



Submitted: 2023-10-10

Accepted: 2023-11-16

Published: 2023-12-01

DOI: <https://doi.org/10.59763/mam.aeq.v5i.75>

SCIENTIFIC NOTE

Observation of *Neogale frenata aureoventris* (Carnivora, Mustelidae) swimming in an irrigation canal in Urcuquí, Imbabura, Ecuador

Evento de natación de *Neogale frenata aureoventris* (Carnivora, Mustelidae) en un canal de riego en Urcuquí, Imbabura, Ecuador

Josué Picho-Paucar  and Diego G. Tirira 

School of Biological Sciences and Engineering, Yachay Tech University,
San Miguel de Urcuquí, Imbabura, Ecuador.

Corresponding author: dtirira@yachaytech.edu.ec (Diego Tirira)

ABSTRACT

Instances of *Neogale frenata* swimming are rare to observe and have not been recorded in South America. Here, we present a note regarding an observation at an irrigation canal in Urcuquí, Ecuador. In a period of less than two minutes, *Neogale frenata aureoventris* swam twice in the canal for a distance of about two meters.

Keywords: agricultural area, Andes, behavior, disturbed area, long-tailed weasel.

RESUMEN

Los eventos de natación de *Neogale frenata* son raros de observar y no existen registros en Sudamérica. Aquí presentamos una nota de natación dentro de un canal de irrigación en Ur-

Citation:

Picho-Paucar, J. & Tirira, D. G. (2023). Observation of *Neogale frenata aureoventris* (Carnivora, Mustelidae) swimming in an irrigation canal in Urcuquí, Imbabura, Ecuador. *Mammalia æquatorialis*, 5, 89–92.

cuquí, Ecuador. En un período inferior a dos minutos, *Neogale frenata aureoventris* nadó en dos ocasiones en un canal de irrigación de agua una distancia de alrededor de dos metros.

Palabras clave: área agrícola, área perturbada, Andes, comadreja de cola larga, comportamiento.

Physical forces encountered by swimming mammals differ markedly from those encountered by running mammals (Dejours, 1987). These differences undoubtedly influenced many of the morphological modifications that occurred during the transition from terrestrial to aquatic locomotion (Williams, 2001). Members of the family Mustelidae are generally terrestrial; however, there are a few reports that mustelids can swim, hunt, and adapt to aquatic life in Neotropical fresh waters (Sheffield & Thomas, 1997). Here we report two events during which a adult male long-tailed weasel, *Neogale frenata aureoventris*, swam in an irrigation canal in the Andes mountains of Ecuador.

In Ecuador, *Neogale frenata aureoventris* (Gray, 1865) inhabits the Andean highlands and foothills in subtropical, temperate, and high Andean forests and páramo throughout the country, between elevations of 1100 and 4225 m; it can be found in primary and secondary forest, humid and dry environments, deforested and cultivated areas, and near human developments (Tirira, 2017).

The records of swimming behavior reported here took place in the Jardín Botánico Yachay, a conservation area comprised of dry-preserved forest located near the San Eloy Hill in northern Urcuquí, Imbabura province, Ecuador (00°25'4" N, 78°11'18" W, 2289 m a.s.l.). The native ecosystem that characterizes the area is classified as Bosque y Arbustal semideciduo del norte de los Valles [semideciduous forest and shrubland of the northern valleys], also known as dry interandean valley vegetation (MAE, 2013); it is located in the temperate zoogeographic zone of the northern Andes. Historically, the water irrigation canals in Urcuquí have provided water daily to hundreds of farmers who harvest beans, corn, and peppers, and other traditional products grown in this area (Ruf, 1995).

On September 26, 2023, at 08:07 hours, we observed a long-tailed weasel swimming in an

irrigation canal. The individual ran out of a bean field, *Phaseolus vulgaris*, and stood on its hind legs at the edge of the irrigation ditch (*acequia*). It turned its head from right to left twice and jumped into the water canal (about 30 cm wide and deep) to swim for about five seconds over a distance of 1.5 meters. Then the weasel exited the canal and quickly ran to another area about 10 meters away, where it jumped into a new water channel (15 cm wide and 20 cm deep). It swam for less than a meter and entered a broken pipe (Figure 1) in an area of avocado trees, sliding over the water for about 1.5 meters. This individual repeated this behavior on two occasions, sticking its head out, watching, and sliding back over the water. Finally, a couple of minutes later, the weasel took another dip in the water, exited the ditch, shook itself off quickly, and ran off through the avocado trees.

These two instances of successful swimming, carried out in less than two minutes, point to the importance of this aquatic behavior as an unusual yet necessary ability for long-tailed weasels to cross channels of water. There is a little evidence of other weasel species (genera *Neogale* and *Mustela*) spending time swimming that varied depending on body fat and fur present and occurred at different speeds (Dagg & Windsor, 1972). The subspecies *Neogale frenata noveboracensis* was reported swimming in Gratiot County, Michigan (Green, 1936), and other locations in North America (Davis, 1994; Wobeser, 1966), but to our knowledge, this is the first report of this species swimming in South America.

