

***Ochrolechia brodoi*, a new lichen for North America from Alaska, with updates to the key of corticolous North American species**

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Abstract. *Ochrolechia brodoi* Kukwa is reported as new for North America and Alaska. Other corticolous species of *Ochrolechia* reported since the publication of Brodo's (1991) revision are summarized, and some couplets from the key in that publication are emended with the addition of *O. brodoi* and *O. xanthostoma*. The latter is reported new to Oregon.

Keywords. Pertusariales, key, Lake Clark National Park, Norway, Oregon.

INTRODUCTION

A puzzling *Ochrolechia* was encountered by the second author during the course of a survey of Lake Clark National Park in southwestern Alaska. It turned out to have been recently described in Europe based on a lichen from Norway collected by the first author (Kukwa 2011). *Ochrolechia brodoi*, as it was called, is new for North America and Alaska.

METHODS

Specimens were examined using Wild M-5 stereomicroscope, and free-hand sections of the thallus were mounted in water and examined with a Leica DMR compound microscope. Chemical studies were done following the methodology of Orange et al. (2001) for thin layer chromatography and Brodo (1991) for spot tests.

RESULTS

***Ochrolechia brodoi* Kukwa** (Fig. 1)

Description of Alaskan material:

Thallus white, very thin, continuous to patchy, somewhat shiny and smooth. Apothecia 0.8-1.5 mm in diameter, with smooth, barely prominent margins; disks pale orange, vaguely to distinctly rosulate (with radiating sterile bands of tissue), not pruinose; algae in margin, partly extending below the hypothecium; excipulum expanded to ca. 40 μm wide laterally; hymenium ca. 325 μm ; ascospores 6–8 per ascus, ellipsoid to broadly ellipsoid, 38–58 \times 22–26 μm .

Chemistry: Amphithecial cortex C+ pink, medulla C–; thallus cortex and medulla C–. Contains gyrophoric acid (major), lecanoric acid (trace), and lichesterinic and protolichesterinic acids (minor).

Specimen examined. – U.S.A. ALASKA. KENAI PENINSULA BOROUGH: Lake Clark National Park, 59.87128°N, 153.09385°W, NAD83, elev. 4 m. *Picea-Betula* forest, 250 m NE of Chinitna Bay Ranger Station, near site of prehistorical pit houses; on *Betula* bark. *B. McCune 35665*, with Nelson, Rosentreter, Tønsberg and Walton, 19 July 2014 (ALA).



Figure 1. *Ochrolechia brodoi*, Alaska, McCune 35665 [ALA]. Scale in millimeters.

DISCUSSION

This species was recently described by Kukwa (2011) based on material that IMB collected in Torne Lappmark, Norway, and called *O. oregonensis* H. Magn., publishing the record as new for Scandinavia and Europe (Brodo 1992). Kukwa (2011) revised the material and described it as *O. brodoi*. The species is known from several localities in Norway. It is very distinctive because of its C+ pink amphithecial cortex and the production of lichesterinic acid, a combination of chemical features that occurs in no other North American species of *Ochrolechia*. Lichesterinic acid is normally found in species of the “*O. parella* group”, all lacking gyrophoric acid except in the epihymenium and therefore with a C– amphithecial cortex, and typically containing variolaric acid (Brodo 1991), which is lacking in *O. brodoi*. The rosulate disk makes it similar to North American and Asian specimens of *O. trochophora* (Vainio) Oshio, which also has a C+ pink amphithecial cortex, but which lacks fatty acids. European specimens apparently lack rosulate disks (Kukwa 2011). In North America, *O. trochophora* var. *trochophora* is only known from the east.

The Alaskan specimen seems to be young to judge from the thin thallus, small apothecia (up to 2.2 mm in diameter in Europe), and poorly developed apothecial margins. There were no truly mature, healthy spores in our specimen, which may explain the discrepancies in spore size ($50\text{--}67 \times 30\text{--}37\mu\text{m}$ in European material). Interestingly, both the European and American specimens were found growing on *Betula*.

