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A First Assessment of Lichen Diversity for One of North America's 'Biodiversity Hotspots' in the Southern Appalachians of Virginia

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ABSTRACT Although the Appalachian Mountains of southwestern Virginia, United States, are known to represent a major 'hotspot' of biodiversity for North America, no significant survey of overall lichen diversity has been conducted in the region thus far. Presented here is a list of 221 distinct taxa of lichens, lichenicolous fungi, and 'lichen allies' collected during the 2008 Hugo L. Blomquist Bryological and Lichenological Foray in the mountains of southwestern Virginia. Collections were made from diverse habitats, primarily in the Mount Rogers National Recreation Area (MRNRA), and yielded 41 potential state records. Particularly noteworthy collections include: *Sphaerellothecium coniodes* (a lichenicolous fungus that was not previously known to exist in North America), *Hypotrachyna lividescens* (a primarily neotropical macrolichen that has not previously been reported from North America), *Pycnora praestabilis* (a lignicolous crust not previously reported from any other location in eastern North America), *Heterodermia erecta* (a foliose lichen previously known in the world only from a single small region of Georgia/North Carolina), and *Psilolechia clavulifera* (a crustose lichen taxon previously reported from only one other location in eastern North America). The sheer diversity of lichens, along with the number of rare and/or potentially endangered taxa, highlights the need for continued preservation efforts in MRNRA and the southern Appalachian Mountains in general.

INTRODUCTION On April 4th–6th, 2008, the Hugo L. Blomquist Foray was held in the Appalachian Mountains of southwestern Virginia, United States. This event provided the lichenological community with an excellent opportunity to gather data on overall lichen diversity in an area that has been identified as one of North America's major biodiversity hotspots (Stein et al. 2000). Previously, Jonathan P. Dey (1978) conducted a macrolichen survey of the high peaks of the Southern Appalachians, identifying 71 species from Mount Rogers and Whitetop Mountain in southwestern Virginia. However, Dey's publication does not paint an accurate picture of the overall lichen diversity in the region, since it explicitly excludes microlichens and focuses only on high elevation sites. The present list represents a first assessment of the full range of diversity of lichens and lichenicolous fungi found in this part of the world.

MATERIALS AND METHODS During one full day (April 5th, 2008) and two partial days (April 4th and 6th, 2008) in the field, 221 nomenclaturally distinct taxa of lichens, lichenicolous fungi, and lichen allies were collected in Hungry Mother State Park (HMSP) and the Mount Rogers National Recreation Area (MRNRA). The number of attendees totaled ~25 people, including both professional and amateur bryologists and lichenologists from across eastern North America. The following collectors have provided their specimen identifications: W.R. Buck (identifications verified by R.C. Harris; specimens stored at NY), J.G. Guccion (specimens stored in the collector's personal herbarium), R.C. Harris (specimens stored at NY), B.P. Hodkinson (collections verified/identified by J.C. Lendemer and/or R.C. Harris; specimens stored in collector's personal herbarium, unless other-

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wise noted), and Gary Perlmutter (potentially problematic specimens were identified/verified by J.C. Lendemer; all specimens deposited in NCU).

The list of taxa collected during the Foray is arranged chronologically by the localities visited, with an alphabetically arranged species list for each. In the interest of providing as complete an inventory as possible, specimens that could only be partially determined are included, along with sterile crusts for which no names are presently known (these are placed at the end of the list for each locality). The numbers following undetermined sterile crusts (e.g., 'sterile crust 2') are intended to provide a reference for specimens that are considered to constitute a single species. Commentary and brief descriptions are provided when necessary. Lichenicolous fungi are indicated by an asterisk (*) and the identity of the host lichen is also provided. Saprophytic fungi related to either lichens or lichenicolous fungi (i.e., 'lichen allies') are indicated with a cross (+). State records are designated with a double-cross (‡).[1]

RESULTS 1. UNITED STATES OF AMERICA. VIRGINIA. SMYTH COUNTY.: Southern Appalachian eastern hemlock ravine forest (*Kalmia* sp., *Rhododendron* sp., *Tsuga* sp.), near Hemlock Haven Ln., ca. 0.3 km northwest of Hungry Mother Dr., Hemlock Haven Conference Center, Hungry Mother State Park. – elev. ca. 2300 ft. - UTM 17 453197E 4082880N – Lat. 36°53′27″N, Long. 81°31′31″W. – 04.April.2008

Bryoria furcellata (Fr.) Brodo & D. Hawksw. – *Hodkinson 8957* (NY).
Buellia curtisii (Tuck.) Imsh. – *Buck 53305*.
Cladonia macilenta Hoffm. var. *bacillaris* (Genth.) Schaerer – *Buck 53307*.
Cladonia ramulosa (With.) J. R. Laundon – *Buck 53308*.
Endocarpon petrolepideum Nyl. – *Buck 53304*.
Mycocalicium albonigrum Nyl. Fink+ – *Buck 53306*.
Pertusaria trachythallina Erichsen – *Buck 53310*.
Usnea subscabrosa Nyl. ex Mot. – *Hodkinson 8956* (NY).

