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ON THE SUMMER PHYTO- AND ZOOPLANKTON OF LAKE PALAEOSTOMI

II. Number, biomass and production of zooplankton

A short survey of L. Palaeostomi, its sample spots, material and methods as well as that of the species composition of its phyto- and zooplankton are given in the first part of the investigation (Haberman, Laugaste, 1982). In order to get a complete survey of the zooplankton of the lake it would be necessary to investigate it seasonally for several years running. The present article is based on the summer (July and August) samples of 1977, and thus it treats only the summer aspect of the zooplankton of L. Palaeostomi.

The weights of the zooplankters, on the basis of which the biomass of zooplankton was calculated, are presented in Table 1, while a survey of the ways of obtaining the weights can be found in the first part of the investigation (Haberman, Laugaste, 1982). Data on the number and biomass of the zooplankton of L. Palaeostomi in different sample spots in July and August of 1977 are presented in Table 2.

As the table reveals, the summer number (average of July and August) of the zooplankton of the lake fluctuates in different parts of it from 83,500 to 3,307,500 ind./m³, biomass from 1.144 to 9.048 g/m³. R. Chkhaidze et al. (Чхаидзе et al., 1976) mentions that during several years the average annual biomass of zooplankton in L. Palaeostomi has fluctuated in the limits of 0.39—2.2 g/m³. E. Kudelina (Куделина, 1940) considers the lake to be rich in plankton, giving the average biomass in April as 10.8 g/m³, but this number is actually the total weight of the zooplankton, phytoplankton and seston. I. Puzanov (Пузанов, 1940) gives the biomass of the zooplankton of the lake as 3.3—6.8 g/m³, regarding the amount to

Table 1

Weights of zooplankters of L. Palaeostomi in summer, 1977

Species, sex, stage	Weight, mg	Species, sex, stage	Weight, mg
Acartia clausi	0.031	*Hexarthra fennica*	0.0003
Calanipeda aquae dulcis ♀	0.040	*Keratella tropica*	0.0002
Calanipeda aquae dulcis juv.	0.019	*Lecane grandis*	0.0009
Calanoida juv.	0.011	*Polyarthra vulgaris* + *P. remata*	0.0004
Mesocyclops leuckarti ♀	0.024	*Synchaeta cecilia*	0.0004
Mesocyclops leuckarti ♂	0.009	*S. curvata*	0.0014
Cryptocyclops bicolor bicolor ♀	0.008	*Trichocerca marina*	0.0009
Cyclopoida juv.	0.006	*T. weberi*	0.0002
Harpacticoida	0.006	*Polychaeta* juv.	
Nauplii	0.002	large	0.008
Asplanchna brightwelli	0.059	small	0.0007
Brachionus angularis	0.0006	average	0.004
B. calyciflorus amphiceros	0.002	*Balanus* juv.	0.0035
B. plicatilis	0.002	*Gastropoda* juv.	0.002
Colurella adriatica	0.0001	*Moerisia maeotica*	0.300

The number (N; ind./m^3) and biomass (B; g/m_3)

	Month	Indicators	Sample					
			1	2	3	4	5	6
Total zooplankton	VII	N	83 500	268 500	175 000	153 000	201 500	966 000
		B	1.144	1.853	4.146	1.285	3.295	2.806
	VIII	N	—	24 000	—	506 000	431 500	1 012 000
		B	—	0.637	—	1.071	1.576	1.692
Average (July—August)		N	83 500	146 250	175 000	329 500	316 500	989 000
		B	1.144	1 245	4.146	1.178	2.436	2.249
Average (July—August) without *M. maeotica*		N	81 000	143 250	168 000	328 000	312 300	987 000
		B	0.394	0.345	2.046	0.728	1.187	1.649

Note: Sample spots 1, 3, 6, 7, 9, 10 — littoral zone; 2, 4, 5, 8, — river-mouths; 11—15 — pela

be moderate. According to E. Voznaya (Барач, 1964), the biomass of the zooplankton of L. Palaeostomi in 1946 was rather low — 0.740 g/m^3 in May and 0.600 g/m^3 in December.

