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Scytinium singulare, a new lichen species from coastal California

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Abstract: *Scytinium singulare* T. Carlberg & P.M. Jørg., is described from coastal California, where it is found on low cut banks along trails in mature mixed hardwood/conifer forests. It has marginal and laminal globose to lobulate isidia that superficially resemble soredia.

Keywords: *Scytinium*, Collemataceae, coastal California, isidia, lobules.

Introduction: In the course of performing field work on Marin Municipal Water District lands in Marin County, California, the first author collected a curious collemataceous lichen, which superficially resembled the recently described *Leptogium insigne* P.M. Jørg. & Tønsberg

(Jørgensen & Tønsberg 2010) from the Pacific Northwest of North America, due to the apparent presence of soredia. However closer examination revealed an anatomy and morphology at variance with that species, by having a proper upper and lower cortex, just like species of the genus

Scytinium (Ach.) S.F. Gray, and also by having distinctive, marginal and laminal, globose to lobulate isidia that are confined to discrete areas of the lobes. While this taxon obviously belongs in the poorly understood *S. californicum* complex, it is clearly new and distinct because of the production of the characteristic dispersal units. We accordingly describe it as new below.

Materials and Methods: Collections made by the first author were examined using standard compound and binocular microscopy techniques. Nomenclature follows Esslinger 2015, except where superseded by current publications that are in press.

Scytinium singulare T. Carlberg & P. M. Jørg. sp. nov. (Figure 1).

Mycobank number: MB 816613.

Scytinio californico similis, sed thallo appanato, lobis vix incisus, margine thallino adscendentibus, in parte soredioide, isidiis globosis obtecto.

Type: USA, California: Santa Cruz Co., Big Basin Redwoods State Park, 37.18092°N -122.2182°W, elevation 321 meters, on face of low vertical cut bank of Skyline to the Sea Trail, approximately 0.5 km S of Maddock Creek crossing, in mature *Sequoia sempervirens*/*Notholithocarpus densiflorus* forest, 2 February 2015, Carlberg 04014A (CAS – holotypus).

Isotypes: US, UPS

Thallus foliose, up to 15 mm broad, forming circular patches over bryophytes. Mature lobes orbicular, mostly entire with ascending margins, upper surface smooth to faintly wrinkled, gray-brown to blue-gray, to 6.0 mm wide; juvenile lobes rounded to fan-shaped, with a downturned margin, fastened to the substrate with a narrow holdfast along one edge. Isidia pale gray to gray-brown to blue-gray, overtly resembling soredia, primarily marginal but also laminal and then in

discrete, roughly circular clusters, globose and to 100 µm diameter, often ‘dimpled’ apically, becoming lobule-like and then up to 0.15 mm wide (Figure 2), cortex one-celled (Figure 3). Areas where gray isidia have been shed resemble pale soralia, but instead retain very small pale isidia. Thallus in section 100–150 µm thick with distinct cellular upper and lower cortex 10–15 µm wide, enclosing a medulla of loosely-woven hyphae interspersed with scattered short chains of *Nostoc*, individual cells 5–6 µm diameter (Figure 4). No chemical reactions. Apothecia and conidiomata not observed.

On moss, sandy clay soil, and moss on soil of low vertical cut banks along trails, in low-elevation moist mature coastal mixed hardwood/conifer forests with greater than 70% canopy cover. The epithet *singulare* refers to the distinctive distribution of the isidia, not only along the lobe margins but also in discrete circular clusters on the surface of the lobes, a configuration that is unique among members of the genus *Scytinium*.

Other specimens examined: USA, California: Del Norte Co., Six Rivers National Forest, 41.97691°N -124.05759°W, west of Rowdy Creek, east of FS Road 19N34, on soil against base of *Notholithocarpus densiflorus* tree in dense coastal *Pseudotsuga menziesii*/*Notholithocarpus densiflorus* forest, 2001, Brooks 10136MB6 (Six Rivers National Forest). Marin Co., Marin Municipal Water District, 37.954824°N -122.574690°W, NE shore of Phoenix Lake, on high cut banks of Bill Williams Road, 2015, Carlberg 04249 (CAS). Marin Municipal Water District, 37.93574°N -122.63790°W, on low moss-covered face of cut bank along Cataract Trail, near terminus at Alpine Lake, in dense *Pseudotsuga menziesii*/*Torreya californica*/*Notholithocarpus densiflorus* forest, 2014, Carlberg 03541 (BG), 03656, 03657 (hb. Carlberg), 04169 (BG). Santa Cruz Co., Big Basin Redwoods State Park, 37.18092°N -122.2182°W, on face of low vertical cut bank of Skyline to the Sea Trail, approx. 0.5 km S of Maddock Creek

crossing, in mature *Sequoia sempervirens*/*Notholithocarpus densiflorus* forest, 2015, Carlberg 04014B (UPS), 04014C (US), 04014D (hb. Carlberg).

Discussion: *Scytinium singulare* is superficially perplexingly similar to “*Leptogium*” *insigne* (which is not a species of *Leptogium*, but belongs in the Arctomiaceae, as shown by Jørgensen & Palice 2016), a species known primarily from the hyperoceanic Pacific Northwest of North America. *Scytinium singulare* differs in anatomy by having well developed cellular cortices, by not swelling as much when wetted, and also in ecology, being terricolous as opposed to corticolous. Additionally its isidia are often dimpled apically (as reported from some hairy species of *Leptogium* in Jørgensen 1997). While the ranges of the two species overlap slightly (Carlberg 2012; Jørgensen & Tønsberg 2010), the current known distribution of *Scytinium singulare* is more southern and inland. In the field it is smoother, thinner, and less gelatinous, with a less distinctly brown color. *S. singulare* nominally shares some of its characters with *Scytinium subaridum* in that both species bear marginal and laminal isidia, however *S. subaridum* has large clavate isidia that are shiny, while the isidia of *S. singulare* are small, dull, and spherical to lobulate, and closely resemble soredia. Additionally the thalli differ markedly in color and shininess.

