

Supplementary Information

Effect of population, collection year, after-ripening and incubation conditions on seed germination of *Stipa bungeana*

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Table S1 Results of the generalized linear mixed effects models (GLMMs) on the effect of year (Y), storage (seed dormancy states) (S), temperature (T), population (P) and their interactions on seed germination percentage of *Stipa bungeana*.

	Wald statistic	n.d.f.	F statistic	F-pr
Year (Y)	16.87	1	16.87	<0.001
Storage (S)	267.03	1	267.03	<0.001
Temperature (T)	118.31	2	59.15	<0.001
Population (P)	128.73	7	18.39	<0.001
$Y \times S$	4.27	1	4.27	0.039
$Y \times T$	27.96	2	13.98	<0.001
$S \times T$	309.22	2	154.61	<0.001
$Y \times P$	341.03	7	48.72	<0.001
$S \times P$	98.03	7	14	<0.001
$T \times P$	23.35	14	1.67	0.059
$Y \times S \times T$	18.28	2	9.14	<0.001
$Y \times S \times P$	66.77	7	9.54	<0.001
$Y \times T \times P$	21.88	14	1.56	0.086
$S \times T \times P$	25.06	14	1.79	0.037
$Y \times S \times T \times P$	6.41	14	0.46	0.954

Table S2 Results of the generalized linear mixed effects models (GLMMs) on the effect of year (*Y*), storage (seed dormancy states) (*S*), water potential (*W*), population (*P*) and their interactions on seed germination percentage of *Stipa bungeana*.

	Wald statistic	d.f.	Wald/d.f.	Chi pr
Year (Y)	0.11	1	0.11	0.737
Storage (S)	22.28	1	22.28	<0.001
Water potential (W)	920.22	3	306.74	<0.001
Population (P)	158.16	7	22.59	<0.001
Y×S	34.02	1	34.02	<0.001
Y×W	24.57	3	8.19	<0.001
S×W	13.64	3	4.55	0.003
Y×S	485.77	7	69.4	<0.001
S×P	54.9	7	7.84	<0.001
W×P	139.41	21	6.64	<0.001
Y×S×W	157.74	3	52.58	<0.001
Y×S×P	29.03	7	4.15	<0.001
Y×W×P	75	21	3.57	<0.001
S×W×P	31.93	21	1.52	0.06
Y×S×W×P	37.08	21	1.77	0.016

Table S3A Correlations between geographic location and germination percentages of fresh and stored seeds of *Stipa bungeana* from eight natural populations incubated at three temperature regimes.

		Germination percentage (%)					
		10/20 °C		15/25 °C		20/30 °C	
		Fresh	Stored	Fresh	Stored	Fresh	Stored
Longitude	R	-0.054	-0.229	0.159	-0.307	0.273	-0.138
	P	0.843	0.393	0.555	0.248	0.307	0.609
Latitude	R	-0.146	0.055	0.076	-0.245	0.022	-0.066
	P	0.589	0.838	0.780	0.360	0.934	0.809
Altitude	R	-0.066	0.185	-0.332	0.210	-0.333	0.031
	P	0.809	0.492	0.209	0.436	0.207	0.911

Table S3B Correlations between geographic location and germination percentages of fresh and stored seeds of *Stipa bungeana* from eight natural populations incubated at four water potentials.

		Germination percentage (%)							
		CK		-0.2		-0.4		-0.6	
		Fresh	Stored	Fresh	Stored	Fresh	Stored	Fresh	Stored
Longitude	R	-0.150	-0.105	0.200	0.038	0.052	0.126	0.013	0.264
	P	0.579	0.699	0.459	0.890	0.850	0.643	0.963	0.323
Latitude	R	-0.171	-0.207	0.055	0.044	0.088	0.079	0.165	0.286
	P	0.527	0.441	0.839	0.872	0.745	0.772	0.542	0.282
Altitude	R	-0.144	-0.013	-0.413	-0.154	-0.241	-0.208	-0.038	-0.322
	P	0.594	0.961	0.112	0.569	0.370	0.439	0.888	0.224

Table S4A Correlations between climate and germination percentages of fresh and stored seeds of

***Stipa bungeana* from eight natural populations incubated at three temperature regimes.**

		Germination (%)					
		10/20 °C		15/25 °C		20/30 °C	
		Fresh	Stored	Fresh	Stored	Fresh	Stored
Mean monthly temperature	R	0.620*	0.434	0.352	0.159	0.244	0.500
	P	0.018	0.121	0.217	0.587	0.401	0.069
Monthly total rainfall	R	0.282	-0.139	-0.012	-0.039	-0.207	-0.062
	P	0.328	0.636	0.968	0.894	0.477	0.832

“*” Significant correlation between the two factors at 0.05 level.

Table S4B Correlations between climate and germination percentages of fresh and stored seeds of

***Stipa bungeana* from eight natural populations incubated at four water potentials.**

		Germination percentage (%)							
		CK		-0.2		-0.4		-0.6	
		Fresh	Stored	Fresh	Stored	Fresh	Stored	Fresh	Stored
Mean monthly temperature	R	0.381	0.340	0.412	0.596*	0.652*	0.384	0.440	0.025
	P	0.179	0.235	0.143	0.024	0.012	0.175	0.115	0.932
Monthly total rainfall	R	-0.189	-0.028	-0.327	-0.039	-0.154	-0.271	-0.006	-0.337
	P	0.516922	0.923	0.253	0.894	0.599	0.348	0.984	0.239

“*” Significant correlation between the two factors at 0.05 level.