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Oecologia Electronic Supplemental Material

Title: Top predators affect the composition of naive protist communities, but only in their early-successional stage

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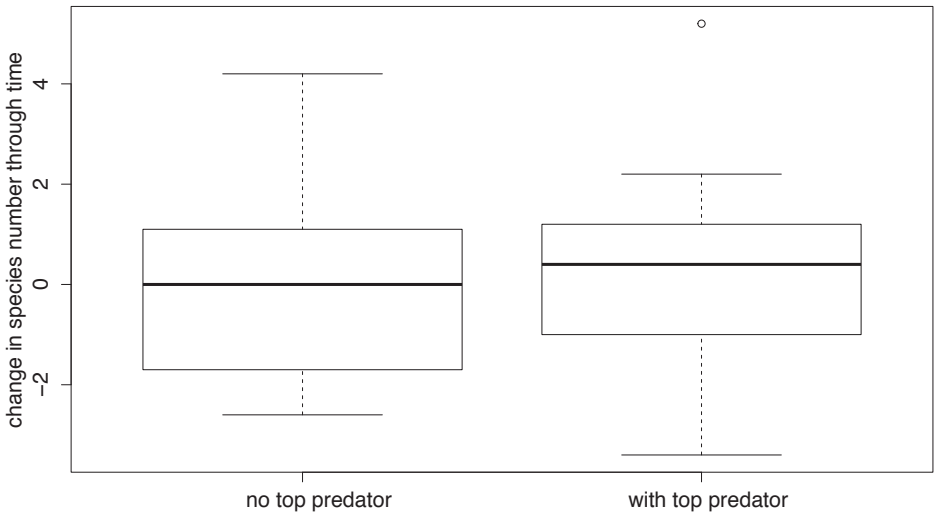
Content:

Fig. S1 Change in protist species number from the beginning to the end of the experiment. a) the predator is present or absent, and **b)** in naive and non-naive communities (as shown as change in protist size classes). The top predator did not change the size distribution of the protists. Instead, community origin was significantly important, but only for the medium-size class species (p-value <<0.001). For communities originating from Switzerland (naive), there was a net loss of medium-sized species during the experiment, while communities originating from Québec (non naive) gained medium-sized species during the experiment

a)



b)

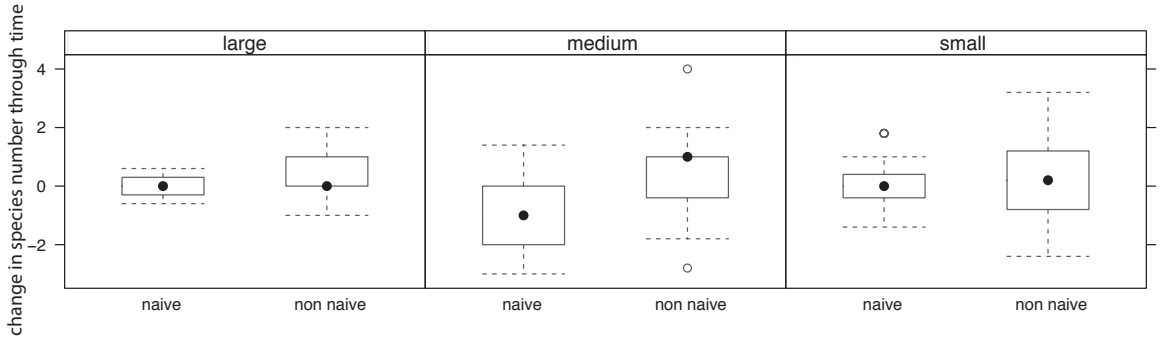
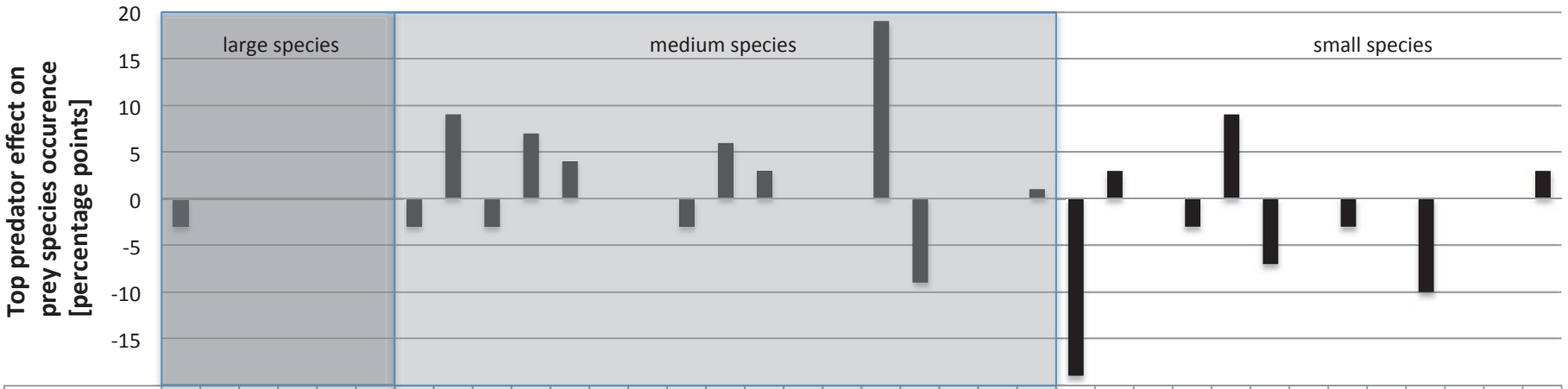


