Oikos

OIK-03984

MacGregor, H. E. A., While, G. M. and Uller, T. 2017. Comparison of reproductive investment in native and non-native populations of common wall lizards reveals sex differences in adaptive potential. – Oikos doi: 10.1111/oik.03984

Appendix 1

Extended materials and methods

Additional information on the quantification of morphological traits

1) **Greenness**: where greenness scores conflicted between the two scorers, we retained the mean value for analyses. Subjective Greenness scores are highly correlated with scores from digital photographs analysed in Photoshop CS4 and with values for green chroma extracted using spectrophotometry (While et al. 2015).

2) **Blackness**: we estimated % ventral blackness from the chest area, by quantifying the proportion of black to non-black pixels in the computer program Image J (Abràmoff et al. 2004), using ventral surface photographs of each lizard taken upon capture. Since chest blackness is highly correlated within individuals with blackness on the throat and stomach (While et al. 2015), this score was therefore considered representative of blackness on an individual's overall ventral surface (see While et al. 2015 for full details of method).

3) **OVS blue area**: for a sample of individuals we estimated the absolute area of blue colouration on their outer ventral scales of their left lateral side (i.e. blue spots) from photographs taken upon capture. In the program Image J, a scaled object in each photograph was used to set the scale for the image and the polygon tool was used to manually trace around the blue areas on the scales to estimate their overall area.

4) **Bite force**: we recorded bite force to the nearest 0.01 Newtons using a custom-made bite force meter. We conducted three successive trials and retained the largest maximum bite force recording as the representative measure for use in analyses (While et al. 2015). Each animal was tested in the middle of the lab light cycle, to maximise the likelihood that they had reached their optimal body temperature, however, to control for variation in body temperature at the time of testing, we also recorded the skin surface temperature of each individual at the time of testing using an infrared duel laser digital thermometer.

5) **OVS UV chroma and OVS hue**: we obtained reflectance spectra from the outer ventral scales (OVS) of a sample of males (see Pérez i de Lanuza et al. 2014 for methods). Where possible we selected the second and third OVS from each side of the male. From the reflectance spectra we calculated OVS UV chroma, the proportion of reflectance in the UV-blue spectrum to that of the visible spectrum ($R_{300-400}/R_{300-700}$) and OVS hue, the wavelength at maximum reflectance. From each male, we retained the average UV chroma and hue scores for the analyses.

Additional information on the outdoor enclosure experiment

1) **Enclosures set-up**: within each enclosure, we created a gradient in habitat complexity by constructing three types of sites that varied in both structural complexity and the opportunity for thermoregulation. Each site consisted of two stacked pallets ($1.14\,m^2$) sandwiched with a sheet of felt underlay, but varied in the number and construction of concrete breezeblocks placed above the pallets, which acted as both shelter and as a thermal resource. We arranged high, medium and low quality pallets in a three by three organization from one side of the enclosure to the other (Supplementary material Appendix 13 Fig. A13).

2) **Assignment to enclosures:** to reduce population of origin effects on mating behaviour and reproductive investment, each enclosure housed lizards sourced from a minimum of three different populations within each sex. Within this constraint, we assigned males and females to the enclosures randomly within further constraints set by when females' laid their first clutches. There was no significant difference among enclosure populations in the SVL of males (Enclosure: $F_{8,63}$ = 0.08, p = 1.00). However, consistent with divergence in female body size between native and non-native populations, there was a significant difference among enclosure populations in the SVL of females (Enclosure: $F_{8,63}$ = 2.60, p = 0.016), with non-native females larger on average (native enclosure females: 58.6 ± 0.81, non-native enclosure females: 62.6 ± 0.80).

3) **Interaction data collection:** to quantify the number, direction and outcome of interactions between individuals, one observer (HEAM) carried out 45 minute periods of observations on each of the enclosures. Daily behavioural observation periods began when we observed the first lizards in the morning and ended at dusk. The sequence of enclosures during interaction data collection remained the same throughout the experiment; however, we rotated the first enclosure of the round between days to avoid a temporal effect on observations.

