ANGUIS FRAGILIS (slow-worm): PREDATION. As part of a mitigation exercise relating to quarry works at Burnt Hill, Ringwood Forest, Hampshire (SU 122 091) 891 reptiles were captured and translocated to an allocated receptor site nearby: a clear-felled area of Plumley Wood (SU 116 097). Upon releasing some of the reptiles on 8 May 2010, an adult male slow-worm was found to have its jaws firmly clamped around a yearling viviparous lizard *Zootoca vivipara*. The slow-worm released the lizard soon afterwards, but it seems very likely that it was attempting to predate the lizard, opportunistically.

The animals had been held together for up to two hours in a cloth bag. It is not known how long this behaviour had been occurring within the bag. The lizard showed no signs of life while gripped by the slow-worm, and its eyes were closed as if dead. The slow-worm had its jaws clamped around the lizard's abdomen, but did not attempt to manoeuvre it in order to swallow it. After about two minutes, the slow-worm released the lizard, and seemingly revived, it ran away. The lizard was recaptured and examined briefly, but did not show any external signs of injury around the abdomen, and was released, apparently unharmed.

It is common practice for ecologists translocating reptiles to hold them, sometimes several species, temporarily in a cloth bag or other container. Viviparous lizards and slow-worms can normally be held together safely; slow-worms are typically much larger than common lizards, but are rarely aggressive. On this occasion, however, an apparent predation attempt was made. It is likely that this situation was brought about by the close proximity of around 20 captive reptiles in one bag.

Figure 1. Male slow-worm attempting to feed on a yearling common lizard.

This is the only time I have encountered a slow-worm preying upon another reptile, despite having captured and translocated thousands of reptiles in this way. Street (1979) cited examples of slow-worms eating an adult common lizard, a juvenile grass snake, and even one cannibalising its own young. However, these are rare examples, and slow-worms typically restrict their diet to slugs, worms and other invertebrates.

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ANGUIS FRAGILIS (slow-worm): MELANISM. During a commercial capture and translocation exercise in Dorset, southern England, on 2 July 2008, an entirely black adult slow-worm was captured. It was around 30cm total length, with an intact tail. Its markings were not at all clear, but the relatively large head indicated that it was a male.

The location was a clear-felled area within a conifer plantation at Avon Common (SZ 135 983) near Christchurch, Dorset. Reptiles were removed from the area as mitigation for future mineral extraction. Between 20 May 2008 and 18 July 2008 18 viviparous lizards *Zootoca vivipara* and 47 slow-worms were captured (during 38 site visits) from approximately 0.3ha of heathy ride remnants (supporting heather, grass and moss). All captured reptiles were translocated to a 5-ha designated receptor area at the northern edge of the original site, where conifer clear-felling had removed shading from heather, tussocky grass and scrub areas.

The melanistic slow-worm was captured under a small roofing felt refuge and later released at the receptor area. Monitoring each subsequent year has not rediscovered the same slow-worm.

Figure 1. Melanistic slow-worm from Dorset.

Whilst melanism is not uncommon in adders *Vipera berus* or viviparous lizards, it seems rarer in the other British reptiles. Street (1979) described melanism in slow-worms as 'rare', Frazer (1983) acknowledged its occurrence and Inns (2009) described it as 'extremely rare'; but none cited specific examples. I am aware of only a few other observations of melanistic slow-worms: one from south London captured in 2008 and one from Witley Common, Surrey (John Gaughan, pers. comm.) and a several individuals captured from a single site in Reading by Adam Egglesfield in 2008 (Jon Cranfield, pers. comm.).

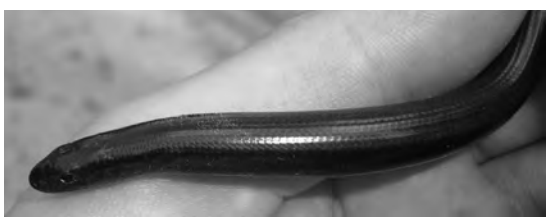

Figure 2. Melanistic slow-worm showing left-hand side view of head.

