

Aral Sea - Zooplankton

Methods of zooplankton sampling and laboratory preparation

Zooplankton study was conducted using standard methods:

- Kiselev I.A. 1969. The plankton of seas and continental waterbodies. Leningrad, Nayka. V. I. 657 p.
- Instruction on collection and treatment of the plankton. 1971. Moscow, VNIRO. 82 p.
- A handbook on collection and treatment of samples at hydrobiological surveys in the fresh waters. Zooplankton and its production. 1984. Leningrad. 34 p.

Sampling methods.

Qualitative sample's collecting was done with Apstein net in open sea and with landing net in shallow water and among of vegetation.

The distribution of zooplankton along with biomass and amount was studied by quantitative sampling. The main tool for sampling used was standard Juday net made of silky or kapron net number 56 with upper ring diameter as 18 cm and the lower one – 24 cm. The net number 64-76 was used to collect Rotatoria. Total sampling from the bottom till the surface layer was employed in the open sea, whereas in the shallow sea was used the filtering of 50-100 liters of water through the net.

Collected animals further stored in 4% formaldehyde.

Laboratory preparation and processing of samples.

Weight calculating method was employed during laboratory work. All the specimens were counted in Bogorov's camera along with such characters as the size of a single specimen and its developmental stage. Small organisms (*Rotatoria*, small *Cladocera*, naupliar and early copepodit stages of copepods) were counted in a part of sample (in 1 cubic centimeter) and then extrapolated to total sample volume as an average arithmetic sum. At least three counts have been done for each sample investigated. Large or non abundant organisms were counted with light binocular. The data obtained are summarized as an amount of living organisms per cubic meter.

Biomass was counted by multiplication of total amount to individual mass. Till 60-80 standard masses, counted by Lukonina for Aral sea zooplankton species (Lukonina N.K. 1960. The Aral Sea zooplankton. Proceeding VNIRO. V. 43, issue 1. P. 177-197).

Later the formula $W = q \cdot l^b$ was employed
(W – weight, mg, l – length, mm, q – the mass referred to the length of 1 mm).

The isometric growth equation (b=3) was used to determine Rotatorian's mass.

The body volume of Copepods nauplia was equated to ellipsoid volume, with animals specific gravity counted by the following equation - **1: $V = 4/3 \Pi \cdot a \cdot b \cdot c$**
(V – body volume (cubic millimeters), a,b,c – half of length, width and height of the body (mm)).

Crustacean mass was counted with allometric growth equation.

Phytoplankton

1. Material was stored in Utermel solution modified by Kuzmin. Samples were concentrated using membrane filter (pore diameter 1 μm). Cell counting was provided with “Uchinskaya” camera (volume 0.01 ml) with light microscope under magnification x600. Biomass was counted by geometric method (Methods of internal water bodies biocenoses study, 1975).
2. Phytoplankton samples volume is 0.5 liter. Sampling was accomplished with glass bottle in 15-20 cm depth. Samples were stored in 45% formaldehyde. Algae samples were studied with light microscope and MFA-2 device.
3. Phytoplankton samples were taken with Ruttner bathometer, from surface to bottom. The samples were fixed by 40% formalin, concentrated to 20-50 ml and counted with a Nayotta camera, 0.05 ml in volume.
Algae were determined according to the USSR Guide for Fresh Water Algae.
4. Sampling was conducted with Apstein net (ring diameter 30 cm, net # 67) for qualitative analysis and with Ruttner bathometer for quantitative one. Biomass counting was conducted accordingly to Morosova-Vodjaniitskaya (1954), Makarova and Pichkily (1970) and Elmuratov (1981).