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Nomenclatural novelties: Tuula Niskanen

**Cortinarius appalachiensis** K.W. Hughes, Harrower, Ammirati, Niskanen & Liimat., sp.nov. **IF550827** 

Type: U.S.A., Tennessee, Great Smoky Mountains National Park, Blount Co., Cades Cove, Loop Rd, Lat Long: 353627N 0834831W, in moss under mostly pine, 27 Sept 2006, coll. E.B. Lickey TFB13412, TENN-F-061675 (TENN, holotype). GenBank no. KP087976. Diagnosis: Pileus up to 30 mm, campanulate-convex, umbonate, dry fibrillose (densely), color near raw sienna (5D7) to mustard yellow when young. Lamellae close to slightly distant, subdecurrent, seceding, raw sienna (5D8, Ridgway, Methuen colors). Stipe up to 35 mm long and 5 mm thick, mostly equal, fibrillose zone left from cortinaceous veil, color near capucine buff. Universal veil yellowish, forming some incomplete girdles on stipe. Basal mycelium white. Odor of soil. Taste none. UV fluorescence: pileus yellow, stipe orange, basal mycelium yellow. Basidiospores (5.7-)6.0-6.8(-7.2) x (3.6-)3.9-4.5(-4.9) um, ellipsoid, moderately verrucose. Lamellar trama hyphae translucent in KOH. Basidia 4-spored, (21.7-)23.4-28.4(-29.8) x (4.3-)5.8-7.6(-8.0)um, some brown to purplish brown depending on the age of the basidium. Pileipellis reddish brown in KOH: hyphae (3.4)3.8-17.0 (-24.2) um wide, cylindrical to broadly cylindrical, some encrusted. No well differentiated subcutis. ITS sequence (GenBank KP087976, holotype) distinct from other members of subgenus Dermocybe. With a sister group relationship to C. ceskae (GenBank FJ039595, holotype) and deviating from it in the ITS region by nine substitutions and indel positions. Ecology and distribution: In Pinus dominated forest, among mosses. Producing basidiomata in autumn. Known from Eastern North America, Tennessee. Etymology: The name refers to the area from where the species was found. Holotype TENN-F-061675 (TENN).

#### Cortinarius birkebakii Ammirati, Niskanen & Liimat., sp.nov. IF550822

Type: U.S.A., Washington, Mason County, Twanoh State Park, mixed Douglas fir-Hemlock, conifer forest (Tsuga heterophylla, Pseudotsuga menziesii), 20 Oct 2007, J. M. Birkebak 10-20-2007-18 (WTU, holotype; NY, isotype). GenBank no. KP087973. Diagnosis: Pileus 10-30 mm, hemispherical to obtusely umbonate, then almost plane with down curved margin, really faintly tomentose-fibrillose, blackish red at centre, in other parts brownish red, often watery streaked and zoned but not truly hygrophanous. Lamellae close to medium spaced, deep red to very dark red. Stipe 25-55 mm long, 3-5 mm thick at apex, 4-7 mm thick at base, cylindrical to narrowly clavate, at first buff pink with some reddish (light to pale pinkish vinaceous) fibrils, soon (or sometimes from beginning) with dark red colors, especially on base, but base proper with pale ochraceous to buff tones, sometimes colors more ferruginous red, sometimes apex orange fibrillose. Universal veil mostly evanescent, red. Basal mycelium presumably orange. Context watery and concolor in pileus, where faded lighter red, in stipe apex pale reddish or pinkish white, otherwise light red but darker, watery red below, rich dark red to blackish red along cortex in base, stuffed to hollow, pith pale reddish white. Odor of lamellae raphanoid. Taste of pileus flesh raphanoid. Basidiospores 7-8.4 (9) x 4.1-5 um, ellipsoid, distinctly verrucose. Lamellar trama regular, parallel interwoven hyphae, in KOH pale pinkish to colorless, some slightly encrusted, wall refractive, cylindrical to inflated, 5-26 um wide, clamps present. Basidia 4-spored, pinkish in KOH. Pileipellis surface hyphae 4.5-11.1 (15-18.5) um wide, cylindrical to broadly cylindrical, pinkish to purplish or slightly brownish, some containing red pigment, some slightly encrusted, no well differentiated subcutis. ITS sequence (GenBank KP087973, holotype) distinct from other members of Cortinarius subgenus Dermocybe. With a sister group relationship to C. idahoensis (GenBank JX045669, holotype) and deviating from it in the ITS region by six substitutions and indel positions. Ecology and distribution: In mixed and coniferous forests. Producing basidiomata in autumn. Known from Western North America, from Oregon to British Columbia. Additional specimens: Canada, British Columbia, OC16 (UBC), GenBank no. FJ039591 (as C. phoeniceus var. occidentalis); OC33 (UBC), GenBank no. FJ039592 (as C. phoeniceus var. occidentalis). U.S.A. Oregon, Douglas-fir, OSC 1064012, GenBank no. EU525946 (as D. sanguinea). U.S.A., Washington, Lake Wenatchee, Chelan County, mixed conifers (Abies, Pinus, Picea, Pseudotsuga, Tsuga, etc.) in soil and litter, 15 Oct 1984, collected by A. Methyen, (JFA9055) (WTU). U.S.A., Washington, Olympic Peninsula, the beginning of the Boulder Creek Trail, Pseudotsuga and Tsuga, 26 Oct 2009, J.F. Ammirati, K. Liimatainen, T. Niskanen 09-142 (H). Etymology: Named for Joshua M. Birkebak.

