

## Attack by a Burrowing Owl (Strigiformes: Strigidae) on a White Worm Lizard (Squamata: Amphisbaenidae)

An animal's territory is defined as an area defended "by threat, song or any other behavior pattern evoking avoidance in other individuals, as well as by actual combat" (Hinde 2008). Despite being energetically costly, possessing a territory has multiple advantages, like greater ease of access to food, increasing the chance of finding potential mates, and providing an appropriate place for nesting and protecting offspring (Brown 1964). In birds, the most common territorial defense behaviors are vocalizations, visual displays, chases, and attacks on invaders (Peek 1972). Some species protect their territory through aerial exhibitions (Byrkjedal 1987) or distraction exhibitions (Clark 1982). Birds of prey usually attack intruders (Carrillo & Aparicio 2001), but owls defend their territory with songs (Grieco 2022) and aggressive behavior, like the Burrowing owl, *Athene cunicularia* (Moura & Martins 2022).

Burrowing owls are small owls (19–26 cm in length) distributed from southern Canada to southern Argentina and Chile (Sick 1997). An open area dweller, this species inhabits grassland, desert, prairies, coastal "restingas", and even anthropic areas (Sick 1997). As the name suggests, burrows are essential to Burrowing owls, which build burrows of their own or use burrows from other animals (Sick 1997). Burrowing owls' dens are used for shelter, nesting, storage of food, and retreating from predators (Thomsen 1971).

Burrowing owl individuals actively defend their

territory against threats and potential predators. Although males and females may protect the burrow, the male is usually the defender (Moulton et al. 2004). The protection of the burrow includes using a deep burrow with satellite burrows, escape, alarm vocalizations, adopting threat postures, and low-lying air attacks (Thomsen 1971, Fisher et al. 2004). During the breeding season, the male guards the den's neighboring area (Moulton et al. 2004), perching in its vicinity and emitting songs to alert the chicks to danger (Thomsen 1971). Physical contact is energetically costly and is rarely used by Burrowing owls to defend the territory (Thomsen 1971). Still, the individuals can perform low flights to expel those approaching the burrow (Moura & Martins 2022).

On a sunny morning (9 a.m.) on 1 December 2021, LFH observed a Burrowing Owl defending its territory against a White Worm Lizard (*Amphisbaena alba*) in his backyard in Santo Antônio de Goiás (16.49°S, 49.32°W), state of Goiás, Brazil. The worm lizard (ca. 400 mm total length) was on the surface, standing in a defensive posture, its head and tail upwards. The owl was a few meters from the reptile. As soon as the worm lizard let its guard down and began moving, the owl attacked the lizard's head. The reptile reacted by thrashing with its mouth open and tail lifted, apparently unharmed. After a few minutes, it let the guard down, moved, and was attacked by the owl, defending itself again. This moving-attack-defense sequence continued for about eight hours (Figure 1). Within this period, the worm lizard burrowed underground three times, avoiding the attacks, but it came to the surface minutes later (interval not recorded), being attacked by the owl again. The aggressive behavior ceased when the worm lizard burrowed underground and did not return to the surface.



Figure 1. Aggressive behavior of a Burrowing owl (*Athene cunicularia*) against a White Worm Lizard (*Amphisbaena alba*) in Goiás, Brazil. A) The worm lizard in the defensive display, with its mouth open and tail lifted. B) The owl observing the worm lizard (not shown). C) The owl (top left) flies, and the worm lizard (bottom right) takes a defensive posture. D) The owl makes a swooping attack on the lizard's head.

The White Worm Lizard is the largest known species of *Amphisbaenia*, reaching up to 800 mm snout-vent length (Colli & Zamboni 1999). With a wide geographic range, from Colombia to southern Brazil (Colli et al. 2016), White Worm Lizards inhabit forests and open areas, including urban environments (Costa et al. 2009). It is a diurnal species, frequently foraging on the surface (Díaz-Ricourte & Serrano 2020), becoming visible to predators (Honório et al. 2022). When threatened, White Worm Lizards stand in a horse-shoe posture (sometimes with thrashing movements), the head and tail upwards, and bite if touched (Albuquerque et al. 2008). This behavior, however, may not be effective against all predators (Honório et al. 2022).

Although worm lizards are part of the diet of Burrowing owls (Nolasco et al. 2020), the behavior described above is not predatory but defensive, and the owl was protecting its territory from an invader (Thomsen 1971, Fisher et al. 2004). One week after the observation, on 08 December, LFH sighted two nestlings outside the owl's burrow. Owl nestlings and eggs are not prey for White Worm Lizards, which feed mostly on invertebrates (Colli & Zamboni 1999), but some snakes prey on birds and even owls (Grundler 2020). Therefore, a snake-like animal around the owl's territory may have motivated its aggressive behavior.

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