

Cortinarius algonquinensis Ammirati, Liimat. & Niskanen, sp.nov.**IF550840**

Type: Canada, Ontario, Algonquin Park, Rock Lake, Old Barclay Estate, in *Leucobryum* under *Pinus*, Tsuga, 30 Sept 1978, J. F. Ammirati 8322 (WTU, holotype, WTU-F-040291; H isotype, H7023377), GenBank no. KP087983. Diagnosis: Pileus 25-30 mm diam., obtusely campanulate, distinctly umbonate, edge of margin slightly incurved to plane, moist to dry, appressed fibrillose to appressed fibrillose scaly, margin light dull yellow (Primuline Yellow), the fibrillose scales, inner margin and disc more brownish, light brown to yellowish brown (Buckthorn Brown, Ochraceous Tawny) to reddish brown (Tawny). Lamellae close, emarginated, bright yellow ochre with slight orange yellow (Apricot Yellow) shade. Stipe 35-40 mm long, 4-6 mm thick at apex, apex shiny, fibrillose, yellowish, below yellow (Antimony Yellow), appressed fibrillose with some brownish to reddish brown tints in places. Basal mycelium dull reddish. Context in pileus concolorous with surface or bright yellow, with some faded areas, becoming somewhat watery olive in age, in stipe bright yellow line at surface of stipe cortex near apex, otherwise yellow ochre to brownish olive, the brownish to olive colors more common towards base. Odor and taste raphanoid. Basidiospores 7-8.5 x 4-4.8 µm, ellipsoid, moderately verrucose. Basidia 4-spored. Pileipellis: epicutis hyphae 3-12 µm wide, cylindrical to tubular or somewhat broadly cylindrical, colorless, brownish or pale vinaceous, some slightly encrusted. ITS sequence (GenBank KP087983, holotype) distinct from the other members of section *Dermocybe* and deviating from *C. pitkinensis* (GenBank KP087982) in the ITS region by seven substitutions and indel positions. Ecology and distribution: In coniferous forests. Known from Eastern North America, Ontario, Canada. Etymology: The name refers to the place where the species was first found.

Holotype WTU, Ammirati 8322.

Cortinarius ammiratii Liimat. & Niskanen, sp.nov.**IF550841**

Type: U.S.A., Washington, Olympic Peninsula, Boulder Creek Trail, in the beginning of the trail by the road, under *Tsuga heterophylla* and some *Salix* spp. and *Alnus*, 26 Oct 2009, collected by J.F. Ammirati, K. Liimatainen & T. Niskanen, T. Niskanen 09-146 (H, holotype; NY, isotype), GenBank no. KP087984. Diagnosis: Pileus 15-35 mm, hemispherical, then low convex to almost plane with a low umbo, fibrillose felty, brown to red brown, when young pale yellowish olivaceous brown near the margin. Lamellae medium spaced, at first yellow, later orange yellow, with age becoming cinnamon brown from spores. Stipe 25-40 mm long, 3-5 mm thick at apex, cylindrical or slightly enlarged at the base, pale yellow, becoming pale yellow brown with age. Universal veil yellowish brown to brown, sparse and forming some girdles on the stipe. Context in pileus yellowish olivaceous, in stipe yellowish brown, darker and more olivaceous towards the base. Odor in lamellae radish-like. Basidiospores 7.5-8.5 x 4.5-5 µm, ellipsoid to somewhat amygdaloid, moderately verrucose. Basidia 4-spored, red in KOH. Pileipellis: epicutis a distinct layer, hyphae 5-13 µm wide, distinctly pale yellow brown, somewhat thick-walled. Lower hyphae vinaceous red in KOH. ITS sequence (GenBank KP087984, holotype) distinct from other members of section *Dermocybe* and deviating from them in the ITS region by more than seven substitutions and indel positions. Ecology and distribution: In conifer dominated forests, presumably associated with *Tsuga heterophylla*. Producing basidiomata in autumn. Known from Western North America, U.S.A., Washington and Canada, British Columbia. Additional specimens: Canada, British Columbia, Plot Fertilization Trials of the SCHIRP research site on northern Vancouver Island, *Tsuga heterophylla* and *Thuja plicata*, in some areas *Pinus contorta*, root tips, GenBank No. DQ481879, DQ481952, DQ481916, DQ481948, DQ481906. Etymology: Named for J.Ammirati, noted mycologist, Professor, University of Washington, Seattle.

