

X. Statistics and Distribution of North American Lichens

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AN attempt at presenting the statistics and the geographical distribution of the Lichens of North America, must necessarily be imperfect, owing to the fact that but a small portion of the continent has been thoroughly explored in search of Lichens; so that new species may be expected to occur, even in the more familiar districts, while considerable accessions to our knowledge may be expected in those which have, as yet, been hardly visited by the Lichenist. The present attempt, therefore, is offered only as an approximation to exactness.

In my "List of North American Lichens" as known at the commencement of 1872, there were enumerated 808 species and subspecies, some being ranked as species, which will hereafter, probably, be reduced to varieties. The additions and corrections since made to that list (which are given in an Appendix to this paper) swell the total to 823, subject to the same reservation in regard to species and varieties. This estimate does not include a considerable number of species collected but not described or published; with the addition of these and other discoveries which may be made, the whole number of North American Lichens may finally reach between 850 and 900; the whole number of Lichens at present known and described being from 1,500 to 2,000, and of Lichens occurring in Europe, about 700. New species are being constantly published, but the title of many of them to rank as such may well be doubted, as it depends to a great extent, on minute chemical differences, as to the value of which Lichenists are not agreed.

Of the five Tribes into which Lichens are divided, according to the arrangement of Professor Tuckerman in his "Genera Lichenum,"

which is that followed in this paper, the Parmeliacei contain in North America, 38 Genera and 411 species; the Lecideacei, 10 Genera and 218 species; the Graphidacei, 11 Genera and 79 species; the Caliciacei, 3 Genera and 40 species; the Verrucariacei, 10 Genera and 75 species. Of the 18 families into which these five tribes are divided, the Usneei contain 7 Genera and 67 species; Parmeliei, 5 Genera and 52 species; Umbilicariei, 1 Genus and 21 species; Peltigerei, 5 Genera and 38 species; Pannariei, 2 Genera and 27 species; Collemei, two sub-families, 7 Genera and 68 species; Lecanorei, three sub-families, 12 Genera (including Myriangium) and 412 species; Cladoniei, 3 Genera and 57 species; Coenogonii, 2 Genera and 3 species; Lecideei, three sub-families, 5 Genera and 217 species; Lecanactidei, 3 Genera and 8 species; Opegraphi, 3 Genera and 31 species; Glyphydei, 2 Genera and 3 species; Arthoniei, 3 Genera and 79 species; Sphaerophorei, 3 Genera and 6 species; Caliciei, 3 Genera and 40 species; Endocarpei, 2 Genera and 10 species; Verrucariei, three sub-families, 8 Genera and 75 species.

The geographical distribution of the species is shown in the following table. In the first column is shown the number of species and sub-species in each genus; in that marked *N.*, the number of Northern species; *S.*, of Southern species, including the territory south of Pennsylvania, the Ohio river, and thence west to the Southern boundary of California; *G.*, species more or less widely distributed in both of these regions; *W.*, species occurring only west of the Mississippi, and north of the column indicated by *S.* (including also a few Arctic species as hereafter noted); *Alp.*, Alpine and sub-Alpine species; *Arc.*, Arctic species; *Tr.*, Tropical and sub-Tropical species; *N. Am.*, species peculiar to North America; *Eu.*, species occurring also in Europe; *N. E.*, species occurring in New England.