2. UNITED STATES OF AMERICA. VIRGINIA. GRAYSON COUNTY.: Comer's Creek Falls, mixed deciduous ravine forest (*Acer* sp., *Kalmia* sp., *Liriodendron* sp., *Quercus* sp.), with waterfalls/cascades, an upland bog, and wooden fences, on Route 741, 0.8 km west of Route 16, Mount Rogers National Recreation Area, Jefferson National Forest. – elev. ca. 3450 ft. - UTM 17 457650E 4062975N – Lat. 36°42′41″N, Long. 81°28′27″W. – 05.April. 2008

Abrothallus hypotrachynae Etayo & Diederich*‡ – *Harris 54076* (on *Hypotrachyna showmanii*).
Agonimia sp. – *Hodkinson 8980* (NY)
Allocetraria oakesiana (Tuck.) Randlane & Thell – *Harris 54017*.
Amandinea polyspora (Willey) E. Lay & P. May – *Harris 54018*.
Amandinea punctata (Hoffm.) Coppins & Scheid. – *Harris 54019*.
Anaptychia palmulata (Michx.) Vain. – *Buck 53353*.
Arthonia caesia (Körb.) Körb. – *Guccion 1345*, *Harris 54020*.
Arthothelium taediosum auct. Amer. – *Guccion 1346*, *Hodkinson 9007*, *Perlmutter 1286*.
Aspicilia laevata (Ach.) Arnold – *Harris 54021*.
Bacidia schweinitzii (E. Michen.) A. Schneid. – *Guccion 1347*, *Harris 54022*, *Perlmutter 1279*.
Baeomyces rufus (Hudson) Rebent. – *Buck 53348* (in a mixed collection filed under *Sphaerellothecium coniodes* (Nyl.) Cl. Roux & Diederich)
Biatora appalachensis Printzen & Tønsberg‡ – *Harris 54023*.
Biatora longispora (Degel.) Lendemer & Printzen – *Perlmutter 1276*.
Biatora vernalis (L.) Fr.‡ – *Buck 53372*.
Buellia stillingiana J. Steiner – *Guccion 1348*, *Harris 54024*, *54025*.
Candelariella efflorescens R.C. Harris & Buck – *Guccion 1349* (first confirmed fertile state record).
Cetrelia chicitae (Culb.) Culb. & C. Culb. – *Harris 54027*, *Perlmutter 1290*.
Chaenotheca furfuracea (L.) Tibell‡ – *Hodkinson 9050* (DUKE).
Chaenothecopsis sp. – *Buck 53352*.
Chrysothrix sp. – *Hodkinson 8985*.
Cladonia caespiticia (Pers.) Flörke ? – *Hodkinson 8997*.
Cladonia fimbriata (L.) Fr. – *Hodkinson 9016*.
Cladonia floerkeana (Fr.) Flörke – *Buck 53328*.
Cladonia macilenta Hoffm. var. *bacillaris* (Genth.) Schaerer – *Harris 54028*, *54029*.
Cladonia ochrochlora Flörke – *Perlmutter 1274*.
Coenogonium luteum (Dicks.) Kalb & Lücking‡ – *Hodkinson 9045* (NY).
Conotrema urceolatum (Ach.) Tuck. – *Hodkinson 9011*.
Cornutispora lichenicola D. Hawksw. & B. Sutton*‡ – *Harris 54077* (on *Lecanora strobilina*).
Dactylospora athallina (Müll. Arg.) Hafellner*‡ – *Buck 53348* (on *Baeomyces rufus*; in a mixed collection filed under *Sphaerellothecium coniodes*).
Dictyocatenulata alba Finley & E. F. Morris‡ – *Hodkinson 8991* (NY).
Diplolaeviopsis ranula Giralt & D. Hawksw.*‡ – *Harris 54078* (on *Lecanora strobilina*), *Hodkinson 9024* (on *Lecanora strobilina*; DUKE).
Flavoparmelia caperata (L.) Hale – *Guccion 1350*, *Harris 54030*, *Perlmutter 1288*.
Flavopunctelia flaventior (Stirton) Hale – *Harris 54031*.
Fuscidea pusilla Tønsberg‡ – *Harris 54032*.
Graphis scripta (L.) Ach. – *Guccion 1351*, *Perlmutter 1289*.

[1]Note: Some of the records listed here were previously published by Hodkinson et al. (2009) as part of a state-wide lichen diversity survey.

