

Tab. 1. – Comparison of spore data from *Cortinarius arcuatorum* collections from California and Europe. (n=31). All measurements are given in μm .

collection	mean n=31	min	max	Q/ mean	V/mean n=31
America					
95/686 Mendocino	9.7 × 5.6	8.8 × 5.1	10.8 × 6.2	1.75	160
95/564 Patrick's Cr.	10.7 × 5.7	9.4 × 5.3	11.5 × 5.9	1.9	182
95/596 Danger Point	10.7 × 5.9	9.7 × 5.3	11.2 × 6.2	1.8	193
JFA 11803 Big Flat	10.6 × 5.8	10.0 × 5.5	11.4 × 6.1	1.8	187
Europe					
82/257 S. Quirico, I	10.1 × 6.0	9.7 × 5.9	10.9 × 6.4	1.7	190
96/193 Stabielle	10.1 × 6.1	9.0 × 5.6	11.2 × 7.1	1.7	198
95/221 Baselica	10.3 × 6.0	9.4 × 5.6	11.1 × 6.5	1.7	197
93/257 Borgotaro, I	10.3 × 6.1	9.7 × 5.5	11.5 × 7.1	1.7	191
82/443 Borgotaro	10.3 × 6.1	9.7 × 5.9	10.9 × 6.5	1.7	202
96/216 Marzocco	10.4 × 6.0	8.8 × 5.3	10.9 × 6.5	1.7	195
94/322 Val di Sella	10.5 × 6.3	9.7 × 5.6	11.2 × 7.1	1.7	216
96/157 Peschiera	10.6 × 5.9	9.7 × 5.3	12.3 × 6.5	1.9	196
74/526 Mendrisio, CH	10.6 × 6.3	9.7 × 5.9	11.8 × 6.8	1.7	218
93/247 S. Quirico, I	10.8 × 6.2	9.7 × 5.6	12.1 × 6.5	1.75	216
82/453 Borgotaro, I	10.8 × 6.3	10.0 × 5.9	11.5 × 7.1	1.7	225
68/135 Hardtwald, F	11.2 × 6.1	10.0 × 5.8	12.7 × 6.8	1.8	222
82/379 Redipuglia, I	11.3 × 6.2	10.3 × 5.6	12.3 × 6.8	1.8	226
82/544 S. Trinit, F	11.5 × 6.4	10.0 × 5.5	13.3 × 7.1	1.8	246
56/63 Stuttgart, D	11.8 × 6.3	10.0 × 5.9	13.6 × 6.8	1.75	243

Cortinarius (Phlegmacium) viridirubescens Moser et Ammirati, sp. nov. – Fig. 7, 14, 23.

Pileo 3–7 cm diam., convexo, primo margine involuto, dein convexo margine stricto, glutinoso, colore laete viride usque flavo-viride, saepe maculato, aetate disco interdum brunneo, lamellis primo argillaceis, dein pallide flavescens, aetate flavo-brunneis, adnatis dein emarginatis, tritis leniter rubescentibus, stipite 5–7 cm longo, apice 10–15 mm crasso, bulbo marginato 25–35 mm lato, laete luteo, bulbo fimbriato e velo flavo, mycelio flavo praedito, cortina pallide flava, carne pilei corticeae stipitis flava, medullae alba, in apice stipitis leniter rubescente, interdum etiam in parte inferiore stipitis bulboque. Sporis (8.8–)9.1–10.8 (–11.5) × 4.9–5.9 μm , amygdaliformibus usque sublimoniformibus, verrucosis, basiis 30–32 × 7.5–8 μm , tetrasporigeris, absque cheilocystidiis, fibulis praesentibus.

Habitatio in Quercetis (*Quercus garrayana*, *Lithocarpus densiflora*) vel silvis mixtis. Holotypus IB 95/688, Mendocino, California, 8 Dec. 1995, leg. M. Moser.

