

Hygrophoraceae (Agaricales) of the Greater Antilles: Hygrocybe subgenus Pseudohygrocybe sections Coccineae and Neohygrocybe†

Sharon A. CANTRELL^{1*} and D. Jean LODGE²

¹Universidad del Turabo, Escuela de Ciencias y Tecnología, P. O. Box 3030, Gurabo, Puerto Rico 00778-3030, USA.

²Center for Forest Mycology Research, USDA Forest Service, Forest Products Laboratory, P. O. Box 1377, Luquillo, Puerto Rico 00773-1377, USA.

E-mail: sharonac@coqui.net

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A key to 17 species in the genus *Hygrocybe*, subgenus *Pseudohygrocybe*, sections *Coccineae* and *Neohygrocybe sensu* Boertmann is provided for the Greater Antilles. Five new species and five taxa that are new reports for the region are described. The new species in section *Coccineae* are *H. pseudoadonis*, *H. viridiphylla*, and *H. zonata*. The new species in section *Neohygrocybe* are *H. albomarginata* and *H. ovinoides*. The new reports are *H. caespitosa*, *H. coccinea*, *H. cf. miniata*, *H. papillata*, and *H. subovina*. Three new combinations are proposed: *Hygrocybe mycenoides*, *H. papillata* and *H. subovina*.

INTRODUCTION

Lodge & Pegler (1990) reported nine taxa from Puerto Rico in *Hygrocybe* subgenus *Pseudohygrocybe*, including *H. subcaespitosa*, and *H. viridula* in section *Coccineae*, and *H. melleofusca* in section *Neohygrocybe*; additional records of these species are reported. Although Pegler (1983) had reported *H. miniata* from the Lesser Antilles, those and other previous collections from Puerto Rico were found to be referable to *H. subcaespitosa*, first described by Murrill from Jamaica. Recent collecting in Puerto Rico and the Dominican Republic has revealed the presence of a taxon that is close to *H. miniata*, five new species and five new reports in sections *Coccineae* and *Neohygrocybe* for the region. A key to seventeen species, including those from Lodge & Pegler (1990) is provided.

For the most part, we have used Boertmann's (1995) definition of subgenera and sections within subgenus *Pseudohygrocybe*. Section *Coccineae* Fayod 1889 as delimited by Arnolds (1990, 1995) and Bon (1990), is

characterized by yellow, orange, red, grey or brown coloured basidiomes with a dry to subviscid pileus that is sometimes hairy or squamulose and a stipe that is always dry. Boertmann (1995) follows the same definition, except for restricting *Coccineae* to species with bright pigments, but he departed from it by including one species with a thin ixocutis on the stipe. We prefer to follow Arnolds (1990) in placing species with a slightly viscid stipe in section *Glutinosae*. Boertmann (1995) separated section *Neohygrocybe* Herink 1959 from section *Coccineae* based on the presence of dull coloured pigments (though these may be absent), lamellae that are never decurrent, context sometimes staining red, and lamellar context hyphae sometimes exceeding 200 µm in length. Pegler (1983) and Lodge & Pegler (1990) included Caribbean species with predominantly brown or grey pilei in Section *Neohygrocybe* although they had broadly attached sinuate to decurrent lamellae. The Caribbean species, *H. melleofusca* appears to be closely allied with *H. caespitosa* Murr. that was described from eastern North America (Baroni *et al.* 1997). Arnolds (1995), however, placed *H. caespitosa* in sect. *Coccineae* subsect. *Squamulosae* despite the brown colouration. The placement of these taxa will not be resolved without additional molecular data. Although there is a strong similarity in the structure of the pileipellis, hypodermium and lamellar trama hyphae in sections *Coccineae* and *Neohygrocybe* as found by Arnolds and confirmed by us, preliminary

* Corresponding author.

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DNA analyses suggest that species in section *Neohygrocybe* do not fall within section *Coccineae*, and *Neohygrocybe sensu* Arnolds (1995) and Boertmann (1995) is polyphyletic (Alexander Kovalenko, pers. comm.; S.A.C. & D.J.L., unpubl.). We have included both sections in this treatment for convenience and recognize that most of the species treated here in section *Neohygrocybe* will eventually be placed in other sections or genera.

MATERIALS AND METHODS

The study area, the system for numbering of collections and microscopic methods were described in Cantrell & Lodge (2000). All collections have been deposited in recognized herbaria (CFMR, CORT, F, JBSD, K, MAPR, NY, UPRRP, ZT). Descriptions are based primarily on a single collection (e.g. holotype or another designated collection), except where otherwise noted, while deviations from the description among the other collections are discussed under comments. This approach was taken because we have found many instances in the literature on *Hygrocybe* where descriptions were based on a mixed species concept. The colour notation used follows Smithe (1975).

TAXONOMY

For a complete key to sections within subgenus *Pseudohygrocybe*, see Cantrell & Lodge (2001).

SECTION COCCINEAE

Hygrocybe aurantia Murrill, *Mycologia* 3: 195 (1911). (Figs 1–3)

Pileus 5–10 mm diam, conical when young, convex to broadly convex, slightly umbonate with age; surface chrome orange (2.2 YR 5.90/16.0), spectrum orange (5.0 YR 6.51/15.5) to orange-yellow (9.9 YR 7.80/13.5) at the margin, translucent-striate when moist, pruinose, moist to dry. *Lamellae* sinuate to slightly decurrent, spectrum orange (5.0 YR 6.51/15.5) to orange-yellow (9.9 YR 7.80/13.5), narrow, subdistant (2 mm⁻¹), with lamellulae of one to two lengths; edge even, concolorous. *Stipe* 8–30 × 0.5–1.5 mm, equal; surface pale orange to orange yellow (9.9 YR 7.80/13.5), smooth, sometimes caespitose, with a slightly strigose base. *Spores* 4–6 × 2.5–5, *Q* = 1–2.3 (mean 1.6), globose, ellipsoid or lacrymoid, with refractive guttules in KOH. *Basidia* 20–30.5 × 4–6.5 µm, subcylindrical to subclavate, 4-spored, guttulate, with basal clamp-connection. *Lamella-edge* fertile. *Pleurocystidia* and *cheilocystidia* none. *Hymenophoral trama* regular to subregular, hyphae 4–10 µm wide, with clamp-connections. *Pileipellis* a cutis of repent, radially arranged hyphae, 5–9 µm wide, not different from tramal hyphae, with occasionally upturned hyphal end cells.

Stipitipellis a cutis of repent hyphae; some gelatinization indicated by presence of material glued to hyphal surface. A slight dextrinoid reaction was noted in the pileus and hymenophoral trama.

Habitat: Lower montane wet forest, characterized by Palo Colorado (*Cyrilla racemiflora*).

Specimens examined: **Jamaica**: Morce's Gap, Blue Mts, 1500 m, on the ground in woods, 29, 30 Dec. 1908, 2 Jan. 1909, W. A. & Edna L. Murrill 743 (NY – holotype). – **Puerto Rico**: *Mun. Rio Grande*: Caribbean National Forest, Luquillo Mts, Big Tree Trail, 18° 18' 40" N, 65° 46' 33" W, 500 m, on soil, 17 Dec. 1995, D. J. Lodge (CFMR-PR 4075); *ibid.*, trail to Mt. Britton, 18° 18' 1" N, 65° 47' 30" W, 700–850 m, on soil among *Marchantia* sp., 21 June 1996, E. & A. Horak (ZT 5690); *ibid.*, Caimitillo Trail, 18° 18' 18" N, 65° 47' 7" W, 700 m, on soil, 21 June 1996, D. J. Lodge & T. J. Baroni, CFMR-PR 3344 (NY); *ibid.*, La Mina Recreation Area, ca picnic area, on mossy, clay soil bank, 16 June 1997, D. J. Lodge & D. Llorens, CFMR-PR 4556 (UPRRP). *Mun. Adjuntas*: Cordillera Central, Guilarte Commonwealth Forest, Guilarte Peak, main trail, 18° 8' 59" N, 66° 45' 46" W, 900 m, on soil, Oct. 1995, B. Ortiz 32 (MAPR). – **USA**: *North Carolina*: Trout Lake, Moses H. Cone Memorial Park, Appalachian Mts., on soil bank, 15 Aug. 1998, R. Vylgalis & S. Verduin (CFMR-NC 3) (S. A. Cantrell NC-3); *ibid.*, 15 Aug. 1998, R. Vylgalis & S. Verduin (CFMR-NC 4) (S. A. Cantrell NC-4).

Comments: This description is based on collection CFMR-PR 4075. This *Mycena*-like species is abundant on mossy soil above 500 m elevation in the Luquillo Mts. and the Cordillera Central of Puerto Rico. The basidiomes in the type collection from Jamaica were slightly larger (pileus 15 mm vs 5–10 mm), but otherwise matches the collections from Puerto Rico in all respects. *Hygrocybe aurantia* is apparently related to **Hygrocybe mycenoides** (A. H. Sm. & Hesler) Lodge & S. A. Cantrell, **comb. nov.** [Basionym: *Hygrophorus mycenoides* A. H. Sm. & Hesler, *Lloydia* 5: 42 (1942).] from the Great Smoky Mts in the southeastern USA, but some of the spores in *H. aurantia* are broader than those reported for *H. mycenoides* (2.5–5 vs 2.5–3.5 µm, respectively) and cheilocystidia are present in *H. mycenoides* (Hesler & Smith 1963). Our collections of *H. aurantia* from North Carolina are indistinguishable from the Caribbean collections. *Hygrocybe aurantia* has also been reported in Europe (Reid 1972) and Japan (Hongo 1952). A similar species is *H. hapuuae* from Hawaii, but it differs from *H. aurantia* by having a subviscid to viscid pileus and stipe, white lamellae, larger spores (6–8 × 4–5 µm) and broader tramal hyphae (to 24 µm wide) (Desjardin & Hemmes 1997).

The slight dextrinoid reaction as well as the minute and sometimes lacrymoid spores are unusual characters in the genus *Hygrocybe*. We suspect that *H. aurantia* and *H. mycenoides* may be related to omphaloid taxa. There are too few morphological characters to make a reassignment of these two species to another genus, so we have treated *H. aurantia* here where it has been traditionally been placed. Molecular data are needed

to augment the morphological differences in order to revise the systematics of this group.

Hygrocybe cantharellus (Schwein.) Murrill, *Mycologia* 3: 196 (1911). (Figs 4–7)

Pileus 12–17 mm diam, broadly convex, slightly depressed or umbilicate, with a inrolled margin; surface

flame scarlet (10.0 R 5.0/16.0) fading to orange-yellow (10.0 YR 8.0/14.0) and straw-yellow (5.0 Y 8.0/6.0), squamulose, moist, hygrophane. *Lamellae* long-decurrent, pale yellow, 3–4 mm broad, distant (1 mm apart), regular, with lamellulae of 1–2 lengths; edge even, white. *Stipe* 20–55 × 2.5–5 mm, flared at apex; surface spectrum orange (5.0 YR 6.5/16.0), orange

Key to Greater Antillean Hygrocybe sections Coccineae and Neohygrocybe, including species from Lodge & Pegler (1990)

Subgen. *Pseudohygrocybe*: Hymenophoral trama regular to subregular, composed of short elements, the longest not exceeding 200 µm in length, usually without tapered ends; lamellae variously attached (adnexed, adnate, decurrent), basidia and spores monomorphic.

