Ecography

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Perner, J., Wytrykush, C., Kahmen, A., Buchmann, N., Egerer, I., Creutzburg, S., Odat, N., Audorff, V. and Weisser, W. W. 2005. Effects of plant diversity, plant productivity and habitat parameters on arthropod abundance in montane European grasslands. – Ecography 28: 429–442.

Appendix 1. Location, stand characteristics, plant community characteristics and some selected soil parameters of the investigated grassland sites. For explanations of the presented parameters see methods section.

	Site characteristics						Plant community characteristics				Selected soil parameters			
Site codes	Position in German Gauss-Krüger grid X	Y	Altitude (m)	Inclination (°)	PDSI (cal/cm²/a)	Wood-distance (m)	Dry biomass (g m⁻²)	Species richness	Effective diversity	Camargo's evenness	pH	Soil moisture (%vol.)	C_{total} (mg g⁻¹)	N_{total} (mg g⁻¹)
A001	4473579	5585998	654.00	10.00	661.09	58.52	342.28	9.00	5.21	0.44	6.13	13.48	48.75	4.41
A002	4466120	5592454	599.00	5.00	704.96	73.15	367.68	21.00	11.31	0.42	6.26	15.21	33.74	3.15
A003	4471145	5591294	631.00	5.00	696.81	59.44	465.28	15.00	9.89	0.50	5.73	21.23	43.03	4.08
A004	4471517	5591872	604.00	5.00	752.03	48.46	418.04	22.00	11.39	0.40	5.69	17.55	33.55	3.14
A005	4465318	5592065	648.00	0.00	727.18	56.69	378.64	17.00	10.91	0.49	6.31	18.89	31.93	3.05
A006	4464734	5592315	666.00	3.00	741.58	64.01	379.48	18.00	10.51	0.45	7.17	21.26	46.61	4.03
A007	4464315	5592500	681.00	3.00	742.75	32.92	376.28	17.00	11.17	0.50	6.24	18.83	57.49	5.10
A008	4465277	5593496	635.00	3.00	742.75	93.27	403.52	19.00	12.45	0.50	5.50	24.18	43.80	3.65
A009	4459735	5592415	617.00	5.00	752.03	53.04	511.92	19.00	10.26	0.41	5.69	17.53	47.61	4.63
A010	4459854	5593564	669.00	8.00	752.05	76.81	124.64	8.00	4.27	0.41	4.35	16.23	47.89	4.32
A011	4458067	5590487	692.00	20.00	697.51	58.52	267.32	33.00	17.54	0.40	5.40	18.04	48.64	3.37
A012	4466417	5594292	616.00	2.00	735.16	47.55	486.68	22.00	13.08	0.45	5.67	27.16	46.00	4.57
A013	4462750	5591600	661.00	5.00	752.03	21.95	281.60	33.00	15.36	0.37	4.89	27.47	51.47	5.21
A014	4459900	5591292	643.00	2.00	726.72	29.26	207.68	23.00	12.56	0.42	5.26	31.22	56.58	4.54
A015	4458466	5594339	499.00	3.00	714.48	54.86	609.60	19.00	11.02	0.45	5.86	27.42	28.58	3.38
A016	4457963	5592347	683.00	2.00	726.72	188.37	506.56	20.00	12.34	0.48	6.36	21.88	47.13	4.12
A017	4452960	5589483	663.00	3.00	737.90	33.83	345.52	19.00	9.19	0.37	5.53	21.99	49.54	4.32
A018	4453070	5589465	654.00	2.00	735.16	53.04	353.16	17.00	9.53	0.43	5.62	25.97	40.07	3.38
A019	4453061	5589571	646.00	2.00	726.72	38.40	267.92	12.00	5.55	0.37	4.56	33.16	57.17	5.01
A020	4458680	5588612	692.00	0.00	727.18	86.87	486.52	18.00	10.71	0.45	5.05	23.52	48.78	4.44
A021	4453808	5591571	686.00	4.00	725.49	23.77	280.48	23.00	13.22	0.44	5.14	34.74	53.82	4.11
A022	4447113	5591873	726.00	1.00	723.14	54.86	421.36	26.00	15.49	0.46	5.60	34.89	55.22	4.31
A023	4447051	5592274	732.00	2.00	728.67	62.18	277.44	24.00	16.42	0.53	5.19	35.04	61.79	4.45
A024	4456975	5584727	625.00	3.00	742.75	73.15	305.18	13.00	7.01	0.41	4.50	20.89	36.79	3.04
A025	4457175	5584965	613.00	2.00	737.01	80.47	204.18	10.00	5.58	0.43	4.70	27.65	38.98	3.30
A026	4456739	5584309	626.00	0.00	727.18	54.86	513.24	15.00	7.70	0.39	5.06	34.57	39.41	3.76
A027	4456071	5585549	618.00	1.00	727.08	45.72	369.46	23.00	12.77	0.42	5.59	40.99	74.59	6.12

Appendix 1. Continued.

