

GETTING TO
KNOW
YOUR
PRAIRIE LICHENS
of
Saskatchewan, Canada

Series III

Bernard de Vries

Irma de Vries

Photograph © Bernard de Vries

Posted/Compiled by: Steve Porter

Conservation Data Centre – Fish & Wildlife Branch

Saskatchewan Environment

March, 2007

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PREFACE

This IIIrd Series is a follow up on Series I (<http://www.biodiversity.sk.ca/ftp.htm>), which gave a general outline on the fascinating biology and diversity of lichens.

While the majority of lichens in Series I were soil lichens, this series describes, with one exception: Blue blister lichen (*Toninia sedifolia*) which is a squamulose soil lichen, some of our colourful lichens gracing rocks and boulders on open semiarid grasslands

Rock lichens are generally more colourful than forest lichens, which tend to be rather subdued, growing in shaded places where sunlight is more filtered, and Ultra Violet rays not much of a problem.

Forest lichens are usually gray when the upper surface lacks pigmentation, but become more transparent, revealing the underlying algae layer,

and can turn olive green or even bright green, when moistened.

The most widespread colour pigments are yellow as in Candleflame lichen (*Candelaria* species) or Goldspeck lichen (*Candelariella* species), orange or orange-red as in many Sunburst lichens (*Xanthoria* species), or the yellowish-green of many Rock-shield lichens (*Xanthoparmelia* species). In fact, any number of brightly coloured pigments can be found in the upper surface of a many rock lichens. Light intensity therefore is thought to be a definite factor why the most intense lichen colours occur mostly in exposed and dry locations.

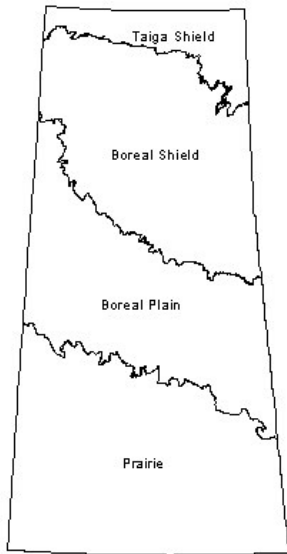
A particular colour can also be a characteristic feature of a species, genus or even families. Variation in colours can be due to environmental conditions, such as light intensity, genetics, hydration, length of storage, or other factors.

Photographing lichens is always a challenge, especially since rock and ground lichens are closely attached to their substrata and require close-up photography, which necessitates a small lens opening and prolonged expose time with the possibility that some light coloured species become bluish in the photo image; a problem difficult to correct, although editing is of some help. A sturdy versatile tripod, flash-lights, remote shutter release, plenty of patience and ingenuity is a must. The camera used was a Canon Digital Rebel XT, 35 mm single lens reflex 50 mm macro-lens at SOS 200, with apertures varying between F 16 and F 32.

It is hoped that this series will bring an awareness and understanding of our colourful prairie rock lichens.

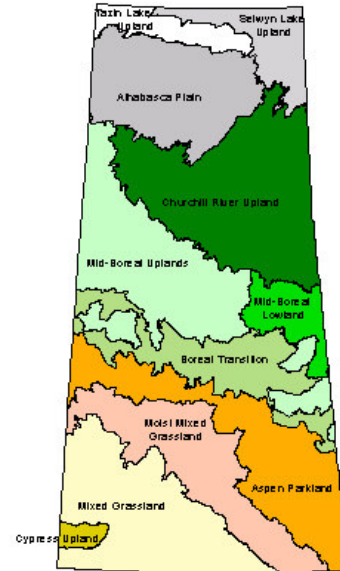
Information on colour pigmentation and in the text are, to some extent, based on Brodo et al, 2001, Nash III et al, 2002, 2004, Thomson, 1994, 1997, and Vitt et al, 1988.

Figure 1a Ecozones of Saskatchewan.



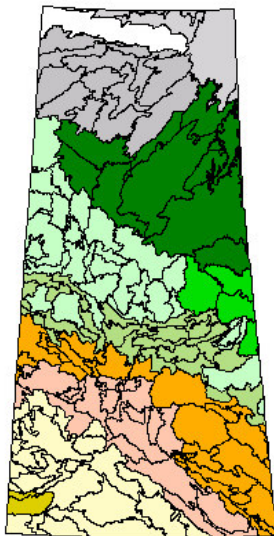
Some species show a wide distribution, ranging north into the Taiga and Boreal Shield Ecozones, Arctic Regions, or south into the Prairie Ecozone (Ecozones of Saskatchewan . Rowe, 1972, Figures 1b, & 1c).

Figure 1c Ecoregions within Ecozones



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



An additional update to the series will be given in the future. The author plans to consolidate these series into a comprehensive field booklet to take along on nature hikes, and a classroom wall chart for Saskatchewan Schools. Comments and suggestions would be appreciated.

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.

Acarospora contigua

H. Magn.

Gold Cobblestone lichen

Location: Rock Glen, southwestern Saskatchewan. Mixed Grassland Ecoregion. Prairie Ecozone.

