

Ecography

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Osem, Y., Perevolotsky, A. and Kigel, J. 2006. Size traits and site conditions determine changes in seed bank structure caused by grazing exclusion in semiarid annual plant communities. – *Ecography* 29: 11–20.

Appendix 1. The abundance of annual plant species in the seed bank (seeds per sample) in grazed and ungrazed subplots in four topographic sites (average of four years). Inc. = higher abundance in the ungrazed subplots. Dec. = lower abundance in the ungrazed subplots.
* p<0.05, ** p<0.01 and *** p<0.001.

Species	South facing slope		Hiltop		North-facing slope		Wadi		Two way ANOVA		
	Grazed	Ungrazed	Grazed	Ungrazed	Grazed	Ungrazed	Grazed	Ungrazed	Fencing	Site	Si × Fen
<i>Avena sterilis</i>	0.00	0.01	0.03	0.04	0.03	0.04	0.17	0.73	*	**	**
<i>Hordeum spontaneum</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.27		*	*
<i>Medicago truncatula</i>	0.29	0.13	0.36	0.15	0.15	0.08	1.93	16.47	***	***	***
<i>Emex spinosa</i>	0.00	0.00	0.00	0.00	0.01	0.01	2.07	2.99	**	***	***
<i>Limonium lobatum</i>	0.01	0.01	0.07	0.11	0.00	0.05	0.61	3.37	***	**	***
<i>Erodium gruinum</i>	0.00	0.00	0.00	0.00	0.01	0.01	0.05	0.19		**	**
<i>Aegilops</i> spp.	2.50	8.01	0.33	0.76	0.63	1.78	1.57	3.64	***	*	*
<i>Onobrychis crista-galli</i>	0.47	2.27	0.36	1.17	0.53	1.47	0.59	4.95	***	*	***
<i>Hymenocarpus circinnatus</i>	0.39	1.71	0.20	0.95	0.41	1.51	1.73	7.95	***	**	***
<i>Stipa capensis</i>	0.21	0.24	0.51	1.08	0.27	0.33	1.52	9.09	***	**	***
<i>Medicago minima</i>	0.13	0.40	0.88	1.59	0.12	0.32	0.16	1.08	***	*	*
<i>Brachypodium distachyon</i>	1.04	4.05	0.19	0.20	0.71	4.49	0.03	0.31	***	***	**
<i>Hippocrepis unisiliquosa</i>	1.95	4.85	1.39	2.01	0.99	1.08	0.91	1.23	**	**	*
<i>Scabiosa porphyronetra</i>	0.01	0.01	0.00	0.00	0.04	0.29	0.17	0.45	**	**	*
<i>Trifolium stellatum</i>	0.00	0.00	0.00	0.00	0.03	0.24	0.05	0.17	*	*	*
<i>Catandula arvensis</i>	0.01	0.00	0.05	0.13	0.07	0.20	0.41	0.71		**	**
<i>Critihopsis delileana</i>	1.79	2.71	4.03	3.59	12.26	12.29	2.88	31.71			***
<i>Plantago</i> spp.	8.58	9.45	12.12	12.63	6.64	9.46	7.11	3.91	inc*	dec***	***
<i>Sedum pallidum</i>	0.21	1.64	4.67	8.48	1.49	1.09	1.51	0.48	dec*	dec*	**
<i>Erodium</i> spp.	0.03	0.03	0.19	0.21	0.03	0.07	0.76	0.49	dec*	dec*	**
<i>Scorpiurus muricatus</i>	0.16	0.31	0.03	0.01	0.04	0.21	0.15	0.07	dec*	dec*	*
<i>Anthemis hebronica</i>	0.05	0.13	0.11	0.23	0.12	0.09	1.75	1.12		***	***
<i>Crepis asperisancata</i>	0.12	0.03	0.05	0.00	0.05	0.07	2.09	1.47		***	***
<i>Hebipnois cretica</i>	0.09	0.00	0.72	0.25	0.34	0.01	0.79	0.60	*	***	***
<i>Daucus subsessilis</i>	0.09	0.08	0.15	0.05	0.12	0.13	0.23	0.08	*	*	*
<i>Anagallis arvensis</i>	1.91	1.35	0.19	0.11	0.22	0.11	1.08	0.96	*	***	***
<i>Frisetaria macrochaeta</i>	6.14	3.84	22.91	18.29	9.55	7.58	1.33	0.36	***	***	***
<i>Rosmaria cristata</i>	0.64	0.47	1.83	0.49	2.27	0.78	5.48	1.12	***	**	*
<i>Catapodium rigidum</i>	0.41	0.20	1.53	1.52	1.16	1.13	2.07	0.23	***	***	*
<i>Filago</i> spp.	0.51	0.72	4.17	2.36	1.64	1.57	3.20	1.47	**	**	***
<i>Reboudia pinnata</i>	0.11	0.09	0.03	0.00	0.03	0.01	0.12	0.19		**	***

