University of Nebraska - Lincoln
DigitalCommons@University of Nebraska - Lincoln

Transactions of the Nebraska Academy of Sciences and Affiliated Societies

Nebraska Academy of Sciences

2002

ADDITIONS TO THE LICHEN FLORA OF NEBRASKA

Robert S. Egan
University of Nebraska at Omaha

Sara Morgan
University of Nebraska at Omaha

Clifford M. Wetmore
University of Minnesota

Douglas Ladd
The Nature Conservancy

Follow this and additional works at: https://digitalcommons.unl.edu/tnas

 Part of the Life Sciences Commons

Egan, Robert S.; Morgan, Sara; Wetmore, Clifford M.; and Ladd, Douglas, "ADDITIONS TO THE LICHEN FLORA OF NEBRASKA" (2002). *Transactions of the Nebraska Academy of Sciences and Affiliated Societies*. 17.
https://digitalcommons.unl.edu/tnas/17

This Article is brought to you for free and open access by the Nebraska Academy of Sciences at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Transactions of the Nebraska Academy of Sciences and Affiliated Societies by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

2002. *Transactions of the Nebraska Academy of Sciences* 28: 1–13

ADDITIONS TO THE LICHEN FLORA OF NEBRASKA

Robert S. Egan and **Sara Morgan**

Department of Biology
University of Nebraska at Omaha
Omaha, Nebraska 68182-0040

Clifford M. Wetmore

Department of Plant Biology
University of Minnesota
1445 Gortner Avenue
St. Paul, Minnesota 55108-1095

and

Douglas Ladd

The Nature Conservancy
2800 S. Brentwood
St. Louis, Missouri 63114-2712

ABSTRACT

Recent field work and literature records have documented 99 species of lichens and three lichenicolous fungi new to Nebraska. The genera *Acrocordia, Bispora, Canomaculina, Catillaria, Cladina, Leproloma, Lichinella, Megaspora, Muellerella, Placynthiella, Polysporina, Pseudevernia, Stigmidium, Strigula,* and *Vulpicida* also represent first reports for the state. These records are summarized here along with information about their distribution within the state, substrate affinities, and relevant data regarding taxonomy and chemical composition of selected species. New species records for Nebraska lichens and lichenicolous fungi since the 1995 Nebraska lichen catalog by Egan et al. are also included. Keys are provided for the Nebraska species of the lichen genera *Candelariella, Physconia, Punctelia,* and *Xanthoria.*

† † †

Field work in Nebraska over the last few years and recent literature reports have documented 99 species of lichen-forming fungi previously unreported for the state in Egan et al. (1995). Most of these collections are from the Niobrara River Valley area (by Ladd, Egan, Morgan), the ponderosa pine forests of northern and western Nebraska (by Morgan, Egan), and from Scotts Bluff National Monument and Agate Fossil Beds National Monument (by Wetmore). Additional collections (by Morgan, Egan) were made in Nebraska's two planted pine forests, the Samuel R. McKelvie National Forest in Cherry County and the Bessey Division of the Nebraska National Forest in Thomas County. Specimens collected by Morgan and Egan are deposited at the herbarium of the University of Nebraska at Omaha (OMA), those of Wetmore at the University of Minnesota (MIN), and Ladd's collections are to be deposited at the herbarium of the New York Botanical Garden (NY). Specimens cited in this paper collected by Kiener are deposited at MIN unless otherwise indicated. For each of the following species accounts, specimens are listed by county (Fig. 1), with the counties listed alphabetically. Reports for eleven lichens and lichenicolous fungi are based on Nebraska records published since the comprehensive catalog of Egan et al. (1995).

Nomenclature follows the most recent North American lichen checklist published on the World Wide Web (Esslinger 2001). Brodo et al. (2001) recently mapped Nebraska distributions for some of these taxa, but no localities or specimens have been cited in the literature. These very recent "map records" are indicated by an asterisk (*).

Acarospora stapfiana (Müll. Arg.) Hue

This lichen is parasitic on saxicolous *Caloplaca* in exposed, usually arid, habitats. The host is typically *Caloplaca trachyphylla* (Tuck.) Zahlbr., a species of the western interior United States and adjacent Canada that has a bright orange, lobate thallus.

SCOTTS BLUFF County: Scotts Bluff National Monument, on rock, Wetmore 77443, 77447, 77473, 77557, 77571, 77624, 77661, 77697, 77889; SIOUX: Agate Fossil Beds National Monument, on rock, Wetmore 77762, 77782, 77827, 77849, 77874, 77889, 77897, 77942, 77960; 13 miles N of Mitchell, on rock, Wetmore 77757.

Acarospora strigata (Nyl.) Jatta

Nebraska is at the eastern edge of the range of this western interior species that usually occurs on exposed calcareous rocks.

GARDEN County: Ash Hollow State Historical Park, on exposed limestone, Ladd 18079; KEYA PAHA: Niobrara Valley Preserve, on caliche blocks, Ladd 16440; SCOTTS BLUFF: Scotts Bluff National Monument, on rock, Wetmore 77457, 77471, 77527, 77533, 77552, 77567, 77568, 77610, 77660,

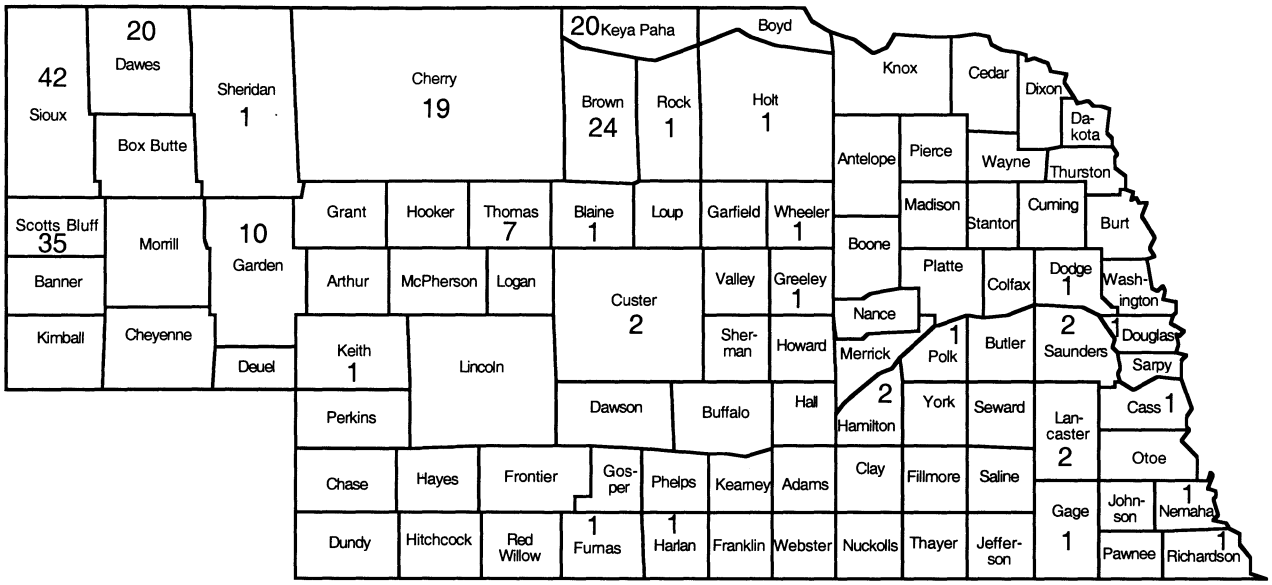

Figure 1. Map of Nebraska counties. Specimens are reported in this paper for all counties containing numbers, and the number in each county is the number of records reported for that county.

77680, 77699; SIOUX: Agate Fossil Beds National Monument, on rock, Wetmore 77830, 77866, 77878, 77930, 77966; 13 miles N of Mitchell, on rock, Wetmore 77738; Ft. Robinson State Park, 2 miles NW of Ft. Robinson, on rock, Egan 13362.

Acrocordia cavata (Ach.) R. C. Harris

The Nebraska record is a significant range extension for this inconspicuous pyrenomycete. Harris (1973) cites specimens from Iowa north and eastward. The Nebraska specimen has been confirmed by Richard Harris (New York Botanical Garden). This is the first report of the genus *Acrocordia* from Nebraska.

BROWN County: Niobrara Valley Preserve, on lower bole of *Tilia americana* in mesic ravine, Ladd 16515.

Amandinea dakotensis (H. Magn.) P. May & Sheard (Sheard and May 1997, p. 163).

The paper includes a map record from southeastern Nebraska.

Amandinea milliaria (Tuck.) P. May & Sheard
Synonym: *Rinodina milliaria* Tuck.

According to Sheard and May (1997), this is a species of the Great Lakes and Atlantic and Gulf coasts. The Nebraska location represents the first non-coastal record for the species.

