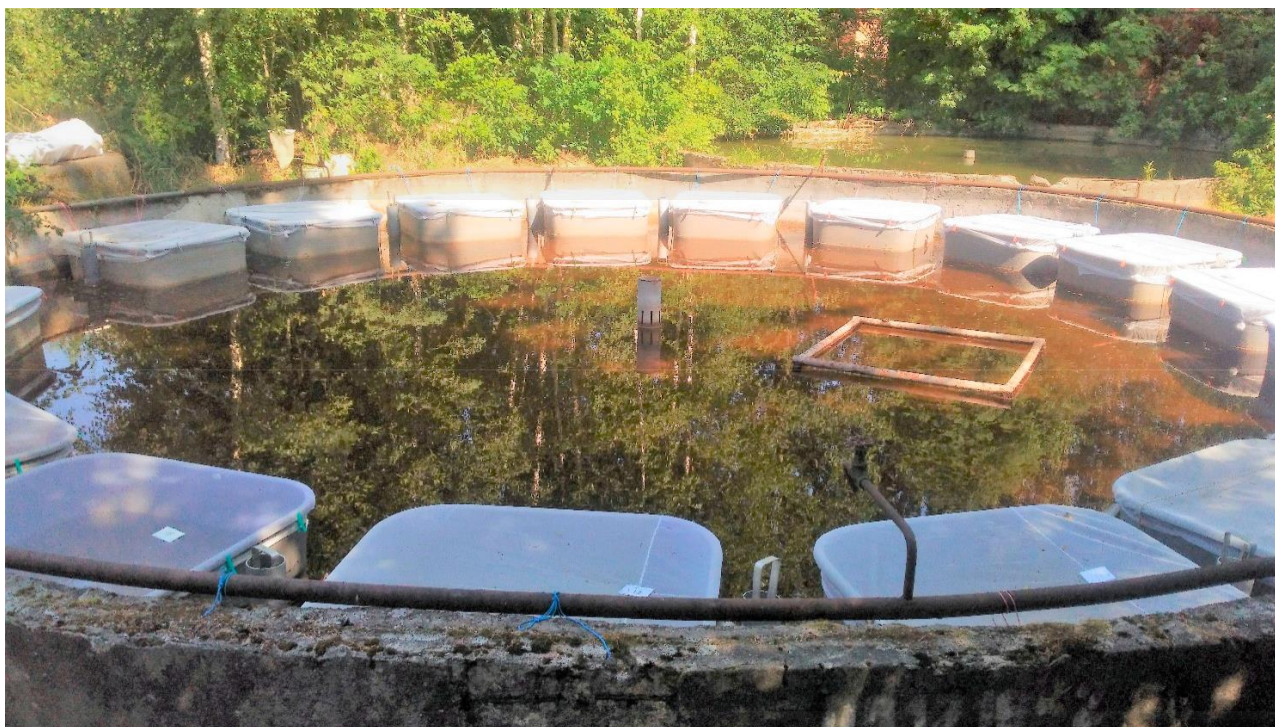


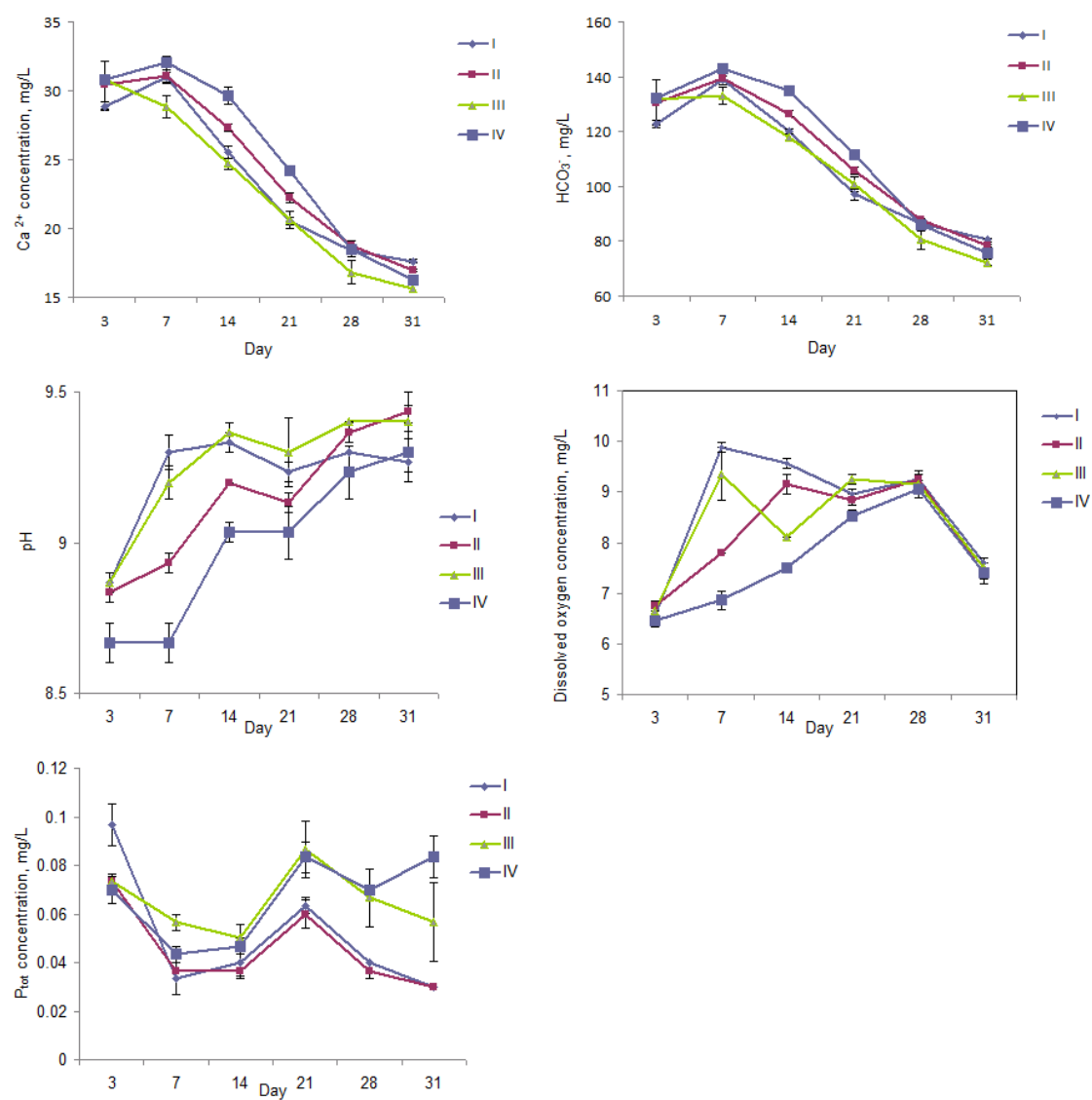
Article

# Effects of Algicidal Macrophyte Metabolites on Cyanobacteria, Microcystins, Other Plankton, and Fish in Microcosms

## Supplementary materials

**Figure S1:** View of microcosms setup. Photo A. Mavrin.



**Figure S2:** Dynamics of hydrochemical variables during exposure. Mean values and confidence intervals are given (n=3).

**Table S1.** List of species of phytoplankton in four treatments (I, II, III, IV) during experimental exposition.

	Treatment			
	I	II	III	IV
<b>Cyanobacteria</b>				
<i>Dolichospermum spiralis</i>	xxx	xxx	xxx	xxx
<i>Dolichospermum affinis</i>	x	x	x	x
<i>Pseudanabaena limnetica</i>	x	x		
<i>Aphanocapsa delicatissima</i>	x	x	x	x
<i>Aphanocapsa planctonica</i>	x	x	xx	x
<i>Aphanothece stagnina</i>	x	-	-	-
<i>Aphanizomenon flos-aquae</i>	xxx	xxx	xxx	xxx
<i>Aphanizomenon issatschenkoi</i>	x	x	xx	xx
<i>Aphanizomenon gracile</i>	-	-	xx	-
