

TABLES

Supplementary Table S1. Sampling categories with corresponding sampling depths at station Struga (S1) (N 42.72285, E 16.88676) during investigating period. Sampling depths were categorized into Surface, Thermocline and DCM layer separated according to temperature (surface and thermocline) ranges and Chl *a* concentration (DCM). Surface layer: 22.6-25.5 °C; Thermocline layer: 17.3-22.3 °C; DCM layer: 0.120-0.222 µgL⁻¹ . Abbreviation: DCM (deep chlorophyll maximum).

Date	Sampling time (UTC)	Sample categories		
		Surface layer	Thermocline layer	DCM layer
12.7.2021	5PM	0	12	75
13.7.2021	5AM	0	12	75
14.7.2021	5AM	0,12	-	75
14.7.2021	5PM	0	5, 12	75
15.7.2021	5AM	0	12	75
15.7.2021	5PM	0	8, 12	75
16.7.2021	5AM	0	12	15,75
17.7.2021	5AM	0	12	75
17.7.2021	5PM	0	8, 12	75
18.7.2021	5AM	0	6, 12	30, 75
18.7.2021	5PM	0	8, 12	65
19.7.2021	5AM	0,8	12, 18	65
19.7.2021	5PM	0	12	65
20.7.2021	5AM	0	12	65
20.7.2021	5PM	0	5, 12	65
21.7.2021	5AM	0	12, 16	65

Supplemental Table S2. eDNA samples (Station-depth-fraction-date) with numbers of raw input reads, filtrated, denoised and non-chimeric reads

Sample ID	16S rRNA			18S rRNA		
	No. of raw reads	No. of clean reads	Shannon diversity index	No. of raw reads	No. of clean reads	Shannon diversity index
S1-0m-02um-13721	206517	181227	6.04	127018	78970	6.86
S1-0m-02um-20721	190020	167664	7.08	133384	93532	8.13
S1-0m-20um-13721	240989	210345	6.82	119597	71447	4.83
S1-0m-20um-20721	117647	37360	5.85	155726	112019	7.20
S1-0m-3um-13721	271223	237156	6.73	111148	82291	6.90
S1-0m-3um-20721	228558	202703	6.06	168768	114754	8.05
S1-75m-02um-13721	181105	161572	7.82	165289	104712	8.39
S1-75m-20um-13721	139268	113708	5.07	135787	98683	4.83
S1-75m-3um-13721	160018	141572	7.41	146243	110289	8.21

Supplementary Table S3. Principal component analysis (PCA) of environmental variables showing loadings (eigenvectors) of environmental variables, with highest values highlighted, and cumulative variability explained by PC1 and PC2 axis with corresponding eigenvalues.

		PC1	PC2
	Eigenvalues	2.48	1.19
	Variation explained (%)	49.6	73.4
Eigenvalues	NO ₂ (μM)	-0.393	0.466
	NO₃ (μM)	-0.602	0.072
	PO ₄ (μM)	-0.316	0.441
	SiO ₄ (μM)	-0.563	-0.154
	Temperature (°C)	0.257	0.748

Supplementary Table S4. List of groups/taxa determined by the Utermöhl method from samples taken at Station Struga (S1) at Lastovo Island in the Adriatic Sea with corresponding maximum abundances (cellL⁻¹), minimum abundances (cellL⁻¹), and frequency of appearance in samples (%). The total number of samples is 60. Abbreviations - Min: minimum abundances, Max: maximum abundances, Fr: frequency of appearance, N.D: not determined

List of taxa/groups	Min	Max	Fr (%)
Diatoms			
<i>Asterionellopsis glacialis</i> (Castracane) Round	1995	1995	1.67
<i>Bacteriastrum jadrinum</i> Godrijan, Maric & Pfannkuchen	380	380	1.67
<i>Bacteriastrum delicatulum</i> Cleve	140	1135	3.33
<i>Bacteriastrum</i> sp.	20	285	8.33
<i>Cerataulina pelagica</i> (Cleve) Hendey	20	1325	26.67
<i>Chaetoceros affinis</i> Lauder	120	1515	3.33
<i>Chaetoceros anastomosans</i> Grunow	80	100	3.33
<i>Chaetoceros atlanticus</i> Cleve	20	20	1.67
<i>Chaetoceros brevis</i> F.Schütt	60	60	1.67
<i>Chaetoceros</i> cf. <i>constrictus</i> Gran	140	140	1.67
<i>Chaetoceros convolutus</i> Castracane	40	40	1.67
<i>Chaetoceros compressus</i> Lauder	80	1700	11.67
<i>Chaetoceros curvius</i> Cleve	60	1325	10.00
<i>Chaetoceros dadayi</i> Pavillard	60	190	5.00

