Mycena sect. *Hygrocyboideae* in the mountains of the Dominican Republic

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Lodge, D. J. (Center for Forest Mycology Research, USDA—Forest Service FPL, P.O. Box 1377, Luquillo, PR 00773-1377), B. A. Perry (Harvard University Herbaria, 22 Divinity Ave., Cambridge, MA 02138) & D. E. Desjardin (Department of Biology, San Francisco State University, 1600 Holloway Ave., San Francisco, CA 94132). Mycena sect. Hygrocyboideae in the mountains of the Dominican Republic. Memoirs of The New York Botanical Garden 89: 131–139, 2004.—A collection of *Mycena epipterygia* from montane cloud forest in the Dominican Republic was found to have one-fourth to one-half monosporous basidia mixed with bisporous basidia. It is described as a new variety, M. epipterygia var. domingensis Lodge, differing from *M. epipterygia* var. *epipterygioides* and other two-spored varieties in having smaller dimensions of spores from bisporous basidia and an abundance of monosporous basidia, as well as differences in ecology and macro- and other microscopic characters. An additional member of sect. Hygrocyboideae, *Mycena griseoviridis*, was found to be common in mid- to high-elevation pine forests of the Dominican Republic. All collections of *M. griseoviridis* examined closely resemble *M. griseoviridis* var. *cascadensis* described from conifer forests in Washington.

KEY WORDS: Agaricales, Dominican Republic, Mycena, disjunct populations, taxonomy

Introduction

Some species and varieties of agarics in the Tricholomataceae are only known to have basidia bearing two spores, including *Mycena epipterygia* var. *epipterygioides* (Pearson) Kühner (Mass Geesteranus, 1989, 1992). While variation in the number of spores per basidium is common among agaric fungi, reports of species that bear one spore per basidium are rare. Bresadola (1931) illustrated a collection of *Conocybe silignea* with monosporous basidia. Smith (1947) noted the occurrence of single-spored basidia in the chapter on diagnostic characters in his monograph of the genus Mycena, but these were not mentioned in the descriptions of any species. In the monograph of the genus *Mycena* by Mass Geesteranus (1992), the presence of some single-spored basidia mixed with other types were noted in *M. adscendens* (Lasch) Mass G. and *M. silvae-nigrae* Mass G. & Schwobel. Mass Geesteranus and Meijer (1997) noted single-spored basidia mixed with other types in Mycena *pistacea* Mass G. & de Meijer from Brazil. The discovery in the mountains of the Dominican Republic of a population of *Mycena epipterygia* (Scop. ex Fr.) Gray that bore abundant monosporus basidia was deemed worthy of further investigation. This collection is described below as a new variety differing from M. epipterygia var. *epipterygioides* and other two-spored varieties based on dimensions of spores from bisporous basidia and an abundance of monosporous basidia, as well as differences in ecology, macroscopic characters, and other microscopic characters.

Other Mycena collections from mid- to high-elevation pine forests in the Dominican Republic that were tentatively identified in the field as *M. epipterygia* belong instead to another species in sect. *Hygrocyboideae* (Fr.) Sing., *M. griseoviridis* A. H. Smith. This is the first report of *M. griseoviridis* in the Dominican Republic. The morphological characteristics of the Caribbean collections most closely resemble those of *M. griseoviridis* var. *cascadensis* described from conifer forests (*Abies* sp.) in the Cascade Mountains of Washington state, U.S.A. This observation of apparently disjunct populations is consistent with previous discoveries of other species and varieties of basidiomycetes that were formerly unknown outside Idaho and the Pacific Northwest, or western North America (Cantrell et al., 2001; Lodge et al., 2002).

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Materials and Methods

Microstructures were studied using hand-cut sections mounted in aqueous 3% KOH or Melzer's reagent after rehydration in 70% alcohol. Capitalized color names are from Ridgway (1912) as reproduced by Smithe (1975) except that the name 'Spectrum Yellow' from Smithe is used in place of the equivalent name 'Lemon Yellow' from Ridgway (1912). Munsell color code notations have been added in parentheses. The spore dimensions are based on 25 spores unless differently noted. Ranges of spore dimensions shown in brackets are extreme values, and those outside the parentheses encompass 75% of the spore measurements. Length to width ratio for each spore is reported as Q. Means were calculated for each collection and are given as L^m, W^m, and Q^m. In the case of *M. epipterygia,* spore dimensions were plotted as length versus width and were found to Fall into two groups corresponding to dimensions of spores measured on single- versus two-spored basidia. Mean length, width, and length to width ratio were calculated separately for the two groups.

Results

DESCRIPTIONS AND NOTES ON MYCENA SECT. *HYGROCYBOIDEAE*

Mycena epipterygia (Scop. ex Fr.) Gray var. domingensis Lodge, var. nov. Figs. 1–6

