

SUPPLEMENTARY MATERIAL

First detection of the bloom forming *Unruhdinium penardii* (Dinophyceae) in a Mediterranean reservoir: insights on its ecology, morphology and genetics

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Supplementary Tab. 1. Sampling scheme in the Cedrino Lake during the study period.

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Jan		X			X	X	X		X
Feb		X	X	X					
Mar		X			X	X	X	X	X
Apr		X	X						
May		X		X	X	X	X	X	X
Jun		X	X						
Jul	X	X		X		X	X	X	
Aug	X	X	X						
Sep	X	X		X			X		
Oct	X		X			X			
Nov						X	X	X	
Dec	X	X	X						

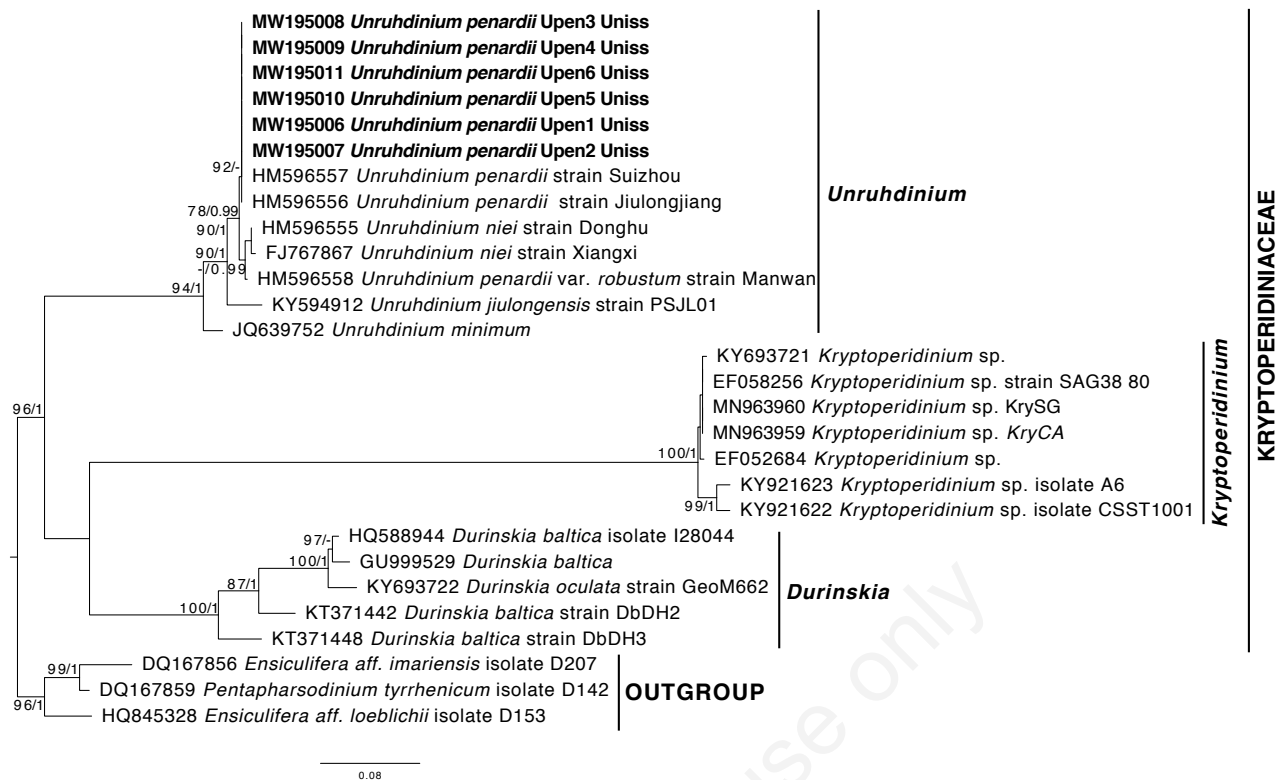
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Supplementary Tab. 2. Average values \pm standard deviations along the water column (from 0 to 30 m) for temperature (Temp), conductivity (Cond), reactive phosphorous (P-PO₄), total phosphorous (TP), dissolved inorganic nitrogen (DIN), and corresponding mixing or stratification (M or S) conditions. Data corresponding to *U. penardii* cell densities higher than 5×10^4 cells L⁻¹ are reported in bold.

