Potentially Toxic Cyanobacteria in a Eutrophic Reservoir in Northern Colombia

Supplementary material

Table S1. Mean values for physicochemical parameters evaluated during the climatic epochs of the years 2015 to 2019 in El Guájaro reservoir, Colombia.

Year		pH		T (°C)		DO (mg/L)		Cond. (µS/cm)		DBO5 (mgO2/L)		TSS (mg/L)	
	Station	**Dry**	**Rain**	**Dry**	**Rain**	**Dry**	**Rain**	**Dry**	**Rain**	**Dry**	**Rain**	**Dry**	**Rain**
2015	LP	8.47	6.83	30.36	27.00	6.24	6.11	1184.67	642.00	5.71	6.04	32.00	33.05
	RO	8.03	6.21	30.23	28.10	5.61	5.99	1023.70	750.33	5.93	5.49	33.04	36.38
	RE	7.58	7.26	27.77	27.05	7.45	6.59	1108.67	840.00	4.21	5.72	21.30	32.93
	AC	7.97	6.23	31.41	28.57	5.37	6.55	789.67	728.67	4.54	5.08	21.10	33.39
	EP	8.15	8.31	30.31	28.18	5.57	6.09	857.33	877.33	4.27	5.04	19.36	28.93
	VR	7.66	6.43	29.86	25.23	6.60	5.93	544.77	664.00	3.44	5.97	13.49	17.27
	LC	7.24	7.29	30.14	25.29	4.44	6.22	1007.00	839.33	3.86	5.87	9.87	30.13
	Mean	7.87	6.94	30.01	27.06	5.90	6.21	930.83	763.10	4.57	5.60	21.45	30.30
	Stand. dev	0.41	0.76	1.10	1.36	0.97	0.26	217.89	91.84	0.93	0.41	8.64	6.23
2016	LP	8.65	6.13	30.15	25.61	4.86	6.22	1092.00	642.00	5.28	4.06	33.72	9.20
	RO	8.73	6.09	30.77	25.95	4.44	6.63	1263.33	345.72	6.64	3.96	28.08	15.13
	RE	8.10	7.30	30.11	26.38	7.35	7.91	983.00	632.00	4.99	3.92	41.47	24.41
	AC	8.30	7.54	30.93	26.05	4.22	5.21	830.00	838.67	5.72	3.50	33.63	16.07
	EP	8.53	8.31	31.14	27.95	5.62	5.44	838.00	805.00	5.17	3.50	32.47	16.23
	VR	7.73	6.51	29.76	26.01	6.07	6.27	838.00	360.46	4.25	3.98	42.84	16.80
	LC	7.49	7.28	30.95	25.45	3.63	6.07	736.33	644.00	4.15	4.11	48.00	9.69
	Mean	8.22	7.03	30.55	26.20	5.17	6.25	940.10	609.69	5.17	3.86	37.17	15.36
	Stand. dev	0.47	0.82	0.53	0.83	1.27	0.88	184.34	193.69	0.86	0.26	7.04	5.09
2017	LP	8.39	8.59	31.35	30.60	6.04	6.92	1089.00	918.00	5.68	5.87	34.13	35.45
	RO	7.06	9.05	28.26	30.47	3.56	6.81	410.02	729.00	4.18	4.79	10.27	28.72
	RE	7.22	9.23	27.98	31.13	4.37	6.68	303.39	727.33	3.86	5.33	16.67	28.49
	AC	7.18	9.18	28.52	30.13	3.60	6.42	410.13	734.67	4.18	4.98	9.03	28.54
	EP	7.15	9.10	28.59	29.87	3.59	6.06	410.33	734.67	4.15	4.88	10.37	27.38
	VR	7.77	7.81	28.36	30.17	6.56	5.83	217.55	881.33	3.91	3.10	23.07	28.00
	LC	7.53	8.40	28.41	30.17	5.30	4.72	172.21	889.67	4.06	3.01	8.53	28.23
	Mean	7.47	8.77	28.78	30.36	4.72	6.21	430.38	802.10	4.29	4.57	16.01	29.26

