

Lichenological Notes 7: On taxa of *Acarospora* and *Sarcogyne*

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ABSTRACT. – *Acarospora cervina* and *A. tongleti* are discussed as not occurring in North America and should be removed from North American checklist. *Sarcogyne sphaerospora* is transferred to *Acarospora* and given a new name *Acarospora lendermeri*. *Sarcogyne reebiae* is considered a synonym of *S. similis*. *Sarcogyne similis* is verified as occurring in Europe in Greece.

KEYWORDS. – *Acarospora janae*, lichenicolous fungi, New Mexico, nomenclature, stromata.

INTRODUCTION

During our studies, we often discover new data that do not fit in main papers we are working on. In Lichenological Notes we publish these random discoveries, lectotypifications, and nomenclatural novelties and make them available to current and future researchers. This is the seventh installment of this series.

MATERIALS AND METHODS

Specimens were studied from GZU, NY, UCR, W and private herbaria Jason Dart (hb. Dart) and Kocourková and Knudsen (hb. K & K) using standard microscopy and spot tests (Brodo et al. 2001). Hand-prepared sections were studied and measured in water. The amyloid reaction of the hymenial and subhymenium substances were tested with fresh, undiluted IKI (Merck's Lugol; for protocol see Knudsen & Kocourková 2018a). The macrophotographs by Tim Wheeler were taken with a Pentax K3 DSLR, mounted on a Stackshot rail, and combined in Helicon Focus.

RESULTS

I – ACAROSPORA CERVINA SHOULD BE REMOVED FROM THE NORTH AMERICAN CHECKLIST

Acarospora cervina (Ach.) A. Massal., Ric. auton. lich. crost., p. 28. 1852. [For discussion of synonymy and conservation proposal refer to Arcadia et al. (2020)].

NOTES. – *Acarospora cervina* is a common calciphyte in Europe, Northern Africa, and Asia (Magnusson 1929). For a detailed description the reader should refer to Magnusson (1929) and for photographs of the species, refer to Wirth et al. (2013). Magnusson did not consider that *A. cervina* occurred in North America (Magnusson 1930, 1956). Egan (1987) excluded *A. glaucocarpa* (Ach.) Arnold from the North American checklist and added *A. cervina* var. *glaucocarpa* (Wahlenb. in Ach.) Körb. based on the taxonomy of Clauzade and Roux (Clauzade et al. 1981). Despite *A. glaucocarpa* eventually being recognized as a separate species from *A. cervina* and reinstated to the North American checklist, *A. cervina* has persisted on the North America checklist (Esslinger 2019) even though there is a lack of accurate records in the literature. We have not seen any specimens of *A. cervina* from North America in our studies of Acarosporaceae, including in our recent studies of the *A. glaucocarpa* group (Knudsen et al. 2020). Because of pictures of *A. cervina* from Europe, that have white edges like the one in Wirth et al. (2013), American lichenologists sometimes identified white-edged specimens of *Sarcogyne wheeleri* K. Knudsen, J.N. Adams, Kocouk. & Y. Wang as *A. cervina*, including the first author until he collected and studied *A. cervina* in the Czech Republic. A recent