SCOTTS BLUFF County: Scotts Bluff National Monument, on *Rhus*, Wetmore 77729.

Amandinea polyspora (Willey) E. Lay & P. May

According to Sheard and May (1997), this is a species of eastern North America ranging westward to Minnesota and Iowa.

KEYA PAHA County: Niobrara Valley Preserve, on shaded decorticate log of *Populus deltoides*, Ladd 16412B.

****Arthonia caesia*** (Flotow) Körber

The Nebraska station is the westernmost known occurrence for this species of the northeastern United States and extreme southeastern Canada. The presence of this species in a deep mesophytic ravine harboring other relictual species reinforces data from vascular-plant studies documenting these habitats in the Niobrara River Valley as a postglacial corridor and refugium of considerable phytogeographic significance (Kaul et al. 1988).

CHERRY County: Niobrara Valley Preserve, on shaded lower bole of *Betula papyrifera* in mesophytic ravine, Ladd 18259.

Arthonia intexta Almq.

This species is parasitic in the apothecia of saxicolous taxa of *Lecidella* and is usually collected accidentally in association with collection of the host lichen.

GARDEN County: Ash Hollow, 22 miles NW of Ogallala, on *Lecidella stigmatea*, Wetmore 77420; KEYA PAHA: Niobrara Valley Preserve, in apothecia of *Lecidella* on exposed caliche, Ladd 16460, 16464; SIOUX: Agate Fossil Beds National Monument, on *Lecidella stigmatea*, Wetmore 77758, 77779, 77934.

****Aspicilia contorta*** (Hoffm.) Kremp.

This is a widespread lichen of exposed saxicolous substrates, mostly in the western two thirds of the United States and adjacent Canada. It predominately occurs on calcareous rocks but occasionally inhabits siliceous substrates. This has often been confused with A. *calcarea* (L.) Mudd, which perhaps does not occur in North America.

DAWES County: Nebraska National Forest, 19 km W of Chadron, on rock, Morgan 573; SW of Chadron State Park, 15 km S of Chadron, on rock, Morgan 547.

Bacidia circumspecta (Nyl. *ex* Vainio) Malme

A pan -emperate corticolous lichen with small, black to sordid or mottled apothecia.

GAGE County: Homestead National Monument, just W of Beatrice, on *Celtis occidentalis*, Wetmore 76603; on *Maclura pomifera*, 76599.

Bispora christiansenii D. Hawksw. (Cole and Hawksworth 2001, p. 313).

This lichenicolous fungus is reported growing on *Caloplaca trachyphylla* (Tuck.) Zahlbr. from Sioux County and represents the first report of this species from North America.

****Bryoria fuscescens*** (Gyelnik) Brodo & D. Hawksw.

The only species of *Bryoria* previously reported from Nebraska is *B. fremontii* (Tuck.) Brodo & D. Hawksw. based on distribution maps in Hale (1969, 1979). In our collections from the western portions of the state, we have failed to locate *B. fremontii* with its characteristic yellow soredia, casting doubt on previous reports of this species from Nebraska. All Nebraska collections in this genus to date are *B. fuscescens*, a species with white soredia and generally smaller thalli.

DAWES County: Nebraska National Forest, 30 km SW of Chadron, on rotten log, Morgan and Egan 380; Fort Robinson State Park, 2 miles NW of Fort Robinson, on bark, Egan 13374; Chadron State Park, 8 miles S of Chadron, on *Pinus*, Egan 13344; SCOTTS BLUFF: Wildcat Hills State Recreation Area, 10 miles S of Scottsbluff, on bark, Egan 13462.

Caloplaca arenaria (Pers.) Müll. Arg.

A species of exposed siliceous rocks, with an uncertain North American distribution. The inconspicuous thallus and numerous small, plane, deep reddish orange apothecia with concolorous margins are characteristic.

CHERRY County: Niobrara Valley Preserve, on exposed quartzite boulders in prairie, Ladd 16546 (MIN, NY).

Caloplaca chrysophthalma Degel.

In the Great Plains and Midwest, this species seems to have a predilection for exposed to lightly shaded trees with nearly neutral bark pH, such as *Fraxinus*, *Juniperus*, and *Querus* species in the white oak group (section *Lepidobalanus*). Although often sterile, the chrome yellow soredia in rounded soralia on a thin grayish thallus and the presence of anthraquinones (K+ magenta) are diagnostic. There are at least three distinct forms of this species in North America. One occurs in the Great Lakes area, another in southwestern USA, and another in south-central USA including Nebraska. The group is still being studied. Previous Nebraska reports of *C. discolor* should be referred here.

BROWN County: Niobrara Valley Preserve, 10 miles S of Norden, on bark, Morgan and Egan 282; on *Quercus macrocarpa*, Ladd 16371, on decorticate log, Ladd 16499; CHERRY: Niobrara Valley Preserve, on base of *Fraxinus pennsylvanica*, Ladd 18295; KEYA PAHA: Niobrara Valley Preserve, on bole of *Quercus macrocarpa*, Ladd 16414.

Caloplaca decipiens (Arnold) Blomb. & Foriss.

This is a sorediate, lobate, yellowish-orange species of exposed calcareous substrates, particularly in southwestern North America. This species was very recently cited from Nebraska in Wetmore and Kärnefelt (1998) with additional records from Scotts Bluff and Sioux counties.

SCOTTS BLUFF County: Wildcat Hills State Recreation Area, 20 km S of Scottsbluff, on rock, Morgan and Egan 459; SIOUX: Gilbert Baker Public Hunting Area, on exposed limestone, Ladd 18126.

Caloplaca galactophylla (Tuck.) Zahlbr. (Wetmore and Kärnefelt 1998, p. 241).

Authors cite a specimen from Cass County (FH, US).

Caloplaca saxicola (Hoffm.) Nordin (Wetmore and Kärnefelt 1998, p. 245).

Specimens are cited from Sioux and Scotts Bluff counties.

Caloplaca subsoluta (Nyl. *ex* Wedd.) Zahlbr.

This is the oldest name for what was previously called *C. cinnabarina* (Ach.) Zahlbr. in North America (Wetmore and Kärnefelt 1999). It is in the *C. squamosa* group, a very difficult group that includes the names *C. squamosa*, *C. irrubescens*, *C. modesta*, *C. subsoluta*, and others. Two species will be recognized in North America in this group: *C. subsoluta* (found in all of the United States) and *C. squamosa* (de Lesd.) Zahlbr. (restricted to southwestern North America). Only *C. subsoluta* occurs in Nebraska.

BROWN County: Keller Park State Recreation Area, 15 km NE of Ainsworth, on rock, Morgan and Egan 217; DAWES: Nebraska National Forest, 30 km SW of Chadron, on rock, Morgan and Egan 390; Chadron State Park, 15 km S of Chadron, on rock, Morgan and Egan 436, 437; SCOTTS BLUFF: Wildcat Hills State Recreation Area, 20 km S of Scottsbluff, Morgan and Egan 456, 460; SIOUX: Smiley Canyon Scenic Drive, 3 miles WNW of Fort Robinson, on rock, Egan 13389; Ft. Robinson State Park, 2 miles NW of Fort Robinson, on rock, Egan 13368.

Caloplaca tominii Savicz (Wetmore 2001, p. 8).

One specimen is listed from Scotts Bluff County. This is a sorediate species similar to *C. citrina* (Hoffm.) Th. Fr. found on soil.

Caloplaca vitellinula (Nyl.) H. Olivier

This saxicolous species is similar to *C. holocarpa* (Hoffm. *ex* Ach.) M. Wade but has a little yellow thallus. Both species need further study.

SCOTTS BLUFF County: Scotts Bluff National Monument,

on rock, Wetmore 77558A, 77645, 77672; SIOUX: Agate Fossil Beds National Monument, on rock, Wetmore 77883, 77884, 77923.

***Candelariella aurella** (Hoffm.) Zahlbr.

Occurring on calcareous rocks, concrete, and on lignicolous and rarely, corticolous substrates, this species is widespread across western North America and eastward in the northeastern United States and adjacent Canada. The scant or non-apparent thallus and abundant, bright yellow, K– apothecia are diagnostic.

DAWES County: Nebraska National Forest, 30 km SW of Chadron, on rock, Morgan and Egan 385, 393; 19 km SW of Chadron, on rock, Morgan 566; Chadron State Park, 15 km S of Chadron, on rock, Morgan 531, 545; on rock, Morgan and Egan 443; on rock, Egan 13330; KEYA PAHA: Niobrara Valley Preserve, on exposed caliche face, Ladd 16461, 16470; on weathered concrete, Ladd 16562; SCOTTS BLUFF: Scotts Bluff National Monument, on rock, Wetmore 77500, 77504, 77532, 77534, 77559, 77593, 77597, 77605, 77658, 77682, 77704, on *Rhus*, Wetmore 77593, on *Fraxinus pennsylvanica*, Wetmore 77579; SIOUX: Agate Fossil Beds National Monument, on rock, Wetmore 77840, 77914, 77932; Ft. Robinson State Park, 2 miles NW of Ft. Robinson, on rock, Egan 13367.

