

Gyroporus and Fuscoboletinus by one each. None of the areas within the southwest has been extensively studied and all warrant further study. Particularly exciting would be an opportunity to study the flora of the forested peaks of southern Arizona and New Mexico because of their isolation from other forested areas.

The data, although obviously incomplete, indicate a rather close affinity with the fleshy fungus flora of the west coast. No rough-spored species, for example, have been found in either area. Furthermore, there is a much greater duplication of species between this region and the west coast than with those on the east coast or midwest. Some eastern species, however, such as Boletus affinis, B. luridus, Suillus subaureus and Tylopilus alboater, do extend into New Mexico, but are not known from more westerly regions. There is much duplication in the floristic composition of the forests of the southwest and far west which is probably the most important factor influencing the similarity of the fungus flora of the two regions.

In the following descriptions of new species all colors in quotes are from Ridgway (1912). Collections are on deposit in the Cryptogamic Herbarium of San Francisco State University (SFSU). Grateful acknowledgement is made to the National Science Foundation for Grants Nos. 2932 and 2932A which financed much of the field work.

Boletus barrowsii Thiers & Smith sp. nov.

Pileus 9-20 cm latus, convexus demum late convexus vel plano-convexus, siccus, tomentosus vel velutinus, albidus vel pallide subroseo-bubalinus, immutabilis. Contextus 2-3 cm crassus, albus, immutabilis. Sapor odorque mites. Tubuli 1-2 cm longi, subflavi vel isabellini; pori 1-2 mm lati, immutabiles. Stipes 8-15 cm longus, 2-5 cm crassus, reticulatus, clavatus, immutabilis, siccus, pileo concolorus. Sporae 13-15 x 4-5 μ m, subcylindricae vel anguste subfusoidae. Cystidia 37-50 x 5-9 μ m, fusoido-ventricosa. Hyphae cuticulae appressae vel intertextae. Holotypus (Thiers 27816) lectus prope Jacob Lake, Kaibab National Forest, Coconino County, Arizona, Aug. 21, 1971; in herbario San Francisco State University (SFSU) conservatus.

Pileus (6) 9-10 (30) cm broad when mature, convex to pulvinate when young becoming broadly convex to plano-convex with age; surface dry, dull, smooth, sometimes obscurely rimose, when young often covered with a fine pruinose coating that is easily removed, or appearing glabrous, sometimes becoming tomentose to velutinous with age, or remaining glabrous, white to whitish or buff ("cartridge buff" to "pale pinkish buff" to "pinkish buff") during all stages of development, unchanging or becoming brown when bruised; margin incurved, entire. Context 2-3 cm thick, floccose, white except sometimes pale vinaceous near the cuticle, unchanging when exposed; taste mild, odor mild or sometimes strong and unpleasant when dried.

Tubes 1-2 cm long, depressed, white when young, becoming yellow ("colonial buff" to "deep colonial buff" to as dark as "Isabella color") with age; pores 1-2 mm, angular, stuffed when young, concolorous with the tubes, unchanging or darkening slightly when bruised.

Stipe 8-15 cm long, 2-5 cm broad at the apex, bulb up to 9 cm broad, equal to clavate to bulbous at the base, sometimes with a narrowed point at the base; solid; surface dry, whitish to pinkish buff or pinkish cinnamon, white at the base, unchanging when bruised, reticulate, often all the way to the base, reticulations typically fine and delicate. Context white, unchanging when exposed.

Spores 13-15 x 4-5 μ m, subfusoid to subellipsoid in face view, inequilateral in profile, smooth, thin-walled, pale ochraceous in KOH and Melzer's reagent; basidia clavate, 4-spored, hyaline in KOH, 25-34 x 8-11 μ m; hymenial cystidia crowded on the pores, scattered to numerous on the sides, hyaline in KOH, thin-walled, cylindrical to subclavate to obscurely fusoid-ventricose, 37-50 x 5-9 μ m; tube trama strongly divergent from a poorly defined central strand, hyaline in KOH, hyphae 3-5 μ m broad; pileus trama homogeneous, interwoven, hyphae 2-4 μ m broad; cuticle poorly differentiated as a cutis of appressed to slightly interwoven hyphae, hyphae 4-6 μ m broad, hyaline, not gelatinous. No clamp connections seen.

Spore deposit dark olive brown.