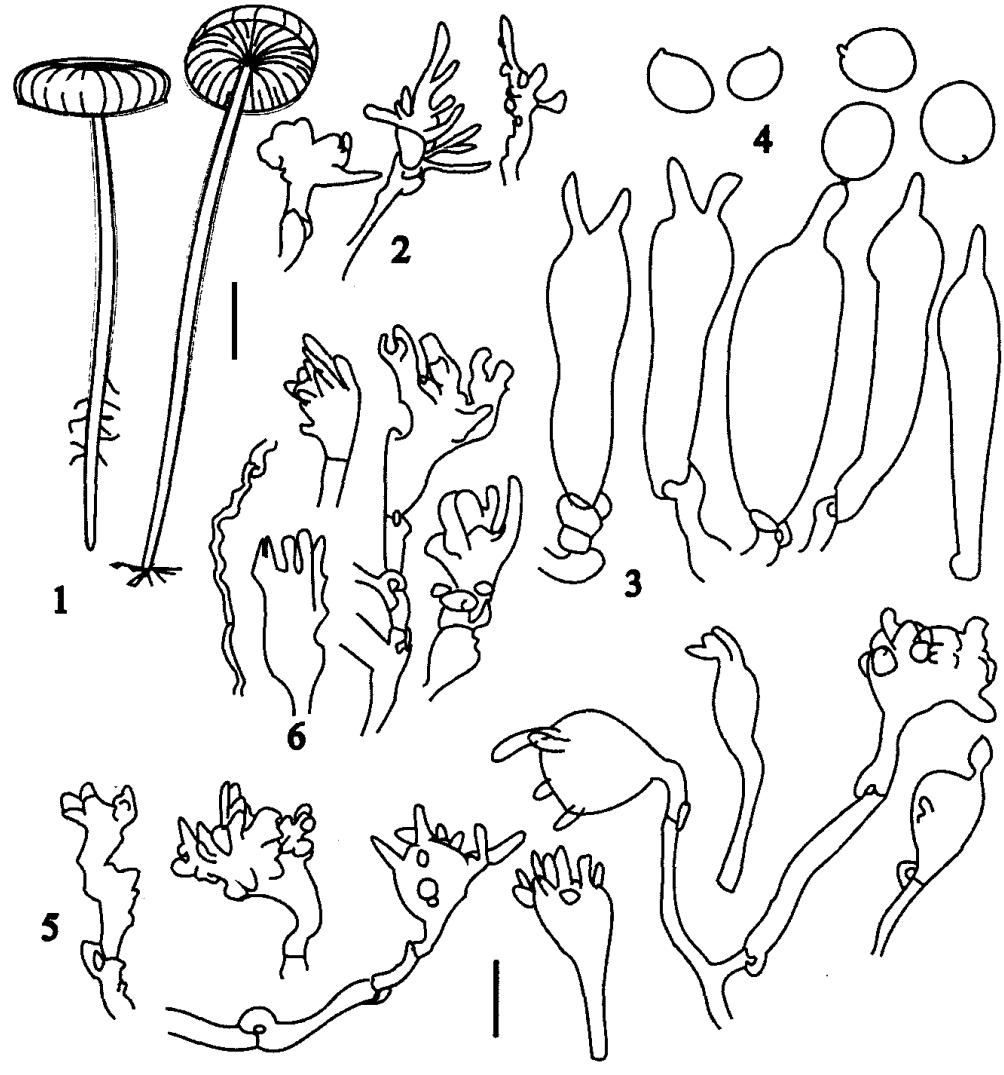
TYPE: DOMINICAN REPUBLIC. La Vega Province: Cordillera Central, Ebano Verde Reserve, near guard house on trail from Casabito to Col, 1550 m, 19°02'21"N, 70°31'05"W, on dicotyledenous debris among mosses, 5 Jan 1997, coll. O. P. Perdomo, *D.J. Lodge DR-171* (HOLOTYPE: JBSD 87808; ISOTYPE: CFMR-DR-171).

A *Mycena epipterygia* var. *epipterygioides* et var. *lignicola* basidiis unisporis vel bisporis er sporae basidiis bisporis minoribus (7.7-9 × 5.6-7.4 µm) differt.

Pileus 8–17 mm broad, convex to broadly convex, center flattened or seldom slightly depressed; margin inrolled when young, with a small sterile margin flared and sometimes slightly crenate; color Olive Yellow (7.5 Y 7.0/7.0) to Citrine (6.3 Y 5.0/5.0) in center and Straw Yellow (5.0 Y 8.0/6.0) to Sulphur Yellow (7.5 Y 8.4/60) on margin when young, center becoming Olive Buff (5 Y 8.0/3.5) with age; surface viscid, granular, translucent-and slightly sulcate-striate for 5-7 mm on margin. Lamellae adnate or slightly arcuate-decurrent. 1.5 mm broad, spaced 1 per mm at margin, two lengths of lamellulae inserted, pale Spectrum Yellow (6.0 Y 8.5/12.0) with white, gelatinized edges. Stipe 33-72 × 1.2-4 mm, tapered at base or clavate, white in the middle portion, Spectrum Yellow (6.0 Y 8.5/12.0) or usually paler than Spectrum Yellow at apex and base, not staining, hollow, context yellow; surface viscid and shiny, glabrous, pruinose at apex when young, with cottony white mycelium and mycelia strands at base. Odor of cucumber and slightly of spoiled fish. Basidiospores distinctly amyloid, blue-gray in Melzer's reagent, broadly ellipsoid, subglobose, or rarely globose, total variation (7.2-)8-9.6 (-11.2) × (5.6)6.4-8(-9,6) µm, Q = 1-1.36, falling into two size classes when plotted as length versus width, those confirmed (n = 6 of 20) or presumably from monosporous basidia 8.8–11.2 × (6.4-)8-9.6 µm (L^m = 9.2-9.6, W^m = 8.2–8.5, Q^m = 1.14-1.2 ± 0.1), those confirmed (n = 3 of 24) or presumably from bisporous basidia (7.2-)8-8.8(-9) × (5.6)6.4-7.2(-7.4) µm (L^m = 8.4, W^m = 6.9-7.2, Q^m = 1.23-1.24). *Basidia* 76% monosporous and 24% bisporous in one basidiome (n = 52), 40% monosporous and 60% bisporous in another basidiome (n = 100), 24.6-36.2 × 7.3–8.1 µm, clavate; clamp connections present on all; sterigmata to 7.8–9.6 µm long × 2.4–3.2 µm wide at base in monosporous basidia, 5–5.8µm long × 1.6-2.5 µm in bisporous basidia. *Pleurocystidia* absent. *Cheilocystidia* 18.5–44 × 5.4-14 µm, clavate, capitate-stipitate, or irregular, with few to numerous digitate appendages; appendages 3.8–9.2 µm long, rarely forked. Lamellar mama composed of short, parallel hyphae 9.6–33.6 × 4.8-7.2 µm and some highly inflated cells 10.4-10.8 × 10.2-14.4 µm near pileus context, with clamp connections; lamellar edge gelatinized, with embedded hyphae 2.5-3 µm diam. and large clamp connections, often of the medallion type. *Pileus context* a Mycena structure (i.e., composed of highly inflated, subisodiametric hyphal cells), staining deeply vinaceous in Melzer's reagent. *Pileipellis* deeply gelatinized; gelatinous zone 250-280 µm deep; embedded hyphae 1.5-3 µm dim. with large medallion clamp connections, smooth, straight; terminal elements often clavate, ornamented with knobby or digitate appendages 1.5-8.5 µm long. *Stipitipellis* a deep ixocutis with embedded hyphae 1-1.5 µm diam., smooth, sinuous, with medallion clamp connections; terminal elements clavate or inflated with digitate appendages.

