

**Cortinarius fulvopaludosus** Kytov., Niskanen & Liimat., sp.nov.**IF553947**

Pileus 1.5-3 cm wide, conical to convex, with an acute umbo, yellowish brown to brown, hygrophanous. Lamellae fairly distant, broad, emarginated, pale ochraceous when young, somewhat darker with age. Stipe 5-7 cm long, 0.15-0.2 cm thick at the apex, 0.2-0.3 cm thick at the base, cylindrical, slender, whitish to honey-coloured. Universal veil very sparse, as white silky fibrils on the stipe. Exsiccata: pileus brown, stipe silky brownish. Basidiospores 7.9-8.7-10.0 x 4.5-5.0-5.4  $\mu\text{m}$ ,  $Q=1.64-1.74-1.82$ , (60 spores, 1 specimen), narrowly amygdaloid-fusoid, often with a very shallow suprahilar depression, finely to fairly finely, densely, evenly verrucose, sometimes somewhat more strongly verrucose at apex, moderately dextrinoid. Lamellar trama hyphae olive yellow to olive brown in MLZ, distinctly but fairly finely scabrous. ITS sequence (GenBank MG136823, holotype) distinct from other members of subgenus *Telamonina* and deviating from them by at least six substitutions and indels.

Holotype H 6033460.

Ecology and distribution: In mesotrophic, mixed forests (*Picea*, *Pinus*, *Betula*, *Alnus*, *Populus*, *Fagus*). Basidiomata found from damp forests. In central and northern Europe. Holotype: FINLAND, Etela-Hame, Orivesi, Hirsila, Lakkasuo, mesotrophic spruce-hardwood swamp, *Picea*, *Pinus*, *Betula*, *Alnus glutinosa*, *Salix* spp., 26 Sept 1994, Kytovuori 94-992a, H6033460, (H, holotype K, isotype). GenBank No. MG136823. Additional specimens: ESTONIA. Tartu, Meeksi, ectomycorrhizal root of *Populus*, UNITE no. UDB005188. FINLAND. Kainuu, Paltamo, Kontiomäki, Mesic to damp grass-herb spruce forest with some *Pinus*, *Betula* and *Populus tremula*, 12 Sep 2008, Kytovuori 08-1635, FICO265-12, H6033534 (H). GERMANY. Thuringia, National Park Hainich, ectomycorrhizal root of *Fagus sylvatica*, GenBank no KJ610811.

Etymology: The name refers to the color of the pileus and the damp habitat from where the species has been found fruiting

**Cortinarius fuscoalbus** Kytov., Niskanen & Liimat., sp.nov.**IF553953**

Pileus 2-4(-5) cm wide, at first hemispherical, later low convex to almost plane, sometimes with a small umbo, dark reddish brown, almost blackish brown from the centre, hygrophanous. Lamellae medium spaced, very pale yellow brown to pale yellow brown. Stipe 4-8 cm long, 0.2-0.5 cm thick, cylindrical to tapering at base, at first silky whitish fibrillose, later pale reddish brown, darker at the base. Universal veil white, forming incomplete girdles on the stipe. Context in pileus brown, pale yellow brown in stipe, darker brown at the base. Basidiospores 6.8-7.2-7.7 x 3.6-3.9-4.1  $\mu\text{m}$ ,  $Q=1.71-1.84-1.96$ , narrowly amygdaloid, fairly finely, densely, separately verrucose, fairly slightly to moderately dextrinoid. Lamellar trama hyphae pale olive, smooth to finely scabrous. ITS sequence (GenBank MG136829, holotype) distinct from other members of sect. *Atroalbi* and deviating from them by at least three substitutions and indels.

Holotype S F44860.

Ecology and distribution: In mesic to damp coniferous forests. Known from Northern Europe and Eastern North America. Holotype: SWEDEN, Angermanland, Sabra, Osternjaland, in wet mixed coniferous forest, 11 Sep 1988, Lindstrom et al. CFP 760, F44860 (S, holotype). GenBank No. MG136829. Additional specimens: CANADA. Quebec, GenBank no. KJ705137. ESTONIA. Ida-Viru, Illuka, spruce-pine paludified forest near river, 23 Oct 2006, A.Kollom, TAAM128658, Unite No. UDB016059. SWEDEN. Uppland, Uppsala, Nasten, mixed forest, 11 Sept 2005, A. Taylor (UPS), Unite No. UDB002234. Note: The closely related *C. atroalbus* and *C. roseomyceliosus* have broader spores, *C. atroalbus* 6.8-7.3-7.7 x 4.3-4.6-4.6  $\mu\text{m}$ ,  $Q=1.50-1.60-1.70$  and *C. roseomyceliosus* 6.1-6.8-7.5 x 4.1-4.3-4.5  $\mu\text{m}$ ,  $Q=1.46-1.58-1.66$ . This is one of the species previously called *C. depressus* in the Nordic countries.

