

IIIC. Usnea Subg. Usnea Sect. Glabratae

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Thallus usually short and tufted, often turning brown in herbarium; surface often (but not always!) smooth.; cortex often thin and papery.

Thallus minute to small, rarely larger, but almost always tufted (not pendulous); rather widely divergently branched; color turning intense brown in herbarium, or persistently straw colored; surface usually glabrous and at most indistinctly papillate (but with a number of exceptions!), never distinctly tuberculate; branches cylindrical, or if not then stiff; usually at most indistinctly articulate; pseudocyphellae absent; fibrils few to dense and regularly distributed; medulla lax to dense.

This group is often difficult to recognize (especially in fresh or recent specimens, that haven't turned brown yet!), and crossreferences to other sections are needed. The absence of papillae and tubercles is not always a good character, because many species in other sections also lack them, or have only a few (sometimes only on certain parts). Section Stramineae is similar, differing mainly in that the thallus is elongated and often somewhat articulated. The subsections of Glabratae don't seem particularly well differentiated from each other.

IIIC1. Subg. Usnea Sect. Glabratae Subsect. Glabratae

Medulla thick and lax. Surface of thallus when fresh pale green to whitish green (not grayish or ashy), in herbarium soon clear yellow, straw color or dusky brown. Fibrils absent or few; spinules absent. Apothecia absent.

Fresh specimens with cortex thin, papery, smooth to very smooth. Thallus mostly small, usually tufted, divergently branched, never tuberculate (?). Thallus segments \pm inflated.

This was called subsect. Pycnocladae, but it contains the implied type species of section Glabratae.

1. Thallus rather large, more than 10 cm long, pendulous, limp, very soft; branching irregular, branchlets rare. 2

1. Thallus mostly not more than 10 cm long, usually much less; typically caespitose or tufted, rigid, compressed basally, inflated above; branches thick in the middle, tips

attenuate.
..... 3

2. Soredia in semiglobose soralia 12 mm in diameter, on lateral branches. CMA 5060:400600:250300. Thallus to 15 cm long, subpendulous, rather soft, pale straw to dusky green, smooth, matt; base dilated, not darkened; from base to tips infrequently irregularly subsympodially and dichotomously branched; branches straight or slightly flexuose, slightly attenuate towards base and tips, 11.5 mm thick in center, rather indistinctly angular compressed, slightly rugulose and indistinctly foveolate; verrucles and soredia sparse. Soredia minutely isidiate, becoming abraded, yellowish white. Medulla lax, white, K+ yellow then red. Apothecia unknown. Florida (but not mentioned by Harris, 1990). U. fallax Mot.

2. Soredia in minute soralia. CMA 6075:340350:150250. Branches ± deformed with wrinkles and sorediate tubercles. Thallus pendulous to prostrate, usually about 12 cm long, but Florida specimens only 46.5 cm; strongly flaccid; surface partly subnitid, partly matt; base slightly attenuate; along whole length infrequently subdichotomously branched; branches ca. 1 mm diam. along whole length, rather abruptly attenuate at bases and apices, strongly and irregularly curved, almost terete; surface smooth but uneven, or deformed by oblong rugae and sorediate tubercles and appearing scabrous. Fibrils very rare and irregularly distributed, ca. 23 mm long, constricted at base, pale. Soredia isidiose; isidia spinuliform, rather elongate, similar to fibrils. Medulla lax, K+ yellow then red. Apothecia unknown. California; southern US (but not mentioned by Harris, 1990); Mexico. U. deformis

3. Axis and inner medulla yellow. Papillae numerous on the main branches. Thallus to 4 cm long, soft, pliant, ± erect, shrubby; base pale; color pale green, turning yellowish brown to dark brown in herbarium; branching ± dichotomous; branches tapered or often somewhat constricted at the base and then slightly fusiform, distinctly segmented by annular, whitebordered cracks and showing conspicuous gaps between the segments especially at the branching points; fibrils sparse; pseudocyphellae numerous on eroded papillae, later becoming sorediate; soralia numerous, especially in the upper part, slightly excavate; isidia absent or rare. CMA 4090:130250:300330. Medulla ± dense to lax. Cortex fragile. Apothecia unknown. Medulla and axis K+ yelloworange, C+ yelloworange, KC++ orange, CK, P+ slightly yellowish (psoromic acid, ± unknown fatty acid and two unknowns). On bark, in

chaparral and woodlands, California to Washington. Differs from typical Glabratae in being densely papillate; may belong in Barbatae. U. wirthii

