

Contributions to the Lichen Flora of Pennsylvania: A Checklist of Lichens Collected During the First Howard Crum Bryological Workshop, Delaware Water Gap National Recreation Area

RICHARD C. HARRIS¹ & JAMES C. LENDEMER²

ABSTRACT. – A checklist of 209 species of lichens and lichenicolous fungi collected during the First Howard Crum Bryological Workshop in the Delaware Water Gap National Recreation Area, Pennsylvania, USA is provided. The new species *Opegrapha bicolor* R.C. Harris & Lendemer, collected during the Foray, is described. *Chrysothrix flavovirens* Tønsberg and *Merismatium peregrinum* (Flotow) Triebel are reported as new to North America.

On April 23-26, 2004, we were graciously allowed to be commensals during the First Howard Crum Bryological Workshop in the Delaware Water Gap National Recreation Area, Pennsylvania, USA. Given the dearth of knowledge of lichen distributions in Pennsylvania and the overall lack of recent vouchers, this was a valuable opportunity to collect in what turned out to be a rich and interesting area.

We were quite surprised by the apparent high lichen diversity, as well as the number of novelties and rarities, in an area so close to the East Coast megalopolis. In four half-days in the field, we collected 209 species in a limited area of the Pennsylvania part of the Park. Some are clearly new to science of which, *Opegrapha bicolor* is described here (see Endnote). Two presumably undescribed species of *Fellhanera* will be published elsewhere, and the *Halecania* will be included in a forthcoming treatment of Ozark lichens. Others are left for the future, as present material (and our knowledge) are inadequate. *Chrysothrix flavovirens* and *Merismatium peregrinum* have not previously been reported from North America. Additional notable finds include *Arthonia apatetica*, *Gyalidea* sp., *Lecanora perplexa*, *Physcia pseudospeciosa*, *Pseudosagedia chlorotica* and *Rimularia badioatra*.

Wetmore (1987) surveyed the Delaware Water Gap National Recreation Area for lichens in 1986. He found 184 species collected from a much wider variety of habitats in both New Jersey and Pennsylvania. The amount of overlap with our list is rather small. A very rough tabulation of records for the Park gives a total of ca. 300 lichen species more or less reliably reported for the Water Gap over the last 30 years. Additional intensive collecting would likely add significantly to this number. A re-survey of the park in 2006, 20 years after Wetmore's study, would seem appropriate.

We are especially grateful to Mary Lincoln (Workshop organizer) and Bill Olson (who coordinated field trips and permits) for their kindness.

CHECKLIST

A list of the lichens collected during the Foray by the following is provided: W.R. Buck (NY), R.C. Harris (NY), J.C. Lendemer (hb. Lendemer, with duplicates in NY). The list is arranged chronologically by the localities visited, with an alphabetically arranged species list for each. In the interest of providing the Park with as an complete inventory as possible, we have included specimens that could

¹ Richard C. Harris: Institute of Systematic Botany, The New York Botanical Garden, Bronx, NY, 10458-5126, USA.

² James C. Lendemer: Research Associate, Lichen Herbarium, Department of Botany, The Academy of Natural Sciences of Philadelphia, 1900 Benjamin Franklin Parkway, Philadelphia, PA, 19103, USA. e-mail: lendemer@ancatsci.org

only be partially determined, as well as sterile sorediate crusts for which no names are presently known (these are placed at the end of the list for each locality). It should be noted that the numbers following undetermined species (i.e. *Lepraria* sp. 2) that occur throughout the checklist are intended to provide a reference for material that we consider to constitute a single taxon. Commentary and brief descriptions are provided when necessary. Lichenicolous fungi are indicated by an asterisk (*) and identity of the host lichen is also provided.

1. UNITED STATES OF AMERICA. PENNSYLVANIA. PIKE COUNTY.: Northern hardwood forest (*Quercus*, *Acer*, *Fraxinus*) dominated by hemlock (*Tsuga*) on steep slopes along several small streams, Childs Recreation Area, ca. 2.5 miles northwest of Dingman's Ferry, Delaware Water Gap National Recreation Area. – elev. ca. 800 ft. - UTM 18 508111E 4564880N – Lat. 41° 14' 07"N, Long. 74° 54' 12"W. – 23.April.2004

Alloctetraria oakesiana (Tuckerman) Randle & Thell – *Lendemmer* 2548.

Amandinea polyspora (Willey) E. Lay & P. May – *Harris* 49442, *Lendemmer* 2608.

Anaptychia palmulata (Michaux) Vainio – *Harris* 49443, *Lendemmer* 2470.

Arthonia apatetica (A. Massalongo) Th. Fries – *Harris* 49447-A.

Aspicilia laevata (Acharius) Arnold – *Buck* 46882, *Harris* 49444.

Bacidia schweinitzii (Fries ex Michener) G. Schneider – *Lendemmer* 3432.

Bacidina delicata (Leighton) V. Wirth & Vězda ? – *Buck* 46897 (pycnidia only), *Lendemmer* 3561 (apothecia and pycnidia).

No authentic material of *B. delicata* has been seen and our material is placed here on the basis of white apothecia with no trace of pigmentation in section and/or white pycnidia. The Water Gap collections differ from published descriptions in having goniocysts forming isidioid structures.

Bacidina egenula (Nylander) Vězda – *Harris* 49445.

Biatora longispora (Degelius) Lendemmer & Printzen – *Harris* 49446, *Lendemmer* 2565.

Biatora printzenii Tønsberg – *Harris* 49447, *Lendemmer* 2521.

Caloplaca citrina (Hoffmann) Th. Fries – *Harris* 49450.

Caloplaca flavovirescens (Wulfen) Dalla Torre & Sarnthein – *Lendemmer* 3403.

