

SHORT COMUNICATION.
FIRST REPORT OF FLESH FLY EGGS (DIPTERA:
SARCOPHAGIDAE) IN *Pristimantis achatinus*
(ANURA: CRAUGASTORIDAE) FROM COLOMBIA

Sebastián Escobar-Vargas¹, Mateo Marín-Martínez² & Juan Camilo Zuluaga-Isaza².*

It is known that there are a considerable number of interactions established between amphibians and dipterans. Among these, there is the predator-prey interaction in which amphibians ingest flies from a broad variety of families (DURÉ & KEHR, 2004). On the other hand, there have been reports of cases of flies parasitizing anurans (BOLEK & JANNOY, 2004; GOSÁ et al. 2009; GÓMEZ-HOYOS et al., 2012). In these cases, the diversity of fly families involved is lower, represented by four families (GOSÁ et al., 2009), and, in the new world, parasitism has been reported in adult anurans by species of Calliphoridae and Sarcophagidae (BOLEK & JANNOY, 2004; GOSÁ et al., 2009; MEDINA et al., 2009).

In this work, we present the first record of a flesh fly (Diptera: Sarcophagidae) depositing its eggs on the body of a leaf litter frog, *Pristimantis achatinus* (Boulenger, 1998; Anura: Craugastoridae; Fig. 1). The frog was sampled at the botanical garden of the Universidad de Caldas (JBUC; 5°4'12" N, 75°31'14" W, 2150 m of elevation), which is located in the central Andes of Colombia, municipality of Manizales, department of Caldas. With the aim of evaluating the bacterial richness of the posterior gut of this species, eight individuals, with an average of snout vent length (SVL) 27.6 ± 7.77 mm, were captured and analyzed. For sampling, approximately 5 mm of an empty micropipette (100 μ L) were introduced in the cloaca of each animal. Suction of the material was performed and the tip was washed with peptone broth. After the procedure, all frogs were released and samples of peptone broth were incubated for 48 hours at 28°C, and the material was inoculated in petri dishes with Crystal Violet agar (Bacto®); subsequently, these were incubated at the same temperature. After three days, bacterial growth was registered in six of the eight petri dishes and, in one of them, 12 dipteran larvae were found, reaching an average of 0.8 mm in length approximately (Fig. 2). Manipulation of the petri dish was minimal to avoid contamination with exogenous microorganisms and to record the development of the flies.

Unfortunately, after 15 days, 100% of the flies had died, some of them at the stage of pupa. These were immediately preserved in 70% alcohol for their taxonomic identification at the lowest taxonomical level possible. It was determined that larvae belong to the family Sarcophagidae (COTO, 1998).

¹ FR: 10-V-2016. FA: 30-IX-2016.

¹ GEBIOME (Genética, biodiversidad y manejo de ecosistemas)

² GEDAR (Grupo de Ecología y Diversidad de Anfibios y Reptiles) Departamento de Ciencias Biológicas, Universidad de Caldas, Manizales, Caldas, Colombia.* E-mail: sebastian.escobar@ucaldas.edu.co

CÓMO CITAR:

ESCOBAR, S., MARÍN, M., & ZULUAGA, J.C., 2016.- First report of flesh fly eggs (Diptera: Sarcophagidae) in *Pristimantis achatinus* (Anura: Craugastoridae) from Colombia. *Bol. Cient. Mus. Hist. Nat. U. de Caldas*, 20 (2): 231-234. DOI: 10.17151/bccm.2016.20.2.17





Figure. 1. Individual of *Pristimantis achatinus* (SVL 38.8 mm) from which the sample of Sarcophagidae larvae was recorded.



Figure. 2. Sarcophagidae larva found in Crystal Violet agar inoculated from a sewer sample of a *Pristimantis achatinus*, municipality of Manizales, department of Caldas, Colombia, 2150 m of elevation.

HOYOS-HOYOS et al., (2012) indicate that the main components of the diet of *P. achatinus* are coleopterans and hymenopterans. However, it has been demonstrated that this species is highly generalist, choosing its prey depending on the availability of resources (LYNCH & DUELLMAN, 1997). For this reason, we would suggest that the frog could have ingested a female fly with eggs, and these survived the digestion through the gut, finally reaching the cloaca. However, despite being generalist, until now there are no known reports of Sarcophagidae fly ingestion by *P. achatinus*.

