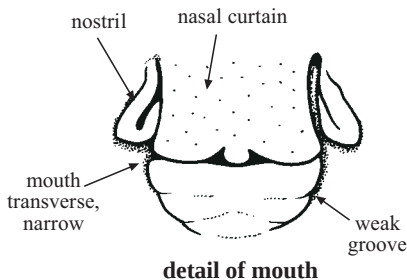


NARKIDAE**Sleeper rays**

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

Diagnostic characters: Small batoids (adults between 9 and 46 cm total length, possibly longer), with **large oval, circular, or pear-shaped pectoral discs and stout shark-like tails. Body entirely naked above and below, without dermal denticles or thorns.** Trunk depressed and flattened, not shark-like. Precaudal tail slightly depressed, with or without lateral ridges on sides, tail abruptly narrower than trunk, **no barbed sting (stinger or stinging spine) on dorsal surface of tail, no electric organs in tail.** Head broad and depressed; **snout moderately elongated, broadly rounded; snout supported by a narrow, slender, rod-like rostral cartilage and by the anteriorly expanded antorbital cartilages; not formed into a rostral saw and without lateral saw teeth.** Five small gill openings on underside of front half of pectoral-fin bases, not visible in lateral view; no gill sieves or rakers on internal gill slits. Eyes dorsolateral on head and anterior and partly medial to spiracles, moderately large to vestigial or absent externally. **Mouth transverse, straight, and very narrow, without prominent knobs and depressions but with strong labial folds and a weak groove around its periphery.** 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 narrow nasal curtain that overlaps mouth.** Oral teeth small, rounded-oval in shape and with a transverse low ridge or single cusps on their crowns, not laterally expanded and plate-like, similar in shape and in less than 25 rows in either jaw. Pectoral fins originating at anterior edges of snout lateral to snout tip and ending posterior to or opposite pelvic-fin origins; disc not subdivided by notches at eyes. **Large kidney-shaped electric organs present at bases of pectoral fins, these visible through skin.** Pelvic fins low, subangular or rounded, not divided into anterior and posterior lobes (except in the New Zealand blind sleeper ray *Typhlonarke*, in which the anterior lobes form leg-like structures separate from the posterior lobes). **A single dorsal fin (*Narke*) or no dorsal fin (*Temera*)** in representatives in the area (2 equal-sized dorsal fins in the western Indian Ocean *Heteronarke*), the dorsal fin (or fins) rounded-angular in shape with apices, anterior, posterior and inner margins, and free rear tips more or less confluent. First dorsal fin originates behind anterior half of total length, origin over pelvic-fin bases or over or behind rear tips of pelvic fins and behind junction between trunk and tail but well anterior to midlength of tail. **Caudal fin large, not shark-like, nearly symmetrical, rounded, and subequal in size to pelvic fins, with vertebral axis hardly raised above body axis; lower caudal-fin lobe absent.** **Colour:** dorsal surface usually brownish or reddish brown, white or brownish below; dorsal surface either plain or with a few large dark spots or blotches, paired white spots, and white side bands on the tail and posterior pelvic bases, without a complex colour pattern or ocelli on pectoral fins.



Habitat, biology, and fisheries: Sleeper rays are a small group of inshore to deep-water batoids confined to the temperate and tropical Indo-West Pacific from South Africa to Japan and Indonesia. These little-known batoids occur from the intertidal and subtidal zone to offshore on the outer shelf and upper slope on soft bottom down to 330 m. Sleeper rays are apparently unable to penetrate fresh water to any extent and are absent from rivers and lakes. They are slow-swimming bottom-dwellers, often found on soft mud or sand. All species are ovoviparous as far as is known. Sleeper rays feed on small invertebrates which are ingested on the bottom; some species and possibly the entire family have restricted prey ranges of small soft-bottom invertebrates, and feed on polychaete worms and possibly small organisms inside mud pellets. Sleeper rays are caught as minor bycatches of offshore trawl fisheries and probably inshore artisanal net fisheries. They can deliver a strong shock to the unwary when disturbed or captured, but are otherwise inoffensive to people. Utilization of these rays is uncertain.