Chaenothecopsis sp. – *Lendemmer* 2707.

Capitulum green; stalk KOH–, N–; ascospores 1-septate; septum ± weak; not associated with algae. Mixed with "*C. nigra*."

Chaenothecopsis nigra Tibell ? – *Harris* 49449.

Our determination is tentative, since stalk is definitely greenish, KOH–. The material is placed here because the ascospores have a very dark septum.

Chaenothecopsis rubescens Vainio ? – *Lendemmer* 3409.

Capitulum KOH+ reddish, ascospores ornamented, but *Trentepohlia* is absent.

Chromofulvea dialyta (Nylander) Marbach – *Harris* 49448, *Lendemmer* 3441.

Chrysothrix candelaris (L.) J. R. Laundon – *Lendemmer* 3409-A.

Cladonia grayi G. Merrill ex Sandstede – *Harris* 49451.

Cladonia didyma (Fée) Vainio var. *didyma* – *Harris* 49452.

Cladonia incrassata Flörke – *Harris* 49453.

Cladonia macilenta Hoffmann var. *bacillaris* (Genth) Schaerer – *Harris* 49454.

Cladonia ochrochlora Flörke – *Harris* 49455, *Lendemmer* 3396.

Cladonia ramulosa (Withering) J. R. Laundon – *Harris* 49456.

Coenogonium pineti (Acharius) *ined.* – *Buck* 46910, *Harris* 49457, *Lendemmer* 3407.

Collema furfuraceum (Arnold) Du Rietz – *Harris* 49458, *Lendemmer* 3434.

Dactylospora lurida Hafellner* – *Lendemmer* 3406.

Dermatocarpon luridum (Withering) J. R. Laundon – *Lendemmer* 2576.

Dibaeis baeomyces (L. f.) Rambold & Hertel – *Harris* 49459.

Dictyocatenulata alba Finley & E. F. Morris – *Harris* 49460.

Endococcus propinquus (Körber) D. Hawksworth* (on *Porpidia albocaerulescens*) – *Harris* 49480-A.

Flavoparmelia baltimorensis (Gyelnik & Föriss) Hale – *Harris* 49462, *Lendemmer* 2531.

Flavoparmelia caperata (L.) Hale – *Harris* 49463, *Lendemmer* 2617.

Fuscidea arboricola Coppins & Tønsberg – *Harris* 49472.

Graphis scripta (L.) Acharius – *Harris* 49464.

Halecania sp. – Harris 49473.

Thallus green, ± shiny, PD+ orange; apothecial disk appearing dotted when wet. This apparently undescribed species seems relatively widespread in eastern North America in very humid, shaded situations.

Hypocnomyce scalaris (Acharius) M. Choisy – Harris 49465, Lendemer 2587.

Hypogymnia physodes (L.) Nylander – Harris 49466, Lendemer 2538.

Imshaugia aleurites (Acharius) S.F. Meyer – Lendemer 2549.

Lecania cuprea (A. Massalongo) v. d. Boom & Coppins ? – Lendemer 3438.

Lecanora sp. – Lendemer 2696.

Lecanora strobilina (Sprengel) Kieffer – Harris 49474, Lendemer 2518.

Lecidea cyrtidia Tuckerman – Harris 49475, Lendemer 2575, Lendemer 2599.

Lepraria sp. 3 (TLC: atranorin, salazinic acid) – Harris 49483.

Lepraria caesiella R. C. Harris in Lendemer – Harris 49484.

Lepraria caesioalba (B. de Lesdain) J.R. Laundon – Harris 49477, Lendemer 2582.

Lepraria incana (L.) Acharius – Harris 49481.

Lepraria lobificans Nylander – Harris 49479, Lendemer 2461.

Lepraria neglecta (Nylander) Erichsen – Harris 49480, Lendemer 2557.

Lepraria normandinoides ined. - (TLC: protocetraric acid!, on rock) Harris 49482, Lendemer 2464; (TLC: fumarprotocetraric acid!, on bark) – Harris 49478, Lendemer 3421.

Leptogium cyanescens (Rabenhorst) Körber – Lendemer 2500, Lendemer 2594.

Loxospora pustulata (Brodo & Culberson) R.C. Harris – Harris 49467, Lendemer 2579.

Melanelixia subaurifera (Nylander) Blanco et al. – Harris 49468, Lendemer 2585.

Micarea peliocarpa (Anzi) Coppins & P. James – Harris 49470, Harris 49471, Lendemer 2526, Lendemer 3402.

Mycobilimbia ahlesii (Körber) ined. – Harris 49476, Lendemer 2603.

Mycobilimbia berengeriana (A. Massalongo) Hafellner & V. Wirth – Buck 46894, Lendemer 2512.

Myxobilimbia sabuletorum (Schreber) Hafellner in Hafellner & Türk – Buck 46848, Harris 49486, Lendemer 2567.

Ochrolechia arborea (Kreyer) Almborn – Harris 49487, Harris 49488, Lendemer 2574.

Parmelia sulcata Taylor – Harris 49489, Lendemer 2618.

Parmelinopsis spumosa (Asahina) Elix & Hale (?) – Lendemer 2473, Lendemer 2622.

See Lendemer & Harris (2004) for notes on the identity of this taxon.

Peltigera polydactylon (Necker) Hofmann s. lat. – Harris 49485.

Phaeophyscia adiastrum (Esslinger) Esslinger – Buck 46823, Harris 49490, Lendemer 2497.

Phaeophyscia rubropulchra (Degelius) Esslinger – Lendemer 2542.

Porpidia albocaulerulescens (Wulfen) Hertel & Knoph – Harris 49491, Lendemer 2468, Lendemer 3436.

