

Ecological Conditions of the Lower Dniester and Some Indicators for Assessment of the Hydropower Impact

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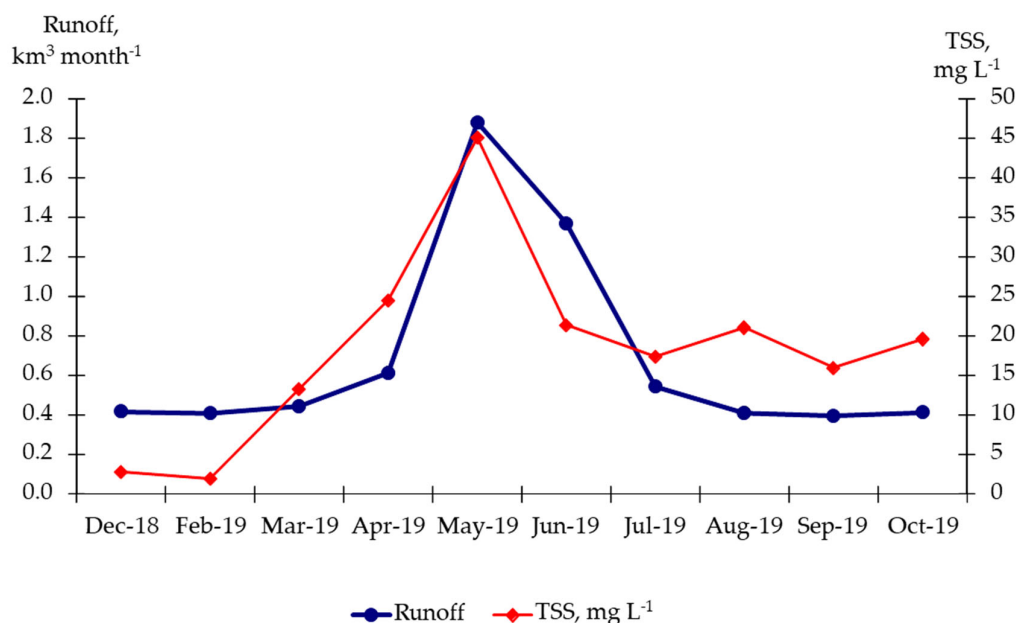


Figure S1. Dynamics of monthly runoff values and amount of total suspended solids.

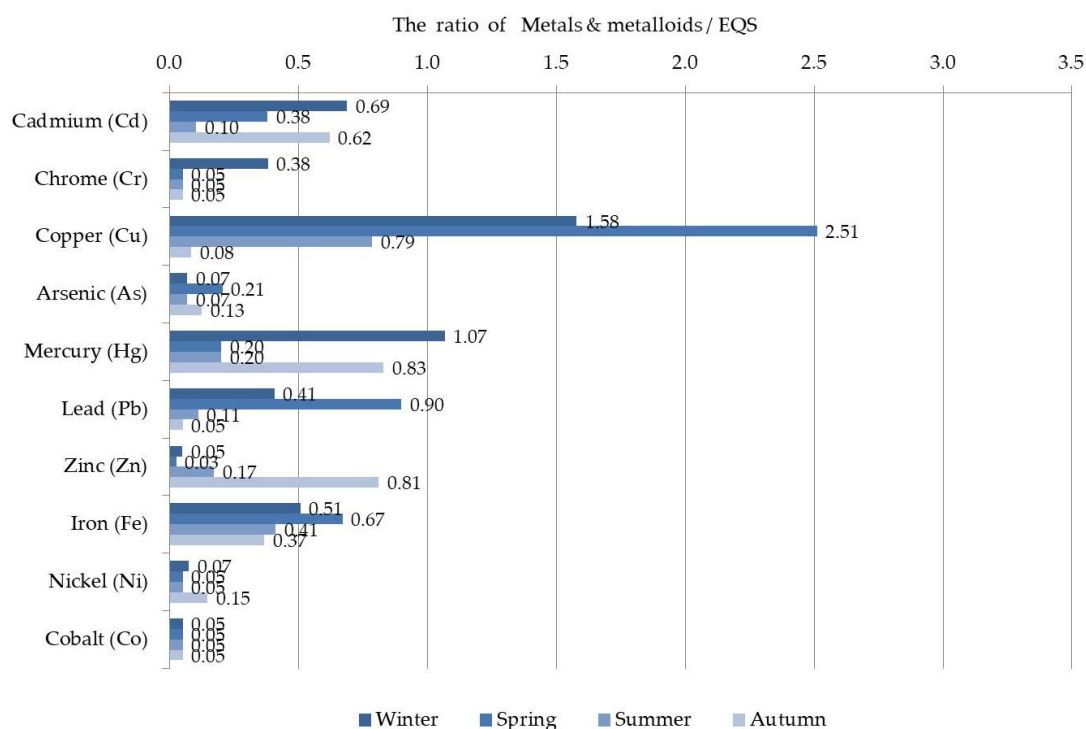


Figure S2. The ratio of the average seasonal concentrations of heavy metals and metalloids to their environmental quality standards (EQS) in the waters of the Lower Dniester near the village of Maiaky.