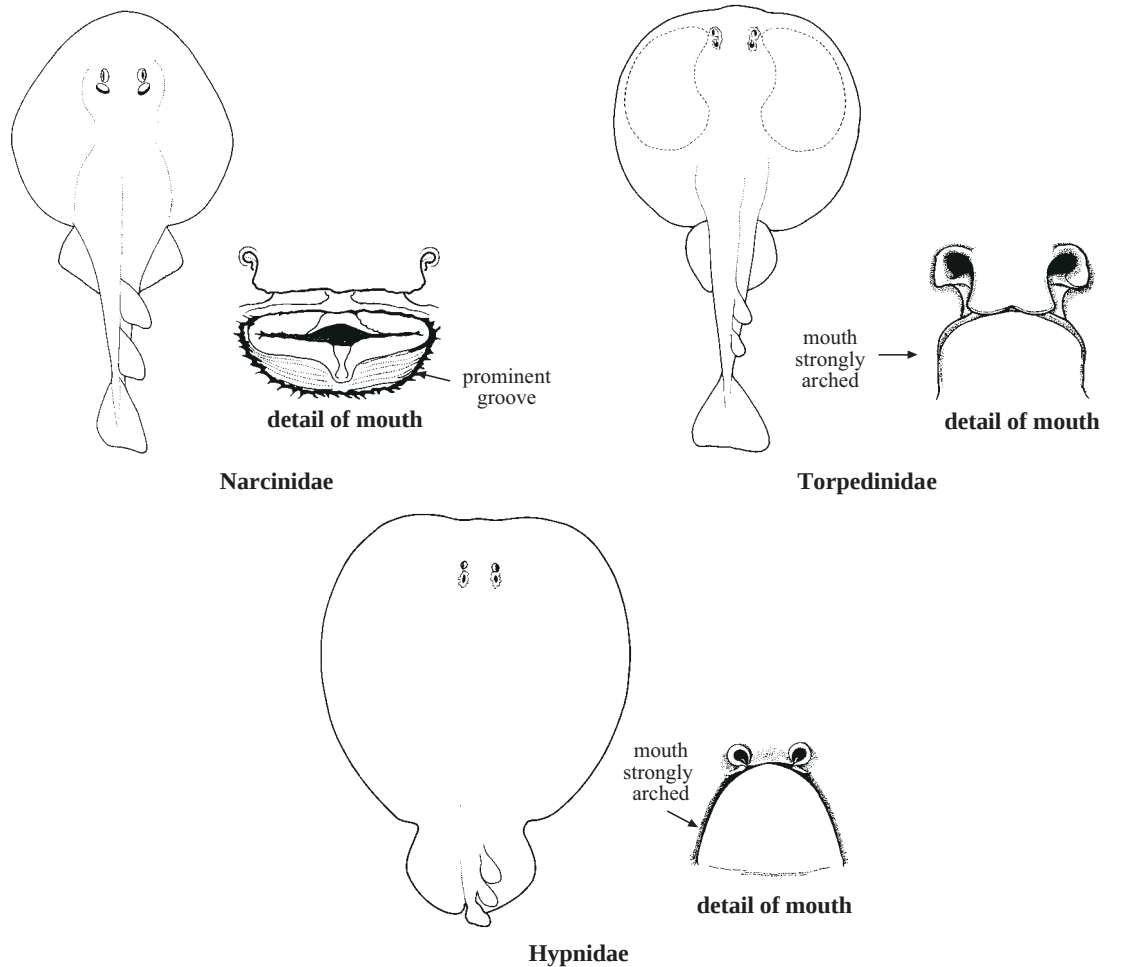
Similar families occurring in the area

Narcinidae: 2 dorsal fins (rather than 1 or none); snout supported by a broad, trough-shaped rostral cartilage; nasal curtain usually broader and shorter; snout longer; mouth with deep groove around its periphery.

Torpedinidae: 2 dorsal fins; snout truncate; pectoral disc transversely elliptical; mouth strongly arched, without labial folds or a peripheral groove.

Hypnidae: 2 dorsal fins; pectoral disc longitudinally pear-shaped; mouth strongly arched and without labial folds or a peripheral groove; teeth tricuspidate; tail, dorsal, and caudal fins very small.

No other batoids in the area combine strong tails with a large round pectoral disc, a single or no dorsal fins, a large caudal fin, and a completely unscaled body.



Key to the species of Narkidae occurring in the area

- 1a. No dorsal fins *Temera hardwickii*
- 1b. One dorsal fin (Narke) → 2
- 2a. Margins of spiracles raised as a low rounded ridge above level of disc; dorsal surface plain or mottled with black spots and blotches or light spots, no light bars on sides of tail and above pelvic fins, no large paired spots on pectoral disc, ventral surface brownish, usually lighter than upper surface; pelvic fins rounded *Narke japonica*
- 2b. Margins of spiracles not raised or little raised above level of disc; dorsal surface plain brownish to greenish (sometimes with dusky spots or blotches), with white bars on sides of tail extending anteriorly to above rear pelvic-fin bases and paired large white spots on rear of pectoral disc, ventral surface white; pelvic fins angular *Narke dipterygia*

List of species occurring in the area

The symbol ♠ is given when species accounts are included.

