

## Appendix: Three New Taxa of California Boletes

(David Arora and Giampaolo Simonini)

The three new taxa of boletes discussed previously in this paper are formally described below. A more detailed descriptive treatment of all seven California porcini species is in preparation.

***Boletus rex-veris*** D. Arora & Simonini *sp. nov.*  
*Pileus rufus, testaceus vel suffusus ochraceus, vulgo siccus. Pagina pori juventute alba, lutescens tum olivacens vel viridulescens. Stipes crassus, juventute albus sed maturitate saepe bruneus vel ferrugineus suffusus, ad partem superam reticulatus. Contextus crassus, albus, ubi incisus immutabilis. Sporae 15–17×4.5–4.9 μm. Pileipellis trichodermium intertextum. Typus hic designatus Arora 2254 (SFSU), Pilgrim Creek Rd., McCloud, CA.*

*Etymology:* (*rex*, king; *veris*, of the spring)

*Pileus* (cap) 10–30 cm broad or occasionally larger, broadly convex or bun-shaped, becoming nearly plane or uneven, usually reddish-brown but varying to tan or paler where hidden by soil or humus and often developing ochre tones in age or where exposed to sunlight, and at other times dark dull brown. Surface typically not viscid except when wet or old, glabrous except for a very fine white bloom that covers often irregular areas of the young cap. *Pore surface* and tube layer white when young, gradually becoming yellow or yellowish-buff and finally olive-yellow or greenish; pores near the pileus margin may become cinnamon-brown in areas, but the pore surface doesn't become uniformly brown or cinnamon. *Stipe* 2.5–10 cm thick and 5–20 cm long or more, typically clavate with a pointed (and often curved) base when young, becoming more or less equal in age but usually retaining a tapered or pointed base. *Stipe surface* white when young, often developing tan or more often reddish-brown tinges in age, especially in the upper portion but occasionally throughout; typically reticulate over the upper portion; reticulum fine and white when young (and sometimes barely discernible), often brown in age as the meshes become wider and coarser. *Context* white in both the cap and the stipe (or reddish-tinged

just above the tube layer), unchanging when cut, firm; odor and taste mild.

*Spores* olive-brown in deposit but yellowish under the microscope, ellipsoid-subfusiform with a prominent suprahilar depression, (14) 15–17 (19)×(4) 4.5–5 (5.2) μm, Q=(3.02) 3.25–3.65 (3.87), *n*=31. *Basidia* (40) 45–60 (65)×9–11.5 μm, clavate, 4-spored. *Pleurocystidia* cylindrical-fusiform, hyaline, (45) 50–65×6.5–7.5 μm. *Cheilocystidia* clavate, sometimes narrowing or with capitulum or wide-fusiform, (30) 45–70×11–17 μm. *Pileipellis* an interwoven trichodermium, often weakly gelatinized in old specimens but typically not at all gelatinized in young ones, made up of chains of cells with cylindrical end cells having sharpened or rounded tips, (20) 30–80 (128)×(6.5) 8–14 (20) μm.

*Material Examined:* Holotype: Arora 2254 (SFSU), collected May 20, 2000, on Pilgrim Creek Rd. under ponderosa pine (*Pinus ponderosa*) at 3,400 ft. elevation near McCloud in Siskiyou County, CA. Isotype: UC 1860313, Siskiyou County, CA. Other: Arora 2255 (SFSU), Siskiyou County, CA; Arora 8202 (SFSU), Plumas County, CA; Arora 8203 (SFSU), Plumas County, CA; Arora 8226 (SFSU), Siskiyou County, CA; Swearingen 052 (SFSU), Yuba County, CA; Swearingen 060 (SFSU), Sierra County, CA; UC 1860234, Jackson County, OR.

