

II. Thallus appearing whitish (usually densely pruinose)

[Note: This group is probably not natural, although it is conceivable that species that are always completely and densely pruinose may have calcium oxalate interspersed within the cortex, analogous to Lecanora subg. Placodium sect. Saccharon; although that group itself is heterogeneous, Poelt considers the character of oxalate-interspersion (as opposed to external deposits) to be taxonomically important. The following key is intended for species with a \pm brown thallus under the pruina, but some species with a yellow thallus (rhizocarpic acid) covered by a very dense pruina (e.g., A. albida and A. subalbida) may also key out here; however, they can be separated by chromatography).

1. **On soil.** Spores spherical, 4-6 μ m diam. Thallus C-.2
1. **On rock.**4

2. **Spores globose, 10-12 μ m. Hymenium 200-250(-300) μ m.** Apothecia brownish black or gray-pruinose, 0.3-0.75 mm across, deeply immersed, 1 per areole, the disc concave. Squamules 0.6-1.5(-1.9) mm across ca. 0.5 mm thick, sordid white to ashy gray, entire, subglobose, usually crowded, the margin coarsely white pruinose, pale below. Spores 24-40 per ascus. Paraphyses 1.7 μ m, the tips not capitate. Thallus K-, C-. On sandy or clayey earth, S. California.A. thelococcoides

2. **Spores subglobose, 4-7 x 3-6 μ m. Hymenium 50-150 μ m;** Apothecia reddish then finally brown-black, sometimes slightly pruinose, 0.4-1.8 mm across, numerous, immersed then semi-immersed or slightly prominent, 1 to few per areole, plane or slightly convex, almost always surrounded by a whitish, entire, sometimes slightly flexuose margin. Thallus whitish, sometimes a little brownish; white pruinose, centrally areolate and marginally squamulose, the squamules often scattered, 1-5 mm across, pale below, \pm plane but irregular, a little lobulate, especially at the periphery, \pm contiguous to slightly imbricate. Paraphyses 1.5-3 μ m, tips 2-5 μ m. On calcareous or gypsum soil, and calcareous rocks.3

3. **Thallus K+ brick red.** S. California, Utah. A. reagens

3. **Thallus K- but apothecial margin (actually the hypothecium) K+ red-orange.** Apothecia large, black; margins irregular. Thallus covered with thick layer of pruina. On gypsiferous clay soils and gypsum outcrops, Utah.A. nodulosa

4. **Thallus umbilicate, to ca. 1 cm diam. Spores spherical.** Discs scabrid. Colorado, Utah.(see Glypholecia scabra)

4. **Thallus not umbilicate; squamules at most a few mm diam. Spores subspherical to ovoid or ellipsoid.**5

5. **Thallus areolate or squamulose.**6

5. **Thallus of short, branched stipes.**(see A. thermophila)

6. **Spores 3-6 μ m wide.**7

6. **Spores narrower, subglobose or \pm ellipsoid.**8

7. Spores subglobose to ellipsoid, 7-13 x 3-6 um. On \pm non-calcareous rock. Areoles \pm dispersed; paraphyses under 2 um wide at base. Apothecia 2-5 per areole, irregular. Utah.A. utahensis

7. Spores spherical to ovoid, 3.5-5 x 4-6 um. Thallus of dispersed to subconfluent, rounded or irregular, raised, dull ivory white, chinky-areolate squamules; squamules pale below, with deep furrows above (forming a few polygonal, subpyramidal areoles, apices plane, bone-white, tartareous-cartilaginous), 0.5-0.8 mm thick; groups of squamules 2-4 mm wide. Apothecia small, spreading, 0.5-0.8 mm or more across, immersed 1-3 in each squamule, the disc flat, black, matt. Hypothecium thin, yellowish. Hymenium 100-120 um, I+ blue then dirty wine red. Paraphyses conglutinate, thin, eseptate; ascia saccate- to oblong-ovoid, scarcely shorter than hymenium, 20-28 um wide. Upper cortex 40-50 um. Squamules affixed by medullary hyphae. Medulla white. Algae 9-18 um diam. Thallus K-, C-. On siliceous rock, California.A. peltastica v. peltastica

8. Cortex C+ red. Areoles red-brown but densely blue-green pruinose, irregular in size and shape, \pm round, not or rarely lobate, (0.3-)0.5-0.7(-1) mm across, ca. 0.3 mm thick, contiguous, not always separated by distinct cracks, broadly attached, plane, pale below. Apothecia numerous, 1/areole, punctiform then somewhat dilated, 0.1-0.4 mm, pale red-brown, thinly pruinose. Spores \pm narrowly ellipsoid, ca. 100/ascus, 5-6 x 1.8-2 um. Cortex 35-50 um thick; cells very small, indistinct. Paraphyses firmly coherent, distinctly dark brown capitate. Hymenium 80-100 um. Thallus areolate, indeterminate, smooth. On non-calcareous sandstone, western Texas.A. caesiofusca