Candelariella deflexa (Nyl.) Zahlbr.

This taxon has a persistently plane apothecium and margin and gray thallus. It is a species of the central USA.

SCOTTS BLUFF County: Scotts Bluff National Monument, Wetmore 77728, on *Populus*, Wetmore 77736; on *Juniperus*, Wetmore 77499, 77648; on *Rhus*, Wetmore 77727; SIOUX: Agate Fossil Beds National Monument, on *Ulmus*, Wetmore 77793.

Candelariella rosulans (Müll. Arg.) Zahlbr.

Nebraska records are near the northern edge of the range for this southern species that consists of closely aggregated, squamulose to lobate areoles.

GARDEN County: Ash Hollow, 22 miles NW of Ogallala, on rock, Wetmore 77401, 77422; SCOTTS BLUFF: Scotts Bluff National Monument, on rock, 77438; on *Pinus ponderosa*, Wetmore 77436; SIOUX: Agate Fossil Beds National Monument, on rock, Wetmore 77770, 77773, 77775, 77796, 77817, 77853, 77859, 77887, 77901, 77929, 77953; 13 miles N of Mitchell, on rock, Wetmore 77753.

Candelariella subdeflexa (Nyl.) Lettau

This corticolous species has a gray thallus with strongly convex apothecia, a disappearing margin and 8 spores per ascus. It is a species of the Central Plains region.

FURNAS County: W of Oxford, Kiener 6349; HARLAN: Mascot, on *Populus*, Kiener 6333; SCOTTS BLUFF: Scotts Bluff National Monument, on *Juniperus*, Wetmore 77426; SIOUX: Agate Fossil Beds National Monument, on *Ulmus*, Wetmore 77791.

Candelariella xanthostigma (Ach.) Lettau

A widespread corticolous species of temperate regions, consisting of tiny, lemon yellow corticate granules.

BROWN County: Long Pine State Recreation Area, 13 km E of Ainsworth, on *Quercus*, Morgan and Egan 197; SCOTTS BLUFF: Wildcat Hills State Recreation Area, 20 km S of Scottsbluff, on bark, Morgan and Egan 475.

Key to Species of *Candelariella* in Nebraska

1. Thallus of numerous, tiny, discrete, subspheroid granules; corticolous ..... *C. xanthostigma*
1. Thallus areolate, lobate, granular, or not apparent; substrate various 2
2. Thallus evident, areolate to subsquamulose; prothallus lacking 3
2. Thallus not apparent, or reduced to a few irregular granules; gray prothallus sometimes present. 4
3. Spores 8/ascus; apothecia with persistent thickened margin ..... *C. rosulans*
3. Spores 16+/ascus; apothecial margins thin, becoming obsolete at maturity ..... *C. vitellina*
4. Prothallus lacking; saxicolous or less commonly lignicolous or corticolous ..... *C. aurella*
4. Gray prothallus present; corticolous 5
5. Apothecia plane, with a persistent rim... *C. deflexa*
5. Apothecia convex, becoming rimless. *C. subdeflexa*

Canomaculina conferenda (Hale) Elix

This member of the former *Parmelia subtinctoria* group is characterized by a uniformly brown, rhizinate lower surface with broad, rounded lobes producing marginal cilia and soredia. The thalli contain atranorin and norlobaridone. The collection cited below was made in 1988 in one of the planted pine forests in the Nebraska Sandhills region. This represents a significant range extension from the nearest known localities for this taxon in the western Ozarks of Missouri and Oklahoma. It is the first report of a species in the genus *Canomaculina* from Nebraska. This lichen resembles *Parmotrema hypotropum* in having marginal soralia and a suberect growth form, but the lower cortex of *C. conferenda* is uniformly brown as opposed to the marginally white and centrally black lower cortex of *P. hypotropum*. In addition, *P. hypotropum* produces atranorin and norstictic acids.

THOMAS County: Bessey Division of Nebraska National Forest, 3 miles W of Halsey, on *Pinus*, Egan 13487.

Catillaria nigroclavata (Nyl.) Schuler

In North America this inconspicuous corticolous crust occurs from the northeastern United States and adjacent Canada westward into the Great Plains. This

is the first species of *Catillaria* to be reported from the state.

KEYA PAHA County: Niobrara Valley Preserve, on shaded decorticate branch of *Juniperus virginiana*, Ladd 16475.

Cladina mitis (Sandst.) Hustich

This is the first report of a "reindeer lichen" in the genus *Cladina* from Nebraska. This record apparently represents a southern outlier for this pan-boreal taxon.

CHERRY County: Niobrara Valley Preserve, among sparse vascular vegetation and quartzite boulders on lightly shaded sandy soil along prairie/woodland interface, Ladd 16536.

Cladonia cenotea (Ach.) Schaerer

A pan-boreal species extending southward into the Rocky Mountains, Appalachians, and Black Hills. The brownish tinged, farinose sorediate podetia with small incurved cups and UV+ thallus (squamatic acid) are diagnostic.

DAWES County: Nebraska National Forest, 30 km SW of Chadron, on decaying wood, Morgan and Egan 370.

Cladonia magyarica Vainio

This species is similar to and easily mistaken for *C. pyxidata*. However, careful TLC analysis revealed the presence of fumarprotocetraric acid and atranorin, the latter compound not known from *C. pyxidata*. Some thalli produce squamules and freely proliferate from the margin of the cup. Brodo et al. (2001) describe *C. magyarica* as an Eastern temperate species, and these collections from Nebraska represent a significant western range extension. We thank Teuvo Ahti, University of Helsinki, Finland, for assistance with the identification of this and other Nebraska Cladoniae.

BROWN County: Keller Park State Recreation Area, 15 km NE of Ainsworth, on soil among grasses, Morgan and Egan 209; Niobrara Valley Preserve, 10 km S of Norden, on soil and *Selaginella*, Morgan and Egan 299, 300; SCOTTS BLUFF: Wildcat Hills State Recreation Area, 20 km S of Scottsbluff, on soil, Morgan and Egan 469a.

Cladonia pleurota (Flörke) Schaerer

The Nebraska record is apparently the first report of this species from the Great Plains. The cupped, greenish yellow podetia containing usnic acid and the red apothecia and pycnidia are diagnostic.

CHERRY County: Niobrara Valley Preserve, on light shaded sandy prairie slope among quartzite boulders and sparse vascular vegetation, Ladd 16537.

****Cladonia pocillum*** (Ach.) Grognot

Some authors do not separate *Cladonia pocillum* from the closely related *C. pyxidata*. Both taxa have goblet-shaped podetia covered with coarse areoles and produce fumarprotocetraric acid. However, the primary thallus of *C. pocillum* is especially well-developed with large squamules that frequently merge into a "foliose-like" thallus mat (see the excellent photograph in Brodo et al. 2001).

BROWN County: Long Pine State Recreation Area, 13 km E of Ainsworth, on soil, Morgan and Egan 191a; SIOUX: Smiley Canyon Scenic Drive, 3 miles WNW of Fort Robinson, on soil, Egan 13384a.

Cladonia robbinsii A. Evans

A lichen of the eastern United States, with outlying populations in the Black Hills and southern Saskatchewan, generally forming mats of largish sterile squamules with a distinct pale creamy yellowish tinge on their lower surface.

BROWN County: Niobrara Valley Preserve, in well-drained sandy soil along prairie/woodland interface, Ladd 16407; Long Pine State Recreation Area, 13 km E of Ainsworth, on soil, Morgan and Egan 195.

Cladonia sobolescens Nyl. *ex* Vainio

This is apparently the first record of this eastern North American lichen from west of Missouri.

CHERRY County: Valentine City Park, on soil, Wetmore 13091.

****Cladonia subulata*** (L.) F. H. Wigg.

Nebraska populations are at the southern edge of the range for this boreal species that is characterized by finely sorediate podetia.

DAWES County: Chadron State Park, 8 miles S of Chadron, on base of *Pinus ponderosa*, Egan 13339; SIOUX: 4 miles N of Harrison, on soil, Kiener 27059 (MIN, OMA).

****Collema coccophorum*** Tuck.

A widely distributed species in the United States, typically occurring on thin soil in pockets and crevices on calcareous rocks.

DAWES County: Chadron State Park, on soil, Kiener 21683; KEYA PAHA: Niobrara Valley Preserve, on exposed, friable caliche, Ladd 16585.

Cyphelium notarisii (Tul.) Blomb. & Forss.

