MICROHABITAT USE OF *RHEOBATES PALMATUS* (WERNER 1899) (ANURA: AROMOBATIDAE) IN A RIVERSIDE ECOSYSTEM OF VILLA DE LEYVA, COLOMBIA.

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Abstract: Microhabitat use in *Rheobates palmatus* Werner, 1899 is described based upon six individuals living in a sector of a stream called El Guamo in the Vereda Sabana, Villa de Leyva municipality, Boyacá department, Colombia. In order to describe the individual’s microhabitat, environmental temperature, relative humidity, substrate and horizontal position (proximity to water bodies) were measured. The range of environmental temperature (14.6-18.4 °C) and relative humidity (80–93%) where the individuals were recorded was characteristic of a cold and wet zone, as well as the types of substrates associated with the stream. Similarly, the species individuals were recorded nearby the stream and in remote areas near pastures. This work is the first basic record on microhabitat characteristics used by *R. palmatus* for the municipality of Villa de Leyva.

Keywords: Ecology, Visual Encounter Survey, environmental parameters, Andes.

INTRODUCTION

The concept of microhabitat refers to the characteristics of the habitat at a finer scale related to physicochemical variables of a specific place (Krausman 1999). According to this, the microhabitat can be defined by its level at which a research can be done for a species or biological group (Johnson 1980, Hall et al. 1997), considering the activities of the individuals in particular places of the habitat (Ricklefs and Miller 1999).

*Rheobates palmatus* Werner 1899, is an endemic frog of the Colombian Andes which has been reported in elevations from 300 to 2400 meters in different types of habitats such as cloud forests and rain forests, and also in habitats with certain level of disturbance like pastures and crops (Lüddecke 2003, Ramirez et al. 2010). According to Lüddecke (1976, 2003), *R. palmatus* is a cryptic species that occurs in wet habitats with small cave-like structures used as refuge or ovoposition zones, although it can be also found in areas with low hills and rocky streams with low course, and puddles surrounded by protective river bed dry forest (Gallego et al. 2008, Acosta-Galvis 2012). Likewise, due to its great tolerance to disturbed habitats and ex-situ conditions, the species can be found in artificial lakes and caves accomplishing different types of activities (Lüddecke 1993, 2003).

Knowledge about microhabitat characteristics of *R. palmatus* that can define its differential use at a finer scale is unknown, for example, considering microhabitat variables such as environmental temperature and relative humidity. According to this, it is important to consider the information about microhabitat requirements of certain amphibian species, particularly the ones restricted to specific microhabitats, since this could have profound implications in their conservation (Zimmerman and Bierregaard 1986, Seebacher and Alford 2002). Here I provide the first preliminary report of microhabitat requirements in *R. palmatus* based on six individuals living in a riverside ecosystem at the Villa de Leyva municipality, Boyacá department, Colombia.

MATERIALS AND METHODS

The individuals of *R. palmatus* were recorded from 25 to 28 November in a sector of a stream called El Guamo (05° 40'59.6" N y 073° 31'12." W at 2241 m elevation) located at the Vereda Sabana.
in the Villa de Leyva municipality, Boyacá department, Colombia. The stream characterizes for having a slow current water course, and shrub vegetation and canopy trees near the stream.

The sampling was conducted along the stream during the day (08:00–12:00 hours) and the night (20:00–00:00 hours) using VES (Visual Encounter Survey) technique (Rueda et al. 2006). Each individual found was photo-identified and the following microhabitat variables registered: environmental temperature, relative humidity, substrate type and horizontal position related to the stream (distance of individuals to the stream). Environmental temperature and relative humidity were measured using an electronic termohigrometer EXTECH™.

Substrate type was measured considering the following categories: leaf litter, steam, rocks (Cadavid et al. 2005, Heyer et al. 1994), and bryophytes; which were defined after the sampling. Horizontal position (distance of individuals to the stream) was evaluated following the categories proposed by Cadavid et al. (2005): I = 0–40 cm, II = 41–80 cm, III = 81–1.20 cm, IV = 1.21–1.60 cm, V = 1.61–2.00 cm, VI = >2.00 cm.

RESULTS AND DISCUSSION

Six individuals of *R. palmatus* were found in three substrate types of a tropical dry forest: leaf litter, rocks and bryophytes, being found most of the individuals in the later substrate (*n* = 4). The individuals of *R. palmatus* were reported in equal number in zones near the stream (*l* = 0–40 cm, *n* = 3), and zones far from the stream (*VI* = > 2.00 cm, *n* = 3) close to pastures (Fig. 1A and B). All frogs were recorded in an environmental temperature range between 14.6-18.4 °C and in a relative humidity range between 80–93%.

Environmental temperature and relative humidity values reported here are characteristic of a humid environmental pocket with a very dry-cold weather proper of high mountain zones (ICN 2004), which can reduce dehydration risk (Lüddecke 2003) of the individuals found. However, low individual sample could have limit the climate interval for the two variables reported in this note, considering that the species can be found abundantly in different types of microhabitats that could eventually have a wider variation on its climatic variables.

The individuals were also registered on different substrate types such as leaf litter, rocks and bryophytes in areas near and far from the stream close to pastures. This could be related to the species reproductive mode and its ecophysiological adaptation capacity to different environments and anthropogenic disturbances. For example, Lüddecke (2003) and Acosta-Galvis (2012) establish that the species reproduces in lotic streams with low water volume, but also occurs in wet habitats with small cave-like structures used for shelter and spawning, formed by plants, soil or rocks, and also by artifacts like water pipes and wall cracks, given that the species is commonly found near human settlements.

Finally, I suggest that increased samplings should be obtained by conducting surveys during a longer time for a better representation of the species microhabitat characteristics. Likewise, further studies should be done to determine the actual microhabitat factors that influence *R. palmatus* occurrence in that area.

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REFERENCES