- | | | |
|--------|---|------------------------------|
| 1 | Pileus and stipe viscid to glutinous; lamella-edge sometimes gelatinised. | Sect. Glutinosae |
| | Pileus viscid or dry; stipe dry or slightly lubricous at most; lamella-edge never gelatinised. | 2 |
| 2(1) | Pileus brightly coloured. | Sect. Coccineae 3 |
| | Pileus dull coloured, yellow- or grey-brown, or almost black. | Sect. Neohygrocybe 14 |
| 3(2) | Basidiome green. | 4 |
| | Basidiome in no part green. | 5 |
| 4(3) | Pileus 10–40 mm diam, slightly depressed or umbonate in centre; stipe robust, 18–40 × 3–5 mm; spores 10.5–14.5 × 8.5–11 µm, mean $Q = 1.4$, subglobose or ellipsoid; hymenophoral trama hyphae 12–23 µm wide. | viridiphylla |
| | Pileus 10–12 mm diam, strongly depressed in centre; stipe slender, 28–33 × 1.5–3.5 mm; spores 9–10 × 5–7 µm, mean $Q = 1.77$, ovoid or amygdaloid; hymenophoral trama hyphae 7.5–12 µm wide. | viridula |
| 5(3) | Pileus yellow, pale yellow or yellow-brown. | 6 |
| | Pileus orange, red, ferruginous. | 7 |
| 6(5) | Pileus pale yellow (straw yellow or buff-yellow) or pale yellow-brown; surface minutely pubescent to granular in centre and radially fibrillose near margin; spores 10–14 × 7–10 µm. | papillata |
| | Pileus orange yellow and straw yellow; surface minutely squamulose, squamulose or fibrillose. | cantharellus |
| 7(5) | Pileus rufous; lamellae violaceous or deep vinaceous. | troyana |
| | Pileus bright, orange or red and lamellae differently coloured | 8 |
| 8(7) | Stipe 1–2 mm diam and less than 15 mm long, or if stipe is larger then spores are less than 7 µm long; spores never constricted. | 9 |
| | Stipe greater than or equal to 2 mm diam and at least 15 mm long, or if stipe is smaller then spores are constricted. | 10 |
| 9(8) | Basidiome orange, lamellae adnate; spores minute, 4–6 × 2.5–5 µm. | aurantia |
| | Pileus roseus, incarnate, crimson, ruby red or flame scarlet; lamellae adnexed, white or pale yellow; stipe white; spores greater than 7 µm long. | pseudoadonis |
| 10(8) | Spores constricted, ca 20% viola bud-shaped (i.e. strangled, with strong basal lobes, and broadest near attachment). | cfr miniata |
| | Spores slightly constricted, never viola bud-shaped. | 11 |
| 11(10) | Pileus depressed or umbilicate and squamulose or felty in centre, diameter often less than $\frac{1}{2}$ length of stipe; lamellae deeply decurrent, white to pale yellow; only a few spores slightly constricted. | cantharellus |
| | Pileus as above or convex, squamulose or smooth, often broader in relation to stipe length than above; lamellae not deeply decurrent (adnexed, adnate or adnate with a decurrent tooth), pale or more deeply coloured; spores not constricted | 12 |
| 12(11) | Lamellae deeply coloured yellow | coccinea |
| | Lamellae pale, cream, buff-yellow or pale yellow | 13 |
| 13(12) | Spores 8–12 × 4.5–6.5 µm | zonata |
| | Spores (6–)7.5–8.5(–10) × 4–6 µm | subcaespitosa |
| 14(2) | Stipe with yellow pigments | 15 |
| | Stipe without yellow pigments | 16 |
| 15(14) | Pileus usually perforated in centre. Stipe pallid, light drab, drab, raw umber, pale horn colour, sometimes with a yellow tint at the base. Spores up to 12 µm long. | melleofusca |
| | Pileus not perforated in centre. Pileus clay coloured. Stipe straw yellow to yellow. Spores to 10 µm long. | caespitosa |
| 16(14) | Pileus 2–6 mm diam; lamellae adnate with a decurrent tooth; banded incrustations on some pileipellis hyphae | albomarginata |
| | Pileus larger, more than 10 mm diam; lamellae sinuate; pileipellis hyphae lacking encrusted pigments. | 17 |
| 17(16) | Pileus without a pale margin; lamellae staining brown; spores 6.5–10 × 5.5–6.5(–8) µm, mean $Q = 1.3$, broadly ellipsoid or subglobose | subovina |
| | Pileus with pale margin; lamellae not staining. Spores shorter, narrower, 5.5–8 × 4–5.5 µm, mean $Q = 1.5$, ellipsoid | ovinoides |

yellow (10.0 YR 8.0/14) at the base, smooth, moist, shiny, silky; stuffed. *Spores* $9.5\text{--}11 \times 5.5\text{--}7 \mu\text{m}$, $Q = 1.4\text{--}1.85$ (mean 1.65), ellipsoid, guttulate. *Basidia* $58\text{--}68 \times 9\text{--}13 \mu\text{m}$, subcylindrical to subclavate, 4-spored, basidioles with a basal clamp-connection. *Lamella-edge* fertile. *Pleurocystidia* and *cheilocystidia* none. *Hymenophoral trama* regular to subregular, hyphae $50\text{--}66 \times 9.5\text{--}13 \mu\text{m}$, slightly constricted at the septa, with numerous clamp-connections; laticiferous hyphae present. *Pileipellis* a cutis of repent hyphae with sections of trichodermium, erect elements $53\text{--}60 \times 10.5\text{--}12 \mu\text{m}$, with numerous clamp-connections. *Stipitipellis* a cutis of repent hyphae.

Habitat: In the Dominican Republic, the species was found in a mixture of broad leaved and pine trees. In Puerto Rico, it was found in subtropical and lower montane wet forests.

Specimens examined: **Costa Rica:** Monte Verde Cloud Forest Preserve, Chomuga trail, cloud forest on leaf litter, 29 Dec. 1979, *D. J. Lodge* (F); Cerro de la Muerte, La Georgina, growing on the ground in leaf litter in mixed oak forest, 31 July 1986, *D. J. Lodge* CR 335 (F); *ibid.*, under *Quercus costaricensis* among mosses and ericaceous shrubs, 3 Jan. 1980, *D. J. Lodge* CR 428 (F); Cerro de la Muerte, Pan Am Highway San Gerardo, on mossy soil, 31 July 1986, *D. J. Lodge* CR 363 (F). – **Dominican Republic:** *Prov. La Vega:* partway between Constanza and Valle Nuevo, $18^{\circ} 46' 28'' \text{N}$, $70^{\circ} 37' 38'' \text{W}$, 2000 m, on soil, 26 Nov. 1997, *H. Miller* (*D. J. Lodge* DR-51) (CFMR-DR 654, JBSD). – **Jamaica:** Blue Mts, Cinchona Station, 1720 m, growing among moss, 20 Nov. 1949, *R. W. G. Dennis* J-23 (K). – **Puerto Rico:** *Mun. Orocovis:* Cordillera Central, Toro Negro Commonwealth Forest, $18^{\circ} 9' 14'' \text{N}$, $66^{\circ} 32' 10'' \text{W}$, 1000 m, on soil, 24 June 1996, *D. J. Lodge*, CFMR-PR 3281 (NY); *Mun. Rio Grande:* Caribbean National Forest, Luquillo Mts, Palo Hueco, Quebrada Grande, west of Espíritu Santo River, main trail, $18^{\circ} 18' 51'' \text{N}$, $65^{\circ} 49' 21'' \text{W}$, 500 m, on soil, 28 Jan. 1998, *C. Laboy*, CFMR-PR 4714 (*S. A. Cantrell* PR 9832) (UPRRP). – **USA:** *North Carolina:* Great Smokey Mts National Park, Mt. Le Conte, on soil in woods, 4 Aug. 1940, *L. Hesler* 12740 (TENN); *ibid.*, Cades Cove, on humus in woods, 2 June 1946, *L. Hesler* 17480 (TENN); *ibid.*, Indian Creek, on soil in woods, 11 Aug. 1940, *L. Hesler* 12788 (TENN).

Comments: This widespread species was originally described from North Carolina (USA) and has previously been found in Costa Rica, Jamaica, Trinidad and Venezuela at high elevations. It is common in the eastern United States and is also widespread in Europe. This description is based on the Dominican Republic collection and agrees with the descriptions given by Boertmann (1995) and Hesler & Smith (1963), except that the lamellar trama hyphae in our collections are not as inflated ($9.5\text{--}13 \mu\text{m}$ vs to $30\text{--}36 \mu\text{m}$ diam). In collections from western North Carolina (near the type locality), we observed trama hyphae similar to those in our collection [(3–) $8\text{--}16 \mu\text{m}$]. The collection from Puerto Rico contains a single basidiome, which is smaller than the Dominican Republic basidiomes and has smaller spores

($7\text{--}10.5 \times 4\text{--}4.5 \mu\text{m}$ vs $9.5\text{--}11 \times 5.5\text{--}7 \mu\text{m}$). The collection from Jamaica by R. W. G. Dennis (J-34) also has smaller spores ($6.5\text{--}9 \times 4\text{--}5 \mu\text{m}$). Hesler & Smith (1963) note that in collections of *H. cantharellus* from North America, spores from 4-spored basidia are $7\text{--}12 \times 4\text{--}6 \mu\text{m}$, whereas spores from 2-spored basidia measure $8\text{--}13 \times 5\text{--}8 \mu\text{m}$. This species might be confused with the common Caribbean species *H. subcaespitosa*, which differs in having a broader pileus relative to the length of the stipe, lamellae that are adnate with a short-decurrent rather than long-decurrent tooth, a white strigose mycelium at the base of the stipe, and a pileipellis primarily composed of repent hyphae. Faded specimens can resemble *H. papillata*, which has a similar shape but differs from *H. cantharellus* by having larger spores ($10\text{--}14 \times 7\text{--}10 \mu\text{m}$ vs $(6.5\text{--})9.5\text{--}11 \times 5.5\text{--}7 \mu\text{m}$, respectively).