#### Holotype J. M. Birkebak 10-20-2007-18 (WTU).

## Cortinarius ceskae Ammirati, Niskanen & Liimat., sp.nov. IF550826

Type: Canada, British Columbia, Victoria, Observatory Hill, 8 Dec 2007, Oluna & Adolf Ceska OC15, UBC F16374 (UBC, holotype). GenBank no. FJ039595. Diagnosis: Pileus 20-30 mm, at first conical, later almost plane, often with an acute umbo, reddish to rusty brown with an olive tone. Lamellae moderately spaced, no notes on young lamellae, cinnamon brown when old. Stipe 30-50 mm long, 4-5 mm thick at apex, cylindrical, fibrillose-rusty fibrils over yellowish background, base of the stipe yellow, at least when young. Context ochre. Odor in lamellae radish-like. UV fluorescence: pileus bright yellow on drying, lamellae bright yellow but patchy, stipe bright yellow, flesh in stipe pale yellow. Basidiospores (6.5-)7-8(-9) x 4-5 um. ITS sequence (GenBank FJ039595, holotype) distinct from other members of subgenus Dermocybe. With a sister group relationship to C. appalachiensis (GenBank KP087976, holotype) and deviating from it in the ITS region by nine substitutions and indel positions. Ecology and distribution: In coniferous forest. Producing basidiomata in autumn. To date only known from Canada, British Columbia. Additional specimen: Canada, British Columbia, Victoria, Observatory Hill, 8 Dec 2007, Oluna & Adolf Ceska OC14, UBC F16373 (UBC), GenBank no. FJ039594. Etymology: Named for Oluna and Adolf Ceska.

Holotype UBC F16374 (UBC).

