

First record of *Hemidactylus agrius* (Squamata, Gekkonidae) in thickets of *Encholirium spectabile* (Bromeliaceae) in the Brazilian semi-arid

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ABSTRACT: Considering that few species of geckos (Gekkonidae, Phylodactylidae and Sphaerodactylidae) have been reported from bromeliads habitats, the aim of this study is to provide preliminary information on the species of geckos associated with Bromeliaceae, and report aspects of the biology of *Hemidactylus agrius* in association with the rupicolous bromeliad *Encholirium spectabile* growing on rocky outcrops in the Agreste region of northeastern Brazil. Fieldwork was conducted from December 2009 to September 2010, during a survey of the herpetofauna in the municipality of Santa Maria (Rio Grande do Norte state), during this study we recorded the occurrence of specimens of *Hemidactylus agrius* in clumps of *E. spectabile*. The finding of a large population of *H. agrius* in thickets of rupicolous *Encholirium spectabile* represents good news for the conservation of this rare species of gecko in the Caatinga Domain of northeastern Brazil.

Keywords: association, rupicolous bromeliads, conservation, Caatinga and gecko.

Pregistro de *Hemidactylus agrius* (Squamata, Gekkonidae) em touceiras de *Encholirium spectabile* (Bromeliaceae) no semiárido brasileiro

RESUMO: Considerando que, apesar da grande diversidade, poucas espécies de geconídeos (Gekkonidae, Phylodactylidae e Sphaerodactylidae) têm sido relatadas habitando bromélias, tendo como base esse pressuposto o objetivo do presente estudo é fornecer informações preliminares sobre as espécies de gecos associados a Bromeliaceae além de reportar aspectos da biologia de *Hemidactylus agrius* em associação com a bromélia rupícola *Encholirium spectabile* em afloramentos rochosos na região do Agreste do Nordeste do Brasil. O trabalho de campo foi realizado no período de Dezembro de 2009 a Setembro de 2010, durante um levantamento da herpetofauna no município de Santa Maria, durante este estudo observamos a ocorrência de vários exemplares de *Hemidactylus agrius* em touceiras de *Encholirium spectabile*. Este achado é relevante para a conservação desta espécie de geconídeo, considerada rara e pouco conhecida na região de Caatinga do nordeste brasileiro.

Palavras-chave: associação, bromélias rupícolas, conservação, Caatinga e geconídeos.

Although highly diverse, few species of geckos (encompassing the families Gekkonidae, Phylodactylidae and Sphaerodactylidae) have been reported from bromeliad habitats. In North and Central America, the species-rich genus *Sphaerodactylus* has been recorded in association with Bromeliaceae: *S. cochranæ* in the Dominican Republic (SCHWARTZ, 1991), *S. argivus lewisi* in the Cayman Islands (BRUNT; DAVIES, 1994); *S. vincenti* on St. Vincent's Islands (SCHWARTZ, 1991), *S. siboney*, *S. celicara* and *S. bromeliarum* in Cuba (FONG; DIAZ, 2004, GARRIDO; SCHWARTZ, 1982, SCHWARTZ, 1991); *S. argus* in Florida (LYNN; GRANT, 1940 cited by KRYSKO; SHEEHY, 2005 p.170), *S. goniorhynchus*, *S. semasiops* and *S. oxyhinus* in Jamaica (SCHWARTZ, 1978, 1991). Fuenmayor; Molina, (2005) record *S. molei* from an epiphytic bromeliad growing on a palm tree in Venezuela.

In Brazil, the following species of geckos have been collected in water-impounding bromeliads in restinga,

tabuleiro woodland and Atlantic Forest habitats: *Hemidactylus brasiliensis* (as *Briba brasiliensis*), *Hemidactylus mabouia*, *Gymnodactylus geckoides*, *Gymnodactylus darwinii*, *Phyllopezus lutzae* (ARAÚJO, 1984, 1991, FREIRE, 1996, VARELA-FREIRE, 1997, TEIXEIRA, 2001, SANTOS et al., 2003, CARVALHO; ARAÚJO, 2007, CARVALHO et al., 2007, AVILA et al., 2009). Recently, the Bromeliad Pigmy Gecko *Coleodactylus elizae* has been described from specimens found in bromeliads in a fragment of the highly threatened Brazilian Atlantic forest in Alagoas State, northeastern Brazil (GONÇALVES et al., 2012). ÁVILA-PIRES (1995) mentions the record of *Gonatodes humeralis* (as *Gonatodes annularis*) from epiphytic bromeliads made by Beebe (1944) in the Brazilian Amazon. Maciel et al. (2005) report the use of terrestrial bromeliads as an oviposition site by *G. humeralis* in Maranhão state, NE Brazil.

The genus *Hemidactylus* (popularly known as víboras, bribas and osgas in Brazil) has three species known

to occur in the Caatinga Domain (VANZOLINI et al. 1980, RODRIGUES, 2003), *Hemidactylus mabouia*, introduced from Africa, *Hemidactylus brasiliensis* (formerly known as *Bribe brasiliensis*) and *Hemidactylus agrius* (Figure 1), a native species considered rare by VANZOLINI et al. (1980). The exotic species *H. mabouia* is closely associated with human dwellings, while *H. agrius* and *H. brasiliensis* are generalist in habitat preferences (RODRIGUES, 2003). *H. agrius* is morphologically similar to its congener *H. mabouia*, but in *H. agrius* the ventral lamellae of the 4th toe reach to the foot's sole, whereas in *H. mabouia* they are separated from it by an area of granules, also *H. agrius* has much more tubercles on the back and limbs especially in the forearm (VANZOLINI et al. 1980).

