

## Two new *Leptogium* species from western North America

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Two distinctive species of *Leptogium* (lichenized Ascomycotina, Collemataceae) are described. *L. polycarpum* P.M.Jørg. & Goward from humid coastal regions has 4-spored asci and bears copious small apothecia all over its upper surface. *L. subaridum* P.M.Jørg. & Goward from semi-arid intermontane region of southern British Columbia and northern Washington is easily recognized by its shiny, thick isidia and special ecology.

Key words: *Leptogium*, lichens, new species, western North America

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### INTRODUCTION

Our understanding of *Leptogium* in North America has progressed little since Sierk (1964) published his account thirty years ago. According to the most recent North American checklist (Egan 1987), only three species (*L. arcticum* P.M.Jørg., *L. burnetiae* A.Dodge, *L. digitatum* (C.W.Massal.) Zahlbr.) have been added since then, all of them large species with hairy lower surfaces. Although Sierk's treatment of most species groups was thorough, additional taxa doubtlessly remain to be discovered, particularly among the smaller species (Goward & Ahti 1992, Jørgensen 1994). Here we report on two undescribed species detected during field work in the Pacific Northwest. Our methods and terminology are the same as in Jørgensen (1994).

### THE SPECIES

***Leptogium polycarpum*** P.M.Jørg. & Goward, *spec. nova* (Fig. 1)

*Leptogium* gelatinoso similis sed thallus cyanescens, lobis latis, apotheciis parvis numerosis obtectis; asci tetraspori, sporae 25–40 × 12–15 µm.

Type: USA. Oregon, Eugene, Spencer Creek, on moss on tree trunks, March 1934 *F.P. Sipe* 832 (UPS, holotype).

Thallus foliose, muscicolous. Lobes broadly rounded, 0.5–1.0 cm wide; upper surface distinctly wrinkled when dry, blue-grey to brownish. Lower surface similar to upper, always blue-grey. Apothecia very numerous, tiny, 0.2–0.5 mm in diam, more or less sunk in the thallus, disc brown, convex with distinct paler thalline margin.



Fig. 1. *Leptogium polycarpum*, type specimen. Scale = 0.5 mm

Thallus swelling considerably when wet, up to 400  $\mu\text{m}$  thick, with distinct cortex of rectangular cells in 1–2 rows, upper to 50  $\mu\text{m}$  wide, lower to 40  $\mu\text{m}$ . Inner part of loose unorientated hyphae with *Nostoc* in beaded, string-like chains, individual cells 4–5  $\mu\text{m}$ . Apothecia with thalline margin to 80  $\mu\text{m}$  wide, proper margin barely visible; subhymenium of densely compacted hyphae, yellowish brown, 40–60  $\mu\text{m}$  wide; hymenium 120–150  $\mu\text{m}$  high, I+ blue, paraphyses simple, conglutinated in a gelatinous matrix, ca. 2  $\mu\text{m}$  wide, somewhat enlarged apically with brownish external pigmentation; asci narrowly cylindrical, 100–125  $\times$  10–15  $\mu\text{m}$ , always 4-spored; spores ellipsoid, muriform 25–40  $\times$  12–15  $\mu\text{m}$ , uniseriate.

*L. polycarpum* is a hygrophilous species, restricted to damp habitats in moist river valleys or other regions subject to much fog and heavy precipitation. It colonizes mossy trees in shaded, sheltered situations at low elevations in the Coastal Western Hemlock Zone. In the Willamette valley, Oregon, it occurs in forest islands in the transitional zone of *Pseudotsuga/Tsuga* forest and *Quercus* savanna. Currently it is only known from a few localities in the Pacific Northwest, but it may eventually turn up in similar habitats at higher elevations further south, for example in Mexico or the Andes.

*L. polycarpum* resembles *L. gelatinosum* (With.) J.R.Laundon, but normally has bluer and broader lobes and much smaller, unusually plentiful apothecia which are more or less sunken into the thallus. It is also unusual in producing four spores only per ascus. We know of only two larger species with that character: *L. rivulare* (Ach.) Mont. which belongs in the *L. azureum* group and has a totally different thallus and ecology (see Jørgensen & James 1983), and *L. victorianum* F.Wilson from SE Australia. The latter has a rather similar thallus, but the apothecia are much larger (1.5–3 mm), the number of spores varies from 3 to 5 (rarely 8) per ascus and in size they are only 18–23  $\times$  6–9  $\mu\text{m}$  (Verdoon 1992: 192).

This taxon was first recognized in the excellent, unfortunately still unpublished thesis of Noble (1982: 447), as *Leptogium* unknown #2, and recorded as being particularly common on the Saanich Peninsula of Vancouver Isl.