It is remarkable that the long-tailed weasel swam around the water canals on both occasions, suggesting that it may use specific criteria to move through different agricultural areas where there is a water canal. The behavior of the weasel during swimming, such as moving lithely, hiding in the water canals, and shaking its head to remove excess water,



FIGURE 1. *Neogale frenata aureoventris* in a broken pipe near the irrigation water canal in Urcuquí, Ecuador. Photograph by J. Picho-Paucar.

demonstrates how this animal has evolved adaptations to the different ecosystems in which it lives. This response points to the strong influence that intermittent swimming by mammals, together with the pressure of increasing energetic efficiency (Williams, 2001), may have on long-tailed weasel behavior.

Semi-aquatic behavior has been documented for another species of the genus, *Neogale vison* (American mink) from North America (Larivière & Jennings, 2009). Additionally, the other species of the genus *Neogale* in Ecuador, *N. africana* (Amazon weasel) and *N. felipei* (Colombian weasel) present naked foot soles with slight interdigital webbing, suggesting that they may have semi-aquatic habits, although the natural history of both species is poorly known (Schreiber et al., 1989; Tirira, 2017). However, these traits are found in other mustelids (e.g., *Gulo* and *Martes*) with terrestrial and arboreal habits (Ramírez-Chaves & Patterson, 2014).

Orcid:

JPP  <https://orcid.org/0000-0002-3875-7426>

DGT  <https://orcid.org/0000-0002-5344-6175>

REFERENCES

- Dagg, A. I., & Windsor, D. E. (1972). Swimming in northern terrestrial mammals. *Canadian Journal of Zoology*, 50(1), 117–130. <https://doi.org/10.1139/z72-019>
- Davis, W. B. (1944). Notes on Mexican mammals. *Journal of Mammalogy*, 25(4), 370–403. <https://doi.org/10.2307/1374900>
- Dejours, P. (1987). Water and air physical characteristics and their physiological consequences. In Dejours, P., Bolis, L., Taylor C. R., & Weibel, E. R. (Eds.), *Comparative physiology: Life in water and on land* (pp. 3–11). Fidia Research Series 9. Springer Science & Business Media.
- Green, C. V. (1936). Observations on the New York weasel, with remarks on its winter dichromatism. *Journal of Mammalogy*, 17(3), 247–249. <https://sci-hub.se/https://doi.org/10.2307/1374422>
- Larivière, S., & Jennings, A. P. (2009). Family Mustelidae (weasels and relatives). In Wilson, D. E., & Mittermeier, R. A. (Eds.), *Handbook of the mammals of the world. Volume 1: Carnivores* (pp. 564–656). Lynx Edicions.
- MAE. (2013). *Sistema de clasificación de los ecosistemas del Ecuador continental*. Subsecretaría de Patrimonio Natural, Ministerio del Ambiente del Ecuador.
- Ramírez-Chaves, H. E., & Patterson, B. D. (2014). *Mustela felipei* (Carnivora: Mustelidae). *Mammalian Species*, 46(906), 11–15. <https://doi.org/10.1644/906>
- Ruf, T. (1995). *El riego campesino particular en Ecuador: Una agricultura económicamente viable y eficiente*. Technical report. INERHI-ORSTOM. https://www.researchgate.net/publication/32973313_El_riego_campesino_particular_en_Ecuador_una_agricultura_economicamente_viable_y_eficiente_las_enzenanzas_del_proyecto_de_investigacion_INERHI-ORSTOM
- Schreiber, A., Wirth, R., Riffel, M., & Van Rompaey, H. (1989). *Weasels, civets, mongooses, and their relatives. An action plan for the conservation of Mustelids and Viverrids*. International Union for Conservation of Nature and Natural Resources.
- Sheffield, S. R., & Thomas, H. H. (1997). *Mustela frenata*. *Mammalian Species*, 570, 1–9. <https://doi.org/10.1644/0.570.1>
- Tirira, D. G. (2017). *A field guide to the mammals of Ecuador*. Asociación Ecuatoriana

de Mastozoología and Editorial Murciélago Blanco. Publicación Especial sobre los mamíferos del Ecuador 10.

Williams, T. M. (2001). Intermittent swimming by mammals: a strategy for increasing energetic efficiency during diving. *Ameri-*

can Zoologist, 41(2), 166–176. <https://doi.org/10.1093/icb/41.2.166>

Wobeser, G. A. (1966). *Ecology of the Long-tailed Weasel (Mustela frenata novaboracensis Emmons) in Rondeau Park, Ontario* [Doctoral thesis, University of Guelph, Ontario].

Copyright © 2023

Josué Picho-Paucar and Diego G. Tirira

This is an open-access article distributed under the terms of the **Creative Commons Attribution License CC BY 4.0**, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

[License Summary](#) - [Full license text](#)