Rare Lichen Status Review: *Dermatocarpon meiophyllizum*
Proposed Addition to California Rare Plant Rank 2B.3, G4 / S3

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Background and Taxonomy

Dermatocarpon meiophyllizum Vainio is a foliose lichen in Verrucariaceae known from Scandinavia, central Europe, the British Isles, and Canada, and from Minnesota, Colorado, Washington, Oregon, and California in the United States (Heiðmarsson 2001; Glavich & Geiser 2004; NatureServe 2022). *Dermatocarpon meiophyllizum* has a light to dark brown upper surface and a smooth, dark brown lower surface. Prior to 2004, Californian specimens of *D. meiophyllizum* were mistakenly identified as *D. luridum*, which may not be present in western North America (Glavich & Geiser 2004; Glavich 2006). *Dermatocarpon luridum* is multi-lobed, green when wet, and the medulla reacts I+ (Melzer's Reagent), whereas *D. meiophyllizum* is single-lobed, unchanged when wet, and I-. Similar Californian species are *Dermatocarpon miniatum* and *D. rivulorum. Dermatocarpon miniatum* has densely packed larger lobes (20-40 mm) that usually are pruinose and grayish. The lobes of *D. rivulorum* are also larger (15-35 mm) and the lower surface distinctly veined or wrinkled, dark brown to black and ±glossy. In contrast, *D. meiophyllizum* is characterized by small lobes (rarely > 15 mm) with brown, epruinose upper surface and darker, smooth lower surface. *Dermatocarpon meiophyllizum* is not included in *Lichens of North America* (Brodo et al. 2001), but *D. luridum* is.

Ecology

Dermatocarpon meiophyllizum is mostly found within the splash zone of lakes or streams but can also be submerged or up to a couple of meters above the water (Heiðmarsson 2001; Glavich 2007; Gilbert & Giavarini 1997; 2000). The species tends to prefer high elevations (up to 2300 m), but has been found in cold, deep canyons at lower elevation (down to 61 m) (Glavich 2007). Important habitat for *D. meiophyllizum* appears to include high elevation, undisturbed, exposed streams with large rocks or bedrock (Glavich 2009). It appears to tolerate some level of desiccation and should perhaps be referred to as semi-aquatic (Glavich 2009).

Distribution and Abundance

Based on herbarium collections in the Consortium of North American Lichen Herbaria (CNALH), there are 18 estimated occurrences of *D. meiophyllizum* and 21 occurrences of *D. luridum* (CNALH 2022). The identifications of the *D. luridum* collections need to be checked, because they could be *D. meiophyllizum* or a different *Dermatocarpon* species. For this reason, the *D. luridum* collections are not included in the estimated occurrences and are highlighted in pink rows at the bottom of the location table. Most occurrences of *D. meiophyllizum* are found in the Sierra Nevada and Klamath Mountains, with a small cluster of occurrences from Marin County, and one collection from Santa Barbara County. The *D. meiophyllizum* collections in CNALH were collected between 1985 and 2016 with only four of these collected prior to 2000. Collections of *D. luridum* range in dates between 1904 and 2006, and the majority of these collections were made prior to 2000. All occurrences of *D. meiophyllizum* in California are on public lands. Some populations occur on protected land such as Yosemite National Park (recs. 11, 12, 13, 14) and Marin Municipal Water District (recs. 15, 16, 17). The remaining known occurrences are on National Forest land, including Inyo (rec. 9), Humboldt-Toiyabe (rec. 10),

Klamath (recs. 1, 2, 3, 4, 5), Shasta-Trinity (rec. 6, 7), Stanislaus (rec. 8), and Los Padres (rec. 18) National Forests. Population trends are currently unknown.

One or more of the 21 occurrences of *D. luridum* included in the location spreadsheet could be *D. meiophyllizum* or another taxon, and the first author intends to review and annotate their voucher specimens. Although currently excluded as occurrences of *D. meiophyllizum*, even if all were eventually determined to be *D. meiophyllizum*, its total known occurrences would be 39, which is still within the occurrence range of a CRPR 2B taxon.

