



## Herpetological results of the 2002 expedition to Sarisariñama, a tepui in Venezuelan Guayana, with the description of five new species

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### Abstract

Sarisariñama is a pink sandstone plateau with a total area (summit and slope) of 832 km<sup>2</sup> located about 600 km SE of Caracas, in Estado Bolívar, Venezuela. It includes diverse environments along an elevational gradient from 400 m up to an elevation of 2100 m at its western cliffs, notably possessing dense forest covering most of its surface, a condition unique among tepui. The plateau is most well-known for its bizarre reptilian megafauna that evolved in isolation atop it, as well as for the international incident which occurred there in 1951. Sarisariñama is also well known among spelunkers for its sinkholes (simas), among which Sima Mayor is the largest on earth. Herpetofaunal surveys at four camps in the uplands and two at the base of the massif revealed 36 species, four of which are here described as new taxa. A more complete analysis of the behaviors and relationships of the four megafaunal reptiles of the plateau were performed to complement the scant data collected at Sarisariñama by the failed 1988 expedition from Simón Bolívar University and Radio Caracas Televisión. For the sake of comprehensiveness, information is also presented on two other vertebrates, *Bathornomimus kevinci* and *Pterygoreos nothos*, which also form part of the terrestrial megafauna of Sarisariñama. The new taxa includes three frogs in the genera *Hyalinobatrachium*, *Anomaloglossus*, and *Pristimantis*, and one gecko (genus *Gonatodes*). In addition to these new species, we name a fifth based on evidence that populations hitherto known as *Hypsiboas benitezi* from east of the Maigual-ida-Parima Mountains, including our Sarisariñama sample, are distinct species. Throughout, we reference common names for most species in the indigenous Ye'kwana language, and we provide information on local legends and cultural anecdotes involving some of the local species. We comment on the zoogeography of the Sarisariñama herpetofauna by comparing it with that of other known tepuis.

**Key words:** Venezuela; Guiana Shield; Sarisariñama; tepui; herpetofauna; new species; *Anomaloglossus*; *Hyalinobatrachium*; *Pristimantis*; *Gonatodes*; *Hypsiboas benitezi*; *Stefania riae*; *Neusticurus*; *Norops ortonii*; biogeography

“Islands in time” is a term introduced by Brewer-Carías (1974) to describe the isolation among plants and animals living on remote tabletop mountain summits in the Venezuelan Guayana. These tabletop mountains are known as tepuis, a term derived from the local Pemón language. Their foreboding vertical cliffs, their near inaccessibility, and their isolation led many an author to locate lost civilizations on their peak. Though this is fantasy, the tops of tepui can still be places of wonder. Tepuis are the result of erosion of a formerly extensive sandstone plateau (Gansser 1974), leading to their position as biogeographic islands in a surrounding sea of lowland forest and/or grassland savanna.

### **A brief history of tepui exploration**

Sarisariñama is an immense tepui with a summit area of 546 km<sup>2</sup> and a slope area measuring 286 km<sup>2</sup> and a maximum altitude of 2,350 m above sea level located in Bolívar State, Venezuela (McDiarmid & Donnelly, 2005). However, this height is somewhat misleading as a large part of the summit surface lies at a lower altitude; indeed the surface of the extensive meseta of the Sarisariñama Tepui is covered by dense jungle vegetation not normally found at high elevations. Additionally, although it looks flat, the meseta is in fact characterized by huge vertical depressions with diameters up to 350 m, accompanied by steep walls of the same depth.

The name Sarisariñama is derived from the name of an evil bird spirit that used to perch on one of the many cliffs at the southern edge of the plateau (Brewer-Carias 1983: 21). This evil spirit was similar to the giant bird Dimoshi whose feathers gave birth to the blowgun canes found nowadays along the Marahuakatepui mountain base (Civrieux 1970). However, it now appears multiple endemic species of the tepui may have played a role in the development in the myth. This mythological giant bird, whose name nowadays is also used to refer to the large harpy eagle (*Harpia harpija*), used to make the noise “sari” when eating humans. Thus, *sarisari* is a repetitive, onomatopoeic name. The suffix *-ña* means place, and *-ma* is indicative of a house, or place. The complete name of the tepui in the indigenous language, *Sarisariñamajidi*, defines a mountainous place where the Dimoshi evil spirit perches or lives and eats humans.

