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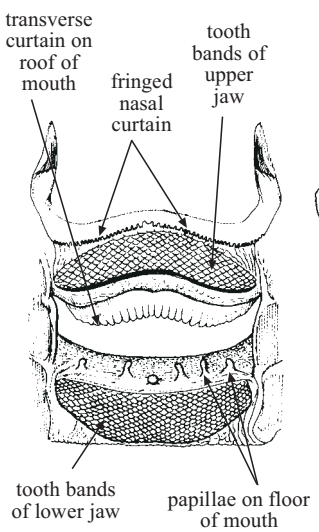
# DASYATIDAE

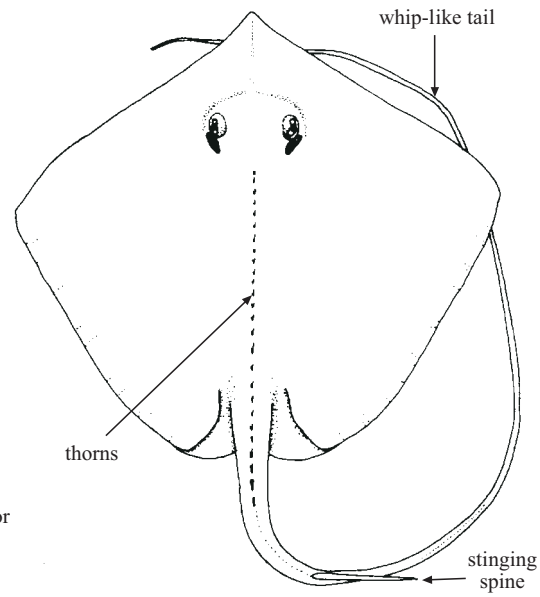
## Stingrays

by P.R. Last and L.J.V. Compagno

**Diagnostic characters:** Small to very large batoids (adults between 40 and 500 cm total length, and 18 to at least 192 cm disc width) with **large, oval, circular, or rhomboidal discs**, and **moderately stout to slender, more or less elongated, whip-like tails mostly longer than disc** length. **Body usually with denticles, thorns, and tubercles on the dorsal surface of disc and tail**; their size, density and distribution varies with growth, sex, and species. Trunk depressed and flattened, not shark-like. Tail moderately depressed or cylindrical, without lateral folds on sides, abruptly narrower than trunk; **usually 1 to 4 prominent barbed stings (stinger or stinging spine) on dorsal surface of tail well behind pelvic fins** (absent or vestigial in *Urogymnus*, and often cut or broken off captured individuals by fishers to protect themselves); no electric organs in tail. Head forming part of disc, broad and depressed, not greatly elevated; snout short or moderately elongated (mostly less than 6 times orbit diameter but more than 6 times in long-snouted and small-eyed species in the area), broadly angular to rounded at tip; snout without a rostral cartilage, entirely supported by pectoral fin skeleton; not formed into a rostral saw and without lateral saw teeth. Five small gill openings on underside of front half of pectoral disc, not visible in lateral view; no gill sieves or rakers on internal gill slits. Eyes dorsolateral on head and just anteromedial to spiracles, usually moderately large but small in a few species in the area. Mouth transverse, straight or broadly arched, and narrow, without prominent knobs, depressions or labial folds but sometimes undulated; **lobate oral papillae usually present on floor of mouth**. Nostrils just anterior to mouth and separated from it by much less than their own widths, connected by broad nasoral grooves with mouth; anterior nasal flaps long and medially expanded and fused into a broad, elongated nasal curtain or internasal flap that overlaps mouth. Oral teeth usually small to moderate-sized, rounded-oval in shape and flat, keeled, or with short cusps on their crowns, not laterally expanded (elevated and hexagonal in *Pastinachus*), similar in shape and usually in less than 50 rows in either jaw; teeth forming close-set pavement with many series functional. Pectoral fins very large, originating at anterior tip of snout and ending posterior to pelvic-fin origins; disc width about 0.9 to 1.4 times length; disc not subdivided at eyes. No electric organs at bases of pectoral fins. Pelvic fins low to high, rounded to angular, and not divided into anterior and posterior lobes. **No dorsal or caudal fins**; membranous skin folds present or absent on upper and lower midlines of tail behind sting origin. **Colour:** most species dull greyish brownish or greenish dorsally, also grey or yellowish; few species with bluish, whitish, or blackish spots, rings, or reticulations, but without paired ocelli on pectoral bases; **most species paler ventrally**, usually white (*Pteroplatytrygon violacea* is dark purple, greyish, or black on both surfaces).




**open mouth of *Dasyatis***




**Habitat, biology, and fisheries:** Stingrays are highly adapted and successful fishes that occur in marine, estuarine, and fresh-water habitats in temperate and tropical areas worldwide. The greatest diversity exists in the tropics and very few species penetrate cold-temperate waters at high latitudes or beyond continental shelves. They are mostly demersal in inshore waters, but at least 1 species is pelagic in the open ocean, several species range offshore onto continental margins, and a few large species occur along the upper continental slopes down to 480 m. Several species are euryhaline and ascend rivers, while some species are confined to fresh water. Viviparous with litters of 2 to 6 young that may take up to 12 months to gestate. Feed mostly on benthic invertebrates. Represented worldwide by more than 60 living species from 5 poorly defined genera that need critical assessment to determine their monophyly and which may not necessarily represent a single family; at least 30 species occur in FAO Fishing Area 71. Ray fisheries are very important

in the area with substantial landings off Indonesia, Thailand, Singapore, and Malaysia. Indonesian fisheries represent about 10% of the world's catch of elasmobranchs and about a third of this (about 10 000 to 25 000 t annually between 1976 and 1990) are rays. Stingrays are the dominant ray components of the catch. Most species are used but information on the relative importance of each on a regional basis is poor. Stingrays are inadequately represented in museum collections because the adults of many species are large, and thus difficult to transport and store. Additional collections and further research is required to resolve nomenclatural problems and better define distributions of most species in this region.

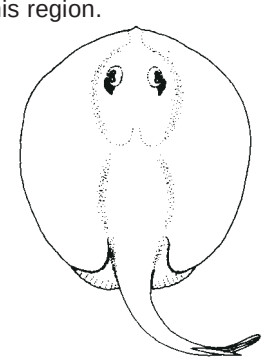
**Similar families occurring in the area**

Urolophidae: tail relatively short with long, low caudal fin (rather than long and lacking a caudal fin); small dorsal fin sometimes preceding sting (always absent in dasyatids); dorsal surface of disc and tail entirely naked in most Indo-Pacific species (rather than with some denticles or scutes in adults).

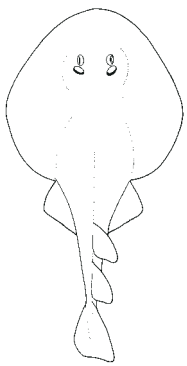
Narcinidae: 2 dorsal fins and a caudal fin (rather than both absent); tail base broad (rather than very slender).

Gymnuridae: disc much broader than long (rather than subequal or only slightly broader); tail very thin and shorter than 1/2 disc width (usually longer than disc width).

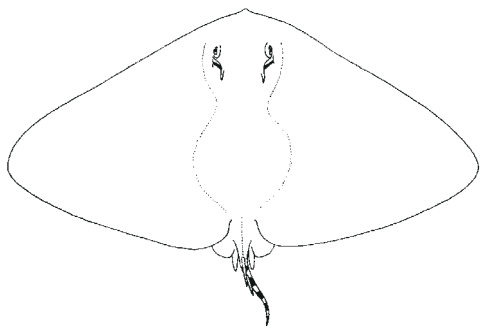
Myliobatidae: head distinct from rest of disc (rather than fused anteriorly); pectoral apices angular, acute (much more rounded in dasyatids).