Porpidia crustulata (Acharius) Hertel & Knoph – Harris 49492.

Pseudosagedia chlorotica (Acharius) Hafellner & Kalb – Lendemer 2624.

Punctelia rudecta (Acharius) Krog – Harris 49493, Lendemer 2621.

Punctelia subrudecta auct. Amer. – Harris 49494, Lendemer 2620.

Rhizocarpon infernum (Nylander) Lyngby f. *sylvaticum* Fryday – Harris 49495, Lendemer 2519.

Rhizocarpon reductum Th. Fries – Lendemer 2457.

Rinodina? sp. – Harris 49507, Harris 49508, Lendemer 2702, Lendemer 2703, Lendemer 3424.

Thallus olive greenish to dark brown, saxicolous, consisting of initially scattered, subsquamulose, soraliolate areoles, later forming a continuous rimose-areolate crust with soralia and often with small swollen isidioid outgrowths. No lichen substances were detected. Immature apothecia suggestive of *Rinodina* are present in Harris 49507 and the general aspect also suggests *Rinodina*. Thus these specimens have been tentatively assigned to *Rinodina*. However, a brief search of the literature did not produce any likely species names.

Rinodina subminuta H. Magnusson – Harris 49447-B.

Scoliosporum chlorococcum (Stenhammar) Vězda – Harris 49489-A.

Scoliosporum umbrinum (Acharius) Arnold – Harris 49469.

Segestria leptalea (Durieu & Montagne) R. C. Harris – Harris 49492-A (saxicolous), Lendemer 3394 (saxicolous), Lendemer 3395 (corticolous).

Trapelia placodioides Coppins & P. James – Harris 49496, Lendemer 2501.

Trapeliopsis gelatinosa (Flörke) Coppins & P. James – Harris 49499, Lendemer 3363.

Trapeliopsis viridescens (Schrader) Coppins & P. James – Harris 49497, Harris 49498, Lendemer 2616.
Tremella? sp.* (on *Punctelia subrudecta*) – Harris 49510.

This fungus is very tentatively assigned to *Tremella*. It forms conspicuous, rough, ± resupinate, black structures ca. 2 mm across which initially are ± discoid or cup-shaped, breaking through the lichen cortex. A section showed a palisade of hyphae producing ± globose basidiospores/condia?.

There are no species of *Tremella* described from *Punctelia* or producing structures of this sort.

Tuckermanopsis americana (Sprengel) Hale – Lendemer 3400.

Tuckermanopsis ciliaris (Acharius) Gyelnik – Harris 49500, Lendemer 3401.

Umbilicaria mammulata (Acharius) Tuckerman – Harris 49501, Lendemer 2597.

Verrucaria sp. 5 – Harris 49461, Lendemer 2517, Lendemer 2627.

Thallus olive green, thick, rimose-areolate, on concrete; areoles weakly rugose; algae arranged in columns; perithecia immersed; involucrellum not laterally expanded, entire; ascospores 17-22.5 x 7.5-9(-10)µm.

Verrucaria praetermissa (Trevisan) Anzi – Lendemer 2591, Lendemer 2626.

Xanthoparmelia conspersa (Ehrhart ex Acharius) Hale – Harris 49502, Lendemer 2286, Lendemer 3361.

Xanthoparmelia cumberlandia (Gyelnik) Hale – Harris 49503, Harris 49505, Lendemer 2309.

Xanthoparmelia plittii (Gyelnik) Hale – Harris 49504, Lendemer 2291, Lendemer 3424.

sterile crustose sp. 5 (corticolous; TLC: norstictic acid; thallus pale olive green, rimose-areolate, with discrete, whitish soralia) – Harris 49509.

2. UNITED STATES OF AMERICA. PENNSYLVANIA. MONROE COUNTY.: Community Drive Wetlands, drained portions bordered by *Alnus*, and swampy portions primarily with *Acer* and *Fraxinus*, bisected by Hogback Ridge forested with dense hemlocks (*Tsuga*) and large semi-calcareous rock exposures and boulders, ca. 1 mile southeast of Shoemakers, ca. 2 miles south of Bushkill, Delaware Water Gap National Recreation Area. – elev. ca. 700-800 ft. - UTM 18 499427E 4547474N – Lat. 41° 04' 43"N, Long. 75° 00' 24"W. – 24.April.2004

Acarospora fuscata (Nylander) Arnold – Harris 49511.

Agonimia sp. – Buck 46959.

Allocetraria oakesiana (Tuckerman) Randle & Thell – Harris 49512.

Amandinea polyspora (Willey) E. Lay & P. May – Lendemer 2600.

Anaptychia palmulata (Michaux) Vainio – Harris 49513, Lendemer 2551.

Anisomeridium distans (Willey) R.C. Harris – Lendemer 2509, Lendemer 3392.

Anisomeridium polypori (Ellis & Everhart) M. E. Barr – Harris 49514.

Aspicilia cinerea (L.) Körber – Lendemer 2672.

Aspicilia laevata (Acharius) Arnold – Harris 49515.

Bacidia schweinitzii (Fries ex Michener) A. Schneider – Harris 49516, Lendemer 2463.

Bacidina delicata (Leighton) V. Wirth & Vězda ? (sterile) – Harris 49562.

Bacidina egenula (Nylander) Vězda – Harris 49517.

Biatora longispora (Degelius) Lendemer & Printzen – Harris 49518, Lendemer 2505.

Lendemer 2505 is a rare collection of *B. longispora* on semi-calcareous rock. Otherwise it is almost entirely corticolous, rarely on bryophytes.

Biatora vernalis (L.) Fries – Buck 46963.

Botryolepraria lesdainii (Hue) Canals et al. – Lendemer 2503.

