

## New and interesting records of lichens and lichenicolous fungi from northwestern USA

Michael Haldeman  
1402 23<sup>rd</sup> Street, Bellingham, WA 98225  
Email: [mhaldy@yahoo.com](mailto:mhaldy@yahoo.com)

**Abstract.** *Buellia dives* and *Lichenodiplis anomala* are reported new to North America. *Caeruleoconidia ochrolechia* is reported new to North America north of Mexico. *Cercidospora stereocaulorum* and *Verrucaria aquatilis* are reported new to the contiguous 48 states of the USA. *Phaeocalicium betulinum* is reported new to the western USA and *Arthonia subfuscicola* as new to northwestern North America. Five other species of lichens and lichenicolous fungi are reported new to the USA portion of the Rocky Mountains. Additional specimen details are provided for six other species with few reports from the region.

**Keywords.** *Buellia dives*, *Caeruleoconidia ochrolechia*, Idaho, *Lichenodiplis anomalus*, Whatcom Co.

The specimens below were collected by the author from 2015 to 2017 from northern Idaho and Whatcom County in northwestern Washington, USA. All specimens are in my personal herbarium unless otherwise noted. Coordinates are approximate. Nomenclature follows Esslinger (2016).

*Arthonia subfuscicola* (Lindsay) Triebel

*Arthonia subfuscicola* was first reported for North America by Triebel et al. (1991) from southern Arizona on *Lecanora carpinea*. As far as I know this is the only North American report until now. In the town of Bellingham, Washington, *L. carpinea* is an abundant corticolous lichen on angiosperm bark. Black smudges are common on the apothecial disks. The few smudges that I have inspected microscopically have been *A. subfuscicola*. New to northwestern North America.

**Specimens Examined.** – U.S.A. WASHINGTON. WHATCOM CO.: Bellingham, on apothecia of *Lecanora carpinea* on *Prunus* (plum tree) bark, 34 m, 48.7183°N, -122.4875°W, 10 December 2015, Haldeman 1113 (herb. Diederich); on *L. carpinea* on *Acer macrophyllum* branch, 189 m, 48.7361°N, -122.4808°W, 26 March 2017, Haldeman 1964 (herb. Diederich).

*Arthophacopsis parmiliarum* Hafellner

*Arthophacopsis parmiliarum* was reported from Alaska, British Columbia, Washington and Oregon by Diederich (2003). New to the US portion of the Rocky Mountains.

**Specimen Examined.** – U.S.A. IDAHO. CLEARWATER CO.: east of Greer, on *Parmelia sulcata* on *Amelanchier alnifolia*, 626 m, 46.4273°N, -116.1196°W, Haldeman 1792 (det. Diederich; herb. Diederich).

*Arthopyrenia plumbaria* (Stizenb. ex Hasse) R. C. Harris

*Arthopyrenia plumbaria* was found at the bases of ericaceous shrubs with *Biatora flavopunctata* and *B. meiocarpa* var. *tacomensis* and on tall shrubs. It is found west of the Cascade Mountains from British Columbia to California (McCune 2017b), but seems to also be fairly common in northern Idaho. These records are the first for the US portion of the Rocky Mountains.

**Specimens Examined.** – U.S.A. IDAHO. CLEARWATER CO.: 3 km north of Sylvan Saddle in the bottom of Tamarack Creek, on *Sorbus scopulina*, 1314 m, 46.5388°N, -115.5642°W, 15 June 2017, Haldeman 2272 (conf. McCune; herb. McCune); IDAHO CO.: near Lolo Pass in open, brushy subalpine forest, on *Vaccinium membranaceum*, 1448 m, 46.5672°N, -

114.5896°W, 14 July 2016, *Haldeman 1392*; **SHOSHONE CO.:** Junction Ridge south of Conrad Peak, on *Menziesia ferruginea*, 1571 m, 47.1270°N, -115.4904°W, 23 September 2015, *Haldeman 993C* (conf. McCune; herb. McCune); Northeast of Gospel Hill, on *Menziesia ferruginea*, 1654 m, 46.9811°N, -115.1476°W, 8 October 2015, *Haldeman 1042*; above the East Fork of Steamboat Creek in old growth *Tsuga heterophylla* forest, on *Sorbus scopulina*, 1102 m, 47.7710°N, -116.1924°W, *Haldeman 2184*.

