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BANJO RAYS

Family Trygonorrhinidae

P.R. Last & B. Séret

Banjo rays are small to large guitarfishes (reaching 1.5 m TL) with a broad, flattened suboval to wedge-shaped disc, and a rather narrow, depressed trunk. The snout varies from very long and pointed to rather short and broadly rounded. Eyes and spiracles are small to medium-sized, and the spiracle has either 1 well-developed fold or none. Nostrils short and almost horizontal. Anterior nasal flaps are very broad, extending over entire length of nostril, with a long median lobe. A broad nasal curtain is present in one genus (*Trygonorrhina*). Mouth profile is weakly convex to strongly arched. The skin is covered with fine to very coarse denticles, with small to very large thorns in row along mid-line of body, and usually small patches near eyes and on shoulders. Short- to long-based pelvic fins are positioned laterally behind disc. Two tilted dorsal fins are well separated with the first well to slightly behind tips of the pelvic fins. Caudal fin small and lacks a prominent ventral lobe. All species have strong colour patterns consisting of lines, bars, spots and blotches on the dorsal surface, but the cranium and rostral cartilage are not usually sharply demarcated at their edges with the snout. The undersurface is mainly white but black blotches are sometimes present on the snout and posterior disc. Until recently, banjo rays were included in the guitarfishes (Rhinobatidae), but molecular research has shown that members of these groups are distinct from each other. Banjo rays are represented by 3 genera (*Aptychotrema*, *Trygonorrhina* and *Zapteryx*) and 8 valid species. They occur in temperate and tropical seas, primarily inshore on continental shelves but also to ~220 m depth. None of the species occurs in freshwater. Bottom-dwellers, they rest on soft and hard substrates, including seagrasses. Viviparous (aplacental) producing large litters of up to 18 pups. Diet consists primarily of small benthic invertebrates and fishes. Not routinely accessed by the fin trade, the flesh of some species is considered of good quality. Typically caught as bycatch of trawl and set-net fisheries.

KEY TO TRYGONORRHINID GENERA

1. Lobe-like expansion of anterior margin of nostrils joined across isthmus to form nasal curtain (fig. 1); disc oval, snout broadly rounded (fig. 4); 1 large fleshy fold on spiracle (fig. 7); Australia *Trygonorrhina* (2 species; fig. 4, pp. 122–123)

Lobe-like expansion of anterior margin of nostrils not connected across isthmus and not forming nasal curtain (figs 2, 3); disc shovel-shaped (fig. 5) or wedge-shaped (fig. 6); small fleshy fold on spiracle present (fig. 9) or absent (fig. 8) 2

2. Disc shovel-shaped or wedge-shaped; snout rather short, length less than 4.5 times eye length (fig. 5); expansions of anterior margin of nostril separated by less than nostril length (fig. 2); upper jaw not or weakly arched (fig. 2); Eastern Pacific and South-West Atlantic *Zapteryx* (3 species; fig. 5, pp. 124–126)

Disc wedge-shaped; snout long, triangular and pointed, length exceeding 4.5 times eye length (fig. 6); expansions of anterior margin of nostril separated by about nostril length (fig. 3); upper jaw strongly arched (fig. 3); Australia *Aptychotrema* (3 species; fig. 6, pp. 119–121)

