



The Elevational Distribution of the Golden Treefrog and its Bromeliad Host on El Tucuche, Trinidad



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Background

Anthropogenic climate change is having an immense impact on many mountaintop endemic species, which are highly sensitive to changes in the environmental conditions of their habitats. This includes the golden treefrog (*Phytotriades auratus*), a bromeliad-dwelling frog native to two mountains in Trinidad and one in Venezuela. This study investigates the elevational distribution of the golden treefrog, as well as that of its host bromeliad *Glomeropitcairnia erectiflora* on El Tucuche, Trinidad, with comparison to historical data, and an evaluation of the environmental conditions (temperature and humidity) within the habitat of these species.

Methods

To determine the elevational distribution of the golden treefrog, audio recorders were placed at five different elevations on both the north and south sides of El Tucuche to record calling behavior of the frog species. Counts of *G. erectiflora* were also performed throughout the north and south sides of the mountain. To assess temperature and humidity on El Tucuche, a data logger was placed with each audio recorder to assess any differences in abiotic factors at different elevations and on different sides.

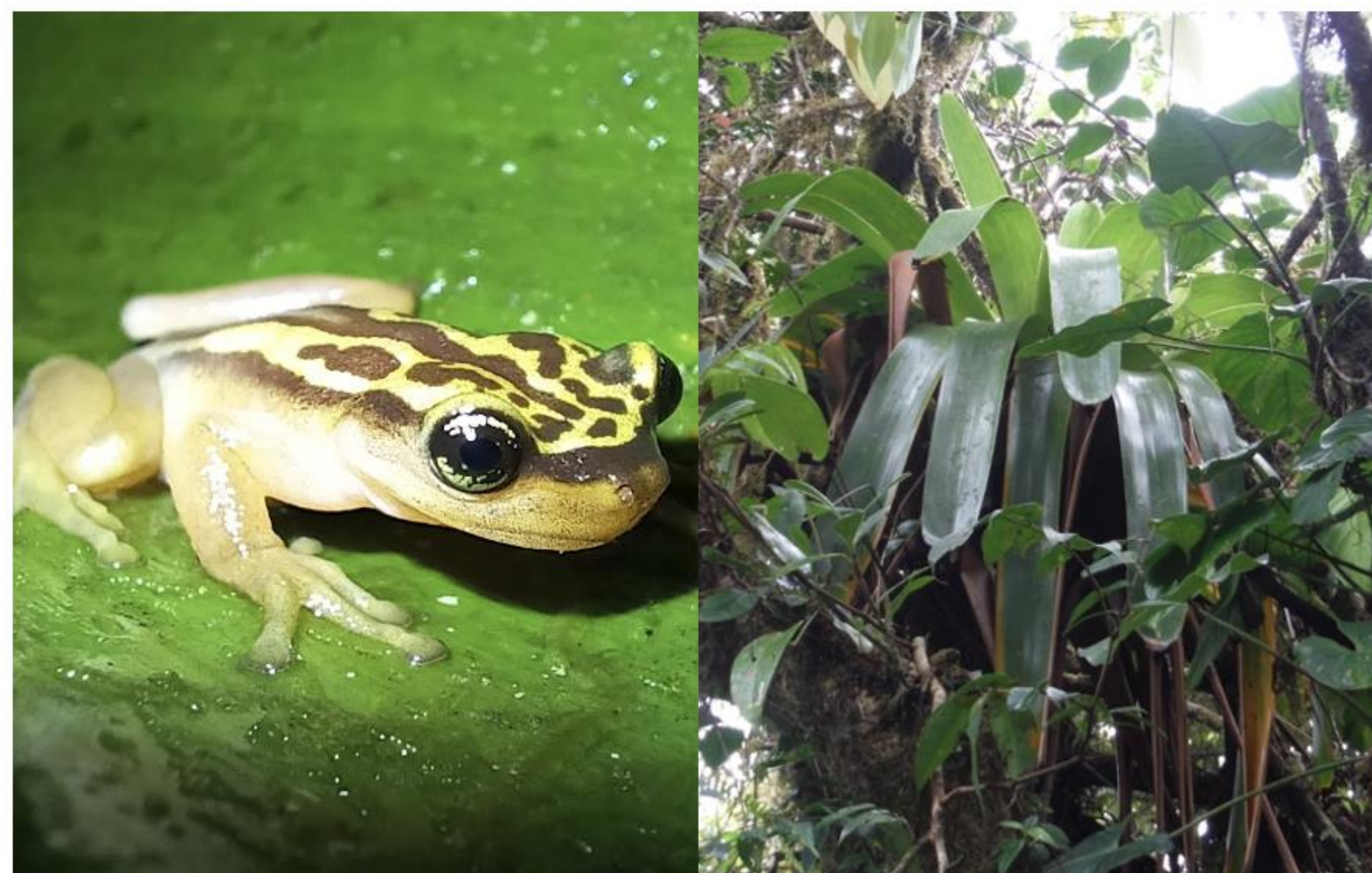


Figure 1. Golden treefrog individual sitting on a *G. erectiflora* leaf, pictured next to a *G. erectiflora* individual, photographed on El Tucuche, Trinidad