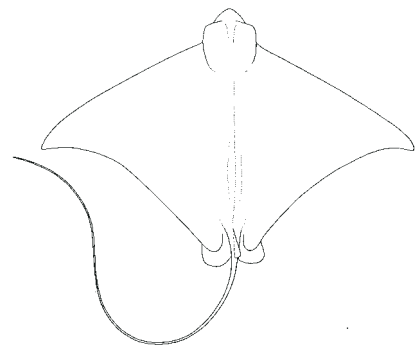
**Urolophidae**



**Narcinidae**



**Gymnuridae**



**Myliobatidae**

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

**1a.** No skin folds on tail (Fig. 1a) (fine ridges are present on posterior tail of *Himantura imbricata*); base of tail narrow and mostly rounded to slightly compressed in cross-section (slightly depressed in *Himantura granulata*) . . . . . → ***2***

**1b.** Skin fold present on undersurface of tail (may be low) and sometimes on dorsal surface behind sting (Fig. 1b); base of tail relatively broad, distinctly depressed . . . . . → ***17***

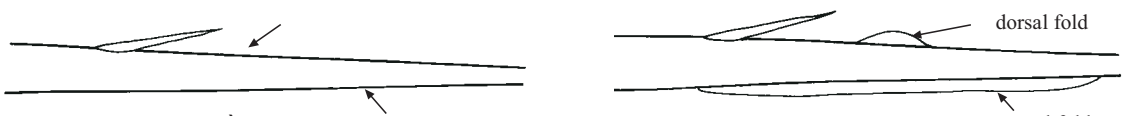



**Fig. 1 side view of tail**

**2a.** Profile of disc typically oval to rounded (less obviously so in *Himantura chaophraya*); apex of pectoral fins broadly rounded . . . . . → ***3***

**2b.** Profile of disc more or less quadrangular; apex of pectoral fins narrowly rounded to angular (juveniles sometimes tend to be more rounded than adults) . . . . . → ***10***

**3a.** Disc distinctly broader anteriorly, almost at maximum width at level of eye front; anterior disc almost truncate with a prominent tip; mainly brackish and fresh water . . ***Himantura chaophraya***

**3b.** Disc shape not as above . . . . . → ***4***

**4a.** Upper surface of disc with pronounced pattern of dark spots or reticulations that are prominent on central portion of disc but obscure or absent on distal third; in brackish and fresh water . . . . . ***Himantura oxyrhynchus***

**4b.** Upper surface mostly plain coloured, without pattern of dark spots or reticulations (white flecks in adult *Himantura granulata*) . . . . . → ***5***

**5a.** Scattered long, sharp thorns present over entire disc in adults; no stinging spine; tail base rounded in cross-section . . . . . ***Urogymnus asperrimus***

**5b.** No long, sharp thorns over disc other than along midline; stinging spine usually present; tail base depressed slightly . . . . . → ***6***

**6a.** Ventral surface of disc entirely white; midline of tail sometimes with greatly enlarged thorns; disc width of adults smaller than 40 cm . . . . . → ***7***

**6b.** Ventral surface of disc with a broad dark margin; midline of tail without greatly enlarged thorns; disc width of adults exceeding 70 cm . . . . . → ***9***

**7a.** Snout broadly triangular; tail long, more than 4 times snout-vent length (when undamaged); dorsal margin of disc white; in brackish and fresh water . . . . . ***Himantura signifer***

**7b.** Snout narrowly triangular; tail short, less than 2 times snout-vent length; dorsal margin of disc not white . . . . . → ***8***

**8a.** Tail of male and juvenile filamentous, without pronounced lateral keels; tail of adult female bulbous beyond sting; thorns on tail very elongate, much longer than 1/2 eye diameter . . . . . ***Himantura walga***

**8b.** Tail filamentous, with pronounced lateral keels; tail of adult female not bulbous; thorns on tail not elongate, much shorter than 1/2 eye diameter . . . . . ***Himantura imbricata***

**9a.** Snout narrowly triangular, its lobe-like tip broad based and elongate; tail dark beyond sting; dorsal surface of disc greyish or brownish, without white flecks . . . . ***Himantura uarnacoides***

**9b.** Snout broadly triangular, its lobe-like tip narrow based and short; tail white beyond sting; dorsal surface of disc usually greyish with white spots and flecks . . . . . ***Himantura granulata***

**10a.** Upper surface of disc with a complex pattern of large dark spots, ocelli, or reticulations . . . . . → ***11***

**10b.** Upper surface of disc white-spotted or uniformly coloured (usually greyish, pinkish, or brownish), but lacking a dense pattern of dark spots, ocelli or reticulations (a few small spots may be present on posterior disc of *Himantura jenkinsii*) . . . . . → ***13***

**11a.** Pattern not dense; dark spots on upper surface much more than diameter of largest spot apart; edges of spots normally fuzzy . . . . . ***Himantura toshi***

**11b.** Pattern extremely dense; dark spots, ocelli or lines on upper surface less than diameter of largest marking apart; edges of markings normally sharp . . . . . → ***12***

**12a.** Pattern dominated by fine spots or reticulations in specimens exceeding 80 cm disc width; smaller specimens with relatively small spots and a broadly angular disc . ***Himantura uarnak***

**12b.** Pattern dominated by ocelli resembling the spots of a leopard in specimens exceeding 80 cm disc width; smaller specimens with relatively large spots and streaks (sometimes connected) with a narrowly angular disc . . . . . ***Himantura undulata***

**13a.** Tail with alternating greyish and white bands (sometimes less distinct in large adults); eye relatively large, combined eye and spiracle less than 2.3 in preorbital snout length . . . . . → ***14***

**13b.** Tail uniformly dark, not banded; eye smaller, diameter more than 2.3 in preorbital snout length . . . . . → ***15***

**14a.** Dorsal surface fully or partly covered in white spots . . . . . ***Himantura gerrardi***

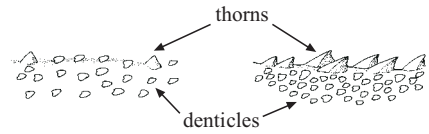
**14b.** Dorsal surface uniform greyish to greenish brown, no white spots . . . . . ***Himantura* sp. A**

**15a.** Snout rather blunt without an extended lobe-like tip; central disc greyish, outer part mostly bluish . . . . . ***Himantura marginata***

**15b.** Snout with an extended lobe-like tip; central disc greyish, pinkish or yellowish, outer part not bluish . . . . . → ***16***

**16a.** Denticles on centre of disc widely spaced (closer together in large adults) (Fig. 2a); no enlarged thorn-like denticles on disc and tail; greyish pink . . . . . ***Himantura fai***

**16b.** Denticles on centre of disc very closely spaced (Fig. 2b); additional enlarged thorn-like denticles present along midline of disc and tail before stinging spine; yellowish brown . . . . ***Himantura jenkinsii***




a) *Himantura fai* b) *Himantura jenkinsii*

**Fig. 2 denticles on dorsal midline above cloaca of adults**

**17a.** Disc oval or subcircular; ventral skin fold deep, extending to tip of tail (Fig. 3a) . . . . . → ***18***

**17b.** Disc more or less quadrangular; ventral skin fold terminating before tip of undamaged tail (sometimes present at tip as a barely detectable ridge), tall in *Pastinachus sephen* (Fig. 3b), but otherwise low (Fig. 3c) . . . . . → ***19***

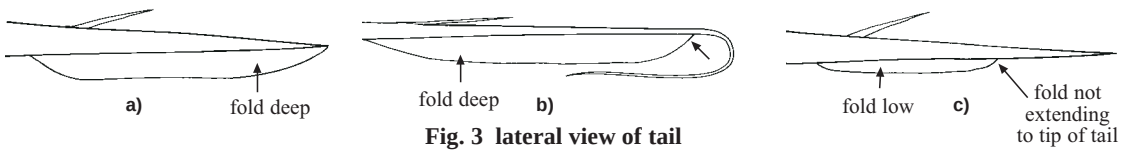



**Fig. 3 lateral view of tail**

**18a.** Disc oval; upper surface brownish with blue spots; usually a blue stripe along each side of the tail . . . . . ***Taeniura lymma***

**18b.** Disc almost circular; upper surface with fine black and white mottling (no blue spots) . . . . . ***Taeniura meyeni***

**19a.** Ventral skin fold deep, its height more than twice height of tail above deepest portion (Fig. 3b); distance from cloaca to stinging spine exceeding 1/2 of disc width . . . ***Pastinachus sephen***

**19b.** Ventral skin fold narrow, its height less than twice height of tail above deepest portion; distance from cloaca to stinging spine less than 1/2 of disc width . . . . . → ***20***

**20a.** Disc trapezoidal, anterior margin uniformly convex; ventral surface almost entirely dark . . . . . ***Pteroplatytrygon violacea***

**20b.** Disc rhomboidal, anterior margin of disc angular; ventral surface mostly pale . . . . . → ***21***

**21a.** Tail banded black and white behind sting; dark transverse band through eyes (occasionally faint); 2 oral papillae on floor of mouth . . . . . → ***22***

**21b.** Tail not banded behind sting; no dark transverse band through eyes; more than 2 oral papillae on floor of mouth . . . . . → ***24***

**22a.** Dorsal surface greyish green, lacking an ornate pattern of spots and reticulations; mostly with up to 4 short thorns on tail preceding sting; snout tip sharply pointed . . . . . ***Dasyatis annotata***

**22b.** Dorsal surface with an ornate pattern of spots and/or reticulations; rarely with thorns on tail preceding sting; snout tip comparatively blunt . . . . . → ***23***

