

Table S1. Material list.

(A) Wild specimens

Species	Locality	Year	Month	Day	Season	Phase	Specimen	Asfc	epLsar	HAsfc
<i>M. oeconomus</i>	Olszowa Droga	1978	4	12	Spring	increase	128220	0.505	0.005468	0.146
<i>M. oeconomus</i>	Olszowa Droga	1978	4	13	Spring	increase	128221	0.456	0.002882	0.142
<i>M. oeconomus</i>	Olszowa Droga	1978	4	13	Spring	increase	128222	1.665	0.006597	0.206
<i>M. oeconomus</i>	Olszowa Droga	1978	4	16	Spring	increase	128235	0.629	0.003957	0.174
<i>M. oeconomus</i>	Olszowa Droga	1978	4	16	Spring	increase	128236	1.471	0.005946	0.280
<i>M. oeconomus</i>	Olszowa Droga	1979	5	5	Spring	increase	131596	2.555	0.003612	0.137
<i>M. oeconomus</i>	Olszowa Droga	1979	5	5	Spring	increase	131601	1.285	0.008416	0.316
<i>M. oeconomus</i>	Olszowa Droga	1979	5	7	Spring	increase	131612	1.267	0.005060	0.111
<i>M. oeconomus</i>	Olszowa Droga	1979	8	10	Summer	increase	133930	1.057	0.005341	0.083
<i>M. oeconomus</i>	Olszowa Droga	1979	8	10	Summer	increase	133932	3.265	0.005151	0.530
<i>M. oeconomus</i>	Olszowa Droga	1979	8	11	Summer	increase	133968	0.664	0.005117	0.179
<i>M. oeconomus</i>	Olszowa Droga	1979	8	11	Summer	increase	133969	1.391	0.003902	0.065
<i>M. oeconomus</i>	Olszowa Droga	1979	8	11	Summer	increase	133979	1.754	0.004506	0.142
<i>M. oeconomus</i>	Olszowa Droga	1980	4	26	Spring	peak	136028	0.603	0.006347	0.173
<i>M. oeconomus</i>	Olszowa Droga	1980	4	26	Spring	peak	136030	0.960	0.004277	0.420
<i>M. oeconomus</i>	Olszowa Droga	1980	4	26	Spring	peak	136031	0.392	0.004724	0.235
<i>M. oeconomus</i>	Olszowa Droga	1980	4	29	Spring	peak	136050	2.005	0.003734	0.014
<i>M. oeconomus</i>	Olszowa Droga	1980	8	10	Summer	peak	136464	1.634	0.003648	0.107
<i>M. oeconomus</i>	Olszowa Droga	1980	8	10	Summer	peak	136467	2.068	0.002166	0.260
<i>M. oeconomus</i>	Olszowa Droga	1980	8	10	Summer	peak	136473	1.669	0.004708	0.060
<i>M. oeconomus</i>	Olszowa Droga	1980	8	10	Summer	peak	136478	1.374	0.009874	0.176
<i>M. oeconomus</i>	Olszowa Droga	1980	8	10	Summer	peak	136483	1.713	0.005647	0.104
<i>M. oeconomus</i>	Barwik	1984	4	29	Spring	increase	149768	1.318	0.004390	0.023
<i>M. oeconomus</i>	Barwik	1984	4	30	Spring	increase	149769	1.617	0.004258	0.217
<i>M. oeconomus</i>	Barwik	1984	4	30	Spring	increase	149771	1.707	0.004153	0.153
<i>M. oeconomus</i>	Barwik	1984	5	1	Spring	increase	149772	1.848	0.006419	0.196
<i>M. oeconomus</i>	Barwik	1984	5	1	Spring	increase	149774	0.712	0.006056	0.011
<i>M. oeconomus</i>	Barwik	1984	5	3	Spring	increase	149777	1.166	0.004086	0.098
<i>M. oeconomus</i>	Barwik	1984	5	4	Spring	increase	149779	1.130	0.006149	0.212
<i>M. oeconomus</i>	Barwik	1985	5	30	Spring	peak	150529	1.230	0.004551	0.127
<i>M. oeconomus</i>	Barwik	1985	5	2	Spring	peak	150530	1.226	0.002202	0.252
<i>M. oeconomus</i>	Barwik	1985	5	2	Spring	peak	150532	2.197	0.004072	0.220
<i>M. oeconomus</i>	Barwik	1985	5	2	Spring	peak	150533	1.279	0.003719	0.177
<i>M. oeconomus</i>	Barwik	1985	5	3	Spring	peak	150536	1.701	0.006497	0.053
<i>M. oeconomus</i>	Białowieża	1998	9	?	Autumn	increase	BPN-10A	0.627	0.005955	0.325
<i>M. oeconomus</i>	Białowieża	1998	9	?	Autumn	increase	BPN-10B	0.970	0.003970	0.214
<i>M. oeconomus</i>	Białowieża	1998	9	?	Autumn	increase	BPN-11	1.354	0.003319	0.197
<i>M. oeconomus</i>	Białowieża	1998	9	?	Autumn	increase	P-6	1.395	0.007042	0.466
<i>M. oeconomus</i>	Białowieża	1999	9	?	Autumn	peak	1999-12	0.920	0.008297	0.314
<i>M. oeconomus</i>	Białowieża	1999	9	?	Autumn	peak	1999-18	1.228	0.006051	0.365
<i>M. oeconomus</i>	Białowieża	1999	9	?	Autumn	peak	1999-3	0.872	0.002382	0.211
<i>M. oeconomus</i>	Białowieża	1999	9	?	Autumn	peak	1999-7	1.659	0.004512	0.046
<i>M. oeconomus</i>	Białowieża	2001	9	?	Autumn	recovery	A2-1	0.778	0.006318	0.307
<i>M. oeconomus</i>	Białowieża	2001	9	?	Autumn	recovery	A2-4	1.833	0.002077	0.078
<i>M. oeconomus</i>	Białowieża	2001	9	?	Autumn	recovery	A2-5	0.821	0.003954	0.044
<i>M. oeconomus</i>	Białowieża	2001	9	?	Autumn	recovery	A2-6	1.564	0.003208	0.232
<i>M. oeconomus</i>	Białowieża	2001	9	?	Autumn	recovery	A2-7	0.336	0.000779	0.198