Reports in the literature do not always separate *C. notarisii* with submuriform ascospores from the widespread *C. tigillare* (Ach.) Ach. that uniformly produces 2-celled spores. Both taxa are known from Nebraska. The bright yellow-green thalli of *Cyphelium notarisii* are extremely common on fence posts and wood in most of central and western Nebraska. In eastern Nebraska, posts and barn boards are more likely to appear orange from *Caloplaca microphyllina* (Tuck.) Hasse. Collections by Hughes were all made on fence posts and are deposited at OMA.

BLAINE County: Dunning, Kiener 28132; BROWN: 4.8 miles S of Ainsworth, Hughes 030-A, 030-B; 21 miles W of Ainsworth, Hughes 034-B; 30 miles S of Ainsworth, Hughes 031-A; 6 miles W of Ainsworth, Hughes 028; 9 miles W of Bassett, Hughes 026-A; Cheatum Ranch, 16 km NE of Ainsworth, on

fence post, Morgan and Egan 250; Bobcat State Wildlife Management Area, 20 km N of Ainsworth, on *Pinus*, Morgan and Egan 270; Niobrara Valley Preserve, 10 km S of Norden, on *Pinus*, Morgan and Egan 301; on *Juniperus virginiana* fence rails, Ladd 16367; CHERRY: Lakes Refuge, Valentine, Kiener 26774 (OMA, MIN); 32 miles SSW of Nenzel, Hughes 041; 39 miles SSW of Nenzel, Hughes 042-B; 5.6 miles S of Valentine, Hughes 045; 9.3 miles E of Nenzel, Hughes 044-A; Samuel McKelvie National Forest, 17 miles SSW of Nenzel, on lignum, Egan 13270, 13279; on *Pinus*, Morgan and Egan 342, 362; CUSTER: Anselmo, Kiener 28133; DAWES: Chadron State Park, 8 miles S of Chadron, on *Pinus*, Egan 13341; DOUGLAS: 3 miles S of Elk City, Hughes 0001-E; GREELEY: 1 mile N of Greeley, Hughes 008-A; 8.4 miles N of Greeley, Hughes 010-B; 2.2 miles N of Greeley, Hughes 009-D; HOLT: 4.4 miles W of O'Neill, Hughes 019; 18 miles S of O'Neill, Hughes 015-C; 13 miles S of O'Neill, Hughes 016; 9 miles W of O'Neill, Hughes 022-A; KEYA PAHA: Niobrara Valley Preserve, 8 km SW of Norden, on *Pinus*, Morgan and Egan 319; on weathered wooden shingles, Ladd 16564; ROCK: 0.2 miles N of Newport, Hughes 023; SHERIDAN: 15 miles S of Rushville, Kiener 26725, 28131; SIOUX: NW of Crawford, Kiener 28112, 28119; Crawford, Kiener 28108, 28122; Fort Robinson State Park, 2 miles NW of Ft. Robinson, on *Pinus*, Egan 13365; THOMAS: Bessey Division of Nebraska National Forest, 4.8 km SW of Halsey, on bark, Morgan 486; WHEELER: 9 miles N of Bartlett, Hughes 014; 0.5 miles N of Bartlett, Hughes 013-C; 6 miles S of Bartlett, Hughes 012.

Diploschistes muscorum (Scop.) Blomb. & Forss.

This gray crustose lichen grows on *Cladonia squamules*, mosses, soil, and occasionally on other lichens. It is widespread throughout North America.

BROWN County: Long Pine, Kiener 29758; Keller Park State Recreation Area, 15 km NE of Ainsworth, on mosses on soil, Morgan and Egan 216; Niobrara Valley Preserve, on mossy soil embankment, Ladd 16393; CHERRY: Valentine City Park, Wetmore 13100; Boardman Creek, Kiener 29542; CUSTER: 21 miles W of Loup City, Wetmore 13111; DAWES: Nebraska National Forest, 19 km SW of Chadron, on mosses over soil, Morgan 576, 576a; HAMILTON: NW of Marquette, Kiener 26466; HARLAN: 8 miles S of Atlanta, Wetmore 15707; KEITH: Kingsley Dam, Ogallala, Kiener 24375; KEYA PAHA: Niobrara Valley Preserve, on sterile sandy soil, Ladd 10219, 16434, 16579; LANCASTER: 5 miles NW of Lincoln, Kiener 12891; POLK: 4 miles E of the Platte River, Wetmore 13116, 13123; SCOTTS BLUFF: Scotts Bluff National Monument, Wetmore 77489, 77686; SIOUX: Fort Robinson State Park, 2 miles NW of Ft. Robinson, on soil and mosses, Egan 13353; Smiley Canyon Scenic Drive, 3 miles WNW of Ft. Robinson, on soil, Egan 13396; THOMAS: Bessey Division of Nebraska National Forest, Wetmore 13101; Wildcat Hills State Recreation Area, 20 km S of Scottsbluff, on mosses over soil, Morgan and Egan 471, Egan 13476a; WHEELER: Pibel Lake, near Spalding in Greeley County, Kiener 28193.

Diplotomma venustum (Körber) Körber [Synonym: *Buellia venusta* (Körber) Lettau]

According to Nordin (1999), in North America this is a widespread species with western tendencies. Nebraska specimens of *D. venustum* exhibit considerable variation in both thickness of the thallus and pruinosity, but all collections at OMA had uniformly 3-septate brown spores and occurred on calcareous rocks. Representative specimens from western Nebraska were verified by Anders Nordin at the University of Uppsala, Sweden.

BROWN County: Bobcat State Wildlife Management Area, 20 km N of Ainsworth, on rock, Morgan and Egan 267; Keller Park State Recreation Area, 15 km NE of Ainsworth, on rock, Morgan and Egan 224; DAWES: Chadron State Park, 15 km S of Chadron, on rock, Morgan 540, 541, 546; Egan 13337; GARDEN: Ash Hollow, 22 miles NW of Ogallala, on rock, Wetmore 77407; KEYA PAHA: Niobrara Valley Preserve, on exposed caliche, Ladd 16457, 16590; SCOTTS BLUFF: Scotts Bluff National Monument, on rock, Wetmore 77542; SIOUX: Agate Fossil Beds National Monument, on rock, Wetmore 77893, 77906.

Hypogymnia tubulosa (Schaerer) Hav.

Brodo et al. (2001) report this species with its characteristic blunt, sorediate lobe tips no closer to Nebraska than north-central Colorado. Hale (1969, 1979) mapped the related *H. physodes*, with soredia under expanded, labriform lobe tips, from extreme western Nebraska, and we have numerous records of that taxon from recent collections.

DAWES County: Nebraska National Forest, 30 km SW of Chadron, on *Pinus*, Morgan and Egan 369; Chadron State Park, 15 km S of Chadron, on *Pinus*, Morgan and Egan 432.

Hypotrachyna laevigata (Sm.) Hale

Hypotrachyna laevigata, a barbatic acid-containing, sorediate species, was reported from the nearby Black Hills as *Parmelia laevigata* (Sm.) Ach. by Wetmore (1968). Hale (1979) maps the distribution of *H. revoluta* (Flörke) Hale, a similar species with gyrophoric acid, from extreme western Nebraska, but we have seen no specimens of this species from the state.

CHERRY County: Samuel R. McKelvie National Forest, 25 km S of Nenzel, on *Pinus*, Morgan and Egan 356.

Lecania erysibe (Ach.) Mudd

Brodo et al. (2001) characterize the North American range of this lichen as western and northern. It is an inconspicuous lichen on calcareous rocks in both exposed and shaded sites.

SCOTTS BLUFF County: Wildcat Hills State Recreation Area, 10 miles S of Scottsbluff, on rock, Egan 13441.

Lecania perproxima (Nyl.) Zahlbr.

Eastward in Missouri and Illinois, this is a lichen of lightly shaded limestone outcrops and massive bluff faces.

BROWN County: Cheatum Ranch, 16 km NE of Ainsworth, on rock, Morgan and Egan 249.

Lecanora argopholis (Ach.) Ach.

This distinctive lobate *Lecanora* grows on rocks throughout much of western North America.

SIOUX County: Agate Fossil Beds National Monument, on rock, Wetmore 77807.

Lecanora meridionalis H. Magn.

This species is in the *L. subfusca* group. It has dark brown to black apothecia and usually is found on conifer bark. Its main distribution is in the upper Great Lakes area, but Brodo (1984) also reported it from Arizona.

SCOTTS BLUFF County: Scottsbluff National Monument, on *Juniperus*, Wetmore 77643.

Lecanora minutella Nyl.

These specimens of *L. minutella* represent a significant western range extension for this taxon (LaGreca and Lumbush 2001) as the nearest localities reported were in southern Missouri. We thank Dr. Scott LaGreca (Harvard University) for determining these collections.

CHERRY County: Samuel R. McKelvie National Forest, 25 km S of Nenzel, on *Pinus*, Morgan and Egan 355; THOMAS: Bessey Division of Nebraska National Forest, 8 km SW of Halsey, on *Pinus*, Morgan 491.

