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New taxa of Hawaiian corticioid fungi are described with keys to *Crustoderma, Radulomyces,* and *Scopuloides*

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Abstract: Four new species of corticioid fungi from Hawaii are described and illustrated. The new genus *Hemmesomyces* is described to accommodate the new species *H. puauluensis. Radulomyces tantalusensis, Crustoderma fuscatum* and *Scopuloides magnacystidiata* also are described as new. In addition, the new combination *Crustoderma vulcanense* is proposed. Keys to the species of *Crustoderma, Radulomyces* and *Scopuloides* are provided.

Key words: Corticiaceae, *Crustoderma fuscatum, Crustoderma vulcanense, Hemmesomyces puauluensis, Radulomyces tantalusensis, Scopuloides magnacystidiata, taxonomy*

INTRODUCTION

Extensive collecting in the Hawaiian Islands over the past decade has revealed a number of corticioid wood-rotting fungi for which no species names are known. Four taxa are described in this paper as new, and a new genus is proposed for one of these. Revised keys to species in the other genera are provided. Authors of fungal names follow Kirk and Ansell (1992). Capitalized color names are from Ridgway (1912). All specimens are deposited at University of Arizona Herbarium, Tucson, Arizona (ARIZ) . Additional specimens are deposited at Center for Forest Mycology Research, Madison, Wisconsin, (CFMR) and U.S. National Fungus Collections, Beltsville, Maryland, (BPI) as indicated. A list of botanical and common names of woody substrates reported herein is provided at the end of this paper.

Hemmesomyces Gib. & Nakasone, gen. nov.

Fructificatio resupinata; systema hypharum monomiticum; hyphae fibulatae; lamprocystidia hyalina ad brunnea, dextrinoidea, pseudoradicata; gloeocystidia hyalina, cylindrica ad globosa 4-10 µm diam, apice mammiformi vel obtuso; basidiosporae globosae vel subglobosae, hyalinae, leviter crassitunicatae; ligno putrido albo.

Basidiocarps resupinate; hymenia1 surface smooth to tuberculate; hyphal system monomitic with clamp connections; cystidia of two types: (1) fusiform, terminal or lateral, with short, knobby branches at base and appearing rooted, tapering to an acute point, arising from subiculum and subhymenium, walls at first hyaline and slightly thickened, then becoming brown, thick, lightly encrusted, sometimes dextrinoid in Melzer's reagent; (2) globose, ellipsoid, or broadly cylindrical, apex obtuse, attenuate or mammiform, arising from subiculum and subhymenium, often containing conspicuous refractive globules or oil-like materials, negative in sulfovanillin, walls hyaline, thin or slightly thick, smooth; basidia clavate, 4-sterigmate; basidiospores globose to subglobose, walls hyaline, smooth, slightly thick, negative in Melzer's reagent; causing a white rot.

Etymology. Named for Dr. Donald E. Hemmes, professor of Biology, University of Hawaii at Hilo, in recognition of his contributions to knowledge of Hawaiian fungi.

The most striking feature of this new genus is the development of terminal or lateral, fusiform cystidia that often appear rooted. The cystidia have thick, brown-pigmented walls that appear dextrinoid in Melzer's reagent but do not react in 2% potassium hydroxide. Rooted cystidia are uncommon in the corticioid fungi. *Tubulicium* Oberw., *Tubulicrinis* Donk and *Litschauerella* Oberw. develop large, rooted cystidia with hyaline walls. Encrusted, fusiform, brown-pigmented cystidia are common in *Amylostereum* Boidin and *Peniophora* Cooke but they are not rooted.

The new genus, *Hemmesomyces,* is proposed because of the unique combination of features: brown, rooted, fusiform cystidia, gloeocystidia (negative in sulfovanillin), globose to subglobose basidiospores, and nodose septate generative hyphae. The affinities of *Hemmesomyces* are not known.

Hemmesomyces puauluensis Gilb. & Nakasone, sp. nov. FIGS. 1, 2

Fructificatio resupinata; superficies hymenii laeve vel tuberculatae, grisea vel vinaceo-bubalina; systema hypharum monomiticum; hyphae fibulatae; cystidia biformis, aliquot

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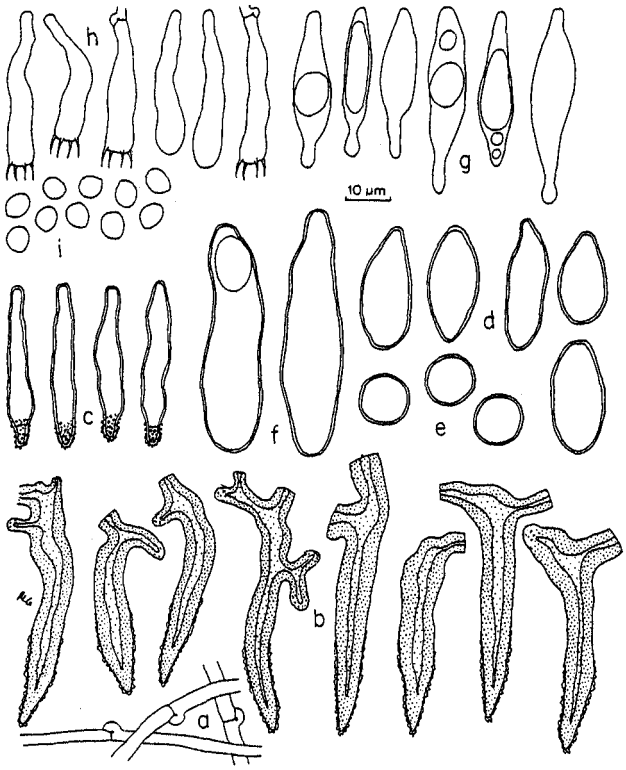


