

SURVEY OF LICHENS ON THE MINESITE AREA

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Prepared by

Clifford Wetmore

Botany Department

University of Minnesota

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The purpose of this study was to collect and identify all species of lichens on all of the vegetation plots in the Minesite study area and prepare species lists based on these collections. Field work was done 7-17 June and 7-12 September, 1977 and about 2200 collections were made. Of these, 2137 have been identified and are included in the following discussion. There are 62 genera, 236 species, and 4 varieties represented. Voucher specimens of all records have been deposited in the University of Minnesota Herbarium.

Each of the 48 "G" plots was thoroughly examined and all lichen species found in each plot were collected but no attempt was made to collect the same species on every substrate within the plot. All possible substrates were studied within each plot even though this may have contributed to more heterogeneity within the plot than was originally intended. For example, a plot that was laid out to sample a middle age red pine plantation had a few quaking aspens in one corner and the lichens on these aspens were collected even though these species were not found on the pines. Likewise, a single rock in a bog plot had several species which only occur on rock and would not be typical of rock-free bogs.

All collections were brought into the lab, pressed if necessary, packeted and identified. Labels were printed for each plot giving location, date of collection and plot number. The lichen names and collection numbers were typed on the printed labels and computer cards punched for each collection. The label data were added to the computerized lichen data base being maintained at the University of Minnesota Herbarium. After correcting any detected errors in the computerized data, parts of this report were generated directly from the data base by computer printout. These lists are enumerated below and have been previously submitted so they are not attached to this report. The voucher specimens for this study are so indicated on the specimen labels and

in the data base. As these lichens are studied over the years and annotated by monographers the computer data base will be updated so at any time in the future an accurate current list can be obtained.

There are some groups of lichens that are being sent to monographers for identification. This is specially true of the genus Pertusaria, some species of Rhizocarpon, Lecidea, Bryoria, Lecanora and Micarea. These unidentified lichens are not included in any of the following lists but will be added to the data base as names become available.

The following notes about some of the plots might be useful in interpreting the plot species lists.

G01 Most of the lichens were on the old trees, logs or branches.

G02 One mound of rock was found in this plot. Many of the fruticose lichens (Bryoria, Evernia, Usnea) were mostly dead or had some regrowth. This is most likely due to the series of very dry years in which this bog became too dry for these lichens and is not due to any rapid decrease in air quality.

G03 There were a few Thuja in this plot with lichens not found on the other vegetation.

G04 The underbrush was very dense in this plot. Less than the usual time was spent here so some lichens probably were missed.

G05 This plot was somewhat disturbed and had some rock outcrops.

G06 The fruticose lichens here (Bryoria, Evernia, Usnea) and the Hypogymnia were in poor condition or dead. See notes under G02.

G07 There were no lichens on the young saplings. The only lichens were on the few older trees and wood.

G08 There were only a few lichens on the young quaking aspens - most lichens were on the old logs and dead snags.

- G09 There were some rocks, alders and standing water in this plot.
- G10 This very thick stand of young quaking aspen had no lichens on the young trees. All lichens found came from old logs and some on the soil.
- G11 This area was cut and burned clean and only one remaining pine snag had any lichens at all. In some of the lightly burned areas a few lichens were found on the soil and rocks.
- G12 This plot also had some balsam fir and other trees and rocks.
- G13 This plot had lots of bare soil and some relict trees.
- G14 There are several rock outcrops in this plot.
- G15 There were a few rocks in this plot.
- G16 There were a few very small lichens in the jack pines but most of the lichens were found on the older trees in the area.
- G17 --
- G18 The best lichen collecting was on the few clumps of Thuja and on the old willows or on old stumps.
- G19 The windrows of old logs contained most of the lichens found here. These lichens are usually only found in older forests.
- G20 Some underbrush and scattered white birch and quaking aspen were present.
- G21 A fairly open stand with some white birch.
- G22 This plot was quite rocky and had windrows of logs with some lichens on the logs. No lichens were found on the young planted pines.
- G23 Scattered old rotting stumps and some quaking aspen were found in this plot adding to the lichen diversity.
- G24 There were some quaking aspens on one side of the plot and some old pine stumps.
- G25 Many lichens typical of more moist locations were found on the rock outcrops and several lichens on the alders in part of this plot make this a very heterogeneous plot.

