

*Cortinarius alces* Niskanen & Liimat., sp. nov.

IF 559320

Holotype H 7071980

Diagnosis: Basidiomata medium (to large-sized), agaricoid (telamonioid), development type stipitocarpic. Pileus 2–10 cm diam., at first hemispherical, later low convex to plane, often with a low and broad umbo, waxy glossy, whitish fibrillose in the margin, reddish brown, but soon drying reddish yellow to strong brown from the centre, strongly hygrophanous. Lamellae medium spaced, adnexed to slightly emerginate, light brown with a paler edge when young, dark reddish brown when old. Stipe 4–8 cm long, 0.5–2 cm thick at the apex, clavate to sometimes almost bulbous, at first silky whitish to greyish white fibrillose but the fibrils disappear easily revealing the reddish brown surface beneath. Context marbled hygrophanous, reddish brown in the pileus, light reddish brown in the stipe apex, dark reddish brown in the stipe base. Universal veil white, forming a thin sock over the lower half of the stipe. Basal mycelium white. Odour indistinct. Basidiospores 9–10 × 6–6.5 (–7) μm, av. 9.4 × 6.2 μm, Q= 1.4–1.6, Qav.= 1.51, ovoidly-amygdaloid, finely to moderately verrucose, more strongly verrucose at the apex.

Specimens examined: Canada: Alberta, Hinton, S of Centre, Road to Percotte Creek, about 3 km from the crossing, old, mossy *Picea* dominated forest with some *Populus*, on rich ground, 30 Aug. 2011, K. Liimatainen, T. Niskanen 11-294, 7071979 (H). GenBank OL584180. USA: Alaska, Fairbanks, trails at the NW side of the campus, at the end of Yukon road (trail starting from parking place), *Picea* dominated forest with some *Betula*, *Populus* and *Alnus*, on rich ground, 15 Aug. 2011, K. Liimatainen, T. Niskanen 11-065, 7071980 (holotype; K isotype). GenBank OL584179; loc. cit. 17 Aug. 2011, K. Liimatainen, T. Niskanen 11-134, 7071981 (H). GenBank OL584181; loc. cit. mesic, mossy, partly needle and leaf covered *Picea* dominated forest with some *Populus*, *Betula*, *Alnus* and *Salix*, on rich ground, 22 Aug. 2011, K. Liimatainen, T. Niskanen 11-200, 7071982 (H). GenBank OL584182; University Campus NE, trails, fairly old, mesic, mossy *Picea* dominated forest with some *Betula* and *Alnus*, 21 Aug. 2011, K. Liimatainen, T. Niskanen 11-185, 7071983 (H). GenBank OL584183.

Etymology: The species belongs to *Cortinarius* sect. *Bovini*, that has been named after ox/cow. This species was named after another big herbivore, the moose (*Alces alces*), that occurs in boreal coniferous forests.

Notes: ITS sequence (GenBank OL584179, ex holotype) distinct from other members of *Cortinarius* sect. *Bovini* and with 97.5% similarity to the closest known species, *C. bovinatus*.

Ecology and distribution: In coniferous forests on calcareous ground. So far known from North America (Alaska, Alberta and Quebec).

*Cortinarius rubiginosus* Ammirati, Bojantchev, Niskanen & Liimat., sp. nov.

IF 559321

Holotype H 7072000

Diagnosis: Basidiomata medium to large-sized, agaricoid (cortinarioid), development type stipitocarpic. Pileus 3–9 cm diam., at first hemispherical, later more or less convex, margin sometimes becoming upturned; with orange fibrils over a whitish ground color, staining bright yellow when bruised and then slowly copper red brown, centre sometimes with small brownish red scales or spots; dry, non-hygrophanous. Lamellae adnate to adnexed, crowded, narrow, at first

cream-colored to pale greyish brown, then orange-spotted and finally orange-caramel. Stipe 5.5–12 cm long, 0.8–1.6 cm thick at the apex, ± cylindrical to somewhat clavate, often tapering at the base, surface at first white to cream-colored with orange fibrils, easily staining reddish, vinaceous or red brown. Context initially white but rapidly turning yellow in exposure and later orange to vinaceous orange. Universal veil yellow to pale orange, forming some incomplete bands on the stipe. Basal mycelium initially white, soon with orange spots. Odor indistinct or slightly fragrant. Exsiccatae rusty red. Basidiospores 6–7 (–7.5) × 4–4.5 (–5) μm, av. 6.6 × 4.3 μm, Q= 1.55–1.67, Qav.= 1.6, amygdaloid to almost citriform, outline sometimes irregular, finely verrucose to almost smooth. Cystidia 20–25 × 4–5 μm, fusoid-ventricose to fusoid cylindrical, on lamella edges (most common) and faces, colorless to yellowish. Pileipellis somewhat duplex-like, the hypoderm is poorly developed but the hyphae beneath the epicutis are hypoderm-like (elements that are short and wide). Epicutis hyphae 4–11 μm wide, colorless, yellowish or with orange-yellow to golden-yellow contents, wall colorless to yellow refractive, smooth to somewhat encrusted.