4) **Classification of social interactions:** we recorded the identity of interacting lizards, the initial location of the receiver, and the nature of the social interaction according to an ethogram (Heathcote et al. 2016, also see Appendix 12 Table A12). We classified behavioural interactions into three categories: male-male territorial interactions, male-female courtship and other. Male–male territorial interactions and male–female courtship were used in further analyses. Male–male

agonistic interactions included behaviours such as chases, physical attacks and aggressive posturing between males. To distinguish these interactions from non-combative male–male behaviour, we only classified interactions as male-male competition when they included a submissive behaviour by one male in the presence of another (i.e. a retreat) and this determined which male was deemed the 'winner' of the encounter. We used this outcome to generate normalised male dominance scores (David 1988), on the basis of dyadic dominance indices (Dij), in which the observed proportion of wins was corrected for chance occurrence (de Vries et al. 2006).

Dij based David's Dominance scores for each male were calculated in R package 'Steepness' following Gammell et al. (2003) with correction and normalisation described by de Vries et al. (2006): the corrected dyadic dominance index (Dij) for individual i in his interactions with another individual j is calculated according to the formula Dij = (Sij + 0.5) / (nij + 1) where Sij is the number of times that i defeats j and nij is the total number of interactions between i and j. For each enclosure, we generated a dyadic dominance index matrix based on Dij. From these matrices, the David's score for each male i of an enclosure was calculated with the formula DS = (W + W2) - (L – L2) where W = ∑Dij, W2 = ∑W (weighted by the appropriate Dij values of those individuals with which i interacted), L = ∑Dji and L2 = ∑L (weighted by the appropriate Dji values of those individuals with which i interacted). We then normalized the DS values using NDS = [DS + (N(N – 1) / 2) / N] where N is the total number of males in an enclosure (7 or 8). NDS values were used as Dominance scores in subsequent analyses. Prior to testing for Origin differences in the steepness of male dominance hierarchies we confirmed that all enclosure hierarchies were significantly linear in form by calculating the slope from a linear regression between normalised dominance score (Dominance) and Dominance rank (1-8, most dominant male to least within and enclosure), for every enclosure, which we simulated over 10 000 iterations (CRAN: Package Steepness, de Vries et al. 2006).

We classified male-female interactions as courtships when they included display behaviour from a male directed towards a female or a tail grab by the male. We deemed these behaviours indicative of male sexual interest in a female or intention to mate.

References

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Appendix 2

Table A2. Details of the native and non-native wall lizard populations included in this study. Year of capture and the sample sizes of males and females are reported for each population. Haplotype abbreviations correspond to Tuscan (TUS) and Venetian (VEN). Populations sampled for the 2014 enclosures experiment are highlighted in grey.

