
New Taxa of *Tricholomataceae* and *Entolomataceae* (*Agaricales*) from Central America

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Ovrebo, C.L. and Baroni, T.J. (2007). New taxa of *Tricholomataceae* and *Entolomataceae* (*Agaricales*) from Central America. *Fungal Diversity* 27: 157-170.

A new genus and species of lignicolous *Tricholomataceae*, *Lepistella ocula*, with affinities to *Lepista*, is described from Central America (Panama and Costa Rica). Two new species of *Entolomataceae* are also described from Panama. *Rhodocybe luteocinnamomea*, from Barro Colorado Island, is distinguished by clitocyboid basidiomata, light cinnamon brown pileus, and by the lack of hymenial cystidia and the lack of clamp connections. *Alboleptonia cylindrocapitata*, also from Barro Colorado Island, is distinguished from others in the genus by its cylindrical-capitate cheilocystidia. *Rhodocybe densifolia*, previously known only from Costa Rica, is reported for the first time from Panama.

Keywords: Basidiomycota, fungal taxonomy, neotropical fungi

Introduction

There have been numerous publications on new species, new reports or summations of taxa of *Agaricales* for Central America, South America and the greater Caribbean region over the past 50 years. A fair portion of those publications have covered, at least in part, members of the three genera we discuss here, *Lepista* (*Tricholomataceae*), *Rhodocybe* and *Alboleptonia* (*Entolomataceae*) (Dennis, 1953, 1970; Singer, 1973, 1978, 1989; Horak, 1976, 1977, 1978, 1982; Baroni, 1981; Pegler, 1983, 1987a,b, 1988, 1997; Bandala, *et al.*, 1988; Ovrebo and Baroni, 1988; Baroni and Halling, 1992, 2000; Ovrebo, 1996; Baroni and Lodge, 1998; Baroni and Ortiz, 2002; Halling and Mueller, 2005). Few reports on agarics have been published for Panama although several recently have focused on fungi from Barro Colorado island (Guzmán-Davalos and Ovrebo, 2001; Buyck and Ovrebo, 2002; Akers and Ovrebo, 2005; Desjardin and Ovrebo, 2006). It is not surprising to find further new species of agarics in this relatively under-explored region.

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A number of collections of pink-spored agarics were found in lowland tropical moist forests on Barro Colorado Island (BCI), Panama. For details on this site, see Buyck and Ovrebo (2002). Two new species of *Entolomataceae*, one *Rhodocybe* and one *Alboleptonia* are reported from BCI and surrounding land areas. A third collection of *Entolomataceae*, *Rhodocybe densifolia* T.J. Baroni & Ovrebo, previously known only from Costa Rica is now documented from Panama as well. In addition, several collections of a small lignicolous agaric with pale pinkish buff spore deposits were collected in Panama and Costa Rica. This species has small verrucose yellow brown colored basidiospores in 3% KOH mounts, and collapsing tramal hyphae that produce a gelatinized aspect in these supporting tissues. An analysis of the nlsu rDNA indicates an affinity with the *Tricholomataceae* (Jean-Marc Moncalvo, unpublished data.). Even though the morphological and histochemical characters of the basidiospores suggest an affinity with the genus *Lepista*, the collection sequenced does not cluster in the clade containing *Lepista* species, but is in a separate clade nearer *Tricholoma*. Because of the unique combination of characters such as darkly pigmented verrucose spores under the light microscope, collapsed gelatinized tissues in the trama, and the lignicolous habit, all features not typical of *Lepista* or any other genus in the *Tricholomataceae*, we propose here a new genus to accommodate this newly recognized tropical agaric.

Materials and Methods

Color notations in parentheses are from Kornerup and Wanscher (1978) and Anonymous (1992). Microscopic features were studied in 3% KOH, NH₄OH, Congo Red, Cotton Blue and Melzer's Reagent. Testing for cyanophilic reactions of spore walls and for cyanophilic bodies in basidia was carried out as follows: un-revived lamella fragments were gently heated over a flame in a drop of cotton blue/lactic acid (Singer, 1986) on a clean glass slide; when the mountant began to release vapor (not boiled), the fragment was removed and placed in a drop of clear lactic acid at room temperature and washed to remove excess dye (destain). This fragment was finally transferred to a fresh drop of clear lactic acid at room temperature on a clean slide to make a squash mount. It has previously been shown that siderophilous inclusions in basidia can be determined by using the cotton blue/lactic acid test described above (Baroni, 1981), since siderophilous inclusions stain in a similar fashion in cotton blue. Notations used in the description of basidiospores follows Baroni and Ortiz (2002). Descriptive statistical analysis of basidiospores was developed using EXCEL 5.0 and Sigmastat 1.0. Scanning electron micrographs

were made on an ISI Supra IIIA scanning electron microscope generally run at 10 Kev. Methods for preparation of samples for SEM are those of Baroni (1981). All line drawings of microscopic structures were made with the aid of a drawing tube and reproduced with a digital WACOM tablet using Adobe Illustrator 10.

Results

Lepistella T.J. Baroni & Ovrebo, **gen. nov.**

Mycobank: 510737

Etymology: ‘*Lepist*’ from genus *Lepista*; *ella* (Latin) - indicating smallness.