In the summer of 1977 both the number and biomass of zooplankton were much higher in the pelagic part (1,975,000—3,307,500 ind./m^3 and 4.761—9.048 g/m^3) than in the littoral and river-mouths (83,500—989,000 ind./m^3 and 1.144—4.146 g/m^3). The biomass of zooplankton is positively correlated with the salinity of the water. In the pelagic part the water salinity is higher (6.47—6.60‰) than in the littoral which is freshened by rivers, or in the river-mouths (2.65—5.33‰) (Тийдор, in press). The brackish-water and marine forms develop on a mass scale in the pelagic part and thus increase the biomass considerably. For the fresh-water forms the salinity is too high all over the lake, even in the river-mouths where the water is comparatively fresh, and they do not develop on a mass scale anywhere. The positive correlation between the biomass of zooplankton and salinity in the water bodies that are connected with the sea has been noticed by other authors as well (Sitaramaiah, 1975; Rao, 1977, a. o.).

In the littoral and in the river-mouths the weighty *Moerisia maeotica* plays rather a great role in the plankton biomass. Without the biomass of *M. maeotica* the biomass here is relatively low (0.318—2.046 g/m^3). In the pelagic part *M. maeotica* occurs rarely, while its occurrence is accompanied by a sharp rise in the biomass (see sample spot 14, Table 2). As *M. maeotica* was caught together with the other plankters in a plankton net and counted together with the others in Bogorov's chamber, errors are possible as for its number. Therefore, Table 2 also offers the number and biomass of the zooplankton without *M. maeotica*. It is conspicuous that in many sample spots where *M. maeotica* occurs, the rest of the zooplankton is relatively scanty, which is probably connected with the predatory way of life of *M. maeotica*. It is known that the jellyfish may use zooplankton as feed in big amounts (Schwartz, 1978).

The average numbers and biomasses in July and August of 1977 (Table 3) are rather similar. Still, in August the number and biomass of both the total zooplankton and its separate groups are somewhat higher. The only exception is *M. maeotica*. Data on the period when the lake had no direct connection with the sea (before December of 1933) and the dynamics of the salinity of water was of seasonal character reveal the mass invasion of jellyfish into the lake in the autumn when the of zooplankton in July and August 1977

Tabel 2

spots									
7	8	9	10	11	12	13	14	15	16
123 000	—	138 000	528 009	3 435 000	2 890 900	1 945 000	3 365 000	2 432 500	—
1.404	—	3.037	1.579	7.739	5,918	5.183	6.680	5.796	—
—	91 500	—	453 000	1 982 500	3 620 000	2 005 000	3 250 000	3 170 000	532 500
—	1.362	—	1.041	5.104	7.491	4.339	11.415	8.101	1.753
123 000	91 500	138 000	490 500	2 708 750	3 255 450	1 975 000	3 307 500	2 801 250	532 500
1.404	1.368	3.037	1.310	6.422	6.704	4.761	9.048	6.948	1.753
123 000	88 000	129 000	489 500	2 708 750	3 255 450	1 975 000	3 302 500	2 801 250	532 500
1.404	0,318	0.337	1.010	6.422	6.704	4.761	7.548	6.948	1.753

gic zone; 16 — L. Maloye Palaeostomi, with fresh water.

water salinity increased due to the scantiness of fresh water in the rivers after a hot summer. The jellyfish were so numerous in the lake that they clogged fishing-nets and hindered fishermen's work (Куделина, 1940). Under the present salinity conditions (throughout the year rather high, up to 12% on the surface) such an invasion in the autumn has not been observed. Jellyfish occur in the lake steadily.

The most important group of the zooplankton are rotifers (forming 56.9% of the number and 35.8% of the biomass of the total zooplankton). As for the number, the larvae of polychaetes occupy the second (27.0%) and copepods the third (13.9%) place. As for the biomass, *M. maeotica* takes the second (30.5%) and *Polychaeta* juv. (21.9%) the third place. The role of the other groups in the plankton is small. The groups of zooplankton are treated in greater detail in the third part of the investigation (III. Different groups of zooplankton (Haberman, in press)). A species is considered to be dominating when it forms at least 20% of the number or biomass of the total zooplankton in the sample. A species may sometimes be dominating only in some parts of the lake, while according to the average of the lake it need not dominate. The dominating zooplankters of L. Palaeostomi are presented in Table 4, and their horizontal distribution over the lake in Table 5.