*Biatora hypophaea* Printzen & Tønsgberg

*Biatora hypophaea* is known from Alaska to Oregon on the west side of the Cascades and from western Norway (Printzen and Tønsgberg 1999). Based on the specimens cited here it was also reported as rarely inland to northern Idaho by McCune (2017b). Both collections listed here were adjacent to thalli of *Pseudosagedia aenea* (see below).

*Specimens Examined.* – **U.S.A. IDAHO. CLEARWATER CO.:** Isabella Creek about 1 km from its confluence with the North Fork of the Clearwater River, on *Acer glabrum*, 564 m, 46.8589°N, -115.6250°W, 30 July 2016, *Haldeman 1438B* (conf. McCune; herb. McCune); mouth of Isabella Creek, on *Alnus rubra* bark, 524 m, 46.8503°N, -115.6314°W, 24 April 2017, *Haldeman 2028B*.

*Buellia dives* (Th. Fr.) Th. Fr.

*Buellia dives* is known from Sweden, Norway and Spain (Giralt et al. 2002). The specimens mentioned here agree with the description by Giralt et al. (2002). Noble's (1982) description of *Buellia* unknown 1 also agrees with this description of *B. dives* but she ruled out this species based on an assumption that *B. dives* should have an oil-inspersed hymenium. Giralt et al. (2002) clarified the confusing literature on this species. Based on the description in Noble (1982), Nordin (pers. comm. 2017) mentions that Noble's *Buellia* unknown 1 is *B. dives* but neither of us have seen her specimens. Her detailed description makes her record for British Columbia the first North American record, and the record listed here the first record of *B. dives* for the USA. In determining *Haldeman 597*, Nordin noted that none of the asci he observed contained more than 12 spores, and that the two thalli are small (4 and 6 mm diameter). Noble also reported only 12 spores/ascus. These North American specimens therefore differ from the 16 spores/ascus reported for European material. Noble (1982) gives the substrate of her two collections as *Alnus* and *Quercus*. The substrate for the Norwegian material, *Alnus incana* (Giralt et al. 2002), matches that of the Idaho collections. The Iberian collections were from *Betula*, *Acer* and *Pinus* (Giralt et al. 2002).

*Specimens Examined.* – **U.S.A. IDAHO. BONNER CO.:** Beaver Creek Campground at the northwest corner of Priest Lake, *Thuja plicata* and *Tsuga heterophylla* forest, on *Alnus incana* bark on lake edge, 761 m, 48.7311°N, -116.8581°W, 13 April 2015, *Haldeman 596* (OSC); *Haldeman 597* (det. Nordin, UPS).

*Caeruleoconidia ochrolechia* Zhurb. & Diederich

This genus and species were recently described from a specimen from Mexico and one from South Korea on the apothecia and thalli of *Ochrolechia* (Zhubenko et al. 2015). The specimens mentioned here are all from the thalli and apothecial verrucae of *Lepra ophthalmiza* which represents a new host for this genus and species. New to North America north of Mexico.

*Specimens Examined.* – **U.S.A. IDAHO. CLEARWATER CO.:** steep, rocky hillside above Orogrande Creek, on apothecia of *Lepra ophthalmiza* on *Thuja plicata* bark, 1040 m, 46.5668°N, -115.6149°W, 31 July 2016, *Haldeman 1475* (det. Diederich; herb. Diederich); **KOOTENAI CO.:** Deception Creek Experimental Forest, old growth *Thuja plicata* forest, on *Lepra ophthalmiza* on *Alnus incana* bark on creek edge, 905 m, 47.7339°N, -116.4986°W, 5 May 2015, *Haldeman 623* (det. Diederich; NY); **SHOSHONE CO.:** North Fork of the Coeur d'Alene, above confluence of East and West Forks of Steamboat Creek, on apothecia of *Lepra ophthalmiza* on bark of *Pseudotsuga menziesii*, 817 m, 47.7205°N, -116.1951°W, 28 August 2016, *Haldeman*

1615 (OSC); Boulder Creek, tributary of Mable Creek on the south side of the St Joe River, *Thuja* and *Tsuga* forest, on *Lepra ophthalmiza* on bark of *Alnus incana*, 780 m, 47.2222°N, -116.0106°W, 7 October 2016, *Haldeman 1849A* (det. Diederich; NY), *Haldeman 1849B* (OSC).

