

= Banded archerfish =

The banded archerfish ( *Toxotes jaculatrix* ) is a brackish water perciform fish of the archerfish genus *Toxotes* . It is silvery in colour and has a dorsal fin towards the posterior end . It has distinctive , semi @-@ triangular markings along its sides . It is best known for its ability to spit a jet of water to " shoot down " prey . Larger specimens may be able to hit prey 2 to 3 metres ( 6 ft 7 in to 9 ft 10 in ) away . The banded archerfish may reach the displaced prey within 50 milliseconds of its hitting the water .

The name ( binomial as well as common ) refers to *Sagittarius* the archer , because of the unusual method banded archerfish use to capture prey . Banded archerfish are found in Indo @-@ Pacific and Oceanian waters , generally in river mouths and mangrove estuaries . They move between fresh , salt , and brackish water over the course of their lifetime , though not to breed . Because of their markings and silvery colour , banded archerfish are sometimes kept as aquarium fish , though they are difficult to care for and not recommended for most home aquaria .

= = Taxonomy and etymology = =

*Toxotes jaculatrix* were originally described by Peter Simon Pallas in 1767 . Since then , several synonyms ( such as *Labrus jaculatrix* and *Sciaena jaculatrix* ) and misspellings ( *Toxotes jaculator* ) have come into use .

*Toxotes* is Greek for " Bowman " or " archer " , and specifically refers to *Sagittarius* . The species name *jaculatrix* is related to the English *jaculate* and means " thrower " or " caster " ( of a dart or arrow ) . Both the common name and binomial name refer to the banded archerfish 's habit of catching prey by shooting " arrows " of water through its mouth .

= = Description = =

Banded archerfish have four dorsal spines , 11 to 13 dorsal soft rays , three anal spines ( of which the third is longest ) and 15 to 17 anal soft rays . The first spine is always the shortest ; the rays become shorter toward the posterior end . There are about 23 scales between the first dorsal spine and the posterior nostrils . Certain areas of the body are tinged green . The back of the fish is olive @-@ green or brown . The dorsal fin is yellowish @-@ green and located towards the posterior end , and its base is shorter than that of the anal fin . The caudal fin is " dirty green " and about the same height until the point of attachment , where it becomes shallower . The anal fin is silver .

The body of the banded archerfish is oblong in shape and raised on the posterior side . The body is generally silver @-@ white in colour , though varying colourations , such as yellow , have been observed . Four to six broad black bars may be present on the dorsal side . The first bar is found anterior to the operculum , the bony plate covering the gills , and the second is found behind the operculum . The third bar is found below the origin of the dorsal fin , the fourth bar below the soft dorsal , and the fifth ( if any ) on the area between the anal fin and caudal fin ( caudal peduncle ) . These bars become shorter as the fish ages . The lateral line curves upwards at the area between the fourth and ninth lateral scales . Banded archerfish can reach a maximum length of 30 centimetres ( 12 in ) ; however , average length is about 20 centimetres ( 7 @.@ 9 in ) .

Banded archerfish have large eyes , which , unlike many other fishes , are positioned for binocular vision . The head is slightly shorter than the body , with a distinctively pointed snout . Juveniles may be yellow @-@ green to brown on the dorsal side and silvery on the ventral side . The juveniles ' flanks are grey @-@ green . Some banded archerfish have irregular yellow patches between their bands .

The possibility of sexual dimorphism in banded archerfish has not been investigated .

= = Comparison to other archerfish = = =

The banded archerfish and its relative the largescale archerfish ( *Toxotes chatareus* ) are

sometimes grouped and sold together under the label " archerfish " . However , the banded archerfish has four dorsal spines whereas largescale archerfish has five . The banded archerfish usually has four to five wedge @-@ shaped bands , but largescale archerfish has six or seven spots and shorter bands in a regular , alternating pattern . Unlike the silvery banded archerfish , the largescale is sooty in colour . The banded archerfish may also be confused with the smallscale archerfish , *Toxotes microlepis* . These are more difficult to distinguish , but the most striking difference is in the last two bands . While both species have four or five wedge @-@ shaped bands , those of the banded archerfish extend to the dorsal fin , whereas those of the smallscale archerfish do not ; there are two spots on the dorsal fin separate from the main bar .