	Stand. dev	0.48	0.53	1.15	0.42	1.26	0.77	306.34	88.89	0.63	1.09	9.56	2.77
2018	LP	8.77	8.88	31.23	30.62	5.84	5.19	1072.33	1147.33	5.56	2.58	32.70	16.02
	RO	8.79	8.37	29.75	30.62	4.49	5.42	1080.33	827.00	3.64	2.69	15.67	23.93
	RE	6.46	8.60	29.97	30.13	4.02	5.59	426.42	556.00	3.91	2.80	14.93	27.03
	AC	7.41	8.31	30.70	30.34	3.60	5.42	418.50	828.67	4.00	2.59	8.49	23.83
	EP	7.17	8.41	29.56	30.24	3.52	5.13	430.15	817.00	4.37	2.48	10.78	23.76
	VR	7.81	8.07	30.71	30.14	6.62	5.52	226.06	562.33	3.92	2.98	25.31	28.10
	LC	6.90	7.52	32.10	31.15	5.06	3.50	181.44	324.67	4.13	2.41	8.75	28.37
	Mean	7.62	8.31	30.58	30.46	4.74	5.11	547.89	723.29	4.22	2.65	16.66	24.44
	Stand. Dev.	0.90	0.43	0.90	0.37	1.17	0.73	374.56	265.60	0.63	0.19	9.13	4.23
2019	LP	8.53	8.93	29.42	33.80	5.36	4.08	1012.70	1138.33	5.75	2.68	28.27	16.33
	RO	8.30	8.46	30.08	33.58	5.20	4.54	1034.66	840.33	5.88	2.59	43.10	23.83
	RE	7.80	8.06	30.24	32.27	4.60	5.51	969.06	559.00	6.45	2.29	28.86	27.60
	AC	7.76	8.44	31.16	33.63	4.35	5.42	529.61	821.67	5.59	2.73	28.01	23.83
	EP	7.72	8.35	30.12	33.61	4.85	5.35	500.99	829.00	5.52	2.75	28.33	21.43
	VR	8.08	8.55	30.48	30.13	4.34	5.65	564.91	560.67	7.26	2.90	43.10	28.00
	LC	7.62	7.86	31.28	32.57	4.21	3.22	499.11	292.67	4.99	2.34	41.11	18.67
	Mean	7.97	8.38	30.40	32.80	4.70	4.82	730.15	720.24	5.92	2.61	34.40	21.81
	Stand. dev	0.34	0.34	0.65	1.32	0.45	0.91	259.18	272.53	0.73	0.22	7.55	4.34

Table S2. Abundance and species richness of cyanobacteria present in El Guájaro reservoir. found from 2015 to 2019.

Richness (Number of species)										
	2015		2016		2017		2018		2019	
	Season		Season		Season		Season		Season	
Station	Dry	Rain	Dry	Rain	Dry	Rain	Dry	Rain	Dry	Rain
LP	9	8	10	12	13	11	11	11	11	10
RO	11	9	10	9	10	10	11	12	7	10
RE	14	9	17	12	14	10	15	12	9	12
AC	12	8	14	13	12	12	14	11	16	12
EP	6	6	10	12	10	9	13	9	13	10
VR	10	7	8	11	6	11	8	11	12	13
LC	12	8	14	13	6	10	8	9	10	13
Mean	10.57	7.86	11.86	11.71	10.14	10.43	11.43	10.71	11.14	11.43
Stand. dev	2.57	1.07	3.18	1.38	3.18	0.98	2.76	1.25	2.91	1.39
Conf. Intv.	1.91	0.79	2.36	1.02	2.36	0.72	2.04	0.93	2.16	1.03
Abundance (Cell/mL)										
	Season		Season		Season		Season		Season	
	2015		**2016**		**2017**		**2018**		**2019**	
Station	Dry	Rain	Dry	Rain	Dry	Rain	Dry	Rain	Dry	Rain
LP	492	179	117	351	165	253	122	186	256	152
RO	496	176	184	270	96	240	186	238	248	270
RE	828	203	225	385	117	225	204	295	230	225
AC	609	146	197	185	96	165	109	193	188	152
EP	306	121	193	220	76	185	121	104	139	130
VR	550	161	104	230	73	218	69	189	159	225
LC	500	179	316	476	73	262	94	239	142	217
Mean	540.14	166.43	190.86	302.43	99.43	221.14	129.29	206.29	194.57	195.86
Stand. dev	157.27	26.63	70.61	105.03	33.11	35.41	48.67	59.57	50.07	51.36
Conf. Intv.	116.50	19.73	52.31	77.80	24.53	26.23	36.05	44.13	37.09	38.05
Total abundance	4946		3453		2244		2349		2733	

Figure S1. Microphotographs of natural samples collected in El Guájaro reservoir during the period 2015-2019. (a-b) *Microcystis aeruginosa*. (c) *Synechocystis sp*. (d) *Merismopedia sp.* (e) *Nostoc sp.* (f) *Nostoc commune.* (g) *Nostoc muscorum* colony. (h) *Spirulina sp*. (i) *Phormidium sp*. (j) *Phormidium papyraceum*. (k) *Oscillatoria tenuis*? (l) *Planktothrix agardii.* (m) *Pseudanabaena catenata.* (n) *Raphidiopsis raciborskii.* (o) *Dolichospermum flos-aquae. (p) Stigonema sp.* (q) *Cylindrospermum sp.* (r) *Raphidiopsis curvata.* (s) *Leptolyngbya sp*. (t) *Anabaena sp.* (u) *Calothrix sp*.