Population	Country	Origin	First record	Abbreviation	Latitude	Longitude	Altitude	Haplotype*	Year(s) of capture	No. females	No. males
Bacchereto	Italy	Native	N/A	BC	43.81	10.99	217	TUS	2015	4	12
Castelarrano	Italy	Native	N/A	CT	44.51	10.73	157	VEN	2013	7	20
Castelfiorentino	Italy	Native	N/A	CL	43.61	10.97	64	TUS	2014	5	7
Castellacio	Italy	Native	N/A	CS	43.49	10.36	281	TUS	2012	1	3
Castelnuovo Berardenga	Italy	Native	N/A	CB	43.34	11.50	337	TUS	2013	4	5
Certaldo	Italy	Native	N/A	CD	43.55	11.04	76	TUS	2014-2015	6	12
Chianni	Italy	Native	N/A	CN	43.48	10.64	297	TUS	2013, 2015	12	36
Colle di Val' Elsa	Italy	Native	N/A	VE	43.42	11.11	229	TUS	2013-2015	20	26
Crespina	Italy	Native	N/A	CR	43.57	10.56	80	TUS	2012	7	15
Greve in Chianti	Italy	Native	N/A	GC	43.59	11.31	227	TUS	2013 - 2015	41	27
Montemassi	Italy	Native	N/A	MM	42.99	11.06	240	TUS	2013	14	8
Montecatini Alto (Terme)	Italy	Native	N/A	MT	43.89	10.79	282	TUS	2015	5	16
Nonantola	Italy	Native	N/A	NO	44.68	11.04	26	VEN	2013	12	16
Peccioli	Italy	Native	N/A	PE	43.54	10.72	127	TUS	2014-2015	11	32
Pian Di Venola	Italy	Native	N/A	PV	44.33	11.19	145	VEN	2012	10	12
Prato	Italy	Native	N/A	PR	43.9	11.11	86	TUS	2013	16	14
Travale	Italy	Native	N/A	TR	43.17	11.01	509	TUS	2013	9	13
Vignola	Italy	Native	N/A	VG	44.47	11.01	121	TUS, VEN	2013	12	8
Dancing Ledge	UK	Non-Native	1990	DL	50.59	-2.01	19	VEN	2009-2011	38	27
Folkestone	UK	Non-Native	1992	FS	51.09	-1.20	96	VEN	2009-2011	12	7
Newton Ferrers	UK	Non-Native	1978	NF	50.32	-4.04	49	VEN	2009-2011	14	11
Seacombe	UK	Non-Native	1986	SC	50.59	-2.02	19	VEN	2009-2011	8	6
Shoreham	UK	Non-Native	1975	SH	50.83	-0.26	5	VEN	2009-2011	55	36
Shorwell	UK	Non-Native	1985	SW	50.65	-1.36	70	TUS, VEN	2009-2011	35	18
Ventnor Botanical Garden	UK	Non-Native	2000	VB	50.59	-1.23	24	TUS, VEN	2009-2014	45	37
Ventnor Town	UK	Non-Native	1930	VT	50.59	-1.21	28	TUS	2009-2014	112	82
West Worthing	UK	Non-Native	2004	WW	50.82	-0.39	6	VEN	2009-2011	24	15
Winspit	UK	Non-Native	1986	WS	50.58	-2.03	11	VEN	2009-2014	29	44

*Mitochondrial sequences analysed by Michaelides et al. 2015. Molecular Ecology.

Appendix 3

Table A3. Mean trait values (± 1SE) and sample sizes for native and non-native lizards.

	Females				Males			
	Native		Non-native		Native		Non-native	
	n	mean (± 1 SE)	n	mean (± 1 SE)	n	mean (± 1 SE)	n	mean (± 1 SE)
SVL (mm)	196	58 ± 0.33	372	61 ± 0.26	282	61 ± 0.35	283	62 ± 0.25
Head length (mm)	196	12.9 ± 0.08	372	12.9 ± 0.04	282	15.5 ± 0.11	283	15.6 ± 0.07
Blackness (%)	126	27 ± 1.24	179	28 ± 1.07	127	46 ± 1.21	143	50 ± 1.22
Greenness	195	5 ± 0.20	365	5 ± 0.13	281	7 ± 0.15	268	7 ± 0.13
Body mass (g)	186	4.56 ± 0.08	225	5.35 ± 0.08	277	5.94 ± 0.10	142	5.96 ± 0.10
Bite force (N)	58	2.72 ± 0.10	31	2.60 ± 0.14	90	7.37 ± 0.34	32	7.86 ± 0.40
Blue spot area (mm^2)	124	3.56 ± 0.34	134	1.70 ± 0.13	124	10.34 ± 0.52	113	9.76 ± 0.55
OVS UV chroma					66	0.37 ± 0.01	28	0.36 ± 0.01
OVS hue (nm)					66	364.8 ± 1.09	28	366.6 ± 2.04

Appendix 4

Table A4. Factor loadings for male body size, the first principal component based on the male traits SVL, head length, head width and mass.

