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A New Squamulose *Sarcogyne* from Oregon

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Abstract: *Sarcogyne squamosa* is newly described from Oregon, USA. It was found on noncalcareous rock in shrub steppe, where it forms reddish brown cushions of imbricate, stipitate squamules. The squamulose thallus with erumpent and sessile apothecia is unique for this genus. This is the third species in the genus with a corticate thallus.

Key words: Acarosporaceae, *Artemisia tridentata*, Columbia Plateau, Hart Mountain, lichenized ascomycetes, *Sarcogyne squamosa*, shrub steppe.

Introduction: The genus *Sarcogyne* Flot. is characterized by polyspory, simple, hyaline spores, lecideine apothecia, and bitunicate but non-fissitunicate asci with a non-amyloid tholus (Knudsen & Standley 2007; Magnusson 1935a, b). The exciple is formed of pigmented or melanized hyphae, which may even be

carbonized. The type of the genus is *Sarcogyne clavus* (DC.) Kremp. (Jørgensen & Santesson 1993). By our estimation the genus has a world-wide distribution of more than 50 species. Currently we recognize 17 species in North America: *S. arenosa* (Herre) Knudsen & Standl. (Knudsen & Standley 2007), *S. athroocarpa* H.

Magn. (Magnusson 1935b), *S. clavus* (Knudsen & Standley 2007; Magnusson 1935a, b), *S. crustacea* K. Knudsen & Kocourk. (Knudsen & Kocourková 2010), *S. dakotensis* H. Magn. (Knudsen & Standley 2007; Magnusson 1935b), *S. desolata* (H. Magn.) K. Knudsen & Standl. (Knudsen & Standley 2007), *S. integra* B. de Lesd. ex H. Magn. (Magnusson 1935b), *S. magnussonii* B. de Lesd. (Knudsen & Kocourková 2012; Magnusson 1935b), *S. mitziae* K. Knudsen, Kocourk. & McCune (Knudsen et al. 2013), *S. novomexicana* H. Magn. (Knudsen & Lendemer 2005; Knudsen & Standley 2007), *S. plicata* H. Magn. (Knudsen & Kocourková 2011; Magnusson 1935b), *S. regularis* Körb. (Knudsen & Standley 2007; Magnusson 1935a, b), *S. "privigna" auct., non* (Ach.) A. Massal. (Knudsen & Standley 2007; Knudsen & Kocourková 2011; Magnusson 1935a, b), *S. reebiae* K. Knudsen (Knudsen & Standley 2007; Knudsen et al. 2011), *S. regularis* Körb. (Knudsen and Standley 2007; Magnusson 1935a, b), *S. sphaerospora* J. Steiner (Lendemer et al. 2009), and *S. similis* (Knudsen & Standley 2007; Magnusson 1935b). In this paper we describe an 18th member of the genus in North America and the third species with a corticate thallus.

The Species: *Sarcogyne squamosa* K. Knudsen & McCune, sp. nov.

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Diagnosis: This species is distinguished from others in the genus by the stipitate squamulose thallus with a corticate lower surface, high hymenium (160-180 µm), and an uninterrupted algal layer.

Typus: USA: Oregon, Lake County, Hart Mountain National Antelope Refuge, north end of Hotsprings Campground, 42.5028° N, 119.6904°W, on volcanic (rhyolite) outcrop in *Artemisia tridentata* steppe, 1822 m, 6/2012, McCune 31964 (OSC). Paratype: Oregon, Lake County, Hart Mountain National Antelope Refuge, Blue Sky Road, low mound of volcanic

rock, 42.22194° N, 119.64230°W, outcrop in *Artemisia tridentata* steppe, 1784 m, 3/2013, McCune 32486 (OSC).

Thallus of small patches of imbricate squamules, up to 2 mm across, c. 0.2-0.5 mm thick, margins crenulate or not, down- or up-turned. Upper surface matt brown to reddish brown, epruinose, smooth, but sometimes becoming fissured in process of vegetative division. Lower surface corticate, white to light brown, sometimes white only toward margins, becoming dark brown or black with melanization. Attachment with stipe, less than half the width of squamule. A thin distinct epicortex present or rarely absent. Cortex usually thin, 20-45 µm thick, paraplectenchymatous, of round to slightly angular cells 3-5 µm diam, upper layer narrow and light brown, lower layer hyaline. Lower cortex formed from apices of medullary hyphae, pigmented light to dark brown. Algal layer even, sometimes thin, c. 100 µm thick, algal cells 10-15 µm in diam, uninterrupted by vertically-oriented hyphal bundles, but distinct medullary hyphae can be distinguished in the algal layer with POL+ crystals, but does not form bundles. Medulla prosoplectenchymatous, c. 100 µm thick, of thin-walled hyphae mostly 2 µm in diam., branching, continuous with hyphae in stipe and endosubstratal hyphae.

Apothecia erumpent, sessile, less than 0.5 mm across, with blackish-red disc that is scabrid and epruinose, red when wetted, margin narrow and brown, relatively even with disc. Exciple up to 80 µm thick, outer layer dark, hyaline within, of radiating hyphae. Hymenium 160-180 µm high, non-inspersed, epihymenium brown and conglutinate, c. 20 µm thick, paraphyses c. 2 µm wide, distinctly septate, apices barely expanded. Subhymenium to 60 µm tall, subparaplectenchymatous, with some oil drops in KOH. Hypothecium narrow, prosoplectenchymatous, expanding into exciple. Asci 100-120 x 30-40 µm, 200+ spores per ascus; ascospores, simple, hyaline, mostly 4-5 x 2 µm.