= = Behaviour = =

= = = Diet and feeding = = =

Banded archerfish are omnivorous . In the daytime , they come to the surface to feed on floating matter . Their diet comprises plant matter and insects , which they are able to " shoot down " . Banded archerfish are also able to capture prey by jumping out of the water and seizing it from low overhanging branches . Young archerfish form small schools while learning aim , increasing the chance that at least one shot will hit the target . Their diet also comprises underwater prey , including crustaceans and small fishes .

= = = Shooting = = =

Banded archerfish have mouths adapted to spit jets of water over distance , usually to knock prey into the water . The banded archerfish shoots the jet of water by raising its tongue against the roof of its mouth , forming a tube . The opercula then close quickly , pressurizing water along the tube . Most archerfish are able to spit at a range of 150 centimetres ( 59 in ) , though some larger specimens may be capable of ranges of up to 2 to 3 metres ( 6 ft 7 in to 9 ft 10 in ) . When a prey is shot down , the banded archerfish begins to move towards the place where it will land within 100 milliseconds and can reach it within 50 ms of its hitting the water .

A study found that banded archerfish could be trained to hit moving targets at an accuracy rate of greater than 50 % . According to this study , the ability to hit moving targets is a complex learned behaviour , and can be learnt from other members of the school . The study concluded that fish could shoot more accurately after observing other members of the school shooting .

The banded archerfish is able to hit targets with a high degree of accuracy , despite refraction of light at the water @-@ air interface . It was believed that they are able to achieve this level of accuracy by positioning their bodies to shoot from directly under the intended target . However , later studies have found that banded archerfish are able to achieve great accuracy even at angles , suggesting that they are somehow able to compensate for refraction . This may also suggest that banded archerfish are capable of three @-@ dimensional tasks .

= = = Breeding = = =

The breeding habits of the banded archerfish are not well known . Banded archerfish first begin to breed when they are about 10 centimetres ( 3 @.@ 9 in ) long . The banded archerfish reproduces by spawning . There are reports that banded archerfish go to saltwater reefs to spawn , but these have not been confirmed . Archerfish lay 20 @,@ 000 to 150 @,@ 000 eggs at a time . Banded archerfish rarely breed in captivity .

= = Distribution and habitat = =

The banded archerfish inhabits the Indo @-@ Pacific and waters off northern Australia , and less

frequently those on the southern coast of Australia . It can be found from India eastwards to the Philippine Islands , southwards to Australia , as well as in waters off the Solomon Islands and the Indonesian Archipelago . It has been observed as far east as the New Hebrides ( now known as Vanuatu ) . The banded archerfish occurs mainly in areas of brackish water . Mangrove estuaries are its primary habitat , though it occasionally moves upstream into freshwater rivers . It is associated with reefs and has been reported to occur near overhanging vegetation . While they may move between fresh and salt water during their life cycle , they do not do so to breed .

= = Relationship with humans = =

Banded archerfish are fairly common in the Indo @-@ Pacific and are not currently endangered . They have a minor commercial role in fisheries and may be sold fresh in markets or collected for the aquarium trade . Banded archerfish are threatened by the destruction of their mangrove swamp habitat and by pollution .

= = = In aquaria = = =

Species in the genus *Toxotes* , including the banded archerfish , are kept as aquarium fish . In aquaria , the banded archerfish can grow up to 25 centimetres ( 9 @.@ 8 in ) long . They swim at the top level of the aquarium . Banded archerfish can be kept in small groups of three to five ; fish of the same size get along but fish that are larger may be aggressive towards those that are smaller , and even try to eat them . They may live from five to eight years in captivity , and occasionally nine or ten . Banded archerfish need warm water , usually between 25 and 30 ° C ( 77 and 86 ° F ) . The aquarium should be large with middling amounts of plant growth and plenty of space for swimming . It should be at least 20 to 30 centimetres ( 7 @.@ 9 to 11 @.@ 8 in ) deep .

Banded archerfish are generally not recommended for average home aquaria despite their attractive appearance because they are difficult to care for and require special conditions . Banded archerfish prefer to shoot and capture live food rather than be fed flake food , and are therefore difficult to feed . They need brackish water as well as a tall canopy . In the wild they are able to jump out of the water to capture prey on overhanging branches ; a tall canopy is required to prevent their jumping out of the aquarium . Banded archerfish should be kept in an aquarium with a volume of at least 45 to 55 US gallons ( 170 to 210 l ; 37 to 46 imp gal ) , though a greater volume is preferred . Because of such difficulties in caring for banded archerfish , the species has not yet been successful in captivity .