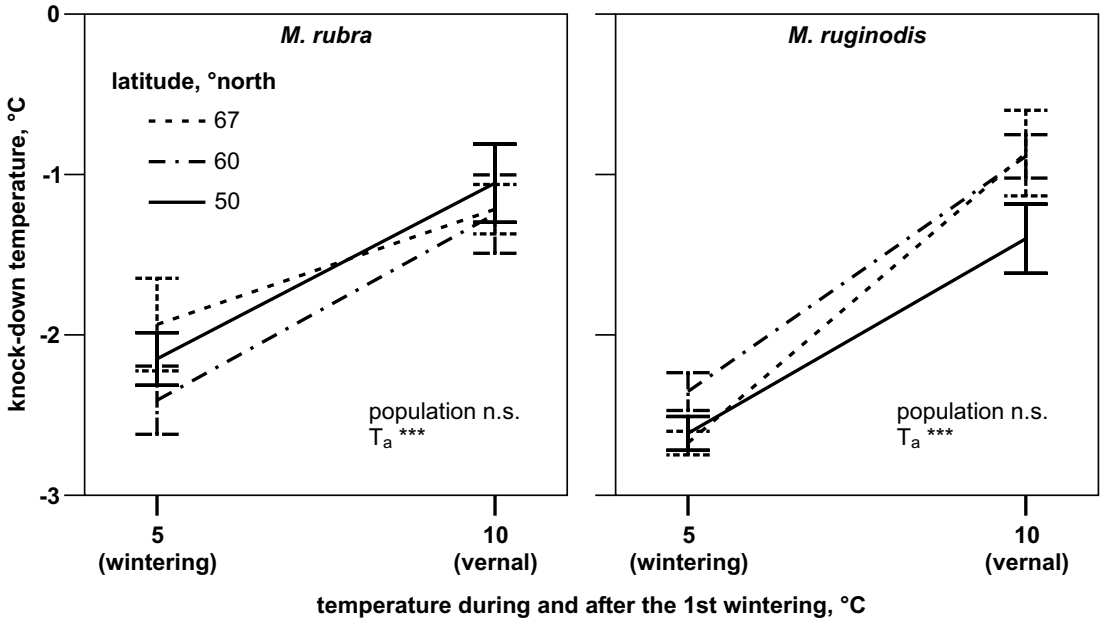

Fig. S1. Change of chill coma temperature in *Myrmica* over a week of artificial spring. Averages of colony means ± s.e.m. (*n*=5 colonies). Populations are coded by latitude. Significance levels: ****P*<.001; n.s., not significant.