- ♠ *Narke dipterygia* (Bloch and Schneider, 1801)
- ♠ *Narke japonica* (Temminck and Schlegel, 1850)
- ? *Narke* sp.^{1/}
- ♠ *Temera hardwickii* Gray, 1831

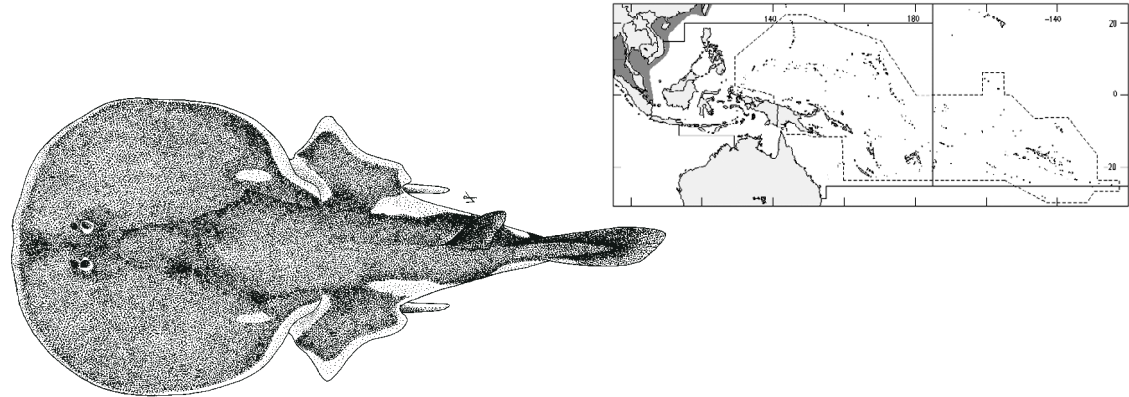
Reference

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

Narke dipterygia (Bloch and Schneider, 1801)

En - Spottail sleeper ray.

Maximum total length at least 18 cm; adult males between 15 and 18 cm. A little-known but locally common dwarf inshore and offshore sleeper ray of tropical and temperate continental shelves that is wide-ranging in the area. Biology little known, caught in local inshore and offshore fisheries but possibly not utilized in the area. Occurs in the Indo-West Pacific from Oman and the Arabian Sea, India, Malaysia (Pinang), Singapore, Indonesia (Malacca), Thailand, Viet Nam, China, Taiwan Province of China, Japan, and possibly the Philippines.

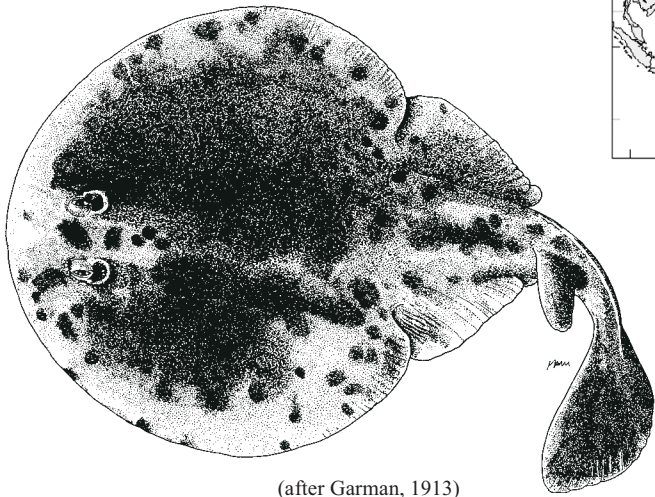


^{1/} Status uncertain, based on specimens of a dwarf *Narke* from Gulf of Thailand (adult males between 15.3 and 15.4 cm) which may or may not be distinct from *N. dipterygia*.

Narke japonica (Temminck and Schlegel, 1850)

En - Japanese sleeper ray.

Maximum total length at least 37 cm; males adult at 23 to 37 cm, females to at least 35 cm. A little-known but locally common inshore and offshore sleeper ray in temperate to subtropical waters, marginal to the area. Biology little known, caught in local inshore and offshore fisheries outside the area, utilization not known within the area. Occurs in the western Pacific from off Japan, Korea, China, Taiwan Province of China, and the South China Sea near Hong Kong.