Fig. S2 Effect of top predator on occurrence of the prey species in the three size classes. X-axis: First line = morpho-species identity according to Msp. Nr in table S1; second line = gain or loss of occurrence on day 6 (in percentage points) when mosquitoes were present/absent. Most species were not affected (we considered gain/loss smaller than 5 percentage points as chance events). Morpho-species 20, 24, 29, and 33 were the most negatively affected by the presence of the top predator. In contrast, morpho-species 8, 10, 15, 19 and 28 were positively affected by mosquito presence. It is likely that these morpho-species profited from the predation on competing species (see also Kneitel 2012). Note that four of these benefitting species were medium-sized, while there is only one from the group of small-sized species. Additionally three (23%) small-sized species and only one (6%) medium-sized species were negatively affected, while the occurrence of large bodied species seemed not to be affected by the mosquitoes



Msp .Nr.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
gain/loss [pp]	-3	0	0	0	0	0	-3	9	-3	7	4	0	0	-3	6	3	0	0	19	-9	0	0	1	-19	3	0	-3	9	-7	0	-3	0	-10	0	0	3

Fig. S3 Protist Community composition at day 0 (start of experiment) according to presence/absence data.

Each triangle represents one community in a 2D NMDS plot (sites: VS, orange triangle; LT, green inverted triangle; LE, purple square; Lac R, blue diamond). Symbols for late succession are filled and early succession are unfilled. Similarity was measured with Jaccard index. Nearby triangles have similar species composition. Note that predators were not yet added. Note that there was generally an equal number of small and medium-sized protists, but not of large protists, within early and late succession communities (data pooled for naive and non-naive communities): 1) For small-sized protists: a total of 8 and 9 morpho-species with an average per tube of 1.85 and 1.50 morpho-species in early and late succession communities, respectively; 2) for medium-sized protists: a total of 10 and 10 morpho-species with an average per tube of 2.95 and 2.95 morpho-species in early and late succession communities, respectively; 3) for large-sized protists: a total of 1 and 5 morpho-species with an average per tube of 0.10 and 1.15 morpho-species in early and late succession communities, respectively; see Table S1 for details)