*Cercidospora stereocaulorum* (Arnold) Hafellner

This species was reported new to the U.S.A from Alaska and also from several sites in British Columbia, Canada, by Zhurbenko (2010). This species had already been reported from *Stereocaulon alpinum* by Svane and Alstrup (2004). This record, close to the Canadian border, is the first for the contiguous 48 states of the USA.

*Specimen Examined.* – **U.S.A. WASHINGTON. WHATCOM CO.:** Mt. Baker, Chowder Ridge between Skyline and Cougar Divides, on alpine sod with outcrops, on phyllocladia of *Stereocaulon alpinum*, 1991 m, 48.8422°N, -121.8581°W, 31 August 2017, *Haldeman 2546*.

*Ionaspis lavata* H. Magn.

The collection listed here was growing with *Ionaspis lacustris* on seasonally submerged rocks. Several other steep mountain streams in the Idaho portion of the Selkirk Mountains are lined with an obvious pink rim that is likely this species. New to the US portion of the Rocky Mountains.

*Specimen Examined.* – **U.S.A. IDAHO. BOUNDARY CO.:** Selkirk Mtns., Lion Creek near the end of Lion Creek Road, on large boulders in creek, 1128 m, 48.7572°N, -116.7319°W, 10 August 2015, *Haldeman 869*.

*Lepraria pacifica* Lendemer

*Lepraria pacifica* was reported west of the Cascades in British Columbia, Washington and Oregon and in California by Lendemer (2013). McCune (2017b) noted it was also rarely inland to northern Idaho. This species may be fairly common in appropriate habitat in northern Idaho.

*Specimens Examined.* – **U. S. A. IDAHO. CLEARWATER CO.:** Grandad Campground on the Dworshak Reservoir, on conifer stump and rotting wood of roots, 488 m, 46.8244°N, -115.914°W, 8 September 2016, *Haldeman 1647* (conf. Lendemer; NY); north-facing slope above Isabella Creek, on bark of large *Thuja plicata*, 647 m, 46.8566°N, -115.6281°W, 24 April 2017, *Haldeman 2042A* and *2042B*; **SHOSHONE CO.:** 3 km up Brown Creek from the North Fork of the Coeur d'Alene River, on bark at base of large *Thuja plicata*, 893 m, 47.7005°N, -116.0454°W, 27 August 2016, *Haldeman 1598*, (conf. McCune; herb. McCune); on bark on the sheltered base of a large *Tsuga heterophylla*, *Haldeman 1599* (conf. Lendemer; NY).

*Lichenodiplis anomala* Etayo & Pérez-Vargas [as 'anomalus'].

*Lichenodiplis anomala* is known from Spain, the Canary Islands and Chile (Pérez-Vargas et al. 2013). These two specimens are the first for North America but see the species description by Pérez-Vargas et al. (2013). They note several references that mention *Lichenodiplis lecanorae* on *Ochrolechia* before *Lichenodiplis anomala* was known.

*Specimens Examined.* – **U.S.A. IDAHO. CLEARWATER COUNTY.:** Cold Springs Trail on the south side of Dent Bridge on the Dworshak Reservoir, on *Ochrolechia szatalaënsis* on *Abies grandis*, 524 m, 46.5994°N, -116.1819°W, 16 April 2014, *Haldeman 462*, (det. Diederich; NY); mouth of Isabella Creek, *Alnus rubra* and *Thuja plicata* forest on the edge of the North Fork of the Clearwater River, on thallus of *Ochrolechia montana* on *Alnus rubra* branch over river, 524 m, 46.8503°N, -115.6314°W, 14 June 2017, *Haldeman 2260*, (conf. Diederich; herb. Diederich).

*Lichenopeltella biatorae* Pérez-Ortega & T. Sprib.

*Lichenopeltella biatorae* was described from British Columbia and Washington (Pérez-Ortega and Spribille 2009). New to the US portion of the Rocky Mts.

