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LECANORA ANNULARIS (LECANORACEAE, LECANORALES),
A NEW LICHEN SPECIES FROM THE CHANNEL ISLANDS
AND THE CENTRAL CALIFORNIA COAST

Kerry Knudsen^{1,3}, James C. Lendemer², and Jana Kocourková¹

ABSTRACT.—*Lecanora annularis*, *n. sp.*, is described from collections from Santa Cruz Island and Santa Barbara Island in Channel Islands National Park and from San Simeon and Point Lobos on the central California coast. The crystal-inspersed parathecium, egranulose epihymenium, and maritime habit distinguish *L. annularis* from all other members of the *L. dispersa* group. It occurs on sandstone and decaying basalt.

RESUMEN.—Existen descripciones de *Lecanora annularis*, *n. sp.*, en colecciones de la Isla Santa Cruz y la Isla Santa Bárbara del Parque Nacional de las Islas del Canal, y de San Simeón y Punta Lobos en la costa central de California. El paratecio esparcido con cristales, el epihimenio sin gránulos, y el hábitat marino distinguen a *L. annularis* de todos los demás miembros del grupo *L. dispersa*. Se encuentra sobre basalto desmoronado y arenisca.

Over 500 species of lichen occur on the Channel Islands of California, all of which are considered native (Knudsen and Kocourková 2012). This diversity accounts for approximately one-third of the lichens reported from the state (Tucker and Ryan 2006, Knudsen and Kocourková 2012). A preliminary list from Channel Islands National Park documented 103 species of lichen and lichenicolous fungi endemic to the California coastal region, from Point Reyes to Baja Sur and on the adjoining islands (Knudsen and Kocourková 2012). In this paper, we describe the new regional endemic *Lecanora annularis*, which occurs on Santa Cruz Island and Santa Barbara Island and along the central coast at San Simeon in San Luis Obispo County and Point Lobos in Monterey County.

***Lecanora annularis* Lendemer &
K. Knudsen, *sp. nov.***

Mycobank No. MB808592

(Fig. 1)

Thallus crustose, thin, discontinuous, endo-substratal, and chasmolithic, rarely forming irregular inconspicuous areoles prior to apothecial initiation, pale brown to whitish. Apothecia occurring singly, sessile to slightly constricted at the base, concave and cupuliform, often becoming +/- plane and weakly

flexuous when mature, [0.4]-0.5-0.7-1.0-[1.3] mm ($n = 40$) in diameter; disc plane and becoming concave, smooth, dark purple-brown, not too weakly pruinose; margin initially level, becoming prominent and strongly raised, then again +/- level when the disc expands at maturity, distinctly bicolored with the rim densely white pruinose and the sides epruinose dark to light brown, rim often with numerous radial fissures especially when young. Amphithecium 100–200 μm thick, corticate, with algae densely filling the area below the cortex and extending approximately three-quarters of the way up the hymenium; cortex strongly delimited, often distinctly thicker (65–90 μm laterally) at the base, bilayered with a distinct gelatinous sheath (10–20 μm thick) covering an inner layer of prosoplectenchymatic anticlinally arranged chondroid hyphae (40–60 μm thick) in which the terminal cell is capped with blue-brown pigment (K–, N–), granules (Pol+, K-insoluble, N-soluble) present only in the apical portion of the cortex where they completely obscure the hyphae; parathecium +/- distinct, 10–15 μm thick, prosoplectenchymatous, densely interspersed with granules (Pol+, K-soluble, N-insoluble) throughout, appearing as a thin and complete Pol+ layer between the hymenium/hypothecium and the algal layer of

