps barely separated in internasal space, weakly convex mouth, no enlarged thorns on body, and upper surface covered with bluish spots and darker blotches. Disc rather thin, length 1.3–1.4 times its width; anterior margins of snout almost straight, outer corner of pectoral fins broadly rounded. Snout moderately elongate, angle $\sim 63\text{--}66^\circ$, tip bluntly pointed; orbit length ~ 4.5 in preorbital length, slightly longer than interorbital space. Rostral ridges well separated. Outer fold of spiracle distinctly larger than inner fold. Tooth rows in upper jaw ~ 80 . Nostrils rather narrow with ~ 42 nasal lamellae, width ~ 1.5 times internasal width; oblique with a sub-oval anterior aperture; anterior nasal flaps almost joined, their interspace about a third of internasal width. Skin granular, entirely covered with minute denticles; lacking thorns but some slightly enlarged denticles near eye and along midline of body; denticles on interorbit not larger than those adjacent. Tail 1.4–1.5 times longer than disc; dorsal fins small, rather widely spaced, interspace 2.4–2.9 times base length of first dorsal fin; apices narrowly rounded to pointed.

COLOUR. Dorsal surface pale yellowish brown with dark brownish blotches over central disc and tail; snout pale blue with short golden bars; a few large bluish spots along rear margins of disc and pelvic fins. Ventral surface white; snout



and posterior margin of disc semi-translucent; large dark blotch sometimes at snout tip. Dorsal fins yellowish brown.

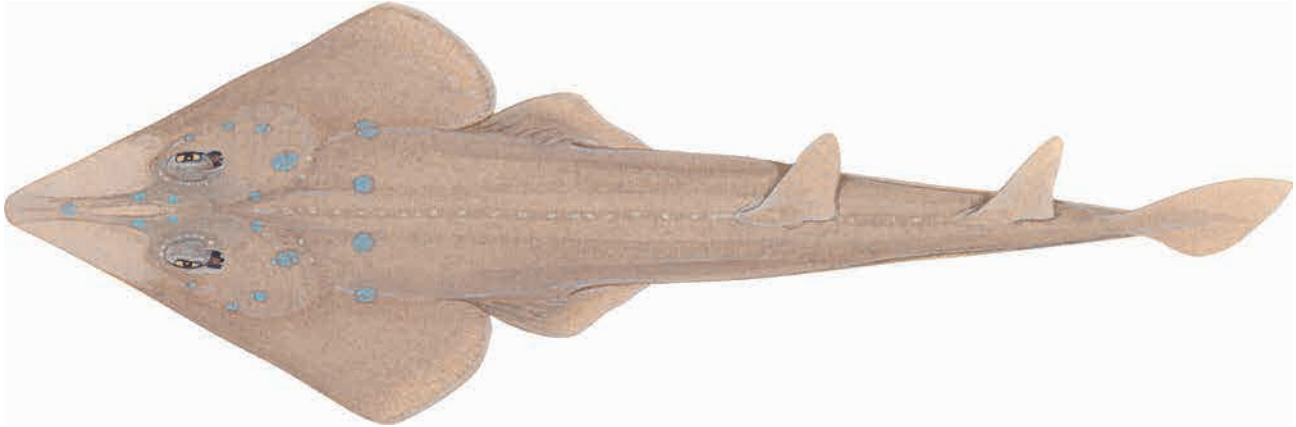
SIZE. To at least 75 cm TL, reports to 205 cm TL are likely to be erroneous. Males mature at ~ 64 cm TL.

HABITAT AND BIOLOGY. Western Indian Ocean; possibly endemic to Zanzibar. Benthic on inner continental shelf. Caught rarely and life history unknown.

SIMILAR SPECIES. Shares a characteristic blue-striped snout with the Stripenose Guitarfish (10.7). Some subtle shape differences exist between these species but more work is needed to determine their relationship.

SPECKLED GUITARFISH

10.9

Pseudobatos glaucostigmus (Jordan & Gilbert, 1883)

DD

IDENTIFICATION. Medium-sized guitarfish with a wedge-shaped disc, moderately long and narrowly triangular snout, large eyes, anterior nasal flaps moderately developed with inner margin extending well into internasal space (to level of nostril inner corner), brownish above with round bluish blotches, and a conspicuous black blotch near ventral snout tip. Disc rather thick, length 1.1 times its width; anterior margins almost straight, outer corner of pectoral fins bluntly angular. Snout angle $\sim 65^\circ$; eye about twice spiracle length, length ~ 4.2 in preorbital length, 1–1.1 in interorbital space. Rostral ridges rather broad, separated throughout their length, nearly parallel. Spiracle with 2 distinct fleshy folds, inner fold smaller. Nostrils large and oblique, length greater than internasal space; anterior nasal flaps extending only slightly into internasal space to inner corner of nostrils. Skin entirely covered with fine denticles; thornlets around orbits, above spiracles, on each shoulder, and a median row on back and interdorsal space. Tail 1.6–1.7 times longer than disc; large dorsal fins widely spaced, apices bluntly pointed.

COLOUR. Dorsal surface brownish grey, covered with series of round slate-coloured blotches; blotches mostly on head, and more or less symmetrically arranged. Ventral surface white, with a conspicuous, black tear-shaped blotch on snout tip.



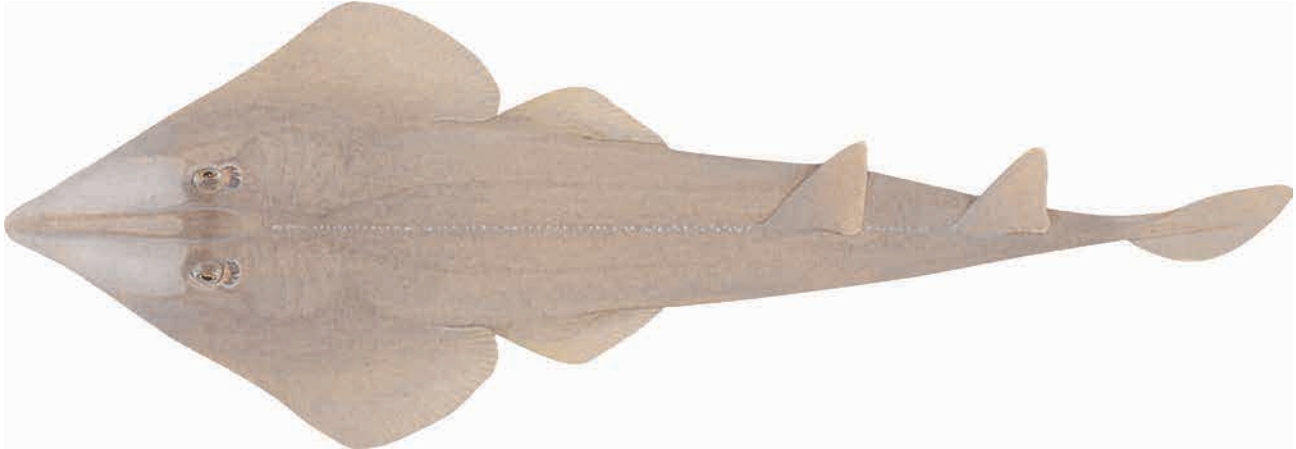
SIZE. Reaches 89 cm TL; size of maturity unknown.

HABITAT AND BIOLOGY. Eastern Central Pacific; Mexico (Baja California, including the Gulf of California) to Ecuador. Benthic, coastal to mid-continental shelf to a depth of 110 m. Adults feed on prawns and crabs, juveniles mainly amphipod crustaceans.

SIMILAR SPECIES. In the Eastern Pacific, the only member of the genus *Pseudobatos* that possesses a pattern of bluish blotches on the dorsal surface.

BRAZILIAN GUITARFISH

10.10

Pseudobatos horkelii (Müller & Henle, 1841)

CR

IDENTIFICATION. Large guitarfish with a wedge-shaped disc, long and narrowly triangular snout, large eyes, anterior nasal flaps moderately developed with inner margin extending well into internasal space (to level of nostril inner corner), and plain olive grey to brownish above with conspicuous, dark oval blotch near ventral snout tip. Disc moderately thick, length ~1.4 times its width; anterior margins almost straight, outer corner of pectoral fins mostly rounded. Snout angle ~55°; eyes about as large as spiracles, orbit length ~4.5 in pre-orbital length, 1.4–1.6 in interorbital space. Rostral ridges rather narrow, separated throughout their length. Spiracle with 2 distinct fleshy folds, inner fold smaller. Nostrils large and oblique, length greater than internasal space; anterior nasal flaps not crossing internasal space. Skin entirely covered with fine denticles; thornlets on rostrum, around orbits, above spiracles, on each shoulder, a median row on back and between dorsal fins. Tail ~1.4 times longer than disc; large dorsal fins widely spaced, apices acutely rounded.

COLOUR. Dorsal surface plain olive grey to chocolate brown. Ventral surface white, outer margins of pectoral and pelvic fins somewhat dusky, a small but conspicuous sooty oval blotch on snout tip.



SIZE. Reaches ~138 cm TL. Females mature at ~90 cm TL.

HABITAT AND BIOLOGY. South-West Atlantic; Brazil to Argentina. Benthic, coastal from nearshore to outer continental shelf to a depth of 150 m. Females produce litters of 4–12 pups. Feeds on crustaceans, molluscs, polychaete worms and small bony fishes.

SIMILAR SPECIES. Thought to be the only plain-coloured *Pseudobatos* in the Western Atlantic but likely to be a variant of the typically white-spotted Chola Guitarfish (10.13).

FRECKLED GUITARFISH

10.11

Pseudobatos lentiginosus (Garman, 1880)

NT

IDENTIFICATION. Small to medium-sized guitarfish with a wedge-shaped disc, moderately long and triangular snout becoming somewhat spatulate at tip, large eyes, anterior nasal flaps moderately developed with inner margin extending well into internasal space (to level of nostril inner corner), and a dense pattern of white spots dorsally. Disc moderately thick, length 1.2–1.3 times its width; anterior margins almost straight, outer corner of pectoral fins mostly rounded. Snout angle $\sim 65^\circ$; eye about twice spiracle length, length ~ 4.5 in preorbital length, 1.1–1.2 in interorbital space. Rostral ridges rather broad, narrowly separated throughout their length, nearly parallel. Spiracle with 2 distinct fleshy folds, inner fold smaller. Nostrils large and oblique, length slightly greater than internasal space; anterior nasal flaps extending well into but not crossing internasal space. Skin entirely covered with fine denticles; thornlets on snout tip (conical and somewhat larger), around orbits, above spiracles, on each shoulder, and in median row on back. Tail 1.5 times longer than disc; large dorsal fins widely spaced, apices acutely rounded.