Etymology: The name refers to the dark pileus and whitish stipe.

**Cortinarius heterodepressus** Kytov., Niskanen & Liimat., sp.nov.**IF553954**

Pileus 1-4 cm wide, convex with a low umbo when young, soon expanding to plano-convex to shallowly plano-depressed, with a very faint silky shade, chocolate brown to chestnut brown, at margin somewhat paler than at the centre, hygrophanous. Lamellae moderately crowded, slightly emarginated, pale ochraceous. Stipe 1-2.5 cm long, 0.3-0.9 cm thick at the apex, cylindrical, at first silky whitish fibrillose, later brown but paler than the pileus. Context in the pileus concolorous with the surface, in the stipe paler, brown, marbled watery, somewhat darker in the base. Universal veil very sparse, white, forming a very thin, silky, easily disappearing sheet on the lower half of the stipe. Exsiccata with a fairly dark brown, sometimes slightly greyish pruinose pileus at the centre. Basidiospores 5.7-6.3-7.0 x 3.0-3.4-3.6  $\mu\text{m}$ ,  $x=6.1-6.4$  x 3.3-3.5  $\mu\text{m}$ ,  $Q=1.58-1.84-2.06$ ,  $Q_{av.}=1.78-1.92$  (100 spores, 3 specimens), narrowly cylindrical to cylindrical-fusoid to narrowly fusoid, punctate to finely, evenly, densely verrucose, indextrinoid to faintly dextrinoid. Lamellar trama hyphae mostly narrow, olive yellowish, smooth. ITS sequence (GenBank MG136830, holotype) distinct from other members of sect. *Atroalbi* and deviating from them by at least three substitutions and indels.

Holotype H 6031902.

Ecology and distribution: In boreal, dry *Pinus* forests, mostly on sandy soil. Known from Fennoscandia and Central Europe. Fruiting bodies mainly occur on habitats with more or less disturbed vegetation as on footpaths, tracks and roadsides in the northern and northwestern Fennoscandia especially in the pine forests where the grazing of reindeers has strongly disturbed the ground layer vegetation of the forest. Fruiting bodies have not been observed in the moss carpet of *Pleurozium schreberi*, *Hylocomium splendens* or *Dicranum* spp. Basidiomata are produced fairly late in the season, in September and October. Holotype: FINLAND, Kainuu, Suomussalmi, Sarkka, dry *Pinus* forest with some *Picea*, *Betula*, on sandy soil, 16 Sep 2002, Niskanen 02-664 & Kytovuori & Liimatainen, H6031902, (H, holotype K, isotype). GenBank No. MG136830. Additional

