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Nomenclatural novelties : Tuula Niskanen & Kare Liimatainen

Phlegmacium viscidoamarum (A. Ortega & Suár.-Sant.) Niskanen & Liimat., comb. nov.

IF 555230

Basionym: *Cortinarius viscidoamarus* A. Ortega & Suár.-Sant., *Fungal Diversity* 36: 95 (2009)

Phlegmacium perpallens (Chevassut & Rob. Henry) Niskanen & Liimat., comb. nov.

IF 555231

Basionym: *Cortinarius perpallens* Chevassut & Rob. Henry, *Docums Mycol.* 8(no. 32): 5 (1978)

Phlegmacium obsoletum (Kühner) Niskanen & Liimat., comb. nov.

IF 555232

Basionym: *Cortinarius obsoletus* Kühner, *Bull. mens. Soc. linn. Soc. Bot. Lyon* 24(2): 39 (1955)

Phlegmacium glaucocephalus (M.M. Moser, Ammirati & Halling) Niskanen & Liimat., comb. nov.

IF 555233

Basionym: *Cortinarius glaucocephalus* M.M. Moser, Ammirati & Halling, in Moser & Ammirati, *Mycotaxon* 74(1): 12 (2000)

Phlegmacium boreidionysae (Kytöv., Liimat., Niskanen & Dima) Niskanen & Liimat., comb. nov.

IF 555234

Basionym: *Cortinarius boreidionysae* Kytöv., Liimat., Niskanen & Dima, in Liimatainen, Niskanen, Dima, Kytövuori, Ammirati & Frøslev, *Persoonia* 33: 127 (2014)

Phlegmacium barrentium (Poirier & Reumaux) Niskanen & Liimat., comb. nov.

IF 555214

Basionym: *Cortinarius barrentium* Poirier & Reumaux, in Bidaud, Moënne-Loccoz, Reumaux & Henry, *Atlas des Cortinaires, Pars V (Annecy)*: 150 (1993)

Phlegmacium sect. *Rhizophora* Niskanen & Liimat., sect. nov.

IF 555235

Typification: *Cortinarius viscidoamarus* A. Ortega & Suár.-Sant., *Fungal Diversity* 36: 95 (2009);
Holotype GDA 53709

Diagnosis: Basidiomata medium- to large-sized, agaricoid, development type pileocarpic. Pileus 3–7.5 cm, at first hemispherical, then convex to almost plane, with more or less yellow and/or ochraceous and orange colours, viscid to glutinous. Lamellae medium spaced to almost crowded, at first whitish to greyish white, later brownish ochraceous, sometimes with a purplish tint. Stipe 4–8 cm long, 0.7–1.3 cm wide at the apex, up to 3 cm at the base, more or less bulbous, sometimes clavate, white, dry. Universal veil yellow, at the margin of the bulb or at the base of the stipe if stipe clavate. Context in pileus and stipe white. KOH reaction negative in context. Basidiospores 10–13 × 5.5–7 μm, amygdaloid, moderately verrucose. Cystidia absent. Pileipellis simplex.

Ecology and Distribution: With deciduous trees. Currently known from temperate and Mediterranean areas in Europe.

Notes: Typical for the species of this section are pileus with more or less yellow, ochraceous and/or orange colours, white stipe and context, more or less bulbous stipe, yellow universal veil and rather large amygdaloid spores. The development type of basidiomata is pileocarpic and the pileipellis is simplex.

Etymology: Named after a species, *Phlegmacium rhizophorum*, belonging to this section. Currently included species: *P. rhizophorum* and *P. viscidoamarum*

Phlegmacium sect. *Caerulea* Niskanen & Liimat., sect. nov.