Site codes	Position in German Gauss-Krüger grid X	Y	Site characteristics: Altitude (m)	Inclination (°)	PDSI (cal/cm²/a)	Wood-distance (m)	Plant community characteristics: Dry biomass (g m⁻²)	Species richness	Effective diversity	Camargo's evenness	Selected soil parameters: pH	Soil moisture (%vol.)	C_{total} (mg g⁻¹)	N_{total} (mg g⁻¹)
A028	4461834	5586816	645.00	2.00	737.01	118.87	169.10	13.00	7.62	0.44	4.66	29.75	49.46	4.38
A029	4461765	5586712	643.00	2.00	737.01	105.16	534.22	22.00	12.93	0.46	5.81	28.12	53.78	4.89
A030	4454882	5589673	651.00	2.00	718.90	177.39	412.46	13.00	7.97	0.47	5.63	26.60	38.45	3.55
A031	4430063	5594135	805.00	4.00	747.51	82.30	230.06	19.00	11.53	0.46	5.27	33.29	43.61	3.34
A032	4431907	5593398	841.00	0.00	727.18	25.60	226.46	16.00	7.26	0.36	5.27	44.38	79.48	4.39
A033	4436285	5591030	823.00	6.00	723.47	65.84	216.14	21.00	10.28	0.38	6.00	39.71	64.83	4.41
A034	4435437	5593752	787.00	7.00	694.50	32.00	339.54	24.00	9.95	0.34	4.80	34.74	46.43	4.11
A035	4438690	5598620	733.00	4.00	704.93	41.15	340.02	22.00	12.54	0.43	5.26	36.36	47.13	3.60
A037	4445732	5596938	710.00	3.00	726.22	61.26	352.50	16.00	8.23	0.39	6.13	33.72	51.84	3.58
A038	4446020	5596174	751.00	2.00	716.53	43.89	416.90	22.00	12.19	0.42	5.84	34.39	55.24	3.82
A039	4447322	5596609	749.00	5.00	735.94	50.29	446.46	31.00	19.44	0.48	5.25	29.38	37.98	3.58
A040	4447777	5593852	668.00	10.00	717.86	96.01	272.78	23.00	10.70	0.38	5.21	34.20	65.36	4.98
A041	4447764	5593825	669.00	8.00	720.90	86.87	357.50	14.00	7.26	0.41	5.24	34.53	57.57	4.36
V001	4473658	5586048	641.00	8.00	676.00	58.52	306.36	13.00	9.15	0.54	5.63	24.72	54.03	4.69
V002	4466649	5591890	585.00	15.00	708.56	47.55	297.32	19.00	13.09	0.53	6.26	21.14	41.61	3.60
V003	4465854	5589716	640.00	5.00	704.96	54.86	253.48	16.00	10.68	0.51	5.47	18.21	49.79	4.10
V004	4465470	5589945	602.00	12.00	760.39	32.00	275.88	22.00	15.15	0.53	5.27	26.64	57.82	5.02
V005	4466263	5590128	628.00	0.00	727.18	42.98	262.24	20.00	13.67	0.53	5.79	22.17	43.46	4.05
V006	4464682	5587991	729.00	2.00	726.72	89.61	366.04	18.00	9.31	0.39	6.20	21.23	75.57	5.44
V007	4462757	5589001	689.00	5.00	704.96	80.47	429.20	21.00	14.45	0.53	6.64	24.35	51.59	3.99
