GETTING TO KNOW YOUR BOREAL LICHENS

of

Saskatchewan, Canada

Series IV

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A pdf version of this document can be found at http://www.biodiversity.sk.ca/ftp.htm

PREFACE

Series IV is a continuation of Series II (http://www.biodiversity.sk.ca/ftp.htm), and describes, in similar format, additional common boreal lichens, occurring across the boreal forest. A number of these species can also be found in the Aspen Parkland Ecoregion.

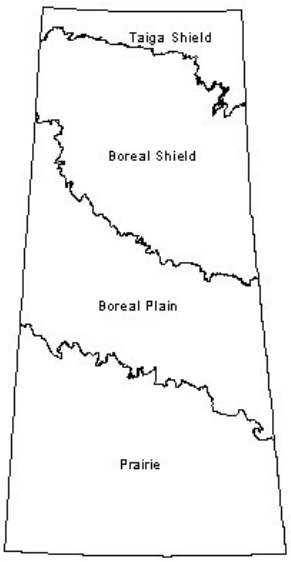
The scientific name, of a lichen refers to its fungal component, while the algal component has its own scientific name. These scientific names are known to lichenologists and students of lichens worldwide because they are stable, but are cumbersome and difficult to pronounce or remembered by the uninitiated. This prompted the need for a more easier common English name for most lichen species. However, such names can vary and often more, or different, common names are given to a certain species.

Scientific names have two components: genus and species. Lichens grouped into the same genus have some characteristics in common. For example in *Cladonia*; most of the lichens belonging to this genus are often upright, having basal scale-like structures and cups, with the scale-like structures the most common factor. The specific names are mostly Latinized descriptions of specific feature: *Peltigera scabrosa* 'scabra - rough', referring to the rough upper surface of this species, *Melanelia exasperatula* referring to '*exasperatis*' rough (roughness on the surface).

The name of the author who described the lichen first is given after the species: *Cladonia cristatella* Tuck. (after Tuckermann, a German Lichenologist). However, when a species has been subsequently placed into a different genus, then the author for this new combination is listed in parentheses: *Cladonia chlorophaea* (Flörke) Spreng, after Flörke and Sprengel - lichenologists.

Studying lichens can require the collection of specimens. The collector must be mindful that over collecting of a species could lead to extirpation. Collect only what you need and leave enough material to ensure survival of the species. It is important to obtain permission to enter private land or to obtain collecting permits in National/Provincial parks. Specimens on grave stones, or protected structures should not be collected, but photographed instead.

Figure 1a Ecozones of Saskatchewan.

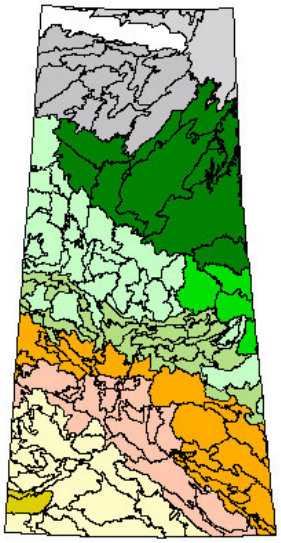


Lichens are best transported home in paper lunch bags (not plastic, as this causes lichens to mold), and stored in 10x15 cm packets for later study. Bulky species can be moistened to become pliable, then lightly pressed flat to prevent damage in storing. Specimens on stone can be collected with a small fragment of the substratum (always wear glasses when chipping stone) and then glued, with its attached lichen, to cardboard. A standard label 10.2x5.1 (4x2") is attached to the package stating the scientific and common name, author(s), location collected, etc.

The intent of this Series was to foster an interest in, and popularize our diversified lichen flora by describing the characters of common lichens and summarizing their distribution. If this has been achieved then we have been successful.

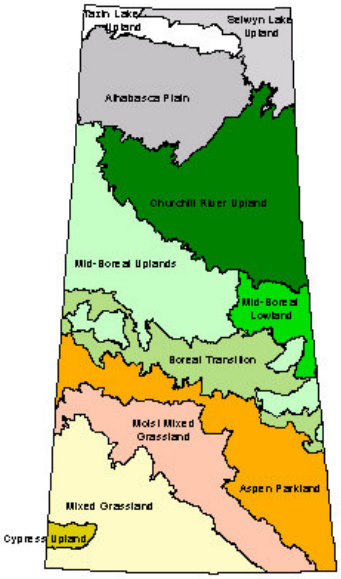
The geographic distribution maps were prepared as dot maps using the Ecoregions of Saskatchewan Map (Padbury and Acton. 1994, Figure 1a), whereby each dot within a dark shading represents the known location and distribution within a Landscape Area (Figure 1b), while lighter shading shows the potential range for the species by Ecoregion within an Ecozone (Figure 1c). If available the site where the photograph was taken is marked *.

Figure 1b. Landscape Areas within Ecoregions



Some species show a wide distribution, ranging north into the Taiga and Boreal Shield Ecozones, Arctic Regions, or south into the Prairie Ecozone (Ecozones of Saskatchewan . Rowe, 1972, Figures 1b, & 1c).

Figure 1c Ecoregions within Ecozones



Maps were prepared by Steve Porter, Conservation Data Centre – Fish & Wildlife Branch, Saskatchewan Environment.