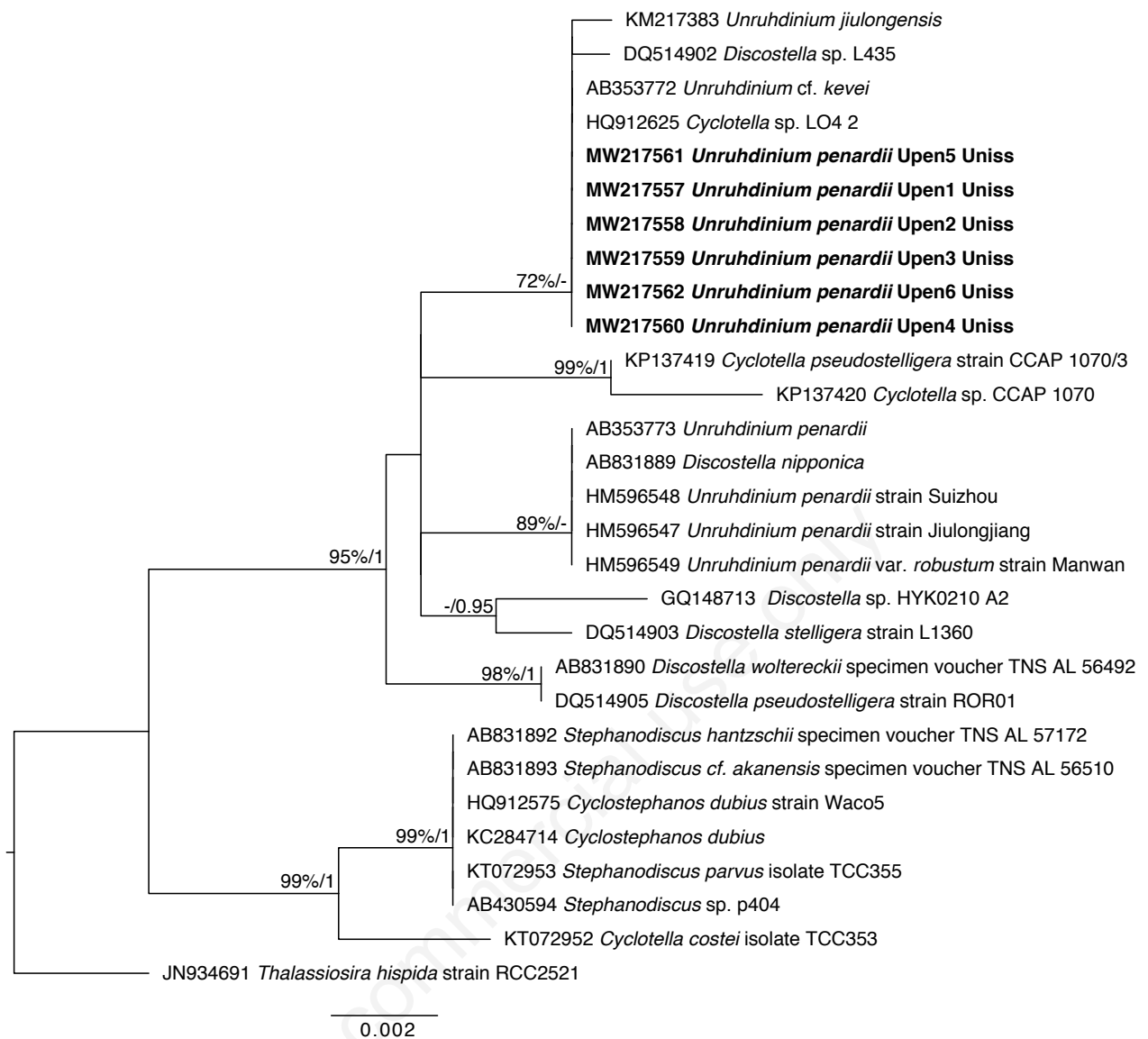
		Temp (°C)	Cond (μ S cm ⁻¹)	P-PO ₄ (mg m ⁻³)	TP (mg m ⁻³)	DIN (mg m ⁻³)	M or S
2010	Jul	23.56 \pm 3.88	340.11 \pm 43.59	67.22 \pm 75.70	87.67 \pm 75.75	369.44 \pm 372.04	S
	Aug	22.42 \pm 3.99	332.12 \pm 45.12	84.56 \pm 136.24	150.44 \pm 204.23	591.11 \pm 1394.82	S
	Sep	20.36 \pm 2.11	353.92 \pm 38.66	57.44 \pm 117.03	142.33 \pm 181.20	594.22 \pm 1199.18	S
	Oct	15.75 \pm 0.47	312.39 \pm 25.88	58.89 \pm 2.76	105.56 \pm 24.24	1298.00 \pm 66.79	M
	Dec	10.40 \pm 0.47	356.44 \pm 6.46	73.56 \pm 12.23	110.78 \pm 19.42	1562.11 \pm 82.30	M
2011	Jan	10.10 \pm 0.33	359.33 \pm 12.20	83.67 \pm 9.04	124.89 \pm 21.69	1661.78 \pm 86.24	M
	Feb	10.47 \pm 0.22	322.00 \pm 10.27	44.22 \pm 4.29	79.11 \pm 19.14	896.78 \pm 145.24	M
	Mar	12.49 \pm 0.93	312.56 \pm 10.24	17.67 \pm 18.21	45.56 \pm 30.67	721.44 \pm 225.23	M
	Apr	14.53 \pm 2.07	303.00 \pm 29.04	3.22 \pm 4.84	34.00 \pm 9.43	438.11 \pm 367.83	M
	May	17.93 \pm 3.58	323.89 \pm 16.08	24.78 \pm 18.34	46.78 \pm 17.43	365.89 \pm 217.97	S
	Jun	19.94 \pm 4.30	362.03 \pm 22.22	32.71 \pm 32.32	80.17 \pm 30.86	356.19 \pm 304.09	S
	Jul	21.28 \pm 3.49	357.23 \pm 36.02	67.17 \pm 78.02	106.95 \pm 84.17	461.93 \pm 292.92	S
	Aug	22.91 \pm 3.54	359.67 \pm 42.28	56.67 \pm 70.81	209.22 \pm 114.81	1136.11 \pm 533.66	S
	Sep	22.62 \pm 1.34	368.11 \pm 27.75	24.00 \pm 33.88	95.25 \pm 46.12	143.78 \pm 96.92	S
	Dec	12.67 \pm 0.23	346.00 \pm 21.74	51.33 \pm 16.49	86.78 \pm 24.45	1459.00 \pm 86.79	M
2012	Feb	11.09 \pm 1.40	349.11 \pm 20.05	15.96 \pm 12.56	137.89 \pm 202.42	1037.42 \pm 245.96	M
	Apr	13.66 \pm 2.31	325.56 \pm 16.35	12.22 \pm 6.44	34.44 \pm 10.81	753.22 \pm 208.21	M
	Jun	19.12 \pm 4.10	338.10 \pm 46.60	57.30 \pm 73.15	119.10 \pm 106.47	708.50 \pm 651.63	S
	Aug	22.76 \pm 4.81	342.00 \pm 43.73	35.33 \pm 68.12	88.00 \pm 107.84	483.33 \pm 665.32	S
	Oct	21.57 \pm 1.60	375.33 \pm 36.80	31.11 \pm 56.97	90.33 \pm 117.13	897.89 \pm 1165.43	M
	Dec	11.34 \pm 0.23	389.56 \pm 2.79	35.56 \pm 6.95	64.89 \pm 13.88	1140.56 \pm 121.22	M
2013	Feb	9.81 \pm 0.41	377.07 \pm 2.38	60.67 \pm 3.59	96.44 \pm 5.04	1691.44 \pm 33.56	M
	May	16.23 \pm 2.17	326.60 \pm 20.13	28.50 \pm 32.65	81.30 \pm 43.10	852.10 \pm 378.68	M