Habitat, habit, fruiting period. — Gregarious in debris among mosses in broad-leaved cloud forest, January.

Additional material examined: Mycena epipteyrgia var. *epipterygia:* SWEDEN. MEDELPAD: Julåsen, among mosses



FIGS. 1-6. *Mycena epipterygia* var. *domingensis* from the Dominican Republic (holotype). 1. Basidiomes. 2. Pileipellis terminal elements. 3. Basidia. 4. Basidiospores: from bisporous basidia, left; from monosporous basidia, right. 5. Cheilocystidia. 6. Stipitipellis terminal elements. Scale bars: Fig. 1 = 10 mm; Figs. 2–6 = 10 µm.

with *Picea* needles, 5 Sep 1991, *D. J. Lodge* (CFMR-SW-3), on monocot debris *D. J Lodge* (CFMR-SW-4). *Mycena epipterygia* var. *epipterygioides* (as *M. epipterygioides*): DENMARK. SJAELLAND: Saekkedam I Rude Skov, among mosses, 2 Nov 1975, *P. Rabenborg* & *H. Knudsen* (sn; CFMR) (det. H. Knudsen; confirmed R. Mass Geesteranus, Nov 1987). *Mycena epipterygia* var. *lignicola:* UNITED STATES, MASSACHUSSETTS: Concord, Estabrook Woods, on *Pinus* log, 21 Oct 2000, *B. A. Perry* & *G. J. Valiant* (GJV 019, FH), 12 Nov 2000, *B. A. Perry* &. *G. J Valiant* (GJV 029, FH). *Mycena epipterygia* var. *viscosa:* SWEDEN. MEDELPAD: Borgsjö, among mosses, 4 Sep 1991. *D.J Lodge* (CFMR-SW-5).

