

Microhabitat partitioning between three invasive Australian skink lizard species.

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ABSTRACT

While habitat and microhabitat preferences of reptile species are well-known, specific instances of microhabitat partitioning in morphologically similar species are not commonly documented.

Detailed here are two examples of microhabitat partitioning involving invasive native skink species in southern Victoria, Australia, two of which have only been shown to be distinctive species in the past 2 decades (*sensu* Hoser 2009, 2012, 2022b, 2022c).

The relevant taxa are *Allengreerus jackyhoserae* (Hoser, 2012) (locally in southern Victoria often misidentified under the name "*Lampropholis delicata* (De Vis, 1888)", *Lampropholis guichenoti* (Duméril and Bibron, 1839) and *Saproscincus sonderi* (Peters, 1878) (locally in southern Victoria often misidentified under the name "*Saproscincus mustelina* (O'Shaughnessy, 1874)").

With an increasing number of wide-ranging putative reptile species being shown to be composite and many, it is important that biological observations are attributed to the correct species-level taxon.

Keywords: Australia; skink; lizard; *Lampropholis*; *Allengreerus*; *Saproscincus*; *guichenoti*; *mustelinae*; *jackyhoserae*; *delicata*; microhabitat; partitioning; invasive species; Victoria; Melbourne, Park Orchards, Crib Point.

INTRODUCTION

Small innocuous and common reptiles are often ignored and overlooked with respect of important aspects of their biology.

To partially correct this anomaly, I report on two cases of habitat partitioning among three invasive species of native Australian skink lizard.

The cases detailed below are typical of similar observations made over many decades in the same part of Australia (Melbourne, Victoria and environs) and go some way to explaining how morphologically similar species complexes can avoid direct competition and confrontation in areas they co-exist, enabling them to have parallel distributions across a wide band of south-east Australia (*sensu* Hoser, 1989).

The relevant locations of the observations are in South-east Australia (being east and south-east of Melbourne, Victoria) and involve three common and invasive species, being *Allengreerus jackyhoserae* (Hoser, 2012) (locally in southern Victoria often misidentified under the name "*Lampropholis delicata* (De Vis, 1888)", *Lampropholis guichenoti* (Duméril and Bibron, 1839) and *Saproscincus sonderi* (Peters, 1878) (locally in southern Victoria often misidentified under the name "*Saproscincus mustelina* (O'Shaughnessy, 1874)").

All three species are each a part of a complex, being within 1/ The so-called "*Lampropholis guichenoti* complex" since shown by Hoser (2022c) to be complex of 5 morphologically similar

species, distributed allopatrically of one another in eastern Australia, 2/ The so called "*Lampropholis delicata*" complex, since shown by Hoser (2022c) to be complex of 19 species, and also transferred to the genus *Allengreerus* Hoser, 2009, and 3/ The so called "*Saproscincus mustelina*" complex, since shown to be a complex of 4 species by Hoser (2022b).

With morphologically similar species within each preceding complex being with divergences measured in millions of years (Hoser 2022b-c), it is self evident that different species will differ in biology and so should be therefore be treated as separate entities in terms of studies and publications.

MATERIALS AND METHODS

The observations made and reported herein were done in the context of being made while "on the job", either as a government-licensed snake catcher, reptile displayer or working with a dog trainer.

However they were not wholly observational in that I also actively sought out lizards at the relevant venues in the context of seeking species to observe, photograph and in the case of insects, snails and other invertebrates to take as food for lizards and frogs I maintained for my live reptile displays business (Reptile Party®).

The observations reported here are in line with others not reported by me, but of similar nature.

RESULTS

OBSERVATION ONE

In 27 January 2021 I was called to a home at 109 Arundel Road, Park Orchards, Victoria, about a half hour's drive east of Melbourne, Victoria, to locate an adult male Copperhead *Austrelaps superbus* Günther, 1858 seen moving across the front and then back yard earlier the same day.

The weather was warm (mid 20's Celsius) and I attended the venue at about 5 PM.

