
A population of skinks (*Mabuya* spp.) and the gecko *Hemidactylus bouvieri boavistensis* behind coastal dunes on Boa Vista, Cape Verde Islands

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THE Cape Verde Islands lie some 1600 km south of the Canary Islands, 500 km west of Senegal in the Atlantic Ocean in the path of the northeast trade winds. Of the nine inhabited islands, the three most easterly generally have a desert landscape of sand/stone with coastal salt flats often fringed by magnificent sandy beaches, some of which are among the most important breeding sites in the world for loggerhead turtles. Terrestrially, there are 37 lizard species recorded from the Cape Verde islands (Schleich, 1984, 1987) many of which are endemics of which the best-known are the giant skink (*Macrosclincus coctei*) and the giant gecko (*Tarentola gigas*) both only found, or formerly found, on the small islands of Raso and Branco as the former of the two species became extinct in the 1940s (Greer, 1976). There are several species of skinks and geckos found distributed throughout the Cape Verde islands belonging to the genera *Mabuya* and *Tarentola* or *Hemidactylus* respectively. The only other element of the terrestrial herpetofauna of the islands is the toad *Bufo regularis* which we observed in concrete water tanks on the island of Santiago where it is said to have been introduced by the Portuguese to control mosquitoes when such water reservoirs were first constructed. They also occur in similar situations on the island of São Nicolau and Santo Antão.

During a visit to some of the Cape Verde islands in June 2004 we took the opportunity to briefly examine habitat utilisation by lizards of the maritime fringe on the islands of Sal, Boa Vista, Santiago, Fogo and Maio. These habitats are variable depending on local topography, being mainly rock in sampled areas on Fogo and Santiago, saltflat vegetation with little rock on

Maio and a combination of both habitats on Sal and Boa Vista. On Fogo, we saw skinks inland up to 2000 m, but on both Fogo and Santiago we found no skinks or geckos in the cliff base boulder screes (the only maritime interface available to us) although Schleich (1987) found both groups on Fogo and Santiago but associated mainly with buildings or a built environment. On Sal, near Santa Maria and on Maio between Vila do Maio and Morro, in sandy, saltflat/dune vegetation we found only *Mabuya* spp., *M. stangeri maioensis* on Maio and *M. stangeri salensis* on Sal. On Boa Vista, behind the dunes which fringe the 10 km long, wide sandy bay south of Sal Rei, in an arid area of rocks and sand, are the remains of stone walled enclosures of unknown agricultural origin and it was here that we found our richest skink/gecko populations. On an earlier visit in 2003 we had located this site and felt it was one of the few areas where it would be possible to quantitatively assess lizard numbers given suitable field equipment.

STUDY AREA AND METHODS

The 'stone walls' of old agricultural enclosures behind dunes some 5 km south of Sal Rei on Boa Vista, cross an almost vegetation-free area of sandy, salty, soil intermixed with small coarse fragments of the local volcanic rock, extending from the landward side of the dunes, 50 m from the beach, towards the village of Rabil. The 'walls', if such they are, consist of lumps of rock up to about 50 cm diameter in linear structureless piles rarely more than 40 cm high and up to 1m wide, and, in the case of the wall we examined, running east /west, although others run in other directions forming a generally interlinked system.

Our aim was to quantify the number of lizards per unit length of wall and to assess the value of this habitat in relation to isolated stone refuges away from the wall. The work was carried out 22nd-25th June 2004 although we first identified the site on an earlier visit in August 2003.

In order to catch the animals we devised a flexible plastic 'quadrat' constructed from 4 m of 40 cm high 'Newtguard' polythene sheet held as near square as possible with four corner posts so as to enclose an area of approximately 1m². Ten quadrats were recorded at 5 m intervals along the wall (Fig. 1) and a further 10 around randomly isolated stones over 30 cm diameter situated up to 20 m from the wall and further 10 situated around similar stones over 20 m from the wall. The nature of the environment made it difficult to create an exactly square quadrat but using 4 corner stakes it was made as square as possible. Sand was then moved to ensure that there were no escape holes under the plastic. The stones were then systematically removed, where possible keeping them within the quadrat and any animals counted, and if possible caught, measured and

Table 1. Boa Vista stone wall, June 2004.

