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Lichens and Lichenicolous Fungi of the Santa Monica Mountains, Part 3: Additions and Corrections to the Annotated Checklist

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ABSTRACT. – Twenty-three species of lichens and two lichenicolous fungi are added to the annotated checklist of the Santa Monica Mountains maintained for the National Park Service for a revised total of 242 taxa. Seven species have not been collected since 1915: *Aspicilia aurantiaca* Owe-Larss. & A. Nordin, *Aspicilia contorta* (Hoffm.) Kremp., *Aspicilia praecrenata* (Nyl.) Hue, *Bacidia veneta* Ekman, *Carbonea latypizodes* (Nyl.) Knoph & Rambold, *Ionaspis alba* Lutzoni, and *Topelia gyalectodes* (Nyl.) B. D. Ryan & H.T. Lumbsch, for a total of twelve species known only from historic Hasse collections. Based on new taxonomic research, three names are removed from the annotated checklist, *Acarospora smaragdula* var. *lesdainii* (Harm. ex. A. L. Smith) H. Magn, *Miriquidica mexicana* Rambold, Sipman & Hertel, and *Placynthiella knudsenii* Lendemer and replaced by the names *A. hassei* Herre, *M. scotopholis* (Tuck.) B.D. Ryan & Timdal, and *P. hyporhoda* (Th. Fr.) Coppins & P. James respectively. *Lecidea austrocalifornica* Zahlbr. is placed in synonymy with *Carbonea latypizodes,* which is reported new for California.

INTRODUCTION

This paper represents the third part in an ongoing floristic study of the Santa Monica Mountains (Knudsen 2005 & 2007a). It represents additions and corrections of the annotated checklist published in 2007 and maintained for the National Park Service. A fourth installment is planned for 2009 to be published in this journal.

The field work for this paper was performed by three of the authors (Knudsen, Lendemer, and Owe-Larsson). Most of work was done in the Sandstone Peak area. The paper is to a great part based on the taxonomic work of Björn Owe-Larsson, Anders Nordin and Leif Tibell (Owe-Larsson et al. 2007). For more information on all *Aspicilia* species discussed one should consult the treatment of the genus in the Sonoran Flora (Owe-Larsson et al. 2007). Ten species of *Aspicilia* are now reported from the Santa Monica Mountains. Eight of the ten *Aspicilia* species reported from the Santa Monica Mountains occur in the Sandstone Peak area above 850 meters on Conejo volcanics.

The methods in this contribution follow those of the previous installments of the series (see Knudsen 2007).

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New Reports

Acarospora thamnina (Tuck.) Herre, Syn. *Acarospora interposita var. nitidella* H. Magn. (Knudsen 2007b)

This stipe-forming *Acarospora* is common among other crusts in the Sandstone Peak area on Conejo volcanics. This is the nineteenth species of *Acarospora* collected in the Santa Monica Mountains.

U.S.A. California: Ventura Co.: Sandstone Peak 34° 07' 18"N, 118° 55' 26"W, 670 m, on Conejo volcanics, 27.iii.2006, *Knudsen 5662* (UCR).

Aspicilia aurantiaca Owe-Larss. & A. Nordin

This species is known from Baja Sur to Riverside County and San Clemente Island. Its northernmost location is a 1911 Hasse collection from the Santa Monica Mountains. It has not been collected since Hasse in the range but is expected to be re-discovered.

U.S.A. California: Los Angeles Co.: Santa Monica Mountains, 1911, *Hasse 2436* (MIN).

Aspicilia contorta (Hoffm.) Kremp.

This species occurs on carbonate substrates. Hasse collected it twice in the Santa Monica Mountains. There have been no known collections in the range since Hasse's collection from 1903.

U.S.A. California: Los Angeles Co.: Santa Monica Mountains, 1899, *Hasse* (MIN); Santa Monica Mountains, 1903, *Hasse 2420* (MIN).

Aspicilia cuprea Owe-Larss. & A. Nordin

This species is common in California and is common on Sandstone Peak. It is rich in norstictic acid. The large brown areoles are easily recognized except in shade forms, when they become paler.

U.S.A. California: Ventura Co.: Sandstone Peak, 34°07.218'N, 118°55.931'W, 940 m, on exposed Conejo volcanics at the top, 29.x.2004, *Owe-Larsson 9097 & Knudsen*, *Owe-Larsson 9103 & Knudsen*, *Owe-Larsson 9112 & Knudsen*, *Owe-Larsson 9113 & Knudsen* (UPS, all four collections); Sandstone Peak, 34°07.313'N, 118°56.061'W, 880 m, on Conejo volcanics near the top, 29.x. 2004, *Owe-Larsson 9123 & Knudsen* (UPS).