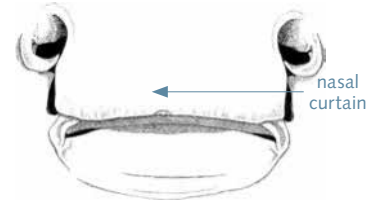


fig. 1

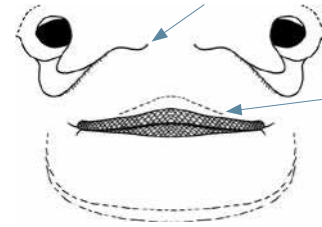


fig. 2

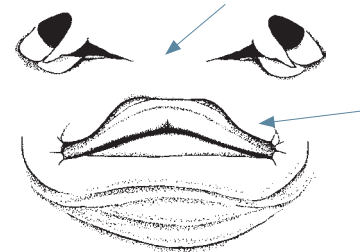


fig. 3

oronasal region

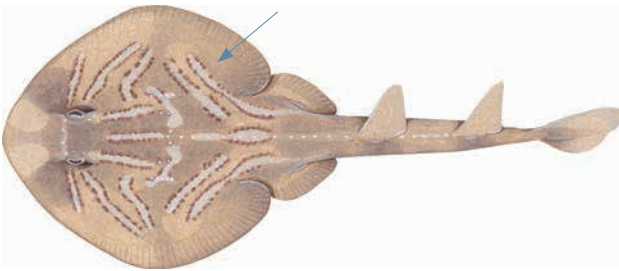


fig. 4

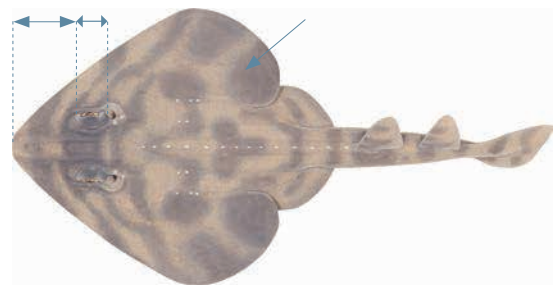


fig. 5

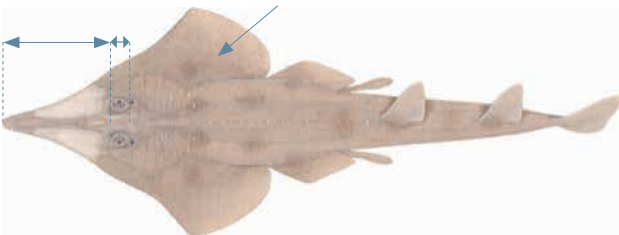


fig. 6

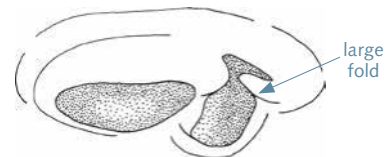


fig. 7

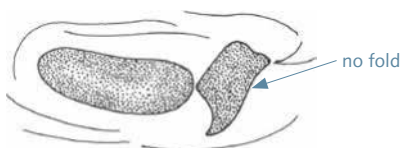


fig. 8

region of left eye and spiracle

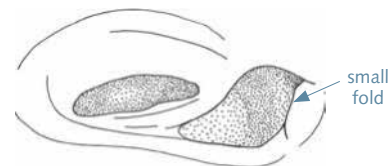
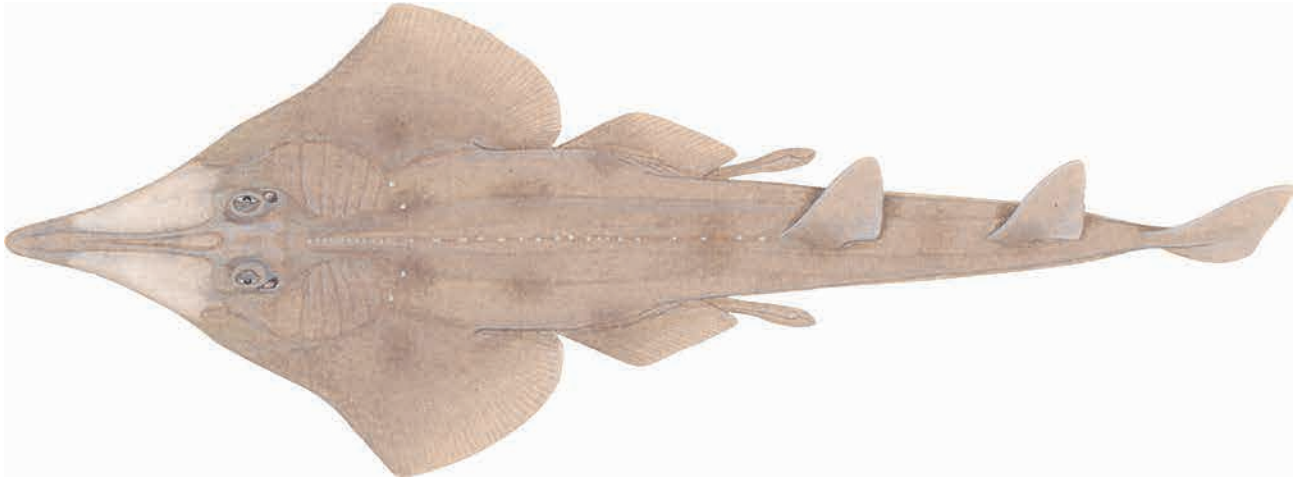


fig. 9

EASTERN SHOVELNOSE RAY

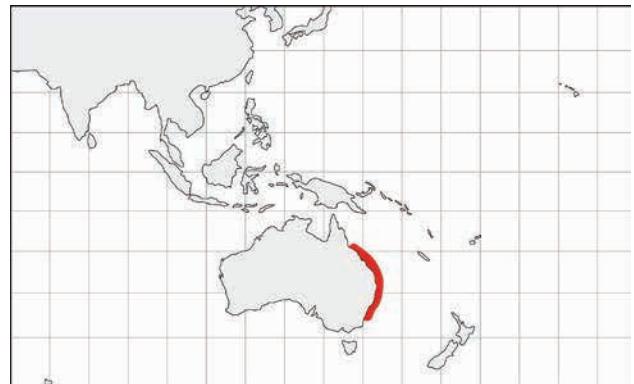
12.1

Aptychotrema rostrata (Shaw, 1794)

LC

IDENTIFICATION. Medium-sized shovelnose ray with wedge-shaped disc, very long and narrowly triangular snout, narrow nostrils, mouth arched forward strongly, and plain or dark blotched above. Disc thick, length 1.3 times width; anterior margins concave, outer corners mostly angular. Snout acute, angle 55° ; orbit small, length 5.7–7.6 in preorbital length, 1–1.1 times interorbital space. Rostral ridges narrowly separated. Spiracle without distinct fleshy folds (often with a small lump). Nostrils nearly transverse, length equal to or slightly shorter than internasal space; no nasal curtain; anterior nasal flaps penetrating only slightly into internasal space; young with relatively broad fleshy lobe on margin of anterior nasal aperture. Skin entirely covered in fine denticles; 2 enlarged thorns on snout tip, 2–3 short preorbital thorns, 1–2 thorns over spiracle, 2 groups of thorns on each shoulder (barely distinguishable in adults), a median row of ~18–20 short, widely spaced thorns on disc and tail, thorns small (sharper in juveniles), slightly compressed. Tail about 1.2 times longer than disc; large dorsal fins widely spaced, apices narrowly rounded. Total vertebrae 171–172.

COLOUR. Dorsal surface uniform greyish brown or with darker blotches over central disc and tail, snout beside dark rostral cartilage distinctly paler; when present, dark or dusky blotches similar in size and usually larger than orbit; no obvious mask around orbit. Ventral surface white with irregular dark flecks; juveniles and some adults with a large black blotch at snout tip and edge of snout black.