A = skink total length (mm);
B = skink tail length (mm);
C = gecko total length (mm);
D = gecko tail length (mm).

	A	B	C	D	REMARKS
1	180	*	*	*	15 lizard eggs
2	*	*	80	*	
3	185	75	*	*	yellow belly
3	*	*	80	*	
4	*	*	60	*	plants in quadrat
4	135	50	*	*	well coloured
4	200	*	*	*	
5	140	55	*	*	plants in quadrat
5	180	*	*	*	
6	185	80	*	*	fat
6	180	*	*	*	
6	170	65	*	*	
6	*	*	70	45	yellow eyelids
6	*	*	42	22	"
6	*	*	72	50	"
6	*	*	63	40	"
6	*	*	63	40	
7	*	*	40	20	
7	*	*	70	45	
8	*	*	*	*	no catch - ant colony
9	180	70	*	*	
9	170	*	*	*	
9	*	*	45	22	
9	*	*	35	20	
9	*	*	70	35	orange tail
10	130	*	*	*	12 fresh lizard eggs
10	130	*	*	*	
10	130	60	*	*	regenerated tail
10	*	*	85	42	
10	*	*	65	35	
10	190	75	*	*	yellow sloughing
STONES OVER 30cm DIAMETER UP TO 20m FROM WALL					
11	80	30	*	*	
12	*		42	20	
13	*		75	45	
13	*		35	15	
13	*		35	15	
14	*		70	35	
15	*		40	20	
15	*		60	30	
15	140		*	*	
TEN RANDOM STONES OVER 30cm DIAMETER, OVER 20m FROM WALL					
16	*		*	*	no catch
17	*		42	20	
18	*		*	*	no catch
19	*		*	*	"
20	90		*	*	
21	*		30	12	
22	*				"
23	*				"
24	*				"
25	*				"



Figure 1. Quadrat on section of wall. All photographs by author.



Figure 2. *Hemidactylus bouveri boavistensis*.



Figure 3. *Mabuya stangeri*.



Figure 4. *Mabuya delalandii*.

photographed. If necessary captured animals were temporarily kept in cotton bird bags while awaiting processing. The stones and the animals were then replaced.

RESULTS

All the geckos were *Hemidactylus bouvieri boavistensis* or Half-finger geckos (Figure 2) and the lizards (skinks) were all *Mabuya* spp. with certainly *M. stangeri* (Figure 3) and *M. delalandii* (Figure 4), the former usually larger usually with bright thigh spots depending on sub-species, the latter a rust-brown back with dark shoulder spots and a bright border to the back stripe – scale counts overlap in the two species, but even within quadrats skinks are elusive! Geckos and skinks were frequently found under the same rock and no statistical correlation was found between their intra-species distribution. Figures 5 and 6 show that although there was a preponderance of large skinks, their distribution approached normality, unlike the geckos, where a bimodal histogram suggests at least two year classes were present. What we believed to