IF 555236

Typification: *Cortinarius perpallens* Chevassut & Rob. Henry, *Docums Mycol.* 8(no. 32): 5 (1978)

Diagnosis: Basidiomata medium- to large-sized, agaricoid, development type pileocarpic. Some parts of the basidiomata often becoming ochraceous yellow where broken or damaged. Pileus 4–13 cm, at first hemispherical, then convex to almost plane, finely innately fibrillose, with bluish colours or completely violaceous blue at least when young, often also with yellowish ochraceous colours or becoming yellowish ochraceous in places with age somewhat viscid to glutinous. Lamellae crowded to almost crowded, pale grey, lavender grey or bluish lavender. Stipe 4–11.5 cm long, 0.8–2 cm wide at the apex, up to 4.5 cm at the base, usually with a marginate bulb, pale blue to bluish white, or white with a lavender blue apex of the stipe, in some species becoming somewhat yellow to brownish yellow with age, dry. Universal veil violaceous blue or if white then discoloring yellow to brown with age, at the bulb margin. Context greyish white to pale grey, sometimes purplish at the apex of the stipe or cortex when young, in some species becoming yellow in the bulb. Odour Scleroderma-like or indistinct. KOH reaction yellow or negative. Basidiospores 8.5–12.5 × 5.5–7 μm, ellipsoid to somewhat amygdaloid, finely to moderately, finely to coarsely verrucose. Cystidia absent. Pileipellis duplex, hypoderm present.

Ecology and Distribution: In the Northern Hemisphere with deciduous trees (Fagaceae, *Tilia*, *Corylus*, *Carpinus*), rarely with coniferous trees (*Pinus*).

Notes: Typical for the species of this section are basidiomata with bluish colours and a marginate bulb and that some parts of the basidiomata often become ochraceous yellow where broken or damaged. The basidiospores are ellipsoid to somewhat amygdaloid, the development type of basidiomata is pileocarpic and the pileipellis is duplex. Currently included species: *P. aurescens*, *P. coerulescentium*, *P. eucaeruleum*, *P. perpallens*, and *P. terpsichores*

Etymology: The species of this section have blue to purplish colours in their basidiomata.

Phlegmacium sect. *Obsoleta* Niskanen & Liimat., sect. nov.

IF 555239

Typification: *Cortinarius obsoletus* Kühner, *Bull. mens. Soc. linn. Soc. Bot. Lyon* 24(2): 39 (1955)

Diagnosis: Basidiomata medium-sized, agaricoid, development type stipitocarpic. Pileus 3–8 cm, at first hemispherical, then convex to almost plane, ochraceous to yellow brown, viscid to almost dry. Lamellae medium spaced to almost crowded, greyish white to purplish. Stipe 4–11 cm long, 0.8–1.8 cm wide at the apex, cylindrical to clavate, white, dry. Universal veil white, abundant, flocculose, forming girdles on the stipe. Context white. Basidiospores 11.5–13.5 × 7–8.5 μm, amygdaloid to ellipsoid, moderately verrucose. Cystidia absent. Pileipellis duplex, hypoderm present.

Ecology and Distribution: In the Northern Hemisphere, currently only known from Europe, with deciduous trees.

Notes: This European section is characterized by the combination of ochraceous to yellow brown pileus, stipitocarpic basidiomata, abundant flocculose universal veil that forms girdles on the stipe, amygdaloid to ellipsoid basidiospores and habitat with deciduous trees. The pileipellis is duplex. Currently included species: *P. obsoletum*

Etymology: Named after the type species of this section.

Phlegmacium sect. *Glaucocephala* Niskanen & Liimat., sect. nov.

