SPECIES FACT SHEET

Common Name: N/A
Scientific Name: *Entoloma occidentale* (Murr.) Blanco-Dios
Synonym: *Leptonia occidentalis* var. *occidentalis* (Murr.) Murr.
Basionym: *Leptoniella occidentale* (Murr.)

Division: Eumycota
Subdivision: Basidiomycotina
Class: Agaricomycetes
Order: Agaricales
Family: Entolomatacea

Type W.A. Murrill, 6-11 November 1911, OR, Benton County, Corvallis

Technical Description: Pileus (cap) 20-30 mm broad at maturity, convex to plane, not umbonate; surface dry, finely scabrous or fibrillose at least near the center, opaque; non-striate; uniformly very dark steel-blue-violet or lilac-black; margin entire and concolorous; context very thin. **Odor:** none. **Taste:** none. **Lamellae:** adnexed with a slight decurrent tooth, several times inserted**,** rather broad and widest in center (ventricose), distant, white to lilac or salmon-colored; margin entire. **Stipe**: 40-50 mm long, 2-3 mm broad at throughout (equal), cartilaginous, glabrous (but see "Taxonomic Problems" below) concolorous with the pileus; basal mycelium whitish.

Microscopic Characters:
Spores: ellipsoid, angular, apiculate, 10.5-13.0 X 6.5-8.5 µm, (average length 10.3 µm; average width 7.1µm). Suprahilar depression distinct. **Basidia:** clavate, 2-4 spored, 35-42 x 8.5-13 µm; length:width ratio 2.6-4.5. **Lamellular cystidia:** absent (Hesler 1963, Largent 1994), cheilocystidia very rare to absent, cylindric to clavate, at times rostrate ventricose, often capitate, 32-40 x 6.2-9 µm (Largent 1971) (but see "Taxonomic Problems" below); pleurocystidia absent. **Pileipellis** a layer of entangled hyphae, with a vacuolar pigment that is dark brown to fuscous in 3% KOH, often with faint internal ring-like encrustations; clamps present; pileocystidia cylindro-clavate 43-85 x 10-15 µm; hyphae of pileal trama up to 18 µm wide. **Stiptipellis** a layer of entangled hyphae at apex; clamps present, hyphae of stipe trama 10-22 µm wide, vascular hyphae absent; caulocystidia long and cylindro-clavate 82.5-90 x 5-7.5µm (Largent 1971). **Basal hyphae:** clamps abundant on hyphae at base of stipe.

Taxonomic Problems: There is some discrepancy in the description of *Leptonia occidentais var. occidentalis (now Entoloma occidentale)*. Murrill's original 1917 description notes a glabrous stipe. Hestler (1963) notes "cheilocystidia and pleurocystidia absent" and "clamps in pileipellis absent". He

makes no mention of the stiptipellis. Largent's study of the Type (1971) found "rare to absent cheilocystidia" which he described as above. He also noted "long caulocystidia" on the upper stipe. This suggests an upper stipe which should appear at least pruinose in fresh material. Largent also notes the presence of occasional clamps on the hyphae of the pellipellis. In 1977, *Leptonia occidentalis var. metallica* was erected as a species (Largent, 1977). The same work references Largent (1971) in stating "cheilocystidia rare but distinct" in *Leptonia occidentalis* var. *occidentalis*. He goes on to use this as the primary distinction between *L. occidentalis* var. *occidentalis* and *L occidentalis* var. *metallica*. Another difference is the color of the young lamellae and an iridescent stipe in *L. occidentalis var. metallica.* It should be noted these slight differences are based on Murrill's fresh notes (1911) that were taken near Corvallis in January, likely in poor light conditions. Largent (1995) describes *L. occidentalis* var. *occidentalis* as not having cheilocystidia, and having a glabrous stipe, which confers more to Murrill's and Hestler's earlier interpretations. The distinction between these two varieties now rests on a glabrous, non-iridescent stipe in *L. occidentalis* var. *occidentalis* and a fibrillose, iridescent stipe in *L. occidentalis* var. *metallica*. There may be a difference in the color of the young lamellae, but that is not clear at this time. The Types of both varieties should be reexamined. If cheilocystidia are absent and caulocystidia are present in *L. occidentalis* var. *occidentalis* then it is likely the varieties are conspecific. A third variety, *L. occidentalis* var. *fibrillosipes* differs in having smaller spores and a non-iridescent, fibrillose stipe. The Type collections for *L. occidentalis* var. *metallica* and *L. occidentalis* var. *fibrillosipes* were collected at the same location, two weeks apart, leading one to wonder if these varieties are actually different.