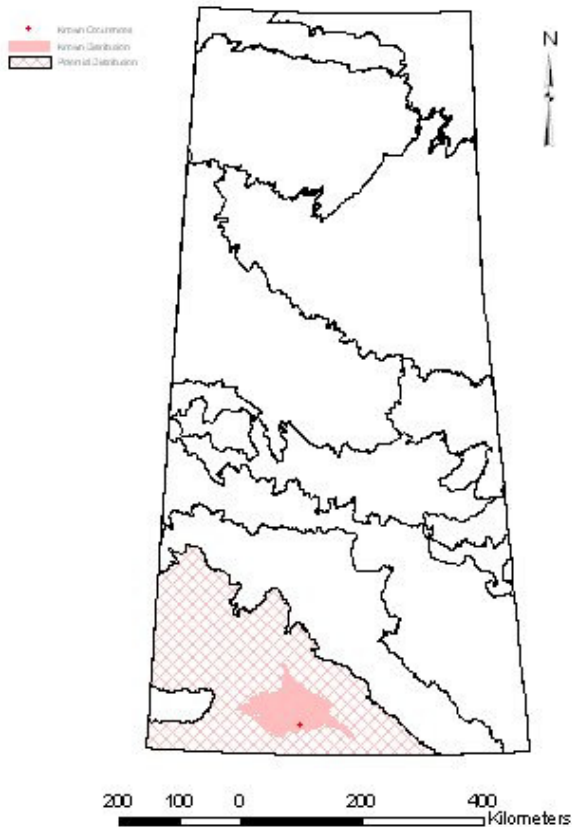
Habitat: On silicious rock in semiarid native prairie.

Geographic Distribution: Locally, but thought to be widespread throughout the semiarid southwest of the Province.



Chemical Reactions: none

Notes: The closely related soil lichen *Acarospora schleicheri* (Soil paint lichen) is similar in colour but the lichen bodies are slightly separated and the lobed more marginally oriented, also the red-brown fruiting bodies are larger. Insufficient field studies of Gold cobblestone lichen can partly be explained by the paucity of the species in Saskatchewan.



Description: Gold cobblestone lichen is a vivid sulphur yellow to greenish-yellow crustose lichen, composed of small scattered or contiguous, convex to flat irregular or angular lichen bodies, with smooth or scalloped margins, often dusted with a white powdery coating. The 1 to 4 reddish brown to almost dark brown fruiting bodies are immersed in the small lichen bodies, but sometimes becoming more prominent with margins the same colour as the lichen body.

Acrospora strigata

(Nyl.) Jatta

Hoary cobblestone lichen

Location: Big Beaver, southcentral Saskatchewan. Mixed Grassland Ecoregion. Prairie Ecozone.

Habitat: On sandstone at base of steep rocky slope in native prairie rangeland.

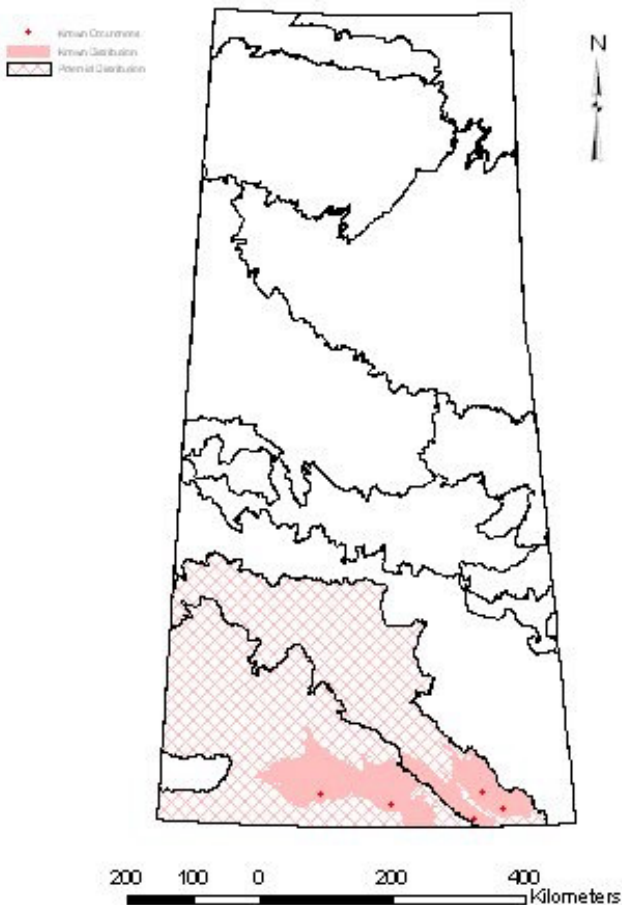
Geographic Distribution: Scattered throughout southern Saskatchewan.

contiguous, cracked crust, noticeable around the fruiting bodies. The one to several small fruiting bodies have immersed reddish brown disks with or without a white powdery coating.



Chemical Reactions: none.

Notes: The species is often associated with the dark orange *Caloplaca trachyphylla* (Desert fire-dot lichen).



Description: The lichen body is pale gray or yellowish gray because of a heavy white powdery coating, (brown when this has been removed), with small round or irregular, more or less dispersed or somewhat

Aspicilia contorta

(Hoffm.) Kremp.

