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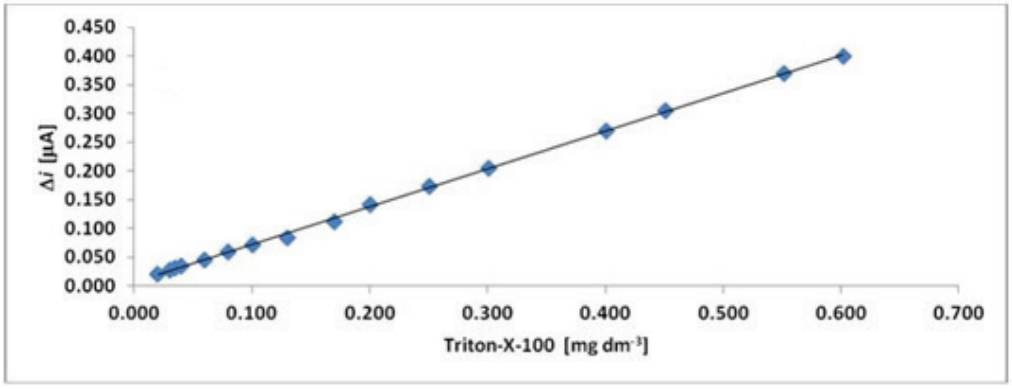

Fig. S1: Calibration plot (linear scale) of Δ*i* versus Triton-X-100 in 0.55 M NaCl. (Δ*i* - adsorption effect measured as the difference between capacity current for base electrolyte and aqueous solutions of surfactant (A).

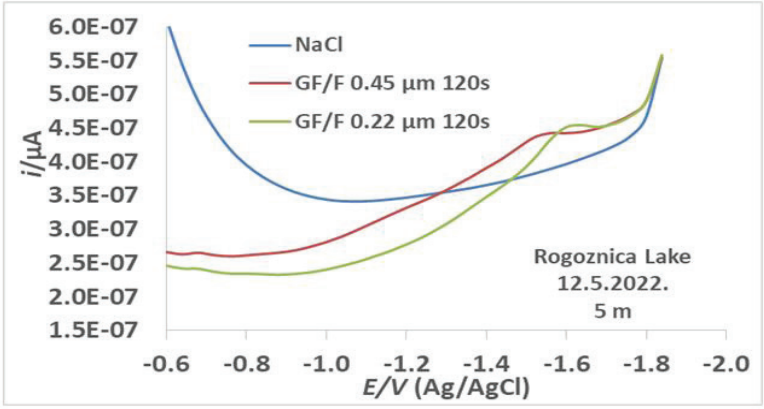

Fig. S2: A.c. voltammograms of the water column sample of Rogoznica Lake sampled at 5m depth, where intense biological activity was recorded. Voltammetric curves revealed the typical desorption wave at around -1.6 V vs. Ag/AgCl in the filtered fractions smaller than 0.45 and 0.22 μm. In a fraction smaller than 0.22 μm, due to the presence of colloidal, highly surface-active OM, the desorption wave was even more expressed and for about 50 mV more negatively positioned. Experimental conditions: accumulation time, ta= 120 s at -0.6 V vs. Ag|AgCl.