- G26 The bog area and rock outcrops added some species to this plot.
- G27 This mature jack pine stand had a lot of brush understory.
- G28 This wet boggy area had been cut and burned and only some of the most common lichens were left.
- G29 The only lichens found here were on the rocks in the grassland and on the two big old white spruce trees. No lichens were in the dense grass.
- G30 This plot had little underbrush and some old quaking aspen.
- G31 There were some Thuja on one side of the plot. The lichens were in fairly good condition with some exceptions.
- G32 --
- G33 Some rocks were found in this plot.
- G34 This plot was wet and boggy with windrows of old logs. Most of the lichens were found on the bare soil.
- G35 Some mature red maple trees had many lichens but few lichens were found on the planted spruce. Some lichens were found on the old white birch and many lichens were on the bare ground.
- G36 Lichens were more abundant in the more open areas on the willows and tree tops. Some young quaking aspen were also present.
- G37 The basal logs of the fir, pine and spruce were gone but the tops of all trees and the entire quaking aspen logs were left. Most of the lichens on the cut tops were still in good condition (6 months after lumbering?) but almost all of the soil and rock lichens were gone due to the lumbering operations, or almost dead due to removal of the tree cover. There were no standing trees and all collections came from cut trees and branches.

- G38 This plot had a few ash bogs in the low areas, moderate underbrush and some rocks. Most of the lichens found on the tops of the trees in the cut area (G37) were also found on the trunks in this plot. Many more species were found in this plot on the undisturbed tree trunks and on the ground.
- G39 This plot included a small patch of mature quaking aspen.
- G40 There were some standing basswood trees and a lot of tree tops.
- G41 This plot also included a few balsam fir, old pine stumps and some quaking aspen.
- G42 Some red maple, balsam fir and quaking aspen were also here and some rocks. A very shady plot.
- G43 This bog was somewhat drier and more shady than G46 and had few natural openings.
- G44 There were many plants of a few species of lichens here but most of the lichens were small and most of the large ones were in poor condition and partly dead.
- G45 The lichens were in fairly good condition but some were dead.
- G46 This plot was the best for lichens of all the plots studied. There was no evidence of damage to the lichens. More rare species were found here than at any other single locality. G43 just across the river was similar to this but not as good. This plot had lots of constant water, some natural openings and fairly old trees.
- G47 --
- G48 Most of the lichens were on the ash and willow and only a few on the bases of older alder.

Table 1 lists the rare species found in the plots but only includes the identified species. A lichen was considered rare if it was found in only one or two plots. The table lists the species and the plots where they were found.

Table 1

Rare lichens in CUNI study area

A list of lichen species found in only one or two plots.

<u>Arthonia radiata</u>	G38 (twice)
<u>Bacidia atrogrisea</u>	G15 (twice)
<u>Bacidia naegelii</u>	G38
<u>Bacidia sabuletorum</u>	G21
<u>Bacidia schweinitzii</u>	G46 (twice)
<u>Biatorrella microhaema</u>	G14
<u>Buellia schaereri</u>	G35
<u>Calicium glaucellum</u>	G03
<u>Calicium parvum</u>	G03
<u>Caloplaca arenaria</u>	G29
<u>Caloplaca flavorubescens</u>	G18
<u>Candelaria concolor</u>	G19, G40
<u>Candelaria fibrosa</u>	G37
<u>Cetraria aurescens</u>	G43, G46
<u>Cetraria orbata</u>	G28, G45
<u>Cetraria sepincola</u>	G31, G45
<u>Cetrelia chicitae</u>	G23, G46
<u>Chaenotheca ferruginea</u>	G38, G43
<u>Chaenotheca laevigata</u>	G46

<u>Chaenotheca trichialis</u>	G43, G46
<u>Chaenothecopsis debilis</u>	G03, G06
<u>Cladonia arbuscula</u>	G41
<u>Cladonia caespiticia</u>	G42
<u>Cladonia cornuta</u>	G36
<u>Cladonia cylindrica</u>	G10, G41
<u>Cladonia farinacea</u>	G25
<u>Cladonia gonecha</u>	G26
<u>Cladonia macilenta</u>	G41
<u>Cladonia stellaris</u>	G05, G25
<u>Collema nigrescens</u>	G19
<u>Cyphelium lucidum</u>	G04
<u>Cyphelium tigillare</u>	G18
<u>Dimerella lutea</u>	G03, G35
<u>Lasallia papulosa</u>	G39
<u>Lecanora caesiocinerea</u>	G07, G11
<u>Lecidea erratica</u>	G19, G34
<u>Lecidea plebeja</u>	G39
<u>Lecidea vernalis</u>	G15
<u>Lepraria neglecta</u>	G14
<u>Leptogium hirsutum</u>	G08
<u>Leptogium saturninum</u>	G38
<u>Leptogium tenuissimum</u>	G24, G37
<u>Lobaria pulmonaria</u>	G15, G35
<u>Lopadium pezizoideum</u>	G43, G46
<u>Melanomma sp.</u>	G12
<u>Micarea violacea</u>	G43 (twice)

