Rev. Biol. Trop. 44 (Suppl. 4): 39-57, 1996

The agaric flora (Agaricales) of La Selva Biological Station, Costa Rica

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Abstract: Sixty-three species of Agaricales (Basidiomycotina) from eight families are reported from La Selva Biological Station and Reserve (Caribbean lowland of Costa Rica). Included are the following genera: *Agaricus, Alboleptonia, Chaetocalathus, Clitocybula, Collybia, Coprinus, Crepidotus, Crinipellis, Dictyopanus, Filoboletus, Gerronema, Hohenbuehelia, Hydropus, Hypholoma, Lepiota, Leucocoprinus, Leucopaxillus, Marasmiellus, Marasmius, Mycena, Nothopanus, Oudemansiella, Panellus, Pleurocollybia, Pluteus, Pyrrhoglossum, Rugosospora, Trogia, Volvariella, Xerulina.* The site is a lowland tropical rain forest. All but seven taxa are reported for Costa Rica for the first time. Complete descriptions are provided for fifteen taxa.

Key words: Agaricales, agarics, tropical fungi, Costa Rica, La Selva Biological Station

Progress is slow in assessing the diversity of the Agaricales in lowland tropical regions. Many genera found in the tropics have not been documented or monographed, thus hindering survey-type studies. For genera that have been monographed there are often conspicuous gaps in regions that have not been collected, necessitating intensive collecting programs in these areas. Because agaricologists rely solely on the presence of basidiomes to confirm the presence of a fungus, a region has to be collected intensively and often for several years to be confident that a representative sample of fungi has been collected. For these reasons, our understanding of the diversity and distribution of the Agaricales in the tropics is far from complete.

The intent of the author's research has been to document the agaric fungi at a lowland neotropical site La Selva Biological Station and Reserve. While still preliminary, the results are intended to improve our understanding of the taxonomy of agaric fungi as well to build a database that will ameliorate our understanding of their diversity.

Very little on agarics has been published from La Selva. Singer (1987, 1989) reported on *Mycena theobromicola* and described four new species of *Collybia, Marasmius* and *Mycena* and Ovrebo and Baroni (1988) described three new *Rhodocybe* species. It is premature to state which genera have the greatest diversity at La Selva, but *Marasmius, Marasmiellus* and *Lepiota* probably will contain the greatest number of species. All agarics collected are presumed to be saprotrophic although several were collected on ant hills. Singer (1987) reported that *Mycena theobromicola* may cause pod rot of cacao fruits but to what extent others are parasitic has not been determined. No ectotrophic agarics have been collected.

MATERIALS AND METHODS

Five collecting trips were made over a six year period. One trip was in January and the others were during various periods between May and August. Details of the locality were described previously (Ovrebo & Baroni 1988).

For taxa that are uncommonly reported or for which recent descriptions and illustrations are unavailable for the region, complete descriptions and illustrations are given, otherwise only the collection data are presented. Color comparisons in parentheses are from Kornerup and Wanscher (1978) and Kelley (1965). Microscopic sections were studied in 2.5% KOH and Melzer's Reagent. In compiling spore statistics, fifteen spores were measured per collection and abbreviations are as follows: $\bar{X}$=mean length x width, Q=range of length/width ratios, $\bar{Q}$=mean length/width ratio.

Agaricaceae

Agaricus endoxanthus Berk. & Br. J. Linn. Soc. London 11: 548. 1871.

On soil. Station grounds, 1 Jul 1986, Ovrebo 2079 (CSU). For description and illustrations see Pegler (1983).

Agaricus ochraceosquamulosus Heinem. Kew Bull. 15: 243. 1961.

Station grounds, on soil at base of small ant hill, 26 Jul 1986, Ovrebo 2278 (CSU); scattered on ant hill, Sendero Suroeste, 18 May 1992, Ovrebo 3281. (USJ). For description and illustrations see Pegler (1983).

Lepiota besseyi H. V. Smith and Weber, Contr. Univ. Mich. Herb. 16: 212. 1987. Fig. 1-2

Pileus 37-65 mm wide, no buttons seen, when mature plane with a low umbo, surface dry, center matted fibrillose, elsewhere punctate with minute squamules, center fuscous with the squamules concolorous, ground color whitish buff, not discoloring; context 3.5 mm thick, light buff but light yellow at the center, pinkish orange coloration developing where cut, odor fragrant, taste slightly nondescript.

Lamellae 4-7 mm wide, free, whitish buff, immediately discoloring pinkish orange where bruised, discoloration changing to brown to finally dark fuscous, close (1 mm apart), faintly fimbriate under 10X; lamellulae numerous but not arranged in distinct tiers.

Stipe 40-65 mm long, 3-6 mm thick, tapered slightly to the apex with a subbulbous base, silky-fibrillose, light buff, discolored fuscous in areas; context hollow, buff when young, older ones with brown context.

Partial veil leaving a membranous annulus, superior, clinging to stipe, dark brown.

Chemical color reactions: 2.5% KOH and 10% $FeSO_4$ no reaction.

Spore deposit buff-colored, spores 8.1-9.8 x 5.8-7.5 µm, ($\bar{X}$=8.9 x 6.44, Q=1.3-1.46, $\bar{Q}$=1.38), broadly elliptic in profile and face view, smooth, truncate with a germ pore, hyaline, dextrinoid. Basidia 20-23 x 6.9-8.1 µm, 4-sterigmate, clavate, hyaline. Pleurocystidia 63-92 x 17-24 µm, clavate to fusiform-ventricose, apex often mucronate, smooth, thin-walled, contents faintly grayish brown. Cheilocystidia similar in shape and coloration to pleurocystidia but smaller, 35-54 x 10-18 µm. Hyphae of lamellar trama 4.6-15 µm wide, hyaline, inamyloid. Hyphae of subhymenium subcellular. Pileus surface composed of interrupted trichodermium with cystidiate end-cells, end-cells 46-130 x 8.1-17 µm, long-clavate, smooth, dark brown to brownish black, darkest at the base. Hyphae of pileus trama up to 14 µm wide, hyaline. Hyphae of stipe surface appressed 3.5-5.8 µm wide, cylindric, light golden brown. Caulocystidia present near the base, 52-81 x 12-23 µm, long-clavate, brown. Hyphae of stipe context 3.5-13 µm wide, cylindric, hyaline. Clamp connections absent.

Scattered, on downed termite nest. Sendero El Surá, 24 Jun 1986, Ovrebo 2015 (CSU).

The holotype of *Lepiota besseyi* was collected from Texas and additional collections sited in the protologue were from Hawaii and southern Louisiana. The distribution thus appears to be tropical to subtropical. The Costa Rican material now extends the distribution southward into tropical mesoamerica.

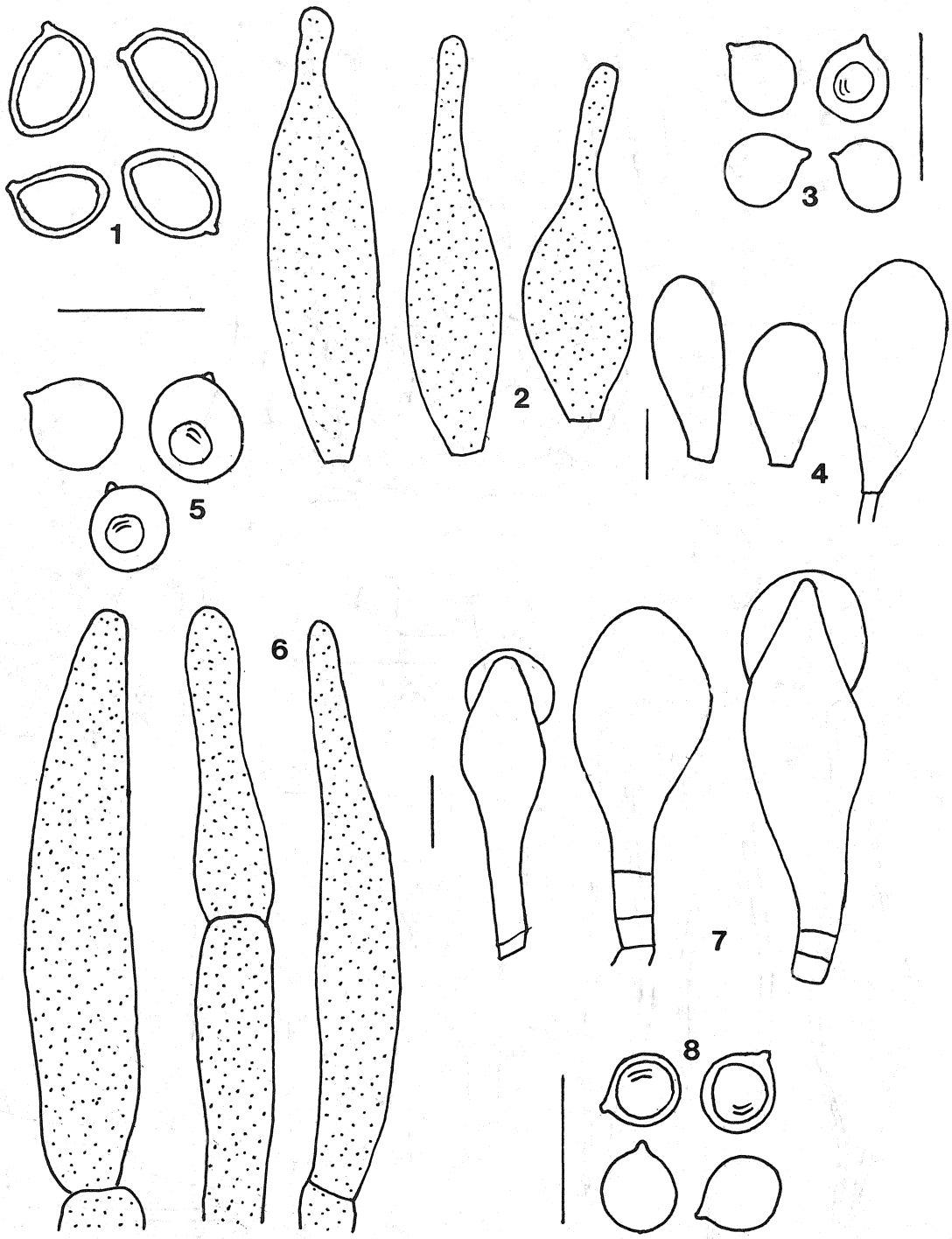
See Weber and Smith (1985) for a colored photograph.

Lepiota hemisclera (B. & C.) Sacc. Syll. Fung. 5: 66. 1887.