Pycnidia visible as reddish dots on thallus surface, globose, c. 80-100 µm diam. Conidiogenous cells, 10-14 x 2 µm, often tapering toward tip. Conidia hyaline, simple, subglobose, 2-3(-4) x (1.5-)2.-2.5 µm. Lacking secondary metabolites.

Distribution and Ecology: *Sarcogyne squamosa* is currently only known from Hart Mountain National Antelope Refuge in south-central Oregon. It is expected to be a shrub steppe to montane species, based on its occurrence in cold steppe on a high plateau at the base of partly forested mountains

Discussion: This is the second species of *Sarcogyne* in North America with a brown corticate thallus. *Sarcogyne mitziae* has a brown corticate thallus of dispersed to contiguous areoles, and grows on soil, in California, Idaho, and Washington (Knudsen et al. 2013), while *S. squamosa* is squamulose and saxicolous. Both have small erumpent apothecia with red discs when wetted and the same size conidia and ascospores. *Sarcogyne mitziae* particularly differs in having a shorter hymenium (80–100 µm tall vs. 160-180 µm) which is interspersed with oil drops and a shorter subhymenium (c. 20 µm vs. 50-60 µm). The other North American *Sarcogyne* with a corticate thallus is *S. crustacea* but it differs in having a greyish-black thallus that is subareolate with longer conidia (4-5 vs. 2-3 µm) a shorter hymenium (90-130 vs. 160-180 µm) and a thicker cortex (c. 50 vs. c. 20-40 µm) (Knudsen & Kocourková 2010). The only other *Sarcogyne* with a brown corticate thallus is *Sarcogyne brunnea* K. Knudsen & Flakus which occurs in the Andes in South America. It differs in having an areolate and densely pruinose thallus, longer conidia (4-5 vs. 2-3 µm), moderate branching of its paraphyses, and an algal layer interrupted by distinct hyphal bundles (Knudsen et al. 2012).

We are not above complaining about species described from one or two small specimens (e.g.

Knudsen 2012). But the squamulose thallus with erumpent and sessile apothecia is unique for this genus. The apothecia are small, often obscured by the imbricate thallus, and would be difficult to observe in the field unless abundant. In the holotype the apothecia are sparse and easily overlooked. The squamulose thallus if sterile could easily be mistaken for a sterile *Psora*. We hope the description will lead to more reports of this species from the Pacific Northwest and elsewhere.

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Literature cited

- Jørgensen P. M. & R. Santesson. 1993. Nine proposals to conserve generic names of lichenized fungi. *Taxon* 42: 881–887.
<http://dx.doi.org/10.2307/1223274>
- Knudsen, K. 2012. Some notes on Acarosporaceae in South America. *Opuscula Philolichenum* 11: 31–35.
- Knudsen, K., A. Flakus and M. Kukwa. 2012. A Contribution to the Study of Acarosporaceae in South America. *Lichenologist* 44: 253–262.
<http://dx.doi.org/10.1017/S0024282911000703>
- Knudsen, K. and J. Kocourková. 2010. Lichenological notes 1: Acarosporaceae. *Mycotaxon* 112: 361–366.
<http://dx.doi.org/10.5248/112.361>
- Knudsen, K. and J. Kocourková. 2011. Lichenological Notes 3: *Sarcogyne plicata* in California. *Mycotaxon* 118: 423–431.
<http://dx.doi.org/10.5248/118.423>
- Knudsen, K. and J. Kocourková. 2012. Lichenological Notes 5: The Neotypification of *Sarcogyne magnussonii*. *Mycotaxon* 121: 139–145. <http://dx.doi.org/10.5248/121.139>

Knudsen, K., J. Kocourková and B. McCune. 2013. *Sarcogyne mitziae* (Acarosporaceae), a new species from biotic soil crusts in western North America. *Bryologist* 116: 122–126.

Knudsen, K. and J. C. Lendemer. 2005. Changes and additions to the checklist of North American lichens - III. *Mycotaxon* 93: 277–281.

Knudsen, K., J. C. Lendemer and R. C. Harris. 2011. Studies in lichens and lichenicolous fungi – no 8: miscellaneous notes on species eastern North America. *Opuscula Philolichenum* 9: 45–75.

Knudsen, K. and S. M. Standley. 2007. *Sarcogyne*. In: T. H. Nash, III, C. Gries and F. Bungartz: Lichen Flora of the Greater Sonoran Desert Region. Volume 3. Lichens Unlimited, Arizona State University, Tempe, pp. 289–296.

Lendemer J. C., J. Kocourková and K. Knudsen. 2009. Studies in lichens and lichenicolous fungi: more notes on some taxa from North America. *Mycotaxon* 108: 491–497.

Magnusson, A. H. 1935a. Acarosporaceae, Thelocarpaceae. In: Zahlbruckner A. (ed.) Dr. L. Rabenhorst's Kryptogamen-Flora von Deutschland, Österreich, und der Schweiz. 2nd IX. Die Flechten. Abt. 5 (1). Borntraeger/Leipzig, pp. 1–318.

Magnusson, A. H. 1935b. On the species of *Biatorella* and *Sarcogyne* in America. *Annales de Cryptogamie Exotique* 7: 115–145.

Figure 1. *Sarcogyne squamosa*, holotype. A. Upper surface. B. Lower surface.

Figure 2. *Sarcogyne squamosa*, holotype. A. Section through upper cortex and algal layer. B. Apothecium.