SPECIES FACT SHEET

Species Common Name: Lemondrop whiskers, needle lichen
Species Scientific Name: *Chaenotheca subroscida* (Eitner) Zahlbr.
Phylum: Ascomycota
Class: Ascomycetes
Order: Caliciales
Family: Coniocybaceae

Technical Description:
The pin lichen *Chaenotheca subroscida* is a diminutive species that requires microscopic examination for identification. Pin lichens are so named because their apothecia resemble small pins arising from the basal crust of the lichen body.

In *C. subroscida*, the pale gray basal crust, or thallus, is minutely granular and usually grows in diffuse patches 0.5-1.0 cm in diameter (Tibell 1980; Tibell and Beck 2001). Larger, flat wart-like projections called verrucae sometimes occur in older parts of the thallus or at the base of the stalks. These verrucae are smooth, brownish or olivaceous, and have with minute pale gray granules scattered on the surface. The apothecia are 0.8-1.5 mm high and 13-22 times as high as the width of their stalk. The stalk is generally slender, 0.05-0.07 mm broad, and is black at the base but covered with dense greenish yellow chemical deposits called pruina on the upper and middle parts. The capitulum, or head, of the apothecium is lenticular, 0.2-0.3 mm in diameter, and has a well developed rim. This rim is also covered with the floury, greenish yellow pruina on the lower side. The cylindrical spore-containing asci are formed singly, with well developed stalks. The uniserately-arranged spores within the asci are spherical, 6-7 µm in diameter, with an irregularly-cracked appearance. The algal partner is *Trebouxia* sp. The thallus contains pseudoplacodiolic acid; the pruina contain vulpinic acid. All chemical spot tests are negative.

Chaenotheca subroscida is characterized by the yellowish powdery appearance of the rim and upper stalk of the apothecium; the slender stalk; the pale gray, minutely granular thallus; the globose, rather large, "platy-cracked" spores, and its trebouxioid algal partner (Goward 1999, Tibell and Beck 2001). It is very closely related to *C. phaocephala* (Tibell and Beck 2001). The two species are nearly identical in appearance, but in contrast to the slender stalk and pale gray granular thallus of *C. subroscida,* the apothecium in *C. phaocephala* has a more robust stalk, the total length of the apothecium is 6-15 times greater than the central stalk width, and the thallus is brownish-green and scale-like or squamulose (Goward 1999, Tibell and Beck 2001). The two species have

different distributions, have never been seen growing together, and may have different ecological requirements (Tibell 1980).

Life History:
Little is known about the reproductive and dispersal biology of *C. subroscida* (NatureServe 2005). However, its restriction to substrates that are very slow to develop (Tibell 1980, NatureServe 2005) suggests that the species is slow to mature, reproduces infrequently, and/or has low fecundity such that populations are very slow (>20 years or 5 generations) to recover from declines in abundance (Peterson 2003).

Range, Distribution (Current and Historic), and Abundance:
Chaenotheca subroscida is widely distributed in cool temperate and temperate areas of western North America and western Eurasia (Tibell and Beck 2001). In North America, it occurs in the Pacific Northwest north to British Columbia, south to California, and east to the Rocky Mountains (Tibell 1980, Goward 1999). Goward (1999) reports this species to be frequent in British Columbia.

Washington sites are on the Mt. Baker-Snoqualmie National Forest in King, Snohomish, and Whatcom Counties, the Okanogan/Wenatchee National Forest in Chelan County and the Gifford-Pinchot National Forest in Skamania County. In Oregon, sites are reported from the Mt. Hood, Willamette, Umpqua, Rogue River-Siskiyou, and Umatilla National Forests as well as Medford and Roseburg Districts BLM. There are three additional, verified sites on the Fremont-Winema and Deschutes National Forests that are not currently in the Forest Service database.

Habitat Associations:
Goward (1999) identifies the habitat as "humid intermontane old-growth forests at lower and middle elevations". He lists the substrate as conifer bark and occasionally wood. Hauck and Spribille (2005) found it to be fairly common on *Picea engelmanni, Larix occidentalis*, *Abies lasiocarpa* and snags in the Salish Mountains of Montana. In North America it is found mainly on the bark of *Picea* and *Thuja*, occasionally on the bark of *Abies*, and *Pinus,* and rarely on the bark of *Quercus* or *Betula* (Tibell 1980, Goward 1999). It rarely occurs on the decorticated twigs of spruce close to the base (Tibell and Beck 2001), and seems to prefer sheltered locations protected from direct rainfall. Association with *Picea* is reiterated in Scandinavia where it is reported in *Picea abies*-dominated forests (Moen and Jonsson 2003, Kuusinen and Siitonen 1998, Kruys and Jonsson 1997).

Substrate information from the Pacific Northwest sites in the US is limited. The Umpqua NF site is from a *Pseudotsuga menziesii* log. The substrates reported from the Winema NF are *Abies grandis* and *P. menziesii* while it was found on the bark and a decorticated branch of *Picea englemannii* on the

Deschutes NF. On the Umatilla it was found on the uphill side of base and bole of a 30" dbh *Abies* sp and on an *Abies grandis* bole.

This taxon is restricted to the bark of old trees, and most known occurrences in the Pacific Northwest are from conifers >200 years old (NatureServe 2005). This association is reinforced by research from Southern Finland where most Caliciales, including *C. subroscida*, were determined to be more frequent in old-growth and late mature stands (Kuusinen and Siitonen 1998).

Cheanotheca subroscida was determined to be more abundant on large islands than small islands in Sweden and occurrences on the small islands was correlated with increasing distance from edges (Moen and Jonsson 2003, Kruys and Jonsson 1997). This suggests that moderation of microclimate is an important determinant of site suitability. Hauck and Spribille (2005) came to a similar conclusion upon finding no relationship between precipitation chemistry and epiphytic lichen abundance.

Threats:
Because of the apparent association with old-growth stands and shady, humid microclimate, loss of habitat through timber harvest or stand replacement fire is the principle threat to this species.

Conservation Considerations:
Kuusinen and Siitonen (1998) emphasize prolonging the stand rotation to > 120 years to improve epiphytic lichen diversity in managed stands. They also endorse retaining structural diversity (e.g. old deciduous trees and snags), which is consistent with recommendations from McCune (http://oregonstate.edu/~mccuneb/epiphytes.htm). Research on relationships with patch size and edges from Sweden suggest that the microclimate along edges may not be favorable to persistence of *C. subroscida*.

Other pertinent information (includes references to Survey Protocols, etc):
Tibell (1980) and Goward (1999) provide keys to the species; Goward's key is for the lichens of British Columbia so it is more relevant to North America.

ATTACHMENTS:

(1) List of References
(2) Photos

Preparer: Kimiora Ward
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Revised: Richard Helliwell, March 19, 2007
Revised by: Rob Huff, May 2010

(Revision added information pertaining to newly documented sites on the Umatilla National Forest and Roseburg BLM, and to update documented status for the Mt. Hood, Mt. Baker-Snoqualmie, and Okanogan/Wenatchee National Forest. The revision also removed Attachment 2, an outdated map of sites of this species in Oregon and Washington).

Attachment 1 – References

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Attachment 2 –*Chaenotheca subroscida.* Photos by Eric B. Peterson, used with permission. More photos available at http://www.crustose.net.