

## The Importance Of The Formation Of Physiological Reflexes In Fish

Aliyeva Mavjudaxon Bahromjon qizi,  
Otajonova Sarvigul Ravibjanovna,  
Ma'murov Xurshidjon Abduvohidovich

Kokand State Pedagogical Institute  
Faculty of Natural Sciences

**Annotatsiya:** Maqolada baliqlarning òziga xosligi, shartli va shartsiz reflekslar , ovqatlanish, mudofa , tadqiqot reflekslari, instinktiv refleksiyalar, konditsioner refleks, baliqlarni turli muhitlardagi harakatlari yoritiladi

**Kalit sòzlar:** baliqlarning òziga xosligi, shartli va shartsiz reflekslar , ovqatlanish, mudofa , tadqiqot reflekslari, instinktiv refleksiyalar, konditsioner refleks,

**Annotation:** The article describes the specificity of fish, conditioned and unconditioned reflexes, nutrition, defense, research reflexes, instinctive reflexes, conditioning reflex, the behavior of fish in different environments.

**Key words:** fish specificity, conditioned and unconditioned reflexes, nutrition, defense, research reflexes, instinctive reflexes, conditioning reflex,

**Аннотация:** В статье описывается специфика рыб, условные и безусловные рефлексy, питание, защита, исследовательские рефлексy, инстинктивные рефлексy, условные рефлексy, поведение рыб в разных средах.

**Ключевые слова:** рыбная специфичность, условные и безусловные рефлексy, питание, защита, исследовательские рефлексy, инстинктивные рефлексy, условный рефлекс,

Fish are unique. It has been known to everyone since ancient times. So most of us have certainly heard stories about blue-bellied and blackfish, about the squid that feeds on its prey by tapping its tail; about a corpse that rose to the surface in the woods and hid in the depths when it saw the fisherman; about a squirrel that kills insects with a stream of water.

P. Pavlov conducted many observations and experiments in which he found that unconditioned and conditioned reflexes are inherent in all living beings. Of course, unconditioned reflex activity is put on fish at the genetic level.

The food reflex plays a big role in fish life. Thus, wild fish are attracted by the movement of the prey: the fish does not pay attention to the attractive objects without movement, and the movement, which is very similar to the movement of fish, certainly does not go unnoticed. In non-predatory fish, the food reflex works both in appearance and in the victim's odor.

The behavior of different fish during hunting also varies: squirrels and squirrels usually attack from ambush; fast-swimming - salmon, tunes - chasing prey. The natural reflexes of caring are very important for the survival of a species. For example, salmon fish chase away all the fish before spawning and put their vaikras in the soil on rocks and sand. The ovipositor protects the baby eggs until they are cooked, the sputum males build a home for the caviar and also protect the fish. The pursuit of freedom is also an unconditional reflex. So, if you put the fish in an aquarium, it can stop feeding and starve to death. In this case, the freedom reflex kills the food reflex. The defensive reflex scares the fish away from noise, shadows, odors. In most cases, the fish avoid danger, but some try to scare the enemy. The needle and kutkutia swell and form a ball. Yersh and the arrow raise their hind wings, and the skate uses daggers.

The research reflex also protects the fish from danger. Seeing foreign objects, the fish sees, listens, tries to determine if it is dangerous. But without approaching the subject, it is impossible to understand what it is. Therefore, overcoming fear, the fish comes closer. The following animal instinct is described in one of Main Reed's novels: the

hunter runs out of food, but he still had to walk a lot. He saw a herd of antelopes, but could not approach them from a shooting distance without fear. Then he got up and waved his legs in the air. This attracted the antelopes, and they came closer and obeyed the instinct of research. Then the hunter quickly jumped to his feet, picked up his weapon, and shot one of the animals.

The same is true of fish. Some fish show this instinct when they drop a bulb into the water. However, not all fish instincts are innate, many are acquired. Once upon a time, squirrels spawned in the ocean, but as there were fewer enemies in the rivers and the conditions were more comfortable, the instinct changed, and they began to spawn in the rivers.

