= Common torpedo =

The common torpedo , ocellate torpedo , or eyed electric ray (Torpedo torpedo) is a species of electric ray in the family Torpedinidae , found in the Mediterranean Sea and the eastern Atlantic Ocean from the Bay of Biscay to Angola . It is a benthic fish typically encountered over soft substrates in fairly shallow , coastal waters . Growing to 60 cm (24 in) long , this species has a nearly circular pectoral fin disc and a short , thick tail with two dorsal fins of nearly equal size and a large caudal fin . It can be identified by the prominent blue spots on its back , which usually number five but may vary from zero to nine , as well as by the small knobs on the rims of its spiracles .

For attack and defense , the common torpedo can deliver a strong electric shock of up to 200 volts . It is a solitary , nocturnal ambush predator that feeds mainly on bony fishes and crustaceans . This species is aplacental viviparous , with the developing embryos nourished by yolk and histotroph (" uterine milk ") produced by the mother . Females produce litters of up to 28 young every year in late summer or autumn , after a gestation period of 4 ? 8 months ; the specifics vary between geographical regions . The common torpedo 's shock is painful but otherwise of little danger to humans . Its electrogenic properties led it to be used in medicine by the ancient Greeks and Romans . In modern times , it has no economic value and is mostly discarded when caught as bycatch in fisheries . The impact of fishing on its population is uncertain , and pending more data the International Union for Conservation of Nature (IUCN) has listed it as Data Deficient .

= = Taxonomy = =

The common torpedo and other electric rays were familiar to the peoples of classical antiquity . Torpedo was the Roman name for electric rays , derived from Latin torpere meaning " to be numb " . Carl Linnaeus , known as the " father of taxonomy " , scientifically described the common torpedo as Raja torpedo in the 1758 tenth edition of his Systema Naturae . However , the common torpedo also appeared in at least 52 pre @-@ Linnaean sources under various names such as Torpedo , Raja tota lævis , Torpedo maculosa , and Torpedo Sinûs Persici . These early accounts , including Linnaeus 's , confounded the common torpedo with other electric ray species . As Linnaeus did not indicate any type specimens , the designation of a lectotype or neotype is warranted in the interest of taxonomic stability . This measure has yet to be taken .

André Marie Constant Duméril was the first author to refer to Torpedo as a genus , in his 1806 Zoologie analytique , ou méthode naturelle de classification des animaux . Duméril did not name any Torpedo species ; the first author to do so was probably Charles Lucien Bonaparte , who assigned Linnaeus 's Raja torpedo to the genus Torpedo in 1838 . Since at the time T. torpedo was the only member of the genus , it became the type species . Within the genus Torpedo , the common torpedo is placed within the subgenus Torpedo , which differs from the other subgenus Tetronarce in having spiracles with papillate rims and ornate dorsal coloration . This species may also be referred colloquially to as crampfish , cramp ray , or torpedo ray .

= = Distribution and habitat = =

Native to the eastern Atlantic Ocean , the common torpedo occurs from the Bay of Biscay to Angola , including all around the Mediterranean Sea . A single record from Belgian waters was most likely erroneous . In European waters , it is encountered less frequently than other electric ray species . This species prefers warmer temperatures . It is rare north of the Mediterranean , and within the Mediterranean it is more common off North Africa than off southern Europe . The common torpedo is a bottom @-@ dweller usually found close to shore at depths of 2 ? 70 m (6 @.@ 6 ? 229 @.@ 7 ft) , though it has occasionally been reported from as deep as 400 m (1 @,@ 300 ft) . It inhabits soft @-@ bottomed habitats such as sandy flats and seagrass beds .

= = Description = =

The pectoral fin disc of the common torpedo is almost circular in shape and about 1 @.@ 3 ? 1 @.@ 4 times wider than long . The front margin of the disc is nearly straight . The two large , kidney @-@ shaped electric organs are visible beneath the skin on either side of the head . The eyes are small and followed by spiracles of comparable size . The lateral and posterior rims of the spiracles bear small , low knobs , which diminish in size with age and may be indiscernible in larger individuals . On the " nape " behind the spiracles , there is a pair of prominent mucous pores . There is a wide , quadrangular flap of skin between the nostrils that almost reaches the mouth . The teeth are small and arranged in a dense quincunx pattern ; each tooth has a single sharp cusp . There are around 22 ? 24 and 20 ? 22 tooth rows in the upper and lower jaws respectively . The five pairs of gill slits are placed on the underside of the disc .

The pelvic fins are distinct from the disc and have rounded outer margins . The short and thick tail bears skin folds along either side and two dorsal fins on top . The first dorsal fin is slightly larger than the second . The well @-@ developed caudal fin is triangular with blunt corners , and is approximately as long as the space between it and first dorsal fin . The skin is smooth and soft , entirely lacking dermal denticles . The dorsal coloration of the common torpedo is light to dark brown , with distinctive large spots (" ocellae ") on the disc ; each ocellus is blue and encircled by darker and lighter rings . Typically there are five ocellae arranged symmetrically in a row of three and another of two ; rays with 0 ? 4 ocellae are less common , and those with more than five are rarer still . An unusual male with eight ocellae was caught off Tunisia , and another with nine off southern France . When present , the sixth ocellus is similarly sized to the first five and positioned at their center ; any additional ocellae tend to be smaller than the first six and placed asymmetrically towards the snout . The underside is cream @-@ colored , with dark disc margins . An adult albino female was captured off Tunisia . Males and females typically measure 30 and 39 cm (12 and 15 in) long respectively ; the largest individual on record was 60 cm (24 in) long . Rays from off West Africa grow larger than those from the Mediterranean .