Heterodermia obscurata (Nyl.) Trevisan – *Guccion 1352*, *Hodkinson 9032* (NY).
Heterodermia speciosa (Wulfen) Trevisan – *Guccion 1353*.
Hypocenomyce scalaris (Ach.) M. Choisy – *Guccion 1354*.
Hypogymnia physodes (L.) Nyl. – *Hodkinson 8995* (DUKE), *Perlmutter 1278*.
Hypotrachyna afrorevoluta (Krog & Swinscow) Krog & Swinscow – *Harris 54033*.
Hypotrachyna lividescens (Kurok.) Hale‡ – *Harris 54036* (previously reported as *Hypotrachyna producta* Hale by Hodkinson et al. (2009)).
Hypotrachyna revoluta (Flörke) Hale – *Harris 54037*.
Hypotrachyna showmanii Hale – *Guccion 1355*, *Harris 54038*, *54039*.
Lecania croatica (Zahlbr.) Kotlov‡ – *Hodkinson 8973* (NY).
Lecanora argentata (Ach.) Malme – *Harris 54040*.
Lecanora hybocarpa (Tuck.) Brodo – *Harris 54041*, *Perlmutter 1299*.
Lecanora pulicaris (Pers.) Ach. – *Guccion 1356*, *Harris 54042*.
Lecanora strobilina (Sprengel) Kieffer – *Guccion 1357*, *Harris 54043*, *54044*.
Lecanora symmicta (Ach.) Ach. – *Guccion 1358*.
Lecanora thysanophora R. C. Harris – *Buck 53329*.
Lecanora sp. – *Hodkinson 8989* (filed under *Rhizocarpon infernulum* f. *sylvaticum*; DUKE).
Lecidea ahlesii (Körber) Nyl. var. *ahlesii*‡ – *Perlmutter 1283*.
Lepraria caesiella R. C. Harris – *Harris 54045*, *Perlmutter 1295*.
Lepraria lobificans Nyl. – *Buck 53333*, *Harris 54046*, *Perlmutter 1275*.
Lepraria normandinoides Lendemer & R. C. Harris – *Harris 54047*, *54048*, *Hodkinson 8978*, *Perlmutter 1291*, *1294*.
Lobaria pulmonaria (L.) Hoffm. – *Buck 53350*.
Loxospora pustulata (Brodo & W.L. Culb.) R.C. Harris – *Perlmutter 1281*.
Marchandiomyces sp. – *Hodkinson 9006* (NY).
Melanelixia subaurifera (Nyl.) O. Blanco et al. – *Harris 54049*, *54050*.
Melaspilea sp.‡ – *Perlmutter 1284*.
Micarea peliocarpa (Anzi) Coppins & P. James – *Buck 53332*, *Harris 54052*, *Hodkinson 9000*.
Micarea (s. lat.) sp. – *Harris 54051*.
Myelochroa galbina (Ach.) Elix & Hale – *Harris 54053*.
Nadvornikia sorediata R. C. Harris – *Buck 53339*.
Ochrolechia arborea (Kreyer) Almb. – *Guccion 1359*, *Harris 54054*, *54055*, *Hodkinson 9033* (DUKE).
Ochrolechia mexicana Vainio – *Hodkinson 9046* (DUKE).
Parmelia sulcata Taylor – *Harris 54056*.
Parmelinopsis horrescens (Taylor) Elix & Hale – *Harris 54034*.
Parmelinopsis minarum (Vainio) Elix & Hale – *Harris 54035*.
Parmotrema hypotropum (Nyl.) Hale – *Harris 54057*.
Parmotrema perlatum (Huds.) M. Choisy – *Guccion 1360*, *Harris 54058*.
Parmotrema reticulatum (Taylor) M. Choisy – *Harris 54059*.
Pertusaria globularis (Ach.) Tuck. – *Buck 53317*, *Perlmutter 1292*.
Pertusaria multipunctoides Dibben – *Hodkinson 8976*.
Pertusaria pustulata (Ach.) Dufour – *Hodkinson 9014*.
Pertusaria trachythallina Erichsen – *Guccion 1361*.
Phaeocalicium polyporaeum (Nyl.) Tibell – *Buck 53331*.
Phaeophyscia adiastola (Essl.) Essl. – *Hodkinson 9021* (fertile; DUKE).
Phaeophyscia pusilloides (Zahlbr.) Essl. – *Guccion 1362*.
Phaeophyscia rubropulchra (Degel.) Essl. – *Guccion 1363*, *Harris 54060*, *Perlmutter 1287*.
Physcia millegrana Degel. – *Guccion 1364*, *Harris 54061*.
Physcia pumilior R.C. Harris – *Perlmutter 1296*.
Physcia stellaris (L.) Ach. – *Guccion 1365*, *Hodkinson 8983* (DUKE), *9025*.
Platismatia tuckermanii (Oakes) Culb. & C. Culb. – *Harris 54062*.
Porpidia albocaerulescens (Wulfen) Hertel & Knoph – *Harris 54063*, *Hodkinson 9031*, *Perlmutter 1293*.
Pseudevernia consocians (Vainio) Hale & Culb. – *Harris 54064*, *Perlmutter 1277*, *1285*.
Punctelia caseana Lendemer & Hodkinson ined. [=*Punctelia subrudecta* auct. Amer. sensu Lendemer (2004); see Lendemer & Hodkinson in press] – *Hodkinson 9047*.
Punctelia rudecta (Ach.) Krog – *Hodkinson 8986*.
Pycnora praestabilis (Nyl.) Hafellner‡ – *Buck 53338*, *Hodkinson 9020* (NY).
Pyrrhospora varians (Ach.) R. C. Harris – *Guccion 1366*, *Harris 54065*, *54066*.
Ramalina americana Hale – *Harris 54067*.
Ramalina culbersoniorum La Greca – *Perlmutter 1297*.
Rhizocarpon infernulum f. *sylvaticum* Fryday – *Hodkinson 8989* (DUKE).
Ropalospora chlorantha (Tuck.) S. Ekman – *Harris 54068*.
Roselliniella sp. ? *‡ – *Harris 54079* (on *Physcia stellaris*).
Scoliciosporum chlorococcum (Stenh.) Vězda – *Guccion 1367*, *Harris 54069*.
Segestria leptalea (Durieu & Mont.) R. C. Harris‡ – *Hodkinson 8979* (NY).
Sphaerellothecium coniodes (Nyl.) Cl. Roux & Diederich*‡ – *Buck 53348* (on *Baeomyces rufus*).
Strigula stigmatella (Ach.) R. C. Harris‡ – *Buck 53323*.
Trapelia coarctata (Turner ex Sm. & Sow.) M. Choisy – *Hodkinson 8979* (filed under *Segestria leptalia*; NY)
Trapelia placodioides Coppins & P. James – *Perlmutter 1280*.
Trapeliopsis flexuosa (Fr.) Coppins & P. James – *Harris 54070*. *54071*.
Trapeliopsis viridescens (Schrad.) Coppins & P. James – *Buck 53314*, *53341*.
Tremella sp. 7 (Diederich 2007) *‡ – *Hodkinson 9019* (on *Flavoparmelia caperata*).
Tuckermannopsis ciliaris (Ach.) Gyelnik – *Harris 54072*.
Umbilicaria mammulata Ach. Tuck. – *Buck 53367*.
Usnea endochrysea Stirton – *Harris 54073*.
Usnea strigosa (Ach.) Eaton (s. str.) – *Harris 54074*, *Perlmutter 1298*.
Xanthomendoza weberi (S. Kondr. & Kärnefelt) L. Lindblom – *Hodkinson 9023*.
Xanthoparmelia plittii (Gyeln.) Hale – *Hodkinson 9038*.