FIG. 1. Microscopic elements of *Hemmesomyces puauluensis* (RLG 17040, HOLOTYPE): a, subicular hyphae; b, thick-walled, brown metuloid cystidía with rooted or knobby outgrowths at base; c, apically encrusted, slightly thick-walled, developing metuloids; d, embedded gloeocystidia, ellipsoid form; e, embedded gloeocystidia, subsphaerical form; f, embedded gloeocystidia, cylindrical form; g, hymenial gloeocystidia with mammiform, attenuated apices; h, basidia; i, basidiospores.

crassitunicatae, subulatae, brunnea, dextrinoidea, radicata, aliquot tenuitunicata, hyalinae, late cylindricea, usque ad 10 µm diam, mammiforme vel attenuata; basidia clavata, 4-sterigmatibus; basidiosporae hyalinae, laeve, globosae vel subglobosae, leviter crassitunicatae, 4.5–6 × 4–4.5 µm; ligno putrido albo.

HOLOTYPUS. U.S.A. HAWAII: Hawaii, Ka'u District, Hawaii Volcanoes National Park, Kipuka Puaulu, ad lignum *Nestegis sandwicensis* (A. Gray) Degener, I. Degener & L. Johnson, 18 Jul 1991, legit Robert *L. Gilbertson* 1 7040 (BPI; ISOTYPUS: ARIZ, CFMR).

Etymology. of Kīpuka Puaulu (Bird Park), a mycologically rich locale in Hawaii Volcanoes National Park (HVNP),