Holotype H, Niskanen 09-146.

Cortinarius cartagoensis Ammirati, Liimat., Niskanen, Halling & J. Carranza, sp.nov.**IF550830**

Type: Costa Rica, Prov. Cartago, Paloverde, about 4.5 km east of km 31 of Inter-American Highway, near town of Paloverde, Lat Lon 094634N, 835642W, 1600 m, *Quercus* sp., 4 Jun 1996, collected by R. Halling & J. Ammirati, J. F. Ammirati 11914 (USJ, holotype; NYBG, isotype), GenBank no. KP087987 (ITS2). Diagnosis: Pileus 11-21 mm diam., conic to obtuse-conic, umbonate, sometimes fairly acute, margin incurved, surface moist to dry, smooth, becoming more or less radially wrinkled, disc and inner margin brownish olive with some dull yellowish tones or shades, disc in places somewhat browner, along edge and slightly inward dull yellowish. Lamellae dull yellowish mixed with some brown, edges remaining yellowish, faces gradually more brownish (dull medium brown with slight yellowish cast in places), lamellulae in 3s, to 10 mm long, to 3 mm wide, narrowly ventricose, adnexed with a decurrent tooth (subdecurrent), subdistant. Stipe 39-55 mm long, apex 2-3 mm thick, base up to 5.5 mm, narrowly clavate, general color dull yellowish buff with watery olivaceous colors mixed in, apical area shiny and pale yellowish (moderate dull color, but distinctly yellow), base brownish olive or darker. Universal veil forming brownish fibrils on surface of the stipe. Context in pileus solid, firm, watery olive faded pale yellow, in stipe solid, mostly olive to olivaceous with some faded dull pale areas in base, but above dull yellowish. Odor and taste raphanoid. UV fluorescence (366 nm): context/tissue somewhat yellow, other parts negative. Basidiospores 7-7.8(-8.1-8.5) x (4.8-) 5-5.7 (-6) µm, short to broadly elliptical or more elliptical, rarely more subglobose, moderately to somewhat coarsely verrucose. Basidia 4-spored, colorless to pale vinaceous, commonly with vinaceous or darker granules. Hyphae of pileus epicutis cylindrical to somewhat enlarged, 4-15 µm wide, some end cells cystioid, pale- to light dull gray-brown vinaceous, gray vinaceous, brownish or vinaceous, sometimes densely filled with similar colored pigments, some encrusted; hyphae of subcutis radially oriented, some cylindrical, but mostly enlarged to inflated. ITS 2 sequence (GenBank KP087987, holotype) distinct from the other members of *Olivaceofusci* and deviating from them more than 8 substitutions and indel positions. Ecology and distribution. Associated with *Quercus*. Known from montane oak forests of Costa Rica. Etymology. The name refers to the Province of Cartago, Costa Rica.

Cortinarius croceosimilis Liimat., Niskanen & Ammirati, sp.nov.

IF550842

Type: Canada, Alberta, Hinton area, Foray location 7, under Pinus and Salix, 5 Sept 2011, T. Niskanen 11-400 (H, holotype; NY, isotype), GenBank no. KP087985. Diagnosis: Pileus 15-35 mm, hemispherical to conical, then low convex to low conical, finally almost plane, with a low umbo, fibrillose felty, yellow brown to brown. Lamellae medium spaced, at first olivaceous yellow, with age becoming cinnamon brown from spores. Stipe 25-40 mm long, 3-5 mm thick at apex, cylindrical or slightly enlarged at the base, pale yellow, becoming pale yellow brown with age. Universal veil yellowish brown to brown, forming incomplete girdles on the stipe. Basal mycelium whitish. Context in pileus and upper part of the stipe olive yellow, darker and more olivaceous towards the base. Basidiospores 7-8 x 4.5-5 µm, amygdaloid to somewhat amygdaloid, moderately verrucose. Pilleipellis: epicutis a distinct layer, hyphae 5-15 µm wide, pale brown, some encrusted. Lower hyphae hyaline, some with red pigment deposits in KOH. ITS sequence (GenBank KP087985) distinct from other members of section Dermocybe and deviating from them in the ITS region by at least seven substitutions and indel positions. Ecology and distribution: In mixed forests. Producing basidiomata in autumn. To date known from Canada, Alberta. Etymology: The name refers to the affinity to *C. croceus*.

Holotype H, Niskanen 11-400.