COLOUR. Dorsal surface greyish to chocolate brown, densely freckled with numerous small white spots over most of the dorsal surface. Ventral surface pale yellowish.



SIZE. Reaches 78 cm TL. Birth size ~ 20 cm TL.

HABITAT AND BIOLOGY. Western Central Atlantic; North Carolina (USA) to Nicaragua, reports from Brazil need confirmation. Benthic, coastal from shore to 30 m depth. Produces litters of up to 6 pups. Feeds on benthic molluscs and crustaceans.

SIMILAR SPECIES. Distinguishable from other *Pseudobatos* species of the Western Atlantic by their strong colour pattern consisting of numerous white spots; the Brazilian Guitarfish (10.10) is plain coloured and the Chola Guitarfish (10.13) has a pattern of dark blotches.

WHITESNOUT GUITARFISH

10.12

Pseudobatos leucorhynchus (Günther, 1867)

NT

IDENTIFICATION. Small guitarfish with a wedge-shaped disc, moderately long and triangular snout, large eyes, anterior nasal flaps moderately developed with inner margin extending well into internasal space (to level of nostril inner corner), and plain brownish dorsally with edges of snout translucent. Disc rather thick, length 1.2–1.3 times its width; anterior margins almost straight, outer corner of pectoral fins mostly bluntly acute. Snout angle $\sim 65^\circ$; eyes about twice spiracle length, length ~ 5.5 in preorbital length, 1–1.1 in interorbital space. Rostral ridges rather narrow, separated throughout their length, but converging anteriorly. Spiracle with 2 distinct fleshy folds, inner fold smaller. Nostrils large and oblique, length greater than internasal space; anterior nasal flaps extending well into but not crossing internasal space. Skin entirely covered with fine denticles; thornlets around orbits, above spiracles, on each shoulder, and in median row on back. Tail ~ 1.4 times longer than disc; large dorsal fins widely spaced, apices acutely rounded.

COLOUR. Dorsal surface plain brownish to greenish brown; snout area, including rostrum, translucent (more hyaline than in other species). Ventral surface white, outer margins of pectoral and pelvic fins somewhat dusky.

SIZE. Reaches 70 cm TL (reports to 118 cm probably erroneous). Females mature at ~ 48 cm TL and males at ~ 51 cm TL, birth size ~ 19 cm TL.



HABITAT AND BIOLOGY. Eastern Central Pacific; Baja California (Mexico) to Ecuador, including Galapagos Islands. Benthic, mainly coastal near the shore to 50 m depth. Produces litters of 1–6 pups.

SIMILAR SPECIES. Resembles another plain-coloured guitarfish from the eastern Pacific, the Pacific Guitarfish (10.14). However, they differ by the appearance of the snout; conspicuously translucent in the Whitesnout Guitarfish rather than being the same colour as the rest of the head in the Pacific Guitarfish.

CHOLA GUITARFISH

10.13

Pseudobatos percellens (Walbaum, 1792)

NT

IDENTIFICATION. Medium-sized guitarfish with a wedge-shaped disc, moderately long and narrowly triangular snout, large eyes, anterior nasal flaps moderately developed with inner margin extending well into internasal space (to level of nostril inner corner), and dorsal surface with pattern of white spots and cloudy dark blotches. Disc moderately thick, length 1.2–1.3 times its width; anterior margins almost straight, outer corner of pectoral fins mostly rounded. Snout angle $\sim 65^\circ$; eyes about twice spiracle length, length ~ 3.5 in preorbital length, 1–1.4 in interorbital space. Rostral ridges rather narrow, separated throughout their length, converging anteriorly, diverging posteriorly. Spiracle with 2 distinct fleshy folds, inner fold smaller. Nostrils large and oblique, length slightly greater than internasal space; anterior nasal flaps extending well into but not crossing internasal space. Skin entirely covered with fine denticles; thornlets around orbits, above spiracles, on each shoulder, and in a median row on back. Tail 1.2–1.3 times longer than disc; large dorsal fins widely spaced, apices bluntly pointed.

COLOUR. Dorsal surface greyish brown, with cloudy dark blotches (sometimes indistinct) and conspicuous small white spots scattered on disc and tail. Ventral surface whitish, outer margins of pectoral and pelvic fins somewhat dusky, faint greyish spots on snout tip.



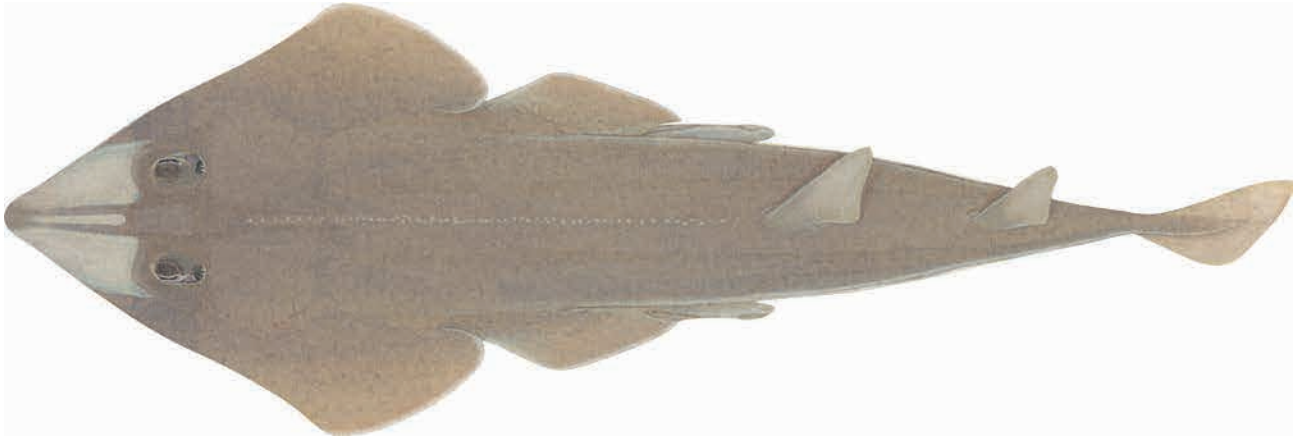
SIZE. Reaches ~ 100 cm TL.

HABITAT AND BIOLOGY. Western Central Atlantic; Caribbean to Brazil, and possibly further south to northern Argentina. Benthic, coastal from nearshore to 110 m depth. Biology largely unknown.

SIMILAR SPECIES. Distinct from most other Western Atlantic *Pseudobatos* by its striking pattern of white spots, much less numerous and larger than those of the Freckled Guitarfish (10.11). The Brazilian Guitarfish (10.10) is likely to be a junior synonym.

PACIFIC GUITARFISH

10.14

Pseudobatos planiceps (Garman, 1880)

DD

IDENTIFICATION. Large guitarfish with a wedge-shaped disc, moderately long and narrowly triangular snout, large eyes, anterior nasal flaps moderately developed with inner margin extending well into internasal space (to level of nostril inner corner), and typically plain olive brown above. Disc moderately thick, length 1.1–1.2 times its width; anterior margins almost straight, outer corner of pectoral fins mostly rounded. Snout angle $\sim 65^\circ$; eyes about twice spiracle length; orbit length ~ 5.1 in preorbital length, 1.1–1.6 in interorbital space. Rostral ridges rather broad, well separated throughout their length, nearly parallel. Spiracle with 2 distinct fleshy folds, inner fold smaller. Nostrils large and oblique, length greater than internasal space; anterior nasal flaps extending well into but not crossing internasal space. Skin entirely covered with fine denticles; thornlets around orbits above spiracles, on each shoulder, and in a median row on back, attenuating with growth. Tail ~ 1.6 times longer than disc; large dorsal fins widely spaced, apices acutely rounded.

COLOUR. Dorsal surface plain olive brown, sometimes with a few small white spots. Ventral surface white, sometimes with a black blotch on snout tip.

SIZE. Reaches at least 114 cm TL, questionable reports to 170 cm TL.



HABITAT AND BIOLOGY. Eastern Central Pacific; southern Mexico to northern Chile, including Galapagos Islands. Benthic, mainly coastal. Biology unknown.

SIMILAR SPECIES. Resembles the Whitesnout Guitarfish (10.12) in being plain coloured but they differ in the appearance of the snout; conspicuously translucent in the Whitesnout Guitarfish and the same colour as the rest of the head in the Pacific Guitarfish.

GORGONA GUITARFISH

10.15

Pseudobatos prahli (Acero & Franke, 1995)

DD

IDENTIFICATION. Medium-sized guitarfish with a wedge-shaped disc, rather short and triangular snout with a broad tip, large eyes, anterior nasal flaps moderately developed with inner margin extending well into internasal space (to level of nostril inner corner), dorsal pattern of cloudy dark blotches and small white spots, and conspicuous black markings on snout tip and along anterior margins of ventral disc. Disc rather thick, length 1.2–1.3 times its width; anterior margins slightly undulate, outer corner of pectoral fins mostly rounded. Snout spatulate, angle $\sim 65^\circ$; eye about twice size of spiracle, length ~ 3 in preorbital length, 1–1.1 in interorbital space. Rostral ridges rather broad, separated throughout most of their length, converging anteriorly, diverging posteriorly. Spiracle with 2 distinct fleshy folds, inner fold smaller. Nostrils large and oblique, length greater than internasal space; anterior nasal flaps extending well into but not crossing internasal space. Skin entirely covered with fine denticles; thornlets around orbits, above spiracles, on each shoulder, and in a median row. Tail ~ 1.6 times longer than disc; large dorsal fins widely spaced, apices bluntly pointed.

COLOUR. Dorsal surface brownish with symmetrical pattern of large, dark cloudy blotches and small white spots; orbits blackish. Ventral surface white or mottled grey, outer margins of pectoral fins blackish; a conspicuous tear-shaped black blotch on snout tip, anterior margins of snout with a



narrow black stripe, connected or not to snout blotch; sometimes with black blotches on anterior gills and each side of mouth.