SIZE. Reported to reach 120 cm TL, but seldom in excess of 100 cm TL. Males mature at 60–68 cm TL and females at 54–66 cm TL; born at 13–15 cm TL.

HABITAT AND BIOLOGY. South-West Pacific, off eastern Australia. Benthic, mainly inshore and on continental shelf to 220 m depth, but usually shallower than 100 m. Common in estuary mouths and off beaches. Feeds mainly on benthic crustaceans and small fishes. Gives birth, mainly in November and December, to 4–18 pups after 3–5 month gestation.

SIMILAR SPECIES. Once confused with a relative from the Indian Ocean, the Western Shovelnose Ray (12.3). These species differ subtly in colour and snout shape.

SPOTTED SHOVELNOSE RAY

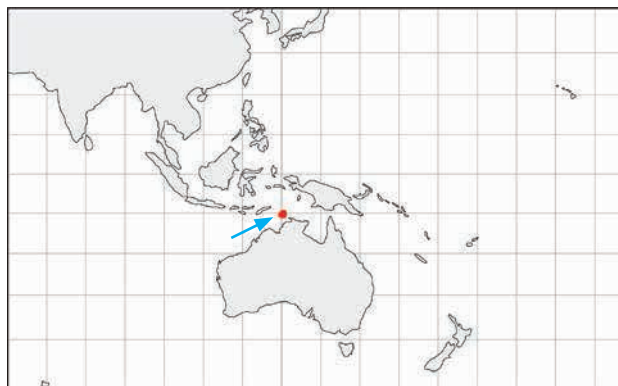
12.2

Aptychotrema timorensis Last, 2004

VU

IDENTIFICATION. Small shovelnose ray with wedge-shaped disc, very long and narrowly triangular snout, narrow nostrils, mouth arched forward strongly, and pattern of white spots on upper disc. Disc thin, length 1.3 times width; anterior margins strongly concave, outer corners broadly rounded. Snout acute, angle $\sim 52^\circ$; orbit small, length ~ 5.2 of preorbital length, exceeding width of interorbital space. Rostral ridges narrowly separated. Spiracle without fleshy folds. Nostrils nearly transverse, slightly narrower than internasal space; no nasal curtain; anterior nasal flaps penetrating only slightly into internasal space. Skin uniformly granular; 2 short thorns before eye; 3–4 thorns near spiracle; ~ 27 widely spaced thorns along midline of disc and predorsal tail; sometimes 2 enlarged thorns on snout tip and a few on each shoulder; thorns strong, compressed slightly. Tail 1.1 times longer than disc; dorsal fins widely spaced, apices angular. Total vertebrae ~ 165 .

COLOUR. Dorsal surface brownish with widely spaced pale spots, symmetrically arranged; spots dark-edged, smaller than pupil of eye, extending from near orbit to caudal fin; spots sometimes paired on shoulder, above pectoral and pelvic-fin insertions, and near origins of pelvic fins, dorsal fins and free rear tip of pectoral fins. Ventral surface uniformly pale; snout tip pale, lacking dark markings.



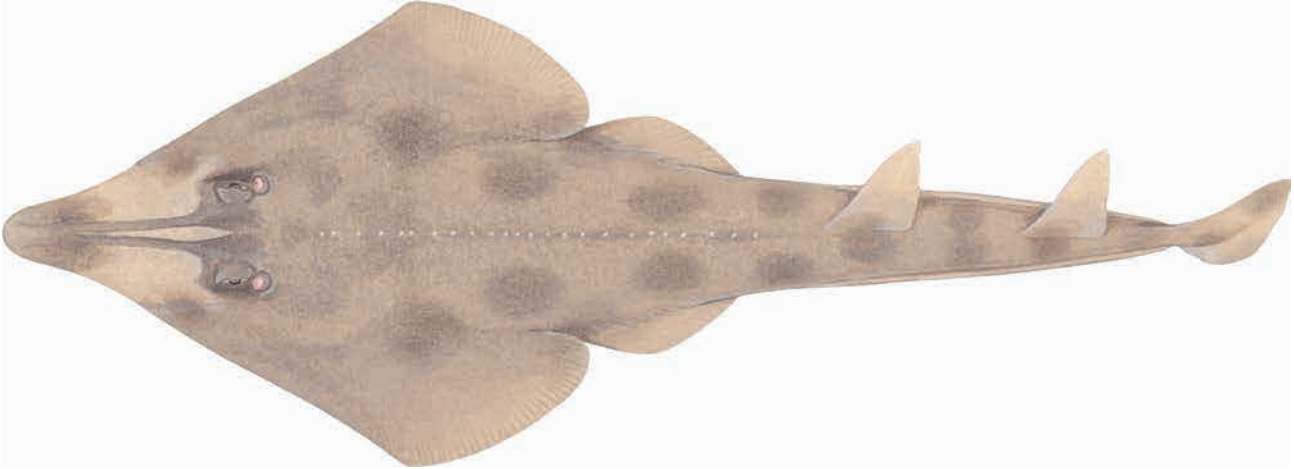
SIZE. To at least 58 cm TL; only two mature males known, 48–50 cm TL.

HABITAT AND BIOLOGY. Eastern Indian Ocean, Arafura Sea (northern Australia). Benthic inshore on mid-continental shelf at ~ 120 m depth. Few specimens ever collected and its biology little known.

SIMILAR SPECIES. Unique within the genus in having white spots and the snout is more narrowly pointed than any other member of the family.