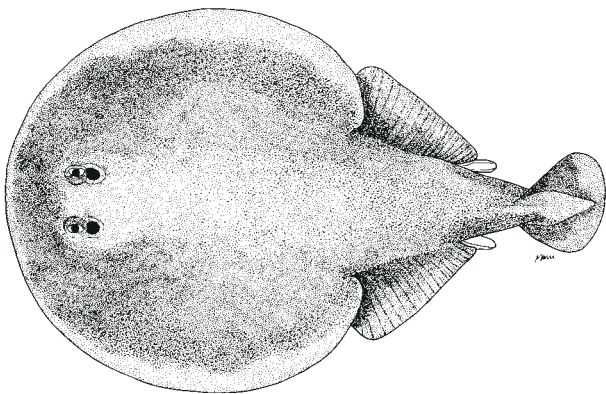


(after Garman, 1913)

Temera hardwicki Gray, 1831

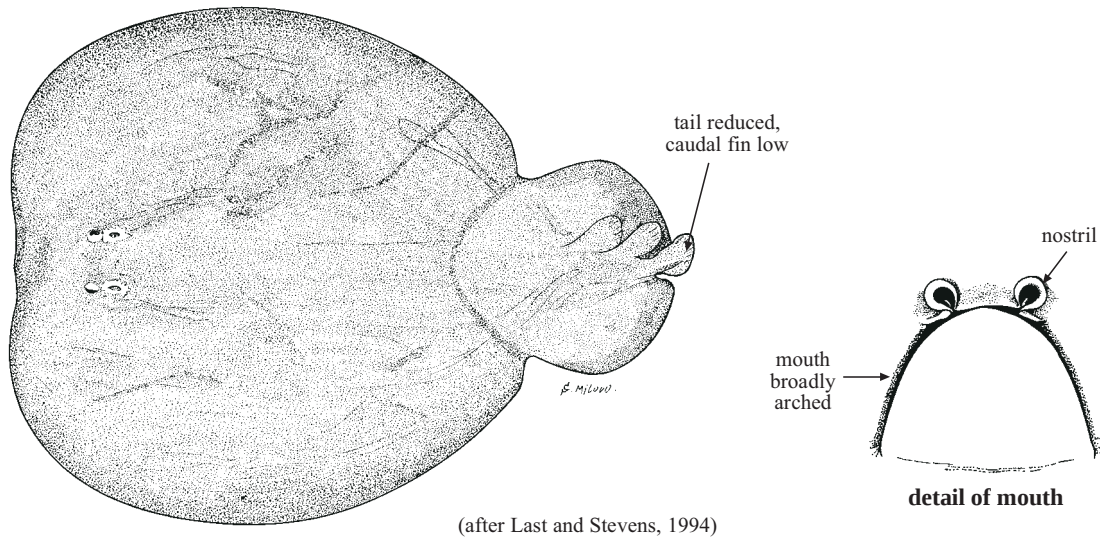
En - Finless sleeper ray.

Maximum total length said to be about 46 cm, but most specimens below 15 cm; females are adult at 11 to 12 cm and males at 11 cm. A little-known but locally common dwarf inshore and offshore sleeper ray of continental tropical waters. Biology little known, one female had 4 fetuses. Caught in local inshore and offshore fisheries but possibly not utilized in the area. Occurs in the Indo-West Pacific from the Andaman Sea near the southern Thai-Myanmar border through the Straits of Malacca and the Malay Peninsula (Pinang, Kelok Kurau) to Singapore and Viet Nam (Cochin China); occurs off Thailand but coast and locality uncertain.



HYPNIDAE**Coffin rays**

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

A single species in this family.***Hypnos monopterygius* (Shaw and Nodder, 1795)****Frequent synonyms / misidentifications:** *Hypnos subnigrum* Dumeril, 1852 / None.**FAO names:** En - Coffin ray.