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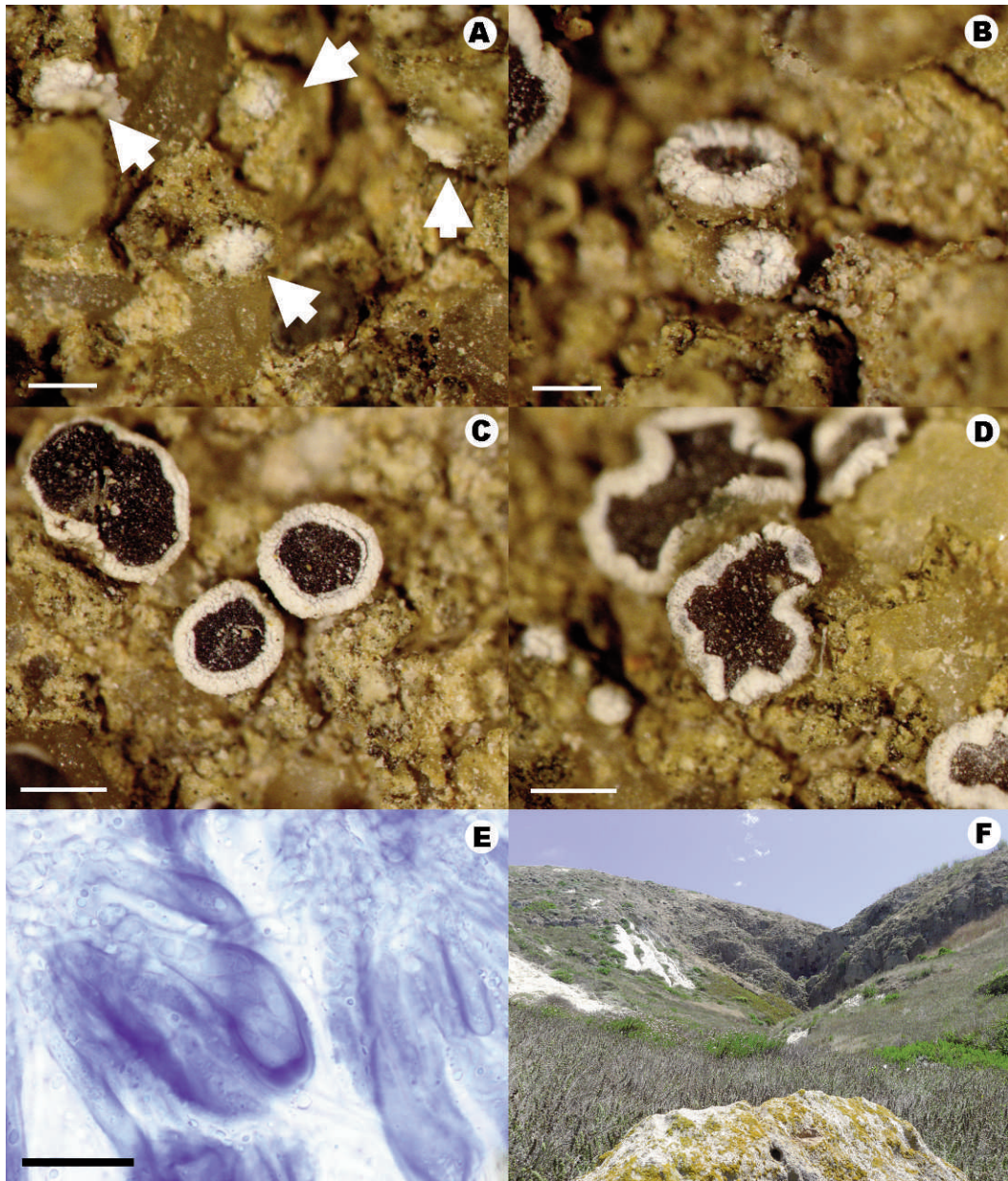


Fig. 1. *Lecanora annularis* (Knudsen 11518) and type locality: A–D, development of apothecia, white arrows point to immature apothecial initials (scale bar: A and B, 0.25 mm; C and D, 0.5 mm); E, asci (scale bar: 20 μ m), microphotographs by J.C. Lendemer; F, the type locality, photographed by Jana Kocourková.

amphithecium; epihymenium deeply pigmented brownish-red (K–, N+ more intense coloration); episamma absent; hymenium hyaline, densely interspersed with oil droplets in the material studied, 60–80 μ m tall; subhymenium indistinct; hypothecium hyaline, 30–45 μ m thick, composed of adglutinated prosoplecten-

chymatic hyphae, not interspersed with granules and only rarely interspersed with sparse oil droplets. Paraphyses slender, simple, expanded, thick, and adglutinated, apically pigmented, free in K. Asci clavate, 8-spored, *Lecanora*-type; ascospores hyaline, simple, ellipsoid to broadly ellipsoid, [9.6]-10.7-11.9-13.1-[14.4] \times

[3.7]-4.9-5.5-6.2-[6.6] μm and l/b ratio [1.6]-1.8-2.0-2.4-[2.9] ($n = 58$). Conidiomata not seen. No secondary metabolites detected with thin-layer chromatography. Spot tests: K–, C–, KC–, P–, UV–.