<u>Nephroma bellum</u>	G08
<u>Nephroma helveticum</u>	G39
<u>Pachyphiale fagicola</u>	G19
<u>Pannaria pityrea</u>	G43, G46 (twice each)
<u>Parmelia aurulenta</u>	G33
<u>Parmelia fraudans</u>	G09
<u>Parmelia infumata</u>	G26
<u>Parmelia plittii</u>	G05, G26
<u>Parmelia revoluta</u>	G46
<u>Parmelia trabeculata</u>	G12
<u>Peltigera evansiana</u>	G39 (twice), G42
<u>Peltigera horizontalis</u>	G05
<u>Peltigera lepidophora</u>	G26
<u>Pertusaria amara</u>	G43, G46
<u>Phaeocalicium polyporaenum</u>	G12
<u>Physcia dubia</u>	G05
<u>Physcia phaea</u>	G33, G39
<u>Physcia setosa</u>	G37, G46
<u>Physcia subtilis</u>	G05
<u>Rhizocarpon petraeum</u>	G14, G21 (twice each)
<u>Rinodina adirondackii</u>	G47
<u>Rinodina archaea</u>	G43
<u>Sphinctrina microcephala</u>	G03
<u>Spilonema revertens</u>	G25, G26
<u>Strigula stigmatella</u>	G43 (twice)
<u>Thrombium epigaeum</u>	G19, G34
<u>Xylographa abietina</u>	G01

Table 2 lists the plots where the rare species were found arranged by number of rare species per plot.

Table 3 lists the plots where only a single collection of a species was found in the total study area. These are arranged in order of number of rare species per plot.

Table 2

Plots with rare lichens arranged by decreasing numbers of rare species per plot. (A rare species was one found only once or twice in the entire study area).

Number of rare species per plot	Plot numbers
10	G46
8	G43
5	G03, G19, G26, G39
4	G05, G38
3	G12, G14, G15, G35, G37, G41
2	G08, G18, G21, G33, G34, G42, G45
1	G01, G04, G06, G07, G09, G10, G11, G23, G24, G28, G29, G31, G36, G40, G47

Table 3

Plots with rare lichens arranged by decreasing numbers of rare species per plot. (These species were only found once in the whole study area).

Number of rare species per plot	Plot numbers
3	G03, G05, G12, G19, G26, G38, G39, G43, G46
2	G08, G14, G15, G18, G41
1	G01, G04, G09, G21, G25, G29, G33, G36, G37, G40, G42, G47

These rare species may be rare for various reasons. Some species are range extensions of known distributions (Parmelia revoluta, Xylographa abietina) some species are rare because of scarcity of suitable substrates in the plots (Physcia dubia, Parmelia plittii, Thrombium epigaeum) but are not rare in northern Minnesota. Other species appear rare because few plots were in the proper vegetation types (plots with good ash bogs or good rock outcrops). Other species were rarely collected because they are minute lichens not easily seen in the field (Pachyphiale fagicola, Biatorrella microhaema, some Calicium species and Chaenotheca species), and other species are always rare throughout their range in North America (Parmelia trabeculata, Cetraria aurescens, Lepraria neglecta).

Table 4 lists all species found on the plots in the study area with the authorities for each.

Table 4

Lichen species list for CUNI vegetation plots

- Acarospora fuscata (Schrad.) Arn.
- Actinogyra muehlenbergii (Ach.) Schol.
- Arthonia caesia (Flot.) Korb.
- A. patellulata Nyl.
- A. radiata (Pers.) Ach.
- Bacidia atrogrisea (Del.) Korb.
- B. chlorococca (Graewe ex Stizenb.) Lett.
- B. epixanthoides (Nyl.) Lett.
- B. fuscorubella (Hoffm.) Bausch
- B. naegelii (Hepp) Zahlbr.
- B. sabuletorum (Schreb.) Lett.
- B. schweinitzii (Tuck.) Schneid.

