

Appendix 1

Table A1. Study sites and ant species characteristics. Mean (\pm sd) head width, worker body mass and load mass are indicated for the three seed-harvesting ant species. Different letters indicate statistically significant differences among species at the different sites in Tukey's tests ($p < 0.05$).

Site	Annual precipitation (mm)*	Average monthly temperature ($^{\circ}$ C) [†]	Plant biomass (g m^{-2} year ⁻¹) [#]	Total patch density and mass (g)%	Mean propagule mass (g)	Ant species	n‡	Head width (mm)	Body mass (mg)	Load mass (mg)
Arid (Sede Boker)	94 \pm 40 (150,69)	18.7 (12-25)	65 \pm 21 (113,57)	736 \pm 148 6.86 \pm 1.62	0.018 \pm 0.012	<i>M. arenarius</i>	4	3.07 \pm 0.58 ^a	45 \pm 16.9 ^a	16 \pm 22 ^{ab}
						<i>M. ebeninus</i>	6	1.85 \pm 0.49 ^c	5.5 \pm 4.0 ^c	3.4 \pm 7.0 ^c
Semi-arid (Hatzerim)	197 \pm 60 (182,111)	20.8 (14-27)	149 \pm 48 (290,110)	742 \pm 118 8.36 \pm 1.29	0.019 \pm 0.013	<i>M. arenarius</i>	5	3.19 \pm 0.58 ^a	39 \pm 14.0 ^b	15.2 \pm 22 ^b
						<i>M. ebeninus</i>	8	1.98 \pm 0.48 ^{bc}	8.4 \pm 4.7 ^d	5.8 \pm 11.7 ^c
Med. A (Lahav)	308 \pm 100 (285,203)	19.6 (14-25)	198 \pm 53 (326,103)	572 \pm 111 5.45 \pm 1.21	0.028 \pm 0.009	<i>M. semirufus</i>	20	2.03 \pm 0.53 ^{bc}	8.6 \pm 5.4 ^d	18.3 \pm 27.5 ^{ab}
Med. B (Amatzia)	380 \pm 140 (400,246)	19.6 (14-25)	195 \pm 42 (253,114)	362 \pm 103 6.25 \pm 1.12	0.022 \pm 0.009	<i>M. semirufus</i>	23	1.99 \pm 0.52 ^{bc}	9.6 \pm 5.5 ^{cd}	20.5 \pm 26.0 ^a
Mesic-Med. (Ramot Menashe)	662 \pm 185 (599,503)	20.3 (16-25)	370 \pm 76 (375,243)	342 \pm 95 5.08 \pm 1.04	0.026 \pm 0.009	<i>M. semirufus</i>	25	2.16 \pm 0.57 ^b	10.3 \pm 6.0 ^c	18.1 \pm 20.1 ^{ab}

* Average annual precipitation for the years 1978-2008 (provided by the Israeli Meteorological Service). Rainfall amounts for the experiment years (2007-2008) are in parentheses. † Average monthly temperature refers to average monthly temperatures between the years 1998-2008 (IMS archives). Average monthly minimum and maximum temperatures between the years 1998-2008 are presented in parentheses. # Plant biomass (aboveground) is the average of 12 0.6×0.6 m samples per year for the years 2007-2010. NPP amounts for the experiment years are in parentheses. % Total number of propagules and their summed mass at natural foraged patches (mean \pm SD). ‡ Number of colonies excluding revisitations.

Table A2. Study sites of the seed-choice experiment.

Site	Location (Lat/Lon)	Annual precipitation (mm) *	No. of nests (total/effective) #	Ant species
Arid A (Sede Boker)	30°51' N 034°46' E	90	7/3	<i>M. arenarius</i> <i>M. ebeninus</i>
Arid B (Helmoniot Yeruham)	30°58' N 034°53' E	100	9/5	<i>M. arenarius</i> <i>M. ebeninus</i>
Semi-arid A (Beer Sheva)	31°16' N 034°49' E	182	7/3	<i>M. arenarius</i> <i>M. ebeninus</i>
Semi-arid B (Hatzerim)	31°16' N 034°39' E	200	14/13	<i>M. arenarius</i> <i>M. ebeninus</i>
Semi-arid C (Gilat)	31°20' N 034°40' E	240	9/8	<i>M. arenarius</i> <i>M. ebeninus</i>
Mediterranean A (Lahav)	31°23' N 034°51' E	308	11/11	<i>M. semirufus</i>
Mediterranean B (Amatzia)	31°32' N 034°52' E	380	10/10	<i>M. semirufus</i>
Mediterranean C (Hirbet Midras)	31°39' N 034°56' E	430	17/16	<i>M. semirufus</i> <i>M. ebeninus</i>
Mediterranean D (Modi'in)	31°54' N 034°57' E	520	9/9	<i>M. semirufus</i>
Mesic- Mediterranean (Ramot Menashe)	32°33' N 035°06' E	635	10/10	<i>M. semirufus</i>

* Average annual precipitation data provided by the climate archive of the Israeli Meteorological Service.

Effective number of nests used in the analyses refers to colonies in which at least 2% of the seeds were taken in total from petri dishes.