Aspicilia knudsenii Owe-Larss. & A. Nordin

This is species is so far known from five locations in California. It occurs on Sandstone Peak.

U.S.A. California: Ventura Co.: Sandstone Peak, 34°07.266'N, 118°56.049'W, 890 m, on exposed, flat rock (Conejo volcanics) near the top, 29.x. 2004, *Owe-Larsson 9119 & Knudsen* (UPS).

Aspicilia pacifica Owe-Larss. & A. Nordin

This species is common in coastal California and on the Channel Islands. It occurs at scattered locations across the Santa Monica Mountains.

U.S.A. California: Los Angeles Co.: in canyon off Kanan Dune Road, 34°3'38"N 118°48'11"W, 399 m, on large boulder, 11.xi.2003, *Knudsen 623.1 & Sagar* (UCR); **Ventura Co.:** Sandstone Peak, 34°07.218'N, 118°55.931'W, 940 m, exposed rock (Conejo volcanics), northern slope, 29.x.2004, *Owe-Larsson 9106 & Knudsen* (UPS), *Owe-Larsson 9108 & Knudsen* (ASU), *Owe-Larsson 9109 & Knudsen* (UPS).

Aspicilia phaea Owe-Larss. & A. Nordin

This montane species is common in the Sandstone Peak area and throughout California.

U.S.A. California, Ventura Co.: Sandstone Peak, 34°07.218'N, 118°55.931'W, 941 m, on rock at the top (Conejo volcanics), common, 29.x.2004, *Owe-Larsson 9098* (UPS), *Owe-Larsson 9099* (ASU), *Owe-Larsson 9104 & Knudsen* (UPS); Sandstone Peak, 34°07.266'N, 118°56.049'W, 890 m, on flat rock below the top (Conejo volcanics), common, 29.x.2004, *Owe-Larsson 9115:a* (UPS), *Owe-Larsson 9122 & Knudsen* (UPS); 34°07.313'N, 118°56.061'W, 880 m, flat, exposed area below the top, on stone on the ground (Conejo volcanics), 29.x.2004, *Owe-Larsson 9126 & Knudsen* (UPS).

Aspicilia praecrenata (Nyl.) Hue

This rare terricolous species is known in the Santa Monica Mountains only from the type collection on "Barton's Peak" by Hasse. We have not been able to locate the type locality. The only two modern collections are from Santa Rosa Island and San Clemente Island. Recently, at the Santa Rosa Island site, no new specimens could be found for DNA analysis. Several recent collections from the Santa Monica Mountains are similar to *A. praecrenata* and may be conspecific with the type, however further study is needed (Owe-Larsson et al. 2007). These collections are saxicolous, and lack aspicilin.

U.S.A. California: Los Angeles Co.: Santa Monica Mountains, "Barton's Peak", 300 m, on clay and disintegrated granite, ii.1898, *Hasse s.n.* (H-NYL-25559, holotype)

Aspicilia santamonicae Owe-Larss. & A. Nordin

This species is currently known only from the type locality on Sandstone Peak.

U.S.A. California: Ventura Co.: Sandstone Peak, northern slope at the top, 34°07.218'N, 118°55.931'W, 940 m, on rocky outcrop (Conejo volcanics), 29.x.2004, *Owe-Larsson 9107 & Knudsen* (UPS, holotype); Sandstone Peak, northern slope a the top, 34°07.218'N, 118°55.931'W, 940 m, on rocky outcrop (Conejo volcanics), 29.x.2004, *Owe-Larsson 9100a & Knudsen* (ASU); Santa Monica Mountains, Sandstone Peak, near the top, 34°07.266'N, 118°56.049'W, 890 m, on flat, exposed rocky outcrop (Conejo volcanics) 29.x.2004, *Owe-Larsson 9117 & Knudsen* (UPS); Santa Monica Mountains, Sandstone Peak, along the path below the top, 34°07.078'N, 118°55.579'W, 791 m, on shaded, N-facing rock (Conejo volcanics), 29.x.2004, *Owe-Larsson 9128 Knudsen* (UPS).

