

The main parts, body shape and outward features of fish

Objective: Learn about the diversity of body shapes of fish, structure of their outer
.organs

Materials and equipment: fresh fish, set fixed preparations of fish (10–20 species). Tables:
"The external structure of fish", "Fish body shape", "Location and types of fish mouth".
.Tools: tweezers, dissecting needles, cuvettes

Basic theoretical information

The main parts of fish body. The body of fish consists of three parts: head, trunk
.and tail

.The head part is the distance from the mouth to the back edge of the gill cover

The trunk part is the distance from the end of head to the anus or to the beginning of the
.anal fin

The tail part is the distance from the anus (from the beginning of the anal fin) to the end of
.the tail fin

There are mouth, eyes, nose and gill openings, spiracles on the head of the fish. Some fish have whiskers which are the bodies of touch and taste (catfish, burbot, eel). Shape of fish head is very diverse. Hammerhead shark's head is shaped like a hammer, on the edge of which there are the eyes [2]. American paddlefish has a head with a large spatulate extension. The upper jaw of some species is stretched into a long xiphoid appendage, which is used in the attack (swordfish); sometimes it has sawtooth appendage (fish-saw). Mouth of pipe-fish is stretched into a long tube [3]. Hagfishes and lampreys have it turned into a kind of suction cup. The head part has the following: the snout which is the distance from the head to the front vertical of eye; the space behind eyes is from the back vertical of the eye to the distal end of the gill cover; cheek is part of the rear vertical of the eye to the rear edge preopercular bone; forehead is the space between the eyes. At the bottom part of the head there are placed: chin which is the part of the head from the beginning of the mandible to the place of connection or attachment of gill membranes; throat is the distance from the gill membranes to the base of the pectoral fin; symfyzys is the place of joining of the bones of
.the lower jaw

Cartilage and sturgeon fish have the holes named spiracles behind eyes, which are remains of not functioning gill slits. Sometimes the fish head has arms as outgrowths of thorns and spines.

The location and structure of the mouth of fish depends on the nature of power. There are (the following types of mouth (Fig. 1

Upper (half-upper) mouth – lower jaw is protruding upwards (white carp, bleak, (1 sabrefish); 2) Terminal mouth – the upper and lower jaw are equal in length (perch, pike); 3) Lower (half-lower) mouth – the upper jaw (or rostrum) is strongly protruding (cartilage, (sturgeon

Figure 1. Forms of fish mouth: 1 – upper; 2 – lower; 3 – terminal; 4 – retractable; 5 – funnel-shaped.

Fish, which feed near the bottom (benthophages) typically have the lower (or half-lower) mouth and planktophages have the upper mouth. Except sharks (predators) which have the lower mouth because of the head hydrodynamic body – the rostrum [5]. Some fish have mouth which is able to push, forming a tube, through the nomination of premaxillary bones (bream, carp). Mouth of hagfishes and lampreys due to parasitic or hemiparasitic way of (power is armed with horny "teeth" and has a funnel shape (sucking mouth

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Location of the eyes of fish depends on the environment. Eyes of bottom fish are at the top of the head or above the midline of the body. Eyes of pelagic species are on the sides of the [head, at about the axis along the body [5, 18-22

Head of fish ends with gill slits or holes, the amount of which may vary: in lampreys – 7 pairs; in hagfishes 1 to 15 pairs on each side; sharks – from 5 to 7 pairs; in chimeras – 4 pairs of gill openings covered with folds of skin; all bony fishes – 1 pair closed by the gill cover

Shapes of fish body. Fish are adapted to living conditions mainly by form of the body. Most of them are streamlined: sharp head from which body gradually thickens, reaches its

greatest thickness in the middle and tapers to the tail. Thereby fish body crashes into the
.(water column with less stress (Fig. 2

Figure 2A. Shapes of fish body: 1 – sagittal (garfish, pike); 2 – torpedo shaped (mackerel); 3 –
bream shaped (bream); 4 – symmetrically flattened laterally (ocean sunfish); 5 –
.(asymmetrically flattened laterally (flounder); 6 – eel shaped (eels, lampreys

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Figure 2B. Shapes of fish body: 7 – needle shaped (pipe- fish); 8 – tape-like (king herring); 9
– flattened in the spinal ventral direction (skate, monkfish); 10 – spherical (fish ball, fish-
urchin); 11-cube-shaped (yellow boxfish); 12 –makrurus shaped (makrurus); 13 – unusual
.(sea horse

Progress of work

To examine carefully the collection of fish and ungroup them by the shape of the body. .1
Pay attention to the location and number of gill openings, the size and placement of the
eyes. 2. Make a schematic drawing of fish and note all of the body parts. 3. To determine the
boundaries of all body departments on 2–3 species of fish. 4. Select the forms of the body,
most commonly found in fish of our waters. 5. Show the types of fish heads with various
.location of mouth

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