Cortinarius ferruginosus (A.H. Sm.) Ammirati, Liimat. & Niskanen, comb.nov.

IF550832

Basionym: *Inocybe ferruginosa* A.H. Sm., *Pap. Mich. Acad. Sci.* **24**: 23 (1939)

Cortinarius hadrocroceus Ammirati, Niskanen, Liimat. & Bojantchev, sp.nov.

IF550834

Type: Canada, Quebec, along road 347 between Notre-Dame-de-la-Merci and Saint-Come, Forets Quebec plantation, under Pinus on sandy soil, Lat Lon N 461555 W 735537, 22 Sep 2010, T. Niskanen 10-122 (H, holotype; NY, isotype), GenBank No. KP087978. Diagnosis: Pileus 20-45 mm, hemispherical, then low convex to almost plane with a low umbo, fibrillose felty, dark brown at the centre, brown to red brown towards the margin, when young pale olivaceous yellow near the margin. Lamellae medium spaced, at first olive yellow, later light olive brown. Stipe 30-65 mm long, 3-6 mm thick at apex, cylindrical or slightly enlarged at the base, pale yellow. Universal veil brown, sparse, forming several incomplete girdles on the stipe. Basal mycelium yellow. Context in pileus and upper part of the stipe pale olive in lower part of the stipe olive. Odor in lamellae indistinct. Basidiospores 7.5-8.3 x 4.5-5 µm, somewhat amygdaloid, moderately verrucose. Basidia 4-spored, red in KOH. Pilleipellis: epicutis a distinct layer, hyphae 5-15 µm wide, distinctly pale brown, most encrusted. ITS sequence (GenBank KP087978, holotype) distinct from other members of section Dermocybe. With a sister group relationship to *C. rufulus* (GenBank GQ159909) and *C. subrufulus* (GenBank KP087977) and deviating from them in the ITS region by 11 substitutions and indel positions. Ecology and distribution: In coniferous forests dominated by Pinus, but also with *Arctostaphylos uva-ursi* in subalpine and alpine zones. Producing basidiomata in autumn. Wide spread, to date known from Europe and Western and Eastern North America. Additional specimens: Austria, *Arctostaphylos uva-ursi* in subalpine and alpine zones, GenBank No. EF077495 (as *C. croceus*). Canada, British Columbia, 1 Mt. Elphinstone Provincial Park, Roberts Creek, 28 Sep 2000, Paul Kroeger, PK 5343, F16479 (UBC) GenBank No. FJ039700 (as *C. croceus*). Canada, British Columbia, Pacific Rim National Park, Tofino, sand dunes, 3 Nov 2007, Tom Odell TO3, F17077 (UBC), GenBank no. FJ717553 (as *C. croceus*). Canada, Ontario, Renfrew County, 1 mi. n. of H.W. 62, Forest Access Rd., near Round Lake, under Pinus banksiana, 29 Sept 1978, J.F. Ammirati JFA8301, WTU-F-040163, H7023351 (WTU, H). Estonia, Parnu, Saarde, Rongu, undisturbed Picea abies forest with Betula pendula, Populus tremula and Pinus sylvestris, environmental sample, UNITE No. UDB002558 (as *C. sp.*). Italy, 14 Aug 1993, E.Campo 2759, GenBank no. JF907918 (as *C. croceus*). Etymology: The name refers to the robust basidiomata and the affinity to *C. croceus*.

Holotype H, Niskanen 10-122.

Cortinarius olivaceoluteus Ammirati, Bojantchev, K.W. Hughes, Liimat. & Niskanen, sp.nov.