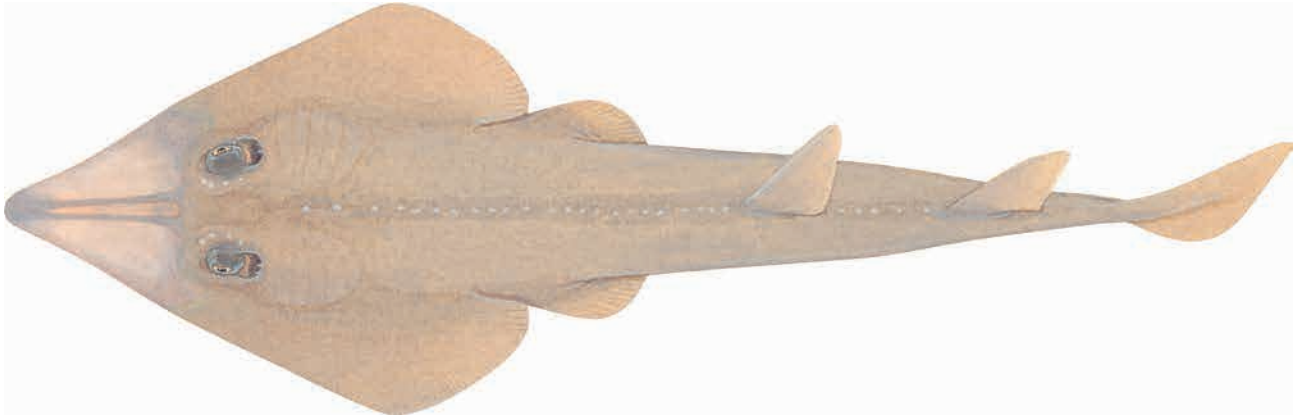
SIZE. Reaches at least 90 cm TL, males mature at ~ 71 cm TL.

HABITAT AND BIOLOGY. Eastern Central Pacific; Mexico to northern Peru. Benthic, coastal and on inner continental shelf from shore to 70 m depth. Biology unknown.

SIMILAR SPECIES. Distinctive guitarfish of the Eastern Pacific, being the only *Pseudobatos* species with prominent colour patterns on both dorsal and ventral surfaces.

SHOVELNOSE GUITARFISH

10.16

Pseudobatos productus (Ayres, 1854)

NT

IDENTIFICATION. Very large guitarfish with a wedge-shaped disc, moderately long and narrowly triangular snout, large eyes, anterior nasal flaps moderately developed with inner margin extending well into internasal space (to level of nostril inner corner), and plain olive green or mottled with dark cloudy blotches above. Disc moderately thick, length 1.2–1.3 times its width; anterior margins almost straight, outer corner of pectoral fins mostly rounded. Snout angle $\sim 60^\circ$; eyes slightly larger than spiracle, length ~ 4.3 in preorbital length, 1–1.1 in interorbital space. Rostral ridges rather narrow, almost separated throughout their length, strongly converging anteriorly, diverging posteriorly. Spiracle with 2 distinct fleshy folds, inner fold smaller. Nostrils large and oblique, length slightly greater than internasal space; anterior nasal flaps extending well into but not crossing internasal space. Skin entirely covered with fine denticles; thornlets on rostral ridges, around orbits, above spiracles, on each shoulder, and in a median row on back and between dorsal fins; thornlets reducing with growth. Tail 1.3–1.4 times longer than disc; large dorsal fins widely spaced, apices acutely rounded.

COLOUR. Dorsal surface brownish mottled with cloudy irregular dark blotches, more or less symmetrically arranged. Ventral surface white, snout tip sometimes with blackish margins.



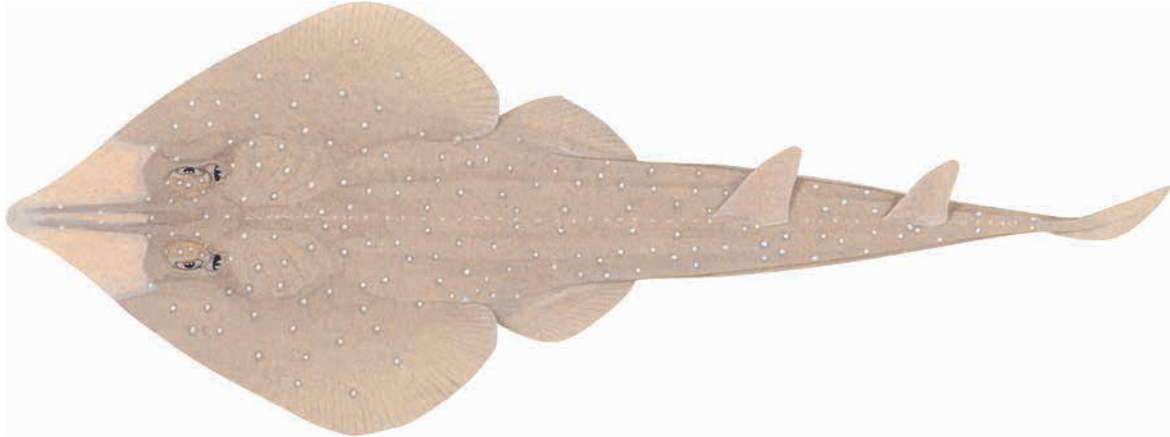
SIZE. Reaches 170 cm TL. Females mature at 87–99 cm TL, males at 91–110 cm TL; birth size 20–24 cm TL.

HABITAT AND BIOLOGY. Eastern Central Pacific; California (USA) to Mexico, including Gulf of California. Benthic, coastal in bays and estuaries inshore to 90 m depth. Females mature at 7 years and produce litters of 1–16 pups. Feeds on crabs, worms, clams and small bony fishes.

SIMILAR SPECIES. Resembles the Pacific Guitarfish (10.14) but differs by its pattern of dark cloudy blotches (otherwise plain or with a few white spots).

WHITESPOTTED GUITARFISH

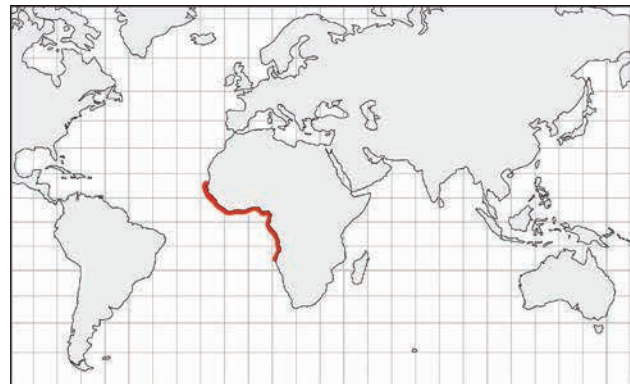
10.17

Rhinobatos albomaculatus Norman, 1930

VU

IDENTIFICATION. Medium-sized guitarfish with a wedge-shaped disc, long and narrowly triangular snout, anterior nasal flaps moderately developed with inner margin extending slightly into internasal space, and greenish brown dorsally with symmetrical pattern of numerous small, pale spots with dark rims. Disc moderately thick, length ~1.1 times its width; anterior margins slightly undulate, almost straight, outer corner of pectoral fins mostly rounded. Snout acute, angle ~60°; eye large, length 4–4.7 in preorbital length, 1.1–1.4 in interorbital space. Rostral ridges separated by a large interspace throughout their length. Spiracle with 2 distinct fleshy folds. Tooth rows in upper jaw 68–131 (number increases with age). Nostrils oblique, length ~1.3 times internasal space; anterior nasal flaps extending into internasal space to inner corner of nostrils. Skin entirely covered with fine denticles; a few thornlets around orbits; median row of blunt thornlets from nape to first dorsal fin and a few between dorsal fins. Tail ~1.4 times longer than disc; large dorsal fins widely spaced, apices mostly angular. Pectoral-fin radials 68–71. Total vertebral centra 177–192.

COLOUR. Dorsal surface greenish brown with a pattern of numerous small, circular, bluish white spots surrounded with blackish rims, and symmetrically arranged on disc and trunk. Ventral surface plain white.



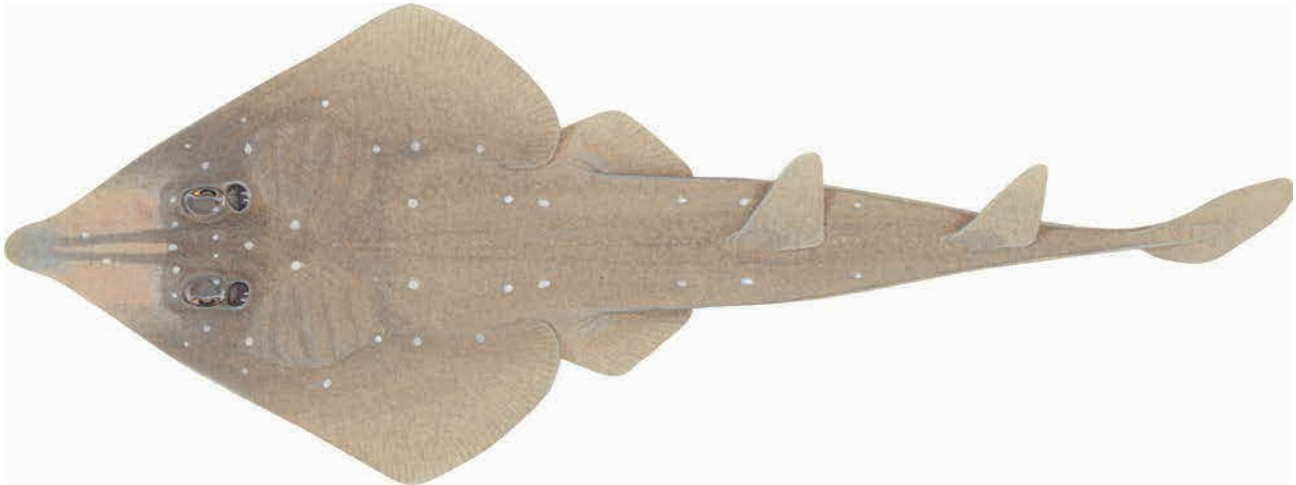
SIZE. Reaches 80 cm TL, commonly 50–60 cm TL. Males mature at ~46 cm TL and females ~52 cm TL; birth size ~15 cm TL.

HABITAT AND BIOLOGY. Eastern Central Atlantic; Senegal to Angola. Benthic on sandy bottoms, coastal to depth of 35 m. Feeds mainly on benthic invertebrates, mostly shrimps. Produces small litters of 2–3 pups.

SIMILAR SPECIES. The smallest guitarfish off West Africa. It has a unique coloration consisting of a symmetrical pattern of light spots, no thorns on shoulders, and thorns of mid-dorsal row blunt (often indistinct in large specimens).