WARNING

The chemicals mentioned in the series are hazardous if used inappropriately, and users of these chemicals must ensure that they are used in a well ventilated area, and avoid direct skin contact.

Cladonia cholorophaea

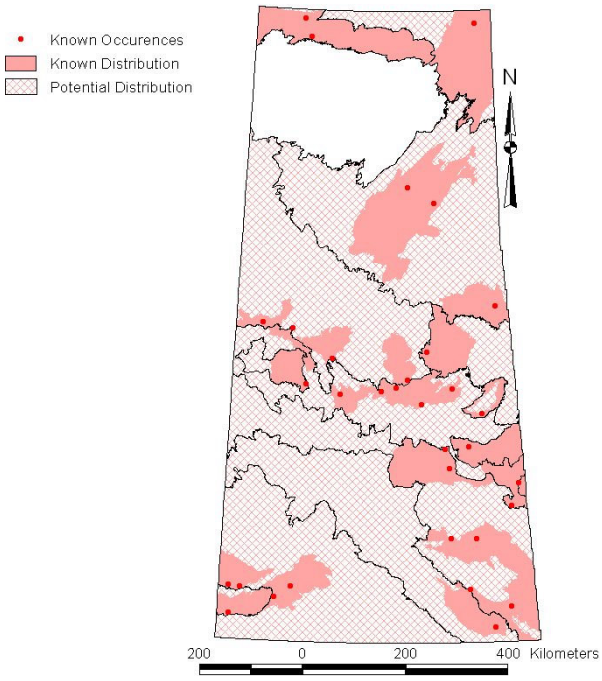
(Flörke ex Sommerf.) Sprengel

Mealy pixie-cup, false pixie-cup

Location: Emma Lake, Boreal Transition Ecoregion, Boreal Plain Ecozone.

Habitat: Acidic mineral soil in mixed boreal forest.

Geographic Distribution: Widespread throughout the boreal forest; scattered across the Aspen Parkland and Moist Mixed Grassland Ecoregions. Also reported for the Cypress Hills Ecoregion in southwestern Saskatchewan.



Description: This cup lichen has upright fruiting stalks arising from abundant primary, deeply divided lobe-like structures without vegetative propagules. The fruiting stalks are pale greenish, hollow or gray-green, covered with fine powdery or grading to granular, diffuse to sparse vegetative propagules, intergrading with small irregular patches of vegetative tissue. The flaring cups are broad, goblet-shaped, closed inside Large brown fruiting bodies are frequently produced on short proliferations from the cup margins.

Chemical Reactions: PD+ red.

Notes: Many lichens resemble mealy pixie-cup in many ways, especially *Cladonia pyxidata* (Pebbled pixie-cup) in colour and cup size. However, this lichen has tongue-shapes primary lobes, a shorter fruiting stalk, and small, rounded patches of vegetative structures in the cups and cup margins. *Cladonia fimbriata* (Trumpet lichen) is also similar to Mealy pixie-cup, but has more powdery masses of vegetative propagules, while cups are taller, narrower and 'trombone' shaped.

A number of segregate species almost indistinguishable from Mealy pixie-cup, but clearly differ in ecology, geographic distribution, but mainly in their chemistry The open cups are thought to facilitate spore dispersal by falling raindrops splashing them out of the cups and transported elsewhere to new sites by air currents.

Cladonia cristatella

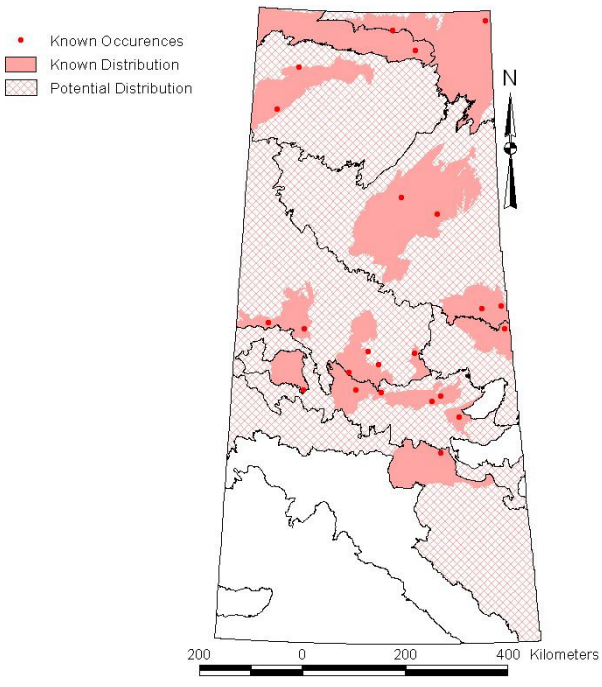
Tuck.

British Soldiers

Location: Nipawin. Boreal Transition, Ecoregion. Boreal Plain, Ecozone.

Habitat: On mossy soil, decaying wood or sometimes on tree bases in Coniferous or mixed boreal forests.

Geographic Distribution: A North American species scattered across the boreal forest.



