

IIID. Subg. Usnea Sect. Ceratinae

Rev. Nov. 1993

Thallus when fresh ± intense, dirty ashy green or glaucous green, never whitish, nor brownish or reddish; color not changing in herbarium, or else dusky brown after a long time and then surface is ± papillate.

Thallus filiform and elongate, or if short and firm then medulla or axis usually ± red or pink (sometimes very pale)

Thallus almost always thick and rather densely, often irregularly, branched, usually large. Branches (even the main ones) terete, or sometimes deformed by tubercles, but at not distinctly angular, nor pitted or furrowed; usually ± thin, the apical portions rather distinct; fibrils usually few and irregular (except, e.g., in the U. strigosa group). Surface matt; cortex usually thick, or at least not vitreous; medulla thick, dense to very dense; axis rather thick.

This section was called Sect. Elongatae subsect. Ceratinae by Motyka, but to me it does not seem to belong with the other members of that section (the branches are ± terete, and in contrast to Longissimae the cortex is strong and persistent, the axis is I, and the thallus can be short rather than elongated). As presently delimited, the Ceratinae are often difficult to recognize, because the medulla and axis in several of the species (especially Group IIID4) can be white; cross references to such species are or should be included in other groups.

IIID1. Ceratinae: "U. ceratina Group"

**Medulla or axis red, to usually pink (or whitish).
Thallus sorediate or isidiate,
usually (?) sterile.
Thallus large, pendulous**

Thallus large (to over 15 cm long), pendulous, often deformed by tubercles. Medulla thick, pale pink, often whitish.

1. Branches usually deformed (not exactly terete). Medulla pink to red, or if white then axis pinkish. Apothecia rare or absent (at least in North American material; European U. ceratina is supposed to be often fertile according to some authors). 2

1. Branches exactly terete, usually distinctly annulate; branchlets numerous. Medulla white (but included in Ceratinae because of other similarities, which are not clear). (see U. hesperina and U. mexicana)

2. Medulla K+ red, P+ orange (salazinic acid). Thallus dark olive to rather pure green, turning fuscous olive in herbarium, + shiny or polished. Almost no fibrils. CMA 50:80:200. Thallus ca. 15 cm long, pendulous, rather rigid; main branches unifrom, flexuous, to 1 mm thick, arching towards, subdichotomously to subsympodially branched, the branches divergent; abruptly attenuate, terete; surface continuous, ± smooth. Medulla dense. Surface rather regularly and abundantly papillate; ecorticate tubercles also present. Soredia absent. Apothecia unknown. On trees. Mostly northeastern US (New England to S. Carolina); British Columbia; New Mexico.

..... U. merrillii (listed by Asahina under U. cribosa)

2. Medulla K or K+ yellow. Thallus ± pale greygreen. 3

3. Thallus dark graygreen, mostly 1530 cm long (but rarely to 80 cm), at first somewhat erect and tufted, then ± stiffly pendant, often long and straggling or scrawny, harsh. Base pale or ± blackened. Main branches often coarse, to 1.5 mm diam., of uniform thickness, only tapering at the apices, typically rather straight when well developed, or somewhat twisted, oftn ± angular; branching usually sparse, occasionally with numerous irregularly arranged lateral branches, with scattered or sometimes abundant single or clustered thin fibrils to 1 cm long, arising at right angles to branches. With conspicuous, large,

irregularly scattered raised, ± hemispherical tubercles, their tips farinose, often bursting to form coarsely granular, ulcerose soarlia, and occasionally, secondarily corticate isidia. Main branches also with smaller, low, translucent, paler papillae. Soredia always present, often isidiose. Axis white, but medulla pinkish. Medulla and axis very compact, pale to deep pink, rarely white. Cortex tough. Medulla K or K+ yellow, CK+ orange. Ch: diffractaic and barbatic acids, ± several accessory substances. CMA 5075:150220:350450. Apothecia rare, lateral on main branches; margins with few rays (fibrils). On trunks of acidbarked old hardwood trees, usually in welllit sites in old woodlands and parklands. ± Eastern US (& Pacific NW?). **U. ceratina** Ach.