Hygrocybe coccinea (Schaeff.) P. Kumm., *Führ. Pilzk.*: 112 (1963). (Figs 8–10)

Pileus $6\text{--}17 \text{ mm}$ diam, convex, conical, umbonate; surface scarlet (8.75 R 4.5/16.5), chrome-orange (2.5 YR 6.0/16.0); margin orange-yellow (10.0 YR 8.0/14.0), translucent-striate; surface smooth, moist, lubricous or sticky. **Lamellae** adnate, spectrum yellow (6.0 Y 8.5/12.0), 2 mm broad, with lamellulae of two lengths; edge even, concolorous. **Stipe** $7\text{--}27 \times 3\text{--}7 \text{ mm}$, tapered at the base; surface chrome orange (2.5 YR 6.0/16.0), some with scarlet (8.75 R 4.5/16.5) at the apex, smooth, silky, moist. **Spores** $6.5\text{--}13.5 \times 4.5\text{--}6.5 \mu\text{m}$, $Q = 1.33\text{--}2$ (mean 1.7), oblong, ellipsoid, some slightly strangulated, with refractive guttules. **Basidia** $41.5\text{--}50 \times 5.5\text{--}7 \mu\text{m}$, subcylindrical or subclavate, 4-spored, with a basal clamp-connection. **Lamella-edge** fertile. **Pleurocystidia** and **cheilocystidia** none. **Hymenophoral trama** regular, hyphae $32\text{--}179 \times 2.7\text{--}18.6 \mu\text{m}$, laticiferous hyphae present. **Pileipellis** an ixocutis, $60\text{--}68 \mu\text{m}$ thick composed of an upper layer of thin, long hyphae, $50\text{--}96 \times 2\text{--}5.5 \mu\text{m}$ with prominent clamp-connections, few erect hyphae present, and a hypodermium of broad hyphae, $27\text{--}70 \times 12\text{--}19 \mu\text{m}$, constricted at the septa, with clamp-connections. **Stipitipellis** a cutis of repent hyphae with patches of gel, $29\text{--}75 \times 4\text{--}5.5 \mu\text{m}$, with clamp-connections and laticiferous hyphae.

Habitat: Subtropical wet forest.

Specimen examined: **Dominican Republic:** *Prov. La Vega:* Ebano Verde Reserve, Cordillera Central, trail from Casabito to El Arroyazo Station, $19^{\circ} 1' 56'' \text{N}$, $70^{\circ} 32' 35'' \text{W}$, 1000 m, on soil, 6 Jan. 1997, *S. A. Cantrell* and *O. P. Perdomo*, *S. A. Cantrell* RD 9726 (CFMR-DR 295, JBSD). – **UK:** *Sussex:* on mossy soil, 19 Oct. 1998, *T. Brown* (*D. J. Lodge* 6) (CFMR-ENG 6). – **Sweden:** Medelpad, Borgsyö, Sept. 1991 (CFMR-SWE 2).

Other specimen examined: **Hygrocybe punicea;** **USA:** North Carolina: Boone, Appalachian State University, behind Continuing Education Centre, on soil in mixed hardwoods on creek bank, 18 Oct. 1980, *S. Marsh* (CFMR-NC 2).

Comments: This is the first report of this species for the Caribbean. It agrees with the description by Hesler & Smith (1963) from North America. European collections described by Arnolds (1990) and Boertmann (1995) differ in the lamellar attachment, which is broadly adnate with a decurrent tooth or slightly decurrent in Europe but is adnexed to sinuate in North America. European and North American collections also differ in stipe shape, which is cylindric in Europe and tapered at the base in North America. Similar species include *H. aurantiosplendens* which differs in having an orange to orange-yellow hygrophane pileus, often with a darker zone toward the margin, a stipe that is spindle-shaped rather than being tapered only at the base and has a slightly fibrillose-striate rather than a silky surface, and more strangulated spores, and *H. punicea* which differs by having a more robust, blood-red strongly hygrophane pileus, pale whitish flesh, a coarsely fibrillose stipe and a thicker ixocutis (125–175 μm vs up to 150 μm).

Hygrocybe *cfr* **miniata** (Fr.) P. Kumm., *Führ. Pilzk.*: 112 (1871). (Figs 11–13)

Pileus 12–20 mm diam, convex to broadly convex, slightly depressed; surface spectrum red (5.0 R 4.0/15.0), geranium (7.5 R 4.0/15.0), margin chrome orange (2.5 YR 6.0/16.0) to spectrum orange (5.0 YR 6.5/16.0), slightly tomentose at centre, smooth toward the margin, moist, shiny. **Lamellae** sinuate (emarginate), cream (3.5 Y 8.5/4.0) to buff yellow (2.5 Y 8.0/6.0), 2 mm broad, thick, close (3 mm⁻¹) at the margin, distant (more than 1 mm apart) half way to the stipe, forked near the margin, slightly intervenose, with lamellulae of two lengths; edge even, concolorous. **Stipe** 30–40 $\times$ 2–4 mm, cylindric, solid; surface chrome orange (2.5 YR 6.0/16.0), spectrum orange (5.0 YR 6.5/16.0), fibrillose, slightly pruinose at the apex, moist, shiny, with a buff yellow (2.5 Y 8.0/6.0) strigose mycelium at the base. Smell and taste farinaceous. **Spores** 7–9.5 $\times$ 4–5.5 μm , $Q=1.4$ –2 (mean 1.65), oblong, ellipsoid, about 37% constricted, ca 20% viola bud-shaped. **Basidia** 44–56 $\times$ 7–9 μm , subcylindrical to subclavate, 4-spored, with basal clamp-connection. **Hymenophoral trama** regular, hyphae 52–88 $\times$ 5.5–20 μm , with distinct clamp-connections. **Pileipellis** a cutis of repent hyphae with a few clusters of erect hyphae at the centre; hyphae 6.5–12 μm wide. **Stipitipellis** a cutis of repent hyphae with patches of erect hyphae, clamp-connections and laticiferous hyphae present.

Habitat: Lower montane wet forest, characterized by Palo Colorado (*Cyrilla racemiflora*).

Specimens examined: **Jamaica:** Manchester Parish, Marshall Pen, 18° 3' 33" N, 77° 31' 53" W, 600 m, on soil in subtropical wet forest on limestone, 8 June 1999, S. A. Cantrell, CFMR-JAM 157 (S. A. Cantrell J-4). – **Puerto Rico:** Mun. Luquillo: Caribbean National Forest, Luquillo Mts, Pico del Este Road close to Navy gate, 18° 17' 47" N,

65° 47' 7" W, 750 m, on soil from Palo Colorado Forest, 26 May 1998, C. Torrens, CFMR-PR 4879 (S. A. Cantrell PR 9857), (CFMR, NY, UPRRP); *ibid.*, MUN. RIO GRANDE, Palo Hueco, below El Cacique, Río Grande watershed, 18° 17' 37" N, 65° 49' 12" W, 790 m, on soil, 11 May 1998, E. Terranova, CFMR-PR 4866 (S. A. Cantrell PR-9856)(UPRRP). – **Sweden:** Femsjö, Smoland, südl. Sten, an Sträbe, on soil in grassland, 21 Sept. 1980, M. Moser (IB 1980/0372 – neotype). – **USA:** North Carolina: Sim's Pond, Julian Price Park, 14 Aug. 1998, C. McCleneghan, CFMR-NC 1 (S. A. Cantrell NC-1)(CFMR).

Comments: The above description is based on CFMR-PR 4879. *Hygrocybe miniata* can be easily confused in the field with *H. subcaespitosa*, but it is microscopically distinct. It differs from *H. subcaespitosa* in the diameter of the hymenophoral trama hyphae (mostly 5.5–20 μm vs mostly 3–6 μm , respectively) and spore shape (ca 20% viola bud-shaped vs none viola bud-shaped, respectively). Our collections agree in most respects with the descriptions given by Arnolds (1990), Boertmann (1995), and Hesler & Smith (1963) except for having paler lamellae (cream to buff yellow vs reddish to yellow).

Hygrocybe papillata (Dennis) S. A. Cantrell & Lodge, **comb. nov.** (Figs 14–16)

Basionym: *Hygrophorus papillatus* Dennis, *Kew Bull.* **8**: 263 (1953).

Pileus 5–13 mm diam, convex to broadly convex, umbonate or slightly depressed at centre; surface buff-yellow (2.5 Y 8.0/6.0) or straw yellow (5.0 Y 8.0/6.0), sometimes pale brownish yellow, minutely pubescent or granular, sometimes minutely squamulose at the centre and radially silky-fibrillose near margin; margin scalloped, sulcate-striate; moist or dry. **Lamellae** arcuate-decurrent, white, 1–3 mm broad, distant (more than one mm apart), without lamellulae or with lamellulae of one length; edge even, concolorous. **Stipe** 30–70 $\times$ 1.5–3 mm, flared at apex, solid; surface buff yellow (2.5 Y 8.0/6.0), trogon yellow (1.0 Y 8.5/7.7), smooth, moist. **Spores** 10–14 $\times$ 7–10 μm , $Q=1.3$ –1.5 (mean 1.45), broadly ellipsoid to ellipsoid, guttulate. **Basidia** 65–92 $\times$ 10.5–14 μm , subcylindrical or subclavate, 4-spored, with a basal clamp-connection. **Lamella-edge** fertile. **Pleurocystidia** and **cheilocystidia** none. **Subhymenium** up to 40 μm deep, composed of interwoven hyphae 4–8 μm wide, with large clamp-connections. **Hymenophoral trama** with a central mediostrium composed of parallel hyphae, 8–25.5 μm wide, and interwoven slender hyphae, 2.5–4 μm wide, with medallion clamp-connections; lateral strata broad, composed of interwoven hyphae 5.5–18.5 μm wide, some elements subglobose. **Pileipellis** a cutis of repent hyphae, 3–13 μm wide. **Stipitipellis** a cutis of repent hyphae; hyphae broad and sausage shaped, 36–106 $\times$ 20–33 μm , constricted at the septa.

Habitat: Lower montane wet forest, characterized by Palo Colorado (*Cyrilla racemiflora*).

Specimens examined: **Puerto Rico:** *Mun. Luquillo:* Caribbean National Forest, Luquillo Mts, Bisley Watersheds, 18° 18' 58" N, 65° 45' 10" W, 200 m, on soil, 28 July 1999, D. J. Lodge & D. Clark (CFMR-PR 5693); *Mun of Naguabo:* upper Río Prieto, 18° 15' 39" N, 65° 46' 7" W, 600 m, on soil, 18 June 1997, S. A. Cantrell, C. Laboy & V. Cuevas, CFMR-PR 4562 (S. A. Cantrell PR 9742)(UPRRP); *Mun Rio Grande:* Caimitillo trail, near picnic area, 18° 18' 20" N, 65° 47' 4" W, 640 m, on mossy soil bank, 21 June 1996, D. J. Lodge & T. J. Baroni, CFMR-PR 3311 (NY); *ibid.*, 18° 18' 14" N, 65° 47' 19" W, 710 m, on mineral soil, 21 June 1996, D. J. Lodge & T. J. Baroni (CFMR-PR 3346); *ibid.*, 18° 18' 17" N, 65° 47' 20" W, 730 m, on mineral soil, 21 June 1996, D. J. Lodge & T. J. Baroni, CFMR-PR 3339 (CORT); *ibid.*, near El Yunque trail, 18° 18' 13" N, 65° 47' 15" W, 700 m, on soil, 11 June 1997, T. J. Baroni, L. Baroni & D. J. Lodge, CFMR-PR 4545 (F); *ibid.*, Big Tree Trail, 18° 18' 34" N, 65° 46' 27" W, 490 m, on mineral soil bank, 18 June 1996, S. A. Cantrell, CFMR-PR 3323 (K); *ibid.*, on soil among debris of broadleaved trees, 29 June 1996, E. Horak & A. Horak (CFMR, ZT 5742); *ibid.*, Tradewinds Trail, 18° 17' 34" N, 65° 47' 47" W, 750 m, on soil among debris of broadleaved trees, 28 June 1996, E. & A. Horak, ZT 5735 (CFMR, ZT). – **Trinidad:** beside trail on crest of northern range N. of Arima, on soil, 25 Sept. 1949, R. W. G. Dennis 49 (K(M) 50499 – holotype).