3. UNITED STATES OF AMERICA. VIRGINIA. WASHINGTON/SMYTH/GRAYSON COUNTIES.: Whitetop Mountain summit, spruce/fir forest (*Abies fraseri*, *Picea rubens*), with abundant mountain-ash (*Sorbus americana*), near the end of the Whitetop summit access road, ~5km west of Whitetop Mountain Rd., Mount Rogers National Recreation Area, Jefferson National Forest. – elev. ca. 5520 ft. - UTM 17 445829E 4054956N – Lat. 36°38′19″N, Long. 81°36′21″W. – 05.April. 2008

Acarospora sp. (aff. *smaragdula?*) – *Hodkinson 9140* (NY), *Perlmutter 1301*.
Allocetraria oakesiana (Tuck.) Randlane & Thell – *Guccion 1368*, *Harris 54080*, *Perlmutter 1329*.
Bacidina delicata (Leight.) V. Wirth & Vězda ?‡ – *Buck 53399* (pycnidia only).
Bacidina egenula (Nyl.) Vězda – *Hodkinson* 9117 (NY).
Bacidina sp. – *Hodkinson* 9074 (NY), *Hodkinson* 9116 (NY).
Biatora appalachensis Printzen & Tønsberg – *Buck 53406*, *Harris 54081*, *54082*, *54083*, *Perlmutter 1336*.
Buellia stillingiana J. Steiner – *Guccion 1369*.
Calicium glaucellum Ach. – *Buck 53396*, *53417*.
Caloplaca cerina (Ehrh. ex Hedw.) Th. Fr. Lich. – *Guccion 1370*.
Caloplaca crenulatella (Nyl.) H. Olivier – *Hodkinson* 9142 (NY).
Cetrelia chicitae (Culb.) Culb. & C. Culb. – *Guccion 1371*, *Harris 54084*.
Cetrelia olivetorum (Nyl.) Culb. & C. Culb. – *Guccion 1372*, *Harris 54086*.
Cladonia caespiticia (Pers.) Flörke – *Harris 54087*, *Perlmutter 1328*.
Cladonia didyma (Fée) Vainio var. *didyma* – *Harris 54088*.
Cladonia floerkeana (Fr.) Flörke – *Hodkinson 9145*.
Cladonia grayi G. Merr. *ex* Sandst. – *Perlmutter 1313*.
Cladonia ochrochlora Flörke – *Harris 54089*.
Cladonia parasitica (Hoffm.) Hoffm. – *Harris 54090*.
Cladonia squamosa Hoffm. – *Buck 53389*, *Guccion 1373*, *Harris 54091*, *Hodkinson 9073*, *Perlmutter 1325*.
Coenogonium pineti (Ach.) Lücking & Lumbsch – *Buck 53400*.
Cystobasidium hypogymniicola Diederich & Ahti*‡ – *Harris 54128* (on *Hypogymnia incurvoides*), *54129* (on *Hypogymnia krogiae*), *Perlmutter 1314* (on *Hypogymnia* sp.).
Endocarpon pallidulum (Nyl.) Nyl.‡ – *Hodkinson 9118* (in a mixed collection filed under *Thelidium zwackhii*; NY).
Everniastrum catawbiense (Degel.) Sipman – *Harris 54092*.
Flavoparmelia caperata (L.) Hale – *Guccion 1374*.
Graphis scripta (L.) Ach. – *Guccion 1375*, *Harris 54093*, *Hodkinson 9091*, *Perlmutter 1306*, *1331*.
Heterodermia neglecta Lendemer, R.C. Harris & E. Tripp ? – *Perlmutter 1309*.
Hypogymnia incurvoides Rass.‡ – *Harris 54094* (with apothecia), *54095*, *54096*, *Hodkinson 9070* (DUKE).
Hypogymnia krogiae Ohlss. – *Buck 53374*, *Guccion 1376*, *Harris 54097*, *Hodkinson 9062* (DUKE), *Perlmutter 1310*, *1312*.
Hypogymnia physodes (L.) Nyl. – *Guccion 1377*, *Harris 54098*.
Hypotrachyna afrorevoluta (Krog & Swinsc.) Krog & Swinsc. – *Perlmutter 1308*.
Hypotrachyna croceopustulata (Kurok.) Hale – *Buck 53421*, *Guccion 1378*, *Harris 54099*, *54100*, *54101*.
Hypotrachyna showmanii Hale – *Guccion 1379*.
Hypotrachyna virginica (Hale) Hale – *Harris 54102*, *54103*.
Imshaugia aleurites (Ach.) S. F. Meyer – *Harris 54104*.
Lecanora cinereofusca H. Magn. – *Buck 53380*, *Guccion 1380*, *Harris 54106*, *Hodkinson 9199* (DUKE)
Lecanora pulicaris (Pers.) Ach. – *Hodkinson 9094*.
Lecanora rugosella Zahlbr. – *Guccion 1381*, *Harris 54107*, *54108*, *Perlmutter 1341*.
Lecanora strobilina (Sprengel) Kieffer – *Hodkinson 9092*.
Lecanora symmicta (Ach.) Ach. – *Harris 54109*.
Lecanora wisconsinensis H. Magn. – *Guccion 1382*.
Lecanora sp. – *Harris 54105*, *Hodkinson 9096* (‘*L. symmicta* group;’ NY), *Perlmutter 1322*, *1340*.
Lepraria lobificans Nyl. – *Harris 54110*.
Lepraria normandinoides Lendemer & R. C. Harris – *Harris 54111*, *54112*, *Perlmutter 1319*.
Loxospora ochrophaea (Tuck.) R. C. Harris – *Hodkinson 9141* (DUKE).
Melanelixia subaurifera (Nyl.) O. Blanco et al. – *Hodkinson 9071*.
Melanohalea halei (Ahti) O. Blanco et al. – *Harris 54113*, *54114*, *Perlmutter 1326*.
Menegazzia subsimilis (H. Magn.) R. Sant. – *Perlmutter 1332*, *1338*.
Micarea bauschiana (Körb.) V. Wirth & Vězda‡ – *Buck 53415* (pale form).
Micarea prasina Fr. (s. str.) – *Buck 53416*, *Harris 54116*.
Parmelia squarrosa Hale – *Harris 54117*, *54118*, *Perlmutter 1337*.
Parmelia sulcata Taylor – *Guccion 1383*, *Harris 54119*, *Perlmutter 1303*.
Parmelinopsis horrescens (Taylor) Elix & Hale – *Guccion 1384*.
Pertusaria trachythallina Erichsen – *Buck 53379*, *53398*, *53419*, *Guccion 1385*, *Harris 54120*, *Hodkinson 9072* (NY), *9095*, *Perlmutter 1304*.
Porpidia albocaerulescens (Wulfen) Hertel & Knoph – *Harris 54121*.
Porpidia crustulata (Ach.) Hertel & Knoph – *Hodkinson 9140* (in a mixed collection filed under *Acarospora* sp. aff. *smaragdula?*; NY), *Perlmutter 1302*.
Porpidia subsimplex (H. Magn.) Fryday – *Perlmutter 1335*.
Pseudevernia consocians (Vain.) Hale & Culb. – *Perlmutter 1311*.
Pseudevernia cladonia (Tuck.) Hale & W. Culb. – *Buck 53401*.
Psilolechia clavulifera (Nyl.) Coppins‡ – *Buck 53404*.
Pyrrhospora varians (Ach.) R.C. Harris – *Guccion 1386*.
Ramalina culbersoniorum La Greca – *Perlmutter 1324*.
Rhizocarpon cinereovirens (Müll. Arg.) Vainio (stictic acid chemotype) – *Hodkinson 9093* (DUKE).
Rhizocarpon infernulum f. *sylvaticum* Fryday – *Buck 53377*, *Hodkinson 9097*, *Perlmutter 1317*, *1333*, *1334*.
Rinodina subminuta H. Magn.‡ – *Buck 53381*.
Ropalospora chlorantha (Tuck.) S. Ekman – *Buck 53391*.
Thelidium zwackhii (Hepp) A. Massal.‡ – *Hodkinson 9118* (NY).
Trapelia coarctata (Turner ex Sm. & Sow.) M. Choisy – *Hodkinson 9146* (‘*T. coarctata* s. lat.;’ NY), *Perlmutter 1323*.
Trapelia corticola Coppins & P. James‡ – *Guccion 1387*, *Harris 54123*.
Trapeliopsis gelatinosa (Flörke) Coppins & P. James‡ – *Harris 54124*.
Trapeliopsis viridescens (Schrad.) Coppins & P. James – *Buck 53403*.
Tuckermannopsis americana (Spreng.) Hale – *Perlmutter 1330*.
Usnea subfloridana Stirton (squamatic acid chemotype) – *Harris 54125*.
Verrucaria sp. – *Hodkinson 9075* (NY), *9119* (NY), *9142* (filed under *Caloplaca crenulatella*; NY), *9144* (NY)
sterile crust 1 (sorediate w/norstictic acid) – *Harris 54126*.
sterile crust 2 (pustulate w/gyrophoric acid) – *Harris 54127*.
sterile crust 3 (sorediate, but not leprose, w/lobaric acid) – *Hodkinson 9120* (NY).