WESTERN SHOVELNOSE RAY

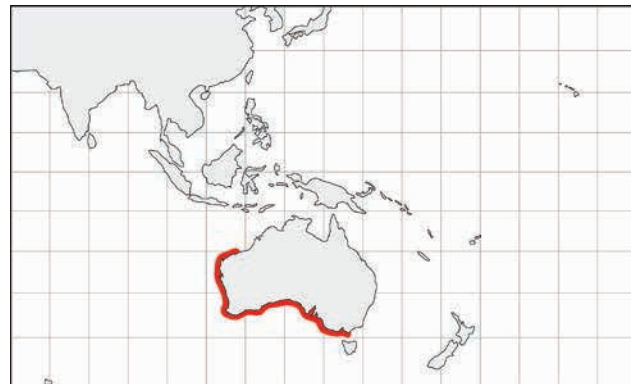
12.3

Aptychotrema vincentiana (Haacke, 1885)

LC

IDENTIFICATION. Medium-sized shovelnose ray with wedge-shaped disc, long and triangular snout, narrow nostrils, mouth arched forward strongly, and yellowish brown with darker brownish or black bars and blotches. Disc thick, length 1.3 times width; anterior margins slightly undulated, outer corners broadly rounded to abruptly angular in adults. Snout acute, angle $\sim 64^\circ$; orbit small, length 5.1–5.9 in preorbital length, 1.1–1.2 times interorbital space. Rostral ridges narrowly separated. Spiracle without distinct fleshy folds (often with a small lump). Nostrils nearly transverse, length equal to or slightly shorter than internasal space; no nasal curtain; anterior nasal flaps penetrating only slightly into internasal space; young with narrow fleshy lobe on margin of anterior nasal aperture. Skin uniformly granular; 2–4 short thorns before eye; 1–2 thorns near spiracle; ~ 18 –20 short, widely spaced thorns along mid-line of disc and predorsal tail; sometimes 2 enlarged thorns on snout tip; 2 groups of thorns on each shoulder; thorns small (sharper in juveniles), compressed slightly. Tail 1.3–1.4 times longer than disc; large dorsal fins widely spaced, apices narrowly rounded. Total vertebrae 167–171.

COLOUR. Dorsal surface yellowish brown with dense coverage of darker cloudy blotches (most distinct in adults); usually with dark brown mask around orbit. Small juveniles uniformly yellowish brown or blotched, noticeably paler beside rostral cartilage; blotches similar in size, and larger than orbit. Ventral surface white with irregular dark flecks; snout tip of juveniles and some adults with small black blotch.



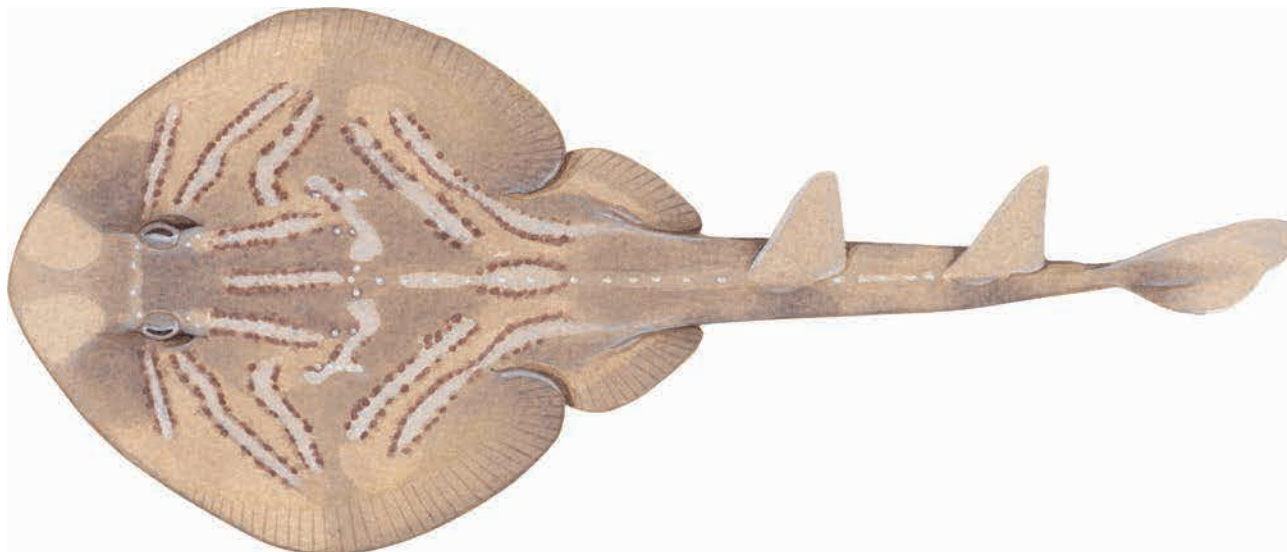
SIZE. To at least 84 cm TL, males mature at ~ 65 cm TL.

HABITAT AND BIOLOGY. Eastern Indian Ocean; western and southern Australia. Benthic, on continental shelf from coastal fringe to 125 m depth. Common on sandy beaches and seagrass beds. Feeds mainly on decapod crustaceans and small bony fishes. Females have litters up to 16 young. Juveniles are taken commonly in beach seines and discarded.

SIMILAR SPECIES. Resembles the Eastern Shovelnose Ray (12.1) but differs in its DNA and aspects of its morphology, such as shape and colour of snout. Minor differences exist between northern and southern populations off Western Australia and these need further investigation.