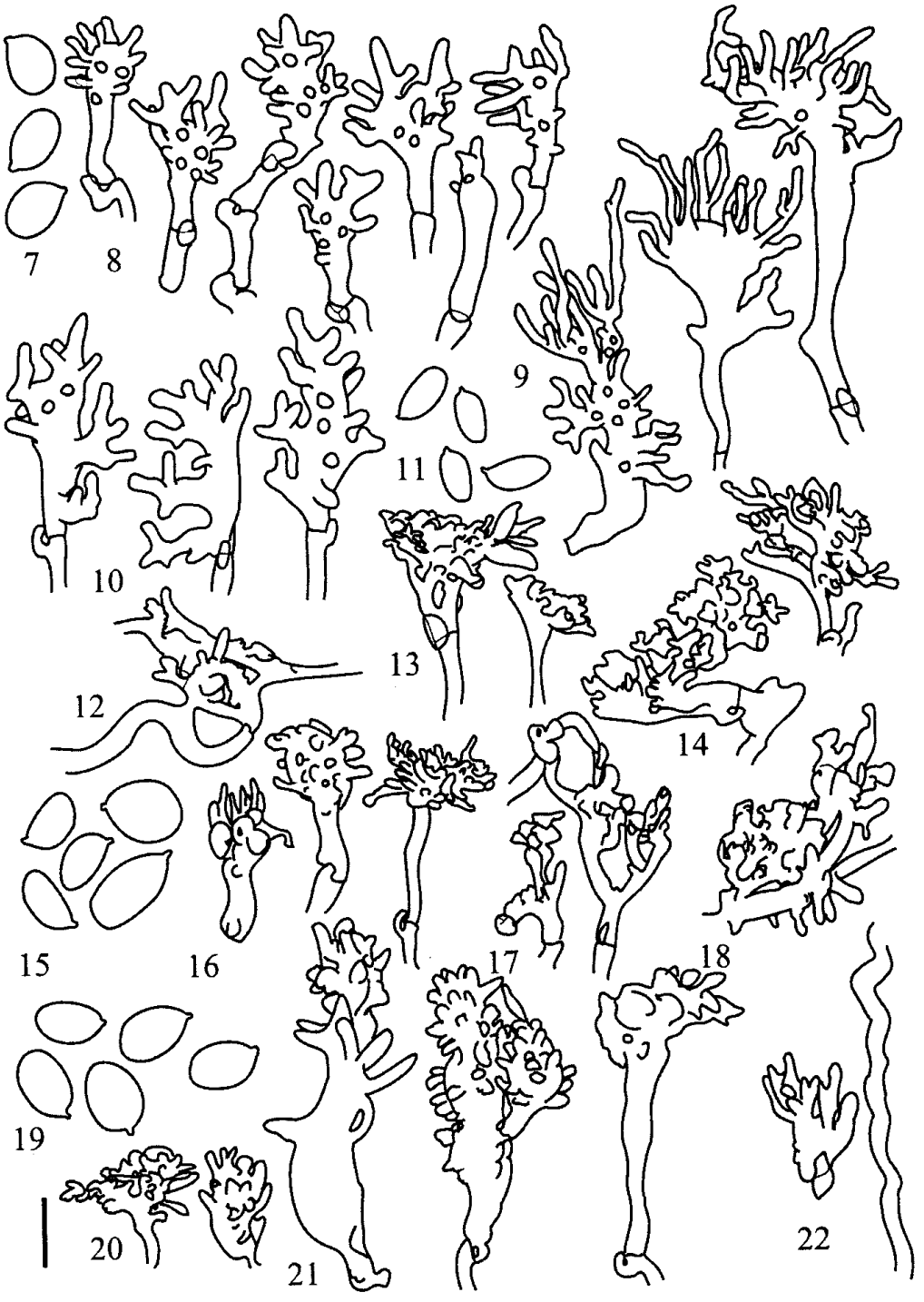
The presence of clamp connections throughout the basidiomes together with the absence of 4-spored basidia indicate placement in *M. epipterygia* var. *epipterygioides* according to the key in Mass Geesteranus (1989). The shape of the cheilocystidia in the collection from the Dominican Republic (i.e., often inflated and

capitate-stipitate, Fig. 5), is indeed similar to those illustrated by Mass Geesteranus (1989) from the European neotype of *M. epipterygia* var. *epipterygioides*, and unlike those of *M. epipterygia* var. *epipterygia* (Fig. 13). *Mycena epipterygia* var. *domingensis* differs from *M. epipterygia* var. *epipterygioides* in having abundant monosporous basidia, and smaller spores derived from bisporous basidia (7.2-9 × 5.6–7.4 vs. 9-9.8 × 7.2–8.1 µm). Mass Geesteranus (1989) has excluded all the reports from North America of *M. epipterygia* var. *epipterygioides* (as *M. epipterygioides*) by Smith (1947) and Hadjisterkoti and Grund (1984) based on the presence of 4- rather than 2-spored basidia. Mycena epipterygia var. *splendipes* (Peck) Mass G. occurs in mixed oak and pine forest of eastern North America, but it differs from *M. epipterygia* var. *domingensis* in having a Citrine rather than a Spectrum Yellow to white stipe, brown staining of the pileus and lamellae, 4-spored basidia, and larger spores from 2-spored basidia (9–11 × 6.5–8 µm; Smith, 1947). Although Kühner synonymized *M. splendipes* with *M. epipterygia* var. *viscosa* (Maire) Ricken from Europe, the latter lacks yellow tints in the pileus, has a sweet rather than a rancid-farinaceous taste, and has different pileipellis and stipitipellis elements (Figs. 17-18).

Mycena epipterygia var. *lignicola* A. H. Sm. (Figs. 7–10) is an additional variety of the *M. epipterygia* group that is commonly characterized by bisporous basidia, in addition to tri- and tetrasprous forms. Although Mass Geesreranus failed to resolve any bisporous basidia in his investigation of the holotype material of *M. epipterygia* var. lignicola, Smith (1947) indicated that 2-spored basidia are common in collections made in northeastern North America. This condition has been confirmed in several collections made in Massachusetts by the second author. As in *M. epipterygia* var. *domingensis*, *M. epipterygia* var. *lignicola* has an olivaceous-yellow pileus, a pure yellow stipe, an iodiform odor, and some capitate stipitate cheilocystidia (Fig. 8). *Mycena epipterygia* var. *domingensis* can be distinguished from *M. epipterygia* var. *lignicola*, however, by the former having monosporous basidia, smaller spores from bisporous basidia (7-9 vs. 9-13 µm), smaller pileipellis terminal elements (Fig. 2 vs. Fig. 9). a pileus with a pale yellow margin, as well as the non-lignicolous habit and growth in hardwood forests. *Mycena epipterygia* var. *lignicola* is typically characterized by a whitish pileus margin, and is restricted to growth on the wood of conifers.

Mycena griseoviridis A. H. Sm., N. Amer. Spp. *Mycena:* 418, fig. 52, pl. 91, cf. var. *cascadensis* A. H. Sm. 1947.