A *Lepista* in habitu lignicola, *stipite* eccentrico, *basidiosporis* in KOH vel NH₄OH colorem flavido-brunneum reagentibus atque in *trama lamellari* et *contextu pilei* hyphis extense collapsis gelatinoideis refractivisque differt.

Typus generis: *Lepistella ocula* T.J. Baroni & Ovrebo

Similar to *Lepista* but differing by the lignicolous habit, eccentric stipe, yellowish-brown pigmented basidiospores in KOH or NH₄OH and the presence of gelatinized refractive collapsed hyphae in the lamella trama and pileus context.

Lepistella ocula T.J. Baroni & Ovrebo, **sp. nov.**

(Figs 1, 4-6, 10)

Mycobank: 510737

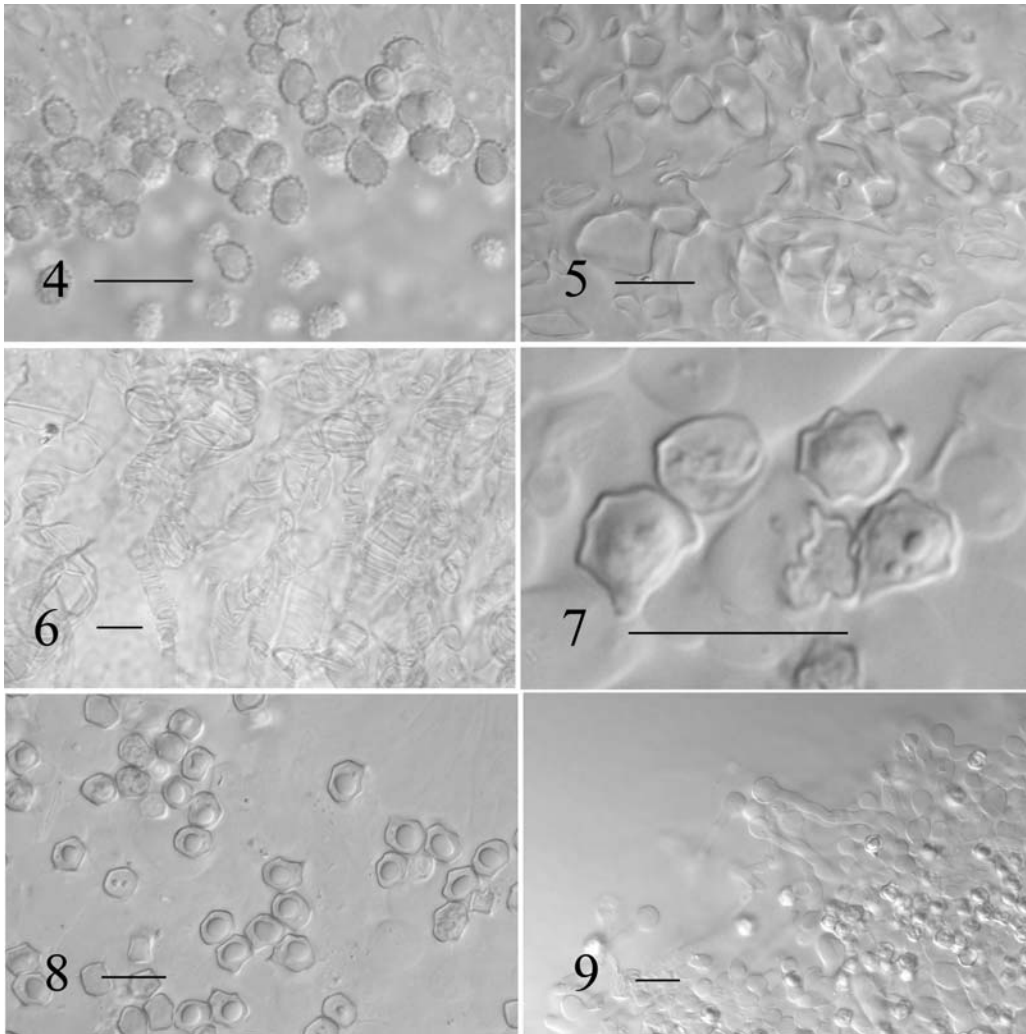
Etymology: *ocula* (Latin) the dark brown “eye” or disc of the pileus.

Pileus 10-35 mm latus, convexus disco depresso, quoad colorem obscurior, glaber, madidus, hygrophanus. *Lamellae* 0.5-1.5 µm latae, pallide bubalinae deinde pallide roseolae, adnexae vel adnatae vel subdecurrentes, arctae. *Stipes* 9-25 mm longus, 1-3 mm latus, centralis vel subexcentricus, bubalinus. Odor et sapor nulli. *Sporae* in massa pallide roseolo-bubalinae. *Basidiosporae* in 3% KOH colorem flavido-brunneum reagentes, 4.6-6.5 × 3.3-4.5 µm, subglobosae, brevi-ellipticae vel ovato-rhombeae, saepe adaxialiter planatae, valde verrucosae loco prope apiculum excepto, verrucis cyanophilicis. *Cystidia hymenialia* nulla. *Pileipellis* cutem e hyphis brunneolis incrustatis compositum formans. *Contextus pilei* atque trama lamellaris ex hyphis laxae intertextis saepe in statu collapsio arcte plicatis, gelatinoideis, inflatis cylindricis. *Fibulae* praesentes. Lignicola atque dense gregari in lignis caudicibusque putridis dicotyledonis in sylvis pluvialibus tropicis. Holotypus hic designatus: Ovrebo 3570, Insula Barro Colorado, Panama (PMA).