BENGAL GUITARFISH

10.18

Rhinobatos annandalei Norman, 1926

DD

IDENTIFICATION. Medium-sized guitarfish with a very broad, wedge-shaped disc, long and pointed triangular snout, oblique nostrils with suboval anterior apertures, prominent thorns around eyes and along mid-line of body, and upper surface with small, widely spaced white spots. Disc thin, length 1.1 times its width; anterior margins almost straight, outer corner of pectoral fins broadly rounded to abruptly angular. Snout obtuse, angle $\sim 68^\circ$, tip bluntly pointed; orbit length 3.6–4.3 in preorbital length, 1.2–1.3 in interorbital space. Rostral ridges well separated. Both folds of spiracle well developed, outer fold slightly taller than inner fold. Mouth width 2.3–2.5 in preoral snout length. Nostrils with ~ 59 nasal lamellae, width 1.3–1.4 times internasal width; anterior nasal flaps penetrating only slightly into internasal space, their interspace about equal to internasal width. Skin smooth to touch, almost entirely covered with minute denticles. Thorns well developed and spiny, most prominent in adult males. Tail 1.2–1.3 times longer than disc; dorsal fins not widely spaced, interspace 2.2–2.4 times base length of first dorsal fin; apices narrowly rounded to angular. Pectoral-fin radials 67–69. Total vertebral centra 161–165.

COLOUR. Dorsal surface and fins greyish to brownish with symmetrical pattern of small white spots; spots widely spaced, of similar size (each a few mm in diameter); disc paler beside rostral shaft. Ventral surface white with broad greyish brown patches on disc and tail, and yellowish areas



around gills; usually translucent on snout either side of rostral shaft.

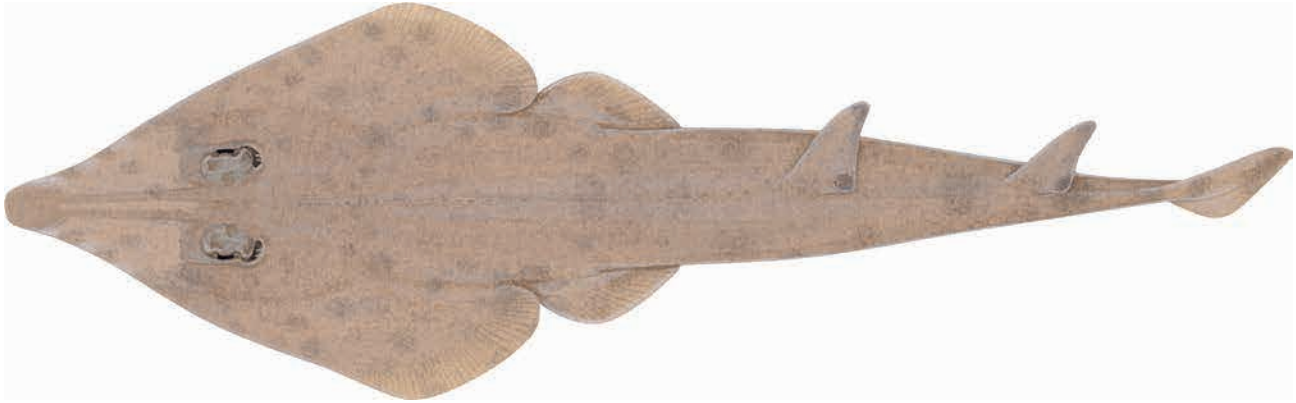
SIZE. To at least 80 cm TL. Males mature by 68 cm TL, born at ~ 20 cm TL.

HABITAT AND BIOLOGY. Northern Indian Ocean; Oman to India (Bay of Bengal). Primarily benthic inshore on inner continental shelf to 90 m depth. Produces litters of up to 6 pups.

SIMILAR SPECIES. Often confused with the Spotted Guitarfish (10.27), which can also have a similar pattern of small, widely spaced white spots. The Bengal Guitarfish has a relatively broader disc with longer spiny thorns along the dorsal mid-line.

BORNEO GUITARFISH

10.19

Rhinobatos borneensis Last, Séret & Naylor, 2016

NE

IDENTIFICATION. Medium-sized guitarfish with a wedge-shaped disc, snout bottle-shaped, anterior nasal flaps moderately developed with inner margin extending well into internasal space (to level of nostril inner corner), no thorns or thornlets on body, body plain brownish above or with faint orange-brown blotches, and no dark blotch on snout undersurface. Disc moderately thick, length 1.3–1.4 times its width; anterior margins undulate, most concave near tip, outer corner of pectoral fins bluntly rounded. Snout angle ~56–57°; moderately long and narrowly triangular, eyes large, length 3.1–4.4 in preorbital length, 1.1–1.5 times interorbital space. Rostral ridges separated almost throughout their length, slightly more widely separated posteriorly. Spiracle with 2 prominent fleshy folds, inner fold smaller. Tooth rows in upper jaw 90–91. Nostrils oblique, length 1.5–1.7 times internasal space; anterior nasal flaps extending well into but not crossing internasal space. Skin finely granular, entirely covered with fine denticles; patch of slightly enlarged denticles around orbit and similar denticles in median row from nape to first dorsal fin. Tail 1.4–1.5 times longer than disc; tall, short-based dorsal fins widely spaced, interspace 2.5–3.3 times base length of first dorsal fin; apices angular in adults. Pectoral-fin radials 66–67. Total vertebral centra 176–180.

COLOUR. Dorsal surface medium brown with darker orange-brown blotches; blotches irregular; young greyish



with faint pale ocelli. Ventral surface white; snout greyish white but lacking dark tear-shaped blotch. Tips of dorsal and caudal fins darker than their bases (tips with black blotches in young).

SIZE. Reaches at least 90 cm TL. Matures at ~63 cm TL.

HABITAT AND BIOLOGY. North-West Pacific; South China Sea off Borneo. Probably benthic on continental shelf. Biology poorly known. Pregnant female had 6 pups.

SIMILAR SPECIES. Similar to the Philippine Guitarfish (10.31) but the Borneo Guitarfish differs significantly in its mitochondrial DNA, has a relatively longer tail and lacks white spots on the upper surface.

SLENDER GUITARFISH

10.20

Rhinobatos holcorhynchus Norman, 1922

DD

IDENTIFICATION. Large guitarfish with a wedge-shaped disc, long and narrowly triangular snout, large eyes, anterior nasal flaps moderately developed with inner margin extending well into internasal space (to level of nostril inner corner), dorsal surface plain olive green, and a conspicuous black blotch near ventral snout tip. Disc rather thick, length 1.2–1.3 times its width; anterior margins almost straight, outer corner of pectoral fins mostly rounded. Snout angle $\sim 65^\circ$; eye about twice spiracle length, length ~ 4.5 in preorbital length, 1–1.1 in interorbital space. Rostral ridges separated throughout their length. Spiracle with 2 distinct fleshy folds, inner fold smaller. Tooth rows in upper jaw 46–47. Nostrils large and oblique, length almost twice internasal space; anterior nasal flaps extending only slightly into internasal space, to inner corner of nostrils. Skin entirely covered with fine denticles; thornlets on rostrum, around orbits and above spiracles, 1–2 on each shoulder, median row of up to 32 large tubercular thorns alternating with smaller ones; row of ~ 10 thornlets between dorsal fins. Tail 1.3–1.4 times longer than disc; large dorsal fins widely spaced, apices acutely rounded. Pectoral-fin radials 71–73. Total vertebral centra 199–203.

COLOUR. Dorsal surface plain olive brown. Ventral surface white, outer margins of pectoral and pelvic fins somewhat dusky, a conspicuous tear-shaped black blotch on snout tip.



SIZE. Reaches 127 cm TL.

HABITAT AND BIOLOGY. South-West Indian Ocean; Kenya to Natal (South Africa). Benthic, mainly on continental shelf, but reported from 75–350 m depths. Taken as bycatch of trawl and gillnet fisheries, biology largely unknown.

SIMILAR SPECIES. Only species of the genus *Rhinobatos* found in the South-West Indian Ocean; most guitarfishes of this region belong to the genus *Acroteriobatus*.

RINGED GUITARFISH

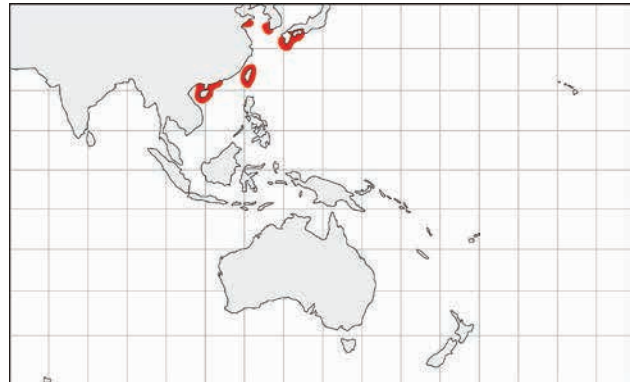
10.21

Rhinobatos hynnicephalus Richardson, 1846

NT

IDENTIFICATION. Medium-sized guitarfish with a wedge-shaped disc, rather short and broad snout, oblique nostrils with a subcircular anterior aperture, anterior nasal flaps penetrating slightly into internasal space, weakly convex to straight mouth, thorns minute or absent on body, and upper surface pale with complex pattern of small dark rings and spots. Disc rather thin, length ~1.2 times its width; anterior margins of snout almost straight, outer corner of pectoral fins broadly rounded. Snout angle ~68°, tip rather broadly rounded; orbit length 4.3–4.7 in preorbital length, 1–1.2 in interorbital space. Rostral ridges well separated. Outer fold of spiracle prominent, inner fold obscure or absent. Nostrils rather narrow, width 1.1–1.5 times internasal width; anterior nasal flaps not crossing internasal space, their interspace about equal to internasal width. Skin coarsely granular, entirely covered with minute denticles. Thorns barely detectable; sometimes slightly larger near eye and along mid-line of body. Tail 1.4–1.6 times longer than disc; dorsal fins rather narrowly spaced, interspace 2.2–2.6 times base length of first dorsal fin; apices narrowly rounded. Pectoral-fin radials 60–64. Total vertebral centra 165–175.

COLOUR. Dorsal surface pale yellowish to greyish brown with variable pattern of small dark spots; spots either in small to large clusters or free, forming lines around eyes; fins



and snout beside rostral cartilage largely pale. Ventral surface white; most of snout and outer pectoral fins translucent.