Pileus 4–8(–17) mm broad, broadly parabolic or conic, one broadly convex and slightly indented in center; color pale Olive, Olive Yellow (7.5 Y 7.0/7.0), light tan, or pale Citrine at center, Straw Yellow (5.0 Y 8.0/6.0), Sulphur Yellow (7.5 Y 8.4/6.0), Olive Yellow (7.5 Y 7.0/7.0), Tawny Olive (8.0 YR 6.7/4.2), drying Buff Yellow (2.5 Y 8.0/6.0); surface viscid, smooth; margin translucent- and slightly sulcate-striate ¾ to center. *Lamellae* adnate with or without a decurrent tooth or slightly sinuate, 1—1.5 mm broad, spaced 1-2 per mm at margin, 1–2 lengths of lamellulae inserted, White, pale Cream (3.5 Y 10/5.5), or Straw Yellow (5.0 Y 8.0/6.0) to pale Spectrum Yellow with white, gelatinized edges. *Stipe* 26-111 × 0.5—2 mm, equal or tapered at base, Spectrum Yellow (6.0 Y 8.5/12), some pale yellow on upper half, not staining or turning slightly yellowish tan or orange brown near base, hollow, context yellow; surface viscid, shiny, smooth, pruinose at apex, with cottony white or grayish white mycelium at base. Odor of cucumber or absent. *Basidiospores* moderately to strongly amyloid, blue-gray in Melzer's reagent, ellipsoid, (6.4–)7.5-9.6(–10.8) × (4.6–)5.6–6.4(–7.5) µm, Q = 1.2–1.7. Q^m = 1.36–1.57 ± 0.1–0.15. Basidia primarily 4-spored, few 3-spored, rarely 2-spored, 25.6–33.6 × 7.2–8 µm, clavate, with sterigmata 3.3–6.6 µm long × 1.6-2.5 µm in 4-spored basidia, 5.4-8.3 × 2.5-3.3 µm in 2-spored basidia; clamp connections present on all basidia; sterigmata to 6.5 µm long. *Pleurocystidia* absent. *Cheilocystidia* (17.4–)22.4–42(–56) × (4.2–)6.5–11.5(–19) µm including appendages, clavate, fusiform, subulate, or irregular, with 1 or 2 (rarely to 5) digitate appendages; appendages 2.5—28 µm long, rarely forked. *Lamellar trama* composed of parallel hyphae 13.4–28 × (2.4–)4.8–8 µm and some inflated cells to 14.4 µm broad near pileus context, with clamp connections; lamellar edge gelatinized, with embedded hyphae 1—3 µm diam. and large clamp connections, often of the medallion type. *Pileus context* with narrow hyphae in the subhymenium 18.4–32 × 3.2–5.6 µm, a Mycena structure (i.e., composed of highly inflated, subisodiametric cells) above with hyphae 7.2 × 8–40 × 24 µm, staining deeply vinaceous in Melzer's reagent. *Pileipellis* deeply gelatinized; gelatinous zone 90-285 µm deep; embedded hyphae 1-1.8 µm diam with clamp connections, some of the medallion type, smooth, straight; terminal elements ornamented with knobby and digitate appendages 1.7–8.3 µm long. *Stipe context hyphae* 18.4–136 × 9.6–20 µm, with clamp connections. *Stipitipellis* an ixocutis, hyphae embedded in gelatinous zone 0.8–1 µm diam, smooth, sinuous; terminal elements clavate with knobby to digitate appendages to 10 µm long.



FIGS. 7-22. 7-10. *Mycena epipterygia* var. *lignicola* (GJV 029). 7. Basidiospores. 8. Cheilocystidia. 9. Pileipellis terminal elements. 10. Stipitipellis terminal elements. 11-14. *Mycena epipterygia* var. *epipterygia* (DJL SW-3). 11. Basidiospores. 12. Stipitipellis terminal element. 13. Cheilocystidia. 14. Pileipellis terminal elements. 15-18. *Mycena epipterygia* var. *viscosa* (DJL SW-5). 15. Basidiospores: from 4-spored basidia, left; from 2-spored basidium, lower right; from 1-spored basidium, upper right. 16. Cheilocystidia. 17. Pileipellis terminal elements. 18. Stipitipellis terminal element. 19-22. *Mycena epipterygia* var. *epipterygioides* from Denmark. 19. Basidiospores. 20. Pileipellis terminal elements. 21. Cheilocystidia. 22. Stipitipellis terminal element and hypha from the gelatinized zone.

Habitat, habit, fruiting period. — Growing among mosses, often among needles, bark, or occasionally on mossy logs of *Pinus occidentalis* at 500–2200 m.

Material examined. DOMINICAN REPUBLIC. Prov. La Vega: Cordillera Central, Manabao, Los Dajaos sector, finca of J. Cruz, with moss on pine needles, 19°04'14"N, 70°45'14"W, 500 m, 14 Jan 1997. O. Perdomo, *D/L-DR-487* (CFMR 487, JBSD 87850), with moss under pines, D. J. Lodge & H. Miller, *DJL-DR-499* (UPRRP); near finca of J. Cruz, on pine litter, 19°04'46"N. 70°48'11"W, 823 m, 16 Jan 1997. D. J. Lodge & H. Miller, *DJL-DR-366* (CFMR 366, JBSD 87873): Valle Nuevo, La Nevera sector, among mosses, 18°46'N, 70°37'20"W, 10 Jan 1997. O. Perdomo, *DJL-DR-476* (CFMR-476, JBSD 87873), 24 Nov 1997. D. J. Lodge & E. Horak, *DJL-DR-923* (CFMR 923, JBSD 87921); near Siberia, across from Fundación Moscoso Puello cabin, on pine bark and needles, 18°46'28"N, 70°37'38"W, 2200 m, 21 Nov 1977. D. J. Lodge, O. K. Miller, H. Miller & E. Horak, *DJL-DR-896* (CFMR-896, JBSD 87908). virgin pine stand, on pine bark, 18"47'00"N, 70°37'40"W, 2220 m, 25 Nov 1997, D. J. Lodge, DJL-DR-927 (CFMR-927, JBSD 87922), on mossy pine log, D. J. Lodge. O. K. Miller & H. Miller, *DJL-DR-929* (NY, JBSD-87924); Parque Nacional Amando Bermúdez, Los Tablones trail, near La Cienega, on pine litter, 19°04'N, 70°72'W, 500 m, 6 Jan 2003, L. Lacey, *LL-III* (CORT, JBSD).

