Journal of Avian Biology

JAV-02262

Botero-Delgadillo, E., Quirici, V., Poblete, Y., Poulin, E., Kempenaers, B. and Vásquez, R. A. 2019. Exploratory behavior, but not aggressiveness, is correlated with breeding dispersal propen-sity in the highly philopatric thorn-tailed rayadito. – J. Avian Biol. 2019: e02262

Supplementary material

Appendix 1.

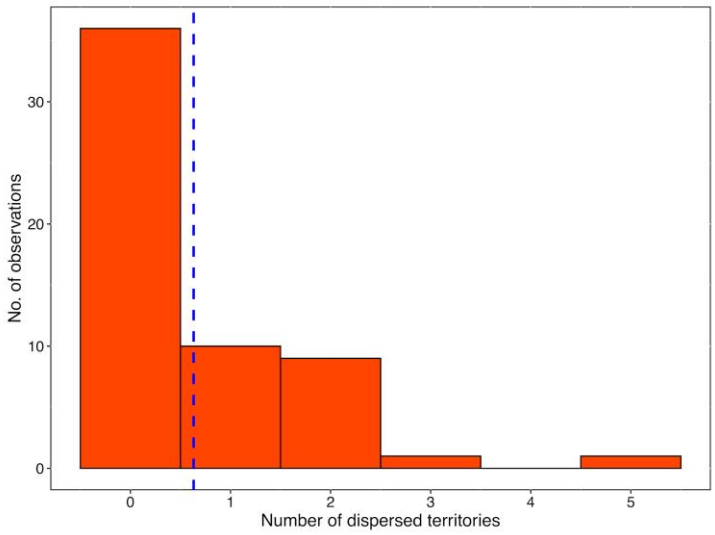

Figure A1. Distribution of breeding dispersal distances for 59 individuals of thorn-tailed rayadito in Fray Jorge National Park during 2012–2014. Dispersal distances are estimated as the number of territories dispersed – or territory units – to control for the potential effect of yearly differences in breeding densities on dispersal behavior.

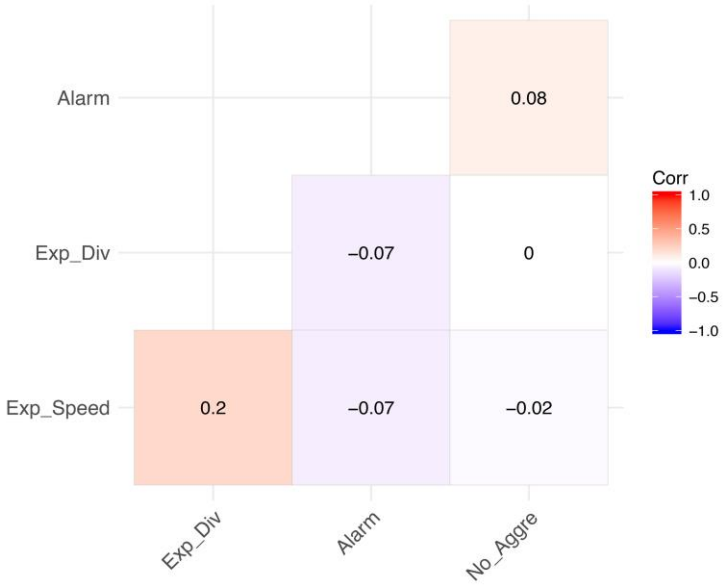

Figure A2. Pairwise correlation matrix for variables of exploratory behavior (Exp_Speed: exploration speed; Exp_Div: exploration diversity) and aggressiveness (Alarm: alarm activity; No_Aggre: number of aggressive interactions with a conspecific intruder) measured for 59 individuals of thorn-tailed rayadito that were subjected to both a novel environment test and a simulated territorial intrusion (STI).

Table A1. Mean values (± standard deviation, SD) of four measures of behavioral traits using two distinct tests in a population of thorn-tailed rayadito in Fray Jorge National Park.

