

## DISTRIBUTION AND NATURAL HISTORY OF THE ECUADORIAN SNAKE *Dipsas andiana* (BOULENGER, 1896) (COLUBRIDAE: DIPSADINAE) WITH CONSIDERATIONS ON ITS CONSERVATION STATUS

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The distribution and natural history of *Dipsas andiana* (Boulenger, 1896), a little-known snake endemic to Ecuador, are revised, and new records are presented that extend its geographical and altitudinal range. A conservation status assessment indicates that *D. andiana* would classify for the IUCN category “Near Threatened (NT).” The ecological distribution of the species is apparently related with seasonal forests of the West Ecuadorian zone, a recently recognized biogeographic area between the very humid Choco and the dry Tumbesian zone.

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**Keywords:** Reptilia, Serpentes, *Dipsas andiana*, Ecuador, distribution, natural history, conservation.

### INTRODUCTION

*Dipsas andiana* (Boulenger, 1896) is a species of the clades Colubridae, Dipsadinae, endemic to the Pacific lowlands and western slopes of Ecuador. Until very recently, the name *Dipsas andiana* was considered a synonym of *Dipsas oreas*, but specimens were usually reported as *Dipsas variegata nicholsi* (now *D. nicholsi*) (Cadle and Myers, 2003). Recently, Cadle and Myers (2003) resurrected *Dipsas andiana* from the Andean *oreas*, restricting *nicholsi* as a Panamanian species, and *variegata* as a taxon distributed in Venezuela, Trinidad, French Guyana, and Brazil.

Cadle and Myers (2003) reviewed 13 specimens of *Dipsas andiana*, four with uncertain localities and nine from six localities in the Ecuadorian provinces of Los Ríos, Bolívar, and Pichincha, between 15 and 1140 m. Recent surveys have provided two additional localities for the species: Río San Francisco, Punta Galeras (first record to the province of Esmeraldas; Ortega, 2005); and Loma Alta (first record to the province of Guayas; C. Martínez, personal communication; Martínez et al., 2005). Because few specimens of *Dipsas andiana* are deposited in USA and Europe collections (despite considerable herpetological fieldwork in western Ecuador),

Cadle and Myers (2003) remarked that the species is probably “on the brink of extinction.”

Herein, I revise and update the available information on *Dipsas andiana*, providing new records for the species, commenting on its particular distribution pattern, and analyzing its conservation status under the IUCN categories.

### MATERIAL AND METHODS

Data herein reported were collected at various localities in the Pacific lowlands and western versant of Ecuador (Table 1). Examined material is deposited in the following Ecuadorian collections: Departamento de Biología, Escuela Politécnica Nacional, Quito, Ecuador (EPN); D. F. Cisneros-Heredia’s collection housed at Universidad San Francisco de Quito, Quito, Ecuador (DFCH); and Fundación Herpetológica Orcés, Quito, Ecuador (FHGO). Coordinates and elevations of the new occurrences were determined using collector’s field notes, and confirmed with the physical map of the Republic of Ecuador 1:1,000,000 published in 2000 by the Instituto Geográfico Militar and the gazetteer of Lynch and Duellman (1997) (Map 1). To assess the conservation status of *Dipsas andiana*, we follow the methodology suggested by IUCN SSC (2001), with optimizations by Cisneros-Heredia and Touzet (2004) and Cisneros-Heredia and McDiarmid (2006).

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**Map 1.** Localities (squares) and projected distribution (lined area) of *Dipsas andiana* (Boulenger), an endemic snake of Ecuador. Numbers of localities correspond to those on Table 1. Question marks refer to undetermined northwestern and southwestern limits of the species' range (see text).

## RESULTS

### *Dipsas andiana* (Boulenger, 1896)

*Leptognathus andiana* Boulenger, 1896:452, pl. 23, Fig. 2a – c (original description). Type locality: “Quito, Ecuador.” Holotype: BMNH 1946.1.20.12 (for a complete synonymy see Cadle and Myers 2003).