Lecanora piniperda Körber

A widespread, but often overlooked, small corticolous crustose lichen of boreal and western North America.

County unknown: Pine Ridge, on *Pinus*, Webber; SCOTTS BLUFF County: Scotts Bluff National Monument, on *Pinus ponderosa*, Wetmore 77437, 77487, 77496; on *Salix*, 77587; on *Juniperus*, 77716; SIOUX: Agate Fossil Beds National Monument, on *Juniperus*, Wetmore 77792.

Lecanora polytropa (Hoffm.) Rabenh.

A common lichen of siliceous rocks in arctic, boreal, western, and northeastern North America. This species has small tan to yellowish apothecia with greenish yellow thalline margins.

DAWES County: Chadron State Park, 15 km S of Chadron, on rock, Morgan and Egan 442, 443.

Lecanora valesiaca (Müll. Arg.) Stizenb.

This species resembles the widespread *L. muralis* (Schaer.) Rebenh. but is more obligately restricted to calcareous substrates, has a densely white pruinose upper cortex, and lacks zeorin. It is locally common on exposed carbonate rocks eastward in the Midwest.

GARDEN County: Ash Hollow State Historical Park, on exposed limestone, Ladd 18087; KEYA PAHA: Niobrara Valley Preserve, on exposed caliche at summit of bluff, Ladd 18174.

Lecidella patavina (A. Massal.) Knoph & Leuckert

This species is very similar to *L. stigmatea* (see below) but has oil drops distributed throughout the hymenium and crystals in the exciple (Brodo et al. 2001).

BROWN County: Keller State Park Recreation Area, 15 km NE of Ainsworth, on rock, Morgan and Egan 223, 237; DAWES: Nebraska National Forest, 30 km SW of Chadron, on rock, Morgan and Egan 381; Chadron State Park, 8 miles S of Chadron, on rock, Morgan and Egan 439, Egan 13331, 13335; Nebraska National Forest, 19 km SW of Chadron, on rock, Morgan 567, 568; SCOTTS BLUFF: Wildcat Hills State Recreation Area, 20 km S of Scottsbluff, on rock, Morgan and Egan 452, 455; Egan 13439.

****Lecidella stigmatea*** (Ach.) Hertel & Leuckert

A common and widespread saxicolous species almost invariably associated with calcareous substrates. This is one of the species that serve as a host for *Arthonia intexta*.

DAWES County: Chadron State Park, 15 km S of Chadron, on rock, Morgan and Egan 438; GARDEN: Ash Hollow, 22 miles NW of Ogallala, on rock, Wetmore 77405; SCOTTS BLUFF: Scotts Bluff National Monument, on rock, Wetmore 77440, 77453, 77461, 77465, 77540, 77546, 77561, 77563, 77620, 77656, 77683, 77700; SIOUX: 13 miles N of Mitchell, on rock, Wetmore 77750; Agate Fossil Beds National Monument, on rock, Wetmore 77815, 77845, 77877, 77888, 77895, 77938, 77944, 77954, 77967.

Lepraria frigida J. R. Laundon

This is one of several sterile crustose lichens separated primarily by chemical characteristics. John A. Elix (Australian National University) kindly identified the chemical constituents of a representative specimen, finding alectorialic acid (major), barbatolic acid (minor), hypoalectorialic acid (minor) and 5,7-dihydroxy-6-methylphthalide (trace). This species is very similar to *Leproloma vouauxii* (see below) but can be separated by its UV+ pale gold fluorescence as contrasted with the UV– thallus of *Leproloma vouauxii*. *Lepraria lobificans* Nyl., also known from Nebraska, contains atranorin (major), zeorin (major), stictic acid (major), constictic acid (minor) and cryptostictic acid (trace) as determined by Dr. Elix.

SIOUX County: Smiley Canyon Scenic Drive, 3 miles WNW of Ft. Robinson, on soil, Egan 13395; Fort Robinson State Park, 2 miles NW of Ft. Robinson, on soil, Egan 13376.

Lepraria lesdainii (Hue) R. C. Harris

This species occurs on sheltered, usually carbonate, rock faces not exposed to direct rain or runoff. It is characterized by a dull, grayish green, leprose thallus and contains a terpene with an Rf value just above that of zeorin. This species is sometimes placed in the genus *Botryolepraria*, as *B. lesdainii* Canals, Hernández-Mariné, Gómez-Bolea and Llimona.

KEYA PAHA County: Niobrara Valley Preserve, on shaded, sheltered caliche face, Ladd 16439.

Leproloma vouauxii (Hue) J. R. Laundon

Chemical determination on a representative specimen was conducted by Dr. John A. Elix. Our specimens contain pannaric acid 6-methyl ester (major), fumarprotocetraric acid (minor), 4-oxypannaric acid 6-

methyl ester (minor) and pannaric acid (trace). Specimens are UV–. This is the first species of the genus *Leproloma* to be reported from Nebraska.

DAWES County: Nebraska National Forest, 30 km SW of Chadron, on soil and mosses, Morgan and Egan 383; on soil and rock, Morgan and Egan 392; SCOTTS BLUFF: Wildcat Hills State Recreation Area, 10 miles S of Scottsbluff, on soil, Morgan and Egan 477; Egan 13473; ; on soil and mosses, Morgan and Egan 551.

***Lichinella nigritella** (Lettau) Moreno & Egea

A characteristic lichen of massive exposures of carbonate rock, typically growing in shallow depressions or intermittent runoff channels. These records are the first for the genus *Lichinella* from the state.

GARDEN County: Ash Hollow, 22 miles NW of Ogallala, on rock, Wetmore 77400; SIOUX: Agate Fossil Beds National Monument, on rock, Wetmore 77761.

***Lobothallia alphoplaca** (Wahlenb.) Hafeller

A widespread species of exposed siliceous rocks in interior western North America.

KEYA PAHA County: Niobrara Valley Preserve, on exposed caliche, Ladd 16595; SIOUX: Agate Fossil Beds National Monument, on rock, Wetmore 77766, 77795, 77848, 77912.

***Megaspora verrucosa** (Ach.) Hafellner & V. Wirth

In montane regions this lichen grows on soil, mosses, and dead alpine vegetation, but local populations occur on the lower boles of hardwoods, occasionally growing over corticolous mosses. The genus *Megaspora* has not been recorded previously from Nebraska.

BROWN County: Niobrara Valley Preserve, 10 km S of Norden, on bark, Morgan and Egan 284; on shaded lower bole of *Quercus macrocarpa*, Ladd 16375; on *Betula papyrifera* in mesic ravine, Ladd 16526; SCOTTS BLUFF: Wildcat Hills State Recreation Area, 20 km S of Scottsbluff, on bark, Egan and Morgan 480b.

Melanelia subaurifera (Nyl.) Essl.

Both *M. subaurifera* and the closely related *M. subargentifera* (Nyl.) Essl. occur in Nebraska. The entirely laminal soredia, arising from the breakdown of the upper cortex or isidia, and the lack of colorless hairs and pruinosity generally separate it from the Rocky Mountain *M. subargentifera*, which has laminal and marginal soredia and an upper cortex that is often pruinose with fine colorless hairs on the lobe tips.

BROWN County: Niobrara Valley Preserve, on *Quercus macrocarpa*, Ladd 18320, 18323; CHERRY: Samuel McKelvie National Forest, 25 km S of Nenzel, on *Pinus*, Morgan and Egan 346.

Muellerella pygmaea (Körber) D. Hawksw. (Cole and Hawksworth 2000, p. 320).

This lichenicolous fungus was found on a specimen of *Caloplaca trachyphylla* (Tuck.) Zahlbr. from Sioux County.

Ochrolechia arborea (Kreyer) Almb.

Although this invariably sterile sorediate crust has a primarily northern distribution in North America, Brodo (1991) reports locations in the Black Hills. The Nebraska locality is not unexpected.

BROWN County: Niobrara Valley Preserve, on shaded decorticate *Juniperus virginiana*, Ladd 16525.

Peltigera lepidophora (Vainio) Bitter

The presence of unusual peltate or flattened isidia clearly distinguish this primarily northern species from *P. evansiana* Gyelnik, the other isidiate *Peltigera* species found in Nebraska, which produces cylindrical isidia.

BROWN County: Meadville, on soil, Kiener 11292; Keller State Recreation Area, 15 km NE of Ainsworth, on soil, Morgan and Egan 220; CHERRY: City Park, Valentine, on soil, Wetmore 13089B; Lower Boardman Creek, on soil, Kiener 29538; DAWES: Nebraska National Forest, 30 km SW of Chadron, on mosses over soil, Morgan and Egan 373; 19 km SW of Chadron, on soil, Morgan 565; HAMILTON: NW of Marquette, on soil, Kiener 26463; KEYA PAHA: Niobrara Valley Preserve, 8 km SW of Norden, on mosses on soil, Morgan and Egan 323; ROCK: Niobrara River N of Bassett, Kiener 11245; THOMAS: Bessey Division of Nebraska National Forest, 8 km SW of Halsey, on soil, Morgan 517.