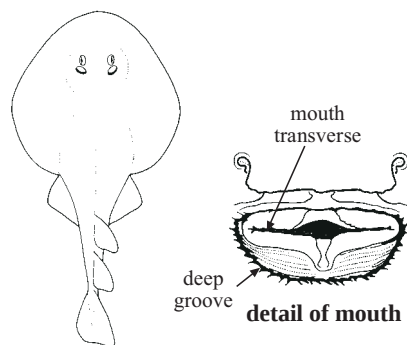
Diagnostic characters: A moderate-sized batoid with a **greatly reduced short slender tail**. Body entirely naked above and below, without dermal denticles or thorns. Trunk depressed and flattened, not shark-like. Precaudal tail slightly depressed, with weak lateral ridges on sides, tail abruptly narrower than trunk, **no barbed sting (stinger or stinging spine) on dorsal surface of tail, no electric organs in tail**. Head broad and depressed; snout moderately elongated, anteriorly nearly straight; snout supported by rostral cartilages consisting of a pair of elongated lateral plates articulating (not fused) with cranium, and by the anteriorly expanded antorbital cartilages; **not formed into a rostral saw and without lateral saw teeth**. Five small gill openings on underside of front half of pectoral-fin bases, not visible in lateral view; no gill sieves or rakers on internal gill slits. Eyes dorsolateral on head and anterior to spiracles, small but well-developed. **Mouth broadly arched and broad, without prominent knobs and depressions and with labial furrows absent; a strong groove at distal ends of mouth but not around its periphery**. 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 short and medially expanded and fused into a narrow nasal curtain that overlaps mouth**. Oral teeth small, with flat bases and 3 prominent cusps, not laterally expanded and plate-like, similar in shape and in over 60 rows (adults) in either jaw. **Pectoral fins large and forming a pear-shaped disc about as wide as long**, originating at anterior edges of snout lateral to snout tip, attached to entire head and ending posterior to pelvic-fin origins; disc not subdivided at eyes. **Large kidney-shaped electric organs at bases of pectoral fins, these visible through skin**. Pelvic fins low, broadly rounded and not divided into anterior and posterior lobes. **Two equal-sized small dorsal fins**, each rounded-angular in shape with apices, anterior, posterior and inner margins, and free rear tips more or less confluent. **First dorsal fin originates far behind anterior half of total length, origin and base over rear half of pelvic-fin bases and well anterior to midlength of tail**. **Caudal fin small, about as large as dorsal fins and much smaller than pelvic fins, not shark-like**, nearly symmetrical and rounded, with vertebral axis hardly raised above body axis; lower caudal-fin lobe absent. **Colour:** uniform chocolate brown, reddish brown, grey, sandy or pinkish above, often with sparse irregular darker and lighter spots and blotches, spiracular papillae and disc margin lighter, underside yellowish, greyish white, or white.

Similar families occurring in the area

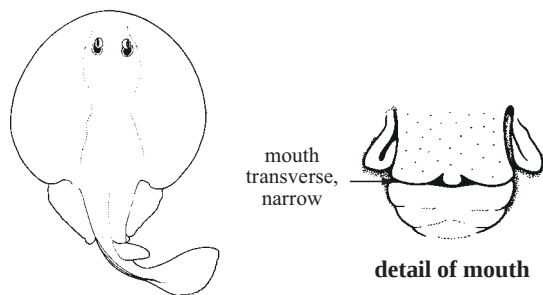
Narcinidae: tail much longer and stouter; caudal fin about as large as pelvic fins; snout longer, broadly rounded and supported by a broad, trough-shaped rostral cartilage; mouth transverse and with strong labial folds and a deep groove around its periphery; teeth ridged or unicuspidate.

Narkidae: pectoral disc rounded anteriorly; mouth very small, transverse, and with strong labial folds; teeth ridged or unicuspidate; a single dorsal fin or no dorsal fin in species in the area; caudal fin much larger than dorsal fin, subequal in size to pelvic fins.

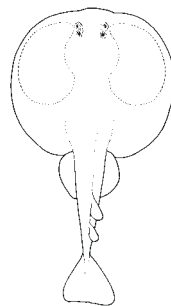
Torpedinidae: pectoral disc transversely elliptical; teeth unicuspidate; paired rostral cartilages fused to cranium; tail longer and stouter; first dorsal fin much larger than second; caudal fin much larger than dorsal fins and subequal in size to pelvic fins.



Narcinidae



Narkidae



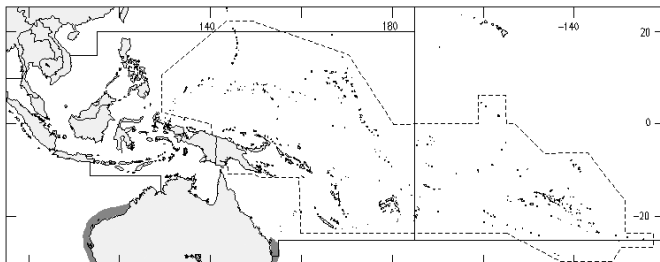
Torpedinidae

No other batoids in the area combine very short slender tails with a large pear-shaped pectoral disc, 2 dorsal fins and a well-developed (if small) caudal fin, and a completely unscaled body.

Size: Maximum total length possibly to 92 cm, but most specimens less than 40 cm; males mature at about 24 cm and reach at least 37 cm; females reach at least 55 cm; young born at about 8 to 11 cm total length.

Habitat, biology, and fisheries: A common inshore and offshore ray of bizarre and characteristic form that occurs from the intertidal parts of sandy bays, estuaries, and off beaches to a depth of 220 m on the uppermost continental slopes; commonest inshore. Biology sketchily known; a slow-moving ray that favors sandy and muddy bottoms and buries itself in the substrate; sometimes stranded out of water by the tide but said to survive for hours. Viviparous. Feeds on small and large fishes, crustaceans, and worms, and probably subdues its prey with its powerful electric organs. Fish prey is often very large relative to body size, and individuals have been found apparently choked by large fishes that they couldn't swallow. Very cryptic when buried and often shocks bathers, swimmers, and divers who accidentally disturb them. Fishermen may receive shocks by stepping on them or when handling specimens in trawl catches. Not utilized to any extent in the area, though often caught in trawls and lobster traps and sometimes speared.

