

SHORT COMMUNICATION

Defensive behavior of *Dipsas sanctijoannis* (Serpentes: Dipsadidae)

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Cadle and Myers (2003) described the snake tribe Dipsadini as docile animals that almost never try to defend themselves by biting their captors. The most common defensive behavior in snakes of this group, dorsoventral flattening of the head to produce a triangular shape, has been reported in several species of *Dipsas*, *Sibon*, and *Sibynomorphus* (Cadle and Myers 2003). Some members of these genera employ other defensive behaviors in addition to changing the shape of the head. These behaviors include: assuming a retracted attack position (*Sibon nebulatus*, Cadle and Myers 2003); mimicking the color pattern and movement of venomous snakes such as *Bothrops jararaca* (e.g., *Dipsas albifrons*, *D. indica*; Sazima 1992, Martins and Oliveira 1998,

Marques *et al.* 2001); expansion of the body (e.g., *D. indica*, *Sibynomorphus mikanii*; Sazima 1992, Cadle and Myers 2003); dorsoventral compression of body (e.g., *Dipsas pavonina*, *D. indica*; Martins and Oliveira 1998); coiling the body and hiding the head (e.g., *Sibon argus*; Cadle and Myers 2003); expulsion of feces or anal-gland secretions (e.g., *D. indica*; Martins and Oliveira 1998); attack with an attempt to bite (e.g., *S. nebulatus*, JARM pers. obs.). Although several studies have contributed to the taxonomic and systematic knowledge of *Dipsas* Laurenti 1768, little is known about the ecology and behavior of members of this genus (Harvey and Embert 2008).

Herein, we report the defensive behavior of *Dipsas sanctijoannis* (Boulenger, 1911) for first time, based on observations of three different individuals in the Municipality of Manizales, Departamento de Caldas, Colombia. The identity of the species was determined by comparing

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digital photographs with descriptions and taxonomic keys provided by Peters (1960), Peters and Orejas-Miranda (1970), Pérez and Santos Moreno (1988), Harvey (2008) and Harvey and Embert (2008). None of the specimens observed was collected.

Dipsas sanctijoannis is endemic to Colombia, where it occurs in the central and western cordilleras of the Colombian Andes, in the departments of Caldas, Cauca, Risaralda, Quindío, and Valle del Cauca, at elevations between 1700 and 2100 m (Peters 1960, Harvey 2008, Harvey and Embert 2008). It is active nocturnally in both arboreal and terrestrial habitats; we observed only one individual by day, and it was inactive on a bush (1.8 m; Individual 1, described below). As reported by Daniel (1939), the snake is known in the municipality of Pensilvania (Departamento de Caldas, Colombia) as “Yaruma tobacco,” because it is often seen on Yarumo trees (*Cecropia* sp.), and because of its dorsal color pattern (dark brown with lighter brown transverse bands) that resembles dry tobacco leaves.

During surveys conducted in several patches of Low Montane Wet Forest (sensu Holdridge 1982, Hartshorn 2002) in Manizales, Caldas, Colombia, between November 2008 and January 2010, we observed three examples of defensive behavior of *Dipsas sanctijoannis*, with some differences in behavior among the three individuals. These observations are as follow.

Individual 1. 30 November 2008 at 09:00 h in secondary forest (Vereda “El Águila” 5°06'27" N, 75°29'30" W, 1900 m) on shrubbery at 1.8 m. The initial defensive behavior of this individual was to escape by moving slowly among the branches of the shrub. When captured, the snake expanded its head posterolaterally to simulate a triangular shape and assumed an attack position, raising and retracting the anterior body; it remained in this position for a few minutes (Figure 1A, B).

Individual 2. 26 June 2009 at 19:35 h, crossing a road (Vereda “Alto Bonito” 5°06'36" N, 75°29'57" W, 1950 m). Immediately after being captured, this individual expanded its head

laterally and produced a foul odor and fecal matter. When placed on a rock, it coiled its body in an irregular manner forming a “ball,” placing the head on the outside (Figure 1C).

Individual 3. 17 January 2010 at 19:00 h in leaf litter at the edge of a road (Vereda “Alto Bonito” 5°06'36" N, 75°29'57" W, 1950 m). This individual first attempted to escape, moving quickly through the leaf litter. After being captured, it produced a foul odor and fecal matter, and later assumed an attack position, slightly raising and retracting the anterior body (Figure 1D).

These are the first reports of defensive behavior in *Dipsas sanctijoannis*. The defensive repertoires of this species are typical for arboreal snakes (Greene 1979, Marques *et al.* 2001); however, the production of a foul odor and fecal matter is a behavior found in a variety of lineages of Neotropical snakes, such as Aniliidae, Boidae, Colubridae, Leptotyphlopidae, and Typhlopidae (Green 1988, Martins and Oliveira 1998). Like its congeners, *D. sanctijoannis* is reluctant to bite and its defensive responses also vary intraspecifically as has been reported in *Sibon nebulatus* (Cadle and Myers 2003).

In general, mimicry in snakes involves either morphology, behavior, or both of the latter (Green 1973, Green and McDiarmid 1981, Marques and Puerto 1991). Some species of Dipsadini demonstrate strong patterns of mimicry with sympatric pitvipers (Sazima 1992, Martins and Oliveira 1998). *Dipsas sanctijoannis* is sympatric in the study area with the Eyelash Palm-pitviper *Bothriechis schlegelii* (Berthold, 1846). There is not a morphological mimicry pattern between the two taxa; instead, the mimicry is partly behavioral. When captured, both species may assume an attack position, raising and retracting the anterior body like S-coil posture (JARM pers. obs.). However, these behavioral similarities may represent a convergent feature having nothing to do with mimicry, thereby implying that phylogenetic history may play a strong role in the occurrence of defensive tactics in Dipsadini.



Figure 1. Defensive behavior of *Dipsas sanctijoannis*. (A) Arboreal attack position. (B) Posterolateral expansion of head to simulate a triangular shape. (C) Coiled body position. (D) Terrestrial attack position. Photos: Julián Andrés Rojas-M.

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