

Professor discovers new lichen species in city of Boulder

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A University of Colorado Boulder scientist unexpectedly discovered two lichen species new to science in the same week while conducting research in Boulder Colorado, near the city's eastern limits.

After a day of fieldwork inventorying lichens at White Rocks Open Space, Erin Tripp was walking back to her car when an unfamiliar lichen caught her eye. Later that week, Tripp spotted a second [species](#) of lichen that she suspected might also be a new species.

Tripp, curator of botany for the University of Colorado Museum of Natural History and assistant professor of ecology and evolutionary biology, was collaborating with ecologist Lynn Riedel and other staff members at the City of Boulder's Open Space and Mountain Parks (OSMP) program to inventory the lichens along the sandstone cliffs that comprise White Rocks.

Lichens are complex life forms composed of at least two separate organisms, primarily a fungus and an alga that form a symbiotic relationship. They can live on soil, rocks, tree bark, desert sand, animal bones and rusty metal, for example.

"If you want to study Colorado lichens, you come here to the museum's Herbarium on campus, which has one of the most important collections of lichens in the country," said Tripp. "New species are generally found in less accessible parts of the world, rather than within city limits of a sizeable metropolis. Yet, here were these two new species to science

within a 10-minute drive of CU-Boulder, which has a very long history of research in lichenology."

The two species Tripp discovered, *Candelariella clarkii* and *Lecidea hoganii*, are at present known only from their populations at White Rocks. They are distinctive by their morphology, anatomy and DNA. One has a charismatic yellowish-green color while the other is distinctive by its conspicuously raised fruiting bodies that are tinged pink on the inside.

The Herbarium's extensive botany collection requires devoted efforts by two collections managers who preserve and help curate some 550,000 specimens from around the world, some dating back more than 150 years. As a way of recognizing the staff members' dedication to advancing knowledge of Colorado botany, Tripp named the two new species after Dina Clark and Tim Hogan, collections managers of the Herbarium.

"Tim and Dina work endlessly and have dedicated their careers to building and preserving the collection, as well as extending its resources to others," said Tripp. "When I saw these species in the field, I thought immediately of Dina and Tim, and honoring their careers via eponymy."

Tripp verified that the two lichens were previously unknown to science through extensive study of the Herbarium's collections as well as reading the literature, historical and modern. DNA analyses conducted in Tripp's molecular lab helped to confirm that both were unknown to science. The two new species were formally described in collaboration with colleague James Lendemer of the New York Botanical Garden in the most recent issue of the journal *The Bryologist*.

Additionally, to facilitate lichen research and conservation by the city of Boulder, Tripp has prepared a field guide of the 57 species of lichens

that occur at White Rocks, with high-resolution photos she took in the field. This book is currently under peer review at The University Press of Colorado. She also has authored a paper on the lichen biota at the White Rocks that will be published soon in the journal *Western North American Naturalist*.

At White Rocks, the unusual geology, its southern exposure and availability of water concentrated in transient springs support diverse vegetation and wildlife and allow other organisms—such as the newly discovered lichens—to flourish along the sandstone outcrops. Protected, moist and shady "microhabitats" created by the formation's rock ledges also contribute to the complex ecosystem found along the sandstone cliffs.

The state of Colorado has designated the 100-acre White Rocks site as a State Natural Area because of its high ecological value in providing habitat for uncommon and rare plant and animal species. The open space surrounding White Rocks is home to sensitive wildlife, including bald eagles, northern leopard frogs, northern harriers and the plains top minnow.

"The fact that White Rocks occurs within a sea of development in the Boulder-Longmont-Denver urban triangle makes the preserve that much more special ecologically," said Tripp.

Because of the sensitive ecological features of White Rocks, OSMP only provides public access to the area through staff-guided hikes during the summer.

"Every year, OSMP works with researchers to help us learn more about the lands we manage," said Brian Anacker, OSMP's research and data manager. "Their research provides important information that helps us protect, manage and restore habitat as well as understand how people

enjoy a diverse range of recreational experiences on the city's open space."

As if discovering two new species of lichen in this small preserve wasn't enough, Tripp may have discovered two additional species of [lichens](#) that are possibly new to science. She is still studying them to confirm her theory.

"The discovery of [new species](#) in relatively densely populated regions of North America illustrates the ecological relevance of small patches of native habitat, which are certain to become even more important in the future," said Tripp. "My long-term goal is to expand the study of lichenology in Colorado and eventually produce a total inventory of what we have throughout the state."

Provided by University of Colorado at Boulder

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