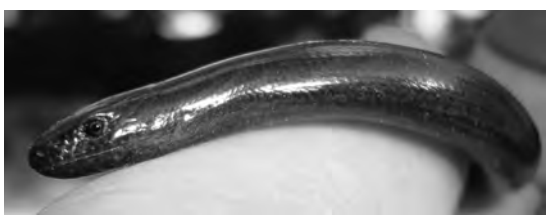

Figure 3. Melanistic slow-worm showing lack of obvious dorsal markings.

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ZOOTOCA VIVIPARA (common or viviparous lizard): INJURY OR PATHOLOGY?

During a commercial capture and translocation exercise in Dorset on 1 July 2008, a male common lizard with unusual leg and facial damage was captured. Its left foreleg was reduced to bone, with the radius and ulna exposed, capped by the withered remains of its left hand. Its right arm was cleanly truncated at the wrist. Both stumps seemed to be healing or healed. Its nasal area was also damaged by soft tissue degeneration around the nasal area, with blackened skin, possibly covering healed lesions. It was not obvious whether these afflictions were due to injury or pathology. The lizard was bright and active, with full mobility, and otherwise seemingly unaffected by the damage.

The location was a clear-felled part of a conifer plantation at Avon Common (SZ 135 983) near Christchurch, Dorset, formerly under Forestry Commission management consented for sand and gravel extraction. Protected species mitigation measures included capture and translocation of

Figure 1. Common lizard showing left foreleg damage.

Figure 2. Common lizard showing right foreleg damage.

Figure 3. Common lizard showing damage to nasal area.

reptiles (viviparous lizards and slow-worms *Anguis fragilis*). Between 20 May 2008 and 18 July 2008, 18 common lizards and 47 slow-worms were captured (during 38 site visits), from an area that would become the quarry 'plant area'.

The 'injured' common lizard was captured under a felt refuge on 1 July 2008, exhibiting normal thermoregulatory behaviour, and showing no obvious signs of suffering. It was released at a receptor area soon afterwards. Figures 1-3 show its injuries. Ongoing monitoring each year since then has not rediscovered the same lizard.

Consideration of these 'injuries' throws up several possible explanations. Pathology is one possibility; perhaps an infection that causes necrosis of the extremities, or a parasitic organism. The nasal damage was superficially reminiscent of the effects of toadfly *Lucilia bufonivora* on common toads *Bufo bufo*, but the lesions seemed to be healed. Frost damage is another possibility. The restriction of necrosis to the anterior extremities, with none evident elsewhere on the body, suggests only partial exposure to frost, however. Another explanation may be partial predation by small rodents, or invertebrates such as ants, consuming parts of the lizard while it hibernated. Alternatively, forestry operations could have caused injuries, which the lizard survived but then became infected or necrotic. Traumatic injury such as this would have probably resulted in less subtle injuries though, and outright death.

Healed head lesions covered with black skin were recently reported from male sand lizards *Lacerta agilis* from Wareham, by Sainsbury *et al.* (2011), but the authors attributed them to male-male combat.

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DRYMOLUBER DICHROUS (northern woodland racer) and ***ANOLIS FUSCOAURATUS*** (slender anole): PREDATION.

Drymoluber dichrous (Peters, 1863) is a ground-dwelling colubrid from northern South America found in both primary and secondary forest (Borges-Nojosa & Lima, 2001). It is active during the day, sleeping in low vegetation at night (Duellman, 1978; Martins & Oliveira, 1998). Stomach contents indicate that the diet of *D. dichrous* is mainly composed of Leptodactylid frogs and lizards of both Sphaerodactylidae and Gymnophthalmidae families (Martins & Oliveira, 1998; Borges-Nojosa & Lima, 2001). It also preys on teiid lizards (e.g. *Ameiva ameiva* and *Kentropyx calcarata*), other snakes and reptile eggs (Martins & Oliveira, 1998; Pinto, 2006). Thus, these studies indicate that *D. dichrous* preys predominantly upon ground dwelling species (but see Duellman [1978]).

