THE INDIAN CLIMBING PERCH

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Possessing accessory branchial organ and eyes capable of aerial vision, the celebrated walking fish can survive out of water for several hours and is even known to climb trees !

POPULARLY known as the 'Indian Climbing Perch', the celebrated walking fish belongs to the genus *Anabas* found all over India. This is a valuable food fish in our country. It is well known for its breathing habits and hardiness which permit easy handling in commerce. The fish can survive out of water for several hours because of its accessory respiratory organs. Hitherto, it was thought that a single species, *Anabas testudineus* (=scandens), occurs in our country. Recent investigations by the author revealed the presence of two species, *Anabas testudineus* (Bloch, 1792) and *Anabas oligolepis* (Bleeker, 1855) (Fig. 1).

Discovery

It was Lieutenant Daldofff (1791), a Dane, who first noticed the fish enjoying itself in the rain water that had collected in the fissure of a Palmyra palm. He named the species *Perca scandens*, or climbing perch. From that time the fish was known and said to climb palmyra trees. Several ichthyologists, however, discounted the story.

Compressed towards the tail fin, the body of the fish is streamlined. It grows to a length of six inches. The head is very hard and blunt. Gill covers are edged with spines projecting backward. The whole body is covered with hard overlapping scales bordered with spinules. The dorsal and anal fins have spiny rays. Spines of the opercular border and fins are useful in protecting the animal from land as well as aquatic enemies.

Respiration

Anabas, like other fishes, possesses ordinary gills for gaseous exchange. But these gills are much reduced and are not enough for respiration.

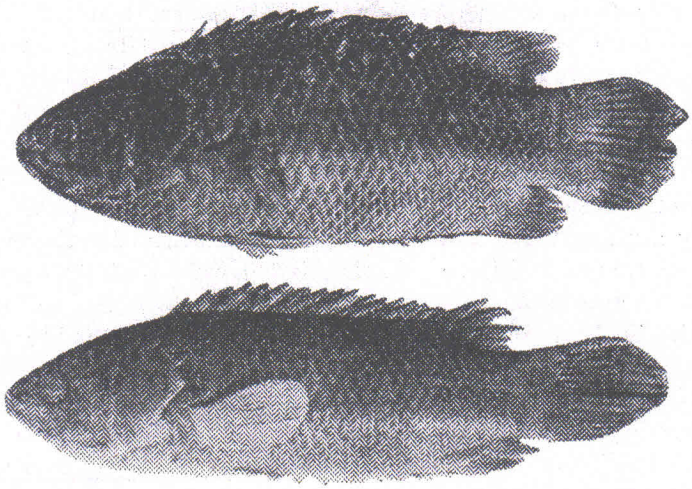

Fig. 1. *Anabas oligolepis* (top) and *Anabas testudineus* (bottom)

There is a special structure called accessory branchial organ to carry out major part of respiratory process. This is situated in a cavity above the gills, consisting of a series of exceedingly thin bony laminae situated one above the other and covered by vascular mucous membrane (Fig. 2). The fish frequently comes to the surface of water to take in atmospheric air. If prevented from coming up to the surface it suffocates and may die. This clearly proves that the fish requires atmospheric air and does not completely depend upon gills for respiration. Respiration by taking in atmospheric air takes place with the help of accessory branchial organ in the presence of moisture. The fish can survive even for two days out of water, if moisture is provided. The Chinese utilise this habit of the fish for transporting it live over long distances in earthenware pots with some water sprinkled on it.

