View metadata, citation and similar papers at core.ac.uk

brought to you by CORE

provided by College of William & Mary: W&M Publish

W&M ScholarWorks

Reports

9-1-1977

Rays in the Chesapeake Bay

Joseph W. Smith
Virginia Institute of Marine Science

J. V. Merriner
Virginia Institute of Marine Science

Follow this and additional works at: https://scholarworks.wm.edu/reports

 Part of the Aquaculture and Fisheries Commons

Recommended Citation

Smith, J. W., & Merriner, J. V. (1977) Rays in the Chesapeake Bay. Marine Resource Advisory No. 14. Virginia Institute of Marine Science, College of William and Mary. http://dx.doi.org/doi:10.21220/m2-bkj2-g971

This Report is brought to you for free and open access by W&M ScholarWorks. It has been accepted for inclusion in Reports by an authorized administrator of W&M ScholarWorks. For more information, please contact scholarworks@wm.edu.

Marine Resource Advisory
A Sea Grant Advisory Service

ADVISORY NO. 14 SEPTEMBER 1977

RAYS IN THE CHESAPEAKE BAY

by Joseph W. Smith and J. V. Merriner, Ph.D.
Department of Ichthyology

Pliny, the ancient Roman historian, describes a tree that withered from it.

Ulysses is said to have been slain by an arrow tipped with it.

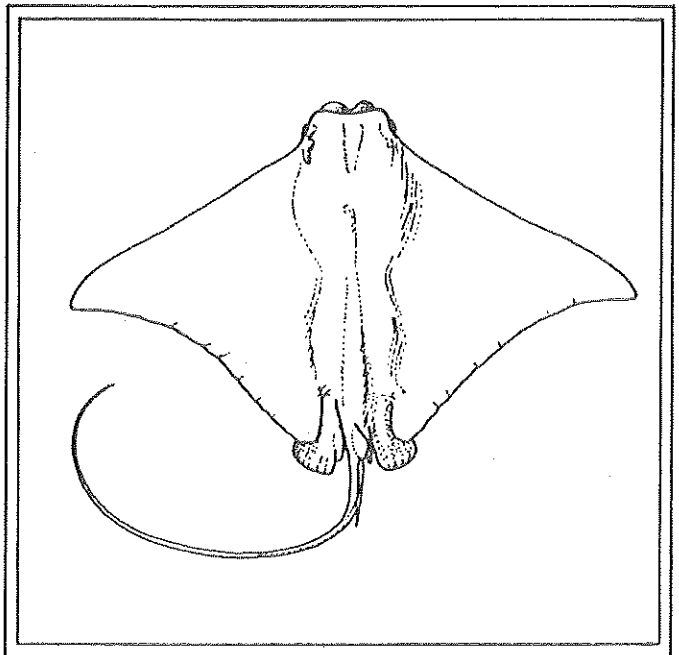
Captain John Smith was its earliest recorded victim in the Chesapeake Bay.

What is this deadly thing, to be avoided at all cost by the wise and prudent? It's the sting of a ray, which is uncomfortable but far from deadly. About a dozen species of rays migrate to the Chesapeake Bay during warmer months.

Stingray injuries frequently occur when a fisherman or beachcomber steps directly on a partially buried ray. The ray is pinned to the bottom and thus has the anchorage necessary to arch its tail and thrust the sting into an ankle or leg. A wader can reduce the chance of stepping squarely on a camouflaged ray and chase the ray from its hiding place by shuffling his feet along the bottom. A ray prefers a hastened retreat to undisturbed waters to an exhibition of aggressiveness towards humans.

When the sting strikes flesh, the pressure causes venom-producing cells to activate. Wounds are typically punctures and lacerations. The latter occurs when the sting is withdrawn and its serrated edges rip the surrounding tissue. Pieces of the stingray apparatus may remain in the wound as the sting is withdrawn.

Initial symptoms of stingray wounds are localized pain and swelling. The pain may spread rapidly, however. Numbness of the afflicted area, fainting, nausea, weakness, and muscle cramps are sometimes experienced.



The cownose ray (Rhinoptera bonasus) *is one of the most abundant rays to enter the Bay. The species commonly occurs from May through October and is often seen in shallow water. Clams and oysters are its preferred food. An average adult measures 36 inches across and weighs 30 pounds.*

RAY CHARACTERISTICS

Rays, along with sharks and skates, comprise a group of fish known as elasmobranchs. The skeleton of these fish is composed entirely of cartilage. Rays may be thought of as sharks that are flattened top to bottom. The pectoral fins are longer, wider, and more fleshy in rays and serve as the primary means of locomotion, as opposed to the tail of sharks. The gill slits are positioned underneath rather than on the sides of the body as in sharks. The mouth is also positioned underneath.

