Niebla Rundel & Bowler
(LECANORALES: RAMALINACEAE)

After Bowler, et al. (1994),
Hale (1979), Hale & Cole (1988), and others

Rev. 4/96

[Description after Bowler & Rundel; information from Spjut's treatment needs to be incorporated]

Thallus fruticose, tufted, or forming entangled unattached mats; lobes erect to prostrate, terete to angular or flattened, sparingly to ± richly branched, solid, either as rigid blades or subcylindrical; surface greenish yellow, sometimes grayish-greenish or mottled with black. Pseudocyphellae absent (at least in most species?). Most species non-sorediate, some sorediate. Cortex moderately thick, under 120 um. Cortical structure extremely variable, with palisade formation overlyhing periclinal mechanical tissue; thin gelatinous matrix either palisade or not markedly such with supportive tissue present or absent. Mechanical tissue interspersed in the medulla; chondroid tissue not attached to cortex when present, not present in all groups. Medulla of chondroid, coalescent hyphae, sometimes erupting as a cottony excrescence on the surface. Cilia absent.

Apothecia present or not, terminal or lateral; thalline margin present, concolorous with thallus. Spores colorless. Pycnidia black, usually conspicuous, common in most species, exobasidial. Cortex with usnic acid; medullary chemistry moderately diverse, low in O-methylation. On bark, rock or soil. Temperate Pacific coast. Mediterranean climate.

A segregate of Ramalina. Although the species have a characteristic gestalt that is usually easily recognizable, the genus is not yet well circumscribed, and many Europeans do not accept it as a separate genus.

Spjut (1995) segregates a new genus (Vermilacinia), which he separates from Niebla as follows:

1. Medulla with chondroid strands free from the cortex; lichen substances primarily ß-orcinol depsidones (salazinic, hypoprotocetraric, norstictic, or protocetraric acids) or depsides (divaricatic or sekikaic acids), rarely acid-deficient; triterpenes abasent or present as accessory constituents; skyrin concentrated at the base of the thallus; Mediterranean-Macaronesia and western north America. ..... Niebla

1. Medulla lacking chondroid strands; lichen substances primarily terpenes ([-] α-16-hydroxykaurane and/or zeorin), rarely without lichen substances or with meta-depside (3,5-dichlorolecanorate); ß-

orcinol depsidones (hypoprotocetraric, salazinic, norstictic, or psoromic acids) absent or present as accessory consitutents; skyrin absent; western South America and western North America. ..... Vermilacinia

Spjut (submitted for publication) describes dozens of new species of Niebla from California or Baja California, which are not incorporated into the present key, which follows the much broader species concepts of Bowler & Rundel.

1. Thallus sorediate, with capitate, ± bluish gray soralia. Surface of branches often black-spotted. Usually on bark (also on rocks according to Hale & Cole). Common in southern California, becoming much rarer northward, to Washington and British Columbia. ..... Niebla cephalota (Tuck.) Rundel & Bowler (Vermilacinia cephalota (Tuck.) Spjut & Hale)

1. Thallus not sorediate (except for occasional morph of N. ceruchoides). Both California and Baja California, unless noted otherwise. 2

> **2. Corticolous.** Mature branches round to irregular in cross-section, cracked, always extruding a white cottony substance with age. Apothecia rare. Medulla K-, C-, P- (fatty acids). ..... N. ceruchis (Ach.) Rundel & Bowler (Verilacinia ceruchis (Ach.) Spjut & Hale
>
> **2. Saxicolous.** 3

3. Mature branches flattened, with angular edges. 4

3. Mature branches ± cylindrical. 9

> **4. Within the medulla individual chondroid strands evident in cross section of blades.** 5
>
> **4. Within the medulla individual chondroid strands absent (but agglutinated hyphae forming a central cylinder may be present).** 8

