

Exploring the Ecophysiology of the Namib Succulent, *Lithops ruschiorum*

Gobabeb Research and Training Centre, Namib Desert, Namibia

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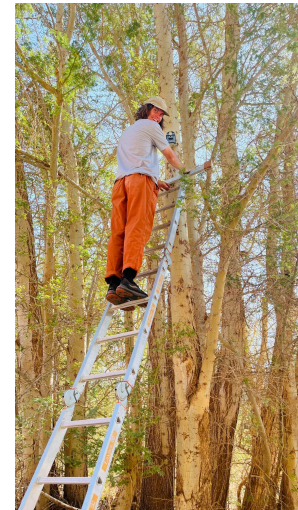
During the summer of 2024, I returned to Namibia to study a rare endemic plant called *Lithops ruschiorum* (pictured). Due to climate change, plant poaching and habitat loss, these enigmatic succulents are becoming increasingly threatened. Apart from demonstrating the wonders of evolution, *Lithops* play various important ecological roles. The loss of this species would be devastating. In collaboration with Gobabeb Research and Training Centre, the National Botanical Research Institute, and Dartmouth's ENVS Department, I sought to determine the unique adaptations of *Lithops ruschiorum*, and assess their distribution and population trends over the last decade and a half.



My fieldwork was conducted across twelve sites in the Namib-Naukluft National Park. A key question guiding our research was how *L. ruschiorum* acquire water in their hyper-arid environment. Since the Namib Desert receives less than 19mm of annual rainfall, small perennial plants (even succulents) cannot purely rely on rain. Therefore, we hypothesized that *L. ruschiorum* make use of an alternative moisture source, i.e. fog. To investigate this unique adaptation, we collected fog samples and tissue samples from several plants for a water isotope analysis and conducted ex-situ experiments on numerous cultivars. For the population and distribution analysis, we visited nearly all known populations of *L. ruschiorum*. At each of the sites we performed population surveys, a careful and tedious task as *L. ruschiorum* closely resemble their rocky environments. Along with the population surveys, we recorded other biotic and abiotic factors such as gradient, aspect and soil characteristics. Although my analysis is not yet finished, our research will greatly contribute to plant conservation in the Namib Desert.



In addition to my own research, I assisted a Dartmouth PhD student, Saima Shikesho, with her fieldwork. This involved collecting dung, hair and plant samples, adjusting phenocams and camera traps, and performing DNA extractions. Our work was conducted along the Kuiseb River that surrounds Gobabeb Research and Training Centre. During some of our field days, we worked with the local Topnaar community to collect samples from livestock and surrounding water sources.



The Paulson Fellowship provided me with the unique opportunity to pursue my academic interests beyond what was achievable in a Dartmouth classroom or lab. This allowed me the freedom to ask my own questions and develop a project aligned with my specific career aspirations. Beyond the research itself, I forged valuable connections with international researchers and gained a deeper understanding of Namibian culture. Overall, the experience was both personally and professionally transformative.