**23a.** Dorsal surface with many large bluish spots . . . . . ***Dasyatis kuhlii***

**23b.** Dorsal surface without bluish spots, covered in a complex pale honeycomb pattern or with fine black speckles . . . . . ***Dasyatis leylandi***

**24a.** Snout extremely elongate; anterior margin of disc broadly concave; mouth without oral papillae . . . . . ***Dasyatis zugei***

**24b.** Snout moderate or short; anterior margin of disc convex, straight or concave; mouth with oral papillae . . . . . → ***25***

**25a.** Row of minute white spots located on disc either side of head; transverse furrow present on belly behind gill slits . . . . . ***Dasyatis brevicaudata***

**25b.** No row of minute white spots on either side of head; no furrow on belly behind gill slits . . . . . → ***26***

**26a.** Upper disc without enlarged thorns but covered with numerous minute spiny denticles with stellate bases; disc very broad (width more than 1.2 times length); tail very broad based, tapering rapidly beyond sting to appear as 2 distinct portions . . . . . ***Dasyatis microps***

**26b.** Upper disc denticles not as above; disc width less than 1.2 times length; tail broad based or tapering evenly but not appearing as distinct portions . . . . . → ***27***

**27a.** Undersurface of disc and pelvic fins whitish with a broad yellowish brown margin; tail length less than twice disc width . . . . . ***Dasyatis akajei***

**27b.** Undersurface of disc and pelvic fins uniformly whitish; tail length usually more than twice disc width when undamaged . . . . . → ***28***

**28a.** Dorsal skin fold present on tail; ventral skin fold 1/2 of disc width or less . . . . . ***Dasyatis fluviorum***

**28b.** No dorsal skin fold on tail; ventral skin fold greatly exceeding 1/2 disc width . . . . ***Dasyatis bennetti***

### List of species occurring in the area

Note: *Dasyatis laosensis* Roberts and Karnasuta, 1987, being exclusively known from pure fresh water, is not listed here. The symbol ✦ is given when species accounts are included.

✦ *Dasyatis akajei* (Müller and Henle, 1841)
✦ *Dasyatis annotata* Last, 1987
✦ *Dasyatis bennetti* (Müller and Henle, 1841)
✦ *Dasyatis brevicaudata* (Hutton, 1875)
✦ *Dasyatis fluviorum* Ogilby, 1908
✦ *Dasyatis kuhlii* (Müller and Henle, 1841)
✦ *Dasyatis leylandi* Last, 1987
✦ *Dasyatis microps* (Annandale, 1908)
✦ *Dasyatis zugei* (Müller and Henle, 1841)

✦ *Himantura chaophraya* Monkolprasit and Roberts, 1990
✦ *Himantura fai* Jordan and Seale, 1906
✦ *Himantura gerrardi* (Gray, 1851)
✦ *Himantura granulata* (Macleay, 1883)
✦ *Himantura imbricata* (Bloch and Schneider, 1801)
✦ *Himantura jenkinsii* (Annandale, 1909)
*Himantura krempfi* (Chabanaud, 1923)[1/]
✦ *Himantura marginata* (Blyth, 1860)
✦ *Himantura oxyrhynchus* (Sauvage, 1878)
✦ *Himantura signifer* Compagno and Roberts, 1982
✦ *Himantura toshi* Whitley, 1939
✦ *Himantura uarnacoides* (Bleeker, 1852)
✦ *Himantura uarnak* (Forsskål, 1775)
✦ *Himantura undulata* (Bleeker, 1852)
✦ *Himantura walga* (Müller and Henle, 1841)
✦ *Himantura* sp. A [Last and Stevens, 1994]

✦ *Pastinachus sephen* (Forsskål, 1775)

✦ *Pteroplatytrygon violacea* (Bonaparte, 1832)

✦ *Taeniura lymma* (Forsskål, 1775)
✦ *Taeniura meyeni* Müller and Henle, 1841

✦ *Urogymnus asperrimus* (Bloch and Schneider, 1801)

### References

Compagno, L.J.V. and T.R. Roberts. 1982. Freshwater stingrays (Dasyatidae) of southeast Asia and New Guinea, with description of a new species of *Himantura* and reports of unidentified species. *Environmental Biology of Fishes*, 7(4):321-339.

Last, P.R. and J.D. Stevens. 1994. *Sharks and rays of Australia*. Australia, CSIRO, 512 p.

Nishida, K. and K. Nakaya. 1990. Taxonomy of the genus *Dasyatis* (Elasmobranchii, Dasyatidae) from the North Pacific. *NOAA Tech. Rpt. NMFS*, 90:327-346.

Michael, S.W. 1993. *Reef sharks and rays of the world: a guide to their identification, ecology and behaviour*. USA, Sea Challengers, 107 p.

Monkolprasit, S. 1984. *The cartilaginous fishes (class Elasmobranchii) found in Thai waters and adjacent areas*. Thailand, Kasetsart University, 175 p.

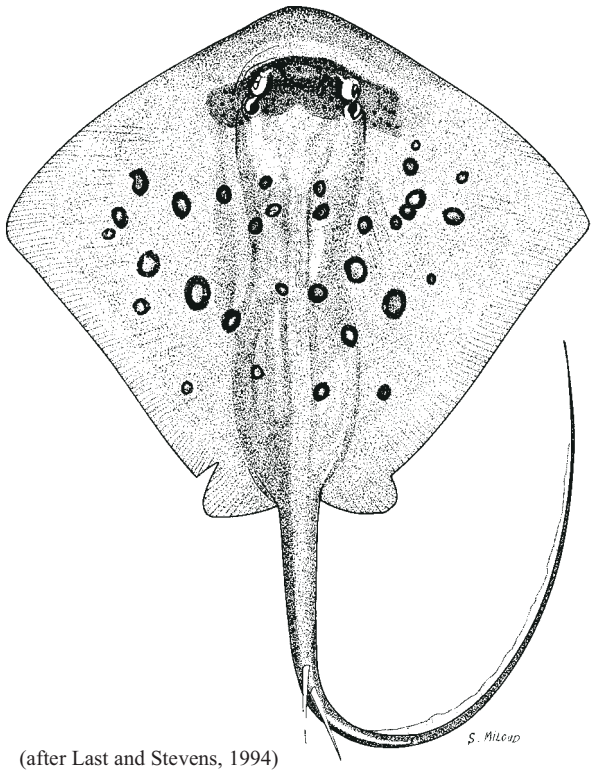
**1/** Not included in the identification key. A fresh-water species, but may also be found in estuaries.

***Dasyatis kuhlii*** (Müller and Henle, 1841)

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

**FAO names: En** - Bluespotted maskray.

**Diagnostic characters: Disc rhomboidal**, trunk thickened, width about 1.1 to 1.3 times length; pectoral-fin apex somewhat angular (narrowly rounded in juveniles). Tail relatively broad-based, slightly depressed, slender and rather compressed beyond sting; its length mostly longer than disc when undamaged; generally with 2 stings. Eyes large, length of eye and spiracle 1.35 to 1.8 in preorbital snout length. Snout broadly rounded, tip seldom pointed; anterior margin almost straight. Mouth small, **2 broad papillae on floor**; labial furrows and folds prominent; lower jaw slightly convex. Lower lip and internasal flap papillate; internasal flap skirt-shaped, moderately elongate and narrow, margin fringed; nostrils long, narrow. Pelvic fins moderately large. **Cutaneous tail folds prominent; ventral fold low, elongate (mostly longer than distance from snout to fifth gill slit); dorsal fold short, situated beyond sting, subequal in height to ventral fold. Denticles confined to single row along disc midline**; **thorn-like, short,** lanceolate, flat-topped, directed posteriorly; extending from nuchal region to almost over cloaca in adults (thorns often absent in juveniles); remainder of disc and tail smooth. **Colour:** dorsal surface greyish, greenish, or brownish with **dark brownish band through orbital region; mostly ornamented with prominent bluish spots or blue, white-edged ocelli**; spots and ocelli variable in size and number; frequently with peppering of fine black spots, concentrated near orbit and on orbital membrane. Ventral surface mostly pale, slightly darker around disc margin. **Tail with alternating black and white bands, tip mostly pale; skin folds pale at base with dark outer margin**.