Peltigera neckeri Hepp *ex* Müll. Arg.

This primarily boreal lichen has been previously documented from the Black Hills. A member of the *P. polydactylon* group, this taxon has black apothecia, pruinose lobe tips, and an otherwise lustrous upper cortex.

SAUNDERS County: N of Cedar Bluffs, on soil, Kiener 16364.

Phaeophyscia adiastola (Essl.) Essl.

A common species through the eastern United States and adjacent Canada, characterized by the abundant rhizines and coarse, isidioid, marginal soredia. This species is also known from the Black Hills.

BROWN County: Niobrara Valley Preserve, 10 km S of Norden, on bark, Morgan and Egan 283.

Phaeophyscia nigricans (Flörke) Moberg

This specimen was identified by Dr. Theodore Esslinger (North Dakota State University). The small thalli, brown cortex, and narrow lobes make *P. nigricans* inconspicuous and easily overlooked in the field. Isidia are present on the lobe tips, and the underside is pale throughout. Esslinger (1978) cites specimens from Colorado, North Dakota, and Wyoming.

BROWN County: Niobrara Valley Preserve, 10 km S of Norden, on *Quercus*, Morgan and Egan 303.

Physcia biziana (A. Massal.) Zahlbr.

This is a western species near the eastern edge of its range in Nebraska. It resembles the widespread *P.*

stellaris (L.) Nyl., but the upper cortex in *P. biziana* is white pruinose, whereas *P. stellaris* can have white maculae but lacks a heavily pruinose upper cortex.

BROWN County: Long Pine State Recreation Area, 13 km E of Ainsworth, on *Juniperus*, Morgan and Egan 186; Niobrara Valley Preserve, on *Tilia americana*, Ladd 18230; SIOUX: Smiley Canyon Scenic Drive, 3 miles WNW of Ft. Robinson, on *Juniperus*, Egan 13401.

Physcia dimidiata (Arnold) Nyl.

Described in Brodo et al. (2001) as a lichen of the "arid western interior," *P. dimidiata* produces rather broad lobes, an abundance of pruina on the surface, and marginal soredia. An excellent photograph can be found in McCune and Geiser (1997).

SCOTTS BLUFF County: Scotts Bluff National Monument, on *Juniperus*, Wetmore 77427, 77637,77718, on *Pinus ponderosa*, Wetmore 77483; Wildcat Hills State Recreation Area, 20 km S of Scottsbluff, on *Juniperus*, Morgan and Egan 465, 480; Egan 13455.

Physcia dubia (Hoffm.) Lettau

In North America this is a lichen of primarily boreal and western regions. It produces distinctive, weakly labriform soralia at the lobe tips.

CHERRY County: Valentine, on rock, Kiener 11425; LANCASTER: S of Lincoln, on sandstone, Kiener 8379; SCOTTS BLUFF: Scotts Bluff National Monument, on brick, Wetmore 77482; SIOUX: Agate Fossil Beds National Monument, on rock, Wetmore, 77819.

Physconia elegantula Essl.

This is the only truly isidiate *Physconia* species and was only recently described by Esslinger (1994). Specimens were cited from Colorado, Wyoming, and other southwestern states. Our material is typical and well developed. Specimens were verified by Theodore Esslinger of North Dakota State University, Fargo.

DAWES County: Nebraska National Forest, 30 km SW of Chadron, on bark, Morgan and Egan 386; on *Fraxinus*, Morgan and Egan 398, 409.

There are now five species of *Physconia* reported from Nebraska. Many early reports of *P. detersa* (Nyl.) Poelt are (so far) referable to *P. leucoleiptes*.

Key to the Species of *Physconia* in Nebraska

1. Thallus lacking soredia or isidia ..... *Physconia muscignea* (Ach.) Poelt
1. Thallus with soredia or isidia 2
2. Thallus isidiate ..... *P. elegantula* Essl.
2. Thallus not isidiate, soredia present 3
3. Medulla yellow, KC+ yellow-orange ..... *P. enteroxantha* (Nyl.) Poelt
3. Medulla white, KC– (sometimes locally KC+ yellowish in older parts of the thallus) 4
4. Medulla C+ rose, gyrophoric acid present ..... *P. kurokawae* Kashiw.
4. Medulla C– 5
5. Soredia KC+ yellow-orange (sometimes tardily or incompletely so), soredia on short side lobes to spreading, lobes often upturned ..... *P. leucoleiptes* (Tuck.) Essl.
5. Soredia KC–, soredia along margins, lobes generally plane ..... [*P. detersa* (Nyl.) Poelt]

****Placidium lacinulatum*** (Ach.) Breuss [Synonym: *Catapyrenium lacinulatum* (Ach.) R. Sant.]

A widely distributed squamulose lichen of both calcareous and arenaceous soils. This species was mapped from throughout Nebraska by Brodo et al. (2001).

GARDEN County: Ash Hollow, 22 miles NW of Ogallala, on soil, Wetmore 77409; SCOTTS BLUFF: on soil, Wetmore 77455, 77469, 77555, 77565, 77604, 77650, 77665; SIOUX: Agate Fossil Beds National Monument, on soil, Wetmore 77772, 77902, 77922, 77968.

Placynthiella icmalea (Ach.) Coppins & P. James

This is a common but often overlooked lignicolous lichen that blends in with the decorticate logs on which it typically grows. It is almost certainly more widely distributed in Nebraska than the single known collection would indicate. The genus *Placynthiella* is reported for the first time from Nebraska.

BROWN County: Niobrara Valley Preserve, on decorticate *Populus* log in open woodland, Ladd 16362.

Pleopsidium flavum (Bellardi) Körber

A bright yellow, areolate crust of western interior North America that is distinctly more lobate than similar species of *Acarospora*. These collections are from the late 1800s, and no recent collections have been seen. Early literature reports of *P. chlorophanum* (Walhlenb.) Zopf may belong here.

Nebraska: locality unknown, Williams 116; Pine Ridge, Webber 41 (MIN).

Polysporina simplex (Davies) Vězda

Polysporina simplex is a widespread lichen on exposed siliceous rocks, but this is the first report of this species and genus from Nebraska. This species seldom produces any apparent thallus and is characterized by black, often angular, apothecia with carbonaceous ridges and irregularities on the surface.

SCOTTS BLUFF County: Scotts Bluff National Monument, on rock, Wetmore 77547, 77569, 77620, 77623, 77647, 77688; SIOUX: Agate Fossil Beds National Monument, on rock, Wetmore 77776, 77876, 77881, 77926; 13 miles N of Mitchell, on rock, Wetmore 77756.

Pseudevernia intensa (Nyl.) Hale & Culb.

This is the first report of the genus *Pseudevernia* from Nebraska. *Pseudevernia intensa* is known from

the Rocky Mountains ranging from southern Wyoming to west Texas, Arizona, and northern Mexico (Brodo et al. 2001). Our collection was made in one of Nebraska's planted pine forests located in the northern Sandhills region of the state.

CHERRY County: Samuel R. McKelvie National Forest, 25 km S of Nenzel, on *Pinus*, Egan 13272.

Psora cerebriformis W. A. Weber

A squamulose terricolous lichen of the western interior United States and adjacent Canada with black marginal apothecia and, typically, with densely pruinose squamules.

SIOUX County: Agate Fossil Beds National Monument, on soil, Wetmore 77894.

Psora globifera (Ach.) A. Massal.

This brown squamulose lichen is typically saxicolous and occurs through much of western North America with a few boreal outliers eastward.

DAWES County: Nebraska National Forest, 30 km SW of Chadron, on rock, Morgan and Egan 391.

Punctelia perreticulata (Räsänen) G. Wilh. & Ladd

Primarily a species of southwestern North America with a foveolate-ridged thallus and abundant fine soredia. This lichen typically occurs on old growth *Juniperus* and *Pinus*.

CHERRY County: Samuel R. McKelvie National Forest, 25 km S of Nenzel, on *Pinus*, Morgan and Egan 350; Niobrara Valley Preserve, on *Pinus ponderosa*, Ladd 18285; KEYA PAHA: Niobrara Valley Preserve, 8 miles SW of Norden, on *Quercus*, Morgan and Egan 322; on *Pinus ponderosa*, Ladd 16573.