Six specimens deposited in Ecuadorian collections increase our knowledge on the geographic and altitudinal range of *Dipsas andiana*. One male specimen (DFCH-D116) was collected dead on the roadside below Tandayapa, Province of Pichincha, on October 1998 by D. F. Cisneros-Heredia and R. Phillips; increasing the altitudinal distribution of the species from 1140 m to at least 1750 m. One female specimen (DFCH-D115) was collected resting during the night in the branch of a shrub ~1 m above ground in bushes ~5 km NW of Puerto Lopez, Province of Manabí, on June 1, 2000, by D. F. Cisneros-Heredia and D. Mosquera. This record is the first from the province of Manabí, expanding the altitudinal range to 5 m towards the coastal area, and extending the geographic range of *D. andiana* 145 km west. One individual (EPN s/n), was collected at Alto Tambo (km 17, Lita – San Lorenzo road), province of Esmeraldas,

**TABLE 1.** Localities Where *Dipsas andiana* (Boulenger) Has Been Recorded

Locality	Coordinates	Altitude, m
<b>Esmeraldas</b>		
(1) Río San Francisco, Punta Galera*	~00°40' N 80°01' W	~200
(2) Alto Tambo	00°56' N 78°32' W	~750
<b>Pichincha</b>		
(3) Puerto Quito*	~00°08' N 79°16' W	~280
(4) Hacienda La Joya	00°05' N 78°59' W	~700
(5) San Miguel de Los Bancos	00°01' N 78°53' W	800
(6) Nanegalito, near to	00°02' N 78°40' W	1600
(7) Tandayapa	~00°01' N 78°39' W	~1750
(8) Santo Domingo*	00°15' S 79°09' W	~600
(9) Las Palmas*	~00°22' S 78°55' W	920
(10) Dos Ríos*	~00°19' S 78°51' W	1140
<b>Manabí</b>		
(11) Puerto López, 5 km NW of Guayas	01°32' S 80°49' W	~0
(12) Loma Alta*	01°52' S 80°38' W	~700
<b>Los Ríos</b>		
(13) Babahoyo*	01°49' S 79°31' W	~15
<b>Bolivar</b>		
(14) Balsapamba*	01°47' S 79°13' W	~800

\* Localities correspond to secondary or literature references (see text).

on December 1990 by J.-M. Touzet. This record is the second known locality from the province of Esmeraldas.

Additionally, three specimens represent new localities in the province of Pichincha. One male specimen (DFCH-D117) was collected dead on the roadside at Hacienda La Joya, a farm 1 km W of the town of San Vicente de Andoas, km 109 of the Quito – Calacali – Nanegalito – Pedro Vicente Maldonado road, Province of Pichincha, on February 27, 2000, by D. F. Cisneros-Heredia and S. Izurieta. One specimen (FHGO 332) was collected at San Miguel de Los Bancos, Province of Pichincha, on February 25, 1990, by A. Murriiqui. One specimen (FHGO 993) was collected apparently near Nanegalito (FHGO catalog indicates “km 83 via Quito – Nanegalito,” however it provides these coordinates and altitude: “00°02' N 78°40' W, 1600 m,” suggesting that the correct locality is somewhere near Nanegalito, ca. km 48 of the Quito – Nanegalito road), province of Pichincha, on October 22, 1994, by J.-M. Touzet.

*Dipsas andiana* is sympatric with *Dipsas elegans* at Tandayapa; with *Dipsas temporalis* at the localities in

**TABLE 2.** Morphological, Scalation, and Color Data of Three Specimens of *Dipsas andiana* (Boulenger) from Ecuador

Specimen	DFCH-D15	DFCH-D116	DFCH-D117
Sex	Female	Male	Male
Dorsal rows	15–15–15	15–15–15	15–15–15
Ventrals	189	186	189
Subcaudals <sup>a</sup>	84	90	101
Postoculars <sup>b</sup>	2	2	2
Primary temporals	2	2	3
Secondary temporals	3	3	4
Supralabials (touching eye) <sup>c</sup>	10(4, 5, 6)	10(4, 5, 6)	9(4, 5)/10(5, 6)
Infralabials (in contact behind mental) <sup>c</sup>	10(2)	10(2)	9(1)/10(1)
No. of dorsal blotches on body	24	22	20

<sup>a</sup> Subcaudal counts on both specimens are not precise because specimens were collected dead on the roadside.