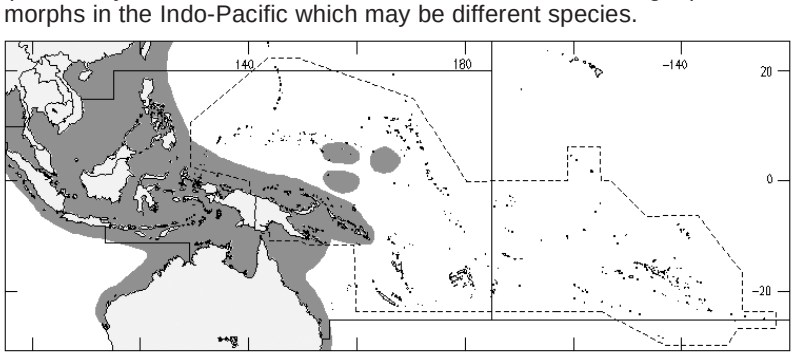


(after Last and Stevens, 1994)

**Size:** Maximum total length at least 67 cm; maximum disc width 38 cm, males mature at about 25 cm disc width.

**Habitat, biology, and fisheries:** Inshore species living mainly on sandy substrates to a depth of 90 m. One of the most commercially important rays of the area; trawled in the Gulf of Thailand in large quantities. Represented by multiple colour morphs in the Indo-Pacific which may be different species.

**Distribution:** Widespread in the tropical Indian and western Pacific Oceans. Eastern extent of range including Melanesia and Micronesia, south to Australia and north to Hokkaido, Japan; western limits off southern Africa and into Red Sea.

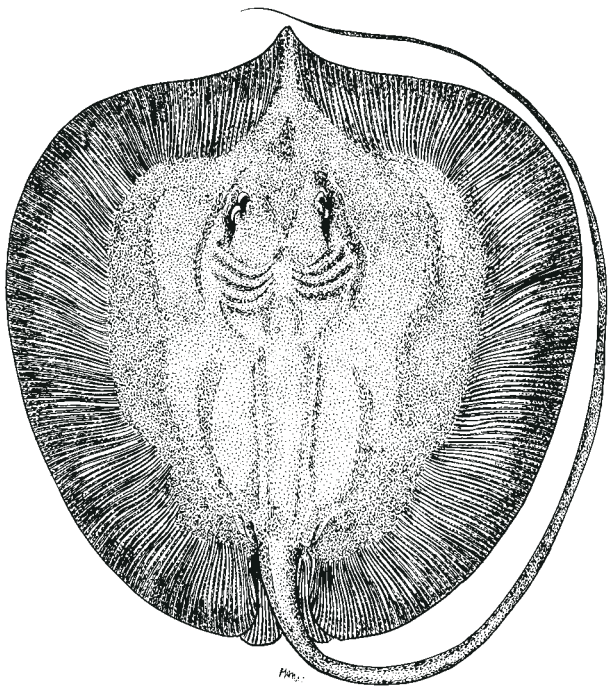


## ***Himantura chaophraya*** Monkolprasit and Roberts, 1990

**Frequent synonyms / misidentifications:** *Himantura* sp.: Compagno and Roberts, 1982 / *Dasyatis fluviorum*: Merrick and Schmida, 1984.

**FAO names: En** - Freshwater whipray.

**Diagnostic characters: Disc subcircular to oval**, trunk thin; slightly longer than wide; pectoral-fin apex broadly rounded; **snout extremely broad, almost truncate anteriorly with an enlarged triangular tip. Tail long** (about 1.8 to 2.5 times disc width), **whip-like**, almost cylindrical in cross-section; mostly with 1 sting. **Eyes very small, interorbital space broad; eye and spiracle together 3 to 4.5 in preorbital snout length**. Mouth small; **2 to 4 enlarged central and 1 to 4 minute lateral papillae on floor (4 to 7 in total)**; labial furrows and folds weak or absent; lower jaw arched slightly. Internasal flap skirt-shaped, broad, short, margin with fine fringe, not papillate. Pelvic fins small, narrow. **No cutaneous folds**. Upper surface of disc granular; band of widely spaced, heart-shaped denticles on raised central portion of disc and on upper tail before sting; finer and more dense granular denticles laterally over disc; short prickle-like denticles on tail beyond sting; 4 to 6 enlarged mid-scapular thorns. **Colour: upper surface uniform greyish brown centrally, often grading to yellowish and pinkish laterally**; covered with dark brown mucous when alive; often with prominent dark dendritic pores inward from disc margin. **Ventral surface white with broad, greyish marginal bands on pelvic fins and posteriorly around disc** from just forward of mouth; frequently with irregular greyish spots near inner margin of band. Tail base greyish above, paler below; **black behind sting**.

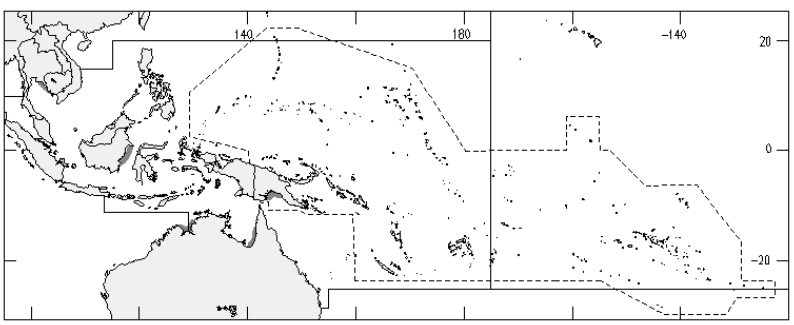


(after Monkolprasit and Roberts, 1990)

**Size:** Maximum total length at least 460 cm; maximum disc width 192 cm, males mature at about 110 cm disc width.

**Habitat, biology, and fisheries:** Very large estuarine and fresh-water species. Caught occasionally in rivers by Thai fishermen. Commercial landings unknown.

**Distribution:** Likely to be widespread through the Indo-West Pacific in large fresh-water systems. Seems to vary greatly in maximum size throughout its range and may consist of more than a single species. Described from rivers of Thailand, but related forms have been collected from India, Malaysia (Sabah), Indonesia, New Guinea, and Australia.

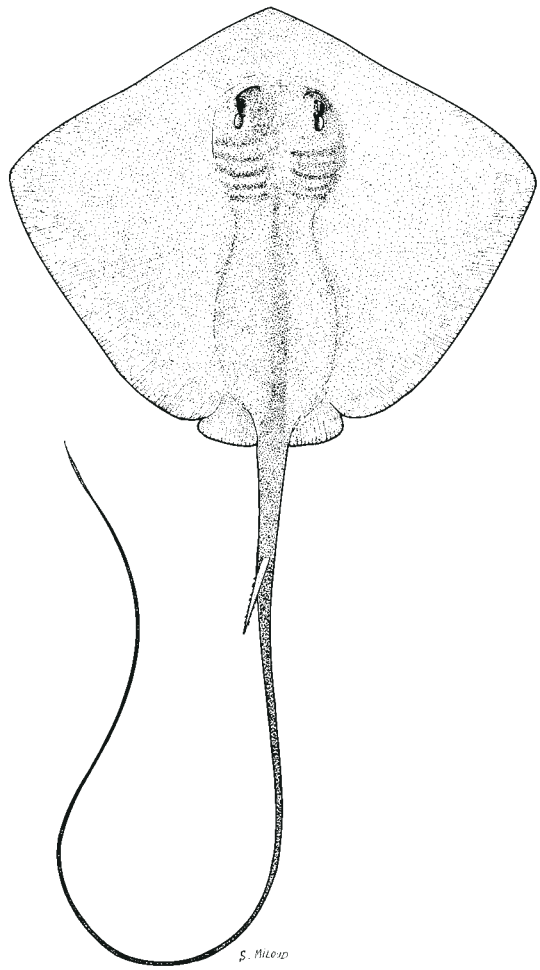


## ***Himantura fai*** Jordan and Seale, 1906

**Frequent synonyms / misidentifications:** None / *Himantura jenkinsii* (Annandale, 1909).

**FAO names: En** - Pink whipray.

**Diagnostic characters: Disc rhomboidal,** very robust centrally, quadrangular, width 1.1 to 1.2 times length; pectoral-fin apex broadly rounded; snout very broad, tip feebly pointed; anterior margin straight to slightly convex. **Tail very long** (about twice disc width), base rather narrow, almost cylindrical in cross-section; **whip-like** behind sting; mostly with single sting. Eyes small, length of eye and spiracle about 2.6 in preorbital snout length; interorbital space broad. Mouth moderately small, **4 papillae on floor (central pair enlarged, laterals minute)**; labial furrows and corrugations prominent. Internasal flap skirt-shaped, short, and very broad, not papillate, marginal fringe very fine; nostrils long, very narrow; lower jaw slightly concave near symphysis. Pelvic fins small, relatively slender. **No cutaneous folds**. Denticles of adults rounded, dense, extending from well before eye, over central disc, and mostly covering entire tail; **no enlarged thorns on midline**; small, sharp, upright thorns on tail beyond sting. **In juveniles**, disc surface and tail mostly smooth, or with **low, flat, widely spaced, heart-shaped denticles** extending from interorbital space posteriorly over centre of disc and onto midline of tail. **Colour: upper surface greyish pink; ventral surface uniformly pale; tail dark greyish or black beyond sting.**