4. UNITED STATES OF AMERICA. VIRGINIA. WASHINGTON COUNTY.: Whitetop

Mountain, open meadow with granitic rock outcrops along the Whitetop summit access road, ~0.5 km from the summit, ~4.5 km from Whitetop Mountain Rd., Mount Rogers National Recreation Area, Jefferson National Forest. – elev. ca. 5375 ft. - UTM 17 445703E 4054693N – Lat. 36°38′11″N, Long. 81°36′26″W. – 05.April.2008

Cladonia furcata (Hudson) Schrader – *Hodkinson 9154* (NY), *9155* (NY).
Flavoparmelia caperata (L.) Hale – *Hodkinson 9153* (NY).
Porpidia crustulata (Ach.) Hertel & Knoph – *Hodkinson 9157* (NY).
Xanthoparmelia conspersa (Ehrh. ex Ach.) Hale – *Hodkinson 9156* (NY).
Verrucaria sp. – *Hodkinson 9158* (NY).

5. UNITED STATES OF AMERICA. VIRGINIA. GRAYSON COUNTY.: Whitetop Mountain, mixed deciduous forest (*Acer* sp., *Quercus* sp.), along the Whitetop summit access road, ~2 km from the summit, ~3 km from Whitetop Mountain Rd., Mount Rogers National Recreation Area, Jefferson National Forest. – elev. ca. 5100 ft. - UTM 17 446173E 4054247N – Lat. 36°37′56″N, Long. 81°36′07″W. – 05.April.2008