Caloplaca flavovirescens (Wulfen) Dalla Torre & Sarnthein – Harris 49520, Lendemer 2515A.

Chaenotheca furfuracea (L.) Tibell – Harris 49521, Lendemer 3437.

Chrysothrix flavovirens Tønsberg – Harris 49523.

This species has not been previously reported from North America. Our identification is tentative. The possibility of a specimen from Connecticut being *C. flavovirens* was first pointed out to Harris by Emmanuel Sérúsiaux. (It wasn't, but the seed was planted.) Subsequently material seemingly referable to *C. flavovirens* was found (Maine, Harris 46235 (NY); New Jersey, Buck 47393 (NY), Lendemer 1910, Lendemer 3293 (hb. Lendemer, NY)). The material was compared morphologically and chemically with *Lichenes isidiosi et solediosi crustacei exsiccati* no.7 (Norway, Tønsberg 13195). The morphology and color match, but chemistry does not. While rhizocarpic acid is present, the "chrysothrix unknown" (recently shown to be diffractaic acid,

Elix & Tonsberg, 2004) is absent in North American material. Further study is required to determine if this chemical difference merits taxonomic recognition.

Cladonia caespiticia (Persoon) Flörke – Harris 49524.
Cladonia cylindrica (A. Evans) A. Evans – Harris 49525.
Cladonia fimbriata (L.) Fries – Harris 49526, Lendemer 2583.
Cladonia furcata (Hudson) Schrader – Harris 49527, Harris 49533, Lendemer 2619.
Cladonia incrassata Flörke – Harris 49528, Lendemer 2509.
Cladonia macilenta Hoffmann var. *bacillaris* (Genth) Schaerer – Harris 49529.
Cladonia ochrochlora Flörke – Harris 49530, Lendemer 3414.
Cladonia petrophila R. C. Harris – Harris 49531, Lendemer 3429.
Cladonia ramulosa (Withering) J. R. Laundon – Harris 49532.
Coenogonium pineti (Acharius) ined. – Harris 49534, Lendemer 2467.
Dermatocarpon americanum Vainio – Lendemer 2588.
Endocarpon sp. – Lendemer 2604.
Endocarpon pallidulum (Nylander) Nylander – Harris 49535, Lendemer 2694.
Endococcus propinquus (Körber) D. Hawksworth* – Harris 49594 (on *Porpidia albocaerulescens*), Harris 49536 (on *Verrucaria* sp.).
Evernia mesomorpha Nylander – Lendemer 2553.
Fellhanera sp. 1 – Harris 49538, Lendemer 2628, Lendemer 2630, Lendemer 2693.
Fellhanera sp. 2 – Harris 49537, Lendemer 2410.
Flavoparmelia caperata (L.) Hale – Harris 49539, Lendemer 2555.
Fuscidea arboricola Coppins & Tønsberg – Harris 49593.
Gyalidea sp. – Harris 49517 (filed with *Bacidina egenula*), Lendemer 3560.
The material is not in good condition. Even so, it does not seem to match any described species.
Heterodermia speciosa (Wulfen) Trevisan – Harris 49540.
Hypogymnia physodes (L.) Nylander – Harris 49541, Lendemer 2537.
Ionaspsis alba Lutzoni – Harris 49592, Lendemer 2623.
Lecanora perplexa Brodo – Harris 49543, Lendemer 2511.
Brodo (1984) included several somewhat diverse morphologies in *L. perplexa* which did not fit well elsewhere. Our material falls into the "*Lecanora subimmergens* in which the thallus was too granulose" category.
Lecanora strobilina (Sprengel) Kieffer – Lendemer 2507.
Lecanora thysanophora R.C. Harris – Harris 49544, Lendemer 2378.
Lepraria sp. 1 (TLC: xanthone?; thallus greenish-gray, dispersed eventually forming a thin continuous crust) – Lendemer 3422.
Lepraria sp. 2 (TLC: usnic acid, zeorin (tr.) terpenes (tr.); thallus light green, dispersed eventually forming a thin continuous crust) – Lendemer 2453.
Lepraria sp. 4 (TLC: unknown spots UV+ yellow, zeorin?; thallus weakly yellowish; no medulla) – Harris 49564.
Lepraria caesiella R. C. Harris in Lendemer – Harris 49563, Lendemer 2304.
Lepraria lobificans Nylander – Harris 49560, Lendemer 2451, Lendemer 3360.
Leptogium cyanescens (Rabenhorst) Körber – Lendemer 2494, Lendemer 2570.
Leptogium dactylinum Tuckerman – Harris 49545, Lendemer 2490, Lendemer 2592, Lendemer 2613.
Micarea peliocarpa (Anzi) Coppins & P. James – Harris 49546, Lendemer 2605.
Muellerella lichenicola (Sommerfelt) D. Hawksworth* (on *Caloplaca flavovirescens*) – Lendemer 2515B.
Mycobilimbia berengeriana (A. Massalongo) Hafellner & V. Wirth – Lendemer 2563.
Mycocalicium subtile (Persoon) Szatala – Harris 49522, Harris 49547, Lendemer 2530.
Myelochroa aurulenta (Tuckerman) Elix & Hale – Harris 49548, Lendemer 2471.
Nadvornikia soreliata R.C. Harris – Harris 49549, Lendemer 2502.
Ochrolechia arborea (Kreyer) Almborn – Harris 49565, Lendemer 2520, Lendemer 2524.
Opegrapha bicolor R. C. Harris & Lendemer sp. nov.¹ – Harris 49566.
Parmelia squarrosa Hale – Harris 49567, Lendemer 2547, Lendemer 2584.
Parmelia sulcata Taylor – Lendemer 2491.
Parmelinopsis spumosa (Asahina) Elix & Hale (?) – Harris 49568.
Peltigera evansiana Gyelnik – Harris 49569, Lendemer 2488.
Peltigera praetextata (Flörke ex Sommerfelt) Zopf – Harris 49570, Lendemer 3410.