3. Axis and medulla white or sometimes the medulla slightly pinkred after storage in herbarium. Papillae often few or absent. 4

4. Soralia large when mature, finally efflorescent, excavate, extending to the full width of the branches and sometimes encircling them, the whole circumference being thus sorediate. Soredia farinose, without isidia even when young; Thallus usually 24 cm long, rarely 67 cm long and wide; nearly whitish green to whitish straw color; old specimens yellow to tan or finally redbrown; very smooth and shiny, without papillae, or rarely sparsely present towards the base. Secondary or tertiary branches clearly constricted or fusiform. Apothecia very small and very rare. Medulla very lax, K or eventually + dark red, P+ orangered (protocetraric acid) or P (usnic acid only). CMA 3575:210375:190225. On conifers, broadleaved trees, and wood, known from a few scattered localities in Canada and northern US, possibly southward or in Alaska. [Also see U. confusa, below]. U. glabrata

4. Soralia much smaller and less distinct, in most species minute. Mostly U. cornuta (U. inflata) agg. 5

5. Medulla K or + yellow to slightly reddish. Thallus to 57 cm long, tufted or bushy, soft; branches constricted and jointed basally, inflated above, to 2 mm thick. Surface in herbarium orangish brown, shiny, on thicker branches intense brown, on thinner branches paler. Base short, distinctly and rather abruptly attenuate; from base almost to summit subsympoidally to subdichotomously branched; branches straight to slightly curved; primary and secondary branches similar, ca. 2 mm thick in middle, terete to slightly foveolate, often smooth to very indistinctly tuberculate; tubercules minute and low but rather dense, somewhat farinose. Fibrils absent or few and poorly developed. Soredia commonly present but often replaced by isidia; isidia rather large, long, pale, becoming eroded. Medulla lax to very lax, I+ blue. CMA 70:300:220. Apothecia unknown. California; Mexico. U. subhirta

5. Medulla K+ red. 6

6. Growing on trees. 7

6. Growing on rocks. 9

7. Thallus without papillae; 510 cm long; soredia farinose, with

minute spines. Medulla lax, axis horny in texture. CMA 40:350:300. Thallus shrubby to subpendulous; surface pale green, in herbarium the thicker branches deep, almost reddish brown, the thinner ones paler. From base to apices infrequently subsympodially branched; branches slightly flexuose, slightly attenuate at base, to 1.3 mm thick in center, towards tips rather regularly attenuate, subterete but almost always deformed and foveolate, almost smooth; sorediate tubercles commonly slightly oblong, rather frequent. Fibrils almost absent to rather frequent, spinuliform, constricted at base, acute or obtuse at tips, often tuberculate. Tips of branches rather frequently branched. Soredia isidose, spinuliform, on rugae and tubercles; isidia rather short. Cortex papery, fragile. Medulla K+ yellow then red. Apothecia unknown. On bark.

California. U. dolosa Mot.

7. Thallus papillate, at least on the thicker branches; very small, not more than 35 cm long and wide. Pacific

Northwest. 8

8. Branches few, to 1 mm thick; papillae numerous; branchlets abundant; in life pale clear green, in herbarium clear or dusky brown. Medulla very lax, K+ yellow, almost immediately deep red, P+ yellow to orange. CMA 30:300:200. Apothecia unknown. U. intexta Stirt.

(lumped under U. inflata by Hawksworth, et al., 1980)

8. Branches attenuate and jointed basally, inflated to 2 mm above; papillae indistinct, very blunt; lurid brown or olive green in herbarium, glaucous green in life. Medulla lax, K+ yellow then soon red. CMA 100:400:200225. Apothecia unknown. On bark. U. subpectinata Stirt. (lumped under inflata by Hawksworth, et al., 1980)

9. Apical and subapical parts and their soralia all black dotted. Thallus densely tufted, to 34 cm tall, firm, pale yellowish olive, above the base yellowish brown and sordid; subapical part smooth, subnitid; branches common from the base, almost parallel, frequently sympodially and subdichotomously branched; secondary branches obliquely ascending and almost parallel, often unbranched; all branches rather abruptly attenuate at base, ca. 1.3 mm thick in center, towards tips subulate, straight or slightly curved. Base often articulate and constricted; branches terete, not rarely foveolate, compressed and variously uneven; thicker branches subtile verruculose papillate; papillae minute, acute, semiglobose, concolorous. Fibrils absent or few and poorly developed. Branch tips subulate, often dichotomously fewbranched, densely

sorediate. Soredia frequent on upper parts of branches, farinose. Medulla very lax, K+ yellow, later red. CMA 5060:225300:200. Apothecia unknown. On rock. Southwestern US. U. caespitiae Mot.