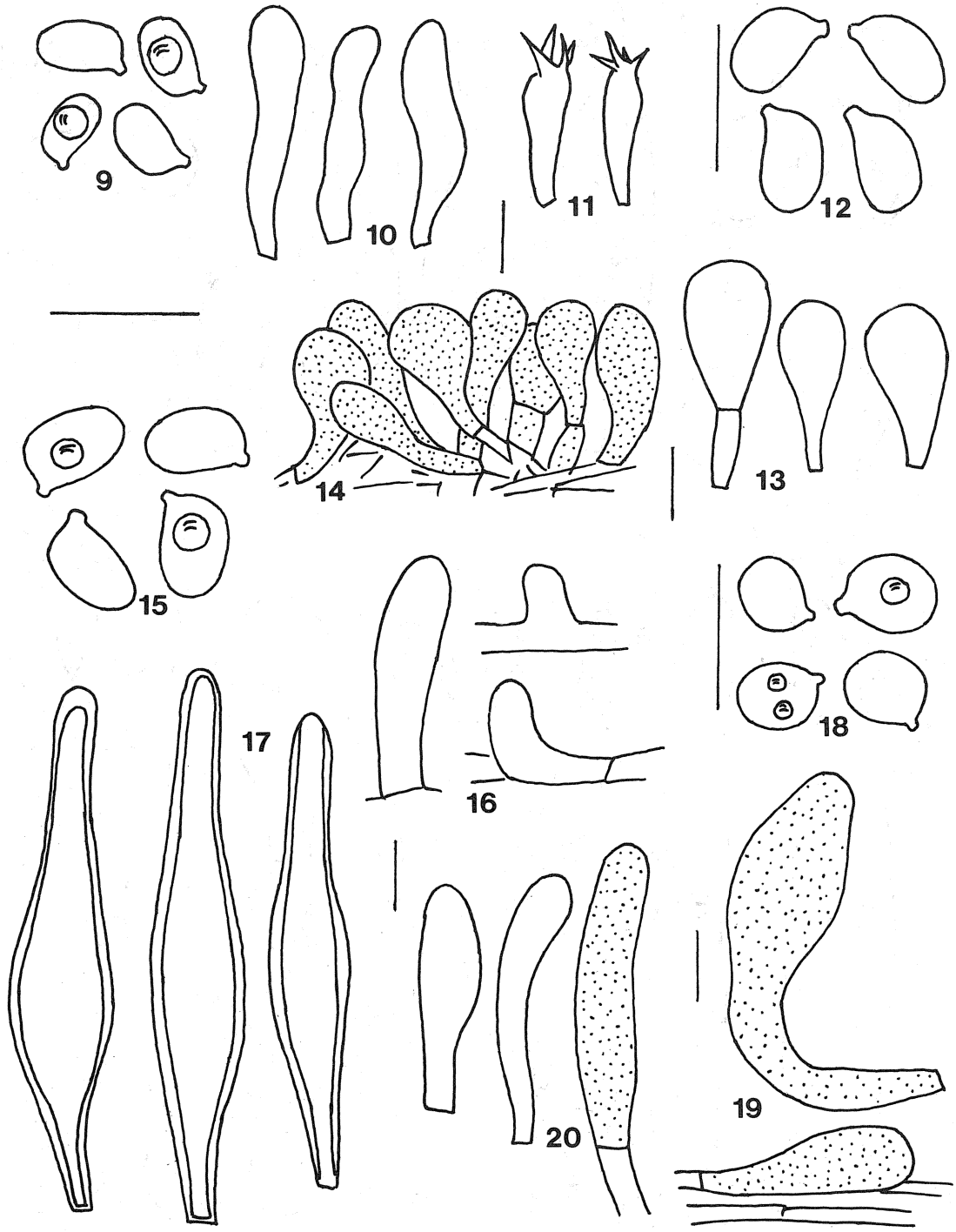
Solitary or scattered in 2's or 3's, on soil and often near rotting dicot logs or fruiting from very rotten logs or wood mulch. Camino Experimental Sur, 27 June 1986, Ovrebo 2045 (USJ); Sendero El Surá, 29 June 1986, Ovrebo 2063 (USJ); 6 July 1986, Ovrebo 2120 (CSU) & 29 July 1989, Ovrebo 2812 (CSU); Sendero Oriental, 28 July 1989, Ovrebo 2806 (CSU); Sendero Oriental, 30 July 1989, Ovrebo 2819 (NY); Sendero Occidental, 24 May 1991, Ovrebo 3164 (CSU, USJ) & 17 May 1992, Ovrebo 3276 (USJ); station grounds, 14 July 1986, Ovrebo 2197 (USJ).

This is another common *Lepiota* at La Selva and one of the more common larger sized taxa. It is easily recognized by the large size, tiny velar warts on the pileus, and by the brownish reticulate pattern that develops in age on the pileus. See Pegler (1983) for a description and illustrations.

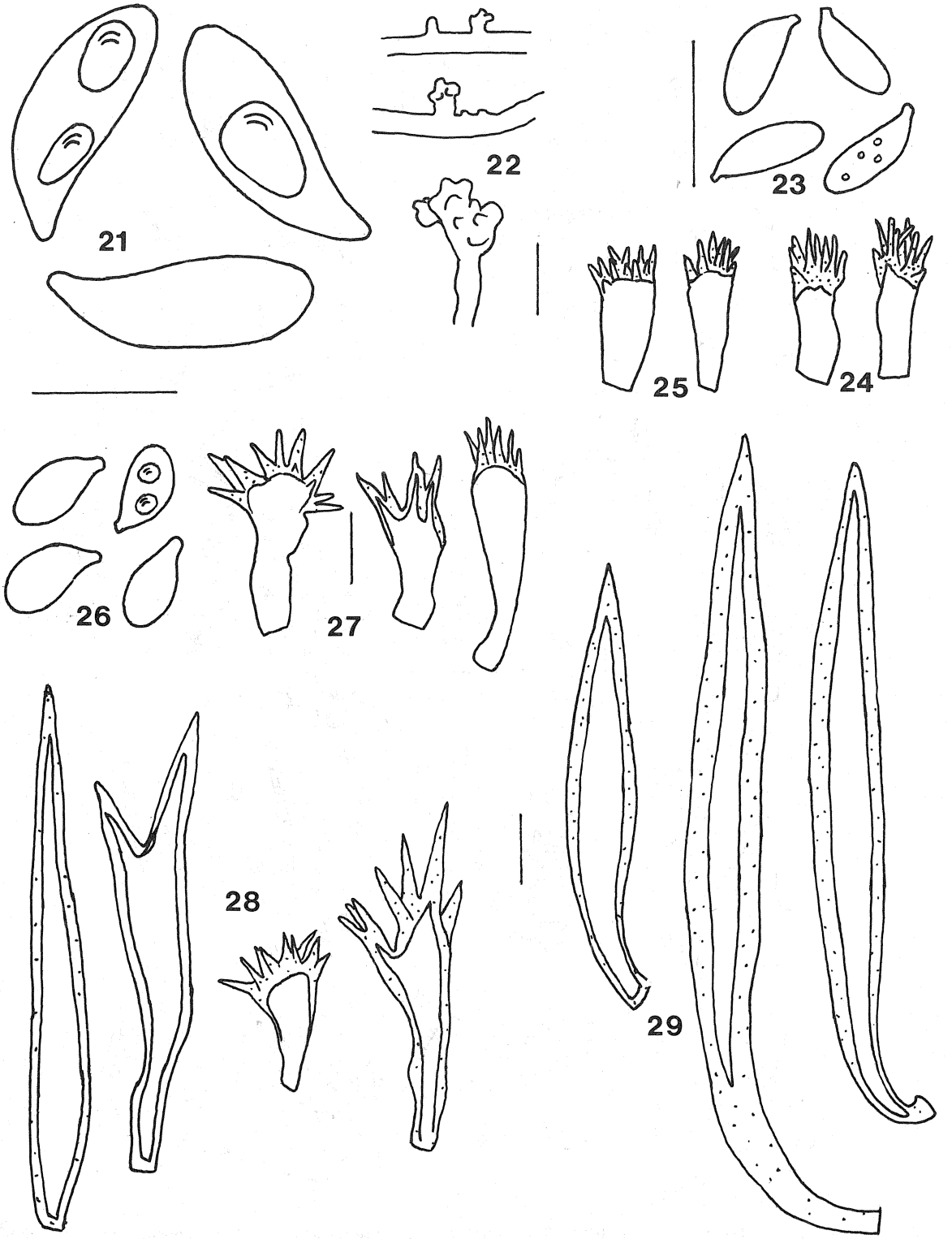
Leucocoprinus fragillisimus (Rav.) Pat. Essai Taxon. 171. 1900.



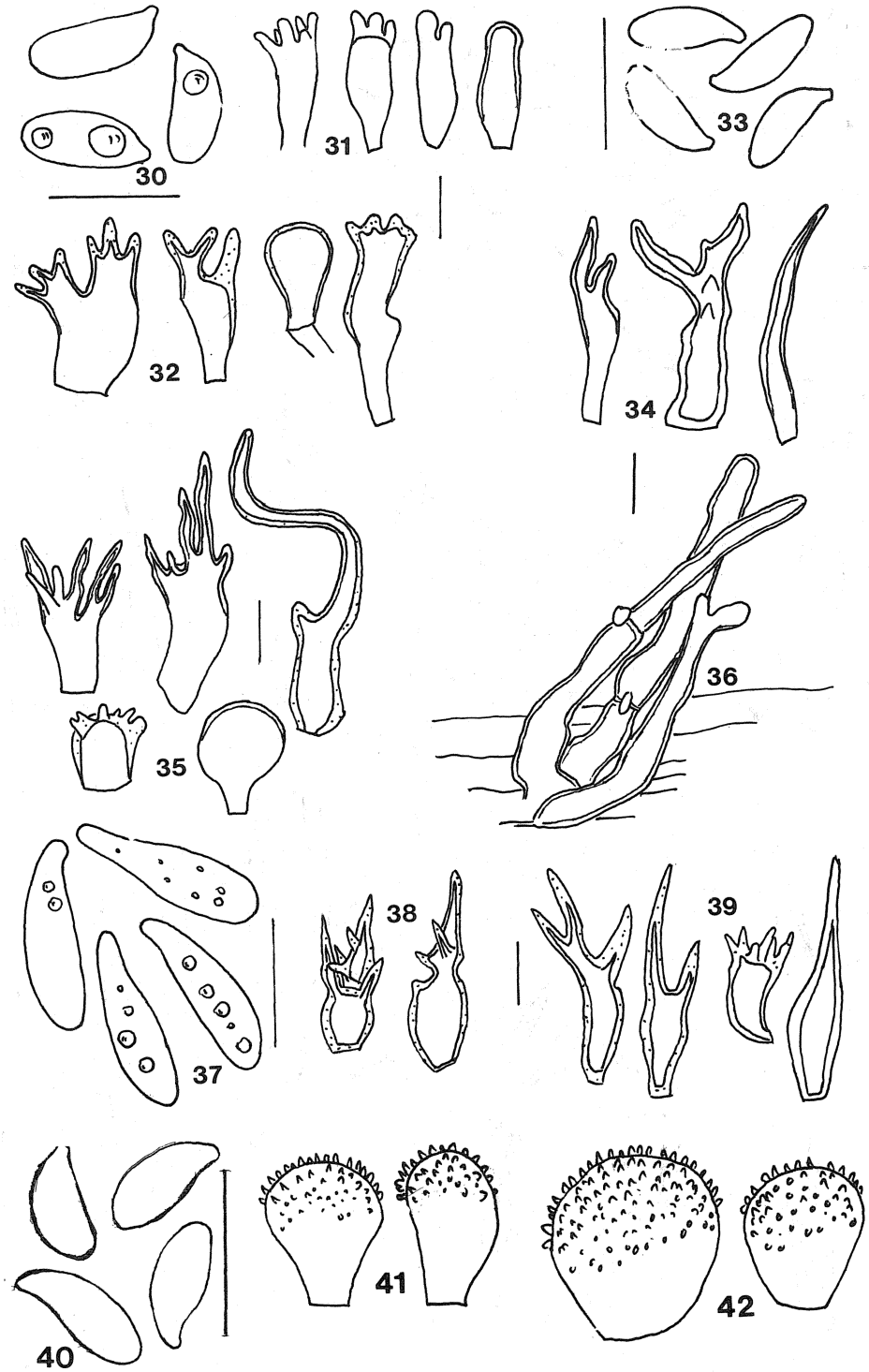
Figs. 1-2. *Lepiota besseyi* (Ovrebo 2015). 1. Basidiospores. 2. Pleurocystidia. Figs. 3-4. *Pluteus rubrotomentosus* (Ovrebo 2177). 3. Basidiospores. 4. Cheilocystidia. Figs. 5-7. *Pluteus yungensis* (Ovrebo 2227). 5. Basidiospores. 6. Elements of the pileus surface. 7. Hymenial cystidia. Fig. 8. *Clitocybula azurea* (Ovrebo 2242), Basidiospores. Scale line equals 10 µm, long one is for spores, short one is for other structures.