*Specimens Examined.* – **U.S.A. IDAHO. BOUNDARY CO.:** Selkirk Mtns., 1 km s of Red Top, on thallus of *Biatora flavopunctata* on *Rhododendron albiflorum*, 1744 m, 48.8894°N, -116.7251°W, 11 August 2015, *Haldeman 874*; **CLEARWATER CO.:** 3 km north of Sylvan Saddle in mesic bottom of Tamarack Creek, on *Biatora flavopunctata* on bark of *Vaccinium membranaceum*, 1315 m, 46.5388°N, -115.5642°W, 15 June 2017, *Haldeman 2273*; **SHOSHONE CO.:** East Fork Steamboat Creek, on thallus of *Biatora flavopunctata* on *Paxistima myrsinites*, 1102 m, 47.7710°N, -116.1924°W, 22 May 2017, *Haldeman 2193A*.

*Llimoniella pertusariae* Diederich & Etayo

Diederich and Etayo (2000) described *Llimoniella pertusariae* from Kittitas Co., in western WA. They also reported a record from Vancouver Island, BC. Diederich (2003) reported this species from additional sites in Alaska, British Columbia, Washington and Oregon. The only host mentioned for those records is *Lepra ophthalmiza* (as *Pertusaria ophthalmiza*) except for one Oregon record on *Pertusaria glaucomela*. All the records reported here are from *L. ophthalmiza*. These are the first records from the US Rocky Mountains.

*Specimens Examined.* – **U.S.A. IDAHO. CLEARWATER CO.:** Isabella Creek Campground on the North Fork of the Clearwater River in *Alnus rubra* and *Thuja plicata* forest, on *Lepra ophthalmiza* on bark of *Alnus rubra* on edge of river, 514 m, 46.8475°N, -115.6261°W, 13 June 2017, *Haldeman 2257A* (det. Diederich; herb. Diederich); **LATAH CO.:** Mantering Creek along Hwy 6, on *L. ophthalmiza* on bark of *Abies grandis*, 841 m, 46.9992°N, -116.6748°W, 22 April 2017, *Haldeman 2014* (det. P. Diederich; herb. P. Diederich); 4 km ne of Cougar Meadows, on *L. ophthalmiza* on bark of *Abies grandis*, 1077 m, 46.9493°N, -116.4708°W, 8 October 2017, *Haldeman 2654*.

*Phaeocalicium betulinum* (Nyl.) Tibell

*Phaeocalicium betulinum* is known from British Columbia, eastern North America, and northern Europe (Selva and Tibell 1999). This is the first record for the western United States.

*Specimens Examined.* – **U.S.A. IDAHO. SHOSHONE CO.:** Donkey Creek 10 meters from its confluence with Marble Creek on the south side of the St. Joe River, on *Betula occidentalis* on the creek edge, 915 m, 47.1925°N, -116.0775°W, 3 June 2017, *Haldeman 2230A* (det. Selva; herb. Selva), *Haldeman 2230B*.

*Phaeopyxis punctum* (A. Massal.) Rambold, Triebel & Coppins

This species was reported from British Columbia and eastern North America (Alstrup and Cole 1998, Diederich 2003) and Arizona (Diederich 2004, Hafellner et al. 2002). New to US northern Rockies.

*Specimen Examined.* – **U.S.A. IDAHO. SHOSHONE CO.:** 2 km up Butte Gulch east of Murray, on squamules of *Cladonia pocillum* on litter over talus, 1026 m, 47.6216°N, -115.8084°W, 13 August 2017, *Haldeman 2457* (conf. Diederich; herb. Diederich).

*Pseudosagedia aenea* (Wallr.) Hafellner & Kalb

*Pseudosagedia aenea* is a widespread species (Brodo 2016, McCune 2017b). The two Isabella Creek specimens were both incidentally collected with *Biatora hypophaea* and one of them appeared to lack algae. The specimen on *Vaccinium* consisted of several small thalli among *Biatora flavopunctata* and *Arthonia apatetica*. New to the Rocky Mountains.