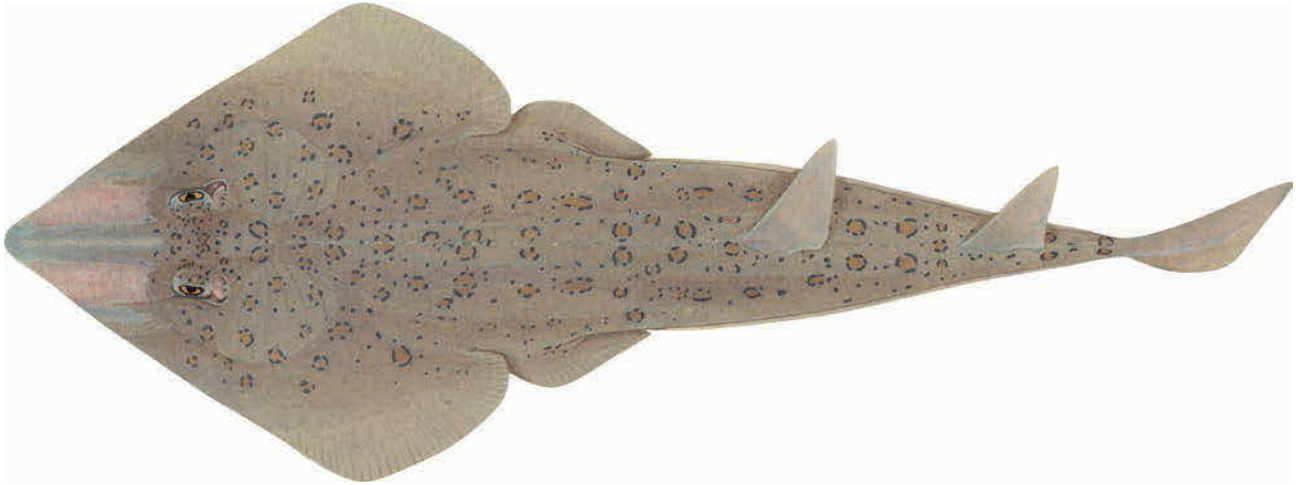
SIZE. To at least 62 cm TL. Males mature at 38–40 cm TL, females at 39–44 cm TL; born at ~16 cm TL.

HABITAT AND BIOLOGY. North-West Pacific; Japan to Vietnam, including Taiwan. Demersal, inshore on continental and insular shelves. Litters of 2–9 pups.

SIMILAR SPECIES. Occurs together with the Bottlenose Guitarfish (10.30) but has broader snout and prominent ring-like markings on the disc.

SPINEBACK GUITARFISH

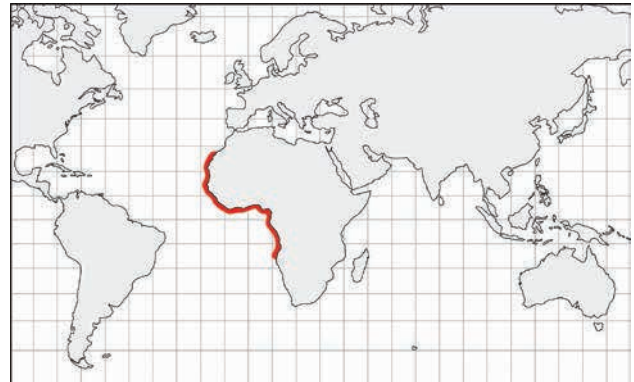
10.22

Rhinobatos irvinei Norman, 1931

VU

IDENTIFICATION. Medium-sized guitarfish with a wedge-shaped disc, moderately long and narrowly triangular snout, anterior nasal flaps moderately developed with inner margin extending into internasal space to level of nostril inner corner, and greenish brown dorsally with a dense pattern of irregular white blotches rimmed with dark spots. Disc moderately thick, length 1.2–1.3 times its width; anterior margins slightly undulate, almost straight, outer corner of pectoral fins mostly rounded. Snout acute, angle ~60°; eye large, length ~3 in preorbital length, about equal to interorbital space. Rostral ridges separated by large interspace throughout their length. Spiracle with 2 distinct fleshy folds. Tooth rows in upper jaw ~69–72. Nostrils oblique, length about equal to internasal space; anterior nasal flaps extending well into but not crossing internasal space. Skin entirely covered with fine denticles; a few thornlets around orbits and above spiracles, 3 on each shoulder, a median row of pointed thornlets from nape to first dorsal fin and a few between dorsal fins; thornlets persistent in adults. Tail ~1.4 times longer than disc; large dorsal fins widely spaced, apices acutely rounded. Pectoral-fin radials 63–71. Total vertebral centra 171–183.

COLOUR. Dorsal surface greenish brown with a distinctive ocellate pattern of pale orange blotches with dark margins, and black spots; ocelli more or less arranged in rows on trunk and forming a typical X-shaped marking on interorbital space. Ventral surface white.



SIZE. Reaches ~100 cm TL, commonly 60–66 cm TL. Males mature at ~42 cm TL.

HABITAT AND BIOLOGY. Eastern Central Atlantic; Morocco to southern Angola, a record from Namibia needs confirmation. Benthic on soft bottoms of inner continental shelf, coastal to 30 m depth. Feeds on benthic invertebrates, mainly crustaceans. Produces small litters of 1–3 pups.

SIMILAR SPECIES. Distinguishable from the Whitespotted Guitarfish (10.17), which also occurs off West Africa, by its pattern of irregularly shaped orange ocelli (*vs.* circular spots with dark rims), persistent pointed thornlets on shoulders and mid-dorsal row (*vs.* thornlets disappearing with growth and absent from shoulders).

JIMBARAN GUITARFISH

10.23

Rhinobatos jimbaranensis Last, White & Fahmi, 2006

VU

IDENTIFICATION. Medium-sized guitarfish with a wedge-shaped disc, long and narrow bottle-shaped snout, oblique nostrils with subcircular anterior aperture, anterior nasal flaps penetrating slightly into internasal space, rudimentary thorns on body, and upper surface dark blotched but without white spots. Disc thin, length 1.3–1.4 times its width; anterior margins of snout strongly concave, outer corner of pectoral fins broadly rounded. Snout angle ~59–60°, tip narrowly rounded; orbit length 4.5–4.8 in preorbital length, 1–1.2 times interorbital space. Rostral ridges well separated. Outer fold of spiracle slightly larger than inner fold. Tooth rows in upper jaw 62–77. Nostrils with 51–55 nasal lamellae, rather narrow; nostril width 1.3–1.4 times internasal width; anterior nasal flaps barely penetrating internasal space, their interspace about equal to internasal width. Skin coarsely granular, entirely covered with minute denticles. Thorns very small, often embedded; located near eye, along mid-line of body and on shoulder. Tail 1.3–1.4 times longer than disc; dorsal fins rather widely spaced, interspace 2.5–3.1 times base length of first dorsal fin; apices narrowly rounded. Pectoral-fin radials 67–71. Total vertebral centra 176–180.

COLOUR. Dorsal surface dark greyish brown with faint rusty brown blotches; paler around disc margin and beside rostral shaft. Ventral surface creamy white, often darker around gills. Dorsal fins yellowish brown, their posterior half usually dusky; caudal fin yellowish brown, ventral



margin pale. Prenatal juveniles covered with light and dark spots.

SIZE. To at least 99 cm TL. Males mature at 77–80 cm TL, females at ~75 cm TL; born at ~13 cm TL.

HABITAT AND BIOLOGY. Eastern Indian Ocean; endemic to central Indonesia. Demersal inshore on inner insular shelf. Produces litters of 6–11 pups. Feeds primarily on small crustaceans.

SIMILAR SPECIES. The Bottlenose Guitarfish (10.30), from further north in the Western Pacific, also has a distinctive bottle-shaped snout. However, these species differ in their mitochondrial DNA and in several morphometric characters, and their ranges do not overlap.

SMOOTHBACK GUITARFISH

10.24

Rhinobatos lionotus Norman, 1926

DD

IDENTIFICATION. Medium-sized guitarfish with a broad wedge-shaped disc, moderately elongate and broadly triangular snout, oblique nostrils with suboval anterior aperture, anterior nasal flaps penetrating well into internasal space, feeble thorns on body, moderately widely spaced dorsal fins, and dorsal surface plain greenish brown with darker brown blotches. Disc thin, length 1.2–1.4 times its width; anterior margins weakly undulate, outer corner of pectoral fins usually broadly rounded. Snout angle $\sim 62^\circ$, tip bluntly pointed; orbit length 3.2–3.6 in preorbital length, subequal to interorbital space. Rostral ridges widely separated. Outer fold of spiracle slightly taller than inner fold. Mouth width ~ 2.6 in preoral snout length. Nostril width ~ 1.3 times internasal width; anterior nasal flaps penetrating ~ 5 mm into internasal space, their interspace subequal to internasal width. Skin finely granular, almost entirely covered with minute denticles. Thorns very short, only slightly larger than adjacent denticles. Tail broad and elongate, 1.4–1.5 times longer than disc; dorsal fins moderately well separated, interspace 2.4–2.8 times base length of first dorsal fin; apices narrowly rounded to angular.

COLOUR. Dorsal surface greenish brown, covered all over with dense symmetrical pattern of darker brown blotches; disc marginally paler beside rostral shaft. Ventral surface white, broad translucent areas on snout beside rostral shaft



and around posterior disc margins. Dorsal and caudal fins similar to upper surface colour but with fewer blotches.

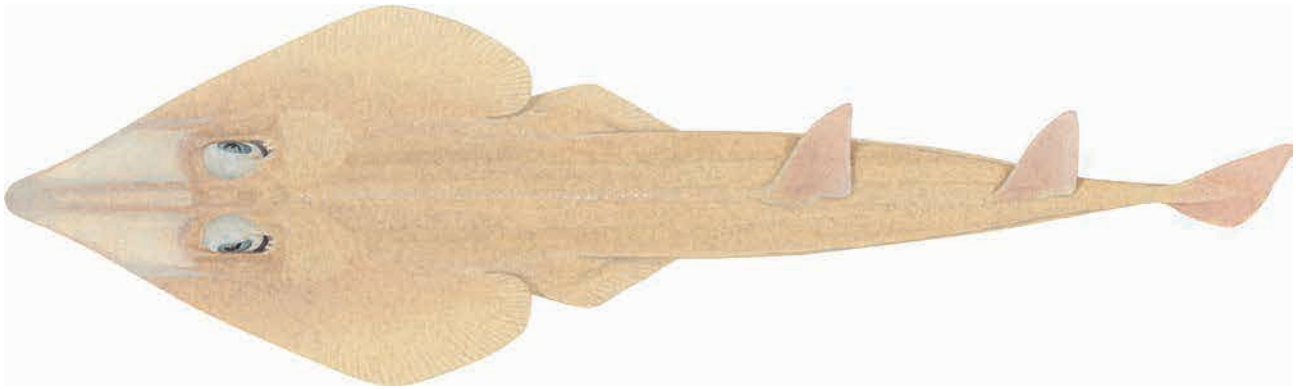
SIZE. To ~ 75 cm TL.

