REPTILES & AMPHIBIANS

# Insights on the Natural History of the Whiptail Lizard, *Ameivula xacriaba* (Squamata: Teiidae), from the Eastern Brazilian Cerrado

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The genus *Ameivula* was established by Harvey et al. (2012) to accommodate species previously assigned to the *Cnemidophorus ocellifer* group. As currently recognized, the genus comprises 11 species distributed across open habitats south of the Amazon River in South America (Goicoechea et al. 2016; Tucker et al. 2016; Arias et al. 2018. Uetz et al. 2026). *Ameivula xacriaba* Arias, Teixeira Jr., Recoder, Carvalho, Zaher, and Rodrigues 2014 is endemic to the Cerrado biome, with distribution restricted to the Planalto dos Gerais, a large sandstone plateau in the central-eastern Cerrado (Arias et al. 2014). This species inhabits savannas with sandy soils, thick herbaceous cover, and sparse arboreal strata, and exhibits increased activity at higher temperatures (Arias et al. 2014; Colli et al. 2020). Within its limited range, it is considered a common species (Teixeira Jr. 2010; Arias et al. 2014).

A decade after the initial description of *Ameivula xacriaba*, little is known about its natural history and reproductive habits. Several predators have been reported for other species of *Ameivula* (Koski et al. 2015; Guimarães and Srbek-Araújo 2018; Leite et al. 2019; Souza et al. 2021; Yves et al. 2021), but only two for *A. xacriaba*, the Argentine Pampas Snake (*Phimophis guerini*) and a scolopendrid centipede (Bocchiglieri and Mendonça 2009). Similarly, courtship behavior has been thoroughly described for *Ameivula ocellifera* (Ribeiro et al. 2011; Sales and Freire 2021) and several species in related teiid genera such as *Ameiva* and *Kentropyx* (e.g., Alfonso and Torres 2012; Moraes and Oliveira 2021; Ramalho et al. 2021), but comparable information is unknown for *Ameivula xacriaba*. Herein, we report predation on *A. xacriaba* by the dipsadid snakes *Oxyrhopus guibei* and *Philodryas olfersii* and describe courtship display for the first time.

The first predation record involved a juvenile *Oxyrhopus guibei* preying on a female *Ameivula xacriaba* at 0926 h on 25 October 2020 in leaf litter in the Municipality of Feira da Mata, Bahia State, Brazil (-44.230000 , -14.102778). When encountered, the snake was biting the lizard on its neck while constricting it (Fig. 1A). The lizard was struggling and kicking the snake with its hindlimbs, causing the snake to release its bite although it continued to constrict the lizard (Fig. 1B). After a few minutes, the lizard died (possibly due to the constriction) and the snake released its prey and attempted to flee, possibly startled by our presence. Neither individual was collected.

The second predation event involved a *Philodryas olfersii* preying on a male *A. xacriaba* at 1021 h on 29 April 2024 at the edge of an artificial reservoir within a wet savanna in Riachinho Municipality, Minas Gerais State, Brazil (-46.138806, -16.327250). When first encountered, the snake was biting the lizard at midbody but not constricting it (Fig.



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**Figure 1.** Predation on an *Ameivula xacriaba* by an *Oxyrhopus guibei* (A); *A. xacriaba* striking the snake with its hindlimbs while being constricted by *O. guibei* (B); a *Philodryas olfersii* biting the chest (C) and ingesting (D) an *A. xacriaba*. Photographs by Afonso Santiago de Oliveira Meneses (A–B) and Luis Felipe Lima (C–D).

1C). The lizard was struggling and trying to bite the snake. Within a few minutes, the lizard died, presumably due to the effects of the snake's venom, and the snake began ingesting it headfirst (Fig. 1D). Neither individual was collected.