<i>Chaetoceros danicus</i> Cleve	20	190	10.00
<i>Chaetoceros decipiens</i> Cleve	40	1510	10.00
<i>Chaetoceros diversus</i> Cleve	40	570	5.00
<i>Chaetoceros lacinosus</i> F.Schütt	200	200	1.67
<i>Chaetoceros messanensis</i> Castracane	220	1700	5.00
<i>Chaetoceros rostratus</i> Ralfs	40	1135	11.67
<i>Chaetoceros simplex</i> Ostensfeld	20	190	21.67
<i>Chaetoceros</i> sp.	40	2460	38.33
<i>Chaetoceros socialis</i> H.S.Lauder	140	1130	5.00
<i>Chaetoceros tenuissimus</i> Meunier	20	380	8.33
<i>Chaetoceros wighamii</i> Brightwell	1325	1325	1.67
<i>Chaetoceros vixvisibilis</i> Schiller	755	2270	5.00
<i>Cocconeis</i> sp.	140	140	1.67
<i>Cyclotella choctawhatcheeana</i>	40	40	1.67
<i>Cylindrotheca closterium</i> (Ehrenberg) Reimann & J.C.Lewin	20	945	53.33
<i>Dactyliosolen fragilissimus</i> (Bergon) Hasle	20	755	23.33
<i>Diploneis bombus</i> (Ehrenberg) Ehrenberg	190	380	5.00
<i>Entomoneis</i> sp.	190	190	3.33
<i>Guinardia flaccida</i> (Castracane) Peragallo	20	570	51.67
<i>Guinardia striata</i> (Stolterfoth) Hasle	20	2270	51.67
<i>Haslea wawriake</i> (Hustedt) Simonsen	190	190	1.67
<i>Hemiaulus chinensis</i> Greville	20	1135	51.67
<i>Hemiaulus hauckii</i> Grunow ex Van Heurck	60	755	11.67
<i>Leptocylindrus danicus</i> Cleve	60	3220	53.33
<i>Leptocylindrus mediterraneus</i> (H.Peragallo) Hasle	40	1135	15.00
<i>Licmophora</i> sp.	20	380	6.67
<i>Lioloma pacificum</i> (Cupp) Hasle	190	190	1.67
<i>Nitzschia longissima</i> (Brébisson) Ralfs	60	380	16.67
N.D. penatae	20	1135	85.00
cf. <i>Plagiotropis</i> Pfitzer	190	190	1.67
<i>Pleurosigma</i> sp.	20	190	8.33
<i>Proboscia alata</i> (Brightwell) Sundström	20	1325	80.00
<i>Proboscia indica</i> (H.Peragallo) Hernández-Becerril	20	570	6.67
<i>Pseudo-nitzschia delicatissima</i> (Cleve) Heiden	40	14060	81.67
<i>Pseudo-nitzschia pseudodelicatissima</i> (Hasle) Hasle	380	2280	5.00
<i>Pseudo-nitzschia seriata</i> (Cleve) H.Peragallo	480	480	1.67
<i>Rhizosolenia imbricata</i> Brightwell	20	755	75.00