IF 555240

Typification: *Cortinarius glaucocephalus* M.M. Moser, Ammirati & Halling, in Moser & Ammirati, *Mycotaxon* 74(1): 12 (2000); Holotype IB 95/679

Diagnosis: Basidiomata medium-sized, agaricoid, development type pileocarpic. Pileus 4–8 (–10) cm, at first hemispherical, then convex to almost plane, bluish violet, bluish greenish grey, dark bluish green to almost blackish, viscid to glutinous, with hygrophanous streaks. Lamellae crowded, adnate to emarginated, blue to bluish violet, in *P. glaucocephalum* later paler, bluish grey. Stipe 3–6 cm long, 1–2 cm wide at the apex, up to 3 cm at the base, with a marginate bulb, bluish violet to bluish green, dry. Universal veil bluish violet or at first greenish soon becoming yellow- to red-brown. Context in pileus white with a bluish or greenish tint, in stipe blue and marbled hygrophanous, in bulb white, sometimes with some yellowish to brownish spots. Odour musty to earthy. KOH reaction on pileus of *P. glaucocephalum* red brown, on context dingy brown. Basidiospores 7–9.5 × 4–5 μm, citriform to amygdaloid-citriform, moderately verrucose. Cystidia absent.

Ecology and Distribution: In the Northern Hemisphere, currently only known from North America. In mixed forests (Pinaceae, Fagaceae, Arctostaphylos manzanita).

Notes: The species of this section are characterized by basidiomata with bluish violet and greenish tints. The development type of the basidiomata is pileocarpic, the bulb is marginate, and the basidiospores are rather small and citriform to amygdaloid-citriform. Typical is also musty to earthy odour. Currently included species: *P. glaucocephalum* and *P. subsolitarium*

Etymology: Named after the type species of this section.

Phlegmacium sect. *Taura* Niskanen & Liimat., sect. nov.

IF 555241

Typification: *Cortinarius barrentium* Poirier & Reumaux, in Bidaud, Moëgne-Loccoz, Reumaux & Henry, *Atlas des Cortinaires, Pars V (Annecy)*: 150 (1993); Holotype G, GK 2398

Diagnosis: Basidiomata medium-sized, agaricoid, development type pileocarpic. Pileus 3–9 cm, at first hemispherical, then convex to almost plane, blue, violaceous or blackish blue, some species with brown streaks or spots, discoloring pale yellow brown in the centre or greyish, some species with white patches of veil at the centre viscid, with hygrophanous streaks or spots. Lamellae moderately crowded to almost crowded, adnate to emarginated, blue, violaceous, or greyish. Stipe 3–8 cm long, 1–2 cm wide at the apex, up to 3 cm at the base, with a marginate bulb, blue, bluish grey or white, dry. Universal veil in part of the species forming a distinct volva at the base of the stipe, blue, or at least blue/violaceous inside the volva. Context in pileus and stipe whitish, becoming yellow in places with age or where damaged, in some species violaceous in cortex or at the top of the stipe. Odour indistinct or slightly malty. KOH in context brown, at least in some species. Basidiospores 7.0–11.5 × 4.5–7 μm, ellipsoid, amygdaloid to amygdaloid-citriform, moderately to strongly verrucose. Cystidia absent. Pileipellis duplex, hypoderm present.

Ecology and Distribution: In the Northern Hemisphere with coniferous (Pinaceae) and deciduous trees (Fagaceae, Corylus).

Notes: Typical for the species of this section are medium-sized basidiomata with blue/violaceous colours and a marginate bulb. The development type of the basidiomata is pileocarpic and the pileipellis is duplex. In part of the species the universal veil forms a distinct volva at the base of the

stipe. The clade was named as /Subolivascetes in Soop et al. 2019. Currently included species: *P. atrochalybaeum*, *P. barrentium* (syn. *P. tauri*), *P. moenne-locozii*, and *P. subolivascens*.

Etymology: Named after *P. tauri* (syn. *P. barrentium*), a species belonging to the section.

Phlegmacium sect. *Dionysae* Niskanen & Liimat., sect. nov.