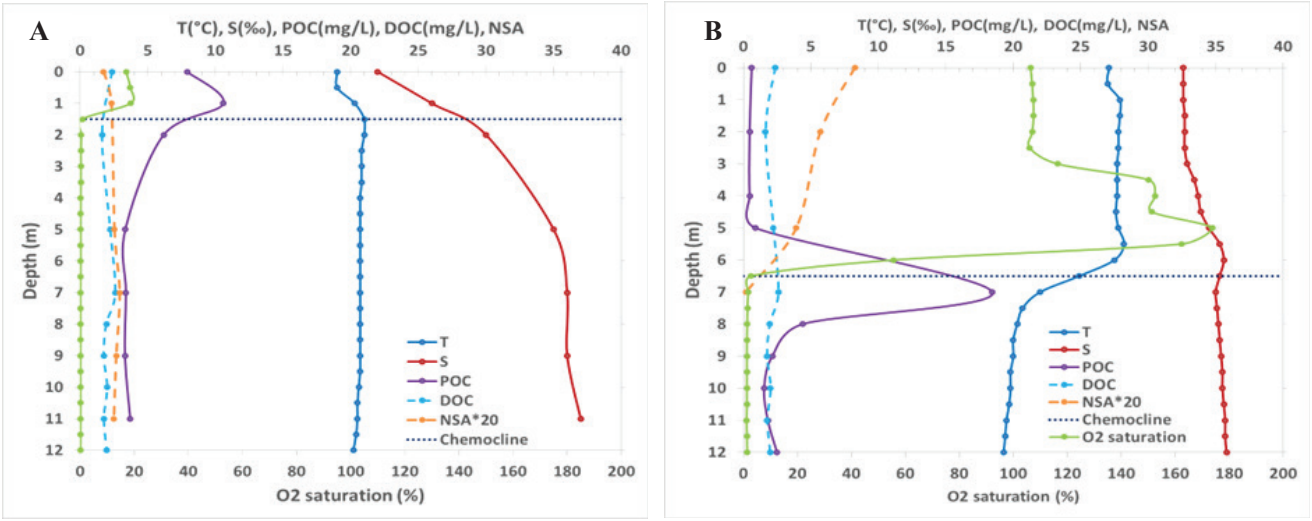

Fig. S3: Physico-chemical properties of the Rogoznica Lake water column on October, 20 2020 (A) and June 28th, 2021 (B). NSA parameter (SAS/DOC ratio) was determined up to the chemocline layer, considering that SAS cannot be measured in an anoxic sample due to reduced sulphur species interference (Simonović *et al.*, 2023).

Table S1. Organic carbon properties (DOC, SAS, NSA) and plankton abundance in surface samples during: the red tide caused by dinoglagellate *Noctiluca scintillans* (A) and zooplankton bloom of invasive ctenophore *Mnemiopsis leidyi* (B).

A Sampling date	Sampling location	Coordinates	DOC (mg L^{-1})	SAS (mg L^{-1})	NSA	Abundance (cells L^{-1})
31.3.2021.	Port of Rovinj-Rovigno*	45.08097°N, 13.63473°E	106.9	13.5	0.127	12008
31.3.2021.	Old Town*	45.08299°N, 13.63195°E	105.8	8.37	0.079	33453
31.3.2021.	Valdibora Bay*	45.09021°N, 13.63339°E	318.1	14.3	0.045	72010
15.4.2021.	Škaraba Bay*	45.06511°N, 13.63845°E	236.3	15.4	0.065	78302
16.4.2021.	Lone Bay*	45.06988°N, 13.63295°E	11.39	2.88	0.253	46800
23.4.2021.	ACI Marina Rovinj-Rovigno*	45.07566°N, 13.63502°E	13.65	2.58	0.211	48696

*measured in dilution.

B Sampling date	Sampling location	Coordinates	DOC (mg L^{-1})	SAS (mg L^{-1})	NSA	Abundance (ind m^{-3})
24.8.2020.	Valdibora Bay	45.09021°N, 13.63339°E	0.959	0.147	0.153	20
25.8.2020.			1.602	0.162	0.101	20
27.8.2020.			1.494	0.203	0.136	0.1
27.8.2020.			2.222	0.334	0.150	60
27.8.2020.			6.768	1.338	0.198	80
27.8.2020.			8.581	1.453	0.169	100
7.9.2020.			2.817	0.611	0.217	400

No.ind- number of individuals.

Table S2. Organic carbon properties (DOC, SAS, NSA) of RL (from 2020 to 2022) surface oxic layer (A), chemocline (B) and samples with maximal oxygen saturation (C). Display C also represent samples where specific desorption peak (represented in Fig. 3.A.e) was measured by a.c. voltammetry method.

A Sampling date	***Rogoznica Lake*** *(43.53091°N, 15.95876°E)*		DOC (mg L^{-1})	SAS (mg L^{-1})	NSA
16.12.2020.	Surface layer [0-2]m		2.378	0.242	0.102
27.1.2021.			2.125	0.190	0.089
24.3.2021.			2.089	0.177	0.085
28.6.2021.			1.994	0.193	0.097
6.9.2021.			1.742	0.262	0.150
12.10.2021.			1.178	0.246	0.138
23.11.2021.			1.984	0.247	0.125
16.2.2022.			1.691	0.211	0.130
6.4.2022.			1.577	0.209	0.133
12.5.2022.			1.576	0.198	0.126
18.7.2022.			2.214	0.179	0.081
B ***Sampling date***	***Rogoznica Lake*** *(43.53091°N, 15.95876°E)*		***DOC (mg L^{-1})***	***SAS (mg L^{-1})***	***NSA***
27.1.2021.	Chemocline		2.253	0.202	0.089
28.6.2021.			2.592	0.198	0.073
16.9.2021.			1.742	0.243	0.139
12.10.2021.			1.714	0.235	0.137
23.11.2021.			1.955	0.214	0.109
12.10.2021.			1.365	0.163	0.119
23.11.2021.			1.159	0.163	0.102
18.7.2022.			2.388	0.150	0.063
C ***Sampling date***	***Rogoznica Lake*** *(43.53091°N, 15.95876°E)*	***Depth (m)***	***DOC (mg L^{-1})***	***SAS (mg L^{-1})***	***NSA***
16.2.2022.	Oxygen saturation maximum (> 100%)	0	2.018	0.278	0.138
6.4.2022.		0	1.638	0.235	0.144
		2	1.515	0.183	0.121
12.5.2022.		5	2.044	0.333	0.163
18.7.2022.		0	2.823	0.229	0.081
		6	1.809	0.200	0.111
10.11.2022.		0	4.175	0.258	0.062