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The Incomappleux discoveries

Three lichen species new to the country, three new to the continent and nine new to the world

By Anne Sherrod

It has been almost two years since *Menziesia* presented the botanical wonders of 'The Incomparable Incomappleux' to its readers (October 2005). The title referred to the Incomappleux River valley near Revelstoke, just south of Glacier National Park. Two-thirds of the valley had been logged, leaving a primeval cedar-hemlock forest with trees up to four metres thick in the upper third. Research by botanist Toby Spribille had documented numerous rare lichen and plant species in this antique inland temperate rainforest.

Since that time, there have been globally significant and surprising discoveries. Spribille has now listed 283 lichen species for the Incomappleux, most of them (about 74 percent) found in old-growth forest. They include three species not previously known in British Columbia or Canada, and three not previously known in North America. Finally, in 2007 Spribille confirmed that nine of the Incomappleux lichen species were not previously known to science at all.

"This is by far the longest list of lichen diversity ever published in western North America for an area of comparable size," says Spribille. "Such levels of lichen diversity and rates of discovery of new species are basically unparalleled in northern conifer forests — even in coastal temperate rainforest," says Spribille. "We are definitely looking at a major

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photo Juscha Grunther

Toby Spribille and colleagues have discovered a globally significant centre of lichen diversity in the forests of the Incomappleux River valley.



photo Toby Spribille

New to science

Pertusaria diluta, seen under a microscope, is one of nine new-to-science lichens recently discovered in the Incomappleux River valley. *P. diluta* is grayish green with pink fruiting bodies. Each fruiting body is about 0.03 mm wide.



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photos clockwise from left: Craig Pettitt, Eric Schindler, C. Pettitt, Bonnie Boldt

Clockwise from left: Incomappleux valley brook. Lichen moth. Yellow and black hair lichens (*Bryoria* spp.). Craig Pettitt with an Incomappleux valley western redcedar.



More lichens to discover – scores more

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center of lichen diversity at a global level that we haven't even begun to fathom or explain."

At the time of the previous article in *Menziesia*, the total results from Dr. Oldriska Ceska's survey of mushrooms in the Incomappleux were not yet available. After much painstaking investigation, Ceska has since listed 50 mushroom species from her one day in the field. Twenty-five of them are coastal species, adding weight to the view that these wet interior cedar-hemlock zone (ICH) forests constitute a globally unique type of rainforest.

Spribille and his colleagues, Trevor Goward and Curtis Björk from B.C., have been studying inland temperate rainforest for years. They have so far identified 13 lichen species new to science at several different locations within B.C.'s inland temperate rainforest. They say there are more to come — scores more. In several recent studies, they have found that there are more species of tree-dwelling lichens in old-growth cedar-hemlock forests than of trees, shrubs, herbs, grasses and mosses combined. Indeed, they have found that these forests support one of the richest epiphytic lichen

floras in the world.

When they started their work, it was believed that interior cedar-hemlock forests had simplified vegetation with relatively few species compared to tropical or coastal temperate rainforest. Of course, both coastal and interior temperate forests have long been associated with high lichen diversity. These researchers were using lichen diversity as an indicator of rainforest conditions, but they were finding significantly more species on the coast than in the Interior. Now, however, there is no site that matches the Incomappleux with 283 total lichen species. And with

the emergent knowledge of literally hundreds of species of lichens, the view of temperate rainforests as being species-poor is fading away.

The Incomappleux has been protected for the last two years by a massive rock slide that came down on the only road into the valley, damaging a bridge. Now, however, the bridge is being repaired, leaving the forest vulnerable. (See www.vws.org for complete details). B.C.'s Interior Wetbelt has been logged at the rate of 47,679 hectares a year for the last 40 years. Hundreds of kilometers of lush, old-growth, valley-bottom forests along rivers have been nearly logged out without any detailed inventory of the biodiversity of these rare forest ecosystems.

"Every valley has a unique set of lichen species which reflects its special environment and history," says Spribille. "Those found in old-growth forest have likely grown in the humid canopies of trees for hundreds of years. They will not survive the drying and exposure brought on by logging. We know almost nothing of how these species spread, but repeated experience has shown that they are not found in second growth forest."

The new microscopic lichens that Spribille, Goward and Björk are discovering are part of a kingdom of microorganisms, fungi, and small plants that transform air, water and minerals into usable food for higher organisms in the forest. This world of invisible and barely visible organisms is the counterpart of the plankton which forms the foundation of the food chain in the oceans. Some lichens, such as the leafy lung lichens, capture nitrogen from the air and make it available to plants. Lichens can provide up to half the nitrogen requirement of a forest. Many animals, such as mountain caribou and flying squirrels, depend upon lichens for food and nesting materials.

More botanical research in old-growth interior cedar-hemlock forest



photos Craig Pettitt, Juscha Grunther (lower left)

Clockwise from top: The lower Incomappleux was logged heavily in the 1980s. The lung lichen *Lobaria pulmonaria* is common to coastal and inland temperate rainforest. Lichen researcher Curtis Björk collecting specimens from the upper Incomappleux River valley.

is desperately needed. Until governments and universities provide more funding, organizations such as the Valhalla Wilderness Society must make a crisis effort to find out what we are losing in some of these forests before it is gone. There are still many important areas of old-growth interior cedar-hemlock that could be protected. To find out how you can help, see the Valhalla Wilderness Society website at www.vws.org.

Anne Sherrod is chairperson of the Valhalla Wilderness Society.



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