

= Porcupine ray =

The porcupine ray (*Urogymnus asperrimus*) is a rare species of stingray in the family Dasyatidae and the only member of its genus . This bottom @-@ dweller is found throughout the tropical Indo @-@ Pacific , as well as off West Africa . It favors sand , coral rubble , and seagrass habitats in inshore waters to a depth of 30 m (100 ft) . A large and heavy @-@ bodied species reaching 1 @.@ 2 ? 1 @.@ 5 m (3 @.@ 9 ? 4 @.@ 9 ft) in width , the porcupine ray has a nearly circular , plain @-@ colored pectoral fin disc and a thin tail without any fin folds . Uniquely within its family , it lacks a venomous stinging spine . However , an adult ray can still defend itself ably with the many large , sharp thorns found over its disc and tail .

The diet of the porcupine ray consists mainly of benthic invertebrates and bony fishes , which it digs up from the sea floor . It is aplacental viviparous , in which the developing embryos are nourished by histotroph (" uterine milk ") produced by the mother . The porcupine ray has long been valued for its rough and durable skin , which was made into a shagreen leather once used for various utilitarian and ornamental purposes , such as to cover sword hilts and shields . It is caught incidentally by coastal fisheries . Because it must be handled carefully due to its thorns , its commercial significance is limited . Unregulated fishing has led to this species declining in many parts of its range , and thus has been listed as Vulnerable by the International Union for Conservation of Nature (IUCN) .

= = Taxonomy = =

German naturalists Marcus Elieser Bloch and Johann Gottlob Schneider described the porcupine ray in their 1801 work *Systema Ichthyologiae* , based on a partial dried skin obtained from Mumbai , India . They placed it in the genus *Raja* and named it *asperrima* , meaning " roughest " in Latin . In the same work , they also described a West African form , *Raja africana* . Later authors have regarded the two as synonymous . However , since the two names were published simultaneously , there is uncertainty about which name has priority . Some works give the ray 's specific epithet as *asperrimus* , and others as *africanus* .

In 1837 , Johannes Peter Müller and Friedrich Gustav Jakob Henle placed the porcupine ray in a new genus , *Gymnura* . As the name *Gymnura* was already in use , referring to the butterfly rays , later that year Müller and Henle replaced it with *Urogymnus* . Both names are derived from the Ancient Greek *oura* (" tail ") and *gymnos* (" naked " or " unarmed ") , referring to the lack of a tail sting . Other common names for this species include black spotted ray , rough @-@ skinned ray , roughback stingaree , Solander 's ray , and thorny ray . There may be more than one species of porcupine ray , as is currently recognized .

= = Distribution and habitat = =

The porcupine ray is widely distributed , but uncommon compared to other stingrays that share its range . It is found all along the continental periphery of the Indian Ocean , from South Africa to the Arabian Peninsula to Southeast Asia to Ningaloo Reef off western Australia , including Madagascar , the Seychelles , and Sri Lanka ; it has colonized the eastern Mediterranean Sea through the Suez Canal . In the Pacific Ocean , its range continues through Indonesia and New Guinea , north to the Philippines , east to the Gilbert Islands and Fiji , and south to Heron Island off eastern Australia . This species is also found in the eastern Atlantic Ocean off Senegal , Guinea , and Côte d 'Ivoire . Bottom @-@ dwelling in nature , the porcupine ray is found close to shore at depths of 1 ? 30 m (3 ? 100 ft) . It inhabits sandy flats , coral rubble , and seagrass beds , often near reefs , and also enters brackish water .

= = Description = =

The pectoral fin disc of the porcupine ray is evenly oval , almost as wide as long , and very thick at

the center , giving it a domed appearance . The tip of the snout is rounded and barely protruding . The small eyes are closely followed by much larger spiracles . Between the narrow nostrils is a skirt @-@ shaped curtain of skin ; the posterior margin of the curtain is strongly fringed and overhangs the mouth . The mouth bears 3 ? 5 papillae on the floor and prominent furrows at the corners . The area around the mouth , including the curtain , are heavily covered by more papillae . There are around 48 tooth rows in either jaw . The teeth are small and flattened . Five pairs of gill slits are located on the underside of the disc .

The pelvic fins are small and narrow . The thin , rapidly tapering tail is about equal to the disc in length and has an almost cylindrical cross @-@ section , without fin folds . The tail also has no venomous stinging spine , unlike other members of the family . A dense patch of flattened , heart @-@ shaped dermal denticles covers the center of the disc and extends onto the tail . Larger individuals additionally have numerous tall , sharp thorns over the entire upper surface of the disc . The porcupine ray is plain light to dark gray or brown above , darkening to blackish towards the tail tip , and white below . This large species grows to at least 1 @. @ 2 m (3 @. @ 9 ft) across and 2 @. @ 2 m (7 @. @ 2 ft) long , and may reach 1 @. @ 5 m (4 @. @ 9 ft) across .

= = Biology and ecology = =

The porcupine ray can sometimes be observed lying still on the bottom in the open or inside caves . It is known to form groups at Ningaloo Reef . Its diet consists primarily of sipunculids , polychaete worms , crustaceans , and bony fishes . When feeding it plows deeply into the bottom , expelling excess sediment from its spiracles in a plume visible from a long distance away . Parasites documented from this ray include the tapeworm *Rhinebothrium devaneyi* , the nematode *Echinocephalus overstreeti* , and the capsalid monogeneans *Dendromonocotyle urogymni* and *Neoentobdella baggioi* . The porcupine ray is aplacental viviparous , with the developing embryos sustained to term by histotroph (" uterine milk ") secreted by the mother . Mangrove forests serve as important habitat for juvenile rays . Males and females mature sexually at about 90 and 100 cm (35 and 39 in) across respectively .

= = Human interactions = =

Despite not having a sting , the porcupine ray is capable of injuring humans with its many sharp thorns . It is reportedly bold and tolerant of being approached closely underwater . The tough , thorny skin of this ray , made into a form of leather called shagreen , had many historical uses . In particular , it was used to cover the hilts of various melee weapons , as its extremely rough texture prevented slippage during battle . For example , the Japanese deemed it the only species whose skin was acceptable for covering sword grips . The Malaysians used it to cover shields . The skin was also used ornamentally , such as by the Chinese , who dyed it and ground down the thorns to yield a mottled pattern . The native inhabitants of Funafuti Atoll used dried portions of the ray 's tail as a rasp @-@ like tool .

Presently , the porcupine ray is caught incidentally in trawls , tangle nets , and beach seines . Its skin continues to be highly valued , while the meat and cartilage may also be utilized . In the Farasan Islands and some other places in the Red Sea , its liver is eaten as a seasonal dish . However , the economic importance of this ray is limited by how difficult it is to handle . The multi @-@ species coastal fisheries that catch the porcupine ray are largely unregulated , which seems to have resulted in its dramatic decline or local extinction in the Bay of Bengal , the Gulf of Thailand , and likely elsewhere in its range . Potential additional threats to this species include habitat degradation from coastal development , and depletion of its food supply from overfishing . As a result , the International Union for Conservation of Nature (IUCN) has assessed it as Vulnerable .