

Elevated nest temperature has opposing effects on parasite abundance in the nests of two wild bird species

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Fig. S1. Experimental heat pack inserted under eastern bluebird nest in nest box.

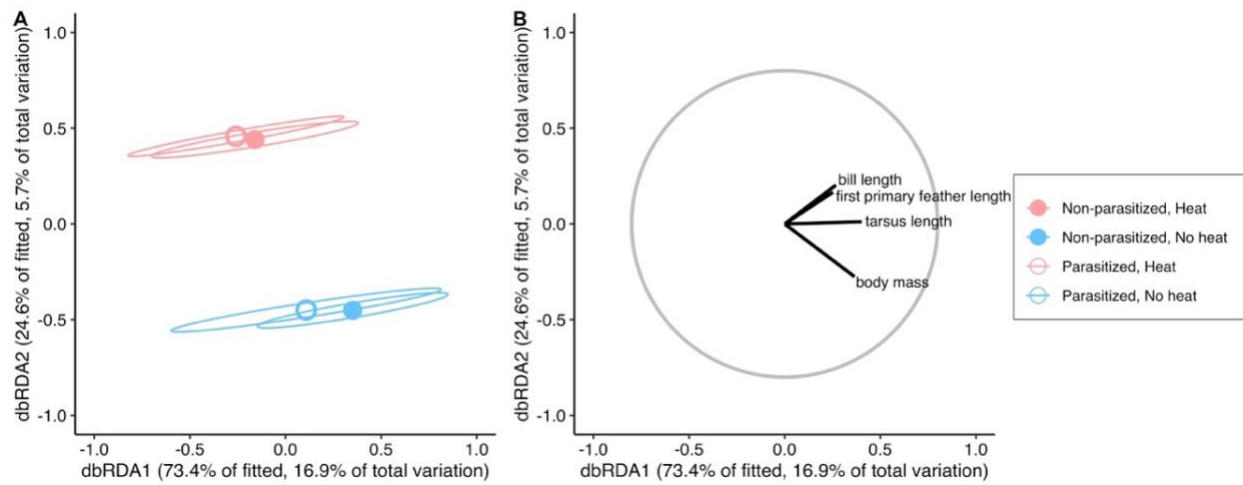


Fig. S2. The effect of heat and parasite treatments on multivariate size and mass of eastern bluebirds. A) Distance-based redundancy analysis (dbRDA) plot of multivariate eastern bluebird size and mass showing differences between heat treatments. Eastern bluebirds tend to weigh less in nests that were heated. Individual points correspond to the four treatments in the experiment. Ellipses are 95% confidence intervals. B) Vector overlay of size and mass responses for the corresponding dbRDA plot. The gray circle corresponds to vector lengths that would have a correlation coefficient of one with each axis.

Table S1. Effect of heat treatment, bird species, and the interaction on parasite abundance, density, and size.

Variables	<i>df</i>	Test Statistic	<i>P</i>
Parasite abundance		Wald χ^2	
log(nest mass)	1	86.978	<0.001
Day first egg hatched	1	43.117	<0.001
Heat treatment	1	52.081	<0.001
Bird species	1	56.739	<0.001
Heat treatment x bird species	1	62.024	<0.001
Error	40		
Parasite density		<i>F</i>	
log(nest mass)	1	9.057	0.005
Day first egg hatched	1	5.380	0.026
Heat treatment	1	2.785	0.103
Bird species	1	6.656	0.014
Heat treatment x bird species	1	4.229	0.046
Error	40		
Parasite size		Wald <i>F</i>	
Parasite abundance	1, 14.772	0.715	0.411
Heat treatment	1, 15.112	0.347	0.564
Bird species	1, 16.617	0.355	0.560
Heat treatment x bird species	1, 15.761	0.031	0.863

Table S2. Effect of heat treatment, parasite treatment, and the interaction on nestling survival.