Arthonia sp. – *Hodkinson 9180* (NY).
Similar to *A. subasteroidea* Anzi, but ascospores smaller (20–24 × 9–11); also, similar to *A. beccariana* (Bagl.) Stizenb., but epispore I+ orange-red.
Biatora longispora (Degel.) Lendemer & Printzen – *Hodkinson 9191*.
Buellia stillingiana J. Steiner – *Hodkinson 9196* (DUKE).
Cladonia furcata (Hudson) Schrader – *Hodkinson 9192*.
Conotrema urceolatum (Ach.) Tuck. – *Hodkinson 9177*.
Graphis scripta (L.) Ach. – *Hodkinson 9193*, *9198*.
Heterodermia erecta Lendemer‡ – *Hodkinson 9186* (NY).
Lasallia papulosa (Ach.) Llano – *Hodkinson 9164*.
Lecanora hybocarpa (Tuck.) Brodo – *Hodkinson 9178*.
Leptogium dactylinum Tuck. – *Hodkinson 9185*.
Melanohalea halei (Ahti) O. Blanco et al. – *Hodkinson 9188*.
Ochrolechia arborea (Kreyer) Almb. – *Hodkinson 9187*.
Peltigera praetextata (Flörke ex. Sommerf.) Zopf – *Hodkinson 9176*.
Peltigera phyllidiosa Goffinet & Miadlikowska – *Hodkinson 9200* (NY).
Pertusaria globularis (Ach.) Tuck. – *Hodkinson 9184* (DUKE).
Pertusaria neoscotica Lamb – *Hodkinson 9182* (NY).
Pertusaria velata (Turner) Nyl. – *Hodkinson 9181* (UV-).
Phaeophyscia adiastola (Essl.) Essl. – *Hodkinson 9197*.
Phaeophyscia rubropulchra (Degel.) Essl. – *Hodkinson 9162*.
Punctelia rudecta(Ach.) Krog – *Hodkinson 9161*.
Pyrenula pseudobufonia (Rehm) R. C. Harris – *Hodkinson 9190*.
Pyxine sorediata (Ach.) Mont – *Hodkinson 9163*.
Thelidium pyrenophorum (Ach.) Mudd – *Hodkinson 9195* (DUKE).
Trapelia placodioides Coppins & P. James – *Hodkinson 9179*, *9194* (DUKE).
Umbilicaria mammulata (Ach.) Tuck. – *Hodkinson 9165*, *9183*.

6. UNITED STATES OF AMERICA. VIRGINIA. WYTHE COUNTY.: Deciduous ravine forest (*Acer* sp., *Liriodendron* sp., *Quercus* sp.) with large limestone outcrops, along Cole Branch Drive, ~3.5 km south of intersection with Pope Rd., just southwest of Collins Cove Horse Camp, near Raven Cliff Karst Area, Mount Rogers National Recreation Area, Jefferson National Forest. – elev. ca. 2400 ft. - UTM 17 495699E 4073487N – Lat. 36°48′26″N, Long. 81°02′54″W. – 06.April.2008

Agonimia opuntiella (Buschardt & Poelt) Vězda‡ – *Guccion 1388*.
Amandinea polyspora (Willey) E. Lay & P. May – *Hodkinson 9241* (NY).
Arthonia anglica Coppins [=*Arthonia dryadum* ined. (Harris and Ladd 2005)]‡ – *Perlmutter 1350* (for a full report of this species in North America, see Lendemer et al. in press).
Arthonia lapidicola (Taylor) Branth & Rostrup ? ‡ – *Hodkinson 9341* (NY).
Arthonia quintaria Nyl. – *Hodkinson 9249* (NY).
Arthothelium spectabile A. Massal. – *Hodkinson 9202* (filed under '*Pertusaria velata* UV+;' NY).
Bacidia coprodes (Körber) Lettau – *Hodkinson 9253* (NY).
Bacidia schweinitzii (Fr. ex Michener) A. Schneid. – *Hodkinson 9311* (pycnidia only; NY), *Perlmutter 1348*.
Bacidia suffusa (Fr.) A. Schneid. – *Hodkinson 9328* (on bark; NY), *Perlmutter 1354*.
Bagliettoa baldensis (A. Massal.) Vězda – *Perlmutter 1362*.
Bilimbia sabuletorum (Schreber) Arnold – *Guccion 1394*, *Hodkinson 9275* (DUKE).
Botryolepraria lesdainii (Hue) Canals et al.‡ – *Perlmutter 1368*.
Buellia curtisii (Tuck.) Imshaug – *Guccion 1389*.
Buellia stillingiana J. Stein. – *Perlmutter 1358*.
Caloplaca cerina (Hedwig) Th. Fr. – *Hodkinson 9310* (NY).
Caloplaca flavovirescens (Wulfen) Dalla Torre & Sarnth. – *Hodkinson 9266* (filed under *Muellerella lichenicola*; NY).
Canoparmelia caroliniana (Nyl.) Elix & Hale – *Hodkinson 9264*.
Cetrelia olivetorum (Nyl.) W. L. Culb. & C. Culb. – *Hodkinson 9329*.
Collema tenax (Sw.) Ach.‡ – *Hodkinson 9214* (NY).
Dermatocarpon muhlenbergii (Ach.) Müll. Arg. – *Hodkinson 9282*, *Perlmutter 1367*.
Endocarpon diffractellum (Nyl.) Gueidan & Cl. Roux – *Hodkinson 9266* (filed under *Muellerella lichenicola*; NY), *Hodkinson 9316* (DUKE).
Endocarpon pallidulum (Nyl.) Nyl. – *Hodkinson 9273* (NY).
Endocarpon petrolepideum (Nyl.) Hue – *Hodkinson 9322* (DUKE).
Eopyrenula intermedia Coppins – *Hodkinson 9265* (DUKE).
Flavoparmelia caperata (L.) Hale – *Hodkinson 9292* [with '*Tremella* sp. 7' sensu Diederich (2007) gall].
Flavopunctelia flaventior (Stirton) Hale – *Hodkinson 9296*.

