Scinax granulatus (Amphibia, Anura, Hylidae): Multi-individual aggregation in a grove of exotic trees

Ruth Anastasia Regnet[1,2] and Daniel Loebmann[1]

[1] *Programa de Pós-Graduação em Biologia de Ambientes Aquáticos Continentais. Universidade Federal do Rio Grande, Instituto de Ciências Biológicas. Avenida Itália, , km 8, Carreiros, CEP 96203-900, Rio Grande, RS, Brasil.*
[2] *Corresponding author, e-mail: regnet_ruth@hotmail.com*

Aggregation is a behavior observed in several vertebrate and invertebrate animal groups. Social insects (*e.g.,* Hölldobler and Wilson, 1990), birds (*e.g.,* Heppner, 1974; Miller, 1992) and migrating mammals (*e.g.,* Frixell, 1995) are among the most well-known examples of animal aggregation. For amphibians, examples of aggregations are mainly reported for tadpoles (Brodie and Formanowiez, 1987; Glos *et al.,* 2007; Smith and Awan, 2009), but it is also known for newly metamorphosed individuals (Heinen, 1993) and adults (Hopkins and Lahanas, 2011). In adults, aggregation behavior can take place during reproduction, especially in species with explosive reproduction (Lynch and Wilczynski, 2006; Swanson *et al.* 2007; Knopp *et al.* 2008).

The *Scinax ruber* species group currently comprises 56 species, representing one of the most speciose clades within this genus (Faivovich *et al.* 2005). This is, among the Neotropical frogs, one of the groups with the greatest taxonomic problems (Faivovich *et al.* 2005). Four species of the *Scinax ruber* group have been reported for the state of Rio Grande do Sul, southern Brazil: *Scinax fuscovarius* (Lutz, 1925), *Scinax granulatus* (Peters, 1871), *Scinax nasicus* (Cope, 1862), and *Scinax perereca* Pombal, Haddad and Kasahara, 1995 (Kwet, 2001).

Scinax granulatus occurs in the Atlantic Rainforest of Southern Brazil as well as all the way to the Pampa in Southern Brazil, Uruguay and Northern Argentina (Haddad *et al.* 2013; Frost, 2015). It is a generalist species regarding habitat use, inhabiting lentic water bodies and their surroundings, being also found in anthropized areas (Maneyro and Carreira, 2012). During periods of inactivity, the frogs hide in and on the bark of native and exotic trees, among grasses or taking advantage of artificial refuges as debris, heaps of stones or even inside homes (Maneyro and Carreira, 2012; Kwet *et al.* 2010). However, there is no information regarding multi-individual aggregation during periods of inactivity for species of the *Scinax ruber* group. We report a record of aggregation of *S. granulatus* in a grove of exotic trees and discuss possible reasons for this behavior.

On 16 October 2014 we performed a field trip to the Universidade Federal do Rio Grande, municipality on Rio Grande, Rio Grande do Sul, Brazil (32°04'42.79" S, 52°10'09.45" W, 10 a.s.l.). Our main goal was to collect data on amphibian species inhabiting the University campus. The collecting permit was issued by Instituto Chico Mendes de ***Conservação da Biodiversidade (ICMBio, Proc. number 40540). This is an anthropized area where native vegetation has been partially replaced by alien trees, especially Acacia mearnsii De Wild., *Pinus elliottii* Engelm. and *Eucalyptus* sp. In an individual of *P. elliottii ca.* 18 m tall, located near a temporary water body, we observed an aggregation of 23 individuals of *S. granulatus* inside a plastic bag, hanging close to a tree trunk. The aggregation was composed of four females (SVL min-max = 2,43-2,93, SD = 0,21), eighteen males (SVL min-max = 2,07-3,44, SD = 0,33) and one unsexed individual that fled before measurements could be taken. The bag was hanging *ca.* 1.5 m above the ground and contained plastic waste inside. Considering the high amount of feces present in the bag, it is reasonable to assume that these individuals were using it as a collective shelter for a long period.

Examples of aggregations aiming to share refuges are poorly documented and the causes of this behavior can be interpreted as a strategy to avoid dehydration (Heinen, 1993) or to lower predation risks (Graves *et al.* 1993; Hopkins and Lahanas, 2011). We speculate that the aggregation of *S. granulatus* herein reported could be associated with the former cause. Moreover, anthropic influence on the habitat, like replacing native vegetation with exotic trees, drastically reduces available microhabitats and may affect water balance. Finally, considering that *P. elliottii* produces substances that may be toxic for some species, it is possible that *S. granulatus* may not be able to survive hidden in the bark of *P. elliottii,* forcing individuals to aggregate in artificial shelters.

ACKNOWLEDGMENTS

We are grateful to Guilherme Sampaio Sansão for reviewing grammar and style of the short note. RAR thanks Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) for a MSc. fellowship.

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Bothrops bilineatus, Floresta Estadual Tapauas, AM. Foto: Paulo Bernarde.