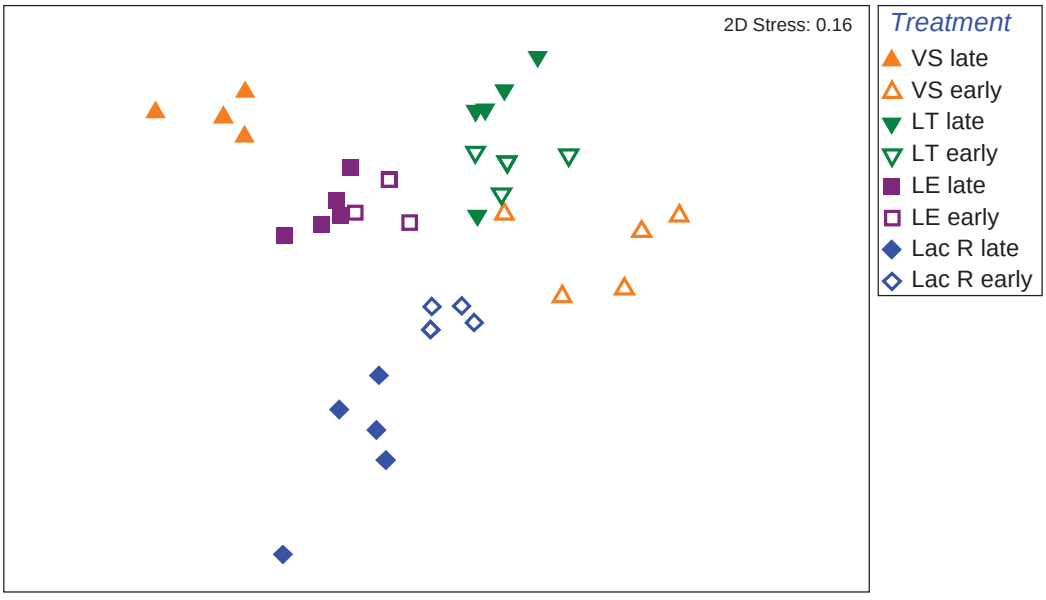


Fig. S4 Results of community respiration.

The Y-axis gives a measure of respiration during 6 hours at the end of the experiment. **a**) The respiration was significantly higher in naive than in non-naive communities (p = 0.038).

b) Interaction plot of respiration with respect to succession stage and naivety status. Respiration was higher in late than in early succession for naive communities, and the opposite for non-naive communities (interaction term: p-value = 0.041). The top predator had no statistically significant effect on community respiration