Table S1 (continued)

(B) Laboratory specimens

Species	Diet	Specimen	Asfc	epLsar	HAsfc
<i>M. oeconomus</i>	S	6		Removed	
<i>M. oeconomus</i>	S	17	2.365	0.004742	0.236
<i>M. oeconomus</i>	S	22	1.599	0.008124	0.425
<i>M. oeconomus</i>	S	31	1.857	0.005048	0.492
<i>M. oeconomus</i>	S	41	2.274	0.009734	0.255
<i>M. oeconomus</i>	C	10	1.513	0.006655	0.242
<i>M. oeconomus</i>	C	13	1.261	0.005899	0.312
<i>M. oeconomus</i>	C	16	1.818	0.005468	0.392
<i>M. oeconomus</i>	C	5	2.230	0.004953	0.149
<i>M. oeconomus</i>	C	8	3.763	0.006021	0.104

All specimens are from the Mammal Research Institute of the Polish Academy of Sciences, abbreviation MRI-PAS. Phases from Białowieża are from Zub et al. (2012).

Table S2. Shapiro-Wilk normality tests on residuals.

	no outlier		with outliers	
	W	P	W	P
Wild Olszowa Droga - Effect season				
Asfc	0.949	0.348	0.933	0.140
epLsar	0.971	0.777	0.923	0.086
HAsfc	0.942	0.261	0.878	0.011
LD1	0.940	0.243	0.949	0.304
Wild Biebrza Marshes Spring - Effect locality				
Asfc	0.951	0.289		
epLsar	0.966	0.559		
HAsfc	0.987	0.986		
LD1	0.918	0.051		
Wild Białowieża Autumn - Effect phase				
Asfc	0.960	0.760		
epLsar	0.956	0.686		
HAsfc	0.951	0.610		
LD1	0.886	0.087		
LD2	0.961	0.766		
Lab - Effect silica				
Asfc	0.934	0.555	0.887	0.187
epLsar	0.972	0.910	0.973	0.919
HAsfc	0.899	0.285	0.885	0.176
LD1	0.941	0.623	0.926	0.444

Bold values indicate significance ($P \leq 0.05$), i.e. non-normal distribution. W: test statistic, P: P-value.

Table S3. Descriptive statistics.

