International experts collect alpine fungi in Beartooth Mountains of Montana

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Armed guards once kept polar bears away while Cathy Cripps collected mushrooms and fungi on the island of Svalbard between Norway and the North Pole. Another time, Cripps encountered musk-oxen while gathering fungi in Greenland.

It's no wonder, then, that some of the world's top experts on fungi asked if they would face grizzly bears in Montana, said Cripps, a Montana State University mycologist who hosted a recent International Symposium on Arctic-Alpine Mycology. Cripps is president of ISAM and curator of the MSU fungi collection.

Mycologists from 10 countries collected fungi and mushrooms above tree line in the Beartooth Mountains near Red Lodge, Mont., in August. It was the first time scientists collected fungi in the alpine regions of the Rockies in a large group, Cripps said. It was also the first time since 1980 that ISAM met in the United States.

No one encountered grizzlies, but Cripps said they did enjoy mountain goats and wild flowers while finding more than 80 species of fungi. At least four of the species are new to science. Carrying red bags so they could spot each other from a distance, the scientists collected mushrooms above ground that indicated fungal mycelium below ground. Cripps said she was happy that smoke from area forest fires had disappeared and that the snow was still melting, providing plenty of moisture for fungal specimens.

"We were particularly looking at fungi important to plant sustainability," Cripps said. "Most plants cannot survive in these habitats without fungi on their roots or fungi to recycle nutrients into the soil. The fungi act as Mother Nature's fertilizer."

About eight percent of the Earth's land surface is covered by arctic or alpine habitat, so the fungi that grow there are important, Cripps continued.

"Without arctic and alpine fungi, most plants would not be able to survive in these habitats, and animals depend on plants for nutrition and habitat," Cripps said. "In our world, it is the fungi that keep terrestrial ecosystems functioning."

Alpine fungi may yield new industrial enzymes and some that make it easier to wash clothes in cold water, she said. Europeans stabilize their ski slopes by adding alpine fungi to the roots of plants.

Cripps received a National Science Foundation grant in 2000 to study alpine fungi in the Rocky Mountains. Cripps said that when she wrote the grant, arctic-alpine ecology was well-known in other areas of the world, but not in the Rockies.

"No one had gone above tree line to look," Cripps said.

Egon Horak from the Institute of Integrative Biology in Zurich, Switzerland, one of the world's best arctic-alpine mycologists according to Cripps and co-host of the Montana conference, said arctic-alpine fungi are widely distributed in cold climate regions, particularly in the northern hemisphere. They are threatened by global warming, however.

The fungi are "earmarked to become extinct unless they have the opportunity to migrate into ecologically adequate sites at higher

elevation," Horak said in an e-mail.

Some of the fungi the scientists gathered in the Beartooths came to MSU to be dried, described and examined more closely. Other collections went to herbaria worldwide. Findings from each of the ISAM scientists will be published in the "Journal of North American Fungi," Cripps said. The fungi and its genetic material will be stored at MSU, where they are available to researchers from all over the world.

Source: Montana State University