5. Medulla P+ red; California to Baja California. 6

5. Medulla P-; Baja California only. 7

> **6. Medulla K+ yellow turning dark red (salazinic acid present); primarily saxicolous, but sometimes also on soil.** Baja California Norte. ..... N. josecuervoi
>
> **6. Medulla K- (protocetraric acid present); terricolous.** Baja California Norte. ..... N. pulchribarbara

7. Thallus isidiate. Ch.: sekikaic or divaricatic acids, usnic acid, triterpenes. ..... N. isidiascens Bowler, Marsh, Nash, & Riefner

7. Thallus not isidiate; one form is sorediate. Medulla K-, C-, P- (barbatic acid according to Hale, 1979; divaricatic acid according to Hale &

Cole). Common on rocks along the seashore in coastal scrub up to 600 ft elev. ..... N. homalea (Ach.) Rundel & Bowler

8. Branches strap-like, strongly flattened in cross section; cortex typically smooth (to gently ridged or reticulate), plane. Ch.: (-)-16-alpha-hydroxykaurane, zeorin, + bourgeanic acid, usnic acid. On boulders or cliff faces in sites well exposed to coastal onshore wind and fog. ..... N. laevigata Bowler & Rundel

8. Branches not strap-like, irregularly prismatic in cross section; cortex typically rough, irregularly ridged. Ch.: bourgeanic acid, (-1)16-alpha-hydroxykaurane, zeorin, ± salazinic acid. On boulders and cliffs, often the most inland and xeric species. ..... N. polymorpha Bowlder, Marsh, Nash & Riefner

9. Mature thallus caespitose; blades short (3 cm). 10

9. Mature thallus becoming subpendulose; blades long (to 8 cm). 13

10. Thallus spongy (compressible); branch tips blunt. Medulla P+ red (salazinic acid). ..... N. robusta (Howe) Rundel & Bowler (Vermilacinia robusta (Howe) Spjut & Hale)

10. Thallus not spongy (solid); branch tips pointed. 11

11. Secondary branching absent; apothecia terminal. Medulla K+ yellow, P+ orange (stictic acid). California. ..... N. combeoides (Nyl.) Rundel & Bowler

11. Secondary branching present, initiated basally; apothecia subterminal to terminal. 12

12. Thallus isidiose-papillate, not fomring dense cushions; branch tips rarely bifurcate; endemic of Morrow Bay, CA. ..... N. tuberculata Riefner, Bowler, Marsh & Nash

12. Thallus not isidiose-papillate, forming dense cushions; branch tips typically bifurcate; occurring in both California and Baja California. Ch.: (-)16-alpha-hydroxykaurane, ± bourgeanic acid, zeorin, unidentified triterpenes, usnic acid. Usually on coastal rocks, cliff faces, or less commonly on soil in sites with extensive exposure to wind and fog. ..... N. ceruchoides Rundel & Bowler

13. Cortex shiny, often maculate, yellow green; widely distributed in California and Baja California. Ch.: (-)-16-alpha-hydroxykaurane, ± zeorin, ± salazinic acid, terpenes, fatty acids, ± usnic acid. On coastal rocks and cliffs along the immediate seashore. ..... N. procera Rundel & Bowler

13. Cortex dull, not maculate, light yellow, becoming whitened frequently; an endemic of Cedros Island and the adjacent mainland,

Baja California. Ch.: ± usnic, 16-alpha-hydroykurane, zeorin, unknown triterpene, ± salazinic acid. On sides and overhangs of boulders and rock outcrops. ..... N. cedroensis Marsh & Nash

