Digital supplementary material to

PREUSS, A., CZUPPON, P., ERNST, U.R. & GADAU, J. 2023: Harbouring *Blochmannia* incurs costs: a trade-off between the necessity of the obligate primary endosymbiont for brood development and its costs for adult carpenter ants (Hymenoptera: Formicidae). – Myrmecological News 33: 211-219.

The content of this digital supplementary material was subject to the same scientific editorial processing as the article it accompanies. However, the authors are responsible for copyediting and layout.

Table S1: qPCR-settings including melting curve.

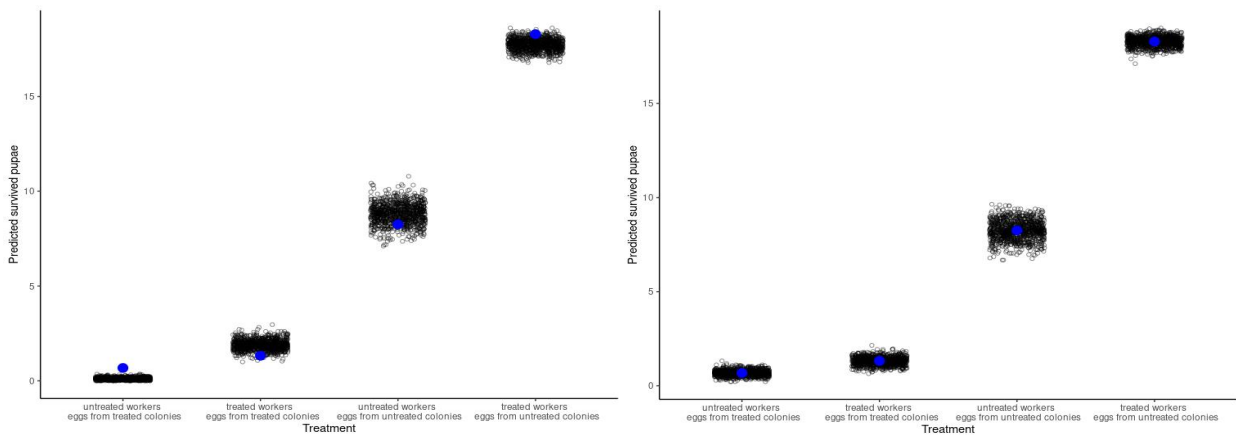| Temperature [°C]	Time [min]	Number of cycles
95	3	1
95	0.17	40
60	1	1
95	0.08	1
65	1	1
97	1	1
40	2	2

Fig. S1: Statistical model diagnostic for the survival from larvae to pupae stage. The blue dots show the experimental result, averaged over all replicates with the same treatment, the black dots show results from 1000 simulations based on the respective model estimates. Left: Generalized linear mixed model without interaction between the treatment of eggs and ant workers, i.e., the fixed effects. The experimental results for eggs from treated colonies are not well described by the statistical model as can be seen by the observations (blue dots) not being in the range of the simulations (black dots) for eggs from treated colony treatments. Right: Generalized linear mixed model with interaction between the fixed effects. The experimental results now fall within the range of the simulated results. This suggests that the interaction between the fixed effects is non-negligible for the survival from larval to pupae stage. Further model diagnostics are provided in the R script *glmm_analyses.R*.

Survival_larvae			
Predictors	*Odds Ratios*	*CI*	*p*
(Intercept)	3.55	1.46 – 8.65	**0.005**
Treatment ants [u]	0.19	0.07 – 0.53	**0.002**
Treatment eggs [u]	232.55	79.71 – 678.43	**<0.001**
Replicate [2]	0.48	0.37 – 0.63	**<0.001**
Random Effects			
σ^2	3.29		
τ_{00} Colony_eggs	0.44		
τ_{00} Colony_ants	0.89		
ICC	0.29		
N Colony_ants	14		
N Colony_eggs	15		
Observations	112		
Marginal R^2 / Conditional R^2	0.643 / 0.746		

Survival_pupae_corrected			
Predictors	*Odds Ratios*	*CI*	*p*
(Intercept)	0.08	0.05 – 0.12	**<0.001**
Treatment ants [u]	1.03	0.55 – 1.90	0.935
Treatment eggs [u]	106.48	65.87 – 172.12	**<0.001**
Replicate [2]	1.84	1.41 – 2.40	**<0.001**
Treatment ants [u] × Treatment eggs [u]	0.06	0.03 – 0.12	**<0.001**
Random Effects			
σ^2	3.29		
τ_{00} Colony_eggs	0.02		
τ_{00} Colony_ants	0.03		
ICC	0.01		
N Colony_ants	14		
N Colony_eggs	15		
Observations	112		
Marginal R^2 / Conditional R^2	0.530 / 0.536		

Fig. S2: Statistical model estimates for the best-fitting models to describe survival from eggs to larvae (left) and survival from larvae to pupae (right). The outputs show the statistical relevance of the fixed effect estimates and the variances of the random effects distributions. In the best-fitting model to describe survival from larvae to pupae, the random effects *colony_eggs* and *colony_ants* contribute only little to the overall variance when compared to the residuals (σ^2).