Pileus with a dark brown disc (6F4 - Chocolate) and light yellowish tan (5D4 – Dark Blonde) to dull smoky grayish brown (6D3-6E3-4) elsewhere and nearly buff at very margin, hygrophanus and becoming buff where moisture evaporates, 10-35 mm diam, in outline circular, elliptical to subreniform, 10-27 mm across on short axis when elliptical or subreniform, convex to broadly convex when young, expanding to plane, at disc depressed or shallowly umbilicate, margin incurved when young, down-curved, straight or uplifted at maturity, often wavy, moist, glabrous, dull, not discoloring; context concolorous with surface, 1-2 mm thick, odor and taste absent. *Lamellae* light



Figs 1-3. Basidiomes. 1. *Lepistella ocula* (Ovrebo 3570). 2. *Rhodocybe luteocinnamomea*, (Ovrebo 3616). 3. *Alboleptonia cylindrocapitata* (Ovrebo 3771). Bars = 1 cm.



Figs 4-9. Microscopic features. **4-6.** *Lepistella ocula*. **4.** Basidiospores (Ovrebo 3570). **5.** Gelatinized hyphae of pileus context (Ovrebo 3042). **6.** Accordion-shaped collapsed hyphae in pileus context (Ovrebo 3570). **7.** *Rhodocybe luteocinnamomea*, basidiospores (Ovrebo 3616). **8-9.** *Alboleptonia cylindrocapitata* (Ovrebo 3771). **8.** Basidiospores. **9.** Cheilocystidia. Bar = 10 μ m.

buff when young, pale pink with age, not discoloring, adnexed or adnate or subdecurrent, 0.5-1.5 μ m diam, crowded (4 lamellae and lamellulae per mm); lamellulae not in distinct tiers. *Stipe* buff or translucent buff, not discoloring, central or eccentric, 9-25 mm long, 1-3 mm thick, equal but often flared slightly at apex, scurfy at apex, glabrous elsewhere, base with white strigose mycelium, hollow and concolorous inside. Whitish mycelium present on substrate.

Macrochemical reactions: no reaction with 3% KOH.

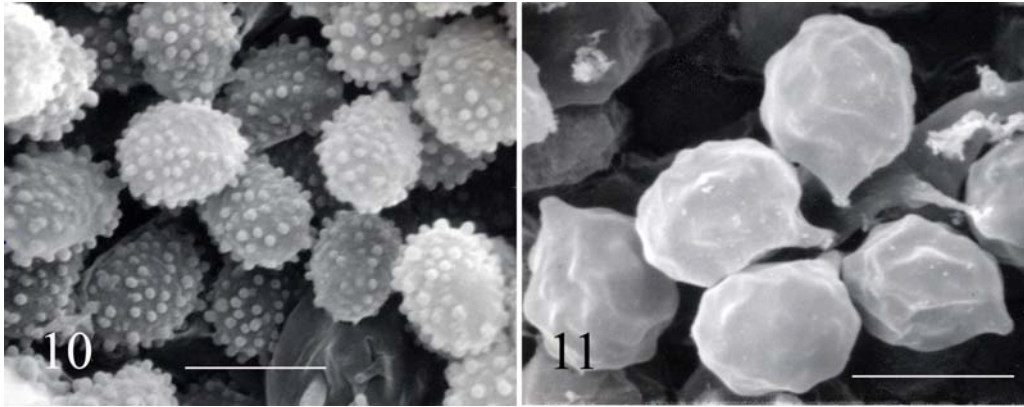
Spore print pale pink or pinkish buff (5A3 – Pale Orange to 5B3 – Greyish Orange) in deposit. *Basidiospores* (4-) $4.6\text{-}6.5 \times 3.3\text{-}4.5$ (-5) μm ($n = 104/3$, $L_m = 5.4 \pm 0.42$, $W_m = 4 \pm 0.34$, $Q = 1.1\text{-}1.65$, $Q_m = 1.36 \pm 0.11$), subglobose or broadly elliptical or somewhat pip-shaped in profile view and often adaxially flattened, subglobose or broadly elliptical in face view, round in polar view, strongly verrucose with verrucae up to $0.8 \mu\text{m}$ in height, with a obscure plage near apiculus, yellowish brown in 3% KOH and 10% NH_4OH , inamyloid, verrucae strongly cyanophilic. *Basidia* $18\text{-}30 \times 6.4\text{-}8 \mu\text{m}$, 4-sterigmate, clavate or narrowly clavate, lacking cyanophilic bodies. Hymenial cystidia absent. *Lamellar hyphae* hyaline, refractive in 3% KOH, loosely interwoven inflated and cylindrical hyphae with much intercellular space, hyphal walls not parallel, but wavy undulating and partially collapsed or becoming accordion-corrugated collapsed and appearing gelatinized, $3\text{-}9 \mu\text{m}$ diam. *Pileus context* hyaline and similar to lamella trama in lower context with radially arranged but mostly accordion-corrugated collapsed walls (very distinctive in Congo Red stained sections) and hyphae very loosely arranged with abundant intercellular spaces, appearing gelatinized, $4\text{-}15 \mu\text{m}$ diam. *Pileipellis* pale yellow brown, yellow brown or ochre brown, repent, compact layer easily distinguished from the context, hyphae cylindrical, (1.6-) $3\text{-}8 \mu\text{m}$ diam, heavily encrusted with pale to darker yellow brown pigments. *Stipitipellis* pale yellowish brown, repent, cylindrical hyphae, $3\text{-}6 \mu\text{m}$ diam, smooth or heavily encrusted with yellow brown pigments. *Stipe context* hyaline, composed of parallel cylindrical or slightly inflated hyphae, $4\text{-}16 \mu\text{m}$ diam. *Clamp connections* present in all tissues.