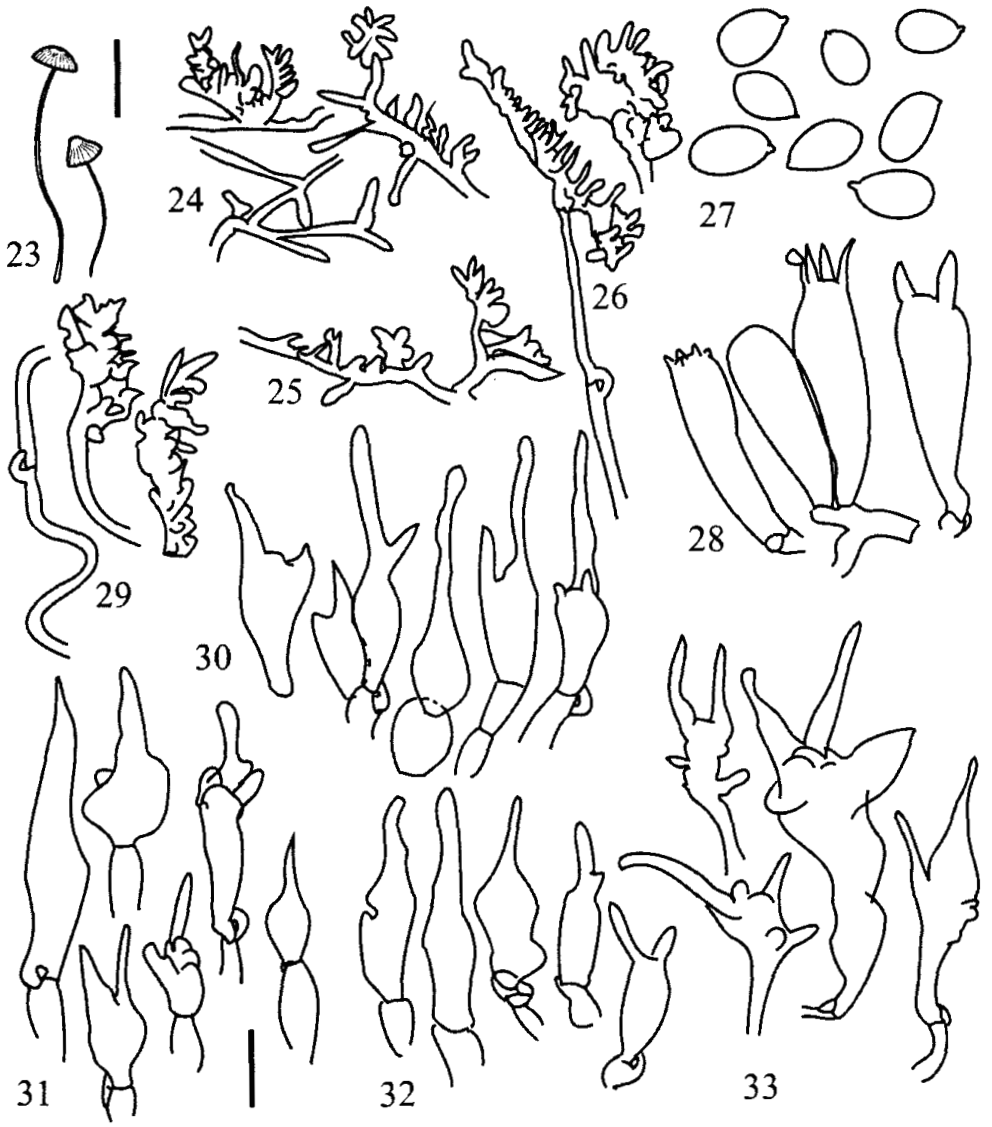
Additional material examined. *Mycena griseoviridis* var. *griseoviridis:* UNITED STATES. Michigan: Ann Arbor, in oak woods, 3 Nov 1936, *A. H Smith 6159* (MICH), under oak tree, 4 Nov 1936, *A. H. Smith 6165* (MICH), 30 Oct 1940. *A. H Smith 15498* (holotype, MICH), on soil under oak, 31 Oct 1940. *A. H. Smith 15516* (MICH). *Mycena griseoviridis* var. *cascadensis:* Washington: Baker Lake, Noisy Creek, scattered on conifer logs, 5 Sep 1941, *A. H. Smith 16656* (holotype, MICH).

The description above is based on the collections cited from the Dominican Republic.

