

Table S1. The list of the localities used in this work

# on the Fig. 1	Bioregion	Name	Layer	Lat.	Long.	Country	Dating	
							direct	indirect
1	EEURSU	Bobylek	Layers 4 and 6	56.190	57.390	Russia		+
2	EEURSU	Krasnyi Bor		55.881	53.101	Russia		+
3	BORS	Cheremoshnik	Mikulino deposits	57.117	39.333	Russia	+	
4	PNTCA	Cherny Yar	Chazar alluvium	48.024	46.111	Russia	+	
5	PNTCA	Shkurlat (Shkurlat layers)		50.379	40.236	Russia		+
6	CEURS	Chernianka		50.916	37.809	Russia		+
7	PNTCA	El'tigen	Karangatian deposits	45.237	36.421	Russia	+	
8	PNTCA	Beglitsa section		45.237	36.421	Russia		+
9	PNTCA	Kabazi II	Unit VI	44.833	34.083	Russia	+	
10	CEURN	Malutino		51.674	35.780	Russia		+
11	CEURN	Mikhailovka 5		52.243	35.320	Russia		+
12	CEURS	Gadiach	Mesin paleosol	50.333	34.000	Ukraine		+
13	CEURS	Novonekrasovka	Karangatian deposits	47.500	28.583	Ukraine		+
14	CEURN	Borisova Gora		55.450	30.667	Belarus		+
15	CEURN	Timoshkovichi		53.667	26.083	Belarus		+
16	CEURS	Vârtop casa de Piatra		43.834	25.165	Romania	+	
17	CEURS	Kozarnika	9a-9b	43.652	22.703	Bulgaria	+	
18	CEURS	Mala Balanica	2 a-c	43.337	22.085	Serbia	+	
19	CEURN	Biśnik Cave	12, 13	50.426	19.832	Poland	+	
20	CEURN	Nietoperzowa Cave	15-13	50.205	19.768	Poland	+	
21	CEURS	Gánovce-Hrádok	C (Eemian phase)	49.030	20.321	Slovakia	+	
22	CEURS	Kalman Lambrecht Cave	5,4	48.167	20.583	Hungary		+
23	CEURS	Horváti-lik	7-21	48.213	20.448	Hungary		+
24	CEURS	Süttő Travertine Complex	units 15, 16	47.745	18.445	Hungary	+	
25	CEURS	Za Hajovnou Cave	ZH P-2, 6ab-6b	49.667	16.933	Czech	+	
26	CEURS	Chlupá čova sluj		49.912	14.083	Czech		+
27	CEURS	Vindija Cave	K	46.305	16.088	Croatia	+	

# on the Fig. 1	Bioregion	Name	Layer	Lat.	Long.	Country	Dating	
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28	CEURS	Veternica	j	45.843	15.873	Croatia		+
29	CEURS	Krapina	units 1-9	46.175	15.891	Croatia	+	
30	CEURS	Betalov podmol	5	45.781	14.206	Slovenia		+
31	CEURS	Caverna degli Orsi	B: Units 120-122	45.604	13.867	Italy		+
32	CEURN	Schönfeld		51.308	13.715	Germany		+
33	CEURN	Gröbern I		51.696	12.448	Germany		+
34	ATE	Grabschütz		51.463	12.292	Germany		+
35	ATE	Rabutz		51.441	12.181	Germany		+
36	ATE	Neumark-Nord 2/2	7	51.322	11.906	Germany	+	
37	ATE	Burgtonna I		51.067	10.733	Germany	+	
38	ATE	Burgtonna II		51.067	10.733	Germany	+	
39	ATE	Burgtonna I-III		51.067	10.733	Germany	+	
40	ATE	Taubach	7, 11	50.951	11.377	Germany	+	
41	ATE	Weimar-Ehringsdorf	upper travertine	50.967	11.350	Germany	+	
42	ATE	Einhornhöhle, Unicorn Cave	D-H	51.637	10.403	Germany	+	
43	ATE	Lehringen		52.887	9.397	Germany		+
44	EURW	Biedermann travertine	lower travertine	48.783	9.267	Germany	+	
45	EURW	Wallertheim	A	49.828	8.062	Germany		+
46	ATE	Tönchesberg	2B	50.369	7.363	Germany		+
47	ATE	Scladina, Sclayn	5	50.485	5.026	Belgium	+	
48	ATE	Zemst, Bos van Aa	II B	50.983	4.467	Belgium	+	
49	ATE	Mesvin IV		50.424	3.969	Belgium	+	
50	ATE	Caours		50.130	1.878	France	+	
51	MDAP	Castel di Guido	4-5	41.903	12.284	Italy	+	
52	MDAP	Grotta Grande of Scario	A, F	40.031	15.458	Italy	+	
53	MDAP	Avetrana	2-7	40.340	17.742	Italy		+
54	MDAP	Cava Nuzzo		40.114	18.294	Italy		+
55	MDAP	San Sidero 3		40.134	18.274	Italy		+
56	MDI	Grotta dei Fiori	upper chamber	39.181	8.540	Italy	+	