#### IF550820

Type: Finland, Uusimaa, Espoo, Luukkaa outdoor recreation area, W side of the lake Kaitalampi, nature reserve area, mesic spruce forest (Picea abies), 16 Aug 2005, T. Niskanen 05-001 (H, holotype; NY, isotype). GenBank no. KP087972. Diagnosis: Pileus 30-70 mm, hemispherical, then low convex to almost plane with a low umbo, almost glabrous to finely appressed-scaly, brown to reddish brown. Lamellae medium spaced, red. Stipe 40-70 mm long, 4-9 mm thick at apex, cylindrical or slightly enlarged at the base, yellow, with age brown at base. Universal veil yellow, forming several incomplete girdles on the stipe. Context dark olivaceous yellow brown in the pileus and base of the stipe, in upper part of the stipe olivaceous yellow brown. UV fluorescence (366 nm): top of the stipe yellow, in other parts negative. Basidiospores 6-6.8 x 3.8-4.3(4.5) um, amygdaloid, moderately verrucose. Basidia 4-spored. Lamellar trama hyphae pale purplish red in KOH. Pileipellis blue in KOH, hyphae cylindrical, 3-11 um wide, finely incrusted to smooth, subcutis somewhat developed, hyphae cylindrical to broadly cylindrical 45-80 x 15-25 um. ITS sequence (GenBank KP087972) distinct from other members of subgenus Dermocybe and deviating from them in the ITS region by at least five substitutions and indel positions. Ecology and distribution: In conifer-dominated forests, in hemiboreal and southern boreal zone and in mountain areas of Central Europe and Eastern North America. Producing basidiomata in late summer and autumn. Wide spread, to date known from Europe and Eastern North America. Additional specimens: Canada, Ontario, Macey Lake Bog, mixed woods, Pinus, Populus, Acer, Quercus, 12 Sept 1977, Joseph F. Ammirati JFA7908 (WTU), GenBank No. U56064. Canada, Ontario, Muskoka. Lake of Bays, N to NE of Peninsula Lake, mixed forest of coniferous and deciduous trees, 16 Sept 2007, collected by Andy Tanas, TN07-202, H7000864 (H). Estonia, Saare, Kihelkonna, pine forest, Sept 2008, Vello Liiv, TU106408 (TU), Unite No. UDB011346 (as semisanguineus). Hungary, Vas, Ketvolgy, in mixed forest under young Picea abies, Quercus and Pinus sylvestris, 9 Oct 2010, Balint Dima, DB4357 (BP). Hungary, Vas, Ketvolgy, in mixed forest under young Picea abies, Quercus and Pinus sylvestris, 6 Oct 2012, Laszlo Albert & Balint Dima, DB4853 (BP). Hungary, Vas, Koszeg, under Pinus, Betula and Quercus, 9 Sept 1995, Laszlo Albert, AL95-31 (BP). U.S.A., Tennessee, Great Smoky Mountains National Park, Sevier Co., Brushy Mtn. Tr., under canopy of mixed hardwood/Tsuga, 2 Sept 2006, E.B. Lickey TFB13349, TENN-F-061612 (TENN). Etymology: The name refers to the red lamellae.

Holotype T. Niskanen 05-001 (H).

#### Cortinarius davemallochii Ammirati, Niskanen & Liimat., sp.nov.

Type: Canada, New Brunswick, Charlotte Co., Lepreau Parish, woods at west end of MacPhersons Beach, 1.4 km southwest of Little Lepreau, scattered to gregarious amongst Sphagnum gametophytes on bog hummocks, associated with Picea mariana, Larix laricina, Empetrum nigrum, Vaccinium oxycoccos, Maianthemum canadense, Ledum groenlandicum and other herbaceous plants, 4 Aug 2011, D. Malloch 04-08-11/01 (NBM, F-04305, holotype; WTU, isotype). GenBank no. KP087971. Diagnosis: Pileus 15-45 mm, hemispherical, then low convex to almost plane with a low umbo or without an umbo, almost glabrous to finely appressed-scaly, grayish brown to light brown when young but taking on some reddish shades during maturation and age and finally with some areas near light brown to reddish brown. Lamellae medium spaced, greyish yellow or slightly more yellow at first, darkening as the spores mature. Stipe 50-65 mm long, 3-5 mm thick at apex, cylindrical or slightly enlarged at the base, fundamentally orange white to orange gray but washed with a light brown to reddish brown color in older material. Universal veil mostly evanescent, probably yellowish white to pale yellow. Basal mycelium yellowish white. Context yellowish brown in the pileus and centre of the stipe, concolorous with the surface tissues near the surface of the stipe. UV fluorescence (366 nm): none. Basidiospores 8.2-9.5(-10) x 5-5.7 um, amygdaloid to ellipsoid to more narrowly ellipsoid, moderately verrucose. Basidia 4-spored. Lamellar trama hyphae pale purplish red in KOH. Pileipellis yellow brown to orange brown in KOH, hyphae cylindrical, 5-12 um wide, subcutis somewhat developed. ITS sequence (GenBank KP087971, holotype) distinct from the other members of subgenus Dermocybe and deviating from them in the ITS region by more than 30 substitutions and indel positions. Ecology and distribution: In damp conifer-dominated forests and bogs among Sphagnum, in hemiboreal and boreal zone. Producing basidiomata in late summer and autumn. Wide spread, to date known from Europe and Western and Eastern North America. Additional specimens: Canada, British Columbia, Vancouver, Burns Bog, birch Forest, in Sphagnum, 08 Sep 1999, Oluna Ceska, 1990908-001, F18918 (UBC), GenBank No. HQ604641. Canada, British Columbia, Vancouver, Burns Bog, Nature Trail, 12 Sep. 1999, Oluna Ceska, 1990912-005, F18922 (UBC) GenBank No. HQ604642. Canada, New Brunswick, Charlotte Co., Lepreau Parish, woods at west end of MacPhersons Beach, 1.4 km southwest of Little Lepreau, scattered to gregarious in Sphagnum carpet in boggy area under stunted black spruce and larch, 08 Sept 2007, Dave Malloch 08.09.07/01 (NBM, WTU). Finland, Uusimaa, Porvoo, Pohjakka, S part of Suurisuo, on open fen among Sphagnum, 06 Aug 2006, Ulla ja Pertti Salo 10695, H6002046 (H). Etymology: Named for Dave Malloch.