HABITAT AND BIOLOGY. Northern Indian Ocean; upper Bay of Bengal, West Bengal to Myanmar, and possibly in the Arabian Sea. Demersal inshore on the continental shelf to at least 70 m. Confused with other species in the Indian Ocean and biology unknown.

SIMILAR SPECIES. Occurs with the Bengal Guitarfish (10.18) in the Bay of Bengal. The Smoothback Guitarfish lacks white markings typifying the Bengal Guitarfish, has a slightly narrower disc, and relatively longer interdorsal space.

BAREBACK GUITARFISH

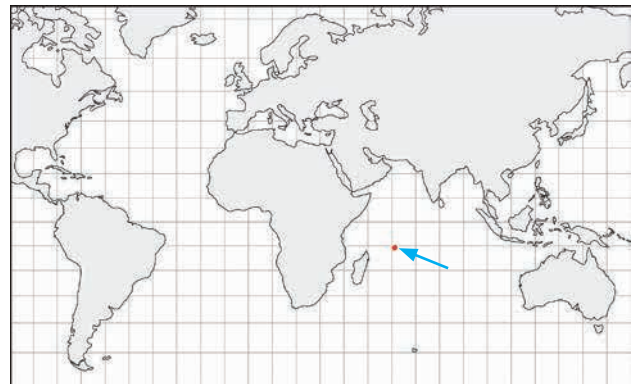
10.25

Rhinobatos nudidorsalis Last, Compagno & Nakaya, 2004

NT

IDENTIFICATION. Small plain-coloured guitarfish with a wedge-shaped disc, long and narrow triangular snout, oblique nostrils with subcircular anterior aperture, anterior nasal flaps penetrating well into internasal space, no thorns or tubercles, and upper surface of body almost entirely smooth. Disc thin, length ~ 1.4 times its width; anterior margins straight to weakly undulate, outer corner of pectoral fins broadly rounded. Snout angle $\sim 60^\circ$, tip narrowly rounded; eye large, orbit length ~ 3.4 in preorbital length, ~ 1.4 times interorbital space. Rostral ridges well separated. Outer fold of spiracle about twice length of inner fold. Tooth rows in upper jaw ~ 78 . Nostrils rather wide, ~ 1.7 times internasal width; anterior nasal flap interspace only slightly greater than internarial width. Skin lacking denticles on most of dorsal surface; minute denticles covering most of ventral surface; tail fins smooth apart from their leading edges; caudal peduncle largely smooth with longitudinal patch of denticles on each side. Tail slender, ~ 1.5 times longer than disc; dorsal fins widely spaced, interspace almost 3 times base length of first dorsal fin; apices narrowly rounded. Pectoral-fin radials ~ 67 . Total vertebral centra ~ 172 .

COLOUR. Dorsal surface pale brownish pink behind eyes, no obvious spots or blotches; snout paler with more translucent skin. Dorsal and caudal fins darker brownish pink. Ventral surface uniformly pinkish or white; oral and



nasal areas similar; small dark streak at margin of each side of snout near its apex, but apex lacking a dark central blotch or marking.

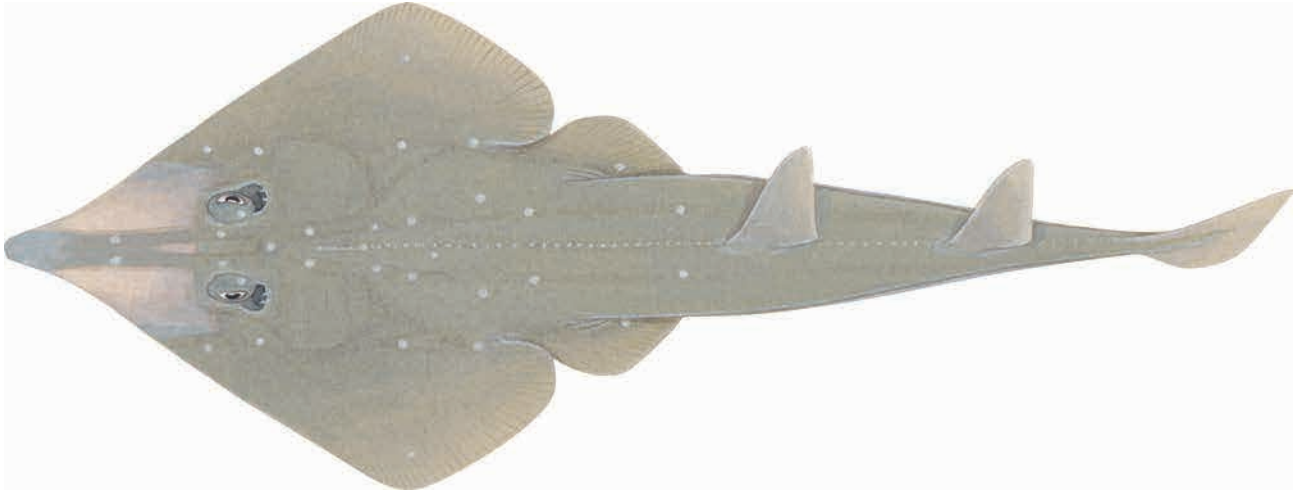
SIZE. Only one known specimen, a 50 cm TL adult male.

HABITAT AND BIOLOGY. Central Indian Ocean; Mascarene Ridge. Probably restricted in distribution, offshore on insular shelves of the Central Indian Ocean to at least 125 m depth. Nothing known of its biology and more specimens needed.

SIMILAR SPECIES. Very poorly known and distinctive guitarfish with an unusually patchy coverage of denticles on the body; denticles missing from most of dorsal surface.

INDONESIAN GUITARFISH

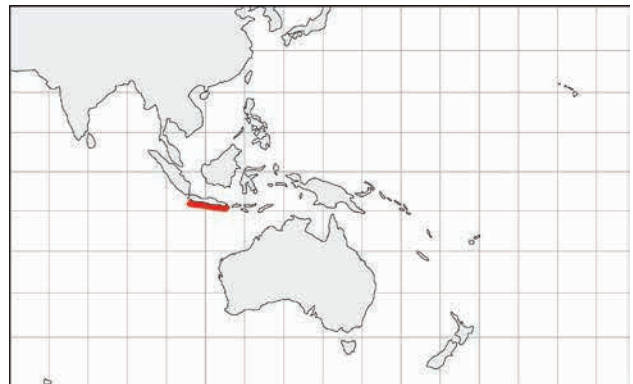
10.26

Rhinobatos penggali Last, White & Fahmi, 2006

VU

IDENTIFICATION. Medium-sized guitarfish with a very broad wedge-shaped disc, long and pointed triangular snout, oblique nostrils with suboval anterior aperture, anterior nasal flaps penetrating slightly into internasal space, small thorns on body, and upper surface usually white spotted (spots sometimes faint). Disc thin, length 1.2–1.3 times its width; anterior margins of snout weakly concave, outer corner of pectoral fins broadly rounded to abruptly angular. Snout angle $\sim 61\text{--}64^\circ$, tip narrowly rounded; orbit length 4.1–4.6 in preorbital length, 0.9–1 times interorbital space. Rostral ridges well separated. Outer fold of spiracle much taller than inner fold. Mouth width 3.1–3.4 in preoral snout length; tooth rows in upper jaw 75–83. Nostrils with 53–57 nasal lamellae, width 1.3–1.4 times internasal width; anterior nasal flap interspace about equal to internasal width. Skin coarsely granular, entirely covered with minute denticles. Thorns well developed, short, broad based; near eye, along mid-line of body and on shoulder. Tail 1.2–1.3 times longer than disc; dorsal fins rather widely spaced, interspace 2.7–2.9 times base length of first dorsal fin; apices narrowly rounded to angular. Pectoral-fin radials 69–73. Total vertebral centra 166–170.

COLOUR. Dorsal surface brownish to dark grey with small, widely spaced white spots (sometimes faint in adults but pronounced in embryos); disc usually palest around its margin and beside rostral shaft. Ventral surface whitish, translucent on snout beside rostral shaft and around



posterior disc margin. Dorsal fins usually weakly bicoloured brownish and grey; caudal fin with dusky posterior margin.

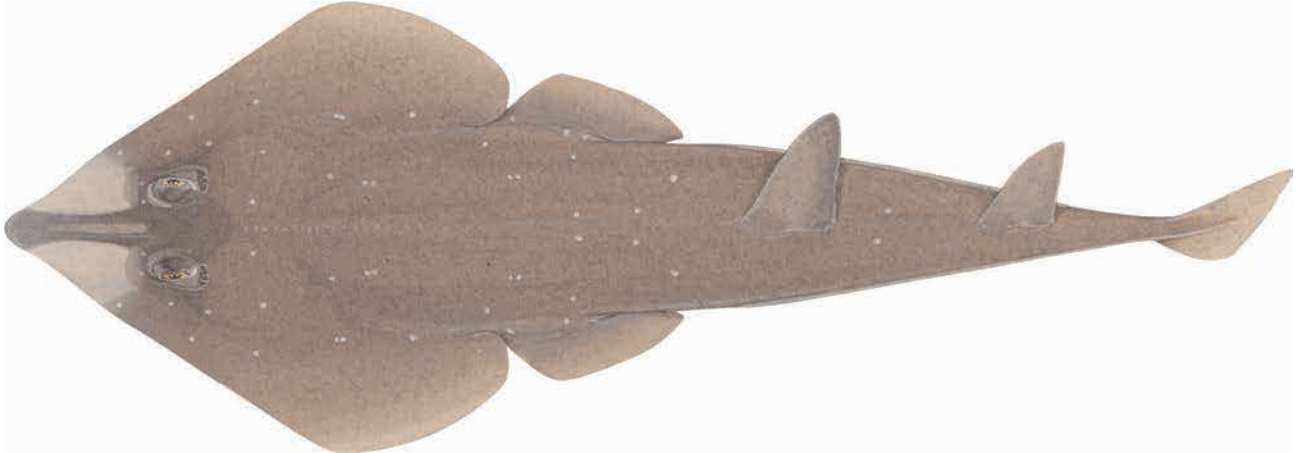
SIZE. To at least 99 cm TL. Males mature at 70–72 cm TL, females at 75 cm TL.

HABITAT AND BIOLOGY. Eastern Indian Ocean; endemic to central Indonesia. Demersal inshore on inner insular shelf. Produces litters of 4–13 pups. Feeds on small crustaceans and probably small bony fishes.

SIMILAR SPECIES. A broad, white-spotted disc also defines the Bengal Guitarfish (10.18) from the Northern Indian Ocean. These species differ in their mitochondrial DNA and can be identified by the dimension of the mouth and dorsal-fin positions.

