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PAPER



Size evolution in island lizards

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ABSTRACT

Aim The island rule, small animal gigantism and large animal dwarfism on islands, is a topic of much recent debate. While size evolution of insular lizards has been widely studied, whether or not they follow the island rule has never been investigated. I examined whether lizards show patterns consistent with the island rule.

Location Islands worldwide.

Methods I used literature data on the sizes of island–mainland population pairs in 59 species of lizards, spanning the entire size range of the group, and tested whether small insular lizards are larger than their mainland conspecifics and large insular lizards are smaller. I examined the influence of island area, island isolation, and dietary preferences on lizard size evolution.

Results Using mean snout–vent length as an index of body size, I found that small lizards on islands become smaller than their mainland conspecifics, while large ones become larger still, opposite to predictions of the island rule. This was especially strong in carnivorous lizards; omnivorous and herbivorous species showed a pattern consistent with the island rule but this result was not statistically significant. No trends consistent with the island rule were found when maximum snout–vent length was used. Island area had, at best, a weak effect on body size. Using maximum snout–vent length as an index of body size resulted in most lizard populations appearing to be dwarfed on islands, but no such pattern was revealed when mean snout–vent length was used as a size index.

Main conclusions I suggest that lizard body size is mostly influenced by resource availability, with large size allowing some lizard populations to exploit resources that are unavailable on the mainland. Lizards do not follow the island rule. Maximum snout–vent length may be biased by sampling effort, which should be taken into account when one uses this size index.

Keywords

Body size, dwarfism, gigantism, island rule, islands, major axis regression, Sauria, snout–vent length.

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INTRODUCTION

Body sizes of animals on islands often differ substantially from those of their mainland conspecifics. Van Valen (1973) interpreted the findings of Foster (1964) as an ‘island rule’, describing the tendency of small mammals to evolve larger sizes on islands than their mainland conspecifics, whereas large mammals evolve to be smaller than their mainland conspecifics. Similar patterns have been shown to occur in birds (Clegg & Owens, 2002) and

snakes (Boback & Guyer, 2003). The island rule has therefore been claimed to be a general pattern of intraspecific size evolution in all terrestrial vertebrates (Lomolino, 2005; Lomolino *et al.*, 2005). The island rule is believed to derive from a combination of factors. Resource limitation can cause a decrease in size in populations of large-bodied animal species. Character release (Dayan & Simberloff, 2005) allows animals to evolve towards the size of their missing competitors. The scarcity of predators on islands may allow populations of small animal species to evolve larger

body sizes, thereby facilitating enhanced feeding efficiency by lengthening the time that can be spent feeding and gut retention time (Case, 1982; Smith, 1992). Character release can also enable large animals to become smaller to achieve greater reproductive success (Raia *et al.*, 2003). High population densities on islands are thought to promote gigantism because large individuals are favoured in intraspecific encounters (Melton, 1982).

The evolution of both small and large animal species towards a medium body size is often perceived to indicate that this size is an evolutionary attractor and is favoured on islands under reduced interspecific competition (Roughgarden & Pacala, 1989; Brown *et al.*, 1993; Damuth, 1993; Miles & Dunham, 1996; Boback & Guyer, 2003; Lomolino, 2005). However, the model, the evolutionary scenario and the empirical evidence for optimal insular size have all been questioned and optimal size often seems to be an *ad hoc* property of a particular data base rather than a biological reality (Blackburn & Gaston, 1996; Meiri *et al.*, 2005b, 2006).

But what about the pattern itself? Although it has been shown that the island rule holds for mammals, birds and snakes, some evidence indicates the most of the patterns that were reported are far from strong. The mammalian data analysed by Lomolino (1985) are based on 71 species, mostly Holarctic ones. Using a global data base of 52 carnivore species and another data base of 91 mammalian species, Meiri *et al.* (2006) found no support for the island rule (see also Meiri *et al.*, 2004). Although birds show a trend from gigantism in small species to dwarfism in large ones (Clegg & Owens, 2002), this pattern disappears when interspecific comparisons are excluded from the analysis (S.M. Clegg, I.P.F. Owens & S. Meiri, unpublished). The interspecific comparisons of Clegg & Owens (2002) mainly involve endemic species on oceanic islands (I.P.F. Owens, pers. comm.), whereas most of the mammal and reptile data (Foster, 1964; Lomolino, 1985; Boback & Guyer, 2003; Meiri *et al.*, 2004) come from land-bridge islands. Using just intraspecific comparisons of land-bridge island animals helps ensure that only closely related taxa are used. It also minimizes the effect of island age, because the separation of island and mainland populations would usually have occurred when sea levels rose at the end of the last ice age.

Patterns of size evolution on islands are often thought to be affected by factors such as island area and isolation (Heaney, 1978; Meiri *et al.*, 2005a; White & Searle, 2007). Size patterns are thought to be strongest on small and remote islands, which differ most from mainland areas in the number of predator and competitor species, and where resources may be more limited. Animals having different diets may also differ in their response to the insular environment: Raia & Meiri (2006) have shown that mammalian carnivores tend to differ little from their mainland relatives, whereas ungulates diverge much more in size. Lizards are often perceived to increase in size on islands, coupled with a tendency for a more herbivorous diet (e.g. Sokol, 1967; Herrel *et al.*, 2004; but see Pough, 1973). Szarski (1962) maintained that lizard herbivory is favoured in relatively predator-free environments such as islands. Olesen & Valido (2003) suggested that dietary shifts may stem from a general scarcity of arthropods on islands, with increased size being necessary to facilitate the digestion of low-quality plant food.

The evolution of size in insular lizards has been widely studied (e.g. Case, 1976, 1978, 1982; Dunham *et al.*, 1978; Pregill, 1986; Petren & Case, 1997; Van Damme, 1999; Jessop *et al.*, 2006), especially in Caribbean *Anolis* (e.g. Schoener, 1970; Losos, 1994; Roughgarden, 1995; Miles & Dunham, 1996). However, explicit treatments of reptile size evolution on islands in relation to ancestral body size have been published only for snakes (but see Lomolino, 2005, for unpublished data on turtles). Boback & Guyer (2003) have shown that the maximum body length of 30 species of insular snakes follows the pattern predicted by the island rule. Lizards, the largest reptilian group, are largely absent from this debate.

To examine whether lizards adhere to the island rule and to test for the effects of diet, island area and isolation, I gathered literature data on body sizes of lizards on continental-shelf islands and compared them with body sizes of conspecifics on the near mainland areas. I aimed to test whether: (1) lizards tend to dwarf or become larger on islands; (2) small lizards become larger and large lizards become smaller on islands compared with their mainland conspecifics; (3) dietary preferences affect lizard size evolution; and (4) island area and isolation affect lizard size evolution.

MATERIALS AND METHODS

I gathered literature data on lizard snout–vent lengths (SVL), the commonest measure used as an index of lizard size. Total length is another common index, but this measure includes tail length, which may change in response to selection pressures other than those affecting body size. Furthermore, tail loss is very common in lizards, and thus using SVL results in higher sample sizes. While the use of body mass, which is not affected by shape as SVL may be, would have been preferable, lizard mass data are seldom reported. Because lizards grow throughout their lives, SVL may be sensitive to population age structure, especially in short-lived species. Many herpetologists therefore use the size of the largest individual as a measure of size, arguing that it is a good measure of the size potential in a population (e.g. Greer, 2001). Consequently, maximum SVL is often the only size measure reported. Because the largest individual can be an outlier, some authors use the size of a number of the largest individuals or a fraction of the largest ones (e.g. the upper decile SVL; Case, 1976). Here, I treat all these indices as equivalent measures of maximum SVL.

Maxima, however, may not be good estimators of body size within populations. Large samples are required to obtain reasonable estimates of asymptotic size even in fast-growing lizards (Stamps & Andrews, 1992). Furthermore, as Dunham *et al.* (1978) argued, selection acts on adult body size through all reproductively active individuals (though not necessarily equally), not just the largest fraction. Therefore, the mean or median size of adults may be better size indices, and these are usually the only size indices used for homeotherms. Finally, the use of maximum size may be sensitive to sampling. It is conceivable that mainland areas are likely to harbour the largest individuals simply because more mainland populations exist (Case & Schwaner, 1993; Trammer, 2005). Especially if a species exhibits strong geographical variation in size on the continent (e.g. Ashton & Feldman, 2003), the

probability that an insular population will contain the largest individual may be low. Therefore, the largest individual may be more likely to inhabit mainland areas. On the other hand, some insular populations may be better sampled because islands often present unique opportunities to capitalize on increasing captures.

