

Vulpicida Mattsson & Lai
(LECANORALES: PARMELIACEAE)

After Mattsson (1993), and others

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Thallus foliose, rosette-forming, or subfruticose; lobes usually dorsiventral with raised tips (or terete in one Eurasian species); upper surface bright to dark yellow (usnic acid), sometimes greenish, often wrinkled or \pm folded; lower surface pale yellow, central parts black; medulla yellow to orange, K- (pinastric and vulpinic acids); rhizines laminal on lower surface, black, rather sparse, rarely close to the margin, simple or irregularly branched; cilia absent; pseudocyphellae absent. Epicortex usually non-pored, smooth and thin, ca. 1 μ m. Upper cortex paraplectenchymatous, with 3-5 layers of pachydermatous cells; uppermost cells isodiametric, 3-5 μ m diam.; cells of the two lower layers usually elongated, 5-6 x 2-3 μ m, sometimes isodiametric; parts of upper cortex exposed to the sun with crystals of usnic acid. Medulla 20-30 μ m thick; medullary hyphae 3-5 μ m thick, surface smooth. Cell walls containing Cetraria-type lichenan (medulla I+ blue). Photobiont green, tebouxioid, 3-15 μ m diam. Algal layer 10-30 μ m thick; algae more abundant in young and more exposed parts of the thallus

Apothecia submarginal or laminal, primordia marginal; disc brown, eperforate; margin often crenulate; hymenium with blue IKI reaction in lower part (0.3% iodine solution); asci of Melanelia-type, i.e., broadly clavate, 40-50 x 20-27 μ m, with moderate or strong IKI reaction in the tholus ("0.03% [??] iodine solution), wide ocular chamber and large axial body; spores subspherical to almost spherical, 4-5 x 3-4 μ m (6-9 x 4-6 μ m according to ?), simple, 8/ascus.

Pycnidia often abundant, usually on marginal or laminal projections, 80-170 x 70-120 μ m, sometimes raised or immersed, generally conspicuous, black; pycnidial wall at least partly with black pigment; pycnospores sublageniform, 6-8 x 1-2 μ m or citriform, 3-4 x 1-2 μ m (7 x 1 μ m according to ?). On bark, wood, soil, or rock, arctic, boreal, temperate.

A segregate from Cetraria, distinguished by containing bright yellow pulvinic acid derivatives (pinastric and vulpinic acids) in the medulla.

Morphologically most similar to Tuckermannopsis, which has tapered cilia, bifusiform conidia, apothecia borne on the underside, cylindrical asci, and medullary depsides and depsidones.

The species descriptions here do not incorporate the extensive information on anatomy presented by Mattsson.

1. Sorediate. Medulla and soredia deep lemon yellow (vulpinic and pinastric acids). V. pinastri

1. Not sorediate (except in rare specimens of V. canadensis).

Medulla yellow (vulpinic acid). 2

2. Terricolous. Thallus erect, (sub-)fruticose, not strongly dorsiventral, deep lemon yellow, orange yellow, or golden yellow (vulpinic acid?--pinastric acid according to Thomson, 1984), brittle. Medulla yellow. On calcareous soils and gravels. V. tilesii (Ach.) J.-E. Mattsson & Lai

2. Corticolous. Thallus foliose, dorsiventral. Pycnidia immersed or sessile, not stalked. Apothecia laminal, with crenulate margins. 3

3. Surface bright lemon yellow or sulfur yellow; lobes irregular, almost lacunose. Pycnidia immersed, with an almost invisible wall. Western N. America. V. canadensis

3. Surface dark greenish yellow (pale yellow or light yellowish green according to Hale); lobes \pm regular and smooth. Pycnidia sessile, with a black outer wall. Southeastern U.S. (Appalachian and Ozark regions). V. viridis

V. canadensis

Thallus loosely attached, adnate to suberect, forming almost orbicular rosettes 2-4 cm broad, sometimes with long, narrow or broad, often erect lobes, giving a fruticose impression; lobes dorsiventral, flat or occasionally slightly canaliculate, generally with raised lobe tips, branches usually short; projections not seen; surfaces intensely bright and deep yellow; upper surface ridged and wrinkled (hand lens); lower surface wrinkled, very sparsely rhizinate.