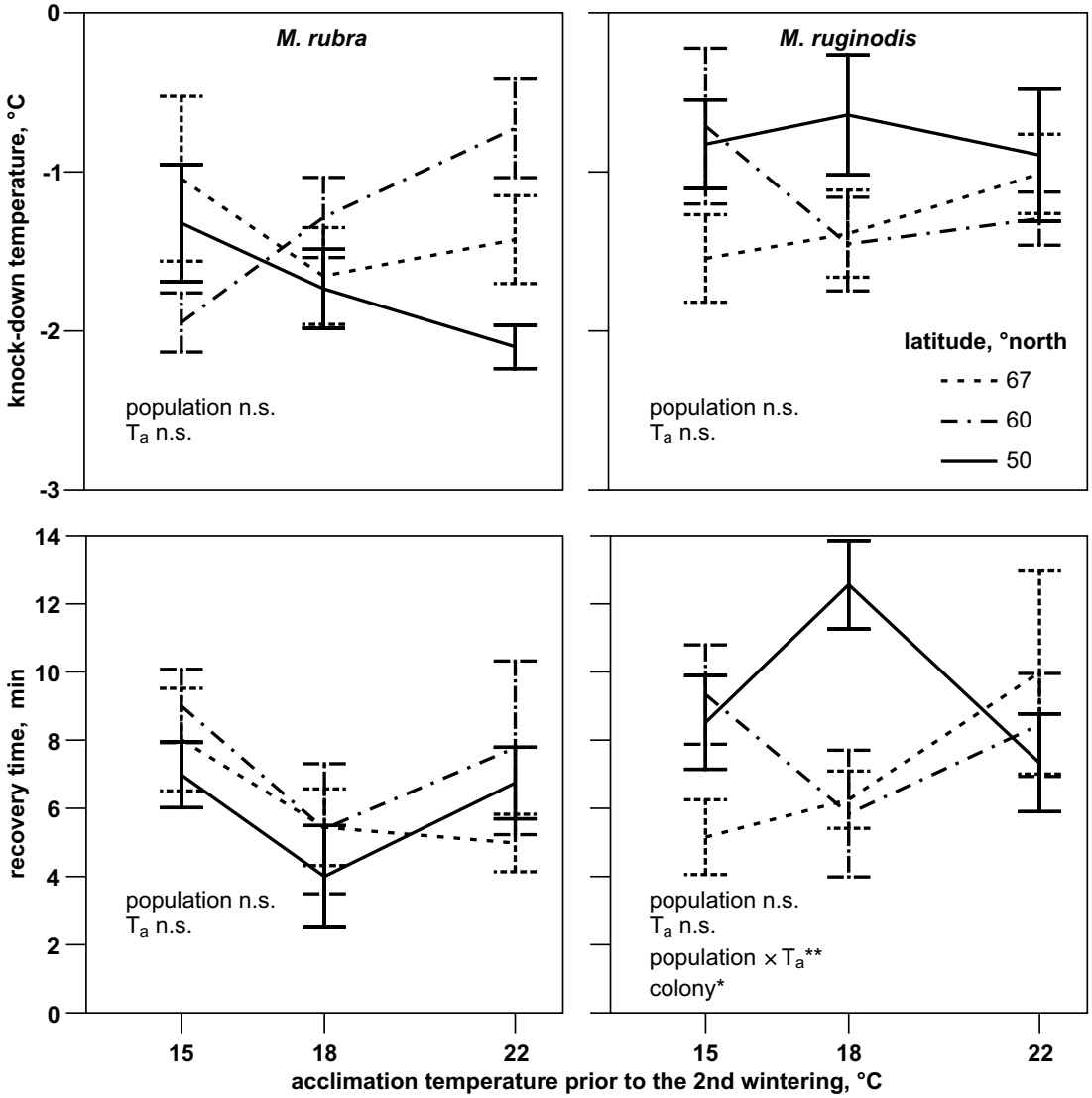

Fig. S2. Chill coma temperature and recovery time of *Myrmica* in the end of the 2nd artificial winter (at 5°C). Averages of fraction means ± s.e.m. (*n*=5 colony fractions). Populations are coded by latitude. Note that here ants were left to recover in naturally warming containers transferred from −3°C to 20°C, instead of immediate transfer of the insects from a container at −3°C to a container at 20°C, which would result in their quick and nearly simultaneous recovery, giving very little variation for analysis (for the dynamics of the warming, see supplementary material Fig. S3). Photography of recovery was performed manually over 20-seconds intervals, also to increase data variation. Abbreviations: T_a, temperature of acclimation. Significance levels: **P*<.05, ***P*<.01; n.s.: not significant.

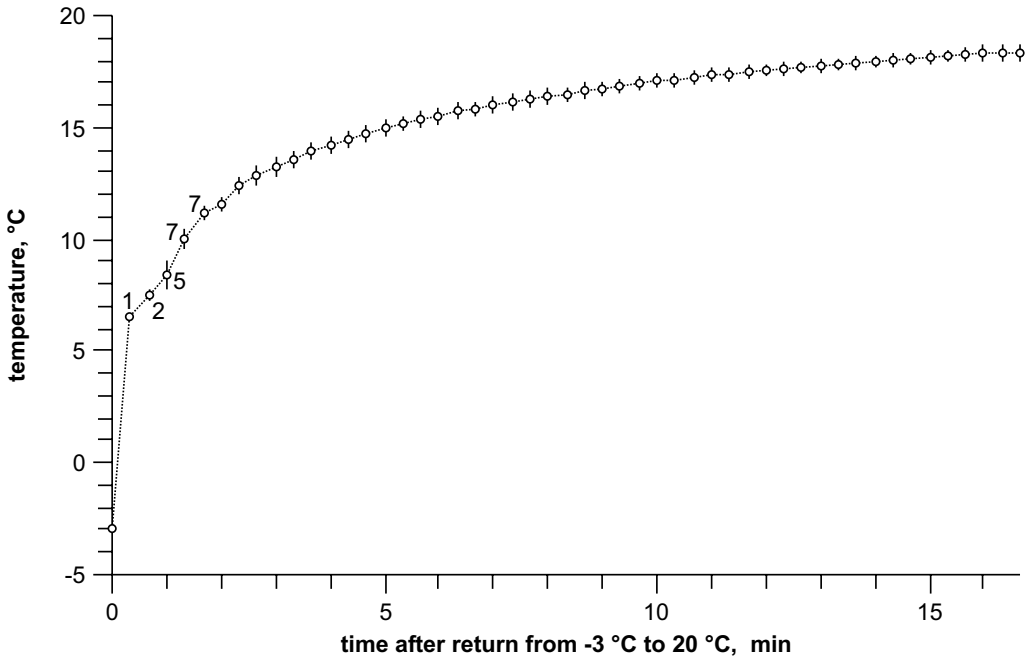

Fig. S3. The dynamics of container warming during the recovery of ants in the end of the 2nd artificial winter. Average container temperatures ± s.e.m. (*n*=8 observations, unless indicated otherwise by the numbers near graph points).

