

Supplementary Tables

Sundering of earthworms by the Fairy Pitta (*Pitta nympha*) - An unexplored strategy of prey preparation for brood provisioning by avian vermivores

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Table S1. Video recording durations (minutes) for each nestlings' age in the four nests. On the date of hatching, the nestlings are 1 day old.

Nest ID	Video recording time (min)												Total
	1 day	2 day	3 day	4 day	5 day	6 day	7 day	8 day	9 day	10 day	11 day	12 day	
Nest 1	0	0	274	276	97	0	0	35	434	0	449	0	1565
Nest 2	0	0	0	338	0	0	153	0	28	0	541	135	1195
Nest 3	521	358	309	527	454	411	450	339	275	232	290	446	4612
Nest 4	0	66	148	369	58	210	35	174	142	315	0	0	1517

Table S2. Video recording durations (minutes) for each time of day and the nestling age class in four nests. The age of the nestlings coded as “young” for 1-7 days old brood, and “old” for 8-13 days old brood.

Nest ID	Time of day	Nestling age class	
		young	old
Nest 1	morning	0	24
	noon	460	463
	afternoon	187	431
Nest 2	morning	0	130
	noon	296	362
	afternoon	195	212
Nest 3	morning	325	42
	noon	1680	859
	afternoon	1025	681
Nest 4	morning	0	0
	Noon	682	404
	afternoon	204	227

Table S3. The lists of the three models that best explain variation in the prey length: *full length* (square-root-transformed) and *sundered section length* (square-root-transformed). Two analyses were conducted for all earthworms (*feeding visit type: OE* and *MLX*). The initial models included *prey sundering* (prey sundered vs. prey not sundered), *time of day* and, *inter-visit interval* as independent variables. Additionally, one analysis was conducted only for sundered earthworms. The initial model included *nestling age class*, *time of day* and, *inter-visit interval* as independent variables. *Nest ID* and *visit ID* within *nest ID* were used as random variables for all the analyses. Each cell contains the value of the effect estimate, standard error ($\pm$ SE), (t-value), *p*-value. Bold font marks the values of the effect estimate that are significantly different from zero. Blank cells indicate that the variable was not included in the model. The best model in the alternative analysis with *visit ID* as a random variable, and *nest ID* as an independent variable, resulted in very similar effect estimates and the same conclusions (Table S4). The table concerns Fig. 2D, E (*p*-values for Fig. 2D, E are marked with red).

Earthworm group	Independent variable	Model ID	Intercept	<i>Prey sundering</i> ; estimate for "sundered prey"	<i>Nestling age class</i> ; estimate for "young"	<i>Time of day</i> ; estimate for "morning (left)" & "noon (right)"	<i>Inter-visit interval</i>	df	logLik	AICc	Δ AICc
All earthworms	Full length	m1	2.389 $\pm$ 0.031, (76.495), < 2E-16	0.210 $\pm$ 0.044, (4.769), 2.47E-06				5	-323.661	657.4	0
		m2	2.411 $\pm$ 0.041, (58.441), < 2E-16	0.208 $\pm$ 0.044, (4.655), 4.21E-06		0.028 $\pm$ 0.140, (0.201), 0.841	-0.041 $\pm$ 0.050, (-0.828), 0.409	7	-326.385	667.0	9.56
		m3	2.401 $\pm$ 0.046, (51.361), < 2E-16	0.210 $\pm$ 0.044, (4.759), 2.58E-06			-0.0003 $\pm$ 0.0009, (-0.304), 0.761	6	-329.609	671.4	13.95
	Full length for unsundered earthworms; Sundered section length for sundered earthworms	m1	2.385 $\pm$ 0.031, (76.82), < 2E-16	-0.631 $\pm$ 0.038, (-16.59), < 2E-16				5	-543.044	1096.2	0.00
		m2	2.404 $\pm$ 0.038, (62.955), < 2E-16	-0.633 $\pm$ 0.038, (-16.461), < 2E-16		0.005 $\pm$ 0.101, (0.050), 0.960	-0.036 $\pm$ 0.041, (-0.891), 0.374	7	-546.272	1106.7	10.53
		m3	2.404 $\pm$ 0.042, (56.993), < 2E-16	-0.632 $\pm$ 0.038, (-16.584), < 2E-16			-0.0005 $\pm$ 0.0008, (-0.664), 0.507	6	-549.017	1110.1	13.98
Sundered earthworms	Sundered section length	m1	1.871 $\pm$ 0.054, (34.594), 3.67E-09		-0.132 $\pm$ 0.051, (-2.556), 0.011			5	-347.418	705.0	0.00
		m2	1.782 $\pm$ 0.044, (39.94), 0.0005					4	-348.587	705.3	0.30
		m3	1.808 $\pm$ 0.050, (35.787), 4.7E-06			-0.008 $\pm$ 0.097, (-0.084), 0.933	-0.053 $\pm$ 0.048, (-1.097), 0.275	6	-351.530	715.2	10.27