The slender anole *Anolis fuscoauratus* has a

wide geographic distribution in the Amazon and Atlantic Forest biomes, within which it is the most common anole (Vitt et al., 2003). This diurnal, lizard inhabits primary and secondary forests but can also be found in forested patches of urban areas, where it is often seen on low vegetation, or occasionally climbing tree trunks into the canopy (Duellman, 1978; Vitt et al., 2003). Records of predators of this species are relatively scarce and no detailed descriptions of predatory episodes have been documented.

On the 27 October 2010 an individual of *D. dichrous* was sighted at approximately 1140 hours in the proximity of the Santo Antônio water spring (07°24'49''S, 39°12'46''W, 807 m a.s.l.) located in the central slopes of the Chapada do Araripe, Municipality of Missão Velha. The snake (TL approximately 110 cm) was seen and photographed moving amongst the leaf litter at the edge of the southern bank of the canal, about 20 m downstream from the spring. After some minutes of observation during which time the snake moved slowly through the vegetation, in a burst of speed it took to chasing an individual of *A. fuscoauratus* (SVL approximately 5 cm), until then unnoticed by the team. The chase occurred over a distance of approximately six metres, towards the centre of the canal, with both the snake and lizard having passed between the feet one of the observers (D. Veríssimo) and finally finishing on top of the backpacks used by the field team. The *D. dichrous* seized the lizard by its upper body (Fig. 1A) and started slowly, whilst making repeated chewing motions, moving back into vegetation. The anole gaped and presented signs of respiratory distress (Fig. 1B), stopping all movement after a few seconds (Fig. 1C). While firmly held, the lizard did not show any sign of movement or struggle, and the snake did