Aspicilia* aff. *tenuis (H. Magn.) Owe-Larss. & A. Nordin

This is a species currently under taxonomic study to establish if California populations are conspecific with the type population of *A. tenuis* from the Crater Lake in Oregon (Owe-Larsson et al. 2007).

U.S.A. California: Ventura Co.: Sandstone Peak, 34°07.218'N, 118°55.931'W, 940 m, on exposed siliceous boulder (Conejo volcanics) at top of peak, 29.x.2004, *Owe-Larsson 9105 & Knudsen* (UPS).

Bacidia veneta Ekman

This species was collected by Hasse on the mature bark of *Malocothamnus fasciculatus* (Torrey & A. Gray) E. Greene in unspecified canyons in the Santa Monica Mountains. It is the first species segregated from a broader concept of *B. circumspecta* (Ekman 2004). It is a possible victim of shortened fire cycles which reduces old-growth *M. fasciculatus* as well as depleting the spore bank. The species is apparently endemic to the Santa Monica Mountains. It has not been collected since Hasse's death in 1915.

U.S.A. California: Los Angeles Co.: Santa Monica Mountains, Hasse s.n. (FH, four collections)

Candelariella vitellina (Hoffm.) Mull. Arg.

This species is frequent on Conejo volcanics near the summit of Sandstone Peak.

U.S.A. California. Ventura Co.: near summit of Sandstone Peak, 34°7'12"N 118°55'58"W, 921 m, on Conejo volcanics, 23.v.2007, *Knudsen 8474* (UCR).

Dimelaena oreina (Ach.) Norman

This common species is infrequent on Sandstone Peak

U.S.A. California. Ventura Co.: near summit of Sandstone Peak, 34°7'12"N 118°55'58"W, 921 m, on Conejo volcanics, 23.v.2007, *Knudsen 8465* (UCR).

Ionaspis alba Lutzoni

This species is frequent in eastern North America. The Hasse collection is the only collection of this species from the Santa Monica Mountains (Owe-Larsson & Nordin 2007) but the species may still persist in one of the canyons with year-round water.

U.S.A. California: Los Angeles Co.: Santa Monica Mountains, 1913, *Hasse 2573* (MIN).

Lecanora mellea W.A. Weber

This species is common in the Santa Ana Mountains in southern California but has only been collected in the Sandstone Peak area where it is infrequent.

U.S.A. California. Ventura Co.: Tri-Peaks, 34°7'16"N 118°56'0"W, 870 m, on Conejo volcanics, 24.v.2007, *Knudsen 8487* (UCR).

Lecidea atrobrunnea (Lam. & DC) Schaer.

This species is common in the Sandstone Peak area.

U.S.A. California. Ventura Co.: below trail to Tri-Peaks, 34°7'9"N 118°56'42"W, 829 m, on Conejo volcanics, 24.v.2007, *Knudsen 8492* (UCR).

Lepraria borealis Lohtander & Tønsberg

This species is infrequent in southern California, and is likely infrequent in the Santa Monica Mountains. Although it is easily overlooked as are most species of *Lepraria*.

U.S.A. California. Los Angeles Co.: Agoura Hills, 34°08'29"N 118°45'48"W, 253 m, on shaded rock outcrop, 12.i.2008, Lendemer *11464 & Knudsen*, *Lendemer 11474 & Knudsen* (NY, both collections).

Lichenoconium lichenicola (P. Karst.) Petr. & Syd.

This lichenicolous fungus, determined by Jana Kovourková, was recently reported new to North America on *Physcia aipolia* (Humb.) Fürnr. from Santa Rosa Island (Etayo et al. 2007). This is the second report for California and North America. Its host was *Physcia dimidiata* (Arnold) Nyl. on Conejo volcanics

U.S.A. California. Ventura Co.: near summit of Sandstone Peak, 34°7'12"N 118°55'58"W, 921 m, 23.v.2007, *Knudsen 8467a* (PRM)

Lichenostigma subradians Hafellner

This fungus is common throughout California especially on *Acarospora socialis* H. Magn.

U.S.A. California. Ventura Co.: Mishe Mokwa Trail, near split to Tri-Peaks Trail, 34°7'13"N 118°56'39"W, 810 m, on *Acarospora socialis*, 27.v.2007, *Knudsen 8501 & Werth* (UCR).

Staurothele drummondii (Tuck.) Tuck.

Staurothele species are infrequent in the Santa Monica Mountains as the habitats they usually occupy are dominated by *Verrucaria* species instead.

