

Habitat-linked morphological variation in the Asian water monitor lizard (*Varanus salvator*) across urban, agricultural, and forest landscapes in peninsular Malaysia

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SUPPLEMENTARY MATERIAL

Table S1: Full pairwise post hoc comparisons of morphological traits among sampling locations, including mean differences, standard errors, confidence intervals, and significance values. Different coloured font indicates significantly different variables.

Dependent Variable	Comparison	(I) Location	(J) Location	Mean Difference (I-J)	Std. Error	Sig.
Thigh Width	Tukey HSD	UMT_Urban	USM_Urban	-1.465	1.081	0.657
Thigh Width	Tukey HSD	UMT_Urban	SA_Agriculture	1.912	1.070	0.385
Thigh Width	Tukey HSD	UMT_Urban	KJ_Agriculture	2.172	1.070	0.257
Thigh Width	Tukey HSD	UMT_Urban	CH_Forest	-0.404	0.992	0.994
Thigh Width	Tukey HSD	USM_Urban	UMT_Urban	1.465	1.081	0.657
Thigh Width	Tukey HSD	USM_Urban	SA_Agriculture	3.376	1.148	0.030
Thigh Width	Tukey HSD	USM_Urban	KJ_Agriculture	3.636	1.148	0.016
Thigh Width	Tukey HSD	USM_Urban	CH_Forest	1.061	1.075	0.861
Thigh Width	Tukey HSD	SA_Agriculture	UMT_Urban	-1.912	1.070	0.385
Thigh Width	Tukey HSD	SA_Agriculture	USM_Urban	-3.376	1.148	0.030
Thigh Width	Tukey HSD	SA_Agriculture	KJ_Agriculture	0.260	1.138	0.999
Thigh Width	Tukey HSD	SA_Agriculture	CH_Forest	-2.316	1.065	0.194
Thigh Width	Tukey HSD	KJ_Agriculture	UMT_Urban	-2.172	1.070	0.257
Thigh Width	Tukey HSD	KJ_Agriculture	USM_Urban	-3.636	1.148	0.016
Thigh Width	Tukey HSD	KJ_Agriculture	SA_Agriculture	-0.260	1.138	0.999
Thigh Width	Tukey HSD	KJ_Agriculture	CH_Forest	-2.576	1.065	0.115
Thigh Width	Tukey HSD	CH_Forest	UMT_Urban	0.404	0.992	0.994
Thigh Width	Tukey HSD	CH_Forest	USM_Urban	-1.061	1.075	0.861
Thigh Width	Tukey HSD	CH_Forest	SA_Agriculture	2.316	1.065	0.194
Thigh Width	Tukey HSD	CH_Forest	KJ_Agriculture	2.576	1.065	0.115
Skull length	Tukey HSD	UMT_Urban	USM_Urban	-0.922	0.434	0.215
Skull length	Tukey HSD	UMT_Urban	SA_Agriculture	0.572	0.430	0.672
Skull length	Tukey HSD	UMT_Urban	KJ_Agriculture	0.459	0.430	0.823
Skull length	Tukey HSD	UMT_Urban	CH_Forest	0.787	0.398	0.282
Skull length	Tukey HSD	USM_Urban	UMT_Urban	0.922	0.434	0.215
Skull length	Tukey HSD	USM_Urban	SA_Agriculture	1.494	0.461	0.012
Skull length	Tukey HSD	USM_Urban	KJ_Agriculture	1.381	0.461	0.026
Skull length	Tukey HSD	USM_Urban	CH_Forest	1.709	0.432	0.001
Skull length	Tukey HSD	SA_Agriculture	UMT_Urban	-0.572	0.430	0.672
Skull length	Tukey HSD	SA_Agriculture	USM_Urban	-1.494	0.461	0.012
Skull length	Tukey HSD	SA_Agriculture	KJ_Agriculture	-0.113	0.457	0.999
Skull length	Tukey HSD	SA_Agriculture	CH_Forest	0.215	0.427	0.987
Skull length	Tukey HSD	KJ_Agriculture	UMT_Urban	-0.459	0.430	0.823
Skull length	Tukey HSD	KJ_Agriculture	USM_Urban	-1.381	0.461	0.026
Skull length	Tukey HSD	KJ_Agriculture	SA_Agriculture	0.113	0.457	0.999
Skull length	Tukey HSD	KJ_Agriculture	CH_Forest	0.328	0.427	0.939