	PC1 loadings			
Proportion variance	SVL	Head length	Head width	Mass
0.96	0.93	0.23	0.13	0.26

Appendix 5

Table A5. Details on the 16 microsatellites used for the analysis of offspring paternity. Primers were combined within five multiplexes.

Multiplex*	Locus		Primer sequence (5'-3')	Product size (bp)	Repeat motif	Range (bp)
1	PmurC150	F	[6-FAM]GTCAGCTTTGCAGCACCTTAG	193	CA	171-217
		R	GCGATTAGAGAAGGCGTTTG			
	PmurC168	F	[HEX]GGTCCGGCTTCAAAGAATAAG	244	TTTC	210-306
		R	CAGAGGACTCGCTCAAGGAC			
	PmurC275_278	F	[6-FAM]GCTTAAAATTAATGCTGCTATTGTATC	245	TATC	219-610
		R	ATAGGTAGAAAATTTATAAACCCTTGG			
2	PmurC164	F	[6-FAM]ATCGATGAATGAAGGGCAGT	216	GATA	170-246
		R	CCAGGCATTGTCAAACTATCTG			
	PmurC038	F	[HEX]CAATGTGCAGTGTTGGGTTG	210	TATC	193-425
		R	ATGTGAGCGACTCCTGGATG			
	PmurC028	F	[6-FAM]TTGCTTCTGAATACGCCTAGC	287	TATC	253-543
		R	AGTGTATTGCGACTGTCAATGG			
3	PmurC356	F	[6-FAM]GATCTTCAGATGAAGGGTAGTTAGAT	159	GTTA	138-178
		R	ATGAAGACAAACAGGCTTGG			
	PmurC109	F	[HEX]AGGAGCCCAGCAGCTGAA	309	GTA	295-355
		R	TTTACATAGACCTGCGGGTATGG			
	PmurC103	F	[6-FAM]CCAGGTCTTGTGATCGAGTG	350	GATA	316-480
4	Pm01	F	[6-FAM] CCACAGGCATCTGGTTAG	128	$(ATT)_{16}$	119-137
		R	TCCATAAGACTGTAAGACAAGCC			
	Pm05	F	[HEX] CAAGAGGGCAGCCTAGTAATG	160	$(AGAT)_{10}$	135-185
		R	AGATGGGCTCATTTCAACTCC			
	Pm09	F	[NED] ACGTGTTTCTGTGCTTTGC	189	$(ATT)_{17}$	176-203
		R	AGTCAGACGAGAGGTTGCC			
	Pm16	F	[6-FAM] GGGATGGAGAAAGATGGCG	192	$(TCTT)_{16}$	179-211
		R	GCACTTGCCTACTGGTCATAC			
5	Pm02	F	[HEX] TTGGGAAGAAGGGGAAGGG		$(AACC)_7$	164-216
		R	ATGGCCGCTAGGTCAAGTG			
	Pm19	F	[6-FAM] CAGCCACAAGGTGAACCAG		$(AGGC)_{11}$	164-204
		R	TGTGAGGTCAGAGGCATGG			
	Pm14	F	[NED] GCAGGATCAGAGCGCAATC		$(GCAG)_7$	151-187
		R	TGTGGCATGTTGAGACACC			

*Mulitplexes 1, 2 and 3 were developed by Heathcote et al. 2015. Conservation Genetic Resources. Multiplex 4 and 5 were developed by Richards et al. 2012. Molecular Ecology Resources.

Appendix 6

Table A6. Pearson's correlation coefficients between phenotypic traits reported separately by origin (native (bottom triangle) and non-native (top triangle)) and sex (males (left) and female (right)). Data are from lizards used in the 2014 enclosure experiment.

