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A new arenicolous *Boletus* from the Gulf Coast of northern Florida

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Abstract — *Boletus abruptibulbus* sp. nov. is described as new to science. It inhabits old sand dunes in mixed oak-pine stands across the Gulf Coast of northern Florida.

Key words — *Boletaceae*, ectomycorrhizal fungi, taxonomy

Introduction

It is not uncommon to find boletes fruiting in sandy inland soils, especially in Florida. However, in coastal sand dunes only two species of *Boletaceae* have been described from North America: *Phylloporus arenicola* A.H. Sm. & Trappe from Oregon (Smith & Trappe 1972) and *Leccinum arenicola* Redhead & Watling from New Brunswick (Redhead & Watling 1979). To these we add *Boletus abruptibulbus* from the Gulf Coast of the Florida Panhandle.

Materials and methods

Color terms are general approximations, while numerical color designations are from Kornerup & Wanscher (1978). Macro-chemical reaction was determined using NH_4OH. Microscopic structures were observed with an Olympus BH-2 compound microscope, free hand sections of fungal dried material were rehydrated and mounted in H_20, 5% KOH and Melzer's solution. In the description of basidiospores, n = number measured, followed by the mean spore lengths and widths ± their standard deviations and the Q_m value, which represents the mean Q value ± their standard deviation; Q = mean length/width ratio. The herbarium acronym is from Holmgren et al. (1990).

Fig. 1. Basidiomata of *Boletus abruptibulbus*, HOLOTYPE, Both 4588 (BUF). Scale bar = 15 mm. Photo by WCR.

Taxonomic description

Boletus abruptibulbus Roody, Both & B. Ortiz **sp. nov.** Figs. 1, 2

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Pileus rubrobrunneus, glaber, siccus vel viscidus in humide, 30-80 mm latus. Contextus albus vel pallide luteus, immutabilis. Tubi flavi, demum olivaceo-viridi, pori concolores. Stipe pallide flavus, bulbosus vel abrupti bulbosus. Basidiosporae 13.5–19.8 × 5–7.2 µm.

Holotype*: Both 4588* (BUF).

Etimology: *abruptibulbus*, abrupt bulb, referring to the abruptly bulbous basal area

Pileus 30–80 mm broad, convex to plano-convex, dry to subviscid when wet, shiny, glabrous, occasionally appressed fibrillose becoming rimulose, pileipellis thin, detersible; reddish brown (8E8) or dark brown (7F8 or 6F8) becoming cinnamon brown (6D6–7); margin incurved when young, becoming decurved when mature, sterile. Pileus trama white to very pale yellow, unchanging when exposed. Odor pleasant, taste mild. Hymenophore tubulose, narrowly depressed near stipe with short decurrent teeth, tubes centrally 3–8 mm long, pale yellow (3A3) at first, becoming pale golden yellow (3A4–5), with age yellowish to greenish olivaceous (3C5 to 3D5), not staining when bruised; pores isodiametric at first, becoming angular to pentagonal in age, sublamellate at the stipe, 1–2 mm broad, concolorous with tubes. Stipe 30–50 mm long, 10–15 mm broad above, 20–25 mm at the bulbous base, equal above, strongly bulbous to abruptly bulbous below, with a strongly developed pseudorhiza 5–15 (–20) mm long, covering with sand adhering to mycelial strands; basal mycelium white; dry, solid, glabrous to minutely pruinose in apical area and there yellow

