

SHORT COMMUNICATION

Water dispersal of *Amphisbaena alba* and *Amphisbaena amazonica* (Squamata: Amphisbaenia: Amphisbaenidae) in Brazilian Amazonia

Gleomar F. Maschio¹; Ana L. da C. Prudente¹ & Tami Mott²

¹ Departamento de Zoologia, Museu Paraense Emílio Goeldi. Caixa Postal 399, 66040-170 Belém, Pará, Brasil.

² Departamento de Biologia e Zoologia, Instituto de Biociências, Universidade Federal do Mato Grosso. Avenida Fernando Correa da Costa, 78060-900 Cuiabá, Mato Grosso, Brasil.

³ Corresponding Author. E-mail: gleomarmaschio@yahoo.com.br

ABSTRACT. Information on the use of aquatic environments by two species of amphisbaenids (*Amphisbaena amazonica* Vanzolini, 1951 and *Amphisbaena alba* Linnaeus, 1758) are presented. These findings suggest that aquatic environments are not a barrier to these animals, until now considered as strictly fossorial. New studies on amphisbaenians in natural conditions are needed in order to better understand which species may use water environment during dispersal events and the frequency of this behavior in the group.

KEY WORDS. Amphisbaenians; dispersal capability; Caxiuanã.

Amphisbaenians, or worm lizards constitute a monophyletic group of approximately 190 species of highly specialized fossorial squamates (GANS 2005, HALLIDAY & ADLER 1986, ZUG 1993, KEARNEY & STUART 2004). Six families are recognized in the suborder Amphisbaenia (VIDAL *et al.* 2007) but only one, the Amphisbaenidae, occurs in Brazil, including at least 60 species (GANS 2005).

Physiological and morphological characters of amphisbaenians – such as the highly compacted skulls without temporal arcs (CARROL 1975, KEARNEY 2003), reduced eyes, fused head scales and a body that is the same diameter throughout its entire length (GANS 1966, 1978) – are some of adaptations for a fossorial life style (HOFFSTETTER & GASC 1975, NAVAS *et al.* 2004). Due to these adaptations, the dispersal capability of amphisbaenians has been considered to be limited (HEMBREE 2006, ALBERT *et al.* 2007).

Until recently, and most likely due to their secretive habits, amphisbaenians were considered the least-known group of squamates (KEARNEY 2003). As a consequence, amphisbaenians are poorly represented in museum collections, resulting in fewer ecological studies of this group (COLLI & ZAMBONI 1999). Nevertheless, the construction of new hydroelectric powerplants in Brazil has offered unique opportunities to collect fossorial fauna, for while the reservoir is being flooding, the fossorial fauna emerges onto the surface. In fact, among the ten new species of amphisbaenians described in the last decade (review in VANZOLINI 2002), four were obtained during the construction of dams (VANZOLINI 1996, 1997, CASTRO-MELLO 2000).

Despite the increasing availability of amphisbaenian

specimens in museum collections, there is still a lack of information about the biology of the group in the wild. SENARIS (1999) observed that when disturbed by a collector in the floodplain of the Orinoco River, state of Anzoátegui, Venezuela, *Amphisbaena gracilis* Strauch, 1881 tried to escape immediately towards the water. According to SENARIS (1999), the swimming behavior of *A. gracilis* probably is an escape response to its natural predators.

Herein, we provide data on the utilization of the aquatic environment by two amphisbaenid species (*Amphisbaena amazonica* Vanzolini, 1951 and *Amphisbaena alba* Linnaeus, 1758) in natural conditions in the National Forest of Caxiuanã, Portel, and Melgaço municipalities, state of Pará, Brazil (Fig. 1), without the provoking stress of a collector.

Amphisbaena amazonica has been found in the Brazilian Amazon and in the southeast of Colombia (GANS 2005). COLLI *et al.* (2002) extended its distribution to open areas of the Brazilian Cerrado (savannah-like vegetation). *Amphisbaena alba* is widely distributed in South America east of the Andes (GANS 2005).

Our first record of the utilization of the aquatic environment by *A. alba* is from August 19, 2005 at 10:00 a.m. A single specimen of *Amphisbaena alba* (weight = 185g; snout-vent length [SVL] = 525 mm; tail length [TL] = 47 mm; Fig. 2) was collected, around 2.5 kilometers away from the left and the right margins in Baía de Caxiuanã (01°56'29.2"S, 51°27'26.5"W), municipality of Portel, Pará. The air temperature was 35.3°C, with slow wind and calm waters. The specimen swam through serpentine movements. During the aquatic locomotion, the specimen kept