Comments: Dennis (1953) noted in his original description of this species from Trinidad that the pileus was papillate, but no information was given about the clamps, the structure of the hymenophoral trama, pileipellis or stipitipellis. Our study of the type material from Trinidad and Dennis' drawings revealed that not all the specimens are papillate. Only some of our collections have specimens with a papillate pileus, and they match Dennis' type collection in all regards. Hesler & Smith (1963) studied the type material and did not observe clamp-connections. Notes in the package of the type material made by Baker in 1960 also indicated that there were no clamp-connections, but in our study of the type material we found numerous clamp-connections in all types of tissue. The structure of the hymenophoral trama of the type material resembles our collections, except for the less inflated hyphae of the mediostrium (12–26 × 4–14 µm), but this stratum did not rehydrate well in the type. A macroscopically similar species is *H. puaena* from Hawaii (Desjardin & Hemmes 1997), but it differs from *H. papillatus* by having a pileus that is non-striate instead of sulcate-striate, smaller spores (7–11 × 5.5–7 µm vs 10–14 × 7–10 µm), and narrower trama hyphae (6.5–13 µm wide vs 10–18 µm wide). This taxon is characterized by very long basidia (to 92 µm) even in the type collection (up to 77 µm).

Hygrocybe pseudoadonis S. A. Cantrell & Lodge, *sp. nov.* (Figs 17–19)

Etym.: pseudoadonis = false *Mycena adonis*.

Pileus 4–8 mm latus convexus usque late convexus, superficie rubinea Prattisii usque flammeo-scarlatina, laevi usque

radialiter fibrillosa, ad centrum granulari, translucenti-striata, humida, hebeti, hygrophana. *Lamellae* adnexae, albae usque stramineae, 0.5–1.5 mm latae, lamellulis longitudinibus una vel duabus, prope marginem furcatis; margine plano, concoloro. *Stipes* 6–11 × 1–1.5 mm, apice angustatus, basi parum bulboso, cavus, superficie alba usque basi straminea, apice parum scarlatina, laevi, hebeti, humida, pulvillo, myceliali parum strigoso. *Sporae* 8–13.5 × 5.5–9.5 µm, $Q = 1.16–1.99$ (media 1.35), ellipsoideae, guttulis refractivis. *Basidia* 33–66.5 × 8–12 µm clavata, 2–4-spore guttulis refractivis numerosis. *Margo lamellae* fertilis. *Pleurocystidia* et *cheilocystidia* nulla. *Trama hymenophoralis* regularis, ex hyphis brevibus parietibus tenuibus, 5.3–12 µm diametro, fibulatis composita. *Pileipellis* ixocutis 6.5–24 µm diametro, fibulata est. *Stipitipellis* cutis est, ex hyphis repentibus, hyphis 3–4 (–6.5) µm, aliquot allantoideus 14.4–53 × 8.8–22 µm, cum area tenuis, gelatinous tunica dispersa.

Typus: **Puerto Rico:** *Mun. Luquillo:* Bisley Watershed, Caribbean National Forest, 18° 18' 58" N, 65° 45' 10" W, 200 m, between mosses on the bark of a living tree along with *Hygrocybe rosea*, 22 Nov. 1996, S. A. Cantrell & A. M. Nieves-Rivera, CFMR-PR 3733 (CFMR – holotypus, NY – isotypus).

Pileus 4–8 mm diam, convex to broadly convex; surface Pratts Ruby (8.4 R 4.4/18.0) to Flame Scarlet (10.0 R 5.0/16.0), smooth to radially fibrillose, granular at the centre, translucent-striate, moist, dull, hygrophanous. *Lamellae* adnexed, white- to straw-yellow (5.0 Y 8.0/6.0), 0.5–1.5 mm broad, with lamellulae of one to two lengths, forked near the margin; edge even, concolorous. *Stipe* 6–11 × 1–1.5 mm, tapered at apex with slightly bulbous base, hollow; surface white to straw yellow (5.0 Y 8.0/6.0) at base, slightly scarlet (8.75 R 4.5/16.5) at apex, smooth, dull, moist, with slightly strigose mycelial pad. *Spores* 8–13.5 × 5.5–9.5 µm, $Q = 1.16–1.99$ (mean 1.35), broadly ellipsoid or ellipsoid, with refractive guttules. *Basidia* 33–66.5 × 8–12 µm, clavate, 2–4 spored, with many refractive guttules and inconspicuous clamp-connections. *Lamella-edge* fertile, not gelatinized. *Pleurocystidia* and *cheilocystidia* none. *Hymenophoral trama* regular, of short, thin-walled hyphae, 5.5–12 µm diam, with clamp-connections. *Pileipellis* an ixocutis, 6.5–24 µm wide, with clamp-connections. *Stipitipellis* a cutis of repent hyphae, with few erect hairs, mostly 3–4 (–6.5) µm wide, some broad and sausage-shaped 14.5–53 × 9–22 µm, with scattered patches of thin, gelatinised coating. Odour and taste not recorded.

Habitat: Subtropical and lower montane wet forest.

Additional specimens examined: **Puerto Rico:** *Mun. Luquillo:* Caribbean National Forest, Luquillo Mts, Bisley Watershed, trail downstream, 18° 18' 58" N, 65° 45' 10" W, 200 m, between mosses on the bark of a living tree along with *Hygrocybe rosea*, Cantrell & A. M. Nieves-Rivera, 27 Jan. 1997, CFMR-PR 4167 (S. A. Cantrell PR-9712) (NY) *Mun. Rio Grande:* Palo Hueco, main trail, 18° 18' 51" N, 65° 49' 21" W, 600 m, on the bark of a living tree, 22 Dec. 1998, CFMR-PR 5386 (S. A. Cantrell PR 98139) (UPRRP).

Comments: This species has been collected three times in the Luquillo Mountains of Puerto Rico

growing together with *Hygrocybe rosea* (syn. *Mycena filicina*) on the same tree among mosses. *H. pseudo-adonis* can be distinguished from *H. rosea* by the non-glutinous pileus and stipe surfaces; lamellae that are pale, adnexed with a non-gelatinised margin rather than deeply coloured, and adnate to decurrent with a gelatinized margin; and a white rather than red stipe. In many other microcharacteristics and in habitat, these two species are similar. Another related species is *H. mexicana*, but it reportedly differs from *H. pseudo-adonis* by having a bright scarlet red stipe and smaller spores ($7\text{--}9.5 \times 4\text{--}7\ \mu\text{m}$).

Hygrocybe subcaespitosa (Murrill) Lodge & Pegler, *Mycol. Res.* **94**: 450 (1990).

Description: See Lodge & Pegler (1990).

Specimens examined: **Puerto Rico**: *Mun. Luquillo*: Caribbean National Forest, Luquillo Mts, Bisley Watersheds, $18^\circ 18' 58''\text{N}$, $65^\circ 45' 10''\text{W}$, 200 m, CFMR-PR 5921; *Mun. Rio Grande*: La Mina Recreation Area, near La Mina Falls, $18^\circ 18' 18''\text{N}$, $65^\circ 46' 38''\text{W}$, 490 m, on soil, 27 June 1993, M. Boyd, CFMR-PR 1195; *ibid.*, $18^\circ 18' 4.5''\text{N}$, $65^\circ 47' 36''\text{W}$, 800 m, on soil, 5 July 1997, D. Llorens, CFMR-PR 6237 (D. Llorens 163); *ibid.*, El Verde Research Area, fork in trail to radiation centre, $18^\circ 19' 24''\text{N}$, $65^\circ 49' 0''\text{W}$, 360 m, on humus, 28 Feb. 1993, D. J. Lodge, CFMR-PR 978; *ibid.*, new control MRCE plot, $18^\circ 19' 23''\text{N}$, $65^\circ 48' 58''\text{W}$, 375 m, on humus, 9 Feb. 1996, H. H. Burdall & D. J. Lodge, CFMR-PR 3758; *ibid.*, Palo Hueco, main trail, $18^\circ 18' 51''\text{N}$, $65^\circ 49' 21''\text{W}$, 575 m, on humus, 13 Apr. 1998, S. A. Cantrell & C. Laboy, CFMR-PR 4863 (S. A. Cantrell PR-9850); *ibid.*, 9 Sept. 1998, S. A. Cantrell & N. Clum, CFMR-PR 5374 (S. A. Cantrell PR-9882); *ibid.*, El Toro Trail, $18^\circ 16' 20''\text{N}$, $65^\circ 49' 44''\text{W}$, 1000 m, on clay soil, 2 July 1997, S. A. Cantrell, R. Bonilla, M. Serrano, D. Llorens & A. Nieves, CFMR-PR 4554 (S. A. Cantrell PR-9756); *ibid.*, CFMR-PR 4567.

Hygrocybe troyana Murrill, *Mycologia* **3**: 198 (1911). (Figs 20–22)

Pileus 1–1.5 cm broad, 3 mm high, subhemispheric to convex; surface ferruginous, smooth, viscid when wet. *Lamellae* decurrent, violaceous, rather broad, distant, two or three times inserted. *Stipe* 40×2.5 mm, cylindrical; surface lateritious (dark brick-red) above, paler below, changing to flavous at the base, glabrous. *Spores* $6.5\text{--}9 \times 3.5\text{--}5.5\ \mu\text{m}$, $Q = 1.2\text{--}2.05$ (mean 1.72), broadly ellipsoid, ellipsoid to oblong, ca 50% constricted. *Basidia* $32\text{--}37.5 \times 6.5\ \mu\text{m}$, clavate, 4-spored, some 2-spored, with a basal clamp-connection. *Lamella-edge* fertile. *Pleurocystidia* and *cheilocystidia* none. *Hymenophoral trama* regular to subregular, hyphae $16\text{--}72 \times 3.5\text{--}26.5\ \mu\text{m}$, some highly swollen in the central zone, laticiferous hyphae present, 3–8 μm wide. *Pileipellis* with a thin ixocutis over hyphae $2.5\text{--}14.5\ \mu\text{m}$ wide with clamp-connections, and refractive laticiferous hyphae, 5–7 μm . *Stipitipellis* a cutis of repent hyphae with a thin gelatinous coating.

Specimens examined: **Jamaica**: Cockpit Country, Troy and Tyre, 625 m, on the ground, 12–14 Jan. 1909, W. A. Murrill & W. Harris 1078 (NY – holotype); *ibid.*, W. A. Murrill & W. Harris 1090 (NY – paratype).

