

Population dependent behavioral responses among color morphs of Common wall lizard (*Podarcis muralis*)?

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SUPPLEMENTARY MATERIAL

Table S1: Results from principal component analysis on behavioral variables obtained after tracking *Podarcis muralis* lizards in an Open field arena. The analysis was conducted on 15 min long trials, divided to 2.5 min intervals. Percentage of variations and (eigenvalues) explained by varimax-rotated components for RC1 44 % (6.19), for RC2 16% (2.21), for RC3 15% (2.1) and for RC4 10% (1.35).

Variables measured	RC1	RC2	RC3	RC4
Distance moved in the arena (cm)	0.96	0.08	0.12	0.09
Distance moved in center (cm)	0.06	0.95	-0.03	0.06
Distance moved in corners (cm)	0.93	-0.21	0.04	-0.06
Distance moved in border zone (cm)	0.94	-0.01	0.17	0.16
Duration of time in center (s)	-0.51	0.29	-0.54	0.18
Duration of time in corners (s)	0.21	-0.26	0.19	-0.89
Duration of time in border zone (s)	0.39	-0.08	0.44	0.65
Number of visits to center	0.04	0.95	-0.08	0.12
Number of visits to corners	0.89	-0.13	0.13	-0.08
Number of visits to border zone	0.92	0.19	0.18	0.12
Number of times mobility was initiated	0.36	0	0.89	0.08
Duration of mobility (s)	0.26	0.04	-0.86	0.04
Mean velocity (cm/s)	0.90	0.1	0.03	-0.04
Maximum velocity (cm/s)	0.66	0.16	-0.23	-0.15

Table S2: Differences in behavioral traits (principal components) among the color morphs (orange, white, yellow, yellow-orange and white-orange) of *Podarcis muralis*. The analysis was conducted on 15 min long trials, divided to 5 min intervals. Models included individual ID as random factor. *MS* refers to mean square, and *F n,d* to F statistic with degrees of freedom for numerator and denominator.

<i>Dependent variables</i>	<i>Predictors</i>	<i>MS</i>	<i>F n, d</i>	<i>p</i>
Locomotion	Morph	0.18	0.52 _(4,84)	0.72
	Body length	0.08	0.24 _(1,84)	0.62
	Time	11.05	32.25 _(2,185)	< 0.001
	Body length:Morph	0.88	2.56 _(4,84)	< 0.05
Boldness	Morph	1.14	1.62 _(4,88)	0.18
	Body length	0.12	0.17 _(1,88)	0.68
	Time	12.42	17.66 _(2,186)	< 0.001
Freezing	Morph	0.35	0.76 _(4,88)	0.56
	Body length	0.92	1.98 _(1,88)	0.16
	Time	8.72	18.79 _(2,186)	< 0.001
Escape	Morph	0.45	0.82 _(4,88)	0.52
	Body length	0.24	0.44 _(1,88)	0.51
	Time	2.28	4.14 _(2,186)	< 0.05

Table S3: Summary statistics of the differences in locomotion among the color morphs (orange (O), white (W), yellow (Y), yellow-orange (YO), white-orange (WO)) of *Podarcis muralis*. The analysis was conducted on 15 min long trials, divided to 2.5 min intervals (Time 1, Time 2 upto Time 6). Individual ID was included as random factor. β (*S.E*) refers to the regression coefficient with standard error. *df* is degrees of freedom, and *t* is t-statistic.

	β (<i>S.E</i>)	<i>df</i>	<i>t</i>	<i>P</i>
(Intercept)	0.15(0.17)	103.87	0.84	0.40
W	-0.16(0.24)	84.00	-0.70	0.49
WO	0.11 (0.31)	84.00	0.35	0.73
Y	0.18 (0.23)	84.00	0.78	0.44
YO	-0.23 (0.31)	84.00	-0.72	0.47
Time 2	0.17 (0.09)	465.00	1.96	0.06
Time 3	-0.11 (0.09)	465.00	-1.26	0.21
Time 4	-0.34 (0.09)	465.00	-3.97	<0.001
Time 5	-0.44 (0.09)	465.00	-5.16	<0.001
Time 6	-0.51 (0.09)	465.00	-5.97	<0.001
Body length	0.10 (0.17)	84.00	0.58	0.56
W: Body length	0.35 (0.26)	84.00	1.34	0.18
WO: Body length	0.13 (0.34)	84.00	0.37	0.71
Y: Body length	-0.20 (0.22)	84.00	-0.94	0.35
YO: Body length	-0.74 (0.30)	84.00	-2.45	<0.05

