

The study of fish nourishment

Objective: Learn basic methods of studying of fish nutrition, learn to select and analyze the .sample material

Materials and Equipment: Fresh fish – 5–8 species. Tools: scissors, scalpel, dissecting needles, ruler, cuvettes, Petri dishes, tweezers, filter paper, thick thread, microscope, .torsion, pharmaceutical and technical scales, formalin

Basic theoretical information

The study of fish nutrition is one of the problems of determination of patterns of stocks and catches of fish [13, 14]. Knowing the features of fish nutrition is used in the research of conditions of fish foraging, processes of acclimatization of new species, determination the causes of fluctuations in numbers, in studying of fish growth, in the process of determining the optimal fishing effort and the development of measures for the most efficient use of feed .resources of reservoirs

There are two methods of collecting and processing materials on studying of nutrition: .individual and group

In case of individual collecting each fish is analyzed separately in case of group collecting all .tracts are collected from a group of fish, and their content is treated as one

Material is collected by means of active gear (scraper, seines, trawls) which do not stay in the water for a long time. The sample for tests on nutrition should consist of 10-100 .individuals, depending on the method of study and research purposes

Collecting of samples for the study of young fish nutrition is carried out in bays and shallow parts of reservoirs using whitebait seine with length of 10 m, made of nylon netting №6. .There must be at least 25 pcs. of each type of youth in the sample

Simultaneously with sampling for nutrition study in the same places hydrobiological samples (benthos, plankton and nekton al.) are taken, it is necessary to conduct hydrochemical and hydrological studies. In the study of nutrition of young fish the data on the nature of the .habitat (soil, vegetation, etc.), weather conditions is recorded additionally in the log

To study the nutrition of fish in the places of their catch the collection must be carried out as :follows

.1 The caught fish is measured and weighed ;

.2 The fish up to 20 cm is fixed completely ;

.3 From the fish longer than 20 cm only intestines should be taken, they are cut off from the
;esophagus to the anus

.4 Each intestine is wrapped in gauze with label fixed in 4% formaldehyde ;

.5 Samples must be fixed and stored in big glass banks ;

.To study the diurnal nutrition of fish samples are taken every 2 hours for 1.5 days

:The degree of filling for each part of gastrointestinal tract is assessed on a scale of Lebedev

;empty – 0

;single – 1

;small filling – 2

;middle filling – 3

;plenty full stomach or intestine – 4

.mass, stretched intestine – 5

Filling of the gastrointestinal tract is recorded by three-digit number. For example, 321 –
.filling of esophagus – 3, stomach – 2, intestines – 1

:The extent of digestion is estimated as follows

;organisms are well preserved – 1

;slightly digested organisms, species identification is possible – 2

half-digested organisms partially damaged, but the definition for the separate parts is – 3
;possible

organisms digested very heavily damaged, but the definition for the separate parts is – 4
;possible

.completely undefined mass – 5

The degree of digestion is also determined in each department of tract and recorded in .three-digit number

Within all the methods of digital processing of materials for determination of the nutrition of fish is the most accurate is the method of indexes. Index of filling of intestines quantifies the intensity of the nutrition of fish. It is determined by the ratio of the feed clot or its individual components to mass of fish. There are general indexes of gut filling (based on the weight of the whole feed clot) and indexes of gut filling (based on the weight of the individual feed components). Index of gut filling is expressed as a percentage, but often to prevent them from lodging in the form of fractions, it is accepted to multiply index of 10,000 or express in .prodecimylus

Progress of work

1. Carry out biological analysis of each individual, and define a standard industrial body .length, weight and age of the fish

2. Make the dissection of fish with scissors or a scalpel on the ventral side of the anus to the head. Gastrointestinal tract should be cut from the esophagus to the anus. To tie with a .thread the front and rear end of the tract to prevent the loss of food

3. Determine the weight of fish without internal organs, sex and stage of maturity of sexual .products

4. To assess the degree of filling of gastrointestinal tract with food by Lebedev's sixpoint ;scale

5. Tract should be cut into three parts, the contents of each is move with a scalpel in a Petri .dish. Bolus of food is dried by filter paper and weighed

6. The content of each part is examined under a microscope. The extent of digestion is .determined

7. Determine the index of intestine filling. This requires the mass of gut to be multiplied by 1000, and then divided by the mass of fish. The results are recorded in prodecimylus – .0/000

8. :The results are added to the Table 5

Table 5. Parameters of fish nourishment

Species of fish №
Sex, stage of fertility
L, cm
L, cm
Mass, g
Age
Degree of intestine filling
The extent of digestion
The index of filling, 0/000
.1
.2
.3

Questions for individual work

1. What fish feed on phytoplankton? 2. What do bentophagous feed on? 3. Which method is used for determining of nutrition spectrum of predatory species? 4. How much food should fish consume? 5. What is the index of intestine filling? 6. What changes in the power range of fish occur throughout their lives

World News of Natural Sciences 18(1) (2018) 1-51