Descriptions of Species

N. cedroensis Marsh & Nash

Cortex dull, not maculate, light yellow, becoming whitened frequently. Thallus fruticose, pendant, to 4.5(-10.5) cm long, 1.5 mm wide, stiff terete branches from a thick narrowly attached holdfast. Color pale whitish yellow-green (due to abrasion by sand and/or salt). Cortex smooth to foveate or reticulate, sometimes transversly cracked. Medulla solid, of adglutinated hyphae without distinct chondroid strands. Apothecia terminal to subterminal, to 4.5 mm diam., multiple; disc white, pruinose; spores straight to slightly curved, 2-celled, hyaline, 10.0-14.0 x 3.0-4.0 um. Pycnidia black, on upper two-thirds of branch. Ch.: ± usnic, 16-alpha-hydroykurane, zeorin, unknown triterpene, ± salazinic acid. On sides and overhangs of boulders and rock outcrops. Endemic to Cedros Island and the adjacent mainland, Baja California

N. cephalota (Tuck.) Rundel & Bowler (Vermilacinia cephalota (Tuck.) Spjut & Hale)

Thallus sorediate, with capitate, ± bluish gray soralia, tufted, small (mostly to 3 cm long); branches to ca. 1 mm diam., ± terete, greenish yellow, often black-spotted. Usually on bark (also on rocks according to Hale & Cole). Common in southern California, becoming much rarer northward, to Washington and British Columbia.

N. ceruchis (Ach.) Rundel & Bowler (Verilacinia ceruchis (Ach.) Spjut & Hale

Thallus tufted, 2-4.5 cm tall. Mature branches round to irregular in cross-section, not inflated, 0.5-1 mm wide; surface greenish yellow, sometimes black-spotted, cracked, always extruding a white cottony substance with age. Apothecia rare, mostly lateral, 1-3 mm wide; disk greenish yellow, pruinose. Medulla K-, C-, P- (fatty acids). Usually on twigs along the seashore or in coastal scrub near sea level. California and Baja California. Also reported from Washington by Fink and others, but those reports are almost certainly based on "Ramalina ceruchis f. cephalota" (= Niebla cephalota), which was lumped under this species by Fink. Large lacunose forms from Baja California have been called Desmazieria testudinaria.

N. ceruchoides Rundel & Bowler

Thallus not isidiose-papillate, forming dense cushions; branch tips typically bifurcate. Thallus cladinaform, densely branched, bushlike, resembling a small cushikon plant. Branches subcylindrical to cylindrical, usually less than 1.0(-1.5) mm diam.; mats 2-3(-6) cm tall, densely branching; branch tips divaricate as in some Cladina morphologies; color yellow-green becoming stramineous with age (sometimes pale gray-green in the field); cushion texture spiny. Branches ± cylindrical, smooth or weakly fasciated. Cortex rigid when dry, cracking when bent. Medulla white, dense.

Apothecia uncommon, subterminal but near the branch tips; discs concave, to 7 mm, pale. Spores 10-13 x 3-4 um. Black pycnidia borne on the attenuate branch tips, otherwise rare; pycnospores straight, 3 x 1 um. Ch.: (-)16-alpha-hydroxykaurane, ± bourgeanic acid, zeorin, unidentified triterpenes, usnic acid. Usually on coastal rocks, cliff faces, or less commonly on soil in sites with extensive exposure to wind and fog. California and Baja California

N. combeoides (Nyl.) Rundel & Bowler

Secondary branching absent; apothecia terminal. Apothecia common, terminal, to 8 mm wide; disk black and heavily pruinose. Thallus tufted, 3-6 cm long, rather fragile, simple to sparingly branched; lobes 2-4 mm wide; surface greenish yellow, blackening towards base, rugose, rarely extruding a white cottony substance with age. Mature branches terete (flattened to irregularly rounded according to Hale & Cole); thalli 1-5(-8) cm tall. Medulla K+ yellow, P+ orange (stictic acid). Basal branches without secondary branches. Common on rocks in exposed coastal scrub habitats from sea level to 200 ft elev. California.