SPOTTED GUITARFISH

10.27

Rhinobatos punctifer Compagno & Randall, 1987

DD

IDENTIFICATION. Medium-sized guitarfish with an angular wedge-shaped disc, moderately elongate and broadly triangular snout, oblique nostrils with a suboval anterior aperture, anterior nasal flaps penetrating slightly into internasal space, thorns feeble, and upper surface extremely variable in coloration from almost plain to strongly ocellate. Disc thin, length 1.1–1.2 times its width; anterior margins of snout almost straight, outer corner of pectoral fins usually broadly rounded. Snout angle $\sim 66^\circ$, tip bluntly pointed; orbit length 3.2–4 in preorbital length, 0.9–1.2 times interorbital space. Rostral ridges very well separated. Both folds of spiracle well developed, outer fold slightly taller than inner fold. Mouth width 2.7–2.8 in preoral snout length; tooth rows in upper jaw ~ 76 . Nostrils with ~ 56 nasal lamellae, width 1.4–1.5 times internasal width; anterior nasal flap interspace ~ 1.2 times shorter than internasal width. Skin finely granular, almost entirely covered with minute denticles. Thorns minute, only slightly larger than adjacent denticles, located near eye, along mid-line of body and on shoulder. Tail elongate, ~ 1.5 times longer than disc; dorsal fins rather widely spaced, interspace 2.4–2.5 times base length of first dorsal fin; apices narrowly rounded, more angular in adults. Pectoral-fin radials ~ 71 . Total vertebral centra ~ 179 .

COLOUR. Dorsal surface yellowish brown to greyish, usually with small widely spaced white spots or larger ocellate markings (rarely plain); disc palest around margin and beside rostral shaft. Ventral surface white, often yellowish around gill region; translucent on snout beside



rostral shaft and around posterior disc margin. Dorsal fins usually bicoloured, pale with dusky posterior half; caudal fin hind margin dusky.

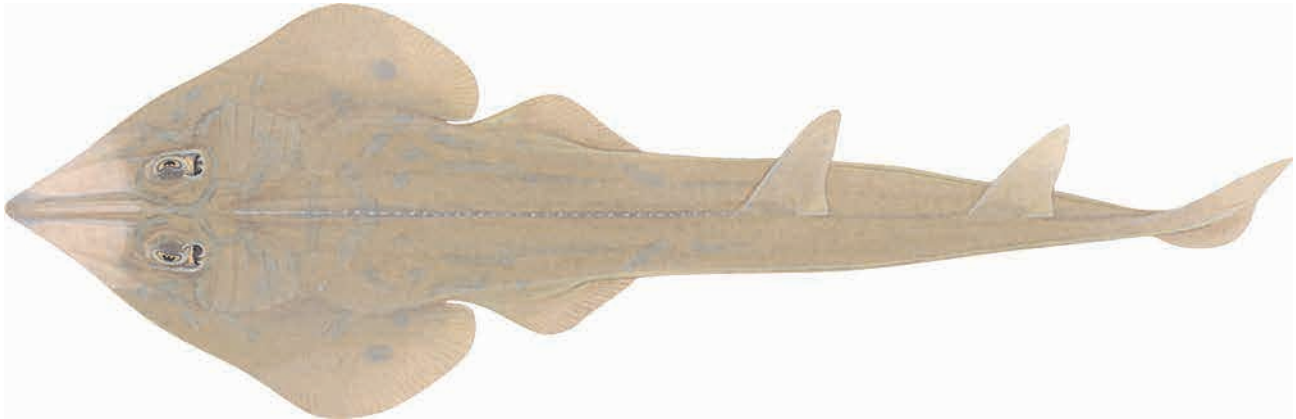
SIZE. To at least 88 cm TL. Matures at ~ 62 cm TL; born at ~ 25 cm TL.

HABITAT AND BIOLOGY. Northern Indian Ocean; Red Sea to Pakistan, probably further east. Demersal inshore on continental shelf to 70 m depth. Produces litters of up to 7 pups. Probably feeds on small crustaceans and fishes.

SIMILAR SPECIES. Often confused with the Bengal Guitarfish (10.18), which occurs in similar areas of the Indian Ocean. However, the Spotted Guitarfish has a relatively narrower disc, and much smaller thorns around the eyes and along the mid-line of the body.

COMMON GUITARFISH

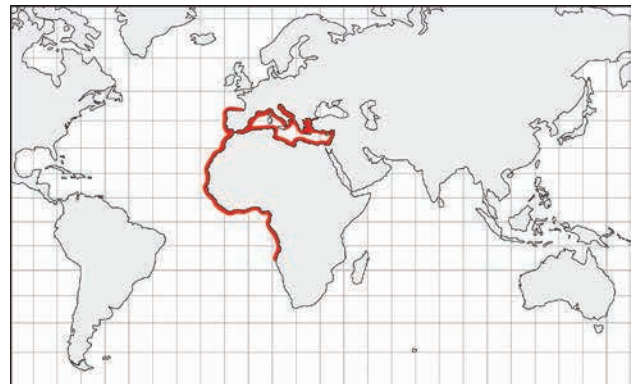
10.28

Rhinobatos rhinobatos (Linnaeus, 1758)

EN

IDENTIFICATION. Medium-sized guitarfish with a wedge-shaped disc, moderately long and narrowly triangular snout, anterior nasal flaps moderately developed with inner margin extending well into internasal space (to level of nostril inner corner), and plain greenish brown to reddish brown above or with faint bluish grey markings. Disc moderately thick, length ~1.2 times its width; anterior margins slightly undulate, outer corner of pectoral fins mostly rounded. Snout angle ~60°; eye large, orbit length 3.2–3.8 in preorbital length, 1–1.4 in interorbital space. Rostral ridges widely separated throughout their length. Spiracle with 2 distinct fleshy folds, inner fold smaller. Tooth rows in upper jaw 70–120. Nostrils oblique, length slightly longer than internasal space; anterior nasal flaps extending well into but not crossing internasal space. Skin entirely covered in fine denticles; thornlets on rostral ridges, around orbits, 2–3 on shoulders (persisting in adults); a median row of thornlets from nape to first dorsal fin and between dorsal fins. Tail 1.4–1.6 times longer than disc; large dorsal fins widely spaced, apices acutely rounded. Pectoral-fin radials 68–72. Total vertebral centra 173–182.

COLOUR. Dorsal surface greenish brown to reddish brown, often with faint bluish grey longitudinal stripes and blotches (sometimes with V or X-shaped marking on interorbit); rostral area semi-translucent. Ventral surface white.



SIZE. Reaches ~100 cm TL. Males mature at ~56 cm TL and females at ~64 cm TL; birth size ~25 cm TL.

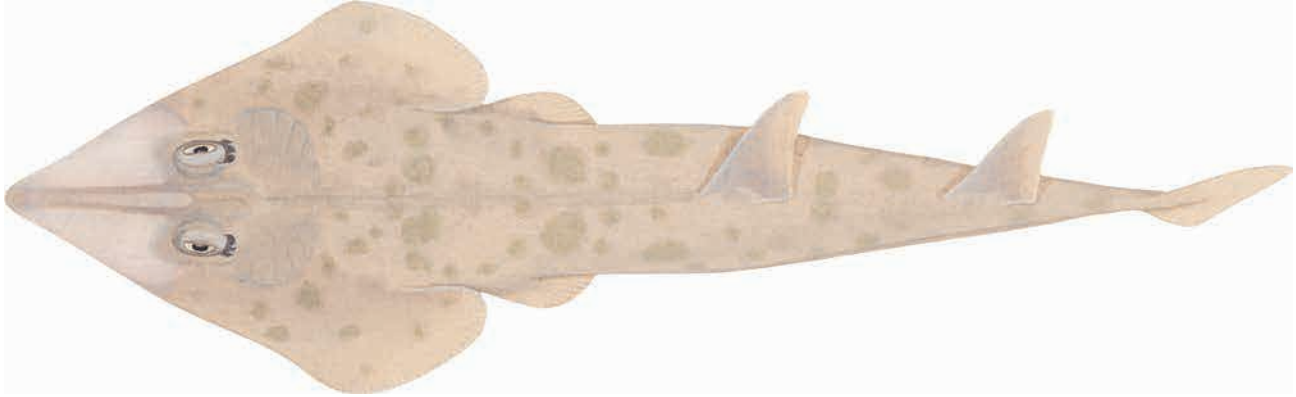
HABITAT AND BIOLOGY. Eastern Atlantic; Bay of Biscay to Angola, also in the Mediterranean Sea. Benthic, coastal and offshore on soft bottoms to 90 m depth. Feeds on benthic invertebrates, mainly crustaceans, and small fishes. Produces litters of 2–7 pups.

SIMILAR SPECIES. Most likely to be confused with the Spineback Guitarfish (10.22) because both species can have an X-like marking between the orbits. However, the Spineback Guitarfish has a distinct pattern of irregular light blotches (rather than being plain or with greenish stripes).

GOLDENEYE GUITARFISH

10.29

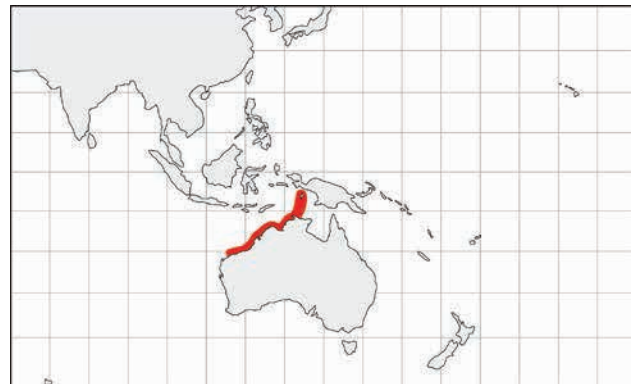
Rhinobatos sainsburyi Last, 2004



LC

IDENTIFICATION. Small guitarfish with a wedge-shaped disc, short and broadly triangular snout, oblique nostrils with subcircular anterior aperture, anterior nasal flaps penetrating well into internasal space, no thorns or tubercles on body, and upper surface plain or with faint dark markings. Disc rather thin, length 1.2–1.3 times its width; anterior margins straight to weakly double concave, outer corner of pectoral fins broadly rounded. Snout angle $\sim 66^\circ$, tip narrowly rounded; eye large, length 3.3–3.6 in preorbital length, 1–1.4 times interorbital space. Rostral ridges narrowly separated. Outer fold of spiracle distinctly larger than inner fold. Tooth rows in upper jaw ~ 80 . Nostrils with ~ 51 nasal lamellae; rather wide, length 1.4–1.6 times internasal width in adults; anterior nasal flap interspace about equal to length of posterior nasal aperture. Skin entirely covered with minute denticles. Tail 1.5–1.6 times longer than disc; dorsal fins narrowly spaced, interspace 2.7–3 times base length of first dorsal fin; apices narrowly rounded. Pectoral-fin radials 59–65. Total vertebral centra 175–185.