	No. Sp.	N.	S.	G.	W.	Alp.	Arc.	Tr.	N. Am.	Eu.	N. E.
I.											
1. Roccella,	2	1	1		1					1	
2. Ramalina,	24	10	12	2	6	1		10	10	5	3
3. Dactylina,	3	3			1	1	2		2	1	
4. Cetraria,	20	16		4	3	5	3		4	14	14
5. Evernia,	5	3	1	1	2	2		1		4	2
6. Usnea,	6	1		5			1			2	5
7. Alectoria,	6	4	1	1	1	3	3	1		6	3
8. Speerschneidera, .	1		1					1	1		
9. Theloschistes,	3			3						3	3
10. Parmelia,	34	12	6	16	3	6	4	6	9	20	19
11. Physcia,	13	6	3	4	1			3	4	7	8
12. Pyxine,	1			1							1
13. Umbilicaria,	21	16		5	5	10	3		7	12	10
14. Sticta,	23	5	12	6				12	3	11	7
15. Nephroma,	4	1	1	2		1		1	1	3	3
16. Peltigera,	8	3	1	4		1		1		7	7
17. Erioderma,	1		1					1	1		
18. Solorina,	2	2					1			2	1
19. Heppia,	1			1						1	1
20. Pannaria,	26	11	5	10	2	1	3	3	7	16	16
21. Ephebe,	3	1	1	1				1	2	1	2
22. Lichina,	1	1							1		1
23. Synalissa,	8	5	2	1				1	4	3	4
24. Omphalaria,	4	1	3					2	2	2	1
25. Collema,	28	11	5	12			1	3	13	13	11
26. Leptogium,	23	7	8	8	3		1	7	8	12	12
27. Hydrothyria,	1			1					1		1
28. Placodium,	28	16	3	9	10	4	5	3	13	15	10
29. Lecanora,	52	33	5	14	15	12	5	5	14	34	21
30. Rinodina,	12	8		4	1	2	2		4	7	7
31. Pertusaria,	18	9	2	7	1	1	5	2	5	11	7
32. Phlyctis,	1	1								1	
33. Conotrema,	1			1						1	1
34. Gyalecta,	9	5	1	3	1		1	1	2	7	7
35. Urceolaria,	2			2						2	2
36. Thelotrema,	14		12	2				12	4	2	2
37. Gyrostomum,	1		1					1			
38. Myriangium,	1			1						1	1
II.											
39. Stereocaulon,	14	8	5	1	1	5	1	5	5	5	7
40. Pilophorus,	1	1				1				1	1
41. Cladonia,	36	18	7	14		8	1	6	10	25	26
42. Coenogonium,	2		2					2			
43. Cystocoleus,	1		1					1			
44. Baeomyces,	6	2	2	2		2		1		5	4
45. Biatora,	67	39	10	18	12	6	10	10	13	47	35
46. Heterothecium, ...	10	2	6	2		1		6	1	4	3
47. Lecidea,	43	38		5	10	20	11		7	36	21
48. Buellia,	38	32		6	11	4	7		17	21	8

	No. Sp.	N.	S.	G.	W.	Alp.	Arc.	Tr.	N. Am.	Eu.	N. E.
III.											
49. Lecanactis,	2	1	1		1	1				2	1
50. Platygrapha,	4	2	2		1			2	2	1	1
51. Melaspilea,	2	1	1					1	2		1
52. Opegrapha,	12	3	5	4				3	6	4	7
53. Xylographa,	3	3				1			2	1	3
54. Graphis,	17	1	14	2				12	2	3	3
55. Chiodecton,	2		2					2			
56. Glyphis,	1		1					1			
57. Arthonia,	34	13	12	9	2	3	1	12	15	15	17
58. Mycoporum,	1			1							1
59. Agyrium,	1	1								1	1
IV.											
60. Siphula,	2	2			2		2		1	1	
61. Sphaerophorus, ...	3	3				3				3	2
62. Acroscyphus,	1		1					1			
63. Acolium,	8	6	2		4	1		2	4	3	2
64. Calicium,	23	14	2	7	1	2		1	5	20	19
65. Coniocybe,	3	2		1					1	2	3
V.											
66. Endocarpon,	8	2	2	2	2	1			2	6	4
67. Normandina,	2	1		1						2	2
68. Segestria,	2	1	1					1		1	1
69. Staurothele,	4	3		1					3	1	2
70. Trypethelium, ...	9		8	1				8	2		1
71. Sagedia,	5	1	1	3				1	2	3	4
72. Verrucaria,	20	14		6		3	1		5	15	10
73. Pyrenula,	21	4	12	5			1	11	5	8	8
74. Pyrenastrum,	2		2					2	1		
75. Strigula,	2		2					2	1		
	823	410	190	222	103	112	75	171	236	363	399

An interesting feature of our Lichen Flora, is the fact that a number of species which occur in Europe, have as yet been found only in the western portion of North America, from Nebraska to the Pacific, only a few of which are connected with Europe through the intervening Arctic region, which are indicated in the following list:

