

Supplementary material

Appendix 1

Table A1. The relationships between the date of the recording of male songs and characteristics of male song.

Table A2. The relationships between the timing of pair formation and characteristics of male song, area of each habitat type in male territory, male morphological traits.

Table A3. The relationships between tempo and male and female parent's feeding rate of each prey size to the nestlings on the 6th and 12th day in LMM analysis (random effect: survey year).

Table A4. The relationships between male and female parent's feeding rate of large prey on the 12th day and brood size in each nest, minimum temperature outside the nests, area of each habitat type in male territory, parent's morphological traits and age, body condition of male parents, characteristics of male song.

Table A5. The relationships between male singing tempo and area of each habitat type in male territory in LMM analysis (random effect: survey year).

Table A6. The relationships between tempo and reproductive success in LMM and GLMM analysis (random effect: survey year).

Table A7. The relationships between chick weight and brood size in each nest, accumulated minimum temperature from hatching, both parent's total feeding rate of each prey size on the 6th and 12th day.

Table A1.

Song characteristics ($n = 58$)	r_s	p
High frequency	-0.036	0.790
Low frequency	0.226	0.088
Max frequency	0.254	0.054
Frequency bandwidth	-0.203	0.126
Note duration	-0.198	0.136
Tempo	0.137	0.303
Song duration	0.138	0.300
Repertorie size	-0.229	0.083

Table A2.

Song characteristics (<i>n</i> = 58)				Area of each habitat type in male territory (<i>n</i> = 37)				Male morphological traits (<i>n</i> = 18)			
	mean ± SD	<i>r_s</i>	<i>p</i>		<i>r_s</i>	<i>p</i>		<i>r_s</i>	<i>p</i>		
High frequency	5.876 ± 0.546	-0.072	0.594	Vegetable field	-0.295	0.076	Tail length	-0.232	0.370		
Low frequency	3.031 ± 0.391	-0.092	0.491	Rice field	-0.292	0.080	Natural wing length	-0.127	0.615		
Max frequency	4.345 ± 0.394	-0.059	0.662	Orchard	-0.053	0.755	Tarsus length	0.080	0.754		
Frequency bandwidth	2.845 ± 0.487	0.021	0.874	Forest	0.167	0.323	Total head length	0.114	0.663		
Note duration	0.063 ± 0.015	0.398	0.002	Abandoned farmland	0.197	0.242	Total culmen length	-0.165	0.527		
Tempo	7.433 ± 1.733	-0.561	< 0.001	Road	-0.001	0.993	Bill depth	0.174	0.490		
Song duration	5.604 ± 4.951	-0.032	0.811	Artificial building	0.231	0.170	Bill width	-0.070	0.784		
Repertoire size	78.50 ± 27.54	0.244	0.065								

Table A3.

Response variable	Slope _{tempo}	SE	<i>t</i>	<i>p</i>
On 6 th day (<i>n</i> = 15)				
Male feeding rate				
Small prey	0.030	0.059	0.504	0.623
Medium prey	0.037	0.029	1.270	0.226
Large prey	0.073	0.037	1.994	0.073
Female feeding rate				
Small prey	- 0.027	0.030	- 0.876	0.397
Medium prey	0.012	0.010	1.219	0.245
Large prey	0.013	0.010	1.269	0.227
On 12 th day (<i>n</i> = 14)				
Male feeding rate				
Small prey	0.011	0.031	0.368	0.719
Medium prey	- 0.009	0.039	- 0.225	0.826
Large prey	0.097	0.044	2.216	0.048
Female feeding rate				
Small prey	0.018	0.084	0.214	0.834
Medium prey	0.028	0.037	0.735	0.476
Large prey	0.097	0.031	3.125	0.009

Table A4.

