

Supplementary material for

Habitat and sex effects on behaviour in fawn-footed mosaic-tailed rats (*Melomys cervinipes*)

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Table S1. Mean \pm SE vegetation (abundance and diversity) measures and substrate types for an abandoned hoop pine (*Araucaria cunninghamii*) plantation (HP) undergoing natural revegetation and a variable secondary rainforest (RF) located in Smithfield, Cairns used to assess variation in habitat complexity

Site	HP				RF			
	0-2m	2-10m	10-30m	> 30m	0-2m	2-10m	10-30m	> 30m
<i>Vegetation measurements</i>								
Tree abundance	53.8 \pm 1.5	20.6 \pm 1.8	13.6 \pm 1.5	6.8 \pm 1.0	69.2 \pm 12.2	21.2 \pm 2.0	6.4 \pm 1.4	1.0 \pm 1.0
Tree diversity	5.4 \pm 0.4	2.4 \pm 0.5	2.0 \pm 0.5	1.0 \pm 0.0	9.6 \pm 0.9	6.2 \pm 0.4	3.8 \pm 0.4	0.4 \pm 0.4
Vine abundance	16.8 \pm 3.3	5.8 \pm 1.2	0.4 \pm 0.2	0.0 \pm 0.0	63.2 \pm 18.5	56.8 \pm 12.6	37.8 \pm 18.2	0.6 \pm 0.6
Vine diversity	3.4 \pm 0.4	2.0 \pm 0.5	0.4 \pm 0.2	0.0 \pm 0.0	5.6 \pm 0.2	4.8 \pm 0.5	3.8 \pm 0.6	0.2 \pm 0.2
<i>Substrate type</i>								
Rocks		0.8 \pm 0.2				0.2 \pm 0.2		
Exposed sol		1.0 \pm 0.0				1.0 \pm 0.0		
Logs		0.6 \pm 0.2				0.8 \pm 0.2		
Leaves		1.0 \pm 0.0				1.0 \pm 0.0		
Vines		1.0 \pm 0.0				1.0 \pm 0.0		
Grass		0.4 \pm 0.2				0.8 \pm 0.2		
Tree roots		0.4 \pm 0.2				0.8 \pm 0.2		
Tree stumps		0.0 \pm 0.0				0.2 \pm 0.2		
Holes		0.2 \pm 0.2				0.4 \pm 0.2		
Branches and sticks		0.8 \pm 0.2				0.2 \pm 0.2		

Table S2. Outputs of principle components analyses generated from the behaviour of fawn-footed mosaic-tailed rats (*Melomys cervinipes*) in four different behavioural tests (open field, novel object, light-dark box, acoustic startle).

Test	Eigen Value			Proportion of Variance			Variable	Loadings			Contribution (%)		
	PC1	PC2	PC3	PC1	PC2	PC3		PC1	PC2	PC3	PC1	PC2	PC3
Open field	2.06	1.11	-	0.52	0.28	-	Inactive	0.69	0.12	-	47.64	1.47	-
							Explore	-0.22	-0.90	-	4.86	81.02	-
							Thigmotaxis	-0.48	0.22	-	22.69	4.80	-
							Rear	-0.50	0.36	-	24.81	12.71	-
Novel object	4.55	-	-	0.76	-	-	Inactive	-0.47	-	-	21.90	-	-
							Explore	0.32	-	-	10.11	-	-
							Thigmotaxis	0.43	-	-	18.60	-	-
							Rear	0.43	-	-	18.07	-	-
							Sniff	0.31	-	-	9.85	-	-
							Latency to approach	-0.46	-	-	21.47	-	-
Light-dark box	3.55	1.73	1.15	0.51	0.25	0.16	Inactive	-0.49	0.24	0.09	24.62	5.79	0.78
							Explore	0.27	0.11	0.76	7.13	1.32	57.58
							Thigmotaxis	0.19	0.47	-0.61	3.44	21.65	36.92
							Time in dark	0.33	-0.56	0.17	11.00	31.00	3.20
							Latency dark	-0.50	0.21	0.07	24.65	4.56	0.53
							Latency light	-0.30	-0.51	-0.08	8.91	25.76	0.69
							Log no. transitions	0.45	0.31	0.05	20.25	9.91	0.30