3. Thallus uniformly whitish straw to almost white, often 3050 cm long. Thallus thick, soft; branches coarse, to 2 mm diameter, often distinct to tips. Many blunt warty papillae on thinner branches. Soredia minute. Medulla K. CMA 50100:165200:330375. Thallus rather compressed, thick but rather soft, matt; base indistinct, the main trunk unbranched for some length; upwards rather sparsely repeatedly subdichotomously branched; axils commonly closed and branches subparallel; branches to ca. 2 mm thick, rather slightly attenuated above, slightly curved, terete to often compressed and subfoveolate; thicker branches commonly rather frequently articulate; surface with rather broad and deep cracks; thinner branches distinctly verruculosepapillate; thicker branches with thick, obtuse, concolorous verrucules, which become white farinose, sometimes elongated into rugulae. Lateral branches rare, similar to main branches, often hanging down, somewhat attenuate, variously curved, coarsely verruclose, obtusely acuminate. Soredia isidiose, short, minute, white, on verrucules. West Coast (at least California). **U. californica**

Additional species, not included in Ceratinae, but with roseate medulla:

Thallus about 30 cm long, typically bearded, with abundant branches and branchlets, with large tubercles and pits; primary branches to 3 mm, almost sticklike. Outer medulla roseate, the rest white. CMA ? :400:500. Eastern US. (**Sect. Barbatae subsect. Tortuosae: U. pachyclada**)

IIID2. Ceratinae: "U. mutabilis group"

Medulla or axis pink or often deep red.

Thallus sorediate or isidiate,

almost always sterile (?).

Thallus shrubby to subpendulous.

Thallus 510(15) cm tall, shrubby. Medulla often deep red.

1. With few if any fibrils. Medulla brick red to whitish rose, K, P (fatty acids). Thallus usually densely tufted, to almost subpendulous, to 15 cm long, with several major axes; main branches ca. 1.2 mm thick, usually much branched; lateral branches to 4 cm long; surface dusky green, the smaller branches paler to ashy gray green. Moderately papillate and isidiate-spinulate, the papillae becoming sorediate. Axis reddish. Apothecia very rare, to 4 mm broad; disk tan, pruinose; margins with fibrils. CMA 60100:200:320. On trees, ± Eastern US, south to Florida. U. mutabilis Stirton

1. With ± dense covering of fibrils. Medulla dense, K+ yellow or red. Fibrils short, spinelike. Thallus pale whitish green to dark glaucous green, partly reddish maculate; matt. Thallus ca. 10 cm long, suberect to subpendulous, thick, firm; base ca. 1.3 mm thick, irregularly attenuate along the whole length; above the base densely subdichotomously branched; branches rather short, variously irregularly curved, ± terete, not rarely partly irregularly but indistinctly deformed; surface continuous and often almost smooth. Isidiate soralia rather frequent, capitate, convex. Medulla I± violet or rosy. Southeastern US; Calif. Perhaps belongs closer to U. subfloridana according to Thomson. U. subcomosa Vain.

ADD:

Cortex partly green (brownish in herb.), partly dark lurid reddish (commonly red of medulla seen only in sections); axis without dark hyphae. Thallus to 68 cm long. CMA 50150:150225:250450. Thallus shrubby and erect, to subpendulous, rigid; base short, rather thick; repeatedly dichotomously branched; branches 1.3-1.5 mm thick, flexuose; surface rather rarely transversely cracked, the thicker branches slightly rimose-areolate; thicker branches verrucose-papillate; papillae long and almost cylindrical, or short and ± semiglobose, wartlike, concolorous. Fibrils absent or few and poorly developed. Soredia white, farinose becoming isidiate; soralia on upper parts of branches on slightly raised,

spinulelike warts. Pale "pseudocephalodia" present. Medulla dense, I+ blue; inner part K+ yellow to red, outer part K. Eastern US (Connecticut to Florida, west to Iowa); California.