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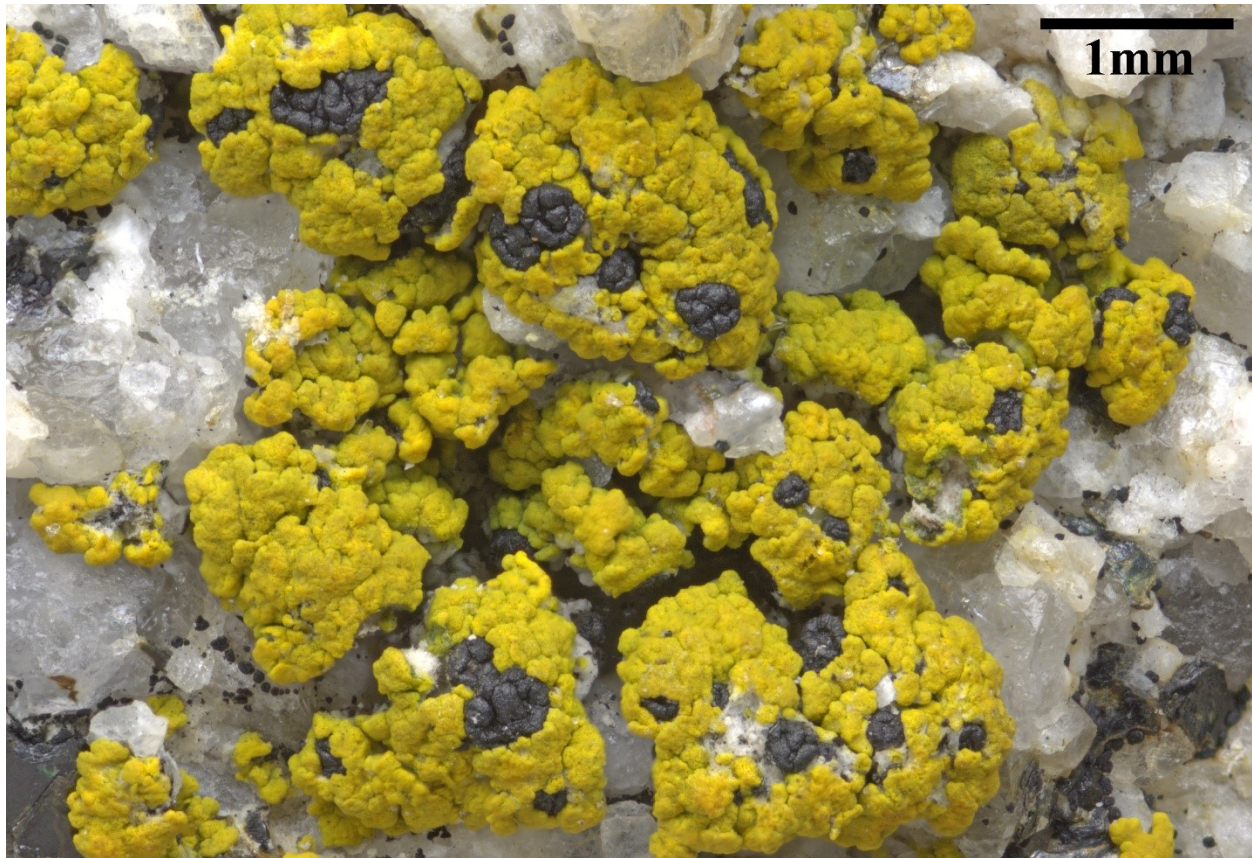


Figure 1. *Acarospora lendemeri* on *Candelariella vitellina*, A.R. Pignolo 866 (UCR). Photograph by Tim Wheeler, courtesy of the U.S. Forest Service.

determination of a depauperate Alaskan specimen as possible *A. cervina* by the first author was revised as either *S. canadensis* (H. Magn.) K. Knudsen, J.N. Adams, Kocouk. & Y. Wang, or *S. wheeleri* and communicated to the collector, but he forgot to correct the identification in a manuscript of the checklist of Glacier Bay National Park lichens (Spribille et al. 2020). *Acarospora cervina* should be removed from the North American checklist. Recently, *A. bullata* Anzi was discovered in North America (Brinker & Knudsen 2018), so it is still possible *A. cervina* may be discovered in North America. The basionym *Lichen cervinus* has been proposed for conservation with a conserved type (Arcadia et al. 2020).

II – TRANSFER OF SARCOGYNE SPHAEROSPORA TO ACAROSPORA

Acarospora lendemeri K. Knudsen & Kocourk., nom. nov.
Mycobank# MB 834579

FIGURE 1.

≡ *Sarcogyne sphaerospora* J. Steiner, Österr. Bot. Z. 49: 251. 1899. **TYPE: TURKEY:** summit of Little Ararat, 3896 m, on *Candelariella*, K.R. von Marilaun s.n. (W[n.v.], holotype).

DESCRIPTION. – Apothecia dispersed on *Candelariella* species. Apothecia 0.4–0.5 μm in width, lecideoid, margin thin and black, disc with carbonized epihymenial accretions (*Polysporina*-type). Parathecium narrowly expanded around the disc up to 40 μm, melanized. Epihymenium 10 μm tall, brown. Hymenium 80–120 μm tall, paraphyses 1 μm wide, IKI+ blue turning red (hemiamyloid). Asci 70–78 × 18–21 μm, ascospores globose 4.0–5.0 μm wide. Subhymenium 40–50 μm tall, blue to red (hemiamyloid). Hypothecium indistinct from hyphae attaching to host.