Table S4. The lists of the three models that best explain variation in the prey length: *full length* (square-root-transformed) and *sundered section length* (square-root-transformed). Two analyses were conducted for all earthworms (*feeding visit type: OE* and *MIX*). The initial models included *prey handling* (prey sundered vs. prey not sundered), *time of day*, *inter-visit interval*, and *nest ID* as independent variables. Additionally, one analysis was conducted only for sundered earthworms. The initial model included *nestling age class*, *time of day*, *inter-visit interval*, and *nest ID* as independent variables. *Visit ID* was used as a random variable in all analyses. Each cell contains the value of the effect estimate, standard error ($\pm$ SE), (t-value), *p*-value. Bold font marks the values of the effect estimate that are significantly different from zero. Blank cells indicate that the variable was not included in the model. The best model in the alternative analysis with *nest ID* and *visit ID* within *nest ID* as a random variable, resulted in very similar effect estimates and the same conclusions (Table S3).

Earthworm group	Independent variable	Model ID	Intercept	<i>Prey handling</i> ; estimate for “sundered prey”	<i>Nestling age class</i> ; estimate for “young”	<i>Time of day</i> ; estimate for “morning (left)” & “noon (right)”	<i>Inter-visit interval</i>	<i>Nest ID</i> ; estimate for “2 (left)”, “3 (middle)”, “4 (right)”	<i>df</i>	logLik	AICc	Δ AICc
All earthworms	Full length	m1	2.389 $\pm$ 0.031, (76.495), < 2E-16	0.210 $\pm$ 0.044, (4.769), 2.47E-06					4	-323.661	655.4	0
		m2	2.411 $\pm$ 0.041, (58.441), < 2E-16	0.208 $\pm$ 0.044, (4.655), 4.21E-06		0.028 $\pm$ 0.140, (0.201), 0.841	-0.041 $\pm$ 0.050, (-0.828), 0.409		6	-326.385	664.9	9.54
		m3	2.401 $\pm$ 0.046, (51.361), < 2E-16	0.210 $\pm$ 0.044, (4.759), 2.58E-06			-0.0003 $\pm$ 0.0009, (-0.304), 0.761		5	-329.609	669.3	13.94
	Full length for unsundered earthworms; Sundered section length for sundered earthworms	m1	2.385 $\pm$ 0.031, (76.82), < 2E-16	-0.631 $\pm$ 0.038, (-16.590), < 2E-16					4	-543.044	1094.1	0.00
		m2	2.404 $\pm$ 0.038, (62.955), < 2E-16	-0.633 $\pm$ 0.038, (-16.461), < 2E-16		0.005 $\pm$ 0.101, (0.050), 0.960	-0.036 $\pm$ 0.041, (-0.891), 0.374		6	-546.272	1104.7	10.52
		m3	2.404 $\pm$ 0.042, (56.993), < 2E-16	-0.632 $\pm$ 0.038, (-16.584), < 2E-16			-0.0005 $\pm$ 0.0008, (-0.664), 0.507		5	-549.017	1118.1	13.97
Sundered earthworms	Sundered section length	m1	1.851 $\pm$ 0.044, (41.428), < 2E-16		-0.138 $\pm$ 0.052, (-2.651), 0.008				4	-347.832	703.7	0.00
		m2	1.750 $\pm$ 0.023, (75.15), < 2E-16						3	-349.276	704.6	0.85
		m3	1.917 $\pm$ 0.081, (23.671), < 2E-16					-0.133 $\pm$ 0.158, (-0.841), 0.402 -0.198 $\pm$ 0.085, (-2.318), 0.021 -0.131 $\pm$ 0.096, (-1.367), 0.173	6	-350.788	713.8	10.00