Habit and habitat: Densely gregarious in clusters of 2-4 basidiomata or scattered, on decaying dicotyledonous stumps or downed logs.

Specimens examined: COSTA RICA, Heredia Province, La Selva Biological Station and Reserve, near Puerto Viejo, Sendero Occidental, 11 May 1991, Ovrebo 3009 (USJ); Lindero Occidental, 13 May 1991, Ovrebo 3042 (USJ). PANAMA, Province of Panama, Gatun Lake, Barro Colorado Island, AVA Trail, 8 August 1997, Ovrebo 3570 (**HOLOTYPE**, PMA; ISOTYPE, NY), Thomas Barbour Trail, 5 August 2001, Ovrebo 4035 (PMA, CSU); Buena Vista Peninsula, 16 August 1999, Ovrebo 3756 (PMA, CSU).

Commentary: *Lepistella ocula* is easily recognized in the field by its small size, brown broadly depressed glabrous pileus with the dark brown disc, adnate or subdecurrent crowded lamellae, central to eccentric stipe and habit of growing in dense clusters on downed decaying logs or stumps. The strongly verrucose small basidiospores and the gelatinized collapsing hyphae in the lamella trama and pileus context (Fig. 5) are also diagnostic.

When this species was first collected, it was assumed to be a *Rhodocybe* in the field because of the pinkish spore deposit. An examination of the



Figs 10-11. Scanning electron micrograph images of basidiospores. **10.** *Lepistella ocula* (Ovrebo 3570). **11.** *Rhodocybe luteocinnamomea* (Ovrebo 3616). Bar = 5 μ m.

basidiospores revealed small verrucose, non-angular spores in polar view and with the verrucae being strongly cyanophilic which immediately eliminated *Rhodocybe* as a possibility. *Lepista* was also considered but rejected for two reasons. First, the basidiospores are quite dark yellow brown in mass when mounted in 3% KOH or 10% NH₄OH, more similar in color to the typical paler brown spored agarics like *Ripartites*. Second, *Lepistella* has an unusual feature not seen in any other fungus we had studied in the past: corrugated-collapsed and obscurely gelatinizing hyphae making up most of the lamella trama and pileus context. In section these collapsed cells in the supporting tissues, both inflated and cylindrical ones, appear to have collapsed like the bellows of an accordion and make the tissues refractive shiny and gelatinized when viewed with DIC optics (Fig. 6). The only indication that the hyphae are gelatinizing or at least producing a gel-like material is the undulating nature of the hyphal walls, in addition to their corrugated or accordion-like collapsing, suggesting that the cell walls are losing their structural integrity. The tissues of the lamellae especially have a rubbery tough or pliant consistency after reviving them for sectioning, somewhat reminiscent of a *Hohenbuehelia*.

One of us (TJB) originally thought this species might be something close to *Ripartites*. However, an analysis of the nlsu rDNA (Jean-Marc Moncalvo, unpublished data) and a blast search using the ITS and partial nlsu sequences show similarity to other species of *Tricholomataceae*, however, none of these were an exact match with our species. The cladogram generated by using nlsu DNA clearly indicated that our new taxon belonged in the *Tricholomataceae* in a clade separate from *Lepista*. Although the basidiospore print color, surface morphology and histochemical reaction of the verrucae to cotton blue are features shared with *Lepista*, the distinctly yellow brown color of the

basidiospores in mass under the light microscope, the lignicolous habit and the striking gelatinized tissues in the context are features unique to this species and not found in *Lepista*. Other members of the *Tricholomataceae* that do produce gelatinized tissues and can also be lignicolous do not have pinkish buff verrucose basidiospores. These other genera (*Resupinatus*, *Hohenbuehila*, *Marasmiellus*, etc.) have white spore deposits and basidiospores that are smooth and acyanophilic.

***Rhodocybe luteocinnamomea* T.J. Baroni & Ovrebo, sp. nov.**

(Figs 2, 7, 11)

MycoBank: 510739

Etymology: *luteus* (Latin) – yellow; *cinnamomeus* (Latin) – light brown color; referring to the color of the pileus.

Pileus 15-45 mm latus, maturitate plano-depressus, glaber, pallide cinnamomeo-brunneus, hygrophanus. *Lamellae* 2.5-3.5 mm latae, decurrentes, juventute bubalinae, maturitate pallide roseolae, non discolorantes, arctae. *Stipes* 25-45 mm longus, 2-5 mm latus, aequalis, glaber, flavescens-bubalinus. *Sporae* in massam depositae roseolo-alutaceae, $4.5-5.5 \times (3.5) 4-4.5 \mu\text{m}$, ab obliquo visae atque in visu faciei ellipticae vel late ellipticae, tuberculato-pustulatae, oblique visae subangulares, in polo visae hexahedricae. *Cystidia hymenialia* absentia. *Fibulae* absentes. Holotypus hic designatus: Ovrebo 3616, Insula Barro Colorado, Panama (PMA).