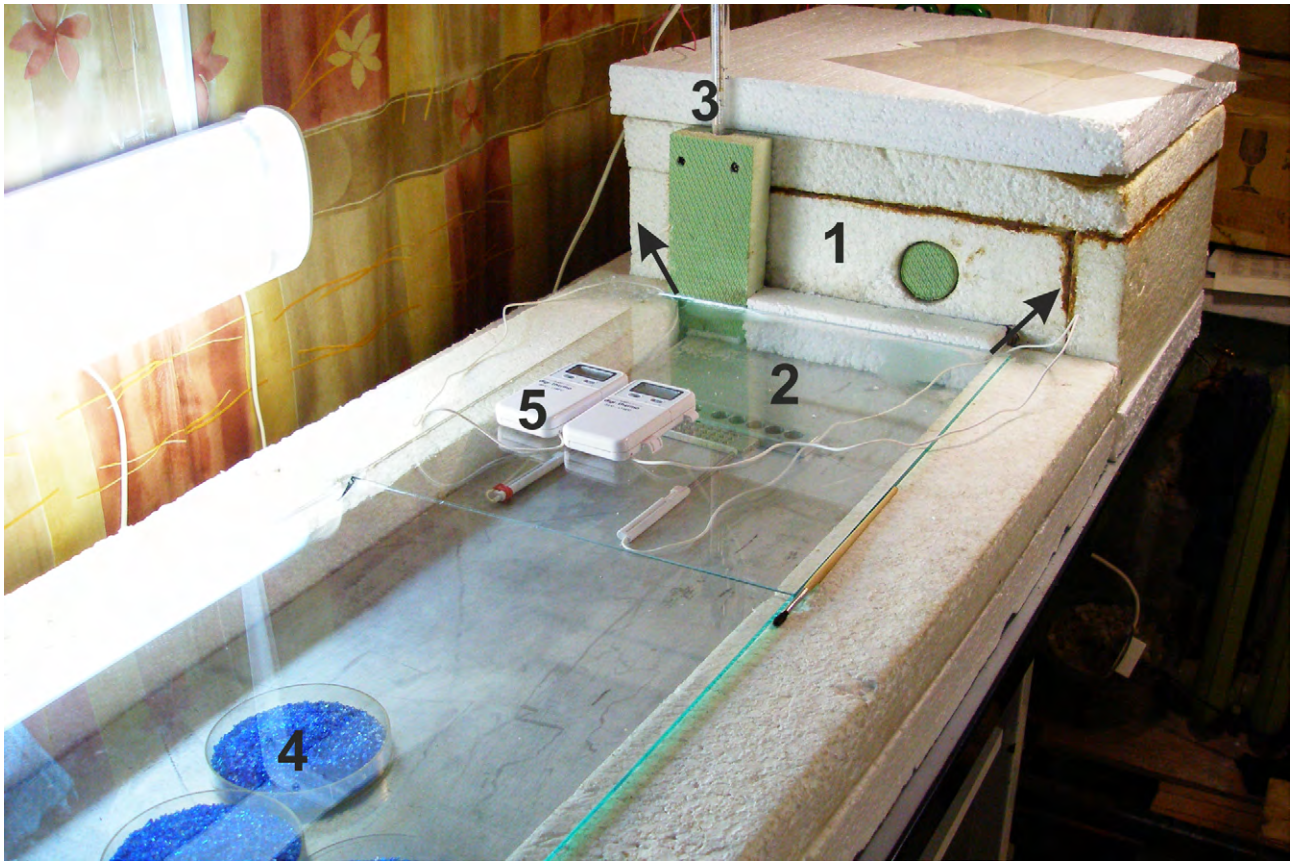

Fig. S4. The thermogradient device. 1: A freezer from a household refrigerator, filled with stones to increase thermal inertia and insulated by 50-mm styrofoam; 2: An aluminium plate, insulated by 50-mm styrofoam and covered by 4-mm glass; 3: A contact thermometer, inserted in the plate and connected to an electric relay (not shown) set to switch the freezer off if the colder end of the plate overcooled below a required temperature; 4: Silica gel, placed under the glass to remove excess moisture; 5: Digital thermometers with thermoprobes. Careful pulling (shown by arrows) of the thermoprobe wires allowed to move the well containers and create the required cooling rate (0.5°C per three minutes, or 0.17°C min^{-1}).