- Biatorella microhaema Norm.
B. resinae (Fr.) Th.Fr.
Bryoria furcellata (Fr.) Brodo & Hawksw.
B. trichodes (Michx.) Brodo & Hawksw.
Buellia arnoldii Serv. & Nadv.
B. schaereri De Not.
B. stillingiana J. Stein.
Calicium abietinum Pers.
C. glaucellum Ach.
C. parvum Tibell
C. salicinum Pers.
C. trabinellum (Ach.) Ach.
Caloplaca arenaria (Pers.) Mull. Arg.
C. cerina (Ehrh.) Th. Fr.
C. chrysophthalma Degel.
C. flavorubescens (Huds.) Laund.
C. holocarpa (Hoffm.) Wade
C. ulmorum (Fink) Fink
Candelaria concolor (Dicks.) B. Stein.
C. fibrosa (Fr.) Mull. Arg.
Candelariella efflorescens Harris
C. vitellina (Ehrh.) Mull. Arg.
Cetraria aurescens Tuck.
C. halei W. Culb. & C. Culb.
C. orbata (Nyl.) Fink
C. pinastri (Scop.) S. Gray
C. sepincola (Ehrh.) Ach.

- Cetrelia chicitae (W. Culb.) W. Culb. & C. Culb.
Chaenotheca brunneola (Ach.) Mull. Arg.
C. chrysocephala (Turn.) Th. Fr.
C. ferruginea (Turn. & Borr.) Mig.
C. laevigata Nadv.
C. trichialis (Ach.) Th. Fr.
Chaenothecopsis debilis (Turn. & Borr. in Schaer.) Tibell
Cladonia amaurocraea (Flk.) Schaer.
C. arbuscula (Wallr.) Rabenh.
C. bacillaris Nyl.
C. botrytes (Hag.) Willd.
C. caespiticia (Pers.) Florke
C. cariosa (Ach.) Spreng.
C. cenotea (Ach.) Schaer.
C. chlorophaea (Flk. ex Somm.) Spreng.
C. coccifera (L.) Willd.
C. coniocraea (Flk.) Spreng.
C. conista (Ach.) Robb.
C. cornuta (L.) Hoffm.
C. crispata (Ach.) Flot.
C. cylindrica (Evans) Evans
C. deformis (L.) Hoffm.
C. digitata (L.) Hoffm.
C. farinacea (Vain.) Evans
C. fimbriata (L.) Fr.
C. furcata (Huds.) Schrad.
C. gonecha (Ach.) Asah.

- Cladonia gracilis (L.) Willd.
C. grayi Merr. ex Sandst.
C. macilenta Hoffm.
C. merochlorophaea Asah.
C. mitis Sandst.
C. multiformis Merr.
C. parasitica (Hoffm.) Hoffm.
C. phyllophora Hoffm.
C. pityrea (Florke) Fr.
C. pleurota (Florke) Schaer.
C. pyxidata (L.) Hoffm.
C. rangiferina (L.) Wigg.
C. rei Schaer.
C. scabriuscula (Del. ex Duby) Nyl.
C. squamosa (Scop.) Hoffm.
C. stellaris (Opiz.) Pouz. & Vezda
C. subulata (L.) Wigg.
C. turgida (Ehrh.) Hoffm.
C. uncialis (L.) Wigg.
C. verticillata (Hoffm.) Schaer.
Collema conglomeratum Hoffm.
C. nigrescens (Huds.) DC.
C. subflaccidum Dege1.
Cyphelium lucidum (Th. Fr.) Th. Fr.
C. tigillare (Ach.) Ach.
Dimerella lutea (Dicks.) Trev.
Diploschistes scruposus (Schreb.) Norm.

- Evernia mesomorpha Nyl.
Heterodermia speciosa (Wulf.) Trev.
Hypogymnia physodes (L.) W. Wats.
H. tubulosa (Schaer.) Hav.
Lasallia papulosa (Ach.) Llano
Lecanora allophana Nyl.
L. caesiocinerea Nyl.
L. chlarona (Ach.) Nyl.
L. cinerea (L.) Somm.
L. coilocarpa (Ach.) Nyl.
L. impudens Degel.
L. meridionalis Magn.
L. pallida var. rubescens Imsh. & Brodo
L. polytropa (Ehrh.) Rabenh.
L. rugosella Zahlbr.
L. subfusca (L.) Ach.
L. symmictera Nyl.
L. thysanophora Harris
L. urceolaria Wetm.
Lecidea anthracophila Nyl.
L. elabens Fr.
L. erratica Korb.
L. friesii Ach.
L. glomerulosa (DC.) Steud.
L. granulosa (Ehrh.) Ach.
L. helvola (Korb.) Oliv.
L. macrocarpa (DC.) Steud.