Although our observations only increase the number of known predators of *Ameivula xacriaba* to four, like other species of *Ameivula*, *A. xacriaba* likely is subject to a wide array of predators. Snakes such as *Oxyrhopus trigeminus* and *Philodryas nattereri* are known predators of *A. ocellifera* (Vitt and Vangilder 1983; Mesquita et al. 2013; Marques et al. 2016; Coelho et al. 2019; Souza et al. 2021). Other common predators of *Ameivula* spp. are lizards in the genus *Tropidurus* (e.g., Santos et al. 2009; Pergentino et al. 2017; Tavares et al. 2017; Guimarães and Srbek-Araújo 2018; Yves et al. 2021). *Tropidurus oreadicus* is syntopic with *A. xacriaba* in the Municipality of Feira da Mata and, although no confirmed records document *T. oreadicus* preying on *Ameivula* spp., several instances of saurophagy have been reported for this species (Araújo 1987; Faria and Araújo 2004; Albuquerque 2010), making it a potential predator of *A. xacriaba*, particularly given the abundance of both species in the area.

Courtship behavior was recorded at 1145 h on 27 October 2020 near the site of the first predation event in the Municipality of Feira da Mata, Bahia State, Brazil. When first encountered, a male *A. xacriaba* near a burrow excavated along a dirt road was fending off male conspecifics; after the other males left, the remaining male remained motionless for a few seconds (duration: 11 s). The male then entered the burrow and began digging with his forelimbs (Fig. 2A), then momentarily withdrew from the burrow before resuming digging (6 s). The male then withdrew as a female slowly emerged from the burrow; as soon as her head and neck became visible, he bit her neck (Fig. 2B), maintaining his grip as she slowly emerged from the burrow and mounting her as soon as her hindlimbs came into view (Fig. 2C) (55 s). With their cloacae aligned and after possible intromission of a hemipenis (although we could not confirm this), the male began convulsive pelvic movements while repeatedly biting her neck and shoulder; the female remained passive as both moved a few centimeters farther out of the burrow but she quickly returned to the burrow after copulation ended (11 s). After the male dismounted, he moved around the entrance while rubbing

