

Myrmecological News	27	Digital supplementary material
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Digital supplementary material to

PÉREZ-SÁNCHEZ, A.J., ZOPF, D., KLIMEK, S. & DAUBER, J. 2018: Differential responses of ant assemblages (Hymenoptera: Formicidae) to long-term grassland management in Central Germany. – *Myrmecological News* 27: 13-23.

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PÉREZ-SÁNCHEZ & al. 2018: Differential responses of ant assemblages (Hymenoptera: Formicidae) to long-term grassland management in Central Germany.

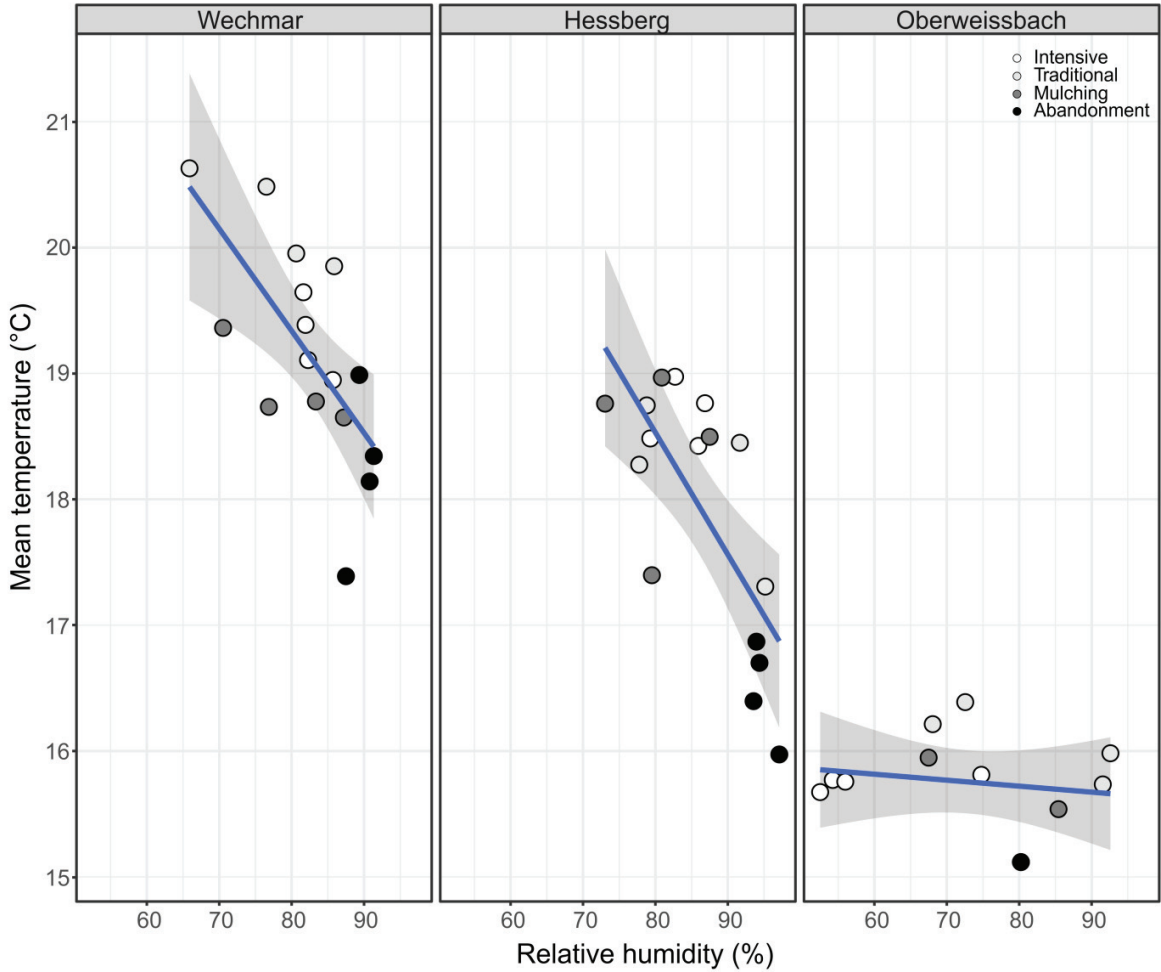


Fig. S1: Microclimate conditions of the experimental grassland sites. The points show the mean temperature and percentage humidity at each plot within the management treatments. The relationship between both variable is represented by the predicted line and confidence intervals (shade area) according with linear regression models per site.

