First record of Egernia predation by the range restricted Spotted Mulga Snake *Pseudechis butleri*

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ABSTRACT

Despite being a hotspot for reptile diversity, there is a chronic knowledge gap surrounding the ecology of Australian reptiles. Understanding the complex interactions between species, such as predator-prey relationships, can be key to informed and effective management, particularly of rare and threatened species. The Spotted Mulga Snake (*Pseudechis butleri*) is a key example of an understudied endemic reptile, limited to the Mid West region of Western Australia. Here, we present the first recorded observation of a Spotted Mulga Snake consuming a Pygmy Spiny-tailed Skink (*Egernia depressa*). This predation event has implications for the susceptibility of the similar-sized juvenile endangered Western Spiny-tailed Skinks, another understudied reptile co-occurring in the Mid West.

Key words: Behaviour, diet, ecology, management

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Introduction

The Spotted Mulga Snake (*Pseudechis butleri*) is a Western Australian endemic species confined to the arid midwestern interior (Figure 1), commonly found in areas of flat, red, sandy soil dominated by mulga (*Acacia aneura*) vegetation (Maryan 1994; Mengden and Fitzgerald 1987). Most observations of Spotted Mulga Snake active behaviour are at night, with observations peaking during the austral spring and after recent rainfall (Maryan 1994). A single study has assessed the diet of *Pseudechis butleri* based on museum specimens, and found prey items to be: *Ctenophorus* dragons, *Pygopus* pygopods, *Cyclodomorphus* and other unidentified skinks, *Varanus caudolineatus*, *Demansia and Pseudonaja* snakes, and one unidentified mammal (Shine 1987). Other than this single dietary study, a series of reproduction observations on a single pair of *P. butleri* (Mengden and Fitzgerald 1987), and a study on their venom (Moore *et al.* 2016), to our knowledge no other studies exist on this species making it the least known of all *Pseuchechis* species.

Fig 1. (A) An example of the mallee woodland where the observation occurred, and (B) the Spotted Mulga Snake (*Pseudechis butleri*) specimen discovered deceased from road-strike.

Observation

On 7 October 2021 (16:55 hrs; clear weather) a single Spotted Mulga Snake was discovered on a sandy track on Ninghan Station, Western Australia, killed by road strike (Figure 1). The body measured approximately 1.2 m (snout-vent length) and was brought back to the station for immediate dissection. Dissection of the stomach revealed a partially digested skink specimen entangled with gastric nematodes. No nematode species are known to parasitise *Pseudechis butleri*, however, based on geographic distribution and similarity of host snake species (*Pseudechis australis*), the nematodes were likely *Abbreviata occidentalis* Jones 1978.

The skink remains (with the torso, back legs and tail remaining; Figure 3) were identified as a Pygmy Spiny-tailed Skink (*Egernia depressa*) based on the presence of three-spined dorsal scales as opposed to two-spined dorsal scales in the sympatric Western Spiny-tailed Skink (*Egernia stokesii*; Storr *et al.* 1999). The surrounding vegetation of flat and sandy mallee woodland was confirmed habitat of Pygmy Spiny-tailed Skinks through discovery of an occupied Callitris log occupied by the skinks (confirmed through scat identification) approximately two kilometres from the Spotted Mulga Snake collection site.

Discussion

To our knowledge, this is the first recorded observation of the consumption of a Pygmy Spiny-tailed Skink by a Spotted Mulga Snake. Few direct observations of predation events have been recorded for the Pygmy Spiny-tailed Skink (e.g., defensive behaviours are only speculated in Chapple 2003), making this record a valuable addition to the natural history of this species.

The identification of the Spotted Mulga Snake's ability to predate on spiny arboreal lizards, whether it be an opportunistic event on the ground, or active hunting at log pile shelter sites, is also important for threatened species management in the region. Juveniles of the sympatric Western Spiny-tailed Skink are similar in appearance, size, and semi-arboreal behaviour to the Pygmy Spiny-tailed Skink and live in similar long-term log pile structures (Chapple 2003; Pearson 2012). In comparison to the more common Pygmy Spiny-tailed Skink, the Western Spiny-tailed Skink (*Egernia stokesii badia*) is endangered, at risk of extinction from several threats including habitat loss, predation from introduced carnivores, and grazing pressure from introduced herbivores (Pearson 2012; Bradley *et al.* 2022; Bradley *et al.* 2023). Predation events by the Spotted Mulga Snake may, therefore,

Fig. 3. The partially digested Pygmy Spiny-tail Skink specimen found during dissection of the Spotted Mulga Snake stomach.

place additional pressure on threatened Western Spiny-tailed Skink populations.

Few studies have been conducted on the basic ecology of *E. s. badia*, including identification of their native predators (e.g., only anecdotal evidence in Lee-Steere 2008; no subspecies-specific records in Pearson 2012; most recent research in Bradley *et al.* 2022). The record of this predation event is, therefore, important to the ongoing management and protection of *E. s. badia*.

Overall, this observation enriches the knowledge of both the diet of an infrequently encountered snake and predator species of the Pygmy Spiny-tail Skink. The recording and sharing of the basic biology of Australia's diverse reptile inhabitants is a critical step towards addressing the chronic knowledge gap surrounding the ecology of Australian reptiles, to help maximise the efficacy of conservation planning and investment.

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