Basidiomata clitocyboid in stature. *Pileus* central region dull ochre to light cinnamon-brown (6C4; 5 YR 5/6), elsewhere light ochraceous buff to buff, occasionally light cinnamon-brown overall, not discoloring, hygrophanous, becoming slightly lighter where moisture leaves, 15-45 mm diam, no buttons seen, expanding through convex-depressed, finally plano-depressed or concave, the edge often wavy, surface dry, glabrous; context 1.5-2 mm thick, light buff, odor nondescript, taste nondescript. *Lamellae* buff when young, pinkish buff at maturity, not discoloring, decurrent, close, 2.5-3.5 mm diam, entire, often splitting transversely; lamellulae present and in varying lengths. *Stipe* yellowish buff, 25-45 mm long, 2-5 mm thick, equal, glabrous, solid, context buff. Scant whitish mycelium at base.

Spore print pinkish tan in deposit. *Basidiospores* $4.5-5.5 (-6) \mu\text{m} \times (3.5)4-4.5 (-5) \mu\text{m}$ ($n = 96/7$, $L_m = 5.09 \pm 0.30$, $W_m = 4.13 \pm 0.29$, $Q = 1-1.38$, $Q_m = 1.23 \pm 0.07$), subglobose or elliptic to broadly elliptic in profile and face view, tuberculate-pustulate in all views, angular or subangular in profile with 5-7 sides, 6-9 sided in polar view, hyaline when seen singly, pale pinkish in mass, inamyloid, walls evenly cyanophilic. *Basidia* $19-27 \times 6-7 \mu\text{m}$, clavate, 4-sterigmate, hyaline, lacking cyanophilic bodies. *Hymenial cystidia* absent. Lamella trama hyaline, hyphae parallel, cylindrical, 4-12 μm diam. Hyphae of subhymenium 2-3 μm diam, cylindrical. *Pileipellis* sordid cream yellow, repent, cylindrical hyphae, 2-5 μm diam, thin-walled, smooth or very finely encrusted

with pale yellow brown pigments. *Pileus context* hyaline, composed of loosely interwoven, cylindrical hyphae, 4-14 μm diam. *Stipitipellis* hyaline or pale yellow, repent, cylindrical hyphae, 3-5 μm diam. *Stipe context* hyaline, parallel hyphae, 4-12 μm diam. *Clamp connections* absent.

Habit and Habitat: Scattered, on soil, leaf litter and woody debris.

Specimens examined: PANAMA, Province of Panama, Gatun Lake, Barro Colorado Island, Shannon Trail, 10 August 1997, Ovrebo 3595 (PMA); Schneirla Trail, 11 August 1997, Ovrebo 3613 and 4 August 2001, Ovrebo 4030 (both PMA); Thomas Barbour Trail, 12 August 1997, Ovrebo 3616 (**HOLOTYPE**, PMA; ISOTYPE, NY); Wheeler Trail, 13 August 1997, Ovrebo 3625 (PMA); Snyder-Molino Trail, 13 Aug 1997, Mendoza 7 (PMA, CSU); Miller Trail, 28 May 2000, Ovrebo 3913 (PMA). BRITISH VIRGIN ISLANDS, Guana Island, Quail Dove Ghut trail, lower Tamarind orchard, 18° 29' 38.6" N, 64° 34' 40.2" W, 20 m, 16 October 1999, D. J. Lodge G-162 (GUA 241, CORT).

Commentary: When first collected, this species was thought to be a *Clitocybe* because of the decurrent gill attachment. Its stature and coloration is reminiscent of the north temperate species *Clitocybe gibba* (Pers.) P. Kummer. The development of the pinkish color to the lamellae and pinkish spore print, along with the microscopic spore morphology, however, place the fungus in *Rhodocybe*.

The lack of clamp connections, central stipe, smooth pileus surface and brownish coloration places *R. luteocinnamomea* in section *Rubrobrunnea* of *Rhodocybe*. Within this section, it is most similar to *R. piperata* (Stevenson) Horak and *R. pseudonitellina* Dennis. *Rhodocybe piperata* is a larger fungus (pileus to 80 mm dia), has larger spores [6.5-10.5 \times 5-7(-8.5) μm], a peppery odor and taste, and so far is only known from New Zealand. *Rhodocybe pseudonitellina* has adnate lamellae and globose or subglobose spores. It was described from Trinidad, West Indies. For more information on the latter two species see Baroni (1981).