Rays feed primarily on animals which live on or in the bottom muds and sands. Ray teeth are adapted to crush or grind food items. Their diet consists of worms, shrimps, bivalve mollusks,

snails, crabs, and small fish. Generally, flapping motions of the pectoral fins are used to dislodge organisms from the bottom. The mouth, positioned ventrally, is then able to seize the prey. Contrary to popular belief, the sting is not used as an offensive weapon to spear potential prey.

Some rays, such as the stingrays, prefer to lie partially buried on the bottom with their eyes above the sands. Dorsal breathing vents (spiracles) act as intake valves for water which is passed across the gills and out ventral gill slits. These rays can lie partially concealed on the bottom and breathe in relatively undisturbed waters. Also, sediments tend to be stirred up below feeding rays. The position of the spiracles allows intake of water with little gill-irritating sediment.

Rays are ovoviviparous, that is, their young are nurtured inside the mother's womb and are born as miniature, free-swimming adults. There is no organ of attachment between mother and developing young, however. Embryos are believed to be nourished by milky secretions of the many finger-like projections (villi) lining the uterine wall. The number of young, usually 1-6, varies from species to species. The "pups" are situated in the uterus with their wings folded upon themselves. Birth is usually tail first with the tail bent forward so as not to injure the mother with the sting.

Males differ externally from females by the presence of a round, almost clothespinlike appendage behind each pelvic fin. These structures, called claspers, are not solid tissue but a rolled-up fin with a hollow groove running its length. During copulation sperm are transmitted to the female via these structures.

The entire tail of stingrays is not poisonous. The part which inflicts wounds is a long, narrow spine (or sometimes spines) situated on the upper side of the tail. The spine is a hard, bonelike spike anchored firmly at its base to the tail and terminating in a sharp point. Along both sides are many serrate edges in a sheath of skin.

Along the bottom side of the spine, two parallel grooves run from the base to tip. Within these grooves is a spongy material known as the venom gland, which is the major site of venom production. The entire venom-producing apparatus, that is, the spine, sheath, and venom glands are called the sting or stinger. There is no evidence to support the idea of an annual loss of stings. Occasionally, two or more may be found overlapping each other on a tail.

The distance from the base of the tail to the sting varies among different families of rays. As the distance increases, the ray is able to arch its tail through a much larger radius. Thus, rays such as the stingrays with stings located further back on their tail possess more efficient striking implements and can generate more power in a strike.

ANN GREER . . . . . .EDITOR

Marine Resource Advisories are monographs on special topics produced by the Virginia Institute of Marine Science Sea Grant Program. Single copies are available without charge.

William J. Hargis, Jr. . . . . .Director

FIRST AID FOR STINGRAY WOUNDS

1. Wash the wound with available cold salt water. Remove any pieces of the sheath or venom gland which may remain in the wound. These may look like shreds of grey mucus.

2. After cleaning and removing all foreign material, submerge the extremity in hot water, as hot as the patient can tolerate, for 30 to 60 minutes. Heat appears to inactivate the venom. Epsom salts may be added if available.

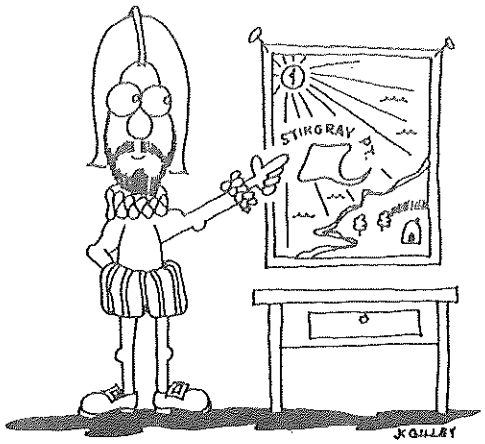
3. Make second inspection for foreign matter around the wound.

4. If pain and swelling do not subside within a reasonable amount of time (1-2 hours), a physician should be consulted. These wounds are often prone to secondary infection.

5. Suturing by a physician may be required if the wound is sufficiently large.

6. Antibiotic and anti-tetanus injections are often recommended by physicians.

From "Venomous Marine Fishes of California" by Dr. E.T. Roche, Marine Resource Leaflet No. 4, Dept. of Fish & Game, 1416 9th Street, Sacramento, CA 95814.