Chiseled sunken disk lichen

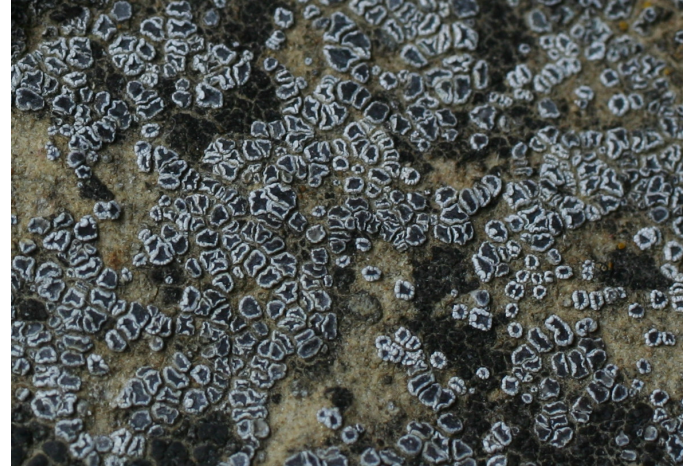
Synonym: *Lecanora contorta* (Hoffm.) J. Steiner

Location: Big Muddy Valley, east of Big Beaver, southcentral Saskatchewan. Mixed Grassland Ecoregion. Prairie Ecozone.

Habitat: On calcareous rock in open native prairie pasture.

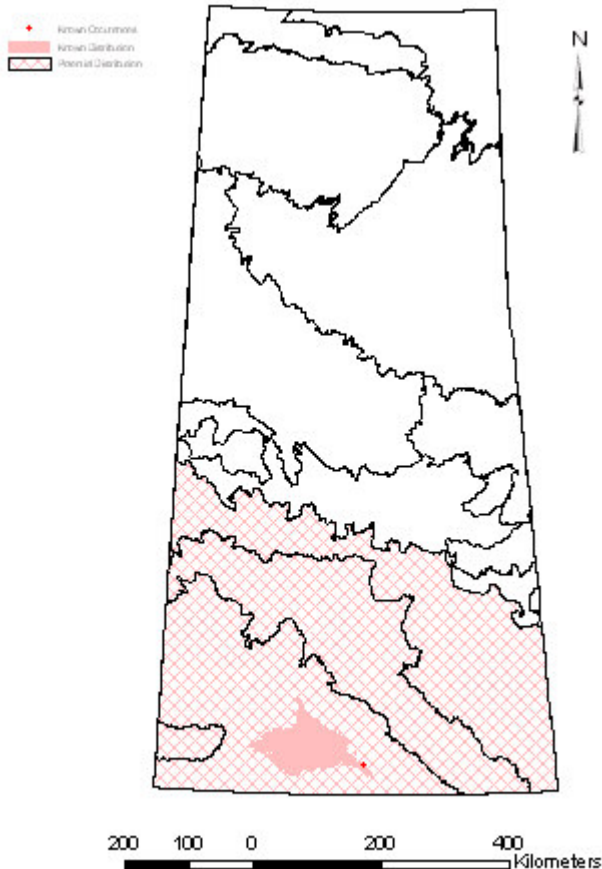
Geographic Distribution: Scattered throughout the arid southwest of the Province.

showing an extension of the white fungal layer to the surface. The fruiting bodies are deeply immersed, usually one per lichen body, and covered with a white powdery dusting.



Chemical Reactions: none.

Notes: The small lichen bodies of the species are mostly contiguous, but not radially oriented, and lack a dark pigmented border between each lichen body, as seen in some other Sunken disk lichens (*Aspicilia* species).



Description: This crustose lichen has small, semi-rounded or chisel-like, contiguous or depressed dark olive to olive gray small lichen bodies, with small tiny white dots caused by a break in the upper surface,

Caloplaca trachyphylla

(Tuck.) Zahlbr.

Desert firedot lichen

Location: Roche Percee, southeastern Saskatchewan. Moist Mixed Grassland Ecoregion, Prairie Ecozone.

Habitat: Dry native prairie remnant, on rock.

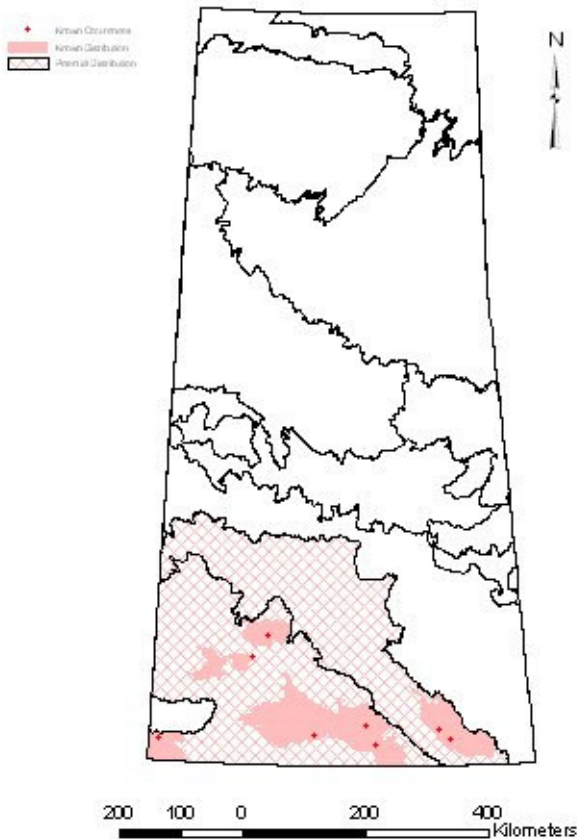
Geographic Distribution: Scattered throughout southern Saskatchewan.

a rather broad margin paler than the disk, and are crowded in the center of the lichen body.