SOUTHERN FIDDLER RAY

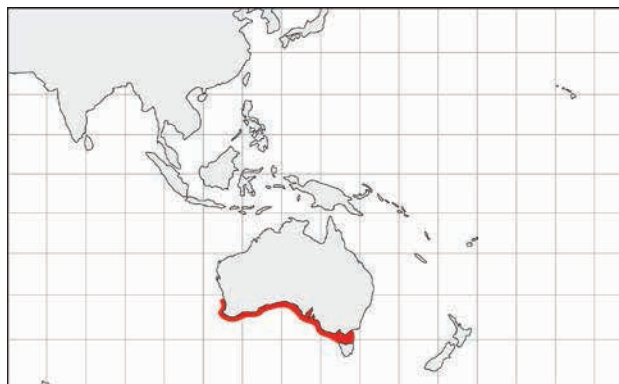
12.4

Trygonorrhina dumerilii (Castelnau, 1873)

LC

IDENTIFICATION. Large shovelnose ray with a suboval disc, short and broadly rounded snout, nostrils partly covered with a large nasal curtain, ridges of small thorns on mid-line of disc and shoulders, and an ornate pattern of dark-edged bands and lacking a distinct triangular or diamond-shaped marking behind the interorbital space. Disc depressed, slightly longer than wide; anterior margins convex, outer corners broadly rounded. Snout obtuse, angle $\sim 110^\circ$; orbit length 2.8–4.2 in preorbital length, 1.5 or more in interorbital space. Rostral ridges widely separated but not visible. Spiracle with 1 large fleshy fold. Mouth broad, straight to slightly convex. Nasal curtain covering most of nostril, only small anterior aperture visible; flap broader than long, extending to upper jaw. Skin velvety, entirely covered in fine denticles. Enlarged thorn-like denticles in row along dorsal mid-line of disc (~ 12 – 16 predorsal) and usually on pair of short ridges on each shoulder (outer ridge longest); 1–2 preorbital, postorbital and spiracular thorns; median thorns on raised mounds, best developed in young. Tail 1.3–1.4 times longer than disc in adults. Dorsal fins large, widely spaced, separated by about length of first dorsal fin or less; apices narrowly rounded.

COLOUR. Dorsal surface usually plain or blotched yellowish to brownish with variable dark-edged bluish grey transverse bands; 3 short parallel stripes radiating posteriorly from eye but not forming a triangular marking; darker bands between and beside eyes; disc and pelvic-fin



margins pale; pattern usually more pronounced in young; rarely black with white fins and disc margin. Ventral surface and lateral skin folds uniformly pale.

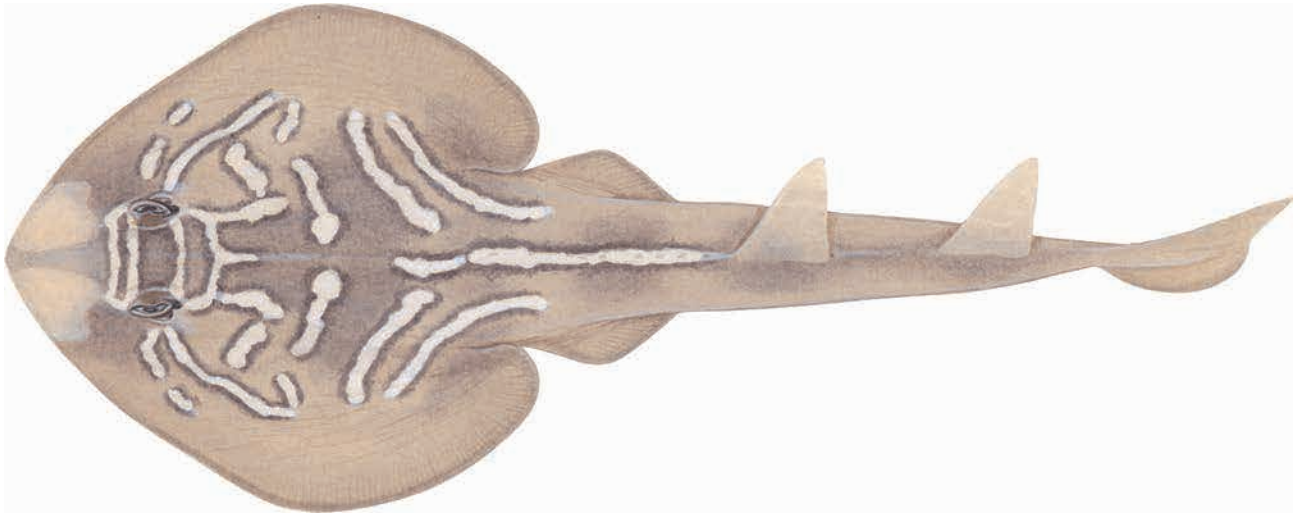
SIZE. Reported to reach 146 cm TL; males mature at ~ 70 cm TL and females at 89 cm TL; born at 21–25 cm TL.

HABITAT AND BIOLOGY. Endemic to southern Australia. Benthic, occurs on continental shelf, mainly on soft bottoms and seagrasses, at 5–205 m depths. Feeds on benthic crustaceans, worms, molluscs and small fishes. Gives birth to 2–5 pups.

SIMILAR SPECIES. A black and white colour variant (*Trygonorrhina melaleuca*), which lives in large marine gulfs near Adelaide (South Australia), was recently shown to be a variant of the Southern Fiddler Ray.

