

A new observation of ophiophagy in the Madagascar Black-backed Smooth Snake, *Liophidium vaillanti* (Mocquard, 1901), in the Kirindy Forest, western Madagascar

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The Madagascar Black-backed Smooth Snake, *Liophidium vaillanti*, a snake endemic to Madagascar, is a small species of the family Pseudoxyrhophiidae (maximum total length near 800 mm; Mercurio et al., 2006) that is primarily known from arid areas in the southern regions of the island (Glaw and Vences, 2007; Glaw et al., 2022). This diurnal snake typically inhabits open areas near forests, including dry deciduous forest edges, shrublands, and rocky environments, such as inland cliffs and outcrops (Raselimanana, 2008; Raxworthy and Vences, 2011). A previous study reported an instance of *L. vaillanti* attempting to prey on *Dromicodryas bernieri* (Duméril et al., 1854) in central southern Madagascar, suggesting potential ophiophagic behaviour in this species (Mercurio et al., 2006). However, its diet and foraging behaviour remain largely undocumented (Glaw and Vences, 2007).

Here, we report a case of ophiophagy by *L. vaillanti* recorded on 24 September 2023 at 10:28 h, in the dry deciduous Kirindy Forest (20.0674°S, 44.6575°E, elevation 56 m). This period represents the peak of the dry season when potential prey is limited. We discovered two snakes under a stilted wooden house that were engaged in a struggle, during which they gradually moved into an adjacent open area. The first snake, identified as *L. vaillanti* and estimated to be about 700 mm long, had grasped a Common Madagascar Catsnake, *Madagascarophis colubrinus* (Schlegel, 1837), by the head and coiled around its body. Based on the context,

the smooth snake likely captured the catsnake while it was resting under the building, as the latter is a largely nocturnal species. Due to the similar size of both snakes, the smooth snake could only constrict about the first quarter length of its prey. The struggle lasted over an hour, with the catsnake attempting to escape by wrapping its tail around a wooden post anchored in the ground and trying to dislodge the smooth snake's hold while inflating its body (Fig. 1A). Despite these efforts, the catsnake eventually ceased resisting, and the smooth snake began swallowing its prey with alternating jaw movements (Fig. 1B). During this process, the presence of nearby human observers did not seem to disturb the predator. At around 13:00 h, after consuming half of the catsnake, the smooth snake regurgitated its prey. Following this, the smooth snake quickly moved to a shaded area near buildings, likely seeking refuge from the heat, leaving the dead catsnake on the ground.

This predation event occurred during the hottest part of the day (ambient temperature > 30°C), suggesting that thermal stress, along with the prey's size potentially exceeding the predator's ingestion capacity, may have triggered the regurgitation. The observations presented here highlight the potential opportunistic predation behaviour of *L. vaillanti*, particularly during a physiologically challenging seasonal period when prey availability is reduced. However, due to the limited number of documented cases, it remains unclear whether *L. vaillanti* is a specialized ophiophagous species or if these observations simply reflect opportunistic behaviour under resource-constrained conditions. This observation also marks the first recorded presence of *L. vaillanti* in the Kirindy Forest, extending its known distribution into the central-western part of Madagascar, where three other members of the genus are known to occur (Goodman et al., 2018). Further research is needed to clarify the distribution range of this species and provide more details on its natural history.

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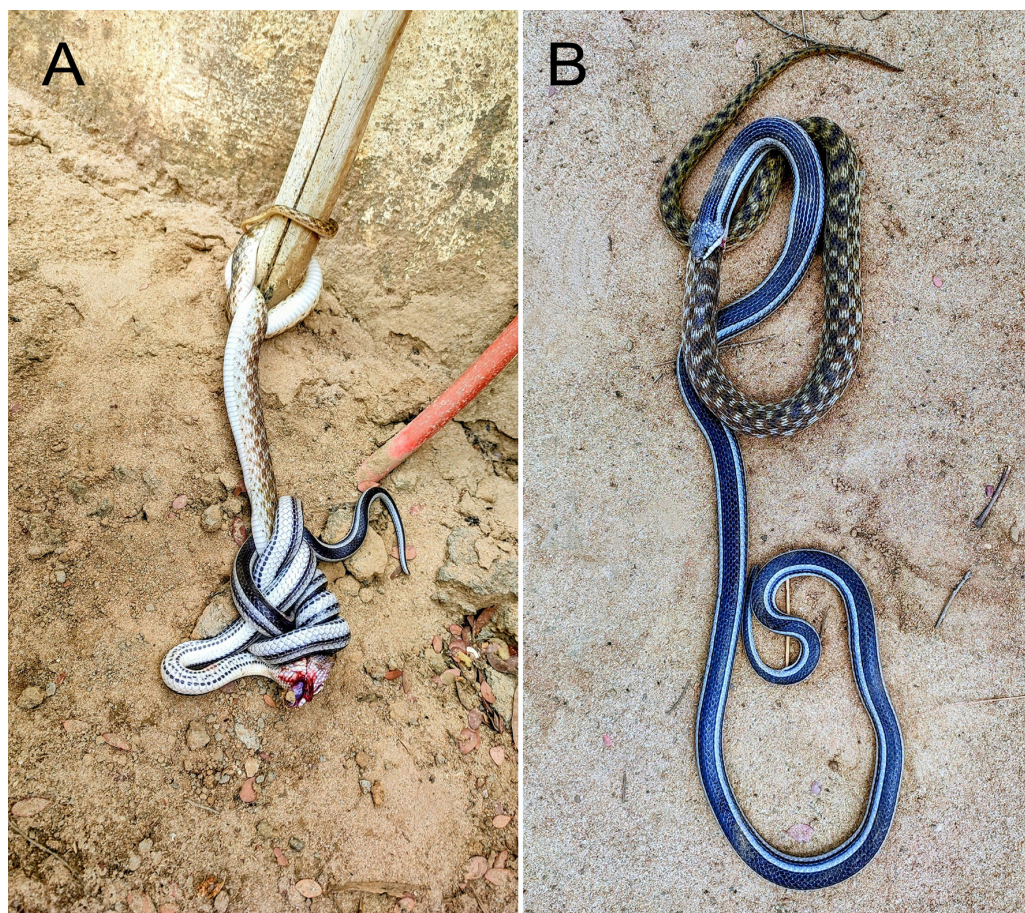


Figure 1. Predation on a Common Madagascar Catsnake (*Madagascarophis colubrinus*) by a Madagascar Black-backed Smooth Snake (*Liophidium vaillanti*) in the Kirindy Forest, Madagascar. (A) The smooth snake (~700 mm long) constricting the catsnake, which attempted to escape by coiling around a wooden support while displaying defensive body inflation. A bleeding wound is visible on the head of the catsnake as the smooth snake bites to maintain its grip. (B) The smooth snake in the process of ingesting the catsnake, which had ceased struggling. The predator adjusted its body position while performing alternating jaw movements. Here, the image provides a clearer view of the comparable body sizes of both snakes. Photos by Domoina Rasoanandrianina.

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