Graphis scripta (L.) Ach. – *Guccion 1390, Hodkinson 9309*.
Heterodermia granulifera (Ach.) Culb. – *Hodkinson 9326*.
Heterodermia hypoleuca (Ach.) Trevisan – *Hodkinson 9336*.
Heterodermia obscurata (Nyl.) Trevisan – *Hodkinson 9276*, *Perlmutter 1346*.
Heterodermia speciosa (Wulfen) Trevisan – *Guccion 1391*, *Hodkinson 9289*, *Perlmutter 1360*.
Hypogymnia physodes (L.) Nyl. – *Hodkinson 9256*.
Hypotrachyna afrorevoluta (Krog & Swinscow) Krog & Swinscow – *Hodkinson 9216*.
Hypotrachyna livida (Taylor) Hale – *Hodkinson 9344*, *Perlmutter 1357*.
Hypotrachyna osseoalba (Vain.) Park & Hale – *Guccion 1392*.
Hypotrachyna revoluta (Flörke) Hale – *Hodkinson 9290* (NY).
Hypotrachyna rockii (Zahlbr.) Hale‡ – *Hodkinson 9205* (NY).
Imshaugia aleurites (Ach.) S. F. Meyer – *Hodkinson 9339*.
Lecanora hybocarpa (Tuck.) Brodo – *Hodkinson 9295*, *Perlmutter 1352*, *1356*.
Lecanora strobilina (Sprengel) Kieffer – *Hodkinson 9353*.
Lecanora thysanophora R.C. Harris – *Hodkinson 9233*, *Perlmutter 1345*.
Lecidea cyrtidia Tuck.‡ – *Hodkinson 9341* (filed under *Arthonia lapidicola* ?; NY).
Lepraria lobificans Nyl. – *Hodkinson 9245*, *Perlmutter 1355*, *1365*.
Leptogium corticola Taylor – *Hodkinson 9297*, *Perlmutter 1344*.
Leptogium cyanescens (Rabenh.) Körb. – *Hodkinson 9355*, *Perlmutter 1343*.
Leptogium lichenoides (L.) Zahlbr. – *Guccion 1393*.
Lichenochora obscuroides (Lindsay) Triebel & Rambold*‡ – *Hodkinson 9349* (on *Phaeophyscia* sp.; NY).
Loxospora pustulata (Brodo & Culb.) R. C. Harris – *Hodkinson 9301*.
Maronea polyphaea H. Magn.‡ – *Hodkinson 9285* (NY).
Melanelixia subaurifera (Nyl.) O. Blanco et al. – *Hodkinson 9359*.
Micarea micrococca (Körber) Gams ex Coppins‡ – *Hodkinson 9250* (NY).
Myelochroa aurulenta (Tuck.) Elix & Hale – *Hodkinson 9254*.
Myelochroa galbina (Ach.) Elix & Hale – *Hodkinson 9224*.
Muellerella lichenicola (Sommerf. ex Fr.) D. Hawksw.*‡ – *Hodkinson 9266* (on *Caloplaca flavovirescens*; NY), *9337* (on *Physcia pumilior*; NY).
Mycoporum pycnocarpoides Müll. Arg.‡ – *Hodkinson 9287* (NY).
Nadvornikia sorediata R. C. Harris – *Hodkinson 9358*.
Opegrapha vulgata Ach. – *Hodkinson 9332*.
Parmelia sulcata Taylor – *Hodkinson 9258*.
Parmelinopsis horrescens (Taylor) Elix & Hale – *Guccion 1395*.
Parmotrema gardneri (C. W. Dodge) Sérus. – *Hodkinson 9324*.
Parmotrema hypotropum (Nyl.) Hale – *Guccion 1396*, *Hodkinson 9211*.
Parmotrema perlatum (Huds.) M. Choisy – *Hodkinson 9317*.
Parmotrema reticulatum (Taylor) M. Choisy – *Guccion 1397*, *Hodkinson 9269*
Parmotrema stuppeum (Taylor) Hale – *Hodkinson 9268* (DUKE).
Pertusaria paratuberculifera Dibben – *Hodkinson 9255*.
Pertusaria pustulata (Ach.) Duby – *Hodkinson 9251*.
Pertusaria trachythallina Erichsen – *Hodkinson 9298*.
Pertusaria velata (Turner) Nyl. – *Hodkinson 9202* (UV+; NY).
Phaeophyscia adiastola (Essl.) Essl. – *Guccion 1398*, *Hodkinson 9263*, *Perlmutter 1361*.
Phaeophyscia ciliata (Hoffm.) Moberg – *Guccion 1399*, *Hodkinson 9229*.
Phaeophyscia hirtella Essl. – *Hodkinson 9212* (NY).
Phaeophyscia rubropulchra (Degel.) Essl. – *Perlmutter 1349*.
Phaeophyscia squarrosa Kashiw. – *Guccion 1400*.
Phlyctis ludoviciensis (Müll. Arg.) Lendemer – *Hodkinson 9230*.
Phlyctis petraea R.C. Harris ined. – *Guccion 1401*, *Hodkinson 9305* (DUKE), *Perlmutter 1363*.
Physcia americana G. Merr. – *Guccion 1402*, *Hodkinson 9225*.
Physcia pumilior R.C. Harris – *Guccion 1403*, *Hodkinson 9246*, *Perlmutter 1359*.
Physcia stellaris (L.) Nyl. – *Hodkinson 9330*.
Physciella chloantha (Ach.) Essl. – *Hodkinson 9279*.
Physconia detersa (Nyl.) Poelt – *Hodkinson 9281* (NY).
Placidium arboreum (Schw. ex E. Michener) Lendemer – *Hodkinson 9348*.
Placynthium nigrum (Hudson) Gray – *Hodkinson 9266* (filed under *Muellerella lichenicola*; NY)
Platismatia tuckermanii (Oakes) Culb. & C. Culb. – *Guccion 1404*, *Hodkinson 9286*.
Porpidia albocaerulescens (Wulfen) Hertel & Knoph – *Guccion 1406*.
Protoblastenia rupestris (Scop.) J. Steiner – *Hodkinson 9237* (DUKE).
Pseudevernia consocians (Vain.) Hale & Culb. – *Guccion 1407*, *Hodkinson 9236*.
Pseudosagedia cestrensis (Michener) R.C. Harris – *Guccion 1405*.
Punctelia caseana Lendemer & Hodkinson ined. [=*Punctelia subrudecta* auct. Amer. sensu Lendemer (2004); see Lendemer and Hodkinson in press] – *Guccion 1408*, *Hodkinson 9267*.
Punctelia rudecta (Ach.) Krog – *Hodkinson 9232*.
Pyrenula subelliptica (Tuck. in Lea) R.C. Harris – *Guccion 1409*.
Pyrrhospora varians (Ach.) R.C. Harris – *Hodkinson 9280*, *Perlmutter 1351*.
Pyxine sorediata (Ach.) Mont. – *Guccion 1410*, *Hodkinson 9362*, *Perlmutter 1347*.
Pyxine subcinerea Stirton – *Hodkinson 9278*.
'*Ramalina americana* group' – *Hodkinson 9304*, *9363*.
Rinodina maculans Müll. Arg. – *Hodkinson 9323*.
Thelidium pyrenophorum (Ach.) Mudd – *Hodkinson 9312* (NY), *Perlmutter 1364*.
Trapelia coarctata (Turner ex Sm. & Sow.) M. Choisy – *Hodkinson 9341* (filed under *Arthonia lapidicola* ?; NY)
Tremella parmeliarum Diederich – *Hodkinson 9228* (on *Parmotrema reticulatum*).
Tremella sp. 7 (Diederich 2007)* – *Hodkinson 9315* (on *Flavoparmelia caperata*).
Trypethelium virens Tuck. ex Michener – *Guccion 1411*.
Tuckermannopsis americana (Sprengel) Hale – *Hodkinson 9259*.
Tuckermannopsis ciliaris (Ach.) Gyelnik – *Guccion 1412*, *Hodkinson 9325*.
Usnea dasaea Stirton – *Hodkinson 9203* (NY), *9222* (DUKE).
Usnea pensylvanica Mot. – *Hodkinson 9331*, *Perlmutter 1342*.
Usnea strigosa (Ach.) Eaton (s. str.) – *Guccion 1413*, *Hodkinson 9291*, *Perlmutter 1353*.
Verrucaria sp. (aff. *dolosa*) – *Hodkinson 9277* (NY).
Thin involucrellum, spores 18–22 × 9–11, similar to *V. dolosa*, *V. floerkeana*, and *V. olivacella*; examined by Othmar Breuss.