EASTERN FIDDLER RAY

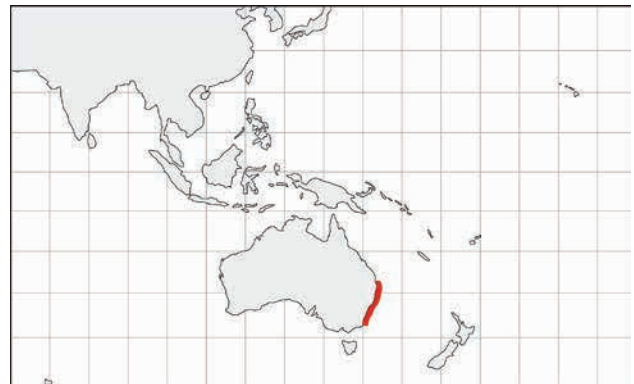
12.5

Trygonorrhina fasciata Müller & Henle, 1841

LC

IDENTIFICATION. Large shovelnose ray with a suboval disc, short and broadly rounded snout, nostrils partly covered with a large nasal curtain, ridges of sharp thorns on mid-line of disc and shoulders, and an ornate pattern of dark-edged bands with distinct triangular or diamond-shaped marking behind the interorbital space. Disc depressed, usually slightly longer than wide; anterior margins convex, outer corners broadly rounded. Snout obtuse, angle $\sim 110^\circ$; orbit length up to 4 in preorbital length, 1.5 or more in interorbital space. Rostral ridges widely separated but rarely visible. Spiracle with 1 large fleshy fold. Mouth broad, straight to slightly convex. Nasal curtain covering most of nostril, only small anterior aperture visible; flap broader than long, extending to upper jaw. Skin velvety, entirely covered in fine denticles. Enlarged thorn-like denticles in row along dorsal mid-line of disc (~ 18 predorsal) and usually on pair of short ridges on each shoulder (outer ridge longest); 1–2 preorbital, postorbital and spiracular thorns; median thorns on raised mounds, best developed and with sharp tips in young. Tail 1.3–1.4 times longer than disc in adults. Dorsal fins large, widely spaced, separated by about length of first dorsal fin or slightly less; apices narrowly rounded.

COLOUR. Dorsal surface plain or blotched brownish to greyish with distinctive pattern of transverse lilac bands (with dark brown margins); bands joined to form characteristic dark triangular or diamond-shaped marking



behind eyes; dark brown spots often present near disc margin and mid-line anterior to eyes; snout largely pale. Dorsal and caudal fins pale. Ventral surface white.

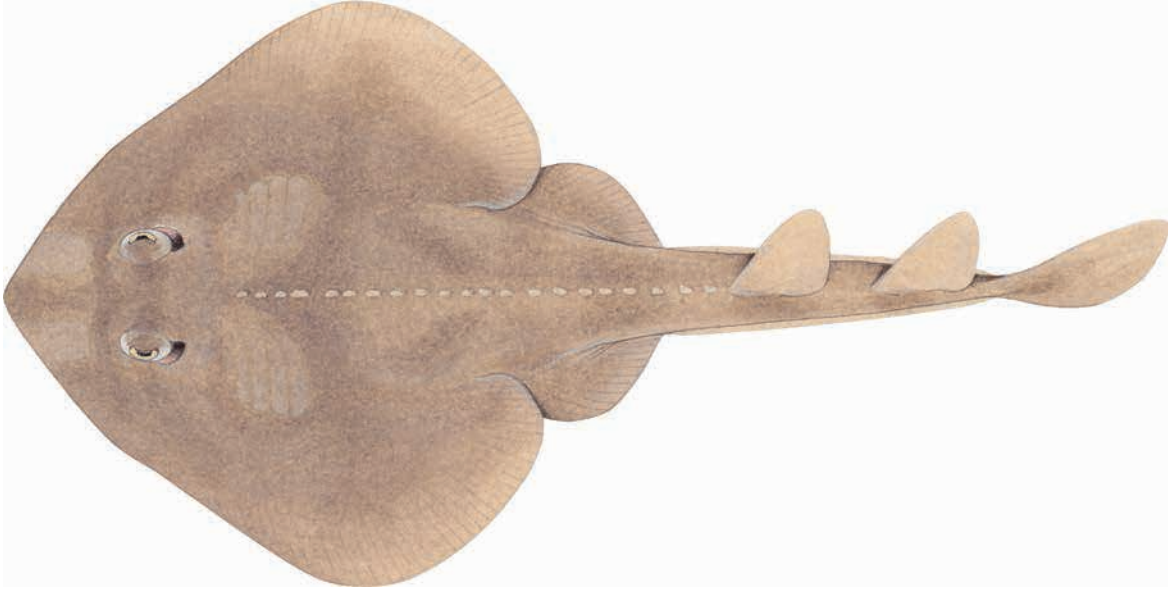
SIZE. Possibly reaches ~ 120 cm TL, but seldom exceeds 110 cm TL; born at ~ 25 cm TL.

HABITAT AND BIOLOGY. South-West Pacific; endemic to eastern Australia. Benthic, mainly inshore and on inner continental shelf to ~ 100 m depth. Feeds mainly on crabs and shrimps. Produces 2–3 pups.

SIMILAR SPECIES. Similar in appearance to the Southern Fiddler Ray (12.4), but can be distinguished by a characteristic triangular marking on the head behind the eyes (otherwise absent).