<i>Coelosphaerium kutzingianum</i>	x	-	x	x
<i>Nostoc kihlmani</i>	-	-	-	x
<i>Phormidium</i> sp.	x	-	-	-
<i>Pseudoanabaena</i> sp.	x	-	x	-
<i>Microcystis aeruginosa</i>	xx	x	xx	xxx
<i>Planktolyngbya limnetica</i>	x	xx	x	xx
<i>Merismopedia</i> sp.	x	x	x	x
<i>Nodularia</i> sp.	x	x	x	x
<i>Snowella fenica</i>	x	x	x	x
<i>Synechocystis</i> sp.	-	-	x	x
<b>Cryptophyta</b>				
<i>Komma caudata</i>	x	x	x	x
<i>Cryptomonas</i> sp.	xx	xxx	xx	x
<i>Cryptomonas marsonii</i>	xxx	xxx	xx	x
<i>Chroomonas acuta</i>	x	x	x	x
<i>Katablepharis ovalis</i>	x	-	x	-
<b>Chrysophyta</b>				
<i>Dynobryon cylindricum</i>	-	-	-	x
<i>Mallomonas</i> sp.	x	x	x	x
<b>Dynophyta</b>				
<i>Ceratium hirundinella</i>	x	xx	xx	x
<i>Gymnodinium</i> sp.	x	x	x	x
<i>Peridinium aciculiferum</i>	-	-	x	x
<i>Peridinium</i> sp.	-	x	x	x
<b>Bacillariophyta</b>				
<i>Aulacoseira granulata</i>	xxx	xxx	xxx	xxx
<i>Fragilaria</i> sp.	x	x	x	x
<i>Navicula</i> sp.	-	-	x	-
<i>Nitzschia acicularis</i>	x	x	x	x