specimens: SWEDEN. Lule Lappmark, Gallivare, Jerttalompolo, Pinus forest, 14 Sept 2000, Kytovuori (H) Stenbron, Pinus forest, 14 Sept 2001, Kytovuori (H). Torne Lappmark, Jukkasjärvi, church village, half-open, dry Pinus forest, 14 Sept 2001, Kytovuori (H). Norrbotten. Tarendo, Kojuniemi, Pinus forest on sand dune, 14 Sept 2001, Kytovuori (H) FINLAND. Varsinais-Suomi, Vihti, Nummela, dry Pinus forest on sand, 09 Sept 2004, Kytovuori (H). Uusimaa, Nurmijärvi, Kiljava, dry Pinus forest on sand, 13 Oct 2004, Kytovuori (H). Kirkkonummi, Meikotrasket, Nasudden, dry Pinus forest on rock, 25 Oct 2004, Kytovuori (2 ex H). Tammisaari, Lappohja, dry Pinus forest on sand, 03 Sept 2004, Kytovuori (H) road crossing to Snappertuna, dry Pinus forest on sand, 15 Oct 2004, Kytovuori (H). Satakunta, Alastaro, Virttaankangas, dry Pinus forest on sand, 13 Oct 2006 Toivonen & Kytovuori 06-1403 (H). Etela-Hame, Loppi, Luutasuo, dry, half-open Pinus forest on sand, 07 Oct 1999, Niskanen & Kytovuori (H). Laatokan Karjala, Parikkala, Saari, below church, dry Pinus forest on sand, 18 Sept 2009, Kytovuori 09-1283 (H), Sarkisalmi, dry Pinus forest, on sand, 17 Sept 2009, Ohenoja (H), Vaaranpera, dry Pinus forest with young Picea, on plain sand delta, 17 Sept 2009 Kytovuori 09-1239, 09-1240 (H). Pohjois-Hame, Saarijärvi, Pyhä-Häkki National Park, dryish road bank, Pinus, Picea, Populus, 16 Sept 2008, Kytovuori 08-1904 (H). Pohjois-Karjala, Kesalahti, Poiksilta, Marjoniemenkangas, dry Pinus forest on sand, 21 Sept 2009, Kytovuori 09-1393. Kainuu, Puolanka, Kurikkavaara, 10 Aug 2002, Kytovuori (H). Ristijärvi, Uva, dry, small Pinus forest, 15 Sept 2005, Kytovuori (H). Suomussalmi, Ammansaari, Aittokoski, dry sandy Pinus forest, 06 Sept 2008, Kytovuori 08-1116 (H). Pera-Pohjanmaa, Kemijärvi, Isokylä, Soppela, dry sandy yard area, some Pinus, 29 Aug 2008, Kytovuori 08-367 (H). Pello, Orajarvi, dry Pinus forest on sand, 17 Oct 2001, Kytovuori (H). Kittilän Lappi. Kolari, Akasjoki, Kalkkikangas, dryish Pinus forest, 16 Aug 2001, Kytovuori (2 ex. H). Sodankylän Lappi, Pelkosenniemi, Suvanto, dry mostly open heath on sand, some young Pinus, 28 Aug 2008, Kytovuori 08-268 (H). FRANCE. Loire, Montbrison, under Pinus sylvestris, 11 Nov 1992, A. Bidaud 92-11-419 (PC), holotype of *C. bohemicus* f. *subheterosporus*. Synonym: *C. bohemicus* f. *subheterosporus* Bidaud. Notes: *Cortinarius heterodepressus* is one of our most characteristic *Cortinarius* species in dry pine forests in Fennoscandia. In the field it is very difficult to distinguish from the very similar, but much rarer *C. heterosporus*, which often grows together with the former. Microscopically *C. heterodepressus* can be easily distinguished by its very narrow, boletoid spores. Etymology: The name refers to the appearance of the species that is a mixture of *C. heterosporus* and *C. depressus* s. auct.

***Cortinarius hinnuleocervinus*** Niskanen, Liimat. & Ammirati, sp.nov.

**IF553951**

Pileus 3-5.5 cm wide, at first conical-convex, later low conical-convex to almost plane, with a low umbo, surface smooth, reddish brown, hygrophanous. Lamellae medium spaced, at first pale greyish brown later cinnamon brown. Stipe 6-12 cm long, 0.6-1.1 cm thick, cylindrical, at first silky grayish white fibrillose, later brown. Universal veil white, forming complete and incomplete girdles on the stipe. Context in the pileus dark reddish brown, very pale brown at the upper part of the stipe, dark brown in the middle and at the base of the stipe. Basidiospores 6.3-8.0 x 5.2-6.0  $\mu$ m, Q= 1.17-1.40, short and broad ellipsoid to broadly ovoid, strongly verrucose, moderately dextrinoid. Lamellar trama hyphae encrusted. ITS sequence (GenBank MG136827, holotype) distinct from other members of sect. *Hinnulei* and deviating from them by at least six substitutions and indels.

Holotype H, Niskanen 12-175.