	Jul	21.67 \pm 5.09	335.56 \pm 34.85	38.00 \pm 68.81	75.78 \pm 107.93	551.78 \pm 509.72	S
	Sep	21.44 \pm 2.46	364.22 \pm 20.62	30.89 \pm 35.88	112.22 \pm 155.13	502.00 \pm 885.56	S
2014	Jan	10.31 \pm 0.15	367.44 \pm 0.73	38.00 \pm 1.32	60.89 \pm 2.26	1000.00 \pm 18.37	M
	Mar	12.96 \pm 1.34	340.33 \pm 7.19	19.00 \pm 19.04	35.56 \pm 11.13	834.44 \pm 223.64	M
	May	18.33 \pm 3.14	360.11 \pm 4.88	29.89 \pm 37.01	42.67 \pm 32.48	562.89 \pm 257.27	S
2015	Jan	10.35 \pm 0.13	464.63 \pm 0.74	23.50 \pm 0.53	41.63 \pm 1.30	820.00 \pm 307.92	M
	Mar	13.54 \pm 0.80	303.89 \pm 29.76	29.67 \pm 3.64	44.22 \pm 8.70	686.11 \pm 20.31	M
	May	17.39 \pm 3.25	338.89 \pm 8.30	7.78 \pm 11.14	25.56 \pm 8.34	376.33 \pm 312.98	S
	Jul	22.47 \pm 5.76	358.89 \pm 11.26	16.44 \pm 23.50	28.78 \pm 22.60	148.56 \pm 231.48	S
	Oct	20.63 \pm 2.16	373.11 \pm 21.14	12.67 \pm 11.85	45.67 \pm 12.85	791.11 \pm 494.84	S
	Nov	17.14 \pm 0.71	375.25 \pm 7.23	14.25 \pm 5.37	35.88 \pm 11.96	757.89 \pm 291.62	M
2016	Jan	10.81 \pm 0.23	440.00 \pm 103.50	23.33 \pm 3.39	34.33 \pm 5.72	843.78 \pm 23.33	M
	Mar	11.62 \pm 0.14	381.89 \pm 2.42	35.13 \pm 1.13	44.00 \pm 1.41	825.22 \pm 15.01	M
	May	17.07 \pm 2.83	311.22 \pm 14.10	13.44 \pm 19.74	34.67 \pm 19.50	299.67 \pm 347.76	S
	Jul	22.06 \pm 3.55	329.33 \pm 10.69	18.22 \pm 25.07	37.67 \pm 22.79	84.33 \pm 117.70	S
	Sep	22.68 \pm 0.42	363.50 \pm 5.76	5.00 \pm 5.32	26.25 \pm 5.50	150.11 \pm 122.49	M
	Nov	14.23 \pm 0.37	391.22 \pm 8.29	6.11 \pm 5.23	57.33 \pm 9.76	868.44 \pm 86.70	M
2017	Mar	15.00 \pm 1.49	325.56 \pm 29.12	5.94 \pm 10.58	47.00 \pm 24.98	533.44 \pm 330.54	M
	May	18.50 \pm 3.79	386.67 \pm 12.25	15.89 \pm 12.63	89.78 \pm 26.33	301.11 \pm 228.48	S
	Jul	23.86 \pm 3.51	426.33 \pm 6.75	25.67 \pm 33.36	74.67 \pm 50.74	293.31 \pm 244.21	S
	Nov	13.22 \pm 0.08	453.89 \pm 2.26	11.22 \pm 0.83	37.11 \pm 3.44	1234.56 \pm 19.05	M
2018	Jan	10.29 \pm 0.22	448.67 \pm 1.50	28.22 \pm 2.22	43.44 \pm 2.60	1507.11 \pm 16.10	M
	Mar	10.80 \pm 0.32	409.00 \pm 9.11	-	13.56 \pm 9.61	1203.33 \pm 21.77	M
	May	16.11 \pm 1.42	328.67 \pm 8.43	16.00 \pm 19.43	109.33 \pm 32.63	438.78 \pm 336.36	M