COLOUR. Dorsal surface uniform pale yellowish brown or variably covered with faint dusky or rusty blotches; front edge of cranium not sharply demarcated; sides of snout, centre of rostral cartilage, and hind margins of pectoral and pelvic fins much paler; eye golden; dorsal fins usually plain.



Ventral surface uniformly white; no dark marking at snout tip.

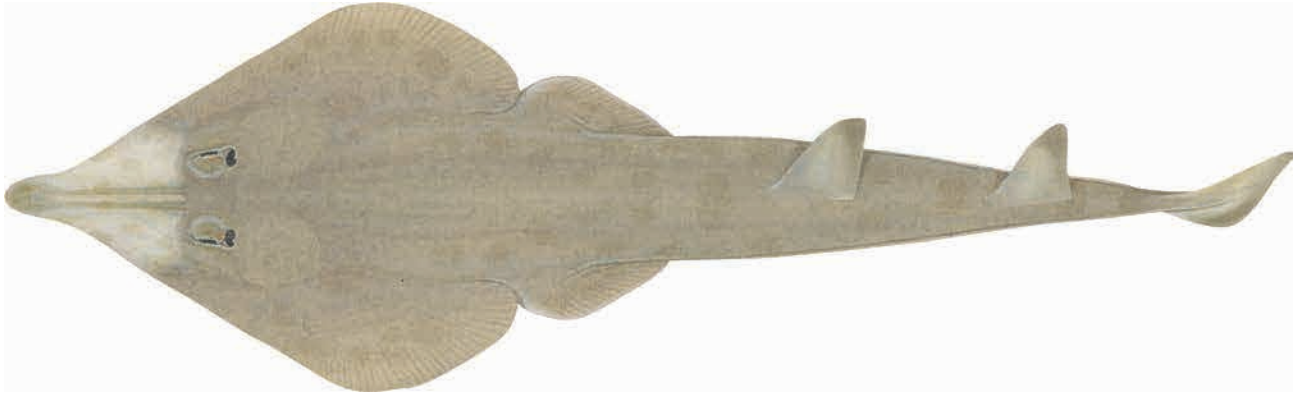
SIZE. To at least 60 cm TL. Males mature at 40–45 cm TL; probably smaller than 22 cm TL at birth.

HABITAT AND BIOLOGY. Eastern Indian Ocean and Western Central Pacific; Western Australia to Papua New Guinea. Demersal on outer continental shelf at depths of 70–200 m. Little known of its biology.

SIMILAR SPECIES. A relatively short triangular snout makes this species distinguishable from all other guitarfishes in the Western Central Pacific.

BOTTLENOSE GUITARFISH

10.30

Rhinobatos schlegelii Müller & Henle, 1841

DD

IDENTIFICATION. Medium-sized guitarfish with a wedge-shaped disc, snout bottle-shaped, anterior nasal flaps moderately developed with inner margin extending well into internasal space (to level of nostril inner corner), body brownish above with or without faint darker blotches, and usually a dark blotch near ventral snout tip (most obvious in young). Disc moderately thick, length 1.3 times its width; anterior margins slightly undulate to almost straight, outer corner of pectoral fins mostly rounded. Snout angle $\sim 50\text{--}56^\circ$; moderately long and narrowly triangular snout; eye large, length 4.3–5 in preorbital length, 1–1.1 times interorbital space. Rostral ridges separated almost throughout their length, more widely separated posteriorly. Spiracle with 2 weak fleshy folds, inner fold rudimentary. Nostrils oblique, length equal to or slightly longer than internasal space; anterior nasal flaps extending well into but not crossing internasal space. Skin entirely covered with fine denticles; minute thornlets around orbits, above spiracle, and on shoulders; median row of blunt thornlets from nape to first dorsal fin. Tail 1.6–1.7 times longer than disc; large dorsal fins widely spaced, apices acutely rounded. Pectoral-fin radials 61–70. Total vertebral centra 193–200.

COLOUR. Dorsal surface plain pale to medium brown, sometimes also with darker cloud-like blotches; blotches roughly symmetrical. Ventral surface white, with or without



prominent tear-shaped dark blotch on snout tip, blotch attenuating with growth (often obscure in adults).

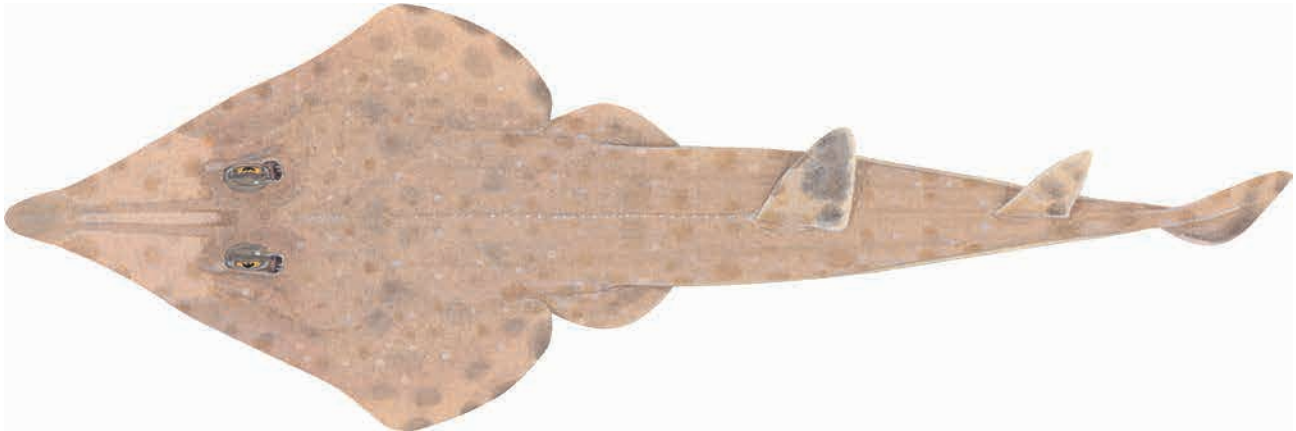
SIZE. Reaches ~ 100 cm TL. Matures at ~ 55 cm TL.

HABITAT AND BIOLOGY. North-West Pacific; Japan to Taiwan, reports from Philippines and India appear to be other species. Benthic on sandy or muddy bottoms, from coastal to offshore on continental and insular shelves to depths of 200 m. Biology poorly known. Produces litters of 1–14 pups.

SIMILAR SPECIES. Confused with other guitarfishes and erroneously thought to be widespread in the Indo-Pacific. Considered to be the same as a species described from Taiwan, *Rhinobatos formosensis* Norman.

PHILIPPINE GUITARFISH

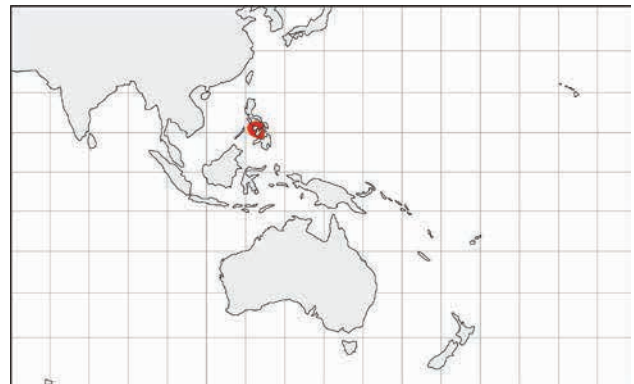
10.31

Rhinobatos whitei Last, Corrigan & Naylor, 2014

NE

IDENTIFICATION. Medium-sized guitarfish with a broadly wedge-shaped disc, narrow and mildly bottle-shaped snout, nostrils oblique with subcircular anterior aperture, anterior nasal flaps penetrating slightly into internasal space, no thorns, and upper surface blotched with white spots. Disc thin, length 1.2–1.4 times its width; anterior margins of snout concave, outer corner of pectoral fins broadly rounded to abruptly angular. Snout angle ~56–60°, tip bluntly pointed; eye rather large, orbit length 3.9–4.8 in preorbital length, 0.8–1.2 times interorbital space. Rostral ridges well separated. Outer fold of spiracle distinctly larger than inner fold. Tooth rows in upper jaw 65–92. Nostrils rather narrow with 50–53 nasal lamellae, width 1.3–1.6 times internasal width; anterior nasal flap interspace 1–1.1 times internasal width. Skin finely granular, entirely covered with minute denticles; orbits and dorsal mid-line with slightly enlarged denticles but no thorns or thornlets. Tail elongate, 1.2–1.4 times longer than disc; dorsal fins rather widely spaced, interspace 2.6–3.2 times base length of first dorsal fin; apices narrowly rounded to angular. Pectoral-fin radials 63–70. Total vertebral centra 173–179.

COLOUR. Dorsal surface greyish brown, mottled with poorly defined white spots and larger diffuse dusky and orange blotches; snout apex slightly darker than rest of snout; white spots concentrated on central disc and anterior tail, dusky blotches near outer part of disc, orange blotches on central disc and near tail margins. Ventral surface whitish, translucent beside rostral cartilage; disc margins



dusky. First dorsal fin weakly blotched anteriorly, darker posteriorly; second dorsal and caudal fins brownish anteriorly, blotched posteriorly; an obvious subcircular blotch over inner margins of both dorsal fins; margin of ventral lobe of caudal fin white.

SIZE. To at least 84 cm TL. Males mature at ~56 cm TL, females slightly larger.

HABITAT AND BIOLOGY. North-West Pacific; Philippine endemic. Demersal on inner insular shelves around the Sulu Sea. Life history unknown.

SIMILAR SPECIES. A bottlenose-shaped head is also typical of the Bottlenose Guitarfish (10.30) from further north in the Western Pacific. These species can be distinguished on body form, squamation, colour pattern, and their mitochondrial DNA.

Séret Bernard, Last P.R., Naylor G.J.P.

Guitarfishes : family Rhinobatidae.

In : Last P.R. (ed.), White W.T. (ed.), de Carvalho M.R. (ed.), Séret Bernard (ed.), Stehmann M.F.W. (ed.), Naylor G.J.P. (ed.), Marshall L. (ill.). Rays of the world.

Clayton South : CSIRO, 2016, p. 77-109.

ISBN 978-0-643-10913-1