Figs. 9-11. *Gerronema retiarum* (Ovrebo 2010). 9. Basidiospores. 10. Cheilocystidia. 11. Basidia. Figs. 12-14. *Hydropus hydrophoroides* (Ovrebo 2300). 12. Basidiospores. 13. Cheilocystidia. 14. Cells of the pileus surface. Figs. 15-17. *Hydropus mycenoides* (Ovrebo 2200). 15. Basidiospores. 16. Elements of the pileus surface. 17. Hymenial metuloids. Figs. 18-20. *Hydropus nigromarginatus* (Ovrebo 2848). 18. Basidiospores. 19. Elements of the pileus surface. 20. Cheilocystidia. Scale line equals 10 µm, long one is for spores, short one is for other structures.



Figs. 21-22. *Marasmiellus volvatus* (Ovrebo 2040). 21. Basidiospores.22. Elements of the pileus surface. Figs. 23-25. *Marasmius digilioi* rebo 3095). 23. Basidiospores. 24. Cells of pileus surface. 25. Cheilocystidia.Figs. 26-29. *Marasmius jalapensis* (Ovrebo 3244). 26. idiospores.27. Cheilocystidia. 28. Cells from pileus surface. 29. Hymenial setae. Scale line equals 10 µm, long one is for spores, short one or other structures.



Figs. 30-32. *Marasmius leveilleanus* (Ovrebo 2035). 30. Basidiospores. 31. Cheilocystidia. 32. Cells of pileus surface. Figs. 33-36. *Marasmius pseudoniveus* (Ovrebo 3090). 33. Basidiospores. 34. Cheilocystidia. 35. Cells of the pileus surface. 36. Caulocystidia. Figs. 37-39. *Marasmius spiculosus* (Ovrebo 2065). 37. Basidiospores. 38. Cheilocystidia. 39. Cells of the pileus surface. Scale line equals 10 µm, long one is for spores, short one is for other structures. Figs. 40-42. *Marasmius hendecaphyllus* (Ovrebo 2094). 40. Basidiospores. 41. Cheilocystidia. 42. Cells of pileus surface. Scale line equals 10 µm, long one is for spores, short one is for other structures.

On soil. Camino Experimental Sur, 13 May 1991, Ovrebo 3034 (CSU). This taxon is a common subtropical to tropical fungus. For description and illustrations see Pegler (1983).

Leucocoprinus birnbaumii (Corda) Sing. Sydowia 15: 67. 1962.

Caespitose, on palm buttress roots, station grounds, 10 Jul 1986, Ovrebo 2145 (CSU); on soil, Lindero Occidental, 27 July 1989, Ovrebo 2798 (USJ); on ant hill, Sendero Suroeste, 19 May 1991, Ovrebo 3109 (CSU).

This is a species common to subtropical and tropical regions. For descriptions and illustrations see Smith & Weber (1982) and Pegler (1983).

Rugosospora pseudorubiginosa (Cifuentes & Guzmán) Guzmán & Bandala, Brenesia 32: 107-112. 1989.

Mostly solitary, occasionally gregarious, on soil or leaf litter.

Sendero Oriental, 25 June 1986, Ovrebo 2031 (USJ), 28 June 1986, Ovrebo 2049 (USJ), 12 May 1991, Ovrebo 3031 (USJ), 18 May 1991, Ovrebo 3097 (USJ), & 16 May 1992, Ovrebo 3271 (CSU, USJ); Sendero El Surá, 26 June 1986, Ovrebo 2033 (CSU); Sendero Occidental, 1 Jul 1986, Ovrebo 2071 (NY) & 14 May 1991, Ovrebo 3057 (CSU, USJ); Sendero El Atajo, 29 July 1989, Ovrebo 2810 (USJ).

This is one of the most commonly encountered fungi at La Selva. It is easily recognized by the small stature and rusty brown pileus whose surface breaks into areolate squamules. See Franco-Molano (1995) for a description and discussion of this species and Pegler (1983) who recognizes this species as *Lepiota epicharis* var. *occidentalis*.

Coprinaceae

Coprinus disseminatus (Pers.: Fr.) S. F. Gray, Nat. arrang. Brit. Pl. 1: 634. 1821.

Densely gregarious, on downed logs and associated sticks and dead leaves. Sendero El Surá, 14 May 1991, Ovrebo 3050 (CSU). See Pegler (1983) for description and illustrations. Also reported from Cocos Island (Gómez P, 1983). This fungus is found in both temperate and tropical regions.

Cortinariaceace

Pyrrhoglossum lilaceipes Sing. Sydowia 15: 77. 1962.

Gregarious or subcaespitose. On adventitious root mass of *Bactris gasipaes*, station grounds, 30 Jul 1986, Ovrebo 2311 (USJ); on downed log, Sendero Hartshorn, 22 May 1991, Ovrebo 3147 (CSU). For description and illustrations see Pegler (1983).

P. pyrrhum (B. & C.) Sing. Mycologia 36: 367. 1944.

Gregarious on dead dicot wood. Sendero Suroeste, 12 Jul 1986, Ovrebo 2175 (CSU). For description and illustrations see Pegler (1983).

Crepidotaceae

Crepidotus martini Sing. Mycologia 47: 775. 1955.

Gregarious on dicot twigs and leaf litter, including dead leaves of *Castilla elastica*. Sendero El Surá, 4 Jul 1986, Ovrebo 2106 (USJ); Camino Experimental Sur, 24 Jul 1989, Ovrebo 2763 (CSU). See Singer (1973) and Pegler (1983) for descriptions and illustrations.

Entolomataceae

Alboleptonia stylophora (Berk. & Br.) Pegler, Kew Bull. 32: 199. 1977.

Gregarious, on lawn. Next to dining hall, 10 May 1991, Ovrebo 2994 (CSU). See Pegler (1983) for description and illustrations. The La Selva fungus differs, however, in possessing cheilocystidia.

Pluteaceae

Pluteus pulverulentus Murr. North American Flora 10: 137. 1917.

Scattered to gregarious, on downed logs or standing dead tree trunk.

Camino Experimental Sur, 24 Jul 1989, Ovrebo 2760 (CSU); Sendero Occidental, 17 May 1991, Ovrebo 3086 (CSU, USJ); Sendero El Surá, 24 May 1991, Ovrebo 3169 (USJ). For description and illustrations see Smith & Stuntz (1958), Singer (1958) and Pegler (1983).

Pluteus rubrotomentosus Sing. Lloydia 21(4): 228. 1958. Figs. 3-4.

Pileus 9-15 mm wide, broadly convex, with or without a low umbo, edge straight, surface dry, tomentose at center, elsewhere with appressed fibrils that become less dense near the edge, faintly sulcate up to 3 mm in from edge, bright red with the yellowish ground color showing through where fibrils not dense, grooves of sulcations red while ridges yellow; context 1 mm thick, yellow, red near surface, odor and taste absent.

Lamellae 2.5 mm wide, free, yellow when young, becoming yellowish tan in age, not discoloring but edge finely reddish marginate and faintly glistening under 10X, close (2 mm), lamellulae numerous but not arranged in distinct tiers.

Stipe 8-14 mm long, 1-1.5 mm thick, tapered slightly to apex, glabrous, silky-fibrillose and yellow over most, finely hirsute and reddish at base; hollow, context slightly fibrous, yellow.

Chemical color reactions: not tested.

Spores 5.2-5.8 x 4.6-5.2 µm ($\bar{X}$=5.34-4.81, Q=1.09-1.22, $\bar{Q}$=1.11), subspherical to spherical in profile and face view, smooth, thin-walled, very pale pink, inamyloid. Basidia 18-23 x 6.9 µm, 4-sterigmate, clavate, hyaline. Cheilocystidia 29-46 x 13-17 µm, clavate, smooth, thin-walled, hyaline. Pleurocystidia absent. Hyphae of lamellar trama 4.6-16 µm wide, slightly inverse to almost parallel, hyaline. Hyphae of subhymenium cellular, cells 4.6-6.8 µm wide, hyaline. Hyphae of pileus surface 6-17 µm wide, appressed or recurved, cylindric, the ends rounded or tapered, smooth, thin-walled, hyaline although in mass pale yellow. Hyphae of pileus trama 5.8-17 µm wide, light yellow. Hyphae of stipe surface 4.6-8.1 µm wide appressed over most of stipe, cylindric, smooth, thin-walled, pale yellow, the base with cystidiate recurved end cells 8.1-11.5 µm wide. Hyphae of stipe trama up to 17 µm wide, light yellow. Clamp connections absent.

Scattered, on dicot logs. Sendero Occidental, 7 Jul 1986, Ovrebo 2125 (USJ); Arboretum, 12, Jul 1986, Ovrebo 2177 (CSU); Sendero El Surá, 27 May 1991, Ovrebo 3197 (UCO, USJ).

This *Pluteus* is easily recognized by the small size, the reddish fibrillose pileus, and yellow lamellae and stipe. It is previously known from Bolivia.