Supplementary Fig. 1. Maximum likelihood phylogenetic tree inferred from the ITS sequences, including representatives of the family Kryptoperidiniaceae and other sequences used as outgroups. *Unruhadinium penardii* sequences obtained in this study are indicated in bold. The bootstrap values (BP) and the Bayesian posterior probabilities (BPP) are provided at each node (% BS/BPP). Only BS and BPP values >70% and >0.90 are shown.



Supplementary Fig. 2. Maximum likelihood phylogenetic tree inferred from the LSU rDNA sequences, including representatives of the family Kryptoperidiniaceae and other sequences used as outgroups. *Unruhdinium penardii* sequences obtained in this study are indicated in bold. The bootstrap values (BP) and the Bayesian posterior probabilities (BPP) are provided at each node (% BS/BPP). Only BS and BPP values >70% and >0.90 are shown.



Supplementary Fig. 3. Maximum likelihood phylogenetic tree inferred from the SSU rDNA sequences of the *Unruhdinium* diatom endosymbiont. It also includes representatives of the diatom family Stephanodiscaceae and *Thalassiosira hispida* as outgroup. The endosymbiont sequences obtained in this study are indicated in bold. The bootstrap values (BP) and the Bayesian posterior probabilities (BPP) are provided at each node (% BS/BPP). Only BS and BPP values >70% and >0.90 are shown.