Wild Biebrza Marshes			Asfc				epLsar				HAsfc			
Season	Locality	N	Mean	Median	SD	SEM	Mean	Median	SD	SEM	Mean	Median	SD	SEM
Spring	Barwik	12	1.428	1.298	0.398	0.115	0.004712	0.004324	0.001304	0.000376	0.145	0.165	0.082	0.024
Spring	Olszowa Droga	12	1.149	1.113	0.687	0.198	0.005085	0.004892	0.001560	0.000450	0.196	0.174	0.106	0.031
Summer	Olszowa Droga (with outliers)	10	1.659	1.651	0.688	0.218	0.005006	0.004912	0.001992	0.000630	0.171	0.125	0.140	0.044
Summer	Olszowa Droga (no outlier)	8	1.494	1.651	0.445	0.157	0.004379	0.004607	0.001125	0.000398	0.125	0.106	0.067	0.024

Wild Białowieża Autumn														
Year	Cycle	N	Mean	Median	SD	SEM	Mean	Median	SD	SEM	Mean	Median	SD	SEM
1998	increase	4	1.086	1.162	0.361	0.181	0.005071	0.004963	0.001727	0.000864	0.300	0.270	0.124	0.062
1999	peak	4	1.170	1.074	0.362	0.181	0.005310	0.005281	0.002495	0.001248	0.234	0.262	0.141	0.070
2001	recovery	5	1.066	0.821	0.615	0.275	0.003267	0.003208	0.002085	0.000932	0.172	0.198	0.109	0.049

Lab														
Silica	N	Mean	Median	SD	SEM	Mean	Median	SD	SEM	Mean	Median	SD	SEM	
high	4	2.024	2.065	0.360	0.180	0.006912	0.006586	0.002423	0.001212	0.352	0.340	0.127	0.063	
low (with outlier)	5	2.117	1.818	0.989	0.442	0.005799	0.005899	0.000636	0.000284	0.240	0.242	0.117	0.052	
low (no outlier)	4	1.705	1.665	0.417	0.209	0.005743	0.005683	0.000720	0.000360	0.274	0.277	0.103	0.052	

N: sample size, SD: standard deviation, SEM: standard error of the mean.

Table S4. Analytical statistics.

(A) Tests on the mean

	no outlier			with outliers	
	t	df	P	U	P
Wild Olszowa Droga - Effect season					
Asfc	-1.361	18.000	0.190	31	0.059
epLsar	1.175	17.817	0.256	64	0.821
HAsfc	1.833	17.989	0.083	76	0.314
LD1	-2.390	16.607	0.029	29	0.043
Wild Biebrza Marshes Spring - Effect locality					
Asfc	1.215	17.639	0.240	94	0.219
epLsar	-0.635	21.329	0.532	66	0.755
HAsfc	-1.324	20.727	0.200	57	0.410
LD1	-1.850	14.422	0.085	34	0.028
Wild Białowieża Autumn - Effect phase					
Asfc	0.056	2	0.946	0.267	0.875
epLsar	1.277	2	0.321	2.601	0.272
HAsfc	1.201	2	0.341	1.942	0.379
LD1	1.526	2	0.264	2.667	0.264
LD2	0.546	2	0.595	0.425	0.808
Lab - Effect silica					
Asfc	1.155	5.871	0.293	13	0.556
epLsar	0.924	3.526	0.414	11	0.905
HAsfc	0.957	5.769	0.377	15	0.286
LD1	-3.457	5.310	0.016	3	0.111

(B) Tests on the variance

	no outlier		with outliers	
	F	P	F	P
Wild Olszowa Droga - Effect season				
Asfc	2.384	0.140	0.434	0.517
epLsar	1.032	0.323	0.000	0.999
Hasfc	0.914	0.352	0.072	0.791
LD1	2.941	0.104	3.825	0.065
Wild Biebrza Marshes Spring - Effect locality				
Asfc	3.738	0.066		
epLsar	0.464	0.503		
Hasfc	0.100	0.755		
LD1	3.631	0.070		
Wild Białowieża Autumn - Effect phase				
Asfc	0.485	0.630		
epLsar	0.191	0.829		
Hasfc	0.112	0.895		
LD1	0.260	0.776		
LD2	2.623	0.121		
Lab - Effect silica				
Asfc	0.036	0.855	0.808	0.398
epLsar	12.001	0.013	15.775	0.005
Hasfc	0.923	0.374	0.248	0.634
LD1	0.465	0.521	0.018	0.896

Bold values indicate significance ($P \leq 0.05$). df : degree of freedom, F : F-test statistic [(A) ANOVA, (B) Levene's test], K : Kruskal-Wallis test statistic, P : P-value, t : Welch t-test statistic, U : Mann-Whitney test statistic.

Table S5. Descriptive statistics, Shapiro-Wilk normality tests and analytical statistics on the silicon concentration (% of the dry mass) in vole faeces (data from Wieczorek et al. 2015b).