<i>Rhizosolenia hyalina</i> Ostensfeld	40	40	1.67
<i>Rhizosolenia</i> sp.	190	190	1.67
<i>Skeletonema marinoi</i> Sarno & Zingone	20	1515	8.33
<i>Striatella unipunctata</i> (Lyngbye) C.Agardh	20	120	5.00
<i>Thalassionema frauenfeldii</i> (Grunow) Tempère & Peragallo	20	1515	50.00
<i>Thalassionema nitzschioides</i> (Grunow) Mereschkowsky	40	1325	15.00
<i>Thalassiosira</i> sp.	20	755	8.33
Dinoflagellates			
<i>Akashiwo sanguinea</i> (K.Hirasaka) Gert Hansen & Moestrup	95	95	1.67
<i>Ceratium tripos</i> (Ostensfeld) Graham & Bronikovsky	20	20	1.67
<i>Dinophysis acuminata</i> Claparède & Lachmann	20	20	3.33
<i>Dinophysis caudata</i> Kent	20	20	1.67
<i>Dinophysis</i> sp.	20	20	1.67
<i>Diplopsalis complex</i>	20	20	1.67
<i>Dissodinium elegans</i> (Pavillard) Matzenauer	95	95	1.67
<i>Gonyaulax</i> sp.	190	190	1.67
<i>Gymnodinium</i> spp.	190	190	1.67
<i>Gyrodinium fusiforme</i> Kofoed & Swezy	20	570	58.33
<i>Gyrodinium</i> spp.	20	380	5.00
<i>Oxytoxum</i> sp.	20	190	20.00
<i>Phalacroma rotundatum</i> (Claparède & Lachmann) Kofoed & J.R.Michener	20	40	3.33
<i>Podolampas</i> sp.	20	95	5.00
<i>Prorocentrum micans</i> Ehrenberg	20	190	6.67
<i>Prorocentrum minimum</i> (Pavillard) J.Schiller	20	190	5.00
<i>Protoperidinium</i> sp.	20	190	5.00
<i>Protoperidinium steinii</i> (Jørgensen) Balech	20	95	5.00
<i>Pyrophacus</i> sp.	20	95	3.33
<i>Scrippsiellasp.</i>	20	760	40.00
<i>Tripos furca</i> (Ehrenberg) F.Gómez	20	190	15.00
<i>Tripos fusus</i> (Ehrenberg) F.Gómez	20	190	5.00
<i>Tripos massiliensis</i> (Gourret) F.Gómez	20	20	3.33
<i>Tripos</i> sp.	20	380	8.33
<i>Tripos teres</i> (Kofoed) F.Gómez	190	190	1.67
N.D. dinoflagellates (micro)	20	970	51.67
N.D. dinoflagellates (<20 µm)	95	23430	91.67
Coccolithophorids			
<i>Calciosolenia brasiliensis</i> (Lohmann) J.R.Young	190	190	1.67

<i>Calyptrosphaera oblonga</i> Lohmann	95	95	1.67
<i>Ophiaster</i> sp.	20	20	1.67
<i>Syracosphaera pulchra</i> Lohman	20	20	1.67
N.D. coccolithophorids (micro)	95	2840	8.33
N.D. coccolithophorids (<10 μm)	710	5680	55.00
Others			
Chlorophyceae	710	3550	41.67
Chrysophyceae	3550	3550	1.67
Cryptophyta	710	8510	50.00
<i>Dictyocha fibula</i> Ehrenberg	20	380	8.33
Other autotrophs	1420	1420	1.67

Supplementary Table S5. Phytoplankton community biodiversity indices at station Struga (S1), Lastovo Island, South Adriatic. Abbreviations: S (total species number), N (total number of individuals), d (species richness), J' (Pielou's evenness), H' (Shannon-Weiner diversity), 1- λ (species diversity); λ (Simpson's Index).