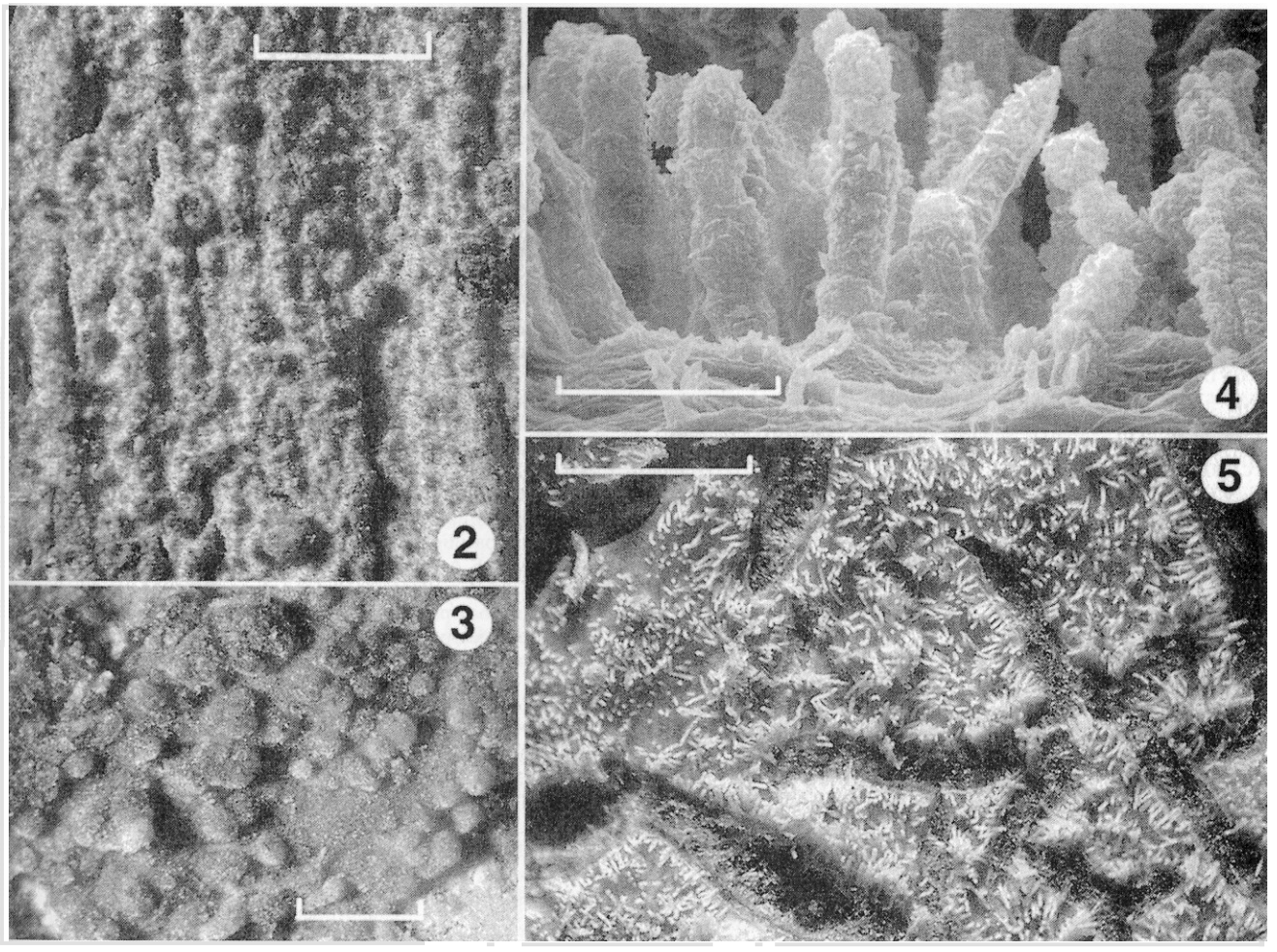
Basidiocarps resupinate, annual or persisting, widely effuse, up to 20 × 5 cm, adherent, up to 150 µm thick excluding tubercules, subceraceous, moderately rimose; hymenia1 surface Light Grayish Olive to Olive-Buff, darkening to Olive-Brown when bruised or cut, turning black in KOH, smooth to tuberculate, up to five tubercules per mm, appearing minutely tomentose with a 30 × lens; margin indistinct, fertile, gradually thinning out, smooth, concolorous with hymenium; hyphal system monomitic; subiculum up to 120 µm thick, a dense tissue of hyphae and cystidia, often stratose; subicular hyphae 2.5-4 µm diam, nodose septate, moderately branched, walls hyaline, thin, smooth; subhymenium thin, dense tissue of indistinct, agglutinated hyphae; hymenium a dense palisade of cystidia and basidia; cystidia of two types: (1) fusiform, with short, knobby outgrowths at base and thus appearing rooted, tapering to an acute or rounded apex, 28–50 × 7–9.5 µm, arising from subiculum and subhymenium, protruding up to 20 µm beyond hymenium, walls brown in KOH, weakly to moderately dextrinoid, up to 4 µm thick, lightly encrusted on the upper half, young forms more or less fusiform lacking knobby outgrowths at base, 27–35 × 5–6.5 µm, arising from subhymenium, walls hyaline, slightly thick, and lightly encrusted at apex; (2) gloeocystidia from hymenium obclavate to fusiform, at apex attenuated or mammiform, 18–40 × 4–10 µm, often containing conspicuous refractive globules, walls hyaline, thin, smooth, negative in Melzer's reagent, those embedded in context ellipsoid to broadly cylindrical, 20–70 × 8–15 µm, empty or filled with dense, refractive, hyaline materials, walls hyaline, slightly thickened, smooth; basidia narrowly clavate; four-sterigmate, 15–30 × 44.5 µm, with a basal clamp, sometimes with adventitious septa; basidiospores subglobose to globose, 4.5–6 × 4-4.5 µm, walls hyaline, slightly thick, smooth, negative in Melzer's reagent. Associated with a white rot.

Specimens examined. U.S.A. HAWAII: Hawaii, Ka'u District, HVNP, Kipuka Puaulu, on olopua, *RobertL. Gilbertson* (RLG) 19370, 19059, on pilo, RLG 18747, 18748, 18791, 18819, on āulu, *RLG 23317*, on olopua, *RLG 17425;* Kīpuka Kī, on mānele, *RLG 20537*. South Hilo District, Kolekole Beach County Park, on 'ōhi'a loke, *RLG 17128;* University Hawaii at Hilo farm, on wiliwili, *RLG 20842*. South Kohala District, Waipi'o Ridge Trail, on common bamboo, RLG 21027. Maui, Hana District, Hana Highway, Sacred Pools, on Chinese banyan, *RLG 23100A*.

The microscopic characters of *H. puauluensis*, particularly the cystidia and slightly thick-walled basidiospores, distinguish it from other genera and species of known corticioid fungi.

Crustoderma fuscatum Gilb. & Nakasone, sp. nov. FIGS. 3, 6

Fructificatio resupinata, mollis et carnosa; superficies hymenii tuberculata, ochracea vel avellanea, ultima nigres cens; systema hypharum monomiticum; hyphae fibulatae; cystidia cylindracea, tenuitunicata, 50–70× 4–6µm; basidia clavata, 4-sterigmatibus, 23–40× 4.5–5.5µm; basidiosporae



FIGS. 2–5. Close up view of hymenophores and scanning electron micrograph of Hawaiian corticioid fungi. 2. Basidiocarp surface of *Hemmesomyces puauluensis* (RLG 17040, HOLOTYPE). Bar = 1 mm; 3. Basidiocarp surface of *Crustoderma fuscatum* (RLG 19063, HOLOTYPE). Bar = 1 mm; 4. Encrusted cystidia of *Scopuloides magnacystidiata* (RLG 18469, HOLOTYPE). Bar = 50 µm; *S. magnacystidiata* hymenophore with cystidia. Bar = 1 mm.