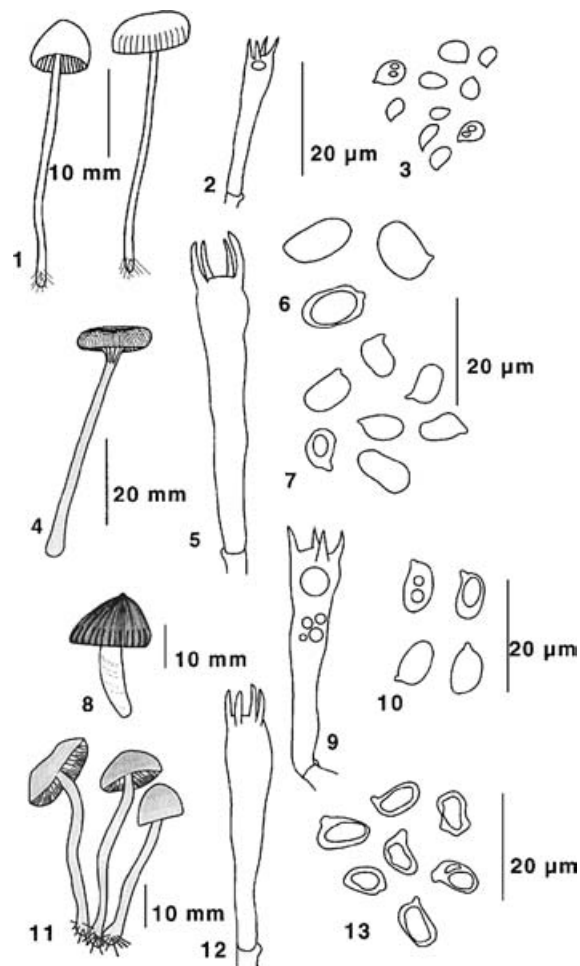
Comments: The macroscopic characteristics presented here are based on Murrill's (1911) original description, while the microscopic characteristics are based on our study of the type material from Jamaica. This species is characterized by the violaceous, decurrent lamellae and strangulated spores. Murrill's original description says that the pileus is viscid when wet. Our examination of the type material confirm that the pileus has a thin ixocutis, which was not observed by Hesler & Smith (1963).

Based on microcharacteristics, *H. constrictospora* is a closely related species, but based on the violaceous colour of the lamellae these two species should be kept separate. Dennis (1953) assigned some Trinidadian collections with salmon-orange lamellae and scarlet pilei to *H. troyana*. We think that the collections from Trinidad probably belong to *H. constrictospora* rather than *H. troyana*. Based on the description of *H. lilaceolamellata* from New Zealand given by Horak (1990), it might be conspecific with *H. troyana*. *H. troyana* should be recollected from Jamaica to determine if it has a lilaceous spore deposit, as was reported for *H. lilaceolamellata* by Mills & Monks (1993).

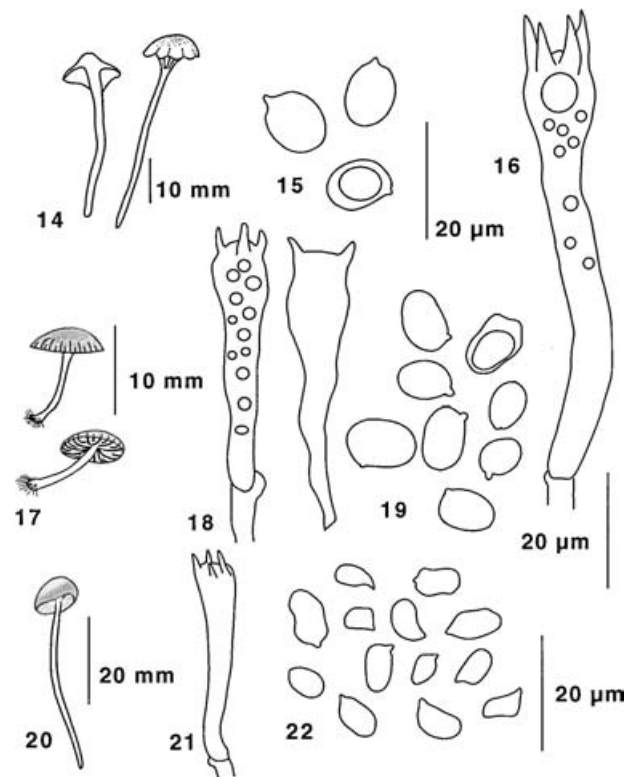
Hygrocybe viridiphylla Lodge, S. A. Cantrell & Baroni, *sp. nov.* (Figs 23–27)

Etym.: viridi, green; phylla, lamellae.

Pileus 10–25 mm diametro, late convexus parum depressus, umbonatus, margine revolutus et sinuoso, superficie viridi pavonis (8.5 GY 5.8/6.1), viridi acetosellae (9.0 GY 4.9/6.3) usque viridi folii (5.0 GY 3.6/3.6), margine crema (3.4 Y 8.4/4.2), ad centrum citrino-viridi (2.1 GY 6.9/5.5) usque olivaceo-lutea (7.5 Y 7.0/7.0), hygrophana, usque crema (3.4 Y 8.4/4.2) usque bubalino-lutea (2.5 Y 8.0/6.0) deflorescenti radialiter fibrillosa, humida, lubrica. *Lamellae* adnatae dente, psittaceae (5.0 GY 5.5/6.0), 3 mm latae, distantes (plus quam 1 mm separatae), lamellis longitudinalibus duabus; margine sinuato, cremeo (3.4 Y 8.4/4.2). *Stipes* 18–40 $\times$ 3–5 mm aequalis usque clavatus, compressus, cavus, superficie apice viridi pavonis (8.5 GY 5.8/6.1) basi viridi pistaciae (6.3 GY 7.8/7.6) usque lutea pallida, pruinosa, sicca, hebeti caespitosa. *Sporae* $10.5\text{--}17 \times 8.5\text{--}11\ \mu\text{m}$, $Q = 1.2\text{--}1.5$ (media 1.4), subglobosae usque ellipsoideae, guttulis numerosis. *Basidia* $62.5\text{--}86.5 \times 10\text{--}16\ \mu\text{m}$ clavata 4-spore; basidiola cylindrica angusta, apice rotundato vel acuto. *Margo lamellae* fertilis. *Pleurocystidia* nulla. *Pseudocystidia* $50\text{--}82 \times 5.5\text{--}10.5\ \mu\text{m}$ (apice aliqua usque $16\ \mu\text{m}$) vermiformia apice interdum lobata et tumida. *Trama* hymenophoralis subparallela, hyphis tumidis $12\text{--}23\ \mu\text{m}$ diametro in septis constrictis, hyphis intertextis $4\text{--}5.5\ \mu\text{m}$ diametro. *Subhymenium* ex hyphis intertextis, $1.5\text{--}6.5\ \mu\text{m}$ diametro compositum. *Pileipellis* ex hyphis plus minusve radialiter dispositis repentibus composita, $5.5\text{--}14.5\ \mu\text{m}$ diametro; in superficie paucae hyphae gelatinosae fortasse praesentes. Fibulae et hyphae laticiferae in contextu tramae hymenophoralis et pileipellis et pilei praesentes.



Figs 1–13. **Figs 1–3.** *Hygrocybe aurantia*. **Fig. 1.** Basidiomes. **Fig. 2.** Basidium. **Fig. 3.** Spores. **Figs 4–6.** *H. cantharellus*. **Fig. 4.** Basidiome. **Fig. 5.** Basidium. **Fig. 6.** Spores from CFMR-DR 654. **Fig. 7.** Spores from CFMR-PR 4714. **Figs 8–10.** *H. coccinea*. **Fig. 8.** Basidiome. **Fig. 9.** Basidium. **Fig. 10.** Spores. **Figs 11–13.** *H. miniata*. **Fig. 11.** Basidiomes. **Fig. 12.** Basidium. **Fig. 13.** Spores.



Figs 14–22. **Figs 14–16.** *Hygrocybe papillata*. **Fig. 14.** Basidiomes, CFMR-PR 3311 (right), cross section from ZT 5742 (left). **Fig. 15.** Spores. **Fig. 16.** Basidium. **Figs 17–19.** *H. pseudodonis*. **Fig. 17.** Basidiomes. **Fig. 18.** Basidia. **Fig. 19.** Spores. **Figs 20–22.** *H. troyana* (holotype). **Fig. 20.** Basidiome. **Fig. 21.** Basidium. **Fig. 22.** Spores.

Typus: Puerto Rico: Mun. Orocovis: Cordillera Central, Toro Negro Commonwealth Forest, near DNR office, upstream from Rd 143, 18° 9' 14" N, 66° 32' 10" W, 1000 m, on soil, 24 June 1996, T. J. Baroni & D. J. Lodge CFMR-PR 3270 (CFMR – holotypus; UPRRP, NY – isotypi).

Pileus 10–25 mm diam, broadly convex, slightly depressed or umbonate, with inrolled and scalloped margin; surface Peacock green (8.5 GY 5.8/6.1), Shamrock green (9.0 GY 4.9/6.3) to Leaf green (5.0 GY 3.6/3.6); margin cream (3.4 Y 8.40/4.2), centre lime-green (2.1 GY 6.9/5.5) to olive-yellow (7.5 Y 7.00/7), hygrophanous, fading to cream (3.4 Y 8.4/4.2) or buff yellow (2.5 Y 8.0/6.0), radially fibrillose, moist to lubricous. *Lamellae* adnate with a decurrent tooth, Parrot green (5.0 GY 5.5/6.0), 3 mm broad, distant (more than 1 mm apart at margin), with lamellulae of two lengths; edge wavy, cream (3.4 Y 8.40/4.2). *Stipe* caespitose, 18–40 × 3–5 mm, equal to clavate, compressed, hollow; surface Peacock green (8.5 GY 5.8/6.1) at apex, Pistachio (6.3 GY 7.8/7.6) to pale yellow at base, pruinose, dry, dull. *Spores* 10.5–17 × 8.5–11.2 µm, $Q = 1.2$ –1.5 (mean 1.4), subglobose or ellipsoid, with many guttules. *Basidia* 62.5–86.5 × 10–16 µm, clavate, 4-spored; basidioles cylindric, narrow, with rounded or pointed apex. *Lamella-edge* fertile. *Pseudocystidia* none. *Cheilocystidia* 50–82 × 5.5–10.5 (some to 16 µm at the apex), vermiform, occasionally lobed and swollen at the apex. *Hymenophoral trama* subparallel, with swollen hyphae 12–23 µm wide, constricted at the septa, interwoven hyphae 4–5.5 µm wide. *Subhymenium* of interwoven hyphae, 1.6–6.4 µm wide. *Pileipellis* of more or less radially arranged repent hyphae, 5.5–14.5 µm wide; a few gelatinized hyphae occasionally present on the surface. Clamp-connections and laticiferous hyphae present in the hymenophoral trama, pileipellis and pileus context. *Stipitipellis* a cutis of repent hyphae, hyphae 5–13 µm wide, with abundant crystals on the surface in KOH.

Habitat: Lower montane wet forest.