Acoustic startle	4.45	1.17	1.10	0.64	0.17	0.16	Inactive	0.46	-0.04	0.23	20.78	0.13	5.42
							Explore	-0.24	-0.72	0.30	5.65	52.44	9.10
							Thigmotaxis	-0.23	0.68	0.41	5.15	46.70	17.08
							Time in dark	-0.35	0.08	-0.63	12.33	0.58	39.85
							Latency dark	0.45	0.02	0.25	20.53	0.03	6.30
							Latency light	0.41	0.01	-0.38	16.80	0.01	14.76
							Log no. transitions	-0.43	-0.03	0.27	18.76	0.11	7.49
Abiotic factors	2.50	1.17	-	0.50	0.23	-	Minimum temperature	-0.57	-0.21	-	32.23	4.54	-
							Maximum temperature	-0.12	-0.76	-	1.38	58.47	-
							Rainfall	-0.51	0.14	-	25.53	1.85	-
							Humidity	0.60	0.16	-	35.60	2.46	-
							Air pressure	-0.23	0.57	-	5.26	32.68	-

Table S3. Spearman's rank correlation matrices generated for the various principal components analyses. Significant correlations indicated in bold.

Abiotic factors	Minimum Temperature	Maximum Temperature	Rainfall	Humidity
Minimum Temperature	-	$R_s = 0.25, P = 0.119$	$R_s = 0.85, P < 0.001$	$R_s = 0.78, P < 0.001$
Maximum Temperature	$R_s = 0.25, P = 0.119$	-	$R_s = -0.23, P = 0.162$	$R_s = -0.14, P = 0.388$
Rainfall	$R_s = 0.85, P < 0.001$	$R_s = -0.23, P = 0.162$	-	$R_s = 0.90, P < 0.001$
Humidity	$R_s = 0.78, P < 0.001$	$R_s = -0.14, P = 0.388$	$R_s = 0.90, P < 0.001$	-

Open Field	Inactivity	Exploration	Thigmotaxis	Rearing
Inactivity	-	$R_s = -0.42, P = 0.006$	$R_s = -0.70, P < 0.001$	$R_s = -0.68, P < 0.001$
Exploration	$R_s = -0.42, P = 0.006$	-	$R_s = 0.14, P = 0.396$	$R_s = 0.11, P = 0.483$
Thigmotaxis	$R_s = -0.68, P < 0.001$	$R_s = 0.14, P = 0.396$	-	$R_s = 0.39, P = 0.013$
Rearing	$R_s = -0.68, P < 0.001$	$R_s = 0.11, P = 0.483$	$R_s = 0.39, P = 0.013$	-

Novel Object	Inactivity	Exploration	Thigmotaxis	Rearing	Sniffing	Latency to approach
Inactivity	-	$R_s = -0.89, P < 0.001$	$R_s = -0.88, P < 0.001$	$R_s = -0.77, P < 0.001$	$R_s = -0.87, P < 0.001$	$R_s = 0.92, P < 0.001$
Exploration	$R_s = -0.89, P < 0.001$	-	$R_s = 0.67, P < 0.001$	$R_s = 0.57, P < 0.001$	$R_s = 0.67, P < 0.001$	$R_s = -0.75, P < 0.001$
Thigmotaxis	$R_s = -0.88, P < 0.001$	$R_s = 0.67, P < 0.001$	-	$R_s = 0.83, P < 0.001$	$R_s = 0.88, P < 0.001$	$R_s = -0.94, P < 0.001$
Rearing	$R_s = -0.77, P < 0.001$	$R_s = 0.57, P < 0.001$	$R_s = 0.83, P < 0.001$	-	$R_s = 0.71, P < 0.001$	$R_s = -0.82, P < 0.001$
Sniffing	$R_s = -0.87, P < 0.001$	$R_s = 0.67, P < 0.001$	$R_s = 0.88, P < 0.001$	$R_s = 0.71, P < 0.001$	-	$R_s = -0.95, P < 0.001$
Latency to approach	$R_s = 0.92, P < 0.001$	$R_s = -0.75, P < 0.001$	$R_s = -0.94, P < 0.001$	$R_s = -0.82, P < 0.001$	$R_s = -0.95, P < 0.001$	-