Two collections from the northwest identified as *Leptonia occidentalis* sl. were recently entered in Genbank, and are at present the only reference collections in Genbank. They share only 64% similarity. I believe at least one of these is misidentified. Collection OSC113798 (incorrectly listed as OSC 113789 in Genbank, GenBank#: EU846252.1) has spores that are too narrow for *L. occidentalis* according to the collection notes by Entin. The second collection, (Loring 4549SL, GenBank#: KU574742.1) is a 100% match to a lignicolus collection from Ohio (*Entoloma occidentale*, Mushroom Observer observation 261277) while *Leptonia occidentalis* var. *occidentalis* is reported to have a terricolous habit. Sequences of the Type collections of *Leptonia occidentalis* and its varieties should be attempted to establish accurate baseline sequences for the species and its varieties.

Similar Species: *Entoloma (*previously *Leptonia) occidentale* is one of several small purple-brown-black, western *Entoloma* species. *Entoloma occidentalis* var. *metallica* (Largent 1977,) has an iridescent, fibrillose stipe and lamellae that are blueish grey when young (see "Taxonomic Problems" above). *Entoloma occidentale* var. *fibrillosipes* (Largent 1994) has a fibrillose stipe, lamellae that

are blueish grey when young, and smaller spores (<10 µm) (see "Taxonomic Problems" above). *Entoloma convexa* var. *convexa* has white lamellae, a fibrillose stipe, and a different pileipellis arrangement. *Entoloma carnea* is larger, has whitish lamellae, and is lignicolus.

Distinctive Field Characters: 1) a terricolous habit 2) the finely scabrous to fibrillose pileus that is evenly colored, steel-blue with a violet component, and if scabrous, likely to be so in the center of the cap 3) lamellae lilac when young, white to salmon with maturity, 4)a smooth, slender, cartilaginous stipe, concolorous with the cap.

Distinctive Microscopic Characters: 1) angular spores, greater than10 µm long 2) a pileipellis of entangled hyphae with clamps.

Life History: *Entoloma occidentale* s.s. is a saprobe. Sporocarps are produced from September through June. Sporocarps are single to gregarious and are found in litter and duff.

Range, Distribution, and Abundance: *Entoloma occidentale* var. *occidentale* is found over a sizable geographic range. It is known from only six northwest collections. Three of these collections were made in 1911, two in the vicinity of Corvallis OR, and another from north of San Francisco CA. Three more recent collections were made. Entin found it in Lincoln Co., Siuslaw NF, Alsea Ranger District and Scot Loring found it twice, one from near Lost Creek Reservoir on Medford BLM and the other near Takilma, Rogue River-Siskiyou NF. *Entoloma occidentale* s.l. is known from approximately 20 collections ranging from central CA to southern BC. In any sense *Entoloma occidentale* is rare. It belongs to a group of colorful fungi that are often picked up but are seldom properly identified.

Habitat Associations: It has been found in low to mid-elevation mixed conifer-hardwood stands that may include *Pseudotsuga menziesii, Calocedrus decurrens, Pinus lambertiana, Arbutus menziesii, Notholithocarpus densiflorus,* and *Berberis nervosa.* Historical collection sites in the vicinity of Corvallis OR are likely non extant.