Pluteus spinulosus Murr. North Amer. Flora 10: 138. 1917.

Solitary, on rotting log. Arboretum, 14 Jul 1986, Ovrebo 2199 (CSU). For descriptions and illustrations see Smith & Stuntz (1958) and Pegler (1983).

Pluteus yungensis Singer, Lloydia 21(4): 232. 1958. Figs. 5-7.

Pileus 38 mm wide, plane with a low rounded umbo, edge straight, dry, dull, tomentose at center, elsewhere with scattered, tiny, pointed sqamules, smokey olivaceous brown overall (between 81 d. gy. Br. & 78 d. y Br.); context 3.5 mm thick, whitish buff, odor and taste absent.

Lamellae 4 mm wide, free, white when young, pink when mature, close (2-3 mm), entire or somewhat eroded; lamellulae numerous but not in distinct tiers.

Stipe 70 mm long, 4 mm thick, equal but slightly enlarged at the apex, glabrous but with longitudinal aspect to surface fibrils, light dingy gray; context solid, white.

Chemical color reactions: not tested.

Spores 5.8-6.3 x 5.8 µm ($\bar{X}$=6 x 5.37, Q=1.09-1.2, $\bar{Q}$=1.12), subglobose to globose in profile and face view, smooth, slightly thick-walled, stramineous-pink in KOH, inamyloid. Basidia 23-31 x 8.1-9.2 µm, 4-sterigmate, clavate to somewhat fusiform, hyaline. Hymenial cystidia on sides and edges similar although those on edge often slightly smaller, (27)40-80 x 14-25(31) µm, arising from the tramal hyphae, broadly fusiform-ventricose, the apex rounded-tapered or somewhat pointed-mucronate, the apex generally surrounded by a large hyaline oil globule, the base with several short cells, smooth, thin-walled, hyaline. Hyphae of lamellar trama 3.5-12 µm wide, slightly inverse, hyaline. Hyphae of subhymenium cellular, cells more or less equidiametric, 5.8-10.4 µm wide, hyaline. Pileus surface an interrupted to continuous trichodermium, generally continuous at center, the elements often appressed at margin, basal hyphae 8.0-20 µm wide, end-cells 45-105 µm long and more or less cylindric or tapered to a rounded apex, smooth, with brownish intracellular pigment. Hyphae of pileus trama 4.5-14 µm wide, hyaline. Hyphae of stipe surface 3.5-9.2 µm wide, appressed, with scattered cystidioid end-cells, smooth, thin-walled hyaline to pale gold. Hyphae of stipe trama up to 14 µm wide, hyaline. Clamp connections absent.

Solitary, on soil. Sendero Occidental, 19 Jul 1986, Ovrebo 2227 (CSU).

This taxon is previously known from Bolivia.

Volvariella volvacea (Bull.: Fr.) Sing. Lilloa 22: 401. 1951.

Solitary or scattered, on stumps or leafy debris of banana plants.

Station grounds, 1 Jul 1986, Ovrebo 2074 (USJ), 6 Jul 1986, Ovrebo 2122 (CSU), 14 Jul 1986 (no number, CSU) & 15 May 1991 Ovrebo 3059 (USJ). For descriptions and illustrations see Shaffer (1957) and Pegler (1983).

Strophariaceae

Hypholoma subviride (B. & C.) Dennis, Kew Bull. 15: 134. 1961.

Gregarious, on decaying dicot logs. Camino Experimental Sur, 27 Jun 1986, Ovrebo 2043 (USJ), Sendero El Surá, 2 Jul, 1986, Ovrebo 2089 (CSU); Sendero Suroeste, 27 Jul 1989, Ovrebo 2797 (USJ). For description and illustrations see Pegler (1983).

Tricholomataceae

Chaetocalathus columellifer (Berk.) Sing. Sydowia 9: 398. 1955.

Gregarious on dead palm petiole. Camino Circular Lejano, 28 Jun 1986, Ovrebo 2051 (CSU). For description see Singer (1976).

Chaetocalathus liliputianus (Mont.) Sing. Lilloa 8: 527. 1942.

Gregarious, on dicot wood. Succession plot area, 29 Jul 1986, Ovrebo 2301 (CSU). See Singer (1976) for description.

Clitocybula azurea Sing. Sydowia Annal. Mycol. Ser. II: 18-19. 1973. Fig. 8

Pileus 3-17mm wide, convex when young, broadly convex to plane when mature, edge straight at all stages, with a small pointed umbo, surface moist, dull, glabrous, translucent-striate 2-4mm in from edge, the edge often slightly wavy when mature, edge occasionally becoming eroded, dark greenish blue (23-24E4) overall with the very edge slightly lighter, hygrophanous and becoming lighter blue (23-24B2) where moisture leaves, not discoloring; context up to 2 mm thick near stipe on largest carpophores, concolorous with surface, odor and taste absent.

Lamellae narrow, .5-1 mm wide, adnate, light greenish blue (24D2-3), not discoloring, entire, crowded (3 lamellae and lamellulae per mm); lamellulae numerous but not arranged in distinct tiers.

Stipe 6-35 mm long, 1-2.5 mm thick, equal or tapered slightly to apex, glabrous, very light translucent bluish green, not discoloring; context solid, fleshy-fibrous, concolorous with surface; base sometimes with whitish strigose mycelium.

Chemical color reactions: no reaction or faintly greenish on pileus with KOH.

Spores white in deposit; 4.5-5.5 x 4.5-5.5 µm ($\bar{X}$=5.2 x 4.88, Q=1-1.2, $\bar{Q}$ =1.07), spherical to subspherical in profile and face view, smooth, thin-walled, hyaline, weakly amyloid. Basidia 20-24 x 5.2-5.8 µm, clavate, 4-sterigmate, hyaline. Hymenial cystidia absent. Hyphae of lamellar trama 3.5-13 µm wide, parallel, hyaline. Hyphae of subhymenium subcellular, dextrinoid. Hyphae of pileus surface forming a cutis of radially oriented and appressed hyphae, 2.3-8.0 µm wide, smooth, thin-walled, hyaline to pale yellowish. Hyphae of pileus trama 5.8-18 µm wide, hyaline. Hyphae of stipe surface 3.5-6 µm wide, parallel, cylindric, smooth, thin-walled, pale yellow. Hyphae of stipe trama 5.8-16 µm wide, parallel and compacted, hyaline, dextrinoid. Clamp connections present.

Gregarious, sometimes in large numbers, on dicot logs. Sendero Oriental, 6 Jul 1986, Ovrebo 2119 (USJ); Arboretum, 12 Jul 1986, Ovrebo 2178 (CSU); Camino Experimental Norte, 21 Jul 1986, Ovrebo 2242 (CSU); Camino Circular Cercano, 18 May 1991, Ovrebo 3104 (USJ). Extralimital collections studied: Ecuador: Napo, Lago Agrio, 16 V 1973, Singer B7509 (F 1017473) (F); Venezuela: Estado Bolivar: along Rio Caronii near rapids just below Uriman, J.A. Steyermark and J. J. Murkack, 11 I 1955 (F 1015726) (F); Brazil: Sao Paulo: Serra de Centareira, 17 XII 1964, Singer B4115 (F 1014600) (this collection at F is labelled as holotype but the protologue states the type as being located in BAFC, a second collection at F has same collection data and number).

This fungus is distinctive in its greenish blue pigmentation and small pointed umbo which present on nearly all basidiomes. It is previously known from Brazil and Venezuela.

Collybia neotropica Singer, Sydowia 15: 54. 1964.

Scattered, on soil, leaf litter or wood debris. Sendero El Surá, 10 May 1991, Ovrebo 2999 (USJ) & 25 May 1991, Ovrebo 3178 (CSU); Sendero Suroeste, 19 May 1991, Ovrebo 3110 (NY). See Pegler (1983) for description and illustrations.

Collybia subpruinosa (Murr.) Dennis, Tran. Brit. Mycol. Soc. 34: 449. 1951.

Scattered on rotting buttress root. Camino Experimental Sur, 3 Aug 1989, Ovrebo 2851 (CSU, NY). See Pegler (1983) for description and illustrations.

Crinipellis eggersii Pat. in Pat. & Lagerheim, Bull. Soc. Mycol. Fr. 9: 125. 1893.

Solitary, on dicot twig. Sendero Oriental, 25 Jul 1989, Ovrebo 2770 (CSU). See Pegler (1983) and Singer (1976) for descriptions and illustrations.

Dictyopanus pusillus (Pers.: Fr.) Singer, Lloydia 8: 224. 1945.

Gregarious, sometimes imbricate, on wood. Sendero Sabalo Esquina, 26 May 1981, Ovrebo 3181 (CSU); Camino Central, 23 May 1992, Ovrebo 3307 (USJ). Common in subtropical and tropical regions. See Pegler (1983) for description and illustrations. Also reported from Cocos Island (Gómez P. 1983).

Filoboletus gracilis (Klotzsch ex Berk.) Sing. Lloydia 8: 216. 1945.

On dead dicot wood. 24 Jun 1986, Ovrebo 2013 (USJ); Sendero Holdridge, 23 Jan 1986, Ovrebo 1992 (CSU); Sendero Holdridge, 28 Jul 1989, Ovrebo 2805 (USJ). Also reported from Cocos Island (Gómez P. 1983). This is a common tropical fungus. For description and illustration see Pegler (1983).

Gerronema retiarum (Berk.) Singer, Nov. Hedwigia 29: 9. 1977. Figs. 9-11.

Pileus 6-30 (-48) mm wide, broadly convex when young, expanding to plane and finally when older somewhat concave, occasionally umbilicate, edge often wavy or lobed, surface dry, dull, glabrous, translucent-striate to translucent-reticulate, medium bright yellow (3A8) overall, often with small scattered brown spots or streaks, hygrophanous and becoming lighter yellow where moisture leaves; context thin, less than 1 mm thick, yellow, odor and taste slight nondescript.

Lamellae .5 - 1.5mm wide, adnate to subdecurrent, intervenose at all stages, concolorous with pileus, often with brownish spots, entire, subdistant (1-1.5 mm apart); lamellulae numerous but not in distinct tiers.

Stipe 10-50 mm long, 1.5-3 mm thick, equal or tapered slightly to apex, occasionally flattened, glabrous, dull, concolorous with pileus; hollow, context concolorous with the surface; base with only a faint trace of yellowish mycelium on some.

Chemical color reactions: all parts becoming immediately dull amber brown with 2.5% KOH.