*Specimens Examined.* – **U.S.A. IDAHO. CLEARWATER CO.:** Isabella Creek about 1 km from its confluence with the North Fork of the Clearwater River, on *Acer glabrum*, 564 m, 46.8589°N, -115.6250°W, 30 July 2016, *Haldeman 1438B* (McCune was unsure of this specimen, it appeared to not be lichenized; herb. McCune); mouth of Isabella Creek, on *Alnus rubra* bark, 524 m, 46.8503°N, -115.6314°W, 24 April 2017, *Haldeman 2028B*; 3 km north of Sylvan Saddle in mesic bottom of Tamarack Creek, on bark of *Vaccinium membranaceum*, 1315 m, 46.5388°N,

-115.5642°W, 15 June 2017, *Haldeman 2273B* (conf. McCune; herb. McCune), *Haldeman 2273A*.

*Rinodina trevisanii* (Hepp) Körber

This species is found west of the Cascades and has been reported from interior British Columbia and in Arizona (Sheard 2010.) These three records from mesic forests in western Clearwater County, Idaho fill a gap in the inland distribution of this species.

*Specimens Examined.* – **U.S.A. IDAHO. CLEARWATER CO.:** Giant Cedar Grove near Elk River, on dead twig of *Thuja plicata*, 1175 m, 46.8872°N, -116.1217°W, 20 May 2016, *Haldeman 1255A* (det. Sheard, SASK); Isabella Creek, on *Acer glabrum*, 564 m, 46.8589°N, -115.6250°W, 30 July 2016, *Haldeman 1438A* (det. Sheard, SASK); above Breakfast Creek, on *Vaccinium membranaceum*, 848 m, 46.8866°N, -115.9843°W, 8 September 2016, *Haldeman 1663* (det. Sheard, SASK).

*Umbilicaria angulata* Tuck.

*Umbilicaria angulata* was not accepted for Montana by McCune et al. (2014). All specimens from inland states that they examined were misidentifications of other species. One of the Clearwater County specimens listed here, *Haldeman 1715B*, was sent to B. McCune and verified by him. No spores were found in the Bonner County specimen but McCune agreed that the morphology was consistent with *U. angulata*. This species is included here as clarification of its occurrence in the US portion of the Rockies.

*Specimens Examined.* – **U.S.A. IDAHO. BONNER CO.:** north end of Priest Lake, on large boulder by road, 805 m, 48.7814°N, -116.8225°W, 14 April 2015, *Haldeman 605*; **CLEARWATER CO.:** old growth *Pinus ponderosa* forest with large outcrops about 3km north of Pot Mt above the North Fork of the Clearwater River, on rock outcrops, 1395 m, 46.7672°N, -115.4289°W, *Haldeman 1715A, 1715B* (herb. McCune); 1273m, 46.7637°N, -115.4243°W, *Haldeman 1709B*.

*Verrucaria aquatilis* Mudd

*Verrucaria aquatilis* is known from Europe, Asia and New Zealand (Orange et al. 2009). H. Thüs confirmed *Haldeman 1962* as morphologically identical to *V. aquatilis*. This is the first report of this species from North America, although it has also been collected from Glacier Bay NP, Alaska in 2012 (Spribille et al. ined.).

*Specimens Examined.* – **U.S.A. WASHINGTON. WHATCOM CO.:** Chuckanut Mountains on the south side of Bellingham, on HCl- rock in the bottom of a small creek, 183 m, 48.6947°N, -122.4739°W, 19 March 2017, *Haldeman 1962* (conf. Thüs; STU) and *1963*.

### ACKNOWLEDGEMENTS

I thank the United States Forest Service's Forest Inventory and Analysis Program for the funding to collect and identify some of the specimens listed above. I also thank Bruce McCune and Paul Diederich for graciously offering encouragement and help with identifications and for reviewing earlier copies of this document. Sara Goeking also reviewed the document which was greatly appreciated. Thanks also to Irwin Brodo, James Lendemer, Anders Nordin, Steven Selva, John Sheard and Holger Thüs who provided useful information and determinations. And especially thanks to Sara and Silas for their support and patience.

### REFERENCES

- Alstrup, V. and M.S. Cole. 1998. Lichenicolous fungi of British Columbia. *The Bryologist* 101: 221-229.
- Brodo, I.M. 2016. Keys to the lichens of North America: revised and expanded. New Haven: Yale University Press. 427 pp.