Tab. S1: Ant species recorded using direct sampling (D) and baits procedure (B) techniques. Species nest abundance per treatment and site is also shown. Management treatments: intensive (Int), traditional (Tra), mulching (Mul) and abandonment (Aba).

#	Species	Wechmar				Hessberg				Oberweissbach			
		Int	Tra	Mul	Aba	Int	Tra	Mul	Aba	Int	Tra	Mul	Aba
1	<i>Formica cunicularia</i> (LATREILLE, 1798)	DB	DB	DB	DB								
2	<i>Formica fusca</i> (LINNAEUS, 1758)			B	D								
3	<i>Formica rufibarbis</i> (FABRICIUS, 1793)	B	D	DB	DB								
4	<i>Formica sanguinea</i> (LATREILLE, 1798)		DB	DB	DB								
5	<i>Lasius flavus</i> (LATREILLE, 1798)	D											
6	<i>Lasius fuliginosus</i> (LATREILLE, 1798)					D			DB				
7	<i>Lasius niger</i> (LINNAEUS, 1758)	DB	DB	DB	DB	DB	DB	DB	DB	DB	DB		
8	<i>Myrmica lobicornis</i> (NYLANDER, 1846)										B		
9	<i>Myrmica rubra</i> (LINNAEUS, 1758)			DB	DB							D	
10	<i>Myrmica ruginodis</i> (NYLANDER, 1846)									DB	B		
11	<i>Myrmica sabuleti</i> (MEINERT, 1861)				D								
12	<i>Myrmica scabrinodis</i> (NYLANDER, 1846)				B	DB	DB	DB	DB	DB	DB	DB	DB
13	<i>Myrmica schencki</i> (EMERY, 1895)		DB	B	D								
14	<i>Myrmica curvithorax</i> (BONDROIT, 1920)	D											
	Number of species detected by direct sampling	5	5	7	9	3	2	2	3	3	4	2	1
#	Species nest counts	Wechmar				Hessberg				Oberweissbach			
		Int	Tra	Mul	Aba	Int	Tra	Mul	Aba	Int	Tra	Mul	Aba
1	<i>Lasius flavus</i> (LATREILLE, 1798)	12	12	0	2	0	1	0	0	0	0	0	0
2	<i>Lasius fuliginosus</i> (LATREILLE, 1798)	0	0	0	0	0	0	0	1	0	0	0	0
3	<i>Lasius niger</i> (LINNAEUS, 1758)	7	2	0	3	0	2	1	1	0	0	0	0
4	<i>Myrmica rubra</i> (LINNAEUS, 1758)	0	0	0	2	0	0	0	0	0	0	0	0
5	<i>Myrmica sabuleti</i> (MEINERT, 1861)	0	0	0	2	0	0	0	0	0	0	0	0
6	<i>Myrmica scabrinodis</i> (NYLANDER, 1846)	0	0	0	0	5	12	1	3	3	5	1	2
	Number of nests (24 m²)	19	14	0	9	5	15	2	5	3	5	1	2
	Number of species detected by nest counts	2	2	0	4	1	3	1	3	1	1	1	1
Total number of species recorded		5	6	7	10	3	3	2	3	3	4	2	1

Tab. S2: Candidates, global and null models fitted for each ant response variable (species richness and nest abundance). The table shows the degrees of freedom (df), Akaike's Information Criterion (AIC), delta AIC (ΔAIC) and the Akaike's weight (w_i) for each fitted model. *Treat*= management treatment; *Site*= grassland site; *%RH*= percentage of relative humidity.