*Habitat and Distribution:* Scattered to gregarious or clustered under mountain conifers, especially ponderosa pine (*Pinus ponderosa*) and lodgepole pine (*P. contorta* subsp. *murrayana*) and fir (*Abies* spp., especially *A. concolor* [Gordon & Glend.] Hildebr.), often buried in the needle duff and soil beneath understory shrubs (e.g., bitterbrush, *Purshia tridentata* [Pursh] DC). In California it is absent at low elevations along the coast but is locally abundant in the mountains; it fruits during the spring months (April–June) at mid-elevations (3,000–4,000 ft.) in the Siskiyou, Mt. Shasta area and Sierra Nevada, and into July at higher elevations (up to 7,000 ft.); it occurs at somewhat lower elevations in the Cascades of Oregon and Washington, extending east through the Blue Mountains to Idaho and perhaps beyond, and north to British Columbia. Outside of California, it also fruits principally in the spring or

early summer, during and after the natural morel crop (*Morchella* cf. *elata* Fr.).

***Boletus regineus*** D. Arora & Simonini *sp. nov.*

*Pileus* tipice juventute atrobrunneus subter tunica tenui, alba, pruinosa, pallescens vel magis cinnamomescens et viscidescens. Pagina pori juventute alba, lutescens tum viridi-flavescentes. Stipes crassus, vulgo albus, ad partem superam reticulatus. Contextus crassus, albus, ubi incisus immutabilis. Sporae 12–15 × 4–4.6 μm. Pileipellis maturitate cutis omnino gelatinosa. Typus hic designatus Arora 7202 (SFSU), Casa Madera, Gualala, CA.

*Etymology:* *regineus*, with the quality of a queen; queenly.

*Pileus* (cap) 7–30 cm broad, at first convex, then broadly convex to nearly plane; color very dark brown when fresh but often entirely or partially overlaid with a fine white bloom that gives it a paler, frosted appearance, in age the hoary patches tending to disappear and the surface often becoming paler brown or cinnamon blotched with even paler (white to pale tan) areas; surface glabrous except for the hoary patches, moist at first but typically becoming viscid in age or wet weather, sometimes uneven or with broad depressions. *Pore surface* and tube layer white when young, becoming yellow, then greenish-yellow as it matures; not blueing when bruised. *Stipe* 2.5–8 cm thick, 7–20 cm long, equal to clavate or slightly bulbous (usually more bulbous when young); surface finely reticulate over at least the upper portion, the reticulation white at first, white or brown in age; surface otherwise glabrous and white or nearly so, sometimes becoming brownish in age but more often remaining white. *Context* thick and white in both the cap and stalk (but sometimes vinaceous-tinged when young), not staining appreciably when cut or sometimes exhibiting a very slight blueing just above the tube layer; odor and taste mild.

*Spores* olive-brown in mass, but yellower than closely related species under the microscope, variable in shape and dimensions, long ellipsoid-fusiform, (11.5) 12–15 (17) × (3.9) 4–4.7 (5.4) μm; Q=(2.5) 2.8–3.3 (4.2), n=30. *Basidia* clavate, hyaline, mostly 4-spored, 23–40 × 8–11.5 μm. *Hymenial cystidia* thin-walled, inconspicuous. *Pileipellis* a completely gelatinized cutis when mature (and sometimes even in

youth), typically 200–250 μm thick. Cuticular cells 7–10 μm wide, variable in shape, sometimes branched or with diverticula.

*Material Examined:* Holotype: DA7202 (SFSU), under tanoak (*Lithocarpus densiflorus* Rehd.) and madrone (*Arbutus menziesii* Pursh), Casa Madera, Gualala, Mendocino County, CA, Nov. 27, 2007. Isotype: UC 1860314, Mendocino County, CA. Other: DA 0036 (SFSU), Santa Cruz County, CA; Arora 7155 (SFSU), Plumas County, CA; DA 9400 (SFSU), Sonoma County, CA; HDT 21316 (SFSU), Mendocino County, CA; HDT 26948 (SFSU), San Mateo County, CA; HDT 45351 (SFSU), Mendocino County, CA; HDT 45406 (SFSU), Mendocino County, CA; HDT 45406 (SFSU), Mendocino County, CA; HDT 48146 (SFSU), Yuba County, CA; Hoare (SFSU), Marin County, CA.