# on the Fig. 1	Bioregion	Name	Layer	Lat.	Long.	Country	Dating	
							direct	indirect
57	MDI	San Giovanni di Sinis		39.181	8.540	Italy		+
58	MDI	Dragonara Cave		40.600	8.300	Italy		+
59	EURW	Grotta del Principe	Br 2	43.793	7.617	Monako	+	
60	EURW	Lazaret	II-III	43.690	7.295	France	+	
61	EURW	Cèdres	couche V	43.322	5.734	France	+	
62	EURW	La Baume Moula-Guercy	XV	44.931	4.867	France		+
63	EURW	Le Grand Abri aux Puces	2	44.231	5.134	France	+	
64	EURW	Saint-Marcel (d'Ardeche)	U	44.330	4.531	France		+
65	EURW	Orgnac 3	5a	44.317	4.450	France	+	
66	EURW	Baume Flandin	1-3	44.310	4.448	France		+
67	EURW	Abri-des-Pêcheurs	ensemble 1	44.408	4.206	France	+	
68	EURW	Grotte des Ramandils	YR-CI	43.033	2.983	France	+	
69	MDIB	Cova del Rinoceront	IIIe	41.274	1.961	Spain	+	
70	EURW	Grotte du Portel	L, K	43.027	1.536	France	+	
71	EURW	Abri Bourgeois-Delaunay, La Chaise	plancher 11	45.667	0.447	France	+	
72	EURW	Coudoulous I	plancher sup.	44.469	1.690	France	+	
73	EURW	Vaufrey	IV	44.800	1.200	France	+	
74	EURW	Bramefond		44.821	1.800	France	+	
75	MDIB	Bolomor	II	40.312	-3.570	Spain	+	
76	MDIB	Cueva Negra	15	38.037	-1.885	Spain	+	
77	MDIB	Cueva del Angel	I - XIII	37.369	-4.479	Spain	+	
78	MDIB	Ambrona	Lower member AS1	41.167	-2.500	Spain	+	
79	MDIB	Cova Eirós	3	42.766	-7.206	Spain	+	
80	MDIB	Arenero de Arriaga	I	40.312	-3.570	Spain	+	
81	MDIB	Villacastin		40.798	-4.372	Spain		+
82	ATBR	Swanton Morley		52.732	0.990	U.K.		+
83	ATBR	Shropham Gravel Pit		52.505	0.947	U.K.		+
84	ATBR	Barrington Chalk Pit		52.144	0.036	U.K.	+	
85	ATBR	Woolpack Farm beds		52.298	-0.097	U.K.		+

# on the Fig. 1	Bioregion	Name	Layer	Lat.	Long.	Country	Dating	
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86	ATBR	Tornewton Cave	hyaena stratum	50.488	-3.660	U.K.		+
87	ATBR	Joint Mitnor Cave		50.483	-3.767	U.K.		+
88	ATBR	Bacon Hole	VIII (west), E	51.559	-4.072	U.K.	+	
89	ATBR	Sewerby cliff		54.104	-0.125	U.K.	+	
90	ATBR	Kirkdale Cave		54.262	-0.960	U.K.	+	
91	ATBR	Victoria Cave	Lower Cave Earth	54.127	-2.264	U.K.	+	

Species	Localities													
	Timoshkovichi	Borisova Gora	Cheremoshnik	Chernyanka	Mikhailovka 5	Gadyach	Shkurlat	Beglitsa, Mezin soil	Novonekrasovka	El'tigen	Kabazi II, I, VI	Cherny Yar	Bobytek	Krasny Bor
<i>Spermophilus pygmaeus</i>								+			14	575		
<i>Spermophilus</i> sp.			4	4		27	14					6	+	
<i>Allactaga major</i>							1						+	
<i>Allactaga</i> sp.												17		
<i>Pygeretmus (Alactagulus) pumilio</i>							1						+	
<i>Meriones meridionalis</i>												10		
<i>Spalax microphthalmus</i>			2		29			+	2	9				
<i>Castor</i> sp.														
<i>Cricetulus migratorius</i>						1						3		
<i>Cricetus cricetus</i>		2	2	2								3	+	+
<i>Dryomys nitedula</i>											3			
<i>Apodemus flavicollis</i>											3		+	+
<i>A. ex gr. sylvaticus-flavicollis</i>		128	1		6							1	+	
<i>Mus musculus</i>		2										2		
<i>Lemmus sibiricus</i>		267										2	+	
<i>Dicrostonyx</i> sp.		1												
<i>Ellobius talpinus</i>									13	19		95		
<i>Clethrionomys glareolus</i>	8	273	2	2	30									+
<i>Cl. ex gr. rutilus-glareolus</i>													+	
<i>Eolagurus cf. luteus</i>			5	5	1		81	+	9	11		560		
<i>Lagurus lagurus</i>						12	126	+	3	1		315		