Table A3. Results of the global models, containing all the factors predicted to be important, for the effects of site and total food *mass* and *density* in the natural foraged patch on *Bs* Schoener's selectivity index (log transformed). Values reported in LMM analyses for fixed and random effects are F statistics and variance components (% of total variance in parentheses), respectively. Significant parameters are shown in bold.

	Bs index (as a function of propagule mass)		Bs index (as a function of propagule density)	
	AIC _C global model = 312.81		AIC _C global model = 241.70	
Factor	F	p-value	F	p-value
Site	5.35	0.0007	2.47	0.0497
Log total patch food mass or density	6.47	0.0125	2.64	0.107
Site × Log total patch mass or density	3.18	0.017	2.52	0.045
Year	0.54	0.46	0.15	> 0.5
Sampling season	0.31	> 0.5	0.20	> 0.5
Ambient temperature	0.23	> 0.5	0.20	> 0.5
Log foraging distance	0.33	> 0.5	3.05	0.083
Plant species richness at patch	2.52	0.11	8.34	0.005
Log forager body mass	3.05	0.084	0.08	> 0.5
Variance	Component	Wald p-value	Component	Wald p-value
Colony (year,site)	0.0025 (0.56)	> 0.5	0.062 (26.77)	0.084

Figure A1. Food preference at artificial seed patches. (A) food baits placed 3-4 m from the nest entrance (here *Messor arenarius*). (B) barley seeds of three different size classes in petri dishes ca. 20 cm apart. (C) *Messor semirufus* foragers in a food bait.