Status and Threats
Dermatocarpon meiophyllizum is currently globally listed as Vulnerable to Secure (G3G5) and is Vulnerable (S3) in Oregon, Imperiled (S2) in Washington state and British Columbia, Canada, and unranked (SNR) in California, Colorado, and Minnesota (NatureServe 2022). Water quality is one of the main habitat factors determining the well-being of aquatic or semi-aquatic lichens. Therefore, a decline in water quality from upstream mining, agricultural, or fertilizer run-off would likely have a negative effect on *D. meiophyllizum*. Logging, road building/decommissioning, cattle grazing, and other activities that generate sedimentation of the streams could impact populations (paraphrased from Glavich 2007). *Dermatocarpon meiophyllizum* appears to prefer some level of exposure, and habitat alterations that would change stream shading such as trail bridge building and stream restoration could impact populations. In addition to the threats previously mentioned, climate change could pose a threat by changing the water temperature of streams, and potentially causing streams to dry out during summer.

Summary
Based on the available information, *Dermatocarpon meiophyllizum* is recommended for addition to California Rare Plant Rank 2B.3 of the CNPS Inventory. If knowledge on the distribution, threats, and rarity status of *D. meiophyllizum* changes in the future, we will re-evaluate its status at that time.

Recommended Actions
CNPS: Add *Dermatocarpon meiophyllizum* to CRPR 2B.3
CNDDB: Add *Dermatocarpon meiophyllizum* to G4 / S3

Draft CNPS Inventory Record
Dermatocarpon meiophyllizum Vainio
silverskin lichen
Verrucariaceae
USDA Symbol: not available
Synonym(s)/Other Name(s): [no prior names in CNPS Inventory / CNDDB]
CRPR 2B.3
Counties: Alpine, Inyo, Marin, Mariposa, Santa Barbara, Siskiyou, Trinity, Tulare, and Tuolumne.
[Old records of *D. luridum* may indicate that *D. meiophyllizum* also occurs (or previously occurred) in Butte, Contra Costa, Fresno, Lake, Monterey, Mono, Plumas, San Mateo, Shasta, Sierra, Solano, and Sonoma counties.]
States: Washington, Oregon, Idaho, Colorado, Minnesota; other: British Columbia, Europe.

Quads: Mt. Morgan 3711846, Boulder Peak 4112351, Disaster Peak 3811946, Thompson Peak 4112311, Dunderberg Peak 3811913, Vogelsang Peak 3711973, Kibbie Lake 3811917, Mount Lyell 3711963, Billys Peak 4112227, San Rafael 3712285, Bates Canyon 3411988.
[Old records of *D. luridum* may indicate that *D. meiophyllizum* also occurs (or previously occurred) in Case Mountain 3611847, Montara Mountain 3712254, Dardanelle 3811937, Hamlin Canyon 3912166, Bates Canyon 3411988, Bloody Mtn. 3711858, Pulga 3912174, Bella Vista 4012262, Monticello Dam 3812251, Calistoga 3812255, Clayton 3712188, Haypress Valley 3912055, Penoyar 4112261, San Geronimo 3812216, Hayfork Bally 4012362, Sims Mountain 4012365.]
General Habitat: Subalpine coniferous forest, upper montane coniferous forest, lower montane coniferous forest, North Coast coniferous forest, coastal prairie
Microhabitat Details: Usually aquatic to semi-aquatic, within splash zone of lakes or streams. Preferred habitat is undisturbed, exposed streams with large rocks or bedrock at high elevations, but it is also found in cold, deep canyons at lower elevations.
Microhabitat: Rocky, lake margins, streambanks
Elevation: 60-2300 m
Life form: foliose lichen (semi-aquatic)
Blooming time: NA
Threats: [unknown]
Taxonomy: Misidentified as *D. luridum* in western North America until 2004.
Selected References:

- Original description: *Acta Societatis Pro Fauna et Flora Fennica* 49 (2): 1-274 (1921).
- Revised nomenclature: *Annales Botanici Fennici* 35: 59–70 (1998); *Evansia* 21: 137-140 (2004).
- Taxonomic treatment: *Nordic Journal of Botany* 20: 605-639 (2001).

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