Pileus 3–7 (–7.6) cm diam., convex, later convex, margin involute at first later straight, only the sterile margin remaining in-rolled, glutinous, color from deep green nearest Met 1D8, to moss green, Citrine (R) or yellowish green, Met 2B7, 2B8, finally the yellow colors can dominate, ground color then Met 2A7, 2A6, but on this ground mottled with green spots, margin often paler and slightly punctate-guttate, occasionally also center more brownish in age (disc

R Roman Green, Mignonette Green then Olive Lake to Buffy Citrine, margin Olive Yellow). – Lamellae argillaceous at first, Tilleul Buff (R), Caill 71M, without any trace of olive, greenish or yellowish or lilac, later becoming pale yellowish, straw yellow, with age yellowish brown, reddening where bruised, rounded adnate, later emarginate, close to crowded, L=90, l=1–3, 22/cm at the margin, 5–7 mm wide (equal to thickness of pileus context). – Stipe 5–7 cm long, apex 10–15 mm, the marginate bulb 25–35 mm, bright yellow, Sulphur Yellow (R) to Pale Green Yellow (R), the bulb darker yellow and also fringed by yellow veil, Lemon Chrome (R) (R Citron Yellow), bulb underneath and mycelium Lemon Yellow (or Picric Yellow) (R). Cortina yellowish. – Context underneath the pileipellis pale greenish yellow, in stipe cortex yellow, (Citron Yellow or Pale Greenish Yellow (R)), in bulb dark yellow, toward the base olive–yellow, in the very base olive–brown, in pileus and stipe center whitish or pallid (oxidized apple slices), after some time staining red near apex and sometimes also in lower part of stipe and bulb (R Jasper Pink with spots of Coral Red). – Odor of hot baked (or not distinctive), taste mild.

Chemical characters. – KOH 20% on pileipellis red-brown, on context in pileus only slightly brownish, on yellow cortex and outside of the bulb dingy red-brown. – UV: pileus dark (reddish), gills yellow, stipe orange, bulb reddish, context yellow with blue areas, in bulb red.

Microscopic characters. – Basidiospores (8.8–)9.1–10.8(–11.5) × 4.9–5.9(–6.2) μm , mean 9.7 (S=0.35) × 5.3 (S=0.24) μm , Q=1.8, V=117–195 μm^3 , mean 145 μm^3 (S=16.5), almond-shaped to sublimoniform, verrucose, apex smooth. – Basidia 30–32 × 7.5–8 μm , 4-spored, clavate. – Without cheilocystidia. – Subhymenial hyphae 3–4.5 μm , gill trama hyphae 7–12 μm , mediostromatic hyphae 14–16 μm , all pale olivaceous in KOH, clamp connections present. – Pileipellis with a gelatinous pellicle of 2.5–4.5 μm wide hyphae, pale olivaceous, clamp connections present, subrepent to somewhat irregular. – Epicuticular hyphae 4–8 μm thick, pale olivaceous, slightly irregular. – No hypocotyl differentiated.

Habitat and distribution. – Under *Lithocarpus densiflora* or deciduous oaks (*Quercus garryana*), also in mixed forests of oak and tanoak with *Pseudotsuga*, *Tsuga* and/or *Sequoia*. Northern California.

Collections examined. – CALIFORNIA: Mendocino Co., Mendocino, Russian Gulch IB 91/524, IB 91/541, 23 Nov. 1991 and 25 Nov. 1991, leg. M. Moser; Mendocino, on Forest Rd. 408 about 8 miles from village, IB 95/622 27 Nov. 1995 leg. M. Moser, 95/688, (holotype) 8 Dec. 1995, leg. M. Moser. Del Norte Co.: Middle Fork of Smith River. Gasquet Flat (north side of river) IB 95/639 30 Nov. 1995, leg.

