Saving Saintpaulia, the African violet

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The African violet Saintpaulia ionantha, subspecies ionantha, pictured in Tanzania in November 1997. Credit: Charlotte Lindqvist

The African violet is one of the world's most common houseplants. You can buy it at Lowe's. You can get it at the nursery. You can find it in the grocery store.

But in the wild, this flower that blooms in brilliant shades of purple and pink is imperiled. The clearing of forests for timber and agriculture has endangered its native habitat, which forms a land-based archipelago of sorts, consisting of the highest points of the Eastern Arc Mountains that run through Kenya and Tanzania.

With these threats in mind, a team of scientists is crowdfunding a project that could help assure the future of the plant: an effort to sequence its genome.

The research, led by University at Buffalo biologists Charlotte Lindqvist and Victor Albert, will likely focus on Saintpaulia ionantha, one of several species that comprise the African violet genus. The project team also includes Aureliano Bombarely, a genobotanist at Virginia Tech with an interest in plant domestication and evolution.

"The Eastern Arc Mountains hold a very large diversity of both plants and animals," says Lindqvist, an assistant professor of biological sciences in the UB College of Arts and Sciences. "It's a biodiversity hotspot, and the African violet can be viewed as a flagship plant, a sort of 'panda of the plant world,' in the conservation of the Eastern Arc Mountains biodiversity."

By mapping the flower's DNA, the project could yield insights that benefit both breeding and conservation.

For commercial growers, the research could elucidate which genes control traits such as petal shape and color. This could bolster the multimillion-dollar African violet industry, making it easier to cultivate plants with desired aesthetic qualities, or even allow for new possibilities—varieties of the flower that have never been seen before.

From the standpoint of conservation, sequencing the genome of a single

plant can actually provide insight into how the size of the species' population fluctuated over the course of history—valuable information for environmental stewardship, Lindqvist says.

"From a single genome, we can get an understanding, or at least a good insight, into how the African violet has adapted in the past to environmental changes," says Lindqvist, who studied the plant in the wild as part of her PhD dissertation. "This information can be used to inform us about how the African violet might adapt or respond to future changes, both when it comes to habitat encroachment and also to changes in the environment."

A scene from the West Usambara mountains in Tanzania, pictured in October 1997. These mountains, part of the Eastern Arc Mountains, are home to African violets. Credit: Charlotte Lindqvist

And while the initial crowdfunding effort will work with one genome, the researchers hope to eventually sequence the DNA of multiple African violets, with genetic samples coming from spare leaves carefully picked from various locations within the Eastern Arc Mountains. This more expansive project will enable the scientists to see the genetic variability within the genus: Which plants are most similar to others, and which are most distinct?

The answer to these questions should inform conservation efforts, helping to determine which populations of African violets must be guarded most carefully in order to preserve genetic diversity. As Lindqvist explains, genetic variation is vital because it allows a species to adapt and survive in the face of threats such as changing climate patterns and novel forms of disease.

More information: For more information on the crowdfunding project, visit experiment.com/projects/the-af … rvation-and-breeding

Provided by University at Buffalo