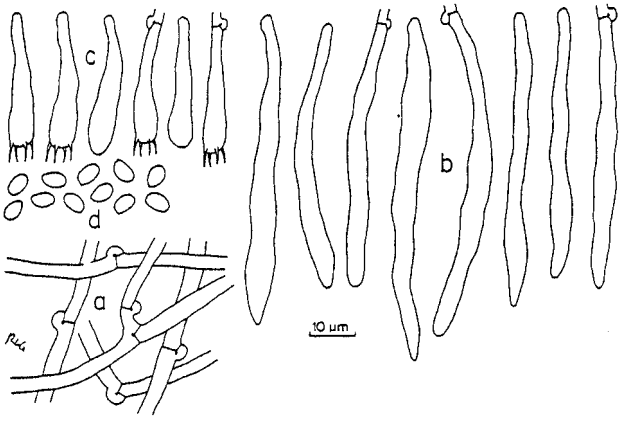


FIG. 6. Microscopic elements of *Crustoderma fuscatum* (RLG 19063, HOLOTYPE): a, subicular hyphae; b, cystidia: c, basidia; d, basidiospores.

cylindricae-ellipsoideae, hyalinae, laeve, 4.5-5.5 × 2.5-3 µm; ligno putrido brunneo.

HOLOTYPUS. U.S.A. HAWAII: Hawaii, Ka'u District, Hawaii Volcanoes National Park, Kīpuka Puaulu, ad lignum *Metrosideros polymorpha* Gaud., 26 Nov 1991, legit *Robert L. Gilbertson 19063* (BPI; ISOTYPUS: ARIZ, CFMR).

Elymology. from the dark coloration of mature and dried specimens.

Basidiocarps resupinate, annual or persisting, effused up to 10 cm, up to 500 µm thick excluding tubercules, soft and fleshy when fresh, drying soft ceraceous (cheesy), easily sectioned, often curling up and peeling away from the substrate on drying, producing a substance that stains paper brown; hymenial surface irregularly tuberculate, 2–4 tubercules per mm, Antique Brown, Saccardo's Umber to Tawny-Olive, then darkening to Mummy Brown or Bone

Brown to almost Black, margin adherent, abrupt and distinct or gradually thinning out, smooth, Pinkish Buff to Cream-Buff; hyphal system monomitic; subiculum a moderately open tissue of partially agglutinated, more or less vertical hyphae, embedded with copious oil-like globular matter; subicular hyphae 2–4.5 µm in diam, nodose septate, frequently branched, walls hyaline, thin; subhymenium thickening, up to 70 µm thick, a dense tissue of much branched, short-celled, agglutinated hyphae; hymenium a dense palisade of cystidia and basidia embedded in oil-like matter; cystidia abundant, cylindric with a rounded, obtuse or tapered, acute apex, 50–70 × 4–6 µm, with a basal clamp, occasionally with secondary septa, arising from subhymenium, protruding up to 30 µm, walls hyaline, thin, smooth; basidia clavate, 4-sterigmate, 23–40 × 4.5–5.5 µm, with a basal clamp; basidiospores cylindric-ellipsoid to oblong, 4.5–5.5 × 2.5–3 µm, walls hyaline, slightly thick, smooth, negative in Melzer's reagent. Associated with a brown rot.

Specimens examined. U.S.A. HAWAII: Hawaii, Hāmākua District, Honokaia Boy Scout Camp, on robusta eucalyptus, *RLG 17848, 17863, 18217, 18238, 18239, 18938, 18948, 18957,* Kalopa State Park, on robusta eucalyptus, RLG 18626, on 'ōhi'a lehua, *RLG 17356, 17362, 17363, 17494,* on ironwood, *RLG 18629, 18633, 18644;* Ka'u District, HVNP, Crater Loop Rd., on 'ōhi'a lehua, *RLG 18967,* Kīpuka Puaulu, on 'ōhi'a lehua, *RLG 20503,* on koa, *RLG 20496,* Hawaii Highway 11, Manuka State Wayside, on 'ōhi'a lehua, *RLG 22256;* South Hilo District, Saddle ROAD, kīpuka at Mile 18, on 'ōhi'a lehua, *RLG 18056,* kipuka at mile 10.5, on koa, *RLG 20960.* Moloka'i, Kamakou Forest Reserve, on robusta eucalyptus, RLG 19304, 19342, on cluster pine, *RLG 21409, 21413.*

The large cylindrical cystidia, thickening subhymenium and associated brown-rot suggest that the best placement of this species is in *Crustoderma* Parmasto. *Crustoderma fuscatum* is further characterized by its dark brown, soft ceraceous basidiocarp that dries black, short basidia and small basidiospores. It has the smallest basidiospores in the genus.

Crustoderma vulcanense (Gilb. & Adask.) Gilb. & Nakasone, comb. nov. (basionym: *Hyphoderma vulcanense* Gilb. & Adask., Mycotaxon 49:376. 1993).

