

**Alectoria** Ach. in Luyken  
(LECANORALES: PARMELIACEAE s. lato?)

After Brodo & Hawksworth, and others

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Thallus fruticose, markedly elongate, pendulous, prostrate, or erect; attached by a basal holdfast; lobes  $\pm$  terete, or occasionally somewhat expanded and dorsiventrally compressed, or angular to faveolate towards the base and at branch axils; surface greenish yellow (usnic acid) or occasionally streaked with blue-black, or sometimes (*A. nigricans*) grayish to pinkish or brown-black (no cortical substance in TLC), generally smooth, occasionally becoming striately ridged towards base and axils; pseudocyphellae always present, often conspicuous, fusiform, white, flat to markedly raised; isidia (soredia bearing spinules?) present in one species; true lateral spinules absent; cortex horny, of longitudinal, periclinal, arachnoid, conglutinated hyphae; hyphae immersed in  $\pm$  large amount of matrix; medulla of loose arachnoid longitudinal hyphae; hyphae distinctly segmented, usually ornamented.

Apothecia mostly rare, lateral, stalked; thalloid margin persistent and often incurved, concolorous with thallus, with (?) or without cilia; disk concave, brown to black; hypothecium pale, over an algal layer; paraphyses branched and anastomosing; asci clavate, unitunicate, thick walled, *Lecanora*-type, I+ blue; tholus I+ blue; 2-4(-8)-spored; spores simple, ellipsoid, brown (or sometimes hyaline, according to Rogers), thin walled, over 20  $\mu$ m long, with distinct, colorless perispore.

Pycnidia rare, immersed in thalloid warts; fulcrum endobasidial; pycnosporangia bacilliform, 7-8  $\times$  0.8  $\mu$ m. Usnic acid usually in cortex; medulla often with orcinol and  $\beta$ -orcinol depsides (alectronic, thamnolic, barbatic, olivetoric, squamatic,  $\alpha$ -collatolic, alectorialic, barbatolic, diffractaic). Photobiont *Trebouxia*. On bark and soil, arctic-alpine to boreal-montane.

**1. Thallus brown-gray, usually pale at base, with at least the tips blackened; cortex KC- (usnic acid absent).** Branch tips usually reflexed. On soil or rock (rarely bark or wood), arctic-alpine. Cortex C+ pink, KC+ red, P+ yellow (alectorialic and usually traces of barbatolic); thallus usually K-, sometimes partly K+ red (unknown). No soredia or isidia, or rarely (f. *sorediata*, in Greenland), with soredia. Apothecia rare. Specimens stain paper pink-brown in herbarium. Often growing in large swards, over soil, humus and gravels, especially common in heath tundras; in boulder trains often common between the boulders, sometimes also on lower branches of spruce. Arctic-alpine, south to Quebec, Washington, and New Mexico.....  
*A. nigricans*

**1. Thallus  $\pm$  yellowish to gray green, sometimes blackening but without brown tinge; cortex KC+ yellow (usnic acid).** ..... 2

**2. Medulla C+ red, KC+ red (olivetric acid).** Thallus pendent, often very long, yellow to grayish green; cortex joined with a fibrous network within the medulla; medulla dense and compact. No soredia or isidia. At low elevations, on trees. Morphologically very similar to A. sarmentosa subsp. sarmentosa, but differs chemically and in other ways (see table below). ..... A. vancouverensis

**2. Medulla C- (no olivetric), but may be KC+ red (alectoronic).**  
..... 3

**3. With numerous isidia-like spinules, and sometimes soredia,** arising in tufts from the pseudocyphellae or scattered along the branches. Thallus caespitose to subpendent, 5-8 cm long; branches 0.4-0.7 mm diam., irregularly flattened and angular, greenish yellow to straw yellow throughout. Medulla KC- or rarely red, CK-, K+ yellow or K-, P- or P+ yellow-orange, UV+ ice-blue or UV- (2 unknowns plus either thamnolic or squamatic acid (and rarely alectoronic acid in Calif.). Usually on conifers and wood, rarely rock, either close to sea level or in mountain or plateau areas (750-1750 m), usually in dry, well-lighted stands, central Calif. to Cascades of Washington and Rocky Mountains (Idaho, Montana, Alberta), with possible disjunct on Queen Charlotte Islands, B.C. Rather uncommon. .... A. imshaugii

**3. Without isidia-like spinules; usually without soredia.** ... 4

**4. Thallus pendent to subpendent, 8-20 cm long or longer.** On bark. (if tips of branches sorediate or granular and often hooked, with medulla KC-, see Ramalina thrausta).. 5

**4. Thallus caespitose and erect to prostrate, usually under 10 cm long (if longer, then stiff);** often on soil or rock. .... 6