The two indices cannot be combined because a small lizard species that is expected to become large can have a maximum SVL larger than the mean SVL of a larger lizard species that is expected to dwarf on islands. I therefore analysed both maximum SVL (including maximum of the largest fraction of the population) and mean SVL (or median SVL where only size ranges were reported) separately. When a sample was based on a single individual it was included in both analyses.

The island rule is described for populations within species and is therefore mostly restricted to land-bridge islands, because populations on oceanic islands are usually isolated for long enough that they diverge at the species level. I used only intra-specific comparisons and only studies that reported the body size of both insular and mainland populations. Taxonomy followed Uetz (2006). To best understand the mechanisms of size evolution it is preferable to compare insular populations with the mainland populations from which they were derived. This is because comparing distant populations may be misleading if size differences result from factors that have nothing to do with insularity. Furthermore, just obtaining the size of insular and mainland populations from anywhere along a species' range is sensitive to sampling (see above). Data on genetic relatedness, however, were available only for the populations described in Radtkey *et al.* (1997). In all other cases I therefore used geographical proximity as a surrogate for genetic relatedness and compared insular populations to populations inhabiting the closest mainland or the closest larger (at least 10 times as large) island. Use of multiple populations of the same species can overestimate the actual number of degrees of freedom, enhancing type 1 errors. On the other hand, if different populations of the same species show different patterns then it is not ancestral body size *per se* that is the main driver of the direction and magnitude of size evolution, but the prevailing autecological conditions faced by each insular population (Schwaner, 1985; Hasegawa & Moriguchi, 1989; Raia & Meiri, 2006). I therefore treat all population pairs as independent, but repeat the analysis with each species counted only once, by averaging the island and mainland sizes of all conspecifics. When sex was reported I compared only animals of the same sex, with the sexes treated as distinct morphospecies when analysing population-level data.

Island area and isolation may often be related to resource availability, species richness (and hence to ecological interactions) and the likelihood of colonization. These factors have been hypothesized to play a major role in determining body size evolution in insular environments and were therefore hypothesized to affect size in a predictable manner (Heaney, 1978; Lomolino, 2005). To test for the effects of these factors, I obtained area and isolation (distance from the nearest mainland) data for most of the islands from the published literature (e.g. Lawlor, 1986; Case & Cody, 2002; Meiri *et al.*, 2005b), from the United Nations Environment Programme website (<http://islands.unep.ch>), and

from maps. I tested for the effects of area and isolation using multiple regression. Because large islands may be more 'mainland like' in relation to factors that are thought to affect body size, such as competition, resource availability and predation (Lomolino, 2005), I used only islands smaller than 10,000 km². I did not use islands that are connected to the mainland during low tides, or artificial islands. I used a large island as 'mainlands' for a smaller island only when it was at least 10 times as large as the smaller island. Repeating the analyses with only continental areas and no large islands serving as the mainland resulted in slightly steeper slopes (i.e. further away than predicted by the island rule), but did not qualitatively change the results (results not shown).

Most lizards in my data set (40 species) feed exclusively on animal matter. However, 17 species also take at least some plant material. Four of these (*Ctenosaura hemilopha*, *Dipsosaurus dorsalis*, *Egernia cunninghami* and *Tiliqua rugosa*) are chiefly herbivorous; the others more omnivorous. To test for the effects of diet on the evolution of body size I compared the slopes of the regression of island on mainland SVL between two dietary categories: species that take at least some plant food (herbivores and omnivores) and those that do not (carnivores). While it may be interesting to look at whether patterns are similar in different lizard clades, or between different biogeographical realms, small sample sizes preclude meaningful analyses at this point.

The SVL of insular lizards was regressed against the SVL of the mainland population. The SVL data were log-transformed prior to all analyses to fit the assumption of parametric tests (Crawley, 2002). If small lizard species become larger and large lizard species become smaller, the slope of this regression would be less than 1. Least-squares regression can seriously underestimate the true regression slope, thereby making the island rule appear more prominent than it actually is (Gould, 1975). The high correlation between insular and mainland SVL ($r = 0.97\text{--}0.98$, see below), however, means that this effect is probably minor (Smith, 1999). Nonetheless, length data are likely to include errors in both axes. I therefore used major axis regression. All analyses were conducted in the R environment (R Development Core Team, 2006).

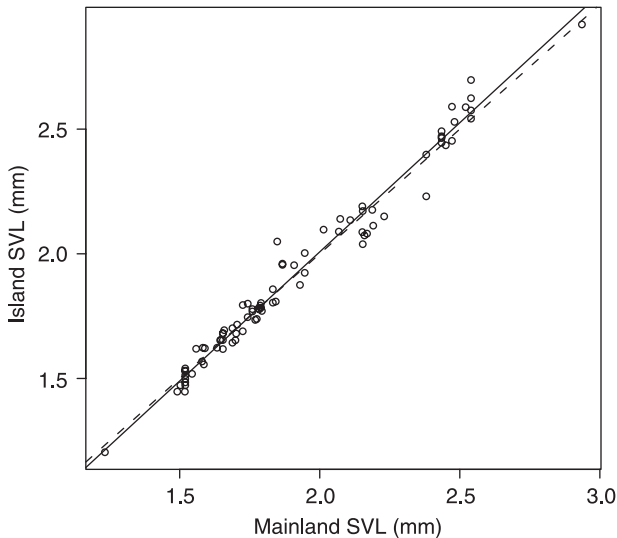
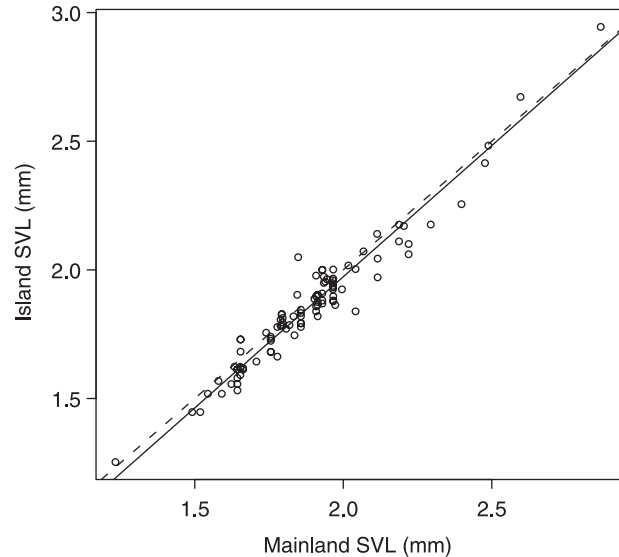
RESULTS

Mean SVL data were available for 83 populations belonging to 40 species in 11 lizard families. Maximum SVL data were available for 100 populations belonging to 46 species in 13 families. Combined, these represent 59 species in 14 families (see Appendices S1–S4 in Supplementary Material; some sources report both size indices). Both data sets include the smallest lizard species (*Sphaerodactylus ariasae*, Hedges & Thomas, 2001) and either the world's largest lizard species (*Varanus komodoensis*, mean SVL) or a close runner-up (*Varanus giganteus*, maximum SVL).

Thirty-seven island populations have a shorter mean SVL than their mainland counterparts, 44 have longer mean SVL and two populations have equal mean lengths. For maximum SVL, these values are 73, 23 and 4, respectively. Ignoring ties, the binomial probabilities for these results are 0.51 for mean SVL, but $\ll 0.001$ for maximum SVL. Where sample sizes are reported, they are much larger on mainlands for both mean SVL (mean mainland

Table 1 Slopes and intercepts of major axis regression of insular snout–vent length (SVL) on mainland SVL.