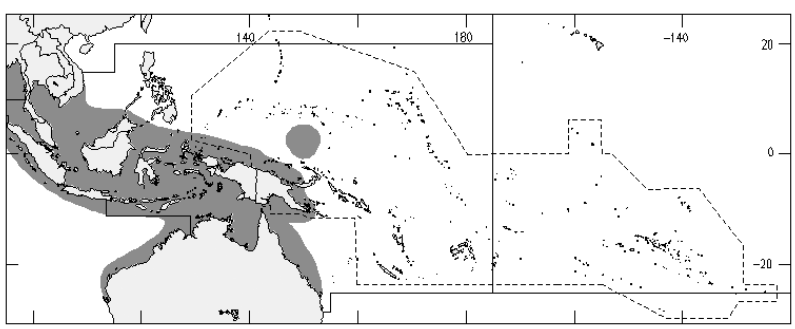



(after Last and Stevens, 1994)

**Size:** Maximum total length at least 500 cm; maximum disc width exceeding 150 cm.

**Habitat, biology, and fisheries:** Occurs in aggregations over soft substrates of inner continental shelf, often near coral reefs. Size of commercial catch unknown.

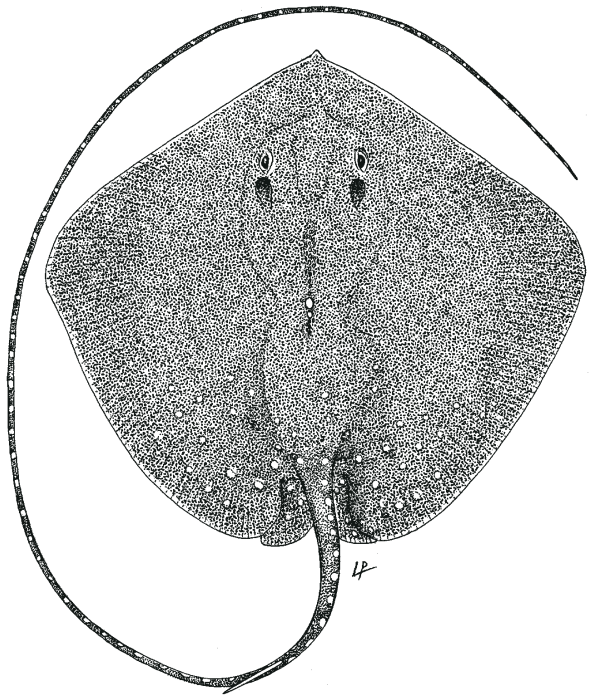
**Distribution:** Inadequately known and frequently confused with *Himantura jenkinsii*. Possibly common and widespread in the tropical Indian Ocean from South Africa to Micronesia in the western equatorial Pacific, including Australia. Not known from north of Fishing Area 71.



## ***Himantura gerrardi*** (Gray, 1851)

**Frequent synonyms / misidentifications:** *Himantura macrurus* (Bleeker, 1852) / None.

**FAO names: En** - Whitespotted whipray.

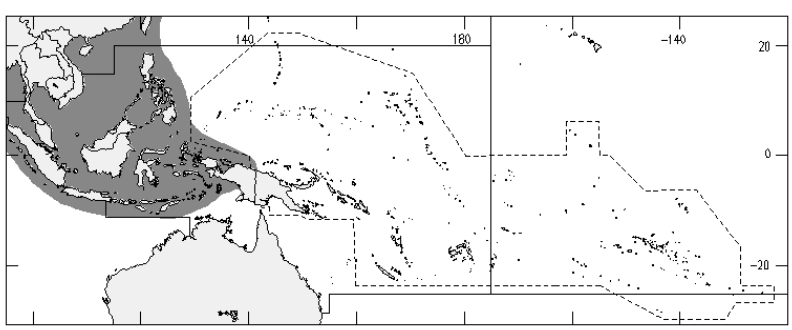


**Diagnostic characters: Disc rhomboidal**, trunk thick, width exceeding length (about 1.1 to 1.2 times length); pectoral-fin apex narrowly rounded (more broadly rounded in juveniles); snout broadly triangular with small tip; anterior margin almost straight. Tail very slender, elongate (about 2.5 to 3 times disc width when undamaged); **whip-like beyond sting;** slightly depressed near base, tapering gradually to sting then rounded beyond; mostly with 1 sting; **no cutaneous folds on tail**. Eyes moderately small, length of eye and spiracle about 2 to 2.5 in preorbital snout length; interorbital space broad. Mouth narrow, **pair of enlarged central papillae on floor**, **usually with 2 minute ones laterally**; labial furrows weakly developed; lower labial folds and papillae weekly developed. Internasal flap skirt-shaped, relatively short and broad, not papillate (mostly smooth), margin with very fine fringe; nostrils moderately long, narrow; lower jaw moderately concave near symphysis. Pelvic fins small, almost triangular. **Denticles low, flat, heart-shaped; in a relatively narrow band on central disc;** usually with 1 prominent pearl thorn, sometimes with a few slightly enlarged denticles before and after pearl thorn, **no enlarged thorns on midline of tail**; tail covered posteriorly with small, sharp thorns; denticles of juveniles restricted to central disc. **Colour: upper surface brownish grey, usually with diffuse white spots confined to posterior 1/2 of disc** (sometimes spots very sparse, absent or also extending over anterior disc); **ventral surface of disc usually uniformly white. Tail base brownish with row of white spots along dorsolateral margin to sting; beyond sting alternating black and white bands on upper half of tail, uniformly dusky on lower half.**

**Size:** Maximum total length at least 200 cm; maximum disc width 90 cm or more.

**Habitat, biology, and fisheries:** Depth distribution limits unknown, but likely to be confined to inner continental shelf. Possibly the most important commercial stingray in the area and the most regularly landed. Important food species, the skin and flesh are dried or used to produce leather for purses and bags.

**Distribution:** Widespread in the Indo-Pacific from India to New Guinea, north to Taiwan Province of China. Reported from the Red Sea and the south and east African coasts, but western records need to be validated.

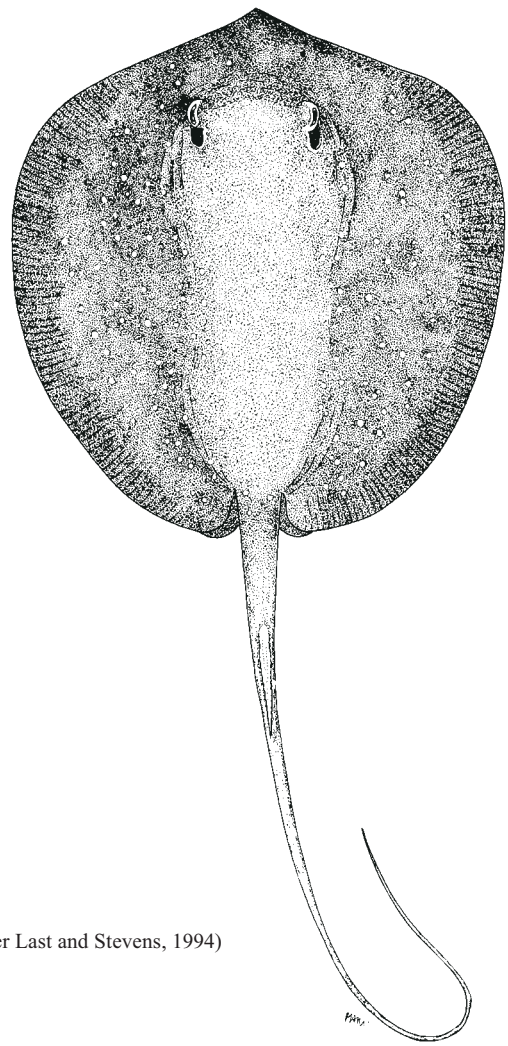


## *Himantura granulata* (Macleay, 1883)

**Frequent synonyms / misidentifications:** *Himantura ponapensis* (Günther, 1910) / None.

**FAO names: En** - Mangrove whipray.

**Diagnostic characters: Disc almost circular to oval**, robust though trunk, width subequal to length; pectoral-fin apex evenly rounded; snout very broad, tip feebly pointed; anterior margin straight to slightly convex. **Tail moderate to short** (about 1.5 to 2 times disc width in juveniles but about subequal in adults), **rather broad-based, almost cylindrical in cross-section; whip-like behind sting,** slightly flattened posteriorly; with 1 or 2 stings. Eyes moderately large, combined length of eye and spiracle about 1.8 to 2.2 in preorbital snout length; interorbital space broad. Mouth rather small, **with 4 or 5 papillae on floor (central 2 or 3 enlarged)**; labial furrows and corrugations prominent. Internasal flap skirt-shaped, rather short and broad, not papillate, margin with very fine fringe; nostrils long, narrow; lower jaw concave at symphysis. Pelvic fins small, relatively slender. **No cutaneous folds present**. **Disc surface granular;** a few, flat, enlarged, heart-shaped thorns on midline, surrounded by smaller denticles on head, over abdomen and along midline of tail; **very small (often obscure) denticles laterally on disc**. **Colour: usually uniformly dark brownish, greyish, or black on central disc**; often paler near margin or where mucous cover has been removed; **usually covered with fine white spots and flecks** (most dense in large specimens); **tail uniformly white beyond sting.** Ventral surface white; **disc margin mostly dark with black blotches**.