Description: This showy forest lichen has persistent and abundant primary, finely divided, small scale like lobes, which as the fruiting stalks, are variable in colour. In the open, the colour tends to be yellowish, and in dappled light more greenish, or even ashy gray in shadier places, which also may produce some small lobes on the fruiting stalks. The underside, of the lobes, is white. The typically unbranched fruiting stalks arise from the primary lobes and are cylindrical, smooth, without small lobes or vegetative propagules, but with an outer protective fungal layer. Clusters of short branches at the summit give the impression of a cup. The quite large fruiting bodies are scarlet red, but can occasionally pale yellowish or orange.

Chemical Spot Reactions: The vegetative body tests K-, C-, KC+ yellowish, and PD-.

Notes: In older literature the species has been recognized as having many forms based on recognition of lobes present or absent on fruiting stalks, whether the fruiting bodies are not uniformly scarlet, or the position of fruiting bodies. These minor variations could very well be environmentally. The common name "British Soldiers" originated about 200 years ago, when the British red-coated soldiers arrived on the east coast.

Evernia mesomorpha

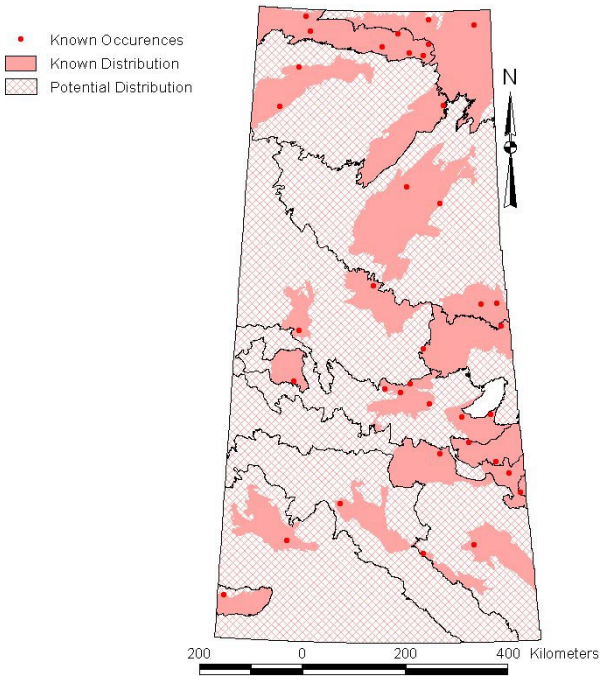
Nyl.

Boreal oak moss, Spruce moss

Location: Emma Lake, Boreal Transition Ecoregion, Boreal Plain Ecozone.

Habitat: White Spruce branches, and on branches and trunks of hardwoods in Mixed boreal forest.

Geographic Distribution: Abundant across the boreal forest and occurring in the Aspen Parkland and Grassland Ecoregions, including the Cypress Upland in southwestern Saskatchewan.



Description: This species is semi pendent or tufted, composed or irregularly but abundantly divided, angularly rounded to partly flattened, soft and pliable yellow green branches. Abundant coarse masses of yellowish to grayish vegetative propagules occur on the angular ridges. No fruiting bodies are present. The inner fungal layer is white and loose.

Chemical Spot Reactions: The upper lichen body tests KC+ yellow, Inner fungal strands UV+ ice -blue. Negative for K, C and PD.

Notes: The species is often found with Beard lichens (*Usnea* species), and because of similar colour often confused with this genus, which has a solid central fungal cord lacking in Boreal oak moss, which also is more pollution tolerant then the Beard lichens. Another lichen Boreal oak moss can be mistaken for is *Ramalina dilacerata* (Punctured ramalina), which although similar in habit and colour, has flattened branches, and does not have a central cord nor vegetative propagules. The genus name *Evernia* apparently alludes to the Greek word for 'growing well', but could also reflect on its abundance in the boreal forest.
Oakmoss lichens are notoriously slow growers, a few mm yearly.

Melanelia exasperatula

(Nyl.) Essel.

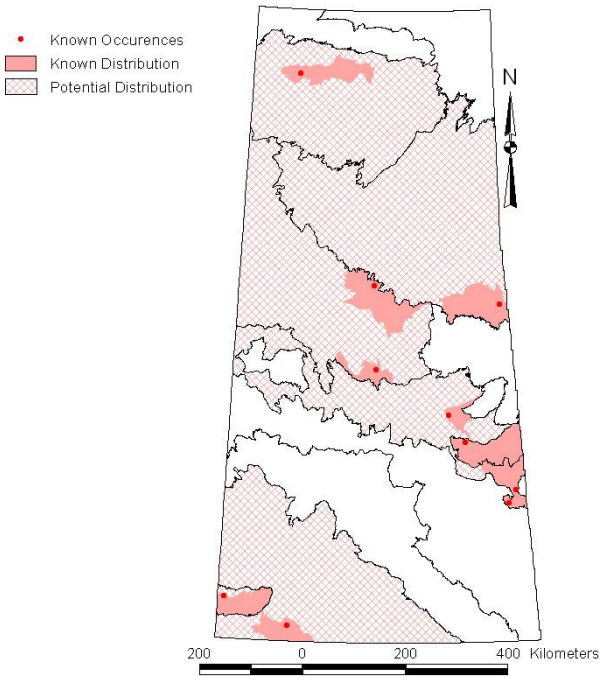
Lustrous camouflage lichen, wart lichen

Synonym: Parmelia exasperatula

Location: Emma Lake, Boreal Transition Ecoregion, Boreal Plain Ecozone.