The brackish-water and marine forms are clearly dominating in L. Palaeostomi. In L. Maloye Palaeostomi with its fresh water, the brackish-water and marine forms are practically absent, while the juvenile forms of the fresh-water copepods (*Mesocyclops leuckarti*, *Cryptocyclops bicolor bicolor*) dominate. Tables 4 (especially the average of July and August) and 5 reveal that the most important species in L. Palaeostomi

Table 3

Average number and biomass of zooplankton of L. Palaeostomi in summer 1977

Month	Indicators	Total zoo-plankton	*Rotatoria*	*Cladocera*	*Copepoda*	*Polychaeta* juv.	*Balanus* juv.	*Gastro-poda* juv.	*Moeri-sia maeo-tica*
VII	Number	1 193 200	882 100	140	90 400	216 000	990	680	2 850
	Biomass	3.705	1.615	0.001	0.250	0.980	0.004	0.001	0.853
VIII	Number	1 423 200	958 400	290	185 900	275 400	1 200	700	1 290
	Biomass	3.798	1.786	0.007	0.510	1.102	0.004	0.001	0.388

Dominating zooplankters in L. Palaeostomi

Sample spots	July			
	Number	%	Biomass	%
1	*Polychaeta* juv.	49.1	*Moerisia maeotica*	65.5
2	*Brachionus plicatilis* *Polychaeta* juv.	74.5 22.6	*M. maeotica* *B. plicatilis*	64.7 21.6
3	*B. plicatilis* *Polychaeta* juv.	60.6 25.8	*M. maeotica* *Polychaeta* juv.	50.6 43.4
4	*B. plicatilis* *Polychaeta* juv.	67.0 28.8	*M. maeotica*	70.0
5	*Polychaeta* juv.	82.6	*M. maeotica* *Polychaeta* juv.	75.8 20.2
6	*B. plicatilis* *Hexarthra fennica*	57.3 22.9	*M. maeotica* *B. plicatilis*	42.8 39.4
7	*B. plicatilis* *Polychaeta* juv.	48.8 32.5	*B. plicatilis*	85.4
8	—		—	
9	*B. plicatilis* *Polychaeta* juv.	47.2 31.9	*M. maeotica*	88.9
10	*B. plicatilis* *H. fennica*	65.7 22.2	*B. plicatilis* *M. maeotica*	44.1 38.0
11	*B. plicatilis*	58.3	*B. plicatilis* *Polychaeta* juv.	51.7 31.0
12	*B. plicatilis*	80.8	*B. plicatilis*	78.9
13	*B. plicatilis* *Polychaeta* juv.	51.5 38.6	*Polychaeta* juv. *B. plicatilis*	57.8 38.6
14	*B. plicatilis*	52.1	*B. plicatilis* *Polychaeta* juv.	52.4 25.4
15	*B. plicatilis*	77.9	*B. plicatilis* *Polychaeta* juv.	65.4 32.6
16	—		—	
Average of 15 sample spots of L. Palaeostomi (without L. Maloye Palaeostomi, sample spot 16)	*B. plicatilis* *Polychaeta* juv. *H. fennica*	**53.0** 22.3 3.2	*M. maeotica* *B. plicatilis* *Polychaeta* juv.	35.4 34.1 15.0

is *Brachionus plicatilis*, *Polychaeta* juv. and *Moerisia maeotica* follow. The abundant occurrence of *Polychaeta* juv. as valuable feed for fish is a positive phenomenon, while the occurrence, of the predatory form *M. maeotica* is a negative one.

To calculate the production of the group of rotifers and *Brachionus plicatilis* occurring on a mass scale and dominating in the zooplankton, a physiological method repeatedly used by M. Ivanova (1975, 1979) was applied. Expenditure on metabolism was calculated on the basis of respiration, using A. Hemmingsen's (1960) formula. 0.4 was taken for the value of K_2 and 0.5 kcal/g of gross weight as the calorific value of rotifers. The obtained data are presented in Table 6. As the table reveals, the P/B coefficient of the group of rotifers during 17 days was