### **A brief history of tepui exploration**

Expeditions to these remote table mountains, especially to their summits, are logistically difficult, expensive and, as a consequence, quite infrequent. Early explorations, although not primarily herpetological, began in the last decade of the 19th Century (1894 and 1898), when E. im Thurn and H. Perkins, followed later by F.V. McConnell and J.J. Quelch, accessed Mount Roraima and made zoological and botanical collections; the discovered reptiles and amphibians were later described by Boulenger (1900). During the Phelps Venezuelan Expedition of the American Museum of Natural History (1937–38), the first specimens from Auyan-tepui were collected (Tate 1938*a,b*; Roze 1958*a*). Juan Rivero succeeded in reaching some of the most inaccessible parts of the Venezuelan Guayana in his search for amphibians in 1950. Especially his collecting in the uplands of the Duida-Marahuaka region contributed many new species, even though he never reached the summit of either tepui (Rivero 1961). The Chimantá massif was first explored by the Chicago Natural History Museum during February 1955, resulting in a herpetological report by Roze (1958*b*). A similar 50s expedition to Sarisariñama relied upon manual climbing, though its purposes had less to do with the native fauna and more the loss of an experimental nuclear cruise missile on the plateau. Unfortunately, this coincidental event had a horribly detrimental effect on herpetological research. The presence of at the time irrecoverable military technology meant that access to the plateau was restricted and many informational documents classified.

Modern exploration of tepuis, beginning at the time when helicopters became available to transport scientists, intensified in the 1960s. The Guiana Shield and its tepuis were explored in earnest when the second author (CBC) directed several multifaceted expeditions to explore the summits of tepuis such as Autana, Neblina, Marahuaka, Sarisariñama, Jaua, Kukenán, Aprada, Ptari, Ilu, and several others whose biota was explored for the first time. The result was a better understanding of the special botany and geology of the region and, in the case of Sarisariñama, the origin of the sinkholes. These so-called simas are sinkholes that penetrate deeply into the world's most ancient sandstone system (Colveé 1973). The western edge of the tepui that was later named Sarisariñama was first explored in 1967 via helicopter, under the leadership of William Phelps and Julian Steyermark, who collected the first herpetological sample (*Euspondylus phelpsi*; Lancini 1968). At that time, the mountain was considered part of Jaua-tepui, with which it was long confused (Steyermark and Maguire 1972).

During 1974, CBC directed the expedition of the Sociedad Venezolana de Ciencias Naturales to the Sarisariñama massif to explore the simas. This 40-member expedition established a significant botanical and ornithological collection (Brewer-Carias 1976; Steyermark and Brewer-Carias 1976). Unfortunately, only an unpublished report exists for the herpetological samples from this expedition, with the material remaining unstudied at the National Museum of Natural History in the United States. Only one new amphibian was described based on specimens from that expedition, the frog *Stefania riae* (Duellman and Hoogmoed 1984). Two additional expeditions explored the bottom of Sima Mayor, one led by CBC for a Japanese film crew and the other organized by Venezuelan and Polish spelunkers who mapped other sinkholes in the same mountain and gathered some additional herpetological specimens (Zawidzki *et al.* 1976:110); we were unable to locate these specimens. In 1988, a team of nature filmmakers from Radio Caracas Television accompanied a party of scientists from Universidad Simón Bolívar to Sarisariñama. During this trip another small collection of amphibian and reptiles was made, and some of them will be treated below.

Most recently (March 2002), the Instituto Geográfico de Venezuela Simón Bolívar (IGSB) of the Ministerio del Ambiente authorized an expedition to Sarisariñama by the Japanese documentary production company NHK to document the biodiversity at the summit of the plateau and at the bottom of Sima Mayor. This expedition was led by CBC, and a herpetofaunal survey was conducted by the authors, Javier Mesa, and Mark Moffett. The results of this latest Sarisariñama expedition are presented herein.

## Species accounts

### Crocodylians

#### Family Alligatoridae

##### *Paleosuchus sp.*

Black Dwarf Caiman, Babo Negro or Morichalero, Yadibe

While the expedition attempted to collect data on all native reptiles and amphibians, for many it was clear that the focus was upon the reptilian megafauna. As we traveled towards the tepui, we came across a skull of a Black Dwarf Caiman along the riverbank at Karanakuni that had recently been cooked and was covered with ants. Black dwarf caimans are hunted and eaten by the native Ye'kwana, so such a sight is not unusual, but it served as a grim reminder for many of the party of what happened on previous expeditions to the plateau.