Species	Localities													
	Timoshkovichi	Borisova Gora	Cheremoshnik	Chernyanka	Mikhailovka 5	Gadyach	Shkurlat	Beglitsa, Mezin soil	Novonekrasovka	El'tigen	Kabazi II, I, VI	Cherny Yar	Bobytek	Krasny Bor
<i>Arvicola ex gr. terrestris</i>	8	60	29	29	95		10	+	180	4	41	346	+	+
<i>Microtus (Terricola) subterraneus</i>		6			12									
<i>Lasiopodomys (Stenocranius) gregais</i>			2	2	2	7	45	+		3	1	55	+	
<i>Microtus aroalis</i>								+	15			39		+
<i>Microtus agrestis</i>	3	14	2	2	107	2	2						+	+
<i>Microtus oeconomus</i>												68	+	
<i>Microtus obscurus</i>											446			

Species	Localities																		
	Süttő Travertine Complex	Mala balanica	Krapina	Kozarnika, L. 9a-9b	Kalman Lambrexht cave	Horvati-lik. L/ 7-21	Vindija Cave, L.K	Za Hájovnou Cave, ZN. P-11	Vartop Casa de Piatra	Neumark-Nord 2/2	Ganovce-Hradok complex III	Nietoperzowa Cave, L. 13-15	Schönfeld	Stuttgart-Unterturkeim, L.travertine	Bísnik Cave L. 12,13,	Taubach, bed 11	Weimar-Eringsdorf Upp. Travertine	Burgtonna, low. layer	Stuttgart-Untertürkheim, Low. layer
<i>Cricetus cricetus</i>				+	+	+	+						+		+	+	+	+	
<i>Cricetus major</i>																+		+	
<i>Allocrietus bursae</i>	+				+	+													
<i>Mesocricetus auratus</i>								+	+										
<i>Mesocricetus newtoni</i>				+															
<i>Glis glis</i>	+		+		+										+		+		
<i>Dryomys nitedula</i>					+										+				
<i>Apodemus flavicollis</i>															+				
<i>Apodemus sylvaticus</i>	+				+	+				+			+		+		+	+	
<i>Apodemus sp.</i>		+																	
<i>Lemmus lemmus</i>															+				
<i>Dicrostonyx guilielmi</i>						+									+				
<i>Chionomys nivalis</i>				+															
<i>Clethrionomys glareolus</i>				+	+	+	+			+					+		+		
<i>Clethrionomys sp.</i>	+																		
<i>Eolagurus luteus</i>								+	+										
<i>Lagurus lagurus</i>				+	+	+		+	+						+			+	

Species	Localities																		
	Süttő Travertine Complex	Mala balanica	Krapina	Kozarnika, L. 9a-9b	Kalman Lambrexht cave	Horvati-lik. L/ 7-21	Vindija Cave, L.K	Za Hájovnou Cave, ZN. P-11	Vartop Casa de Piatra	Neumark-Nord 2/2	Ganovce-Hradok complex III	Nietoperzowa Cave, L. 13-15	Schönfeld	Stuttgart-Unterturkeim, L.travertine	Bísnik Cave L. 12,13,	Taubach, bed 11	Weimar-Eringsdorf Upp. Travertine	Burgtonna, low. layer	Stuttgart-Untertürkheim, Low. layer
<i>Arvicola ex gr. terrestris</i>																			+
<i>Arvicola terrestris-cantianus</i>				+									+						+
<i>Microtus (Terricola) subterraneus</i>				+	+					+	+				+	+			+
<i>Lasiopodomys (Stenocranius) gregais</i>	+					+									+				
<i>Microtus arvalis</i>	+			+	+	+		+					+	+	+	+	+	+	
<i>Microtus agrestis</i>					+							+	+	+	+	+			
<i>Microtus ex gr. arvalis-agrestis</i>							+			+	+								+
<i>Microtus oeconomus</i>					+	+				+		+	+						

Localities

Species	Ambrona, L.AS1	Arenero de Arriaga, L.1	Bolomor, II	Cava del Rinoceront , L.IIIa,b,c	Cueva del Angel, I-XIII	Cueva Negra del Estrecho, L.15	Villacastin	Cova Eiros, L.3	Avetrana	Castel di Guido	Grotta Grande of Scario	Cava Nuzzo	San Giovanni di Sinis	Dragonara Cave	Grotta dei Fiori
<i>Arvicola terrestris</i>											+				
<i>Arvicola sapidus</i>	+	+	+			+	+	+							
<i>Microus (Iberomys) cabreræ brecciensis</i>	+	+	+	+		+	+								
<i>Microtus (Terricola) duodecimcostatus</i>		+					+								
<i>Microtus (Terricola) subterraneus</i>							+								
<i>Microus (Terricola) savii / Microus (Terricola) brachycercus</i>									+		+	+			
<i>Microtus (Terricola) lusitanicus</i>								+							
<i>Microtus arvalis</i>		+					+	+							
<i>Microtus agrestis</i>							+	+							
<i>Microtus (Tyrrhenicola) henseli</i>													+	+	+