Ecology and distribution: In mixed forests (*Lithocarpus*, *Picea*). Known from Western North America, from California to Washington. Holotype: USA, California, Humboldt County, N of Korb, by the road 299, mixed forest of *Lithocarpus* and *Picea*, 30 Nov 2012, leg. K. Liimatainen & J. Olsson, T. Niskanen 12-175 (H, holotype K, isotype). GenBank No. MG136827. Additional specimens: USA. Washington. Olympic National Park. Olympic Hot Springs, conifers, 02 Oct 1941, A. H. Smith 17523, MICH10344 (MICH, holotype of *C. distans* var. *olympianus*). Chelan County. Tumwater Campground, mixed conifer forest, 25 Sept 2010, coll. J. Ammirati, JFA13502 (WTU). Synonym: *Cortinarius distans* var. *olympianus* A.H. Sm., *Lloydia* 7(3): 212 (1944). Etymology: The name refers to the affinity to *C. hinnuleus* and to the color of the pileus.

***Cortinarius paludosaniosus*** Liimat., Niskanen, Dima & Ammirati, sp.nov.

**IF553952**

Pileus 2.5-3.5 cm wide, at first conical, later low conical to almost plane with an acute umbo, surface smooth, yellow red brown, hygrophanous. Lamellae medium spaced, yellow red brown. Stipe 3-6 cm long, 0.3-0.4 cm thick, cylindrical, at first silky brownish yellow, later darker, browner. Universal veil yellow, forming complete and incomplete girdles on the stipe. Context in the pileus and upper part of the stipe yellow red brown, darker towards the base of the stipe. Basidiospores 8.0-9.0 x 5.0-5.5  $\mu$ m, Q= 1.52-1.71, amygdaloid to ellipsoid, moderately verrucose, strongly dextrinoid. Lamellar trama hyphae smooth. ITS sequence (GenBank MG136828, holotype) distinct from other members of sect. *Saniosi*. With a sister group relationship to *C. aureovelatus* (GenBank DQ102652) and deviating from it by 16 substitutions and indels.

Holotype H, Niskanen 07-342.

Ecology and distribution: In mixed forests, associated with deciduous trees. Known from Europe and North America. Holotype: USA, Washington, Seattle, in park, on lawn, near several coniferous and deciduous trees, 2 Oct 2007, coll. Liimatainen & Niskanen, T. Niskanen 07-342 (H, holotype K, isotype). GenBank No. MG136828. Additional specimens: FRANCE. Courcouronnes, under *Populus*, 11 Nov 1988, PML 1182 (PC, holotype of *C. saniosus* var. *paludophilus*). GERMANY, GenBank no. AY669621. ITALY, 23 Sep 1995, E. Campo, GenBank no. JF907952. SPAIN. Granada, Sierra Nevada, under *Salix*, A. Capilla 1998/0860 (IB). GenBank no. DQ102684. USA. Washington. King County. University of Washington campus, Seattle, *Populus*, *Corylus*, *Arbutus*, *Rubus*, *Ulmus*, *Acer*, 20 Oct 1997, coll. J. Ammirati, JFA12455 (WTU) Highland Parkway, *Populus trichocarpa*, 15 Oct 2007, coll. J. Birkebak, JMB10-15-2007-05 (WTU), GenBank no. FJ717541. Whatcom County. Lummi Shore Road, near Frenale, *Populus*, 18 Oct 2015, coll. R. Morrison, MJ-15-1 (WTU). Synonym: *Cortinarius saniosus* var. *paludophilus* Carteret & Reumaux, in Bidaud, Carteret, Reumaux & Moëne-Loccoz, *Atlas des Cortinaires* (Meyzieu) 20: 1650 (2012). Etymology: The name is derived from the synonym *Cortinarius saniosus* var. *paludophilus*.

***Cortinarius psammocola*** Kytov., Niskanen & Liimat., sp.nov.

**IF553945**

Pileus 2-5 cm wide, subumbonate when young, with age often expanding to somewhat planodepressed with a small umbo and down curved margin, innately fibrillose with blackish fibrils, dark sordid chestnut brown, hygrophanous. Lamellae medium spaced,

strongly emarginated, pale ochraceous. Stipe 3-5 cm long, 0.3-0.7 cm thick, cylindrical, greyish ochraceous. Context purplish greyish. Universal veil white, very sparse, forming a very thin, silky, easily disappearing coating on the stipe. Exsiccata: pileus fairly dark brown, fibrillose with blackish fibrils. Basidiospores 7.0-7.8-8.6 x 4.3-4.7-5.2 um, av.= 7.5-8.2 x 4.6-4.8 um, Q= 1.52-1.67-1.82, Qav.=1.64-1.72 (120 spores, 3 specimens), narrowly ellipsoid to oblong-cylindrical to obovoidly oblong, moderately to strongly, densely, sharply verrucose (almost echinate), most strongly verrucose at the apex, somewhat dark coloured, somewhat to moderately dextrinoid. Lamellar trama hyphae olive yellowish in MLZ, smooth. ITS sequence (GenBank MG136821, holotype) distinct from other members of sect. Verni and deviating from them by at least nine substitutions and indels.