(A) Descriptive statistics

Year	N	[Si]			
		Mean	Median	SD	SEM
2008	115	0.920	0.696	1.083	0.101
2009	111	1.175	1.173	0.427	0.041
2010	52	0.515	0.501	0.196	0.027

(B) Shapiro-Wilk on residuals

	W	P
[Si]	0.529	<0.001

(C) Analytical statistics

	K	P
[Si]	90.825	<0.001

Bold values indicate significance ($P \leq 0.05$). K: Kruskal-Wallis test statistic, N: sample size, P: P -value, SD: standard deviation, SEM: standard error of the mean, W: Shapiro-Wilk test statistic.

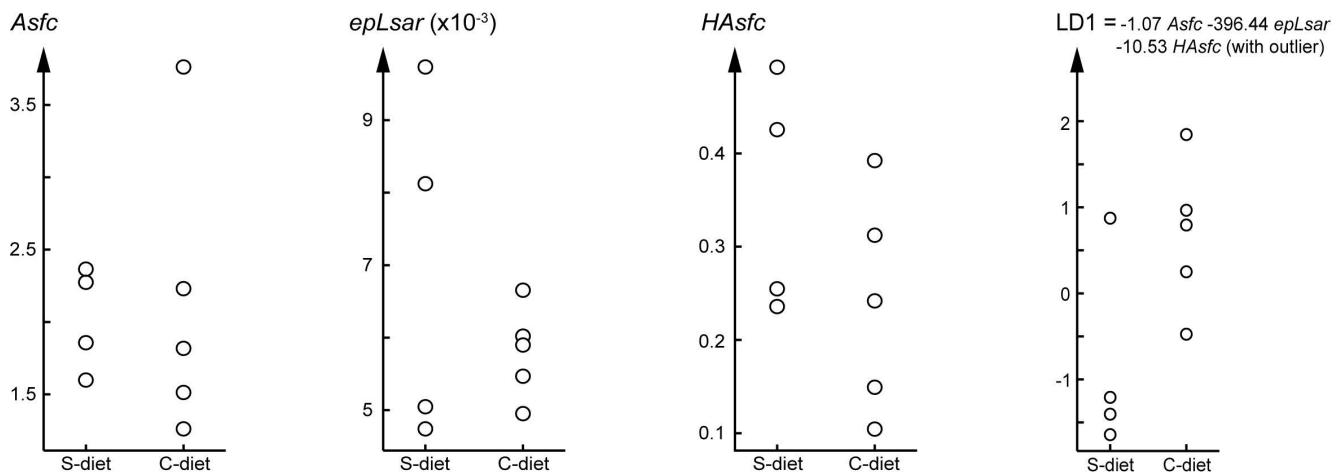
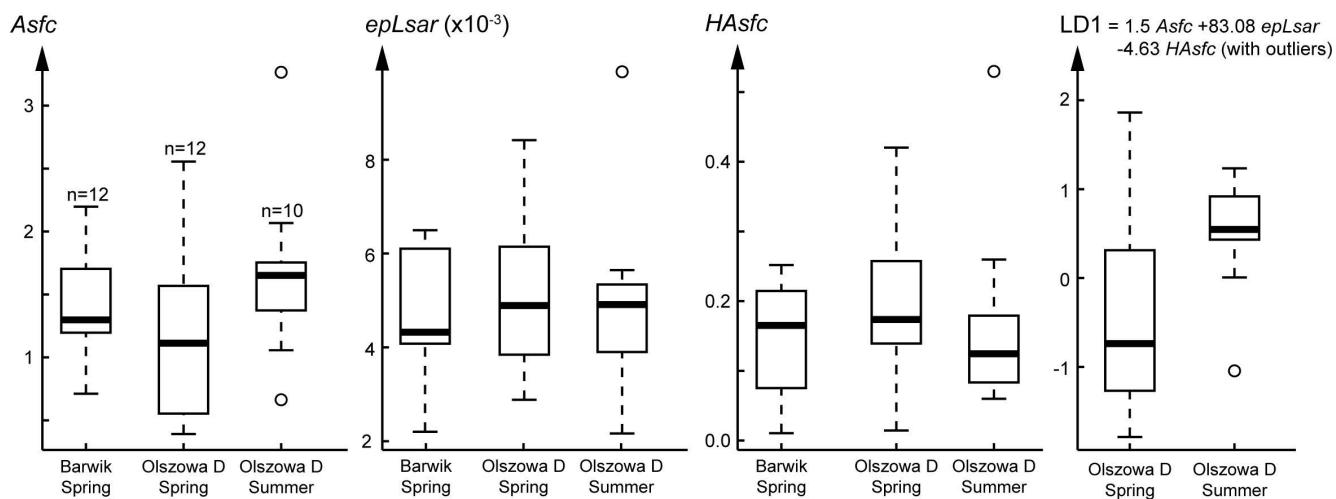
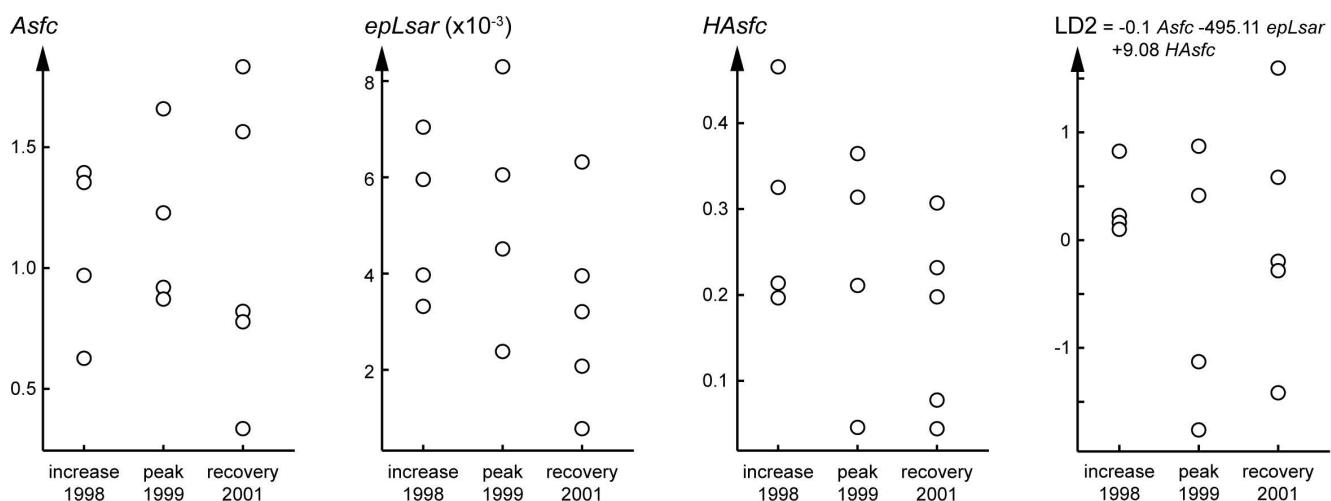
A. Silica**B. Biebrza Marshes****C. Białowieża**