Table 4

in summer 1977

August			
Number	%	Biomass	%
—		—	
B. plicatilis	72.9	*M. maeotica*	94.2
—		—	
B. plicatilis	75.0	*B. plicatilis*	70.9
Polychaeta juv. *B. plicatilis*	61.2 29.7	*Polychaeta* juv.	67.0
B. plicatilis *H. fennica*	60.0 23.5	*B. plicatilis*	71.8
—		—	
Polychaeta juv.	72.1	*M. maeotica*	77.1
—		—	
B. plicatilis	66.3	*B. plicatilis* *Polychaeta* juv.	57.6 34.6
B. plicatilis *Polychaeta* juv.	70.6 25.2	*B. plicatilis* *Polychaeta* juv.	54.8 39.2
B. plicatilis	77.3	*B. plicatilis*	74.7
B. plicatilis *Polychaeta* juv. *H. fennica*	36.2 20.9 21.8	*Polychaeta* juv. *B. plicatilis*	38.7 33.4
B. plicatilis *Polychaeta* juv.	61.6 22.9	*B. plicatilis* *M. maeotica* *Polychaeta* juv.	35.0 26.2 26.1
B. plicatilis *Polychaeta* juv.	63.0 29.4	*B. plicatilis* *Polychaeta* juv.	49.3 45.8
Nauplius	70.4	*Nauplius* *Cyclopoida*	42.8 21.4
B. plicatilis *Polychaeta* juv. *H. fennica*	55.7 21.1 4.1	*B. plicatilis* *Polychaeta* juv. *M. maeotica*	40.7 22.8 18.0

16.7, that of *B. plicatilis* — 16.1, the diurnal specific speed of production 0.98 and 0.94, respectively.

According to T. Ito (1955, 1957) the diurnal specific speed of *B. plicatilis* in the fish ponds of Japan at a high feed concentration and approximately the same temperature (26—28 °C) as in L. Palaeostomi, was over 1.0. The rather high diurnal specific speed of production ($r \approx 1$) stated in L. Palaeostomi allows us to indirectly characterize the lake as a water body of high productivity. The temperature of water of 25.2—27.2° observed in the lake during the period of the mass development of *B. plicatilis* coincides with the temperature interval of 20—28° when Q_{10} of the species equals 1 (Epp, Lewis, 1980). This temperature may probably be considered as the optimum one for the development of

Dominating forms	Month	Indicators	Sample spots (1, 3, 6, 7, 9, 10 — littoral: 2, 4, 5, 8, —						
			1	2	3	4	5	6	7
Brachionus plicatilis	VII	N	16 500	200 000	106 000	102 500	8 300	553 000	60 000
		B	0.033	0.400	0.212	0.205	0.017	1.106	1.200
	VIII	N	—	17 500	—	380 000	128 000	607 000	—
		B	—	0.035	—	0.760	0.256	1.214	—
	Average	N	16 500	108 800	106 000	241 200	68 200	580 000	60 000
		B	0.033	0.218	0.212	0.482	0.136	1.160	1.200
Polychaeta juv.	VII	N	41 000	61 000	45 000	44 000	166 500	23 000	40 000
		B	0.164	0.244	1.800	0.176	0.666	0.092	0.160
	VIII	N	—	0	—	47 000	264 000	10 000	—
		B	—	0	—	0.188	1.056	0.040	—
	Average	N	41 000	30 500	45 000	45 500	215 000	16 500	40 000
		B	0.164	0.122	1.800	0.182	0.861	0.066	0.160
Hexarthra fennica	VII	N	1 000	1 000	9 000	1 500	5 000	221 000	1 000
		B	0.0003	0.0003	0.003	0.0004	0.002	0.066	0.0003
	VIII	N	—	500	—	14 000	9 000	238 000	—
		B	—	0.0002	—	0.004	0.003	0.071	—
	Average	N	1 000	750	9 000	7 750	7 000	229 500	1 000
		B	0.0003	0.0002	0.003	0.002	0.002	0.069	0.0003
Moerisia maeotica	VII	N	2 500	4 000	7 000	3 000	8 300	4 000	0
		B	0.750	1.200	2.100	0.900	2.490	1.200	0
	VIII	N	—	2 000	—	0	0	0	—
		B	—	0.600	—	0	0	0	—
	Average	N	2 500	3 000	7 000	1 500	4 160	2 000	0
		B	0.750	0.900	2.100	0.450	1.240	0.600	0

* Without sample spot 16 — L. Maloye Palaeostomi with fresh water.