Habitat: White Spruce bark in Mixed boreal forest

Geographic Distribution: Across the boreal forest, and occasional extending into the Aspen Parkland. Also reported for the Cypress Upland Ecoregion in southwestern Saskatchewan.



Description: This not too uncommon leaf lichen has flat or marginally slightly raised, loosely to moderately appressed olive-green to olive-brown, broadly rounded,.smooth to slightly wrinkled and often very shiny lobes. The upper surface has no powdery vegetative propagules, only hollow vegetative structures, which start as small bumps constricted first at the base, later becoming inflated, lustrous club-shaped or barrel-shaped, with simple or occasionally forked tips (insert). The under surface is pale to dark brown and smooth to wrinkly, bearing many attachment structures. Fruiting bodies are mostly absent

Chemical Reactions: None for the inner fungal layer.

Notes: Lustrous camouflage lichen can be confused with some similar olive to brown camouflage species, having cylindrical vegetative propagules and no chemical reaction for the inner fungal layer. *Melanelia subelegantula* (Subelegant brown) has slightly flattened but not hollow vegetative outgrowth on its upper surface, and lobes are somewhat covered with a powdery substance. *Melanelia elegantula* (Elegant brown) has small granular to cylindrical but non-inflated or flattened vegetative propagules. Both can be found on bark in a similar habitat as Lustrous camouflage lichen.
The species name *exasperatula* is derived from the Latin word *exasperis* meaning 'roughness', probably referring to the rough upper surface.

Peltigera canina

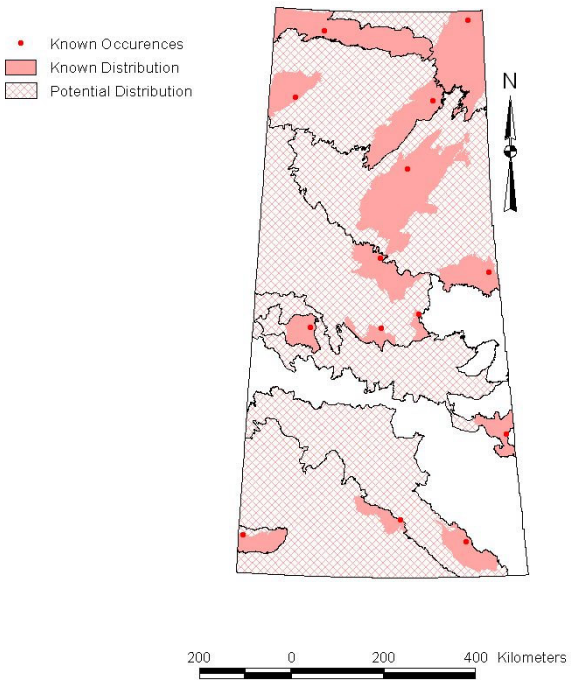
(L.) Willd.

Dog lichen

Location: Nipawin, Boreal Transition Ecoregion, Boreal Plain Ecozone.

Habitat: Needle humus over mineral soil in open Jack Pine forest.

Geographic Distribution: Common across the boreal forest; infrequently in the Aspen Parkland Ecoregion. Also reported for the Cypress Upland Ecoregion in southwestern Saskatchewan.



Description: Dog lichen is a fairly large and more or less circle forming lichen with pale lobes when wet, becoming brownish grey when dry. The dull., flat lobes are up to 25 mm wide, marginally slightly wavy and turned down, with a fine hairy covering, especially near the lobes tips. The lower surface is whitish or brownish towards the centre, with conspicuous flat to rounded brown, raised veins that become off white at the margins, and with conspicuous pale, tufted or brush-like holdfast structures, often becoming confluent and mat-forming, especially toward the centre. The large, chestnut- or blackish brown fruiting bodies are saddle shaped, vertical on erect lobe margins.

Chemical Reactions: None

Notes: Dog lichen is very similar to *Peltigera rufescens* (field dog lichen) and *Peltigera scabra* (rough pelt). The former is more brittle, with smaller upturned lobe tips and a thicker white hairy covering on the upper surface. The latter lacks hairs and has a roughened surface. Both occur in similar habitat.

According to the Doctrine of Signatures dog pelt was recommended as a cure for rabies, because of the erect fruiting bodies bearing a resemblance to 'dog teeth'. Herbalists of old valued this species as a remedy for liver complaints, because its growth form resembles a liver.