When this taxon was originally described, it was mistakenly thought to be associated with a white rot. Numerous collections made subsequently are associated with a brown rot; therefore, it belongs in the genus Crustoderma. Examination of basidiospores in a large number of collections indicates the basidiospore size is 5–7 × 2–2.5 µm, slightly shorter than was reported in the original description. This is one of the most common wood-rotting fungi in Hawaii and is a major decomposer of native and exotic hardwoods.

Specimens examined. U.S.A. HAWAII. Hawaii, Hawaii Highway 137, Opihikao, near the Kiluaea lava flow, on false kamani, *RLG 16832* (ISOTYPE: ARIZ); Ka'u District, HVNP, Crater Loop Trail, on 'ōhi'a lehua, *RLG 17794, 18860, 19011*; Manuka State Wayside, on 'ōhi'a lehua, *RLG 19032, 19033, 19038, 19040, 19044, 19046.*

KEY TO THE SPECIES OF CRUSTODERMA

1. Basidiocarps primarily on dead conifers 2
1. Basidiocarps primarily on dead angiosperms 9
2. With only one kind of cystidium 3
2. With two kinds of cystidia and hyphidia; basidiospores 7–9.5 × 4–5 µm; reported from British Columbia, Canada and Oregon . . . . . .*C. testatum* (H. S. Jacks. & Dearden) Nakasone
3. Basidiospores usually ≥3 µm diam 4
3. Basidiospores ≤3 µm diam; basidia small, 19–30 × 4.5–5.5 µm; basidiospores 7–8 × 2.5–3µm, reported from Louisiana, U.S.A., on *Pinus* sp. . . . . *C. nakasoneae* Gilb. & M. Blackw.
4. Basidiocarps cream, yellow, brown, or gray 5
4. Basidiocarps white; basidiospores 7–9 × (3.5–)4–4.5 µm; cystidia thin-walled, reported from Spain on juniper . . . . . *C. sabinicum* (Majón & G. Moreno) Nakasone [=*Hyphoderma multicystidium* (Hjorstam & Ryvarden) Hjortstam & Tellería]
5. Basidiocarps cream, brown, or gray 6
5. Basidiocarps yellow to orange; basidiospores 7–8(–9) × (2.5–)3–4(–4.5) µm; reported from Europe and U.S.A. . . . . *C. dryinum* (Berk. & M.A. Curtis) Parmasto
6. Basidiospores small, 6–8 × 4–5 µm; basidiocarps gray; cystidia >100 × 7–12 µm; reported from Europe and British Columbia, Canada . . . . . *C. longicystidiatum* (Litsch.) Nakasone
6. Not with the above combination of characters 7
7. Cystidia 80–130 × 5–9 µm diam; basidiopores 8–12 × 4–5.5 µm; on *Pinus*; reported from Europe, U.S.A. and Canada . . . . . *C. corneum* (Bourdot & Galzin) Nakasone
7. Cystidia typically wider, 8–16 µm diam 8
8. Basidia 30–40 µm long; basidiospores 9–12(–13) × 5.5–6.5(–7.0) µm; reported from Maryland, U.S.A. . . . . *C. marianum* Nakasone
8. Basidia 40–80 µm long; basidiospores 8–12 × 4.5–6 µm; reported from Washington, Oregon, and Montana, U.S.A., and British Columbia and Alberta, Canada . . . . . *C. resinosum* (H.S. Jacks. & Dearden) Gilb.
9. Basidia large, mostly over 45 µm long 10
9. Basidia smaller, usually less than 45 µm long 12
10. Basidiocarps yellow; basidiospores 7–8(–9) × (2.5–)3–4(–4.5) µm; reported from Europe and U.S.A. . . . . *C. dryinum*
10. Basidiocarps gray or some shade or brown; basidiospores 5–8 µm diam 11
11. Hyphidia present; basidiocarps gray; basidiospores 8–9 × (5–)6–6.5(–7) µm; reported from North Carolina on *Castanea* sp. . . . . *C. carolinense* Nakasone
11. Hyphidia absent; basidiocarps dull yellowish brown to pinkish brown; basidiospores 7–9(–10.5) × (6–)(6.5–7(–8) µm; reported from eastern U.S.A. and Panama . . . . . *C. flavescens* Nakasone & Gilb.
12. Basidiospores up to 10–15 µm long 13
12. Basidiospores shorter than 10 µm 14
13. Basidiospores (9–)10–12(–13) × 5.5–6.5(–7) µm; reported from Maryland . . . . . *C. marianum*
13. Basidiospores 11–13(–15.3) × 4.5–5.5 µm; reported from Australia and New Zealand . . . . . .*C. patricium* (G. Cunn.) Nakasone [=*Hyphoderma*