U.S.A: California: Ventura Co.: Sandstone Peak, 34°07'18"N 118°55'26"W, 670 m, on Conejo volcanics in drainage, 11.iii.2005, *Knudsen 2487* (UCR).

Topelia gyalectodes (Nyl.) B.D. Ryan & H.T. Lumbsch

This crustose species on rock is known only from Hasse collections from the type locality in Malibu Canyon (Ryan & Lumbsch 2007)

U.S.A. California: Los Angeles Co.: Santa Monica Mountains, Malibu Canyon, *Hasse s.n.* (H-NYL, holotype; FH, NY, isotypes).

Trapelia placodioides Coppins & P. James

This crustose species on Conjeo volcanics is rare in the Santa Monica Mountains.

U.S.A. California. Ventura Co.: Party Rock, 34°06'37"N, 118°54'22"W, 698 m, on Conejo volcanics, 12.i.2008, *Lendemer 11506 & Knudsen* (NY).

Umbilicaria phaea Tuck.

Common throughout Santa Monica Mountans.

U.S.A. California. Ventura Co.: Sandstone Peak area, near split between Tri-Peaks and Backbone trails, 34°7'9"N 118°56'42"W, 829 m, on Conejo volcanics, 13.v.2007, *Knudsen 8385 & Werth* (UCR)

Verrucaria papillosa Ach.

The species is apparently infrequent in the Santa Monica Mountains, occurring on shale, in dry interior canyons. The names for *Verrucaria* used by Hasse (1913) are generally out-dated or mis-applications of European names.

U.S.A. California: Los Angeles Co.: Calabash Canyon (Santa Monica Mountain Conservancy), north-facing hillside above stream, 34°8'32"N 118°41'21"W, 285 m, on shale, 29.xi.2006, *Knudsen 7956 & Painter* (UCR, SBBG).

Xanthoparmelia amableana (Gyelnik) Hale

The species is common in the Sandstone Peak area.

U.S.A. California. Ventura Co.: near summit of Sandstone Peak, 34°7'12"N 118°55'58"W, 921 m, on Conejo volcanics, 23.v.2007, *Knudsen 8477* (UCR).

Corrections

Acarospora hassei Herre

This species was in the past treated as *Acarospora smaragdula* var. *lesdainii* (Harm. ex. A. L. Smith) H. Magn. Knudsen (2005, 2007a) but further study of the *A. smaragdula* group has led to its recognition as a distinct species and *A. smaragdula* var. *lesdainii* is not recognized as occurring in California (Knudsen 2007b).

Carbonea latypizodes (Nyl.) Knoph & Rambold

Syn. nov. *Lecidea austrocalifornica* Zahlbr., Cat. Lich. Univ., 3: 738. 1925. TYPE: U.S.A, California, Los Angeles Co., Santa Monica Mountains, on soil with *Acarospora obpallens* (Nyl. ex Hasse) Zahlbr. and *Caloplaca subpyraceella* (Nyl. ex Hasse) Zahlbr., xi.1896, *Hasse s.n.* (H-NYL-12067, lectotype).

Mycobilimbia austrocalifornica (Zahlbr.) K. Knudsen, Opuscula Philolichenum, 2: 36. 2005.

Lecidea subplebeia Nyl. ex Hasse, Bull. Torrey Bot. Club, 24: 447. 1897. [non *L. subplebja* Vain. Étud. Lich. Brésil 2: 59 (1890)].

As part of the Sonoran flora project, Christian Printzen recently studied the type of *Lecidea austrocalifornica* and pointed out that it had been misdetermined as a *Mycobilimbia* and had a *Lecanora*-type ascus (Prinzten, pers. comm., Knudsen 2005). The type was re-examined to clarify the issue and the chemistry studied by high performance liquid chromatography (HPLC). The type of *Lecidea austrocalifornica* contained atranorin (minor) and 2'-*O*-methylperlatolic acid. Both of these characters suggested placement in *Carbonea* (Hertel) Hertel and a relationship to *C. latypizodes*. Comparison of specimens of *L. austrocalifornica* with specimens of *C. latypizodes* in NY confirmed that *L. austrocalifornica* is a synonym of that species. *Carbonea latypizodes* is reported new for California, and all of the specimens we have examined represent the chemotype of this species that contains only atranorin and 2'-*O*-methylperlatolic acid (Rambold 1989).

