

## Supplement tables

**Table S1: Statistical significance of organization level, temperature and interaction of those effects on NP of C-/G-BSC<sub>all</sub>, C-/G-BSC<sub>dom</sub>, and C-/G-BSC<sub>soil</sub>**

Effect	df	F	p
<i>N. commune</i>			
Organization level	2	38.06	0.000000
Temperature	3	9.41	0.000035
Organization level * Temperature	6	5.03	0.000035
<i>Z. ericetorum</i>			
Organization level	2	53.61	0.000000
Temperature	3	1.64	0.197700
Organization level * Temperature	6	1.81	0.124760

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**Table S2: P-values of a tukey post-hoc test for NP depending on organization level (on top) and temperature (below) in a C-BSC.**

Organization level	BSC	Soil	<i>N. commune</i>	
BSC		0.089400	0.000117	10
Soil	0.089400		0.000117	
<i>N. commune</i>	0.000117	0.000117		
Temperature	7 °C	12 °C	17 °C	25 °C
7 °C		0.946163	0.079124	0.000210
12 °C	0.946163		0.240197	0.000565
17 °C	0.079124	0.240197		0.098648
25 °C	0.000210	0.000565	0.098648	

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**Table S3: P-values of a tukey post-hoc test for NP depending on organization level in a G-BSC.**

Organization level	BSC	Soil	<i>Z. ericetorum</i>
BSC		0.026302	0.000119

Soil	0.026302	0.000119
<i>Z. ericetorum</i>	0.000119	0.000119

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**Table S4: Statistical analysis of upper limits of optimum water content of both BSC-Systems and their respective separate organisms. Shown are p-values of the tukey post-hoc test.**

	C-BSC <sub>all</sub>	G-BSC <sub>all</sub>	C-BSC <sub>soil</sub>	G-BSC <sub>soil</sub>	C-BSC <sub>dom</sub>	G-BSC <sub>dom</sub>
C-BSC <sub>all</sub>		0.82	0.65	0.14	0.00	0.02
G-BSC <sub>all</sub>	0.82		0.11	0.86	0.00	0.00
C-BSC <sub>soil</sub>	0.65	0.11		0.00	0.15	0.38
G-BSC <sub>soil</sub>	0.14	0.86	0.00		0.00	0.00
C-BSC <sub>dom</sub>	0.00	0.00	0.15	0.00		1.00
G-BSC <sub>dom</sub>	0.02	0.00	0.38	0.00	1.00	

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**Table S.5: Statistical analysis of lower limits of optimum water content of both BSC-Systems and their respective separate organisms. Shown are p-values of the tukey post-hoc test.**

	C-BSC <sub>all</sub>	G-BSC <sub>all</sub>	C-BSC <sub>soil</sub>	G-BSC <sub>soil</sub>	C-BSC <sub>dom</sub>	G-BSC <sub>dom</sub>
C-BSC <sub>all</sub>		0.94	0.52	0.39	0.04	0.06
G-BSC <sub>all</sub>	0.94		0.14	0.95	0.01	0.01
C-BSC <sub>soil</sub>	0.52	0.14		0.01	0.81	0.79
G-BSC <sub>soil</sub>	0.39	0.95	0.01		0.00	0.00
C-BSC <sub>dom</sub>	0.04	0.01	0.81	0.00		1.00
G-BSC <sub>dom</sub>	0.06	0.01	0.79	0.00	1.00	

15 **Table S6: Mean values of maximum respiration rate per area of soil of both study sites. Sample size is n=3 in both cases.**

	Parking Lot	Standard deviation	Mehlinger Heide	Standard deviation
Max. respiration before autoclaving [ $\mu\text{mol}/\text{m}^2\text{s}$ ]	-0.23	0.20	-0.43	0.24

Max. respiration after autoclaving [ $\mu\text{mol/ m}^2\text{s}$ ]      -0.06      0.01      -0.09      0.01

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**Table S7: Statistical significance of organization level, temperature and interaction of those effects on DP of C-/G-BSC<sub>all</sub>, C-/G-BSC<sub>dom</sub>, and C-/G-BSC<sub>soil</sub>**

Effect	df	F	p
<i>N. commune</i>			
Organization level	2	0.14	0.871999
Temperature	3	6.27	0.000930
Organization level * Temperature	6	0.12	0.993160
<i>Z. ericetorum</i>			
Organization level	2	1.01	0.376154
Temperature	3	2.92	0.047354
Organization level * Temperature	6	0.63	0.705086

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**Table S8: P-values of a tukey post-hoc test for DP depending on temperature in a C-BSC.**