Mass Geesteranus (1989, 1992) treated *M. griseoviridis* as a variety of *M. epipterygia.* We, as well as S. Redhead (pers. comm., 16–30 Mar 2003), recognize *M. griseoviridis* at the species level, in part because of the distinctive cheilocystidia of this taxon when compared to the varieties of the *M. epipterygia* group (Figs. 8, 13, 16 & 21 vs. Figs. 35 & 38). The cheilocystidia in the collections from the Dominican Republic are generally subulate, fusiform or rarely clavate in shape with one or two, or rarely to five digitate appendages at or near the apex, of which one is usually much longer than the others (Figs. 30-33). The cheilocystidia described above most closely match those of the type of *Mycena griseoviridis* var. cascadensis A. H. Sm. (Figs. 35 & 38) that was described by Smith (1947) as growing on conifer logs in the Cascade Mountains of Washington, and illustrated by Smith (1947) and Mass Geesteranus (1989, 1992). Mass Geesteranus (1989, 1992) noted the coarser ornamentation of the cheilocystidia and terminal elements of *M. griseoviridis* var. *cascadensis* (Figs. 37-39), but was undecided as to whether to treat it as a separate variety of *M. epipterygia* or as a form of *M. epipterygia* var. *griseoviridis* (A. H. Smith) Mass G. (Figs. 34-36). Smith (1947) indicated that *M. griseoviridis* var. *cascadensis* could be distinguished from the type variety by its "simple to seldom-branched cystidia" in addition to its more intense coloration and different habitat. Comparison of the cheilocystidia and stipitipellis terminal elements of the holotype material of both *M. griseoviridis* var. *griseoviridis* and *M. griseoviridis* var. *cascadensis* (Figs. 35, 36, 38, 39), however, reveals that while these ornaments may indeed often be coarser and / or less branched in var. *cascadensis,* there is a sufficient amount of overlap between the taxa to make such distinctions difficult at best.

Mycena griseoviridis var. *griseoviridis* was described by Smith (1947) as growing in oak or pine forests from Tennessee, Michigan, Quebec, Oregon, and California, either at low elevations in the fall or near melting snowbanks in the summer. *Mycena griseoviridis* var. *cascadensis* was described as growing on conifer logs (*Abies* sp.) in the Cascade ranges of Washington in September. An additional taxon that is commonly found associated with melting snowbanks at higher elevations in the Sierra Nevada and Cascade Ranges of California, and which undoubtedly represents the western, summertime form of Smiths *M. griseoviridis,* differs from both varieties of *M. griseoviridis* in pileus characters, spore size, and habitat. It is being described as a new species by the second and third authors (in prep.). The Dominican collections were found growing among mosses or on pine logs, bark, or needles in pine forest at 500-2200 m in the Cordillera Central of the Dominican Republic (Fig. 40).

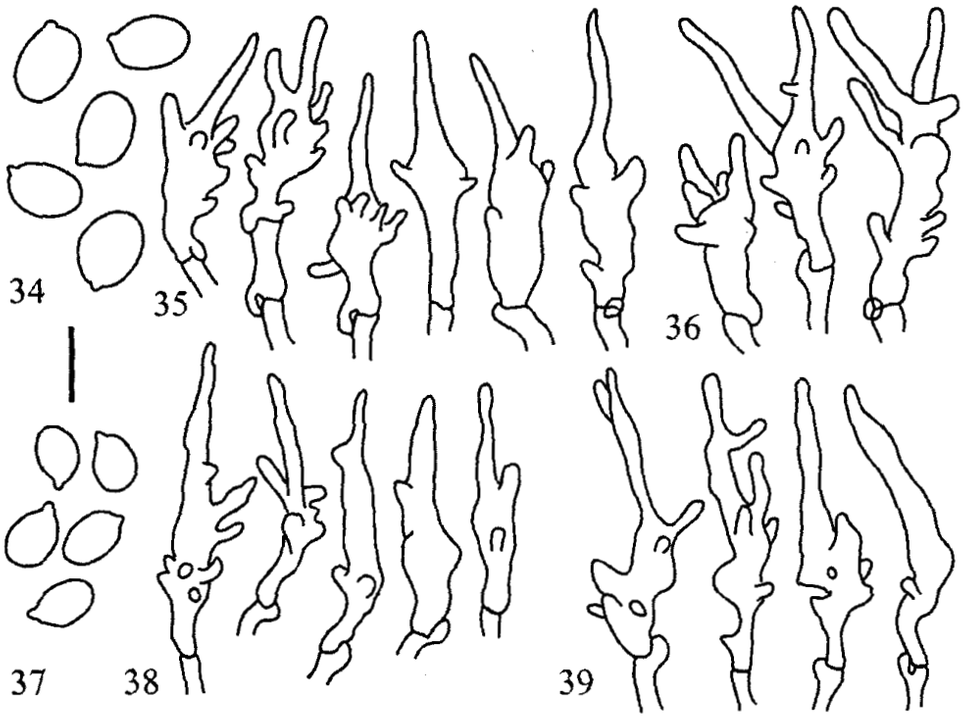
The material from the Dominican Republic does not differ microscopically from the holotype material of *Mycena griseoviridis* var. *cascadensis* from Washington. Macroscopically, however, the Dominican taxon differs slightly from Smith's (1947) description of *M. griseoviridis* var. *cascadensis* in that the former lacks brownish or grayish tones on the pileus when young, has a longer stipe, and has infrequent yellowish brown to orange-brown stains that develop at the stipe base. The Dominican taxon also differs macroscopically from the type variety of *M. griseoviridis* in its lack of brownish or grayish tones on the pileus, as well as the lack of greenish tones to the lamellae and stipe. The paler coloration of the Dominican taxon, as well as its growth in coniferous forests at higher elevations certainly allies it more closely



