

MUSHROOM EXPLORATION OF THE HIMALAYAS

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In November 2019, before the world shut down because of Covid, I was in Kathmandu with my daughter Carol and met with Shiva Devkota, Nepal's leading mycologist. Over cookies and cups of sweet milk tea, I pitched the idea of bringing people to Nepal to look for mushrooms in the Khumbu. Climate change, and with it the rapidly warming Himalayas, made the search for mushrooms an essential element in understanding the impact a warming climate had on this biodiverse part of the planet. Before we could ascertain

whether mushrooms were a sentinel species in a changing environment, we needed to figure out and inventory what was growing in the region now. The project would combine a trek to Everest Base Camp organized by International Mountain Trekking with a search for every mushroom we could find.

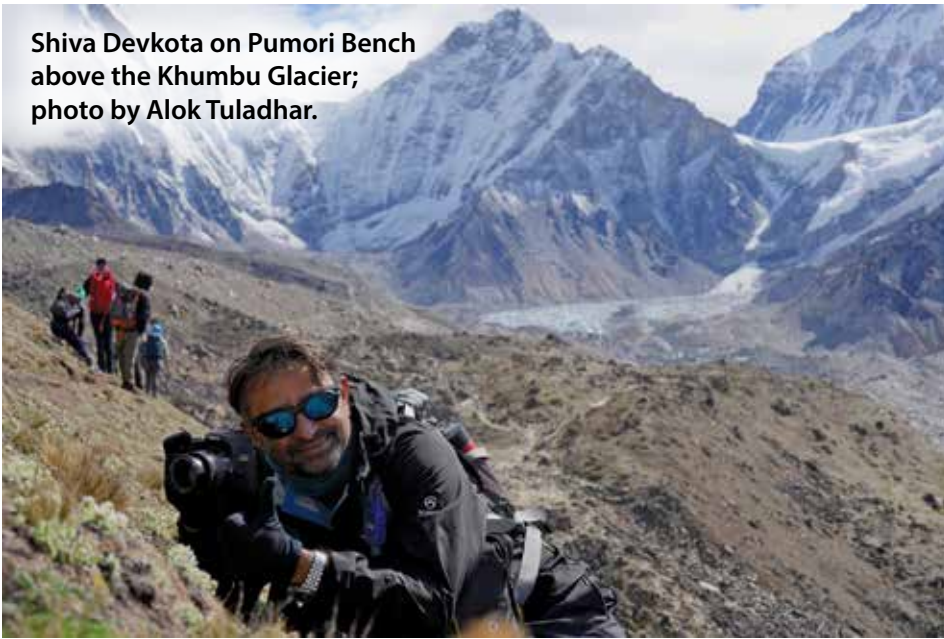
On June 19, 2022, our team of scientists—which included Britt Bunyard, publisher and editor in chief of FUNGI Magazine, Thomas Roehl, a Ph.D candidate in mycology from Clark University, and a crew of citizen scientists from the United States and Mexico—rose before dawn at the Kathmandu Guest House and set off in Toyota Land Cruisers (each truck packed with a bright orange laundry tub filled with ice and Nepali beer) for the long drive to the Solukhumbu. It was the rainy season, and that rain caused a landslide which, for a while, blocked our way across a road etched into the side of the rising hills of the lower Himalaya. The road was cleared and before long, as we lurched and bumped up the deeply rutted dirt roads to Salleri village, our sharp-eyed mushroom hunters were jumping out, grabbing mushrooms and taking note of the specific geolocation of each find.

“No one told me about this,” I heard Britt complain a day later, as he looked out across the deep valley at the ominous gray and fast-moving waters of the Dudh Koshi (Milk River) to the turquoise roofs of Phakding village and the long high suspension bridge we would need to cross to get to our tea house for the night. A yak train, burdened with propane canisters, ambled toward us as we waited our turn to cross, the bells around their thick hairy necks clanging with each step. I told Britt the bells scare away Tibetan wolves, which didn't seem to distract or to ease his trepidation. “Don't look down,” I suggested, as I watched him carefully step onto and progress down the narrow, metal footpath and make his way across the bridge decorated with prayer flags snapping in the wind.



Tenzing Tashi Sherpa holding *Leccinium aurantiacum*; photo by Alok Tuladhar.

Shiva Devkota on Pumori Bench above the Khumbu Glacier; photo by Alok Tuladhar.



Later that afternoon, on a foray into the mostly deciduous forest behind the village, we discovered *Amanita tullossiana* (named in honor of Dr. Rodham E. Tulloss for his contribution to the study of *Amanitaceae*), an ash gray mushroom, its pileus covered with dark grey universal veil remnants and

stipe with rows of recurved scales. A beautiful poisonous mushroom never before reported in Nepal and only first described as a new species in 2018 from Uttarakhand, India.

We started finding lots of other interesting mushrooms and lichens: an unknown species of *Psilocybe*; a pretty

yellow jelly *Calocera cornea*; the rapidly blue staining mycorrhizal *Boletus sensibilis*; *Hypomyces chrysospermus*, the parasitic ascomycete bolete eater; and the wispy *Usnea longissima*, known almost universally as Old Man's Beard and valued in Sherpa communities for its medicinal and spiritual qualities. At night after dinner, we would hear our resident mycologists Britt, Shiva, and Thomas describe to us and sometimes debate what exactly we had found along the trail. I watched the warm, purpose-driven collegiality that spread and grew through the group, including our wonderful guides, Sonam Jangbu Sherpa, Phu Chiri Sherpa, Tenzing Tashi Sherpa, and Sonam's fiancé, Pushpa Gurung. We were on a mission, and everyone's eyes and attention were needed to find the next prize.