Distribution: Occurs off most of temperate and tropical Australia (except for the southern and northern parts), with a disjunct distribution from Western Australia (Broome) to South Australia (St. Vincent's Gulf), and from New South Wales (Eden) to Queensland (to at least Caloundra), but absent from the intermediate area including Tasmania and Victoria.



References

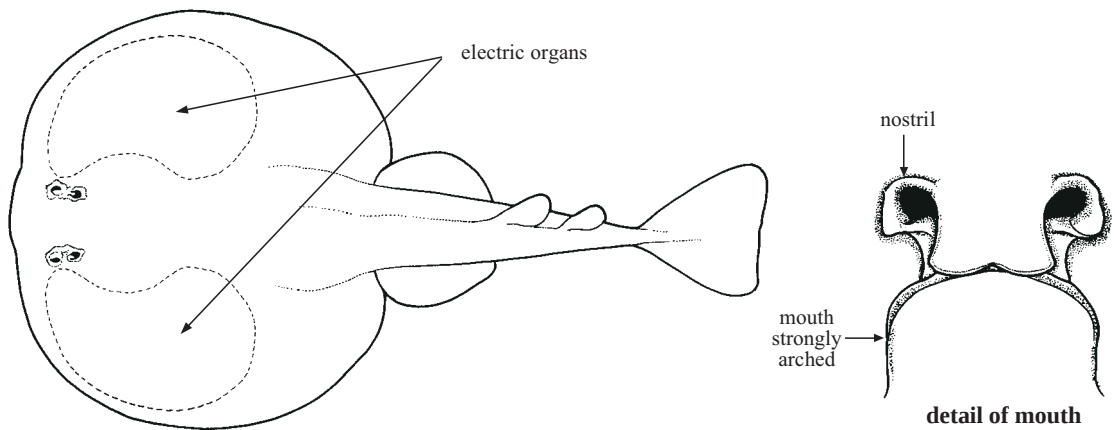
- Last, P.R. and J.D. Stevens. 1994. *Sharks and rays of Australia*. Australia, CSIRO, 512 p.
- Grant, E. M. 1978. *Guide to fishes*. Brisbane, Department of Harbours and Marine, 768 p.
- Whitley, G.P. 1940. *The fishes of Australia. Part I. The sharks, rays, devil-fish and other primitive fishes of Australia and New Zealand*. Australian Zoological Handbook. Sydney, Royal Zoological Society of New South Wales, 280 p.

TORPEDINIDAE

Torpedos

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

Diagnostic characters: Small to moderately large batoids (adults between 20 and 180 cm total length) with **large, transversely elliptical discs and short stout shark-like tails. Body entirely naked above and below, without dermal denticles or thorns.** Trunk depressed and flattened, not shark-like. Precaudal tail slightly depressed, with lateral ridges on sides, tail abruptly narrower than trunk, **no barbed sting (stinger or stinging spine) on dorsal surface of tail**, no electric organs in tail. Head broad and depressed; **snout moderately elongated, anteriorly nearly straight or undulated, not formed into a rostral saw and without lateral saw teeth; snout supported by a rostral cartilage consisting of a pair of elongated lateral plates fused with cranium, and by the anteriorly enlarged antorbital cartilages.** Five small gill openings on underside of front half of pectoral-fin bases, not visible in lateral view; no gill sieves or rakers on internal gill slits. Eyes dorsolateral on head and anterior to spiracles, small but always well developed. **Mouth broadly arched and broad, without prominent knobs and depressions and with labial furrows absent; strong grooves at distal ends of mouth but not around its periphery.** 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 short and medially expanded and fused into a narrow nasal curtain that overlaps mouth.** Oral teeth small, with flat bases and a prominent cusp, not laterally expanded and plate-like, similar in shape and in 20 to 75 rows in either jaw. Pectoral fins large, originating at anterior edges of snout lateral to snout tip, attached to entire head and ending posterior to pelvic-fin origins; disc about as wide as long or slightly wider than long and not subdivided at eyes. **Large kidney-shaped electric organs at bases of pectoral fins, these visible through skin.** Pelvic fins low, broadly rounded and not divided into anterior and posterior lobes. Two dorsal fins, the first much larger than the second and close to it, these rounded-angular in shape with apices, anterior, posterior and inner margins, and free rear tips more or less confluent, not falcate. **First dorsal fin originates far behind anterior half of total length, origin over or just behind rear fourth of pelvic-fin bases and well anterior to midlength of tail. Caudal fin large, much larger than dorsal fins and about size of pelvic fins or larger, not shark-like,** nearly symmetrical and subangular, with vertebral axis hardly raised above body axis; lower caudal-fin lobe absent. **Colour:** variably plain or spotted above, from greyish or brownish to black, dark and light spots variably present or absent, sometimes with eye-like spots (ocelli) in species found elsewhere than in the area; usually lighter below, often uniformly white or with a dark margin to the pectoral and pelvic fins.