B. plicatilis. It is known that the stability of the salt content is of great significance for the development of *B. plicatilis*, especially in the alternation of the reproduction types (Ito, Iwai, 1960; Lubzens et al., 1980). The absolute indices of salinity which are optimum for the occurrence of this or that type of reproduction are quite different, as *B. plicatilis* has many ecological forms and races. The water salinity in the pelagic part of L. Palaeostomi (6.47—6.60‰) in August of 1977 seems to be rather favourable for *B. plicatilis*, taking into account its mass occurrence.

The water salinity of the lake has changed in the course of years. Before 1933, when it was connected with the sea by the River Kaparcha only, the salinity was low and the lake was considered to be a fresh-water one. In December of 1933 the high water formed a direct connection with the sea in the shape of a canal, the water salinity increased, and the lake became a brackish-water body (Table 7, Хаберман, in press). As the water salinity in the lake has changed, its zooplankton has changed likewise. Before 1933 the role of fresh-water species in the lake was high since cladocerans (*Diaphanosoma brachyurum*) were dominating in the zooplankton in the spring, *Calanipeda aquae dulcis* (now occurring scantily) in the summer when the salinity increased, and *B. plicatilis* and marine forms in the autumn when the salinity continued to increase. The biomass of plankton (phyto- and zooplankton + seston) was rather high — 10.8 g/m³ (Куделина, 1940).

zooplankters in L. Palaeostomi

river-mouths; 11—15 — pelagic zone; 16 — L. Maloye Palaeostomi)									Average of L. Palaeostomi*
8	9	10	11	12	13	14	15	16	
—	65 000	347 000	2 000 000	2 334 000	1 000 000	1 750 000	1 895 000	—	745 500
—	0.130	0.694	4.000	4.668	2.000	3.500	3.790	—	1.568
5 000	—	300 000	1 400 000	2 800 000	725 000	2 000 000	2 000 000	25 000	942 000
0.010	—	0.600	2.800	5.600	1.450	4.000	4.000	0.050	1.884
5 000	65 000	323 500	1 700 000	2 567 000	862 500	1 875 000	1 947 500	25 000	701 700
0.010	0.130	0.647	3.400	5.134	1.725	3.750	3.895	0.050	1.475
—	44 000	46 000	600 000	266 800	750 000	425 000	472 500	—	216 100
—	0.176	0.184	2.400	1.067	3.000	1.700	1.890	—	0.980
66 000	—	90 000	500 000	230 000	420 000	745 000	930 000	2 500	300 200
0.264	—	0.360	2.000	0.920	1.680	2.980	3.720	0.010	1.201
66 000	44 000	68 000	550 000	248 000	585 000	585 000	701 000	2 500	218 700
0.264	0.176	0.272	2.200	0.994	2.340	2.340	2.805	0.010	0.983
—	9 000	117 000	375 000	250 100	150 000	630 000	20 000	—	127 900
—	0.003	0.035	0.112	0.075	0.045	0.189	0.006	—	0.038
0	—	38 000	5 000	170 000	437 500	35 000	80 000	2 500	93 400
0	—	0.011	0.002	0.051	0,131	0.010	0.024	0.100	0.028
0	9 000	77 500	190 000	210 050	293 750	332 500	50 000	2 500	94 600
0	0.003	0.023	0.057	0.063	0.088	0.100	0.015	0.001	0.028
—	9 000	2 000	0	0	0	0	0	—	3 000
—	2.700	0.600	0	0	0	0	0	—	0.853
3 500	—	0	0	0	0	10 000	0	0	1 400
1.050	—	0	0	0	0	3.000	0	0	0.423
3 500	9 000	1 000	0	0	0	5 000	0	0	2 600
1.050	2.700	0.300	0	0	0	1.500	0	0	0.773

Due to the established connection between L. Palaeostomi and the sea, much salty marine water penetrated into the lake, the salinity conditions were spoilt, and a decrease of the biomass of zooplankton followed (in May of 1946 0.740 g/m^3, in December — 0.600 g/m^3). The data on the summer of 1977 reveal that a brackish-water biocoenosis of a specific character exists in L. Palaeostomi. The average summer biomass of the whole lake is 3.752 g/m^3 (the average one for the pelagic zone without L. Maloye Palaeostomi is 6.776 g/m^3, the maximum one 9.048 g/m^3), the brackish-water and marine forms develop on a mass scale, while the number of the fresh-water forms is very low.