Threats: *Entoloma occidentale* has been found in lower elevation valley margin forests prone to development. Primary threats include overall loss of habitat to development, loss of associate tree species, activities resulting in the local loss of overstory, loss of litter and duff, compaction or other soil disturbances. Threatening activities include housing development, logging, fuels management, road construction, utility corridors, ORV use, and other ground disturbing activities. Anthropogenic and naturally induced fires are a threat, especially those with high heat intensity at ground level and/or those resulting in tree mortality and loss of organic layer. Additional threats may include

changes in hydrology, periodicity of precipitation, vegetation changes due to climate change, pollution, and introduction of invasive species.

Conservation Considerations: Sequences of the Type collections of *Entoloma occidentale* and its varieties should be attempted to establish accurate baseline sequences for the species and its varieties.

Conduct pre-disturbance and purposive surveys. Implement accepted multi-visit protocols to increase the likelihood of sporocarp detection. Revisit known sites to confirm persistence. An unsuccessful detection of sporocarps does not necessarily mean the population has been extirpated; the mycelium can still be present though not producing sporocarps during a given period or year. Consider buffering documented sites from land management activities that would result in site disturbance or loss of overstory or associate species. Consider incorporation of patch retention areas (as described in Standards and Guidelines 1994, C-41). Protect known sites and potential habitat from OHV use. When conducting management activities in high-potential habitat, consider leaving all or most host trees and minimize soil disturbance; with fuel reduction projects, avoid high-intensity fires and retain ample ground litter and coarse woody debris.

Conservation Rankings and Status:
Global: G1, T1
State: OR S1, WA Not ranked
Oregon Biodiversity Information Center (ORBIC) List 1
(Ranks from ORBIC, http://orbic.pdx.edu accessed March 1st, 2017)

Other pertinent information (includes references to Survey Protocols, etc):

The current fungi survey protocol is found at the ISSSSP website:
http://www.fs.fed.us/r6/sfpnw/issssp/documents/inventories/inv-sp-fu-ver1-2008-12.pdf

The fungi survey protocol for Survey and Manage is found at the Survey and Manage website:
http://www.blm.gov/or/plans/surveyandmanage/protocols/

Preparer: Ron Hamill

Date Completed: March 17, 2017

References:

Blanco-Dios, J. B. 2015. Notas sobre el genero Entoloma s.l. en el noroeste de la Penninsula Iberica (VII): nuevas combinaciones y nuevos. Tarrelos 17: 36

Castellano, M.A. and T. O'Dell. 1997. Management Recommendations for Survey and Manage Fungi. Version 2.0. https://www.blm.gov/or/plans/surveyandmanage/MR/Fungi/toc.htm. Accessed Mar. 11, 2017.

Castellano, M. A., J. E. Smith, T. O'Dell, E. Cazares, and S. Nugent. 1999. Handbook to Strategy 1 Fungal Species in the Northwest Forest Plan. PNW-GTR-476. https://www.fs.fed.us/pnw/pubs/pnw_gtr476.pdf. Accessed Mar.11, 2017.

Cushman, K. and R. Huff. 2013. Conservation Assessment for Fungi Included in Forest Service Regions 5 and 6 Sensitive and BLM California, Oregon and Washington Special Status Species Programs. R6 USFS and OR/WA BLM Interagency Special Status/Sensitive Species Program. https://www.blm.gov/or/plans/surveyandmanage/recommendations/fungi.php. Accessed Mar. 11, 2017.

Hestler, L. R. 1963. A Study of Rhodophyllus Types. Brittonia 15: 324-366.

Largent, D. L. 1971. Rhodophylloid Fungi of The Pacific Coast (United States). I: Type Studies and new Combinations of Species Described Prior To 1968 Brittonia 23: 238-245.

Largent, D. L. 1977. The Genus *Leptonia* on The Pacific Coast of The United States. Bibliotheca Mycologica 55: 1-286.

Largent, D. L. 1994. Entolomatoid Fungi of The Western United States and Alaska. Mad River Press, Eureka, CA. 516 pp.

Murrill, W. A., ed. 1917. Subtribe 2 Pluteanne, in North American Flora 10(2): 77-127. New York Botanical Garden, NY.

Photo

Entoloma occidentale s.l (4549SL). Photo by Scot Loring.