Unit of analysis	Size index	<i>n</i>	<i>r</i>	Major axis slope	95% CI of the slope	<i>P</i> (slope ≠ 1)	Intercept	95% CI of the intercept
Populations	Mean SVL	83	0.989	1.036	1.002–1.071	0.039	−0.064	−0.131 to 0.003
Species averages	Mean SVL	40	0.983	1.013	0.953–1.077	0.68	−0.024	−0.14 to 0.090
Populations	Maximum SVL	100	0.971	1.019	0.970–1.071	0.44	−0.066	−0.161 to 0.030
Species averages	Maximum SVL	46	0.979	1.030	0.967–1.097	0.35	−0.079	−0.205 to 0.046

**Figure 1** Mean snout–vent length (SVL). Regression of (log-transformed) island SVL on mainland SVL of 83 island–mainland population pairs. Island and mainland values are based on mean SVL values. The solid line is the major axis fit; the dotted line shows the null expectation, a slope of 1 and intercept of zero.**Figure 2** Maximum SVL. Regression of (log-transformed) island snout–vent length (SVL) on mainland SVL of 100 island–mainland population pairs. Island and mainland values are based on maximum SVL values of each population. The solid line is the major axis fit; the dotted line shows the null expectation, a slope of 1 and intercept of zero.

sample size = 28.8, mean island sample size = 15.3, $n = 62$ pairs, Wilcoxon matched pairs test, $U = 412.5$, $P = 0.011$) and maximum SVL (mean mainland sample size = 32.6, mean island sample size = 15.5, $n = 48$ pairs, $U = 145$, $P = 0.001$). While this difference may not bias mean SVL, it is reasonable to expect that a larger sample will contain the largest individual by chance alone. Thus, the greater number of insular dwarves in the maximum SVL data may simply be an artefact of lower sample sizes.

Major axis slopes and intercepts for the regression of population-level insular SVL on mainland SVL are shown in Table 1. The slope is always slightly higher than 1, but this excess is significant only for mean SVL when populations are considered separately (Figs 1 & 2). Thus, mean SVL seems to evolve in a direction opposite to that predicted by the island rule: small lizards become smaller, while larger lizards become larger still on islands. The intercept does not differ significantly from zero in any test. In all data sets, body sizes of islands and mainland populations are highly correlated (r values between 0.971 and 0.989).

Isolation had no significant effect in either case (mean SVL, $n = 83$, slope = 0.0025 ± 0.0093 , $t = 0.27$, $P = 0.79$; maximum SVL,

$n = 100$, slope = -0.014 ± 0.009 , $t = 1.46$, $P = 0.15$). Area had no significant effect on mean SVL ($n = 83$, slope = -0.0015 ± 0.004 , $t = 0.35$, $P = 0.73$) but was significantly and positively associated with maximum SVL ($n = 100$, slope = 0.0128 ± 0.005 , $t = 2.58$, $P = 0.012$), although the slope is shallow. Thus, larger maximum (but not mean) SVL seems to be associated with larger islands.

Diet significantly affected the regression, with slopes for lizards that include plants in their diet being shallower than those for lizards eating only animal food (ANCOVA, test for different slopes, with mainland SVL as a covariate: maximum SVL, $t = 2.755$, $P = 0.007$; mean SVL, $t = 2.554$, $P = 0.013$). Major-axis slopes for the two dietary categories are shown in Table 2. In only one case does the slope differ significantly from 1: the mean SVL of carnivorous lizards shows an opposite pattern to the island rule, with small lizards becoming smaller still on islands, and large lizards becoming even larger.

DISCUSSION

I found that lizards do not follow the island rule. In fact, some of the results suggest that size is diverging on islands, with small

Table 2 Slopes of major axis regressions of insular snout–vent length (SVL) on mainland SVL for different dietary groups.

Diet	Size index	<i>n</i> (populations)	Major axis slope	95% CI of the slope	<i>P</i> (slope ≠ 1)
Carnivores	Mean SVL	57	1.051	1.022–1.081	0.001
Carnivores	Maximum SVL	80	1.043	0.994–1.094	0.084
Omnivores and herbivores	Mean SVL	26	0.968	0.845–1.108	0.621
Omnivores and herbivores	Maximum SVL	20	0.902	0.718–1.128	0.343

lizards becoming smaller still and large lizards evolving even larger sizes. This is especially evident in carnivorous species. While omnivorous and herbivorous lizard species show patterns consistent with the island rule, this is not statistically significant. Island area and isolation have little effect on size evolution. There is no overall tendency for lizards either to become larger or to dwarf on islands. When maximum SVL is used as a size index, insular dwarfism is significantly more frequent than gigantism. I believe, however, that this difference reflects a bias rather than an actual pattern, because maximum size is probably sensitive to sampling efforts (Case & Schwaner, 1993), which are larger on mainlands. With mean SVL, neither dwarfism nor gigantism predominates. Furthermore, the intercepts of the island–mainland regression were not significantly different from zero in any test, and the slopes were not significantly different from 1 or slightly steeper.

Interestingly, there is also some tendency towards insular dwarfism in the snake data of Boback & Guyer (2003), with 21 of 30 species having lower maximum SVL on islands (binomial test, $P = 0.043$). I do not suggest, however, that the snake data are biased: Boback & Guyer (2003) used means when multiple island populations existed (S.M. Boback, pers. comm., 2006).

An alternative explanation would be that the pattern is real, and that insular lizards have accelerated life-history characteristics, as has been suggested for insular elephants (Raia *et al.*, 2003). Under this scenario, mean size may be similar but few insular lizards reach old age and therefore they do not attain very large size. This hypothesis, however, may be at odds with the notion that the scarcity of predators and competitors leads to increased densities and higher levels of intraspecific competition, selecting for large size (Case, 1982; Melton, 1982). Thus, for lizards, sampling bias is probably a more parsimonious explanation. The use of maximum SVL as a measure of size should perhaps be restricted to populations for which large numbers of specimens were measured (Stamps & Andrews, 1992).

Furthermore, contrary to data reported above, interspecific patterns seem to show that insular gigantism may be the rule rather than the exception in lizards, with many of the largest taxa in several lizard clades being insular endemics (e.g. Russell & Bauer, 1986). Both the largest carnivorous and the largest herbivorous lizard species, for example, are insular endemics (*Varanus komodoensis* and species of *Cyclura*, respectively), and in some taxa the largest forms are predominantly insular endemics (Bauer & Russell, 1986; Greer, 2001). In a series of works, Pregill and co-workers have shown that many islands were inhabited by very large lizards that went extinct shortly after human occupation (e.g. Pregill, 1986; Pregill & Dye, 1989; Pregill & Worthly, 2003).

Thus, data on the maximum SVL of some insular populations may underestimate true potential size. Accounting for this underestimate would lower the slope of the island–mainland regression, making current patterns seem more consistent with the island rule.

For mean SVL, lizard sizes seem to be diverging on islands, with small lizards becoming somewhat smaller and large lizards increasing in size. Lizards that eat only animal food, probably the predominant lizard feeding behaviour, show the strongest pattern. However, large size coupled with herbivory is a common feature of many insular lizards (Szarski, 1962; Pough, 1973; Olesen & Valido, 2003); herbivorous and omnivorous lizard species actually show a pattern consistent with the island rule, although this is not statistically significant. Small animal-eating lizards feed mainly on arthropods, while larger ones include large proportions of vertebrate food in their diets (Case & Schwaner, 1993). Olesen & Valido (2003) argued that insects are often scarce on islands relative to the mainland, while on the other hand islands may harbour an excess of vertebrate prey in the form of sea-bird chicks (Schwaner & Sarre, 1990; Bonnet *et al.*, 2002; Boback, 2003; see also Goltsman *et al.*, 2005). Thus, the size patterns described above may stem from the relative abundance of different prey types.

Area and isolation seem to have very little influence on size evolution. Area was positively correlated with maximum SVL, but the slope of this relationship is shallow, and it may, again, simply reflect sampling effects. These results agree with most of the empirical data published for mammals (reviewed in Meiri *et al.*, 2005a). There are, however, many examples of size changes in response to the presence of competitors in island lizards (Schoener, 1970), suggesting that further within-archipelago studies may reveal area and isolation to be important.

The use of a single value for each species, rather than data for multiple population pairs, avoids inflating the number of degrees of freedom (Lawlor, 1982). Considering only the highest reported size for each species, however, can mask enormous intraspecific variation in the body sizes of insular populations. In many species, populations of both insular dwarves and insular giants are known from nearby islands that differ in the nature of their resource base and in community composition (Schwaner, 1985; Hasegawa & Moriguchi, 1989; Raia & Meiri, 2006). Thus, even if these populations share the same mainland ancestor, it is the island-specific conditions that affect body size, rather than ancestral body size as expected by the island rule. If we reduce this question to a study of just the largest insular and mainland specimens, we may overlook the true mechanisms that drive size evolution.

