

Calvatia baixaverdensis



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Calvatia baixaverdensis R.L. Oliveira, R.J. Ferreira, P. Marinho, M.P. Martín & Baseia, *sp. nov.*

Etymology. In reference to the region where this species was collected, Baixa Verde, João Câmara, RN, Brazil.

Classification — *Agaricaceae*, *Agaricales*, *Agaricomycetes*.

Basidiomata growing solitary, epigeous, incrustations in the rooting base, subglobose and 31–36 mm wide × 16–28 mm high. **Exoperidium** < 0.1 mm thin, fragile, slightly tomentose, evanescent, white to yellowish white (3A1, 3A2; Komerup & Wanscher 1978). **Mesoperidium** < 0.1 mm thin, fragile, membranaceous, persistent at the base, smooth with senescence, greyish brown to brown (4C4, 6D3, 6E4, 7F4). **Endoperidium** < 0.3 mm thin, fragile and brittle at the apex, resistant and persistent at the base, papyraceous, olive brown to brown (4D6, 6E4). **Rhizomorphs** not seen. **Subgleba** reduced, woolly, compact, brownish beige (6E3). **Gleba** powdery, not persistent, brownish beige, brown to dark brown (6E3, 6E4, 6F4), at maturity. **Exoperidium** hyphallic, 2.0–5.3 µm diam, intertwined, frequent and non-regular septa, double V branching, walls ≤ 1.1 µm thin, straight for curves, hyaline, dextrinoid, low reaction and cyanophilic. **Mesoperidium** compacted, collapsed, hyaline, not dextrinoid and cyanophilic. **Endoperidium** apical composed of two layers of hyphae continuous, all brown, not dextrinoid and cyanophilic, hyphae 2.4–6.6 µm diam, frequent and non-regular true septa, double V branching, and mycosclereids globose, subglobose, pyriform, ovoid, ellipsoid, or rectangular, 15.4–60.3 µm high × 4.6–57.6 µm diam, weakly interconnected, branched, breaking in the septa, regular and thick walls ≤ 1.4 µm thin and straight for curves. **Endoperidium** basal hyphallic, 1.9–3.9 µm diam, rare and non-regular true septa, V-shaped branches, single and double, and in T, walls < 1.0 µm thin, tortuous and regular, brown, dextrinoid, and cyanophilic. **Subgleba** hyphallic, 1.5–3.8 µm diam, rare true septa, branching V, single and double, and T, cyanophilic nodes frequent, regular walls ≤ 1.0 µm thin, straight for curves, reddish brown, not dextrinoid and cyanophilic. **Paracapillitium** absent. **Capillitium** *Calvatia*-type, 1.9–3.5 µm diam, hyaline to light brown, dextrinoid and cyanophilic; septa frequent and non-regular, V-branching, single and double, and in T, fragmenting in any part of the capillitium or frequent in the septa; walls ≤ 0.8 µm thin and regular, straight, with large and numerous conspicuous pits (1–3 µm wide).

Basidiospores globose to subglobose, 3.4–5.3 µm wide × 3.3–5.0 µm high ($\chi = 4.1 \pm 0.3 \times 3.9 \pm 0.3$; Q_m (medium coefficient) = 1.05; n (measurement numbers) = 30), verrucose, ornamentation < 1 µm length; pedicels present in some basidiospores ≤ 0.7 µm in length.

Habit & Habitat — Basidiomata growing solitary on moist soil.

Typus. BRAZIL, Rio Grande do Norte, João Câmara, Serra do Torreão, 17 Feb. 2017, R.L. Oliveira (holotype UFRN-Fungos 3027; ITS sequence GenBank MT152990, MycoBank MB827690).

Additional materials examined. BRAZIL, Rio Grande do Norte, João Câmara, Serra do Torreão, 17 Feb. 2017, R.L. Oliveira (UFRN-Fungos 3027); *ibid.*, 17 Feb. 2017, R.L. Oliveira (UFRN-Fungos 3028); *ibid.*, 5 Mar. 2019, R.L. Oliveira (UFRN-Fungos 3117); *ibid.*, 5 Mar. 2019, R.L. Oliveira (UFRN-Fungos 3118).

Notes — *Calvatia baixaverdensis* is morphologically related to species of sect. *Calvatia*: *C. craniiformis*, *C. subtomentosa*, *C. rugosa*, *C. nodulata*, and *C. holothurioides*. *Calvatia craniiformis*, *C. rugosa* and *C. subtomentosa* have a capillitium with large conspicuous pits (1–3 µm wide) similar to *C. baixaverdensis*. However, *C. craniiformis* presents subglobose to globose basidiospores with punctate ornamentation, and well-developed cellular subgleba. *Calvatia rugosa* has exoperidium granulose, furfuraceous to subvelutinous, endoperidium smooth, membranous, very thin (< 0.5 mm), subgleba well-developed and lanose to cellular (Reid 1977). *Calvatia subtomentosa* has basidiospores 3.6–4.4 µm diam, and capillitium 3.6–5.8 µm, branched, septate, rather short fragments (Dissing & Lange 1962), but is easily distinguished from *C. baixaverdensis* in the ornamentation of the basidiospores, equinulate, and in the absence of pedicels, besides the absence of large pits in the capillitium and nodules in the hyphae of subgleba in *C. subtomentosa*. *Calvatia nodulata* and *C. holothurioides* are other morphologically close species to *C. baixaverdensis* mainly by the basidiospores 3–5 µm diam and capillitium 2–4 µm diam; however, *C. nodulata* has exoperidium granulose to pilose, subgleba occupying half of the basidiomata, and capillitium with spaced nodules (Alfredo et al. 2014), and *C. holothurioides* has subgleba prominent, cellular, capillitium with pores up to 2 µm diam (Rebriev 2013).

Colour illustrations. Brazil, Rio Grande do Norte, João Câmara, Serra do Torreão, where the specimens were collected. From bottom to top: mature basidiome *in situ*; longitudinal section through mature basidiome; capillitium under SEM; basidiospores under SEM. Scale bars = 10 mm (basidiomes), 1 mm (SEM photos).

Supplementary material

FP1067 The ITS nrDNA consensus phylogenetic tree was obtained with a Bayesian analysis using MrBayes v. 3.2.7a (Ronquist & Huelsenbeck 2003) under T92+G+I evolutionary for 5 M generations.

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