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| 1. <i>Dactylina madreporiformis</i> . | 27. <i>B. glebulosa</i> . |
| 2. <i>Evernia divaricata</i> . | 28. <i>B. cinnabarina</i> (Arctic). |
| 3. <i>E. vulpina</i> . | 29. <i>B. cuprea</i> (Arctic). |
| 4. <i>Alectoria Fremontii</i> . | 30. <i>B. castanea</i> (Arctic). |
| 5. <i>Umbilicaria rugifera</i> . | 31. <i>B. quercea</i> . |
| 6. <i>U. murina</i> . | 32. <i>B. erysibe</i> . |
| 7. <i>Solorina crocea</i> (Arctic). | 33. <i>B. artyta</i> . |
| 8. <i>Leptogium albo-ciliatum</i> . | 34. <i>B. sphaeroides</i> . |
| 9. <i>L. scotinum</i> . | 35. <i>Lecidea mamillaris</i> . |
| 10. <i>L. palmatum</i> . | 36. <i>L. vesicularis</i> . |
| 11. <i>Placodium fulgens</i> . | 37. <i>L. vitellinaria</i> (Arctic). |
| 12. <i>P. callopismum</i> . | 38. <i>L. borealis</i> . |
| 13. <i>P. variabile</i> . | 39. <i>L. turgidula</i> (Arctic). |
| 14. <i>P. sinapispermum</i> (Arctic). | 40. <i>L. atro-brunnea</i> (Arctic). |
| 15. <i>P. fulvo-luteum</i> (Greenland). | 41. <i>L. insularis</i> . |
| 16. <i>Lecanora crassa</i> (<i>or</i> <i>lentigera</i>). | 42. <i>L. caulescens</i> . |
| 17. <i>L. verrucosa</i> (Arctic). | 43. <i>L. epigaea</i> . |
| 18. <i>L. Schleicheri</i> . | 44. <i>L. badia</i> . |
| 19. <i>L. peliscypha</i> . | 45. <i>Lecanactis abietina</i> (Arctic). |
| 20. <i>L. rhagadiosa</i> . | 46. <i>Arthonia impolita</i> . |
| 21. <i>Rinodina aterrima</i> . | 47. <i>Siphula ceratites</i> . |
| 22. <i>Pertusaria bryontha</i> (Arctic). | 48. <i>Acolium tympanellum</i> . |
| 23. <i>P. dactylina</i> (Arctic). | 49. <i>Endocarpon cinereum</i> , |
| 24. <i>Gyalecta rhexoblephara</i> (Arctic). | <i>v. cartilagineum</i> (Greenland). |
| 25. <i>Biatora decipiens</i> . | 50. <i>Phacopsis vulpina</i> . |
| 26. <i>B. globifera</i> (Arctic). | |

Of the relation of our Lichen Flora to that of Asia and Japan, I have little information. The following, originally published as American, have been found in the regions indicated.

<i>Cetraria Richardsonii</i>	Siberia.	<i>U. Muhlenbergii</i>	Siberia.
<i>C. chrysantha</i>	Japan.	<i>U. Pennsylvanica</i>	Asia; Japan.
<i>Umbilicaria rugifera</i>	Siberia.	<i>Collema leptaleum</i>	Japan.

Alectoria Fremontii, *Cetraria Oakesiana*, *Thelotrema subtile*, and *Conotrema urceolatum*, occur in Europe; *Usnea cavernosa*, in S. America and India; *U. angulata*, in S. America and New Zealand; *Ramalina reticulata*, in New Zealand; *Pannaria leucosticta*, in New Zealand; and *R. tenuis*, is cosmopolitan. These lists might doubtless be extended.

APPENDIX.

The following additions and corrections to my list of North American Lichens are here noted.

ADDITIONS.

