

Vertical micro-distribution of microbial communities living in *Sphagnum fallax*

Lihong Song*, Daniel Gilbert, Donghui Wu

*Corresponding author: lihong_song@qq.com

Aquatic Microbial Ecology 77: 1–10 (2016)

Table S1. Trophic groups and distribution patterns of dominant species in each microbial group.

Species		Trophic group ¹	Maximum		Minimum		<i>P</i> ²
Genus name	Species name		Biomass (Mean±SD)	Depth /cm	Biomass (Mean±SD)	Depth /cm	
Microalgae	<i>Cylindrocystis brebissonii</i>	Primary producer	246±111	0.5-1	33±12	5-6	0.02
Cyanobacteria	<i>Anabaena cylindrical</i>	Primary producer	61±37	3-4	4±2	0-0.5	0.09
Ciliates	<i>Vorticella sp1</i>	Mixotrophic protist	36±4	0.5-1	0±0	5-6	0.01
	<i>Uronema sp1</i>	Mixotrophic protist	11±3	1-2	3±1	0-0.5	0.53
	<i>Microthorax sp1</i>	Mixotrophic protist	8±4	0.5-1	0±0	5-6	0.10
Heterotrophic flagellates	<i>Rhodomonas ovalis</i>	Heterotrophic protist	16±8	5-6	0±0	0-0.5	0.12
	<i>Cryptomonas sp1</i>	Heterotrophic protist	7±7	3-4	0±0	0-0.5	0.44
Testate amoebae	<i>Hyalosphenia papilio</i>	Mixotrophic protist	443±161	0.5-1	21±17	5-6	0.01
	<i>Heleopera sphagni</i>	Mixotrophic protist	198±124	2-3	6±7	0-0.5	0.04
	<i>Amphitrema wrightianum</i>	Mixotrophic protist	141±16	3-4	1±1	0-0.5	0.01
	<i>Hyalosphenia elegans</i>	Heterotrophic protist	127±32	4-5	0±1	0-0.5	0.00
	<i>Physochila griseola</i>	Heterotrophic protist	120±37	5-6	0±0	0-0.5	0.01
	<i>Heleopera petricola</i>	Heterotrophic protist	66±56	3-4	0±0	0-0.5	0.15
	<i>Archerella flavum</i>	Mixotrophic protist	47±15	0.5-1	2±1	5-6	0.01
Rotifers	<i>Bdelloid sp1</i>	Micro-metazoa	142±9	0-0.5	42±21	5-6	0.03
	<i>Lecane sp1</i>	Micro-metazoa	40±21	2-3	11±3	0-0.5	0.26

Species		Trophic group ¹	Maximum		Minimum		P ²
Genus name	Species name		Biomass (Mean±SD)	Depth /cm	Biomass (Mean±SD)	Depth /cm	
Fungi	hyphae of ascomycete	Decomposer	50±28	5-6	1±1	0-0.5	0.04
	<i>Helicoonpluriseptatum</i>	Decomposer	8±2	5-6	2±1	0-0.5	0.04

1 The trophic groups classification for testate amoebae was according to Mitchell and Gilbert (2004), microalgae, cyanobacteria and ciliates were according to Kreutz and Foissner (2006).

Heterotrophic flagellates were considered as heterotrophic protists. Rotifers were considered as micro-metazoa. Fungi were considered as decomposer.

2 Kruskal-Wallis test for the variance of microbial species biomass in depth, df=6.

Table S2 Pearson correlation between various functional microbial groups in *sphagnum fallax* capitula, green stems and litter layers.

		Cyano-bacteria	Mixotrophic Ciliates	Heterotrophic Ciliates	Heterotrophic Flagellates	Mixotroph Testate Amoebae	Heterotrophic Testate Amoebae	Rotifers	Nematodes	Bacteria	Fungi
Capitula	Microalgae	-0.03	0.48	0.58	0.38	0.91*	0.49	-0.05	-0.73	0.85*	0.77
	Cyanobacteria		0.17	0.65	0.90*	0.30	0.76*	0.62	0.66*	0.48	-0.05
	Mixotrophic Ciliates			0.11	0.41	0.51	0.31	0.72*	-0.40	0.43	-0.08
	Heterotrophic Ciliates				0.84*	0.76*	0.70	0.23	0.04	0.88*	0.49
	Heterotrophic Flagellates					0.68	0.85*	0.63	0.27	0.79*	0.20
	Mixotrophic Testate Amoebae						0.70	0.22	-0.48	0.96*	0.66
	Heterotrophic Testate Amoebae							0.31	0.19	0.80*	0.53
	Rotifers								0.25	0.23	-0.53
	Nematodes									-0.29	-0.43
Bacteria										0.68	
Green stems	Microalgae	-0.44	-0.37	-0.06	0.11	0.01	-0.12	-0.83*	0.55	0.10	0.08
	Cyanobacteria		0.16	0.05	-0.23	0.12	0.15	0.39	0.37	-0.18	-0.08
	Mixotrophic Ciliates			0.25	-0.72	-0.30	-0.77*	0.49	-0.28	-0.74	-0.69
	Heterotrophic Ciliates				0.29	0.83*	-0.12	0.33	0.40	0.37	-0.82*
	Heterotrophic Flagellates					0.64	0.83*	0.08	0.26	0.97*	0.29
	Mixotrophic Testate Amoebae						0.35	0.13	0.53	0.76*	-0.42
	Heterotrophic Testate Amoebae							0.15	0.18	0.78*	0.64
	Rotifers								-0.29	-0.01	-0.27

		Cyano-bacteria	Mixotrophic Ciliates	Heterotrophic Ciliates	Heterotrophic Flagellates	Mixotroph Testate Amoebae	Heterotrophic Testate Amoebae	Rotifers	Nematodes	Bacteria	Fungi
	Nematodes									0.31	-0.20
	Bacteria										0.20
Litter	Microalgae	0.54	0.44	0.54	0.42	0.62*	0.20	0.70*	0.32	-0.20	0.43
	Cyanobacteria		0.86*	0.17	-0.18	0.82*	-0.38	0.61	-0.04	-0.66*	0.02
	Mixotrophic Ciliates			0.18	-0.14	0.63*	-0.52	0.50	0.04	-0.43	0.06
	Heterotrophic Ciliates				-0.11	0.27	0.29	0.04	0.23	0.36	0.20
	Heterotrophic Flagellates					-0.22	0.33	0.11	0.29	0.29	0.52
	Mixotrophic Testate Amoebae						-0.38	0.85*	0.36	-0.63*	-0.25
	Heterotrophic Testate Amoebae							-0.35	-0.34	0.20	0.75*
	Rotifers								0.44	-0.59	-0.14
	Nematodes									0.29	-0.41
	Bacteria										0.02

* $p < 0.05$, exact permutation test

References

- Kreutz M. and Foissner W. 2006. The Sphagnum ponds of Simmelried in Germany: A biodiversity hot-spot for microscopic organisms. *Protozoological Monographs*, 3: 1-267
- Mitchell E.A.D. and Gilbert D. 2004. Vertical micro-distribution and response to nitrogen deposition of testate amoebae in *Sphagnum*. *Journal of Eukaryotic Microbiology*, 51(4): 480-490