V008	4463537	5589008	664.00	5.00	698.82	64.01	328.04	20.00	13.50	0.52	5.83	27.25	58.85	4.64
V009	4465530	5594883	644.00	1.00	730.95	80.47	283.76	25.00	14.42	0.44	5.03	19.92	40.31	3.84
V010	4463544	5595280	549.00	10.00	756.49	36.58	431.88	30.00	18.38	0.46	5.81	16.96	33.86	3.35
V011	4465135	5587820	721.00	2.00	737.01	50.29	289.28	28.00	18.27	0.50	5.52	31.50	61.50	4.24
V012	4462332	5589022	719.00	2.00	715.65	40.23	354.48	21.00	11.92	0.43	6.24	28.17	41.79	3.32
V013	4462863	5588537	689.00	4.00	703.27	29.26	345.36	27.00	14.40	0.42	5.33	35.60	62.72	5.28
V014	4460651	5585412	683.00	8.00	720.90	36.58	218.56	25.00	11.02	0.35	5.19	19.37	45.68	3.72
V015	4460693	5585400	688.00	5.00	724.56	21.95	398.20	14.00	6.51	0.35	4.55	15.74	43.49	3.83
V016	4460699	5583355	619.00	3.00	742.75	150.88	266.56	28.00	14.63	0.40	5.57	25.62	42.42	3.62
V019	4450456	5588743	654.00	3.00	737.90	21.03	365.80	22.00	7.15	0.28	5.56	38.04	54.53	4.71
V020	4451602	5588842	676.00	2.00	728.67	14.63	214.60	21.00	8.58	0.32	4.67	34.74	49.49	3.72
V021	4451661	5588941	685.00	4.00	747.51	38.40	540.44	27.00	13.87	0.39	5.65	28.82	41.83	3.60
V022	4458298	5580809	546.00	15.00	645.88	32.00	327.70	25.00	15.16	0.46	5.63	27.69	38.23	3.66
V023	4455188	5581797	593.00	0.00	727.18	36.58	389.10	27.00	12.07	0.35	5.38	27.33	37.28	3.42
V024	4455220	5582029	583.00	10.00	717.86	23.77	482.38	29.00	17.04	0.44	5.06	29.46	35.29	3.20
V025	4453454	5586304	606.00	5.00	744.08	58.52	520.10	26.00	16.66	0.49	4.98	28.73	43.03	3.88
V026	4446357	5581571	596.00	1.00	727.08	43.89	572.42	14.00	5.69	0.34	5.56	33.25	46.21	3.98
V029	4430010	5593791	787.00	3.00	737.90	87.78	202.92	16.00	8.00	0.38	4.50	39.01	61.41	4.45
V030	4432156	5592865	833.00	3.00	726.22	102.41	548.38	20.00	12.95	0.50	5.09	40.63	58.38	3.85
V031	4436293	5591149	818.00	2.00	726.72	81.38	244.26	16.00	10.69	0.51	5.82	35.97	62.39	4.82
V034	4446721	5589600	754.00	1.00	730.96	155.45	587.78	18.00	9.26	0.39	5.90	30.48	63.30	4.79
V035	4446574	5589981	733.00	8.00	689.00	27.43	341.34	20.00	10.45	0.40	5.12	33.49	43.34	3.69
V036	4446818	5592050	717.00	3.00	734.05	74.98	353.02	12.00	5.76	0.37	4.66	36.33	73.08	4.79
V037	4464864	5584284	684.00	1.00	723.17	107.90	338.10	29.00	18.54	0.48	5.04	31.31	43.96	3.64