Peltigera rufescens

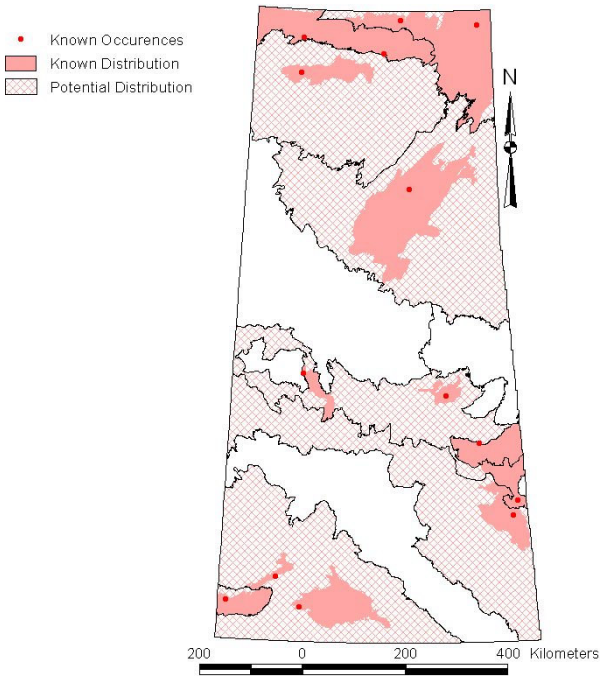
(Weiss) Humb.

Field dog lichen, felt pelt

Location: Prince Albert. Boreal Transition Ecoregion. Boreal Plain Ecozone.

Habitat: Needle humus over dry, sandy soil on exposed and sunny locations in open Jack Pine forest.

Geographic Distribution: Scattered throughout the boreal forest, and reported for Cypress Hills Inter-Provincial Park, Cypress Upland Ecoregion.



Description: This foliose lichen has small to medium sized gray to brown crisp lobe margins, usually with an appressed white covering of fine hairs on the upper surface. The underside has distinct raised veins with pale margins, but tending to be come darker elsewhere. The attachment structures are thick tufts of fungal strands, coalescing towards the centre into an almost continuous mat, especially noticeable along the veins. The common dark-red brown fruiting bodies are saddle-shaped on upright lobes.

Chemical Reactions: None

Notes: Although Field dog-lichen resembles *Peltigera canina* (Dog lichen) which also occurs in a similar habitat and substratum, it is more brittle, and has smaller narrower lobes, upturned at the margins, and with a strong covering of fine hairs.

Physcia stellaris

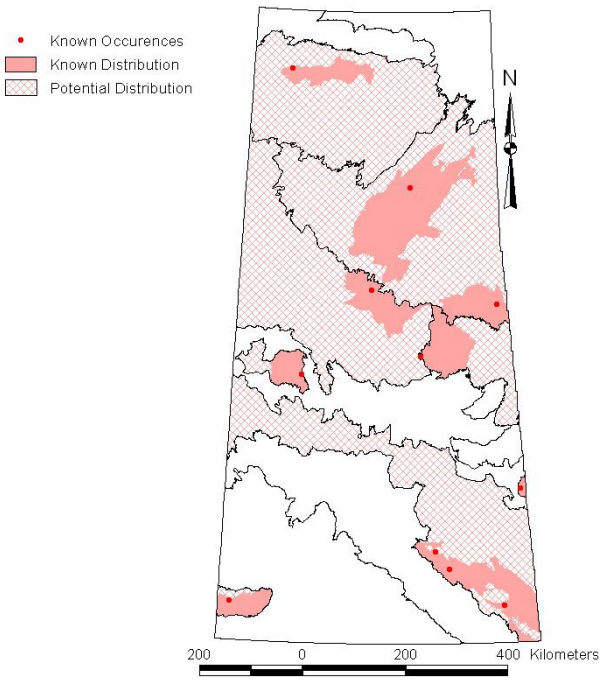
(L.) Nyl.

Star rosette lichen, black eyed rosette, grey star lichen

Location La Ronge, mixed Boreal Upland Ecoregion, Boreal Plain Ecozone.

Habitat: On Balsam Poplar bark. Also found on bark of other trees and tall shrubs in mixed boreal forest.

Geographic Distribution: Widespread throughout the boreal forest and scattered across the Aspen Parkland, and Cypress Upland Ecoregions.



Description: This pale gray, often centrally darkened leaf lichen, forms pale gray rosettes of narrow, more or less smooth, uniform lobes, lacking distinct white spotting on the upper surface although older parts can have some spotting. The flat to convex lobes radiate outwards in a star-like pattern, and can become crowded in older plants. There are no vegetative propagules. Copious quite large dark brown to almost black fruiting bodies are crowded near the center, and mostly devoid of a white frosting on their surface. The lower surface is white to tan with many brown holdfast structures.

Chemical Reactions: The inner fungal layer tests K-.

Notes: Star rosette lichen is often confused with the similar leaf lichen *Physcia aipolia* (Hoary rosette lichen), which is K+ for the fungal layer, and has a copious white spotting. While both species can be found on the same tree, they appear to be vertically stratified; *Physcia stellaris* (Black eyed rosette) mainly occurs higher on the tree, while *Physcia aipolia* grows nearer the ground.

Ramalina dilacerata

(Hoffm.) Hoffm.