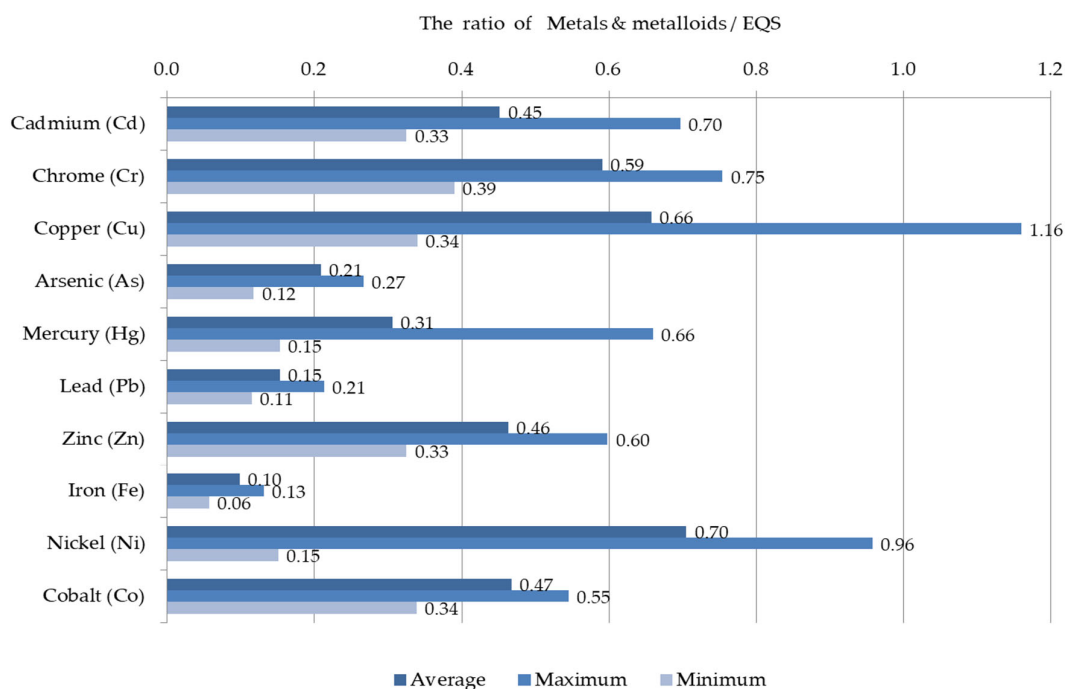


Figure S3. The ratio of average and extreme concentrations of heavy metals and metalloids to their environmental quality standards (EQS) in bottom sediments of the Lower Dniester.

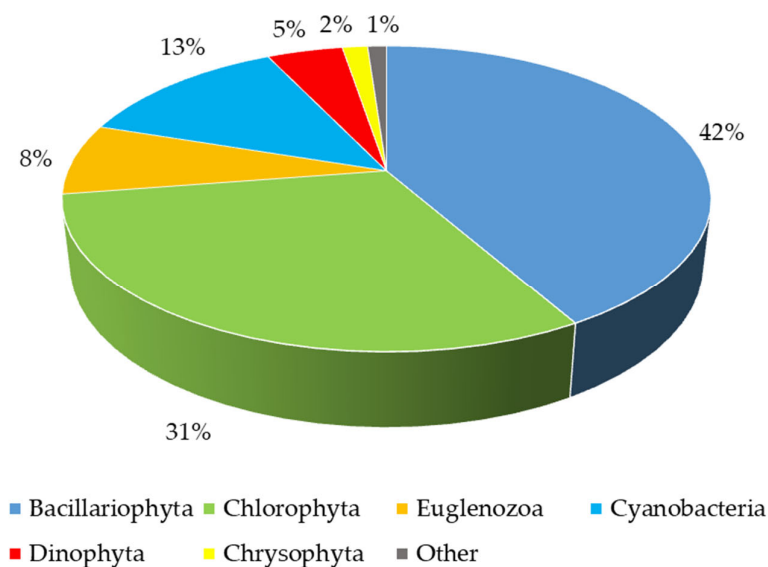


Figure S4. Taxonomic structure of phytoplankton of the Lower Dniester (2018–2020).