SHORTNOSE GUITARFISH

12.6

Zapteryx brevirostris (Müller & Henle, 1841)

VU

IDENTIFICATION. Small guitarfish with a shovel-shaped to suboval disc, bluntly rounded snout, well-developed median and scapular thorns, 1 low skin fold on spiracle, denticles on nape unusually scalloped (edges curved), and usually covered with dark cloudy blotches. Disc much shorter than tail, length ~42% TL. Snout obtuse, rather short, forming an anterior angle of 105–107°; rostral ridges separated; preorbital length 2.1–2.5 times orbit length, 1.9–2.2 times interorbital space. Nostrils narrow, almost horizontal, separated by about their width; innermost edges of anterior nasal flaps extending well into internasal space, separated by about length of anterior aperture of nostril. Skin covered with small dermal denticles of varying shapes above, interspersed with larger conical denticles; much finer and flatter ventrally. Thorns low, bases stellate or scalloped; in 2 rows on each shoulder, small beside eyes, and short row of 4–8 on disc margin at level of nape; regular row of 21–23 domed thorns extending from nape to dorsal fin; no obvious thorns along edges of rostral cartilage. Dorsal fins separated by less than length of first, posterior margins longer than their bases. Clasper of adult male not extending beyond rear tip of first dorsal in adults.

COLOUR. Dorsal surface uniformly greyish brown or yellowish with darker cloudy blotches over disc and on tail at bases of dorsal fins; pale translucent beside rostral cartilage; edges of eye and sides on body distinctly white



edged. Ventral surface greyish or white, edges of pectoral and pelvic fins dusky.

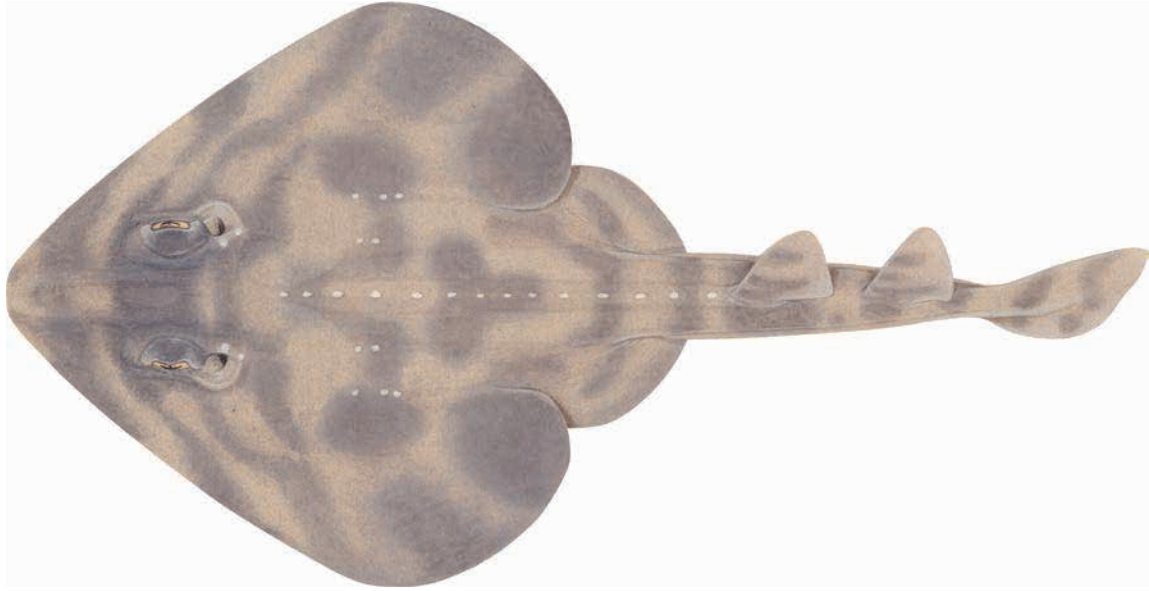
SIZE. Attains ~66 cm TL. Males mature at 43–45 cm TL, females at 42–48 cm TL; born at 13–16 cm TL.

HABITAT AND BIOLOGY. South-West Atlantic; northern Argentina to southern Brazil, historical records further north to Bahia Province. Benthic inshore over soft bottoms to at least 50 m depth. Gestation lasts about a year, produces litters of 1–8 pups in autumn. Feeds on benthic crustaceans and polychaetes.

SIMILAR SPECIES. Edges of denticle bases on the nape are characteristically curved, rather than being star-shaped as in other members of the genus.

BANDED GUITARFISH

12.7

Zapteryx exasperata (Jordan & Gilbert, 1880)

DD

IDENTIFICATION. Medium to large guitarfish with a shovel-shaped disc, blunt snout, large median and scapular thorns, no dermal folds on spiracles, pair of large black blotches near rear ventral tips of disc, and blotched dorsal pattern with prominent bars around eyes and on snout. Disc shorter than or equal to tail, length 45–50% TL. Snout obtuse, rather short, forming an anterior angle of ~100°; rostral ridges very widely separated throughout their length; preorbital length 3–4 times orbit length, less than 2.5 times interorbital space. Nostrils narrow, almost horizontal and well separated; anterior nasal flaps extending slightly into internasal space. Skin covered with granular denticles above, much finer and indistinct ventrally. Thorns well developed, on low ridges forward of shoulder; regular row of 13–15 thorns extending from nape to dorsal fin, forming spiny tubercles in adults; 2 thorn patches on each shoulder, 2–4 orbital thorns in young, absent in adults; no obvious thorns along edges of rostral cartilage. Dorsal fins rather close together, separated by less than horizontal length of first. Clasper of adult male not extending beyond rear tip of first dorsal in adults.

COLOUR. Dorsal surface yellowish or brownish with darker blotches and bars over disc and tail; prominent black cross bars between orbits and two more on snout, fins blotched. Ventral surface white with large blackish blotch of similar width to mouth at end of each pectoral fin, occasionally with other less regular blotches.