Fig. S1. Plots of the microwear texture complexity (Asfc), anisotropy (epLsar) and heterogeneity (HAsfc), and of the axes of the linear discriminant analysis (LD1 and LD2). (A) S-diet vs. C-diet for laboratory voles (with outlier). **(B)** Seasons and localities in the Biebrza Marshes for wild voles (with outliers). The thick horizontal lines mark the median; the boxes enclose the first (25%) and third (75%) quartiles, i.e. the interquartile range (IQR); the whiskers (dashed lines) extend to 1.5 IQR; open circles represent outliers. **(C)** Wild vole population phases in Białowieża in spring. See Fig. 1e for plots of LD1 with outliers removed.

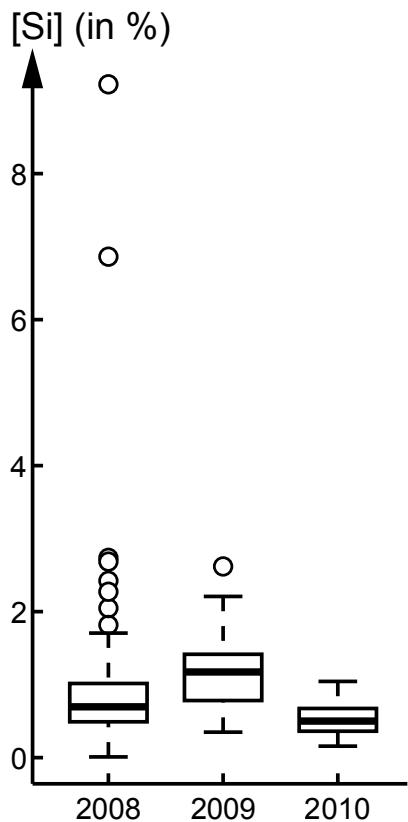


Fig. S2. Silicon concentration in vole faeces (% of the dry mass) in 2008 (N=115), 2009 (N=111) and 2010 (N=52). The thick horizontal lines mark the median; the boxes enclose the first (25%) and third (75%) quartiles, i.e. the interquartile range (IQR); the whiskers (dashed lines) extend to 1.5 IQR; open circles represent outliers. Data from Wieczorek et al. (2015b).