Spores white in deposit; 5.5-7 x 3.5-4.5 µm ($\bar{X}$=6.27 x 4.04, Q=1.33-1.75, $\bar{Q}$ =1.56), elliptic in profile and face view, smooth, thin-walled, hyaline, inamyloid. Basidia 22-29 x 5.5-6.9 µm, clavate, yellowish gold in mass, 4-sterigmate, the sterigmata often twisted and bent and up to 6.5 µm long. Cheilocystidia 29-40 x 6-10 µm, cylindric, cylindro-flexuous or subclavate, smooth, thin-walled, hyaline to dull yellowish gold but without distinctive content. Hyphae of lamellar trama 3-11.5 µm wide, interwoven, hyaline to light yellow, inamyloid. Hyphae of subhymenium 2.5 µm wide, cylindric, hyaline. Hyphae of pileus surface 3.5-8 µm wide, radially repent, cylindric, smooth, thin-walled, hyaline to light yellowish orange. Hyphae of pileus trama 3.5-12 µm wide, hyaline to pale yellow. Hyphae of stipe surface 3.5-8 µm wide, appressed, occasionally with cystidioid end cells, smooth, thin-walled, hyaline to golden colored. Hyphae of stipe context 3.5-13 µm wide, parallel, hyaline. Oleiferous hyphae scattered, hyaline to ochre. Clamp connections present.

Gregarious, often fruiting in large numbers, on downed logs. Camino Experimental Norte, 24 Jun 1986, Ovrebo 2010 (CSU) & 17 May 1991, Ovrebo 3089 (CSU); Sendero Sabalo Esquina, 25 June 1986, Ovrebo 2020 (USJ); Sendero El Suampo, 30 Jul 1989, Ovrebo 2817 (USJ); Camino Circular Lejano, 15 May 1991, Ovrebo 3067 (USJ) & 14 May 1992, Ovrebo 3257 (CSU).

This fungus is distinctive in its bright yellow pigmentation, intervenose hymenophore, and is often found fruiting in large numbers. It appears to be very similar to Pegler's description of *Collybia plectophylla* (Mont.) Sing. (Pegler, 1983), so there may be a question regarding the proper generic disposition of the fungus if they are the same organism. The La Selva collection differs by possessing cheilocystidia.

Hohenbuehelia nigra (Schwein.) Sing. Lilloa 22: 256. 1951.

On small dicot log. Camino Central, 15 Jul 1986, Ovrebo 2204 (CSU). For descriptions and illustrations see Thorn & Barron (1986), and Pegler (1983).

Hydropus angustispermus Singer, Flora Neotrop. monogr. no. 32: 59. 1982.

Scattered to gregarious, on dicot logs and twigs. Sendero El Surá, 26 Jul 1986, Ovrebo 2279 (CSU), Sendero Oriental, 12 May 1991, Ovrebo 3027 (USJ) & Lindero Occidental, 13 May 1991, Ovrebo 3044 (CSU). This species is also reported from Santa Rosa, Guanacaste (Singer & Gómez, 1982).

Hydropus hydrophoroides Sing. Fl. Neotropica Monogr. no. 32: 71. 1982. Figs. 12-14

Pileus 53 mm wide, plane with a slightly undulating margin, surface dry, dull, glabrous, sulcate, translucent-striate, buff at center, elsewhere dull gray with translucent striations dark gray; context 2.5 mm thick, white at the center, gray on the margin, odor and taste absent.

Lamellae up to 4 mm wide, adnate with a subdecurrent tooth, white to translucent white, not discoloring, distant (lamellae and lamellulae 2 mm apart), not intervenose but faintly rugulose, entire; lamellulae present but not in distinct tiers.

Stipe 57 x 5 mm, equal, glabrous, light whitish buff, not discoloring; hollow, context concolorous with surface; a buff rhizomorph 1 µm in dia attached to base.

Spores white in deposit; 6.5-7.5 x 4-4.5 µm ($\bar{X}$=6.97 x 4.48, Q=1.44-1.75, $\bar{Q}$=1.56), elliptic in profile and face view, smooth, thin-walled, hyaline, inamyloid. Basidia 31-36 x 7-8 µm, 4-sterigmate, clavate, hyaline. Cheilocystidia 20-35 x 7-13 µm, clavate to sphaeropedunculate, smooth, thin-walled, hyaline. Pleurocystidia absent. Hyphae of lamellar trama 3.5-14 µm wide, parallel, hyaline. Hyphae of subhymenium 2.5-3 µm wide, cylindric, interwoven. Pileus surface hymeniform, often interrupted in places, cells 22-48 x 10-19 µm, clavate, pyriform or sphaeropedunculate, smooth, thin-walled, with light grayish brown intracellular pigment. Hyphae of pileus trama 3.5-13 µm wide, hyaline, inamyloid. Hyphae of stipe surface 3.5-6 µm wide, cylindric, hyaline. Caulocystidia abundant at apex, occasional elsewhere, erect or repent, often collapsed, 25-55 x 11-18 µm, clavate to sphaeropedunculate, smooth, thin-walled or walled thickened to .5 µm, hyaline. Hyphae of stipe trama 4.5-12 µm wide, hyaline. Clamp connections present.

Solitary, on soil. Camino Experimental Sur, 29 Jul 1986, Ovrebo 2300 (CSU).

The other known collection is the type from Colombia.

Hydropus mycenoides (Dennis) Sing. var. *mycenoides*, Sydowia 15: 66. 1961. Figs. 15-17

Pileus 11-30 mm wide, broadly conic when young, expanding to plane, occasionally with a low umbo, surface moist, glabrous but with radial structure evident, finely rugulose, drab olivaceous gray (5D4-5E5) with center darkest and almost fuscous, not discoloring; context 1.5 mm thick, translucent gray, odor slightly nondescript, taste absent.

Lamellae 1-2 mm wide, deeply adnexed, white, not discoloring, close (2 mm), entire; lamellulae numerous but not in distinct tiers.

Stipe 40-80 mm long, 1.5-2.5 mm thick, equal, surface glabrous but with 10X finely pruinose overall, translucent-white, not discoloring; hollow, context concolorous with surface.

Spores white in deposit; 6.5-8 x 4.5-5 µm (n=30, $\bar{X}$ =7.25 x 4.7, Q=1.4-1.66, $\bar{Q}$=1.54), elliptic to obovate in profile, elliptic in face view, smooth, thin-walled, hyaline, inamyloid. Basidia 25-28 x 6.3-6.9 µm, 4-sterigmate, clavate, hyaline. Metuloids on sides and edges, 70-92, µm long, 16-20 µm wide at widest point, neck 5-9 µm wide, ampulliform with a narrow base, smooth, wall thickened to 2-3 µm at upper mid-portion, hyaline, inamyloid. Hyphae of lamellar trama 3.5-13 µm wide, parallel, hyaline. Hyphae of subhymenium 2.9 µm wide, cylindric, hyaline. Pileus surface predominantly a cutis, hyphae 3.5-7 µm wide, cylindric, smooth, thin-walled, hyaline, with scattered dermatocystidia, cells 12-32 x 7-12 µm, hyaline; subcutis composed of broader cells 7-17 µm wide, slightly inflated, smooth, thin-walled, with light fuscous intracellular pigment. Hyphae of pileus trama 2.5-12 µm wide, hyaline. Hyphae of stipe surface 4.5-6 µm wide, cylindric, smooth, thin-walled, hyaline. Caulocystidia 29-40 x 9-11.5 µm, scattered on stipe, cylindric to subfusiform, smooth, thin-walled, with brownish intracellular pigment. Hyphae of stipe tama 4.5-14 µm wide, parallel, hyaline. Clamp connections present.

Solitary or often two in close proximity, on buried wood. Sendero El Surá, 14 Jul 1986, Ovrebo 2200 (USJ) & 22 Jul 1986, Ovrebo 2252 (CSU).

This fungus is fairly common at La Selva and when encountered appears to be terricolous. Careful removal from the soil will show that it is always attached to buried wood.

Hydropus nigritus (B. & C.) Singer, Beih. Sydowia 7: 55. 1973.

Scattered, on wood debris and sticks. Sendero El Atajo, 21 May 1991, Ovrebo 3129 (USJ) & Sendero Las Vegas, 23 May 1991, 3158 (CSU).

Hydropus nigritus is easily recognized by the light-colored basidiomes that blacken. It occurs in temperate as well as tropical regions. See Singer (1982) and Pegler (1983) for descriptions.

Hydropus nigromarginatus Singer, Flora Neotropica Monograph no. 32: 60. 1982. Figs. 18-20

Pileus 25-60 mm wide, varying from almost plane to depressed to umbilicate, the edge straight or often wavy; surface moist, glabrous, smooth to faintly sulcate, opaque at the center, translucent-striate on the margin, center dark brown (6F4), lightening outward to brownish gray (6C2-6D3), not discoloring; context 1 mm thick, translucent grayish brown, odor and taste nondescript.

Lamellae 2-3 mm wide, subdecurrent to decurrent, fleshy grayish buff (5B3) when young, in age pale fleshy gray (6C3), fuscous marginate, not discoloring, distant (lamellae and lamellulae 2-3 mm apart on mature specimens at mid-pileus), intervenose-rugulose, lamellulae present.

Stipe 15-35 mm long, 6-7 mm wide, equal, base rounded, glabrous, dull gray, not discoloring; hollow, context concolorous with surface.

Spores 5.5-6.5 x 5-6 µm ($\bar{X}$=6.13 x 5.4, Q=1.08-1.2, $\bar{Q}$=1.14), subspherical in profile and face view, smooth, thin-walled, hyaline, inamyloid. Basidia 32-37 x 7-8 µm, 4-sterigmate, hyaline. Cheilocystidia 31-50 x 5-11 µm, narrowly cylindric, narrowly clavate or clavate, smooth, thin-walled, with pale yellowish brown intracellular pigment, no reaction in Melzer's reagent. Pleurocystidia absent. Hyphae of lamellar trama 5-10 µm wide, hyaline. Hyphae of subhymenium 2-3 µm wide, interwoven, cylindric, hyaline. Pileus surface mainly a cutis, cells 3-5 µm wide, cylindric, smooth, thin-walled, with fuscous intracellular pigment, dermatocystidia scattered, repent or erect, 26-45 x 7-15 µm, clavate, smooth, thin-walled, with fuscous intracellular content. Hyphae of pileus trama 5-20 µm wide, hyaline. Hyphae of stipe surface 4-6 µm wide, cylindric, smooth, thin-walled, with pale brown intracellular pigment. Caulocystidia scattered over stipe, 25-42 x 6-16 µm, cylindric to broadly clavate, smooth, thin-walled, hyaline or with pale brown intracellular pigment. Clamp connections present.

Scattered, on sticks and wood debris. Sendero Oriental, 3 Aug 1989, Ovrebo 2848 (CSU).

Leucopaxillus gracillimus Singer & Smith, Pap. Mich. Acad. Sci. Arts & Lett. 28: 131. 1943.

Scattered on soil. Sendero Occidental, 14 May 1991, Ovrebo 3052 (CSU). See Pegler (1983) for description and illustrations.

Marasmiellus albofuscous (B. & C.) Sing. Beih. Nova Hedw. 44: 24. 1973.