NOTES. – *Sarcogyne sphaerospora* was originally described from a small number of apothecia found growing on *Candelariella* in Turkey (Magnusson 1937, Steiner 1899). It has been reported from Mongolia and Kashmir (Huneck, et al. 1992, Pino-Bodas et al. 2017). The species is easy to identify because it has carbonized epihymenial accretions, is a parasite on *Candelariella*, and has globose ascospores (4.0–5.0 µm wide) (Lendemer et al. 2009). In a recent phylogeny, it was recovered in the genus *Acarospora* closely related to another lichenicolous fungus, *A. subfuscescens* (Nyl.) H. Magn. (Pino-Bodas et al. 2017, Westberg et al. 2015). Here we transfer *S. sphaerospora* to the genus *Acarospora*. Because the epithet is already preoccupied by *A. sphaerospora* H. Magn., a European lichen with gyrophoric acid (Magnusson 1929), we name the species in honor of James Lendemer of the New York Botanical Garden, who collected the taxon in the San Bernardino Mountains of southern California and reported it new for North America (Lendemer et al. 2009). So far, the species has only been collected in North America in the San Bernardino Mountains of southern California. It appears to be high elevation montane species.

Specimens examined. – **AFGHANISTAN. KABUL PROVINCE:** ISTALIF DISTRICT: 5505 m, 4.vii.1975, on sterile *Candelariella* cf. *kansuensis*, *H. Huss 64* (GZU). **PROVINCE KUNAR:** Bashgal-Quelltäler, Suengal-Tal, 35°55'N 71°12'E, 3700 m, 2.ix.1969, on *C. cf. kansuensis*, *D. Podlech s.n.* (GZU). **U.S.A. CALIFORNIA. SAN BERNARDINO CO.:** San Bernardino Mountains, San Bernardino National Forest, FS 2N93 off CA 38, 34°10'18"N 116°47'11"W, 2274 m, 7.x.2008, on *C. rosulans*, *J.C. Lendemer 14917A & K. Knudsen* (NY); San Bernardino Mountains, San Bernardino National Forest, San Gorgonio Mountain, 34°06'00"N 116°50'11"W, 3409 m, 12.ix.2015, on *C. vitellina*, *A.R. Pignoli 866* (UCR).

III – ACAROSPORA TONGLETI SHOULD BE REMOVED FROM THE NORTH AMERICAN CHECKLIST

Acarospora tongleti (Hue) Olivier, Lich. Eur., p. 83. 1909. ≡ *Lecanora tongletii* Hue, Bull. Soc. Bot. Fr. 44: 427. 1897. **TYPE: BELGIUM:** Dinaut, Drehanche, 1894, sur des affleurements calcaireo-schisteux, *A. Tonglet s.n.* (P[n.v.], holotype; W!, isotype).

NOTES. – *Acarospora tongleti* is only known from the type collection made in Belgium on calcareous mica-schist. It has a thinly pruinose, areolate thallus with several punctiform apothecia per areole (0.2–0.3 µm wide) and produces gyrophoric acid (Magnusson 1929; for drawing see Roux et al. 2019). Clauzade and Roux treated *A. variegata* H. Magn. as a form of *A. tongleti* (Clauzade et al. 1981) though Roux now accepts it as a distinct species (Roux et al. 2019). *Acarospora variegata* differs from *A. tongleti* in being epruinose, in having a wider parathecium expanding around the apothecial disc (25–40 µm in *A. variegata* vs. 5–10 µm in *A. tongleti*), having larger apothecia (up to 1 mm wide in *A. variegata* vs. 0.2–0.4 mm in *A. tongleti*), and in having a hemiamyloid hymenial gel rather than the euamyloid hymenial gel reported for *A. tongleti* (Magnusson 1929). *Acarospora variegata* is a rare species apparently endemic to central Europe occurring in Germany and Slovakia and is in need of revision (Magnusson 1929). It is possibly a low elevation morph of *A. squamulosa* (Ach.) Trevis, with at least most apothecia lacking epihymenial accretions and forming a more areolate crust than is usual. Magnusson (1929) reported *A. variegata* from Las Vegas, New Mexico, based on a collection made by G.A. Brouard in 1927. That specimen became the holotype of *A. janae* K. Knudsen, which differs from *A. variegata* in having a thin parathecium and euamyloid hymenial gel (Lumbsch et al. 2010, Knudsen & Kocourková 2017, Knudsen et al. 2011). Thus, *A. variegata* does not occur in North America and has already been removed from the North American checklist. *Acarospora tongleti* was added to the North American checklist because Clauzade et al. (1981) considered *A. variegata* a form of *A. tongleti*, and *A. tongleti* is still included on the checklist (Egan 1987, Esslinger 2019). The name should be removed from the North American checklist.