Table S5. The three models to determine factors affecting the probability of prey sundering (*prey sundering: prey sundered*) in visits when only earthworms were brought to the nest (*feeding visit type: OE*). The initial model included *nestling age class*, *earthworm length category*, *number of earthworms*, and *inter-visit interval* as independent variables. *Nest ID* and *visit ID* within *nest ID* were used as random variables. As the response variable is binary, we used Binomial distribution. Each cell contains the value of the effect estimate, standard error ($\pm$ SE), (Z-value), *p*-value. Bold font marks the values of the effect estimates that are significantly different from zero. Blank cells indicate that the variable was not included in the model. The best model in the alternative analysis with *visit ID* as a random variable, and *nest ID* as an independent variable, resulted in similar effect estimates and conclusions except for the *inter-visit interval*. The *p*-values for Fig 2F, G, H, I are marked in red.

Random variable	Model ID	Intercept	<i>Nestling age class</i> ; estimate for “young”	<i>Earthworm length category</i> ; estimate for “short”	<i>Number of earthworms</i>	<i>Inter-visit interval</i>	<i>Nest ID</i> ; estimate for “2 (left)”, “3 (middle)”, “4 (right)”			<i>df</i>	logLik	AICc	ΔAICc
<i>Nest ID</i> and <i>Visit ID</i> within Nest ID	m1	0.419 ± 0.612, (0.685), 0.493	1.178 ± 0.301, (3.912), 9.14E-05	-0.736 ± 0.258, (-2.853), 0.004	-0.361 ± 0.104, (-3.441), 0.0005	-0.010 ± 0.005, (-1.879), 0.060				7	-191.650	397.6	0
	m2	0.236 ± 0.581, (0.407), 0.684	1.063 ± 0.293, (3.621), 0.0002	-0.735 ± 0.258, (-2.850), 0.004	-0.400 ± 0.103, (-3.870), 0.0001					6	-193.475	399.2	1.56
	m3	0.111 ± 0.608, (0.184), 0.854	1.110 ± 0.300, (3.695), 0.0002		-0.376 ± 0.106, (-3.545), 0.0003	-0.010 ± 0.005, (-1.879), 0.060				6	-195.763	403.8	6.14
<i>Visit ID</i>	m1	-0.981 ± 0.477, (-2.055), 0.039	1.199 ± 0.303, (3.957), 7.60E-05	-0.736 ± 0.259, (-2.834), 0.004	-0.365 ± 0.105, (-3.476), 0.0005	-0.011 ± 0.005, (-2.003), 0.045	1.159 ± 0.608, (1.906), 0.056	2.354 ± 0.405, (5.814), 6.10E-09	2.149 ± 0.468, (4.589), 4.45E-06	9	-184.928	388.4	0
	m2	-1.012 ± 0.478, (-2.118), 0.034	1.070 ± 0.295, (3.621), 0.0002	-0.733 ± 0.260, (-2.820), 0.004	-0.410 ± 0.104, (-3.942), 8.07E-05		0.866 ± 0.598, (1.450), 0.147	2.165 ± 0.388, (5.578), 2.44E-08	1.961 ± 0.453, (4.321), 1.55E-05	8	-187.021	390.5	2.07
	m3	-1.260 ± 0.475, (-2.648), 0.008	1.130 ± 0.303, (3.728), 0.0001		-0.382 ± 0.106, (-3.580), 0.0003	-0.011 ± 0.005, (-1.988), 0.046	1.026 ± 0.608, (1.686), 0.091	2.334 ± 0.405, (5.761), 8.34E-09	2.181 ± 0.471, (4.630), 3.65E-06	8	-189.004	394.5	6.04

Table S6. The three models to determine factors affecting the probability of prey sundering (*prey sundering: prey sundered*) in all visits that include at least one earthworm (*feeding visit type: OE* and *MIX*). The initial model included *nestling age class*, *earthworm length category*, *feeding visit type* (*OE* or *MIX*), *time of day*, *number of prey items*, and *inter-visit interval* as independent variables. *Nest ID* and *visit ID* within *nest ID* were used as random variables. As the response variable is binary, we used Binomial distribution. Each cell contains the value of the effect estimate, standard error ($\pm$ SE), (Z-value), *p*-value. Bold font marks the values of the effect estimate that are significantly different from zero. Blank cells indicate that the variable was not included in the model. The best model in the alternative analysis with *visit ID* as a random variable, and *nest ID* as an independent variable, resulted in very similar effect estimates and the same conclusions. The *inter-visit interval* did not remain in any of the best models.