IF 555242

Typification: *Cortinarius boreidionysae* Kytöv., Liimat., Niskanen & Dima, in Liimatainen, Niskanen, Dima, Kytövuori, Ammirati & Frøslev, *Persoonia* 33: 127 (2014); Holotype H, Kytövuori 97-1220

Diagnosis: Basidiomata medium-sized, agaricoid, development type pileocarpic. Pileus 4–10 cm, at first hemispherical, then convex to almost plane, innately fibrillose, grey-brown, dark grey, bluish grey, ochraceous brown to brown, often with an olivaceous tint at margin viscid to glutinous. Lamellae crowded to almost crowded, adnate to emarginated, at first violaceous to violaceous grey, later violet grey to pale brownish grey. Stipe 3–9 cm long, 1–2 cm wide at the apex, up to 2.5 cm at the base, with a marginate bulb, violaceous blue to violaceous grey, at least in the upper part, with age discolouring yellowish white, pale ochre to yellow brown, dry. Universal veil yellow, at bulb margin. Context in pileus white, in stipe violaceous, in bulb at first whitish, later brownish yellowish. Odour farinaceous. KOH in context yellow or brown. Basidiospores 8.5–12 × 5–6.5 μm, citriform to amygdaloid-citriform, moderately to strongly densely verrucose, often with interconnected warts. Cystidia absent. Pileipellis duplex, hypoderm present.

Ecology and Distribution: In the Northern Hemisphere with coniferous (Pinaceae) and deciduous trees (Fagaceae, Cistus) on calcareous soil.

Notes: The species of this section are characterized by the innately fibrillose pileus, marginate bulb, farinaceous smell, citriform to amygdaloid-citriform spores and habitat on calcareous ground. Typical are also bluish/violet colours at least in the stipe and lamellae when young. The development type of the basidiomata is pileocarpic and the pileipellis is duplex. Currently included species: *P. boreidionysae*, *P. dionysae*, *P. mahiquesii*, *P. olivaceodionysae* and *P. palazonianum*.

Etymology: Named after *C. dionysae*, a species belonging to the section.

Thaxterogaster sect. *Vespertini* Niskanen & Liimat., sect. nov.

IF 555243

Typification: *Agaricus vespertinus* Fr., *Syst. mycol.* (Lundae) 1: 233 (1821)

Diagnosis: Basidiomata medium-sized (to large-sized), agaricoid, development type somewhat stipitocarpic to stipitocarpic. Pileus 3–12 cm, at first hemispherical, then convex to almost plane, finely innately fibrillose, ochraceous yellow to ochraceous brown, dry to somewhat viscid. Lamellae moderately crowded to almost crowded, adnate to emarginated, at first pale grey, later ochraceous brown, sometimes with a purplish tint. Stipe 5–11 cm long, 0.5–1.5 cm wide at the apex, up to 3 cm at the base, clavate to bulbous, with a rooting base, at first whitish silky-fibrillose, later pale brown to brown-spotted, sometimes with a purplish tint at the apex, becoming vinaceous red at the base when bruised, dry. Universal veil at first white later ochraceous, usually sparse. Context in pileus and stipe whitish to yellowish brown. Odour in lamellae sweetish, *C. subtortus*-like. KOH reaction negative. Basidiospores 6–7.5 × 4.5–5.5 μm, broadly ellipsoid to subglobose, moderately verrucose. Cystidia absent. Pileipellis duplex, hypoderm present.

Ecology and Distribution: In the Northern Hemisphere with coniferous (Pinaceae) and more rarely with deciduous trees (Fagaceae).

Notes: This boreal monotypic section is characterized by the combination of more or less stipitocarpic basidiomata, pileipellis duplex, ochraceous brown pileus and initially white stipe with a rooting base that becomes vinaceous red when bruised, and broadly ellipsoid to almost subglobose spores. The basidiomata are most reminiscent of those in *T. subgen. Multiformes* but the species of

the subgen. *Multiformes* have amygdaloid to ellipsoid spores and the base of the stipe is not rooting and does not turn vinaceous red when bruised. Currently included species: *T. vespertinus*.

Etymology: Named after the type species of this section.