Chemical Reactions: Upper body and fruiting bodies K+ deep purple.

Notes: Desert firedot lichen resembles *Xanthoria elegans* (Elegant sunburst lichen) or the shorter and smoother lobed *Caloplaca saxicola* (Firedot lichen), but cannot be lifted from the substrate with the lower surface remaining intact. Both are found in similar habitat or as associates on rocks.



Description: This orange to reddish orange lichen has thick, convex, contiguous, closely adherent, lumpy and parallel radiating peripheral lobes up to 5mm long and 1 mm wide with rough tips. The interior is composed of small and somewhat adherent irregular shaped bodies. An upper protective layer is present but it lacks a lower side. The lichen is closely adhered to its substratum by small flat structures (hapters). The abundant and small fruiting bodies are orange-red, somewhat roughish, with

Candelariella aurella

(Hoffm.) Zahlbr

Hidden gold speck lichen

Location: Rock Glen, southwestern Saskatchewan. Mixed Grassland Ecoregion. Prairie Ecozone.

Habitat: Open native semiarid prairie, on calcareous rock.

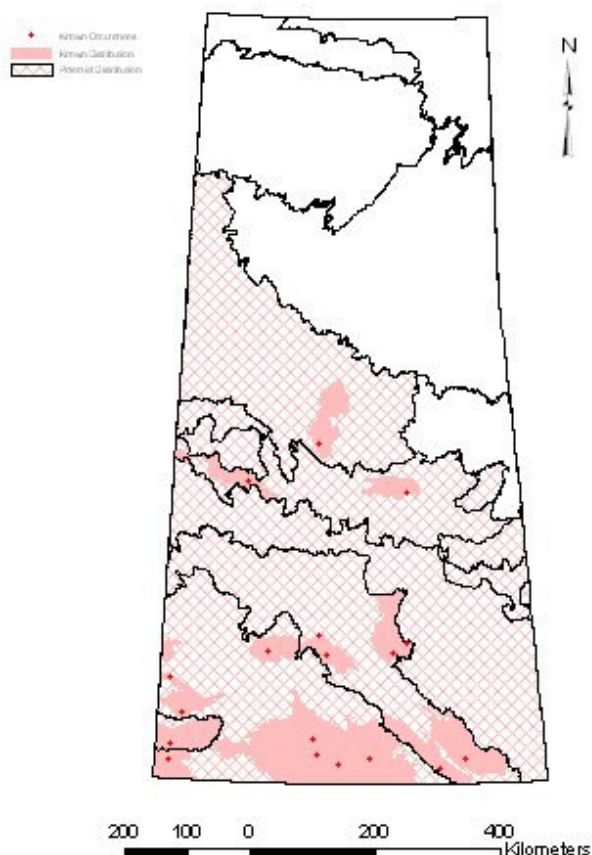
Geographic Distribution: Scattered throughout Saskatchewan, except perhaps the more northern regions; common on the southern semiarid grasslands.

yellowish-brown fruiting bodies, have an entire to wavy margin. The discs are flat becoming somewhat rounded, and tend to become angular with a rough surface.



Chemical Reactions: Negative, but can be K+ pale rose and UV+ dark orange.

Notes: Hidden gold speck lichen can be confused with *Candelariella vitellina* (Common gold speck lichen), with a visible vegetative body which can be fertile or infertile, and similar in colour and habitat. Hidden gold speck lichens is always fertile, and at times has almost no visible lichen body. It is one of the most common gold speck lichens in North America, primarily on calcareous rock, but at times growing on bark or weathered bones.



Description: Hidden gold speck lichen is a mustard to dark yellow crustose lichen, consisting of dispersed, scattered granules on a dark pigmented fungal mat visible between the granules. The common relatively small, thin to occasionally disappearing yellow to

Candelariella vitellina

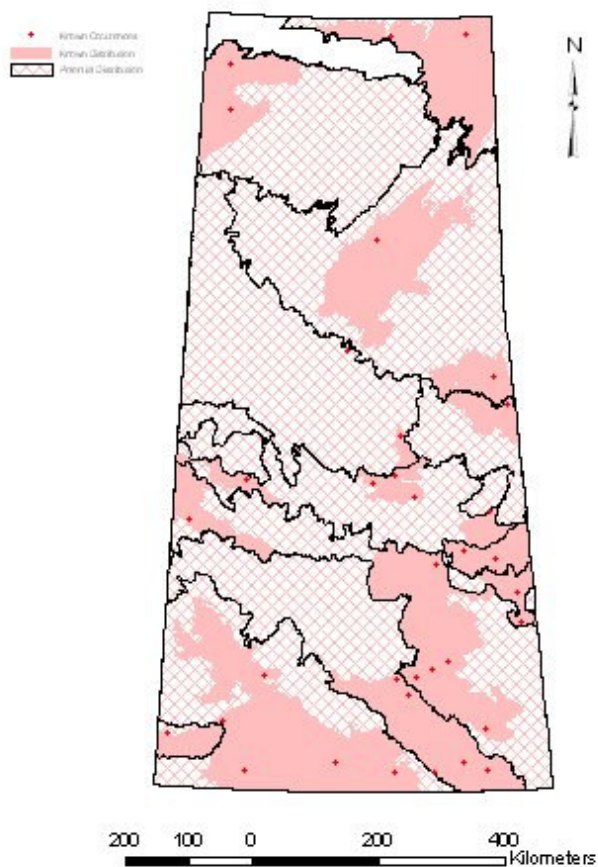
(Hoffm.) Müll Arg.