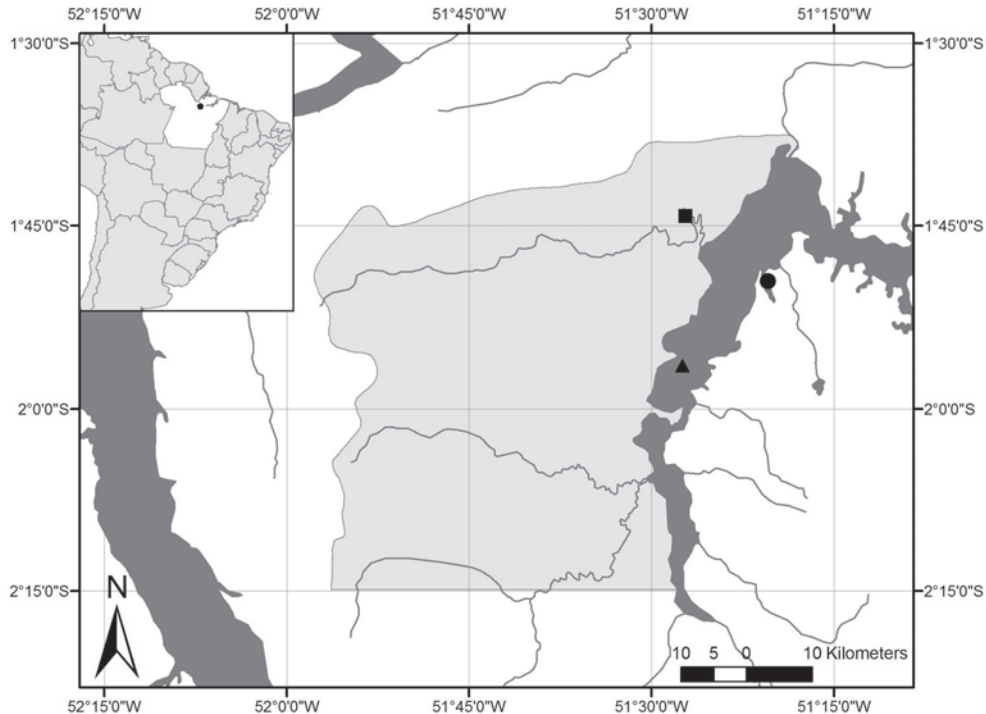


Figure 1. Geographic location of National Forest of Caxiuanã, Portel e Melgaço municipalities, Pará. (Triangle) First record, Baía de Caxiuanã; (Circle) second record, Igarapé Marinaú; (Square) third record, Igarapé Curuá.

its face level with the surface of the water column and approximately every 10 seconds it lifted its head above the water to breath. We collected this specimen using a motorboat.

Our second recording occurred on May 15, 2006 at approximately 2:00 p.m. We collected a single specimen of *A. amazonica* (weight = 12 g; SVL = 228 mm; TL = 32 mm; Fig. 3) approximately 15 meters away from the left and right margins of the Igarapé Marinaú (01°49'33.88"S, 51°20'24.20"W), approximately 2,000 m before it meets the Baía de Caxiuanã, municipality of Portel, Pará. We observed the specimen to be swimming at a faster pace (marked by a stronger stroke) than our previous record of the *A. alba*, although it displayed the same serpentine movements. The frequency with which the specimen raised its head above the water was also higher than *A. alba*. This behavior was observed for approximately 10 minutes without any response to our presence. We collected this specimen using a kayak.

Our third record is of another specimen of *A. amazonica* that we observed on July, 24, 2007 at approximately 4:30 p.m., in the Igarapé Curuá (01°44'12.79"S, 51°27'11.04"W), at Scientific Station of Ferreira Penna, municipality of Melgaço, Pará. We were unable to collect this specimen and therefore lack its meristic data. We observed the specimen moving through the water column around aquatic macrophytes (*Nymphaea* sp.) at the same speed as our other specimen of *A. amazonica* (Fig. 4),

and it raised its head to approximately the same height as our previously recorded *A. amazonica*.

Although the reasons for which these strictly fossorial species were in the water are unknown, we suggest that perhaps in extreme situations- such as when escaping from predators- amphisbaenids may move towards water. HEMBREE (2006) and ALBERT *et al.* (2007) have suggested that amphisbaenian species display low dispersal capabilities. Nevertheless, herein we report dispersals of *A. alba* and *A. amazonica* across water, one of the *A. alba* having crossed 2.5 km of open water, suggesting that these amphisbaenian species can overcome what we thought could be natural aquatic barriers. Our findings emphasize the need to conduct further ecological studies of amphisbaenians in their natural habitats in order to gain a better understanding of the dispersal capabilities of these fossorial squamates.

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Figures 2-3. (2) *Amphisbaena alba* in serpentine movements in the Baía de Caxiuana, Portel, Pará; (3) *A. amazonica* in serpentine undulations in the Igarapé Marinaú, Portel, Pará. Note the head of the specimen above water.

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