Comments: This species resembles *H. chloochlora* but lacks dimorphic spores and basidia (Pegler 1983). It is also similar to *H. viridula* described from the Luquillo Mountains of Puerto Rico, which differs from *H. viridiphylla* by having smaller spores (9–10 × 5–7 µm vs 10.5–17 × 8.5–11 µm, respectively) and basidia (28–36.5 × 3.5–8.5 µm vs 62.5–86.5 × 10–16 µm, respectively), by having narrower trama hyphae (7.5–12 µm vs 12–23 µm, respectively) and by lacking cheilocystidia (Lodge & Pegler 1990). *H. virescens* from North America differs by having more yellow pigments in the pileus and smaller spores (7–9 × 5–6.5 µm) and lacking cheilocystidia (Hesler & Smith 1963). *Gliophorus viridis* (Stevenson) Horak differs by having a glutinous pileus and stipe (Horak 1990).

Hygrocybe viridula Lodge & Pegler, *Mycol. Res.* **94**: 455 (1990).

Description: See Lodge & Pegler (1990).

Specimens examined: Dominican Republic: Prov. Santiago: Plan Sierra's Los Montones Conference Centre, near San Jose de las Matas, 19° 17' 18.4" N, 70° 55' 31.4" W, 800 m, on a soil bank, T. J. Baroni, CFMR-DR 1146 (TJB 9023). – Puerto Rico: Mun. Rio Grande: Caribbean National Forest, Luquillo Mts, La Mina Recreation Area, Caimitillo trail, 18° 18' 20" N, 65° 47' 4" W, 680 m, on mineral soil, E. Terranova (CFMR-PR 5652).

Comments: This is the second collection of this rare and beautiful species. It is identical with the type except for having a perforated, slightly larger pileus (19 mm instead of 10–12 mm diam) and a margin that is undulating rather than inrolled.

Hygrocybe zonata S. A. Cantrell & Lodge, *sp. nov.* (Figs 28–31)

Etym.: zonata, zoned, for the colour zonation of the pileus.

Pileus 7–15 mm diametro juventute late conicus maturitate late parabolicus vel late convexus, margine involuto, superficie aurantia spectri (5.0 YR 6.5/16.0) aurantio-lutea (10.0 YR 8.0/14.0) creamea (3.5 Y 8.5/4.0) zonata ad marginem alba minute granulari humida usque sicca hebeti, margine non striato. *Lamellae* adnatae dente decurrenti albae vel parum cremeae (3.5 Y 8.5/4.0) 2 mm latae subdistantes usque confertae (2–3 per mm) prope marginem et stipitem furcatae anastomosantes, lamellis longitudinibus duabus, margine plano concoloro. *Stipes* 24–56 × 2–3.5 mm aequalis cavus basi pulvillo myceliali parvo, superficie apice lutea spectri (6.0 Y 8.5/12.0) infra aurantio-lutea (10.0 YR 8.0/14.0) aliquot in medio aurantia spectri (5.0 YR 6.5/16.0) basi alba laevi sericeo-fibrillosa humida parum nitida, contextu albo. *Sporae* 8–12 × 4.5–6.5 µm, $Q = 1.25$ –2.16 (media 1.7) late ovoideae vel ovoideae vel ellipsoideae, 23 % constrictae guttulis refractivis una usque pluribus. *Basidia* 33.5–56 × 6–9 µm cantharelloidea 4-sporea fibula basali. *Margo lamellae* fertilis. *Pleurocystidia* et *cheilocystidia* nulla. *Trama hymenophoralis* regularis; hyphae 26.5–60 × 3–12 µm fibulatae. *Pileipellis* cutis est, ex hyphis repentibus plus minusve intertextis latis 23–56 × 6.5–13.5 µm composita, fibulis insignis, aliquot extremis hypharum erectis singulis et fasciculatis praesentibus sed infra incipientibus, apicibus hyphis prostratis inaequantibus vel vix aequantibus, squamulas ergo non formantibus; hyphae erectae 28–36 × 7–10.5 µm. *Stipitipellis* cutis est, ex hyphis repentibus, 26–40 × 8–10 µm, fibulis praesentibus.

Typus: Puerto Rico: Mun. Rio Grande: Palo Hueco, Caribbean National Forest, Luquillo Mts, Palo Hueco, El Cacique, Río Grande Watershed, 18° 18' 51" N, 65° 49' 21" W, 575 m, on humus between the roots of a palm (Prestoea montana), 1 July 1998, S. A. Cantrell, C. Laboy & R. Negrón, CFMR-PR 4898 (CFMR – holotypus; NY, UPRRP – isotypi).

Pileus 7–15 mm diam, broadly conical when young, broadly parabolic to broadly convex with age, with inrolled margin; surface spectrum orange (5.0 YR 6.5/16.0) at centre, orange yellow (10.0 YR 8.0/14.0), cream (3.5 Y 8.5/4.0), white at the margin, zoned, minutely granular, moist to dry, dull; margin not striate. *Lamellae* adnate with a decurrent tooth, white or

slightly cream (3.5 Y 8.5/4.0), 2 mm broad, subdistant to close ($2-3 \text{ mm}^{-1}$), forked near the margin and stipe, anastomosed, with lamellulae of two lengths; edge even, concolorous. *Stipe* $24-56 \times 2-3.5 \text{ mm}$, cylindric, hollow, with short strigose hairs at the base; surface spectrum yellow (6.0 Y 8.5/12.0) at the apex grading into orange yellow (10.0 YR 8.0/14.0) below, some spectrum orange (5.0 YR 6.5/16.0) in the middle and white at the base, smooth to silky-fibrillose, moist, slightly shiny; context white. *Spores* $8-12 \times 4.5-6.5 \mu\text{m}$, $Q=1.25-2.16$ (mean 1.7), broadly ovoid, ovoid to ellipsoid, about 23% constricted, with one to several refractive guttules. *Basidia* $33.5-56 \times 6-9 \mu\text{m}$, subcylindrical to narrowly subclavate, 4-spored, with a basal clamp-connection. *Lamella-edge* fertile. *Pleurocystidia* and *cheilocystidia* none. *Hymenophoral trama* regular, hyphae $26-60 \times 3-12 \mu\text{m}$, with clamp-connections. *Pileipellis* a cutis of repent, more or less interwoven, broad hyphae $23-56 \times 6.5-13.5 \mu\text{m}$, with medallion clamp-connections; some individual and clusters of upward directed hyphal ends present, but these originate below and their apices do not or just reach the level of the prostrate hyphae and therefore do not form squamules, these upright hyphae $28-36 \times 7-10.5 \mu\text{m}$. *Stipitipellis* a cutis of repent hyphae, $26-40 \times 8-10 \mu\text{m}$, with clusters of erect hyphae $40-80 \times 4 \mu\text{m}$, with clamp-connections.

Habitat: Lower montane wet forest.

Other specimens examined: *H. substrangulata*: **Denmark**: N. Jylland, Boertmann 96005 (CFMR-DEN 1). – **UK**: Dorset: Studland, 17 Nov. 1958, P. M. Orton 1561 (K(M) 595115).

Comments: This species is unique in the zonation of the pigments in the pileus and the structure of the pileipellis. The erect hyphae of the pileipellis in *Hygrocybe zonata* originate in the hypodermium and have their ends embedded among the repent surface hyphae, unlike the structure of similar species such as *H. subcaespitosa* or *H. substrangulata*, in which the only erect elements are upturned hyphal ends of the surface hyphae. This unique structure is probably responsible for the dull, grainy appearance of the surface of *H. zonata*. Macroscopically, it resembles faded specimens of *H. subcaespitosa*, but the latter differs in having a pileipellis composed of a cutis of mostly repent hyphae and smaller, rarely constricted spores ($7.5-8.5 \times 4-6 \mu\text{m}$ vs $8-12 \times 4.5-6.5 \mu\text{m}$) (Lodge & Pegler 1990). The spore shape and dimensions and hyphal dimensions are most similar to those of *H. substrangulata*, but the pileipellis of the latter is a cutis of repent, radially arranged (parallel) hyphae (at least one-third from the centre to the margin) with some ascendant hyphal ends, and it lacks erect elements that originate in the hypodermium. Macroscopically, *H. substrangulata* is hemispherical or convex at first (Boertmann 1995) rather than conic or broadly parabolic as in *H. zonata*. We observed large medallion clamp connections in the pileipellis of the type of *H. substrangulata*, similar to those in *H. zonata*, whereas we observed only large

simple clamp-connections in the pileipellis of a collection of *H. substrangulata* sent by David Boertmann from Denmark. The type and the Danish collection of *H. substrangulata* were otherwise similar.

SECTION NEOHYGROCYBE

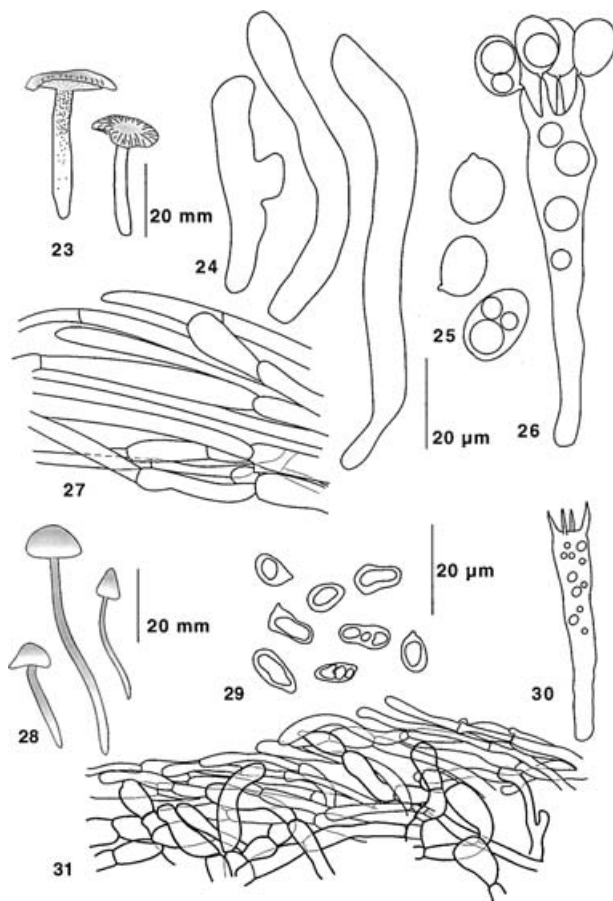
Hygrocybe albomarginata S. A. Cantrell & Lodge, **sp. nov.** (Figs 32–37)

Etym.: albo, white; marginata, margin; for the white margins on the pileus and lamellae.