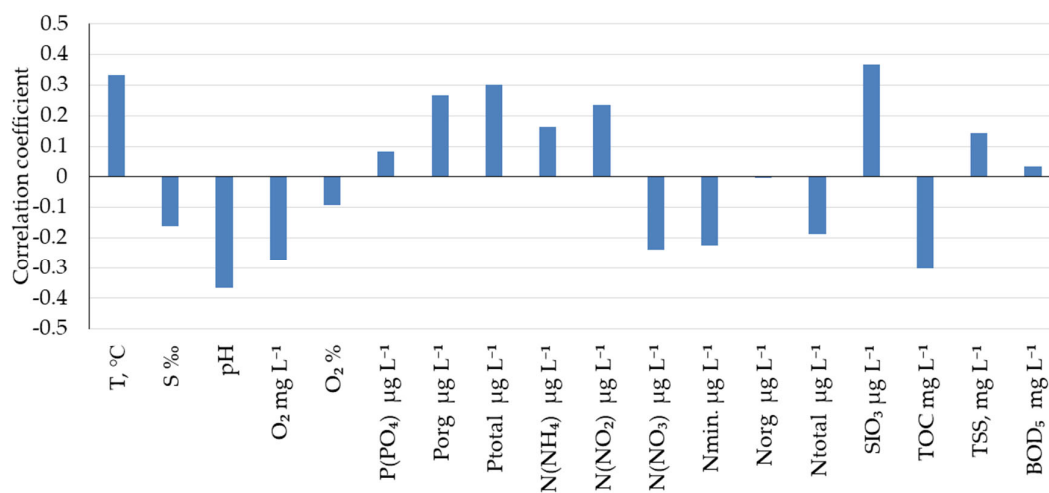


Figure S5. Correlations between phytoplankton biomass and hydrochemical indicators (2018–2020).

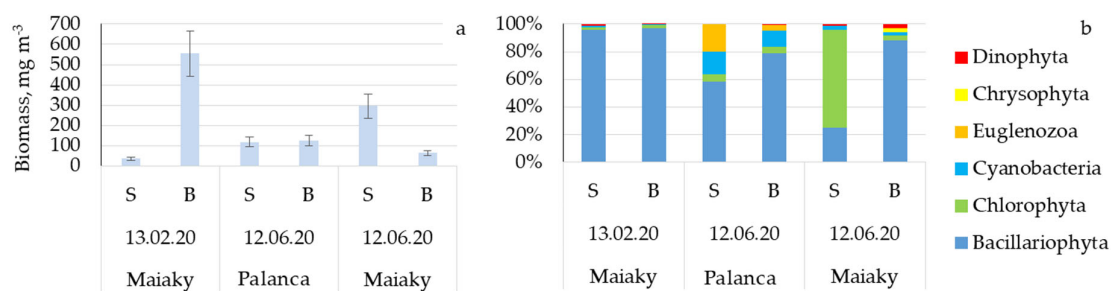


Figure S6. Changes of (a) total phytoplankton biomass and (b) the contribution of different classes in the surface (S) and bottom (B) layer of Lower Dniester (2020).

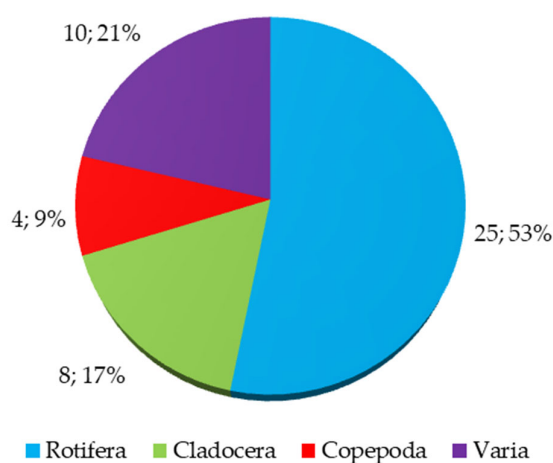


Figure S7. Taxonomic diversity of zooplankton in the Lower Dniester during 2016–2020.

Table S1. Inter-annual variation of zooplankton abundance and biomass (Average \pm SE) in the Lower Dniester in 2016–2020.

