Dipsas alternans (Squamata: Dipsadidae): record of the largest size and height ever documented

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Dipsas alternans (Fischer, 1885) is a snake of the family Dipsadidae, endemic to the Atlantic Forest, ranging from southern to southeastern Brazil, from the state of Rio Grande do Sul to Espírito Santo (Passos et al., 2004; Nogueira et al., 2019). This species can reach up to 94 cm in snout-vent length, has arboreal and nocturnal habits, but daytime activity also occurs (Passos et al., 2004; Marinho et al., 2020). *Dipsas alternans* had been considered a synonym of *Dipsas incerta* (Jan, 1863), but Passos et al. (2004) determined that the latter name corresponds strictly to populations in the Guianas. Based on differences in ventral, subcaudal, and preocular scales of preserved specimens, they placed the Atlantic Forest populations under the name *D. alternans*, revalidated.

During field monitoring carried out in March and April 2023 in the Projeto Dacnis-Legado das Aves partnership area (47°26′58.8″ O, 24°12′15.5″ S, WGS-84, elevations 215 to 350 m above sea level) in the municipality of Miracatu, São Paulo, Brazil, in the Vale do Ribeira (Ribeira valley) region, we recorded three individuals of *D. alternans*. This private reserve consists of a matrix of Atlantic Forest, ranging from primary forest to patches of secondary forests in advanced regeneration, totalling 75 ha. According to Koeppen's classification, the climate in the study area is defined as type Af (Sakay & Lepsch, 1987), characterized as tropical, hot, and humid, without a well-defined dry season.

The first individual was found on 16/03/2023 at 18:06. It was a juvenile that was moving along the branches of

a bush at a height of less than 1 m (Fig. 1A). It exhibited the defensive behavior of head triangulation when being handled for photographs. The second individual, also a juvenile (Fig. 1B), was found on 28/04/2023 at 19:51, resting on the branches of a bush at the edge of the trail, approximately 90 cm above the ground. It did not exhibit any defensive behavior during handling and remained at rest after the photographic documentation. The third individual, found on 29/04/2023 at 19:10, was located at 4.92 m above the ground (height measured with a Bosch GLM 20 digital tape measure) on the leaves of a samambaiaçu (*Dicksonia sellowiana* Hook.) (Fig. 1C). It was an adult, and because we did not immediately recognize the species due to the shedding process, distance from the ground, and size (Fig. 2A), we captured the individual for identification.

The characteristics used to determine the species were the uniform brown color of the head, except for two dark brown parietal spots with yellow or almost white borders (Fig. 2B); the light brown supralabials; the black iris; and the round dark brown dorsal spots with black borders surrounded by thin white borders (Fig. 2C) (Passos et al., 2004; Mebert et al., 2020). We also determined the snake's size with a measuring tape: it had a total length of 102 cm (74.6 cm SVL, 27.4 cm TL). With the help of a probe sexer, we determined that it was a female. After measurement and photography, the animal was released in the same location.

Although *D. alternans* has a wide geographic distribution, searches on the Specieslink platform (*https://specieslink.net/*) in the atlas of Brazilian snakes (Nogueira et al., 2019) revealed that the closest records to Miracatu are in the municipalities of Juquitiba – the type locality of the species (Passos et al., 2004) –, Eldorado, and Cananéia, all in the state of São Paulo, at distances of 55 km, 74 km and 94 km from Miracatu, respectively. A specimen from Miracatu collected by F. C. Oliveira in 1995 and deposited at Instituto Butantan (IBSP 55952) as *D. incerta* should, considering the work by Passos et al. (2004), be identified as *D. alternans*.

Marinho et al. (2020) reported three specimens of *D. alternans* in reproductive activity 1.5 m above the ground. Despite knowing that the species has arboreal habits, there is a gap in its natural history, with no indications of which forest strata it uses. For other *Dipsas* species, such as *D. indica* (Laurenti, 1768), there are reports up to 2.5 m above ground (Natera-Mumaw & Battiston, 2008). Ray et al. (2023) found *D. aparatiritos* (Ray et al., 2023) foraging at a height of 2 m. *Dipsas variegata* (Duméril, Bibron & Duméril, 1854) was seen at rest on fern leaves 3 m above the ground (Lotzkat et al.,

2008). There are no reports of *Dipsas* above 3 m. Our encounter, therefore, is the highest above-ground level record for a snake of the genus *Dipsas*.