According to Passos; Borges-Nojosa, (2011), *Hemidactylus agrius* is a little-studied species whose geographical distribution is restricted to northeastern Brazil where it has been recorded in the Caatinga (VANZOLINI, 1978, VANZOLINI et al., 1980) and Cerrado Domains (ANDRADE et al., 2004). Rodrigues (1986) records the presence of *H. agrius* in the Caatinga of Cabaceiras municipality (Paraíba state, NE Brazil), where it is abundant on rock outcrops, while emphasizing its absence in other localities of the semiarid Caatinga. Despite the fact *H. agrius* had been recorded from the states of Ceará, Paraíba, Pernambuco, Piauí, Maranhão and Rio Grande do Norte (VANZOLINI et al., 1980, RODRIGUES, 2003, BORGES-NOJOSA; CASCON, 2005, FREIRE et al., 2009, ANDRADE et al., 2013), no report mentions the occurrence of *H. agrius* in association with bromeliads. Since there is no published report on geckos associated with *Encholirium* species, a bromeliad genus endemic to xeric areas in Brazil (FORZZA et al., 2003), the main goal of the present study is to provide preliminary information regarding the biology of *H. agrius* in association with this bromeliad growing on rock outcrops in the Agreste region, northeastern Brazil.



Figure 1. Nocturnal activity of adult specimen *Hemidactylus agrius* on leafblade of *Encholirium spectabile*. Photo by Jaqueiuto Jorge.



Figure 2. General view of rock outcrop in Santa Maria (RN) with thickets of *Encholirium spectabile*. Photo by Jaqueiuto Jorge.

The field work was carried out from December 2009 through September 2010 during a survey of the herpetofauna in Santa Maria municipality (5.854° S, 35, 701° W, WGS84 datum, 137 m elevation, Rio Grande do Norte state, Brazil), the area was characterized according Rizzini (1997), where recognizes within the Caatinga Domain a ecotonal region close to the Atlantic forest called “Agreste” characterized by higher air humidity values, deeper soil profiles and dense vegetation. We observed specimens of a gekkonid lizard in association with thickets of *Encholirium spectabile* growing on rock outcrops (Figure 2). Specimens of a gecko were collected, identified as *Hemidactylus agrius* and deposited in the Herpetological Collection of the Departamento de Botânica, Ecologia e Zoologia of UFRN (CHBEZ nr. 3354). The bromeliad specimens were identified according to Smith e Downs (1974).

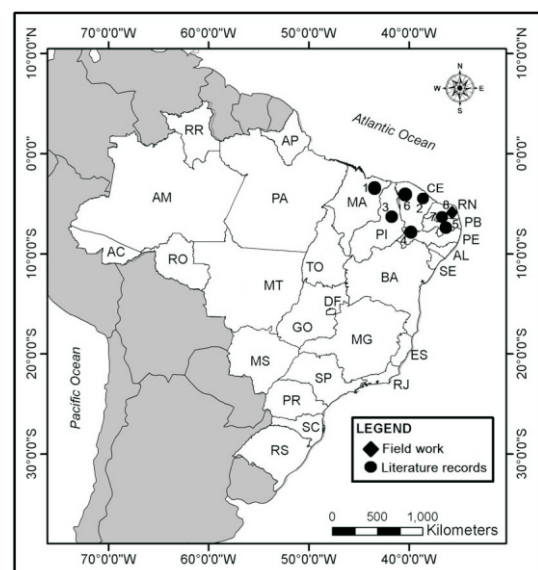


Figure 3. Geographical distribution of *Hemidactylus agrius* in northeast of Brazil. 1. Urbano Santos-MA (ANDRADE et al., 2004); 2. Coluna-CE (VANZOLINI, 1978); 3. Valença do Piauí-PI (VANZOLINI, 1978); 4. Exu-PE (VANZOLINI et al., 1980); 5. Cabaceiras-PB (RODRIGUES, 1986); 6. Fazenda Almas-CE (BORGES-NORJOSA; CASCON, 2005); 7. Serra Negra do Norte-RN (FREIRE et al., 2009, ANDRADE et al., 2013); 8. Santa Maria-RN (present field work).

During fieldwork we observed more than fifteen specimens of *Hemidactylus agrius* in thickets of *Encholirium spectabile* in one particular night. The abundance of *H. agrius* associated with *Encholirium spectabile* in Santa Maria raises two hypotheses: 1) Jorge et al., (2009) reported a great diversity of arthropods associated with *Encholirium spectabile* thickets in Santa Maria which may serve as foraging sites and thus support the trophic ecology of *H. agrius*. The large amount of prey resources could promote a greater abundance of *H. agrius* compared with other areas of Caatinga studied. 2) The tightly packed, thorny foliage of *Encholirium* could serve only as a refuge from predation for the local population of *H. agrius*.

The finding of a large population of the *Hemidactylus agrius* associated with rupicolous thickets of *Encholirium spectabile* represents good news for the conservation of this rare gecko and suggests that this xerophilous bromeliad may represent a habitat neglected by herpetological surveys and in need of detailed inventorying of their associated fauna. Due to their potential to harbor populations of rare lizard species *Encholirium* thickets may deserve a higher priority in conservation efforts considering that, according to FORZZA et al., (2003), many species of the Brazilian endemic genus *Encholirium* are threatened by habitat disruption such as caused by granite and limestone mining in rock outcrops.

Santos et al., (2003) hypothesized that tank bromeliads play a keystone role in the conservation of populations of *Hemidactylus brasiliensis* in restinga and tabuleiro areas in eastern Rio Grande do Norte state, and we likewise suggest that the thickets of bromeliads of the genus *Encholirium* may play a significant (if not keystone) role in the conservation of *H. agrius* in the semiarid areas of northeastern Brazil.

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