Habitat, biology, and fisheries: Torpedos are a moderately large group of inshore to offshore and deep-water batoids of almost circumglobal distribution that are found in warm-temperate to tropical continental and oceanic insular waters. They occur off sandy beaches, in muddy enclosed bays, in estuaries, off river mouths, on the edges of continental shelves well off the bottom, and on the upper continental slopes. They range in depth from the intertidal down to 1 100 m. These electric rays are apparently unable to penetrate fresh water to any extent and are absent from rivers and lakes. They are slow-swimming batoids often resting on soft mud or sandy substrates. All species are ovoviparous as far as is known. Torpedos feed on small to large fishes and invertebrates that are usually caught and ingested on the bottom; their jaws and mouths are highly distensible to allow them to swallow very large prey. At least some species will deliberately shock potential fish victims with their powerful electric organs to stun them, then use their flexible pectoral discs as manipulators to guide the prey into their mouths. The electric

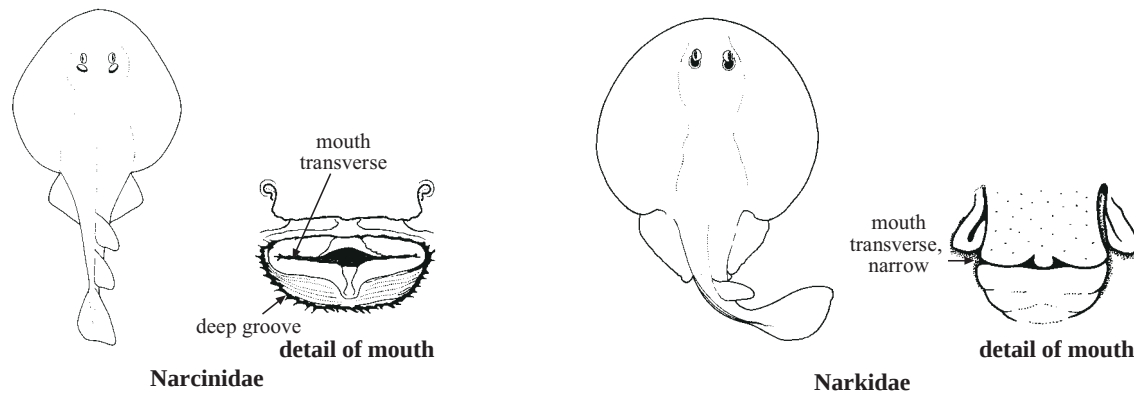
organs are also defensive, and can successfully protect these rays against predators such as sharks and octopuses. Torpedos are caught as minor bycatches of small local inshore fisheries and in offshore trawl fisheries. They can deliver a strong shock to the unwary when disturbed or captured. Some species may aggressively confront divers underwater, but are otherwise inoffensive to people. Utilization of these rays is uncertain in the area.

Similar families occurring in the area

Hypnidae: pectoral disc pear-shaped; teeth tricuspidate; paired rostral cartilages only articulated to cranium; tail very short and slender; dorsal fins equal sized; caudal fin about as large as dorsal fins and much smaller than pelvic fins.

Narcinidae: tail longer and stouter; caudal fin usually more rounded and asymmetrical; snout longer, broadly rounded and supported by a broad, trough-shaped rostral cartilage; mouth transverse and with strong labial folds and a deep groove around its periphery.

Narkidae: pectoral disc rounded anteriorly; mouth very small, transverse, and with strong labial folds; species in the area with a single dorsal fin or no dorsal fin.



Key to the species of Torpedinidae occurring in the area

- 1a. Dorsal surface with many dark brownish blotches and spots on a pinkish brown background *Torpedo* sp. (Philippines)
- 1b. Dorsal surface greyish, brownish or black, with lighter and darker areas or a few blotches but not strongly spotted → 2
- 2a. Precaudal tail shorter, distance from rear tips of pelvic fin to lower caudal-fin origin less than 3/4 of caudal-fin height and less than 1/2 pelvic-fin span across apices. *Torpedo macneilli*
- 2b. Precaudal tail longer, distance from rear tips of pelvic fin to lower caudal-fin origin more than 3/4 of caudal fin height and over than 1/2 pelvic-fin span across apices *Torpedo* sp. A

List of species occurring in the area

The symbol ♦ is given when species accounts are included.