Lizards show either no consistent pattern of size evolution on islands relative to their size on the mainland or a pattern opposite to the island rule. It seems, therefore, that the claim that all vertebrate groups show patterns consistent with the island rule (Lomolino, 2005) is premature. Patterns in all groups for which the rule was shown to hold may be sensitive to the use of particular data sets, size indices and analytical techniques.

ACKNOWLEDGEMENTS

I am indebted to Liz Butcher and Barbara Sanger from the Michael Way Library for their invaluable help in obtaining some of the old and neglected literature sources used in this work. I thank Tamar Dayan, Ally Phillimore and Andy Purvis for stimulating discussion. Dave Orme kindly helped me obtain area and isolation data. I thank Scott Boback, Sonya Clegg, Meirav Meiri, Virginie Millien, Miguel Olalla-Tarraga, Ian Owens, Pasquale Raia, Daniel Simberloff, Gavin Thomas and an anonymous referee for many important comments on earlier versions of this manuscript.

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BIOSKETCH

Shai Meiri is studying macroecological patterns in diverse vertebrate groups. He is interested in the evolution of body size, biogeographical correlates of morphology and the morphological signature of speciation.

Editor: Tim Blackburn

SUPPLEMENTARY MATERIAL

The following supplementary material is available for this article:

Appendix S1 Maximum snout–vent length (SVL) data and sources

Appendix S2 Mean snout–vent length (SVL) data and sources

Appendix S3 Geographical data on the islands used in this study

Appendix S4 References for online Appendices S1 and S2

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Appendix S1. Maximum snout-vent length (SVL) data and sources.

Family	Species	Island	Mainland	Sex
Polichrotidae	<i>Anolis marmoratus</i>	Desirade	Guadeloupe	female
Polichrotidae	<i>Anolis marmoratus</i>	Desirade	Guadeloupe	male
Polichrotidae	<i>Anolis marmoratus</i>	Kahouanne	Guadeloupe	female
Polichrotidae	<i>Anolis marmoratus</i>	Kahouanne	Guadeloupe	male
Polichrotidae	<i>Anolis marmoratus</i>	Petite Terre	Guadeloupe	male
Polichrotidae	<i>Anolis marmoratus</i>	Petite Terre	Guadeloupe	female
Polichrotidae	<i>Anolis marmoratus</i>	Terre de Bas	Guadeloupe	male
Polichrotidae	<i>Anolis marmoratus</i>	Terre de Bas	Guadeloupe	female
Polichrotidae	<i>Anolis marmoratus</i>	Terre de Haut	Guadeloupe	female
Polichrotidae	<i>Anolis marmoratus</i>	Terre de Haut	Guadeloupe	male
Phrynosomatidae	<i>Callisaurus draconoides</i>	Angel de La Guarda	N. Baja	unsexed
Scincidae	<i>Carlia fusca</i>	Jamna	New Guinea	unsexed
Teiidae	<i>Cnemidophorus hyperythri</i>	Carmen	Baja California & S. Californ	unsexed
Teiidae	<i>Cnemidophorus hyperythri</i>	Coronado	Baja California & S. Californ	unsexed
Teiidae	<i>Cnemidophorus hyperythri</i>	Espiritu Santo	Baja California & S. Californ	unsexed
Teiidae	<i>Cnemidophorus hyperythri</i>	Espiritu Santo	La Paz, Baja California	unsexed
Teiidae	<i>Cnemidophorus hyperythri</i>	Monserate	Baja California & S. Californ	unsexed
Teiidae	<i>Cnemidophorus hyperythri</i>	Monserate	La Paz, Baja California	unsexed
Teiidae	<i>Cnemidophorus hyperythri</i>	San Francisco	Baja California & S. Californ	unsexed
Teiidae	<i>Cnemidophorus hyperythri</i>	San Francisco	La Paz, Baja California	unsexed
Teiidae	<i>Cnemidophorus hyperythri</i>	San Jose	Baja California & S. Californ	unsexed
Teiidae	<i>Cnemidophorus hyperythri</i>	San Jose	La Paz, Baja California	unsexed
Teiidae	<i>Cnemidophorus hyperythri</i>	San Marcos	Baja California & S. Californ	unsexed
Teiidae	<i>Cnemidophorus tigris</i>	Angel de La Guarda	El Arco & Punta Abreojos	unsexed
Teiidae	<i>Cnemidophorus tigris</i>	Carmen	San Ignacio & La Presa de Sa	unsexed
Teiidae	<i>Cnemidophorus tigris</i>	Cedros	El Arco & Punta Abreojos	unsexed
Teiidae	<i>Cnemidophorus tigris</i>	Coronado	Bahia Los Angeles	unsexed
Teiidae	<i>Cnemidophorus tigris</i>	Espiritu Santo	La Paz, Baja California	unsexed
Teiidae	<i>Cnemidophorus tigris</i>	Partida Norte	El Arco & Punta Abreojos	unsexed
Teiidae	<i>Cnemidophorus tigris</i>	San Esteban	NE Baja	unsexed
Teiidae	<i>Cnemidophorus tigris</i>	San Esteban	Bahia Los Angeles	unsexed
Teiidae	<i>Cnemidophorus tigris</i>	San Francisco	La Paz, Baja California	unsexed
Teiidae	<i>Cnemidophorus tigris</i>	San Lorenzo Norte	Bahia Los Angeles	unsexed
Teiidae	<i>Cnemidophorus tigris</i>	San Marcos	San Ignacio & La Presa de Sa	unsexed
Teiidae	<i>Cnemidophorus tigris</i>	San Pedro Martir	Bahia Los Angeles	unsexed
Teiidae	<i>Cnemidophorus tigris</i>	Tiburón	Bahia Los Angeles	unsexed
Gekkonidae	<i>Coleonyx switaki</i>	San Marcos	Baja California	unsexed
Gekkonidae	<i>Cyrtopodion caspius</i>	Vulf	Caucasus to Kazakhstan	female
Dibamidae	<i>Dibamus bourreti</i>	Katba	N. Vietnam and SE China	male
Anguidae	<i>Elgaria multicarinata</i>	Coronado	Baja California	unsexed
Anguidae	<i>Elgaria multicarinata</i>	San Martin	Baja California	unsexed
Agamidae	<i>Gonocephalus grandis</i>	Tioman	Malay Peninsula	male
Gymnophthalmidae	<i>Gymnophthalmus speciosus</i>	Trinidad	Venezuela	female
Gymnophthalmidae	<i>Gymnophthalmus speciosus</i>	Trinidad	Venezuela	male
Gymnophthalmidae	<i>Gymnophthalmus underwo</i>	Barbados	N. Guyana	female
Gymnophthalmidae	<i>Gymnophthalmus underwo</i>	Dominica	N. Guyana	female
Gymnophthalmidae	<i>Gymnophthalmus underwo</i>	Grenada	N. Guyana	female
Gymnophthalmidae	<i>Gymnophthalmus underwo</i>	Guadeloupe	N. Guyana	female
Gymnophthalmidae	<i>Gymnophthalmus underwo</i>	St. Vincent	N. Guyana	female
Gymnophthalmidae	<i>Gymnophthalmus underwo</i>	Trinidad	N. Guyana	female
Gekkonidae	<i>Hemidactylus homoeolepis</i>	Socotra	Oman	unsexed
Phrynosomatidae	<i>Holbrookia propinqua</i>	Padre	Texas	female