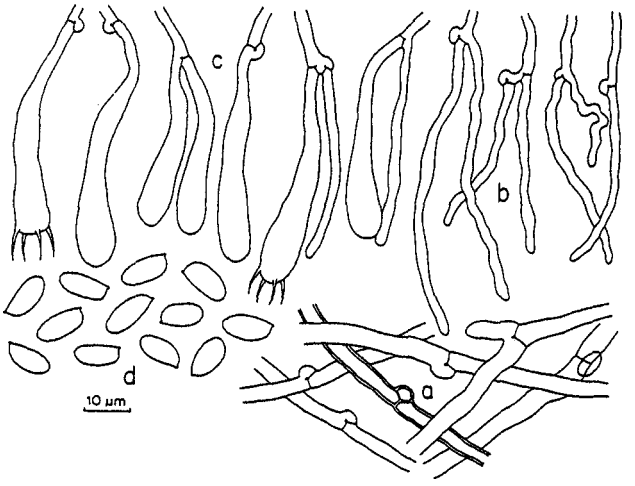


FIG. 7. Microscopic elements of *Radulomyces tantalusensis* (RLG 18310, HOLOTYPE): a, subicular hyphae; b, hyphoid hymenial elements; c, basidia; d, basidiospores.

assimile (H.S. Jacks. & Dearden) Donk]

14. Basidiocarps gray or brown 15
14. Basidiocarps cream, yellow or tan 16
15. Hymenophore tuberculate, dark orange-brown, drying black; cystidia thin-walled, basidiospores 4.5–5.5 × 2.5–3 µm; reported from Hawaii . . . . . *C. fuscatum* Gilb. & Nakasone
15. Hymenophore smooth, gray; cystidia occasionally thick-walled; basidiospores 7–8(–11) × 4–5 µm; reported from southern Arizona on *Opuntia* spp. . . . . *C. opuntiae* Nakasone & Gilb.
16. Basidiocarps yellow; basidiospores 7–8(–9) × (2.5–)3–4(–4.5) µm; widely distributed in Europe and U.S.A. . . . . *C. dryinum*
16. Basidiocarps pale cream to tan; basidiospores 5.5–9 × 2.5–3 µm 17
17. Cystidia thick-walled, up to 320 µm long; reported from the Reunion Islands . . . . . *C. borbonicum* Boidin & Gilles
17. Cystidia thin-walled, 40–150 µm long; reported from the Hawaiian Islands 18
18. Cystidia 80–150 µm long . . . . . *C. gigacystidium* Gilb. & Hemmes
18. Cystidia 40–50 µm long . . . . . *C. vulcanense* (Gilb. & Adask.) Gilb. & Nakasone

Radulomyces tantalusensis Gilb. & Nakasone, sp. nov. FIG. 7.

Fructificatio resupinata, cornea; superficie hymenii mellea vel olivaceo-ochracea, leave vel leviter tuberculata; subiculum album, fibrosum; systema hypharum monomiticum; hyphae hyalinae, tenui- vel crassitunicatae, fibulatae; cystidia nulla; hyphidia hyphoid, 1.5–3 µm diam; basidia anguste clavata, 2-4 serigmatibus, 30–55 × 68.5 µm; basidiosporae cylindric-ellipsoideae, hyalinae, leave, 10–12× 4–5 µm; ligno putrido albo.

HOLOTYPUS: U.S.A. HAWAII: Oahu, Honolulu District, Manoa, Tantalus Drive, ad lignum *Mangifera indica* L., 6 Oct 1991, legit Robert L. Gilbertson 18310 (BPI; ISOTYPUS: ARIZ, CFMR).

Etymology. of Tantalus, an historical area in the foothills above Honolulu on Oahu.

Basidiocarps annual or persisting, resupinate, widely effuse, adherent, up to 400 µm thick, corneous to ceraceous, moderately rimose on drying; hymenial surface continuous, smooth to slightly tuberculate, Antimony Yellow, Yellow Ocher, Maize Yellow or Colonial Buff, younger areas Warm-Buff, older areas Tilleul-Buff, often with a hygrophanous aspect; margin abrupt, with adherent or detached, fibrillose edges, Buff-Yellow, Ivory Yellow to White; hyphal system monomitic; subiculum 100–180 µm thick, a moderately open tissue composed of more or less vertical, branched, non-agglutinated hyphae; subicular hyphae 3–5 µm in diam, nodose septate with scattered simple septa, moderately branched, walls hyaline, thin to slightly thick, smooth; subhymenium thickening, 50–180 µm thick, a dense tissue of vertically arranged, short-celled, moderately branched hyphae; hymenium ~50 µm thick, a dense palisade of hyphoid elements and basidia developed in loose candelabrums; hyphoid sterile elements abundant, filiform, often somewhat moniliform or irregularly constricted with a knobby appearance, 1.5–3 µm in diam, with a basal clamp, walls hyaline, thin, smooth; basidia narrowly clavate with an elongated stalk, 2–4sterigmate, often containing large spherical globules, 30–55 × 6–8.5 µm, with a basal clamp; basidiospores cylindric-ellipsoid, 10–12 × 4–5 µm, walls hyaline, thin, smooth, negative in Melzer's reagent. Associated with a white rot.

Specimens examined. U.S.A. HAWAII: Oahu, Honolulu District, Tantalus Drive, on mango, *RLG 18300, 18306;* Pu'u Ohia Trail, on guava, *RLG 18335.* Hawaii, Hāmākua District, Kalopa State Park, on guava, RLG 18636; Waipi'o Valley, on kukui, *RLG 17922.*

Microscopic characters of *R. tantalusensis* and *R. submolaris* Parmasto (1968), from the Altai Mountains of Russia, are similar. Macroscopically they are quite distinct; *R. submolaris* basidiocarps are soft, fissile, and crack into small blocks on drying. Basidiocarps of *R. tantalusensis* are firm and compact, become hard and horny on drying, and do not crack into small blocks.