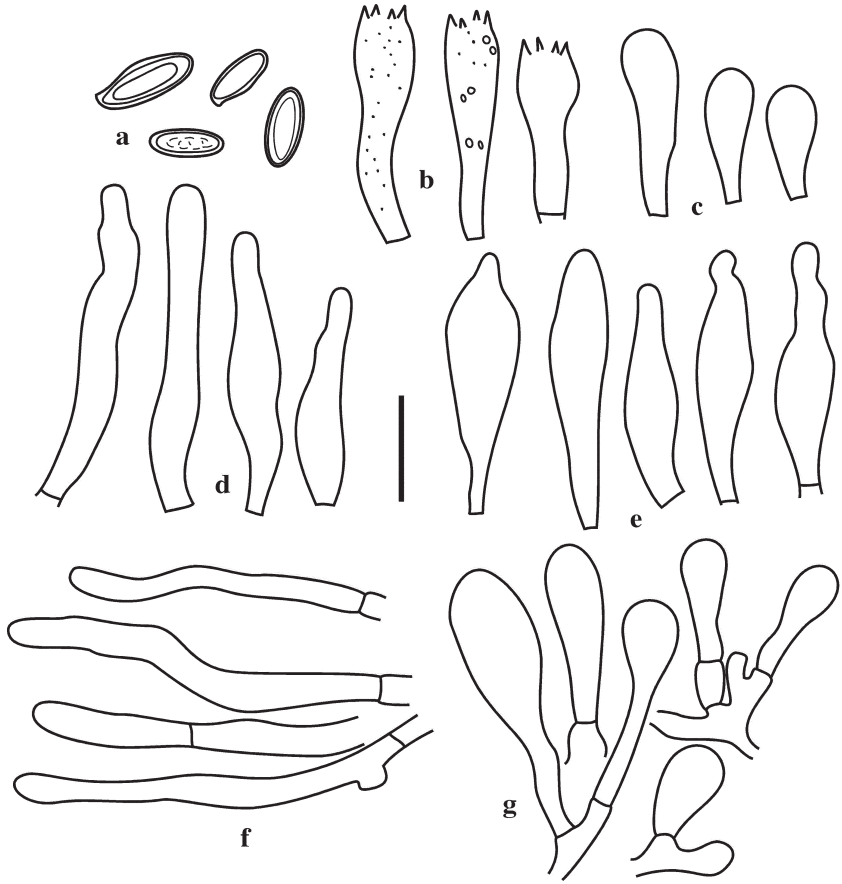

Fig. 2. Microscopic features of *Boletus abruptibulbus*, HOLOTYPE, Both 4588 (BUF).
a. Basidiospores. b. Basidia. c. Basidioles. d. Pleurocystidia. e. Cheilocystidia.
f. Elements of the pileipellis. g. Caulocystidia.
Scale bar = 20 μm.

(3A2–3), gradually and irregularly reddish-concolor with pileus downward, bulbous area with deeper reddish stains, not staining when bruised. Stipe trama solid, pale yellow, larval tunnels reddish brown, unchanging when cut.

Basidiospores 13.5–19.8 (–22.5) × 5–7.2 μm, (n = 20, 15.3 ± 2.39 × 5.8 ± 0.66; Q_m = 2.68 ± 0.26), smooth, fusoid, grayish yellow or greenish yellow in KOH, dextrinoid in Melzer's. Basidia 28.8–42.3 × 7.2–11.7 μm, clavate, hyaline, 4-sterigmate. Basidioles 20.7–35.1 × 7.2–9 μm, clavate. Pleurocystidia 41.4–61.2 × 7.2–10.8 μm, narrowly subfusoid to subcylindric or cylindric, some with an attenuate base, hyaline, smooth and thin-walled. Cheilocystidia

31.5–49.5 × 7.2–13.5 μm, fusoid-ventricose to fusoid, some fusoid-capitate, hyaline, smooth and thin-walled. Pileipellis a tangled layer of repent hyphae 3–13.5 μm, broad, subgelatinous, contents golden yellow in H_2O, becoming grayish yellow in KOH; orange yellow to pale orange brown in Melzer's; end cells cylindrical. Tube trama boletoid, moderately divergent, grayish yellow in KOH, lateral strata elements 3.6–7.2 μm broad, loose, gelatinized in KOH; mediostratum 27–51 μm wide, subparallel to parallel hyphae 3.6–19 μm broad. Pileus trama hyphae interwoven, 4.5–22.5 μm broad, hyaline in KOH, yellow in Melzer's, smooth, thin-walled. Stipitipellis hyphae 3.6–13.5 μm broad, subparallel to interwoven, hyaline in KOH, pale orange yellow or grayish yellow in Melzer's. Caulocystidia 17.1–51.3 × 7.2–17.1 μm, broadly clavate or clavate, some in clusters, hyaline, thin-walled. Clamp connections absent.