<sup>b</sup> DFCH-D115 has the lower postocular on the right side very tiny, almost unnoticeable without close inspection.

<sup>c</sup> Variation left/right side.

the province of Esmeraldas; with *Dipsas gracilis* and *Sibon nebulatus* at Hacienda La Joya, Nanegalito, Puerto Quito, Santo Domingo, and at the localities in the province of Esmeraldas; and with an non-described species of *Sibynomorphus* at the locality in the province of Manabí.

## DISCUSSION

All examined specimens showed the typical coloration described by Cadle and Myers (2003) for *Dipsas andiana*, including the characteristic U-shaped marking. The number of dorsal blotches fluctuates within variation range described for the species by those authors (Table 2) and most meristic characters also coincides with the variation described by Cadle and Myers (2003), except that there is one more subcaudal scale for females and one scale less for males (Table 2).

Based on information provided by Cadle and Myers (2003) and data presented herein, *D. andiana* inhabits the following vegetation formations [*sensu* Sierra, 1999, with modifications by Anderson and Jarrin (2002) and Cisneros-Heredia (2006)]: Seasonal Lowland Evergreen forest, Foothill Seasonal Evergreen forest, Low Montane Evergreen forest, Littoral Dry shrubs, and Montane Dry shrubs.

*Dipsas andiana* has not been collected further north in the very humid Chocoan lowlands or further south into the extremely xeric Tumbesian area. The absence of records from these areas, otherwise rather close to the actual known localities of the species, could indicate that: (1) surveys in these zones have failed to find the species because its low natural densities or survey methods are not exploring habitats/microhabitat occupied by

the species; or (2) the ecological distribution of the species is related with the Seasonal Evergreen Forest and the Seasonal Dry Forest, as seen in *Leptodactylus labrosus* (personal observation) [Seasonal Evergreen Forest as defined by Anderson and Jarrin (2002) and Cisneros-Heredia (2006)], and the species could be endemic to the West Ecuadorian zone, a recently recognized biogeographic area between the very humid Choco and dry Tumbesian zone.

If the geographical range of *Dipsas andiana* is in fact related to the seasonal forest of western Ecuador, the locality Alto Tambo would be conceivably the northernmost limit on its distribution as this locality is already in the border towards non-seasonal forest. To the south, seasonal forests extend along the western versant of the Andes as far as to the province of Azuay and El Oro, but the southernmost record of *Dipsas andiana* is at Babahoyo, in the province of Los Ríos (Map 1). More information is needed to establish the northern and southern limits of the distribution of *D. andiana*.

The distribution of *Dipsas andiana* encompasses ~30,000 km<sup>2</sup> (extent of distribution and polygon area, *sensu* IUCN SSC, 2001), and an altitudinal range between 5 – 1750 m a.s.l. The species has been found only in forested areas in primary and secondary forests; and it is apparently not adapted to heavily impacted habitats, such as grasslands or intensive-agriculture crops. The paucity of specimens collected over the years suggests that *D. andiana* has natural low densities. The poor conservation status of West Ecuadorian forest (due to extreme deforestation, uncontrolled expansion of the agricultural frontier and colonization, and indiscriminate use of pesticides and other chemical compounds in crops) suggest that although *Dipsas andiana* is probably not on

the verge of imminent extinction as previously suggested (Cadle and Myers, 2003), the species should be placed under the IUCN category of Near Threatened. This classification is justified because although the species has a rather large geographic range (larger than 20,000 km<sup>2</sup> considered for a Vulnerable species), the habitats along this range are severely fragmented and modified, and if these tendencies continue, the species could be classified for an endangered category, such as Vulnerable or Endangered. Since *D. andiana* is endemic to Ecuador, this category should apply to the national and global level.

Our knowledge on the ecology and conservation status of *Dipsas andiana* and several other species of Ecuadorian Dipsadinae (e.g., *Sibynomorphus petersi*) is still limited. Efforts to support basic and applied research on Ecuadorian reptiles are urgently needed, as well as recruitment and training of new students, and support to collections already established.

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