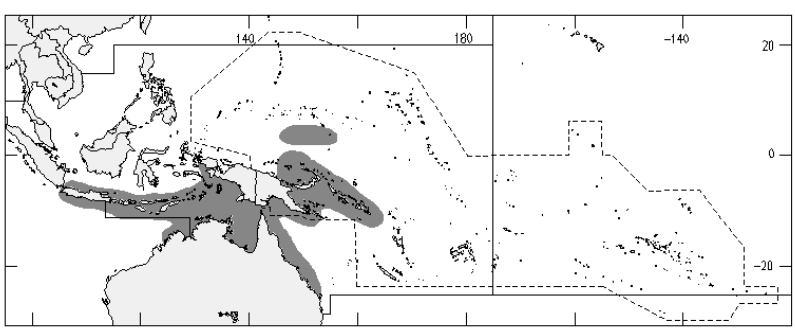


(after Last and Stevens, 1994)

**Size:** Maximum total length 230 cm; maximum disc width exceeding 97 cm.

**Habitat, biology, and fisheries:** Inshore species living in the shallows near tropical reefs over sandflats and coral rubble. Also occurs in mangrove habitats and deeper on continental shelf to a depth of 85 m. Feeds on small fishes, and bottom-dwelling crustaceans and large infauna. Commercial catches likely but quantities unknown.

**Distribution:** Possibly widespread in the Indo-West Pacific from the Maldives to the Caroline and Santa Cruz islands, including tropical Australia.

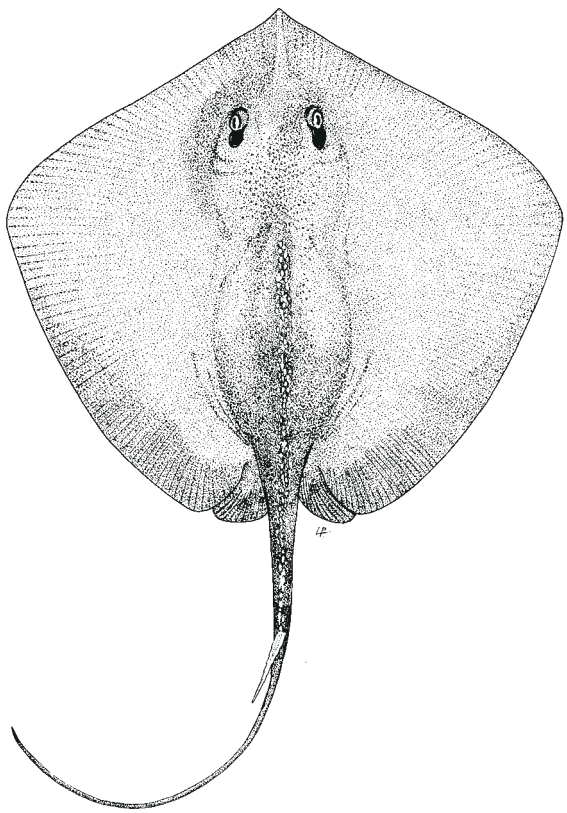


## ***Himantura jenkinsii*** (Annandale, 1909)

**Frequent synonyms / misidentifications:** *Himantura draco* Compagno and Heemstra, 1984 / *Himantura fai* Jordan and Seale, 1906.

**FAO names: En** - Jenkin's whipray.

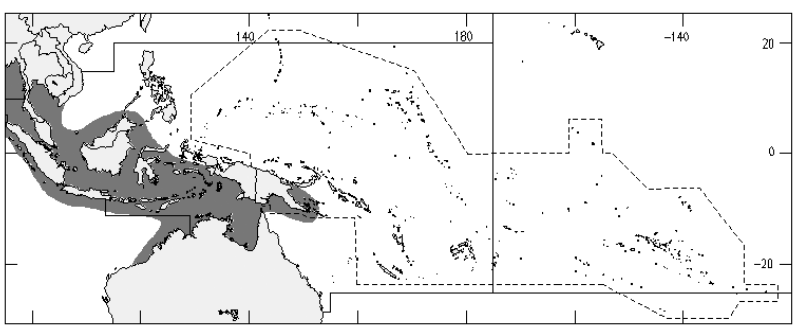
**Diagnostic characters: Disc rhomboidal**, trunk robust, width about 1.1 times length; pectoral-fin apex broadly rounded; snout broadly triangular, tip feebly pointed; anterior margin almost straight. **Tail moderate (slightly longer than disc width); whip-like**, base almost round in cross-section; up to 3 stings; **no cutaneous folds**. Eyes rather large, length of eye and spiracle about 2.4 to 2.7 in preorbital snout length; interorbital space of moderate width. Mouth moderately broad, with **4 papillae on floor (central 2 not greatly enlarged)**; labial furrows and papillae well developed; lower jaw weakly convex, slightly indented at symphysis. Internasal flap skirt-shaped, short and very broad, not papillate, margin with fine fringe; nostrils long, narrow. Pelvic fins small, relatively slender. Disc with a dense band of **closely-spaced, flat, heart-shaped denticles extending from between eyes in a broad patch over centre of disc and onto all surfaces of tail**; remainder of upper disc with minute granulations; in juveniles, denticle band narrow but much broader in scapular region; **additional irregular row of enlarged, upright, spear-shaped thorns along dorsal midline to sting (forming 2 or 3 rows before sting in adults). Colour: upper surface yellowish or brownish**, paler over central denticle patch; juveniles and females with small, dark spots on hind portion of disc; ventral surface, including disc margin, white; tail greyish posteriorly.



**Size:** Maximum total length at least 200 cm; maximum disc width 104 cm.

**Habitat, biology, and fisheries:** Inshore species living mainly on sandy substrates to a depth of 50 m. Common throughout parts of its range, such as off Sri Lanka and India, where it comprises substantial component of the batoid catch.

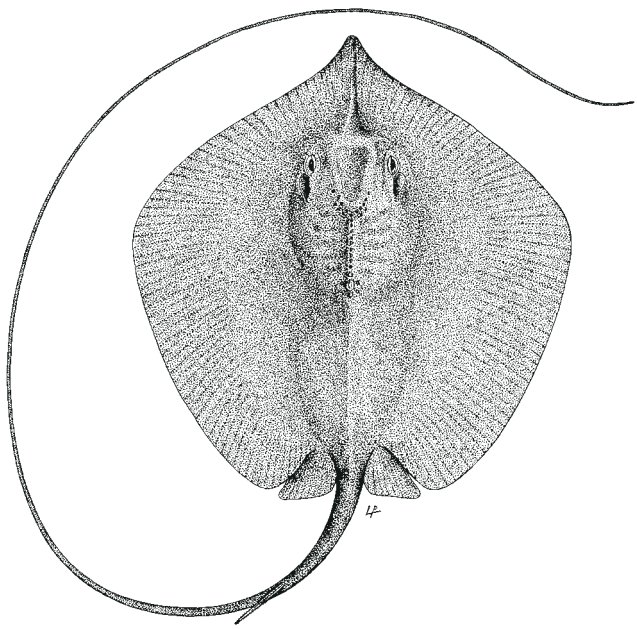
**Distribution:** Tropical Indo-Pacific from Australia to southern Africa; appears not to extend northward into China Seas and Japan.