Common gold speck lichen

Location: Rock Glen, southwestern Saskatchewan. Mixed Grassland Ecoregion. Prairie Ecozone.

Habitat: On calcareous rock in open native prairie.

Geographic Distribution: A common species in the southern grassland region of Saskatchewan, and widespread throughout the Province.



scalloped margins which have the same colour as the lichen.



Chemical Reactions: None, although the lichen body can be K+ pale rose, UV+ dark orange.

Notes: *Candelariella aurella* (Hidden gold speck lichen) is somewhat similar to Common gold speck lichen, occurring in similar habitat, mostly on calcareous rock, and always fertile. Its vegetative body mostly obsolete, consisting of small yellow granules, or immersed in the substrate. Common gold speck lichen can be found on various rocks, wood, but seldom on bark or soil.

Description: This crustose lichen is composed of small flattened cushion-like granular lemon-yellow or egg-yolk lichen bodies, fertile or infertile (photo) which when well developed can have scalloped margins. The often crowded small fruiting bodies are tightly attached to the surface, flat or slightly convex with entire or partly granulose or disappearing, wavy or incompletely

Glypholecia scabra

(Hoffm.) Müll Arg.

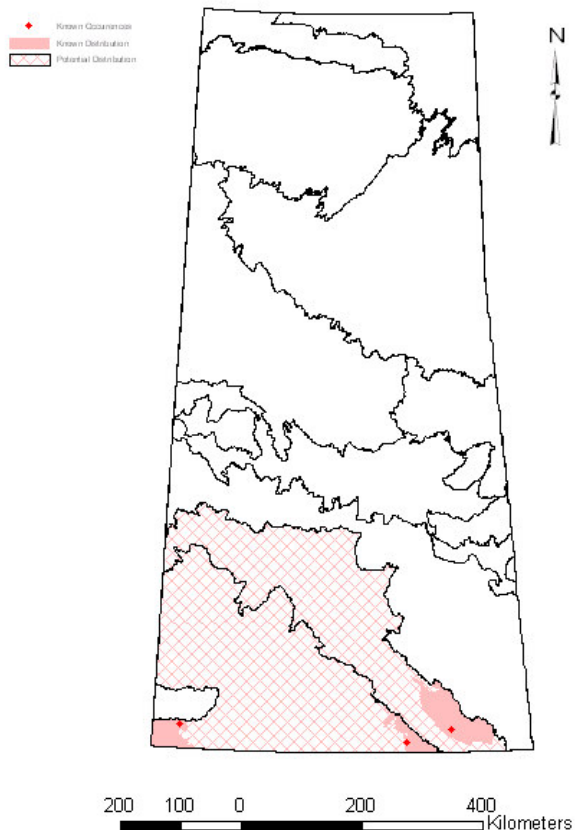
Un-named lichen

Synonym: *Acarospora scabra* (Pers.) Th. Fr.

Location: South of Estevan. Southeastern Saskatchewan. Moist mixed grassland Ecoregion in the Prairie Ecozone.

Habitat: On calcareous rock in open but sheltered location.

Geographic Distribution: Known from three locations only in southern Saskatchewan. The species is also reported from Europe and North America.



giving it a chalky appearance. The lower side is white or somewhat darkened, lacking attachment structures but having a single, broad central holdfast. The common fruiting bodies are at first immersed and single, becoming more raised and compounded in groups upon maturing, and have bare, red-brown or “burgundy” disks.



Chemical Reactions: Upper side C+ red, K-, PD-

Notes: Although the lichens used in this series are commonly found across southern Saskatchewan, there are lichens which are not easily found and considered rare or endangered. *Glypholecia scabra* is one of them. This distinct lichen has been reported from three localities in Southern Saskatchewan, mostly on pasture land in highly unstable habitats (cattle trampling & base of eroding and slumping slopes). It is not likely to be found by the casual observer, as it blends well with its calcareous rock surface upon which it grows. The strikingly reddish-brown or near burgundy colored fruiting bodies resemble no other lichen species, and is an aid in identification.

Anyone who might happen to find this species, is politely asked **Not To Collect It**, but to take colour photos and careful detailed notes of the species in its natural habitat (type of rock it grows on and immediate surroundings), and notify the author (e-mail: bdevries@accesscomm.ca, or 29 Hogan Place, Emerald Park, SK. S4L 1C1) of your exciting find. The author would then be able to visit the location and verify the species.

Description: This rare, foliose lichen has broadly, partly ascending rounded lobes, which are concave or slightly convex, with rolled under margins. The upper side is grayish or bluish white with a slight frosting

Rhizoplaca melanophthalma

(DC.) Leuckert & Poelt or (Ramond) Leuckert & Poelt.)