Holotype H, Kytovuori 99-722.

Ecology and distribution: In boreal, dry Pinus forests mostly on sandy soil. Mainly occurring in habitats with more or less disturbed vegetation as on footpaths, tracks and roadsides on bare soil or among low mosses. It seems to produce basidiomata fairly late in the season, in September and October. The species is rare and so far only collected from a few places from northern hemiboreal and southern boreal pine forests in Finland. Based on ecological studies also known from North West Spain (KY659394).

Holotype: FINLAND, Uusimaa, Tammisaari, Lappohja, dry Pinus forest on sandy soil, 10 Oct 1999, Kytovuori 99-722 (H, holotype K, isotype). GenBank No. MG136821. Additional specimens: FINLAND. Uusimaa, Hanko, Tvarminneby, dry Pinus forest on sandy soil, 15 Oct 2004, Kytovuori (H). Tammisaari, Lappohja, road crossing to Snappertuna, dry Pinus forest on sandy soil, 15 Oct 2004, Kytovuori (H). Etela-Savo, Ristiina, Hankataipale, Pinus dominated forest, 11 Oct 2005, Kytovuori (H).

Etymology: The name refers to the growing place of the species.

**Cortinarius quercoconicus** Liimat., Kytov. & Niskanen, sp.nov.

**IF553949**

Pileus 1-3 cm wide, at first convex to conical, later low convex to low conical to almost plane, with an acute or broader, small umbo, surface finely scaly, ochraceous brown to dark ochraceous brown, hygrophanous. Lamellae medium spaced to rather distant, yellow brown to dark yellow brown. Stipe 3-6 cm long, 0.2-0.5 cm thick, cylindrical, at first somewhat fibrillose, pale brown later brown. Universal veil brown, abundant, forming a ring and floccose scales on the stipe. Context dark ochraceous brown, almost blackish brown at the base of the stipe. Basidiospores 7.3-8.2-8.8 x 4.5-5.1-5.4 um, av.=7.9-8.6 x 5.0-5.2 um, Q=1.50-1.62-1.71, Qav.=1.60-1.65 (69 spores, 2 specimens), amygdaloid to fairly narrowly fusoid (ovoidly to most often obovoidly), with a shallow suprahilar depression or not, somewhat thick-walled, finely to fairly strongly, sharply verrucose, strongly dextrinoid. Lamellar trama hyphae yellow in MLZ, strongly incrustated with small to large, red brown spots. Pileipellis partly covered by up to 15 um wide, pale sepia-coloured, very finely, densely scabrous hyphae, some lower hyphae with larger incrust spots. Amorphous, olive pigment spots present deep in the cuticle. Stipitipellis incrustated with red brown spots. Universal veil incrustated. ITS sequence (GenBank MG136825, holotype) distinct from other members of sect. Ochrovelati. With a sister group relationship to *C. castaneopallidus* and deviating from it by ten substitutions and indels.

Holotype H 7018166.

Ecology and distribution: In hemiboreal and temperate deciduous forests. Known from central and northern Europe. Holotype: SWEDEN, Oland, Hogsrum, Haltorp nature reserve, deciduous forest (Carpinus, some Ulmus, Corylus, Fraxinus, Tilia), on mull soil, 10 Sept 2003, Kytovuori, Liimatainen Niskanen 03-1305, H7018166, (H, holotype K, isotype). GenBank No. MG136825. Additional specimens: SWEDEN. Uppland, Uppsala, Bondkyrka, Kvarnbo, under Salix and Quercus on rich ground, 11 Sep 1986, Lindstrom et al. CFP 485, F44892 (S). GERMANY, Thuringia, several sequences from soil, e.g GenBank no. HF675625. Note: This species has previously been called as *C. psammocephalus* together with its sister species *C. castaneopallidus*, but we conclude that the original description does not represent either of the species and therefore describe this one here as new.

Etymology: The name refers to the conical pileus and habitat often with Quercus.

