



Nota científica
(Short communication)

USE OF BIOLOGICAL RESOURCES BY *ELACHISTOCLEIS PEARSEI* (RUTHVEN, 1914)
(ANURA: MICROHYLIDAE) IN A LENTIC ECOSYSTEM FROM THE DEPARTMENT
OF SUCRE, COLOMBIA

USO DE RECURSOS BIOLÓGICOS POR *ELACHISTOCLEIS PEARSEI* (RUTHVEN, 1914)
(ANURA: MICROHYLIDAE) EN UN ECOSISTEMA LÉNTICO DEL DEPARTAMENTO
DE SUCRE, COLOMBIA

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Recibido: 28/04/2016; aceptado: 31/10/2016

Editor responsable: Gustavo Aguirre León

Atencia-Gándara, P., Conde, Ó., & Solano, L. (2017) Use of biological resources by *Elachistocleis pearsei* (Ruthven, 1914) (Anura: Microhylidae) in a lentic ecosystem from the department of Sucre, Colombia. *Acta Zoológica Mexicana* (n.s.), 33(1), 130-132.

Atencia-Gándara, P., Conde, Ó. y Solano, L. (2017) Uso de recursos biológicos por *Elachistocleis pearsei* (Ruthven, 1914) (Anura: Microhylidae) en un ecosistema léntico del departamento de Sucre, Colombia. *Acta Zoológica Mexicana* (n.s.), 33(1), 130-132.

ABSTRACT. The use of resources (diet, time of activity and microhabitat) by *Elachistocleis pearsei* in a locality of the department of Sucre is described. The non-invasive method used to obtain the digestive tract content showed high effectivity. Results show that this species is an active specialist forager that principally ingests ants, nevertheless diet composition is diverse; its activity is limited to the outskirts of the water source and increases in the season of higher precipitation.

RESUMEN. Se describe el uso de recursos: dieta, tiempo de actividad y microhábitat, por la especie *Elachistocleis pearsei* en una localidad del departamento de Sucre. El método no invasivo utilizado para extraer el contenido estomacal mostró alta efectividad. Los resultados indican que la especie es una forrajera activa y especialista que consume mayormente hormigas, aunque la composición de su dieta es más amplia; su actividad se limita a los alrededores del cuerpo de agua e incrementa en temporada de alta precipitación

In Colombia *Elachistocleis pearsei* occurs in lowlands, from 0 to 1015 m of altitude, along the Caribbean and the Magdalena river valley (Acosta-Galvis 2012), where this species inhabits ecosystems like savannas, which are highly perturbed habitats, and the Tropical dry forest, considered one of the most altered and threatened ecosystems due to the decrease of its original area (Miles *et al.* 2006; IAVH 2014). *Elachistocleis pearsei* exhibits a marked seasonality; it is active during periods of high precipitation in permanent and temporal lagoons and ponds, as well as floodplains and small streams (Acosta-Galvis 2012). The use of resources of one given species includes its microhabitat, diet, and time of activity; such aspects are important in the ecological structure of an assemblage of

anurans (Toft 1985; Muñoz-Guerrero *et al.* 2007; Blanco-Torres 2009). Herein, we contribute to the knowledge of some important aspects of the natural history of *E. pearsei*, in the department of Sucre, Colombia.

From May 27th to June 10th, 2015 (first rainy period of the year) frog sampling was conducted from Monday to Friday, from 19:00 to 22:00 hours, in a “jagüey” (temporary pond) located at 209 m of altitude in position southeast in the University of Sucre (9°18'50,861" N - 75°23'16,376" W). The locality is considered Tropical dry forest, because it has warm weather, mean annual temperature of 27° C, relative humidity of 77% and mean annual precipitation of 1090 mm (Aguilera 2005). The pond is surrounded by a herbaceous coverage, clay soil,



a few big mature trees and zones of small shrubs; its soil has a leaf litter layer, humid organic matter near the pond and dry organic matter further apart. By direct catching, we collected 24 frogs (12 males and 12 females). For every collected individual, the following morphometric data were gathered: Snout-vent length (SVL) and head width (HW), using a manual caliper Discover. Moreover, in the field the time of capture, and the location of the individual with respect to the water source, according to three pre-established distances were recorded: 0-3 m; 3-7 m and 7-12 m; finally, the type of substrate each individual was on (leaf litter, grassland, rubble, organic matter and clay soil) was categorized.