Pertusaria pustulata (Acharius) Duby – Harris 49571.
Phaeocalicium polyporaenum (Nylander) Tibell – Harris 49572.
Phaeophyscia adiastrata (Esslinger) Esslinger – Harris 49573, Harris 49574, Lendemer 2485, Lendemer 2544, Lendemer 2556, Lendemer 2560, Lendemer 2569.
Phaeophyscia rubropulchra (Degelius) Esslinger – Harris 49575.
Phaeophyscia sciastra (Acharius) Moberg – Lendemer 2525.
Phaeophyscia squarrosa Kashiwadani – Harris 49576, Lendemer 2472, Lendemer 2596.
Phlyctis sp. (saxicolous) – Harris 49517, Harris 49561, Lendemer 2606.
Physcia millegrana Degelius – Harris 49578.
Physcia phaea (Tuckerman) J. W. Thomson – Harris 49579.
Porpidia albocaulerulescens (Wulfen) Hertel & Knoph – Harris 49580, Lendemer 2601.
Pseudosagedia chlorotica (Acharius) Hafellner & Kalb – Harris 49587, Lendemer 2568.
Pseudosagedia guentheri (Wallroth) Hafellner & Kalb – Lendemer 2474, Lendemer 2625.
Psilolechia lucida (Acharius) M. Choisy – Harris 49581, Lendemer 2676.
Punctelia rudecta (Acharius) Krog – Harris 49582, Lendemer 2533.
Punctelia subrudecta auct. Amer. – Harris 49583, Lendemer 2492.
Pyxine sorediata (Acharius) Montagne – Lendemer 2448.
Ropalospora viridis (Tønsberg) Tønsberg ? – Lendemer 3412.
Stigmidium sp.* – Harris 49517 (on unidentifiable crust [filed with *Bacidina egenula*]).
Strigula stigmatella (Acharius) R.C. Harris – Lendemer 3391.
Thelenella muscorum (Fries) Vainio – Buck 46928.
Trapelia involuta (Taylor) Hertel – Harris 49584.
Trapelia placodioides Coppins & P. James – Harris 49585, Lendemer 2510, Lendemer 2589.
Trapeliopsis viridescens (Schrader) Coppins & P. James – Buck 46971, Harris 49586.
Verrucaria sp. 6 – Harris 49535-A.
 Thallus pale brown, thick, rimose areolate, on HCl+ rock; perithecia immersed, several/areole; ascospores 14-17 x 5.5-6.5µm.
Verrucaria calkinsiana Servit – Harris 49588, Lendemer 2573.
Vezdaea leprosa (P. James) Vězda – Buck 46955, Lendemer 3545.
Xanthoparmelia angustiphylla (Gyelnik) Hale – Lendemer 3362.
Xanthoparmelia plittii (Gyelnik) Hale – Harris 49589.
 sterile crustose sp. 1 (saxicolous, rock HCl+; TLC: no lichen substances; thallus pale brownish gray, weakly areolate, with minute pale green soralia) – Harris 49592, Lendemer 2287.
 sterile crustose sp. 4 (corticolous, TLC: perlatolic acid group; sorediate) – Lendemer 2452, Lendemer 2454.
 sterile crustose sp. 8 (saxicolous; TLC: gyrophoric acid; thallus weakly placodioid, rimose-areolate, gray with thin white pruina, with soralia; soredia brown; photobiont chlorococcoid) – Harris 49591.
 sterile crustose sp. 10 (corticolous; TLC: perlatolic acid group; thallus initially thin, scanty, soon forming bright green soralia which then coalesce; pycnidia present with conidia suggestive of *Fellhanera*) – Harris 49590.

3. UNITED STATES OF AMERICA. PENNSYLVANIA. MONROE COUNTY.: Series of localities along Freeman Tract Road (River Road North) between intersection with Community Drive and terminus on west shore of Delaware River, ca. 2 miles southeast of Shoemakers, south of Bushkill, Delaware Water Gap National Recreation Area. – elev. ca. 500 ft. - UTM 18 499336E 4546600N – Lat. 41° 04' 15"N, Long. 75° 00' 28"W. – 25.April.2004

Acarospora canadensis H. Magnusson – Harris 49600.
Agonimia sp. – Buck 46985.
Amandinea polyspora (Willey) E. Lay & P. May – Harris 49636.
Anisomeridium distans (Willey) R. C. Harris – Harris 49617.
Arthonia apatetica (A. Massalongo) Th. Fries – Lendemer 2292-A.
Aspicilia laevata (Acharius) Arnold – Harris 49605.
Bacidina sp. (saxicolous) – Lendemer 2506, Lendemer 3443.
 Thallus of granular areoles, dispersed to aggregated, green; apothecia pale to dark brown with margin mostly excluded; exciple, hymenium and hypothecium pale, often blotched with brown, KOH+ purplish.