Agamidae	<i>Japalura polygonata</i>	Ishigaki	Taiwan	female
Agamidae	<i>Japalura polygonata</i>	Ishigaki	Taiwan	male
Lacertidae	<i>Lacerta trilineata</i>	Spetsai	Peloponesus	male
Lacertidae	<i>Lacerta trilineata</i>	Spetsai	Peloponesus	female
Tropiduridae	<i>Liolaemus cyanogaster</i>	Chiloe	Chile	female
Tropiduridae	<i>Liolaemus pictus</i>	Chiloe	Chile	male
Tropiduridae	<i>Liolaemus pictus</i>	Chiloe	Chile	female
Tropiduridae	<i>Liolaemus zapallarensis</i>	Isla de los locos	Chile, 31-34S	female
Gekkonidae	<i>Lygodactylus capensis</i>	Pemba	Morogoro, Tanzania	female
Gekkonidae	<i>Lygodactylus capensis</i>	Pemba	Ujiji, Tanzania	male
Gekkonidae	<i>Lygodactylus picturatus</i>	Ukerewe	Tanzania	male
Gekkonidae	<i>Lygodactylus picturatus</i>	Ukerewe	Tanzania	female
Scincidae	<i>Mabuya caissara</i>	Ilhabela	Sao Paulo area	female
Lacertidae	<i>Mesalina adramitana</i>	Masirah	S. Arabian Peninsula	unsexed
Lacertidae	<i>Mesalina brevirostris</i>	Tunb	Hadramut	male
Gekkonidae	<i>Pachydactylus geitje</i>	Robben	S. Africa	unsexed
Scincidae	<i>Pseudemoia baudini</i>	Jobi (Yapen)	New Guinea	female
Scincidae	<i>Scincella melanosticta</i>	Koh Tao	Thailand	unsexed
Scincidae	<i>Scincella vandenburghi</i>	Cheju	Korea	unsexed
Scincidae	<i>Scincella vandenburghi</i>	Maehwado	Korea	unsexed
Scincidae	<i>Scincella vandenburghi</i>	Tsushima	Korea	unsexed
Scincidae	<i>Scincella vandenburghi</i>	Uido	Korea	unsexed
Gekkonidae	<i>Sphaerodactylus ariasae</i>	Beata	Hispaniola	female
Scincidae	<i>Sphenomorphus minutus</i>	Jobi (Yapen)	New Guinea	female
Scincidae	<i>Trachylepis maculilabris</i>	Idjwi	E. Africa	male
Scincidae	<i>Trachylepis maculilabris</i>	Idjwi	E. Africa	female
Varanidae	<i>Varanus giganteus</i>	Barrow	Western Australia	male
Varanidae	<i>Varanus rosenbergi</i>	Kangaroo	Western Australia	unsexed
Iguanidae	<i>Ctenosaura hemilopha</i>	San Esteban	Baja California	unsexed
Iguanidae	<i>Dipsosaurus dorsalis</i>	Santa Catalina	Baja California	unsexed
Scincidae	<i>Egernia cunninghami</i>	West	South Australia	unsexed
Scincidae	<i>Tiliqua rugosa</i>	Rottneest	adjacent W. Australia	unsexed
Teiidae	<i>Ameiva ameiva</i>	Tobago	Trinidad	unsexed
Polichrotidae	<i>Anolis aeneus</i>	Grenada	Guyana	male
Teiidae	<i>Cnemidophorus lemniscatus</i>	Tobago	Trinidad	unsexed
Tropiduridae	<i>Leiocephalus cubensis</i>	Cayo Cachiboca	Cuba	male
Tropiduridae	<i>Leiocephalus cubensis</i>	Cayo Cachiboca	Cuba	female
Tropiduridae	<i>Leiocephalus cubensis</i>	Isla de Pinos	Cuba	male
Tropiduridae	<i>Leiocephalus cubensis</i>	Isla de Pinos	Cuba	female
Tropiduridae	<i>Leiocephalus stictigaster</i>	Isla de Pinos	Cuba	female
Tropiduridae	<i>Leiocephalus stictigaster</i>	Isla de Pinos	Cuba	male
Scincidae	<i>Mabuya macrorhyncha</i>	Alcatrazes	Sao Paulo area	female
Scincidae	<i>Mabuya macrorhyncha</i>	Buzios	Sao Paulo area	female
Scincidae	<i>Mabuya macrorhyncha</i>	Vitoria	Sao Paulo area	female
Tropiduridae	<i>Microlophus atacamensis</i>	Santa Maria	Bahia Inglesa	male
Phrynosomatidae	<i>Petrosaurus mearnsi</i>	Angel de La Guarda	Baja California Norte	unsexed
Phrynosomatidae	<i>Petrosaurus mearnsi</i>	Meija	Baja California Norte	unsexed
Lacertidae	<i>Podarcis pityusensis</i>	Formentera	Ibiza	unsexed
		SVL	Maximum SVL	
		UDL	Upper Decile SVL	
		nr	not reported	

Statistic			maianan		Diet	reference
	n island	n mainland	island SVL (mm)	SVL (mm)		
SVL	nr	nr	53.0	57.0	Carnivorous	Roughgarden 1995
SVL	nr	nr	80.0	82.0	Carnivorous	Roughgarden 1995
SVL	nr	nr	48.0	57.0	Carnivorous	Roughgarden 1995
SVL	nr	nr	73.0	82.0	Carnivorous	Roughgarden 1995
SVL	nr	nr	66.0	82.0	Carnivorous	Roughgarden 1995
SVL	nr	nr	48.0	57.0	Carnivorous	Roughgarden 1995
SVL	nr	nr	75.0	82.0	Carnivorous	Roughgarden 1995
SVL	nr	nr	55.0	57.0	Carnivorous	Roughgarden 1995
SVL	nr	nr	54.0	57.0	Carnivorous	Roughgarden 1995
SVL	nr	nr	80.0	82.0	Carnivorous	Roughgarden 1995
SVL	nr	nr	73.0	94.0	Carnivorous	Grismer 2002
SVL	1	93	46.0	60.0	Carnivorous	Loveridge 1948
SVL	nr	nr	70.0	72.0	Carnivorous	Grismer 2002
UDL	nr	nr	64.0	61.5	Carnivorous	Radtkey et al. 1997
SVL	nr	nr	60.0	72.0	Carnivorous	Grismer 2002
UDL	nr	nr	61.0	62.1	Carnivorous	Radtkey et al. 1997
SVL	nr	nr	68.0	72.0	Carnivorous	Grismer 2002
UDL	nr	nr	67.4	62.1	Carnivorous	Radtkey et al. 1997
SVL	nr	nr	62.0	72.0	Carnivorous	Grismer 2002
UDL	nr	nr	65.0	62.5	Carnivorous	Radtkey et al. 1997
SVL	nr	nr	66.0	72.0	Carnivorous	Grismer 2002
UDL	nr	nr	62.5	62.5	Carnivorous	Radtkey et al. 1997
UDL	nr	nr	60.6	61.5	Carnivorous	Radtkey et al. 1997
UDL	nr	nr	86.7	92.3	Carnivorous	Radtkey et al. 1997
UDL	nr	nr	84.0	92.3	Carnivorous	Radtkey et al. 1997
UDL	nr	nr	88.6	92.3	Carnivorous	Radtkey et al. 1997
UDL	nr	nr	92.5	92.5	Carnivorous	Radtkey et al. 1997
UDL	nr	nr	110.6	130.5	Carnivorous	Radtkey et al. 1997
UDL	nr	nr	91.0	92.3	Carnivorous	Radtkey et al. 1997
SVL	nr	nr	84.0	99.0	Carnivorous	Grismer 2002
UDL	nr	nr	79.0	92.5	Carnivorous	Radtkey et al. 1997
UDL	nr	nr	93.5	130.5	Carnivorous	Radtkey et al. 1997
UDL	nr	nr	76.0	92.5	Carnivorous	Radtkey et al. 1997
UDL	nr	nr	85.5	92.3	Carnivorous	Radtkey et al. 1997
UDL	nr	nr	75.5	92.5	Carnivorous	Radtkey et al. 1997
UDL	nr	nr	100.3	92.5	Carnivorous	Radtkey et al. 1997
SVL	nr	nr	89	86	Carnivorous	Grismer 2002
SVL	1	293	55.7	68.5	Carnivorous	Szczerbak and Golubev 1996
SVL	1	3	138	130	Carnivorous	Darevsky 1992
SVL	nr	nr	115	166	Carnivorous	Grismer 2002
SVL	nr	nr	126	166	Carnivorous	Grismer 2002
SVL	1	1	150	154	Carnivorous	Taylor 1963
SVL	5	16	38.0	44.0	Carnivorous	Cole et al. 1990
SVL	7	18	33.0	39.0	Carnivorous	Cole et al. 1990
SVL	38	30	41.0	44.0	Carnivorous	Cole et al. 1990
SVL	6	30	34.0	44.0	Carnivorous	Cole et al. 1990
SVL	2	30	36.0	44.0	Carnivorous	Cole et al. 1990
SVL	23	30	41.0	44.0	Carnivorous	Cole et al. 1990
SVL	27	30	41	44.0	Carnivorous	Cole et al. 1990
SVL	49	30	41.0	44.0	Carnivorous	Cole et al. 1990
SVL	17	45	41	46	Carnivorous	Arnold 1980
SVL	117	73	57	55	Carnivorous	Judd and Ross 1978