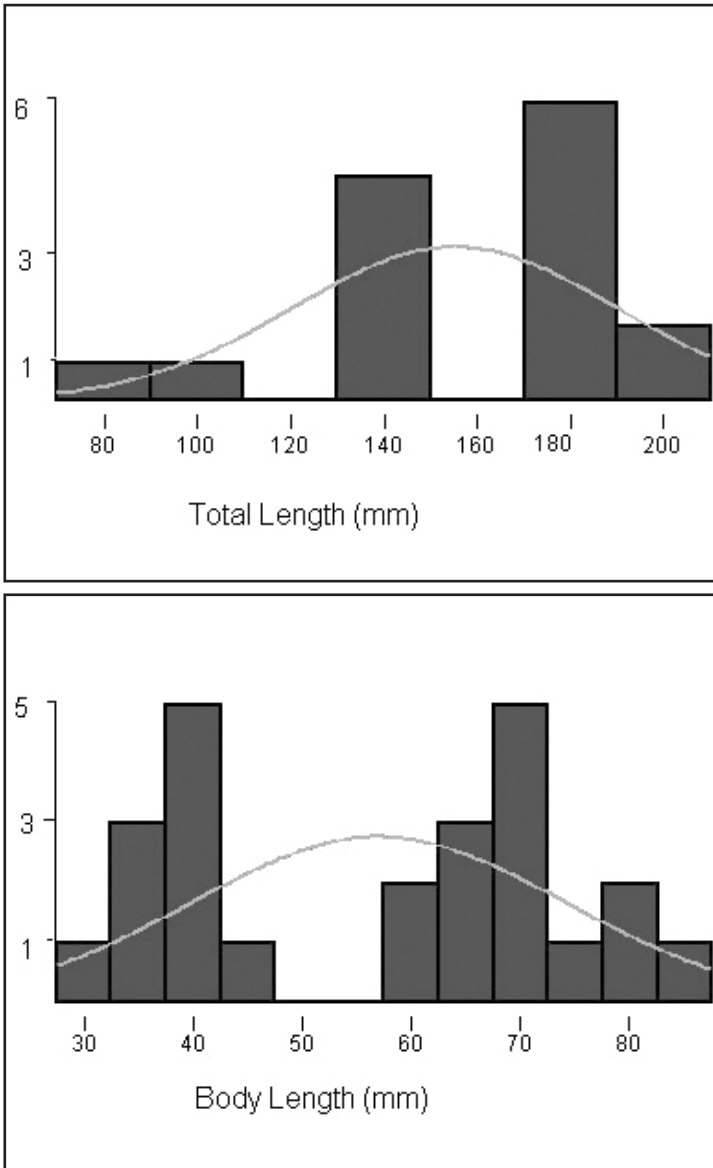


Figure 5 (above). Total gecko body length (mm) plotted against numbers of individuals.

Figure 6 (below). Body length categories of lizards caught along wall on Boa Vista plotted against number.

be skink eggs were found under stones in two quadrats and, along the wall, the only quadrat with no skinks or geckos included an ant colony under one large stone. The further we moved from the wall, the scarcer became suitable sized stones and our catch rate also dropped proportionately.

DISCUSSION

On Maio and Sal we watched *Mabuya* spp. moving within and between stones and saltmarsh scrub or between clumps of the latter when the former were absent. The problems associated with catching skinks within the saltmarsh scrub was a major reason for focussing on the rocky habitats of Boa Vista. Our survey area on Boa Vista had very sparse vegetation, insufficient to detract from the efficiency of capture. There were several kilometres of derelict stone walls in the general area in which we were working and if our quadrats were typical of the area, and we believe that they were, then there would seem to be in the order of some 30 individuals of both skink and gecko per 100 m of derelict wall – a quantification of population size which previous work does not provide (Schleich, 1982). The walls provide good habitat continuity and probably harbour good populations of both lizard types, which was in contrast to the sparsity of animals under suitably sized stones with increasing distance from the wall, suggesting isolated stones, which are the norm for this area, are possibly avoided due to their isolation. In this location the wall provides the corridor for movement that, in thick saltmarsh scrub, may be provided by the vegetation. This suggests that these

man-made structures are an advantage to the overall biodiversity of this part of the island.

Because of the limited numbers of skinks and the fact that two species were present, no conclusions can be drawn from the body length data except that young and older animals plus eggs are present suggesting no spatial separation of age classes and an entire life cycle spent within the wall. However, with geckos, two distinct peaks (and possibly a third) are seen on the histogram

suggesting 2 (or 3) age cohorts within the population.

Having visited the area in the previous year we felt that the flexible plastic quadrat would work within the rock pile environment. The technique helped quantify the animals in the sample area but clearly for areas with larger rocks or other environments different techniques would be required but we would recommend it for similar situations elsewhere where population quantification is required.

The Cape Verde islands are best known to herpetologists for their importance as a world-class loggerhead turtle breeding site, but their 'bread and butter' terrestrial species offer considerable interest and have begun to exercise the minds of, particularly, molecular ecologists (Brehm *et al.*, 2001; Brown *et al.*, 2001; Carranza *et al.*, 2000, 2002), however most people ask 'where?' when the islands are mentioned, visit them for their herpetology, empty beaches and hospitality before the new airport brings in the tourist throngs!

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