The *D. alternans* individual we measured represents the longest specimen ever recorded for the species. The largest documented individuals consisted of a male of 85.6 cm SVL and a female of 94 cm SVL (Passos et al., 2004). Encounters with snakes during field research can be rare (Fitch, 1987), especially in the Atlantic Forest (e.g., Sazima, 1989; Sazima & Haddad, 1992; Muscat et al., 2021), so data obtained during such encounters is essential for basic knowledge of the biology of various species. New studies may reveal the presence of *D. alternans* in other locations in the Vale do Ribeira and add new knowledge to its natural history.

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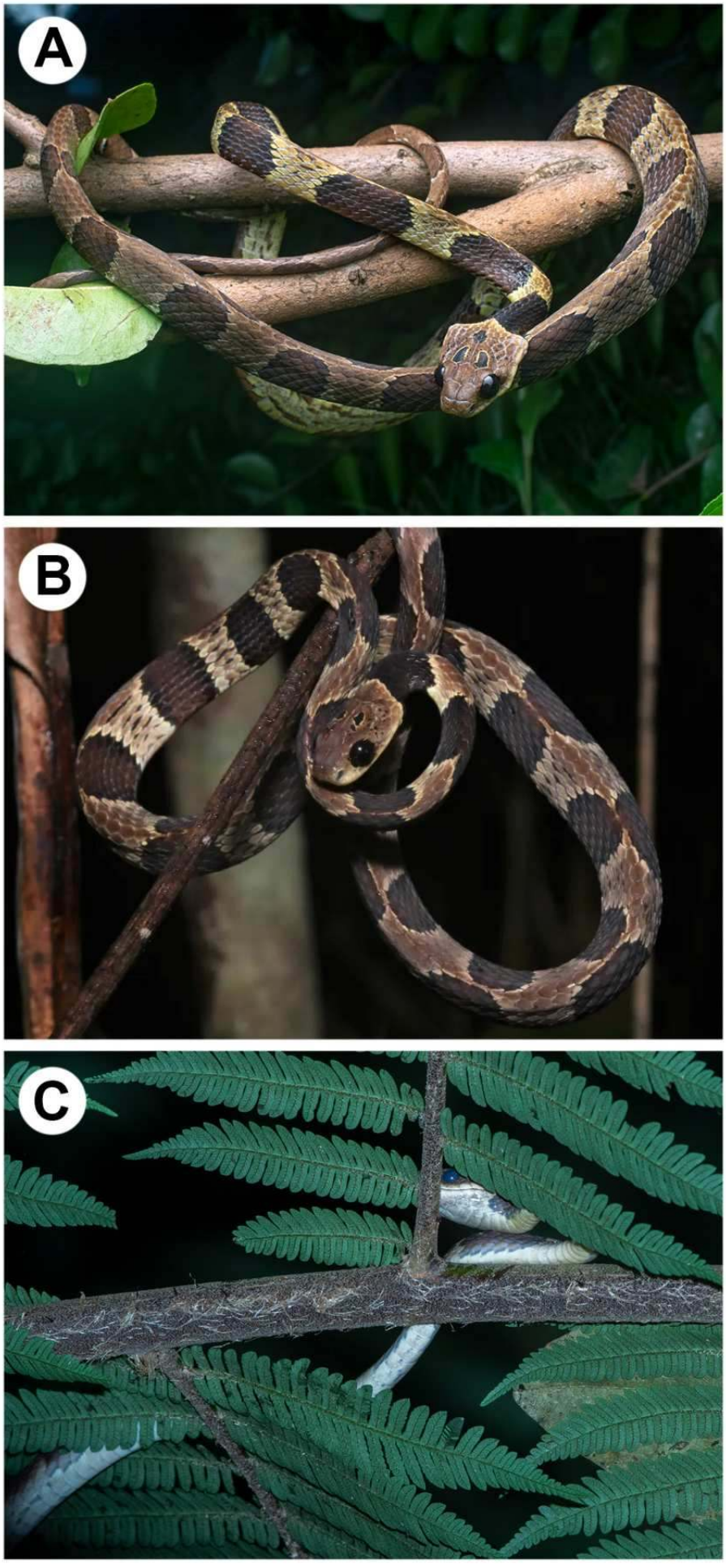


Figure 1. (A) and (B) Juvenile *Dipsas alternans* found on shrubs in the Projeto Dacnis-Legado das Aves partnership area, on 29/04/2023 and 28/04/2023; (C) Adult *Dipsas alternans* on fern tree leaves in the Projeto Dacnis-Legado das Aves partnership area, on 29/04/2023.



Figure 2. (A) *Dipsas alternans* of 102 cm total length captured in the Projeto Dacnis-Legado das Aves partnership area, on 29/04/2023; (B) Visible parietal marks even during the shedding process; (C) Clear supralabials (black arrow), black iris (red arrow), and distinct dorsal spots (white arrow), characterizing the species.