***Himantura uarnacoides*** (Bleeker, 1852)

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

**FAO names: En** - Bleeker's whipray.

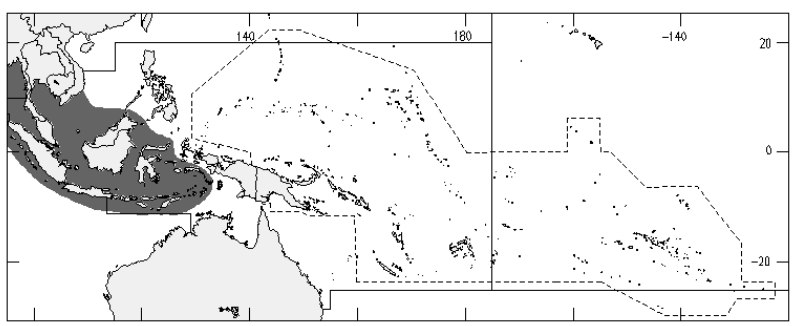


**Diagnostic characters: Disc subrhomboidal**, trunk rather thick, width slightly exceeding length; pectoral-fin apex broadly rounded; snout narrow and acutely pointed, **apex strongly produced**; **anterior margin distinctly concave**. Tail very elongate and slender (usually more than 3 times disc width when undamaged); **whip-like beyond sting;** almost rounded near base, tapering gently to sting; mostly with 1 sting; **no cutaneous folds**. Eyes small, length of eye and spiracle about 3 to 4 in preorbital snout length; **interorbital space space rather narrow**. Mouth narrow, with **2 small papillae on floor;** labial furrows weakly developed; lower labial folds and papillae weak. Internasal flap skirt-shaped, short and broad, not papillate (almost smooth), margin with fine fringe; nostrils long, narrow, not oblique; lower jaw deeply concave near symphysis. Pelvic fins small, almost triangular. **Denticles low, flat, heart-shaped; forming a very broad band from well before interorbit, extending along centre of disc and onto upper tail** (density increasing with size); denticles present over entire tail beyond sting in adults; **a prominent pearl thorn at centre of disc**, sometimes with slightly enlarged denticles or smaller pearl thorn adjacent; **no enlarged thorns on midline of tail**. **Colour: uniform dark brown or yellowish (greyish green in juveniles) above**; **greyish brown (white in juveniles) ventrally, with darker margin of disc and tail; dorsal tip of snout, lower jaw, base of pelvic fins, and some areas of belly usually white; tail lacking distinct black and white rings**.

**Size:** Maximum total length at least 300 cm; maximum disc width 105 cm.

**Habitat, biology, and fisheries:** Inshore species occurring on soft substrates to depths of at least 30 m. Taken in commercial quantities off India and Indonesia where the flesh is used for food and the skin to produce leather.

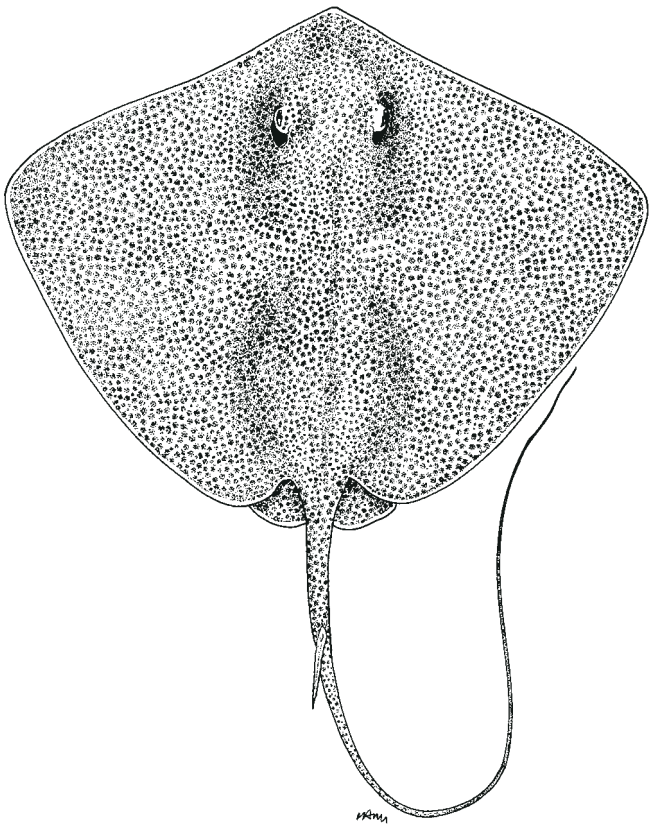
**Distribution:** Indo-West Pacific from India to eastern Indonesia.



## ***Himantura uarnak*** (Forsskål, 1775)

**Frequent synonyms / misidentifications:** *Himantura punctata* (Günther, 1870); *Himantura* sp. 1 [Gloerfelt-Tarp and Kailola, 1984] / None.

**FAO names: En** - Reticulate whipray.

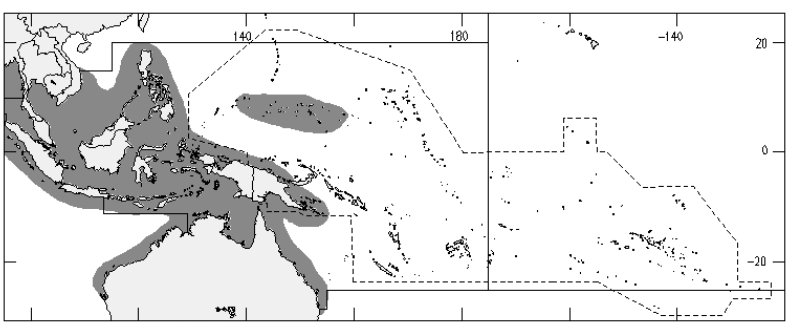


**Diagnostic characters: Disc rhomboidal**, trunk thick, width exceeding length (subequal in length in juveniles); pectoral-fin apex narrowly rounded (broadly rounded in juveniles); snout broadly triangular (**extremely obtuse in juveniles**), tip pointed; anterior margin almost straight. **Tail very slender, elongate** (about 3 to 3.5 times disc width in juveniles when undamaged); **whip-like beyond sting;** slightly depressed near base, tapering rapidly to sting, flattened slightly near tip; mostly with 1 sting; **no cutaneous folds**. Eyes moderately small, length of eye and spiracle about 1.9 to 2.2 in preorbital snout length in juveniles; interorbital space broad. Mouth narrow, **usually 5 papillae on floor (3 centrally)**; labial furrows weakly developed; lower labial folds and papillae present. Internasal flap skirt-shaped, relatively short and broad, not papillate (almost smooth), margin with fine fringe; nostrils long, narrow; lower jaw deeply concave near symphysis. Pelvic fins small, almost triangular. **Denticles low, flat, heart-shaped; in a broad band from interorbit, extending along centre of disc onto tail (density increasing with size);** 2 prominent pearl thorns in centre of disc but enlarged thorns absent from midline of tail; adult tail covered posteriorly with small, sharp thorns. **Colour: highly ornamented dorsally; white, yellow or orange with dense pattern of fine, dark brown spots or reticulations; juveniles yellowish or brownish with dense array of small, dark brown spots (spaces between spots much narrower than 1/2 largest spot); more than 5 (usually about 7) spots in a direct line across interspiracular space**; tail mostly with 3 distinct rows of spots before sting; dorsal and ventral surfaces black beyond sting, laterally with pale bands; **ventral surface uniformly pale.**

**Size:** Maximum total length at least 450 cm; maximum disc width about 150 cm.

**Habitat, biology, and fisheries:** Inshore ray occurring on soft substrates; often intertidal, but to depths of at least 50 m. Important commercial species through some of its range.

**Distribution:** Widespread in the Indo-Pacific; from Australia west to South Africa and the Mediterranean Sea, north to Taiwan Province of China, but apparently absent from Japan.



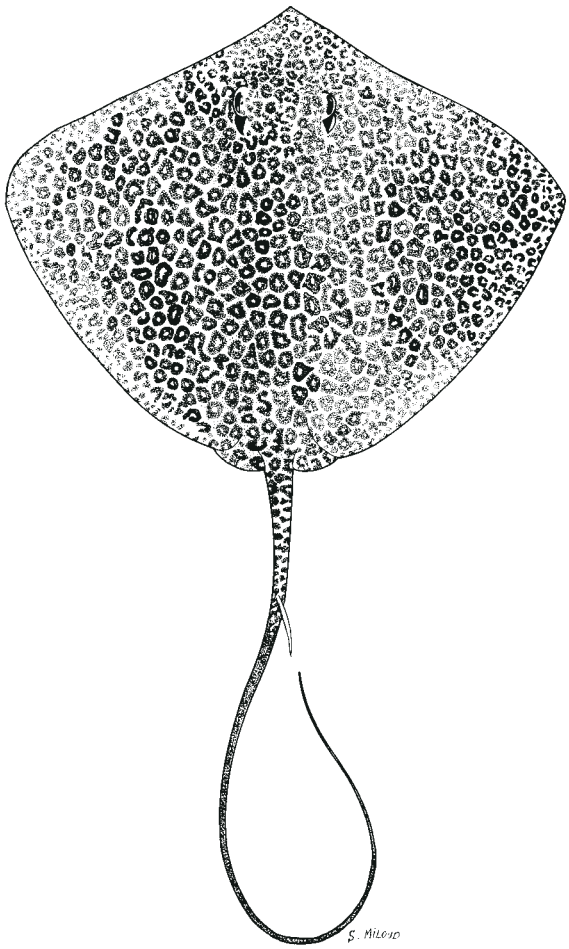

**Remarks:** Several colour morphs exist, some of which may prove to be distinct species.

## ***Himantura undulata*** (Bleeker, 1852)

**Frequent synonyms / misidentifications:** *Himantura fava* (Annandale, 1909) / *Himantura uarnak* (non Forsskål, 1775).