IF550829

Type: U.S.A., Washington, King County, Federal Way, Rhododendron Garden south of Seattle, conifers, soil and woodchips, 30 Oct 1979, collector Mike Beug, J. F. Ammirati 8443 (WTU, holotype; H, isotype). GenBank no. KP087986. Diagnosis: Pileus 18-67 mm diam., obtusely convex to convex or plane, becoming slightly uplifted in age, with a distinct umbo, edges of margin incurved, finely fibrillose-scaly overall, margin dull yellow to olive yellow (near Old Gold or slightly more yellowish) but the overall appearance is Cinnamon Brown to Mars Brown or brownish tawny, not hygrophanous. Lamellae close to crowded, adnexed to emarginated, edges somewhat uneven, olive yellow (dull olive amber yellow to olive), becoming brownish in age, edges more yellowish than faces when young. Stipe 30-45 mm long, 4-8 mm thick at apex, somewhat to distinctly clavate, apex pale- to light yellow, silky and shiny at first, duller with slight olive tint in age (dull light yellow). Cortina yellowish. Universal veil heavy, leaving a zone near the apex and pale brownish yellow fibrils and patches on stipe which become reddish brown in age. Basal mycelium whitish or olive to reddish or dull yellow. Context in pileus watery olive with some yellow mottling or dingy yellowish where less water soaked, in stipe olive to brownish olive or dingy yellow where faded, cortex in stipe brown, in base of the stipe dark olive brown. Odor raphanoid. Taste raphanoid. UV fluorescence (366 nm): context/tissue yellow. Basidiospores 7-8(8.5) x 4-5(5.5) µm, ellipsoid to broadly ellipsoid, distinctly, moderately verrucose. Basidia 4-spored, colorless to pinkish in KOH. Pilleipellis with a distinct, but rather thin epicutis, subcutis not well differentiated from trama. Hyphae of pileus epicutis cylindrical to tubular, mostly 4-11 µm wide, some encrusted, wall more or less refractive, color brown, pale brownish, pale yellowish or reddish brown, some with vinaceous pigment. ITS sequence (GenBank KP087986, holotype) distinct from the other members of section Olivaceofusci. With a sister group relationship to *C. olivaceopictus* (GenBank U56050) and *C. olivaceofuscus* (GenBank UDB015963) and deviating from them in the ITS region by at least 10 substitutions and indel positions. Ecology and distribution: In coniferous and mixed forests. Producing basidiomata in spring and autumn. Known from Western and Eastern North America. Additional specimens: Canada, British Columbia, Queen Charlotte Islands, Anthony Island, Sgaang Gwaii, mixed conifers, 6 Sept 2005,

collected by Oluna Ceska, Judson Brown, Adolf Ceska, Bryce, Clint Kendrick, P. Kroeger, F15991 (UBC), GenBank no. FJ157091 (as *C. cf. olivaceopictus*). U.S.A., California, Sierra Nevada, Stanislaus National Forest, off Aspen Valley Road, mixed conifers, 14 May 2007, D. Bojantchev DBB20070514 (UC). U.S.A., Idaho, Bonner County, Tule Bay, Priest Lake, under conifer, 03 Oct 1968, A.H. Smith 76894, MICH139275 (MICH). U.S.A., Tennessee, Great Smoky Mountains National Park, Tremont area, Sam[€]™s Creek Trail, gregarious mixed hardwoods with *Tsuga*, *Betula*, *Quercus*, etc., 12 Sept 2004, collected by Ron Petersen (JFA13079) (WTU). U.S.A. Washington, Grays Harbor County, Quinault, Quinault RNA, *Tsuga*, *Picea* forests, 20 Oct 1993, collected by G. Walker (JFA11108) (WTU), GenBank No. U56049 (as *D. olivaceopicta*). Etymology: The name refers to the color of the basidiomata.

Holotype WTU, Ammirati 8443.

Cortinarius pitkinensis Ammirati, Liimat. & Niskanen, sp.nov.