The Ladoga trout also enters the river and rises upstream. However, fish instinct does not always change depending on the circumstances. Thus, the construction of the Volkhov power plant blocked the white fish from their breeding grounds and led to the almost extinction of this species. Many experiments were conducted as a result of studying the conditioned reflexes of fish. For example, if you make a knot from red thread in an aquarium, the fish will definitely "taste" it. At the same time, you need to throw your favorite dishes in the corner and repeat these steps. Soon, the fish turn themselves into a right corner, even if they just don't bring food. If you replace the red thread with green, the fish will not touch it without feeding. But you can retrain them - keep them green round and don't touch the red.

Sound can also produce a conditioned reflex. If they hear a bell while feeding the fish, they will approach when the bell rings. Most of the fish are unique. There are "hunting stories" about blackbirds and bluebirds. It's about fish that get lost in the depths when they come out of the woods into the water and see a fisherman. It's about

a "smart" crow - it hits the food with its tail and eats it. As for the "cunning" trout, they deceive their less intelligent partners. Most of these stories are the product of imagination, but there are examples that confirm the meaningful actions of the fish. The clever movements of the fish include avoiding specific captives and avoiding the nets of thick and rough forest fishermen. How to explain these "smart" actions of a fish. Confirmation of this, from the great Russian physiologist I P. Pavlov, has not been reported by anyone else.

As a result of many experiments and observations, I. P. Pavlov found that all animals have two types: unconditioned reflex and activity associated with conditioned reflexes. Clearly, reflex activity has been put into the animal "in such a way" that it has been developed for a long time and for many generations, and consists of a chain of the body's instinctive reactions to changes around it. The food reflex also plays a key role in the lives of animals, including fish.

The food reactions of fish are very diverse. Predatory fish feed on the food, which is especially involved in the actions of the victim. Place a dead sponge on the bottom of the trout aquarium, it is ignored. However, if we throw a live sponge into an aquarium, we can see that the whole flock of fish is moving, and we can see that the prey is also the most agile. The attitude of predators to artificial food is less important. No beast will approach a prey that has not moved, and the most noticeable thing is that it has moved so fast that it has disturbed the waves in the same way.

Conditional reflexes of fish. The connective nerve tube of the vertebrae creates the best conditions for connecting all parts of the nervous system. Its leading part intensifies the control functions of the brain, and has remarkable changes in structures with physical reflexes. Most people who fish in an aquarium know how easy it is to

teach them to swim to the surface when the owner makes a gesture of throwing a pinch of food into the water. Seeing the hand of a man approaching the surface of the water is a sign of one of the conditioned food reflexes of the present, if it has led to the occurrence of a defensive reaction ahead. In aquarium fish, it is possible to develop conditioned food reflexes, such as lighting a certain place in the aquarium, where feeding, touching the aquarium wall, if accompanied by feeding, and so on.

The ability to develop new behavioral skills in the natural environment helps fish adapt to living conditions. The fact is that fish produced under artificial conditions on a fish farm die in large numbers from predators when they enter an open water basin, river or lake, because a safe life in industrial ponds does not develop their protective behavior. Improving the survival of live fish species is achieved by artificially developing their conditioned protective reflexes in the wild fish species. To develop such reflexes, a scary owl resembling a wild fish was lowered into the pool with a pool of fish, and an electric current passed through the water and beat on its surface. After such combinations, only the appearance of the number of the predator seemed to avoid the fish. The practical significance of such a method of increasing the efficiency of fisheries can be assessed based on the results of experiments conducted on one of the farms in the Karelian watershed. In the fenced area of the pond, they caught some valuable fish and a predator - a gull. released a pre-calculated number. After 1–2 days, it was determined how many fish were stored.

It is well known that amateur fishermen regularly bring in the rest of their food and throw away everything that may be suitable for the fish, especially to ensure good holding in their favorite movements in the favorite place. In this way, a conditioned food reflex is produced in fish conditions, which attracts them to the feeding site.

Recently, there have been reports of the consumption of eel in some places to increase the number of coastal fishing fish. Conditioned reflexes, as we know, are the body's temporary connection with the environment. It is a complete balancing tool for the body to temporarily lose balance without rebalancing and reappear. But they are also formed in the presence of NOP, which accelerates the formation of conditioned reflexes and prolongs their retention time. But the reflexes and instincts provided for in the natural environment are long-term memories.