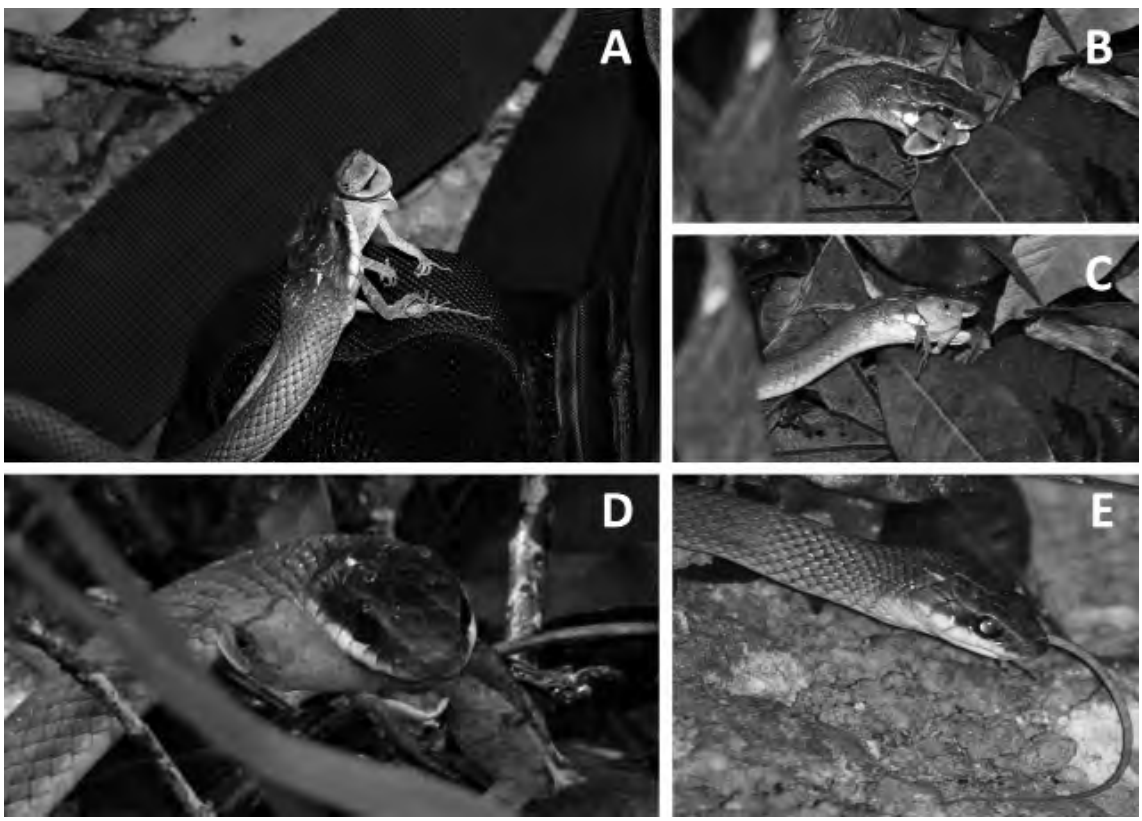

Figure 1. *Drymoluber dichrous* predation of *Anolis fuscoauratus*: A. snake seizing the lizard, B. lizard gaping, C. lizard immobilized, D. snake preparing to swallow lizard, E**.** tip of lizard's tail hanging from the snake's mouth. Photographs by A. Campos, except D by D. Veríssimo.

not constrict or use its body to restrain its prey (Fig. 1D). The prey was then handled and adjusted to be ingested from the head and swallowing ensued quickly. After three minutes, only the tip of the tail of the anole was visible, hanging from the snake's mouth (Fig. 1E).

Our observation confirms the suspicion by Martins (1994) that active search for prey is a strategy employed by this species. On the other hand, despite *A. fuscoauratus* being an abundant species (Borges-Nojosa & Lima, 2001), its predominantly arboreal habits appear to make it unlikely prey for this snake. This might explain why episodes involving both species have not been documented in the wild.

The lack of struggle by the lizard may have been death feigning, which has been documented in other neotropical lizards (Gomes et al., 2004), or the result of envenomation. We suggest the latter given that, although the presence of Duvernoy's glands has not yet been documented for the genus *Drymoluber,* it has been described for its closest relative, the genus *Mastigodryas*, (Serapicos & Merusse 2006; Pyron et al., 2011).

This report represents a new prey species for *D. dichrous* and a newly confirmed predator of *A. fuscoauratus*.

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CYCLORAMPHUS ELEUTHERODACTYLUS (alto button frog): CALLING AMONG ROCKS AND CAVES.

Cycloramphus eleutherodactylus (Miranda-Ribeiro, 1920) is the most widespread species in the genus, found in the states of Minas Gerais, Rio de Janeiro, São Paulo, and Paraná among the mountainous region of the Atlantic forest of southeast and south Brazil (Heyer, 1983a; Heyer & Maxon, 1983; Frost, 2010). Its natural history is poorly known and there are still some taxonomic and systematic issues to be resolved (Lutz, 1954; Heyer, 1983a; Verdade, 2005). Only one previous study mentioned the calling of *C. eleutherodactylus* in which it is said to be rarely heard in rock crevices (Lutz, 1954). Advertisement and territorial calls have been described from data gathered in 1991 from the Serra de Paranapiacaba mountain range, municipality of Santo André, state of São Paulo (23º46'S, 46º18'W; Fig. 1, site 1) (Brasileiro et al., 2007). However, the calling sites were not cited by Brasileiro et al. (2007) and were described as: two males heard calling sheltered in rock crevices inside a cave, approximately 2 m from the entrance (C.F.B. Haddad, pers. comm.). Like several other species within this genus, the IUCN Red List and others consider this species to be data deficient (Verdade & Heyer, 2004; Mikichi & Bérnils, 2004) and it is also classed as near threatened in the state of Rio de Janeiro (Bergallo et al., 2000). Herein we describe some features of calling behaviour and locations of *C. eleutherodactylus* from south and southeast Brazil. Voucher specimens were collected and deposited at the Museu de História Natural Capão da Imbuia, state of Paraná (MHNCI 6584), Coleção de Anfíbios CFBH, Instituto de Biociências, Universidade Estadual Paulista "Júlio de Mesquita Filho", campus de Rio Claro, state of São Paulo (CFBH 25678-25680; 28026-28036) and Instituto de Biociências, Universidade de São Paulo, state of São Paulo (MCL 127; MTR 11687).