The type locality of of *Lecidea astrocalifornica* was apparently at "Brown's Lake" (probably a vernal pool) on "adobe clay and small pebbles" near the Old Soldier's Home where Hasse worked as a surgeon (Hasse 1913). In Hasse's time this area on the coastal plain would have been considered part the foothills of Santa Monica Mountains. It is now urbanized and part of Santa Monica or Brentwood. The Old Soldier's Home has become a Veterans Hospital and on a recent excursion we were unable to find any lichens on the extensive property which now includes a golf course as well as medical facilities next to the San Diego Freeway. At this time no new specimens have been found of *C. latypizodes* from the Santa Monica Mountains and the report remains historical. It is expected on sandstone. Three other locations have been found in southern California and are cited below.

Carbonea latypizodes can easily be mistaken for a *Lecidella*, particularly *L. carpathica* Körb., because of a similar thallus and dark hypothecium. *Lecidella carpathica* usually contains sufficient atranorin for the thallus to react K+/P+ yellow while *C. latypizodes* in southern California has negative spot tests. Chromatography (TLC or HPLC) is the most reliable method of distinguishing the two species. *Carbonea latypizodes* contains atranorin and 2'-*O*-methylperlatolic acid (Rambold 1989) while *L. carpathica* contains atranorin, chloroatranorin, diploicin, thuringione, 4,5-dichloro-3-*O*-methylnorlichexanthone and ±arthothelin. Some specimens Hasse identified as *Lecidea subplebeia* were found to be *Lecidella asema* (Nyl.) Knoph & Hertel but that species can readily be distinguished from *C. latypizodes* by the presence of xanthones in the thallus which react UV+ orange and C+/KC+ yellow-red (test best performed under the microscope on a squash mount of the thallus).

It should be noted that on the soil with the type specimen of *Lecidea autrocalifornica* there are only a few apothecia of *Caloplaca subpyraceella* and the status of this species needs clarification with a lectotype to be selected from the Hasse specimens present in H, FH or NY. This species is possibly conspecific with *C. crenulatella* (Nyl.) Oliver.

Specimens of *Carbonea latypizodes* : **U.S.A. California. Orange Co.:** Santa Ana Mountains, Weir Canyon, south of Windy Ridge Road, long sandstone slab on north-facing slope, 33°49'52"N 117°43'17"W, 416 m, common on sandstone, 30.v.2006, *Knudsen 6412 & Knudsen* (UCR); Fremont Canyon, south ridge, north-facing slope, 33°49'28"N 117°43'21"W, 618 m, common on soft sandstone, 3.i. 2008, *Knudsen 4445* (NY, PRM, UCR); **Santa Barbara Co.:** Santa Cruz Island, Channel Islands National Park, ridge south of Cananda Cervida along truck trail above Christi Ranch, 34°01'59"N 119°50'23"W, 216 m, on soil and small pebbles in thin-soiled opening of stunted *Adenostoma fasciculatum* chaparral, 16.vi.2007, *Knudsen et. al. 8573* (CANB, UCR).

Miriquidica scotopholis (Tuck.) B.D. Ryan & Timdal

This species is common throughout southern California but in the Santa Monica Mountains only frequent in the Sandstone Peak area. In earlier papers we have reported this species as *M. mexicana* (Knudsen & Owe-Larsson 2005; Knudsen 2007a). Further investigation has led to *M. mexicana* being synonymized with *M. scotopholis* (Lendemer & Knudsen 2008)

Placynthiella hyporhoda (Th. Fr.) Coppins & P. James

This species was previously included in *P. knudsenii* Lendemer (Knudsen 2005 & 2007a) but differs with reddish subhymenium and slightly smaller spores (Printzen & Knudsen 2007). It occurs on sandstone on Castro Ridge and on soil in areas of Conejo volcanics and on detritus at bases of *Adenostoma fasciculatum*. *Placynthiella knudsenii* is no longer recognized as occurring in the Santa Monica Mountains and is currently known from a single collection in the Ozarks and several collections from Riverside and San Diego counties in California.

Conclusions

The annotated checklist, published in 2007, reported 217 taxa of lichens and lichenicolous fungi, with seven known only from historic collections. In this paper 25 more taxa are added to the on-going checklist with seven known only from historic collections, for a total current amount of 242 species and with 14 species known only from historic collections before 1915 (year of Hasse's death). We do not know how many more species will be documented as currently occurring in the range. The final number of species known only from historic collections made by Hasse before 1916 may be as high as 50 or more.

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