Type Material

HOLOTYPE.—California: Santa Barbara Co., Channel Islands National Park, Santa Cruz Island, drainage above Potato Harbor, on decaying basalt boulder, 73 m, 2012, K. Knudsen 14882.1 & J. Kocourková (NY; UCR, isotype).

PARATYPES.—California: Monterey Co., Point Lobos State Reserve, on sandstone, 8 m, 2009, K. Knudsen 11518 & J. Kocourková (NY, UCR, UGDA). San Luis Obispo Co., San Simeon State Park, on sandstone boulder, 5 mm, 2010, K. Knudsen 12189 (NY, UCR, UPS). Santa Barbara Co., Channel Islands National Park, Santa Barbara Island, west slope of Signal Peak, on scattered decaying basalt rocks, 180 m, 2013, K. Knudsen 16172 (UCR).

Etymology

The name refers to the distinct white ring of thick pruina that forms on the margin of the apothecia, which is conspicuous in contrast to the epruinose dark purple-brown disc and brown cortical surface of the amphithecium. This feature is present during all 3 stages of the development of the margin (level with disc, becoming raised above it, and then level again as disc expands) and is a good character for identifying specimens in the field.

Diagnosis

Similar to *Lecanora crenulata* Hook., differing in having a parathecium completely interspersed with crystals and an egranulose epihymenium.

DISCUSSION

Based on the thin to endolithic thallus, the lack of secondary metabolites, and the white pruinose margin of the apothecia, *Lecanora annularis* is treated as a member of the *L. dispersa* group. Following the revision of this group of 19 species in North America by Šliwa (2007), *L. annularis* is unique in this group in having a parathecium that is densely interspersed throughout with granules (Pol+ and soluble in K but not in N) and in having a maritime habit. The lack of both an episamma and gran-

ules in the epihymenium, combined with the aforementioned features, is an additional character distinguishing *L. annularis* from other members of the *L. dispersa* group.

In the *L. dispersa* group, *L. crenulata* is most similar to *L. annularis*. Both species have a prosoplectenchymatous parathecium. *Lecanora crenulata* has crystals in the upper 20 μm of the parathecium but not throughout the parathecium like *L. annularis*. *Lecanora crenulata* also differs from *L. annularis* in having coarse epihymenial granules, a pruinose disc, and a crenulate white apothecial margin. *Lecanora crenulata* occurs on calcareous substrates, especially limestone, throughout North America (Šliwa 2007). *Lecanora crenulata* is usually collected on caliche in Channel Islands National Park and never in areas exposed to salt spray. *Lecanora annularis* is recorded only from sandstone and volcanic rock. It can tolerate salt spray.

Lecanora annularis is currently known from the northern portion of the coastal California lichen region (Knudsen and Kocourková 2012), occurring on Santa Barbara Island and Santa Cruz Island, as well as along the central coast in San Simeon and on Point Lobos. At the type locality, *L. annularis* occurs at 73 m, and is near the border of the Potato Harbor formation, an uplifted Pleistocene dune (Muhs et al. 2009). We did not collect *L. annularis* on the calcareous Potato Harbor formation. It occurs at 180 m on Signal Peak on Santa Barbara Island on volcanic rock but not on nearby exposed caliche (where we collected *L. crenulata*). At San Simeon and Point Lobos, *L. annularis* occurs in the upper littoral zone from 2 to 8 m where it is exposed to salt spray and inundations in storms. At all 4 sites, *L. annularis* occurred on noncalcareous rock, either sandstone or volcanic rock. All populations were small and intermixed with other saxicolous lichens common in coastal California.

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