We collected information of the frogs from three locations: The Estação Biológica de Boracéia (EBB), municipality of Salesópolis, state of São Paulo (23º38'S, 45º50'W); Parque Estadual

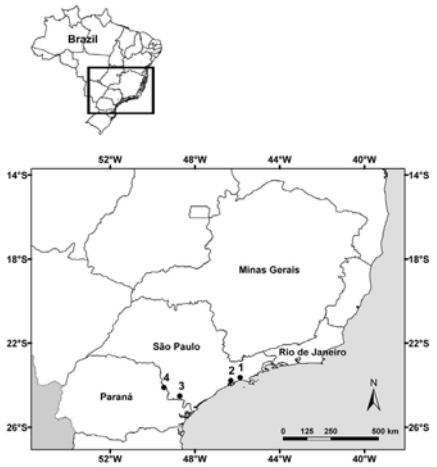

Figure 1. Study sites in the states of São Paulo, and Paraná, Brazil. Black dots show the surveyed localities:1 - Estação Biológica do Alto da Serra de Paranapiacaba (municipality of Santo André); 2 - Estação Biológica de Boracéia (EBB, municipality of Salesópolis); 3 – Parque Estadual Turístico do Alto Ribeira (PETAR, municipalities of Iporanga and Apiaí); 4 - Morungava Farm (municipality of Sengés).

Turístico do Alto Ribeira (PETAR), municipalities of Apiaí and Iporanga, state of São Paulo (24º17'S, 48º27'W), and Morungava Farm, municipality of Sengés, state of Paraná (24º6´S, 49º27´W, Fig. 1). The EBB was surveyed monthly from April 2003 to November 2005 by researchers and students while under the auspices of M.T. Rodrigues' Herpetological Laboratory, University of São Paulo. During these surveys, *C. eleutherodactylus* was seen twice displaying reproductive behaviour. One male was found calling over a rock near a stream (November 2003), and one female was found under a humid rock close to a stream, laying over a clutch of eggs (November 2005) (V.K. Verdade, pers. comm.).

PETAR was visited from October to December 2009 and surveyed both near and within nine caves (Fig. 2, A-B) and along forest trails (Araujo et al., 2010). Eighteen individuals of *C. eleutherodactylus* were found in November and December. Of these, seven males, five females with eggs, and one juvenile (N = 13 individuals) were found in seven different caves. During the same time period, one male was heard calling from near the entrance of

one of these caves (Fig. 2, C-D) and another four males were heard calling from crevices in large rocks in the forest.

More observations at the Morungava Farm, during two days in both November 2007 and 2008, found several more calling males. Calling males were found in one cave of 20 m in height by 150 m length (Fig. 2, E). A total of 23 males of *C. eleutherodactylus* were found calling and 17 call sites were measured (Fig. 3). Six of these sites were used in both years. Males were heard calling constantly at any time of day from 8:30 – 22:00, apparently increasing call rates at dusk (around 19:00). Only one male was found at the entrance to the cave and the remainders were found within the cave in similar locations (Fig. 2, F-G). Generally, *C. eleutherodactylus* were calling from several heights from the ground and always hidden in rock crevices, usually in dark areas far from the entrance of the cave (Fig. 3). Additionally, three juveniles were found in the cave (35, 55, and 70 m away from the cave entrance; Fig. 2, H). Neither eggs nor tadpoles were found.