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(**Rubigineae:** U. pennsylvanica)

IIID3. Ceratinae: "U. strigosa Group"

**Medulla or axis pink or often deep red;
Thallus without soredia or isidia,
with abundant apothecia on tips of main branches.
Thallus short, tufted to subpendulous; fibrils numerous.**

Thallus mostly 510 cm long, or sometimes larger; tufted. Tuberculate or moderately papillate. Branches ashy to dusky green, with many stiff erect bristly fibrils. Branches and "cilia" (fibrils?) well developed, resistant to damage. CMA 50:300:450. Base of thallus not black (any darkening disappears with growth); "papillae" having predominantly sloping sides. Medulla deep rose red to white, K or K+ red, P or P+ yellow. Ch: Four strains (check Tavares may partially correspond to different subspecies): 1) usnic alone; 2) norstictic & galbinic acids; 3) psoromic acid; 4) fumarprotocetraric acid. On trees. ± Eastern US.

1. "Papillae" wide, often remaining undeveloped so that ramuli are few; lateral branchlets tend to be long and closely spaced in groups interspersed with unextended "papillae;" younger branchlets subnitid; cortical lumina ca. 12(3) mm wide; CMA 200225:350:200300; thallus dark olive in age. U. strigosa ssp. rubiginea

1. "Papillae" medium in width, typically extending more or less regularly into ramuli; thallus cortex tends to be rough (rimose).
..... 2

2. Ramuli typically regularly interspersed with short, lateral branchlets (fibrils); cortical lumina small (ca. 12 mm wide); CMA 85100:200325:175400; thallus clear graygreen turning yellowish.
..... U. strigosa ssp. major

2. Ramuli less regularly arranged, but not closely grouped; cortical lumina large (ca. 25 um wide); CMA 75:175:250; thallus persistently graygreen. U. strigosa spp. strigosa

ADD?:

Base of thallus not black (any darkening disappears with growth); "papillae" having predominantly sloping sides. Small red spots [cortex? parasite?] scattered over branches and ramuli; cortex subnitid; "papillae" on stipes of apothecia elongate, sharply raised, frequently inflated just above base; cortical cell lumina 11.5 um wide. CMA 5060:175250:100125. Thallus clear bluish gray green, turning yellowish. (Section?): U.

michauxii

IIID4 Ceratinae: "U. hesperina and U. mexicana Groups"

Branches terete, usually distinctly annulate; branchlets numerous. Medulla and axis white (but included in Ceratinae because of other similarities, which are not very clear); crossreferences in keys to other sections are necessary.

1. **Sterile; with rather large isidiose soralia.** Papillae low (very short), farinose, very few in v. liturata Mot. Nodules (tubercles?) small (short?), all sorediate, giving rise to isidiate soralia. Thallus 1030 cm tall, dichotomously and not very abundantly branched, the branches almost parallel. Medulla very dense and farinose. Medulla K+ and especially KC+ yellow then redbrown. Branches of thallus neither incurved, nor pleated, almost straight or a little sinuous, the terminal branches often very long. Thallus greenish gray, browning slightly in herbarium. Branches about equal in thickness over most of their length. CMA 7590:120150:300. Eastern

US. U. hesperina

1. **Fertile, with minute apothecia; esorediose.** Axis with sordid yellow or dark hyphae in central part. CMA 40100:60120:250650. Thallus to 60 cm long, pendulous, compressed, rather rigid, subgluacous ashy green, appearing subvitreous. Main branches at first unbranched; above rarely subdichotomously branched; axils narrow. Branches unifrom, slightly flexuose, ca. 1 mm thick along their length, somewhat attenuated towards tips, smooth, rather rarely and irregular annulate and cracked. Branchlets rather irregularly distributed, 13 cm long, thickened at base, often slightly flexuose, elongated and hairlike towards tips, terete, sometimes slightly papillate. Apothecia apparently not frequent, subterminal, on lateral branches, ca. 2 mm diam.; margin smooth, with few or no fibrils; disc dirty whitish pruinose, almost plane. Medulla K. Southern US (and Mexico). U. mexicana