Appendix 2. Numbers of arthropods collected per functional group in two suction samples per grassland site (sampling area 2 × 0.5 m^2). Only taxa with > 50 individuals were considered. For description of the used functional group abbreviations see Table 1.

Site codes	Herbivores					Carnivores							Detritivores		
	HCS	HCW	HMI	HTS	HVS	CBS	CCH	CHG	CPA	CPW	CSH	CWS	DBS	DCW	DGR
A001	42	10	6	8	8	1	5	0	0	23	0	14	71	5	329
A002	7	1	5	0	41	2	15	0	2	6	0	25	54	0	720
A003	69	15	3	3	22	31	10	0	1	56	0	25	40	1	145
A004	40	1	2	1	39	4	8	0	2	12	0	10	16	1	111
A005	5	3	5	0	1	1	0	0	0	15	0	4	23	6	460
A006	33	8	4	1	5	7	11	0	1	47	1	9	65	0	111
A007	97	6	4	10	43	0	9	1	3	41	0	12	143	2	101
A008	5	6	9	0	1	7	5	0	1	12	0	7	37	3	129
A009	67	2	6	1	45	4	5	1	1	12	0	3	60	4	56
A010	46	7	0	13	67	1	1	48	0	7	0	7	0	1	40
A011	29	1	3	3	3	3	3	1	0	7	0	7	5	1	109
A012	4	7	5	20	25	2	2	0	2	6	1	9	19	1	509
A013	15	0	4	2	103	5	0	0	2	13	1	6	8	0	66
A014	23	1	6	3	56	14	1	0	0	13	4	6	14	3	29
A015	29	6	13	1	27	8	1	20	3	14	0	9	14	2	638
A016	5	3	6	1	5	4	1	0	1	10	0	3	10	4	230
A017	59	3	5	0	4	0	0	0	0	3	0	4	22	2	93
A018	15	5	6	0	105	1	8	0	0	12	3	13	42	3	96
A019	62	1	5	5	44	8	1	0	0	13	1	17	18	0	163
A020	12	2	14	2	8	19	3	0	0	12	0	9	45	1	623
A021	7	3	3	7	51	0	1	1	0	6	4	9	6	0	99
A022	11	2	2	5	24	3	11	0	2	22	0	17	18	0	196
A023	43	8	2	1	25	5	7	0	3	28	1	24	43	1	254
A024	14	1	8	12	208	1	1	17	4	13	3	12	8	0	37
A025	11	6	2	35	256	23	2	2	3	10	0	11	9	0	92
A026	7	3	5	15	29	6	6	37	0	50	1	17	22	0	183
A027	12	2	9	3	80	2	7	0	2	20	1	21	8	1	180
A028	13	3	1	0	28	2	1	0	0	5	0	14	1	0	6
A029	19	4	3	1	27	2	6	2	0	26	0	16	26	0	240
A030	20	2	11	0	0	3	5	3	6	12	0	9	13	1	129
A031	11	4	6	6	0	4	2	1	1	27	1	8	3	0	49
A032	5	0	1	0	0	5	2	67	4	6	4	3	1	0	21
A033	31	4	4	0	83	22	2	0	1	34	1	26	19	0	59
A034	63	2	8	0	0	6	1	2	1	23	5	6	13	0	71
A035	11	0	0	1	140	4	0	0	1	6	0	19	6	0	93
A037	4	10	5	6	13	3	3	0	1	13	0	10	21	1	94
A038	3	4	6	3	14	47	5	3	2	35	1	11	30	0	40
A039	40	17	8	6	11	3	4	61	1	31	0	11	42	1	98
A040	134	7	5	6	25	3	1	2	1	30	0	14	2	0	112
A041	7	3	3	1	127	1	2	1	1	19	1	15	15	1	39
V001	195	8	3	7	20	1	1	0	2	7	0	18	23	0	648
V002	42	2	9	3	40	2	2	1	2	6	1	18	25	0	555
V003	176	15	18	11	25	8	6	0	1	32	1	29	67	5	327
V004	50	4	12	1	26	2	9	0	2	17	0	11	50	1	348
V005	18	1	1	4	26	2	3	0	0	23	0	11	23	0	563
V006	50	4	12	17	81	1	2	0	2	47	2	22	34	2	207
V007	18	6	3	9	11	1	11	1	2	23	2	36	49	0	346
V008	11	0	8	0	10	13	0	0	1	1	0	1	30	0	447
V009	17	0	8	1	41	0	1	0	5	12	0	7	8	1	51
V010	97	2	2	0	93	1	0	4	0	8	0	10	30	0	74
V011	395	1	7	3	240	2	1	0	2	40	0	16	25	1	65
V012	32	1	5	10	40	4	0	0	2	33	0	9	16	0	316
V013	68	0	40	16	210	9	2	0	0	18	4	14	31	1	99
V014	8	1	2	14	42	2	1	4	0	8	1	18	7	0	87
V015	61	4	1	6	115	0	1	1	0	10	2	12	5	0	26
V016	35	2	1	1	25	4	1	3	0	6	1	11	3	2	22
V019	33	2	4	5	41	6	2	2	2	21	0	10	20	0	75
V020	0	0	0	0	11	3	2	0	0	0	1	4	3	0	46
V021	17	13	6	0	9	4	5	0	0	31	0	19	27	2	238
V022	32	2	8	5	130	1	2	1	1	30	1	42	13	1	333
V023	61	5	13	11	31	3	0	0	1	30	0	8	14	0	78
V024	34	0	17	0	139	14	2	2	3	34	0	14	22	0	142
V025	91	2	11	5	26	5	1	0	4	42	0	7	26	3	461
V026	0	0	5	0	0	0	0	0	0	5	0	15	3	0	0

Appendix 2. Continued.