<i>Evernia intensa</i> , Nyl., Flora, 1872.....	Mexico.
<i>Parmelia crinita</i> v. <i>eciliata</i> , Nyl., Flora, 1869.....	Mexico.
<i>P. praesignis</i> , Nyl., Flora, 1872.....	Mexico.
<i>P. colpodes</i> v. <i>cristulata</i> , Nyl., Syn. p. 404.....	North America.
<i>P. tiliacea</i> v. <i>sublaevigata</i> , Nyl. (<i>P. sublaevigata</i> Nyl.).....	North America.
† <i>P. livida</i> Tayl., Nyl., Syn. 383.....	New Orleans.
<i>P. perforata</i> v. <i>cetrata</i> , Nyl., Syn. p. 378.....	New Orleans.
<i>Physcia setosa</i> (Nyl.), Syn. p. 429.....	Mexico.
<i>P. obscura</i> v. <i>compacta</i> , Nyl., Syn. p. 428.....	Arctic.
<i>Umbilicaria cylindrica</i> v. <i>Delisaei</i> , Nyl., Scand. p. 117.....	Arctic.
<i>Sticta pallida</i> , Hook.....	Mexico.
** <i>Placodium murorum</i> v. <i>tegulares</i> , Fw.....	New England.
<i>P. arcticum</i> (Kbr. Parerg. p. 63).....	Labrador.
* <i>Lecanora caesio-alba</i> , Kbr.....	New York.
<i>L. cupressi</i> , Nyl. Flora, 1872.....	North America.
<i>L. cinerea</i> varr. ** <i>lacustris</i> , Nyl. * <i>Hoffmanni</i> , ib.....	North America.
<i>L. rhagadiosa</i> , Ach.	Yellowstone.
<i>Rinodina sophodes</i> varr. ** <i>atro-cinerea</i> (Nyl.) ** <i>roboris</i> (Duf.)	New England.
* <i>R. aterrima</i> (Kremph.).....	California.
** <i>Pertusaria leioplaca</i> v. <i>marginata</i> , Nyl., En. p. 336.....	North America.
<i>P. pustulata</i> v. <i>schizostoma</i> , Nyl., ib. p. 336.....	New England.
<i>P. paradoxa</i> , Linds., W. Greenland, p. 344.....	Greenland.
<i>Thelotrema postpositum</i> (Nyl.), N. Gr. p. 552.....	Louisiana.
<i>Stereocaulon denudatum</i> v. <i>caespitosulum</i> , Nyl., Syn. p. 247.	New England.
<i>S. strictum</i> , Th. Fr. Ster. p. 42.....	Mexico.
<i>S. albicans</i> , Th. Fr. Ster. p. 63 (<i>S. nanum</i> Ach. saltem pp.) ...	New England.
<i>Cladonia uncialis</i> v. <i>turgescens</i> , Schaer.....	United States.
<i>Heterothecium leptocheilum</i> , Tuck. (Nyl. Antill., p. 14)	Mexico.
<i>H. chloritis</i> (Tuck.), Nyl. N. Gr. p. 66.....	Southern.
* <i>Lecidea mamillaris</i> (Gouan)	Yellowstone.
<i>L. Campsteriana</i> , Linds. l. c., p. 358.....	Greenland.
<i>L. Vahlia</i> , Linds. ib., p. 358.....	Greenland.
<i>Buellia discoensis</i> (Linds.), ib. p. 356.....	Greenland.
<i>B. Egediana</i> (Linds.), ib. p. 330.....	Greenland.
<i>B. Groenlandica</i> (Linds.), ib. p. 351.....	Greenland.
<i>B. insignis</i> , Naeg., Linds. l. c., p. 355.....	Greenland.

<i>B. papillata</i> v. <i>albo-cincta</i> , Th. Fr.....	Northwest.
<i>Opegrapha subvulgata</i> , Nyl., Flora, 1869.....	Mexico.
<i>Graphis pruinosa</i> (Eschw.), Nyl., N. Gr. p. 564	Mexico.
<i>Segestria nucula</i> v. <i>granulata</i> , Nyl., Antill., p. 22	Mexico.
<i>Verrucaria Campsteriana</i> , Linds. l. c., p. 343	Greenland.
[<i>This and V. tartaricola</i> Linds. are probably parasitic fungi.]	
§ <i>Pyrenula subelliptica</i> , Tuck., Lea Cincinn. p. 47.....	Ohio.
<i>Phacopsis vulpina</i> , Tul.....	California.

Opegrapha antiqua, Lesq., in Hayden's Report, 1873, pp. 370, 418, is the only fossil Lichen as yet recorded on this Continent.

CORRECTIONS.

Umbilicaria mammulata, Ach. = *U. spodochoa*.

U. polyphylla v. *deusta* = *U. flocculosa* Hoffm.

Sticta crenulata, Del. = *S. Ravenelii* T. = *S. erosa* (Eschw.).

Pannaria Michneri, T. = *P. molybdaea* Pers. f.

Synalissa lignyota should be *S. fuliginea* (Wahl.).

Lecanora coniza, T. = *L. subfusca*.

Urceolaria hybocarpa, T. = *L. subfusca*, f.

Stereocaulon chlorellum, T. is not a species, the specimens belonging to *Ramalina*.

Biatora leucoblephara, Nyl., perhaps does not differ from *B. tricholoma*, Mont.

Lecidea grossa, Pers. should be transferred to *Heterothecium*.

Arthonia pruinosa, Ach. = *A. impolita* (Ehrh.).

Page 10, after No. 202, insert: 6. Spores muriform, plurilocular.

POSTSCRIPT.—Since these pages were sent to the printer, I have had the opportunity of examining the Lichens collected by Dr. Coulter, Botanist to the United States Exploring Expedition to Colorado, during the summer of 1873. Among them are three which are new to the United States, but occur in Europe, as follows:

1. *Solorina bispora*, Nyl.
2. *Lecanora calcarea* (L.), Smf., with an elegantly effigurate thallus.
3. *Endococcus erraticus* (Mass.), Nyl. Parasitic on *Placodium elegans*.



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