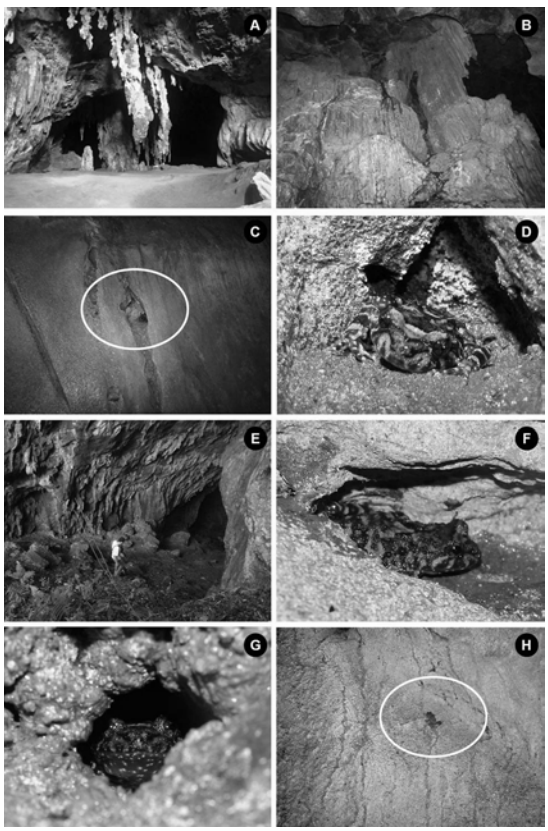

Figure 2. (A) Entrance of the Morro Preto cave at Parque Estadual Turístico do Alto Ribeira (PETAR), municipality of Iporanga, state of São Paulo, Brazil; (B) internal view of Cafezal cave (PETAR); (C) adult male of *Cycloramphus eleutherodactylus* sheltered in humid rock crevices in Cafezal cave; (D) detail of observed male in Cafezal cave; (E) entrance of the cave at Morungava Farm, municipality Sengés, state of Paraná; (F-G) males at calling sites in the cave at Morungava Farm; (H) a juvenile found climbing in the cave at Morungava Farm. Photos: T. H. Condez (A); F. C. Centeno (B-D); A. M. X. Lima (E-H).

C. eleutherodactylus uses rocky formations as reproductive sites. If rocks and caves are important to the reproduction of this frog, then their availability may in part determine the distribution of this species. While we did not exhaustively search other possible calling locations, such as under logs or among roots in the forest, it is possible that the frogs could prefer rocks and caves. This apparent association with rocky formations is common within the genus, especially for the stream dwellers *Cycloramphus* (Giaretta & Cardoso, 1995; Giaretta & Facure, 2003; Lima et al., 2010). Forest litter species may also shelter under logs, or use leaf litter for reproduction (Heyer & Crombie, 1979; Brasileiro et al., 2007; V.K. Verdade, pers. comm.). In Brazil, other frogs have been found in caves but the implications of such an association have not been fully explored (Pinto-da-Rocha & Sessegolo, 2001). No other species has been reported to consistently call from within caves, with the exception of the cave-dwelling frog *Litoria cavernicola*, in Australia (Tyler & Davis, 1979). We suggest that it is likely that while caves are not necessary the only place where these frogs can be found, they could occur in higher abundance within caves. We therefore recommend that caves are searched systematically for this species and that attention be drawn to the acoustic quality of caves, a factor that may be important for courtship behaviour.