= = Biology and ecology = =

As with other members of its family , the common torpedo can subdue prey and deter threats with strong electric shocks generated from a pair of large electric organs . Derived from muscle tissue , each organ is made up of 400 ? 500 columns , each column constituting a stack of around 400 jelly @-@ filled disks (" electroplaques ") . The columns together essentially act as batteries connected in parallel . The discharge of the electric organs can reach 200 volts , and may occur singly or in bursts (" trains ") . Experiments in vitro have found that the nerves inervating the electric organ essentially stop functioning at temperatures below 15 ° C (59 ° F) . Winter water temperatures regularly drop below this threshold in the wild , suggesting the ray may not use its electric organs for part of the year , or has a yet @-@ unknown physiological mechanism to adapt electric organ function to colder conditions .

Solitary and nocturnal , the common torpedo spends much time resting on the sea floor , often buried in sediment . It is an ambush predator that pounces onto prey and stuns them with electricity , the process taking only a fraction of a second . Once the prey is immobilized , it is manipulated to the mouth with motions of the disc , and swallowed whole . Adults feed almost entirely on small benthic bony fishes , including soles , herring , mullet , gobies , goatfishes , porgies , dragonets , and jack mackerels . Large decapod crustaceans are a minor secondary food source , while very rarely skates may be consumed . Juveniles are less exclusively piscivorous than the adults and feed on a variety of invertebrates as well . The most significant prey species differ between seasons and geographic regions . For example , in the Tyrrhenian Sea , juvenile common sole (Solea solea) are by far the most important prey item in autumn and winter , but in spring and summer they become less available and other fishes figure more prominently in the ray 's diet . Known parasites of this species include the tapeworm Phyllobothrium lactuca , and the monogeneans Amphibdella paronaperugiae and Amphibdelloides benhassinae .

= = = Life history = = =

The common torpedo is aplacental viviparous , in which the embryos are sustained by yolk , supplemented by histotroph (" uterine milk ") secreted by the mother . However , the organic content of the histotroph in this species is only 1 @.@ 2 % , much lower than in stingrays , and the embryo loses mass over the course of development as its initial yolk supply is expended for metabolic processes . Adult females have two functional ovaries and two functional uteruses , though the reproductive tract on the right side is more developed and consequently tends to carry more embryos . It has an annual reproductive cycle with well @-@ defined seasonality , though the details differ between geographic regions . In the Mediterranean , mating occurs from December to February and birthing from late August to early September after a gestation period of 4 ? 6 months ; litter sizes range up to 19 and the newborns measure 8 @.@ 0 ? 9 @.@ 7 cm (3 @.@ 1 ? 3 @.@ 8 in) long . By contrast , off West Africa the gestation period lasts 6 ? 8 months and birthing occurs from September to October ; litter sizes range up to 28 and the newborns measure 10 @.@ 2 ? 12 @.@ 5 cm (4 @.@ 0 ? 4 @.@ 9 in) long . The litter size increases with female size .

Sexual segregation occurs during the breeding season as pregnant females move into shallow coastal waters . The common torpedo is unusual among sharks and rays in that birthing has been documented both at higher and at lower salinities than seawater , in estuaries and lagoons . Immediately after birth , this species is capable of producing electric shocks of up to four volts . Newborns grow rapidly , with a commensurate increase in electrogenic capacity : after four months , they almost double in weight and can generate 26 volts . Males and females mature sexually at similar lengths : 25 and 26 cm (9 @.@ 8 and 10 @.@ 2 in) respectively in the Tyrrhenian Sea , 18 and 22 cm (7 @.@ 1 and 8 @.@ 7 in) respectively off Egypt , 19 cm (7 @.@ 5 in) for both off Tunisia , and 30 and 31 cm (12 and 12 in) respectively off Senegal .

= = Human interactions = =

The electric shock of the common torpedo can be severe , but is not life @-@ threatening . In classical antiquity , the electrogenic properties of this species led it (and other strongly electric fishes) to be used in medicine for the treatment of pain and diseases such as gout . For example , the Roman physician Scribonius Largus , in his Compositiones medicae (c . 50 AD) , recommended that chronic headaches be treated by the application of a live torpedo to the affected area . The common torpedo is edible , but is little @-@ valued by commercial or artisanal fisheries and is mostly discarded when caught . Because of its shallow @-@ water habits , it may survive being captured and discarded relatively well . It is susceptible to several types of demersal fishing gear , including bottom trawls and trammel nets ; fishing activity is heavy within its range but no specific data regarding this species are available . As a result , the International Union for Conservation of Nature (IUCN) has listed it under Data Deficient . The common torpedo has been kept in aquariums , but requires live fish for food .