Holotype D. Malloch 04-08-11/01, F-04305 (NBM).

## Cortinarius pseudofervidus Niskanen, Liimat., Ammirati & Kytov., sp.nov. IF550821

Type: Sweden, Medelpad, Torp, N Getberget, in rich coniferous forest, 29 Aug 1985, Brandrud et al. CFP 334, F44496 (S, holotype). GenBank no. JN114087. Diagnosis: Pileus 25-70 mm, hemispherical, then low convex to almost plane with a low umbo or without an umbo, brown to bright red brown. Lamellae medium spaced, deep orange red brown to rusty red. Stipe 40-80 mm long, 3-9 mm thick at apex, cylindrical or slightly enlarged at the base, yellowish. Basal mycelium yellow, orange-yellow to orange. Context yellow brown to brown. Basidiospores 6.5-7.5 x 4.2-5.0 um, Q= 1.39-1.65, amygdaloid to ellipsoid, somewhat verrucose. Basidia 4-spored. Lamellar trama hyphae orange red in KOH, not encrusted. Pileipellis orange red in KOH, surface hyphae encrusted, subcutis not well differentiated. ITS sequence (GenBank JN114087, holotype) distinct from the other members of subgenus Dermocybe. With a sister group relationship to C. smithii (GenBank JX045689, holotype) and deviating from it in the ITS region by seven substitutions and indel positions. Ecology and distribution: In Picea abies dominated forests, in hemiboreal and boreal zone, often on rich ground. Producing basidiomata in late summer and autumn. Known from northern Europe. Additional specimens: Estonia, Tartu, Soekula, about 3 km E of Vedu village, birch-aspen-spruce boreo-nemoral forest, A. Kollom, 13 Sep 2008, TAAM128727, UNITE No. UDB016103. Estonia, Tartu, Vara, along a mossy ditch under young spruces, A. Kollom, 28 Aug 2008, TAAM128710, UNITE No. UDB016097. Finland, Varsinais-Suomi, Pernio, herb-rich Picea abies dominated

forest with some Pinus, Betula, Corylus and Quercus, Maija-Liisa & Pekka Heino 881-2004 (TUR), GenBank No. JN114088. Finland, Pera-Pohjanmaa, Kiiminki, Picea abies forest, M. Ohenoja, 31 Aug 1972, GenBank No. JN114089. Norway, Hornsjoen, Nannestad, Akershus, Sudnorwegen, Nadelwald, moorig, 31 aug 1981, leg. Brandrud and Hoiland, MM81/355 (IB), GenBank No. U56041. Etymology. The name C. fervidus was misapplied for this species in northern Europe. Note: Cortinarius fervidus ss. Brandrud et al. 1990 p.p., Kytovuori et al. 2005 p.p.

Holotype F44496, CFP 334 (S).

