

## Research investigates reproductive resource defense in golden rocket frogs

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Male golden rocket frogs transport their tadpoles "piggy back" and care for them throughout development, which can last for months. Credit: James Paul Tumulty

Some things in life are worth fighting for. For animals, the defense of space, known as territoriality, usually functions to safeguard valuable

resources like food and mates. However, for a species of tropical frog, researchers have recently discovered a surprising addition to things that adults find worth defending: suitable nurseries.

Human parents are well aware of the lengths some will go to to secure a first-rate [nursery](#) school for their children. Oddly enough, a parallel can be found next to the world's tallest single-drop waterfall (Kaieteur Falls, Guyana) home to a population of small golden-colored frogs. These small poisonous frogs spend their entire lives in enormous plants called giant tank bromeliads: within these plants, eggs are laid in the lower leaves and hatch as tadpoles.

Fathers then transport their young to pools higher in the plant through an elaborate piggyback ritual where tadpoles cling to a father's back. The tadpoles must survive in selected leaf axils until metamorphosis, meaning the quality of a nursery can have [profound implications](#) for the success of the tadpoles contained within them.

"Of course, if a [frog's](#) only suitable breeding-ground is on top of an isolated waterfall in the middle of the Guyanian Amazon, it isn't surprising that there isn't room for everyone. Thus, in addition to their intense parental care duties, male rocket frogs are extremely territorial and aggressively defend established areas in bromeliads (which consist of multiple leaves) from potential intruders," says researcher Chloé Fouilloux from University of Jyväskylä, Finland.

## **Male poisonous frogs defend territories**

Researchers Chloé Fouilloux (University of Jyväskylä, Finland), Johana Goyes Vallejos (University of Missouri), and James Tumulty (College of William and Mary) wondered if the intense territoriality of males had any relationship to their intensive care-giving duties. In their study, recently [published](#) in *Evolutionary Ecology*, the team first measured

variation in bromeliad pools to understand what made nurseries desirable.

One feature that stood out was the amount of mucilage, or "goop" as the researchers affectionately call it. Frog parents avoid this mucilaginous substance that fills nurseries and strongly decreases the amount of oxygen in the water. The team then mapped out male territories to see if the locations of these high-quality nurseries coincided with the territories. Indeed, these clear pools occurred more frequently within defended territories, suggesting males choose which plants to defend based on their characteristics.

"In other words, males defend areas that may benefit their reproductive output in the future—perhaps a cognitive feat of future planning that is not typically associated with amphibians. In human terms, these parents are securing spots in Montessori schools before they were even pregnant," says Fouilloux.

**More information:** Chloe A. Fouilloux et al, Home is where the high-quality resources are: nursery characteristics and territory distribution suggest reproductive resource defense in golden rocket frogs, *Evolutionary Ecology* (2023). [DOI: 10.1007/s10682-023-10273-1](https://doi.org/10.1007/s10682-023-10273-1)

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