Skull length	Tukey HSD	CH_Forest	UMT_Urban	-0.787	0.398	0.282
Skull length	Tukey HSD	CH_Forest	USM_Urban	-1.709	0.432	0.001
Skull length	Tukey HSD	CH_Forest	SA_Agriculture	-0.215	0.427	0.987
Skull length	Tukey HSD	CH_Forest	KJ_Agriculture	-0.328	0.427	0.939
Weight	Games-Howell	UMT_Urban	USM_Urban	-2.164	0.999	0.206
Weight	Games-Howell	UMT_Urban	SA_Agriculture	0.150	1.004	1.000
Weight	Games-Howell	UMT_Urban	KJ_Agriculture	0.951	0.980	0.867
Weight	Games-Howell	UMT_Urban	CH_Forest	-1.829	1.226	0.571
Weight	Games-Howell	USM_Urban	UMT_Urban	2.164	0.999	0.206
Weight	Games-Howell	USM_Urban	SA_Agriculture	2.315	0.949	0.120
Weight	Games-Howell	USM_Urban	KJ_Agriculture	3.116	0.924	0.011
Weight	Games-Howell	USM_Urban	CH_Forest	0.335	1.182	0.999
Weight	Games-Howell	SA_Agriculture	UMT_Urban	-0.150	1.004	1.000
Weight	Games-Howell	SA_Agriculture	USM_Urban	-2.315	0.949	0.120
Weight	Games-Howell	SA_Agriculture	KJ_Agriculture	0.801	0.929	0.909
Weight	Games-Howell	SA_Agriculture	CH_Forest	-1.979	1.186	0.460
Weight	Games-Howell	KJ_Agriculture	UMT_Urban	-0.951	0.980	0.867
Weight	Games-Howell	KJ_Agriculture	USM_Urban	-3.116	0.924	0.011
Weight	Games-Howell	KJ_Agriculture	SA_Agriculture	-0.801	0.929	0.909
Weight	Games-Howell	KJ_Agriculture	CH_Forest	-2.780	1.166	0.133
Weight	Games-Howell	CH_Forest	UMT_Urban	1.829	1.226	0.571
Weight	Games-Howell	CH_Forest	USM_Urban	-0.335	1.182	0.999
Weight	Games-Howell	CH_Forest	SA_Agriculture	1.979	1.186	0.460
Weight	Games-Howell	CH_Forest	KJ_Agriculture	2.780	1.166	0.133
Relative Thigh Width	Tukey HSD	UMT_Urban	USM_Urban	0.003	0.471	1.000
Relative Thigh Width	Tukey HSD	UMT_Urban	SA_Agriculture	3.037	0.466	<0.001
Relative Thigh Width	Tukey HSD	UMT_Urban	KJ_Agriculture	2.342	0.466	<0.001
Relative Thigh Width	Tukey HSD	UMT_Urban	CH_Forest	0.433	0.432	0.854
Relative Thigh Width	Tukey HSD	USM_Urban	UMT_Urban	-0.003	0.471	1.000
Relative Thigh Width	Tukey HSD	USM_Urban	SA_Agriculture	3.034	0.500	<0.001
Relative Thigh Width	Tukey HSD	USM_Urban	KJ_Agriculture	2.339	0.500	<0.001
Relative Thigh Width	Tukey HSD	USM_Urban	CH_Forest	0.430	0.468	0.890
Relative Thigh Width	Tukey HSD	SA_Agriculture	UMT_Urban	-3.037	0.466	<0.001
Relative Thigh Width	Tukey HSD	SA_Agriculture	USM_Urban	-3.034	0.500	<0.001
Relative Thigh Width	Tukey HSD	SA_Agriculture	KJ_Agriculture	-0.695	0.496	0.628
Relative Thigh Width	Tukey HSD	SA_Agriculture	CH_Forest	-2.604	0.464	<0.001
Relative Thigh Width	Tukey HSD	KJ_Agriculture	UMT_Urban	-2.342	0.466	<0.001
Relative Thigh Width	Tukey HSD	KJ_Agriculture	USM_Urban	-2.339	0.500	<0.001
Relative Thigh Width	Tukey HSD	KJ_Agriculture	SA_Agriculture	0.695	0.496	0.628
Relative Thigh Width	Tukey HSD	KJ_Agriculture	CH_Forest	-1.909	0.464	0.001
Relative Thigh Width	Tukey HSD	CH_Forest	UMT_Urban	-0.433	0.432	0.854
Relative Thigh Width	Tukey HSD	CH_Forest	USM_Urban	-0.430	0.468	0.890
Relative Thigh Width	Tukey HSD	CH_Forest	SA_Agriculture	2.604	0.464	<0.001
Relative Thigh Width	Tukey HSD	CH_Forest	KJ_Agriculture	1.909	0.464	0.001
Relative Skull Length	Tukey HSD	UMT_Urban	USM_Urban	-0.309	0.151	0.248
Relative Skull Length	Tukey HSD	UMT_Urban	SA_Agriculture	1.042	0.149	<0.001