On the other hand, there are other features suggesting that this is not a case of survivorship to predation. Some species of Sarcophagidae have been categorized as parasites, found in different anuran families (see GOSÁ et al., 2009; Medina et al., 2009; GÓMEZ-HOYOS et al., 2012). Also, the location of the fly eggs in the cloaca of the frog makes it more feasible that these eggs had been deposited by a parasite. GÓMEZ-HOYOS et al., (2012) made the first report of myiasis in frogs from the Cordillera Central of Colombia, in which an individual of *Pristimantis thectopternus* (LYNCH, 1965) was parasitized by a larvae of a Sarcophagid species. This observation was made approximately at 50 km to the southeast of the location of the present record. Despite the information collected, it is not possible to conclude with total certainty whether this is a case of predation or parasitism, even when the evidence and external information allow us to suppose that this is a case of parasitism. Moreover, we can suggest that parasites in adult frogs are more common than have been reported, as it is known for larval stages of anurans (VILLA, 1977; ROJAS-MORALES & ESCOBAR-LASSO, 2013).

ACKNOWLEDGMENTS

We thank Daniel Ricardo Toro for letting us use the Applied Microbiology Laboratory, Lucimar Gomes Diaz and Professor Luciano Fiuza for their careful observations on the taxonomy of the dipterans. We thank Prof. Viviana Andrea Ramírez, Gustavo González, and Julian Andrés Rojas for their valuable comments to the manuscript, and Diego Gomez Hoyos for the taxonomic confirmation of the anuran.

REFERENCES

- BOLEK, M. G., & JANOVI, J., 2004.- Observations on Myiasis by the Calliphorids, *Bufo lucilia silvarum* and *Bufo lucilia elongata*, in Wood Frogs, *Rana sylvatica*, from Southeastern Wisconsin. *Journal of Parasitology*, 90 (5), 1169–1171.
- COTO, D., 1998.- *Estados inmaduros de insectos de los órdenes Coleoptera, Diptera y Lepidoptera: Manual de reconocimiento*. Turrialba, Costa Rica: Enseñanza Centro Agronómico Tropical de Investigación.
- DURÉ, M. I., & KEHR, A. I., 2004.- Influence of microhabitat on the trophic ecology of two leptodactylids from northeastern Argentina. *BioOne*, 60 (3), 295–303.
- GÓMEZ, et al., 2012.- Flesh fly myiasis (Diptera: Sarcophagidae) in *Pristimantis thectopternus* (Anura : Strabomantidae) from Colombia. *Herpetology Notes*, 5, 27–29.
- GOSÁ, et al., 2009.- Probables casos de parasitismo de *Lucilia bufonivora* (Diptera : Calliphoridae) en anuros del norte ibérico. *Bol. Asoc. Herpetol. Esp.*, 20, 112–117.
- HOYOS, et al., 2012.- An Approach to the Ecology of the Herpetofauna in Agroecosystems of the Colombian Coffee Zone. *BioOne*, 7(1), 25–34.

- LYNCH, J. D., & DUELLMAN, E. M., 1997.- *Frogs of the Genus Eleutherodactylus in Western Ecuador Biogeography*. Kansas: Natural History Museum Dyche Hall, Kansas University.
- MEDINA, *et al.*, 2009.- Primer registro de miasis por Sarcophagidae (Diptera: Oestroidae) en *Hyalinobatrachium fleischmanni* (Anura: Centrolenidae) de Panamá. *Revista Mexicana de Biodiversidad*, 80, 263–264.
- ROJAS-MORALES, J.A. & ESCOBAR-LASSO, S., 2013.- Notes on the natural history of three glass frog species (Anura: Centrolenidae) from the Andean Central Cordillera of Colombia. *Bol. Cient. Mus. Hist. Nat. U. de Caldas*, 17: 127-140.
- VILLA, J., 1977.- A symbiotic relationship between frog (Amphibia, Anura, Centrolenidae) and fly larvae (Drosophilidae). *Journal of Herpetology*, 11: 317-322.