Most people coming to the Khumbu look up at the world's highest peaks. We looked down and, to our great pleasure and surprise, found more than 150 different species of mushrooms along the way. Some had never been reported in Nepal. Some species we



On the approach to Dingboche by Alok Tuladhar.

could not identify because they appear to be unknown to science. And some, like *Suillus granulatus* growing in gregarious clusters in the pine forests on the way up to Namche Bazaar, we sauteed with shallots, fresh-picked *Zanthoxylum simulans* (Sichuan peppercorns) and small, blazing-hot green chilis for our homemade pizza, assembled in the kitchen of Namche's historic Khumbu Lodge.

The weather was at times rainy, cloudy, partly cloudy and cool. Perfect trekking weather. I knew we were hiking in the shadow of some of the world's greatest peaks, but we would not see those peaks for a few more days as we steadily gained elevation. When they did occasionally show themselves, they did so in a tantalizing burlesque—the clouds would open for a few minutes and then close in again, leaving to our imaginations the soaring snowcapped mountains we knew were there. Happily, we kept finding mushrooms, along with bright green leafy foliose lichens that were photographed in situ, then



Guys on rocks with dramatic clouds, photo by Alok Tuladhar.

placed in plastic trays which hung from day packs so they could be studied and analyzed later. We explored and found mushrooms in dark birch forests, rhododendron-covered hillsides; the mossy fern banks of crystal streams that cut across our path; and in the

rich dung patties left along the trail by Himalayan tahr, yaks, donkeys and other beasts of burden. Each day of trekking was interrupted and slowed by new discoveries. We also ate plenty of mushrooms. On practically every menu where we stopped for lunch or stayed

International Mountain Trekking's Mushroom Trek Through Annapurna



Explore the grandeur of the Himalayas in Nepal with International Mountain Trekking on a unique small-group mushroom trek through Annapurna. This trek will be led by Shiva Devkota, Ph.D, Nepal's leading mycologist.



For more information, visit www.IMT-Nepal.com or contact Rick Silber: 202-255-1191 rsilber@IMT-Nepal.com

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Amanita tullossiana.

overnight, mushrooms were offered in soups, in momos, on pizzas, and in dishes of rice and vegetables. So much for my brilliant idea that we would “discover” something new. We were hiking in the Hindu Kush Himalaya—a land of mountains and mushrooms, the most densely populated high-altitude and biodiverse region on earth, and we quickly corrected our assumption that giving something a scientific name was the same as making a discovery.

Immediately after arriving at Everest Base Camp, several of our team split off, led by Phu Chiri, who with 8 successful summits of Mt. Everest under his belt guided our teammates Shiva “Dusty” Panthi, Sarah Watson, and Carla Gonzalez-Campos up the beautiful 20,075 ft. Lobuche Peak. In Dingboche, we rented all the equipment they would need—crampons, mountaineering boots, and ice axes. The team moved immediately to high camp. After sunset, it started snowing. Despite a midnight alpine start, the snow slowed them down, and after a long hard day



A variety of mushrooms abounds in the temperate forests of Nepal during monsoon season.

with the summit only a hundred or so meters above, they turned around. As Ed Viesturs famously said, “Getting to the top is optional. Getting down is mandatory.” They rejoined our group in Pheriche, and we greeted them with warm hugs and glasses of Khukri spiced rum. The storm clouds moved off during the night, and the following day was clear with a brilliant Himalayan bluebird sky. This was our last day of trekking. We were heading toward Phortse village, where the colorful Buddhist festival of Dumji which celebrates the birth of Guru Rinpoche on a lotus flower, was just beginning. But first, Sonam and Pushpa were married in a simple, beautiful and traditional ceremony. Sonam and Pushpa dressed in traditional Sherpa attire. Phu Chiri chanted Buddhist prayers; rice wine was poured into a bright ceramic goblet with dabs of Yak butter on the rim. This goblet was passed to Sonam whose smile spoke of the love he felt for Pushpa, as he dipped his fingers into the cup, pulling out and casting into the air droplets of golden wine. This was repeated by Pushpa. Sonam’s mother, Ang Serki, welcomed Pushpa into her home, where she became part of Sonam’s family.

The last day of the trek began with the sound of helicopters. You hear them before you see them. The resonant

thumping sound echoes off the deeply carved valley walls as they slice through the thin air. Then you spot them, tiny red dragon flies growing ever larger, reflecting the sun and moving against the background of vast green forests plunging down to silty rivers that carry away billions of gallons of water, and the very mountains themselves. Like Mt. Everest, rising just slightly faster than glaciers can grind and rain dissolve and wash it away. This was the last morning of our trek and these helicopters had come to take us from the landing pad on the edge of Phortse village back across the Khumbu to Nepal’s ancient capital city, Kathmandu.

This trek represents a first step in the process of documenting the rich diversity of mushrooms and lichens of the Khumbu. The Himalayas are warming three times faster than the rest of the planet. Climate change is impacting every aspect of the biome, water, and the people who have lived in the Himalayas for hundreds of years. Because of the necessity of this mycological census, we will return to the Himalayas in 2023 to continue our work and exploration.

Editor’s note: If you are interested in joining this expedition in 2023, please contact International Mountain Trekking at www.imt-nepal.com or email Britt at fungimag@gmail.com. †