9. Tips and upper parts not black dotted. Soralia minute (60200 um), punctiform, smaller than half of branch's diameter, numerous, often coalescing to form larger sorali-like patches, isidiate when young. Thallus ± erect and stiff when wet, 26(10) cm. Main branches terete, to 1.5 mm diam., inflated, with few to numerous, short, lateral branches clearly constricted and often annulated at the point of attachment, mostly curved, often widely divergent to 90° in terminal branches; branching anisotomic dichotomous, ± isotomic towards apices, often appearing clawlike. Surface ± dark dull graygreen becoming ± dark brown in herbarium; base usually concolorous or paler, rarely blackened; cortex often smooth and ± shinyglassy in lower parts of main branches, more rarely corrugateareolate, sparsely to densely papillate above, without papillae on upper branches. Scattered or clustered isidiolike structures present together with ± roughened, whitish gray, erose, ± erumpent soralia. Medulla very lax, K+ yellow to red, P+ yellow to orangered (ch.: 1) salazinic, ± protocetraric and ± constictic acids, or 2) stictic, norstictic, menegazziac, constictic and ± salazinic acids). Usually on trees. U. cornuta s. lato. 10

10. Thallus usually about 3 cm tall and wide, rarely more, very divergently branched at base; branches constricted basally, soon inflated to ca. 1.3 mm; indistinctly papillate, branchlets not numerous, tips very bluntly pointed. Medulla lax. CMA 3540:200300:200300. ± Southern US. U. cornuta s. str.

10. Thallus 47 cm long, erect or prostrate; branches inflated up to 2 mm; branchlets none; pale green, in herbarium reddish brown; tips short, nearly awllike. Medulla scarcely lax. CMA 80:200:400. California. "U. inflata"

ADD:

Thallus yellowgray or gray, caespitose, 13.4(8) cm long, attached to substrate at a single point, usually branching near base to form several major axes, the main branches inflated and sparingly to much divided, with short lateral branches; sparsely to densely papillate. Apothecia small and lateral or unknown. Soralia verruculiformtuberculate, soredia isidioid. Medulla white, thick but very lax, K+ red, P+ intense yellow (salazinic and consalazinic acid, or salazinic and alectorialic? acid and traces

of unknowns, or salazinic and norstictic acids), or K+ yellow (stictic, constictic and possible trace of unknown); protocetraric acid strain has been reported from Japan. Axis narrow. Apothecia unknown. Very common on twigs of firs and various hardwoods in sprucefir forests and less commonly in fire cherry communities. Southern Appalachians. Similar to U. glabrata but differing especially in that the soredia are not farinose and the soralia are not crateriform and eroded. U. confusa Asah.

IIIC2. Subg. Usnea Sect. Glabratae Subsect. Ciliiferae

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Medulla thick and loose. Cilialike fibrils dense but thallus not appearing strongly spinulose or strigose. Apothecia usually present.

Thallus small to medium sized, always tufted, fertile, esorediate, smooth to rarely indistinctly papillate; branches rather long, \pm perpendicular and regular. Cortex rather thin, papery; axis thin.

The distinction between this subsection and the fertile group within subsect. Scabridae (IIIC3a) seems rather weak, the main difference being that the latter is more densely spinulosestrigose.

1. Thallus with relatively few "cilia" (fibrillike structures); cilia not perpendicular. Thallus to about 4 cm long. Apothecia small; margin distinctly cupuliform. Thallus not basally constricted. Medulla lax, K. CMA 100200300:150200 um.

California. U. australis

1. Thallus with many cilia; cilia \pm perpendicular. Thallus to ca. 6 cm (or more?) long. Thallus suberect, firm, rigid. Base attenuate; dichotmously branched. Main branches distinctly inflated, to 2 mm thick in center, somewhat attenuated towards tips, to 0.3 mm thick below apothecia, \pm frequently branched, rarely articulate, not constricted, terete, smooth or very indistinctly verruculose papillate. Cilia fibrillike, articulate, to 3 cm long, subulate towards tips. Branch tips almost hairlike. Thallus pale yellowish in life, turning roscoppery to distinctly brown (not olive) in herbarium; surface sometimes appearing pruinose. CMA 100:300:300. Apothecia not rare, terminal, plane, ca. 4 mm diam.; margin smooth, with few but distinct, long, straight or slightly flexuous fibrils.