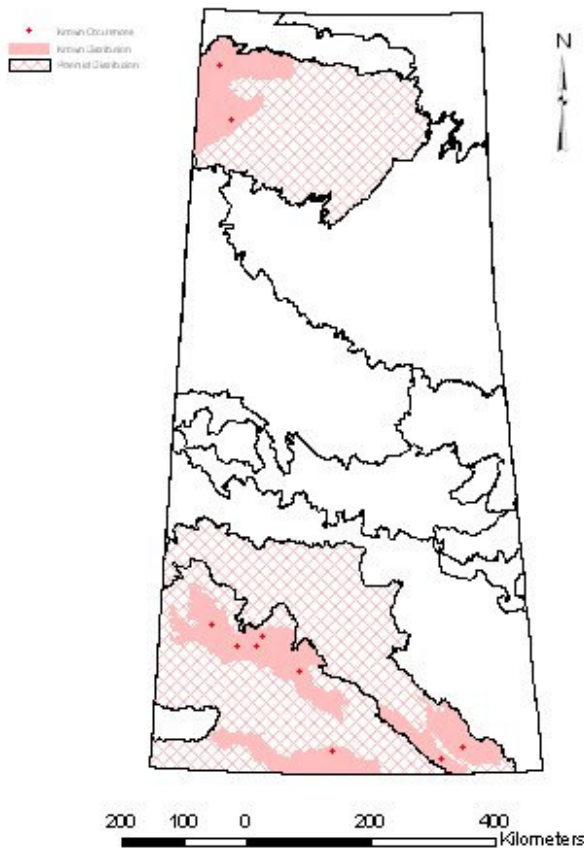
Green rock-posy

Synonym: *Lecanora melanophthalma* (DC.) Ramond

Location: South of Estevan. Mixed Grassland Ecoregion. Prairie Ecozone.

Habitat: On acid or calcareous rocks at base of unstable open east facing slope.

Geographic Distribution: Widespread throughout Saskatchewan in suitable places, but mainly in open semiarid localities in southern Saskatchewan.



becomes detached from its substratum and vagrant. The underside is pale to dark brown or near black. The numerous crowded, sessile fruiting bodies have a thick margin with the same colour as the lichen body. The disks are pale yellow-brown through greenish black and with a greenish frosting.



Chemical Reactions: Upper lichen body KC+ yellow, inner fungal strands PD+ yellow or PD-, K-, C-, KC-, or rarely PD+ yellow, K-, C+ red, KC+ red.

Notes: Green rock-posy is a variable species, at times almost becoming crustose-like, that is very closely appressed to its rock surface, or forming sperical masses which become vagrant, and blown about over open soil. It often is associated with *Rhizoplaca chrysoleuca* (Orange rock-posy) which has tan, to pale or dark orange fruiting bodies.

Sometimes the microscopic red lichen body of the parasitic *Caloplaca epithalina* (Parasitic firedot lichen) can be seen on the surface of Green rock-posy.

Description: This foliose umbilicate lichen has a somewhat rather thick and cartilaginous flat, yellowish green to a darker yellow body up to 25 mm in diameter with downrolled or crenate lobes which are often marginally greenish black. Occasionally the species

Toninia sedifolia

(Lscop.) Timdal

Blue blister lichen

Location: Big Muddy Valley east of Big Beaver, southcentral Saskatchewan. Mixed Grassland Ecoregion. Prairie Ecozone.

Habitat: Calcareous soil in dry open native prairie rangeland.

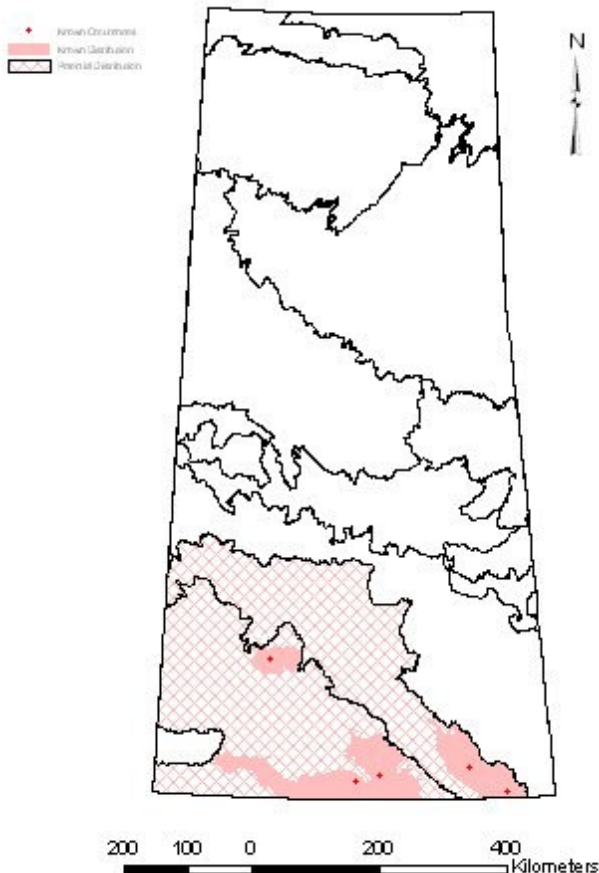
Geographic Distribution: Scattered throughout southern Saskatchewan.

lacking; underside is dark, with a few small attachment structures. The flat, convex, contorted black fruiting bodies are mostly covered with a bluish powdery dusting, and located between the small lichen bodies.



Chemical Reactions: None.

Notes: This species is rather variable in body form and degree of powdery dusting.



