

Manufacturing of preparations from scales and determination of the growth rate of fish

Objective: Learn to make preparations from fish scales and master the method of determining of E. Lea about growth rate of fish of different age groups

Materials and equipment: A set of fixed or fresh fish – 10–20 species. Preparations: scales of different species of fish. Table: "The growth and size of the fish." Tools: scalpel, forceps, dissecting needles, soft brush, microscope, magnifying glass of 10–20 increase, ruler, calipers, ocular micrometer

Basic theoretical information

Manufacturing of preparations from scales. Selected samples of scales often need to be kept for long time, so permanent preparations should be made

Selected fish scales are put for 1–10 minutes in a weak solution of ammonia. After this they are washed using detergent. To remove mucus and epidermal pellicle scales are wiped with a soft cloth

The scales should be observed under a microscope or with a slight increase under binocular. It is selected 5–8 scales with the correct form of the intact edges, 3–4 of which, with most distinct annual rings are separated for survey

_____ № Preparation

, Zander, № 400, 26.05.17

, Zaporozhian Reservoir

Viyskove village

N; 35°20'80.05" E "30.75'22°48

L – 34,0 cm, l – 28,0 cm, m = 350 g

.Figure 8. The example of label for preparation of scales

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Then wet scales are placed between the two lenses of subject that are fixed quiescently.

Labels which indicate the following information: the number of preparation, name and number of fish according to biological journal, date, place of collecting, station of selection, absolute length (L), industrial length (l) and weight of fish (m) are made on preparations (Fig. 8).

The logbook is prepared for preparations, where numbers of preparations will be recorded. Thereafter, the finished product is stored in boxes

Determining of the growth rate of fish. Growth of fish is defined as increasing of its weight and linear body sizes. Fish grow throughout life, but uneven: at a younger age, they grow faster. It is known that during puberty, migration, wintering or spawning their growth slows or even stops. The presence of age rings on scales allows determining the relationship (between growth of fish scales and body (Fig. 9

Analysis of growth allows making important economic conclusions about the profitability of growth and the maximum allowable age of fish in terms of the most rapid and fulling use of food resources of reservoirs

Figure 9. The ratio between the growth rate of the fish body and its scales (by Nikolskiy, 1963)

In his studies about age and growth E. Lev concluded that fish length and length of scales vary with age directly proportional in relation to each other

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$L C$

=

$\ln cx$

= whence \ln ,

$L C$

where L is fish length, mm; C is length of scales (from the center to the edge of the part in which age rings are determined); l_n is fish length at different ages, mm; cx is length of scales (in different years (from the center of the scales

Knowing length of fish in the moment of its catch and in all the previous years, its annual growth can be determined

$$\dots t_1 = l_1; t_2 = l_2 - l_1; t_3 = l_3 - l_2$$

Progress of work

Determine the absolute length of each specimen. 2. To select fish scales and determine age. 3. Manufacture a preparation of scales. 4. Use calipers or eyepiece micrometer measure the length of scales from the center to the edge of each age ring. 5. to calculate a linear increase in years of life for each specimen using E. Lea formula, record the data into a Table 3

Table 3. The growth rate of fish

Species	L, cm	Age	No
			Linear increase (t1; t2; t3...), cm
			.1
			.2
			.3

Questions for individual work

How are preparations from fish scales made? 2. What is the growth increase in fish? 3. How does the growth of fish scales and body occur? 4. What is the growth rate of fish? 5. List the age groups of fish, number of rings on the scales and designations of ages