IF550839

Type: U.S.A., Colorado, Pitkin County, Elk Camp, gregarious to caespitose along drainage in mosses, *Picea*, 25 Aug 1978, coll. J.F. Ammirati & A.H. Smith, J. F. Ammirati 8237 (WTU, holotype, WTU-F-040015; H isotype, H7023360), GenBank no. KP087982. Diagnosis: Pileus 20-60 mm diam, obtusely conic with rounded disc expanding to convex then plane with low umbo, sometimes depressed around disc, margin incurved then decurved to plane or somewhat uplifted, appressed fibrillose, at first olive yellow (Old Gold) to faintly orange-yellow olive (Aniline Yellow) with slight brownish cast to disc, eventually becoming evenly Sayal Brown then rich reddish Tawny to Chestnut (very reddish brown) or darker brown (Bister). Lamellae yellow (Primuline Yellow) in buttons, becoming orange ochraceous buff, almost a light ochraceous orange, then brownish to rusty brown or reddish brown with some reddish brown spots in age, edges \hat{A} ± uneven, concolor or paler than faces, \hat{A} ± close, adnexed, seceding. Stipe 40-75 mm long, 4-10 mm thick above, narrowly clavate, surface yellow (Strontian Yellow) with Tawny zones before veil breaks, cortina yellow, at maturity yellow but becoming duller and paler with age, developing Tawny to brownish tones and eventually rusty brown from spores, basal mycelium dull yellow to olive yellow or olive buff, sometimes watery olive or reddish brown streaked. Context in pileus solid, firm, rich light yellow (Strontian Yellow) becoming watery olive to watery brown, fading to dingy whitish, context in stipe solid becoming hollow, rich light yellow (Strontian Yellow) almost lemon yellow at first, becoming watery olive to brownish olive, fading to whitish in places, olive in base with some yellow in cortex above. Odor raphanoid. Taste raphanoid. Basidiospores 7.8-9.6 x 4.5-5.2µm, ellipsoid to more or less amygdaloid, moderately verrucose. Basidia 4-spored, colorless or filled with red vinaceous contents. Pileipellis: epicutis well developed, hyphae 5.2-14 µm wide, cylindrical to tubular, vinaceous, brown vinaceous, ochraceous or colorless in KOH, wall of some yellowish refractive, some encrusted; lacking a well differentiated subcutis. ITS sequence (GenBank KP087982, holotype) distinct from the other members of section *Dermocybe* and deviating from *C. croceus* (GenBank KP087990, neotype) in the ITS region by seven substitutions and indel positions. Ecology and distribution: In coniferous forests. Known from Western North America, Colorado. Etymology: The name refers to the place where the species was first found.

Holotype WTU, Ammirati 8237.

Cortinarius subrufulus Ammirati, Liimat. & Niskanen, sp.nov.

IF550833

Type: U.S.A., Washington, Olympic Peninsula, Ocean Shores Park, *Pinus*, *Picea*, and *Salix*, on sandy soil, 11 Nov 2009, collected by J.F. Ammirati & T. Niskanen, T. Niskanen 09-207 (H, holotype; NY, isotype). GenBank no. KP087977. Diagnosis: Pileus 20-50 mm, hemispherical, then low convex to almost plane, fibrillose felty, brown to red brown, when young pale yellowish brown near the margin. Lamellae medium spaced, at first yellow orange to reddish orange, later orange to reddish orange. Stipe 30-65 mm long, 3-8 mm thick at apex, cylindrical to somewhat clavate, pale yellow fibrillose. Universal veil reddish orange to brown, forming several incomplete girdles on the stipe. Basal mycelium yellow. Context yellow to reddish yellow. Odor in lamellae radish-like. Basidiospores 7-8 x 4.2-4.7 µm, ellipsoid, moderately verrucose. Basidia 4-spored, pale red to red in KOH. Pilleipellis: epicutis a distinct layer, hyphae 3-10 µm wide, distinctly pale brown, more or less thick walled. Lower hyphae red to aniline red in KOH, 5-15 µm wide. ITS sequence (GenBank KP087977, holotype) distinct from other members of section *Dermocybe*. With a sister group relationship to *C. rufulus* (GenBank GQ159909) and deviating from it in the ITS region by seven substitutions and indel positions. Ecology and distribution. In mixed forests (*Pinus*, *Picea*, and *Salix*). Producing basidiomata in autumn. Known from Western North America, U.S.A., Washington and Canada, British Columbia. Additional specimen: Canada, British Columbia, Manning Provincial Park, Strawberry Flats, under spruce, 6 Oct 2007, Brian Didier et al. F17087 (UBC), GenBank No. FJ717525 (as *C. croceus*). Canada, British Columbia PK5930, GenBank no. HQ604644 (as *C. cf. rubicundulus*). Etymology. The name refers to the affinity to *C. rufulus*.

Holotype H, Niskanen 09-207.

Cortinarius tillamookensis Ammirati, Liimat. & Niskanen, sp.nov.