IV – SARCOGYNE REEBIAE IS A SYNONYM OF SARCOGYNE SIMILIS

Sarcogyne similis H. Magn., Ann. Cryptog. Exot. 7: 135. 1935. **TYPE: U.S.A. CALIFORNIA. SANTA CRUZ CO.:** Santa Cruz Mountains, Devil's Cañon, 701 m, 8.viii.1906, on sandstone, *A.W.C.T. Herre 948* (FH!, lectotype, designated Knudsen & Lendemer 2005).

= *Sarcogyne californica* H. Magn., Ann. Cryptog. Exot. 7: 138. 1934. **TYPE: U.S.A. CALIFORNIA. LOS ANGELES CO.:** Topanga Canyon, 1908, on sandstone, *H.E. Hasse 1102* (FH!, lectotype designated by Knudsen & Lendemer 2005).

Syn. nov. = *Sarcogyne reebiae* K. Knudsen, Lichen Flora of the Greater Sonoran Desert Region 3: 294. 2007[2008].
TYPE: U.S.A. CALIFORNIA. ORANGE CO.: Santa Ana Mountains, Weir Canyon, 33°50'18"N 117°44'8"W, 278 m, 6.vi.2006, on sandstone outcrops, *K. Knudsen 6435* (UCR!, holotype; ASU!, hb. K&K!, isotypes).

Notes. – *Sarcogyne similis* is a common species on siliceous rock in North America (Magnusson 1935, Knudsen & Standley 2007, Knudsen et al. 2011). It has an endolithic thallus and produces apothecia either directly from endosubstratal hyphae, or by replication by division, or from epilithic stromata which are first functionally pycnidia, then split open and decay as an apothecium emerges (Knudsen et al. 2011, Poelt & Vězda 1974). When produced from endosubstratal hyphae or division, the apothecia are immediately thin-margined. But when the apothecia emerge from stromata, at first they have a thick margin that is donut-shaped. In southern California, stromata are rare and apothecia are usually produced directly from endosubstratal hyphae or by replication by division. *Sarcogyne reebiae* was originally described from southern California based on the ontogeny from stromata (Knudsen & Standley 2007). Later research revealed that the ontogeny from stromata was common in eastern North America (Knudsen et al. 2012). We found *S. reebiae* was anatomically indistinguishable from *S. similis* and that stromata production was absent to frequent but not obligatory. Therefore, we treat *S. reebiae* a synonym of *S. similis*.

Poelt and Vězda (1974) reported *S. similis* from Greece and described the ontogeny of apothecia from stromata. We have verified their report of its occurrence in Europe (Greece). It was not included in recent keys to *Sarcogyne* in Europe (Knudsen & Kocourková 2018b, Roux et al. 2019). In Poelt's two collections of *S. similis* from the same locality in Greece, stromata were common in one specimen. In the other, apothecia were produced from endosubstratal hyphae and there was replication by division and only two pycnidia were present. A third collection from Attica on serpentine we determined as *S. similis* but the ascospores differ slightly in being wider than average ($4-6 \times 2.5-3.0 \mu\text{m}$).

Recent specimens examined. – **GREECE. ATTICA:** low rocks and blocks among the macchia on the N side of the Pentelicon just E of Dionysius, 11.iv.1971, on granite, *J. Poelt 72755* (GZU, with stromata), *J. Poelt 72798* (GZU, with pycnidia); Höhe, NW Kap Sounion (Sunion), 7.iv.1971, on serpentine, *J. Poelt 73300* (GZU, with pycnidia). **U.S.A. CALIFORNIA.** MONTEREY CO.: Cholame Valley, 33°41'07"N 1105°55'15"W, 507 m, 17.v.2019, on granite, *J. Dart 1332* (hb. Dart, with stromata, det. as *S. reebiae*). **NEW MEXICO.** DON ANA CO.: Organ Mountains, Baylor Canyon Pass trail on E-facing side of mountain crest, juniper-pinyon pine woodland with oaks, 32°22'15.8"N 106°33'44.8"W, 1920 m, 10.iii.2020, on granite, *J. Kocourková 10303 & K. Knudsen* (hb. K&K, without stromata).

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