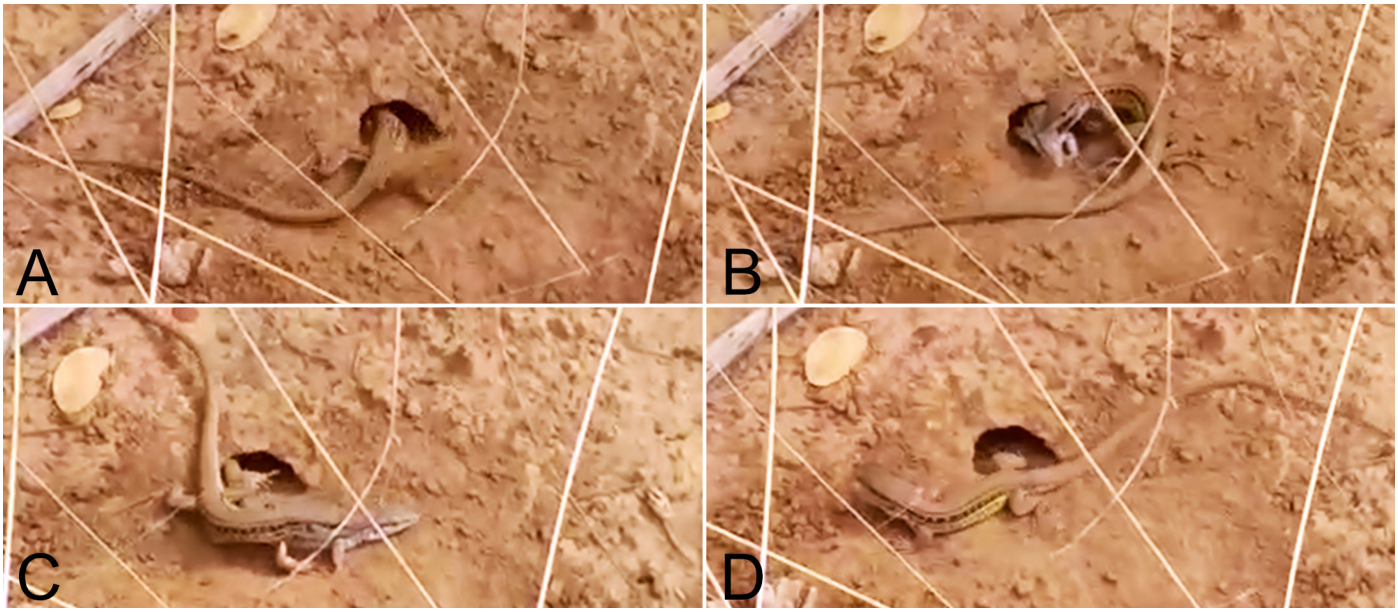


**Figure 2.** Courtship of *Ameivula xacriaba*: Male excavating and entering the burrow of a female (A); biting the female's neck as she begins to emerge from the burrow (B); mounting the female, biting her neck, and possibly inserting a hemipenis (C); and wagging his pelvis, hindlimbs, and the base of his tail at the entrance to the burrow (D). Photographs by Pedro Cerqueira Vogeley.

his cloaca at the opening and wagging his pelvis, hindlimbs, and the base of his tail (Fig. 2D) (61 s). The entire sequence lasted 144 s. At this time, the male resumed digging at the entrance of the burrow, followed by additional cloacal rubbing; he then moved to the opposite side of the entrance and continued rubbing, briefly moving away from the burrow, but soon returning and approaching the entrance to resume digging with his forelimbs, entering the burrow as he dug. After entering, he quickly turned around and started digging again, this time while exiting the burrow, pushing dirt forward with his forelimbs, and engaging in additional cloacal rubbing at both the entrance and in the surrounding area.

Given the brief duration of the observed courtship, whether copulation was successful is uncertain. Reports involving *A. ocellifera* recorded substantially longer durations of copulation, ranging from 0.8–121 min (Ribeiro et al. 2011; Sales and Freire 2021). Although opportunistic copulations have been documented, this does not appear to be case in our observation, as opportunistic copulations are not preceded by courtship (Sales and Freire 2021). Our observation includes several indicators of consensual copulation, including burrow excavation, entry into the burrow, pelvic rubbing, and the female willingly exiting the burrow (Ribeiro et al. 2011; Sales and Freire 2021).

Despite evidence of a consensual copulation, our observation of the putative intromission phase was brief (11 s) compared to that reported for *A. ocellifera* (29–55 s) (Sales and Freire 2021). Another notable difference between our observation and previous reports on *A. ocellifera* involves male positioning during the intromission phase. After cloacal contact and eversion of the hemipenis, male *A. ocellifera* typically begin biting the female's pelvic region instead of her neck, assume an arched position that is maintained until withdrawal of the hemipenis (Ribeiro et al. 2011; Sales and Freire 2021), whereas in our observation of *A. xacriaba*, the male continued biting the female's neck. This highly arched posture, sometimes called the "doughnut posture" (Crews 1987), is commonly observed in smaller species of teiids (Carpenter 1962; Mahrdt 1976; Crews 1987; Anderson and Vitt 1990; Alfonso and Torres 2012; Sales and Freire 2021).

Given the very short period of putative intromission and absence of the arched posture, we have to consider the possibility that the male we observed did not achieve hemipenial insertion, although other aspects of the courtship displays were indicative of successful consensual copulation. Copulation might have been curtailed due to our presence, but an alternative explanation is that the observed pair had already copulated at least once, and this was a male guarding the female's burrow. Before and after the intromission phase, we observed the male circling the burrow's entrance while performing cloacal rubbing and digging, behaviors associated with post-copulatory female accompaniment in *A. ocellifera* (Sales and Freire 2021). In any case, our first documented observation of courtship in *A. xacriaba* suggests that, despite its brief duration, such behavior can be highly complex.

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