- ♦ *Torpedo macneilli* (Whitley, 1932)
- ♦ *Torpedo* sp. A. [Last and Stevens, 1994]
- ♦ *Torpedo* sp. (Philippines) [*T. marmorata* of Fowler, 1941, Herre, 1953]

References

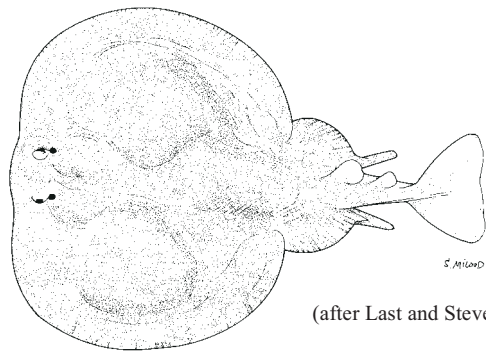
Talwar, P.K. 1981. The electric rays of the genus *Torpedo* Houttuyn (Rajiformes: Torpedinidae) of Indian seas. *Bull. Zool. Surv. India*, 3:185-189.

Parin, N.V. and A.N. Kotlyar. 1985. Electric rays of genus *Torpedo* in the open waters of the southeastern Pacific Ocean. *J. Ichthy.*, 25:1-12.

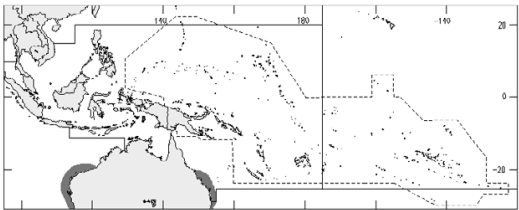
***Torpedo macneilli* (Whitley, 1932)**

En - Shorttail torpedo.

Maximum total length at least 107 cm, males maturing at 60 cm. A temperate and tropical offshore torpedo of the southern Australian continental shelves and slopes at depths of 90 to 750 m. Biology little known, caught by trawlers but not utilized as far as known. Can severely shock anyone handling them in nets, so specimens should be treated with caution. Occurs off southern half of Australia from Western Australia (Port Hedland) to southern Queensland (Swain Reefs), including Tasmania.



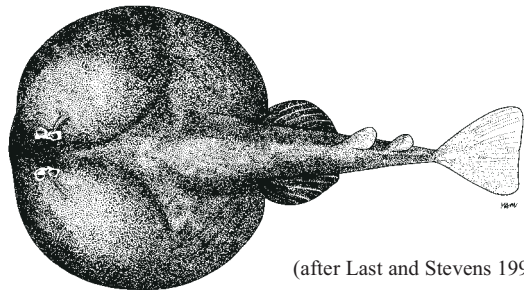
(after Last and Stevens 1994)



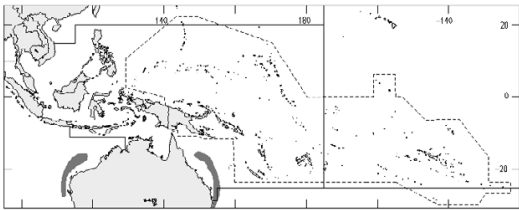
***Torpedo* sp. A [Last and Stevens, 1994]**

En - Longtail torpedo.

Maximum known total length about 34 cm (immature males), probably grows much larger. A tropical torpedo of the continental slopes of northern Australia at depths of 400 to 560 m, broadly sympatric with *Torpedo macneilli* but occurring in somewhat deeper water where there is overlap. Biology little known, probably not utilized. Occurs in a disjunct distribution pattern off Western Australia (Shark Bay to the Rowley Shoals), and off the east coast of Australia from New South Wales (Newcastle) to Queensland (Bowen).



(after Last and Stevens 1994)



***Torpedo* sp. [*Torpedo marmorata* of Fowler, 1941; Herre, 1953]**

En - Philippine torpedo.

Maximum total length about 11 cm, probably grows larger. Known from a single specimen from San Andreas Island (13°38'N, 121°58'E), northeast side of Tayabas Bay, Luzon, at northwest end of Mompog Pass between Luzon and Boac Island in a depth of 92 m. Referred to the eastern Atlantic *Torpedo marmorata* Risso, 1810, but probably not identical to that species as margins of spiracles lack papillae and the colour pattern is different.

(no illustration available for this species)

