



Supplementary figure S1. Phylogenetic relationships of sinistral (red) and dextral (blue) snails of the genus *Satsuma*. The tree is based on the combined CO1, ITS and ETS sequences using the most-likelihood method. The numbers above or below branches indicate MP and ML bootstrap values, followed by Bayesian posterior probabilities (< 50% not shown).

Supplementary Table S1. Summaries of generalized linear mixed models in accounting for the occurrence of sinistral snail genera.

Full model in the Test 1 to test the effect of Snake (AIC [Akaike Information Criterion]: 360.8)

Fixed effects	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	-6.5379	1.4320	-4.566	4.98E-06
Shape	4.1205	1.5032	2.741	0.00612
Size	0.8307	0.4169	1.992	0.04633
Shape × Size	-0.9177	0.4595	-1.997	0.04578
Snake	0.8597	0.3585	2.398	0.01649

Correlation of fixed effects

	(Intercept)	Shape	Size	Shape × Size
Shape	-0.937			
Size	-0.959	0.906		
Shape × Size	0.859	-0.948	-0.884	
Snake	-0.038	-0.034	-0.065	0.089

Full model in the Test 2 to test the effect of interaction between Snake and Size (AIC: 354.2)

Fixed effects	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	-5.0695	1.4674	-3.455	0.000551
Shape	3.1143	1.4926	2.087	0.036929
Size	0.2361	0.4801	0.492	0.622851
Shape × Size	-0.4681	0.4903	-0.955	0.339750
Snake	-1.6739	1.0892	-1.537	0.124329
Snake × Size	1.0463	0.4035	2.593	0.009514

Correlation of fixed effects

	(Intercept)	Shape	Size	Shape × Size	Snake
Shape	-0.946				
Size	-0.951	0.892			
Shape × Size	0.884	-0.945	-0.907		
Snake	-0.388	0.311	0.458	-0.380	
Snake × Size	0.435	-0.359	-0.563	0.463	-0.930

Full model in the Test 3 to test the effect of interaction between Snake and Shape (AIC: 353)

Fixed effects	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	-7.1564	1.4739	-4.855	1.20E-06
Shape	5.0046	1.5360	3.258	0.001121
Size	0.7483	0.4132	1.811	0.070152
Shape × Size	-0.8315	0.4519	-1.840	0.065742
Snake	2.4744	0.7262	3.407	0.000656
Snake × Shape	-2.4810	0.8742	-2.838	0.004541

Correlation of fixed effects

	(Intercept)	Shape	Size	Shape × Size	Snake
Shape	-0.951				
Size	-0.898	0.851			
Shape × Size	0.811	-0.885	-0.897		
Snake	-0.288	0.274	-0.082	0.084	
Snake × Shape	0.239	-0.263	-0.563	-0.061	-0.820

Supplementary Methods

For our analyses of biogeography, first we confirmed by taxonomic reports^{57,58} that pareatid snakes were distributed from eastern India and southern China to Malay Peninsular with several islands including Sumatra, Borneo, Java, Palawan, Mindanao, Taiwan, Ishigaki and Iriomote Islands. Second, we strictly determined the geographic range of pareatids by referring literature on Chinese^{59,60}, Bornean⁶¹ and Indian⁶² snakes. Our data on stylommatophoran snails primarily depended on a comprehensive monograph⁶³ and general illustrated books^{64 65}. For deep investigations on the edge of the snake range, we referred literature on Japanese⁶⁶, Taiwanese⁶⁷, Chinese⁶⁸, Indian⁶⁹, Malaysian and Indonesian^{70,71} snails.

Supplementary References:

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