Variables	<i>df</i>	Wald χ^2	<i>P</i>
Eastern bluebird			
log(nest mass)	1	26.951	<0.001
Day first egg hatched	1	4.367	0.037
Heat treatment	1	0.982	0.322
Parasite treatment	1	3.523	0.061
Parasite treatment x heat treatment	1	0.008	0.931
Error	45		
Tree Swallow			
log(nest mass)	1	20.286	<0.001
Day first egg hatched	1	3.257	0.071
Heat treatment	1	3.293	0.070
Parasite treatment	1	0.414	0.520
Parasite treatment x heat treatment	1	6.979	0.008
Error	29		

Table S3. Nestling multivariate growth analysis.

Variables	<i>df</i>	Test Statistic	<i>P</i>
Eastern bluebird		Pseudo <i>F</i>	
log(nest mass)	1	2.135	0.121
Day first egg hatched	1	7.211	0.002
Heat treatment	1	2.837	0.057
Parasite treatment	1	0.101	0.959
Parasite treatment x heat treatment	1	3.165	0.049
Error	38		
Tree swallow		Pseudo <i>F</i>	
log(nest mass)	1	0.457	0.678
Day first egg hatched	1	2.287	0.098
Heat treatment	1	1.980	0.131
Parasite treatment	1	1.478	0.231
Parasite treatment x heat treatment	1	0.060	0.984
Error	24		

Table S4. Eastern bluebird univariate growth analysis.

Variables	<i>df_{num}</i> , <i>df_{den}</i>	Wald <i>F</i>	<i>P</i>
Bill length			
log(nest mass)	1, 38.696	0.133	0.717
Day first egg hatched	1, 39.181	6.848	0.013
Heat treatment	1, 38.209	0.143	0.707
Parasite treatment	1, 37.176	1.275	0.266
Parasite treatment x heat treatment	1, 38.176	2.575	0.117
Tarsus length			
log(nest mass)	1, 38.852	2.504	0.122
Day first egg hatched	1, 39.79	7.564	0.009
Heat treatment	1, 38.198	1.372	0.249
Parasite treatment	1, 36.792	1.530	0.224
Parasite treatment x heat treatment	1, 38.175	1.540	0.222
First primary length			
log(nest mass)	1, 38.628	1.628	0.210
Day first egg hatched	1, 39.005	3.780	0.059
Heat treatment	1, 38.199	1.481	0.231
Parasite treatment	1, 37.291	3.345	0.075
Parasite treatment x heat treatment	1, 38.165	7.744	0.008
Mass			
log(nest mass)	1, 38.704	1.378	0.248
Day first egg hatched	1, 39.205	4.389	0.043
Heat treatment	1, 38.210	5.453	0.025
Parasite treatment	1, 37.161	0.174	0.679
Parasite treatment x heat treatment	1, 38.177	0.302	0.586

Table S5. Effect of heat treatment, parasite treatment, and the interaction of nestling hemoglobin.

Variables	<i>df</i>	<i>F</i>	<i>P</i>
Eastern bluebird			
Body mass	1	8.041	0.007
Heat treatment	1	0.317	0.577
Parasite treatment	1	1.703	0.200
Parasite treatment x heat treatment	1	0.062	0.805
Error	38		
Tree swallow			
Body mass	1	6.028	0.022
Heat treatment	1	0.233	0.634
Parasite treatment	1	4.170	0.053
Parasite treatment x heat treatment	1	3.450	0.077
Error	22		

Table S6. Effect of heat treatment, parasite abundance, and the interaction on nestling hemoglobin.

Variables	<i>df</i>	<i>F</i>	<i>P</i>
Eastern bluebird			
Body mass	1	5.439	0.031
Heat treatment	1	1.654	0.214
Parasite abundance	1	0.011	0.917
Parasite abundance x heat treatment	1	0.142	0.711
Error	19		
Tree swallow			
Body mass	1	5.317	0.050
Heat treatment	1	0.216	0.655
Parasite abundance	1	27.092	0.001
Parasite abundance x heat treatment	1	8.791	0.018
Error	8		