- Lecidea nylanderi (Anzi) Th. Fr.
L. oligotropha Laund.
L. plana Lahm ex Korb.
L. plebeja Nyl.
L. scalaris (Ach.) Ach.
L. uliginosa (Schrad.) Ach.
L. vernalis (L.) Ach.
Lepraria finkii (Hue) Harris
L. neglecta (Nyl.) Lett.
Leptogium cyanescens (Ach.) Korb.
L. hirsutum Sierk
L. saturninum (Dicks.) Nyl.
L. tenuissimum (Dicks.) Fr.
Leptorhaphis contorta Degel.
L. epidermidis (Ach.) Th. Fr.
Lobaria pulmonaria (L.) Hoffm.
Lopadium pezizoideum (Ach.) Korb.
Melanomma sp.
Micarea melaena (Nyl.) Hedl.
M. violacea Hedl.
Mycocalicium compressulum (Vain.) Szat.
M. subtile (Pers.) Szat.
Mycoblastus sanguinarius (L.) Norm.
Nephroma bellum (Spreng.) Tuck.
N. helveticum Ach.
N. parile (Ach.) Ach.
N. resupinatum (L.) Ach.

Ochrolechia androgyna (Hoffm.) Arn.

O. rosella (Tuck.) Vers.

Pachyphiale fagicola (Hepp) Zw.

Pannaria pityrea (DC.) Degel.

Parmelia aurulenta Tuck.

P. caperata (L.) Ach.

P. conspersa (Ach.) Ach.

P. cumberlandia (Gyeln.) Hale

P. exasperata De Not.

P. exasperatula Nyl.

P. flaventior Stirt.

P. fraudans Nyl.

P. galbina Ach.

P. infumata Nyl.

P. olivacea (L.) Ach.

P. plittii Gyeln.

P. revoluta Florke

P. rudecta Ach.

P. septentrionalis (Lynge) Ahti

P. solediosa Almb.

P. squarrosa Hale

P. subaurifera Nyl.

P. subrudecta Nyl.

P. sulcata Tayl.

P. taractica Kremp.

P. trabeculata Ahti

P. ulophyllodes (Vain.) Sav.

Parmeliopsis aleurites (Ach.) Nyl.

P. capitata Harris

P. hyperopta (Ach.) Arn.

P. placorodia (Ach.) Nyl.

Peltigera apthosa (L.) Willd.

P. canina (L.) Willd.

P. canina var. praetextata (Flk. in Somm.) Hue

P. canina var. rufescens (Weiss) Mudd

P. canina var. spuria (Ach.) Schaer.

P. elisabethae Gyeln.

P. evansiana Gyeln.

P. horizontalis (Huds.) Baumg.

P. horiz-poly = horizontalis or polydactyla

P. lepidophora (Nyl.) Vain.

P. neckeri (not yet described)

P. polydactyla (Neck.) Hoffm.

Pertusaria amara (Ach.) Nyl.

Phaeocalicium polyporaem (Nyl.)

P. populneum (Brond ex Duby) Schmidt

Phlyctis argena (Ach.) Flot.

Physcia adscendens (Th. Fr.) Oliv.

P. aipolia (Ehrh.) Hampe

P. caesia (Hoffm.) Hampe

P. dubia (Hoffm.) Lett.

P. grisea (Lam.) Zahlbr.

P. luganensis Meresch.

P. orbicularis (Neck.) Poetsch

Physcia phaea (Tuck.) Thoms.
P. pusilloides Zahlbr.
P. setosa (Ach.) Nyl.
P. stellaris (L.) Nyl.
P. subtilis Degel.
P. teretiuscula (Ach.) Lynge
Platismatia tuckermanii (Oakes) W. Culb. & C. Culb.
Polyblastiopsis fallaciosa (Stizenb.) Zahlbr.
Pseudevernia consocians (Vain.) Hale & Culb.
Ramalina dilacerata (Hoffm.) Vain.
R. fastigiata (Pers.) Ach.
R. intermedia (Del. ex Nyl.) Nyl.
R. sinensis Jatta
Rhizocarpon grande (Flk. ex Flot.) Arn.
R. obscuratum (Ach.) Massal.
R. petraeum (Wulf.) Massal.
Rinodina adirondackii Magn.
R. archaea (Ach.) Massal.
R. dakotensis Magn.
R. exigua (Ach.) S. Gray
Sphinctrina microcephala Korb.
Spilonema revertens Nyl.
Stenocybe major Nyl.
S. pullatula (Ach.) B. Stein
Stereocaulon paschale (L.) Hoffm.
S. saxatile Magn.
S. tomentosum Fr.
Strigula stigmatella (Ach.) Harris