## Cortinarius rubrobrunneus Ammirati, Liimat. & Niskanen, sp.nov. IF550824

Type: Canada, Ontario, Campbellville Road, Halton Forest, under Pinus, 8 Sept 1977, collected by C. Ovrebo, J. F. Ammirati 7903 (WTU, holotype; , DAOM isotype). GenBank no. KP087975. Diagnosis: Pileus 12-25 mm diam., convex with slight umbo, becoming broadly convex, more or less umbonate, edge of margin slightly incurved to decurved, appressed fibrillose-tomentose, margin slightly scaly, disc and inner margin reddish brown (Bay, Mahogany Red), at edge brownish red (Burnt Sienna), somewhat faded areas reddish brown (Liver Brown) to more brown (Kaiser Brown) with some tints of brownish orange (Sanfords Brown), moist, more or less slowly hygrophanous, not striate. Lamellae close, adnexed, reddish brown (Hays Russet to Mahogany Red), becoming rusty from spores. Stipe 25-40 mm long, 2-4 mm thick at apex, base somewhat enlarged, appressed fibrillose, shiny, at first concolorous with pileus surface but a lighter shade of reddish to reddish brown, with some light brownish ochraceous to ochraceous areas, buff yellow at base when mature, discoloring darker reddish brown to dark brown where handled. Context in pileus solid, firm to watery, more or less concolorous with surface, faded pale brownish tan, in stipe stuffed to hollow, tinted with surface colors at first, fading to brownish tan, somewhat ochraceous in base. Odor fungoid. Taste raphanoid-fungoid, slightly bitterish. Basidiospores 7-7.8(-8.5) x 4.5-5(-5.2) um, ellipsoid to broadly ellipsoid, moderately verrucose. Basidia 4-spored, colorless, pinkish or with vinaceous contents in KOH. Lamellar trama hyphae colorless to pinkish in KOH, scattered masses of refractive, yellow to red granules in tramal tissue of pileus and lamellae. Pileipellis hyphae 5.2-14 um wide, cylindrical to tubular, repent to more loosely arranged, colorless to pinkish or with vinaceous contents in KOH, not encrusted, subcutis not differentiated but distinctly red pigmented in sections. ITS sequence (GenBank KP087975, holotype) distinct from other members of subgenus Dermocybe. With a sister group relationship to C. fervidus and deviating from it in the ITS region by five substitutions and indel positions. Ecology and distribution: In mixed forests, presumably with conifers. Producing basidiomata in autumn. Known from Ontario, Canada. Additional specimen: Canada, Ontario, Mississauga, North side of Mullet Creek, Acer, Tsuga, 1975, collected by Ed Checko, JFA7313 (WTU), GenBank no. U56052 (as D. phoenica). Etymology: The name refers to the colour of the basidiomata.

Holotype J. F. Ammirati 7903 (WTU).

## Cortinarius rubrophyllus (Moenne-Locc.) Liimat., Niskanen, Ammirati & Dima, comb.nov. IF550804

Basionym: Cortinarius malicorius var. rubrophyllus Moënne-Locc., in Bidaud, Moënne-Loccoz, Reumaux & Henry, Atlas des Cortinaires (Meyzieu) 6: 190 (1994)

# **Cortinarius timiskamingensis** Malloch, Ammirati, Liimat. & Niskanen, sp.nov. **IF550823**

Type: Canada, Ontario, Timiskaming District, Burt Township, 1.2 km SW of Burt Lake along Burt Creek, in deciduous forest (Alnus rugosa, Corylus cornuta, Acer spicatum) on rich soil, 3 Sept 1981, D. Malloch 3-9-81/2 (NBM, holotype; WTU, isotype). GenBank no. KP087974. Diagnosis: Pileus 7-42 mm diam., turbinate at first, expanding to more broadly turbinate, finally nearly plane or somewhat depressed at center, low, rounded umbo, dry, glabrous to very finely fibrillose-scaly, reddish brown (Methuen 9D-E8) at first, retaining this color at maturity, with a yellowish ground color which adds yellow to the red color as the pileus expands, fading to brownish orange (Methuen 5C5). Lamellae close to subclose, adnexed, not marginate, violet brown (Methuen 10E-F7). Stipe 32-53 mm long, 2.4-6.6 mm wide, more or less equal, surface dry, glabrous, concolorous with red pileus colors but more strongly influenced by yellowish ground color, darkening to violet brown (10E-F5) on the lower half. Context pale yellow in pileus and center of stipe, brownish red (Methuen 10D7 in the stipe cortex. Odor indistinct. Taste slightly bitterish. UV fluorescence (366 nm): negative in all parts. Basidiospores 5.9-6.7 x 4.1-4.6 um, ellipsoid, broadly ellipsoid, or subglobose, moderately verrucose. Basidia 4-spored, pinkish or with dark red contents in KOH. Lamellar trama hyphae pinkish to pale vinaceous in KOH. Pileipellis hyphae 4.5-17 um wide, cylindrical to tubular, distinctly blue-purple in KOH (very strong coloration), fading to colorless of slightly ochraceous, some encrusted, lacking a distinct subcutis. ITS sequence (GenBank KP087974, holotype) distinct from other members of subgenus Dermocybe and deviating from them in the ITS region by more than 15 substitutions and indel positions. Ecology and distribution: In deciduous forest (Alnus rugosa, Corylus cornuta, Acer spicatum), on rich soil. Producing basidiomata in autumn. To date only known from Ontario, Canada. Etymology: The species was first found Timiskaming District, Ontario, Canada.