***Alboleptonia cylindrocapitata* T.J. Baroni & Ovrebo, sp. nov.**

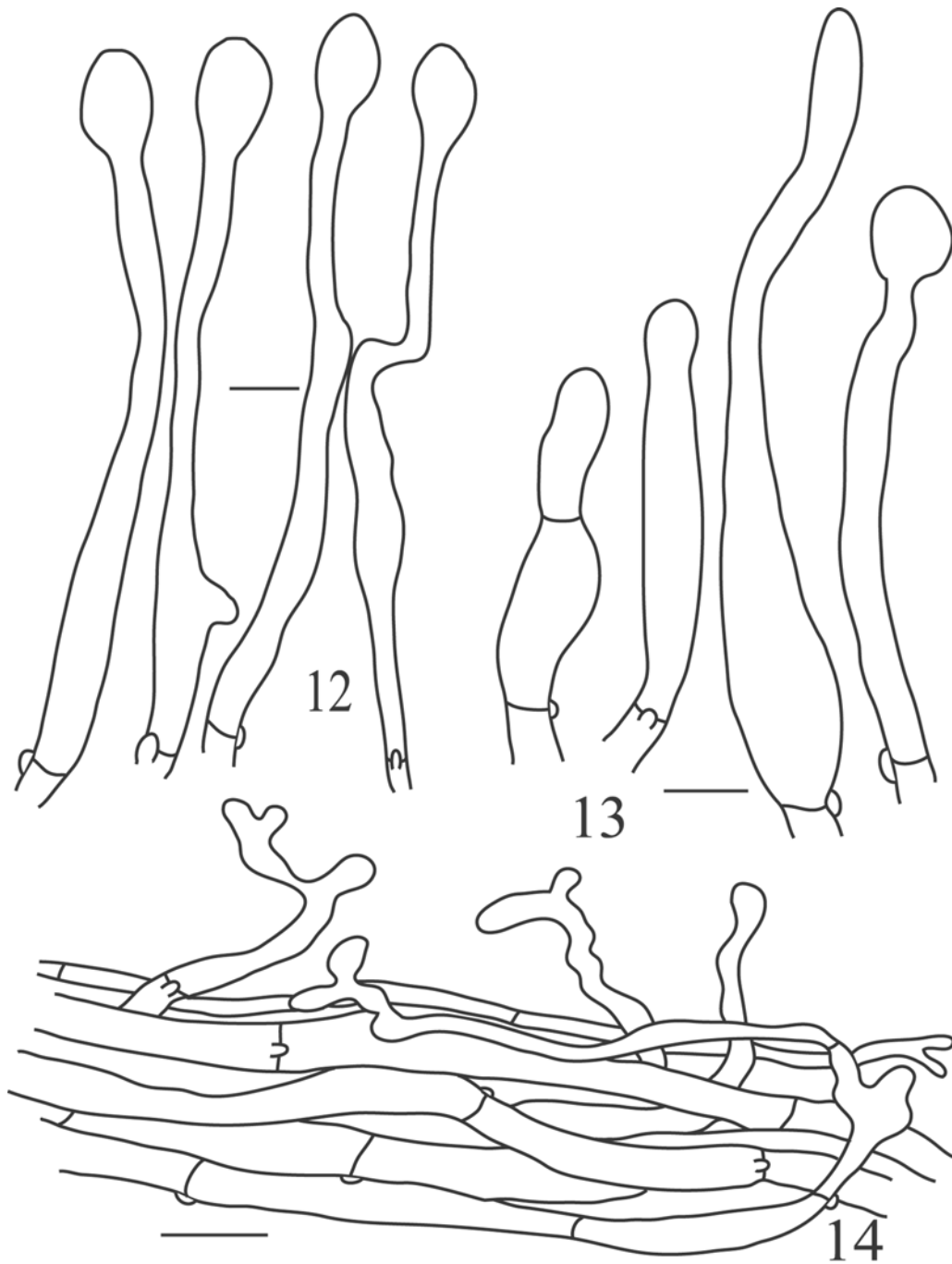
(Figs 3, 8-9, 12-14)

Mycobank: 510740

Etymology: *cylindro* (Latin) – cylindric; *capitatis* (Latin) – knob-like head; referring to the shape of the cheilocystidia.

Basidiomata stipite pileoque albis, disco in pileo flavido-ochrascenti. *Lamellis* bubalinis adnatis fimbriatis. *Stipite* pubescente. *Basidiosporis* heterodiametricis, oblique visa 5-7-angulatis. Ab congeneribus cheilocystidiis cylindricis capitatis differt. Holotypus hic designatus: Ovrebo 3771, Panama (PMA).

Basidiomata clitocyboid or collybioid in stature. *Pileus* white, several with slight yellowish ochre hues over disc, 17-33 mm diam, convex when young, becoming broadly convex, glabrous; context 2-2.5 mm thick, white, odor and taste farinaceous. *Lamellae* buff when young, pink at maturity, adnate, close, 3-4 mm diam, edges fimbriate, becoming eroded with age; lamellulae



Figs 12-14. Microscopic features, *Alboleptonia cylindrocapitata* (Ovrebo 3771). **12.** Cheilocystidia. **13.** Caulocystidia. **14.** Pileipellis. Bar = 10 μ m.

in numerous tiers. *Stipe* grayish white, 15-35 mm long, 2-4 mm thick, equal, surface frosted with pubescence, white mycelioid at base.

Macrochemical reactions: 3% KOH no reaction.