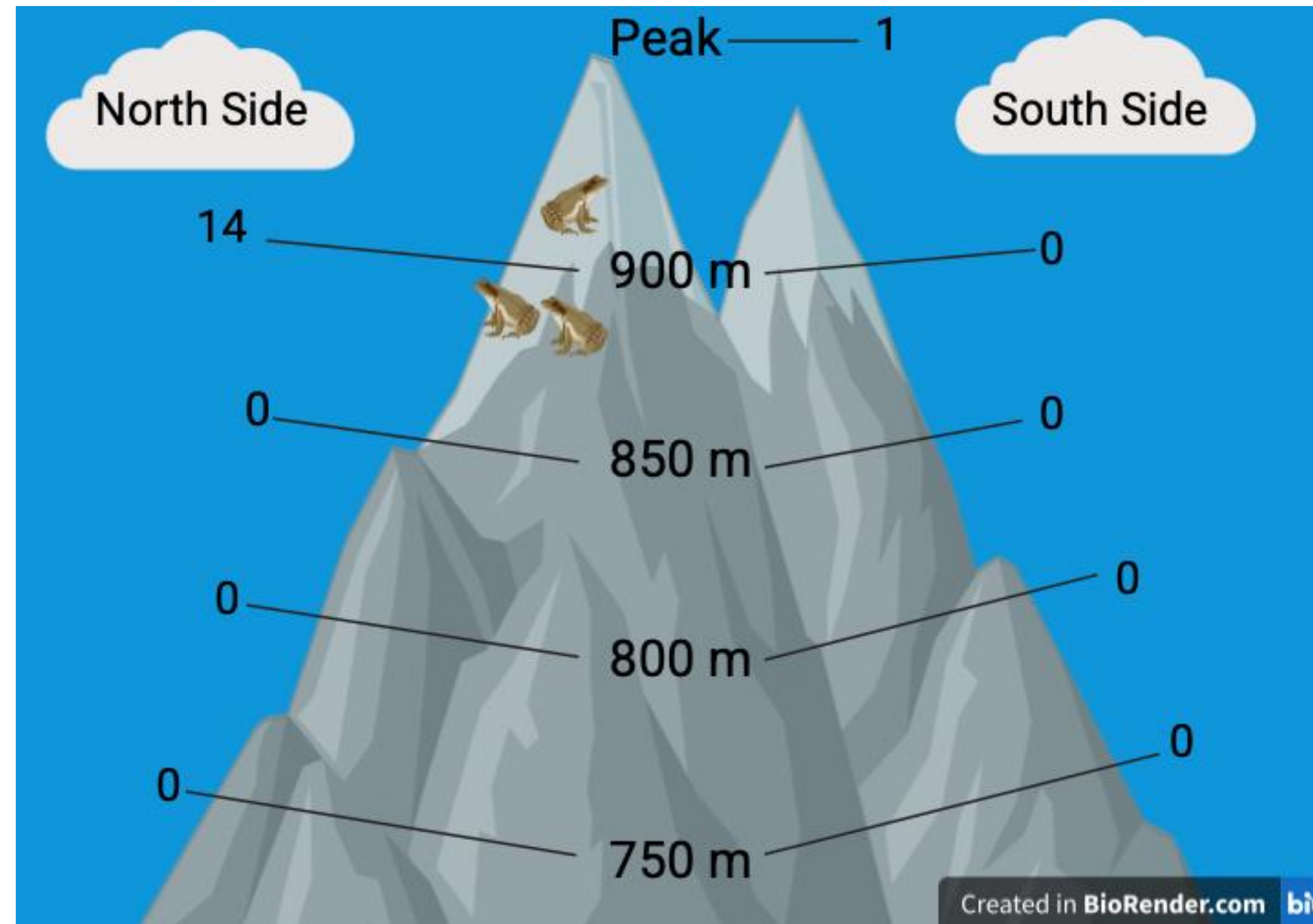


Figure 2. Total *P. auratus* detections on El Tucuche, Trinidad. 18 audio recorders were deployed throughout the mountain and were set to record for five minutes, every hour, from 6:00 P.M.-9:00 A.M., every day, from July-November.