Densely gregarious or in caespitose clusters, on dead logs or snags. Arboretum, 10 Jul 1986, Ovrebo 2146 (USJ); Camino Experimental Sur, 21 Jul 1986, Ovrebo 2245 (CSU); Sendero Occidental, 14 May 1991, Ovrebo 3055 (CSU). See Pegler (1983) and Singer (1973) for descriptions and illustrations. This fungus is described without a veil. One collection (Ovrebo 2245) which in every other respect matches the concept of *M. albofuscous* had fibrillar velar remnants on the stipe.

Marasmiellus nigripes (Schw.) Sing. Pap. Mich. Acad. Sci. Arts & Lett. 32: 130. 1948.

On dicot twigs. Sendero El Surá, 7 Jul 1986, Ovrebo 2086 (USJ); Sendero Oriental, 31 Jul 1986, Ovrebo 2317 (CSU). This fungus is common to both temperate and tropical regions. Also reported from Cocos Island (Gómez P. 1983) and Santa Rosa, Guanacaste (Singer & Gómez P. 1982). For descriptions and illustrations, see Singer (1973) and Pegler (1983).

Marasmiellus purpureus (B. & C.) Murr. North Amer. Flora 9: 244. 1915.

On standing dicot twig. Sendero Oriental, 29 Jul 1986, Ovrebo 2297 (CSU). For description of Costa Rican material from Santa Rosa, Guanacaste, see Singer and Gómez P. (1982).

Marasmiellus stenophylloides (Dennis) Dennis, Kew Bull. Addit. Ser. 3: 31. 1970.

Gregarious, often in clusters of 2-5, on dicot sticks. Sendero Oriental, 22 May 1992, Ovrebo 3302 (CSU) & 23 May 1992, Ovrebo 3305 (CSU); Sendero Occidental, 27 May 1992, Ovrebo 3332 (USJ). For descriptions and illustrations see Singer (1973) and Pegler (1983).

Marasmiellus troyanus (Murr.) Dennis, Kew Bull. Addit. Ser. 3: 31. 1970.

On monocot leaves, sticks and roots, sometimes on root masses of *Bactris gasipaes*. Camino Experimental Sur, 21 Jul 1986, Ovrebo 2243 (USJ) & station grounds, 30 Jul 1986, Ovrebo 2309 (CSU). For descriptions and illustrations see Singer (1973) and Pegler (1983).

M. volvatus Sing. ex Sing. Fieldiana, new ser. 21: 37. 1989. Figs. 21-22.

Pileus 6-40 mm wide, unopened buttons subglobose to elliptic, expanding to convex, broadly convex or nearly plane, often slightly depressed at the center, surface moist, glabrous, strongly sulcate from edge of disc outward, occasionally slightly bumpy on ridges, the edge plicate, somewhat translucent or opaque, white overall, hygrophanous and remaining white where moisture leaves, not discoloring, drying light yellow; context thin, up to 1mm thick at center, white.

Lamellae 1-2.5mm wide, adnate to deeply adnexed, white, not discoloring, drying yellow, distant (1-2mm apart), entire, not intervenose but often slightly rugulose, occasionally forked, lamellulae present but not between every pair of lamellae.

Stipe 7-55mm long, 1-2mm thick, equal or tapered slightly to apex, the base subbulbous, glabrous and with slight silky aspect, white, not discoloring; context solid or occasionally hollow, fleshy-fibrous, white. Partial veil leaving a low ridge of tissue 1-2.5 mm up from the base.

Chemical color reactions: yellow on all parts with 2.5% KOH.

Spores white in deposit; 15-20 x 5-7 µm ($\bar{X}$=17.8 x 6.52, Q=2.57-3.33, $\bar{Q}$ =2.75), fusoid with a suprahilar depression, smooth, thin-walled, hyaline, inamyloid. Basidia 37-46 x 8.1-9.2 µm, 2- or 4-spored, clavate, hyaline. Cheilocystidia inconspicuous, 23-29 x 10-12 µm, clavate, smooth, thin-walled, hyaline. Hyphae of lamellar trama subparallel, 3.5-12 µm wide, hyaline. Hyphae of subhymenium 2.3-2.9 µm wide, cylindric, hyaline. Hyphae of pileus surface forming an intermittent to continuous Remeales-structure with well developed coralloid cells, cells 3.5-5.8 µm wide, smooth, thin-walled, hyaline. Hyphae of pileus trama 4-12 µm wide, hyaline. Hyphae of stipe surface 1.7-4.6 µm wide, appressed to slightly interwoven, with occasional scattered coralloid cells, smooth, thin-walled, hyaline. Hyphae of stipe context 3.5-13 µm wide, hyaline. Clamp connections present throughout carpophore.

Gregarious, often in large numbers, on dead dicot wood. Camino Experimental Sur, 27 Jun 1986, Ovrebo 2040 (CSU) & 25 Jul 1986, Ovrebo 2272 (CSU); Sendero Oriental, 29 Jul 1986, Ovrebo 2305 (USJ); Sendero El Surá, 24 Jul 1989, Ovrebo 2759 (CSU, USJ); Sendero Holdridge, 1 Aug 1989, Ovrebo 2833 (USJ); station grounds, 12 May 1991, Ovrebo 3032 (USJ).

See Singer (1988) for photograph.

Marasmius atrorubens (Berk.) Berk. Hook. Journ. Bot. 8: 137. 1856.

On dicot leaves. Sendero Oriental, 6 Jul 1986, Ovrebo 2117 (CSU). For descriptions and illustrations see Singer (1976) and Pegler (1983).

Marasmius bellus Berk. Hook. Journ. Bot. 8: 139. 1856.

On dicot twigs. Succession Plots, 28 June 1986, Ovrebo 2050 (CSU). For descriptions and illustrations see Singer (1976) and Pegler (1983).

Marasmius berteroi (Lev.) Murr. var. *major* Singer, Sydowia 18: 344. 1965.

On well decayed dicot wood, decomposing leaf litter or soil. 22 Jan 1986, Ovrebo 1979 (CSU); near old farm house, 23 Jan 1986, Ovrebo 1990 (CSU); Lindero Occidental, 13 May 1992, Ovrebo 3251 (USJ). For descriptions and illustrations see Singer (1965, 1976).

Marasmius cladophyllus Berk. in Hook. Journ. Bot. 8: 138. 1856.

On monocot and dicot leaf litter and twigs. Sendero Holdridge, 23 Jan 1986, Ovrebo 1987 (CSU); Sendero

El Surá, 24 Jun 1986, Ovrebo 2009 (USJ); Sendero Oriental, 3 Jul 1986, Ovrebo 2095 (CSU); Sendero Oriental, 26 Jul 1989, Ovrebo 2784 (USJ). This is a common *Marasmius*. For descriptions and illustrations see Singer (1965, 1976) and Pegler (1983).

Marasmius digilioi Sing. in Sing. & Digilio, Lilloa 25: 201. 1952. Figs. 23-25

Pileus 7-19 mm wide, convex when young, expanding to plane, the edge wavy to subcrisped, generally with a low, narrow umbo, surface dry, dull, glabrous, shallowly sulcate, only faintly translucent-striate near the edge, dark smokey olive brownish gray (5F3-5), slightly lighter when older (5E5), not discoloring; context immeasurably thin, concolorous with surface.

Lamellae 1-2 mm wide, deeply adnexed, light buff when young, becoming dingy yellowish buff in age, not discoloring, not marginate, entire, subdistant (lamellae and lamellulae about .5mm apart); lamellulae in two tiers.

Stipe 30-45 mm long, .5 mm thick, somewhat wiry, glabrous, buff at apex, medium dark brown below; mycelium at base strigose, ochre, mycelium on leaves ochraceous buff.

Chemical color reactions: no reaction with 3% KOH.

Spores 8-9 x 3 µm ($\bar{X}$=8.73 x 3, Q=2.67-3, $\bar{Q}$=2.91), narrowly fusoid in profile and face view, smooth, thin-walled, hyaline. Basidioles 21-27 x 5-6 µm, fusoid, hyaline, mature basidia not seen. Cheilocystidia in the form of siccus-type broom cells, body 13-17 x 5-7 µm, cylindric, hyaline, setulae 5-6 µm long, 1 µm wide at base, erect, tapered to acute apex, yellowish brown or occasionally hyaline. Hyphae of lamellar trama 4-11 µm wide, interwoven, cylindric, hyaline, dextrinoid. Hyphae of subhymenium, cylindric, hyaline. Pileus surface a hymeniform layer of siccus-type broom cells, body 11-15 x 5-7 µm, cylindric to clavate, hyaline, thin-walled, setulae 4-7 µm long, 1 µm wide at base, erect, tapered to apex, dark orange-brown. Hyphae of pileus context 3-9 µm wide, cylindric, hyaline, dextrinoid. Hyphae of stipe surface 4-5 µm wide, cylindric, somewhat thick-walled, yellowish green. Hyphae of stipe trama dextrinoid. Clamp connections present throughout carpophore.

Scattered, on twigs and leaf litter. Sendero Oriental, 18 May 1991, Ovrebo 3095 (CSU).

This taxon is previously known from Bolivia and Argentina.

Marasmius haematocephalus (Mont.) Fr. Epicrisis. 382. 1838.

On dicot leaf litter. Camino Experimental Sur, 24 Jun 1986, Ovrebo 2011 (CSU); station grounds, 27 Jun 1986, Ovrebo 2042 (CSU) & 10 May 1991, Ovrebo 2995 (USJ). For descriptions and illustrations see Singer (1965, 1976) and Pegler (1983). This is a common *Marasmius* species at La Selva. The pileus coloration of the La Selva material was dull dark pink to pinkish violet (11E6, 11D5, 11-12C4-5). Of the nine varieties of this species recognized by Singer (1976), the La Selva fungus fits most closely color-wise to var. *oenechinus* Sing. This species is also reported from Cocos Island (Gómez P. 1983).

M. heliomyces Murr. Bull. Torr. Bot. Club 67: 149. 1940.

Gregarious to caespitose, on leaf litter or woody debris. Camino Experimental Sur, 26 Jul 1989, Ovrebo 2790 (CSU); Lindero Occidental, 21 May 1991, Ovrebo 3130 (USJ). For descriptions and ilustrations see Singer (1976) Halling (1983). This fungus was previously known only from Florida.

M. hendecaphyllus Singer, Fieldiana, new series, no. 21: 46. 1989. Figs. 40-42

Pileus 1-3 mm wide, hemispheric, umbilicate, sulcate, glabrous, opaque, white, not discoloring but becoming slightly yellowish when older; context immeasurably thin.

Lamellae less than 1 mm wide, adnate to a collarium, white, distant (9-11 per basidiome); lamellulae absent.

Stipe 2-14 mm long, .3 mm thick, equal, wiry, glabrous, brownish black, lightest at apex, the base with a tiny white to light brown mycelial mat.