S	N	d	J'	H'(loge)	1- λ
98	13156.6	10.22702	0.582843	2.672315	0.846061

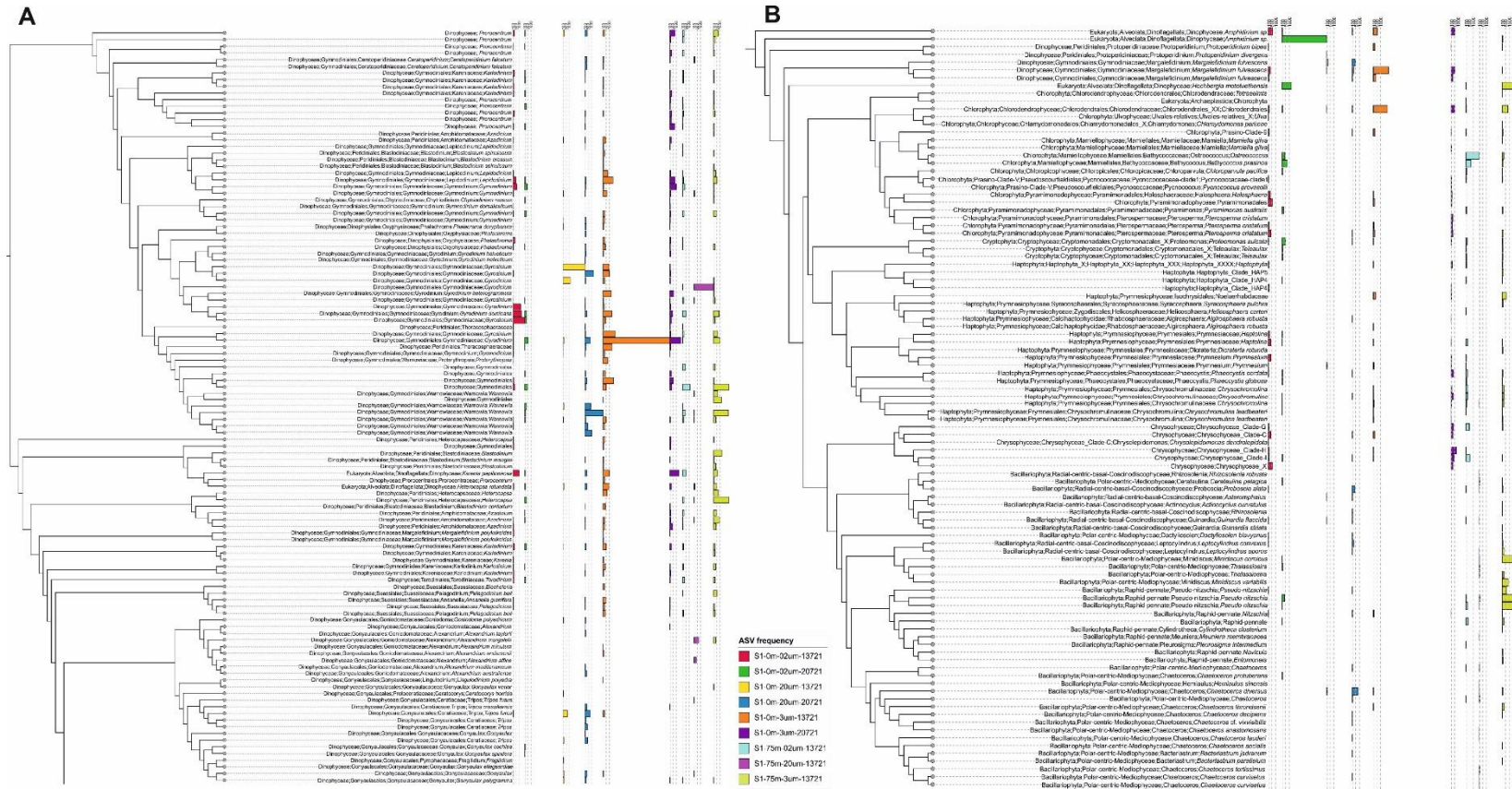
Supplementary Table S6. Maximum bacterioplankton and picophytoplankton abundance determined by flow cytometry. Abbreviations: Max (maximum abundance), HB (heterotrophic bacteria); HNA HB (high nucleic acid heterotrophic bacteria); LNA HB (low nucleic acid heterotrophic bacteria), PRO (*Prochlorococcus*); SYN (*Synechococcus*); PPE (Picoeukaryotes);.

	Max (cell mL ⁻¹)	Water layer	Date
HB	6.28E+05	Thermocline	15.7.2021
LNA HB	3.62E+05	Thermocline	17.7.2021
HNA HB	3.23E+05	Surface	21.7.2021
PRO	3.52E+04	DCM	17.07.2021.
SYN	1.47E+04	Thermocline	18.07.2021.
PPE	1.51E+03	DCM	20.07.2021.