HOW STINGRAY POINT GOT ITS NAME

In 1608, Captain John Smith discovered more than Indians on the newly settled shores of the Chesapeake Bay. Chapter five, "The Accidents that Happened in the Discovery of the Bay of Chisapeack", of The Third Book of the Processings and Accidents of the English Colony in Virginia, describes Capt. Smith and his crew lancing large fish with their swords in the reeds near the mouth of the Rappahannock River. The captain lanced a fish, looking quite similar to a harmless English skate.

". . .being much of the fashion of a Thornback, but a long tayle like a ryding rodde, whereon the middest is a most poysoned sting, of two or three inches long, breaded like a saw on each side, which she strucke into the wrest of his arme neere an inch and a halfe: no bloud nor wound was seene, but a little blew spot, but the torment was instantly so extreme, that in foure houres had so swolen his hand, arme, and shoulder, we all with much sorrow concluded his funerall, and prepared his grave in an Island by, as himselfe directed: yet it pleased God by a precious oyle Doctor Russell at the first applyed to it when he sounded it with probe, (ere night) his tormenting paine was so well asswaged that he eate of the fish to his supper, which have no lesse joy and content to us then ease to himselfe."

This point of land at the mouth of the Rappahannock River still bears the name given to it by these early English explorers -- Stingray Point.

FISH SEEN AS PESTS

Fishermen generally regard rays as nuisances since they have little present market value. A common practice of fishermen is to chop off a ray's tail above the sting. This renders the ray virtually harmless, although the sting retains its poisonous attributes.

Commercial haul seine and pound net fishermen usually cull rays overboard. On rare occasions, a schooling species such as the cownose may be caught in such great numbers that the nets cannot be raised and a day's catch is lost.

Sportfishermen often foulhook rays while bottom fishing. If the ray is sufficiently large, the fisherman may lose a favorite rig, not to mention several yards of line. A school of rays may also temporarily chase the more sought-after game fish from an area.

Chesapeake Bay shellfish are a favorite food of cownose and eagle rays. While feeding they destroy acres of shellfish beds. Commercial shellfish growers attribute substantial losses in recent years to summertime cownose ray predation. Management of the ray population, mechanical barriers around shellfish beds or sonic devices may help to alleviate this problem in the future.

On the positive side, sections of ray wings make excellent crab bait if menhaden is in short supply. Because it is tougher than menhaden, it lasts two to three times longer in a bait well and gives comparable results. Ray meat was once used as the standard bait in crab trot line fishery of the Bay.

RAYS FOR GOURMETS

Ray meat has been considered a delicacy in Europe for some time, but American diners have used it sparingly.

The fish has been described by adventuresome Americans as tasting like everything from scallops to veal. Filleted ray wings may be soaked overnight in brine, then soaked in fresh water before dipping in batter to bake or fry. A classic French recipe calls for merely scrubbing the wing portions well, poaching them in a court bouillon *of vinegar, water, and salt, and saucing them in browned melted butter, capers, and a dash of wine vinegar.*

Ray Marseillaise

- 2 pounds fresh ray fillets
- 3 tablespoons cooking oil
- 1 medium minced onion
- 2 medium chopped tomatoes
- 1 clove minced garlic
- 1 tablespoon chopped parsley
- ½ cup dry white wine

Cut ray into serving size portions. Pour oil in oven-proof dish or skillet and place over medium heat on range top. Add vegetables, salt and pepper. Arrange fish portions over vegetables. Pour wine over fish, cover and bring to a boil. Transfer dish to 350 degree oven. Bake 15 minutes or until fish flakes easily when tested with a fork. Remove fish from sauce and arrange on preheated platter. Strain sauce and heat to boiling. Pour hot sauce over fillets and serve. Makes 6 servings.

The VIMS Sea Grant Program has also published a more detailed booklet on rays which occur in the Chesapeake Bay area. It contains ray biology and anatomy, and characteristics of each species with illustrations. This booklet, Educational Series Number 20, can be ordered from the VIMS Sea Grant Publications Office for 50 cents a copy.

Marine Resource Advisory
A Sea Grant Advisory Service

VIRGINIA INSTITUTE OF MARINE SCIENCE
Gloucester Point, Virginia 23062

ADDRESS CORRECTION REQUESTED

BULK RATE
U S POSTAGE
PAID
Gloucester Point, Va.
PERMIT NO. 6