

Digital supplementary material to

PARMENTIER, T., DEKONINCK, W. & WENSELEERS, T. 2016: Survival of persecuted myrmecophiles in laboratory nests of different ant species can explain patterns of host use in the field (Hymenoptera: Formicidae). – Myrmecological News 23: 71-79.

Appendix S4: Effect of longer myrmecophile settling time (one hour) on ant aggression

Some myrmecophiles need longer settling times than the 10 s used in our experiments before normal interactions between ants and myrmecophiles can be observed (pers. communication, C. von Beeren). In this experiment, we tried to assess whether longer settling times of myrmecophiles could affect the aggression response of the ants in our study system. *Thiasophila angulata* beetles were collected in a *F. rufa* colony (West-Vleteren) in October 2015 and were kept with workers and nest material in a plastic 1 L container until the aggression tests on 30/11/2015. These tests were similar to those described in the material and method section “Ant aggression towards tested species“. The only difference was that the first 20 interactions were now scored after one hour instead of 10 s after the introduction of the myrmecophile. We replicated these aggression tests seven times with different beetle specimens.

The proportion of aggressive interactions in both treatments were modelled with a quasibinomial GLM and differences were tested with a likelihood ratio test.

Appendix S4: Table: Interactions between *F. rufa* and *T. angulata* for a settling time of 1 h and 10 s (data from Table 1). Mean proportions of a particular category out of a total of 20 interactions are given. 95% confidence intervals were calculated by running quasibinomial models with the function `confint` in R. They are listed in brackets under the means. Aggressive interactions are opening mandibles, biting and acid spraying. The category “Abdomen bending” gives the proportion of interactions in which the beetle bent its abdomen.

Settling time	N	Ignoring	Showing interest	Opening mandibles	Biting	Acid spraying	Proportion aggressive interactions	Abdomen bending
1 h	7	0.39 [0.27-0.53]	0.07 [0.03-0.15]	0.48 [0.34-0.62]	0.06 [0.02-0.14]	0.00	0.54 [0.39-0.67]	0.26 [0.13-0.42]
10 s	35	0.40 [0.34-0.46]	0.15 [0.12-0.19]	0.32 [0.26-0.38]	0.12 [0.08-0.16]	0.01 [0.01-0.02]	0.45 [0.39-0.51]	0.13 [0.08-0.19]

Confidence intervals of all interactions are overlapping in both treatments. We did not find significant differences in the proportion of aggressive interactions between the two treatments (quasibinomial GLM, Chisq LR 2.5729, $P = 0.2762$). This suggests that the settling time of 10 s used in our experiment is sufficient to reflect the interactions between host ants and the unspecialized myrmecophiles studied here.

Appendix S5

Appendix S5: Table: A series of quasibinomial GLMs compare survival of three beetles introduced in colony fragments of different ant species and in a control set-up without ants, with survival of the beetles introduced in a *F. rufa* colony fragment (P -values indicated as P_{rufa}). P -values are Bonferroni corrected. Bonferroni corrected P -values of a series of quasibinomial GLMs, which compared survival of three beetles in colony fragments of different ant species with a control set-up without ants, are also reported (P -values indicated as $P_{control}$). Number of replicates and total number of myrmecophile individuals per treatment are given. In each replicate survival of 9-13 individuals of the three myrmecophile species were tested.

Ant species	$N_{replicates}$	<i>T. angulata</i>			<i>L. anceps</i>			<i>A. talpa</i>		
		$N_{individuals}$	P_{rufa}	$P_{control}$	$N_{individuals}$	P_{rufa}	$P_{control}$	$N_{individuals}$	P_{rufa}	$P_{control}$
<i>F. rufa</i>	10	109	reference	1.000	109	reference	0.286	112	reference	1.000
Control	10	111	1.000	reference	105	0.286	reference	110	1.000	reference
<i>F. cunicularia</i>	9	91	1.000	0.731	87	0.025	0.333	100	0.368	1.000
<i>M. ruginodis</i>	10	97	1.000	1.000	109	0.002	0.065	116	1.000	1.000
<i>L. fuliginosus</i>	10	109	< 0.001	< 0.001	93	< 0.001	0.020	101	0.417	1.000
<i>L. niger</i>	10	97	< 0.001	< 0.001	108	< 0.001	< 0.001	110	< 0.001	0.016
<i>T. caespitum</i>	9	107	< 0.001	< 0.001	108	< 0.001	< 0.001	113	< 0.001	< 0.001
<i>C. vagus</i>	10	100	< 0.001	< 0.001	100	< 0.001	< 0.001	100	< 0.001	< 0.001
<i>M. pharaonis</i>	8	81	< 0.001	< 0.001	98	< 0.001	< 0.001	83	< 0.001	< 0.001
<i>S. fugax</i>	10	100	< 0.001	< 0.001	100	< 0.001	< 0.001	100	< 0.001	< 0.001
Total beetle individuals		1002			1017			1045		

Appendix S6

Appendix S6: Table: Bonferroni corrected *P*-values of Post hoc pairwise tests in which we compared the proportion of aggressive ant interactions between the four associates.

	<i>T. angulata</i>	<i>L. anceps</i>	<i>A. talpa</i>
<i>T. angulata</i>			
<i>L. anceps</i>	< 0.001		
<i>A. talpa</i>	< 0.001	0.003	
<i>P. scaber</i>	< 0.001	0.001	0.6168