<i>Pinularia</i> sp.	x	-	-	-
<i>Synedra nana</i>	x	x	x	x
<i>Belonastrum berolinensis</i>	x	x	x	-
<i>Ulnaria acuc</i>	-	x	xx	x
<b>Chlorophyta</b>				
<i>Chlorella</i> sp.	x	x	x	x
<i>Chlamydocapsa planctonica</i>	-	-	x	-
<i>Coelastrum sphaericum</i>	x	-	-	-
<i>Coelastrum microporum</i>	x	x	x	x
<i>Coelastrum astroideum</i>	x	x	x	x
<i>Botryococcus braunii</i>	x	x	x	x
<i>Actinastrum</i> sp.	-	-	-	x
<i>Ankyra judayi</i>	-	x	x	-
<i>Ankyra ancora</i>	x	-	-	x
<i>Ankistrodesmus fusiformis</i>	xx	x	x	xx
<i>Dictyosphaerium ehrenberg</i>	--	x		x
<i>Dictyosphaerium subsolitariu</i>	x	x	x	x
<i>Dictyosphaerium pulhellum</i>	-	x		x
<i>Geminella planctonica</i>	-	x	x	-
<i>Geminella pulcha</i>	-	x	-	-
<i>Gloeotila pelagica</i>	-	x	x	x
<i>Gloeotila fenica</i>	x	x	-	x
<i>Keratococcus suecicus</i>	-	-	-	x
<i>Korschikoviella limnetica</i>	x	x	x	-
<i>Kirchneriella obesa</i>	-	-	-	x
<i>Kirchneriella lynaris</i>	-	-	-	x
<i>Pediastrum borianum</i>	x	x	x	x
<i>Planctonema lauterbornii</i>	x	x	x	x
<i>Planktosphaeria gelatinosa</i>	x	x	-	-
<i>Pandorina morum</i>	x	-	-	x
<i>Eudorina elegans</i>	-	-	-	x
<i>Sphaerocystis schroeteri</i>	x	x	x	x
<i>Oocystis lacustris</i>	x	x	x	x
<i>Monoraphidium contortum</i>	x	-	x	x
<i>Monoraphidium dubovskii</i>	x	x	-	x
<i>Monoraphidium mirabile</i>	x	-	x	x
<i>Monoraphidium griffithii</i>	x	x	x	x
<i>Nephrocytium agardhianum</i>	-	x	x	x
<i>Volvox</i> sp.	x	x	-	-
<i>Scenedesmus quadricauda</i>	x	x	x	x
<i>Scenedesmus acuminatus</i>	-	x		x
<i>Scenedesmus sempervirens</i>	x	x	x	x

<i>Selenastrum gracile</i>	x	-	-	-
<i>Tetraëdron minimum</i>	x	x	x	x
<i>Sorastrum spinulosum</i>	-	x	-	x
<b>Charophyta</b>				
<i>Mougeotia</i> sp.	xx	xxx	xxx	xxx
<i>Elakatothrix</i>	x	x	x	x
<i>Cosmarium meneghinii</i>	x	x	x	x
<i>Cosmarium impressulum</i>	x	-	-	x
<i>Closterium acutum</i>	-	x	x	x
<i>Spirogyra</i> sp.	-	x	-	-
<i>Spondylosium planum</i>	-	-	x	-
<i>Stauroastrum</i>	x	x	x	x
<i>Staurodesmus</i>	x	-	-	-

Note.

xxx species dominates, accounting for more than 10% of the total phytoplankton biomass

xx species less than 5% of total biomass

x species makes up 5 to 10% of the total biomass

- species not found.