Description: A characteristic crustose lichen with scattered, strongly folded, rounded, erect, small simple lichen bodies, lacking marginally lobes. The smooth upper side is pale blue gray as a result of a fine powdery dusting on the surface; dark brown when this dusting is

Xanthoparmelia cumberlandia

(Gyelnik) Hale

Cumberland rock-shield

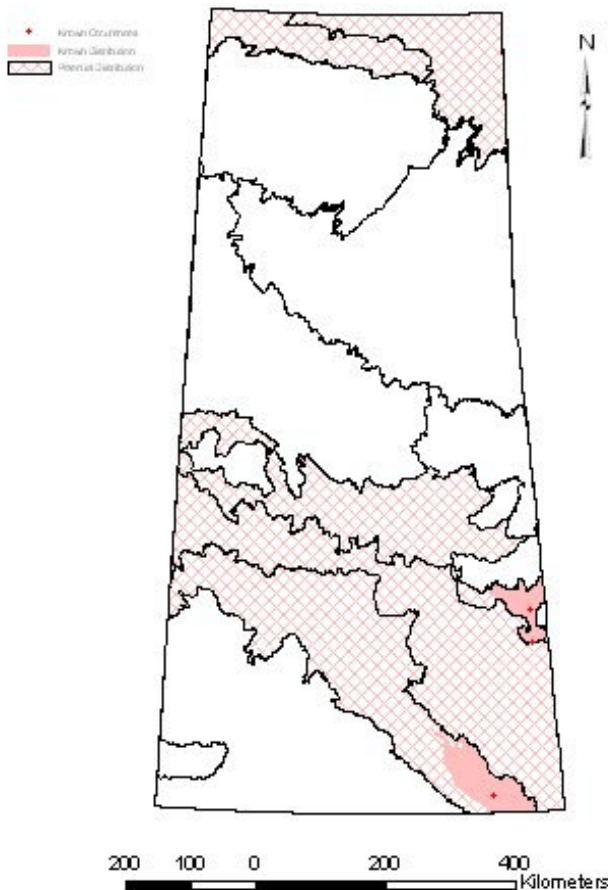
Synonym: *Parmelia cumberlandia* (Gyelnik), Hale

Location: Togo, southeastern Saskatchewan. Aspen Parkland Ecoregion. Prairie Ecozone.

Habitat: On partly submerged rock, on small open knoll in disturbed remnant prairie.

Geographic Distribution: Although widespread in North America, the species has been collected twice in Saskatchewan.

contiguous, somewhat rounded or toothed, frequently with a black margin. The upper surface often shows centrally overlapping lobes, which can develop small, flat or branched lobes. Vegetative propagules, small white spots and a white powdery dusting are lacking. The pale brown lower surface has small light coloured, unbranched attachment structures. Small, black, globular bodies are common on the upper surface. Light to dark brown fruiting bodies are common, often with inrolled toothed margins.



Chemical Reactions: Upper surface PD+ orange, K+ yellow to orange, C-, KC-. Inner fungal layer PD+ orange, K+ yellow to orange, C-, KC-.

Notes: Cumberland rock-shield is one of the common and widespread rock-shield lichens in North America. Its geographic distribution in southern Saskatchewan, is relatively unknown, as little work has been done on the species.

Description: This quite large foliose, yellow-green lichen is firmly or loosely attached to the rock. The lobes are smooth, shiny, irregular, elongate, separate or

Xanthoparmelia mexicana

(Gyelnik) Hale

Salted rock-shield

Synonym: *Parmelia mexicana* Gyelnik

Location: Rock Glen, southwestern Saskatchewan. Mixed Grassland Ecoregion. Prairie Ecozone.

Habitat: On exposed rock in open native prairie.

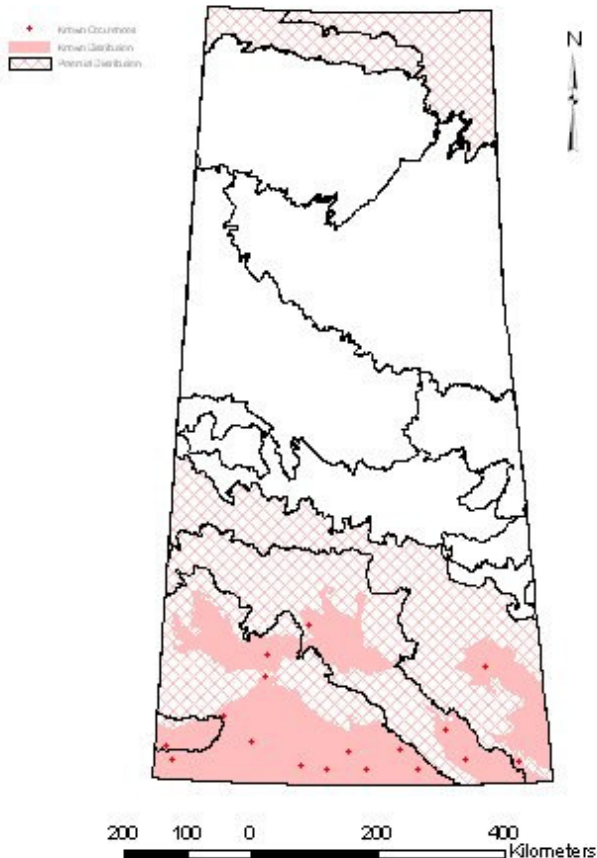
Geographic Distribution: A widespread species throughout western arid North America and ranging into the southern semiarid grassland of Saskatchewan.

branched small erect vegetative propagules (see insert). Powdery or granulate vegetative propagules are absent. The light to dark brown semisessile and marginally smooth fruiting bodies, when present, are on the upper surface. The lower surface is pale brown.