Key to the Species of *Punctelia* in Nebraska

1. Thallus sorediate, medulla C+ red 2
1. Thallus isidiate or lacking soredia and isidia, medulla C+ or C– 3
2. Lobes reticulately ridged and wrinkled, soredia often associated with the ridges .... *P. perreticulata*
2. Lobes lacking reticulate ridges, older portions may be wrinkled, soredia generally laminal in rounded soralia ..... *P. subrudecta* (Nyl.) Krog
3. Isidia present, medulla C+ red ..... *P. rudecta* (Ach.) Krog
3. Isidia absent, medulla C+ or C– 4
4. Medulla C– (fatty acids present) ..... *P. bolliana* (Müll. Arg.) Krog
4. Medulla C+ red (lecanoric acid present) 5
5. Conidia long, over 10 µm (Nebraska record questionable) ..... [*P. hypopleucites* (Nyl.) Krog]
5. Conidia short, under 10 µm ..... *P. semansiana* (Culb. & C. Culb.) Krog

Rhizocarpon disporum (Nägeli *ex* Hepp) Müll. Arg.

Widespread on exposed siliceous rocks through western North America and to be expected elsewhere in Nebraska. This species is characterized by a usually conspicuous black prothallus and a diffusely areolate, dark grayish thallus.

CHERRY County: Niobrara Valley Preserve, on exposed quartzite boulder, Ladd 16543, 16555, 16560.

Rinodina archaea (Ach.) Arnold

This species has a white pruinose thallus and brown apothecia and is usually found on bryophytes on soil in many parts of the USA.

SCOTTS BLUFF County: Scottsbluff National Monument, on soil, Wetmore 77599, 77668; SIOUX: Agate Fossil Beds National Monument, on soil, Wetmore 77918; Simley Canyon Scenic Drive, 3 miles WNW of Ft. Robinson, on wood, Egan 13397.

Rinodina calcigena (Th. Fr.) Lange

Found on calcareous rocks, this species is also known from North Dakota and Utah and is characterized by a well developed brownish thallus, convex apothecia, and spores lacking endospore thickenings.

SIOUX County: 13 miles N of Mitchell, on rock, Wetmore 77745, 77748.

Rinodina populicola H. Magn.

Brodo et al. (2001) map this inconspicuous corticolous crust from the central United States and adjacent Canada. This is one of a few species of *Rinodina* with more than eight spores per ascus.

KEYA PAHA County: Niobrara Valley Preserve, on branches of *Acer negundo*, Ladd 16419.

Sarcogyne novomexicana H. Magn.

A species of uncertain distribution, abundance, and taxonomic status. Magnusson (1934) cites a single specimen from New Mexico. This taxon resembles *S. regularis* but has larger, more prominently reddish, completely epruinose apothecia and a pale exciple with notably enlarged cells in the upper portion. The ascospores are 5–6 µm long as compared to 3–5 µm in *S. regularis*.

KEYA PAHA County: Niobrara Valley Preserve, on old, weathered concrete pillars, Ladd 16563.

Sarcogyne regularis Körber

This species was first reported from Nebraska by Magnusson (1934) but was not listed in Egan et al. (1995). It is a widespread lichen of calcareous rocks and concrete through most of interior North America and is characterized by dark reddish brown to nearly black, pruinose apothecia. All of the collections cited below are from calcareous rock.

BROWN County: Keller Park State Recreation Area, 15 km NE of Ainsworth, on rock, Morgan and Egan 200; DAWES: Nebraska National Forest, 19 km SW of Chadron, on rock, Morgan 570; Chadron State Park, 15 km S of Chadron, on rock, Morgan 536, 537; GARDEN: Ash Hollow, 22 miles NW of Ogallala, on rock, Wetmore 77402; KEYA PAHA: Niobrara Valley Preserve, Ladd 16348; SCOTTS BLUFF: Scotts Bluff National Monument, on rock, Wetmore 77454, 77543, 77603, 77676, 77698, 77706; SIOUX: Agate Fossil Beds National Monument, on rock, Wetmore 77826, 77842, 77864, 77913, 77916, 77958, 77965.

Staurothele elenkinii Oksner

According to Thomson (1991), this is an arid saxicolous species of the Ukrainian steppes and interior western United States with outlying populations in the high arctic. Several specimens are mapped and cited from areas adjacent to western Nebraska.

SCOTTS BLUFF County: Scotts Bluff National Monument, on rock, Wetmore 77544, 77549, 77621, 77655, 77696, 77710; SIOUX: Agate Fossil Beds National Monument, on rock, Wetmore 77856, 77871; 13 miles N of Mitchell, on rock, Wetmore 77743; Wildcat Hills State Recreation Area, 20 km S of Scottsbluff, on rock, Morgan and Egan 453.

Staurothele monicae (Zahlbr.) Wetmore

Thomson (1991) characterizes the North American populations as lichens of calcareous rocks in the interior western United States.

SCOTTS BLUFF County: Scotts Bluff National Monument, on rock, Wetmore 77553, 77570, 77667; SIOUX: Agate Fossil Beds National Monument, on rock, Wetmore 77945; 13 miles N of Mitchell, on rock, Wetmore 77749.

Stigmidium cerinae C. Roux & Triebel (Cole and Hawksworth 2001, p. 330).

Authors report this lichenicolous fungus from thalli of *Caloplaca trachyphylla* (Tuck.) Zahlbr. from Sioux County.

Strigula submuriformis (R. C. Harris) R. C. Harris

Harris (1973) cites records of this lichen from the northeastern United States, and it is known to occur at least as far west as Missouri. This is apparently the first report of this species from the Great Plains, and the genus *Strigula* is recorded here for this first time from Nebraska.

RICHARDSON County: Indian Cave State Park, on bark, Egan 11816 (MIN).

Thrombium epigaeum (Pers.) Wallr.

An inconspicuous lichen of silty or sandy soils scattered through the United States and southern Canada but apparently rare southward. Bird and Beil (1973) cite two Kiener collections from Dodge County, Nebraska.

DODGE County: NW of Fremont, on sandy soil, Kiener 13766; Sandpit Lakes, Fremont, on sandy soil, Kiener 13903, 16380.

****Toninia tristis*** (Th. Fr.) Th. Fr. subsp. ***asiae-centralis*** (H. Magn.) Timdal.

Griffin et al. (1995) makes a casual report of this species from Nebraska but cites no specimens, and this report was not included in Egan et al. (1995). This is a dark brown squamulose lichen with a North American range primarily in the Rocky Mountains and western high arctic.

BROWN County: Cheatum Ranch, 16 km NE of Ainsworth, on rock, Morgan and Egan 243; SIOUX: Agate Fossil Beds National Monument, on soil, Wetmore 77886.

****Trapeliopsis flexuosa*** (Fr.) Coppins & P. James

A widely distributed, often weedy, species of wood and conifer bark growing on trees, fallen logs, fence rails, weathered boards, and old shingles. The small, turgid, dark greenish gray sorediate areoles are distinctive.

BROWN County: Niobrara Valley Preserve, on decorticate *Populus* log, Ladd 16365; KEYA PAHA: Niobrara Valley Preserve, on shaded decorticate *Pinus ponderosa* log, Ladd 16423; THOMAS: Bessey Division of the Nebraska National Forest, 8 km SW of Halsey, on bark, Morgan 513; on rotten log, Morgan 516.

Usnea lapponica Vainio

This shrubby, sorediate "old man's beard" occurs on conifers in boreal regions in the Rocky Mountains, the Great Lakes region and eastward.

CHERRY County: Samuel R. McKelvie National Forest, 25 km S of Nenzel, on *Pinus*, Morgan and Egan 353; DAWES: Nebraska National Forest, 30 km SW of Chadron, on *Pinus*, Morgan and Egan 407; SCOTTS BLUFF: Wildcat Hills State Recreation Area, 20 km S of Scottsbluff, on *Pinus*, Morgan and Egan 482; Egan 13442; on bark, Egan 13463a.

Verrucaria calciseda DC.

A widespread lichen of calcareous rocks and rarely concrete, with a pale, continuous thallus and small, black perithecia etching pits in the substrate.

SIOUX County: Agate Fossil Beds National Monument, on rock, Wetmore 77841, 77903.

Verrucaria calkinsiana Servít

Another peritheciate lichen of calcareous substrates with a thin, dingy gray, somewhat scurfy thallus. The perithecia are larger than those of *V. calciseda* and do not form pits in the substrate.

KEYA PAHA County: Niobrara Valley Preserve, on face of friable caliche escarpment, Ladd 16442.

Verrucaria marmorea (Scop.) Arnold

An attractive and distinctive purplish crustose lichen on exposed calcareous rocks.

SCOTTS BLUFF County: Scotts Bluff National Monument, on rock, Wetmore 77459, 77591, 77606, 77677, 77709.

Verrucaria muralis Ach.

A widespread species of calcareous substrates with a whitish thallus and partially immersed perithecia.

GARDEN County: Ash Hollow, 22 miles NW of Ogallala, on rock, Wetmore 77403; SCOTTS BLUFF: Scotts Bluff National Monument, on rock, Wetmore 77458, 77470, 77573, 77613, 77681, 77691; SIOUX: Agate Fossil Beds National Monument, on rock, Wetmore 77742, 77879, 77943.