Males	SVL (mm)	Body mass (g)	Head length (mm)	Greenness	Blackness (%)	Blue spot area (mm^2)	Bite force (N)	OVS hue (nm)	OVS UV chroma
SVL (mm)		0.83	0.82	0.22	0.22	0.25	0.19	0.29	-0.14
Body mass (g)	0.89		0.82	0.41	0.16	0.25	0.32	0.36	-0.09
Head length (mm)	0.91	0.93		0.35	0.22	0.25	0.37	0.44	-0.20
Greenness	0.64	0.68	0.70		0.05	0.20	0.37	0.37	-0.20
Blackness (%)	0.37	0.26	0.38	-0.01		-0.28	-0.21	0.36	-0.30
Blue spot area (mm^2)	0.37	0.37	0.49	0.37	0.05		0.08	-0.06	0.30
Bite force (N)	0.83	0.83	0.87	0.55	0.31	0.34		-0.10	0.28
OVS hue (nm)	0.31	0.40	0.20	0.26	0.01	-0.05	0.27		-0.62
OVS UV chroma	0.29	0.17	0.37	0.19	0.34	0.46	0.26	-0.36	

Females	SVL (mm)	Body mass (g)	Head length (mm)	Greenness	Blackness (%)	Blue spot area (mm^2)	Bite force (N)
SVL (mm)		0.76	0.69	0.26	0.33	-0.05	0.77
Body Mass (g)	0.91		0.67	0.19	0.38	-0.16	0.54
Head Length (mm)	0.86	0.82		0.30	0.34	0.08	0.62
Greenness	0.68	0.61	0.67		0.60	0.17	0.22
Blackness (%)	0.44	0.31	0.33	0.34		0.14	0.32
Blue Spot Area (mm^2)	-0.04	-0.06	-0.14	-0.12	-0.03		0.05
Bite Force (N)	0.68	0.62	0.61	0.34	0.35	-0.20	

Appendix 7

Table A7. Results from tests for divergence in first clutch reproductive investment (clutch size, clutch mass and mean egg mass) for native and non-native females sampled between 2010 and 2015. Models were run controlling for post-parturition body mass (above) and excluding post-parturition body mass (below). Source population nested within origin was included as a random effect in all models. Significant effects are highlighted bold.

	Response	n	Origin	Post-parturition body mass	Year	SVL
	Post-parturition body mass	296	**$F_{1,19}$ = 5.59, p = 0.03**		**$F_{5,268}$ = 273.46, p < 0.001**	**$F_{1,287}$ = 4.78, p < 0.001**
Models controlling for post-partum mass	Clutch size	296	**χ^2_1 = 5.39, p = 0.02**	**χ^2_1 = 26.17, p = 0.02**	χ^2_5 = 5.82, p = 0.32	
	Clutch mass	283	**$F_{1,13}$ = 15.53, p = 0.002**	**$F_{1,195}$ = 111.89, p < 0.001**	**$F_{5,138}$ = 5 .95, p = 0.003**	
	Mean egg mass	283	$F_{1,13}$ = 1.93, p = 0.19	**$F_{1,195}$ = 9.25, p = 0.003**	**$F_{5,138}$ = 3.37 , p = 0.007**	
Models excluding post-partum mass	Clutch size	296	χ^2_1 = 5.57, p = 0.06		χ^2_1 = 5.28, p = 0.38	
	Clutch mass	283	**$F_{1,17}$ = 5.59, p = 0.03**		**$F_{5,219}$ = 3 .11, p = 0.01**	
	Mean egg mass	283	$F_{1,12}$ = 1.58, p = 0.23		**$F_{5,154}$ = 3.49 , p = 0.005**	

Appendix 8

Table A8. Results from tests for differences between native and non-native experimental females in their within-season patterns of reproductive investment. Models were run excluding post-parturition body mass (above) and replacing post-parturition body mass with SVL (below) to demonstrate the consistency of effects reported in Table 2 of the main manuscript. Female ID nested within Population and Origin was included as a random effect in all models. Significant results are highlighted bold.