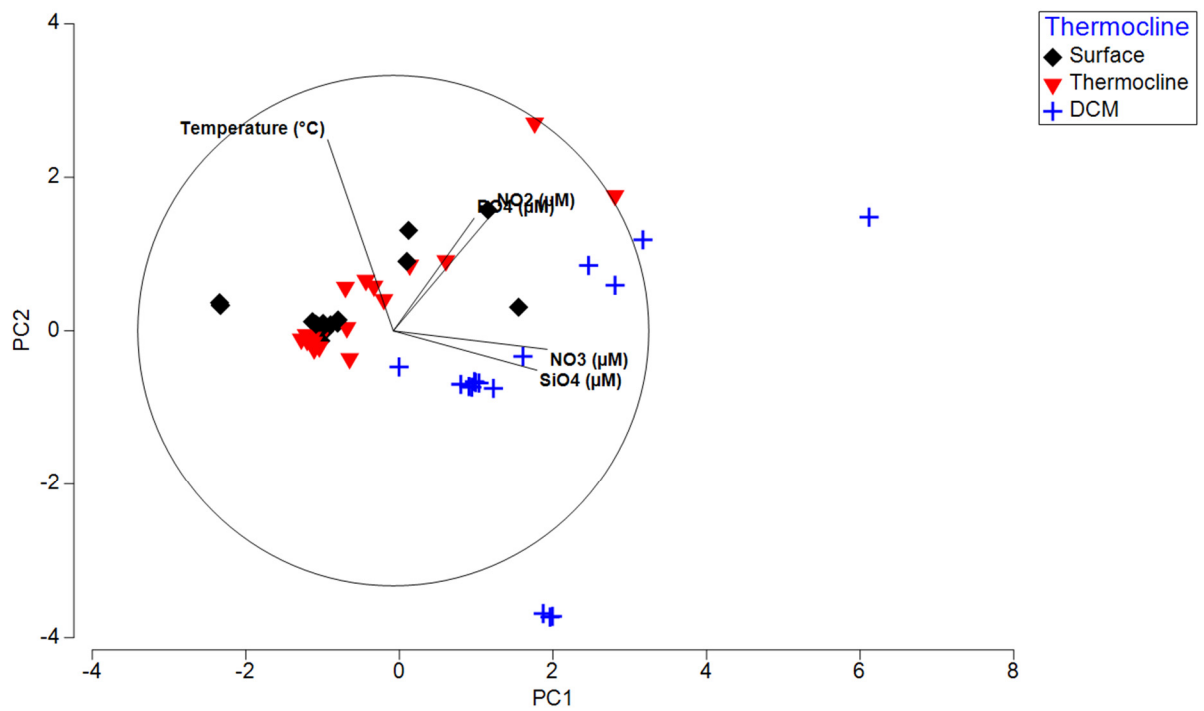
Supplementary Table S7. Canonical correspondence analysis (CCA) results showing percentage of variability explained by constrained and unconstrained axes, eigenvalues for constrained axes, and ANOVA permutation test results (F and p value) for entire model and for constrained axis.

	Variability explained	Eigenvalues	ANOVA	
			F-test value	p value
Constrained axis	0,183			
Unconstrained axis	0,817			
CCA1		0,026	6,591	0,001
CCA2		0,007	1,814	0,736
CCA model			1,939	0,003