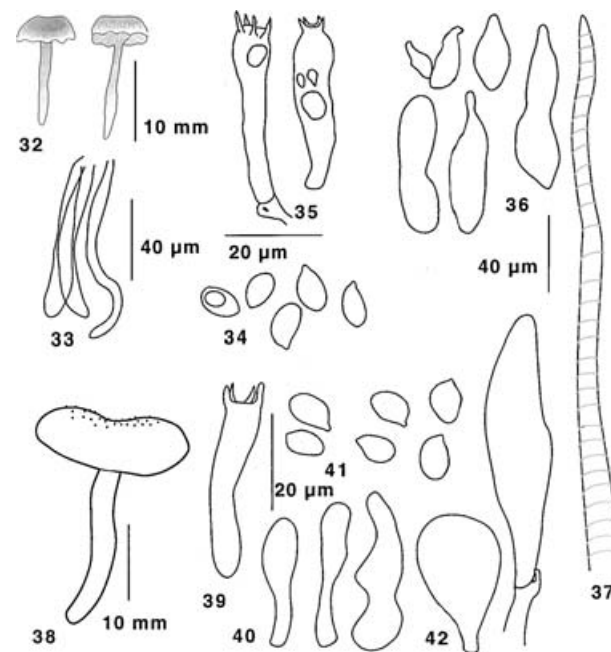
Pileus 2–6 mm diametro, convexus usque parum depressus, superficie brunneo-vinacea (5.0 R 2.8/2.0) margine albo, radialiter fibrillosa parum sulcato-striata, hygrophana, nitida (argentea) sericea. *Lamellae* adnatae dente, fumoso-griseae (5.0 Y 7.0/2.0), 2–3 mm latae, distantes (plus quam 1 mm separatae), lamellis aequilongis intervenosis, margine plano albo. *Stipes* 14–15 × 1 mm expansus, superficie fumoso-grisea (5.0 Y 7.0/2.0) apice brunneo-vinacea (5.0 R 2.8/2.0) basi alba, fibrillosa, nitida sericea, pulvillo myceliali parvo. *Spores* $7-9.5 \times 4-5.5 \mu\text{m}$, $Q=1.63-2.18$ (media 1.78), ellipsoideae, guttulis numerosis. *Basidia* $30-31 \times 7-9.5 \mu\text{m}$, clavata, guttulis numerosis. *Margo lamellaris* sterilis. *Pseudocystidia* praesentia. *Trama hymenophoralis* regularis, 4–9.5 µm diametro, hyphis in septis constrictis, fibulis praesentibus sed non manifestis. *Pileipellis* trichodermium est, ex hyphis latis contento brunneo compositum, 18.5–32 µm diametro, hyphis tenuibus hyalinis 2.5–4 µm diametro mixtis; hyphae erectae genera duo: longo-subulatae aciculares et brevi-ovoideae ventricosae lageniformes; hyphae laticiferae praesentes.

Typus: **Puerto Rico**: Mun. Rio Grande: Caribbean National Forest, La Coca trail, 18° 19' 7" N, 65° 46' 20" W, 450 m, on soil, 12 Sept. 1997, S. A. Cantrell (CFMR-PR 4694 – holotypus).

Pileus 2–6 mm diam, convex to slightly depressed; surface brown vinaceous (5.0 R 2.8/2.0) with a white margin, radially fibrillose-silky, slightly sulcate-striate, hygrophanous, shiny (silvery). *Lamellae* adnate with a decurrent tooth, smoke-grey (5.0 Y 7.0/2.0), 2–3 mm broad, distant (more than 1 mm apart), with lamellulae of one length, intervenose; edge even, white. *Stipe* 14–15 × 1 mm, flared at apex; surface smoke grey (5.0 Y 7.0/2.0), brown vinaceous (5.0 R 2.8/2.0) at apex, white at the base, fibrillose-silky, shiny, with small white mycelial pad. *Spores* $7-9.5 \times 4-5.5 \mu\text{m}$, $Q=1.63-2.18$ (mean 1.78), ellipsoid, hyaline, smooth, thin-walled, with many guttules. *Basidia* $30-31 \times 7-9.5 \mu\text{m}$, 4-spored, clavate, with many guttules. *Lamella-edge* sterile, composed entirely of pseudocystidia. *Pleurocystidia* and *cheilocystidia* none. *Hymenophoral trama* regular, 4–9.5 µm wide, hyphae constricted at the septa, clamp-connections present but not obvious. *Pileipellis* a trichodermium, composed of broad repent hyphae with brown contents, 18.5–32 µm wide mixed with thin, hyaline hyphae, 2.5–4 µm wide; erect hyphae of two kinds, long subulate, acicular with banded incrustations, and short ovoid, ventricose or lageniform elements lacking incrustations; laticiferous hyphae present.



Figs 23–31. Figs 23–27. *Hygrocybe viridiphylla*. Fig. 23. Basidiomes. Fig. 24. Cheilocystidia. Fig. 25. Spores. Fig. 26. Basidium. Fig. 27. Pileipellis. Figs 28–31. *H. zonata*. Fig. 28. Basidiomes. Fig. 29. Spores. Fig. 30. Basidium. Fig. 31. Pileipellis.



Figs 32–42. Figs 32–37. *Hygrocybe albomarginata*. Fig. 32. Basidiomes. Fig. 33. Cheilocystidia. Fig. 34. Spores. Fig. 35. Basidia. Fig. 36. Pileocystidia. Fig. 37. Pileipellis squamule hypha. Figs 38–42. *H. caespitosa*. Fig. 38. Basidiome. Fig. 39. Basidium. Fig. 40. Sterile elements in the lamella-edge. Fig. 41. Spores. Fig. 42. Pileipellis hyphae terminal elements.

Habitat: Lower montane wet forest, characterized by Tabonuco (*Dacryodes excelsa*).

Additional specimens examined: **Puerto Rico:** *Mun. Rio Grande:* Luquillo Mts, Caribbean National Forest, La Coca Trail, 18° 19' 7" N, 65° 46' 20" W, 450 m, on soil, 8 July 1998, *S. A. Cantrell & N. Perez, CFMR-PR 5217 (S. A. Cantrell PR-9867) (NY, UPRRP).*

Comments: This is the smallest species among the blackish members of section *Coccineae*. The banded hyphae in the pileipellis are not found in any other species with dark pigments, although *Hygrocybe waolipo* from Hawaii has incrustations on the pileipellis hyphae, but not banded (Desjardin & Hemmes 1997). *Hygrocybe waolipo* is similar to *H. albomarginata* in lacking an odour or red staining reaction, but it is much larger (20–35 vs 2–6 mm diam), lacks a whitish pileus margin, lacks erect elements in the pileipellis, has pseudocystidia that are not confined to the lamellar edge, and has broader spores (5.5–7 µm).

Hygrocybe caespitosa Murrill, *Mycologia* **6**: 2 (1914). (Figs 38–42)

Pileus 20 mm diam, broadly convex with an inrolled margin, depressed at centre, not perforated; surface clay colour (9.0 YR 5.5/5.5) with cinnamon-brown (7.0 YR 4.0/4.0), squamulose, with uplifted scales at the centre, moist. **Lamellae** sinuate, greyish white, 4 mm broad, distant, forked near the stipe, with lamellulae of one length; edge even. **Stipe** 20 × 3 mm, equal; surface straw yellow (5.0 Y 8.0/6.0), smooth, moist. **Spores** 7.5–10 × 5–6.5 µm, $Q=1.3$ –1.8 (mean 1.47), broadly ellipsoid or ellipsoid, guttulate. **Basidia** 34.5–43 × 6–7.5 µm, cylindric-clavate, 2–4 spored, with a basal clamp-connection. **Lamella-edge** fertile or sterile. **Pleurocystidia** none. **Sterile structures** (cheilocystidia or aborted basidia) 25–27 × 5–6.5 µm, clavate, some slightly contorted. **Hymenophoral trama** subregular, hyphae 2.5–6 µm wide, with clamp-connections. **Subhymenium** 12–13 µm thick, hyphae very short, 2.5–4 µm wide. **Pileipellis** a cutis of repent hyphae with pale brown contents in KOH, with clusters of upturned clavate hyphal ends, and few laticiferous hyphae, with few clamp-connections.

Specimens examined: **Puerto Rico:** *Mun. Rio Grande:* Luquillo Mts, Caribbean National Forest, La Mina Recreation Area, Caimitillo trail, 18° 18' 18" N, 65° 47' 7" W, 690 m, on soil, 28 June 1996, *T. J. Baroni (CFMR-PR 3515); Mun. Luquillo:* Bisley, 24 June 1999, *D. J. Lodge & N. C. Clum (NCC-9956) (CFMR-PR 5640, NY).* – **USA:** *New York:* New York, east of Bronx Park, 26 Sept. 1909, *W. A. Murrill (NY – holotype); ibid., 8 Oct. 1911 (NY – paratype).*

Comments: Both the macro- and microcharacteristics of these collections fit the description of *Hygrocybe caespitosa* (Hesler & Smith 1963). The only and probably not important difference is the presence of sterile structures on some lamellar edges of one of our collections that could be either aborted basidia or

cheilocystidia but which are absent in the type material from New York. This species differs from the similar, but more common species in the West Indies, *H. melleofusca*, in having clamp-connections in the pileipellis that are rare and inconspicuous rather than abundant and prominent, a thicker pileus that is not perforated, presence of some obpyriform hyphal ends in the pileipellis, and slightly shorter spores (6.5–9(–10) vs 8–10(–12) µm long).

Hygrocybe melleofusca Lodge & Pegler, *Mycol. Res.* **94**: 453 (1990).

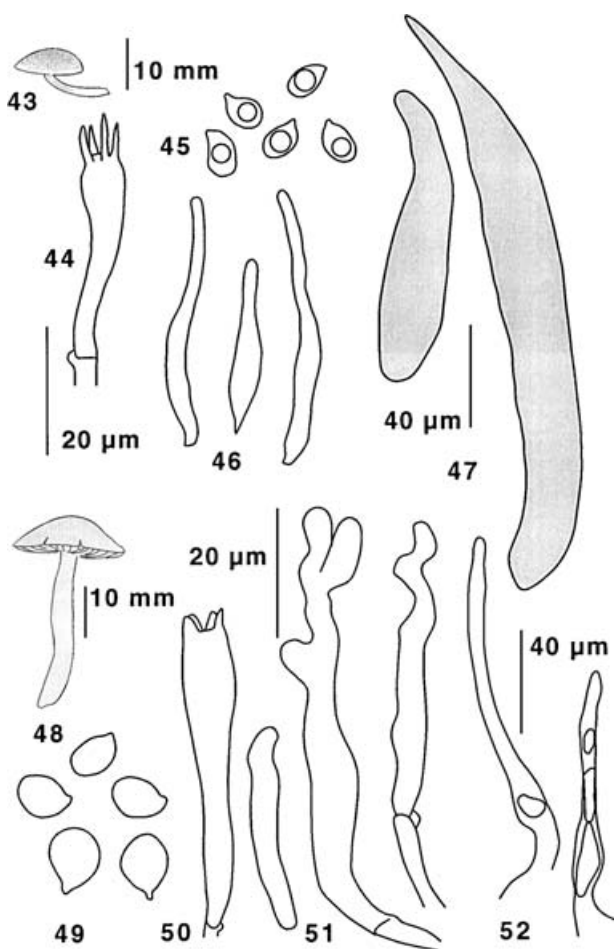
Description: See Lodge & Pegler (1990).