	Feeding rate of large prey on the 12 th day			
	Male parent		Female parent	
	r_s / W	p	r_s / W	p
Brood size on the 12 th day ($n = 34$)	$r_s = 0.317$	0.068	$r_s = 0.123$	0.487
Minimum temperature outside nests on the 12 th day ($n = 34$)	$r_s = 0.064$	0.720	$r_s = -0.042$	0.814
Area of each habitat type in male territory ($n = 16$)				
Vegetable field	$r_s = 0.659$	0.006	$r_s = 0.735$	0.001
Rice field	$r_s = 0.112$	0.680	$r_s = 0.282$	0.289
Forest	$r_s = 0.059$	0.829	$r_s = 0.256$	0.339
Orchard	$r_s = 0.097$	0.722	$r_s = 0.323$	0.223
Abandoned farmland	$r_s = 0.088$	0.744	$r_s = -0.257$	0.337
Road	$r_s = 0.628$	0.009	$r_s = 0.413$	0.112
Artificial building	$r_s = 0.138$	0.609	$r_s = 0.031$	0.910
Morphological traits ($n_{male} = 15$, $n_{female} = 10$)				
Tail length	$r_s = 0.018$	0.950	$r_s = 0.050$	0.898
Natural wing length	$r_s = 0.013$	0.965	$r_s = 0.298$	0.403
Tarsus length	$r_s = -0.308$	0.265	$r_s = 0.298$	0.403
Total head length	$r_s = -0.151$	0.591	$r_s = 0.292$	0.413
Culmen length	$r_s = -0.005$	0.985	$r_s = -0.450$	0.192
Bill depth	$r_s = 0.116$	0.681	$r_s = -0.371$	0.291
Bill width	$r_s = -0.273$	0.324	$r_s = 0.104$	0.776
Age ($n_{adult\ male} = 13$, $n_{yearling\ male} = 11$, $n_{adult\ female} = 4$, $n_{yearling\ female} = 6$)	$W = 71$	0.987	$W = 20$	0.114
Body condition of male parents ($n = 15$)	$r_s = 0.082$	0.771		
Characteristics of male song ($n = 14$)				
High frequency	$r_s = 0.156$	0.594	$r_s = 0.354$	0.215
Low frequency	$r_s = 0.442$	0.114	$r_s = 0.516$	0.059
Max frequency	$r_s = 0.319$	0.267	$r_s = 0.459$	0.098
Frequency bandwidth	$r_s = -0.235$	0.418	$r_s = -0.143$	0.626
Note duration	$r_s = -0.130$	0.659	$r_s = -0.248$	0.392
Song duration	$r_s = -0.323$	0.260	$r_s = -0.284$	0.326
Repertoire size	$r_s = -0.282$	0.329	$r_s = -0.286$	0.322

Table A5.

Response variable	Slope _{tempo}	SE	<i>t</i>	<i>p</i>
Area of each habitat type in male territory (<i>n</i> = 38)				
Vegetable field	0.338	0.140	2.406	0.021
Rice field	0.283	0.342	0.826	0.414
Orchard	0.044	0.069	0.637	0.528
Forest	- 0.031	0.039	- 0.797	0.431
Abandoned farmland	0.014	0.054	0.266	0.792
Road	- 0.003	0.066	- 0.050	0.961
Artificial building	- 0.038	0.048	- 0.784	0.439

Table A6.

Response variable	Slope _{tempo}	SE	z / t	p	Error distribution and link function
The date of clutch initiation ($n = 46$)	0.013	0.024	$z = 0.562$	0.574	Negative binomial, log
Clutch size ($n = 28$)	- 0.003	0.053	$z = -0.054$	0.957	Poisson, log
On the 6 th day					
Brood size ($n = 19$)	0.017	0.065	$z = 0.262$	0.793	Poisson, log
Nest predation ($n = 19$)	- 0.026	0.641	$z = -0.041$	0.967	Binomial, logit
Average chick weight ($n = 16$)	0.309	0.361	$t = 0.855$	0.408	Gaussian, identity
Weight of the largest chick in each brood ($n = 16$)	0.426	0.410	$t = 1.039$	0.316	Gaussian, identity
Weight of the smallest chick in each brood ($n = 16$)	0.269	0.281	$t = 0.957$	0.358	Gaussian, identity
On the 12 th day					
Brood size ($n = 17$)	- 0.0006	0.070	$z = -0.008$	0.993	Poisson, log
Nest predation ($n = 16$)	- 0.096	0.383	$z = -0.251$	0.802	Binomial, logit
Average chick weight ($n = 16$)	0.376	0.145	$t = 2.588$	0.023	Gaussian, identity
Weight of the largest chick in each brood ($n = 16$)	0.428	0.173	$t = 2.477$	0.028	Gaussian, identity
Weight of the smallest chick in each brood ($n = 16$)	0.466	0.322	$t = 1.444$	0.171	Gaussian, identity

Table A7.

	Average chick weight		Weight of the largest chick in each brood		Weight of the smallest chick in each brood	
	r_s	ρ	r_s	ρ	r_s	ρ
On the 6 th day						
Brood size ($n = 46$)	0.019	0.901	0.118	0.436	- 0.099	0.513
Accumulated minimum temperature from hatching to the 6 th day ($n = 46$)	- 0.067	0.656	- 0.071	0.641	0.004	0.978
Total feeding rate of both parents ($n = 39$)						
Small prey	- 0.254	0.119	- 0.300	0.063	- 0.193	0.240
Midium prey	0.111	0.501	0.104	0.529	0.192	0.242
Large prey	0.218	0.182	0.265	0.103	0.272	0.094
On the 12 th day						
Brood size ($n = 37$)	- 0.108	0.526	- 0.121	0.477	- 0.085	0.616
Accumulated minimum temperature from hatching to the 12 th day ($n = 37$)	0.121	0.476	0.159	0.347	0.074	0.662
Total feeding rate of both parents ($n = 32$)						
Small prey	0.015	0.934	0.007	0.970	- 0.042	0.821
Midium prey	0.119	0.517	0.190	0.297	0.037	0.839
Large prey	0.370	0.037	0.421	0.016	0.325	0.069