Holotype D. Malloch 3-9-81/2 (NBM).

#### Cortinarius trappei Ammirati, Liimat. & Niskanen, sp.nov. IF550825

Type: U.S.A., Washington, Chelan County, above Rainy Pass on the trail to Lake Anne, gregarious in moist soil and mosses, Abies lasiocarpa, 29 Aug 1989, collected by F. Cazarez and D. Luoma (IB, holotype, M. Moser 1989/0360; WTU, isotype, JFA10001). GenBank no. U56042. Diagnosis: Pileus 17-27 mm diam., nearly hemispheric to obtuse with a rounded disc, subumbonate to slightly depressed, margin slightly enrolled at edge, usually appearing incurved to decurved, surface moist to dry, opaque, usually with a thin coating of ochraceous to ochraceous brown (light colored fibrils from veil, brown mixed with Warm Buff (pale yellow with slight orange tint)), basic color Brick Red (reddish brown) to Liver Brown (dull red), around disc with some Carob Brown (dark brown with slight reddish tint) or blackish red streaks or spots, disc often coated with persistent veil. Lamellae close to slightly distant, emarginated, Maroon (violet brown) with edges near Garnet Brown (brownish red) to rich red, becoming rusty

brown from spores when mature. Stipe 35-52 mm long, 4-6 mm thick at apex, base somewhat clavate to enlarged, 5-8 mm thick, surface longitudinally fibrillose, fibrils yellowish to brownish or reddish, apex light ochraceous buff with a reddish cast in places, lower stipe and base more ochraceous (yellow ochre or more yellowish) or stipe rich wine red in place but with ochraceous to ochraceous buff tones. Cortina pale dull yellowish. Universal veil ochraceous. Basal mycelium more or less ochraceous buff. Context in pileus solid, firm to subfragile, watery deep red over lamellae, otherwise pale brownish with tints of surface colors beneath cuticle, faded dingy whitish above stipe apex, stipe stuffed then hollow, brownish white, pale, slightly tinted with color of cortex, cortex above dull to bright red with pale streaks, below watery dull brown, in base a mixture of dark brown and dull red. Odor raphanoid. Taste bitterish then raphanoid. Basidiospores 7.4-8.5 x 4.1-5.2 um, ellipsoid, moderately verrucose. Basidia 4-spored, pinkish in KOH. Pileipellis: Veil hyphae over surface 2.5-9 um wide, cylindrical, slightly encrusted, yellowish, pinkish or pale vinaceous. Pileipellis hyphae 6-15 um wide, cylindrical to tubular or broadly cylindrical, with purple pigment fresh in KOH, also dried material when first mounted in KOH, later fading to pinkish or paler, more or less encrusted. ITS sequence (GenBank U56042, isotype) distinct from the other species of Cortinarius subgenus Dermocybe. Deviating from the other species of the subgenus in the ITS region by more than 10 substitutions and indel positions. Ecology and distribution: In coniferous forest. Producing basidiomata in late summer and autumn. To date only known from Western North America, Washington state. Additional specimens: Canada, British Columbia, Vancouver, North Shore Mountains Seymour Watershed, Tsuga, Abies, Thuja, Cupressus, 10 Oct 1993, Sharmin Gamiet SG54-101093-13 (WTU) GenBank No. U56053 (as Dermocybe phoenicea var occidentalis). USA, Washington, Whatcom County, Silver Fir Camp, Mt. Baker, mixed conifers, 11 Nov 1987, J. F. Ammirati JFA9670 (WTU), GenBank No. U56072. Etymology: Named for Dr. James Martin Trappe, noted mycologist and the one who organized the expedition to the area where this species was collected in 1989.