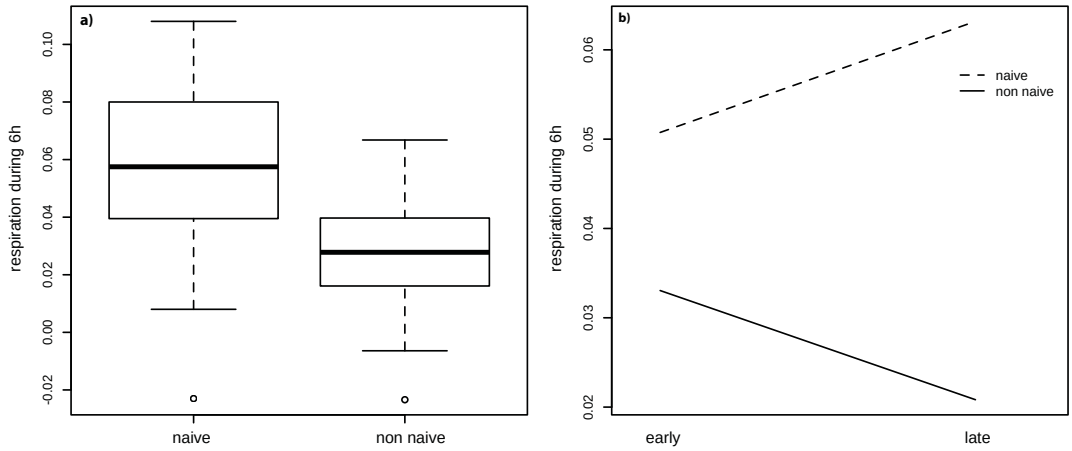


Table S1 Morpho-species (Msp) list. List of all protist detected in the *Sarracenia* samples of the four sites used in the experiment (LT, LE, VS, Lac R) and the total percentage of occurrence in the various treatments (early = early succession; late = late succession), at the beginning (d0) and end of the experiment (d6), with and without top mosquitoes (mosq). The last column gives the mosquito effect on occurrence in percentage points [pp] measured on day 6. The list is organized by size classes: size class *l* (large species, 40µm-150µm); size class *m* (medium species, 8µm-40µm); size class *s* (small species < 8µm). Legend: LT = Les Tennasses; LE = Les Embreux; VS = Vallée des Sources; Lac R = Lac Rimouski

Msp. Nr.	species-name	size	systematics	total	early	late	LT	LE	VS	Lac R	d0	d0 early	d0 late	d6 with mosq	d6 no mosq	mosq effect in [pp] on occurrence
msp1	unknown Ciliate sp. A	*l*	Ciliophora	5	8	2	0	0	4	15	0	0	0	6	9	-3
msp2	cf. *Pleuronema* sp. A	*l*	Ciliophora	13	0	25	0	0	50	0	13	0	25	13	13	0
msp3	cf. *Euplotes* sp.	*l*	Ciliophora	37	23	50	0	89	58	0	30	10	50	41	41	0
msp4	*Tetrahymena* cf. *pyriformis*	*l*	Ciliophora	7	0	14	0	0	0	27	3	0	5	9	9	0
msp5	unknown Ciliate sp. C	*l*	Ciliophora	10	0	19	0	0	0	39	10	0	20	9	9	0
msp6	cf. *Pleuronema* sp. B	*l*	Ciliophora	3	0	6	12	0	0	0	8	0	15	0	0	0
msp7	*Bodo* sp. A	*m*	"Flagellata"	72	81	64	50	96	50	92	85	85	85	63	66	-3
msp8	*Bodo* cf. *saltans*	*m*	"Flagellata"	25	25	25	4	50	19	27	38	25	50	22	13	9
msp9	Chrysomonadida sp. A	*m*	"Flagellata"	47	73	21	58	62	27	42	70	95	45	31	34	-3
msp10	cf *Bodo* sp. C	*m*	"Flagellata"	38	46	29	31	54	31	35	3	5	0	63	56	7
msp11	*Chilomonas* sp.	*m*	"Flagellata"	12	0	23	0	0	46	0	13	0	25	13	9	4
msp12	Chrysomonadina sp. C	*m*	"Flagellata"	4	4	4	8	0	8	0	10	10	10	0	0	0
msp13	unknown flagellate sp. B	*m*	"Flagellata"	<1	2	0	0	0	4	0	3	5	0	0	0	0
msp14	Chrysomonadina sp. D	*m*	"Flagellata"	25	21	29	73	8	8	12	28	25	30	22	25	-3
msp15	Chrysomonadina sp. E	*m*	"Flagellata"	3	0	6	4	0	8	0	3	0	5	6	0	6
msp16	cf. *Chlamydomonas* sp.	*m*	"Flagellata"	17	0	35	0	42	15	12	8	0	15	25	22	3