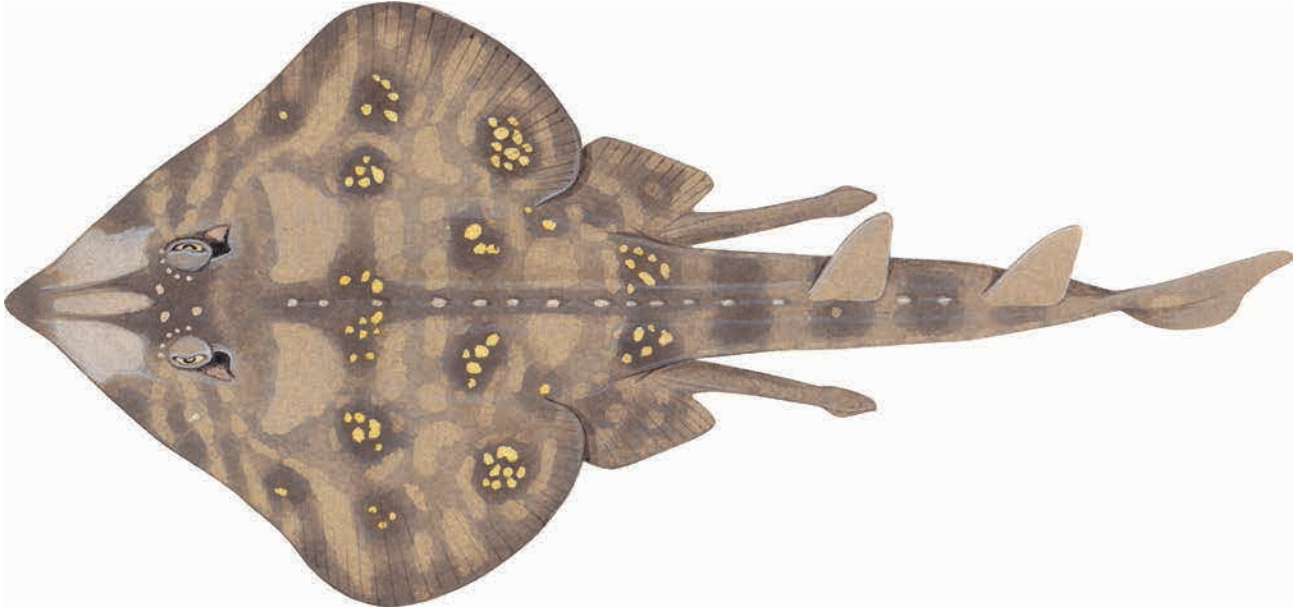
SIZE. Reaches ~97 cm TL. Males mature at 64–70 cm TL, females at 57–77 cm TL; born at 15–18 cm TL.

HABITAT AND BIOLOGY. North-East Pacific; California to northern Mexico, records to Peru probably misidentifications. Benthic, coastal on rocky reefs mainly shallower than 10 m, moves offshore onto soft bottoms in autumn and winter; also reported at depth of 200 m. Large litters of 4–11 pups, born in winter. Adults feed mainly on benthic fishes. Commercially important part of artisanal fisheries.

SIMILAR SPECIES. Has a less angular snout than the Southern Banded Guitarfish (12.8) with two dark transverse bars (otherwise missing).

SOUTHERN BANDED GUITARFISH

12.8

Zapteryx xyster Jordan & Evermann, 1896

DD

IDENTIFICATION. Medium-sized guitarfish with a broad rhombic disc, bluntly pointed snout, large median and scapular thorns, no dermal folds on spiracles, pair of large black blotches near rear ventral tips of disc, and blotched dorsal pattern with small white pectoral ocelli in most stages of growth. Disc shorter than or equal to tail, length 44–50% TL. Snout angular, rather short, forming an anterior angle of ~80°; rostral ridges very widely separated throughout their length; preorbital length 3–4 times orbit length, ~2.7 times interorbital space. Nostrils narrow, almost horizontal and well separated; anterior nasal flaps extending slightly into internasal space. Skin covered with granular dermal denticles above, finer and indistinct ventrally. Thorns well developed, on ridges forward of shoulder; regular row of ~12 thorns extending from nape to dorsal fin, best developed in young; 2 thorn patches on each shoulder, usually 3 orbital thorns; row of smaller thorns along rostral ridges. Dorsal fins well apart, separated by more than horizontal length of first. Clasper extending to end of first dorsal fin or beyond in adults.

COLOUR. Dorsal surface brownish or greyish, with light and dark blotches on disc and tail; usually 2 pairs of pectoral ocelli (on central and posterior fins); ocelli white or yellowish centrally with darker margin, most distinct in young; anterior and inner margins of orbits black. Ventral surface white with pair of large black blotches at rear of each pectoral fin.



SIZE. Reaches 78 cm TL. Males mature at ~47 cm TL, females at ~45 cm TL; born at ~18 cm TL.

HABITAT AND BIOLOGY. Eastern Central Pacific; Mazatlan (Mexico) to Peru. Benthic, continental shelf on rocky and sandy bottoms to depths of 150 m. Night feeder, feeds largely on small fishes and prawns. Likely bycatch of gillnet and prawn trawl fisheries.

SIMILAR SPECIES. Occurs in the Eastern Pacific with the Banded Guitarfish (12.7). As the name suggests, the Southern Banded Guitarfish has a more southerly range. It also has a more angular disc and differs subtly in coloration.

Last P.R., Séret Bernard.

Banjo rays : family Trygonorrhinidae.

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