Conditioned reflexes are formed in the presence of the upper parts of the central nervous system. They can be very complex because the conditional effect is not just a single environmental factor, but a whole complex of them. In humans, both words and thoughts can serve as a conditioned stimulus to a second signaling system (which separates them from animals), and conditioned reflexes are the same under the influence of certain environmental factors. Conditioned reflexes (e.g., in a laboratory setting) can become reflexes with more resistant natural conditions than those developed. They are formed in the life of the organism in its natural presence under the influence of stimuli in the body, they are constantly associated with the means that cause this or that unconditioned reflex, determining the connection of the organism with the external environment. At first glance, natural conditioned reflexes look like unconditioned ones. The appearance and smell of the meat indicate that the dog has bones. It's just an unconditional reflex. But this is not the case. Soviet physiologist I.S. Tsitovich showed that a dog that had been drinking milk for 7 months did not produce saliva to smell the meat. What is observed in these adult dogs is not unconditional, but a naturally occurring reflex.

The technique of conditioned reflexes is widely used in testing to determine the toxicity of substances in warm-blooded animals. The application of this technique in fish experiments has shown that it is more sensitive than many other methods and has revealed that pathological changes can occur in the body. The essence of the technique is to determine the conditioned reactions of fish, in which the effect of test substances or complex wastewater is applied. The study of conditioned reflexes is an important methodological technique in determining the nature and extent of exposure to harmful chemicals in the body in a chronic sanitary-toxicological experiment (S. Cherkinsky and V. Tugarinova, 1962; O. N. Elizarova, 1962 and others). The development of the reflex takes place as follows. The fish are kept in an experimental aquarium for 2-3 days without food. Under the influence of hunger, by slowly throwing food into the food, the fish eventually learns to push the door with its head and get out of the food. Pressing the door immediately provides food. In the future, this action will be combined with any indifferent stimulus in accordance with the indifferenced method of developing a conditioned reflex in animals. The sloping bottom prevents the fish from stopping in the feeder. Taking the food, the fish goes deep. Kokorina Ep. Conditioned reflexes and the effectiveness of animals. - M.: Agropromizdat, 1986.

In the following months, examination of conditioned reflexes confirmed that a dose of 12.5 mg / kg was effective, as it resulted in a marked change in conditioned reflexes, an increase in latent periods, and a state of change in all experimental rats. Negative conditioned reflexes are produced only after the strengthening of the response. The intermittent lamp (negative conditioned stimulus) is canceled after 10 seconds to strengthen the food after 10 seconds. Fish that enter the eating zone are either hit by a stick or an electric shock. Differential stimuli should be used between

positive presentations. First, it is best not to use more than two negatives for five positives, and then there should be equal warnings (five positives and five differentiators) in the experiment. During the exercise, the fish stop accessing food (negative conditioned reflex occurs). In such a choir, the fish are not punished. After developing conditioning reflexes and strengthening the stereotype, the animals were distributed in each group in such a way that different higher nervous activity manifested differently. In females, conditioned reflexes are formed under the conditions of mating, artificial insemination, fishing for male fish, and so on. Some mares, for example, have resistance to the appearance of a stable human, leading animals to a specimen, female, or artificial insemination. When the male fish enters, the female in the hunt begins to show signs of pearls. Typically, conditioned reflexes of movement in fish are manifested in 4-10 combinations. The total duration of the stimulant effect of conditioners usually lasts 15 seconds, of which 10 seconds are conditioned by conditioned stimuli and 5 seconds with unconditional strengthening.

It is characteristic that such a reaction is recorded only in fishing schools and how accurately it reflects the education of the species. - An important event is emphasized: if a group of fish serves as an imitation, the repetitive reaction becomes more accurate; there was often no such reaction to a person's behavior (E.Sh. Airapetyants, VV Gerasimov, 1965, V.Verasimov, 1965, 1967). On this basis, individual members of the pack are given the opportunity to move individually so as not to disrupt the movement of the pack within their "living space" (E. Shaw, 1965).

The role of congenital positioning reflexes is clearly demonstrated in experiments on several fish species. Thus, the aquarium was divided into longitudinal glass divisions and two groups of fish were placed, which were visually connected to each other.



They made contact. One group was dealing with an occasional electric shock, which was thrown at half of the aquarium. Without the second, the indestructible group mimicked the behavior of the former in 83–95% of the experiments. On this basis, it is possible to develop a conditioning reflex in fish, which is an unconditional conditioned reaction.

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