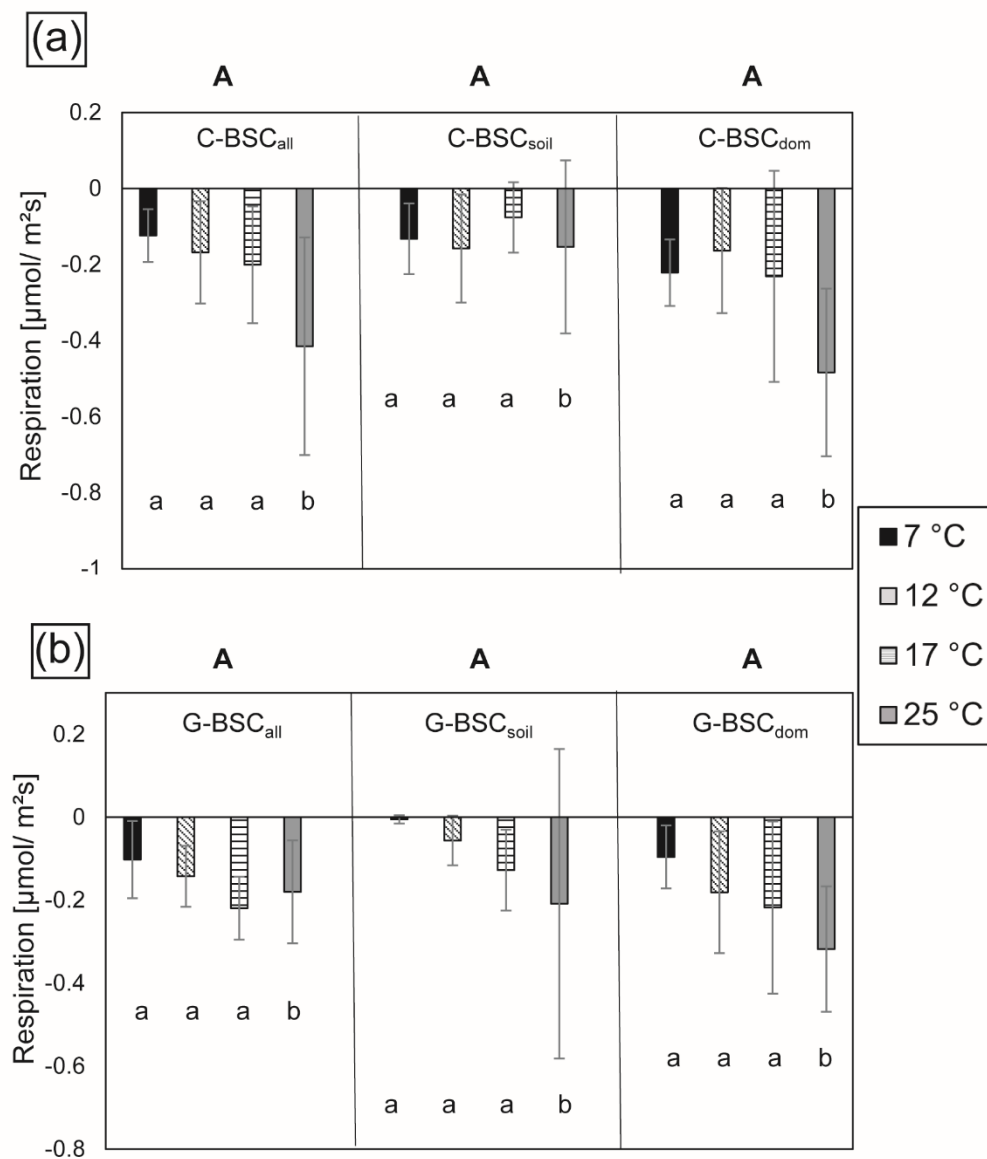
Temperature	7 °C	12 °C	17 °C	25 °C
7 °C		0.993744	0.815237	0.000847
12 °C	0.993744		0.925885	0.001784
17 °C	0.815237	0.925885		0.010604
25 °C	0.000847	0.001784	0.010604	