Behavioral test	Behavioral trait	Variable measured	Mean values (SD)	
			Females (n = 42)	Males (n = 42)
Novel environment	Exploratory behavior	Exploration speed (movs/min)	23.9 (7.2)	24.7 (5.4)
		Exploration diversity (Brillouin's index)	1.3 (0.2)	1.3 (0.3)
			Females (n = 37)	Males (n = 37)
Agonistic behavior (STI)^	Aggressiveness	Alarm activity (number of movements)	65.9 (33.3)	43.7 (29.4)
		No. aggressions towards intruder	0.4 (0.7)	2.3 (3.1)

^STI: simulated territorial intrusion.

Table A2. Mixed-effects models for testing between-year and sex-related differences in behavioral traits in a population of thorn-tailed rayadito in Fray Jorge National Park. Behavioral data were collected during two reproductive seasons in 2013–2014.

Behavioral trait	Variable measured	Models*				
Exploratory behavior	Composite variable**	Multilevel multivariate linear model				
			Estimate	SE	*t* value	p
		Exploration speed (ES)	24.60	1.27		
		Exploration diversity (ED)	1.28	0.05		
		ES:Year^	-2.10	1.91	-1.10	0.27
		ED:Year^	-0.02	0.08	-0.22	0.83
		ES:Sex^	0.56	1.64	0.34	0.73
		ED:Sex^	0.00	0.07	0.05	0.96
		ES:Year:Sex^	0.38	2.56	0.15	0.88
		ED:Year:Sex^	-0.01	0.11	-0.11	0.91
Aggressiveness	Alarm activity	Linear mixed-effects model				
			Estimate	SE	*t* value	p
		Intercept	63.67	7.10		
		Year^	4.97	10.44	0.48	0.64
		Sex^	-17.61	9.96	-1.77	0.08
		Year:Sex^	-9.88	14.70	-0.67	0.50
	No. of aggressions	Negative-binomial mixed-effects model				
			Estimate	SE	*z* value	p
		Intercept	-1.93	0.52		
		Year^	0.72	0.57	1.25	0.21
		Sex^	1.75	0.40	4.41	<0.001
		Year:Sex^	-0.22	0.56	-0.39	0.70

Breeding pair identity was included as a random effect in all models (variance explained: 1.28, 1.66, and 2.09, respectively).

*The multivariate multilevel model included partition and pair identity as random effects (see main text for details). Models for aggressiveness only included pair identity as a random effect.

*Composite variable consisted of exploration speed and exploration diversity.

^Parameter estimates and standard errors (SE) were estimated relative to '2013' level in variable 'Year', and 'Female' level in variable 'Sex'.

Table A3. Binomial mixed-effects models testing the relationship between breeding dispersal and personality traits in a population of thorn-tailed rayadito in Fray Jorge National Park. Models used individual dispersal status ('dispersed'/'non-dispersed') as the response variable. Capture-mark-recapture data to identify dispersal status were collected during three reproductive seasons in 2012–2014.

Personality trait	Models by factors*	Estimate	SE	*z* value	p
Exploratory behavior	Intercept	-12.49	5.74		
	Exploration speed (ES)	0.24	0.12	*z* = 1.99	0.04
	Exploration diversity (ED)	3.94	3.06	*z* = 1.29	0.19
	Sex^	5.13	6.31	*z* = 0.81	0.42
	ES:Sex^	-0.21	0.17	*z* = -1.24	0.21
	ED:Sex^	-0.05	3.7	*z* = 0.01	0.98
Aggressiveness	Intercept	1.18	1.89		
	Alarm activity (AA)	-0.03	0.03	*z* = -1.03	0.30
	No. of aggressions (NA)	-0.05	1.06	*z* = -0.05	0.96
	Sex^	-2.74	2.31	*z* = -1.19	0.23
	AA:Sex^	0.02	0.04	*z* = 0.48	0.63
	NA:Sex^	0.62	1.12	*z* = 0.56	0.58

Breeding pair identity was included as a random effect in both models (variance explained: 2.16 and 5.04, respectively).

* Models included pair identity as a random effect.

^Parameter estimates and standard errors (SE) were estimated relative to 'Female' level in variable 'Sex'.