FIGS. 23-33, *Mycena griseoviridis* cf. var, *cascadensis* from the Dominican Republic. 23. Basidiomes (left DR-487. right DR-499). 24-26. Pileipellis elements. 24. DR-927. 25. DR-923. 26. DR-929. 27. Basidiospores. 28. Basidia. 29. Stipitipellis hypha and terminal elements (DR-927). 30-33. Cheilocystidia. 30. DR-927. 31. DR-929. 32. DR-487. 33. DR-923. Scale bars: Fig. 23 = 10 mm; Figs. 24–33 = 10 µm.

with *M. griseoviridis* var. *cascadensis.* Since the only known collection of *M. griseoviridis* var. *caradensis* is the type, however, a more complete taxonomic comparison of this species and the Dominican taxon cannot be made until additional material is collected from the Cascade ranges of the Pacific Northwest.

While it seems odd that the specimens from the Dominican Republic most closely match a variety of *My cena griseoviridis* that was previously known only from the Pacific Northwest, other disjunct populations of species and varieties of *Lactarius* and *Suillus* known previously only from western or northwestern North Amer-



FIGS. 34-39. *Mycena griseoviridis* types. 34-36. *Mycena griseoviridis* var. *griseoviridis* (holotype). 34. Basidiospores. 35. Cheilocystidia. 36, Stipitipellis terminal elements. 37–39. *Mycena griseoviridis* var. *cascadensis* (holotype). 37. Basidiospores. 38. Cheilocystidia. 39. Stipitipellis terminal elements. Scale bar: 10 µm.

ica have also been found in montane pine forests of the Dominican Republic (Cantrell et al., 2001; Lodge et al., 2002). The pine forests in the Dominican Republic most often have an open rather than a closed canopy with an understory shrub layer dominated by *Baccharis,* Hypericum, and Rubus species and scattered bracken ferns, tree ferns and representatives of the Ericaceae, and a ground layer of tussock grasses and mosses including Sphagnum sp. (Fig. 40). It does nor currently snow in the Dominican Republic (there is controversial evidence of prior glaciation), but it frequently freezes at night during winter in the higher elevations, unlike the Cascade Mountains that periodically have abundant snow. It is not clear if *Mycena griseoviridis* var. *cascadensis* in Washington and the geographically separated taxon from the Dominican Republic represent relict populations of a previously more widely distributed taxon. The relationship among these populations may become more apparent with the undertaking of a molecular study of *M. griseoviridis* and related taxa.

Acknowledgments

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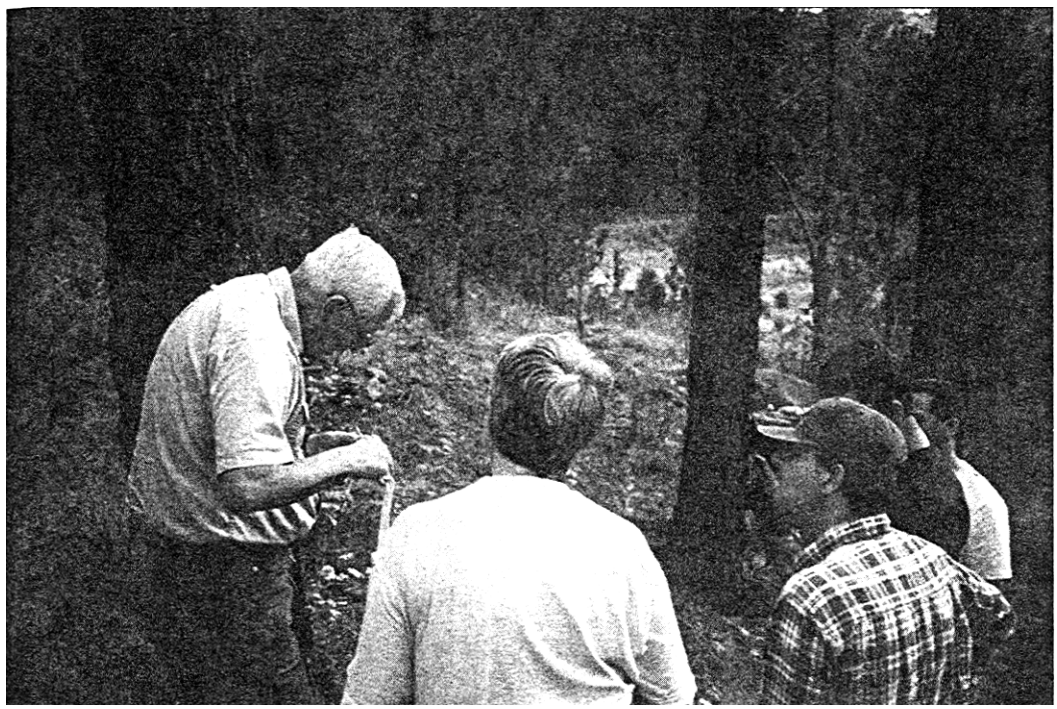

FIG. 40. Habitat of *Mycena griseoviridis* cf. var. *cascadensis* at 2200 m in the Juan B. Pérez Rancier National Park (formerly known as Valle Nuevo National Park) in the Cordillera Central of the Dominican Republic. Pine forests in the Dominican Republic typically have open stands of *Pinus occidentalis* with a shrub and grass understory, known as a mattoral vegetation type, but they occasionally form closed canopy forest. Orson K. Miller Jr. (left) standing in the foreground.

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