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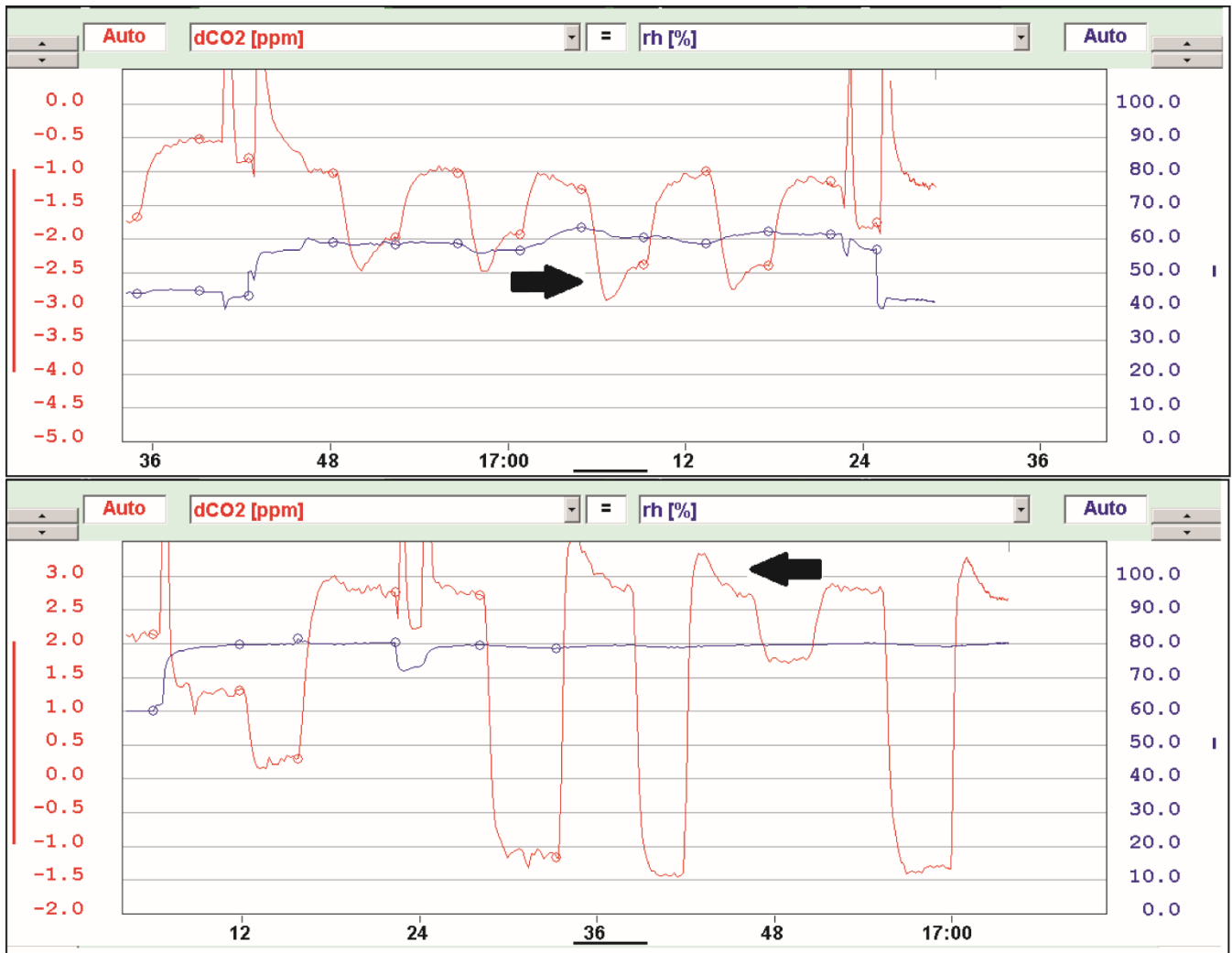
**Table S9: P-values of a tukey post-hoc test for NP depending on temperature in a G-BSC.**

Temperature	7 °C	12 °C	17 °C	25 °C
7 °C		0.407509	0.079389	0.041412
12 °C	0.407509		0.803020	0.637984
17 °C	0.079389	0.803020		0.991962
25 °C	0.041412	0.637984	0.991962	

Supplement figures



5 **Figure S1: Temperature dependent dark respiration per area in (a) *N. commune* and (b) *Z. ericetorum* (dominated BSCs, as well as separated organism and soil. Capital letters describe significant differences in organization level between BSC, organism and soil, whereas lower case letters compare temperature differences in one of the groups only. Sample size: n=6 for *N. commune*, n=4 for *Z. ericetorum*.**



5 Figure S2: CO<sub>2</sub> exchange pattern of *N. commune* at 7 °C with optimal water content. The blue line represents relative humidity at the moment of measurement, while the red line represents the difference of CO<sub>2</sub> between reference and sampling gas in the GFS 3000. The graph points downward when light is turned on. Abscise is the time. The black arrow marks one example of a sudden increase of CO<sub>2</sub> uptake as soon as the light was turned on (a), or release as soon as the light was shut off (b).