Table 6

Production of *Rotatoria* and *Brachionus plicatilis* and P/B coefficients in L. Palaeostomi in the July—August of 1977 at 26 °C

	$\overline{W}$	N_1	N_2	P_1	P_2	P	B_1	B_2	$\overline{B}$	P/B
Rotatoria	0.91^{-3}	1940	2108	1.76	1.91	31.2	1.78	1.96	1.87	16.7
B. plicatilis	0.95^{-3}	1659	1925	1.58	1.83	28.9	1.66	1.92	1.79	16.1

Note: N_1, P_1, B_1 — 23. VII; N_2, P_2, B_2 — 9. VIII; N — thous. ind./m^2; P — kcal per 24 h/m^2; B — kcal/m^2; P/B — per 17 days.

Table 7

Water salinity in L. Palaeostomi

	1932			1933			1942	1943		1946		1977
	May	June	August	February	May	July	April	May	September	May	December	August
Surface water in the middle of lake	0.19	0.41	0.20	0.43	0.02	0.99	2.39	12.38	11.13	4.83	3.17	6.60
Water at the bottom in the middle of lake	0.17	0.39	0.24	1.04	0.05	1.50	2.92	12.43	11.60	5.37	12.97	—

REFERENCES

Epp, R. W., Lewis, W. M. Metabolic uniformity over the environmental temperature range in *Brachionus plicatilis* (*Rotifera*). — Hydrobiologia, 1980, 73, 145—147.

Haberman, J., Laugaste, R. On the summer phyto- and zooplankton of Lake Palaeostomi. I. Species composition of phyto- and zooplankton. Brief characterization of the lake. — ENSV TA Toim. Biol., 1982, **31**, 226—232.

Haberman, J. On the summer phyto- and zooplankton of Lake Palaeostomi. III. Different groups of zooplankton. — ENSV TA Toim. Biol., (in press).

Hemmingsen, A. M. Energy metabolism as related to body size and respiratory surfaces and its evolution. — Rept. Steno Memor. Hospital, 1960, 9, 110.

Ito, T. Studies on the «Mizukawari» in eelculture ponds. I. The feeding activity of *Brachionus plicatilis* on phytonannoplankton. — Rep. Fac. Fish. Univ. Mie, 1955, 2, 162—167.

Ito, T. Studies on the «Mizukawari» in eelculture ponds. VI. The relation between the growth of *Brachionus plicatilis* and quantity of phytoplankton. — Rep. Fac. Fish. Univ. Mie, 1957, 2, 502—508.

Ito, T., Iwai, T. Studies on the «Mizukawari» in eelculture ponds. VII. The relation between the feeding habits of *Brachionus plicatilis* and the size of phyto plankters. — Rep. Fac. Fish. Univ. Mie, 1960, 2, 509—516.

Lubzens, E., Fischer, R., Berdugo-White, V. Induction of sexual reproduction and resting egg production in *Brachionus plicatilis* reared in sea water. — Hydrobiologia, 1980, 73, 55—58.

Schwarz, S. Biomasseuntersuchungen am Zooplankton der ostmecklenburgischen Küstengewässer — ein Beitrag zum Eutrophiestatus. Teil 4: Zur Biomasse und Topographie der Boddenketten von Rügen. — Acta hydrochim. hydrobiol., 1978, 6, 299—306.

Барач Г. П. Палеостоми. Гидробиология. — В кн.: Озерные водоемы Грузии и их рыбохозяйственное значение. Тбилиси, 1964, 63—65.

Иванова М. Б. Продукция зоопланктона. — В кн.: Биологическая продуктивность северных озер. Л., 1975, 97—115.

Иванова М. Б. Продукция коловраток. — В кн.: Общие основы изучения водных экосистем. Л., 1979, 141—149.

Куделина Е. Н. Гидробиологическая характеристика озера Палеостоми. — Тр. науч. рыбохоз. и биол. ст. Грузии, 1940, 3, 311—373.

Пузанов И. И. Материалы к познанию фауны и рыбного промысла озера Палеостоми. — Тр. науч. рыбохоз. и биол. ст. Грузии, 1940, 3, 273—306.