Year	Characteristic	Rotifera	Copepoda	Cladocera	Varia	Total*
2016	Abundance, ind m ⁻³	2697 \pm 1084	38464 \pm 31376	3526 \pm 1766	331 \pm 157	45019 \pm 34066
	Biomass, mg m ⁻³	6.9 \pm 2.5	864.2 \pm 783.9	192.6 \pm 80	2.6 \pm 1.5	1066.3 \pm 855.5
2017	Abundance, ind m ⁻³	17073 \pm 11740	5383 \pm 1297	3173 \pm 2153	1050 \pm 230	26678 \pm 11571
	Biomass, mg m ⁻³	32.5 \pm 22.8	64.1 \pm 28.4	259.7 \pm 217.9	20.8 \pm 9.9	377.1 \pm 230.1
2018	Abundance, ind m ⁻³	3692 \pm 1240	1969 \pm 846	1521 \pm 1027	1224 \pm 426	8405 \pm 2492
	Biomass, mg m ⁻³	13.5 \pm 5.8	30.1 \pm 14.9	143.9 \pm 101.1	4.4 \pm 1.3	191.8 \pm 112.9
2019	Abundance, ind m ⁻³	293 \pm 74	341 \pm 104	49 \pm 15	727 \pm 476	1409 \pm 497
	Biomass, mg m ⁻³	0.8 \pm 0.2	2.3 \pm 0.8	2.1 \pm 1.3	2.2 \pm 1.4	7.3 \pm 2.6
2020	Abundance, ind m ⁻³	195 \pm 41	277 \pm 131	35 \pm 14	82 \pm 43	589 \pm 194
	Biomass, mg m ⁻³	1.4 \pm 0.4	2.6 \pm 1.1	1.4 \pm 0.6	0.2 \pm 0.1	5.7 \pm 1.8

*Total Abundance Total N: KW-H(3;54) = 20.5502; $p = 0.0004$; Total biomass KW-H(4;54) = 22.9079; $p = 0.0001$.

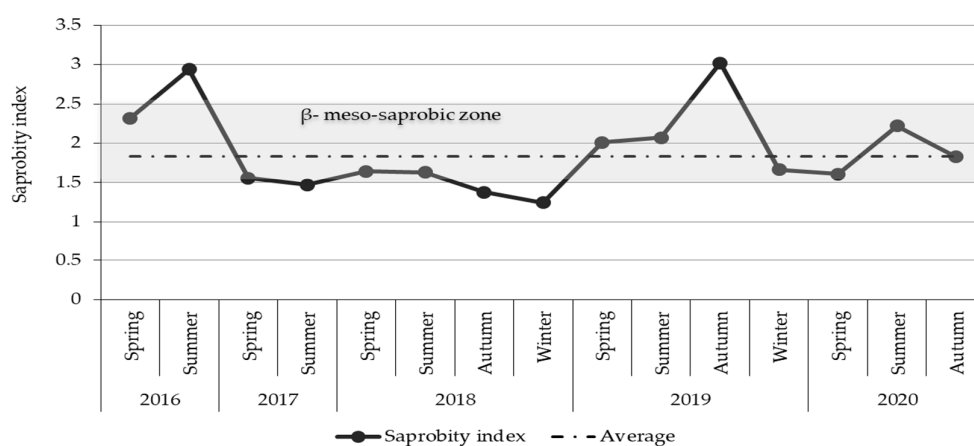


Figure S8. Saprobity level for zooplankton in the Lower Dniester during 2016–2020 according to [4,5] and project data.