SVL	24	37	61	65.9	Carnivorous	Ota 1991
SVL	56	112	66	68	Carnivorous	Ota 1991
SVL	6	5	148.0	160.0	Carnivorous	Clark 1967
SVL	8	1	118.0	117.0	Carnivorous	Clark 1967
SVL	1	2	60.0	60.0	Carnivorous	Donoso-Barros 1966
SVL	1	3	59.0	64.2	Carnivorous	Donoso-Barros 1966
SVL	3	3	67.0	62.0	Carnivorous	Donoso-Barros 1966
SVL	2	1	95.0	81.0	Carnivorous	Donoso-Barros 1966
SVL	1	1	28	33	Carnivorous	Loveridge 1947
SVL	1	1	28	31	Carnivorous	Loveridge 1947
SVL	1	1	42	43	Carnivorous	Loveridge 1947
SVL	1	1	37	38	Carnivorous	Loveridge 1947
SVL	2	72	90.0	87.0	Carnivorous	Vanzolini and Reboucas-Spieker 1976
SVL	6	64	41.5	46.0	Carnivorous	Arnold 1980
SVL	1	14	36.0	42.0	Carnivorous	Anderson 1896
SVL	1	nr	39.0	45.0	Carnivorous	Fitzsimons 1943
SVL	1	4	42.0	45.0	Carnivorous	Brown 1953
SVL	1	12	44.0	51.0	Carnivorous	Taylor 1963
SVL	43	1	53.6	45.1	Carnivorous	Chen et al. 2001
SVL	1	1	41.5	45.1	Carnivorous	Chen et al. 2001
SVL	29	1	53.7	45.1	Carnivorous	Chen et al. 2001
SVL	1	1	48.1	45.1	Carnivorous	Chen et al. 2001
SVL	3	1	17.9	17.1	Carnivorous	Hedges and Thomas 2001
SVL	1	1	33.0	35	Carnivorous	Loveridge 1948
SVL	nr	nr	92.0	88.0	Carnivorous	Loveridge 1942
SVL	nr	nr	94.0	86.0	Carnivorous	Loveridge 1942
SVL	nr	nr	880.0	736.0	Carnivorous	Pianka and King 2004
SVL	nr	nr	470	395	Carnivorous	Pianka and King 2004
SVL	nr	nr	304.0	308.0	Herbivorous	Grismer 2002
SVL	nr	nr	129.0	154.0	Herbivorous	Grismer 2002
SVL	nr	nr	180.0	250.0	Herbivorous	Chapple 2003
SVL	55	96	260.0	300.0	Herbivorous	Greer 2005
SVL	nr	nr	150.0	197.0	Omnivorous	Case 1978
SVL	nr	nr	77.0	80.0	Omnivorous	Schwartz and Henderson 1991
SVL	nr	nr	104.0	104.0	Omnivorous	Case 1978
SVL	9	37	69.0	110.0	Omnivorous	Schwartz 1959
SVL	17	28	69.0	81.0	Omnivorous	Schwartz 1959
SVL	23	37	100.7	110.0	Omnivorous	Schwartz 1959
SVL	30	28	72.1	81.0	Omnivorous	Schwartz 1959
SVL	26	57	62.0	72.0	Omnivorous	Schwartz 1959
SVL	34	59	79.0	81.0	Omnivorous	Schwartz 1959
SVL	7	54	74.0	85.0	Omnivorous	Vanzolini and Reboucas-Spieker 1976
SVL	45	54	81.0	85.0	Omnivorous	Vanzolini and Reboucas-Spieker 1976
SVL	6	54	76.0	85.0	Omnivorous	Vanzolini and Reboucas-Spieker 1976
SVL	1	1	112.0	70.5	Omnivorous	Donoso-Barros 1966
SVL	nr	nr	100.0	85.0	Omnivorous	Case 2002
SVL	nr	nr	100.0	85.0	Omnivorous	Case 2002
SVL	nr	nr	80.0	70.0	Omnivorous	Arnold and Ovenden 2004

Appendix S2 Mean snout-vent length (SVL) data and sources

Family	Species	Island	Mainland	sex
Agamidae	<i>Gonocephalus grandis</i>	Tioman	Malay Peninsula	male
Agamidae	<i>Japalura polygonata</i>	Ishigaki	Taiwan	female
Agamidae	<i>Japalura polygonata</i>	Ishigaki	Taiwan	male
Dibamidae	<i>Dibamus bourreti</i>	Katba	N. Vietnam and SE China	male
Gekkonidae	<i>Cyrtopodion caspius</i>	Vulf	Caucasus to Kazakhstan	female
Gekkonidae	<i>Lygodactylus capensis</i>	Pemba	Morogoro, Tanzania	female
Gekkonidae	<i>Lygodactylus capensis</i>	Pemba	Ujiji, Tanzania	male
Gekkonidae	<i>Lygodactylus picturatus</i>	Ukerewe	Tanzania	male
Gekkonidae	<i>Lygodactylus picturatus</i>	Ukerewe	Tanzania	female
Gekkonidae	<i>Sphaerodactylus ariasae</i>	Beata	Hispaniola	female
Gymnophthalmidae	<i>Gymnophthalmus speciosus</i>	Trinidad	Venezuela	female
Gymnophthalmidae	<i>Gymnophthalmus speciosus</i>	Trinidad	Venezuela	male
Gymnophthalmidae	<i>Gymnophthalmus underwoodi</i>	Barbados	N. Guyana	female
Gymnophthalmidae	<i>Gymnophthalmus underwoodi</i>	Dominica	N. Guyana	female
Gymnophthalmidae	<i>Gymnophthalmus underwoodi</i>	Grenada	N. Guyana	female
Gymnophthalmidae	<i>Gymnophthalmus underwoodi</i>	Guadeloupe	N. Guyana	female
Gymnophthalmidae	<i>Gymnophthalmus underwoodi</i>	St. Vincent	N. Guyana	female
Gymnophthalmidae	<i>Gymnophthalmus underwoodi</i>	Trinidad	N. Guyana	female
Lacertidae	<i>Lacerta trilineata</i>	Spetsai	Peloponesus	female
Lacertidae	<i>Lacerta trilineata</i>	Spetsai	Peloponesus	male
Lacertidae	<i>Mesalina brevirostris</i>	Tunb	Hadramut	male
Lacertidae	<i>Podarcis hispanica</i>	Cies	Galicia	female
Lacertidae	<i>Podarcis hispanica</i>	Columbrete Grande	Spain	female
Lacertidae	<i>Podarcis melisellensis</i>	Bisevo	Vis	unsexed
Lacertidae	<i>Podarcis melisellensis</i>	Greben	Vis	unsexed
Lacertidae	<i>Podarcis melisellensis</i>	Pod Mrcaru	Lestovo	unsexed
Lacertidae	<i>Podarcis melisellensis</i>	Tajan	Lestovo	unsexed
Phrynosomatidae	<i>Holbrookia propinqua</i>	Padre	Texas	female
Phrynosomatidae	<i>Petrosaurus mearnsi</i>	Angel de La Guarda	Baja California Norte	unsexed
Phrynosomatidae	<i>Petrosaurus mearnsi</i>	Meija	Baja California Norte	unsexed
Polychrotidae	<i>Anolis paternus</i>	Isla de Pinos	W. Cuba	male
Polychrotidae	<i>Anolis paternus</i>	Isla de Pinos	W. Cuba	female
Polychrotidae	<i>Anolis equestris</i>	Cayo Santa Maria	C. Cuba	female
Polychrotidae	<i>Anolis luteogularis</i>	Cayo Cantiles	C. Cuba	male
Polychrotidae	<i>Anolis luteogularis</i>	Cayo Cantiles	C. Cuba	female
Polychrotidae	<i>Anolis luteogularis</i>	Cayo Real	W. Cuba	female
Polychrotidae	<i>Anolis luteogularis</i>	Cayo Real	W. Cuba	male
Polychrotidae	<i>Anolis luteogularis</i>	Isla de Pinos	W. Cuba	female
Polychrotidae	<i>Anolis luteogularis</i>	Isla de Pinos	W. Cuba	male
Polychrotidae	<i>Norops bremeri</i>	Isla de Pinos	W. Cuba	male
Polychrotidae	<i>Norops bremeri</i>	Isla de Pinos	W. Cuba	female
Polychrotidae	<i>Norops jubar</i>	Cayo Santa Maria	N. Central Cuba	female
Polychrotidae	<i>Norops jubar</i>	Cayo Santa Maria	N. Central Cuba	male
Scincidae	<i>Egernia cunninghami</i>	West	South Australia	unsexed
Scincidae	<i>Hemiergus decrensiensis</i>	Kangaroo	South Australia	unsexed
Scincidae	<i>Lerista bougainvillii</i>	Kangaroo	Eyre Peninsula	male
Scincidae	<i>Lerista bougainvillii</i>	Kangaroo	Eyre Peninsula	female
Scincidae	<i>Mabuya macrorhyncha</i> *	Queimada Grande	Sao Paulo area	female
Scincidae	<i>Pseudemoia baudini</i>	Jobi (Yapen)	New Guinea	female
Scincidae	<i>Scincella melanosticta</i>	Koh Tao	Thailand	unsexed
Scincidae	<i>Scincella vandenburghi</i>	Cheju	Korea	unsexed