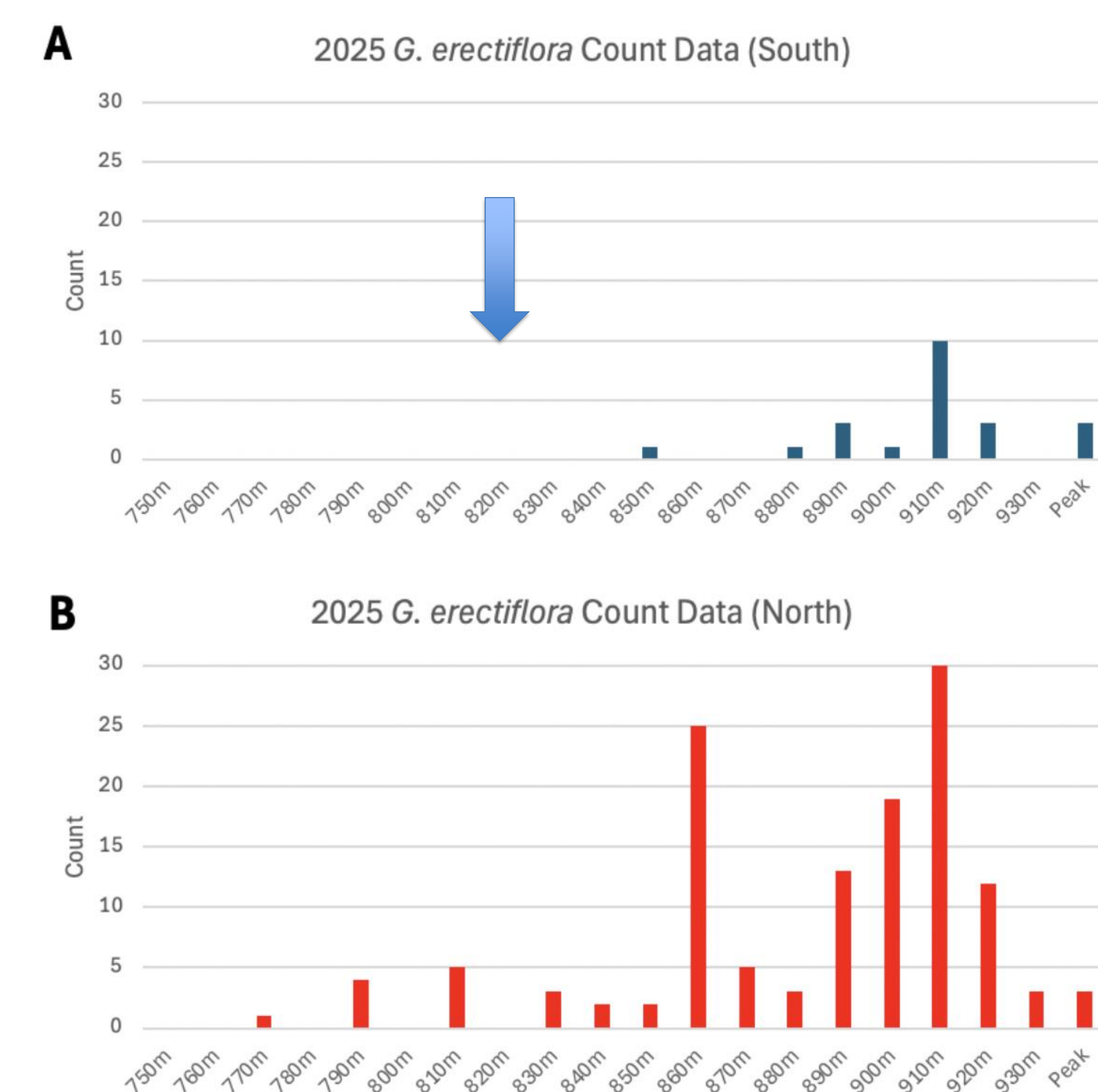


Figure 3. *G. erectiflora* count data on El Tucuche, Trinidad from July, 2025 on the (A) south and (B) north sides of the mountain. Counts were performed within a 25 m² area every 10 m in elevation, from 750 m-peak (936 m). Arrow represents the lowest elevation in which *G. erectiflora* were counted in 1993 on the south side (822 m)

