

# New species of voiceless frog discovered in Tanzania

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UC assistant professor Lucinda Lawson led an international team that discovered a new species of amphibian called the Ukaguru spiny-throated reed frog during a survey in Tanzania. Credit: Christoph Liedtke

Researchers discovered a new species of frog in Africa that has an

unusual trait: it's completely silent.

The Ukaguru spiny-throated reed frog does not croak, sing or ribbit. Found in Tanzania's Ukaguru Mountains for which it is named, *Hyperolius ukaguruensis* is among the few frogs around the world that do not vocalize to other frogs.

The new [species](#) belongs to a group of "spiny throated" reed frogs, which true to their name have tiny spines on the male's throat. Since they can't rely on sound to recognize members of their species, they might use spines instead.

"It's a very odd group of frogs," said Lucinda Lawson, a conservation biologist and assistant professor of research at the University of Cincinnati.

"The male frogs don't call like most other frogs do. We think they may use the spine as something like Braille for species recognition," Lawson said. "Without a call, they need some other way to recognize each other."

This group of frogs has only a few species, found in [small populations](#) that make them rare and at risk of extinction. Finding a new member of this group is a major win for conservation, Lawson said.

The discovery was described in the journal *PLOS ONE*.

Lawson in 2019 led an international team on an amphibian search of the Ukaguru Mountains, where scientists have conducted at least seven previous surveys. They were hoping to find the beautiful tree toad, *Churamiti maridadi*, an amphibian that has only been observed twice in the wild in this same forest and is feared extinct.

"Our hopes were not very high. We knew the odds were stacked against

us," said study co-author H. Christoph Liedtke, a postdoctoral researcher with the Spanish National Research Council.

Researchers scoured undisturbed streambanks both day and night, documenting their search with handheld global-positioning satellite receivers. They looked under logs and in tree holes in an area of forest used by beekeepers, poachers and small-scale loggers.

They also set pitfall traps made of plastic buckets buried at ground level to catch amphibians that hide under the leaf litter. Researchers consulted with local foresters and distributed photos of the toad to nearby residents hoping someone—anyone—might have seen it.

While researchers never found the toad, they came across a locally abundant population of reed frogs unknown to science.

"Time spent looking for the beautiful tree toad yielded unexpected results. It was a fantastic finding that made the effort well worth it," Liedtke said.

The newly discovered reed frog joins a family of nearly 200 species in the genus *Hyperolius*. Lawson said they immediately recognized they had found something special.

"With any *Hyperolius*, I can probably tell by looking at it whether it's new or potentially new," Lawson said.

"Immediately it was clear that it was a spiny-throated reed frog. But this one was a golden, greenish brown instead of the green color found in the other species," Lawson said. "Sometimes color variation doesn't mean anything, but it might here."

A combination of genetic and genomic analyses confirmed the frog was

distinct from other members of *Hyperolius*. Researchers also identified its closest evolutionary relation, *Hyperolius ruvuensis*, another species that is critically endangered and is likely extinct.

Measurements found that the frog has unique body proportions, with smaller eyes in relation to its head than other spiny-throated reed frogs.

Describing a species is the first step toward protecting it, particularly in increasingly fragmented forests like those in the Ukaguru Mountains, Lawson said.

According to the study, the newly discovered [frog](#) could be of high conservation concern.

"The Mamiwa-Kisara North Forest Reserve is a T-shaped remnant forest," Lawson said. "It has a lot of edge effects from people cutting firewood. There are all sorts of pressures on this forest. It's easy to cross the whole thing in just a few hours of hiking."

Knowing how many species exist and where is critical to conservation, Liedtke said.

"The Ukaguru Mountains are part of the greater Eastern Arc Rift, a fascinating cradle of biodiversity, with many species endemic to single mountain blocks," Liedtke said. "The fast population growth in Tanzania means that the mountain forest habitats are under growing threats from people."

Amphibians are especially susceptible to human impacts. Since they absorb chemicals through their skin, they are vulnerable to toxins or changes in water acidity.

"If a bird's habitat is destroyed, they sometimes can fly to a new [forest](#)."

But that's hard for amphibians," Lawson said.

Having a diverse number of species is important to maintain healthy ecosystems, Lawson said.

"We think about this question a lot: why does one species matter?" Lawson said.

Frogs are part of the food chain. They eat insects and, in turn, are eaten by other animals.

"If this one species goes extinct, nothing much happens. We just lose one more strand in the fabric of the ecosystem," Lawson said. "But if you keep pulling out strands, the ecosystem becomes destabilized and the fabric unravels."

Co-author Simon Loader, curator of vertebrates at London's Natural History Museum, said he was thrilled to help describe a [new species](#). The discovery shows how much more there is to learn about diversity-rich parts of the world.

"We still have a long way to go before understanding what species are there and where they can be found," he said. "This is particularly the case for the biodiverse-rich submontane forests of Tanzania."

**More information:** Lucinda P. Lawson et al, Diversification of spiny-throated reed frogs (Anura: Hyperoliidae) with the description of a new, range-restricted species from the Ukaguru Mountains, Tanzania, *PLOS ONE* (2023). [DOI: 10.1371/journal.pone.0277535](https://doi.org/10.1371/journal.pone.0277535)

Provided by University of Cincinnati

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