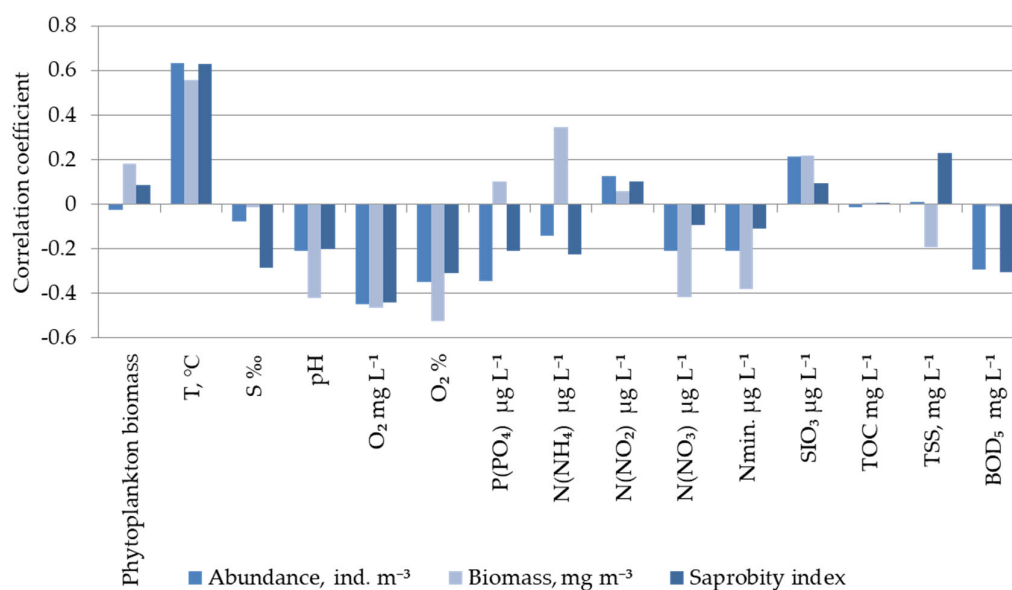


Figure S9. Correlations between zooplankton statistics and hydrochemical indicators.

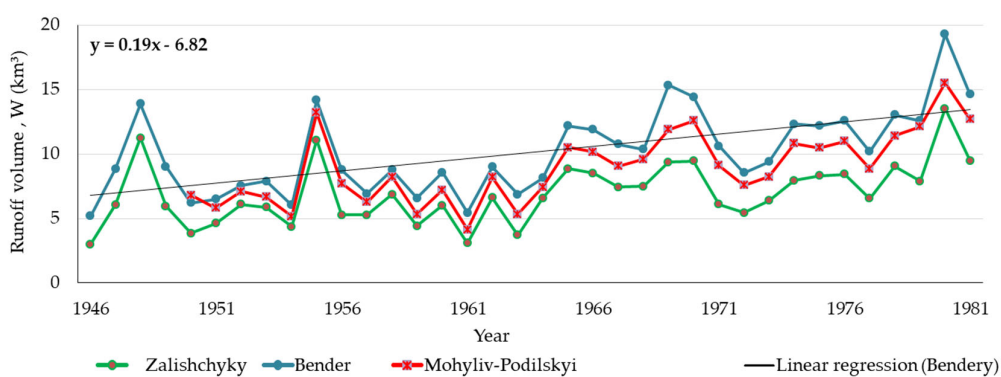


Figure S10. Combined hydrograph of the annual runoff volumes for the 1946–1981 period within selected HGS.

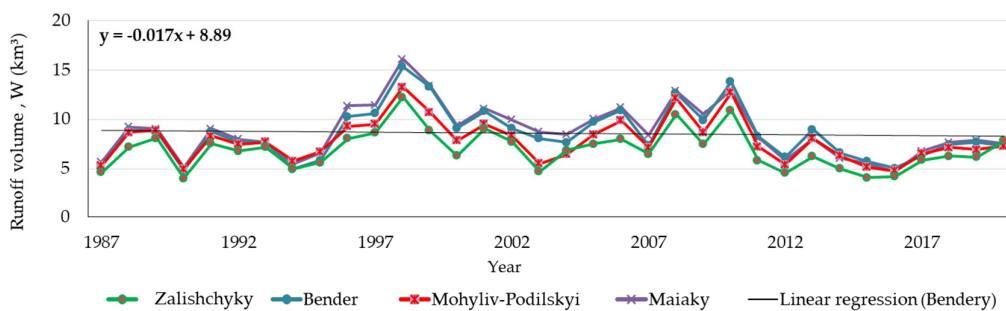


Figure S11. Combined hydrograph of the annual runoff volumes for the 1987–2020 period within selected HGS.

Table S2. Long-term variations of nutrients in the Lower Dniester (above the line—average values; below the line—range of variation).