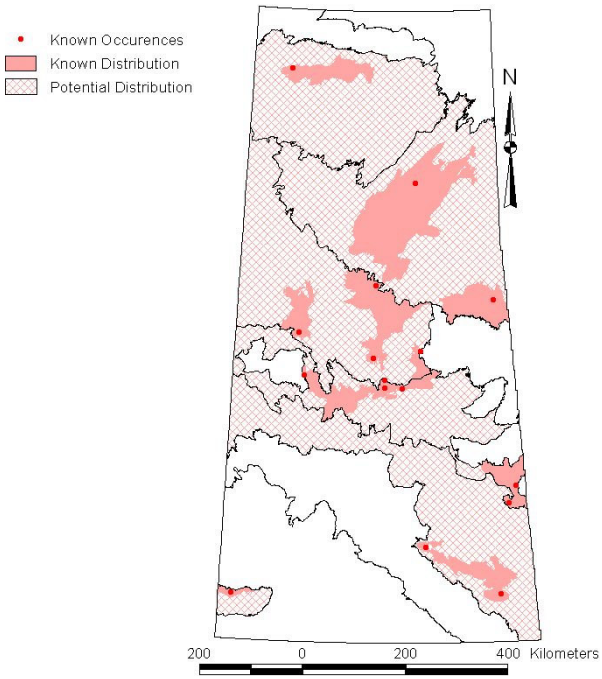
Punctured ramalina, Perforated ramalina

Synonym: *Fistulariella dilacerata, Fistulariella minuscule, Ramalina minusuila*

Location: Duck Mountain Provincial Park. Boreal Transition Ecoregion. Boreal Plain Ecozone.

Habitat: White Birch bark and on branches and twigs of various trees and sometimes tall shrubs in mixed forest.

Geographic Distribution: Widespread throughout the boreal forest, and occurring in the Aspen Parkland and Cypress Upland Ecoregions.



Description: Punctured ramalina is a greenish yellow, short tufted species, with rather smooth, hollow, inflated branches with many perforations into the inner fungal layer especially near branch bases. Its outer protective layer is rather thin. No vegetative propagules are present. Fruiting bodies are common, and mainly at or close to the branch tips, although some do occur marginally. The disks are pale yellow with a light frosted appearance.

Chemical Reactions: All spot tests are negative.

Notes: This lichen is similar in colour and habitat to some species of *Usnea* species (Beard lichen) or *Evernia mesomorpha* (Boreal oak moss), but lacks a solid central cord as in Beard lichens, nor does it have vegetative propagules as in Boral oak moss. The name Ramalina comes from the Latin *ramalia*, meaning 'twigs', probably referring to it preference for branches and twigs.

Umbilicaria muehlenbergii

(Ach.) Tuck.

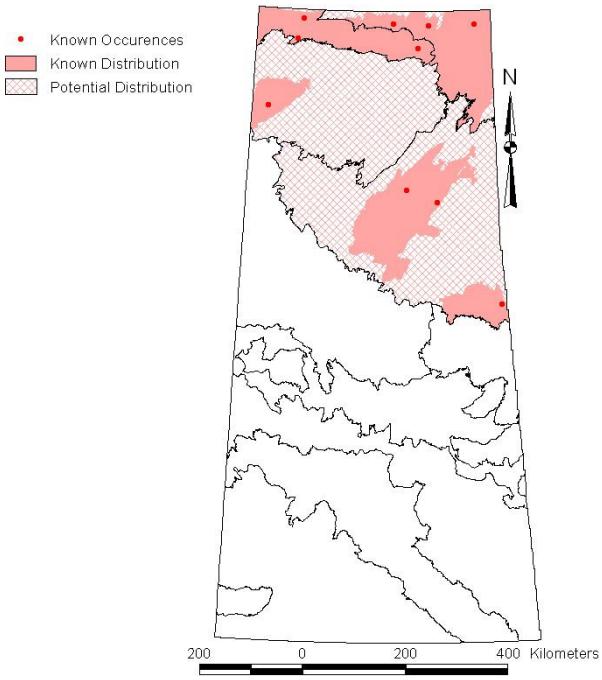
Plated rock tripe

Synonym: *Actonogyra muehlengergia, Gyrophora muehlenbergii*

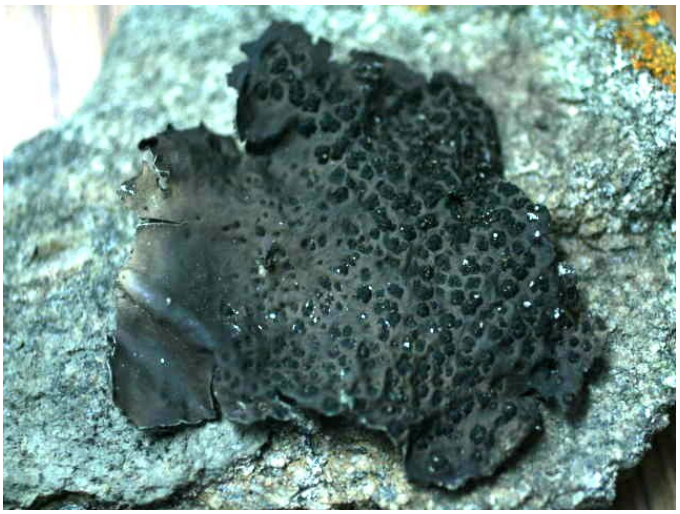
Location: Amisk Lake, Southwest of Creighton, Churchill River Upland Ecoregion, Boreal Shield Ecozone.

Habitat: On large outcroppings within mixed boreal forest.