**5. Branches ± regular, terete or occasionally flattened at axils and towards base, pendent, to 2.5 mm diam.; medulla usually lax, usually KC+ red, CK-, K-, C-, P-, UV+ ice-blue (alectoronic acid, squamatic acid, and perhaps α-collatolic acid); cortex ± uniform throughout.** On conifers, boreal-montane, extremely common.  
..... A. sarmentosa spp. sarmentosa

**5. Branches recurved and tangled; subpendent; medulla dense, usually KC-; cortex very uneven in thickness, giving thallus a knobby appearance.** Tennessee to Nova Scotia. .... A. fallacina

**6. Branches usually over 2 mm wide (to 4 cm according to Thomson), at least the main stems weakly to strongly compressed, expanded.** Surface greenish yellow to yellowish, the apices often blackened, the sides ridged or striated or foveolated;

thallus prostrate to decumbent; branching dichotomous, sparse, anisotomic at base, isotomic towards the apices. Medulla P-, K-, C-, CK-, usually KC+ red (alectoronic acid), but (according to Thomson) KC-, sometimes without acids or possibly sometimes with squamatic acid and  $\alpha$ -collatolic acid (UV+ ice-blue); cortex with accessory atranorin. Apothecia very rare. Usually on soil, in open, more or less windswept gravelly areas and on old frost boils, sometimes mixed in heath vegetation, arctic-alpine, south to Newfoundland, Alberta, and Washington. Considered a separate species by Thomson, but it intergrades with ssp. sarmentosa in Europe. .... A. sarmentosa ssp. vexillifera

**6. Branches usually under 2 mm wide, terete to angular, not flattened.** Cortex often streaked with bluish black. .... 7

**7. Medulla KC-, CK+ yellow, K-, C-, P-, UV- (with diffractaic acid), or (according to Thomson) sometimes without acids, or rarely C+ red, KC+ red (alectoronic acid). Apothecia rare.** Branches yellow to yellow-green, often blackened in parts,  $\pm$  round in section, usually less than 2 mm diam., without compressed and expanded main stems, the tips often curved and drooping, pointed, black to blue-black; surface smooth to slightly ridged or tuberculate; whitish pseudocyphellae to 1 mm long, numerous, raised, longitudinally oriented. Thallus erect, loosely attached. On soil or humus especially in heath tundras, often in sheltered places between frost-riven boulders in fell fields, sometimes on lower branches of spruce and willows. Arctic-alpine, southward into northern fringes of boreal forest, and in mountains in Mexico. .... A. ochroleuca

**7. Medulla KC+ red, CK-, K-, C-, P-, UV- (alectoronic; no diffractaic). Apothecia frequent.** Branches somewhat angular, the tips not drooping. Thallus caespitose to subpendent, sometimes to 15 cm long. On bark, soil or rock, Washington to northern California, and Mexico. Bruce McCune (pers. comm.) questions whether this species is really distinct from A. sarmentosa, but see table below. .... A. lata

	<u>A. sarmentosa</u>	<u>A. lata</u>	<u>A. vancouverensis</u>
Chem.	C-, KC+/- UV+/-, P-(+)	C-, KC+/- UV+/-, P-	C+ red, KC+ red, UV-; cortex P+ o-y
Length	20-40(-80) cm [or 8-15 cm*]	5-8(-15) cm	15-20(-200) cm
Habit	pendent [or $\pm$ caespitose prostrate*] (to prostrate)	pendent	
Texture	$\pm$ flaccid [or stiff*]	stiff	stiff
Color	green-gray to golden yellow	yellow to yellow-green	straw to yellow- or gray-green
Blue-black striation	occasional at base	usual (espec. near base)	absent
X-section	terete/angular [or $\pm$ flat*]	$\pm$ angular	$\pm$ flat espec. at axils
Twisting	no?	no?	often
Foveolation	some, espec. toward base	no	strong
Diam. (mm)	0.5-2(-2.5) [or 2-4(-40)*]	0.5-1.5(-2)	0.4-0.9
Branching	$\pm$ isotomic [or partly anisotomic*]	$\pm$ isotomic	$\pm$ isotomic
Spinules	no [or $\pm$ yes*]	no (but $\pm$ w/ short laterals	no
Axils	acute/obtuse	mostly acute	mostly acute
Pseudocyph.	not twisting	not twisting	twisting
Medulla	loose/dense?		dense
Apothecia	$\pm$ common [or rare*]	very common	not uncommon
Spores	23-35(-48) x $\pm$ 14-20 $\mu$ m	35-45 x 18-24 $\mu$ m	23-35 x 16-23 $\mu$ m
Substrate	bark/wood [or soil/ rock*]	soil/rock & bark/wood	bark/wood
Elevation (approx.)	30-1000 m [or to 2800 m*]	1500-2000 (-3000) m	30-1000 m

\* = subsp. vexillifera

## **Literature**

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