Scincidae	<i>Scincella vandenburghi</i>	Maehwado	Korea	unsexed
Scincidae	<i>Scincella vandenburghi</i>	Tsushima	Korea	unsexed
Scincidae	<i>Scincella vandenburghi</i>	Uido	Korea	unsexed
Scincidae	<i>Sphenomorphus minutus</i>	Jobi (Yapen)	New Guinea	female
Scincidae	<i>Tiliqua rugosa</i>	Duffield	Tumby Bay	male
Scincidae	<i>Tiliqua rugosa</i>	Reevesby	Tumby Bay	male
Scincidae	<i>Tiliqua rugosa</i>	Spilsby	Tumby Bay	male
Scincidae	<i>Tiliqua rugosa</i>	St. Peter	Tumby Bay	male
Scincidae	<i>Tiliqua rugosa</i>	Wardang	Pt. Pearce	male
Tropiduridae	<i>Leiocephalus carinatus</i>	Isla de Pinos	Cuba	male
Tropiduridae	<i>Leiocephalus cubensis</i>	Cayo Cachiboca	Cuba	female
Tropiduridae	<i>Leiocephalus cubensis</i>	Cayo Cachiboca	Cuba	male
Tropiduridae	<i>Leiocephalus cubensis</i>	Isla de Pinos	Cuba	female
Tropiduridae	<i>Leiocephalus cubensis</i>	Isla de Pinos	Cuba	male
Tropiduridae	<i>Leiocephalus stictigaster</i>	Isla de Pinos	Cuba	female
Tropiduridae	<i>Leiocephalus stictigaster</i>	Isla de Pinos	Cuba	male
Tropiduridae	<i>Liolaemus cyanogaster</i>	Chiloe	Chile	female
Tropiduridae	<i>Liolaemus pictus</i>	Chiloe	Chile	male
Tropiduridae	<i>Liolaemus pictus</i>	Chiloe	Chile	female
Tropiduridae	<i>Liolaemus zapallarensis</i>	Isla de los locos	Chile, 31-34S	female
Tropiduridae	<i>Microlophus atacamensis</i>	Santa Maria	Bahia Inglesa	male
Varanidae	<i>Varanus acanthurus</i>	Barrow	Western Australia	unsexed
Varanidae	<i>Varanus acanthurus</i>	Groot Eylandt	N. Australia	unsexed
Varanidae	<i>Varanus gouldii</i>	Bernier	Western Australia	unsexed
Varanidae	<i>Varanus gouldii</i>	Wardang	Western Australia	unsexed
Varanidae	<i>Varanus komodensis</i>	Kode	Rinca	unsexed
Varanidae	<i>Varanus rosenbergi</i>	Kangaroo	South & Western Australia	female
Varanidae	<i>Varanus rosenbergi</i>	Kangaroo	South & Western Australia	male
Varanidae	<i>Varanus rosenbergi</i>	Reevesby	South Australia	unsexed
Varanidae	<i>Varanus rosenbergi</i>	Spilsby	South Australia	unsexed
Varanidae	<i>Varanus rosenbergi</i>	Taylors	South Australia	unsexed
Varanidae	<i>Varanus rosenbergi</i>	Thistle	South Australia	unsexed

*Median SVL. In all other populations mean SVL was used
nr

		island	mainland		
n island	n mainland	SVL (mm)	SVL (mm)	diet	reference
1	1	150	154	Carnivorous	Taylor 1963
24	37	54.8	59.6	Carnivorous	Ota 1991
56	112	59.9	60.8	Carnivorous	Ota 1991
1	3	138	118.3333	Carnivorous	Darevsky 1992
1	293	55.7	55.3	Carnivorous	Szczerbak and Golubev 1996
1	1	28	33	Carnivorous	Loveridge 1947
1	1	28	31	Carnivorous	Loveridge 1947
1	1	42	43	Carnivorous	Loveridge 1947
1	1	37	38	Carnivorous	Loveridge 1947
3	1	16.0	17.1	Carnivorous	Hedges and Thomas 2001
5	16	33.8	33.1	Carnivorous	Cole et al. 1990
7	18	29.7	31.8	Carnivorous	Cole et al. 1990
38	30	32.6	33.1	Carnivorous	Cole et al. 1990
6	30	29.7	33.1	Carnivorous	Cole et al. 1990
2	30	30.5	33.1	Carnivorous	Cole et al. 1990
23	30	31.5	33.1	Carnivorous	Cole et al. 1990
27	30	34	33.1	Carnivorous	Cole et al. 1990
49	30	34.7	33.1	Carnivorous	Cole et al. 1990
8	1	122.8	117.0	Carnivorous	Clark 1967
6	5	129.7	155.2	Carnivorous	Clark 1967
1	14	36.0	38.6	Carnivorous	Anderson 1896
nr	nr	52.0	50.7	Omnivorous	Galan 2003
nr	nr	63.1	55.3	Omnivorous	Castilla and Bauwens 2000
14	8	48.9	53.1	Carnivorous	Clover 1979
15	8	62.3	53.1	Carnivorous	Clover 1979
15	31	60.8	61.7	Carnivorous	Clover 1979
12	31	63.5	61.7	Carnivorous	Clover 1979
123	69	50.3	48.8	Carnivorous	Fitch 1985
nr	nr	91.3	73.6	Omnivorous	Case 2002
nr	nr	90.3	73.6	Omnivorous	Case 2002
nr	nr	45.0	44.1	Carnivorous	Schettino 1999
nr	nr	41.6	36.2	Carnivorous	Schettino 1999
nr	nr	136.5	128.5	Omnivorous	Schettino 1999
nr	nr	120.5	147.5	Omnivorous	Schettino 1999
nr	nr	118.5	144.4	Omnivorous	Schettino 1999
nr	nr	109.3	142.4	Omnivorous	Schettino 1999
nr	nr	122.2	141.9	Omnivorous	Schettino 1999
nr	nr	148.5	142.4	Omnivorous	Schettino 1999
nr	nr	155.0	141.9	Omnivorous	Schettino 1999
nr	nr	60.4	60.4	Carnivorous	Schettino 1999
nr	nr	45.2	44.4	Carnivorous	Schettino 1999
nr	nr	41.8	38.9	Carnivorous	Schettino 1999
nr	nr	49.4	45.6	Carnivorous	Schettino 1999
nr	nr	170.0	240.0	Herbivorous	Chapple 2003
nr	nr	45.0	50.0	Carnivorous	Wilson and Swan 2003
16	24	47.9	50.3	Carnivorous	Qualls et al. 1994
19	37	58.7	57.5	Carnivorous	Qualls et al. 1994
73	54	75.0	85.0	Omnivorous	Vanzolini and Reboucas-Spieker 1976
1	4	42.0	38.3	Carnivorous	Brown 1953
1	12	44.0	48.79167	Carnivorous	Taylor 1963
43	1	45.1	45.1	Carnivorous	Chen et al. 2001

