

# Report on Lichen Survey of the Upper Duncan River Area, 6 Aug 2004

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**Abstract:** *A one-day survey was conducted for rare plants and lichens in the upper Duncan River area in August 2004. Lichen diversity was varied along a series of collecting sites from south to north, with highest diversity of oceanic, typical rainforest lichens on the west bank of the Duncan River opposite of Giegerich Creek. A new locality for the devil's matchstick lichen (*Pilophorus acicularis*) represents the easternmost record of this oceanic species in British Columbia. The results of this brief collecting excursion point to the need for more detailed inventory. Inventories up until now have shown forests in limestone-influenced areas to be richer in species than those on granite or schist. Future field work should more closely examine the possible relationship of bedrock type to species diversity.*

## Background

Little is known about the botany of the Selkirk Mountains, other than what has been gleaned from surveys in readily accessible areas, such as Glacier National Park along Highway 1. Particularly poorly known are the interior valleys and sub-ranges of the Selkirks. One of these valleys is the Duncan River Valley, which extends almost due south from Glacier National Park 100 km to Duncan Lake and its mouth into Kootenay Lake. Only one previous lichenological survey is known to have taken place in this area, in September of 2002. This brief survey only included the mouth of Hall Creek on the valley bottom and the vicinity of a small adjacent lake. However, it yielded a rich oceanic lichen macroflora, including many of the same species that have already been documented for the Incomappleux River to the west (Spribille 2002), including the COSEWIC Species of Concern *Nephroma occultum*. The main objective of the 2004 survey was to conduct a cursory check whether oceanic lichens have a more widespread distribution in the upper Duncan Valley.

## Survey results

A total of 139 lichen collections were made during the one day survey on 6 Aug 2004. These collections were taken primarily during five main collecting stops. The main highlights and findings at each site are summarized under the respective headings:

### 1) confluence of Westfall and Duncan Rivers

A brief survey was made here in an alluvial area with mixed hemlock, cedar and cottonwood. There was evidence of nutrient enrichment especially along the brief section of the Westfall River surveyed that feeds into the Duncan. Fine silt, apparently from recent run-off, covered the area. The main lichens of interest that were collected are *Sphaerophorus globosus*, on hemlock trunks (typical rainforest and oldgrowth species) and *Brigantiaea praetermissa* (crustose lichen species typical of inland rainforests, and found primarily in the ITR region). *Lobaria pulmonaria* and *Leptogium saturninum* were also common.

**2) end of road, near headwaters and south of boundary of Glacier National Park, near inlet of Butters Creek; 51°02'23"N 117°14'48"W, 1340m;**

This was a narrow band of unlogged Engelmann spruce-Subalpine fir (ESSF) between two large clearcuts. The lichen flora was different than that of cedar-hemlock forests and was a rich assemblage of crusts typical of snow-rich, altitudinally low-end ESSF forests. Highlights included *Arthonia apatetica*, on alder stalks, and a variety of biatoroid crusts that may belong in part to undescribed species. These collections will require more work.

**3) mid-drainage between 1) and 2), near inlet of Alicia Creek; 50°56'48"N 117°12'01"W, 1103m;**

This was an oldgrowth western hemlock forest on a west-facing slope above the Duncan River. The site was over granitic bedrock and the lichen flora was extremely poor. Although there was every reason to believe that the forest received as much precipitation as the Duncan below the Westfall confluence, almost no oceanic lichens were found. Only one individual of *Lobaria pulmonaria* was found after extensive searching. Interesting at this site was the discovery of *Lobaria linita* on a boulder under the forest canopy (the species is a boreal and wet forest species, also common along the Incomappleux), *Tuckermannopsis subalpina* on the stalks of huckleberries, and the crust *Ochrolechia androgyna* on hemlock trunks, a species found at these latitudes primarily in wet forests (also common in the Incomappleux).

**4) between 2) and 4), south of Hume Creek; 50°53'03"N 117°11'32"W, 1036m;**

This site was similar in aspect and general elevation to site #3 but was situated over schistose bedrock (a bedrock change took place over a rather short distance along the road). The site appeared to be far less nutrient-limited, with large quantities of *Lobaria pulmonaria* present and relatively frequent *Sphaerophorus globosus* and *Sphaerophorus tuckermannii*, two typically oceanic macrolichens. No intensive inventory was conducted, but it is likely that this site would have provided higher levels of richness of oceanic macrolichens, particularly if collecting were extended downslope towards the river.

**5) the west bank of the Duncan River at the river bridge opposite of the confluence with Giegerich Creek; 50°42'24"N 117°06'30"W, 686m;**

A brief stop was made at the Duncan River crossing north of Hall Creek and the steep east-facing slope above the river checked. This area displayed, for standards of inland rainforests, excellent diversity. Oceanic macrolichens included *Pseudocyphellaria anomala*, *Sticta fuliginosa*, *Lobaria scrobiculata*, *Sticta oroborealis s.lat.*, *Parmeliella parvula*, *Lobaria linita* on bark and rock, *Platismatia norvegica*, *Hypogymnia oceanica*, *Polychidium dendriscum*, *Pilophorus acicularis* and oceanic microlichens such as *Gyalideopsis piceicola*, *Microlychnus epicorticis*, *Pycnora sorophora*, *Spilonemella americana* and *Lichinodium canadense*. *Pilophorus acicularis* is new to the Duncan and becomes the easternmost record in BC. This site appears to match the high richness of the Hall Creek site surveyed in 2002, suggesting either a source of nutrient enrichment along the west bank of the Duncan River or a possible humidity effect on the west side of the valley, or both.

## **Discussion**

The Duncan Valley lichen flora reflects its high precipitation and can be characterized as a typical BC inland rainforest lichen flora. Patterns of richness within the valley vary greatly.

The two main diversity “hotspots” identified so far appear to be centred on the lower portions around and north of Hall Creek. However, these rich areas may extend a considerable way up the valley on east-facing slopes; these were not surveyed during the present field trip. The only other sites surveyed were west-facing slopes and a site in the Engelmann spruce-Subalpine fir zone at the headwaters. A marked difference in biomass of oceanic lichens, and in particular the lung lichen *Lobaria pulmonaria*, is visible between sites #3 and #4, namely between a site on granite and one on schist. The schistose rocks in this area appear to be somewhat calcareous.

It would be very useful to map diversity patterns in the Duncan Valley relative to bedrock. At present, it appears that there is a high concentration of diversity in one small area. However, this is based only on a cursory one-day survey and a survey lasting only a few hours in 2002. The true extent of diversity in the Duncan Valley and adjacent side-valleys has yet to be explored. One possible approach would be the placement of comprehensive inventory plots along the east and west flanks of the valley, with equal numbers of plots on various bedrock types taken from geological maps. This could be important to determine if there is an enrichment effect on the west side of the valley from the calcareous Badshot Range. If this were the case, these high-diversity forests should be assigned high priority for future conservation.

## **Literature**

Spribile T (2002): Oceanic lichens in the Incomappleux River Valley, southeastern British Columbia. Unpubl. Report to Valhalla Wilderness Society, 7 pp.