Thrombium epigaeum (Pers.) Wallr.

Umbilicaria deusta (L.) Baumg.

Usnea cavernosa Tuck.

U. dasypoga (Ach.) Rohl.

U. fulvoreaegens (Ras.) Ras.

U. hirta (L.) Wigg.

U. subfloridana Stirt.

Xanthoria fallax (Hepp) Arn.

X. polycarpa (Ehrh.) Oliv.

Xylographa abietina (Pers.) Zahlbr.

The computer generated plot species lists give all species found in each plot with the total number of species per plot at the end of each list. The plots are listed in numerical order.

The computer generated species maps give a graphic presentation of the occurrence of each species in the plots. A plastic overlay can be used with these maps to identify plot numbers or to overlay vegetation types for comparison of distributions. In some plots more than one collection of a given species was made so the total number of collections will not always be the same as the number of plots with that species.

One computer print out lists the lichens species and the recorded substrates on which that lichen was found in the plots. The species lists are in two sections and the species are alphabetical with plots arranged in numerical order within each species. Substrates were not recorded for some lichens that grow on the ground or when part of the substrate (part of the rock) is evident in the packet.

One set of printouts lists all recorded substrates within each plot regardless of lichen species. This list is also in two parts and lists the plots in numerical order and the recorded substrates alphabetically within each plot.

There have been changes in the names of some common lichens that occur in our area and the following list gives the more important changes arranged by their older names with the correct names on the right.

<u>Alectoria</u>	all brown species here are now <u>Bryoria</u>
<u>Alectoria nidulifera</u>	<u>Bryoria furcellata</u>
<u>Anaptychia speciosa</u>	<u>Heterodermia speciosa</u>
<u>Caloplaca aurantiaca</u>	<u>Caloplaca flavorubescens</u>
<u>Caloplaca lamprocheila</u>	<u>Caloplaca arenaria</u>
<u>Cladina</u>	<u>Cladonia</u> subgenus <u>Cladina</u>
<u>Cladonia nemoxyna</u>	<u>Cladonia rei</u>
<u>Cladonia alpestris</u>	<u>Cladonia stellaris</u>
<u>Cladonia sylvatica</u>	<u>Cladonia arbuscula</u>
<u>Collema subfurvum</u>	<u>Collema subflaccidum</u>
<u>Crocynia</u>	<u>Lepraria</u>
<u>Mycocalicium parietinum</u>	<u>Mycocalicium subtile</u>
<u>Pannaria microphylla</u>	<u>Pannaria leucophaea</u>
<u>Ramalina minuscula</u>	<u>Ramalina dilacerata</u>
<u>Usnea barbata</u>	various <u>Usnea</u> species
<u>Usnea comosa</u>	<u>Usnea subfloridana</u>
<u>Usnea sorediifera</u>	<u>Usnea fulvovireagens</u>
<u>Usnea trichodea</u>	misidentification, mostly <u>Usnea cavernosa</u>

Concluding remarks. My general impression of the lichens of the study area are that they are typical of most of the northern part of the state. There does not seem to be much that is unique there that could not be found in other areas. The rare species found in this study could probably be found in other localities in similar habitats. As is evident from this report, the most interesting areas are the cedar swamps. Old, undisturbed cedar swamps have more noteworthy lichens than any other habitat. Areas that have been cut and burned have the least lichens and will take the longest time to become repopulated with lichens. The rock outcrop habitat was missing from these studies and would have been interesting since a whole group of lichens grow on such rocks and nowhere else.

Since the label data from these collections is a part of the permanent computerized data base which is maintained at the herbarium, these records will be kept current. More copies of the printouts provided for this report (or any others) can be obtained at any time. Inquiries should be directed to the author. As mentioned above, one copy of each of the computer printouts has been sent in ahead of this report and is not duplicated here.