**Cortinarius sphagnoravus** Liimat., Kytov., Niskanen & Ammirati, sp.nov.

**IF553950**

Pileus 1-4 cm wide, at first conical to conical-convex, later low conical to almost plane, with a more or less acute, small umbo, surface finely whitish fibrillose, reddish brown but the fibrils on the surface make it look more greyish brown, hygrophanous, sometimes 1/4 pellucid-striate. Lamellae medium spaced, at first pale yellow brown later more brown. Stipe 4-8 cm long, 0.2-0.5 cm thick, cylindrical, at first silky whitish fibrillose, later pale brown. Universal veil white, forming incomplete girdles on the stipe. Context in pileus brown, very pale brown at the upper part of the stipe, somewhat darker brown at the base of the stipe. Basidiospores 7.5-8.5-9.3 x 4.8-5.3-5.7 um, av.= 8.2-8.7 x 5.2-5.3 um, Q=1.44-1.60-1.74, Qav.=1.53-1.62 (130 spores, 3 specimens), narrowly ellipsoid to oblong, fairly finely verrucose, more strongly verrucose at apex, somewhat to moderately dextrinoid. Lamellar trama hyphae pale yellow to yellowish brown in MLZ, smooth to very finely scabrous. ITS sequence (GenBank MG136826, holotype) distinct from other members of sect. Ravi and deviating from them by more than 20 substitutions and indels.

Holotype S F44869.

Ecology and distribution: In mesic to damp hemiboreal, boreal and mountainous coniferous forests (Picea, Tsuga, Pseudotsuga, Abies). Known from Europe and North America. Holotype: SWEDEN. Angermanland, Haggdager, Sjö, in wet spruce forest with blueberry, 3 Sept 1988, H. Lindstrom et al. CFP746, F44869 (S, holotype). GenBank No. MG136826. Additional specimens: GERMANY. Picea abies ectomycorrhiza GenBank no. AF430262. SWEDEN. Picea abies forest, soil sample GenBank no. EF521210. CANADA. Newfoundland, Avalon Peninsula, Salmonier, boreal coniferous forest and bogs, 29 Sept 2007, anonymous (Niskanen 07-316), H7001130 (H). U.S.A., Alaska, Bonanza Creek, Picea mariana forest, soil sample, GenBank no. KF617238. U.S.A., Washington, Snohomish county, Barlow Pass, mixed coniferous forest (mainly Tsuga heterophylla, some Pseudotsuga and Abies), 03 Oct 2009, Liimatainen & Niskanen F09-051 (H).

Etymology: The name refers to the color of the pileus and damp habitat.

**Cortinarius subminiatus** Kytov., Niskanen & Liimat., sp.nov.

**IF553946**

Pileus 1-2.5 cm wide, first conical, later expanding to subumbonate with a narrow, fairly acute umbo, surface smooth, dark

ochraceous to liver brown with a pale ochraceous margin, hygrophanous, with age narrowly pellucid striate at the margin. Lamellae medium spaced, emarginated, ochraceous when young, later darker brown. Stipe 2.5-7 cm long, 0.2-0.5 cm thick, slender, cylindrical, slightly clavate at the base, whitish to pale ochraceous. Universal veil scarlet red, forming fibrillose coating on the pileus margin (when young) and on the most part of the stipe, colour strongest at the base. Exsiccata: pileus ochraceous to dark brown, red universal veil colour still distinct. Basidiospores 9.1-10.2-11.3 x 5.7-6.2-6.6  $\mu\text{m}$ ,  $av. = 9.9-10.3 \times 6.1-6.2 \mu\text{m}$ ,  $Q=1.50-1.65-1.79$ ,  $Q_{av.}=1.61-1.68$  (240 spores, 7 specimens), narrowly oblong-ellipsoid to very slightly amygdaloid, with a blunt to round apex, somewhat thick-walled, finely, densely, evenly verrucose, slightly more strongly verrucose at the apex, moderately dextrinoid. Lamellar trama hyphae yellow to reddish brown in MLZ, distinctly to fairly strongly scabrous, sometimes with larger, red brown incrust plates and spots. ITS sequence (GenBank MG136822, holotype) distinct from other members of sect. Anthracini. With a sister group relationship to *C. miniatopus* (epitype) and deviating from it by two substitutions in the ITS 2 region, ITS1 regions identical.

Holotype H 6031919.