The anatomy is clearly that of the genus *Scytinium* (Otálora et al. 2014), and the new species is certainly part of the difficult complex of *S. californicum*, the taxonomy of which needs further revision, especially in North America, where the distinction between *S. californicum* and *S. lichenoides* s.l. has not been settled. This new taxon stands out mainly because of its unusual dispersal units, some of which are so large (and heavy) that they can only be suitable for short distance dispersal, so the species is possibly rather local.

Currently known only from California, the species occurs at locations less than 16 km from the ocean (Figure 5), between 200–350 m elevation. Forest associates include *Arbutus menziesii*, *Notholithocarpus densiflorus*, *Pseudotsuga menziesii*, *Sequoia sempervirens*, *Torreya californica*, and *Umbellularia californica*. Forest habitat is generally cool, moist, and dark, due to high canopy cover (>70%). Mosses are invariably present, both on the soil of the cut banks and also on the bases of nearby trees.

The northernmost location near Rowdy Creek in Del Norte County is less than 4 km from the border between Oregon and California, and we expect that the species will be found in southwest Oregon. The specimen from this area is smaller, and some of the details of its habitat vary slightly: the substrate is closer to weak sandstone than to sandy clay or soil, and the lichen was found growing against the base of a *Notholithocarpus densiflorus* tree instead of a cut bank.

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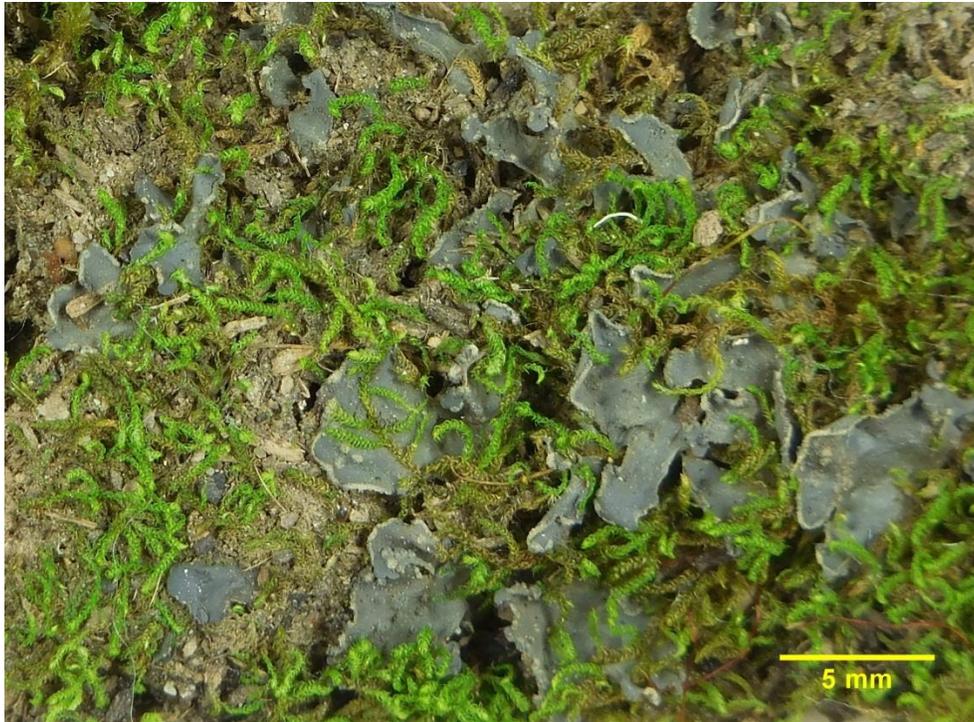


Figure 1. Several thalli of *Scytinium singulare*.



Figure 2. Marginal and laminal isidia. Note the marginal areas where only small pale isidia occur.

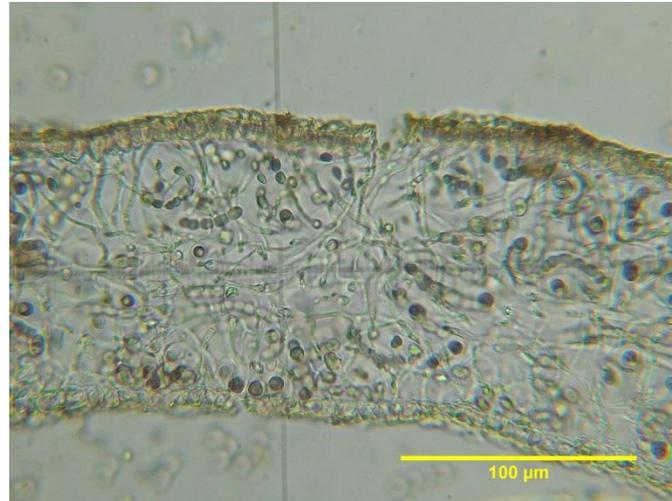


Figure 3. Isidium with well-developed cortex.

Figure 4. Internal anatomy of *Scytinium singulare*.



Figure 5. Global range and distribution of *Scytinium singulare*.