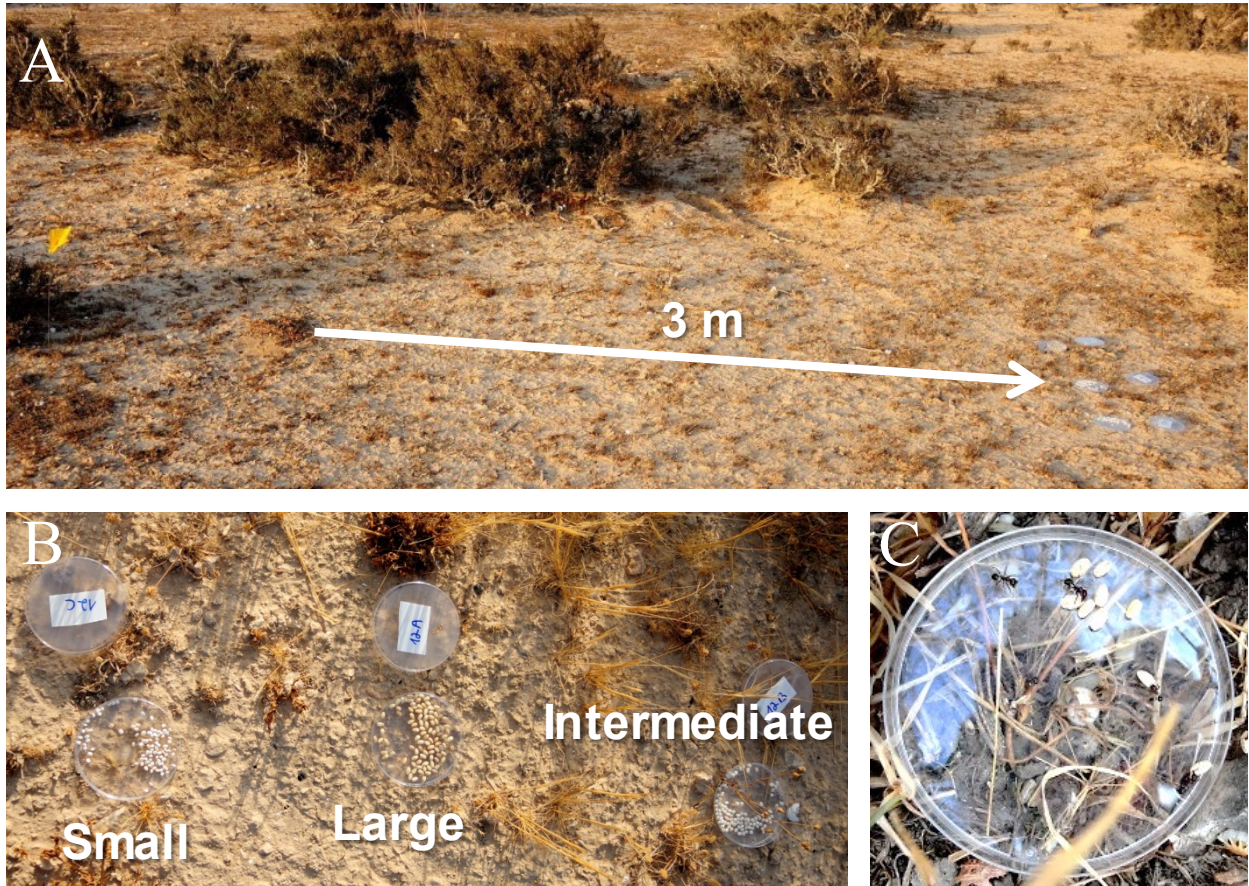


Figure A2. Correlations between mean propagule mass and relative propagule density (A) or relative propagule mass (B) in the food patch. Pearson's correlations for relative propagule density in different sites: **arid: $r = -0.62$, $p = 0.0105$** ; semi-arid: $r = -0.47$, $p = 0.107$; **Medit. A: $r = -0.52$, $p = 0.0036$** ; Medit. B: $r = -0.29$, $p = 0.11$; mesic-Medit.: $r = -0.13$, $p > 0.5$. Pearson's correlations for relative propagule mass in different sites: arid: $r = -0.01$, $p > 0.5$; semi-arid: $r = 0.34$, $p = 0.26$; Medit. A: $r = 0.03$, $p > 0.5$; **Medit. B: $r = 0.59$, $p = 0.0005$** ; mesic-Medit.: $r = 0.18$, $p = 0.33$. Significant correlations following FDR corrections are indicated in bold.

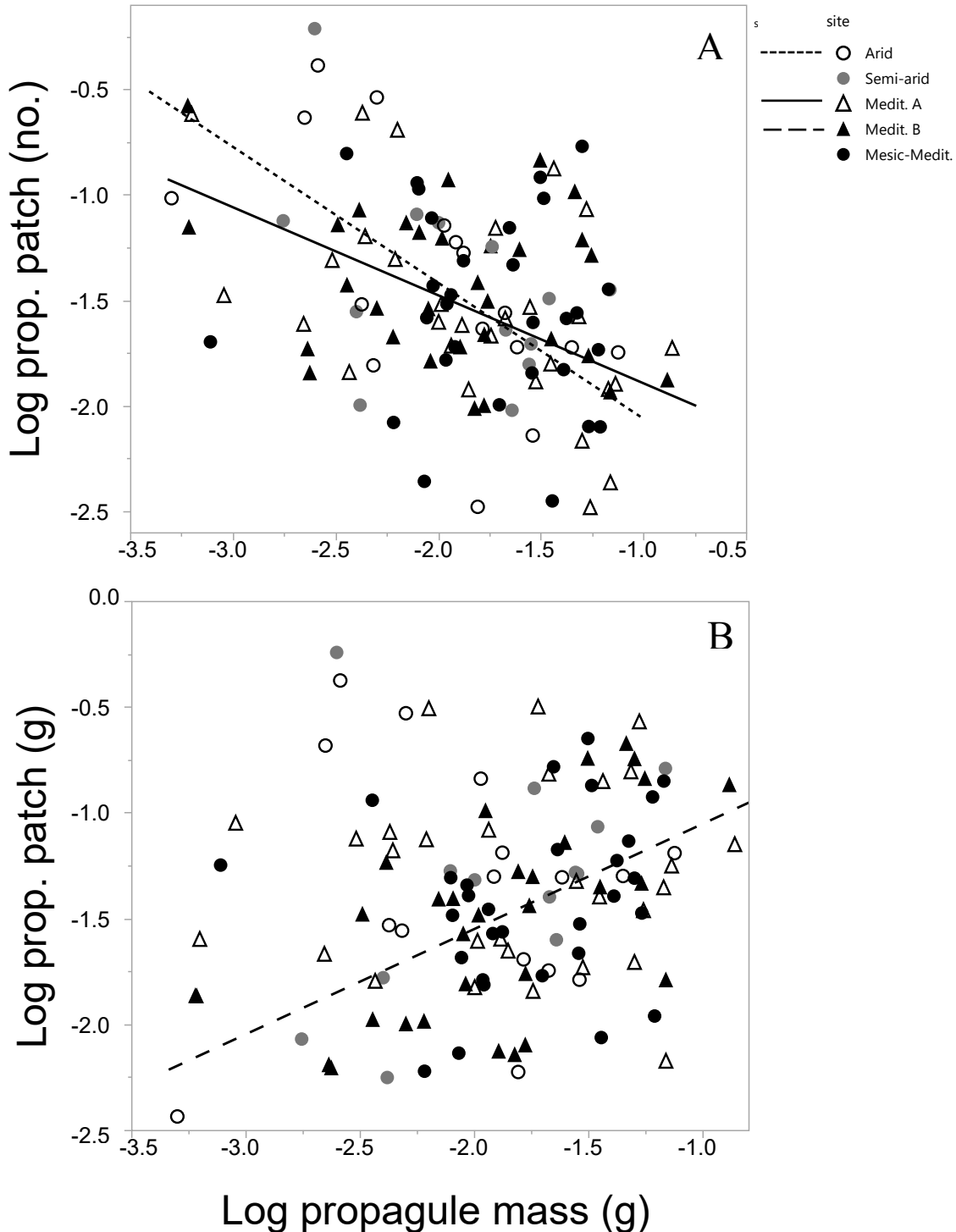


Figure A3. Differences in diet selectivity at artificial seed patches (mean \pm SE), measured as Schoener's selectivity index (B_s), between the two ant species co-occurring at one of the Mediterranean sites (Hirbet Midras). Numbers above bars denote sample sizes.