Bacidina egenula (Nylander) Vězda – Harris 49600-A.
Biatora longispora (Degelius) Lendemer & Printzen – Buck 47004.
Biatora printzenii Tønsberg – Harris 49619, Lendemer 3439.
Botryolepraria lesdainii (Hue) Canals et al. – Harris 49602, Lendemer 2566.
Caloplaca sp. – Lendemer 3405.
Caloplaca flavovirescens (Wulfen) Dalla Torre & Sarnthein – Harris 49595, Lendemer 2610.
Caloplaca sideritis (Tuckerman) Zahlbruckner – Lendemer 3411.
Caloplaca subsoluta (Nylander) Zahlbruckner – Buck 46994, Harris 49596, Lendemer 2686.
Candelaria concolor (Dickson) Stein – Lendemer 2559.
Cladonia cristatella Tuckerman – Harris 49639.
Cladonia cylindrica (A. Evans) A. Evans – Harris 49640, Lendemer 2450.
Cladonia grayi G. Merrill ex Sandstede – Harris 49637, Harris 49638.
Cladonia macilenta Hoffmann var. *bacillaris* (Genth) Schaerer – Harris 49620.
Cladonia peziziformis (Withering) J.R. Laundon – Harris 49621, Harris 49641, Lendemer 2456.
Endocarpon sp. – Harris 49601.
Endococcus propinquus (Körber) D. Hawksworth* (on *Porpidia albocaerulescens*) – Harris 49635.
Fellhanera sp. 1 – Harris 49617.
Flavoparmelia baltimorensis (Gyelnik & Főriss) Hale – Harris 49622.
Flavoparmelia caperata (L.) Hale – Lendemer 2536.
Graphis scripta (L.) Acharius – Lendemer 2578.
Heterodermia speciosa (Wulfen) Trevisan – Harris 49604, Lendemer 2546.
Ionaspis alba Lutzoni – Lendemer 2611.
Lecanora symmicta (Acharius) Nylander – Harris 49643, Harris 49644.
Lecanora thysanophora R.C. Harris – Lendemer 2465.
Lecidea cyrtidia Tuckerman – Harris 49645, Lendemer 2580.
Lepraria sp. 2 (TLC: usnic acid, zeorin (tr.), terpenes (tr.)) – Harris 49406, Lendemer 2462.
Lepraria caesiella R.C. Harris in Lendemer – Lendemer 2305.
Lepraria lobificans Nylander – Harris 49607, Lendemer 2455.
Leptogium cyanescens (Rabenhorst) Körber – Harris 49623.
Leptogium dactylinum Tuckerman – Harris 49624.
Leptogium lichenoides (L.) Zahlbruckner – Lendemer 2487, Lendemer 2571.
Melanelixia subaurifera (Nylander) Blanco et al. – Harris 49646, Lendemer 2489.
Merismatium peregrinum (Flotow) Triebel* (on *Rimularia badioatra*) – Harris 49618.
 Apparently new to North America.
Micarea erratica (Körber) Hertel et al. – Harris 49647.
Myelochroa aurulenta (Tuckerman) Elix & Hale – Harris 49597, Harris 49608, Lendemer 2541, Lendemer 2543.
 Harris 49608 has apothecia, which are only rarely produced in this sorediate species.
Myelochroa galbina (Acharius) Elix & Hale – Harris 49609, Harris 49625, Lendemer 2532.
Ochrolechia arborea (Kreyer) Almborn – Harris 49649, Harris 49650, Harris 49651.
Parmelia squarrosa Hale – Lendemer 2498.
Parmelia sulcata Taylor – Lendemer 2595.
Peltigera evansiana Gyelnik – Lendemer 2493.
Peltigera praetextata (Flörke ex Sommerfelt) Zopf – Buck 46993, Harris 49626.
Phaeocalicium curtisii (Tuckerman) Tibell – Buck 47012.
Phaeophyscia adiastrata (Esslinger) Esslinger – Harris 49627, Lendemer 2527.
Phaeophyscia pusilloides (Zahlbruckner) Esslinger – Harris 49628, Lendemer 2540, Lendemer 2545.
Physcia millegrana Degelius – Harris 49629, Harris 49652, Lendemer 2477, Lendemer 2558.
Physcia phaea (Tuckerman) Thomson – Harris 49630, Lendemer 2478, Lendemer 2615.
Physcia stellaris (L.) Nylander – Lendemer 3404.
Physconia leucoleiptes (Tuckerman) Esslinger – Harris 49610, Lendemer 2534, Lendemer 2581.
Porpidia albocaerulescens (Wulfen) Hertel & Knoph – Harris 49611.
Porpidia crustulata (Acharius) Hertel & Knoph – Harris 49653.
Protoblastenia rupestris (Scopoli) J. Steiner – Harris 49612.
Pseudosagedia cestrensis (Tuckerman ex Michener) R.C. Harris – Lendemer 2577.
Punctelia rudecta (Acharius) Krog – Harris 49613, Lendemer 2561.

Punctelia subrudecta auct. Amer. – Lendemer 2552.

Pyrrhospora varians (Acharius) R.C. Harris s. lat. – Harris 49654, Lendemer 2516.

Pyxine soredata (Acharius) Montagne – Harris 49631, Lendemer 2667.

Rimularia badioatra (Krempelhuber) Hertel & Rambold – Harris 49618.

The specimen has only a few apothecia which lack ascospores, possibly because they are infested with *Merismatium peregrinum*. The determination is suggested by immature asci of *Rimularia* type, presence of gyrophoric acid, and presence of *M. peregrinum* (restricted to *Rimularia badioatra* and *R. gibbosa* (Acharius) Coppins et al.).

Rinodina sp. (corticolous) – Lendemer 2522.

Rinodina oxydata (A. Massalongo) A. Massalongo – Harris 49598, Harris 49599, Harris 49614, Lendemer 2528, Lendemer 2612.

Sarcogyne regularis Körber – Harris 49615.

Staurothele diffractella (Nylander) Tuckerman – Harris 49632, Lendemer 2562.

Thelidium minutulum Körber – Harris 49603, Lendemer 2586.

Thelidium zwackhii (Hepp) A. Massalongo – Lendemer 2609-A.

Trapelia coarctata (Smith) M. Choisy s. lat. – Harris 49633.

Trapelia placodioides Coppins & P. James – Lendemer 2572.