Macrochemical reactions: With 12% of aqueous solution of ammonia (NH_4OH) immediately dark red on the pileus surface and on the bulbous base of the stipe on dried material, remaining so for about 15 seconds, and then slowly fading.

Ecology, range distribution: Solitary to gregarious in sand, on older dunes in a transition zone between coastal scrub and oak-pine woods (*Quercus geminata*, *Q. myrtifolia*, *Pinus clausa*). At present only known from the Gulf Coast of the Florida Panhandle. Fruiting from December to March.

> Material examined: USA. FLORIDA. *Franklin County*: Alligator Point, 7 Dec 2004, W.C. Roody (*Both 4587)* (BUF); Bald Point State Park, 31 Jan 2008, W.C. Roody *(Both 4595)* (BUF); *Gulf County:* Cape San Blas, 19 Dec 2003, W.C. Roody, *(Both 4586)* (BUF); 4 Jan 2005, W.C. Roody, *(Both 4588)* (HOLOTYPE: BUF); St. Joseph Peninsula State Park, 30 Jan 2005, W.C. Roody, *(Both 4589)* (BUF).

Commentary: The strongly bulbous to abruptly bulbous base, the prominent pseudorhiza, the fairly large spores, and the habit in coastal sand dunes are diagnostic features of *Boletus abruptibulbus* that sets it apart from other boletes. The abruptly bulbous base appears to be more common in mature specimens while the bulbous base is more prevalent in immature ones. According to Redhead & Watling (1979) "the basal sand ball consisting of both mycelial threads and sand grains" is common to many arenicolous fungi and hence not a diagnostic feature of *B. abruptibulbus*. Within *Boletus* it appears to be closest to *Boletus auriporus* Peck and *B. flaviporus* Earle with which it shares the overall color scheme, especially the shiny and somewhat viscid pileus, but the color of the hymenophore lacks the vivid golden yellow of these, the stipe lacks the viscidity and fine yellow floccosity found in both *B. auriporus* and *B. flaviporus*. In addition the spores of *B. abruptibulbus* are longer (13.5–19.8–22.5 μm) than either of those of *B. auriporus* (11–16.05 μm: Both 1998, type study) or *B. flaviporus* (11–15: Thiers 1975). Bessette et al. (2007) published an abbreviated

macromorphological description (pp. 208-209) and a color photograph (p. 49) as *Boletus abruptibulbus* W.C. Roody and Both [nom. inval.].

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Literature cited

Bessette AE, Roody WC, Bessette AR, Dunaway DL. 2007. Mushrooms of the Southeastern United States. Syracuse University Press, New York, USA. 373 pp.

Both EE. 1998. New taxa of boletes and two boletes with identity problems. Bulletin of the Buffalo Society of Natural Sciences 36: 215–132.

Holmgren PK, Holmgren NH, Barner, LC. 1990. Index Herbariorum, part I: the herbaria of the world. Reg Veg 120: 1–693. http://sweetgum.nybg.org/ih/.

Kornerup A, Wanscher JH. 1978. Methuen handbook of colour. 3rd ed., reprinted. Eyre Methuen Ltd., London. 252 pp.

Redhead SA, Watling R. 1979. A new psammophilic *Leccinum*. Canadian Journal of Botany 57: 117–119.

Smith AH, Trappe JM. 1972. The higher fungi of Oregon's Cascade Head Experimental Forest and Vicinity – I. The genus *Phaeocollybia* (*Agaricales*) and notes and descriptions of other species in the Agaricales. Mycologia 64: 1138-1153.

Thiers HD. 1975. California Mushrooms – A field guide to the boletes. Hafner Press, New York. 261 pp.