IF550838

Type: U.S.A., Oregon, Tillamook County, Sand Lake, gregarious, *Pinus*, 12 Nov 1971, J.F. Ammirati JFA6130, MICH139446 (MICH, holotype). GenBank no. KP087981. Diagnosis: Pileus 12-40 mm diam., obtuse expanding to plano-umbonate, margin slightly incurved, dry, appressed fibrillose, yellowish olive (Isabella Color to Old Gold) with olive brown (Dresden Brown to Saccardos UMBER or dark brown (Bister) streaks and blotches. Lamellae adnexed, close, at first dingy yellow (Honey Yellow) to olive yellow (Aniline Yellow) becoming brownish to ochraceous and finally shaded rusty brown from spores. Stipe 30-60 mm long, 3-7 mm thick, equal, apex silky, light yellow (Straw Yellow to Amber Yellow) to dull yellow (more or less Olive Ochre), downward dull yellow (more or less Olive Ochre) to near the base but in part masked by olive brown (Dresden Brown) to dull brown fibrils. Basal mycelium buff yellow. Context in stipe olive fading to olive yellow (Honey Yellow) or pale yellow, in stipe stuffed to hollow, cortex yellowish but soon olivaceous, in base olive to dark olive brown, pith pale yellowish or shaded olivaceous. Odor and taste raphanoid to pungent. Basidiospores 7-9.5 x 4.5-6µm, equilateral, verrucose. Basidia 4-spored, colorless to yellowish, or with yellow, orange or reddish orange pigment in KOH. Pileipellis: epicutis hyphae cylindrical to inflated, 5-15 µm wide, some encrusted, colorless to pale brownish or containing brown, reddish brown or reddish pigment in KOH. ITS sequence (GenBank

KP087981, holotype) distinct from the other members of section Dermocybe and deviating from them in the ITS region by at least five substitutions and indel positions. Ecology and distribution: In Pinus forests, often on sandy soil. Producing basidiomata in autumn. Known from Europe and Western North America, Oregon. Additional specimens: Estonia, Parnu, Saarde, boreal pine forest, 6 Oct 2011 Anu Kollom, TU105237 TU(M), UNITE No. UDB015917 (as *C. huronensis*). Estonia, Saare, Karla, Pinus forest, 12 Oct 2008 Vello Liiv, TU106433 TU(M), UNITE No. UDB011759 (as *C. croceus*). Great Britain, Scotland, Moray, Culbin Forest, Plantation of Pinus sylvestris and P. nigra, with a few Betula pubescens, 24 Oct 2003, Dave Genney, UNITE No. UDB001556 (as *C. croceus*). Sweden, Vastmanland, Skinnskatteberg, Riddarhyttan Research plots, Pinus sylvestris, 29 Sep 2004, A.F.S. Taylor, CN0087 (UPS), UNITE No. UDB002251 (as *C. huronensis*). Etymology: The name refers to the place where the species was first found.

Holotype MICH 139446.

Cortinarius transatlanticus Ammirati, Liimat. & Niskanen, sp.nov.

IF550835

Type: U.S.A., Washington, Olympic National Park, Hoh River, Picea sitchensis, Tsuga heterophylla, in soil, mosses and litter, 17 Nov 1993, collected by Glenn Walker and Marcangelo Puccio, J. F. Ammirati 11244 (WTU, holotype; H isotype), GenBank No. KP087979. Diagnosis: Pileus 10-18 mm diam., conic to broadly conic, more or less umbonate, edge incurved, opaque, appressed to matted fibrillose, to fibrillose scaly at least at edge, ochraceous brown to reddish brown, sometimes dark red brown, typically margin near Ochraceous Tawny or browner (edge the brightest), streaked at times with orange brown to ochraceous colors, sometimes with an olive cast (Tawny Olive). Lamellae close, adnexed, brown yellow to brownish orange yellow with yellowish edges, eventually more brownish. Stipe 30-40 mm long, 3-4 mm thick at apex, 4-6 mm at base, cylindrical to narrowly clavate, light yellow to pale yellow silky fibrillose above, duller yellowish below, with orange to dull orange veil fibrils up to cortina. Universal veil orange, forming some incomplete girdles on stipe. Basal mycelium pale orange. Context solid and firm in pileus, watery olivaceous with yellow to pale yellow in stipe cortex, watery olive in base, dull orange around base. Odor in lamellae not distinctive or somewhat iodoform. Taste not distinctive. Basidiospores (8.1) 8.9-9.6(10) x (4.8)5.2-5.6(5.9) μm , ellipsoid to slightly amygdaloid, distinctly verrucose. Pileipellis: epicutis a distinct layer, hyphae 4-17 μm wide, distinctly yellow brown, more or less thick walled, very slightly encrusted (few hyphae). ITS sequence (GenBank KP087979, holotype) distinct from the other members of section Dermocybe and deviating from the sister species *C. tillamookensis* (GenBank KP087981, holotype) in the ITS region by seven substitutions and indel positions. Ecology and distribution: In coniferous forests but also with Betula at least in the subalpine areas of Europe. Producing basidiomata in autumn. Known from Europe and Washington, Western North America. Additional specimens: Sweden, Northern Sweden, Abisko Research Station, Betula, 24 Aug 2004, A.F.S. Taylor, UNITE No. UDB001144 (as *C. croceus*). U.S.A., Washington, NE of Mt. Baker, Easy Pass trailhead, coniferous forest (Tsuga heterophylla, Abies and some Picea engelmannii), 28 Sept 2009, J.F. Ammirati & T. Niskanen 09-031 (H). U.S.A., Washington, Skyline Divide Trail, subalpine forest, Abies lasiocarpa, Tsuga mertensiana, 23 Sept 1995, J.F. Ammirati JFA11467 (WTU). Etymology: The name refers to the distribution of the species. Note: Synonym Cortinarius uliginobtusus var. asphagnis Rob. Henry, Bull. trimest. Soc. mycol. Fr. 97(3): 257 (1981). Type: France. R. Henry 71357 (PC, holotype), GenBank No. KP087988.