**FAO names: En** - Leopard whipray.

**Diagnostic characters: Disc quadrangular**, trunk thick, slightly longer than wide (width about equal to length in juveniles); pectoral-fin apex narrowly rounded (more angular in juveniles); snout broadly triangular (**rather acute in juveniles**), tip pointed; anterior margin almost straight. **Tail very long and slender** (over 3.5 times disc width in juveniles when undamaged); slightly depressed or rounded near base, tapering rapidly to sting, **whip-like beyond sting;** flattened slightly near tip; mostly with 1 sting; **no cutaneous folds**. Eyes moderately small, length of eye and spiracle about 2.2 in preorbital snout length; interorbital space broad. Mouth narrow, **usually with pair of central papillae on floor**; labial furrows weakly developed; lower labial folds and papillae present; lower jaw deeply concave near symphysis. Internasal flap skirt-shaped, smooth, relatively short and broad, margin with fine fringe; nostrils long, narrow. Pelvic fins small, subtriangular. **Upper surface granular in adults** (smooth in juveniles); 1 enlarged scapular thorn; often with small, associated thorn patch extending onto nuchal area; no greatly enlarged thorns on midline of tail. **Colour: adults yellowish or brownish with a heavy pattern of dark rings (resembling a leopard's spots) over most of upper disc and tail; juveniles grey-brown with large black spots (interspaces only slightly narrower than diameter of largest spots), usually 2 or 3 spots in interspiracular space;** tail base usually with single row of dark spots on each side, with alternating black and white bands beyond sting; **ventral surface white**.

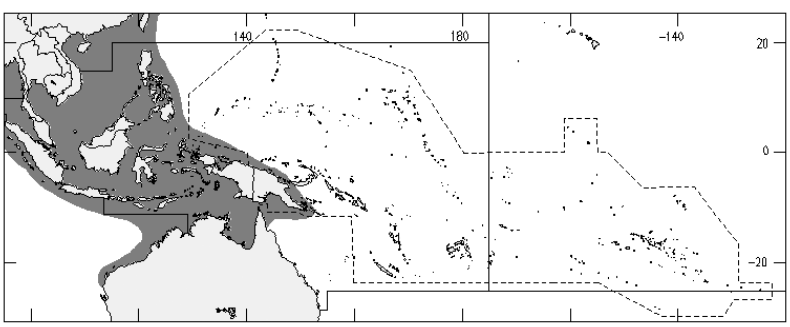



(after Last and Stevens, 1994)

**Size:** Maximum total length at least 410 cm; maximum disc width 140 cm.

**Habitat, biology, and fisheries:** Inshore ray taken occasionally in trawl catches. Minor commercial importance and often confused with *Himantura uarnak*. Another colour form with very large rings over the disc (known as *H. fava*) may be a distinct species.

**Distribution:** Widespread in the Indo-West Pacific from India, north to the Japanese Archipelago, east to the Torres Strait, Australia. May be present in the south-western Indian Ocean.

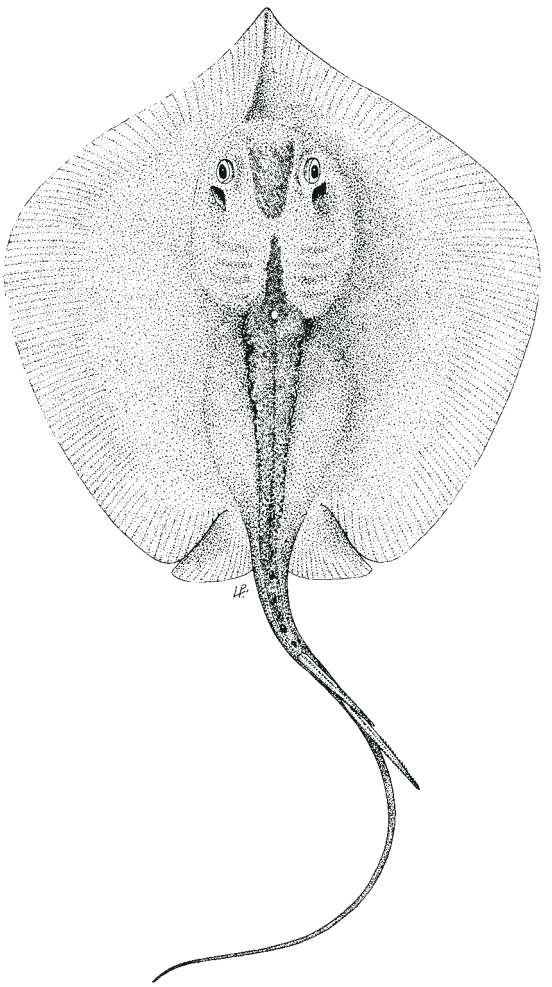


## ***Himantura walga*** (Müller and Henle, 1841)

**Frequent synonyms / misidentifications:** *Himantura heterurus* (Bleeker, 1852) / *Himantura imbricata* (non Bloch and Schneider, 1801).

**FAO names: En** - Dwarf whipray.

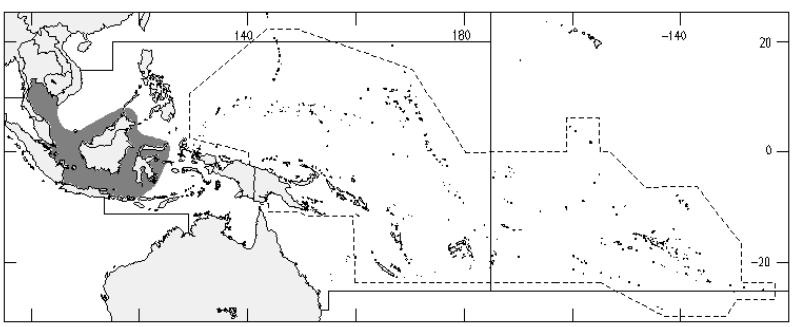
**Diagnostic characters: Disc almost oval**, trunk thin, width subequal to length (slightly narrower than length in mature females); pectoral-fin apex broadly rounded; **snout acute**, extended into a prominent tip; anterior margin slightly concave. **Tail base rather broad, depressed, tapering rapidly at sting;** length slightly longer than disc in males and juveniles, subequal in mature females; **filamentous beyond sting in mature males, initially bulbous then terminating in a fine filament in mature females**; mostly with 2 stings; **no cutaneous folds.** Eyes very small, length of eye and spiracle about 2.9 to 3.3 in preorbital snout length in adults; interorbital space of moderate width. Mouth narrow, **2 small papillae on floor;** labial furrows moderate to weakly developed; lower labial folds and papillae feeble. Internasal flap skirt-shaped, moderately elongate, not papillate (almost smooth), margin with very fine fringe; nostrils short, broadened slightly; lower jaw deeply concave near symphysis. Pelvic fins small, almost triangular. **Denticles low, flat, heart-shaped; adults with dense broad band from just before orbit, extending along centre of disc and onto midline of tail to sting** (density increasing with size); band distinctly narrower in vicinity of gills; **no greatly enlarged thorns in centre of disc; tail with mostly 4 to 6, greatly enlarged, spear-like thorns** (absent in small juveniles); tail beyond sting completely smooth. **Colour: upper surface of adults plain greyish brown,** becoming paler yellowish around disc margin; ventral surface uniformly white with some dusky patches; tail greyish brown dorsally to sting, white ventrally, white beyond sting in males, mostly dusky and white in females.



**Size:** Maximum total length at least 40 cm; maximum disc width 18 cm.

**Habitat, biology, and fisheries:** Habitat not well defined but most abundant inshore. Also ventures into large coastal embayments. Important commercially in some parts of its range; taken in reasonable quantities by trawlers in the Gulf of Thailand.

**Distribution:** Indo-West Pacific from Thailand to southeastern Indonesia. Reported from India but, due to confusion with *Himantura imbricata*, its westward distribution in the Indian Ocean is unclear.

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