*Habitat and Distribution:* Solitary or in groups, commonly associated with hardwoods, especially tanoak (*Lithocarpus densiflorus* Rehd.), but also with madrone (*Arbutus menziesii* Pursh), golden chinquapin (*Chrysolepis chrysophylla* [Dougl. ex Hook.] Hjelmq.), manzanita (*Arctostaphylos* spp.), and oak (*Quercus* spp.); common in the coastal ranges from central California north to Oregon, and in the foothills of the Sierra Nevada, usually fruiting in the fall (October–December) and occasionally in the spring. It also occurs in the low to mid-elevations of the Cascades of Oregon and Washington in association with conifers, but is not nearly as abundant there as in the hardwood forests of California.

***Boletus edulis* var. *grandedulis*** D. Arora &

Simonini *var. nov.*

*Similis* Boleto *eduli* var. *eduli* sed interdum magnus et pagina pori maturitate brunneus vel cinnamomeus. Holotypus Arora 7188 (SFSU), Casa Madera, Gualala, CA.

*Etymology:* *grand*, large; *edulis*, referring to *B. edulis*.

Similar to typical (European) *B. edulis* but larger and with brown to cinnamon pore surface when mature. *Pileus* (cap) 10–50 cm broad or more, convex or bun-shaped in most stages, viscid when moist, whitish soon becoming pale brown

to brown or often deep reddish-brown as it matures, or yellow-brown in dry weather (often yellowest at margin); smooth or wrinkled. *Pore surface* whitish when young, becoming tan or slightly yellowish as it matures and then becoming distinctly brown to cinnamon or even reddish at maturity; *not* blueing when bruised but may stain slightly brownish; tube layer olive-yellow or olive when mature. *Stipe* often massive, up to 15 cm thick and 40 cm or more long, often bulbous when young, clavate to more or less equal in age; surface typically white at first, remaining white or becoming pale brown to brown in age; upper portion covered with a fine white reticulum when young, the reticulum sometimes obscure in age and at other times conspicuous and extending nearly to the base. *Context* in both the cap and stipe thick, firm, white, not staining when cut (or rarely blueing slightly just above the tube layer); odor and taste mild or pleasant.

*Spores* olive-brown in mass, yellowish under the microscope, smooth, fusiform to subellipsoid, (12) 13–15.5 (17) X (3.8) 4–5.5 (6)  $\mu\text{m}$ ; Q=(2.5) 2.7–3.5 (3.9),  $n=30$ . *Basidia* clavate, 2-, 3-, or 4-spored. *Hymenial cystidia* inconspicuous, fusoid-ventricose. *Pileipellis* an often gelatinized trichodermium of interwoven hyphae with irregular, often diverticulate end cells 34–52 $\times$ 6–10  $\mu\text{m}$ .

*Material Examined:* Holotype: Arora 7188 (SFSU), with *Pinus muricata*, Casa Madera, Gualala, Mendocino County, Nov. 17, 2007. Isotype: UC 1860315, Mendocino County, CA. Other: Arora 0201 (SFSU), Mendocino County, CA; Arora 0206 (SFSU), Mendocino County, CA; Arora 6001 (SFSU), Monterey County, CA; Arora 7190 (SFSU), Mendocino County, CA; Thiers 8155 (SFSU), Mendocino County, CA; Thiers 30750 (SFSU), Sonoma County, CA; Swearingen 044 (SFSU), Monterey County, CA; Swearingen 049 (SFSU), Monterey County, CA; Swearingen 98–02 (SFSU), Tuolumne County, CA.

*Habitat and Distribution:* Solitary to gregarious in coastal pine forests and at their edges (especially with *Pinus muricata*, *P. radiata*, *P. attenuata* Lemmon, and *P. contorta* Dougl.), less commonly associated with live oaks (*Quercus agrifolia* Née and *Q. parvula* var. *shrevei* [C.H.Mull.] Nixon), and found at mid-to-high elevations in the Sierra Nevada with *Pinus* and *Abies* spp. Abundant in the fall and winter (and occasionally spring) from San Luis Obispo County in central California north along the coast to Mendocino County and beyond, and fruiting during the summer and fall in the Sierra Nevada and other mountain ranges.