**Table S2.** Mean concentrations of various microcystin forms and their 95% confidence intervals in experimental treatments I, II, III, and IV. The different letters show significant differences ( $p < 0.05$ ) between pairs per date.

Treatment	I	II	III	IV	I	II	III	IV	I	II	III	IV
Mean	19.07	19.07	19.07	19.07	5.08	5.08	5.08	5.08	19.08	19.08	19.08	19.08
[D-Asp3]MC-LR	0.338	0.309	0.409	0.433	0.316	0.093	0.437	0.363	0.222	0.037	0.454	0.491
MC-LR	6.405	6.744	9.371	9.360	0.280	0.401	2.326	2.043	0.123	0.143	0.683	1.248
[D-Glu-OCH36]MC-LR	0.092	0.101	0.140	0.151	< 0.001	< 0.001	0.024	0.021	< 0.001	< 0.001	< 0.001	< 0.001
[D-Asp3]MC-RR	0.006	0.010	0.014	0.012	< 0.001	< 0.001	0.000	0.002	< 0.001	< 0.001	< 0.001	< 0.001
MC-LW	0.020	0.022	0.035	0.041	< 0.001	0.002	0.013	0.009	< 0.001	< 0.001	< 0.001	< 0.001
[Dha7]MC-YR	0.532	0.534	0.617	0.699	0.516	0.128	0.465	0.367	0.208	0.065	0.238	0.260
MC-RR	0.039	0.050	0.075	0.076	0.001	0.002	0.006	0.005	0.003	0.014	0.007	0.011
MC-YR	1.911	1.988	1.639	1.609	3.635	0.658	5.229	2.624	1.756	0.247	5.694	4.028
Treatment	I	II	III	IV	I	II	III	IV	I	II	III	IV
95% confidence intervals	19.070	19.070	19.070	19.070	5.080	5.080	5.080	5.080	19.080	19.080	19.080	19.080
[D-Asp3]MC-LR	0.026	0.022	0.336	0.072	0.086	0.031	0.044	0.030	0.011	0.000	0.056	0.017
MC-LR	0.494	0.020	0.101	1.120	0.109	0.048	0.952	0.194	0.033	0.091	0.252	0.043
[D-Glu-OCH36]MC-LR	0.007	0.007	0.115	0.025	-	-	0.002	0.002	-	-	-	-
[D-Asp3]MC-RR	0.000	0.000	0.000	0.002	-	-	0.001	0.000	-	-	-	-
MC-LW	0.002	0.002	0.029	0.007	-	0.001	0.001	0.001	-	-	-	-
[Dha7]MC-YR	0.006	0.031	0.220	0.016	0.006	0.001	0.008	0.010	0.007	0.000	0.004	0.003
MC-RR	0.003	0.004	0.062	0.013	0.000	0.001	0.001	0.000	0.000	0.000	0.001	0.000
MC-YR	0.147	0.260	1.444	0.330	0.180	0.083	0.167	0.437	0.274	0.016	0.324	0.140
Treatment	I	II	III	IV	I	II	III	IV	I	II	III	IV
Letter of significance	19.07	19.07	19.07	19.07	5.08	5.08	5.08	5.08	19.08	19.08	19.08	19.08
[D-Asp3]MC-LR	a	a	a	a	b	a	b	b	b	a	c	c
MC-LR	a	a	a	a	a	a	b	b	a	a	b	c
[D-Glu-OCH36]MC-LR	a	a	b	c	-	-	a	a	-	-	-	-
[D-Asp3]MC-RR	a	ab	b	b	-	-	a	a	-	-	-	-
MC-LW	a	a	b	b	-	a	b	b	-	-	-	-
[Dha7]MC-YR	a	a	a	a	c	a	c	b	a	b	a	a
MC-RR	a	b	c	c	a	a	b	b	a	d	b	c
MC-YR	a	a	a	a	b	a	c	b	b	a	c	c