To avoid causing a demographic impact on the population, a non-invasive method to extract the stomach content, called stomach-flushing (Solé *et al.* 2005) was applied; at the end of the procedure, the frogs were released back in the collection sites. The items obtained from the stomach contents were identified to the level of order, following taxonomic keys. The frequency of occurrence of prey was estimated as the number of times we counted the prey appearing in the stomachs with contents ($n = 21$). Statistical analyses included the Index of dietary importance (IIA, from Spanish abbreviation) (Sampedro *et al.* 2011); trophic niche overlap between males and females was evaluated with the Jaccard similarity index and the minimum common percentages index (QR) (Odum 1984); to assess differences in time of activity between males and females a chi square test (χ^2) was applied to the frequency of encounter of every sex in three time intervals.

During rainy periods, *Elachistocleis pearsei* exhibits a peak of activity between 19:00 and 21:00 hours, followed by a general decrease in the number of individuals, males ceasing to call around the pond; there was not significant difference in the time of activity between males and females (Table 2). In absence of rain, there was a noticeable decrease in the activity of the frogs, making them difficult to sample; therefore, it was not possible to gather any data for the dry season of the year. Most individuals of the species (91.7%) were found between 0 and 3 meters around the pond; frogs were rarely seen at distances beyond 3 m, except after heavy rain, when some individuals standing on very humid clay soil or hiding under the vegetation, were observed in all the surroundings of the pond. The 12 males collected, had an average SVL of 33.55 mm (range = 30-39 mm) and an average HW of 8.16 mm (range = 7 - 9 mm). The 12 females had an average SVL of 39 mm (range = 32.1-45.1 mm) and an average HW of 9.09 mm (range = 8-11.5 mm). Twenty one (87.5 %) of the individ-

uals regurgitated stomach contents. A total of 293 preys were found, belonging to six taxonomic orders: Hymenoptera, Coleoptera, Orthoptera, Diptera, Acari and Isoptera. The most abundant order was Hymenoptera (95.56%, IIA = 91.01%) (Table 1), which was the main type of prey consumed by both sexes. Females consumed four categories of prey, while males consumed six categories; Acari and Isoptera were the only orders not shared by males and females. The percentage of diet similarity between sexes was 66.7% according to the Jaccard index, and 93.74 for QR. On the other hand, there was no association between the morphometric measurements and the number of items found per stomach (SVL: $R^2 = 0.03861$, $p = 0.3933$; HW: $R^2 = 0.00308$, $p = 0.81112$). Our results suggest that *E. pearsei* is an actively foraging species, with some preference for small invertebrates, mainly ants; these findings are consistent with recent studies about the species that, similarly to our findings, concluded this is a specialist species towards the consumption of ants (Blanco-Torres *et al.* 2015). However, we believe the trophic range of *E. pearsei* may be wider, as items of some orders found in stomach contents of several individuals had not been pre-

Table 1. Composition of preys present in the diet of *Elachistocleis pearsei* ($n = 21$) in a lentic ecosystem in the department of Sucre. N° items = number of eaten items; % = percentage of prey; ni = number of stomachs containing any category of prey; IIA% = index of dietary importance.

Prey	N° Items	%	ni	IIA%
Hymenoptera (Formicidae)	280	95.56	20	91.01
Coleoptera (Scarabaeidae)	3	1.02	3	0.150
Orthoptera	2	0.69	2	0.065
Diptera	3	1.02	3	0.150
Acari	3	1.02	2	0.101
Isoptera	2	0.69	1	0.036
Total	293		21	

Table 2. Frequency of males and females of *Elachistocleis pearsei* in three time intervals during their activity period (value of Chi-squared test).

Time interval	Males	Females
19:00-20:00	8	7
20:01-21:00	2	5
21:01-22:00	2	0

$(X^2 = 3.3524, df = 2, p = 0.18709)$

viously reported, such as Diptera, Coleoptera (Subfamily Aphodiinae) and Orthoptera, although their indexes of dietary importance were not very high: IIA = 0.150%, 0.150% and 0.065%, respectively (Table 1). Studies on the diet of another species of the family Microhylidae have shown similar results to ours (Van Sluys *et al.* 2006; López *et al.* 2007); it is common to find ants as the most representative group in the diet of these frogs. The temporal similarity of the trophic niche between males and females could explain the similar composition of their diet because all the individuals actively forage for prey at the same time during the night, when all of them have the same probability of eating the same groups of arthropods.

Finally, it was evidenced that the non-invasive method applied is effective and decreases the impact on the population to a minimum, allowing the analysis of larger sample sizes; also, this study improves our knowledge about the natural history of the species in the lowlands of the Colombian Caribbean.

ACKNOWLEDGEMENTS. The authors thank Dr. Alcides Sampeiro and two anonymous reviewers for helpful comments on the manuscript, and to the Universidad de Sucre for granting permission to carry out our work in the campus Puerta Roja; the Laboratory management center allowed us to use equipment and laboratory spaces.

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