Table S1. Latitudinal trends tested by one-df *a priori* polynomial contrasts (± standard error), with *p*-values boldfaced for contrasts significantly greater ($p<.025$) than expected zero value.

Trait	Dataset	Species	Linear contrast, *L*	*p*	Quadratic contrast, *Q*	*p*	Corresponding GLM
Knock-down	Acclimation	*M. rubra*	−.031±.083	.705	.119±.077	.123	Table S3
		M. ruginodis	−.116±.094	.219	.004±.088	.965	Table S3
	Hardening	*M. rubra*	−.005±.003	.152	.006±.003	.053	Table S4
		M. ruginodis	−.093±.096	.333	.151±.089	.091	Table S4
Recovery	Acclimation	*M. rubra*	−.973±.192	**.000**	−.830±.178	**.000**	Table S5
		M. ruginodis	−.007±.005	.173	−.030±.005	**.000**	Table S5
	Hardening	*M. rubra*	−.926±.304	**.003**	−.903±.227	**.000**	Table S6
		M. ruginodis	−.475±1.620	.770	2.595±1.431	.073	Table S6

Table S2. Temperature-dependence trends tested by one-df *a priori* polynomial contrasts (± standard error), with *p*-values boldfaced for those significantly greater ($p<.025$) than expected zero value. Values in italic: signs inversed due to reciprocal data transformation.

Trait	Dataset	Species	Linear contrast, *L*	*p*	Quadratic contrast, *Q*	*p*	Corresponding GLM
t° of acclimation							
Knock-down	Acclimation	*M. rubra*	1.447±.077	**.000**	−.172±.077	.026	Table S3
		M. ruginodis	1.305±.074	**.000**	−.155±.074	.038	Table S3
	Hardening	*M. rubra*	.038±.003	**.000**	−.014±.003	**.000**	Table S4
		M. ruginodis	1.009±.086	**.000**	−.098±.082	.235	Table S4
Recovery	Acclimation	*M. rubra*	2.029±.178	**.000**	−.039±.176	.827	Table S5
		M. ruginodis	*−.057±.004*	**.000**	*.018±.004*	**.000**	Table S5
	Hardening	*M. rubra*	3.455±.229	**.000**	−1.051±.225	**.000**	Table S6
		M. ruginodis	21.275±1.370	**.000**	−7.725±1.280	**.000**	Table S6
t° of hardening							
Knock-down	Hardening	*M. rubra*	.004±.003	.172	.014±.003	**.000**	Table S4
		M. ruginodis	.093±.081	.255	.506±.081	**.000**	Table S4
Recovery	Hardening	*M. rubra*	.423±.226	.064	−.852±.229	**.000**	Table S6
		M. ruginodis	2.615±1.275	.043	−3.101±1.271	**.016**	Table S6

Table S3. Final GLMs for knock-down during the acclimation period. Abbreviations: pop, population; at, acclimation temperature; ad, acclimation duration. Significant effects (with $p<.025$) are boldfaced. Footnotes show automatic corrections for error mean squares (denominators of *F*-ratios) in higher-order factors. Factors shown with only one mean square had the residual MS as the denominator.

M. rubra					*M. ruginodis*				
Source	df	MS	*F*	*p*	Source	df	MS	*F*	*p*
Intercept	1	.0014	.002	.967	Intercept	1	.046	.066	.797
	383.488	.794 [a]				367.673	.691 [c]		
pop	2	1.004	.459	.642	pop	2	.534	.299	.746
	12.590	2.184 [b]				15.414	1.787 [d]		
at	2	141.384	178.767	**.000**	**at**	2	107.460	156.016	**.000**
pop × at	4	.820	1.037	.388	pop × at	4	1.369	1.987	.096
colony(pop)	12	2.282	2.886	**.000**	**colony(pop)**	12	2.271	3.297	**.000**
size	1	.000	.001	.981	size	1	.059	.086	.770
ad	1	45.713	57.801	**.000**	**ad**	1	48.806	70.859	**.000**
Residue	379	.791			Residue	364	.689		

[a] $.002\ MS_{colony(pop)} + .998\ MS_{Residue}$

[b] $.934\ MS_{colony(pop)} + .066\ MS_{Residue}$

[c] $.002\ MS_{colony(pop)} + .998\ MS_{Residue}$

[b] $.694\ MS_{colony(pop)} + .306\ MS_{Residue}$

Table S4. Final GLMs for knock-down in the hardening trials. Abbreviations: pop, population; at, acclimation temperature; ht, hardening temperature. Significant effects (with $p<.025$) are boldfaced. Footnotes show automatic corrections for error mean squares (denominators of *F*-ratios) in higher-order factors. Factors shown with only one mean square had the residual MS as the denominator. To standardize variance, data for *M. rubra* were transformed as $\log_{10}(x+11.5)$ and non-significant interaction terms were removed.