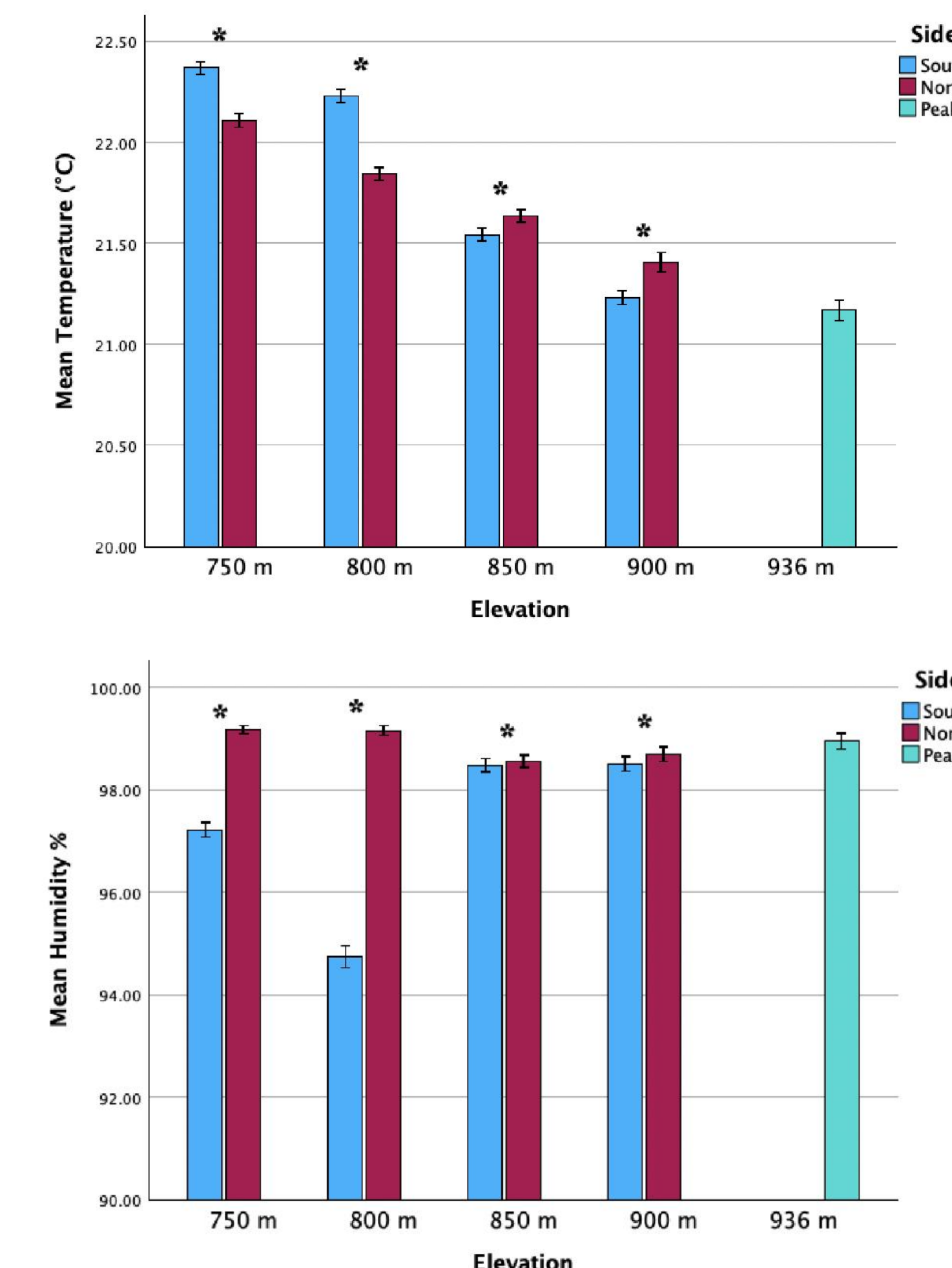


Figure 4. Mean temperature and relative humidity at different elevations and on different sides of El Tucuche, Trinidad from July 15-November 14, 2025. *: data is significantly different between the north and south side at the specific elevation

Results

After three months of data collection, the audio recorders detected 14 *P. auratus* vocalizations on the north side of El Tucuche at 900 m, and one vocalization on the peak (936 m). A positive correlation was found between *P. auratus* detections and *G. erectiflora* count ($\rho = 0.766$, $p = 0.016$). *G. erectiflora* were found to be significantly more abundant on the north side of the mountain than the south side ($U = 82$, $p = 0.002$). *G. erectiflora* density has also decreased over the past three decades since they were first surveyed ($p = 0.002$, $\beta = -0.761$) and their elevational range has shifted upslope on El Tucuche.

Future Directions

This study reveals the urgent need for conservation action in *P. auratus* and *G. erectiflora*, as their population sizes are very small throughout El Tucuche, and the golden treefrog relies on these bromeliads for their survival. Possible intervention could involve captive breeding, to increase population sizes of the frogs in captivity and reintroducing them into their native regions. Future research can incorporate our methods onto its two other known localities, El Cerro del Aripo and Cerro Humo, to compare the elevational distributions of these species and environmental conditions on these other mountains to those of El Tucuche.

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