Verrucaria sp. 1 – Lendemer 2466.

Thallus thin, rarely slightly rimose, on HCl– rock; perithecia superficial; involucrellum lacking below; ascospores 15-17 x 6-8µm.

Verrucaria sp. 2 – Harris 46655, Lendemer 2469.

With the above; thallus thicker, distinctly rimose, on HCl– rock; perithecia immersed in the thallus with abundant "oil" droplets at base; involucrellum ± expanded laterally and thin below; ascospores 17-20 x 7-8.5µm.

Verrucaria sp. 3 – Lendemer 2564, Lendemer 2609.

Thallus thick brown, rimose, on HCl+ rock; photobiont arranged in columns (as in *V. nigrescens* group); perithecia mostly immersed in the thallus; involucrellum present below; ascospores 20-23 x (7.5)-9-12.5µm.

Verrucaria sp. 4 – Buck 46995.

Externally similar to species 1 but ascospores larger, 19-21 x 8.5-10µm and on HCl+ rock.

Verrucaria baldensis A. Massalongo – Harris 49634, Lendemer 2602.

Verrucaria calkinsiana Servit – Harris 49616, Lendemer 2607.

Xanthoparmelia plittii (Gyelnik) Hale – Harris 49656.

sterile crustose sp. 2 (corticolous; TLC: unknown; thallus grayish, rimose, with pale greenish soralia) – Lendemer 2292 .

sterile crustose sp. 3 (corticolous; TLC: atranorin, zeorin; thallus white, continuous, with concolorous soralia eventually coalescing) – Lendemer 2449.

sterile crustose sp. 6 (corticolous; TLC: no substances detected; thallus gray green, initially ± continuous, becoming rimose, soraliate, with conspicuous white prothallus) – Lendemer 2679.

sterile crustose sp. 7 (corticolous; TLC usnic acid, zeorin; rather similar to *Lecanora thysanophora* but lacking the distinctive prothallus and lacking atranorin) – Harris 49657, Harris 49658, Harris 49659, Harris 49660.

sterile crustose sp. 9 (corticolous; TLC: no substances detected; thallus brownish gray, without obvious prothallus, with small pale green soralia) – Harris 49661.

4. UNITED STATES OF AMERICA. PENNSYLVANIA. PIKE COUNTY.: Upland oak (*Quercus*) dominated forest with exposed east facing slopes and a small maple (*Acer*) swamp with *Sphagnum* drainage, Pocono Environmental Education Center, Delaware Water Gap National Recreation Area. – elev. ca. 750 ft. - UTM 18 507598E 4557406N – Lat. 41° 10' 05"N, Long. 74° 54' 34"W. – 26.April.2004

Amandinea polyspora (Willey) E. Lay & P. May – Lendemer 3433.

Anaptychia palmulata (Michaux) Vainio – Lendemer 2480.

Arthonia caesia (Flotow) Körber – Lendemer 2673.

Cetrelia olivetorum (Nylander) Culberson & C. Culberson – Lendemer 3426.

Chaenothecopsis debilis (Turner & Borrer ex Smith) Tibell – Lendemer 2706, Lendemer 2710.

- Cladonia chlorophaea* (Flörke ex Sommerfelt) Sprengel – Lendemer 3428.
Cladonia cylindrica (A. Evans) A. Evans – Lendemer 2668, Lendemer 3423.
Cladonia polycarpoides Nylander – Lendemer 2637.
Cladonia pyxidata (L.) Hoffmann – Lendemer 2446.
Cladonia rangiferina (L.) F. H. Wiggers – Lendemer 2389, Lendemer 2459.
Cladonia rei Schaerer – Lendemer 2550, Lendemer 2593.
Cladonia squamosa Hoffmann – Lendemer 2665.
Cladonia subtenuis (Abbeyes) Mattick – Lendemer 2388, Lendemer 2460.
Dibaeis baeomyces (L. f.) Rambold & Hertel – Lendemer 2598.
Diploschistes scruposus (Schreber) Norman – Lendemer 3435.
Evernia mesomorpha Nylander – Lendemer 2539.
Flavoparmelia baltimorensis (Gyelnik & Főriss) Hale – Lendemer 2486.
Flavoparmelia caperata (L.) Hale – Lendemer 2475, Lendemer 2504.
Flavopunctelia flaventior (Stirton) Hale – Lendemer 2484.
Gyalideopsis sp. – Lendemer 2590 (hyphophores only).
Heterodermia speciosa (Wulfen) Trevisan – Lendemer 2483.
Lecanora oreinoides (Körber) Hertel – Lendemer 2629.
Leptogium dactylinum Tuckerman – Lendemer 2529.
Lobaria pulmonaria (L.) Hoffmann – Lendemer 2499.
Loxospora pustulata (Brodo & Culberson) R.C. Harris – Lendemer 2479.
Mycocalicium albonigrum (Nylander) Fink – Lendemer 2523.
Myelochroa aurulenta (Tuckerman) Elix & Hale – Lendemer 2535.
Myelochroa obsessa (Acharius) Elix & Hale – Lendemer 2614.
Ochrolechia arborea (Kreyer) Almborn – Lendemer 2458.
Ochrolechia pseudopallescens Brodo – Lendemer 2513.
Ochrolechia yasudae (Vainio) Oshio – Lendemer 2554.
Parmelia squarrosa Hale – Lendemer 2226, Lendemer 2496.
Parmelia sulcata Taylor – Lendemer 2476, Lendemer 2495.
Phaeophyscia adiastrata (Esslinger) Esslinger – Lendemer 2482, Lendemer 2485.
Phaeophyscia rubropulchra (Degelius) Esslinger – Lendemer 2481.
Physcia pseudospeciosa J. W. Thomson – Lendemer 2447.
Physcia pseudospeciosa is possibly one of North America's rarer endemic macrolichens. It is known from less than ten sites. In addition to this collection, we have seen material from one additional site in Pennsylvania (see Lendemer, 2005) and two sites in North Carolina. The type is from West Virginia (Thomson, 1963), and the species was reported by Moberg (Moberg, 2002) from Georgia, North Carolina and the state of Chihuahua, Mexico.
Pyxine sorediata (Acharius) Montagne – Lendemer 2355. .
Rhizocarpon grande (Flörke ex Flotow) Arnold – Lendemer 3571.
Trapeliopsis flexuosa (Fries) Coppins & P. James – Lendemer 2347.
Tuckermanopsis ciliaris (Acharius) Gyelnik – Lendemer 3427.
Xanthoparmelia conspersa (Ehrhart ex Acharius) Hale – Lendemer 2754.
Xanthoparmelia plittii (Gyelnik) Hale – Lendemer 2288, Lendemer 2381.
Xanthoparmelia somloënsis (Gyelnik) Hale – Lendemer 2308, Lendemer 2635.
Xanthoparmelia tasmanica (Hooker f. & Taylor) Hale – Lendemer 2307, Lendemer 2514.