N. homalea (Ach.) Rundel & Bowler

Thallus not isidiate; one form is sorediate. Surface plated (deeply and conspicuously transversely cracked). Apothecia usually abundant and mostly lateral (according to Hale, 1979, and Hale & Cole's description, but terminal according to the first choice in Hale & Cole's key!), 1-2 mm wide; disk greenish yellow pruinose. Thalli tufted, commonly 1-6(-15) cm or more tall, leathery. Branches typically 1-4 mm wide; typically matt, greenish yellow, turning brownish in herbarium, blackening at the base. Medulla K-, C-, P- (barbatic acid according to Hale, 1979; divaricatic acid according to Hale & Cole). Common on rocks along the seashore in coastal scrub up to 600 ft elev. California and Baja California.

N. isidiascens Bowler, Marsh, Nash, & Riefner

Thallus isidiate. Thallus fruticose, shrublike, flattend or subcylindrical branches similar to N. homalea in variability, to 1.2 cm breadth (usually less than 0.5 cm) and 3.5 cm in length, branching laterally from straplike blades or unbranched from smaller cushion-like tufted thalli; color yellow-green. Branches solid, flattened or subcylindrical, smoth, with abundant coralloid isidia extending the length of the branches on both the blade surfaces and on the blade edges with varying degrees of density Isidia easily broken off; tips blunt. Cortex rigid, similar in anatomy to N. homalea consistently with chondoroid strands embedded in the white medulla. Apothecia rare; disc up to 7 mm diam. Spores uniseptate, 10-14 x 3-4 um, usually straight, rarely gently curved. Pycnidia black, uncommon on some plants, common on others; pycnospores straight, 4.5-6.0 x 1.5 um. Ch.: sekikaic or divaricatic acids, usnic acid, triterpenes. On rocks in open maritime scrub habitats. California and Baja California (Norte & Sur)

N. josecuervoi (Rundel & Bowler) Rundel & Bowler

Medulla K+ yellow turning dark red (salazinic acid present); primarily saxicolous, but sometimes also on soil. Thallus bushlike, in dense clumps up to 10 cm diam. and up to 7 cm in height. Branches rigid, ca. 3 mm diam. basally, arising from a thalloid attachment plate, becoming finer (less than 1 mm) and with abundant terete branches terminally. Basal portions often discolored, becoming brown or blackening. Branches compressed, solid, sub-cylindrical basally, occasionally flattened and angular. Cortex smooth, yellow-green, sharply reticulate-ridged, and shallowly lacunose terminally. Black pycnidia abundantly disposed along the ridges, especially terminally. Ridges basally following a ± longitudinal orientation defining the margins, becoming reticulate and transverse above. Medulla white. Apothecia common, terminal, to 1 cm diam., often 3 or 4 lobed like a cloverlake; disc pale. Spores straight or slightly curved, 1-septate, 8.8-11 x 3.3-4.4 um. Baja California Norte.

N. laevigata Bowler & Rundel

Branches strap-like, strongly flattened in cross section; cortex typically smooth (to gently ridged or reticulate), plane. Thallus fruticose; branches strongly compresssed, to 2.5 cm wide and 5(-6) cm long, commonly 1 cm braod and 2.,5 cm in length, unbranched; aberrant forms can be wider and elss smooth. Branches arising as a tuft from a basal plate; color light yellow-green to green, usually blackened basally. Branches solid; cortex very rigid, friable, cracking when bent. Cortex a thick palisade formation overlying a thinner supportive layer. White deposits of crystalline (-)-16-alpha-hydroxykaurane present along cortical cracks. Medulla white, fluffy. Apothecia common, primarily terminal, often clumped on the terminal margins of blade apices; disc concave, often curled inward and lobed, whitish, to 8 mm diam. but usually much smaller (4 mm). Spores 10-14 x 4-5 um, straight to gently curved, rarely strongly curved. Black chambered pycnidia present, particularly on the terminal half of the blade, along the margins and on any ridges which occur; pycnospores straight, 4.0-5.5 x 1 um. Ch.: (-)-16-alpha-hydroxykaurane, zeorin, + bourgeanic acid, usnic acid. On boulders or cliff faces in sites well exposed to coastal onshore wind and fog. California and Baja California.