Medulla white, somewhat lax. U. ciliifera

IIIC3. Subg. Usnea Sect. Glabratae Subsect. Scabridae

Medulla thick and lax. Thallus pale green when fresh, yellowish straw to dusky brown in herbarium. Thallus densely spinulose and strigose (fibrilloseciliate).

Thallus fertile or sorediose, minute to small, rarely medium or longer, usually bushy; bristly, with minute pointed branchlets or cilia.

IIIC3a. Scabridae:

**Thallus fertile, branches ending in apothecia;
no soredia;
pendulous or tufted.**

1. Thallus pendulous or subpendulous, soft, limp, to 10 cm (rarely to 25 cm) long; branches thick, up to 2 mm thick; usually with very many spinules. Color in herbarium brown. Base slightly attenuate, pale. Infrequently subsynmpodially branched; branches ca. 2 mm diam along whole length, usually articulate and constricted at base, terete; spinules ca. 2 mm long, fragile; surface smooth, but poorly developed spinules resembling papillae. Medulla arachnoid, K+ deep red. CMA
6090:250400:250400. Apothecia frequent, commonly terminal on tips of lateral branches, 58(15) mm diam.; margin smooth or becoming etriucately rugose, smooth and shiny, with spinules or rather rare, short, spinuliform, fibrils; disc plane, pale carneous. Southern US (but not mentioned by Harris, 1990). U. subelegans (Vain.) Mot.

1. Thallus tufted, 25 cm tall and wide, rarely more; with + numerous minute papillae. Medulla K or slightly yellowish. Southern US (but not mentioned by Harris, 1990). 2

**2. Thallus relatively large (35 cm long), pale, pure green, in herbarium finally pale bronwish. Medulla very lax. CMA
5080:225345:225345.** Thallus rather wide; base short, distinctly and abruptly attenuate, moderately dark; branching subsympodial; branches straight to slightly falcate, distinctly constricted at base, to 1.8 mm thick in center, somewhat attenuate towards tips, terete, rarely articulate. Papillae acute, concolorous. Fibrils rather frequent, minute, 13 mm long, straight, constricted at base, indistinctly attenuate towards obtuse or rather acute tips, slightly pale, appearing rather soft. Apothecia frequent, terminal, ca. 5 mm diam. or rarely larger;

margin with numerous short fibrils. Mexico. U. cirrosa
var. cirrosa

2. Thallus small (23 cm long), dark (in herbarium pure brown).

Medulla moderately dense. CMA 50:200:150. Thallus suberect, shrubby, rigid. Rather densely branched above the base; branches almost straight, attenuate at base, ca. 1 mm thick in center, somewhat attenuate towards tips, terete, frequently verrucosepapillate; papillae short, obtruse, tuberculiform, concolorous; spinules frequent, 13 mm long, not or scarcely constricted at base, straight, attenuate, rather acutely acuminate, often sparsely tuberculate at base. Apothecia frequent, terminal, 23 mm wide; margin with rather frequent fibrils 23 mm long. Texas. U. cirrosa var. ramillosa
Mot.

IIIC3b. Scabridae

**Thallus sterile;
isidiose soredia abundant.**

1. Thallus large, to 20 cm long, pendulous, very soft and limp, pale clear green in life, dusky brown to nearly red in herbarium; pruinose chaffy with abundant spinules. Medulla K+ vivid red. CMA 100:400:400. Base short, indistinct. Soon above base and along whole length sparsely irregularly subsympodially branched, sometimes the lateral branches almost perpendicular but soon hanging and almost parallel; branches irregularly to subserpentine curved, irregularly and distinctly articulate, constricted at base, mostly ca. 1.5 mm thick in center, terete, smooth or indistinctly papillate and spinulate. Fibrils very variable in size, irregularly distributed, constricted and often articulate at base, rather abruptly inflated above, acute, cartilaginous and often cracked. Soredia frequent on thinner and also thicker branches, isidiose, scattered or in indistinct soralia. Apothecia unknown. Southwestern US (Texas); Mexico. U. furfurosula

1. Thallus small, usually 68 cm long and wide, soft, ashy green in life, in herbarium soon dark (cervine) brown, the thinner branches paler and almost straw color; branches densely spinulose; soredia on thinner branches or tips, isidiose, but often abraded and appearing farinose, pale straw color. Surface shiny. Base indistinct; branching ± sparse, along whole length subsympodially and subdichotomously; branches often divergent, straight to slightly flexuose, ca. 1 mm diam. at base, gradually attenuating towards tips, often subarticulate and constricted, terete or slightly deflexed; papillae absent; spines 0.51 mm long, perpendicular, constricted at base and often subarticulate, acute at tips. Fibrils absent. Medulla K+ yellow then red; axis dusky. CMA 80100:300350:400450. Apothecia unknown. Southern US (but not mentioned by Harris, 1990). Texas; Mexico. U. spinulifera

IIIC4 Subg. Usnea Sect. Glabratae Subsect. Xanthopogae

Medulla rather thin, dense or lax. Thallus yellowish straw and almost unchanged in herbarium.

