

Amanita magniverrucata sp. nov.

Pileus 6-15 cm latus, convexus vel globosus demum plano-convexus vel planus vel depressus, margine valde appendiculatus, albus, verrucis densis, magnis, conspicuis, pyramidalibus obtectus; verrucae omnino albae demum apice bubalinae vel subbrunneae. Lamellae adnexae vel liberae, albae vel subbubalinae, in sicco bubalinae vel subbrunneae, margine fimbriatae. Stipes 7-12 cm longus, apice 1-2 cm crassus, subaequalis, sursum attenuatus, albidus vel albus; annulus amplus, apicalis vel superus, plerumque persistens; bulbus conspicuus, usque 6 cm crassus, conspicue radicans; volva ex circulis verrucarum friabilium, evanescentium, circum apicem bulbi constans. Sporae 8.5-12.3 x 5.5-8.5 μ m, hyalinae, ovoideae vel subglobosae, amyloideae. Holotypus: R. S. Keller 801, San Mateo Co., California, 13 March 1970. SFSU.

Pileus 6-15 cm broad when mature, convex to globose when young becoming plano-convex to occasionally plane to irregular to shallowly and broadly depressed with age; margin strongly incurved to inrolled when young becoming decurved and sometimes eventually plane, often strongly appendiculate with partial veil fragments, fragments disappearing with age and margin eventually appearing uneven and somewhat eroded; surface moist to subviscid, viscosity never strongly apparent, covered during all

stages of development with large (0.5-2 cm broad at base, up to 1 cm high), conspicuous pyramidal warts; warts strongly attached to surface and when removed leaving a noticeable depression or scar on the pileus, typically covering the entire surface of the pileus and rarely disappearing with age, rarely more abundant on the disc and somewhat smaller and obscure toward the margin, persistent even when dried, white to whitish but usually with age assuming "warm buff" to pale brown colors at least at the tips; ground color of the pileus white to whitish, unchanging or darkening slightly when bruised, occasionally with a few scattered brownish to buff colored stains when old. Context 8-18 mm thick, white, unchanging when exposed, firm, FeSO₄ greenish then dark gray on context. Taste mild, odor strong, pungent, unpleasant.

Lamellae adnexed to shallowly notched becoming free with age; close to subdistant, broad and usually ventricose, thick, white to whitish to pale ivory to pale buff, drying buff to light brown, not changing when bruised; much of partial veil often remaining attached to lamellae, margin usually fimbriate and whitish when dry; lamellulae in several tiers.

Stipe 7-12 cm long, 1-2 cm broad at apex, subequal or tapering toward the apex, with a conspicuous bulbous enlargement at base, bulb not abrupt, up to 6 cm broad, with a strongly developed, conspicuous, root-like extension; surface dry, white to whitish, usually showing tawny to brown or buff colored stains, especially when dried; above annulus glabrous and obscurely striate, below annulus appressed fibrillose, often with scattered patches or warts or universal veil tissue, not floccose or squamulose, outer layer of stipe sometimes rupturing to form irregular patches in lower portion of stipe. Annulus ample, apical to superior, usually persistent, but sometimes reduced and disappearing with age, upper surface smooth, lower surface often with scattered fibrillose patches; sometimes remaining attached to lamellae. Volva represented by one or more irregular to concentric bands of friable scales near the apex of the bulb, frequently disappearing with age.

Spores white in mass, 8.5-12.3 x 5.5-8.5 μ m, ovoid to subglobose, hyaline, amyloid, thin-walled, apiculus eccentric. Basidia 4-spored, some 2-spored, clavate, hyaline in KOH, 40-55 x 8-12 μ m. Pleurocystidia and cheilocysti-

dia not differentiated. Marginal cells of lamellae globose to saccate to clavate, abundant, terminal, hyaline in KOH, thin-walled, 22-55 x 13-40 μm . Lamellar trama bilateral, strongly divergent from a well developed central strand, hyaline, hyphae 3-8 μm wide. Pileal trama interwoven, hyaline, homogeneous except for scattered laticiferous hyphae, hyphae 4-6 μm wide. Pileal cuticle interwoven to radially appressed, hyphae 3-12 μm wide, terminal cells sometimes large and sausage shaped. Universal veil tissue composed of numerous clavate to globose sphaerocysts, 30-50 x 20-38 μm , with connective hyphae 2-5 μm wide, often with short, blunt-tipped to spinose branches. Volval tissue similar. Annulus similar to volva but sphaerocysts usually smaller. Clamp connections not seen.

Habit, habitat and distribution. This *Amanita* is known with certainty only from the coastal forests of northern and central California. So far it has been found in association with Bishop pine, *Pinus muricata* D. Don., but is probably also associated with other closely related pines. It is usually rare; however, in winter of 1981 basidiocarps were quite abundant in Marin Co., California.

Material studied. CALIFORNIA: Marin Co.: H. D. Thiers 41750, 41753, 41755. San Mateo Co.: C. Calhoun 375; M. Concannon 381; R. S. Keller 788, 801 (Holotype); C. Rickard 1977; H. D. Thiers 8736, 25290.

Observations. The amyloid spores, appendiculate margin of the pileus and the warty, friable volva place this species in section *Lepidella*. It is distinct by the very large, conspicuous, pyramidal, permanent warts on the pileus, the characteristic nature of the bulb with its noticeable pseudorhiza, the bands of warts representing the volva and the absence of floccose or squamulose tissue on the stipe. It is somewhat suggestive of the drawing of *Amanita ravenelii* (Berk. & Curt.) Sacc. in Bas (1969); however, the volva is quite different. The size, abundance, color and permanence of the pileal warts distinguish it from *Amanita cokeri* (E. J. Gilb. & Kühner) E. J. Gilb.