Ecology and distribution: In boreal dry *Pinus* forests on sandy soil, but also in mesic *Picea* dominated forests with pine. At least associated with *Pinus* but may also be associated with *Picea*. Rare in boreal Fennoscandia, but very easily overlooked because the species is very small and the red stipe is mostly hidden in the moss cover. Holotype: FINLAND, Koillismaa, Kuusamo, Oulanka National Park, Kiutakongas, dry *Pinus* forest with some *Pinus*, *Betula*, on sandy calcareous soil, 18 Sept 2002, Niskanen 02-786 & Kytovuori & Liimatainen H6031919, (H, holotype K, isotype). GenBank No. MG136822. Additional specimens: NORWAY. Vestfold, Fredrikstad, Fredrikstads marka, in spruce forest, 13 Sept 1986, Lindstrom et al. CFP 488, F41143 (S). FINLAND. Satakunta, Ikaalinen, Seitsemien National Park, aged *Picea* dominated forest, 08 Sept 2005, Ohenoja, TUR172320 (TUR). Etela-Hame, Ruovesi, Siikaneva, Moskulanmaki, submesic *Picea* forest with some *Betula*, *Pinus*, *Populus tremula*, 24 Aug 2004, Liimatainen & Niskanen 04-259, TUR173480 (TUR), Tampere, Teisko, Vattula Nature Reserve, 21 Aug 2004, Kosonen, TUR168962 (TUR). Viiala, 10 km S of Lempaala, with *Picea*, 07 Aug 1986, Elborne, F005332 (OULU). Etela-Savo, Mikkeli, Hiirola, calcareous *Picea* dominated forest, 04 Sept 1983, Issakainen & Kytovuori H6041332 (H). Laatokan Karjala, Parikkala, Vaaranpera, Porokangas, dry *Pinus* forest on sandy soil, with young *Picea*, 17 Sept 2009, Niemela (H), Tohmajarvi, Peera-Musko, fairly moist *Picea* forest with scattered *Pinus*, *Populus tremula*, *Betula*, 22 Sept 2004, Vauras 22438F, TUR166233 (TUR). Pohjois-Hame, Saarijarvi, Pyha-Hakki National Park, old *Picea* dominated forest, 10 Sept 2002, Kytovuori (H). Oulun Pohjanmaa, Kalimenoja, *Pinus* dominated forest, 03 Sept 1974, Ulvinen F005333 (OULU) *Picea* dominated forest, 10 Sept 1983, Ohenoja F006519 (OULU) 04 Sept 1984, Ohenoja F005336 (OULU) 08 Sept 1988, Ohenoja F017367 (OULU). Pera-Pohjanmaa, Kemijarvi, Pietarinselka, *Pinus* forest, 16 Aug 1933, Vare F014993 (OULU). Keminmaa, Hyypio, Sivakkavaara, *Pinus* forest, 31 Aug 1992, Vare & Ohtonen F017455 (OULU). Rovaniemi, Tennila, Veitsikangas, dry *Pinus* forest, 06 Sept 1991, Vare F005338 (OULU) 16 Aug 1993, Vare F015002 (OULU). Kittila Lapland. Muonio, Tuoreselka, dry *Pinus* forest, 04 Sept 1993, Ohtonen F015672 (OULU). Sompion Lappi. Sodankyla, Aska, Askankangas, dry *Pinus* forest, 21 Aug 1993, Vare F014992 (OULU) 04 Sept 1993, Ohtonen F015671 (OULU) Lokka, Kupperoisempalo, 04 Sept 1993, Ohtonen F015574 (OULU). Inarin Lappi. Inari, Angeli, Savujarvi, dry *Pinus* forest, 06 Sept 1993, Ohtonen F015575 (OULU) Nukkumajoki, Mitatonlampi, *Pinus* forest, 31 Aug 1993, Paulus 411/93 & Matero F070549 (OULU). Notes: *Cortinarius subminiatopus* and *C. miniatopus* are macroscopically very similar and therefore difficult to identify in the field. However, *C. miniatopus* has much smaller spores (7.0-7.9-8.8 x 4.5-5.1-5.4  $\mu\text{m}$ ,  $av. = 7.5-8.2 \times 5.0-5.2 \mu\text{m}$ ,  $Q=1.44-1.56-1.71$ ,  $Q_{av.}= 1.52-1.62$  (240 spores, 7 specimens) and grows in mesic to damp *Picea* forests.