	Response	Origin	Clutch	Origin × Clutch	SVL
Models excluding post-partum mass	Clutch size	$F_{1,67}$ = 5.47, p = 0.02	$F_{1,64}$ = 0.02, p = 0.89	$F_{1,63}$ = 2.98, p = 0.09	
	Clutch mass	$F_{1,68}$ = 2.75, p = 0.10	$F_{1,57}$=2.98, p = 0.17	**$F_{1,59}$ = 14.89, p < 0.001**	
	Mean egg mass	**$F_{1,68}$ = 13.08, p < 0.001**	**$F_{1,61}$ = 6.98, p = 0.01**	**$F_{1,61}$ = 8.01, p < 0.001**	
Models controlling for SVL	Clutch size	$F_{1,64}$ = 0.00, p = 0.95	$F_{1,65}$ = 0.01, p = 0.94	**$F_{1,65}$ = 5.39, p = 0.02**	**$F_{1,81}$ = 74.69, p < 0.001**
	Clutch mass	$F_{1,66}$ = 0.34, p = 0.56	$F_{1,60}$ = 2.74, p = 0.14	**$F_{1,59}$ = 18.00, p < 0.001**	**$F_{1,75}$ = 66.83, p < 0.001**
	Mean egg mass	**$F_{1,66}$ = 8.29, p = 0.005**	**$F_{1,61}$ = 7.29, p = 0.009**	**$F_{1,61}$ = 8.89, p = 0.004**	$F_{1,76}$ = 2.43, p = 0.12

Appendix 9

Table A9**.** Correlations between male-female courtship networks and paternity networks from the nine experimental enclosure populations. Combined test statistics are reported for native and non-native enclosures, respectively.

	Matrix correlations by enclosure				Fisher's combined test			
	Enclosure	Matrix correlation (R_M)	p	Logged	df	Sum	χ^2	p
Native	1	0.193	0.144	-1.94				
	3	0.268	0.049	-3.02				
	7	0.627	0.002	-6.32				
	8	0.141	0.151	-1.89				
	9	0.157	0.16	-1.78	10	-14.95	29.91	0.0009
Non-native	2	0.2	0.096	-2.34				
	4	-0.003	0.406	-0.9				
	5	0.262	0.052	-2.95				
	6	0.623	0	-8.11	8	-14.3	28.61	0.0004

Appendix 10

Table A10. Results from tests for differences between native and non-native males in the slope of the relationship between seven known or putative sexually selected traits and relative fertilization success during the enclosures experiment. Results for main effects are reported from models excluding non-significant interaction terms. Traits were standardized (mean = 0, SD = 1) prior to analysis and SVL was included as a covariate. Regression estimates (± 1 SE) for traits from analyses performed separately by origin are also reported.