Random variable	Model ID	Intercept	<i>Nestling age class</i> ; estimate for “young”	<i>Earthworm length category</i> ; estimate for “short”	<i>Feeding visit type</i> ; estimate for “OE”	<i>Time of day</i> ; estimate for “morning (left)” & “noon (right)”	<i>Number of prey items</i>	<i>Inter-visit interval</i>	<i>Nest ID</i> ; estimate for “2 (left)”, “3 (middle)”, “4 (right)”	<i>df</i>	logLik	AICc	Δ AICc
<i>Nest ID</i> and <i>Visit ID</i> nested within <i>Nest ID</i>	m1	0.388 $\pm$ 0.513, (0.755), 0.450	0.842 $\pm$ 0.216, (3.894), 9.88E-05	-0.670 $\pm$ 0.207, (-3.230), 0.001		1.323 $\pm$ 0.789, (1.676), 0.093	-0.151 $\pm$ 0.211, (-0.715), 0.474	-0.348 $\pm$ 0.081, (-4.274), 1.92E-05		8	-281.971	580.2	0
	m2	0.699 $\pm$ 0.547, (1.278), 0.201	0.932 $\pm$ 0.218, (4.267), 1.98E-05	-0.682 $\pm$ 0.207, (-3.294), 0.0009	-0.388 $\pm$ 0.242, (-1.602), 0.109			-0.388 $\pm$ 0.084, (-4.594), 4.35E-06		7	-283.070	580.4	0.13
	m3	0.688 $\pm$ 0.552, (1.247), 0.212	0.899 $\pm$ 0.220, (4.076), 4.58E-05	-0.653 $\pm$ 0.208, (-3.137), 0.001	-0.337 $\pm$ 0.245, (-1.376), 0.168	1.251 $\pm$ 0.790, (1.584), 0.113	-0.133 $\pm$ 0.212, (-0.628), 0.529	-0.378 $\pm$ 0.084, (-4.459), 8.23E-06		9	-281.020	580.4	0.18
<i>Visit ID</i>	m1	-0.616 $\pm$ 0.398, (-1.548), 0.121	0.848 $\pm$ 0.217, (3.901), 9.58E-05	-0.669 $\pm$ 0.208, (-3.205), 0.001		1.279 $\pm$ 0.789, (1.621), 0.105	-0.169 $\pm$ 0.213, (-0.795), 0.426	-0.359 $\pm$ 0.082, (-4.377), 1.20E-05	0.529 $\pm$ 0.521, (1.017), 0.309	10	-275.258	571.0	0
	m2	-0.318 $\pm$ 0.456, (-0.698), 0.485	0.931 $\pm$ 0.219, (4.246), 2.17E-05	-0.682 $\pm$ 0.208, (-3.275), 0.001	-0.368 $\pm$ 0.243, (-1.518), 0.128			-0.397 $\pm$ 0.085, (-4.661), 3.15E-06	0.537 $\pm$ 0.525, (1.024), 0.305	9	-276.438	571.3	0.27
	m3	-0.311 $\pm$ 0.463, (-0.673), 0.501	0.901 $\pm$ 0.221, (4.066), 4.79E-05	-0.653 $\pm$ 0.209, (-3.117), 0.001	-0.316 $\pm$ 0.245, (-1.288), 0.197	1.210 $\pm$ 0.790, (1.532), 0.125	-0.152 $\pm$ 0.213, (0.713), 0.475	-0.388 $\pm$ 0.085, (-4.537), 5.71E-06	0.528 $\pm$ 0.522, (1.012), 0.311	11	-274.425	571.4	0.43