Models	Predictors	df	AIC	ΔAIC	w_i
Response variable: Species richness					
Candidate 1	<i>Site</i>	3	144.23	0	0.57
Candidate 2	<i>Site</i> + <i>%RH</i>	4	145.85	1.63	0.25
Candidate 3	<i>Treat</i> + <i>Site</i>	6	147.85	3.63	0.09
Candidate 4	<i>Site</i> x <i>%RH</i>	6	149.51	5.29	0.04
Global	<i>Treat</i> + <i>Site</i> + <i>%RH</i>	7	149.85	5.63	0.03
Candidate 5	<i>Site</i>	9	153.39	9.17	0.01
Candidate 6	<i>Treat</i> x <i>%RH</i> + <i>Site</i>	10	154.23	10.01	<0.01
Candidate 7	<i>Treat</i> x <i>Site</i>	12	155.54	11.31	<0.01
Candidate 8	<i>Treat</i> x <i>Site</i> + <i>%RH</i>	13	157.46	13.23	<0.01
Null	1	1	160.22	15.99	<0.01
Candidate 10	<i>%RH</i>	2	161.76	17.54	<0.01
Candidate 11	<i>Treat</i>	4	163.72	19.49	<0.01
Candidate 12	<i>Treat</i> + <i>%RH</i>	5	165.72	21.49	<0.01
Candidate 13	<i>Treat</i> x <i>%RH</i>	8	169.47	25.24	<0.01
Candidate 14	<i>Treat</i> x <i>Site</i> x <i>%RH</i>	23	175.88	31.65	<0.01
Distribution family: Poisson					
Response variable: Nest abundance					
Candidate 1	<i>Treat</i> + <i>Site</i>	7	136.19	0	0.40
Global	<i>Treat</i> + <i>Site</i> + <i>%RH</i>	8	136.65	0.46	0.32
Candidate 2	<i>Treat</i> x <i>Site</i>	13	138.66	2.47	0.12
Candidate 3	<i>Treat</i> x <i>%RH</i> + <i>Site</i>	11	139.74	3.55	0.07
Candidate 4	<i>Treat</i> x <i>Site</i> + <i>%RH</i>	14	140.22	4.03	0.05
Candidate 5	<i>Site</i>	10	140.59	4.39	0.04
Candidate 6	<i>Treat</i> + <i>%RH</i>	6	145.76	9.56	<0.01
Candidate 7	<i>Treat</i>	5	146.06	9.87	<0.01
Candidate 8	<i>Treat</i> x <i>%RH</i>	9	147.86	11.66	<0.01
Candidate 9	<i>Site</i>	4	155.87	19.68	<0.01
Candidate 10	<i>Site</i> + <i>%RH</i>	5	157.31	21.12	<0.01
Candidate 11	<i>Treat</i> x <i>Site</i> x <i>%RH</i>	24	157.36	21.17	<0.01
Null	1	2	159.00	22.81	<0.01
Candidate 12	<i>%RH</i>	3	159.94	23.75	<0.01
Candidate 13	<i>Site</i> x <i>%RH</i>	7	161.00	24.81	<0.01
Distribution family: Negative binomial					

Footnote: Since the collinearity between T_{mean} and *Site* factors within models (VIF= 3 to 10), the T_{mean} was excluded from the analyses.

Tab S3: Candidates, global and null models fitted for the evaluation of monopolization (Mo values) variation among treatments within each grassland site. The table shows the degrees of freedom (df), Akaike's Information Criterion (AIC), delta AIC (Δ AIC), and the Akaike's weight (w_i) per fitted model. *Treat*= management treatment; %RH= percentage of relative humidity.

Models	Predictors	df	AIC	Δ AIC	w_i
Response variable: Mo values (Wechmar)					
Candidate 1	<i>Treat</i>	4	1121.82	0	0.71
Global	<i>Treat</i> + %RH	5	1123.6	1.78	0.29
Candidate 2	%RH	2	1177.37	55.55	<0.001
Null	1	1	1186.04	64.22	<0.001
Family distribution: Poisson					
Response variable: Mo values (Hessberg)					
Global	<i>Treat</i> + %RH	5	660.99	0	0.66
Candidate 1	%RH	2	663.66	2.67	0.17
Null	1	1	664.37	3.38	0.12
Candidate 2	<i>Treat</i>	4	666.38	5.39	0.04
Family distribution: Poisson					
Response variable: Mo values (Oberweissbach)					
Candidate 1	<i>Treat</i>	4	369.52	0	0.72
Global	<i>Treat</i> + %RH	5	371.43	1.91	0.28
Candidate 2	%RH	2	400.40	30.88	<0.001
Null	1	1	410.57	41.05	<0.001
Family distribution: Poisson					

Footnote: T_{mean} data was excluded from these analyses due to its correlation with %RH data within Wechmar and Hessberg; and its collinearity with *Treat* factor in models fitted for Oberweissbach data (VIF= 3 to 10).