Apothecia common, laminal (marginal according to Hale); thalline margin crenulate; disc dark brown. Pycnidia almost spherical, immersed. Cortex with usnic acid. Medulla K+ yellowish, C-, P- (pinastric and vulpinic acids). Very common on conifers (Pinus or Pseudotsuga) in open, moderately xeric to mesic forests, in the northern Rocky Mountains and on the east side of the Cascades south to northern California.

V. pinastri

Thallus foliose, crisped lobate, the lobes rounded, overlapping; upper surface intensely bright yellow when exposed to the sun, to yellowish green (or grayish green, according to Hale) in more shaded habitats, smooth, dull;

forming adnate rosettes with short lobes, especially when saxicolous, or with elongated and more erect lobes on thin branches; lobes dorsiventral, mat or slightly canaliculate with short branches; lower surface pale yellow to brownish yellow with scattered whitish rhizines; marginal soralia common, short (elongate according to Hale); black marginal projections with pycnidia rare.

Apothecia very rare, submarginal towards tips of lobes, the margin confluent with upper side of thallus, even, sorediate; disc 2.5 mm broad, red-brown, flat, epruinose. Pycnidia rare, on projections. Usnic acid in the cortex; pinastric and vulpinic acids in the medulla; occasionally small amounts of triterpenoids and aromatic substances present. Usually on branches of Betula, Juniperus and other conifers, and also on lignum; occasionally on humus, soils, and rocks. Arctic, lower alpine, and boreal, Alaska to Greenland, S to Great Lakes area and northeasternmost U.S., and Washington, and in the Rockies to New Mexico.

V. tilesii

Thallus intensely bright yellow to yellow-orange, forming tufts of dorsiventral, almost vertical lobes. Branching irregular; lobes narrow, to 3-4 mm broad, flat or slightly canaliculate, rarely terete; tips somewhat dentate; branches short or almost absent; pseudocyphellae absent, but marginal fissures sometimes present; black projections with pycnidia scattered marginally; upper surface smooth to slightly sulcate; lower surface smooth, concolorous with upper, without rhizines. Medulla loose; cortex very irregular in thickness even in same thallus, very thin in spots.

Apothecia rare, submarginal or, in terete specimens, lateral; thalline margin even. Usnic acid in the cortex, pinastric and vulpinic acids in the medulla. Occasionally small amounts of triterpenoids and other aromatic substances. Reported by ? to contain rangiformic acid. On exposed, periodically wet calciferous soil. Arctic to (sub-)alpine, Alaska to NE Canada, with disjunct in SE Canada, and south in the Rockies to New Mexico. The color is darker and more intense than that of Flavocetraria nivalis, which is usually larger but has a similar gross morphology.

V. viridis

Thallus adnate, 2-3 cm broad, rosette-forming, with comparatively broad, flat dorsiventral lobes with raised tips; branches short; projections not seen; surfaces dark yellowish green; (lower surface light yellow according to Hale); lower surface sparsely rhizinate.

Apothecia common, laminal, to 2-3 mm diam; margins crenulate; discs brown. Pycnidia sessile, hemispherical, pyriform, or almost conical. Usnic acid in the cortex; medulla with pinastric and vulpinic acids (without pinastric acid according to Hale); occasionally small amounts of triterpenoids and also other aromatic substances. Widespread but rather rare, on branches of deciduous trees (often in canopies) in open woods in humid habitats, on the coastal plain close to the Atlantic coast of North America, in the Appalachian

Mountians and westwards through the interior highland region to eastern Oklahoma and Texas, with the exception of the lower parts of the Mississippi Valley.

Literature

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