Holotype WTU, Ammirati 11244.

Cortinarius viridiflavus Ammirati, Bojantchev, Liimat. & Niskanen, sp.nov.

IF550837

Type: U.S.A., Oregon, Tillamook County, Otis, Cascade Head Experimental Forest, Tsuga, Pseudotsuga, Picea, soil and humus, 3 Nov 1995, coll. Egon Horak, J. F. Ammirati 11673 (WTU, holotype; H isotype, H7023325). GenBank no. KP087980. Diagnosis: Pileus 16-28 mm diam., obtuse to convex or plane, umbonate or sometimes depressed on disc, margin decurved then narrowly incurved at edge, surface moist to dry, strongly appressed fibrillose to innately fibrillose, outer margin orange ferruginous (Sanfords Brown), inward similar to margin or Auburn to Bay with the center usually Chestnut Brown or blackish Chestnut Brown (near Light Seal Brown). Lamellae close to crowded, adnexed, rich deep orange mixed with dull brownish tones on faces, edges lighter but brighter orange, intensely bright orange viewed from edges. Stipe 25-65 mm long, 3.5-6 mm thick at apex, base slightly enlarged, surface with a thin coating of reddish fibrils from base to cortina zone, younger stipes with yellowish tones below but usually dull reddish to vinaceous tinted, apical area dull yellowish (Mustard Yellow), shiny, silky fibrillose, in age overall much duller, olivaceous to brownish with apex often pallid buff. Universal veil reddish or reddish orange to reddish brown or vinaceous brown. Basal mycelium dull orange buff, dull buff or sometimes brownish or dingy sordid in age. Context solid and firm in pileus, pale dull yellowish to pale yellowish olive buff, and watery olive over lamellae, stipe hollow mature, pale dull yellowish streaked with watery brown in cortex above, below pale dull yellowish, with some dull orange red or reddish streaks in cortex below, in age darker, with pale dull yellowish in cortex but mainly olivaceous to dingy buff. Odor raphanoid. Taste raphanoid. Basidiospores 6-7.5 (8) x 3.8-4.6 μm , ellipsoid to broadly ellipsoid, distinctly verrucose. Pileipellis: epicutis hyphae 4-14 μm wide, cylindrical to tubular or broadly cylindrical, colorless, brownish or with reddish to brown orange pigment some slightly encrusted. ITS sequence (GenBank KP087980, holotype) distinct from the other members of section Dermocybe and deviating from them in the ITS region by at least eight substitutions and indel positions. Ecology and distribution: In coniferous forests. Producing basidiomata in autumn. Known from Western North America, Oregon and California. Additional specimens: U.S.A., California, Casper Creek, Little Lake Road, Tsuga, Pseudotsuga, Sequoia, 7 Dec 1995, JFA11889, H7023362 (WTU, H). U.S.A., Oregon, Fogarty State Park, gregarious to scattered on road bank in soil, humus and moss, Picea, Tsuga, Thuja, 5 Nov 1995, J.F. Ammirati 11687, WTU-F-041366, H7023316 (WTU, H). U.S.A., Oregon, Pacific City, mixed conifers, 11 Nov 1970, AHS79800, MICH139338 (MICH). Etymology: The name refers to the color of the basidiomata. Note: Cortinarius fibrillosipes var. viridiflavus nom. prov., Ammirati, J. F. The section Dermocybe of Cortinarius in North America. PhD Dissertation. University of Michigan, pp. 125-129. 1972.

Holotype WTU, Ammirati 11673.