This key to the species of *Radulomyces* M. P. Christ. includes taxa accepted by Parmasto (1997), except for *R. repandus* (Fr. : Fr.) Boidin & des Pomeys because of a lack of critical information. Also included are three newly described species from Hawaii and *R. rickii* (Bres.) M. P. Christ., sometimes considered conspecific with *R. confluens* (Fr. : Fr.) M. P. Christ.

KEY TO THE SPECIES OF *RADULOMYCES*

1. Hymenial surface hydnoid, raduloid, plicate, or pitted . . . 2
1. Hymenial surface smooth or tuberculate 4
2. Hymenial surface plicate to pitted, basidiospores 7.5–10 × 5.5–7 µm, reported from Tasmania and eastern U.S.A. . . . . *Radulomyces fuscus* (Lloyd) Ginns
2. Hymenial surface hydnoid or raduloid 3
3. Basidiocarps with irregular spines, basidiospores 8–11(–13)

× 6.5–8 µm, reported from northern Europe . . . . . *Radulomyces molaris* (Chaillet ex Fr. : Fr.) M. P. Christ.
3. Basidiocarps with slender spines up to 10 mm long, basidiospores slightly thickwalled, globose to subglobose, 5.5–6.5(–7) × 5–6(–6.5) µm, reported from Asia . . . . . *Radulomyces copelandii* (Pat.) Hjortstam & Spooner
4. Basidiospores ellipsoid to cylindrical or sigmoid 5
4. Basidiospores globose to subcylindrical or ovoid 11
5. Basidiospores up to 4 µm diam 6
5. Basidiospores 4–5(–6.5) µm diam 7
6. Hymenial surface grayish buff; basidiospores 5–6(–7) µm long . . . . . *R. kama'aina* Gilb. & Hemmes
6. Hymenial surface purplish; basidiospores 7–8 µm long . . . . . *R. poni* Gilb. & Hemmes
7. Basidiospores usually ≤5 µm diam 8
7. Basidiospores usually ≥5 µm diam 10
8. Basidiospores sigmoid, 12–14 × 4.5–5 µm . . . . . *Radulomyces subsigmoideus* Hjortstam & Ryvarden
8. Basidiospores cylindric to ellipsoid ≤12 µm long 9
9. Basidiocarps when dried soft and fissile, cracking into small angular blocks; reported from the Altai Mountains of Russia . . . . . *Radulomyces submolaris* Parmasto
9. Basidiocarps when dried hard and horny, not cracking; reported from Hawaii . . . . . *Radulomyces tantalusensis*
10. Basidiospores ellipsoid to subglobose 11
10. Basidiospores oblong to short cylindric, 10–14(–15) × 5.5–6.5 (–7) µm; basidia 40–55 × 6.5–8(–9) µm; reported from Georgia (former U.S.S.R.) . . . . . *Radulomyces roseolus* Parmasto
11. Basidiospores ellipsoid to subglobose, smooth, 8–12 × 6.5–9 µm; basidiocarps tuberculate to smooth; reported from Europe, U.S.A., and Canada . . . . . *Radulomyces confluens*
11. Basidiospores subglobose, minutely spinulose, 7–9 × 6–8 µm; basidiocarps smooth or slightly farinaceous; reported from Europe . . . . . *Radulomyces rickii*

Scopuloides magnacystidiata Gilb. & Nakasone, sp. nov. FIGS. 4, 5, 8

Fructificatio resupinata, rimosa ubi exsiccata; superficies hymenii griseo-alba, cystidiata cum cystidia propria sub 10× lens; systema hypharum monomiticum; hyphae hyalinae, simple-septatae, 5–12 µm in diam; cystidia abundantia, cylindrica, incrustia, simple-septata, to 150 µm longa et 20 µm late; basidia clavata, 4-sterigmatibus, 11-14 × 4-5.5 µm; basidiosporae oblongae vel brevi-cylindricae, hyalinae, laeve, 4-5 × 2-2.5 µm; ligno putrido albo.

HOLOTYPUS. U.S.A. HAWAII: Hawaii, South Hilo District, Stainback Highway, ad lignum *Psidium cattleianum* Sabine, 10 Oct 1991, legit *Robert L. Gilbertson 18469* (BPI; ISOTYPUS: ARIZ, CFMR).

Etymology. named for the large, prominent cystidia.