Specimens examined: **Puerto Rico:** *Mun Canovanas:* Luquillo Mts, Caribbean National Forest, Cubuy, La Condesa forest tract, 18° 16' 50" N, 65° 54' 30" W, 500 m, on soil, 23 Jan. 1998, *C. Laboy, CFMR-PR 5414; Mun. Luquillo:* Luquillo Mts, Caribbean National Forest, Bisley trail, 18° 18' 59" N, 65° 45' 51" W, 200 m, on soil, 4 Oct. 1997, *A. Perez Mycology Class, CFMR-PR 4682; ibid., Bisley Watershed below parking area, 18° 18' 52" N, 65° 44' 49" W, 175 m, on soil, 8 Oct. 1996, S. A. Cantrell & D. J. Lodge, CFMR-PR 3486; ibid., 6 June 1997, T. J. Baroni, CFMR-PR 4328; ibid., 14 June 1997, CFMR-PR 5089 (TJB 8549); Bisley Watershed, Tower trail, 18° 18' 52" N, 65° 44' 42" W, 310 m, on soil, 27 Jan. 1996, *D. J. Lodge, CFMR-PR 4038; Mun. Rio Grande:* Luquillo Mts, Caribbean National Forest, Caimitillo Trail, La Mina Recreation Area, 18° 18' 14" N, 65° 47' 19" W, 710 m, on soil, 21 June 1996, *D. J. Lodge & T. J. Baroni, CFMR-PR 3338; ibid., 16 June 1997, D. J. Lodge & T. J. Baroni, CFMR-PR 5451; ibid., 18° 18' 17" N, 65° 47' 20" W, 730 m, on clay soil, 11 June 1997, D. J. Lodge & T. J. Baroni, CFMR-PR 4544; ibid., 18 Jan. 1998, H. & O. K. Miller & D. J. Lodge, CFMR-PR 5411; ibid., Tradewinds trail, 18° 17' 34" N, 65° 47' 47" W, 770 m, on soil, 15 July 1997, *S. A. Cantrell, D. Llorens & M. Serrano, CFMR-PR 4596 (S. A. Cantrell PR-9758); Mun. Orocovis:* Toro Negro Comm. Forest, 18° 9' 14" N, 66° 32' 10" W, 1000 m, on soil, 23 June 1996, *T. J. Baroni, CFMR-PR 3276.***

Hygrocybe ovinoides Lodge, S. A. Cantrell & Baroni, **sp. nov.** (Figs 43–47)

Etym.: ovinoides, resembling *Hygrocybe ovina*.

Pileus 14 mm diametro late convexus, superficie atrogriseo-brunnea (6.0 R 2.5/1.0) margine albido translucido-striata usque sulcato-striata radialiter fibrillosa. **Lamellae** sinuatae griseae mediae pallidae (N 7.5) 2.5 mm latae distantes (plus quam 1 mm separatae), lamellulis aequilongis, margine plano pallidiore. **Stipes** 18 × 2–3 mm aequalis, superficie grisea sordida (0.1 Y 6.8/2.1) laevi usque fibrillosa nitida sericea humida. **Sporae** 5.5–8 × 4–5.5 µm, $Q=1.3$ –1.8 (media 1.5), ellipsoideae tenuibus guttulis refractivis. **Basidia** 32–40 × 6–7 µm clavata fibulis basalibus. **Margo lamellae** fertilis. **Pseudocystidia** 40–93 × 4–9.5 µm vermiformia ventricosa cylindrica hyalina ad et prope marginem lamellarum abundantissima. **Trama hymenophoralis** regularis, hyphis 92–164 × 9.5–22 µm aliquibus contento brunneo, fibulis praesentibus. **Pileipellis** cutis est hyphis angustis 4–8 µm diametro appendicibus erectis unciformibus vel extremis



Figs 43–52. **Figs 43–47.** *Hygrocybe ovinoides*. **Fig. 43.** Basidiome. **Fig. 44.** Basidium. **Fig. 45.** Spores. **Fig. 46.** Pseudocystidia. **Fig. 47.** Pileocystidia. **Figs 48–52.** *H. subovina*. **Fig. 48.** Basidiome. **Fig. 49.** Spores. **Fig. 50.** Basidium. **Fig. 51.** Cheilocystidia. **Fig. 52.** Pileocystidia.

angustatis ventricosis elatis, $116\text{--}230 \times 22\text{--}28\ \mu\text{m}$, super hyphas diametro majore $8\text{--}32\ \mu\text{m}$ contento brunneo capientes.

Typus: **Puerto Rico:** *Mun. Río Grande:* Caribbean National Forest, Caimitillo trail, upper part, $18^\circ 18' 17''\text{N}$, $65^\circ 47' 20''\text{W}$, 730 m, on clay soil, 11 June 1997, *T. J. Baroni* (CFMR-PR 4547 – holotypus).

Pileus 14 mm diam, broadly convex; surface dark greyish brown (6.0 R 2.5/1.0) with a whitish margin, translucent- and sulcate-striate, radially fibrillose. **Lamellae** sinuate (emarginate), pale neutral grey (N 7.5), 2.5 mm broad, distant (more than 1 mm apart), with lamellulae of one length; edge even, paler. **Stipe** $18 \times 2\text{--}3\text{ mm}$, cylindric; surface drab grey (0.1 Y 6.8/2.1), smooth, fibrillose-silky, shiny, moist. **Spores** $5.5\text{--}8 \times 4\text{--}5.5\ \mu\text{m}$, $Q = 1.3\text{--}1.8$ (mean 1.55), ellipsoid, with refractive guttules. **Basidia** $32\text{--}40 \times 6\text{--}7\ \mu\text{m}$, clavate, with basal clamp-connection. **Lamella-edge** fertile. **Pleurocystidia** and **cheilocystidia** none. **Pseudocystidia** $40\text{--}93 \times 4\text{--}9.5\ \mu\text{m}$, vermiform, ventricose, cylindric, hyaline, most abundant on and near the gill edge. **Hymenophoral trama** regular, hyphae $92\text{--}164 \times 9.5\text{--}22\ \mu\text{m}$, some with brown contents, clamp-connections present.

Pileipellis a cutis with narrow hyphae, $4\text{--}8\ \mu\text{m}$ wide, with hook-like erect appendages or uplifted ventricose tapered ends, $116\text{--}230 \times 22\text{--}28\ \mu\text{m}$, over larger-diameter hyphae, $8\text{--}32\ \mu\text{m}$, with brown contents.

Other specimens examined: *Hygrocybe mellita:* **Guadeloupe:** Basse-Terre, Sainte-Rose, Trace de Sofaia, solitary on soil in hygrophytic forest, 25 Oct. 1977, *J. P. Fiard* 1048 (K). *H. waolipo:* **Hawaii:** *Nars:* Pu'u Maka'ala, $19^\circ 29' 7''\text{N}$, $155^\circ 16' 14''\text{W}$, scattered in soil under hapu'u in montane wet forest, 26 Sept. 1994, *D. E. Hemmes* 587 (SFSU).

Comments: This species, represented by a single basidiome in the holotype, resembles *Hygrocybe ovina* but has a whitish band on the pileus margin, does not bruise red before turning brown, lacks an odour, and has smaller spores ($5.5\text{--}8 \times 4\text{--}5.5$ vs $(6\text{--})7\text{--}9\text{--}(11) \times 4.5\text{--}6\text{--}(7)\ \mu\text{m}$, respectively). *H. ovina* is found in Europe and North America. *Hygrocybe ovinoides* differs from the North American species, *H. subovina*, in having a whitish pileus margin and ellipsoid rather than globose or subglobose spores, and lacking a red staining reaction or pleurocystidia. *H. waolipo* from the Hawaiian Islands resembles *H. ovinoides* in lacking both an odour and a red staining reaction, but it differs in having a perforated blackish pileus that lacks a pale margin and having larger spores ($7\text{--}9.5 \times 5.5\text{--}7\ \mu\text{m}$) (Desjardin & Hemmes 1997). A species described by Pegler (1983) from Guadeloupe, *H. mellita*, differs from *H. ovinoides* in lacking a whitish pileus margin, having smaller spores ($5\text{--}6.5 \times 3\text{--}4.5\ \mu\text{m}$), and having a strong and distinctive odour of honey.

Hygrocybe subovina (Hesler & A. H. Sm.) Lodge & S. A. Cantrell, **comb. nov.** (Figs 48–52)

Basionym: *Hygrophorus subovinus* Hesler & A. H. Sm., *N. Am. Sp. Hygrophorus*: 162 (1963).

Pileus 22 mm diam, broadly convex, umbonate; surface vandyke brown (8.7 YR 2.9/1.6), radially fibrillose, moist, dull. **Lamellae** sinuate, dark drab (9.6 YR 4.3/2.4) to light drab (0.2 Y 5.8/2.5), bruised black on edge, distant (more than 1 mm apart), with lamellulae of one length, edge even, paler. **Stipe** $32 \times 4\text{ mm}$, equal; surface vandyke brown (8.7 YR 2.9/1.6), fibrillose, moist, dull. **Spores** $6.5\text{--}10 \times 5.5\text{--}8\ \mu\text{m}$, $Q = 1\text{--}1.5$ (mean 1.3), globose to subglobose. **Basidia** $37\text{--}41.5 \times 5.5\text{--}8\ \mu\text{m}$, cylindric, 4-spored, with basal clamp-connection. **Lamella-edge** sterile. **Pleurocystidia** absent. **Pseudocystidia** extending to $60\ \mu\text{m}$ beyond the basidia, ventricose, vermiform, cylindric, with crystalline incrustation and some with brown contents. **Cheilocystidia** $30.5\text{--}44 \times 4\text{--}5\ \mu\text{m}$, vermiform, cylindric, with clamp-connection. **Hymenophoral trama** regular, central area composed of short elements, $30.5\text{--}80 \times 10.5\text{--}20\ \mu\text{m}$; margin composed of long conductive elements, $240\text{--}520 \times 8\text{--}12\ \mu\text{m}$ that extend beyond the basidia forming the pseudocystidia. **Pileipellis** a repent cutis, hyphae with brown slightly banded walls, hyphae $8\text{--}10\ \mu\text{m}$ wide, some with brown globular contents; clamp-connections present.

Specimens examined: **Puerto Rico:** *Mun. Rio Grande:* Cai-mitillo Trail, Caribbean National Forest, Luquillo Mts, 18° 18' 9" N, 65° 47' 11" W, 645 m, on mineral soil, 21 June 1996, D. J. Lodge & T. J. Baroni (CFMR-PR 3340). – **USA:** *Tennessee* Cades Cove, Great Smoky Mts National Park, on soil in deciduous woods, 8 June 1957, L. R. Hesler 22583 (TENN – holotype).

Comments: Our collection is somewhat overmature. It agrees with the type collection from the Great Smoky Mountains in Tennessee, except that it lacks an odour and the lamellae stained blackish when collected, so it was not possible to look for a pinkish to reddish staining reaction.

Note

For coloured images of some of these beautiful species see website <http://www.cortland.edu/nsf/ga.html>.

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