Thallus medium-sized, fruticulose or caespitose, yellowish to straw colored, rarely brownish green, almost smooth or rather distinctly ramulose, mostly sterile, sorediose.

Soredia isidiate. Medulla K+ bright red. Branches often distinctly thickened. Thickly papillate. CMA 100:200:200 um.

..... U. condensata

IIIC5. Sect. Glabratae Subsect. Osseoleucae

Medulla thin, dense to very dense. Thallus yellow or green in life, rarely pale yellowish; turning deep fuscous in herbarium.

Thallus medium sized to rather large, North American species sterile, sorediose or not.

1. Thallus ca. 8 cm long, matt, almost pure green when fresh, in herbarium often deep brown, tufted, very hard and cartilaginous; primary branches to 2.5 mm thick, secondary ones to 1.5 mm thick; not much attenuated, very blunt; tips almost fingerlike; branchlets seldom present, very short, thick. Soredia abundant, farinose. Medulla rather lax. CMA 90100:250330:330450. Medulla P. Pacific Northwest; also reported from Florida (but not mentioned by Harris, 1990). U. occidentalis

1. Thallus 15 cm long or more, very smooth, usually polished and shiny, or if somewhat mat then persistently pale and scarcely turning brown; soredia on branchlets and tips. 2

2. Thallus 1824 cm long, pale straw or nearly yellow; fibrils almost always simple, almost nonpapillate. Medulla K+ yellow then reddish. Soredia leprose but isidiiose. Thallus pendulous, rather stiff and rigid. Base thick, ± unbranched for some distance, or soon dichotomously and repeatedly sparsely branched; branches soon subparallel, almost stragith, ca. 1.5 mm thick at base, gradually and regularly attenuated towards tips, terete, commonly distinctly annular cracked; thinner branches continuous. Papillae absent. Fibrils rather rare but regularly distributed, flexuose, simple, attenuated and hairlike towards tips, slightly tuberculate in upper part, the thicker ones indistinctly annulate. Branch tips slender, flexuous, often branched. Soredia rare, on upper parts of fibrils, farinose, apparently not isidiate, white. Cortex very hard, horny in texture. Medulla dense. CMA 5075:5075:300375. ± Southeastern US. U. subplicata (Vain.) Mot.

2. Thallus to 15 cm long, pale ashy green, reddish tan in old herbarium specimens; fibrils almost always branched, rather distinctly papillate. Medulla K. Thallus pendulous, hard and stiff, compressed; base scarcely distinct, soon branched above base; main branches mostly unbranched, straight or slightly flexuose, uniformly ca. 0.7 mm thick along most of their length, terete, ± continuous, almost smooth, almost without papillae, sometimes with minute verrucules. Branchlets (fibrils) very

noticaeble, 0.51 cm long, perpendicular, nearly always again branched; tips acute or obtuse. Soredia usually absent, but thallus appearing hoary when soredia are present. Medulla very dense; axis horny in texture. Fleshcolored pseudocephalodia present on fibrils. CMA 60:80:400. Apothecia unknown. Florida (but not mentioned by Harris, 1990). U.
finkii

Additional Species? (keyed out close to but not in the Glabratae):

Thallus about 15 cm long, pendulous, hairlike, greenish strawcolored, very smooth. Apothecia only 24 mm. CMA 60:170:100. Surface smooth. Base short, indistinct, with narrow dark zone. Primary branches ca. 0.50.7 mm diam., often slightly obute anulate and foveolate, usually short, soon repeatedly dichotomously branched; secondary branches terete, ca 0.40.5 mm diam., somewhat attenuate towards tips, rarely articulate. Soredia absent or few and poorly developed, farinose, developing from tubercles, on subapical parts of branches Fibrils usually absent. Medulla K₊ brown, I. Apothecia not rare, lateral then terminal, 24 mm diam., plane; margin with few, short fibrils. Southeastern US (but not mentioned by Harris, 1990); Mexico. (see **Stramineae**: U. trichinella Mot.)