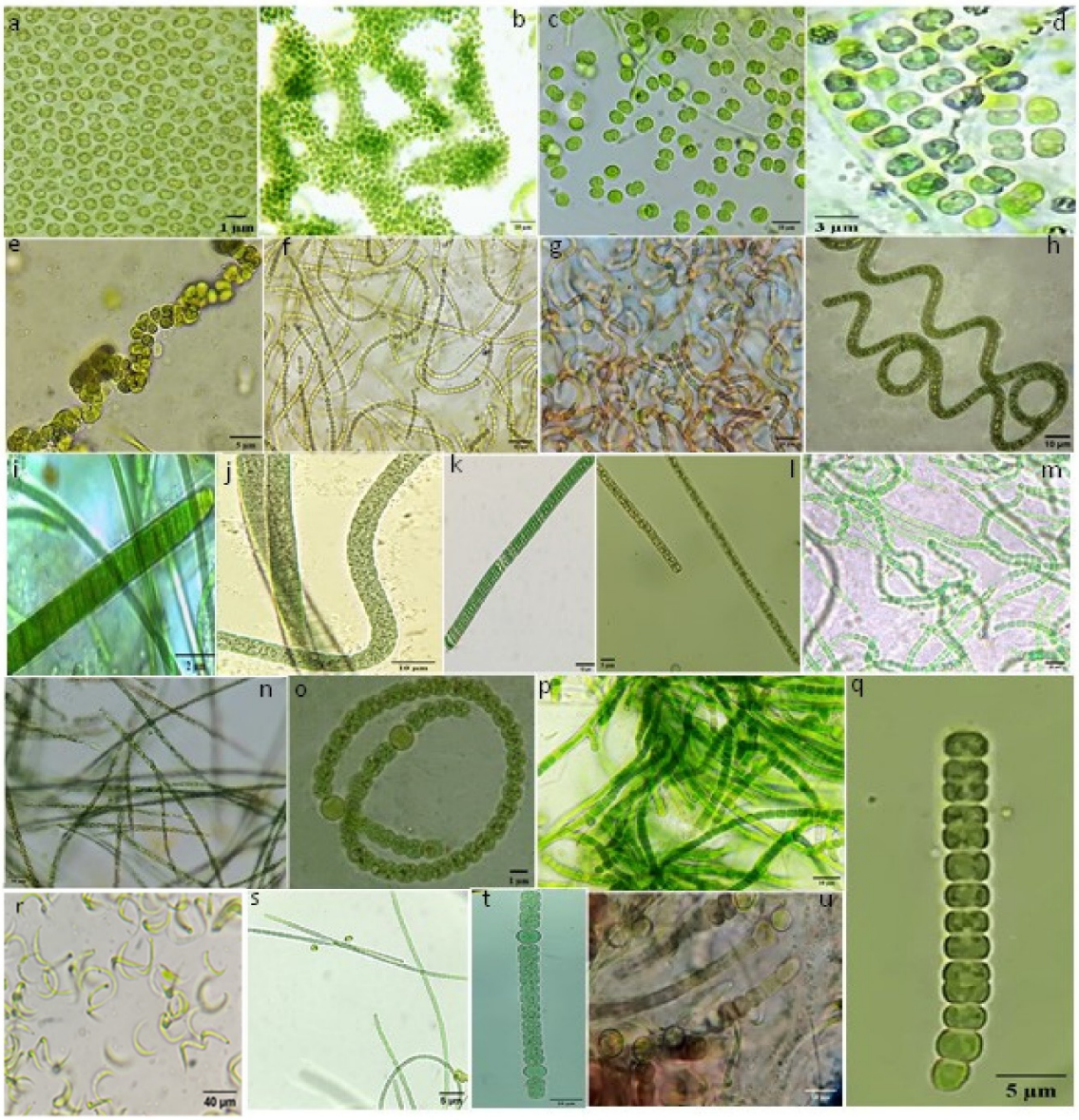

Figure S2. NMDS non-metric multidimensional scaling analysis of the cyanobacterial community with interaction between significant environmental variables and confidence ellipses of climatic epochs.