Spores 7.5-9.2 x 3.5-4 µm ($\bar{X}$=8.44 x 3.73, Q=2.14-2.46, $\bar{Q}$=2.26), fusoid with a suprahilar depression, smooth, thin-walled, hyaline, inamyloid. Basidia 16-20 x 6.3-6.9 µm, clavate, 4-sterigmate. Hymenial cystidia of rotula-type broom cells, 13-20 x 9-15 µm, saccate, setulae less than 2 µm long, hyaline, faintly dextrinoid. Hyphae of lamellar trama 4.6-12 µm wide, subparallel, hyaline, nondextrinoid. Hyphae of subhymenium 2.3 µm wide, cylindric. Cells of pileus surface hymeniform with rotula-type broom cells, 20-33 x 17-30 µm, more or less globose

) broadly pyriform, setulae up to 1 µm long, hyaline ut light brown in mass. Hyphae of stipe surface up to 2 µm wide, cylindric, thick-walled, dark brown. Hyphae of stipe context 3.5-12 µm wide, thin-walled, yaline. Clamp connections present.

Gregarious on dicot leaf. Sendero Sábalo Esquina, 3 ıl 1986, Ovrebo 2094 (CSU).

This fungus was described from Brazil and is also nown from Colombia.

M. jalapensis Murrill, North Amer. Flora 9: 264. 915.Figs. 26-29

Pileus 30-50mm wide, more or less convex at all ages, glabrous, dull, smooth when young, becoming ıallowly sulcate nearly to center when mature, not bviously translucent-striate, dull flesh-pink overall at ll stages (53 m. O - 57 l. Br) but darkest at center, ygrophanous, and becoming slightly lighter where ıoisture leaves, not discoloring; context thin, 1-1.5 m thick, buff to translucent buff; odor and taste ondescript.

Lamellae 2-5mm wide, deeply adnexed, dull pink, ghter than pileus, not discoloring, faintly minutely rownish dotted under 10X lens, entire, distant (2-2.5 m betweem lamellae and lamellulae), lamellulae resent but not in distinct tiers.

Stipe 40-75 mm long, 3-4 mm thick, equal, labrous but under 10X faintly brownish-dotted, hitish buff overall when young, becoming dark ddish brown in age (7EF7) with the apex remaining ghter, not discoloring; hollow, context concolorous ith surface; base with whitish strigose mycelium, ıycelium on surrounding substrate yellowish buff.

Chemical color reactions: no reaction with 3% OH.

Spores white in deposit; 7-8 x 3.5-4 µm ($\bar{X}$=7.57 x .8, Q=1.88-2.14, $\bar{Q}$ =1.99), elliptic with suprahilar epression in profile, obovate in face view, smooth, ıin-walled, hyaline, inamyloid. Basidia 22-24 x 6-7 m (mature ones scarce), 4-sterigmate, clavate, yaline. Cystidia in the form of setae very abundant on des and edge, 65-115 x 9-11(15) µm, acicular-fusoid, ıpered to a point, those on or near the edge ccasionally forked or branched, the base often curved, all 1.5-3 µm thick, melleous to golden brown, arkest toward the apex, unchanging or slightly extrinoid; edge also with broom cells, body 15-33 X .5-10 µm, mainly hyaline but occasionally golden rown on larger cells, setulae 3-7 long, 1-3 µm wide at the base, tapered to an acute apex, erect or oblique, hyaline to light golden. Hyphae of lamellar trama 3-8 µm wide, parallel, cylindric, hyaline, dextrinoid. Hyphae of subhymenium 2-3 µm wide, cylindric, hyaline. Pileus surface a combination of broom cells, setae and cells transitional between the two; setae 55-80 x 7.5-10 µm, acicular-fusoid, wall thickened up to 2 µm, golden brown, not clearly dextrinoid; body of transitional cells 15-35 x 6-10 µm, golden brown, thick-walled, setulae 6-15 µm long, 1.5-3 µm wide at the base, straight, tapered to an acute apex, golden brown; broom cells with body 10-20 x 6-8 µm, setulae 2-5 µm long, 1-1.5mm at the base, straight, acute, hyaline to melleous, not dextronoid. Stipe surface with a dense covering of setae, with scattered transitional broom cells and broom cells, setae and broom cells often in rosette-like clusters, shapes like those on pileus and lamellae; surface hyphae 3-4 µm wide, cylindric, greenish yellow. Hyphae of stipe trama 5-10 µm wide, cylindric, hyaline, dextrinoid. Clamp connections present.

Scattered to subcaespitose, on dicot log. Camino Experimental Sur, 12 May 1992, Ovrebo 3244 (CSU).

Originally described from Mexico, *Marasmius jalapensis* is also known from Bolivia. The spores of the above fungus are slightly narrower (2.5-3.5 mm wide) than reported by Singer (1976).

Marasmius leoninus Berk. Hook. Journ. Bot. 8: 135. 1856.

On dicot leaf litter and twigs. Sendero El Surá, 29 Jun 1986, Ovrebo 2062 (CSU); station grounds, 10 May 1991, Ovrebo 2996 (CSU); Sendero Holdridge, 12 May 1991, Ovrebo 3023 (USJ). This is a common species at La Selva. For descriptions and illustrations see Singer (1976) and Pegler (1983).

Marasmius leveilleanus (Berk.) Pat. Bull. Soc. Mycol. France 33: 55. 1917. Figs. 30-32

Pileus 14-50 mm wide, convex when young, expanding to broadly convex, plano-convex to plano-hemispheric, with a low rounded umbo, the edge straight, surface dry, glabrous, strongly sulcate from disc outward, often with interconnecting ridges, the ridges often bumpy, the center smooth to somewhat rugulose-pitted, dull tawny (lighter than 6D5) to dull rusty brown (55 s. Br - 56 deep Br.), generally darkest at the center, odor absent to slightly farinaceous, taste absent to slightly farinaceous.

Lamellae 2.5-6.5mm wide, free, rugulose between lamellae, light buff, edge concolorous, entire, rarely

forked, distant (2-5mm apart), lamellulae absent or 1-2 present.

Stipe 26-70mm long, 1mm thick, equal but flared slightly at the apex, glabrous, subpolished, somewhat wiry and tough, dull dark brown overall with apex often whitish, hollow; insititious.

Chemical color reactions: no reaction with 2.5% KOH.

Spores white in deposit; 8-10 x 4-4.5 µm ($\bar{X}$=8.83 x 4.15, Q=2-2.38, $\bar{Q}$ =2.13), elliptic to subfusiform in profile with adaxial face frequently flattened, elliptic in face view, smooth, thin-walled, hyaline, inamyloid. Basidia 23-32 x 6-7 µm, 4-sterigmate, clavate, hyaline. Cheilocystidia present in the form of broom cells, intermixed with basidia, body 15-23 x 5-7 µm, cylindric to clavate, hyaline, setulae knob-like to cylindric and finger-like, or occasionally absent and apex rounded, cylindric setulae 3-9 x 1.5-3.5 µm, body and setulae thin to slightly thick-walled, hyaline. Hyphae of lamellar trama 3.5-9 µm wide, subparallel to interwoven, cylindric, hyaline, weakly dextrinoid. Hyphae of subhymenium 2-3.5 µm wide, cylindric, hyaline. Pileus surface hymeniform, consisting of cells with or without setulae, the apex of cells without setulae rounded and smooth, body of all cells 17-30 x 5-11.5 µm, cylindric, clavate, sphaeropedunculate or versiform, some smooth cells twisted or contorted, thin to thick-walled, hyaline to dull rusty brown, setulae knob-like to cylindrical, often present only as bumps, cylindrical setulae 5-10 x 1.5-3 µm, the apex rounded, hyaline to rusty brown, weakly to strongly dextrinoid. Hyphae of pileus trama 3.5-9 µm wide, hyaline, weakly dextrinoid. Hyphae of stipe surface 3.5-5.8 µm wide, appressed, longitudinal, cylindric, cells short (as short as 7 µm long), thin-walled, brown. Hyphae of stipe trama 3.5-9 µm wide, cylindric, hyaline, not dextrinoid. Clamp connections present.

Solitary to scattered on dicot twigs. Sendero El Surá, 26 Jun 1986, Ovrebo 2035 (CSU), 24 Jul 1989, Ovrebo 2764 (USJ) & 25 Jul 2989, Ovrebo 2777 (USJ); Sendero Sabalo Esquina, 24 Jul 1989, Ovrebo 2772 (CSU); Sendero Occidental, 11 May 1991, Ovrebo 3019 (CSU, USJ); station grounds, 16 May 1991, Ovrebo 3078 (CSU).

Marasmius leveilleanus is the only species contained in *Marasmius* sect. *Leveilleani* Sing. The section is distinguished from other sections by the insititious stipe, free, lamellae, pigmented pileus and stipe and by the structure of the pileus surface which consists of broom cells that vary from being smooth to having cylindrical setulae or knob-like outgrowths.

Singer (1976) stated that *M. leveilleanus* is pantropical and rare in the neotropics. The species was described from Ceylon and Singer (1976) cites a collection from Zaire and one from Veracruz, Mexico. The La Selva material now establishes a neotropical distribution southward to southern Central America.

Marasmius niveus Mont. Ann Sci. Nat. IV 1: 117. 1854.

Gregarious, on soil, well-mulched leaf litter or well-mulched wood debris. Sendero Sábalo Esquina, 25 June 1986, Ovrebo 2027 (USJ); station grounds, 19 May 1991, Ovrebo 3113 (CSU, USJ); Sendero Occidental, 20 May, 1991, Ovrebo 3127 (CSU). This is a common tropical species. For descriptions and illustrations see Pegler (1983) and Singer (1976).

Marasmius pallescens Murr. North American Flora 9: 261. 1915.

Gregarious on dicot leaf litter. Sendero El Surá, 28 June 1986, Ovrebo 2052 (CSU). For descriptions and illustrations see Singer (1976) and Pegler (1983). This taxon may simply be a light form of *M. haematocephalus*.

Marasmius pallipes Spegazzini, Anal. Soc. Ci. Argentina 16: 272. 1883.

Densely gregarious, on logs, dead fallen branches or on roots exposed at soil surface. Camino Experimental Norte, 11 May 1991, Ovrebo 3003 (USJ); Sendero Oriental, 13 May 1991, Ovrebo 3036 (CSU); Lindero Occidental; 14 May 1991, Sendero Occidental, Ovrebo 3056 (USJ).

This species fruits in dense swarms of mushrooms on logs or small branches and one fruiting was observed with basidiomes arising from an exposed root. See Pegler (1983) and Singer (1976) for descriptions and illustrations.

Marasmius pseudoniveus var. *pseudoniveus* Singer, Sydowia 18: 340. 1965. Figs. 33-36

Pileus 20-45mm wide, broadly convex to plane, sulcate, milky white and somewhat translucent appearing but not translucent-striate, occasionally discolored reddish brown in spots, hygrophanous, becoming opaque-white where moisture leaves; context immeasurably thin, odor and taste absent.