Site codes	Herbivores					Carnivores							Detritivores		
	HCS	HCW	HMI	HTS	HVS	CBS	CCH	CHG	CPA	CPW	CSH	CWS	DBS	DCW	DGR
V029	67	0	17	1	225	2	1	0	1	6	2	8	7	0	98
V030	27	1	22	7	145	7	4	0	4	43	6	46	56	1	328
V031	13	2	19	1	6	4	0	0	3	20	1	13	15	0	139
V034	158	2	11	11	16	4	0	1	1	27	0	14	71	1	65
V035	38	7	4	0	13	6	2	0	1	15	0	9	15	0	180
V036	78	3	0	14	50	4	4	29	3	9	0	57	23	3	223
V037	200	5	6	11	26	15	0	6	0	41	0	47	16	0	67

Appendix 3. The eigenvalues and the eigenvector coefficients (loadings) of a standardized principal component analysis (PCA) of the variables contained within parameter-groups I and II. Loadings > 0.5 are shown in boldface type to highlight the meanings of the representative axes (for explanations of used abbreviations see methods section).

	PCA	axis 1	axis 2	axis 3	axis 4
		Edaphic factors			
PG		soil1	soil2	soil3	soil4
	Eigenvalues	*0.3524*	*0.2179*	*0.0986*	*0.0928*
I	C_{total}	–0.4003	**0.8924**	0.0045	0.0130
I	N_{total}	–0.1806	**0.7403**	–0.2764	–0.0778
I	C-N ratio	–0.4619	**0.6062**	0.3597	0.1360
I	K^+	0.1943	–0.0665	**0.7679**	0.4171
I	Mg^{2+}	**0.6696**	0.3260	0.1939	–0.0012
I	P_{total}	0.3944	0.2433	–0.2734	**0.5986**
I	SO_4^{2-}	**–0.7869**	0.0415	–0.1508	0.4807
I	Ca^{2+}	**0.7776**	0.3830	–0.0033	–0.2289
I	N_{min}	**0.6662**	0.2479	–0.3210	0.2919
I	pH	**0.8520**	0.3662	0.1687	–0.1068
I	soil-moisture	**–0.6591**	0.4138	0.1504	–0.2888
		Site characteristics			
		site1	site2	site3	site4
	Eigenvalues	*0.3904*	*0.2515*	*0.2186*	*0.1394*
I	Altitude	–0.4268	**–0.7337**	–0.4837	0.2135
I	Inclination	**0.8156**	–0.1347	0.1499	0.5424
I	PDSI	**–0.6776**	**0.5669**	–0.0951	0.4586
I	Wood-distance	–0.5042	–0.3595	**0.7807**	0.0836
		Management			
		manage1	manage2	manage3	manage4
	Eigenvalues	*0.5088*	*0.3633*	*0.0652*	*0.0421*
I	Cutting_2001	–0.4163	**0.8580**	–0.2116	0.0261
I	Grazing_2001	**0.9354**	–0.1041	–0.2361	–0.2143
I	Fertilization_2001	0.7224	0.5441	0.3329	–0.2563
I	Cutting_historical	–0.3565	**0.8872**	–0.1738	–0.1085
I	Grazing_historical	**0.9263**	–0.0413	–0.3332	0.1326
I	Fertilization_historical	0.7054	0.5899	0.1970	0.3331
		Vegetation structure			
		vegstru1	vegstru2	vegstru3	vegstru4
	Eigenvalues	*0.3103*	*0.2716*	*0.1380*	*0.0696*
II	Total plant cover	**–0.7689**	–0.3290	0.0855	0.0336
II	Tall-grasses cover	**0.6245**	**–0.5231**	0.1534	0.2448
II	Short-grasses cover	**–0.8523**	0.2764	–0.1220	0.0739
II	Forbs cover	**–0.6865**	–0.2466	0.0272	0.1491
II	Mosses cover	–0.2923	0.3714	**0.6995**	–0.2821
II	Total plant height	–0.1301	**–0.9165**	0.0256	–0.2098
II	Tall-grasses height	0.0896	**–0.6523**	0.4313	0.4962
II	Short-grasses height	**–0.8724**	0.2028	–0.0957	0.0997
II	Forbs height	–0.0440	**–0.8084**	–0.0073	**–0.5355**
II	Mosses height	–0.0722	0.1974	**0.8851**	–0.0405
II	LAI	**–0.5962**	**–0.5758**	–0.0567	0.0930