

Study finds remarkable diversity of lichen species in Florida state park

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If you seek America's most diverse, densely packed human population, head for New York's Manhattan, but if it's lichens you fancy instead of people, then Southwestern Florida is your best bet.

This special kind of symbiotic fungus thrives in the Fakahatchee Strand Preserve State Park not far from the [Everglades National Park](#), and its remarkable diversity was documented in a census led by Robert Lücking, collections manager and adjunct curator in the botany department of The Field Museum, Chicago, and organized by William Safranek, assistant professor at the College of Medicine, University of Central Florida. Lücking's team of 19 taxonomists and graduate students, accompanied by several park personnel including park biologist Mike Owen, documented 432 different [lichens](#) within one square kilometer of Fakahatchee, including 18 never before identified by scientists and nearly 100 previously not known from North America.

This appears to be more lichen biodiversity in a relatively small space than anywhere else in North America, Lücking said. Only eight parks in North America have a higher number of species reported, but corresponding to a much larger area actually sampled. And many more species are to be expected when continuing the survey at Fakahatchee. The discovery, published in the Florida Museum of Natural History Bulletin, marks the latest effort by Field Museum scientists and their colleagues to raise the profile of lichens and add to knowledge about them.

Composite organisms consisting of a fungus and a green alga or some other photosynthetic partner, lichens thrive all over the world, from the frozen Arctic to rocky coasts and dry deserts. But their favored environment in terms of species richness is tropical rain forest, and Fakahatchee (which in the Seminole Indian language roughly means "muddy creek") seems to be the ideal spot for them in the United States. This also applies to other tropical organisms, such as epiphytic orchids and bromeliads, which is why Fakahatchee is often called the "Amazon of North America".

The lichen biodiversity census was the focus of a weeklong workshop that attracted professional and amateur taxonomists from 18 institutions in the U.S. and Canada as well as Puerto Rico, Peru and Austria, including resident biologists Rick and Jean Seavey who have been working on southwestern Florida lichens for years and maintain a website [www.seaveyfieldguides.com], and James Lendemer from the New York Botanical Garden who is conducting a survey of eastern North American lichens together with several colleagues.

Finding so many varieties of lichens was a function of the fact that there are lots of species at Fakahatchee and so many taxonomists were out looking, said Lücking. "Different people have different methods of looking," he said. "You can have several people working near each other and some individuals will find things that others overlook." One of the co-authors, Ralph Common, a particularly keen collector and microscopist, found seven species new to science in just a single genus of lichen.

The Florida workshop was one of several underwritten by the National Science Foundation in recent years. The goal is to increase knowledge of species before many go extinct. Scientists estimate that some 100,000 species of fungus, including 17,500 lichens, are known, but perhaps another million more exist, but are unknown to science.

Lichens can be useful as biosensors, helping to assess the overall health of a forest and aiding in land management planning. Some have also been used in perfumes, dyes and medications. Increasing human knowledge of them can have value beyond just basic science, Lücking said.

Earlier this year, Lücking worked with his Field Museum colleague Thorsten Lumbsch, in collaborating with 102 lichenologists from around the world to author a single scientific paper introducing 100 newly-discovered lichens to science, some of these originating from Fakahatchee. While common in physics, such large collaborations are relatively rare in biological taxonomy.

To tackle the huge territory of uncharted [species](#), Lücking and Lumbsch believe that collaboration is essential. The NSF workshops and the report of the Fakahatchee [census](#), authored by 19 taxonomists, are part of that change, said Lücking.

"Large collaborations in the area of taxonomy and systematics have been unusual in the past," he said, "but they are becoming more common."

Provided by Field Museum

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