Basidiocarps annual or persisting, resupinate, effused to 3 cm, adherent, thin, 70–110 µm thick, corneous, brittle when dry, cracking moderately to extensively into small angular blocks on drying; hymenial surface smooth, translucent, Pale Smoke Gray to Pale Olive Gray, older areas Cartridge Buff, hispid from large, crowded cystidia clearly discernible with a 10× lens; margin indistinct and thinning out or abrupt, fertile to the edge; hyphal system monomitic; subiculum thin, up to 40 µm thick, a dense tissue with hyphae arranged parallel to substrate, concolorous with hymenial surface; subicular hyphae 5–12 µm in diam, simple septate with rare single clamps, infrequently branched, agglutinated, walls hyaline, thin to slightly thickened; subhymenium dense, up to 35 µm thick, composed of indistinct, agglutinated hyphae; cystidia abundant, cylindrical with simple septa, often constricted at septa, up to 150 µm long and 20 µm wide including incrustations, originating in subiculum and protruding up to 80 µm beyond hymenium, walls thin, hyaline, faintly dextrinoid in Melzer's reagent, heavily encrusted with coarse crystals; basidia clavate, 4-sterigmate, 11–14 × 4-5.5 µm, simple-septate at the base; basidiospores oblong to short-cylindric, 4–5 × 2–2.5 µm, walls hyaline, smooth, thin-walled, negative in Melzer's reagent. Associated with a white rot.

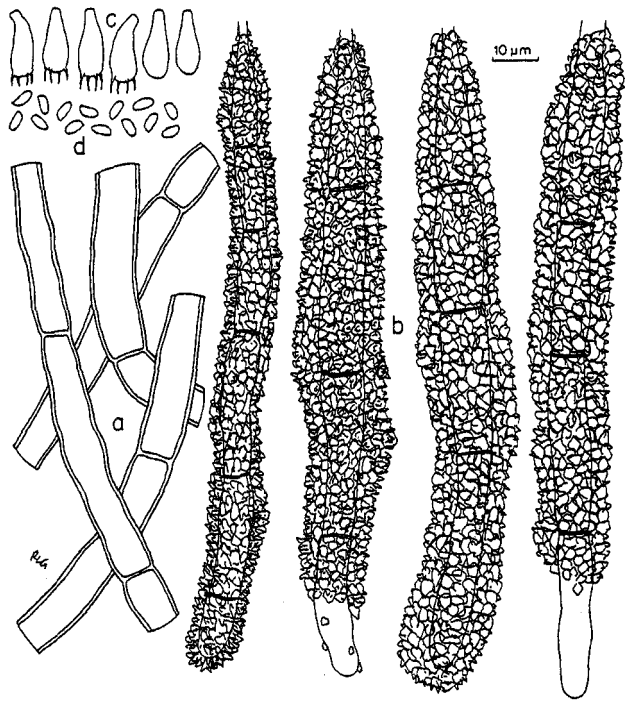


FIG. 8. Microscopic elements of *Scopuloides magnacystidiata* (RLG 18469, HOLOTYPE): a, subicular hyphae; b, cystidia; c, basidia; d, basidiospores.

Specimens examined. U.S.A. HAWAII: Hawaii, Hāmākua Dist., Kalopa State Park, on ironwood, *RLG 18634* (CFMR), Honokaia Boy Scout Camp, on guava, *RLG 18199* (CFMR). The abundant, large cystidia, clearly visible with a 10× hand lens, distinguish this from other species of *Scopuloides.* Macroscopic basidiocarp characters, including the translucent appearance when fresh, the corneous, brittle texture when dry, combined with the distinctive large cystidia make *Scopuloides* the appropriate generic placement for this species.

KEY TO THE SPECIES OF *SCOPULOIDES*

1. Cystidia with acute apices present 2
1. Cystidia with acute apices absent . . . . . *Scopuloides magnacystidiata* Gilb.& Nakasone

2. Basidia small, 10–15 × 3–4 μm .... *Scopuloides rimosa* (Cooke) Jülich [=*Scopuloides hydnoides* (Cooke & Massee) Hjortstam & Ryvarden]
2. Basidia larger, 25–32(–45) × 5–6(–7) μm ..... *Scopuloides leprosa* (Bourdot & Galzin) Boidin, Lanquetin & Gilles

BOTANICAL AND COMMON NAMES OF TREES AND SHRUBS REPORTED AS SUBSTRATES IN THIS PAPER

(from Wagner et al. 1999)

Acacia koa A. Gray, koa
Aleurites moluccana (L.) Willd., kukui or candle nut
Casuarina equisetifolia L. ex J.R. & G. Forst., ironwood or horsetail casuarina
Coprosma montana Hillenbr., pilo
Erythrina sandwicensis Degener, wiliwili
Eucalyptus robusta Sm., robusta eucalyptus
Ficus microcarpa L. f., Chinese banyan
Mangifera indica L., manako or mango
Metrosideros polymorpha Gaud., 'ōhi'a lehua
Nestegis sandwicensis (A. Gray) Degener, I. Degener & L. Johnson, olopua or pua
Pinus pinaster Ait., cluster pine
Pisonia sandwicensis Hillebr., āulu
Psidium cattleianum Sabine, strawberry guava or waiawī
Psidium guajava L., kuawa or guava
Sapindus saponaria L., mānele
Schizostachyum glaucifolium (Rupr.) Munro, 'ohe or common bamboo
Syzgium jambos (L.) Alston, ōhi'a loke or rose apple
Terminalia catappa L., false kamani

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