Relative Skull Length	Tukey HSD	UMT_Urban	KJ_Agriculture	0.530	0.149	0.005
Relative Skull Length	Tukey HSD	UMT_Urban	CH_Forest	1.137	0.139	<0.001
Relative Skull Length	Tukey HSD	USM_Urban	UMT_Urban	0.309	0.151	0.248
Relative Skull Length	Tukey HSD	USM_Urban	SA_Agriculture	1.351	0.160	<0.001
Relative Skull Length	Tukey HSD	USM_Urban	KJ_Agriculture	0.839	0.160	<0.001
Relative Skull Length	Tukey HSD	USM_Urban	CH_Forest	1.446	0.150	<0.001
Relative Skull Length	Tukey HSD	SA_Agriculture	UMT_Urban	-1.042	0.149	<0.001
Relative Skull Length	Tukey HSD	SA_Agriculture	USM_Urban	-1.351	0.160	<0.001
Relative Skull Length	Tukey HSD	SA_Agriculture	KJ_Agriculture	-0.512	0.159	0.013
Relative Skull Length	Tukey HSD	SA_Agriculture	CH_Forest	0.095	0.149	0.969
Relative Skull Length	Tukey HSD	KJ_Agriculture	UMT_Urban	-0.530	0.149	0.005
Relative Skull Length	Tukey HSD	KJ_Agriculture	USM_Urban	-0.839	0.160	<0.001
Relative Skull Length	Tukey HSD	KJ_Agriculture	SA_Agriculture	0.512	0.159	0.013
Relative Skull Length	Tukey HSD	KJ_Agriculture	CH_Forest	0.607	0.149	0.001
Relative Skull Length	Tukey HSD	CH_Forest	UMT_Urban	-1.137	0.139	<0.001
Relative Skull Length	Tukey HSD	CH_Forest	USM_Urban	-1.446	0.150	<0.001
Relative Skull Length	Tukey HSD	CH_Forest	SA_Agriculture	-0.095	0.149	0.969
Relative Skull Length	Tukey HSD	CH_Forest	KJ_Agriculture	-0.607	0.149	0.001
Body Condition	Tukey HSD	UMT_Urban	USM_Urban	-0.623	0.487	0.705
Body Condition	Tukey HSD	UMT_Urban	SA_Agriculture	1.332	0.482	0.050
Body Condition	Tukey HSD	UMT_Urban	KJ_Agriculture	1.130	0.482	0.137
Body Condition	Tukey HSD	UMT_Urban	CH_Forest	-0.950	0.447	0.215
Body Condition	Tukey HSD	USM_Urban	UMT_Urban	0.623	0.487	0.705
Body Condition	Tukey HSD	USM_Urban	SA_Agriculture	1.955	0.517	0.002
Body Condition	Tukey HSD	USM_Urban	KJ_Agriculture	1.753	0.517	0.008
Body Condition	Tukey HSD	USM_Urban	CH_Forest	-0.327	0.484	0.962
Body Condition	Tukey HSD	SA_Agriculture	UMT_Urban	-1.332	0.482	0.050
Body Condition	Tukey HSD	SA_Agriculture	USM_Urban	-1.955	0.517	0.002
Body Condition	Tukey HSD	SA_Agriculture	KJ_Agriculture	-0.202	0.513	0.995
Body Condition	Tukey HSD	SA_Agriculture	CH_Forest	-2.282	0.480	<0.001
Body Condition	Tukey HSD	KJ_Agriculture	UMT_Urban	-1.130	0.482	0.137
Body Condition	Tukey HSD	KJ_Agriculture	USM_Urban	-1.753	0.517	0.008
Body Condition	Tukey HSD	KJ_Agriculture	SA_Agriculture	0.202	0.513	0.995
Body Condition	Tukey HSD	KJ_Agriculture	CH_Forest	-2.080	0.480	<0.001
Body Condition	Tukey HSD	CH_Forest	UMT_Urban	0.950	0.447	0.215
Body Condition	Tukey HSD	CH_Forest	USM_Urban	0.327	0.484	0.962
Body Condition	Tukey HSD	CH_Forest	SA_Agriculture	2.282	0.480	<0.001
Body Condition	Tukey HSD	CH_Forest	KJ_Agriculture	2.080	0.480	<0.001

Figure S1: Mean values ($\pm 95\%$ confidence intervals) of seven morphological traits of *Varanus salvator* across five sampling locations and three habitat types.