FIGURES

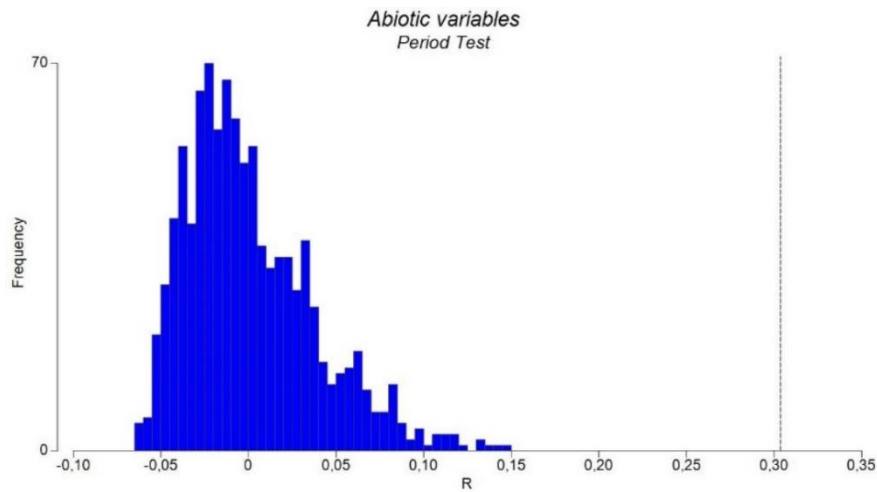


Supplementary Figure S1. Cladogram with adjacent ASV frequencies showing microscopy-relevant 211 taxa. Cladogram was constructed using plugin q2-phylogeny, MAFFT program, and FastTree, and visualized using iTOL 4.4.2. Taxonomy dataset generated in QIIME2 using PR2 database was added to the cladogram, representing 211 relevant taxa spread through Dinophyta, Cryptophyta, Haptophyta, Chlorophyta and Bacillariophyta. Sample frequency (number of ASVs identified as individual representative sequence) was added using FeatureTable.

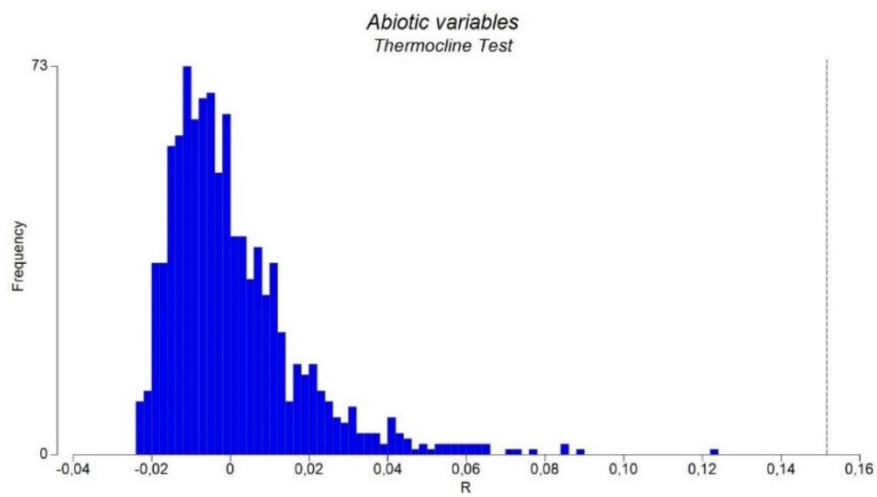


Supplementary Figure S2. Principal component analysis (PCA) of environmental variables with overlaid vectors whose direction and length indicate negative or positive correlations of abiotic variables with PC1 and PC2 axes.

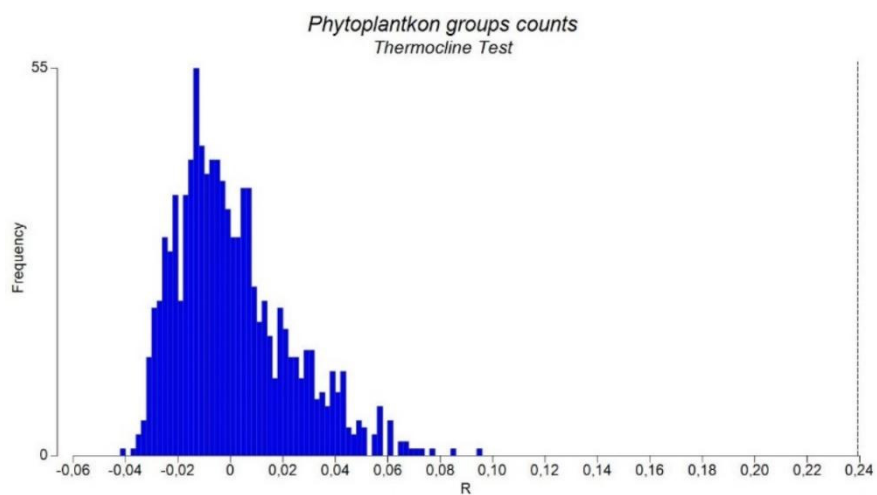
(A)



(B)



(C)



Supplementary Figure S3. Analysis of similarities (ANOSIM) test confirming: (A) significant nutrient concentration decrease after 16 July 2021, (B) significant nutrient gradient with distinct concentrations between surface, thermocline and deep chlorophyll maximum layer, (C) significant vertical distribution of nano-, micro-, picophytoplankton and bacterioplankton.