No snake was located, but at the rear of the back yard (north-facing yard), amongst vegetation and rocks, adjacent to mowed lawns and in dappled sunlight filtering through deciduous trees, I noticed three *Allengreerus jackyhoserae* (Hoser, 2012) moving amongst the vegetation and caught one.

In the front yard on the south-east corner and under a sheet of thick bark beneath a dense low pine tree I found an adult *Saproscincus sonderi* resting. It was cool and moist under the sheet of bark.

This section of the yard was wholly shaded on all sides and very cool by comparison with the back yard where the *A. jackyhoserae* had been seen.

In my searching for the Copperhead, I entered the reserve at the north boundary of the property (known as the 100 Acres Reserve), which is a mosaic of mainly open grassy areas on the perimeter and then becoming open wooded bushland (but with minimal low vegetation) beyond. That is the reserve has mainly small, medium and large trees, but not much vegetation or grasses covering the ground as such.

Scuttling under a fallen log I noticed an adult *Lampropholis guichenoti*, which I was able to capture and to confirm the ID of the lizard.

This area was also warm as compared to the other mentioned sites, but differed from the area the *A. jackyhoserae* were found in that there were no succulent green trees (European kinds) overhead, or mowed and well-watered lawns in the same area, as had been the case for where the *A. jackyhoserae* were found.

This microhabitat partitioning between the three skinks of the three genera in terms of *Saproscincus* taking the cooler/coolest microhabitat and *Lampropholis* taking the warmer/warmest is something I have observed throughout south-east Queensland, New South Wales and Victoria, wherever I have found more than one species in these genera present at any location.

However I am unaware of this being documented in this exact form to this date and hence the reporting of this observation.

OBSERVATION TWO

On Saturday 29 July 2023, I visited Jack's Beach reserve at Crib Point, about an hour's drive south east of Melbourne, Victoria. The foreshore bushland was moderately dense scrubby forest habitat with scattered fallen logs. Under these I located several specimens of *A. Jackyhoserae*, and no other species. Next to the immediately adjacent Woolley's Road, was a ditch (on the south side) and behind that a wall of dense tea-tree like vegetation. A log well embedded log was seen under this vegetation. It was lifted and yielded an adult *S. Sonderi*. This again was a location far more shaded and cooler than from where the located proximally *A. Jackyhoserae* had been found.

DISCUSSION

Why or how the relevant species chose their preferred microhabitat is not known.

Whether this preference is driven by competition from one or other species, or is simply an artefact of built in preferences is not known and should be investigated.

Furthermore it is not known why in south-east Australia, skinks in the three preceding named species complexes seem to do well around human habitation in large cities (see also Hoser 2022a), whereas other native skink species do not seem to do well and often die out in these areas, even if common prior to urbanisation.

By way of example, in areas of St. Ives South, (New South Wales) before urbanisation (in the 1960's), Copper-tailed skinks *Ctenotus taeniolatus* White, 1790 were common, but within a few years of housing development, they effectively disappeared (although they remain common in undisturbed national parks nearby). The three preceding named genera (but not *Ctenotus taeniolatus* White, 1790) continue to occupy the built up area and in greater numbers than preceding the urbanisation.

In Melbourne's suburbs, small skinks of other genera tend to expire from heavily urbanised areas, but the those of the genera *Allengreerus* Hoser, 2009, *Saproscincus* Wells and Wellington, 1984 and *Lampropholis* Fitzinger, 1843 not only survive, but generally increase in number.

Hence I have described them as "invasive species" in the context of this paper.

Furthermore, while they are native to the areas they are currently invasive to, the risks these lizards pose to other ecosystems if translocated by people should not be underestimated and governments should prepare for risks these species may pose, if and when they are translocated and manage to invade new areas.

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- Cover photo of this issue of *Australasian Journal of Herpetology* is an adult *A. jackyhoserae* from Crib Point, Victoria.

CONFLICT OF INTEREST

None.