Light-Dark Box	Time in the Dark	Inactivity	Thigmotaxis	Exploration	Latency to enter the dark	Latency to enter the light	Log. Number of Transitions
Time in the Dark	-	$R_s = -0.79$, $P < 0.001$	$R_s = -0.10$, $P = 0.551$	$R_s = 0.11$, $P = 0.507$	$R_s = -0.73$, $P < 0.001$	$R_s = 0.34$, $P = 0.035$	$R_s = 0.09$, $P = 0.593$
Inactivity	$R_s = -0.79$, $P < 0.001$	-	$R_s = -0.01$, $P = 0.973$	$R_s = -0.44$, $P = 0.005$	$R_s = 0.82$, $P < 0.001$	$R_s = -0.11$, $P = 0.520$	$R_s = -0.43$, $P = 0.007$
Thigmotaxis	$R_s = -0.10$, $P = 0.551$	$R_s = -0.01$, $P = 0.973$	-	$R_s = -0.11$, $P = 0.499$	$R_s = 0.21$, $P = 0.208$	$R_s = -0.50$, $P < 0.001$	$R_s = 0.40$, $P = 0.011$
Exploration	$R_s = 0.11$, $P = 0.507$	$R_s = -0.44$, $P = 0.005$	$R_s = -0.11$, $P = 0.499$	-	$R_s = -0.49$, $P = 0.002$	$R_s = -0.27$, $P = 0.096$	$R_s = 0.68$, $P < 0.001$
Latency to enter the dark	$R_s = -0.73$, $P < 0.001$	$R_s = 0.82$, $P < 0.001$	$R_s = 0.21$, $P = 0.208$	$R_s = -0.49$, $P = 0.002$	-	$R_s = -0.14$, $P = 0.385$	$R_s = -0.31$, $P = 0.058$
Latency to enter the light	$R_s = 0.34$, $P = 0.035$	$R_s = -0.11$, $P = 0.520$	$R_s = -0.50$, $P < 0.001$	$R_s = -0.27$, $P = 0.096$	$R_s = -0.14$, $P = 0.385$	-	$R_s = -0.49$, $P = 0.002$
Log. Number of Transitions	$R_s = 0.09$, $P = 0.593$	$R_s = -0.43$, $P = 0.007$	$R_s = 0.40$, $P = 0.011$	$R_s = 0.68$, $P < 0.001$	$R_s = -0.31$, $P = 0.058$	$R_s = -0.49$, $P = 0.002$	-

Acoustic Startle	Time in the Dark	Inactivity	Thigmotaxis	Exploration	Latency to enter the dark	Latency to enter the light	Log. Number of Transitions
Time in the Dark	-	$R_s = -0.94$, $P < 0.001$	$R_s = 0.39$, $P = 0.069$	$R_s = 0.52$, $P = 0.013$	$R_s = -0.95$, $P < 0.001$	$R_s = -0.61$, $P = 0.002$	$R_s = 0.68$, $P < 0.001$
Inactivity	$R_s = -0.94$, $P < 0.001$	-	$R_s = -0.51$, $P = 0.015$	$R_s = -0.62$, $P = 0.002$	$R_s = 0.99$, $P < 0.001$	$R_s = 0.70$, $P < 0.001$	$R_s = -0.75$, $P < 0.001$
Thigmotaxis	$R_s = 0.39$, $P = 0.069$	$R_s = -0.51$, $P = 0.015$	-	$R_s = 0.30$, $P = 0.171$	$R_s = -0.46$, $P = 0.031$	$R_s = -0.53$, $P = 0.011$	$R_s = 0.51$, $P = 0.015$
Exploration	$R_s = 0.52$, $P = 0.013$	$R_s = -0.62$, $P = 0.002$	$R_s = 0.30$, $P = 0.171$	-	$R_s = -0.58$, $P = 0.005$	$R_s = -0.72$, $P < 0.001$	$R_s = 0.70$, $P < 0.001$
Latency to enter the dark	$R_s = -0.95$, $P < 0.001$	$R_s = 0.99$, $P < 0.001$	$R_s = -0.46$, $P = 0.031$	$R_s = -0.58$, $P = 0.005$	-	$R_s = 0.70$, $P < 0.001$	$R_s = -0.75$, $P < 0.001$
Latency to enter the light	$R_s = -0.61$, $P = 0.002$	$R_s = 0.70$, $P < 0.001$	$R_s = -0.53$, $P = 0.011$	$R_s = -0.72$, $P < 0.001$	$R_s = 0.70$, $P < 0.001$	-	$R_s = -0.83$, $P < 0.001$
Log. Number of Transitions	$R_s = 0.68$, $P < 0.001$	$R_s = -0.75$, $P < 0.001$	$R_s = 0.51$, $P = 0.015$	$R_s = 0.70$, $P < 0.001$	$R_s = -0.75$, $P < 0.001$	$R_s = -0.83$, $P < 0.001$	-