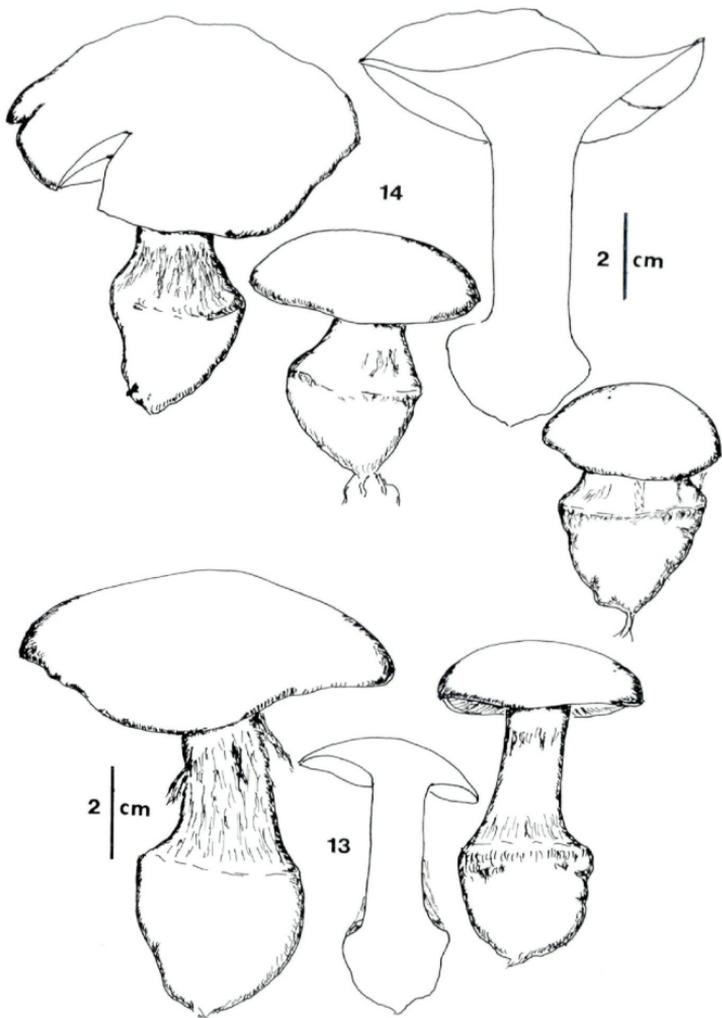
J. F. Ammirati and M. Moser, IB 95/651 same area, 2 Dec. 1995, leg. M. Moser, JFA 10217, Boise Creek Campground, leg. J. F. Ammirati, 16 Nov. 1990, JFA 10218, Boise Creek Campground Humboldt Co., 16 Nov. 1990, leg. J. F. Ammirati & D. Largent, IB 95/673, Boise Creek Campground, Humboldt Co., leg. D. Largent, 5 Dec. 1995.

At first the species seemed closely related to *C. atrovirens* Kalchbr. It differs, however, by argillaceous gills, white colors in the context and reddening of parts of context and gills. *C. ionochlorus* R. Maire (Maire, 1937) differs by lilac gills and yellow, not reddening context, *C. subionochlorus* R. Henry (Henry, 1961) differs by olive yellow gills with lilac toward the margin of the pileus and with olive green to yellow green context which can even have some lilac tints in the upper part of stipe. There are also differences in the reaction with KOH. In spite of these differences we think that the species is best placed within this group, i. e. section Scauri.