M. rubra					*M. ruginodis*				
Source	df	MS	*F*	*p*	Source	df	MS	*F*	*p*
Intercept	1	1.348	1060.547	**.000**	Intercept	1	.156	.184	.668
	381.959	.001 [a]				350.506	.846 [c]		
pop	2	.004	1.242	.321	pop	2	1.563	1.217	.322
	13.086	.003 [b]				16.090	1.284 [d]		
at	2	.112	88.883	**.000**	**at**	2	58.920	69.824	**.000**
ht	2	.014	10.957	**.000**	**ht**	2	16.916	20.046	**.000**
pop × at	4	.003	2.181	.071	pop × at	4	1.026	1.216	.304
					pop × ht	4	.398	.472	.756
at × ht	4	.002	1.868	.115	at × ht	4	.420	.497	.738
					pop × at × ht	8	.702	.832	.575
colony(pop)	12	.003	2.398	**.005**	colony(pop)	12	1.400	1.659	.074
size	1	.003	2.411	.121	size	1	1.167	1.383	.240
Residue	377	.001			Residue	347	.844		

[a] $.003\ MS_{colony(pop)} + .997\ MS_{Residue}$

[b] $.904\ MS_{colony(pop)} + .096\ MS_{Residue}$

[c] $.003\ MS_{colony(pop)} + .997\ MS_{Residue}$

[d] $.792\ MS_{colony(pop)} + .208\ MS_{Residue}$

Table S5. Final GLMs for recovery in the acclimation period. Abbreviations: pop, population; at, acclimation temperature; ad, acclimation duration. Significant effects (with $p<.025$) are boldfaced. Footnotes show automatic corrections for error mean squares (denominators of *F*-ratios) in higher-order factors. Factors shown with only one mean square had the residual MS as the denominator. To standardize variance, data for *M. ruginodis* were transformed as $(x+.5)^{-0.5}$ and a non-significant interaction term was removed.

M. rubra					*M. ruginodis*				
Source	df	MS	*F*	*p*	Source	df	MS	*F*	*p*
Intercept	1	34.120	12.286	**.001**	**Intercept**	1	.082	57.385	**.000**
	245.692	2.777 [a]				239.566	.001 [c]		
pop	2	65.693	14.046	**.001**	**pop**	2	.033	13.647	**.000**
	13.084	4.677 [b]				17.649	.002 [d]		
at	2	180.747	65.182	**.000**	**at**	2	.150	104.904	**.000**
pop × at	4	9.385	3.385	**.010**					
colony(pop)	12	4.824	1.740	.059	colony(pop)	12	.003	1.965	.028
size	1	6.417	2.314	.130	size	1	.006	4.401	.037
ad	1	467.545	168.609	**.000**	**ad**	1	.222	154.801	**.000**
Residue	244	2.773			Residue	238	.001		

[a] $.002\ MS_{colony(pop)} + .998\ MS_{Residue}$

[b] $.929\ MS_{colony(pop)} + .071\ MS_{Residue}$

[c] $.002\ MS_{colony(pop)} + .998\ MS_{Residue}$

[d] $.704\ MS_{colony(pop)} + .296\ MS_{Residue}$

Table S6. Final GLMs for recovery in the hardening trials. Abbreviations: pop, population; at, acclimation temperature; ht, hardening temperature. Significant effects (with $p<.025$) are boldfaced. Fraction means were used, transformed in *M. ruginodis* as $x^{1.7}$, and insignificant interaction terms were removed, to standardize variance.

M. rubra					*M. ruginodis*				
Source	df	MS	*F*	*p*	Source	df	MS	*F*	*p*
Intercept	1	2.375	1.043	.309	Intercept	1	5.664	.082	.775
pop	2	31.531	13.847	**.000**	pop	2	114.625	1.659	.195
at	2	282.723	124.160	**.000**	**at**	2	9818.171	142.072	**.000**
ht	2	19.463	8.547	**.000**	**ht**	2	351.171	5.082	**.008**
					pop × at	4	85.367	1.235	.300
					pop × ht	4	18.338	.265	.900
					at × ht	4	240.502	3.480	**.010**
size	1	13.323	5.851	**.017**	size	1	160.983	2.329	.130
Residue	127	2.277			Residue	109	69.107		