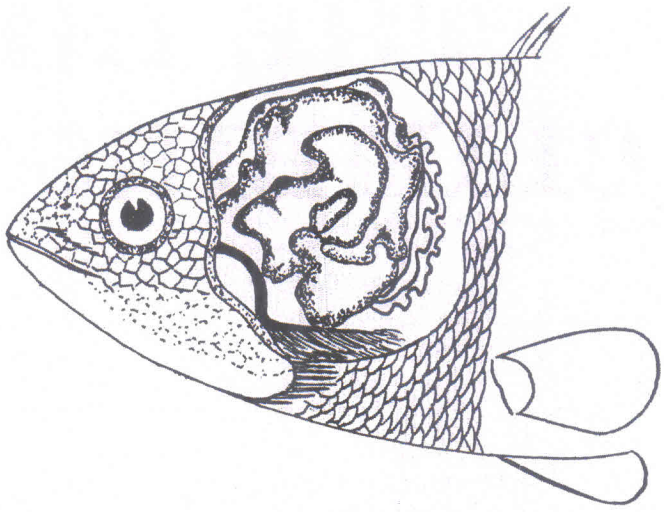

Fig. 2. Accessory branchial organ of *Anabas*

Grinding apparatus

The climbing perch is a voracious feeder. In laboratory it accepts almost any food from *idli* to cockroaches. Margins of jaws are provided with rows of small conical teeth. They are helpful in killing and crushing insects. When regularly fed with cockroaches these fishes put on weight within a short period. *Anabas* is found in paddy fields where it feeds on paddy grains. In a way it destroys paddy crop. Just before the crop is ready the plant bends. *Anabas* is then seen jumping out to bite the grain. In laboratory, when fed with paddy grains it immediately swallows them, then makes grinding sounds which are clearly audible from a distance and vomits out the husk! For this purpose there is an efficient grinding apparatus in the pharynx. This grinding apparatus consists of two sets of teeth, one on the roof of pharynx and the other on the floor. The dorsal set of teeth roofing the pharynx is in three patches. An anterior 'T' shaped patch consists of a number of bluntly conical teeth, some of them are lengthy. Behind this patch are two patches of teeth arranged side by side nearer to the longitudinal arm of 'T' shaped patch. In these two patches, a number of teeth with blunt surfaces are crowded together so that a hard, uneven surface is formed very much resembling the face of 'grinding stone' (Fig. 3, left). Teeth situated towards inner side are much stronger. The ventral set of teeth forming the floor of the pharynx consists of two patches. Both these patches are more or less trinagular in shape closely set so that it appears as a single triangular patch (Fig. 4, right). Each patch is made up of a number of hard teeth with blunt surfaces. Teeth situated towards the inner side are stronger. The sound that is audible when the climbing perch is fed with paddy is evidently due to the fact that the paddy grain or grains are well ground between these two sets of pharyngeal teeth, one dorsal and the other ventral in position. As a result of grinding, paddy is dehusked, husk is vomited and the well ground grain is swallowed.

Walking

Anabas often goes on excursions over land from pond to pond. Its eyes are capable of aerial vision. During such movements the fish uses its gill covers and fins. Though it can move on land in an upright position, the usual movement is effected with the animal lying on lateral side. In this position the gill covers and the tail fin are used. The gill cover facing the ground opens out and gains hold with the help of its spinous margin. Meanwhile, the tail fin hits against the ground, the fish jerks forward and the gill cover comes back to normal position. This process is repeated. It has been noticed that both gill covers open out and close in at the same time. While moving in an upright manner, the paired fins are well spread, gill covers open and close persistently and tail fin lashes sidewise violently. However, the fish cannot move in a straight line. The fish moves fast out of water.

Climbing of palmyra trees to about 5 feet from ground level is discounted by many ichthyologists. But even today, native fishermen narrate stories of having seen *Anabas* climbing wild date-palm and drink-

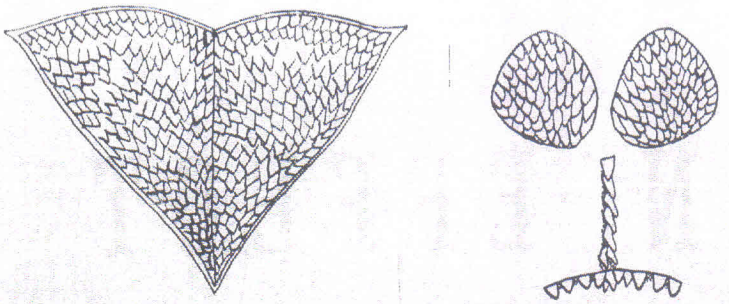

Fig. 3. Dorsal (left) and ventral (right) sets of teeth of *Anabas*

ing toddy. H.M. Smith (1945), a noted ichthyologist, states that in Thailand *Anabas* is exposed for sale in large wicker baskets. The fish is often seen climbing up the sides of the wicker baskets and jumping out. He asserts that "A palmyra palm, with its rough bark and its fronds beginning near the ground, would be no more formidable for an *Anabas* to ascend than would be the vertical side of a wicker basket".

Colour

It is greenish on dorsal side and flanks, pale yellow on abdomen. Paired fins are yellow. There is a distinct dark spot on the base of caudal. The two largest spines of the gill cover are connected by a black membrane. In juveniles four faint vertical bands are seen. They disappear with age. It has been found that fishes collected from Kolleru lake (Andhra Pradesh), which have got connection with the sea are as a rule very dark. This may be due to various environmental factors.

Variety

Day (1878) collected a specimen of *Anabas*, deep orange in colour, from Ganjam district in Orissa. The author collected a number of specimens of the above variety. They were light grey on dorsal side and flanks and deep orange on abdomen. All these specimen were identified as *Anabas testudineus*. One specimen has also been collected from Red Hills, Madras state, which had a dark patch of 8 mm. diameter on posterior part of head and a dark spot on posterior border of eye.

Accidents

As stated by Day (1878), accidents do occur resulting in death of persons. Fishermen kill the fish by breaking their vertebral column by a bite. Occasionally the fish slips into mouth. Extrication of the fish is difficult as the spiny rays of the fins and operculum are backwardly directed. The person dies of suffocation and bleeding. Recently, a similar case has been recorded from a village near Bhimavaram (Andhra Pradesh) reporting the death of an 18 year old boy. While clearing a tank he caught an *Anabas*. He put the head end of the fish in his mouth so that his hands would be free for cleaning the tank. The fish slipped into his mouth causing death. Dr. E.W. Gudger, of the American Museum of Natural History, has published accounts of cases in which Oriental children and adults have been killed by live fish wedged in the pharynx.