1	1	41.5	45.1	Carnivorous	Chen et al. 2001
29	1	47.8	45.1	Carnivorous	Chen et al. 2001
1	1	48.1	45.1	Carnivorous	Chen et al. 2001
1	1	33.0	35	Carnivorous	Loveridge 1948
17	10	291.2	272.2	Herbivorous	Sarre and Dearn 1991
21	10	278.8	272.2	Herbivorous	Sarre and Dearn 1991
8	10	310.2	272.2	Herbivorous	Sarre and Dearn 1991
3	10	296.0	272.2	Herbivorous	Sarre and Dearn 1991
28	14	272.3	281.8	Herbivorous	Sarre and Dearn 1991
1	nr	125.0	103.2	Omnivorous	Schettino 1999
17	28	63.7	68.0	Omnivorous	Schwartz 1959
9	37	83.9	88.4	Omnivorous	Schwartz 1959
30	28	72.1	68.0	Omnivorous	Schwartz 1959
23	37	100.7	88.4	Omnivorous	Schwartz 1959
26	57	54.3	58.9	Omnivorous	Schwartz 1959
34	59	64.4	69.7	Omnivorous	Schwartz 1959
1	2	60.0	57.5	Carnivorous	Donoso-Barros 1966
1	3	59.0	62.1	Carnivorous	Donoso-Barros 1966
3	3	62.0	61.3	Carnivorous	Donoso-Barros 1966
2	1	90.0	81.0	Carnivorous	Donoso-Barros 1966
1	1	112.0	70.5	Omnivorous	Donoso-Barros 1966
3	63	141.3	169.8	Carnivorous	Case and Schwaner 1993
nr	nr	250.0	240.0	Carnivorous	Wilson and Swan 2003
4	71	283.8	296.5	Carnivorous	Case and Schwaner 1993
4	71	389.0	296.5	Carnivorous	Case and Schwaner 1993
20	228	831.4	862.9	Carnivorous	Jessop et al. 2006
13	10	338.1	302.7	Carnivorous	Case and Schwaner 1993
27	26	387.3	331.9	Carnivorous	Case and Schwaner 1993
4	10	497.7	346.7	Carnivorous	Case and Schwaner 1993
4	10	420.7	346.7	Carnivorous	Case and Schwaner 1993
4	10	348.3	346.7	Carnivorous	Case and Schwaner 1993
16	10	375.8	346.7	Carnivorous	Case and Schwaner 1993

Appendix S3. Geographical data on the islands used in this study

Island	Realm	Area (km ²)	Isolation (km)	latitude	North/S outh	longitude	east/w est
Barrow	Australia	235.9	55	20.80	S	115.38	E
Bernier	Australia	42.67	0.5	24.85	S	113.13	E
Duffield	Australia	0.075	29	34.66	S	136.32	E
Groot Eylandt	Australia	2258.2	39	14.00	S	136.83	E
Jamna	Australia	0.85	9.4	2.02	S	139.25	E
Jobi (Yapen)	Australia	2278	28.5	1.83	S	136.00	E
Kangaroo	Australia	4500	14.1	35.75	S	137.15	E
Kode	Australia	9.6	0.9	8.78	S	119.67	E
Reevesby	Australia	3.73	12.4	34.52	S	136.30	E
Rottnest	Australia	17.05	18	32.00	S	115.31	E
Spilsby	Australia	4.05	26	34.67	S	136.33	E
St. Peter	Australia	37.31	3.5	32.28	S	133.52	E
Taylors	Australia	2.55	2.8	34.88	S	136.00	E
Thistle	Australia	41.13	7.8	35.00	S	136.22	E
Wardang	Australia	17.56	3.8	34.48	S	137.36	E
West	Australia	0.14	0.8	15.53	S	136.55	E
Idjwi	Ethiopean	285	10	2.12	S	29.08	E
Pemba	Ethiopean	889.9	52	5.17	S	39.80	E
Robben	Ethiopean	5	12	33.81	S	18.37	E
Ukerewe	Ethiopean	530	1.5	2.03	S	32.97	E
Angel de La Guarda	Nearctic	895	13	29.33	N	113.42	W
Carmen	Nearctic	151	6	26.00	N	111.15	W
Cedros	Nearctic	347.5	24	28.20	N	115.25	W
Coronado	Nearctic	8.5	2	29.07	N	113.53	W
Espiritu Santo	Nearctic	99	6	24.50	N	110.37	W
Meija	Nearctic	3	24	29.57	N	113.58	W
Monserate	Nearctic	19.4	13	25.68	N	111.05	W
Padre	Nearctic	119	2	27.00	N	97.00	W
Partida Norte	Nearctic	1.36	17.88	28.88	N	113.07	W
San Esteban	Nearctic	40.72	34.5	28.70	N	112.60	W
San Francisco	Nearctic	2.6	8	24.83	N	110.58	W
San Jose	Nearctic	194.1	5	25.00	N	110.62	W
San Lorenzo Norte	Nearctic	4.26	21	28.70	N	112.93	W
San Marcos	Nearctic	31.5	5	27.22	N	112.10	W
San Martin	Nearctic	2.3	5	30.50	N	116.12	W
San Pedro Martir	Nearctic	30	52	28.37	N	112.33	W
Santa Catalina	Nearctic	194	32	25.65	N	110.82	W
Tiburón	Nearctic	1208	2	29.00	N	112.42	W
Alcatrazes	Neotropic	1.35	25	24.12	S	45.70	W
Barbados	Neotropic	430	145	13.00	N	59.00	W
Beata	Neotropic	42.1	7	17.60	N	71.52	W
Buzios	Neotropic	7.5	24	23.81	S	45.14	W
Cayo Cachiboca	Neotropic	30.3	57.7	20.67	N	78.75	W
Cayo Cantiles	Neotropic	16.6	63.2	21.70	N	82.50	W
Cayo Real	Neotropic	7.36	30	21.97	N	83.58	W
Cayo Santa Maria	Neotropic	13	42	22.66	N	79.04	W
Chiloe	Neotropic	8477.5	5	44.00	S	72.00	W
Desirade	Neotropic	27	10	16.53	N	61.08	W
Dominica	Neotropic	787.3	500	15.57	N	61.45	W
Grenada	Neotropic	345	144	12.06	N	61.74	W
Guadeloupe	Neotropic	875.7	570	3.57	N	3.26	W
Ilhabela	Neotropic	348	4	23.78	S	45.36	W

Isla de los locos	Neotropic	1.3	20	30.00	S	71.00	W
Isla de Pinos	Neotropic	2237.3	50	21.50	N	82.90	W
Kahouanne	Neotropic	0.05	0.1	16.25	N	61.20	W
Petite Terre	Neotropic	1.7	8.5	16.18	N	61.12	W
Queimada Grande	Neotropic	0.43	33	2.67	S	43.18	W
Santa Maria	Neotropic	33.9	7.1	36.98	S	73.53	W
St. Vincent	Neotropic	344	275	13.22	N	61.33	W
Terre de Bas	Neotropic	7	10.5	15.85	N	61.63	W
Terre de Haut	Neotropic	7	10.5	15.87	N	61.58	W
Tobago	Neotropic	308.8	30	11.15	N	60.67	W
Trinidad	Neotropic	5008.7	11	10.67	N	60.42	W
Vitoria	Neotropic	2	31	20.32	S	40.35	W
Ishigaki	Oriental	226.8	266	24.34	N	124.16	E
Katba	Oriental	140	16	20.73	N	107.05	E
Koh Tao	Oriental	21	70	10.08	N	99.87	E
Tioman	Oriental	228	39	2.78	N	104.18	E
Bisevo	Palaeartic	5.8	5	42.93	N	16.78	E
Cheju	Palaeartic	1829	82	33.00	N	127.00	E
Cies	Palaeartic	1.8	2.5	42.25	N	8.88	W
Columbrete Grande	Palaeartic	0.13	50	39.90	N	0.68	E
Formentera	Palaeartic	84.9	3.6	38.75	N	1.37	E
Greben	Palaeartic	0.06	1	43.00	N	16.15	E
Maehwado	Palaeartic	0.014	20	35.00	N	126.00	E
Masirah	Palaeartic	700	14.4	20.40	N	58.80	E
Pod Mrcaru	Palaeartic	1.3	0.5	42.80	N	16.92	E
Socotra	Palaeartic	3607	340	12.50	N	53.90	E
Spetsai	Palaeartic	22	2	23.25	N	37.33	E
Tajan	Palaeartic	1.3	3.5	42.70	N	16.95	E
Tsushima	Palaeartic	689	48	34.00	N	129.00	E
Tunb	Palaeartic	10.3	72	26.23	N	55.32	E
Uido	Palaeartic	10.6	40	34.61	N	125.85	E
Vulf	Palaeartic	0.1	5	40.29	N	49.98	E

Appendix S4 References for island-mainland snout-vent length (SVL) data.

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