Table S4: Differences in correlation between body length and locomotion within different color morphs (orange (O), white (W), yellow (Y), yellow-orange (YO), white-orange (WO)) of *Podarcis muralis*. Models included individual ID as random factor. *MS* refers to mean square, and *F n,d* to F statistic with degrees of freedom for numerator and denominator.

<i>Morph type</i>	<i>Predictors</i>	<i>MS</i>	<i>F n, d</i>	<i>p</i>
Y	Time	1.64	5.87 _{5, 125}	<0.001
	Body length	0.80	2.86 _{1, 23.86}	0.1
O	Time	1.38	3.94 _{5, 115}	<0.01
	Body length	0.08	0.23 _{1, 22}	0.63
W	Time	2.35	7.28 _{5, 125}	<0.001
	Body length	1.37	4.24 _{1, 24}	0.052
YO	Time	0.94	1.52 _{5, 115}	0.2
	Body length	3.40	5.52 _{1, 22}	<0.05
WO	Time	1.93	7.50 _{5, 40}	<0.001
	Body length	0.32	1.25 _{1, 7}	0.3

Table S5: Summary statistics of the differences in freezing behavior among the color morphs (orange (O), white (W), yellow (Y), yellow-orange (YO), white-orange (WO)) of *Podarcis muralis*. The analysis was conducted on 15 min long trials, divided to 2.5 min intervals (Time 1, Time 2, upto Time 6). Individual ID was included as random factor. β (*S.E*) refers to the regression coefficient with standard error. *df* is degrees of freedom, and *t* is t-statistic.

	β (<i>S.E</i>)	<i>df</i>	<i>t</i>	<i>P</i>
(Intercept)	-0.34 (0.16)	142.81	-2.13	<0.05
W	-0.05 (0.20)	88.00	-0.25	0.80
WO	0.44 (0.27)	88.00	1.62	0.11
Y	0.12 (0.20)	88.00	0.613	0.54
YO	-0.01 (0.25)	88.00	-0.037	0.97
Time 2	0.31 (0.12)	465.00	2.656	<0.01
Time 3	0.31 (0.12)	465.00	2.705	<0.01
Time 4	0.30 (0.12)	465.00	2.588	<0.01
Time 5	0.36 (0.12)	465.00	3.062	<0.01
Time 6	0.39 (0.12)	465.00	3.376	<0.001
Body length	0.01 (0.07)	88.00	0.094	0.93

Table S6: Differences in behavioral traits (principal components) among the three main color morphs (orange, white, yellow) of *Podarcis muralis*. Individual ID as random factor. *MS* refers to mean square, and *F_{n,d}* to F statistic with degrees of freedom for numerator and denominator.

<i>Dependent variables</i>	<i>Predictors</i>	<i>MS</i>	<i>F_{n,d}</i>	<i>p</i>
Locomotion (RC1)	Morph	0.26	0.79 _(2,68)	0.5
	Time	4.77	14.56 _(5,365)	<0.001
	Body length	0.71	2.15 _(1,70)	0.46
Boldness (RC2)	Morph	2.27	2.85 _(2,48.96)	0.19
	Time	1.41	1.78 _(5,365)	<0.001
	Body length	0.74	0.92 _(1,70)	0.16
Freezing (RC3)	Morph	0.14	1.52 _(2,70)	0.32
	Time	73.95	788.29 _(5,365)	<0.001
	Body length	0.40	4.24 _(1,70)	0.09
Escape (RC4)	Morph	0.08	0.10 _(2,70)	0.6
	Time	0.41	0.54 _(5,365)	0.13
	Body length	0.06	0.07 _(1,70)	0.26

Fig. S1: Satellite images of the habitats in a) Cerdanya valley b) Val d’Aran. During our current study, the animals were collected from anthropized small towns within the Cerdanya valley; unlike the poorly inhabited areas of Val d’Aran from our previous study.