Geographic Distribution: Scattered throughout the boreal forest.



Description: This dark brown foliose lichen is attached to its substratum by a single central holdfast, and usually grows in a distinct circular form. The upper surface is occasionally cracked but not distinctly segmented, with a smooth to slightly roughened upper surface, which is shallowly pitted, folded or wavy. The pale to dark brown lower surface is roughened with many small sharp bumps, covered with a network of overlapping pale to dark brown plates, which can form marginally slender filaments. The many fruiting bodies consist of radiating, branched ridges split by fissures and usually sunken into depressions on the upper surface.



Chemical Reactions: Fungal strand C+ red, KC+ red, K-, PD-.

Notes: A network of plates on the lower surface is characteristic of many rock tripes. Plated rock tripe has only pale to dark brown but not black plates; *Umbilicaria torrefacta* (Punctured rock tripe) has also plates but mainly restricted to the central holdfast, while the lower surface is pale brown. The fruiting bodies of plated rock tripe have many ridges, radiating from the centre, rather than forming concentric ridges found in other species. Rock tripes contain some minerals and vitamins, and browsed by Musk Oxen as a winter food.

Usnea hirta

(L.) F.H. Wigg.

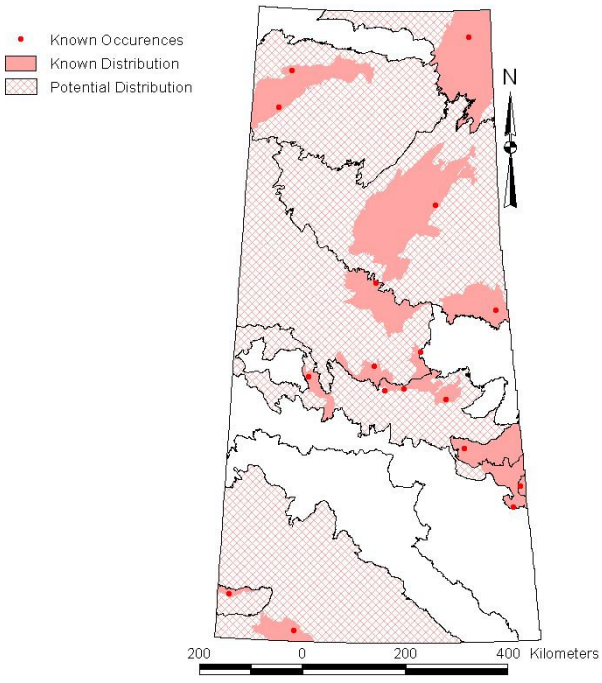
Bristly beard lichen, Shaggy old man's beard, Shaggy beard lichen

Synonym: *Usnea variolosa*

Location: Emma Lake, Boreal Transition Ecoregion, Boreal Plain Ecozone.

Habitat: Old hard weathered wood within mixed boreal forest.

Geographic Distribution: Across the boreal forest and extending south into the more northern Aspen Parkland. Also reported for the Cypress Upland Ecoregion in southwestern Saskatchewan.



Description: Bristly beard lichen is a rather small tufted or short pendant branched hair lichen with pale yellowish green branches and base. Numerous short side branches usually are perpendicular to the main stem and have many small spines. They are ridged and angular upon cross-section, without powdery vegetative structures, but bearing many copious minute vegetative outgrowths with an outer protective layer. The tough, thick white inner fungal strand is lax. There are no fruiting bodies present.

Chemical Reactions: No reactions for the inner fungal strand.

Notes: This lichen could be mistaken for *Usnea subfloridana* (Nit beard) which has numerous small warty bumps and tiny peg-like vegetative propagules, mixed with powdery vegetative structures on its branches. In general, the genus *Usnea,* is recognized by its tough, flexible, inner fungal strand. This strand can be seen by holding a stem section and pulling it gently apart. The cord gives strength and resilience to the lichen body. *Usnea* species also provide a valuable winter nutrient for ungulates, and due to their large surface area, are valuable indicators of atmospheric pollution. The genus name *Usnea* comes from the Arabic word meaning 'moss' while the species name *hirta* comes from the Latin for 'hairy or 'shaggy'.

Vulpicida pinastri

(Scop.) J.E. Mattsson & M.J. Lai

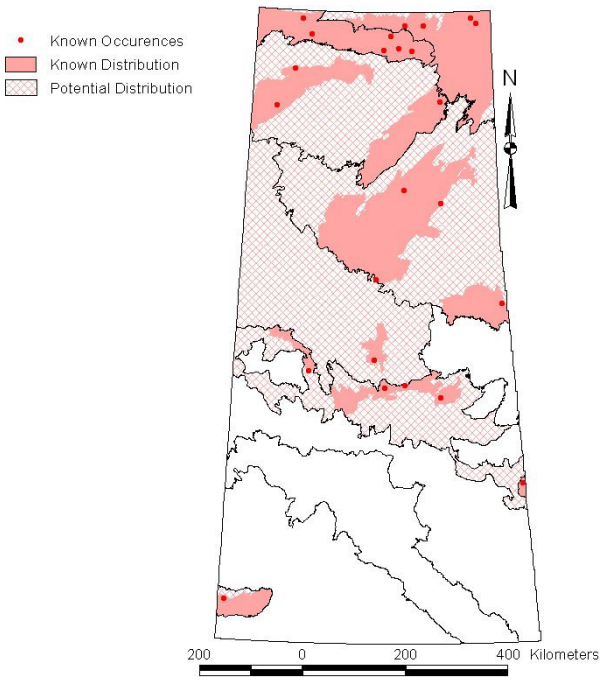
Powdered sunshine lichen

Synonym: *Cetraria pinastri, Tuckermannopsis pinastri*

Location: Cypress Hills Interprovincial Park, Cypress Upland Ecoregion, Prairie Ecozone.