<i>Carrichtera annua</i>	0.28	0.19	0.31	0.52	0.37	0.54	0.32	0.51	
<i>Bromus</i> spp.	0.24	0.44	1.27	1.12	3.56	4.46	1.31	0.91	*
<i>Taraxacum officinale</i>	0.00	0.00	0.05	0.00	0.44	0.22	0.65	0.65	*
<i>Linum strictum</i>	0.33	0.47	0.23	0.01	0.12	0.21	0.07	0.09	*
<i>Trifolium scabrum</i>	0.00	0.01	0.41	0.04	0.01	0.57	0.35	0.20	**
<i>Trigonalla monspeliaca</i>	0.13	0.25	2.95	1.72	2.11	2.67	1.77	1.68	***
<i>Trifolium campestre</i>	0.01	0.08	0.01	0.00	0.05	0.13	0.29	0.39	*
<i>Trifolium tomentosum</i>	0.04	0.00	0.13	0.08	0.38	0.68	0.47	0.63	*
<i>Euphorbia chamaepeplus</i>	0.17	0.09	0.40	0.24	0.22	0.67	0.32	0.21	
Total seed-bank	32.53	49.21	70.52	69.25	54.16	64.01	64.77	116.04	***
		inc**	inc*	inc*	inc*	inc*	inc**	inc***	***

Appendix 2. Species size traits. Plant size: tiny <30, small=30-59, medium=60-100 and large>100 mg plant⁻¹. Dispersal unit mass: tiny<5, small=5-10, medium=11-20 and large>20 mg dispersal⁻¹. * Dispersal units in which size cannot be determined (see text). Seed mass: tiny<0.3, small=0.3-0.9, medium=1-3 and large>3 mg seed⁻¹. T-tiny; S-small; M-medium; L-large.

Species	Family	Plant size		Disp. unit size		Seed size	
		category	mg	category	mg	category	mg
<i>Reboudia pinnata</i>	Cruciferae	L	1580	*	*	T	0.28
<i>Hedypnois cretica</i>	Asteraceae	L	530	L	21.00	M	1.54
<i>Scorpiurus muricatus</i>	Fabaceae	L	480	L	151.00	L	7.59
<i>Hordeum spontaneum</i>	Poaceae	L	400	L	27.25	L	14.6
<i>Onobrychis crista-galli</i>	Fabaceae	L	320	L	115.00	L	9.83
<i>Avena sterilis</i>	Poaceae	L	310	L	41.90	L	10.50
<i>Erodium gruinum</i>	Geraniaceae	L	300	L	69.50	L	8.70
<i>Aegilops</i> spp.	Poaceae	L	280	L	83.20	L	4.73
<i>Emex spinosa</i>	Polygonaceae	L	270	M	17.60	L	5.70
<i>Medicago truncatula</i>	Fabaceae	L	220	L	91.10	L	4.37
<i>Trifolium stellatum</i>	Fabaceae	L	200	S	7.30	M	2.45
<i>Scabiosa porphyroneura</i>	Dipsacaceae	L	190	M	18.10	L	3.33
<i>Erodium malacoides/cicutarium</i>	Geraniaceae	L	190	T	4.10	S	0.71
<i>Hymenocarpus circinnatus</i>	Fabaceae	L	160	L	30.00	L	5.08
<i>Stipa capensis</i>	Poaceae	L	130	S	6.50	S	0.90
<i>Calendula arvensis</i>	Asteraceae	L	120	S	8.80	M	1.15
<i>Limonium lobatum</i>	Plumbaginaceae	L	110	L	50.10	S	0.73
<i>Medicago minima</i>	Fabaceae	L	110	L	29.85	M	1.34
<i>Carrichtera annua</i>	Cruciferae	M	80	T	1.13	M	1.13
<i>Hippocrepis unisiliquosa</i>	Fabaceae	M	80	M	12.40	M	1.80
<i>Anthemis hebronica</i>	Asteraceae	M	60	*	*	T	0.18
<i>Crithopsis delileana</i>	Poaceae	M	60	M	11.70	L	3.11
<i>Crepis asper/sancta</i>	Compositae	M	66	T	0.10	T	0.09
<i>Daucus subsessilis</i>	Umbelliferae	M	66	T	0.90	S	0.48
<i>Trifolium scabrum</i>	Fabaceae	S	50	*	*	S	0.85
<i>Trifolium campestre</i>	Fabaceae	S	50	*	*	S	0.33
<i>Trifolium tomentosum</i>	Fabaceae	S	40	*	*	S	0.67
<i>Trigonalla monspeliaca</i>	Fabaceae	S	40	T	0.62	S	0.62
<i>Plantago cretica/coronopus</i>	Plantaginaceae	S	40	T	0.50	S	0.50
<i>Brachypodium distachyon</i>	Poaceae	S	30	S	5.80	L	5.55
<i>Bromus alopecurus/fasciculatus</i>	Poaceae	S	30	T	1.35	M	1.02
<i>Torilis tenella</i>	Umbelliferae	S	30	T	0.47	T	0.25
<i>Anagallis arvensis</i>	Primulaceae	S	30	T	0.38	S	0.38
<i>Linum strictum</i>	Linaceae	S	30	*	*	T	0.21
<i>Rostraria cristata</i>	Poaceae	T	20	T	0.13	T	0.11
<i>Catapodium rigidum</i>	Poaceae	T	20	T	0.19	T	0.17
<i>Filago</i> spp.	Asteraceae	T	20	T	0.05	T	0.05
<i>Euphorbia chamaepeplus</i>	Euphorbiaceae	T	10	T	0.33	T	0.29
<i>Trisetaria macrochaeta</i>	Poaceae	T	10	T	0.02	T	0.02
<i>Sedum pallidum</i>	Crassulaceae	T	10	T	0.01	T	0.01