Years	Nitrogen species						Phosphorus species			Silicate
	NH ₄ ⁺	NO ₂ ⁻	NO ₃ ⁻	DIN	DON	TDN	DIP	DOP	TDP	
			mgN L ⁻¹					mgP L ⁻¹		mgSi L ⁻¹
1952–1954	<u>0.188</u> 0–1.09	<u>0.035</u> 0–0.044	<u>0.57</u> 0.010–1.00	<u>0.80</u> –	–	–	<u>0.057</u> 0.013–0.100	–	–	<u>5.22</u> 1.38–10.0
1977–1978	–	<u>0.080</u> –	<u>1.29</u> –	–	<u>1.38</u> –	<u>2.75</u> –	<u>0.091</u> –	<u>0.028</u> –	<u>0.119</u> –	<u>4.00</u> –
1985–1988	<u>0.554</u> 0.010–1.51	<u>0.191</u> 0.001–0.91	<u>1.30</u> 0.050–2.54	<u>2.11</u> –	<u>0.51</u> 0.07–1.04	<u>2.62</u> –	<u>0.090</u> 0.010–0.260	<u>0.041</u> 0.040–1.200	<u>0.131</u> –	<u>4.41</u> 1.90–7.30
2003–2004	<u>0.073</u> 0.001–0.25	<u>0.031</u> 0.001–0.16	<u>0.86</u> 0.058–1.57	<u>0.96</u> 0.08–1.67	<u>1.67</u> 0.08–6.44	<u>2.63</u> 0.85–6.86	<u>0.074</u> 0.010–0.138	<u>0.029</u> 0.003–0.091	<u>0.103</u> 0.023–0.166	<u>2.46</u> 0.85–3.35
2018–2020	<u>0.067</u> 0.014–0.18	<u>0.034</u> 0.008–0.061	<u>1.18</u> 0.090–2.76	<u>1.34</u> 0.16–2.94	<u>1.10</u> 0.35–2.0	<u>2.38</u> 0.63–3.89	<u>0.075</u> 0.022–0.137	<u>0.028</u> 0.003–0.102	<u>0.103</u> 0.063–0.184	<u>2.89</u> 1.63–5.33

Abbreviations: DO - Dissolved Oxygen, TOC - Total Organic Carbon, BOD₅ - Biological Oxygen Demand, TSS - Total Suspended Solids, TDN - Total Dissolved Nitrogen, TON - Total Organic Nitrogen as a difference between TDN and DIN, DIP - Dissolved Inorganic Phosphorus, TDP - Total Dissolved Phosphorus, DOP - Dissolved Organic Phosphorus.

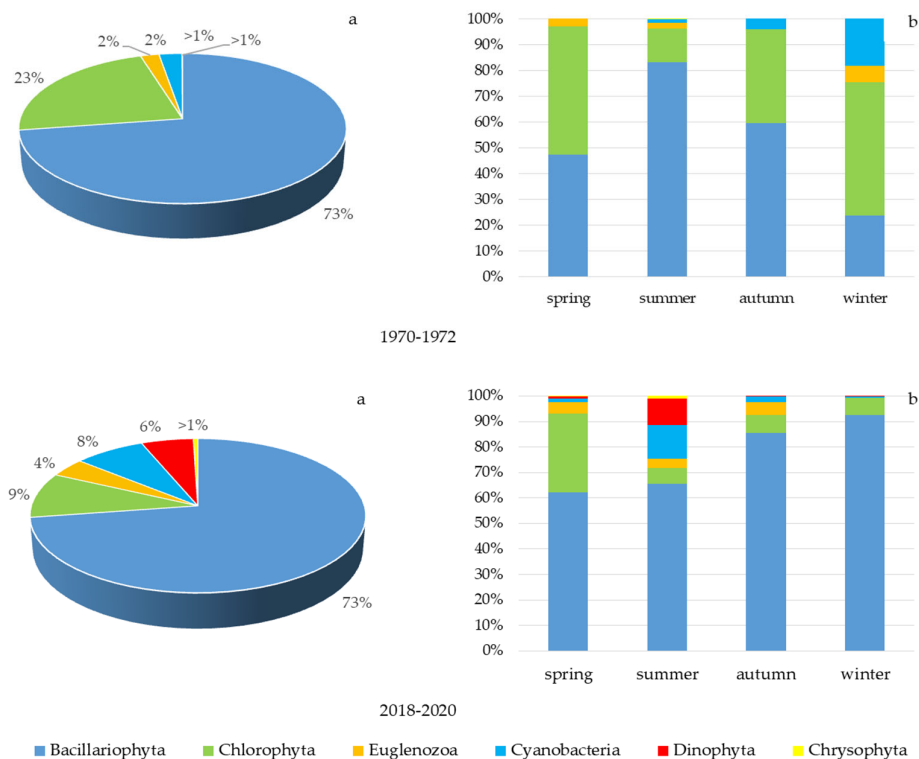


Figure S12. The contribution of different phyla of microalgae in the total phytoplankton biomass (a) total biomass per year; (b) seasonal changes of biomass; 1970–1972 according to [15], 2018–2020—our data.

References

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