Brodo (1991) reported and treated 19 species of *Ochrolechia* growing on bark or wood. The addition of *O. brodoi* to the list, together with *O. turneri* (Turner) Hasselrot and *O. microstictoides* Räsänen reported in Brodo & Lendemer (2012), and the recognition of *O. mahuensis* Räsänen as distinct from *O. androgyna* (Hoffm.) Arnold (Kukwa 2011) brings that number up to 22. The transfer of *Pertusaria xanthostoma* (Sommerf.) Fr. to *Ochrolechia* as *O. xanthostoma* (Sommerf.) K. Schmitz & Lumbsch by Schmitz et al. (1994) adds still another species since that taxon has been reported from British Columbia to Alaska (Dibben 1980, Noble et al. 1987). The species also occurs in Oregon and is new for the state (Oregon: Clatsop Co., summit of Onion Peak, 6 km E of ocean, open area on basaltic breccia outcrops bordered by

shrubs and *Abies* forest, on rotten snag, 890 m, July 2001, *McCune 26151* [OSC]). There is evidence, however, that the North American material called “*Pertusaria xanthostoma*,” with one or two ostioles per verruca and eight spores per ascus, is not conspecific with *O. xanthostoma* s. str., described from Europe, which has up to five ostioles per verruca and consistently has four spores per ascus (T. Spribille, pers. comm.). The new soreciate species, *O. microstictoides*, *O. turneri* and *O. mahluensis* are all keyed out in Brodo & Lendemer (2012), and *O. brodoi* (Fig. 1) and *O. xanthostoma* (Fig. 2) can be added to the key in Brodo (1991: 769-770) as follows:

- 11(b): delete “; contains variolaric acid” 21
- 20. Containing lichesterinic acid; apothecia typically rosulate; coastal Alaska *O. brodoi* Kukwa
- 20. Lacking fatty acids; apothecia rosulate or not 20(a)
- [20(a) as in couplet “20”, leading to *O. trochophora* and *O. subpallenscens*]
- 21. Epihymenium C– or C+ yellow; lacking gyrophoric acid, with or without variolaric acid..... 22
- 21. Epihymenium C+ pink or red; containing gyrophoric and variolaric acids; apothecial disks UV– or slightly yellow-orange, lightly pruinose to pruinose scabrose, rarely epruinose.. 23
- 22. Apothecia subglobular, consistently opening only by a single ostiole (rarely two); medulla KC+ pink, UV+ white (alectoronic acid; lacking variolaric acid); thallus thin and continuous, smooth; Oregon to Alaska *O. xanthostoma* (Sommerf.) K. Schmitz & Lumbsch s. lat. (Fig. 2)
- 22. Apothecia flat, discoid, opening broadly when mature; medulla KC–, UV– (lacking alectoronic acid, containing variolaric acid) 22(a)
- [22(a) as in couplet “22” leading to *O. szatalaënsis* and *O. farinacea*.)]

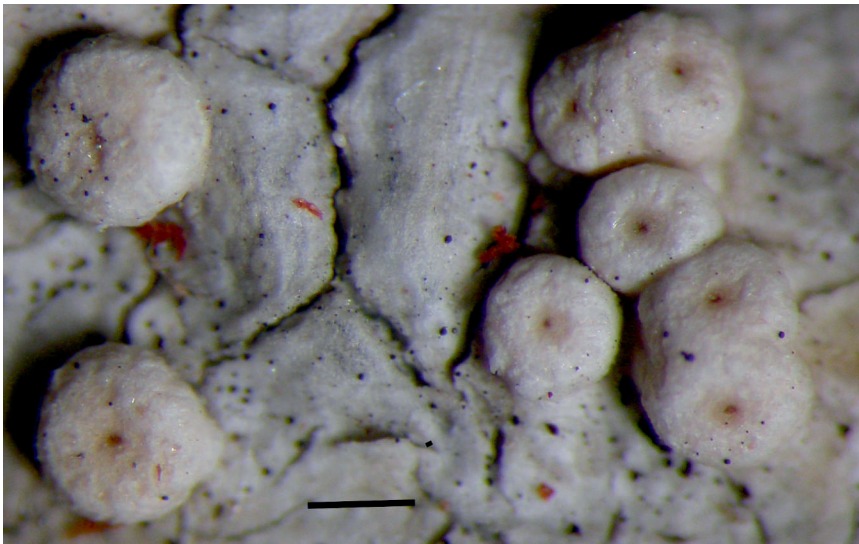


Figure 2. *Ochrolechia xanthostoma* s. lat., British Columbia, Haida Gwaii, *Brodo 26578* [CANL]. Scale = 0.5 mm.

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