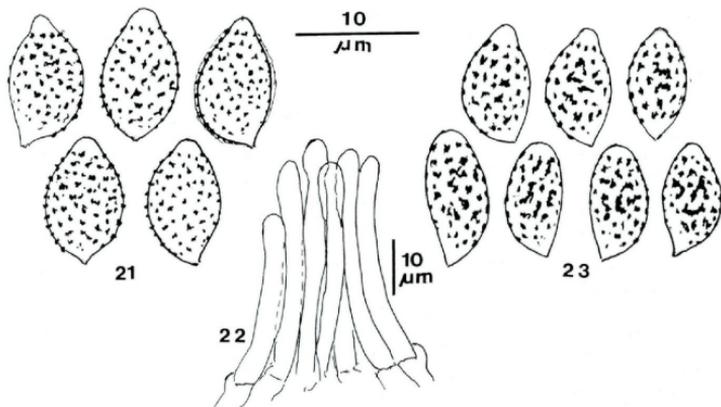
In Washington, Olympic Natl. Park, near Soleduck Falls one young, still closed specimen was collected (IB 95/176) which seemed at first to belong also to this taxon. It was, however, growing under *Pseudotsuga*. In addition, although immature, the few mature spores found were broader than in *C. viridirubescens* and no reddening of the context or gills was observed. This collection, therefore, seems to belong to another species.

Cortinarius (Phlegmacium) fulmineus (Fr.) Fr. Epicrisis p. 267.1838. Hym. Europ. p. 347, 1874. – Fig. 8, 20.

Pileus 4–15 cm diam., convex with involute margin at first, later applanate and finally center depressed and margin undulate, but margin even in old specimens remaining somewhat involute, glutinous, in young specimens with bright yellow color (Pinard Yellow (R), Martius Yellow (R) to near Picric Yellow (R), later only the marginal area remaining so or slightly darker, Chrome Yellow or Lemon Yellow (R), the center becoming fulvous, bright orange-brown, Xanthine Orange, Orange Rufous (R), some areas tinted Sanford's Brown (R), with age over most of the surface so, disc sometimes spotted, toward the margin sometimes with brown streaks but not innately fibrillose. – Lamellae at first yellow, viewed from edges Straw Yellow to Amber Yellow, Deep Colonial Buff (R), Caill 87L, later becoming brownish with an olivaceous tinge, Caill 65N, 60P, gill edge sometimes brownish, rounded adnate to emarginate, edges uneven to serrulate, sometimes with darker brown spots, close, L=120–140, l=1–3, 12–17–19/cm at margin, 4–7–12 mm wide, about half to one times the thickness of pileus context. – Stipe 3.5–11.5 cm long, 13–35 mm thick at apex, the obliquely marginate bulb 30–



Figs. 13–14. Basidiomata. – 13. *C. flavobulbus* 95/629. – 14. *C. viridirubescens* 95/688.



Figs. 21–23. – 21. Basidiospores of *C. griseocoeruleus* 95/685. – 22. Cheilocystidia of *C. griseocoeruleus* 95/582. – 23. Basidiospores of *C. viridirubescens* 95/688.

the spore size and he cites for his *C. arcuatorum* (here again as species) the plate of Bertaux (1957) in Bull. Soc. Myc. de France, Atlas pl. 112 (under the name of *C. fulvoincarnatus*). Romagnesi (1961) gives the spore size for *C. arcuatorum* to be 9–11.2 × 6.6 µm. The large dimensions given by Henry may be due to the fact that he measured them in lactic acid.

In studying the literature it becomes difficult if not impossible to distinguish the two taxa, with taxonomic characteristics overlapping in many instances. Also, we have made numerous collections of this species complex from different parts of Europe (Germany, Switzerland, France, Italy), which has further confirmed our opinion that there is a single species with a certain range of variability but not enough to recognize distinct taxa.

Our Californian collections are generally of small size but otherwise agree well with the European material in all other characteristics. When we compare the mean values for the spores they are about 0.3–0.5 mm narrower than the values found for European collections. This is particularly striking for the collection from Mendocino, which is otherwise the most typical in macroscopic characters. Single spore sizes overlap, however, as shown in Tab. 1. We cannot determine at this time whether or not this is significant. We could compare only four collections all from northern California. The junior author has observed the same species complex in Costa Rica (Central America), but these collections have not yet been studied in detail.