Basidiospores $6.6-8.9 \times 5.7-7.3 \mu\text{m}$ ($n = 32$, $L_m = 8 \pm 0.54$, $W_m = 6.7 \pm 0.42$, $Q = 1-1.4$, $Q_m = 1.21 \pm 0.09$), heterodiametric, 5-7 angled in profile view, 4-5 angled in polar view, inamyloid, walls cyanophilic. *Basidia* (2-) 4-sterigmate, clavate, $25-36 \times 8-12 \mu\text{m}$. *Cheilocystidia* hyaline, cylindrical or narrowly ventricose and mostly with a strongly capitate head, $61-101 \times 5.6-7.2 \mu\text{m}$, capitulum $7-11.3 \mu\text{m}$ diam. *Pleurocystidia* absent. *Lamellar trama* hyaline, hyphae parallel, with inflated and cylindrical cells, $4-40 \mu\text{m}$ diam. *Pileus context* hyaline, of radially arranged, inflated or cylindrical hyphae, $6-22 \mu\text{m}$ diam. *Pileipellis* hyaline, a loosely entangled layer ($40-140 \mu\text{m}$ deep or less than $20 \mu\text{m}$ in some areas) of cylindrical hyphae, $2-4 \mu\text{m}$ diam, producing scattered projecting subdiverticulate end cells, repent hyphae making a transition into the context, $4-7.2 \mu\text{m}$ diam. *Stipitipellis* a layer of repent cylindrical hyphae, $3.2-5.6 \mu\text{m}$ diam, with slightly thickened walls. *Clamp connections* present.

Habit and habitat: Scattered on soil.

Specimens examined: PANAMA, Province of Panama, Gatun Lake, Island #54, near Barro Colorado Island: 18 May 1999, Ovrebo 3771 (**HOLOTYPE**, PMA; ISOTYPE, NY)

Commentary: None of the species of *Alboleptonia* known to date produce capitate cheilocystidia (Baroni and Lodge, 1998; Dennis, 1970; Pegler, 1983; Largent and Benedict, 1970; Noordeloos, 1992; Horak, 1978, 1982). Horak (1982) and Noordeloos (1992) do describe two white species of *Entolomataceae* with capitate cystidia on the surface layers of the pileus and in one species also the stipe, but these species lack cheilocystidia. *Alboleptonia cylindrocipitata* is well characterized by the cylindrical capitate cheilocystidia, white convex pileus, white frosted pubescent stipe, farinaceous odor and taste, and the 5-7 angled heterodiametric basidiospores. The pileus surface is composed of entangled cylindrical hyphae, with scattered, subdiverticulate, projecting end cells, another feature unique to this species.

Entoloma cephalotrichum (P.D. Orton) Noordeloos produces scattered cylindrical-capitate or narrowly tibiiform end cells on the surface hyphae on the pileus and stipe, while *Claudopus tympanifer* Horak has cylindrical-capitate end cells in the pileus surface hyphae only. *Entoloma cephalotrichum*, besides lacking capitate cheilocystidia, is also a small species with the pileus only 2-15 mm broad often with a small papilla on the pileus and large basidiospores, $8-12.5 \times 6-7 \mu\text{m}$. These characters easily separate *E. cephalotrichum* from *Alboleptonia cylindrocipitata*. *Claudopus tympanifer*, also lacking capitate cheilocystidia, in addition lacks a stipe or the stipe is only rudimentary, it lacks

an odor and taste, the lamellae are distant, and the basidiospores are $6-7.5 \times 5-6$ μm , nearly isodiametric, and 5-6 angled in profile view.

Rhodocybe densifolia T.J. Baroni & Ovrebo, Mycologia 80:511 (1988).

Habit and habitat: Scattered, on downed hardwood log.

Specimens examined: PANAMA, Province of Panama, Gatun Lake, Barro Colorado Island, Donato Trail, 18 August 1999 Ovrebo 3773 (PMA, UCO).

Commentary: Numerous basidiomata of *R. densifolia* were collected from a decaying log on BCI. This species is easily recognized in the field by its dark brown colors on the pileus that fade considerably to a medium brown or tan color as moisture is lost (hygrophanous), the crowded lamellae and the eccentric stipe. The small subglobose basidiospores with undulate-tuberculate ornamentation and angular aspect in polar view, lack of hymenial cystidia and the dark brown encrusted hyphae of the pileipellis also help to distinguish this taxon. *Rhodocybe densifolia* was originally described from Costa Rica where it was found on the grounds of the La Selva Biological Station. This report is only the second one known in the literature and is a new report for Panama.

Acknowledgements

CLO thanks the Smithsonian Tropical Research Institute for granting permission to collect on Barro Colorado Island and the Organization for Tropical Studies for permission to collect at La Selva Biological Station. Field work by CLO in Panama was funded by a Mellon Comparative Research Grant administered by the Organization for Tropical Studies and Smithsonian Tropical Research Institute, and by the Joe C. Jackson College of Graduate Studies and Research, University of Central Oklahoma; funding in Costa Rica was provided by the Jackson College of Graduate Studies. Continuing research on *Entolomataceae* of the Caribbean region and Central America by TJB has been funded by the National Science Foundation (DEB-9525902 and DEB-0103621). For the collection made by Dr. D.J. Lodge, travel from Puerto Rico to the BVI was supported by the U.S. Department of Agriculture, Forest Service, Center for Forest Mycology Research (CFMR), while expenses within the BVI's were supported by The Conservation Agency (Rhode Island, USA), with facilitation by Dr. J. Lazelle. Specimen processing and initial examination of the BVI collection was supported by the US National Science Foundation's Biotic Surveys & Inventories Program, grant DEB-9525902 to the Research Foundation of the State University of New York, College at Cortland, in collaboration with Forest Service, CFMR. We thank Jason Jackson for extracting the DNA. Drs. Rytas Vilgalys and Jean-Marc Moncalvo provided valuable advice regarding interpretation of the molecular data and Dr. D. Jean Lodge for providing collections for study. Ms. Patricia Eckel kindly produced the Latin diagnoses.