LITERATURE CITED

- Brodo, I. M. 1984. The North American species of the *Lecanora subfusca* group. In: H. Hertel & F. Oberwinkler (eds.). Beitrage zur Lichenologie. Festschrift J. Poelt. Beiheft zur Nova Hedwigia, 79: 63-185.
Elix, J.A. & T. Tønberg. 2004. Notes on the chemistry of some lichens, including four species of *Lepraria*. Graphis Scripta, 16: 43-45.
Lendemer, J.C. 2005. Contributions to the Lichen Flora of Pennsylvania: The Lichen Flora of the Diabase Region of Northern Bucks and Montgomery Counties. Opuscula Philolichenum, 2: 21-26.
Lendemer, J.C. & R.C. Harris. 2004. A checklist of the lichens collected on the 28th A. Leroy Andrews Foray. Evansia, 21(2): 88-100.

- Moberg, R. 2002. *Physcia*. In: Nash III, T.H., Ryan, B.D., Gries, C., Bungartz, F. (eds.). Lichen Flora of the Greater Sonoran Desert Region. I: 358-373. Lichens Unlimited, Arizona State University, Tempe, Arizona.
- Thomson, J. W. 1963. The Lichen Genus *Physcia* in North America. Beihefte zur Nova Hedwigia, 7: i-vii, 1-172. J. Cramer.
- Torrente, P. & J.M. Egea. 1989. La Familia Opegraphaceae en el Area Mediterranea de la Peninsula Iberica y Norte de Africa. Bibliotheca Lichenologica, 32: 1-282.
- Wetmore, C. M. 1987. Lichens and Air Quality in Delaware Water Gap Recreation Area: Final Report. Privately published, St. Paul. 1-31 + 9 figs.

END NOTE

1. *Opegrapha bicolor* R. C. Harris & Lendemer, *sp. nov.*

Opegrapha distincta, disco et interdum margine albo pruinoso, margine saepe aurantico pruinoso, ascosporis 3-septatis, 16-19 x 4-5.5 μ m et conidiis 1-septatis 12.5-13.5 x 1.5-2 μ m.

TYPE: USA. PENNSYLVANIA. MONROE COUNTY: Middle Smithfield Township, Delaware Water Gap National Recreation Area, Community Drive wetlands/Hogback Ridge, 1.5 km S of Bushkill, 41°04'46"N, 75°00'44"W, mesic forest, on white oak at edge of wetland. 24.April.2004. R.C. Harris 49566 (NY, holotype; hb. Lendemer, isotype).

Thallus whitish (brownish where photobiont absent), immersed in bark, forming patches to 2 cm across; photobiont *Trentepohlia*. Ascomata lirelliform, slightly immersed to sessile, sinuous and/or bent, mostly unbranched, occasionally once branched, mostly narrowed at ends, to 1.5 mm. long, 0.2-0.3 mm across, with disk white pruinose and margin often becoming white pruinose or in places orange pruinose; margin slightly raised; orange pruina KOH+ red, not dissolving. Exciple brown-black, 25-50 μ m thick at sides, variable below, absent, thin or rarely \pm equal to upper part (depending on degree of immersion?). Epithymenium pale yellow brown, covered with coarse colorless crystals of pruina. Hymenium colorless, ca. 50 μ m high. Asci subcylindrical, with spores in two rows. Ascospores colorless, becoming brownish and roughened in old age, 3-septate, with cells roughly equal, clavate, 16-~~17.8~~-19 x 4-~~4.8~~-5.5 μ m. Pycnidia abundant, conspicuous, conical, white and/or orange pruinose, to 1.5 mm across. Conidia colorless, rod-shaped, straight or slightly curved, 1-septate, 12.5-13.5 x 1.5-2 μ m.

Opegrapha bicolor (named for the two colors of pruina) is an elegant and distinctive species. In an admittedly limited survey, we find only three other species with orange pruina. *Opegrapha ochrocheila* Nylander is probably the most similar in ascospore and conidial size, but differs in lacking white pruina and in having conidia 1-3 septate (2-septate *vide* Torrente & Egea, 1989). *Opegrapha ochrocincta* R. G. Werner also lacks white pruina and has nonseptate conidia 4-6 μ m long. In *Opegrapha aurantiaca* de Lesdain, from Cuba, the disk is said to be weakly white pruinose, but material identified as this from Florida is a more robust species with strong orange pruina on the margin, lacking a white pruina, and the conidia in Cuban type are said to be only 4-6 μ m long.