Habitat: Lodgepole Pine bark and on twigs and branches of deciduous trees and shrubs in open Lodgepole Pine forest.

Geographic Distribution: Frequently throughout the boreal forest, and the Cypress Hills Upland Ecoregion.



Description: This species forms greenish-yellow to yellow foliose rosettes with flattened, adherent, or marginally uplifted lobes mostly 2-5 mm wide. Lobe margins are can be finely divided or ruffled, dissolving into fine powdery masses of brilliant yellow vegetative propagules. Fruiting bodies are rare, and mostly absent. The lower surface is pale yellow to almost white, with sparse to abundant pale to dark brown attachment structures.

Chemical Reactions: None.

Notes: This very showy forest lichen is the only yellow bark dwelling species in our boreal forest. The yellow colour comes from two poisonous lichen substances, *pinastric* and *vulpinic* acids, which are thought to be a grazing insects or invertebrates repellent. In Europe it was used to kill wolves and foxes; indeed the generic name *vulpicida* comes from the Latin *vulpes* 'Fox' and *cadeare* 'to kill'.

Xanthoria hasseana

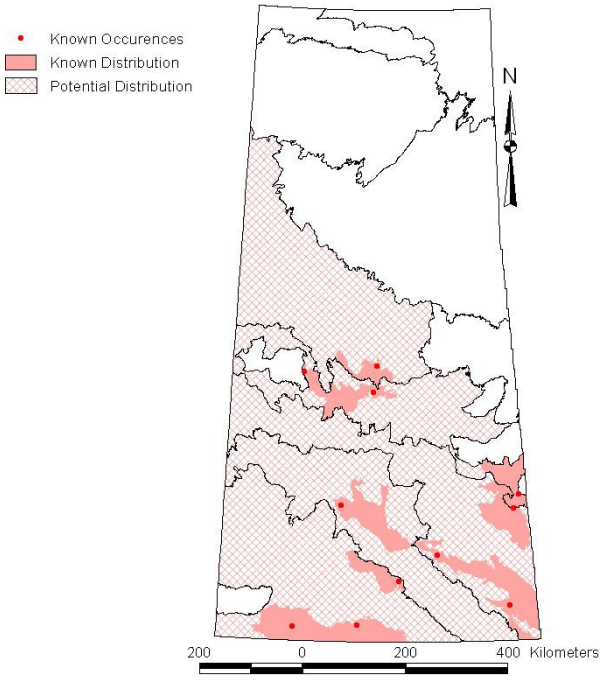
Räsänen.

Poplar sunburst lichen

Location: North of Prince Albert.

Habitat: Bark of Balsam Poplar in mixed forest.

Geographic Distribution: Across the Aspen Parkland and into the Boreal Transition Ecoregions.



Chemical Reactions: K+ dark purple for the outer protective layer.

Notes: A similar species *Xanthoria polycarpa* (Pin-cushion sunburst lichen) is also yellow-orange to orange, with many fruiting bodies in the center, and occurs in the same habitat. It, however, lacks true attachment structures, and small marginal fungal outgrowths at its fruiting bodies.

Description: A common and widespread medium sized yellow-orange to orange foliose lichen, which form small, loosely attached rosettes, with finely divided, overlapping lobes. Vegetative propagules are absent. The white, lower surface has many somewhat elongated attachment structures. The numerous fruiting bodies have a dark orange disk with margins the same colour as the lichen body. Sometimes characteristic white fungal extensions can bee seen at underside of these margins.

References

Additional information on these species can be found in the following reference list.

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Johnson, D., L. Kershaw, A. MacKinnon, and J. Pojar. 1995. *Plants of the Western Boreal Forest & Aspen Parkland.* Lone Pine, Edmonton, Alberta, Canada.

Thomson, J.W. 19944. *American Arctic Lichens* 1 The Macrolichens. Columbia State University Press. New York, U.S.A.

Vitt,D.H., E. Marsh, and R.B. Bovey. 1988. *Mosses, Lichens & Ferns of Northwest North America*. Lone Pine, Edmonton, Alberta, Canada.

Map References

Padbury, G.A. and D.F. Acton. 1994. Ecoregions of Saskatchewan map. Agriculture and Food Canada. Available from Information Services Corporation, Saskatchewan.

Chemical Abbreviations: C = sodium hypochloride, K = potassium hydroxide, KC = a combination of K & C, PD = paraphenylenediamine, UV=ultra violet light.

The SKCDC is always interested in your plant/animal observations. Please visit http://www.biodiversity.sk.ca/ or contact Steve Porter, sporter@serm.gov.sk.ca.