

## = Cloudy catshark =

The cloudy catshark ( *Scyliorhinus torazame* ) is a common species of catshark , belonging to the family Scyliorhinidae . It is a bottom @-@ dweller that inhabits rocky reefs in the northwestern Pacific Ocean , from the shore to a depth of 320 m ( 1 @,@ 050 ft ) . Growing up to 50 cm ( 20 in ) long , this small , slim shark has a narrow head with a short blunt snout , no grooves between the nostrils and mouth , and furrows on the lower but not the upper jaw . It is also characterized by extremely rough skin and coloration consisting of a series of dark brown saddles along its back and tail , along with various darker and lighter spots in larger individuals .

The diet of the cloudy catshark consists of molluscs , crustaceans , and bony fishes . It is oviparous , with females laying encapsulated eggs two at a time in nursery areas . The claspers of the male bear numerous hooks that likely serve to facilitate copulation . This harmless shark can be readily maintained in captivity and is used as a model organism for biological research . It is caught incidentally , and generally discarded , by commercial fisheries . These activities do not appear to have negatively affected its population , leading it to be listed under Least Concern by the International Union for Conservation of Nature ( IUCN ) .

## = = Taxonomy = =

The original description of the cloudy catshark was published in 1908 by Shigeo Tanaka in the Journal of the Faculty of Science , University of Tokyo . He gave it the specific epithet torazame , which is its Japanese name ( ?? , literally " tiger shark " ) , and assigned it to the genus Catulus . The type specimen was a 45 cm ( 18 in ) long adult male caught off Misaki , Kanagawa , Japan . Subsequent authors have synonymized Catulus with Scyliorhinus .

## = = Description = =

The cloudy catshark reaches 50 cm ( 20 in ) long and has a thin , deep , and firm body . The narrow head makes up slightly under one @-@ sixth of the total length , and is two @-@ thirds as wide as it is long . The snout is short and rounded . The large nostrils are preceded by small , triangular flaps of skin that do not reach the wide mouth . The medium @-@ sized eyes are horizontally oval , equipped with rudimentary nictitating membranes ( protective third eyelids ) , and followed by moderate spiracles . There are no grooves between the nostrils and the mouth . There are furrows extending from the corners of the mouth over the lower jaw only . The small teeth have a long central cusp typically flanked by two pairs of cusplets . The five pairs of gill slits are short , with the fourth pair over the pectoral fin origins .

The two dorsal fins are placed towards the back of the body , with the first originating over the rear of the pelvic fin bases . The first dorsal fin has a rounded apex and is larger than the second dorsal fin , which has a more angular shape . The pectoral and pelvic fins are moderate in size . In males , the inner margins of the pelvic fins are merged to form an " apron " over the long , cylindrical claspers . The origin of the anal fin lies approximately between the dorsal fins . The caudal peduncle is about as deep as the body , and leads to a low caudal fin with an indistinct lower lobe and a ventral notch near the tip of the upper lobe . The skin is thick and very rough due to the dermal denticles , which are large and upright with three backward @-@ pointing teeth . This species is brown on the back and sides , with 6 ? 10 indistinct darker dorsal saddles , and plain yellowish on its ventral side . Larger sharks also have many large , irregularly shaped light and dark spots .

## = = Distribution and habitat = =

The cloudy catshark is common in the northwestern Pacific off Japan , Korea , China , and possibly the Philippines . Bottom @-@ dwelling in nature , this species can be found from the shore out to a depth of 320 m ( 1 @,@ 050 ft ) on the continental shelf and upper continental slope . It favors rocky reefs and does not appear to be migratory .

## == Biology and ecology ==

The cloudy catshark feeds primarily on molluscs , followed by crustaceans and bony fishes . A predator of both this shark and its egg cases is the blotchy swell shark ( *Cephaloscyllium umbratile* ) . A known parasite of this species is the myxosporidian *Chloromyxum scyliorhinum* . Reproduction is oviparous ; adult females have a single functional ovary and two functional oviducts . As a prelude to mating , the male bites at the female 's pectoral fin , side , and gill region . Once he has a grip , he wraps his body around hers and inserts one of his claspers into her cloaca . Copulation may last between 15 seconds and 4 minutes . The claspers of the male are unusual in that each has a row of around a hundred hooks running along the inner margin . These hooks likely serve to anchor the male to the female during copulation . The female is capable of storing sperm within her nidamental gland ( an organ that secretes egg cases ) for many months .

Females produce two mature eggs at a time , one per oviduct . The eggs are enclosed in smooth , translucent yellow , vase @-@ shaped capsules measuring 1 @.@ 9 cm ( 0 @.@ 75 in ) across and 5 @.@ 5 cm ( 2 @.@ 2 in ) long . There are long tendrils at the four corners of the capsule . The eggs are laid in defined nursery areas : One such area is located at a depth of 100 m ( 330 ft ) off Hakodate . When the embryo is 3 @.@ 6 cm ( 1 @.@ 4 in ) long , it has external gills , undeveloped fins , and no pigmentation . At an embryonic length of 5 @.@ 8 cm ( 2 @.@ 3 in ) , the external gills have all but disappeared , and a covering of small denticles is present . By a length of 7 @.@ 9 cm ( 3 @.@ 1 in ) , the embryo has well @-@ developed fins and pigmentation , and generally resembles the adult . The eggs take 15 months to hatch at 11 @.@ 3 ° C ( 52 @.@ 3 ° F ) , and 7 ? 9 months to hatch at 14 @.@ 5 ° C ( 58 @.@ 1 ° F ) . The newly hatched shark measures 8 cm ( 3 @.@ 1 in ) long or more . Maturation size tends to increase with decreasing water temperature : Off northerly Hakodate , both sexes mature at over 38 cm ( 15 in ) long , while some females remain immature even at 47 cm ( 19 in ) long . By contrast , off southerly Tsushima Island both sexes mature at around 33 cm ( 13 in ) long . The maximum lifespan is at least 12 years .

## == Human interactions ==

Harmless to humans , the cloudy catshark adapts well to captivity and has reproduced in the aquarium . It is often used as a model organism in physiology research . On September 25 , 1995 , Masuda Motoyashi and colleagues used this species to perform the first successful artificial insemination of a shark or ray . The cloudy catshark is caught incidentally by commercial fisheries with bottom fishing nets including trawls and gillnets , as well as on bottom longlines . Captured individuals are typically discarded , possibly with a high survival rate due to their hardiness . Some 40 % of the fish discarded in Yamaguchi Prefecture fisheries are of this species . The bottom trawl fishery operating off Fukushima Prefecture may catch over a ton of cloudy catsharks annually , which are also discarded .

Despite heavy fishing pressure within its range , the cloudy catshark remains common , perhaps because it may be more biologically productive than most other sharks . As a result , it has been assessed as Least Concern by the International Union for Conservation of Nature ( IUCN ) . Cloudy catsharks from a number of locations off Japan have been found to be contaminated with polychlorinated biphenyls ( PCBs ) and dichlorodiphenyldichloroethylene ( DDEs ) , which they acquire from their food . One likely source of these pollutants is the use of the pesticide DDT by developing nations in southern Asia .