Table S1 continued

Msp. Nr.	species-name	size	systematics	total	early	late	LT	LE	VS	Lac R	d0	d0 early	d0 late	d6 with mosq	d6 no mosq	mosq effect in [pp] on occurence
msp17	unknown Ciliate sp. B	*m*	Ciliophora	13	0	25	50	0	0	0	13	0	25	13	13	0
msp18	*Cyclidium* sp.	*m*	Ciliophora	5	10	0	19	0	0	0	13	25	0	0	0	0
msp19	unknown flagellate sp. E	*m*	"Flagellata"	6	10	2	0	15	0	8	0	0	0	19	0	19
msp20	*Cercomonas* sp.	*m*	"Flagellata"	13	25	0	0	0	19	31	5	10	0	13	22	-9
msp21	*Euglena* cf. *gracilis*	*m*	"Flagellata"	2	4	0	0	0	0	8	5	10	0	0	0	0
msp22	Euglenoidina sp.	*m*	"Flagellata"	<1	0	2	0	0	0	4	3	0	5	0	0	0
msp23	unknown flagellate sp. D	*m*	"Flagellata"	<1	0	2	0	0	0	4	0	0	0	1	0	1
msp24	HNF sp. A	*s*	"Flagellata"	12	14	10	8	4	15	19	15	25	5	0	19	-19
msp25	HNF sp. B	*s*	"Flagellata"	46	50	42	19	58	23	85	43	40	45	50	47	3
msp26	HNF sp. C	*s*	"Flagellata"	5	6	4	0	0	12	8	8	5	10	3	3	0
msp27	cf. *Chrysocococcus* sp.	*s*	"Flagellata"	38	54	21	46	4	46	54	25	45	5	44	47	-3
msp28	cf. *Notosolenus* sp.	*s*	"Flagellata"	18	27	10	23	0	15	35	10	0	20	28	19	9
msp29	HNF sp. D	*s*	"Flagellata"	10	15	4	0	0	19	19	10	20	0	6	13	-7
msp30	cf. *Chlorella* sp.	*s*	"Algae"	11	0	21	0	0	42	<1	8	0	15	13	13	0
msp31	HNF sp. E	*s*	"Flagellata"	9	10	8	0	12	0	23	10	0	20	6	9	-3
msp32	HNF sp. F	*s*	"Flagellata"	4	8	0	0	0	0	15	10	20	0	0	0	0
msp33	HNF sp. G	*s*	"Flagellata"	15	21	10	0	0	12	50	23	25	20	6	16	-10
msp34	HNF sp. H	*s*	"Flagellata"	2	0	4	0	0	0	8	5	0	10	0	0	0
msp35	HNF sp. I	*s*	"Flagellata"	<1	2	0	0	0	0	4	3	5	0	0	0	0
msp36	*Microspora* cf. *abbreviata*	*s*	"Algae"	5	0	10	0	0	19	0	0	0	0	9	6	3

Table S2 **Results from the linear model for bacterial abundance** with respect to mosquito presence, successional state (early; late) and naivety (naive; non naive)

Variable	Parameter	SE	t	p-value
Intercept	3145.4	560.5	5.612	<0.001
Mosquito	314.5	733.8	0.429	0.670
Succession	452.6	733.8	0.617	0.540
Naivety	-102.5	733.8	-0.140	0.889
Succession:Mosquito	**219.9**	**847.4**	**0.26**	**0.796**
Naivety:Mosquito	**-478.5**	**847.4**	**-0.5650**	**0.574**
Succession:Naivety	623.7	847.4	-0.736	0.465

Table S3 **Results from the linear model for respiration** with respect to successional state (early; late) and naivety (naive; non naive). See also Figure S4.This is the best model according to AIC, where the factor Mosquito was removed

Variable	Parameter	SE	t	p-value
Intercept	0.05	0.005	8.6	<0.001
Succession	0.012	0.008	1.49	0.1413
Naivety	**-0.017**	**0.008**	**-2.12**	**0.038**
Succession:Naivety	**-0.024**	**0.011**	**-2.09**	**0.041**

Table S4 **Results from the full linear model for respiration** with respect to mosquito presence, successional state and naivety (note that the 3-way interaction was not included)

Variable	Parameter	SE	t	p-value
Intercept	0.045	0.007	5.795	<0.001
Mosquito	0.011	0.01	1.100	0.27
Succession	0.009	0.01	0.928	0.357
Naivety	-0.011	0.01	-1.16	0.249
Succession:Mosquito	**0.0059**	**0.011**	**0.504**	**0.61**
Naivety:Mosquito	**-0.0116**	**0.011**	**-0.99**	**0.32**
Succession:Naivety	-0.024	0.0110	-2.09	0.04