Vulpicida pinastri (Scop.) J.-E. Mattsson & M. J. Lai

This is the first report of the genus *Vulpicida* from Nebraska. So far *V. pinastri* has been found only in the two planted pine forest areas of the state, although it is common in the nearby Rocky Mountains and the Black Hills (Wetmore 1968; Brodo et al. 2001).

CHERRY County: Samuel R. McKelvie National Forest, 25 km S of Nenzel, on *Pinus*, Egan 13267; THOMAS: Bessey Division of the Nebraska National Forest, 3 miles W of Halsey, on *Pinus*, Egan 13484.

Xanthoparmelia lavicola (Gyelnik) Hale

Xanthoparmelia lavicola is the only species of *Xanthoparmelia* reported from Nebraska that produces psoromic acid. Thalli are isidiate with a pale brown lower cortex. According to Hale (1990), this species occurs from western North America southward.

SIOUX County: Agate Fossil Beds National Monument, on rock, Wetmore 77801.

Xanthoparmelia somloënsis (Gyelnik) Hale

This is primarily an eastern species of exposed siliceous rocks characterized by a pale lower cortex and the presence of salazinic acid. It is closely related to *X. coloradoensis* (Gyelnik) Hale, a species widespread in the Rocky Mountain west.

BROWN County: Niobrara Valley Preserve, on shaded quartzite boulder, Ladd 18245; SIOUX: Agate Fossil Beds National Monument, on rock, Wetmore 77820.

****Xanthoparmelia wyomingica*** (Gyelnik) Hale

Although similar to the more abundant *X. chlorochroa* (Tuck.) Hale, *X. wyomingica* can be distinguished by its narrower lobes that tend to spread and fatten at the tips rather than remain inrolled as in *X. chlorochroa*. Both species produce usnic and salazinic acids. The specimen cited below was growing mixed at this site with *X. chlorochroa*. However, I (Egan) have made mass collections of *X. chlorochroa* at other localities in western Nebraska that contained no material referable to *X. wyomingica*.

SIOUX County: 17 miles N of Scottsbluff on Route 71, on soil, Egan 13437A (OMA, MIN).

Xanthoria fulva (Hoffm.) Poelt & Petutschnig (Lindblom, 1997, p. 138).

Author reports this taxon from Saunders County. Most reports of *X. candelaria* (L.) Th. Fr. from Nebraska can be referred here.

Xanthoria hasseana Räsänen (Lindblom, 1997, p. 140).

The only specimen of this species cited from Nebraska was collected in Cherry County. Nebraska reports of *X. polycarpa* (Hoffm.) Rieber can be referred to this species or to *X. montana*.

Xanthoria montana L. Lindblom (Lindblom, 1997, p. 145).

Records in this paper are from extreme northwestern Nebraska, namely Dawes and Sioux counties.

Xanthoria ulophyllodes Räsänen (Lindblom, 1997, p. 164).

Unlike *X. montana*, primarily a western Rocky Mountain taxon, *X. ulophyllodes* is distributed in eastern Nebraska—reported from Nemaha County.

Key to the Species of *Xanthoria* in Nebraska

1. Thallus lacking soredia 2
1. Thallus sorediate 4
2. On rock ..... *X. elegans* (Link) Th. Fr.
2. On bark 3
3. Ascospores ellipsoid with a wide septum, 5–8 µm .. .. *X. hasseana*
3. Ascopores cylindrical to ellipsoid with a narrow septum, 1.5–3 µm ..... *X. montana*
4. On rock ..... *X. sorediata* (Vanio) Poelt
4. On bark 5
5. Lobes narrow, 0.3–0.5 mm, soredia on the lobe tips and lower edge; most common in eastern Nebraska ..... *X. fulva*
5. Lobes wider, 0.8–1.5 mm, soredia marginal or submarginal 6
6. Soredia marginal in crescent-shaped pockets or "bird nests" bordered by the upper and lower cortex; widespread but very common in central and western Nebraska .... *X. fallax* (Hepp) Arnold
6. Soredia from lobe margins or lower surface but lacking the split cortex "bird nests", lobes often raised; eastern Nebraska ..... *X. ulophyllodes*

ACKNOWLEDGMENTS

We thank the Nebraska Game and Parks Commission, U.S. Forest Service, The Nature Conservancy, the National Park Service, and Jan and Butch Cheatum for permission to collect lichen specimens in numerous natural areas across the state. Funding from the Biol-

ogy Department and the University Committee on Research, University of Nebraska at Omaha, is appreciated. We again acknowledge the assistance of colleagues for critical determinations or verifications: Teuvo Ahti, Irwin Brodo, Jack Elix, Theodore Esslinger, Richard Harris, Scott LaGreca, and Anders Nordin.

LITERATURE CITED

Bird, C. D., and C. E. Beil. 1973. *Thrombium epigaeum* (Pers.) Wallr. in North America. *Syesis* 6: 101–104.

Brodo, I. M. 1984. The North American species of the *Lecanora subfusca* group. *Beihefte zur Nova Hedwigia* 79: 63–185.

———. 1991. Studies in the lichen genus *Ochrolechia*. 2. Corticolous species of North America. *Canadian Journal of Botany* 69: 733–772.

———, S. D. Sharnoff, and S. Sharnoff. 2001. *Lichens of North America*. New Haven, Yale University Press: 795 pp.

Cole, M. S., and D. L. Hawksworth. 2001. Lichenicolous fungi, mainly from the USA, including *Patriciomyces* gen. nov. *Mycotaxon* 77: 305–338.

Egan, R. S., R. Witt, Y. E. Peck, J. P. Goeden, and T. L. Cherney. 1995. A preliminary catalog of the lichen-forming fungi of Nebraska. *Transactions of the Nebraska Academy of Sciences* 22: 13–25.

Esslinger, T. L. 1978. Studies in the lichen family Physciaceae. II. The genus *Phaeophyscia* in North America. *Mycotaxon* 7: 283–320.

———. 1994. New species and new combinations in the lichen genus *Physconia* in North America. *Mycotaxon* 51: 91–99.

———. 2001. *A cumulative checklist for the lichen-forming lichenicolous, and allied fungi of the continental United States and Canada*. Retrieved on November 1, 2001 from the World Wide Web at http://www.ndsu.nodak.edu/instruct/esslinge/chcklst/chcklst7.htm

Griffin III, D., R. C. Harris, and W. R. Buck. 1995. The bryophytes and lichens of Rock Hill Preserve, Florida. *Evansia* 12: 31–39.

Hale, M. E., Jr. 1969. *How to Know the Lichens*. Dubuque, Iowa, Wm. C. Brown: 226 pp.

———. 1979. *How to Know the Lichens*. Second Edition. Dubuque, Iowa, Wm. C. Brown: 246 pp.

———. 1990. A synopsis of the lichen genus *Xanthoparmelia* (Vainio) Hale (Ascomycotina, Parmeliaceae). *Smithsonian Contributions to Botany* 74: 1–250.

Harris, R. C. 1973. The corticolous pyrenolichens of the Great Lakes region. *Michigan Botanist* 12: 3–68.

Kaul, R. B., G. E. Kantak, and S. P. Churchill. 1988. The Niobrara River Valley, a postglacial migration corridor and refugium of forest plants and animals in the grasslands of central North America. *Botanical Review* 54: 44–81.

LaGreca, S., and H. T. Lumbsch. 2001. Three species of *Lecanora* new to North America, with notes on other poorly known lecanoroid lichens. *Bryologist* 104: 204–211.

Lindblom, L. 1997. The genus *Xanthoria* (Fr.) Th. Fr. in North America. *Journal of the Hattori Botanical Laboratory* 83: 75–172.

Magnusson, A. H. 1934. On the species of *Biatorella* and *Sarcogyne* in America. *Annales de Cryptogamie Exotique* 70: 115–145.

McCune, B., and L. Geiser. 1997. *Macrolichens of the Pacific Northwest*. Corvallis, Oregon State University Press: 386 pp.

Nordin, A. 1999. *Buellia* species with pluriseptate spores. New and unrecorded species in North America. *Bryologist* 102: 249–264.

Sheard, J. W., and P. F. May. 1997. A synopsis of the species of *Amandinea* (lichenized Ascomycetes, Physciaceae) as presently known in North America. *Bryologist* 100: 159–169.

Thomson, J. W. 1991. The lichen genus *Staurothele* in North America. *Bryologist* 94: 351–367.

Wetmore, C. M. 1968. Lichens of the Black Hills of South Dakota and Wyoming. *Publications of the Museum, Michigan State University* 3: 209–464.

———. 2001. The *Caloplaca citrina* group in North and Central America. *Bryologist* 104: 1–11.

———, and I. Kärnefelt. 1998. The lobate and subfruticose species of *Caloplaca* in North America. *Bryologist* 101: 230–255.

———, and ———. 1999. What is *Caloplaca cinnabarina*? *Bryologist* 102: 683–691.