- Brodo, I.M., S.D. Sharnoff and S. Sharnoff 2001. Lichens of North America. New Haven: Yale University Press. 795 pp.
- Diederich, P. 2003. New species and new records of American lichenicolous fungi [Neue Arten und neue Funde von amerikanischen lichenicolen Pilzen]. *Herzogia* 16: 41-90.
- Diederich, P. and J. Etayo. 2000. A synopsis of the genera *Skyttea*, *Llimoniella* and *Rhymbocarpus* (lichenicolous Ascomycota, Leotiales). *Lichenologist* 32: 423-485.
- Esslinger, T. L. 2016. A cumulative checklist for the lichen-forming, lichenicolous and allied fungi of the continental United States and Canada. North Dakota State University: <http://www.ndsu.edu/pubweb/~esslinge/chcklst/chcklst7.htm> (Version 21, 15 November 2016), Fargo, North Dakota; also published in *Opuscula Philolichenum* 15: 135-390.
- Giralt, M., T. Tønsberg and H. Holien. 2002. Notes on the misunderstood *Buellia dives* (Th. Fr.) Th. Fr. *Lichenologist* 34: 1-5.
- Hafellner, J., D. Triebel, B. D. Ryan and T. H. Nash III. 2002. On lichenicolous fungi from North America. II. *Mycotaxon* 84: 293-329.
- Hardman, A., D. Stone and S. Selva. 2017. Calicioid lichens and fungi of the Gifford Pinchot and Okanogan-Wenatchee National Forests in Washington, U.S.A. *Opuscula Philolichenum* 16: 1-14.
- Lendemer, J.C. 2013. A monograph of the crustose members of the genus *Lepraria* Ach. s. str. (Stereocaulaceae, lichenized Ascomycetes) in North America north of Mexico. *Opuscula Philolichenum* 11: 27-141.
- McCune, B. 2017a. Microlichens of the Pacific Northwest. Volume 1: Key to the genera. Corvallis, OR: Wild Blueberry Media. iv + 215 pp.
- McCune, B. 2017b. Microlichens of the Pacific Northwest. Volume 2: Key to the species. Corvallis, OR: Wild Blueberry Media. iv + 755 pp.
- McCune, B. and L. Geiser. 2009. Macrolichens of the Pacific Northwest, 2<sup>nd</sup> ed. Corvallis, OR: Oregon State University Press. 464 pp.
- McCune, B., R. Rosentreter, T. Spribille, O. Breuss and T. Wheeler. 2014. Montana Lichens: An Annotated List. *Monographs in North American Lichenology* 2: 1-183. Corvallis, OR: Northwest Lichenologists.
- Orange, A., D. L. Hawksworth, P. M. McCarthy and A. Fletcher. 2009. *Verrucaria* Schrad. (1794). Pp. 931-957. In: C. W. Smith et al. (eds.). *The Lichens of Great Britain and Ireland*. London: Natural History Museum and British Lichen Society.
- Pérez-Ortega, S. and T. Spribille. 2009. Three new species of *Lichenopeltella* (Microthyriaceae, Ascomycota) from northwest North America. *Nova Hedwigia* 89: 219-228.
- Printzen, C. and T. Tønsberg. 1999. The lichen genus *Biatora* in northwestern North America. *The Bryologist* 102: 692-713.
- Sheard, J. W. 2010. The lichen genus *Rinodina* (Ach.) Gray (Lecanoromycetidae, Physciaceae) in North America, North of Mexico. Ottawa: NRC Research Press. 246 pp.
- Svane, S.J. and V. Alstrup. 2004. Some lichenicolous fungi from Iceland. *Acta Botanica Islandica* 14: 53-58.
- Thüs, H. and M. Schultz. 2009. *Freshwater Flora of Central Europe Volume 21/1. Fungi 1. Teil/1<sup>st</sup> part: Lichens*. Heidelberg: Spektrum Akademischer Verlag.
- Triebel, D., Rambold, G. and Nash III, T.H. 1991. On lichenicolous fungi from continental North America. *Mycotaxon* 42: 293-296.
- Zhurbenko, M. 2010. Lichenicolous fungi and lichens growing on *Stereocaulon* from the Holarctic, with a key to the known species. *Opuscula Philolichenum* 8: 9-39.
- Zhurbenko, M.P., A. Frisch, Y. Ohmura and G. Thor. 2015. Lichenicolous fungi from Japan and Korea: new species, new records and a first synopsis for Japan. *Herzogia* 28: 762-789.