Lamellae 1-3.5mm wide, adnate to adnexed, milky white with scattered brownish spots, distant (lamellae

and lamellulae 2 mm apart), entire, not intervenose; lamellulae not seen.

Stipe 22-50 mm long, 1.5-2 mm thick, equal finely pruinose to tomentose, white at the apex, dark brown below with a yellowish brown transitional zone; hollow; base with buff to ochraceous buff mycelium.

Spores light buff in deposit, 8.5-10 x 3-3.5 µm ($\bar{X}$=9.3 x 3.33, Q=2.57-3, $\bar{Q}$ =2.8), elongate-pip-shaped and often with adaxial face flattened in profile, fusoid in face view, smooth, thin-walled, inamyloid. Basidia 19-21 x 5-6 µm, 4-sterigmate, clavate, hyaline. Cheilocystidia (18)26-47 µm long, 3-8 µm wide at the base, setoid, usually tapering to a subacute apex, often forked or branched, sometimes with cross-walls, often thick-walled (.5 -1 µm thick), hyaline to pale yellowish. Hyphae of lamellar trama 3-10 µm wide, subparallel to interwoven, cylindric, dextrinoid, often with scattered crystals. Hyphae of subhymenium 3-4 µm wide, cylindric, hyaline. Pileus surface hymeniform and three cell-types present: (1) smooth, pyriform to subglobose cells, 12-20 x 10-13 µm, often slightly thick-walled over the apex; (2) siccus-type broom cells, body 12-20 x 6-10 µm, cylindric to clavate, thick-walled (.5 µm), pale melleous, setulae varying from short rounded extensions 2.5 long x 2 µm wide, to being long and tapered to a subacute apex, -17 µm long x 1-2 µm wide at the base, pale melleous, slightly thick-walled, not dextrinoid; (3) setae with or without small basal cell, 45-85 µm long 5-7 µm wide at the base, tapered to a subacute apex, often curved, often branched or forked, the wall thickened and up to 1.5 µm thick at the base, pale melleous to light yellowish brown. Thin-walled hyphae of pileus context up to 20 µm wide, cylindric to inflated, hyaline, thick-walled hyphae narrower, 2.5-µm wide, wall up to 2 µm thick, cylindric, hyaline, dextrinoid. Hyphae of stipe surface 4-5 µm wide, cylindric, thick-walled, dull yellow. Caulocystidia abundant and formed from recurved surface end-cells, 1-100 x 4-8 µm, cylindric to subgeniculate, often flexuous, apex rounded to subacute, thick-walled (1-1.5 µm), often forked or branched, often septate, solitary or occasionally in clusters of 2 or 3, hyaline to pale melleous, not distinctly dextrinoid. Hyphae of stipe context 5-12 µm wide, hyaline but in mass dull yellow, dextrinoid. Clamp connections present.

Gregarious, often in clusters of 2-3 basidiocarps, on downed log. Camino Experimental Sur, 17 May 1991, Ovrebo 3090 (CSU).

This fungus is previously known from Colombia and Brazil.

Marasmius setulosifolius Singer ex Singer, Sydowia 18: 343. 1965.

Scattered on leaf litter. Sendero El Suampo, 15 May 1991, Ovrebo 3068 (USJ); Sendero Oriental, 26 May 1991, Ovrebo 3186 (CSU). For description and illustration see Singer (1965, 1976).

Marasmius spiculosus Sing. Sydowia 18: 343. 1965. Figs. 37-39.

Pileus 13-30 mm wide, convex when young, expanding to more or less plane, edge often wavy, surface dry, dull, sulcate, translucent-striate, medium brown overall (6D4-6E5), when mature slightly darker brown at the center, not discoloring; context less than 1 mm thick, translucent brownish buff, odor and taste nondescript.

Lamellae 2-4 mm wide, free, light buff when young, becoming dingy cinnamon buff, when older often with a faint yellowish coloration, not discoloring, entire, distant (2-3 mm apart), lamellulae numerous, in 2-3 tiers.

Stipe 12-40 mm long, 1-2 mm thick, equal, the base subbulbous, surface very finely brownish pruinose overall as seen with lens, buff when young, medium to dark brown over most when mature, apex remaining buff and often with yellowish transition zone between buff and brown, not discoloring; hollow, context somewhat fibrous; basal mycelium tomentose-cottony, ochraceous brown.

Chemical color reactions: not tested.

Spores white in deposit; 14-15.5 x 4.5-5.5 µm ($\bar{X}$=14.67 x 5.07, Q=2.73-3.1, $\bar{Q}$=2.9), elongate-dacryoid in profile, bowling pin-shaped in face view, smooth, thin-walled, hyaline, inamyloid. Basidia 20-25 x 5.8-6.9 µm, 4-sterigmate, clavate, hyaline. Cheilocystidia intermixed with basidioles, in the form of siccus-type broom cells, body 6.9-12(17) x 5.8-8.1 µm, clavate to subglobose, brown, thick-walled, setulae several to numerous, occasionally with only one and then setoid, 4.6-15(23) x 1.2-1.8 µm, tapered to a point, thick walled, light brown. Lamellar trama 3.5-11.5 µm wide, subparallel, hyaline, dextrinoid. Hyphae of subhymenium 2.3-2.9 µm wide, cylindric, not distinctive as a layer. Pileus surface a hymeniform layer of siccus-type broom cells and setae, body of broom cells 9.2-15 x 5.8-8.1 µm, clavate, brown, thick-walled, setulae 2 or 3 to numerous, 2.3-13.8 µm long, tapered to a point, erect, brown, thin-walled, setae 39-45 x 5.8-7.5 µm, acicular, brown, thick-

walled. Hyphae of pileus context 2.9-12 µm wide, hyaline. Hyphae of stipe surface appressed, 2.3-3.5 µm wide, cylindric, smooth, thin-walled, dull yellowish brown. Caulocystidia present as broom cells or setae, body of broom cells 10-16 x 5-8 m m., thick-walled, hyaline to light brown, setulae 2-17 µm long, 1-2 µm wide, hyaline to light brown, setae 35-70 x 4-9 µm, acicular, thick-walled, hyaline to light brown. Hyphae of stipe context up to 9.1 µm wide, parallel, hyaline. Clamp connections present.

Gregarious on base of dead tree. Sendero Holdridge, 30 June 1986, Ovrebo 2065 (CSU).

The above collection lacks hymenial gloeocystidia mentioned by both Singer (1976) and Pegler (1983). If lack of gloeocystidia is consistent in the Costa Rican material, recognition of a separate species or variety may be warranted.

Mycena theobromicola (Murr.) Dennis, Trans. Brit. Mycol. Soc. 34: 472. 1971. On *Theobroma cacao* fruits. Station grounds, 28 Jul 1986, Ovrebo 2285 (CSU). For description of material from La Selva see Singer (1987) and for Santa Rosa, Guanacaste Singer & Gómez P. (1982).

Nothopanus hygrophanus (Mont.) Sing. ex Pegler, Kew Bull. 23: 247. 1949.

Gregarious, on downed dicot logs. Lindero Occidental, 21 Jan 1986, Ovrebo 1978 (CSU) & 24 Jul 1989, Ovrebo 2769 (USJ); Camino Experimental Norte, 13 Jul 1986, Ovrebo 2190 (USJ). This is a common neotropical fungus. For description and illustrations see Pegler (1983).

Oudemansiella canarii (Jungh.) Hohnel, Sitzber. K. Akad. Wiss. Wien Math. Nat. Kl. 118: 276. 1909.

Common on small dicot logs and branches. Station grounds, 23 Jan 1986, Ovrebo 1991 (USJ) & 13 May 1991, Ovrebo 3033 (USJ); Camino Experimental, 7 Jul 1986, Ovrebo 2127 (CSU). This is a common tropical fungus. Also reported from Cocos Island (Gómez P. 1983). For descriptions and illustrations see Singer (1964) and Pegler (1983).

Panellus luteus (Dennis) Sing. Kew. Bull. 8: 44. 1953.

Gregarious on downed dicot log, 22 Jan 1986, Ovrebo 1985 (CSU); Sendero Surá, 21 May 1991, Ovrebo 3132 (CSU, USJ) For description and illustration see Pegler (1983).

Pleurocollybia praemultifolia (Murr.) Sing. Mycologia 39: 80. 1947.

Gregarious, on well rotted log, Sendero El Surá, 19 Jul 1986, Ovrebo 2234 (CSU). For descriptions and illustrations see Pegler (1983) and Singer (1970).

Trogia cantharelloides (Mont.) Pat. Essai Taxon. Hymen. 129. 1900.

On leaf litter, soil and rotten stumps. Sendero El Surá, 18 Jul 1986, Ovrebo 2222 (CSU); Sendero Occidental, 26 Jul 1989, Ovrebo 2787 (USJ); Lindero Occidental, 2 Aug 1989, Ovrebo 2845 (USJ). For a description and illustration see Pegler (1983), although the colored photographic plate does not reveal the bright violaceous lamellar color.

Xerulina asprata (Berk.) Pegler, Kew Bull.: 27: 196. 1972.

On dicot wood, Sendero Oriental, 25 Jun 1986, Ovrebo 2039 (CSU). For description and illustration see Pegler (1972, 1983). This fungus is both temperate and tropical in distribution.

ACKNOWLEDGMENTS

I thank the Organization for Tropical Studies for permission to collect and use the facilities at La Selva. Fieldwork in Costa Rica was supported by grants from the Tinker Foundation administered by the Mesoamerican Ecology Institute, Tulane University, and by faculty research grants from the Graduate College, University of Central Oklahoma. A trip to the Field Museum to study mycological collections was funded by a Field Museum herbarium grant. Thanks are extended to Roy Halling and Timothy Baroni for assistance in identifying collections. Special appreciation and thanks are due to the late Rolf Singer who always assisted willingly in many ways.

RESUMEN

La diversidad de hongos Agaricales en zonas bajas tropicales ha sido poco estudiada. Sesenta y tres especies de Agaricales (Basidiomycotina) de ocho familias han sido halladas en la Estación Biológica La Selva, un bosque lluvioso tropical de bajura. Los géneros son: *Agaricus, Alboleptonia, Chaetocalathus, Clitocybula, Collybia, Coprinus, Crepidotus, Crinipellis, Dictyopanus, Filoboletus, Gerronema, Hohenbuehelia, Hydropus,*

Hypholoma, Lepiota, Leucocoprinus, Leucopaxillus, Marasmiellus, Marasmius, Mycena, Nothopanus, Oudemansiella, Panellus, Pleurocollybia, Pluteus, Pyrrhoglossum, Rugosospora, Trogia, Volvariella, Xerulina. Con siete excepciones, estos táxones se informan de Costa Rica por vez primera; aquí se presentan descripciones completas para 15 táxones.

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