Chemical Reactions. HNO_3 - cuticle orange, context yellow. FeSO_4 - context gray.

Habit, habitat and distribution. Gregarious to solitary in soil under conifers. It is typically found under ponderosa pine (Pinus ponderosa Dougl. ex P. & C. Lawson) but firs (Abies sp.) have sometimes been observed in the immediate vicinity. In New Mexico it has also been found in mixed populations of conifers and hardwoods, particularly oaks. At present Boletus barrowsii is known from New Mexico and Arizona in the southwestern United States and from Idaho in the northwestern region. It has also been found in Mexico.

Material studied. Arizona: Thiers 27739, 27816 - holotype, 27817, 27818, 27819, 28110, 28176, 28185, 28279, 28969. Idaho: Miller 9, 9a, Trueblood 2220. New Mexico: Barrows 922, 1348. Mexico: Guzman 3013.

Observations. The white tubes that are "stuffed" when young and which later become yellow plus the reticulate stipe place this species in the section Boletus, Subsection Boleti with Boletus edulis, B. aereus and other well known species. The white to pallid color of the pileus and stipe readily distinguishes it from other species within that section. Other characteristics which distinguish it are the somewhat narrow spores, the absence of any amyloid reaction in the hymenium and the poorly developed cuticle. Its edibility is unknown.

This species is named in honor of Charles Barrows of Sante Fe, New Mexico, who first brought it to our attention.

Leccinum subalpinum sp. nov.

Pileus 8-20 cm latus, globosus vel convexus demum plano-convexus vel planus vel depressus, siccus demum viscidus, tomentosus vel appresso-fibrillosus demum fibrilloso-squamosus, rufus vel lateriticus vel rufobrunneus. Contextus albus tarde fuscus. Sapor et odor mites. Tubuli 1-2.5 cm longi, pallide olivaceo-bubalini, tactu avellanei. Stipes 6-15 cm longus, 1-3 cm crassus, siccus, albus; squamae parvae, albae aetate nigrae. Sporae 13.5-15.5 x 4-5 μm , ellipsoideae vel subellipsoideae. Cystidia 28-35 x 8-13 μm . Cuticula

intertexta. Holotypus (Thiers 26823) lectus prope Bald Mountain Pass, Uintas Mountains, Wasatch National Forest, Summit County, Utah, Aug. 7, 1970; in herbario San Francisco State University (SFSU) conservatus.

Pileus (5) 8-20 cm broad, globose to convex when young becoming pulvinate to plano-convex to plane to slightly depressed on the disc with age; surface dry to subviscid when young becoming viscid with age, conspicuously tomentose to appressed fibrillose when young, typically becoming strongly appressed-fibrillose scaly with age, usually scales more strongly developed toward the margin, tips of scales sometimes breaking free with age, remaining strongly apparent in dried basidio-carps; surface more or less evenly colored dark reddish brown ("morocco red" to "burnt sienna" to "mahogany red" to "bay") when young, often with areas irregularly distributed which are red ("grenadine red" to "flame scarlet"), unchanging or becoming dark reddish brown to reddish orange ("Kaiser brown" to "Hays russet" to "Mars orange" to "English red") with age, unchanging when bruised; margin usually with a conspicuous sterile flap. Context white, unchanging or very slowly and erratically changing directly to fuscous with no reddish intermediate phase; taste and odor mild.

Tubes 1-2.5 cm long, adnexed to deeply depressed, pallid ("pale olive buff"), staining pale vinaceous ("avellaneous") when exposed or bruised; pores small, up to 1 mm broad, angular, concolorous with the tubes, staining brown when bruised.

Stipe 6-15 cm long, 1-3 cm broad at apex, equal to subclavate to clavate, not bulbous, occasionally ventricose; solid; surface dry, background white or occasionally pale umber or gray, scabrosities typically pallid when young becoming very dark brown or black with age, sometimes remaining inconspicuous. Context white, unchanging or slowly becoming fuscous, rarely with a slightly reddish intermediate phase in basal portion, occasionally becoming blue in the base.

Spores 13.5-15.5 x 4-5 μm , pale ochraceous in KOH, ochraceous in Melzer's reagent, ellipsoid to subcylindric in face view, ventricose in profile, smooth, thin-walled; basidia 18-22 x 7-9 μm , hyaline, clavate, 4-spored; hymenial cystidia rare to scattered, obscure, hyaline,