Тийдор Р. Э. Краткая гидрохимическая характеристика озера Палеостоми. — В кн.: Озеро Палеостоми. Продукционно-биологические свойства и условия жизни рыб. Гидробиол. исследования XII (в печати).

Хаберман Ю. Х. Характеристика озера Палеостоми. — В кн.: Озеро Палеостоми. Продукционно-биологические свойства и условия жизни рыб. Гидробиол. исследования XII (в печати).

Чхаидзе Р. И., Сергеева Ж. Н., Глонти Ц. А., Бурчуладзе С. Г. Гидробиологическая характеристика оз. Палеостоми. — В кн.: Тез. докл. III съезда Всесоюзн. гидробиол. общества. Рига, 1976, 2, 251—253.

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PALEOSTOMI JÄRVE SUVINE FÜTO- JA ZOOPLANKTON

II. Zooplanktoni arvukus, biomass ja produktsioon

Suvine (juuli-augusti keskmine) zooplanktoni arvukus on järve eri osades 83 500—3 307 500 isendit kuupmeetri kohta ning biomass 1,144—9,048 g/m³. Zooplanktoni hulk on positiivses korrelatsioonis vee soolsusega: kõrgema soolsusega (6,47—6,60‰) pelagiaalis on biomass suurem — 4,761—9,048 g/m³ — kui madalama soolsusega (2,65—5,33‰) litoraalis ja jõgede suudmeis — 1,44—4,146 g/m³. Kogu järve keskmine biomass on juulis 3,705 g/m³ ning augustis 3,798 g/m³, pelagiaali keskmised (ilma Maloje Paleostomita) vastavalt 6,263 ja 7,290 g/m³.

Domineerivad riimvee- ja merevormid, mageveeliike on väga vähe. Tähtsamad plankterid on *Brachionus plicatilis*, *Polychaeta* juv. ning *Moerisia maeotica*.

P/B koefitsient 17 päeva kohta on kogu rotatooride rühmal 16,7 ja *Brachionus plicatilis*'el 16,1, produktsiooni erikiirus vastavalt 0,98 ja 0,94 ööpäevas.

Seoses otseühenduse tekkimisega Musta mere ja Paleostomi järve vahel 1933. a. detsembris muutus tugevasti järve vee soolsus ning ühtlasi zooplanktoni iseloom ja biomass. Praegu kujutab Paleostomi järv endast riimveelist eutroofset veekogu, kus on välja kujunenud kindla omapäraga riimveebiotsönoos.

Юта ХАБЕРМАН

ЛЕТНИЙ ФИТО- И ЗООПЛАНКТОН ОЗЕРА ПАЛЕОСТОМИ

II. Численность, биомасса и продукция зоопланктона

Летняя (средняя для июля—августа) численность зоопланктона в разных частях озера колеблется от 83 500 до 3 307 500 *экз./м³*, биомасса — от 1,144 до 9,048 *г/м³*. Количество зоопланктона находится в положительной корреляции с соленостью воды. В пелагиали с повышенной соленостью воды (6,47—6,60%) биомасса зоопланктона (4,761—9,048 *г/м³*) выше, чем в литорали и устьях рек (1,44—4,146 *г/м³*), где соленость меньше (2,65—5,33%). Средняя биомасса для всего озера в июле 3,705 *г/м³*, в августе 3,798 *г/м³*, для пелагиали (без пресноводной части озера — Малого Палеостоми) соответственно 6,263 и 7,290 *г/м³*. Доминируют солоноватоводные и морские формы, численность пресноводных видов очень незначительна. Наиболее важные виды зоопланктона в озере это *Brachionus plicatilis*, *Polychaeta* juv. и *Moerisia maeotica*.

P/B коэффициент по данным 17 дней у коловраток 16,7, у *B. plicatilis* 16,1, удельная скорость продукции в сутки равна соответственно 0,98 и 0,94.

В результате появления прямого сообщения между Черным морем и озером Палеостоми (в декабре 1933 г.) соленость воды озера сильно изменилась в связи с чем изменились также характер и биомасса зоопланктона. В настоящее время озеро — солоноватоводный эвтрофный водоем с установившимся своеобразным солоноватоводным биоценозом.