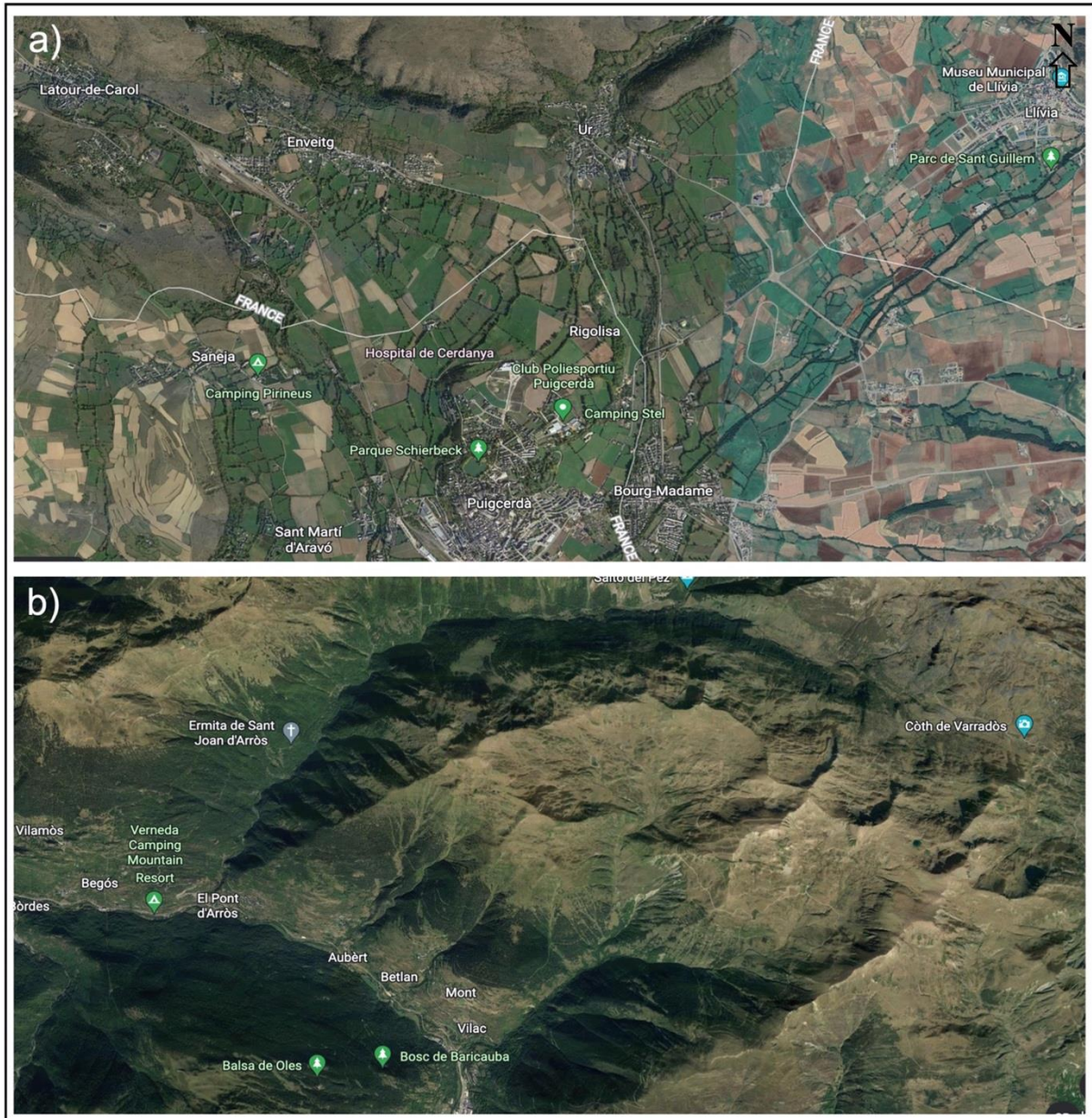


Fig. S2: Variation in locomotion (upper panel) and freezing behavior (lower panel) in association with the body length of color morphs (orange, white, yellow, yellow-orange and white-orange) of *Podarcis muralis* lizards. Presented locomotion and freezing behaviors were calculated as residual scores from mixed models including morphs and time as predictors and individual ID as random factor.