Trait	Native	Non-native	Origin	Trait	Origin × Trait	SVL
PC1_Bodysize	0.47 ± 0.10	0.42 ± 0.15	$F_{1,7} = 0.04$, $p = 0.85$	**$F_{1,58} = 25.57$, $p < 0.001$**	$F_{1,57} = 0.08$, $p = 0.78$	
Greenness	-0.07 ± 0.14	0.21 ± 0.17	$F_{1,6} < 0.01$, $p = 0.95$	$F_{1,56} = 0.55$, $p = 0.46$	$F_{1,55} = 1.01$, $p = 0.32$	**$F_{1,54} = 13.54$, $p < 0.001$**
Blackness	0.13 ± 0.11	0.12 ± 0.16	$F_{1,6} = 0.04$, $p = 0.85$	$F_{1,59} = 2.85$, $p = 0.10$	$F_{1,56} = 0.02$, $p = 0.88$	**$F_{1,55} = 16.87$, $p < 0.001$**
Blue spot area	0.01 ± 0.13	-0.25 ± 0.16	$F_{1,6} < 0.01$, $p = 0.94$	$F_{1,56} = 1.16$, $p = 0.29$	$F_{1,55} = 1.87$, $p = 0.18$	**$F_{1,56} = 21.31$, $p < 0.001$**
Bite force	0.05 ± 0.18	-0.16 ± 0.16	$F_{1,7} = 0.06$, $p = 0.82$	$F_{1,62} = 0.80$, $p = 0.37$	$F_{1,60} = 0.69$, $p = 0.41$	**$F_{1,60} = 17.97$, $p < 0.001$**
OVS UV chroma	0.07 ± 0.12	-0.07 ± 0.16	$F_{1,6} < 0.01$, $p = 0.94$	$F_{1,57} = 0.02$, $p = 0.88$	$F_{1,56} = 0.54$, $p = 0.47$	**$F_{1,56} = 19.83$, $p < 0.001$**
OVS hue	-0.02 ± 0.12	0.08 ± 0.17	$F_{1,6} < 0.01$, $p = 0.94$	$F_{1,54} = 0.08$, $p = 0.77$	$F_{1,52} = 0.14$, $p = 0.71$	**$F_{1,56} = 17.54$, $p < 0.001$**

Appendix 11

Table A11. Mean (± 1 SE) initial capture mass, enclosures release mass, and enclosures recapture mass (grams) reported by Sex and Origin.

Data exclude the lizards that were not recaptured from the enclosures.

Sex	Origin	Initial capture mass	Enclosures release mass	Enclosures recapture mass
Males	native	6.15 ± 0.26	6.41 ± 0.26	6.61 ± 0.26
	non-native	6.02 ± 0.22	6.00 ± 0.20	6.13 ± 0.21
Females	native	4.71 ± 0.18	4.65 ± 0.14	5.41 ± 0.17
	non-native	6.02 ± 0.21	5.03 ± 0.16	5.97 ± 0.25

Appendix 12

Table A12. Ethogram used for behavioural data collection during the 2014 enclosures experiment.

Behaviour	Description	Code
Basking	Basking	1
Approach	Walking directly towards another individual at a slow pace	2
Charge	Sudden, short, and fast paced approach directly towards another individual (aggressive)	3
Display	(1) Male–male aggression: (a) throat puffed out, (b) exposure of outer ventral scales on lateral flanks directly towards another male either stationary or with a sideways approach, (c) forehead pointing down towards substrate and shoulders raised on approach to a male. (2) Courtship: forehead pointing towards substrate and shoulders raised on approach to a female	4
Alert	Stationary with front legs extended, and head and forebody raised	5
Attack	Successful or unsuccessful attempt to bite another individual (excluding tail grab)	6
Head grasp	One male with jaws locked around the upper jaw of another male (rare escalation of violence, typically following an extended period of displaying by two males of similar body size)	7
Chase/follow	Extended pursuit of another individual	8
Retreat	(1) Submissive movement away from the vicinity of another individual (usually under cover) preceded by looking directly towards that individual. (2) Escape undercover following aggressive behaviour by another individual	9
Freeze	Abrupt halt to previous behaviour followed by no movement (typically leads to a retreat)	10
Wave	In sight of another lizard, rapid movement of front leg(s) either onto the substrate or in the air (aggressive or submissive)	11
Tail quiver	Female shaking her tail rapidly in response to the presence of a male or in response to a tail grab	12
Tail grab	A male attaching his jaws onto the tail of a female prior to copulation	13
Male tongue flick on female	Male flicking his tongue towards a female	14
Mating	Two lizards copulating	15
Female back pat	Female lies by male with one front leg on his back	16
Defecate	Defecate	17
Moving/patrolling	Moving/patrolling	18
Male alert by female	Alert by female	19
Fight	Aggression between individuals with physical contact	20
Hunting/feeding	Observations of feeding behaviours	21
Male–female lying together	Male and female lying side by side	22

Appendix 13

Figure A13. Photograph of outdoor enclosures used to house lizards during the 2014 experiment.