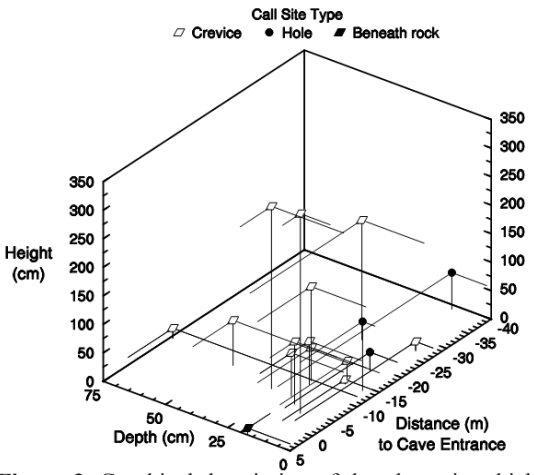

Figure 3. Graphical description of the places in which male frogs were observed vocalizing in the cave in Morungava Farm, municipality of Sengés, state of Paraná, Brazil. In this three-dimensional representation, the lines connect the individual to the zero points of the three axes (height from the ground, distance from the cave entrance and depth in the calling site), thus allowing comparison and visualization of their positions within the cave.

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PEDIOPLANIS HUSABENSIS Berger-Dell'Mour & Mayer, 1989. (Husab Sand Lizard) (Sauria Lacertidae): MAXIMUM SIZE. On 12 June 2009 a large specimen of *Pedioplanis husabensis* was collected from the rocky substrate of the Schieferberg, Langer Heinriech Uranium Mine, Namibia (22°49'26.9"S; 15°18'48.0"E; 2215CD, 631 m a.s.l), by W. Conradie and M. Matengu. The male specimen (Port Elizabeth Museum, PEM R18138) measures 61.23 mm snout-vent length (SVL) and has a tail length (partly regenerated) of 132.96 mm (Fig. 1). Branch (1998) gave the average size range of this species as 45-55 mm SVL, with a maximum size of 58 mm. The holotype described by Berger-Dell'Mour & Mayer (1989) measured 59.3 mm SVL and has a tail length of 112 mm. The new specimen

Figure 1. *Pedioplanis husabensis.*

represents a 3.3 % increase in maximum length from the holotype. Specimens were collected under the Namibian Ministry of Environmental and Tourism Permit (#1367/2009).

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PEDIOPLANIS LINEOOCELLATA LINEOOCELLATA (Duméril and Bibron, 1839) (Spotted Sand Lizard) (Sauria, Lacertidae): MAXIMUM SIZE. On 17 February 2010 an exceptionally large specimen of *Pedioplanis l. linecoocellata* was collected on semi-compacted calcrete sands with scattered thorny bushes near a dried-out pan in the Tswalu Kalahari Game Reserve, Northern Cape Province, South Africa (27°17'52.5"S; 22°13'51.0"E; 2722AC, 1034 m. a.s.l). The male specimen (Port Elizabeth Museum, PEM R18605) measures 64.10 mm snout-vent length (SVL) and has a tail length (partly

regenerated) of 141.42 mm (Fig. 2).

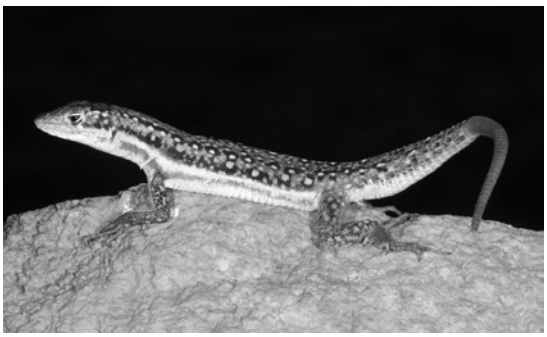

Figure 2. *Pedioplanis lineoocellata.*

Branch (1998) gave the average size range of this species as 45-55 mm SVL, with a maximum size of 58 mm. Wasiolka et al. (2010) gave the maximum size of males used in their study as 63.6 mm SVL and tail length of 148.75 mm. This specimen itself is an increase 9.7% increase on the maximum size reported by Branch (1998). Taking this new maximum size in consideration the specimen from Tswalu represents a 1.5% increase in maximum length. The largest female (PEM R18608) from the same collection site measured 60.1 mm SVL and tail length of 92.68 mm. Bauer & Branch (1999) reported that the body size of *Cordylosaurus subtesselatus* (Dwarf Plated Lizard) shows a South to North cline in increasing body size. This seems true in this species also, but further investigation is needed.

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