Specimens examined: USA: California. Humboldt County. Big Lagoon, trail starting from the school, spruce forest with moss cover, 3 Dec 2012, K. Liimatainen & J. Olsson, T. Niskanen 12-223, 7072000 (holotype; K(M), isotype), GenBank OL584184; Marin County. Point Reyes N.S., off Mt. Vision Rd., elev. 1220 ft., under *Pinus muricata*, 14 Dec 2015, coll. D. Bojantchev DBB71014; Mendocino County. Jackson State Forest, intersection of roads 408 & 409, Sequoia, *Notholithocarpus*, coll. L. Norvell, S. Redhead, 17 Nov 1992, LNN92.11.17-1 (WTU); loc. cit. mixed conifer dominated forest (*Tsuga*, *Fagus*, *Quercus*), 17 Nov 2012, T. Niskanen 12-077, 7072001 (H), GenBank OL584185; loc. cit. 23 Nov 2012, K. Liimatainen & D. Bojantchev, T. Niskanen 12-112, 7072002 (H), GenBank OL584186; Sonoma County. Salt Point State Park, 0.8 mi. North of Hwy 1, under *Pinus muricata*, 23 Dec 2016, coll. D. Bojantchev DBB72607; Trinidad, Sue-Meg State Park, 22 Nov 2013, mixed conifer stand, coll. D. Bojantchev DBB64701. Washington, Clallam County, LaPush, *Picea*, 10 Oct 1987, coll. N. Laycock, JFA9614 (WTU); near West Fk Pysht River and FS road 3116, late-seral coniferous forest dominated by *Tsuga heterophylla*, *Thuja plicata*, and *Gualtheria shallon* directly at the collection site, with *Pseudotsuga menziesii*, *Vaccinium parvifolium*, and *Mahonia nervosa* nearby, 11 Dec 2018, coll. S. Loring, SCL17718 (WTU); Grays Harbor County. Copalis, *Picea*, 28 Sept 1969, coll. B. Woo, DES15071 (WTU); Pierce County. Mount Rainier National Park, Ipsut Creek, conifer forest, 20 Oct 1995, coll. M. T. Seidl, MTS4204 (WTU).

Etymology: *Rubiginosus* (Latin) = rusty or rust-colored, refers to the colour of the exsiccatae and the colours that the fresh basidiomata gain after handling and with age.

Notes: ITS sequence (GenBank OL584184, ex holotype) distinct from other members of *C. sect. Crassi* and with 97.2% similarity to the closest known species, *C. rubicundulus*.

Ecology and distribution: In mixed conifer forest. So far known from North America (California, Vancouver and Washington).

*Cortinarius victoriaensis* Liimat., sp. nov.

IF 559322

Holotype K(M) 162337

Diagnosis: Basidiomata (medium to) large-sized, agaricoid (phlegmacioid), development type stipitocarpic. Pileus 6–12 cm diam., at first hemispherical, then convex to plano-convex, white to brownish white. Lamellae medium spaced, adnate to emarginate, at first almost white to very pale brown, later pale brown to brown. Stipe 7–15 cm long, 1–2 cm thick at the apex, rooting, white. Context white. Universal veil white, peronate, forming a distinct ring at the upper part of the stipe. Odour indistinct or could be somewhat mealy. Basidiospores (10–) 10.5–12 × 5–6 μm, av. 11.2 × 5.6 μm, Q= 1.7–2.2, Qav.= 2.0, amygdaloid to citriform, finely verrucose. Cystidia absent. Pileipellis simplex, hypoderm not developed.

Specimens examined: Australia: Victoria, Marysville, junction of Marysville Woods Point Road and Water Race Walking Track, 500 m alt., grid ref. 55H CU905470, on soil associated with *Eucalyptus obliqua*, 10 May 1995, K.C. Beaton & N.H. Sinnott 3115 (holotype). GenBank OL584188 (LSU), OL555377 (RPB1), OL555376 (RPB2).

Etymology: The species was first collected from Victoria State, Australia.

Ecology and distribution: In *Eucalyptus* forest. So far known from Australia (Victoria).