sterile crust 4 (sorediate w/atranorin, zeorin, and norstictic acid) – *Hodkinson 9210* (NY).

DISCUSSION

High Lichen Diversity

This list provides only a first assessment of the lichen biodiversity present in this region. During the short duration of the foray, 221 distinct taxa were collected and subsequently identified (yielding 41 taxa that were not previously reported and verified for the state of Virginia). This is compared with ~150 taxa collected recently in similar studies in the Piedmont of North Carolina (Perlmutter and Lendemer 2008) and the Coastal Plain of Virginia (Hodkinson and Case 2008); it should be noted that each of these studies involved multiple collecting trips and an attempt to provide a list that was as complete as possible for the study area. The total number of taxa documented in the present study is greater than one third of the species known from the state of Virginia (Hodkinson et al. 2009; state lichen checklist available at: http://www.duke.edu/~bph8/VirginiaLichens/checklist.html). In addition to the high diversity of known species, a number of the reported specimens may represent species new to science (annotated as 'sp.' or 'sterile crust'). Many of these collections are currently under study to better understand their taxonomic placement. The collection of so many species in such a short amount of time indicates an extremely rich lichen flora, and it is likely that many more species are present in the diversity of under-sampled micro-habits within the study area.

Rare Taxa and Major Range Extensions

Of the described species collected and identified, five are particularly worthy of note. The first known North American collection of *Sphaerellothecium coniodes* (Nyl.) Cl. Roux & Diederich (a lichenicolous fungus, found on *Baeomyces rufus*) was identified from material gathered for this study. While lichenicolous fungi are generally under-collected, the identification of this species from only a single location on the continent highlights the unique habitat represented by certain moist, deciduous ravine forests (e.g., Comer's Creek Falls in MRNRA). A portion of the same site had an open upland bog that yielded collections of two taxa that were especially noteworthy. One of these taxa, *Hypotrachyna lividescens* (Kurok.) Hale, is a primarily neotropical macrolichen that has not previously been reported for North America, though specimens from the highest point in Alabama (*Harris 28345*) and a mid-elevation site in the Great Smoky Mountains of North Carolina (*Lendemer 18914 & Tripp*) are stored at NY (Lendemer et al. 2009; for more information on specimens, see The C.V. Starr Virtual Herbarium of The New York Botanical Garden at http://sciweb.nybg.org/science2/VirtualHerbarium.asp). The other taxon, *Pycnora praestabilis* (Nyl.) Hafellner, is a lignicolous crust (collected here on fenceposts) that has not previously been reported from any other location in eastern North America.

Another particularly notable collection is *Psilolechia clavulifera* (Nyl.) Coppins, a species that may have been collected only one other time in eastern North America (Harris 2004). Since this species was collected at the summit of one of Virginia's highest peaks (Whitetop Mountain), it may be especially susceptible to the effects of climate change. In a nearby deciduous forest below the summit, a collection was made of *Heterodermia erecta* Lendemer, a foliose lichen previously known only from a few collections in southwestern North Carolina and northern Georgia (Lendemer 2009).

The five species discussed above should be considered for special protection due to their apparent rarity and our lack of understanding regarding their world-wide distributional patterns. As a first step, I propose the addition of these species to the state of Virginia's ''Rare Non-Vascular Plant List'' (Townsend 2009) to encourage further monitoring.

Continued Preservation is Crucial

Additional lichen collecting, with a special emphasis on the often overlooked microlichens, would likely add significantly to the number of species in MRNRA. A full survey of the area's lichen biota would seem appropriate given the amount of diversity and the number of rare or potentially endangered taxa found in this preliminary study. The results presented here highlight the importance of preserving unique habitats (e.g., ravine forests, upland bogs, and high peaks)

found in MRNRA and the southern Appalachian Mountains as a whole.

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