Etymology: The name refers to the affinity to *C. miniatopus*.

***Cortinarius subpaleaceus*** Kytov., Niskanen & Liimat., sp.nov.

**IF553948**

Pileus 1.5-3 cm wide, at first convex, later low convex to almost plane, finely white scaly to fibrillose, pale reddish brown, hygrophanous. Lamellae medium spaced, pale ochraceous when young, somewhat darker with age. Stipe 4-8 cm long, 0.2-0.5 cm thick, cylindrical, at first whitish silky fibrillose, later pale ochraceous brown. Universal veil white, abundant, forming a ring and floccose girdles on the stipe. Context pale ochraceous brown. Basidiospores 7.5-8.0-8.6 x 4.8-5.1-5.4  $\mu\text{m}$ ,  $av.=8.0-8.3 \times 4.9-5.3 \mu\text{m}$ ,  $Q=1.44-1.58-1.68$ ,  $Q_{av.}= 1.44-1.62$  (190 spores, 7 specimens), narrowly ellipsoid to slightly amygdaloid-ellipsoid, with blunt apex, often somewhat thick-walled, fairly finely to moderately verrucose, hardly more strongly verrucose at apex, somewhat to moderately dextrinoid. Lamellar trama hyphae yellowish to pale olive brown in MLZ, smooth to finely scabrous. ITS sequence (GenBank MG136824, holotype) distinct from other members of sect. Paleacei. With a sister group relationship to *C. hemitrichus* and deviating from it by three substitutions and indels.

Holotype H, Kytovuori 08-995.

Ecology and distribution: In hemiboreal and boreal coniferous forests, occasional. Known from Europe and North America. Holotype: FINLAND, Kainuu, Kianta, Ahjola, Huuhkajalehto, old, mesic *Picea* forest with some *Betula*, *Pinus*, *Populus tremula*, 04 Sept 2008, Kytovuori 08-995 (H, holotype K, isotype). GenBank No. MG136824. Additional specimens: FINLAND. Kainuu, Suomussalmi, Juntusranta, Portinvaara, somewhat calcareous grass-herb *Picea* forest with some *Pinus*, *Betula*, *Populus tremula*, *Salix*, damp depression, 03 Sept 2008 Kytovuori 08-848 (H). Pera-Pohjanmaa, Tornio, Korkiamaa, Runteli, damp, calcareous grass-herb *Picea* forest with some *Pinus*, *Betula*, *Populus tremula*, 30 Aug 2004, Liimatainen & Niskanen F04-584a (H). Koillismaa, Taivalkoski, Metsakyla, Katajavaara, old, mesic *Picea* forest with damp grass-herb depressions, some *Pinus*, *Betula*, *Populus tremula*, 02 Sept 2008, Kytovuori 08-737 (H). SWEDEN. Medelpad, Borgsjo, Bergasen, fairly rich grass-herb forest of *Picea* and *Pinus* with some solitary *Betula*, 13 Sept 1995, P. & I. Kytovuori 95-1282 (H) Torp, N Getberget, submesic *Picea* dominated forest, 04 Sept 1987, Lindstrom et al. CFP605a, F44889 (S). Pite Lappmark, Arvidsjaur, Avaviken, Skavliden, mesic grass-herb *Picea* forest with some *Pinus*, *Betula*, 11 Sept 2009, P. & I. Kytovuori 09-1108 (H). CANADA. British Columbia, SMI201 (UBC), GenBank no. FJ039560. USA. Washington, Skagit Co., Easy Pass trailhead, mixed conifers (*Abies*, *Tsuga*, *Pseudotsuga*, *Picea*, *Pinus*) and some *Alnus*, 28 Sept 2009, Niskanen et al. 09-029 (H). Note: The sister species *C. hemitrichus* can easily be distinguished from *C. subpaleaceus* by narrower, fusoid spores ( $Q=1.56-1.70-1.82$ ,  $Q_{av.}= 1.68-1.72$ ), darker, greyish to blackish brown pileus and habitat with *Betula*. The species described here has previously been called as *C. pilatii* in the Nordic countries but the study of the type specimen revealed that to be another species in sect. Flexipedes.

Etymology: The name refers to the affinity to *C. paleaceus* (current name *C. hemitrichus*).