Appendix 14

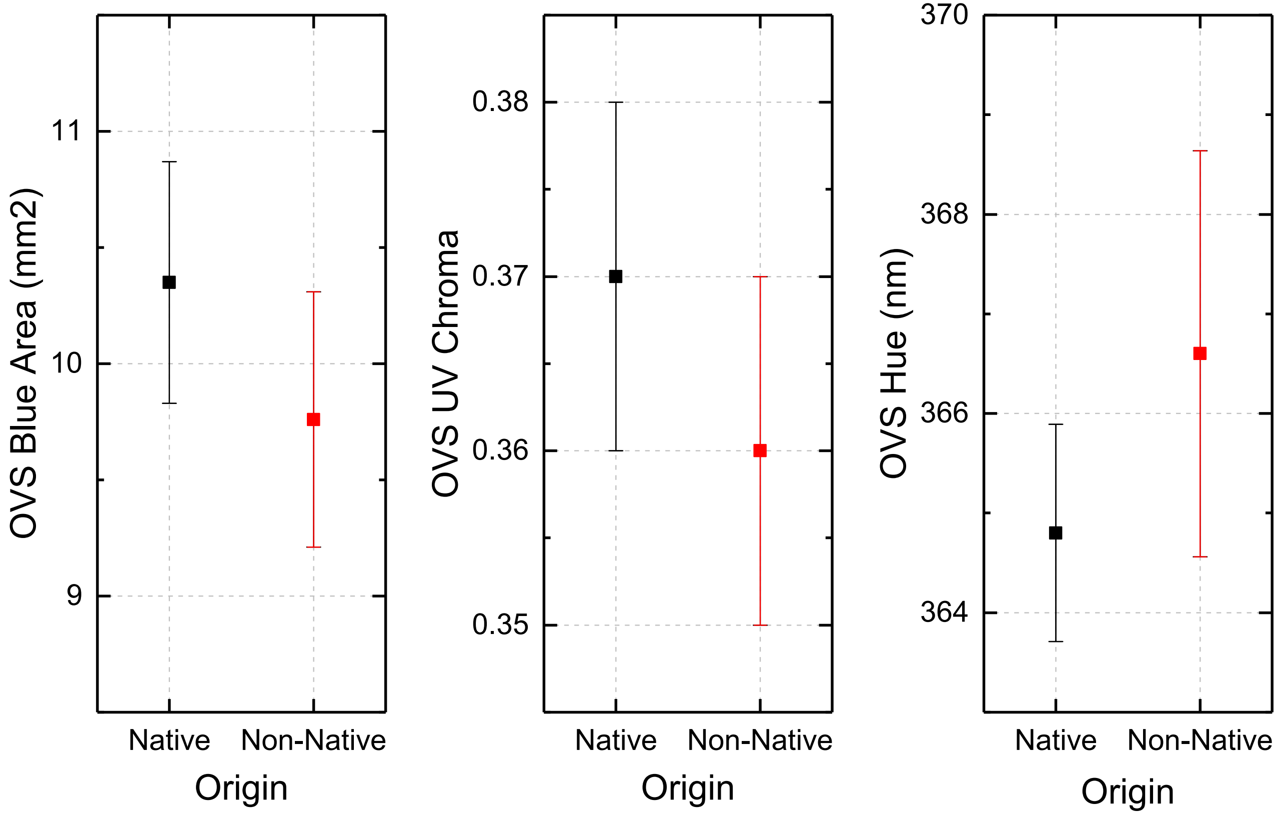

Figure A14. Outer ventral scale traits (area of blue colouration (OVS blue area) and spectral reflectance (OVS UV chroma and OVS hue)) expected to be under sexual selection in *Podarcis* lizards. Values depict the mean (± 1SE) for native and non-native males, respectively. See Table A2 for sample sizes.