N. polymorpha Bowlder, Marsh, Nash & Riefner [syn.: N. reticulata Rundel ined.?]

Branches not strap-like, irregularly prismatic in cross section; cortex typically rough, irregularly ridged. Thallus clumped and tufted, branching relatively sparse. branches irregularly compressed, sometimes flattened to 6 mm in width, the surface crinkled and irregularly lacunose. Cortex greenish yellow. Medulla white, without well developed embedded chondroid strands. Apothecia primarily terminal, often in triplets. Disc cupped and pale greenish white, to ca. 5 mm diam. Spores uniseptate, (10-)12-14(-15) x 3.0-3.5(-4.0)

um, straight or slightly curved. Pycnidia black, primarily situated along the ridged areas of the blades. Pycnospores straight, 4-5 x 1.5 um. Ch.: bourgeanic acid, (-1)16-alpha-hydroxykaurane, zeorin, ± salazinic acid. On boulders and cliffs, often the most inland and xeric species. California and Baja California.

N. procera Rundel & Bowler

Cortex shiny, often maculate, yellow green; widely distributed in California and Baja California. Thallus fruticose, subpendulous in larger plants. Branches cylindrical or sub-cylindrical (slightly angular), 1-2(-4) mm diam., to 8 cm in length, sparingly branching, occasionally with short lateral branchlet proliferation, the branchlets from the major branches often perpendicular to the branch axis. Branch apices pointed. Color greenish yellow, with black spots of necrotic tissue, branches often blackened on one side, and around base. Branches solid and stiff, unridged and without angular plates. Cortex rigid, friable and smooth, cracking when bent, similar to N. robusta. Medulla white, lacking chondroid strands. Apothecia common, terminal or subterminal, either single or clustered. Disc concave to convex and frequently lobed, whitish to tan, to 6 mm diam. Spores straight, 11.0-12.5(-13.0) x 3.5(-4.0) um. Black chambered pycnidia present, laminal and terminal, less numerous than in many other Niebla species; pycnospores straight, 4.0 x 1.5 um. White fluffy deposits of (-)-16-alpha-hydroxykaurane are present in most herbarium specimens. Ch.: (-)-16-alpha-hydroxykaurane, ± zeorin, ± salazinic acid, terpenes, fatty acids, ± usnic acid. On coastal rocks and cliffs along the immediate seashore. California and Baja California.

N. pulchribarbara (Rundel & Bowler) Rundel & Bowler

Medulla K- (protocetraric acid present); terricolous. Thallus bushlike, in clumps up to 22 cm diam. and up to 7 cm in height. Branches rigid, compressed, solid, becoming discolored brown or blackening where they rest on the earth. No basal plate or point of attachment, but frequently with a flattened (ca. 1 cm diam.) portion giving rise digitally to branches which intertwine, forming a cohesive clump. Above, the main branches leaterally digitate producting erect laciniae (1-2 mm diam.). Cortex smooth, with generally longitudinal ridges along the main branches, the ridges becoming transversely reticulate on the terminal branchlets producing a multifaced, polygonal appearance. Ridges frequently displaying black pycnidia, especially terminally. Cortex yellow-green; medulla white. Apothecia not seen. Baja California Norte.

N. robusta (Howe) Rundel & Bowler (Vermilacinia robusta (Howe) Spjut & Hale)

Thallus spongy (compressible); branch tips blunt. Branches inflated, rounded. Apothecia larger, urn-shaped. Spores 10-12 um. Medulla P+ red (salazinic acid). California and Baja California.

N. tuberculata Riefner, Bowler, Marsh & Nash

Thallus isidiose-papillate, not forming dense cushions; branch tips rarely bifurcate; endemic of Morrow Bay, CA.

Literature

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