References

- Akers, B.P. and Ovrebo, C.L. (2005). *Leucoagaricus bivelatus*, a new volvate lepiotoid species. Mycotaxon 91: 303-308.

- Anonymous. (1992). *Munsell soil color charts*. Revised edition. Munsell Color, New York. 10 pl.
- Bandala-Muñoz, V.M., Guzmán, G. and Montoya-Bello, L. (1988). Especies de macromicetos citadas de Mexico, VII. *Agaricales*, Parte II (1972-1987). *Revista Mexicana de Micología* 4: 205-250.
- Baroni, T.J. (1981). *A revision of the genus Rhodocybe Maire (Agaricales)*. Beihefte Nova Hedwigia 67. Vaduz: J. Cramer.
- Baroni, T.J. and Halling, R.E. (1992). New species of *Rhodocybe* from South America with a key to species. *Mycologia* 84: 411-421.
- Baroni, T.J. and Halling, R.E. (2000). Some *Entolomataceae (Agaricales)* from Costa Rica. *Brittonia* 52: 121-135.
- Baroni, T.J. and Lodge, D.J. (1998). *Alboleptonia* from the Greater Antilles. *Mycologia* 90: 680-696.
- Baroni, T.J. and Ortiz, B. (2002). New species of *Oudemansiella* and *Pouzarella* (Basidiomycetes: *Agaricales*) from Puerto Rico. *Mycotaxon* 82: 269-279.
- Buyck, B. and Ovrebo, C.L. (2002). New and interesting *Russula* species from Panama. *Mycologia* 94: 888-901.
- Dennis, R.W.G. (1953). Les *Agaricales* de l'Île de la Trinité. *Rhodosporae-Ochrosporae*. *Bulletin de la Société Mycologique de France* 69: 145-198.
- Dennis, R.W.G. (1970). Fungus flora of Venezuela and adjacent countries. *Kew Bulletin, Additional Series* 3: 1-531.
- Desjardin, D. and Ovrebo, C.L. (2006). New species and new records of *Marasmius* from Panama. *Fungal Diversity* 21: 19-39.
- Guzmán-Dávalos, L. and Ovrebo, C.L. (2001). Some species of *Gymnopilus* from Costa Rica and Panama. *Mycologia* 93: 398-404.
- Halling, R.E. and Mueller, G.M. (2005). Common mushrooms of the Talamanca Mountains, Costa Rica. *Memoirs of The New York Botanical Garden* 90: 1-195.
- Horak, E. [1976 (1974/75)]. On cuboid-spored species of *Entoloma (Agaricales)*. *Sydowia* 28: 171-237.
- Horak, E. [1977 (1976/1977)]. Additions to "On cuboid-spored species of *Entoloma*". *Sydowia* 29: 289-299.
- Horak, E. (1978). *Entoloma* in South America. I. *Sydowia* 30: 40-111.
- Horak, E. (1982). *Entoloma* in South America. II. *Sydowia* 35: 75-99.
- Kornerup, A. and Wanscher, J.H. (1978). *Methuen handbook of color*. Third edition. Methuen & Co., Ltd., London.
- Largent, D.L. and Benedict, R.G. (1970). Studies in the rhodophylloid fungi II. *Alboleptonia*, a new genus. *Mycologia* 62: 437-452.
- Noordeloos, M.E. (1992). *Entoloma* s. l. *Fungi Europei* 5: 1-760.
- Ovrebo, C.L. (1996). The agaric flora (*Agaricales*) of La Selva Biological Station, Costa Rica. In: *Fungi of Costa Rica: selected studies on biodiversity and ecology* (eds. J. Carranza and G.M. Mueller). *Revista de Biología Tropical*: 39-57.
- Ovrebo, C.L. and Baroni, T.J. (1988). Three new species of *Rhodocybe* from Costa Rica. *Mycologia* 80:508-514.
- Pegler, D.N. (1983). Agaric flora of the Lesser Antilles. *Kew Bulletin, Additional Series IX*: 1-668.
- Pegler, D.N. (1987a). A revision of the *Agaricales* of Cuba 1. Species described by Berkeley & Curtis. *Kew Bulletin* 42: 501-585.
- Pegler, D.N. (1987b). A revision of the *Agaricales* of Cuba 2. Species described by Earle and Murrill. *Kew Bulletin* 42: 855-888.

- Pegler, D.N. (1988). A revision of the *Agaricales* of Cuba 3. Keys to families, genera and species. Kew Bulletin 43: 53-75.
- Pegler, D.N. (1997). *The agarics of São Paulo, Brazil*. Royal Botanic Gardens, Kew.
- Singer, R. (1973). Diagnoses Fungorum Novorum Agaricalium III. Beihefte Sydowia 7: 1-106.
- Singer, R. (1978). Interesting and new species of Basidiomycetes from Ecuador. II. Nova Hedwigia 29: 1-98.
- Singer, R. (1986). *The Agaricales in modern taxonomy*. Ed. 4. Koeltz Scientific Books, Koenigstein, Germany.
- Singer, R. (1989). New taxa and new combinations of *Agaricales* (Diagnoses Fungorum Novorum Agaricalium IV). Fieldiana: Botany New Series 21: 1-133.

(Received 26 February 2007; accepted 10 July 2007)