*Specimens examined* — Canada. British Columbia, Queen Charlotte Isl., Moresby Isl., Jedway, along road to foot of Harriet Harbour, near stream inlet, *Picea-Tsuga-Alnus* stand at shore, on *Populus*, Brodo 12579 with *Schofield* (CANL); Vancouver Isl., Sidney, on Cedar bark, 1914 *Macoun* (UBC); Fraser valley, Chilliwack area, Bridal Falls, on *Acer macrophyllum* trunk, Goward 78-1084 (UBC); Hope area, in moss on trunk of *Acer macrophyllum*, Brodo 15653 (CANL). USA. Oregon, Polk County, Rickreall Ridge, ACEC, Coast Range, on base of small *Quercus*, McCune 19539 with Rosentreter, Thiel & Christy (OSU); Benton County, Camp Adair, Wilson Game Management Area, on trunks of deciduous trees, McCune 20048 (OSU); Paul Dunn State Forest, on shrub branch in *Pseudotsuga* forest, McCune 20227 (OSU).

***Leptogium subaridum* P.M.Jørg. & Goward, spec. nova** (Fig. 2)

*Leptogium californico* similis sed thallo laevigato et isidioso, in regio subarido.

Type: Canada. British Columbia, Vaseux, 2 km E of Gallagher Lake in Atsikkak Creek Valley (Ponderosa Pine-zone), alt. 500 m, 15 May 1991 T. Goward 245 (CANL, holotype; BM, UBC, isotypes).

Thallus foliose, muscicolous on the ground. Lobes rounded with dentate margins, 2–3 mm wide; upper surface smooth to finely striate, dark greenish-brown, often shiny towards the margins and with laminal, clavate to dactyliform, shining isidia. Lower surface similar, but paler, often with tufts of anchoring hyphae. Apothecia not known.



Fig. 2. *Leptogium subaridum*, type specimen. Scale = 1 mm

Thallus 100–125  $\mu\text{m}$  thick, upper and lower cortex dark-coloured, paraplectenchymatous, 15–20  $\mu\text{m}$  wide consisting of rectangular cells; inner part consisting of unoriented closely interwoven hyphae with aggregates of emerald-green *Nostoc* (?) cells, individual cells 8–10  $\mu\text{m}$  in diam.

*L. subaridum* is found in unusually dry habitats for the genus, in open *Pinus ponderosa*/*Pseudotsuga menziesii* forests, as well as somewhat exposed outcrops in the semi-arid intermontane. Obviously it takes advantage of the moisture collected in the moss-cushions it grows in, where it is often associated with the lichen *Leptochidium albociliatum* (Desm.) M.Choisy. As yet it is only known from a restricted region in British Columbia and adjacent Washington. We suspect it will prove to have a wider distribution in similar vegetation west of the Rockies.

*L. subaridum* is superficially very similar to the recently described *L. magnussonii* Degel. & P.M.Jørg. (Jørgensen 1993) from Scandinavia which, however, mostly grows on maritime rocks, has undulating lobe margins, more granulate or coralloid, thinner, non-shiny isidia, and contains a different photobiont. In Sierk (1964), *L. subaridum* would key out close to *L. dactylinum* Tuck., a species inhabiting wet calcareous rocks in the deciduous forests of the eastern US. That species, however, has more squamiform, bluish

lobes with thinner, coralloid isidia. *L. dactylinum* is a member of the *L. cyanescens* group, while *L. subaridum* definitely belongs in the poorly understood *L. californicum* complex. Care should be taken not to confuse *L. subaridum* with occasionally small-lobulate specimens of that complex. These are not truly isidiate, and have only flattened secondary lobules on the thallus.

*Specimens examined* — Canada. British Columbia, Moyie Lake, S end near Braunagel Creek, 950 m, *Goward & Clark 81-1590*; Osoyoos area, SW of Kilpoola Lake, near US border and Similkameen River, 920 m, *Goward & Lea 90-921*; Vaseux Lake area, near Irrigation Creek (Ponderosa Pine zone), 600 m, *Goward 91-150*. USA. Washington, midway between Creston and Davenport, ca. 75 km W of Spokane, *Goward 90-20* (stunted form). All in herb. Goward.

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## REFERENCES

- Egan, R. S. 1987: A fifth checklist of lichen-forming, lichenicolous and allied fungi of the continental United States and Canada. — *Bryologist* 90:77–173.
- Goward, T. & Ahti, T. 1992: Macrolichens and their zonal distribution in Wells Gray Provincial Park and its vicinity, British Columbia, Canada. — *Acta Bot. Fennica* 147:1–60.
- Jørgensen, P. M. 1994: Further notes on European taxa of the lichen genus *Leptogium* with emphasis on the small species. — *Lichenologist* 26:1–30.
- Jørgensen, P. M. & James, P. W. 1983: Studies in some *Leptogium* species of western Europe. — *Lichenologist* 15:109–125.
- Noble, W. 1982: The lichens of the coastal Douglas-fir Dry Subzone of British Columbia. — 942 pp. Unpublished Ph.D. thesis, University of British Columbia.
- Sierk, H. A. 1964: The genus *Leptogium* in North America, north of Mexico. — *Bryologist* 67:245–317.
- Verdoon, D. 1992: *Leptogium*. — *Flora Australia* 54:173–192.

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