Chemical Reactions: None for the upper surface. Inner fungal layer: K+ yellow to red, C-, KC-, PD+ yellow to orange.

Notes: Salted rock-shield belongs to a centrally group of chemical distinct species, with densely crowded rounded to cylindrical, erect vegetative propagules, and mostly with a pale brown lower side, found widely distributed throughout the arid and semiarid west



Description: The lichen body of this rather large (up to 10 cm diameter) yellowish-green, more or less circular foliose lichen is closely or loosely attached to its substratum. The broadly lobes are somewhat irregular, rounded, smooth, and often with shiny tips which can be brown to blackish-brown. Upper surface is smooth, shiny, without a frosty covering, moderately to densely crowded with rounded, becoming cylindrical and often

Xanthoparmelia wyomingica

(Gyelnik) Hale

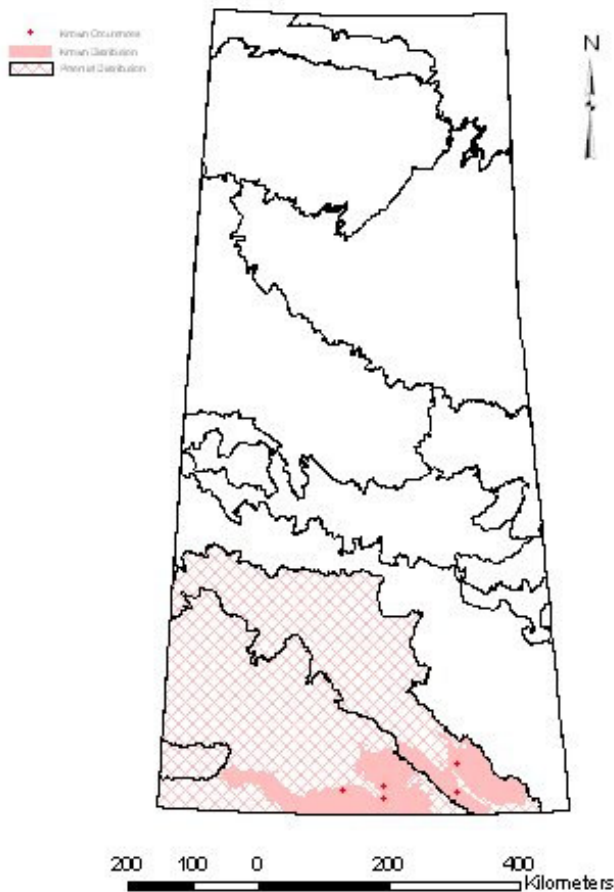
Shingled rock-shield

Synonyms: *Parmelia wyomingica* (Gyelnik) Hale

Location: Roche Percee, southeastern Saskatchewan.
Moist Mixed Grassland Ecoregion. Prairie Ecozone.

Habitat: In dry open native prairie remnant on small rock.

Geographic Distribution: Scattered throughout southern Saskatchewan.



shiny, upper surface lacking vegetative propagules. The lower surface has a pale centre but becomes darker at the lobe tips. The small attachment structures are simple, light to dark brown, at times projecting beyond the lobe margin. Fruiting bodies, when present, are on the upper surface, and have a light to dark brown disc, with a smooth margin.



Chemical Reactions: Upper surface negative to all reagents. The inner fungal layer: PD+ orange, K+ red, C-, KC-.

Notes: This species resembles *Xanthoparmelia chlorochroa* (Tumbleweed shield lichen) in form and colour, but is always attached to a rock or pebble, and has flatter, not tightly inrolled, lobes.

Description: A loosely attached or partially free, yellow-green often rosette forming lichen. The narrow, overlapping lobes are separate, sublinear, short, plane or somewhat rolled, and strongly overlapping, toothed, and often edged in dark brown or black, with a smooth,

References

The following technical manuals are useful for lichen identification, common names, and geographic distribution are recommended:

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- Johnson, D., L. Kershaw, A. MacKinnon, and J. Pojar. 1995. *Plants of the Western Boreal Forest and Aspen Parkland*. Lone Pine, Edmonton, Alberta. *
- Nash, T.H.III, B.D. Ryan, C. Gries, and F. Bungartz. 2002. *Lichen Flora of the Greater Sonoran Desert Region*. Volume I. Lichens Unlimited, Arizona State University, Tempe, Arizona, U.S.A.
- Nash, T.H. III, B.D. Ryan, P. Diederich, C. Gries, and F. Bungartz. 2004. *Lichen Flora of the Greater Sonoran Desert Region*. Volume II. Lichens Unlimited, Arizona State University, Tempe, Arizona, U.S.A.
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- Thomson, J. W. 1994. *American Arctic Lichens 1-The Macrolichens*. Columbia University Press, New York, U.S.A.
- Thomson, J. W. 1997. *American Arctic Lichens 2-The Microlichens*. The University of Wisconsin Press, Madison, Wisconsin, 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.*

Note: Those marked * are recommended illustrated field-books for the beginner.

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

Map References

- Padbury, G. A., and D. F. Acton. 1994. *Ecoregions of Saskatchewan Map*. Agriculture and Agri-Food Canada. Available from Information Services Corporation, Saskatchewan.
- Rowe, J. S. 1972. *Forest Regions of Canada*. Ministry of the Environment, Canada. Ottawa, Canada.

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.

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