8. Cortex C-.9

9. Areoles white pruinose in center, black at the margins but pale below. Spores ellipsoid, 3.5-4 x 2.5 um. Squamules usually 0.5 mm across, rarely to 1 mm, only 0.1-0.2 mm thick; blackish brown under pruina; widely attached to the stone; subround lobate; dispersed to contiguous and then angular. Upper cortex 20-30(-40) um thick, transparent; cells 4-5 um diam. Apothecia black, 0.1 mm diam., epruinose, round, concave, 1-several per areole, immersed. Hypothecium 15-25 um thick. Hymenium 85-90 um. Paraphyses 2-2.5 um thick. Pycnospores 1.5-0.2 x 0.6 um. On siliceous rock, Arizona, Mexico.A. nigromarginata

9. Areoles not black at margins; pale or dark below.10

10. Spores \pm globose or subglobose.11

(also see A. arenacea, below)

10. Spores \pm ellipsoid.12

11. Hymenium 80-90 um. Apothecial disks punctiform, finally to 0.3 mm diameter. On calcium-containing rock. Spores 3-4 x 2.5-3 um. Thallus squamulose, indeterminate, dark red-brown but densely bluish-white pruinose; squamules dispersed to subcontiguous, 0.5-1 mm across, convex, pale below. Apothecia (1-)2-5 per areole, the disc concave. Paraphyses 1.8-2.5 um, the tips brown capitate, 4 um. Thallus K-, C-. Colorado.A. coloradiana

11. Hymenium higher. Apothecial disks expanded, 0.3-0.8 mm. Discs black, scabrid. 11b

11b. Hymenium 100-120 um. Areoles 0.3-0.5 mm thick, smooth, white pruinose, pale below. Cortex 30-40 um thick, the cells 3-4 um. On siliceous rock. California.A. epilutescens

sensu Magnusson [need to get more complete description]

11b. Hymenium 170-180 um. Areoles 0.2-0.3 mm thick. Squamules rounded to sublobate, crowded or rarely dispersed, chalky white, pale yellowish when wet, thinly pulvinate, 0.5-2 mm wide, corticate above, medulla white, I-, algae 15-18 um wide. Apothecia usually solitary, rarely 2-3 per areole; disc immersed, black, matt, brown when wet, scabrid, 0.3-0.8 mm wide, margin rather thick, entire to subentire, inflexed; hypothecium pale; hymenium 170-180 um high, I+ blue, in upper part turning wine red; paraphyses slender, conglutinate, thinly septate, tips clavate and yellow-brown, asci ovoid to ellipsoid-cuneate, scarcely shorter than hymenium, spores ovoid, 4 x 203 um. Thallus KC+ slightly yellowish. On granite, S. California. A. epilutescens Zahlbr.

12. Hymenium 100-200 um high. Apothecia \pm black. Cortical cells 2-3 um.13

12. Hymenium 80-85(-100) um. Areoles 0.5-1 mm wide. Apothecia ca. 0.5 mm diameter.14

13. Spores 3-4.5(-5) x 2-2.5 um. Paraphyses tips to 2.5 um thick. Areoles 1-1.5 mm across, 0.3-0.7 mm thick. Thallus areolate-squamulose, indeterminate, chalky or bluish white; areoles scattered to subcontinuous, plane, usually deeply fissured, pale below. Apothecia 0.2-0.5 mm, immersed 1-5 per areole, the disc black or very dark reddish brown, plane or subconcave. Hymenium 100-200(-140) um high. Paraphyses 1.8-2(-2.5) um below, the tips not thickened. Thallus K-, C-. On various rock types, very common, at least in the Great Basin. A. strigata

13. Spores 4-5.5 x 1.8 um. Paraphyses tips 4-5 um (in KOH). Areoles 0.4-0.7(-1) mm diam., 0.2-0.4 mm thick. Thallus indeterminate, areolate; areoles contiguous, gray-white (pale reddish brown when moist). Apothecia 0.2-0.4 mm diameter, sometimes faintly pruinose, smooth, level with thallus or impressed, 1-2 per areole. Hymenium ca. 100 um; paraphyses 1.8 um, Thallus K-, C-. Illinois, New Mexico. A. cinereoalba

14. 10-20(-30) um thick. Apothecia red-brown, usually 1 per areole, impressed, becoming dilated, \pm concave. Spores 3.5-5 x 1.8-2 um. Thallus indeterminate, squamulose-areolate, the squamules dispersed to grouped, minute, red-brown but often \pm densely white pruinose, irregularly rounded, convex to subplane or uneven, often with very thin \pm radiating fissures on surface, 0.5-1 mm across, (0.15-)0.2-0.3 mm thick, pale below, broadly attached. Upper cortex lumina 3-5 um diam. Apothecia when well developed to 0.4-0.5 mm diam.; disc smooth or very thinly rough. Hymenium 80-85(-90) um. On siliceous rocks (sandstone), New Mexico. A. superfusa

14. Cortex 35-60 um. Apothecia black, 1-5 per areole, immersed, scabrid, concave, ca. 0.5 mm diam.; margin prominent, diffuse. Areoles sordid white, irregular, 0.5-1 mm wide, scabrid to almost cracked, broadly attached; base pale. Cortex 35-60 um thick. Hypothecium 20-30 um. Hymenium 85-100 um. Paraphyses 1.7-2 um thick, the tips 3-3.5 um. Spores at least 100 per ascus, 3.5 x 2 um, broadly ellipsoid, many subglobose. Thallus effuse, areolate. On sandstone, Utah. Similar to A. strigata but areoles diffuse, disc larger and concave, and spores smaller. A. arenacea