

Polyporus lowei, a New Species from the Great Lakes Region

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Burdsall, Harold H., Jr., and Frances F. Lombard (USDA, Forest Service, Forest Products Laboratory, Center for Forest Mycology Research, Madison, WI 53705, U.S.A.). ***Polyporus lowei***, a new species from the Great Lakes Region. *Mere. New York Bot. Gard.* **49**: 147–151. 1989. A new species of *Polyporus* from the Great Lakes Region of the United States is described and illustrated.

Key Words: *Polyporus*, Polyporaceae, cultures, decay, taxonomy

Introduction

The genus *Polyporus* Mich.: Fr. is a small genus of wood decay fungi now recognized by stipitate basidiocarps, with a black stipe base. Most of these species occur on dead wood but several cause heartrot in living trees; e.g., *P. admirabilis* Peck, *P. coronadensis* Gilbn. & Martin, and *P. squamosus* Huds.: Fr.

In 1974 and 1976, the senior author found a species of *Polyporus* with large basidiocarps fruiting on dead sugar maple (*Acer saccharum* Marsh.). Two other specimens of the same species were found in the University of Michigan herbarium. Attempts to identify the species proved futile. Therefore, we describe it here as a new species.

Materials and Methods

The methods employed in studying the cultures were the same as used in previous studies (Davidson et al., 1942). The "key patterns" were based on 2 week old cultures inoculated in the center of Petri dishes on 1.5% malt extract agar (MEA) and incubated at 25°C. The "species code" of Nobles (1965, as amended by Boidin, 1966,

p. 6) was based on 6 week old cultures inoculated at the sides of the dishes.

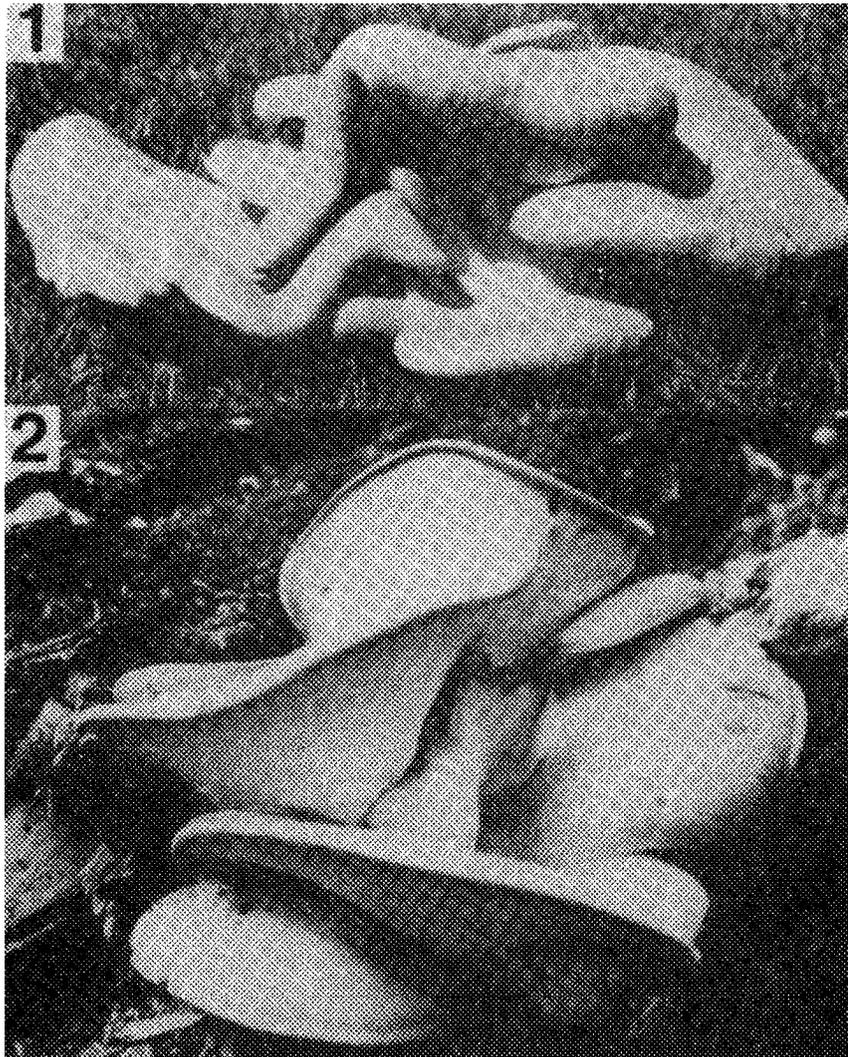
Test tube culture was grown at room temperature (about 25°C) in diffuse light. Extracellular oxidase production was detected by the Baven-damm test described by Davidson et al. (1938), in which cultures were grown on MEA containing 0.5% gallic acid (GAA) or tannic acid (TAA). For the constant temperature study, cultures on MEA were placed in incubators 24 hours after plating and measured at the end of 16 days. Mat diameters were averages of three replications. Killing temperatures were determined by removing those cultures without observable growth from the higher test temperatures and incubating them at 25°C for 3 weeks. Those that did not grow were presumed to have been killed at the test temperatures.

Capitalized color names are from Ridgway (1912) and herbarium designations are from Holmgren et al. (1981).

Polyporus lowei Burdsall & Lombard, sp. nov.

Figs. 1-6.

Basidiocarpi pileati, lateraliter ad affixa, 7-17 cm lata, usque ad 29 cm lata in aggregates, su-



FIGS. 1,2. *Polyporus lowei*. 1. Young basidiocarp (HHB 7912, $\times \frac{1}{2}$). 2. Mature basidiocarp (holotype, $\times \frac{1}{2}$).

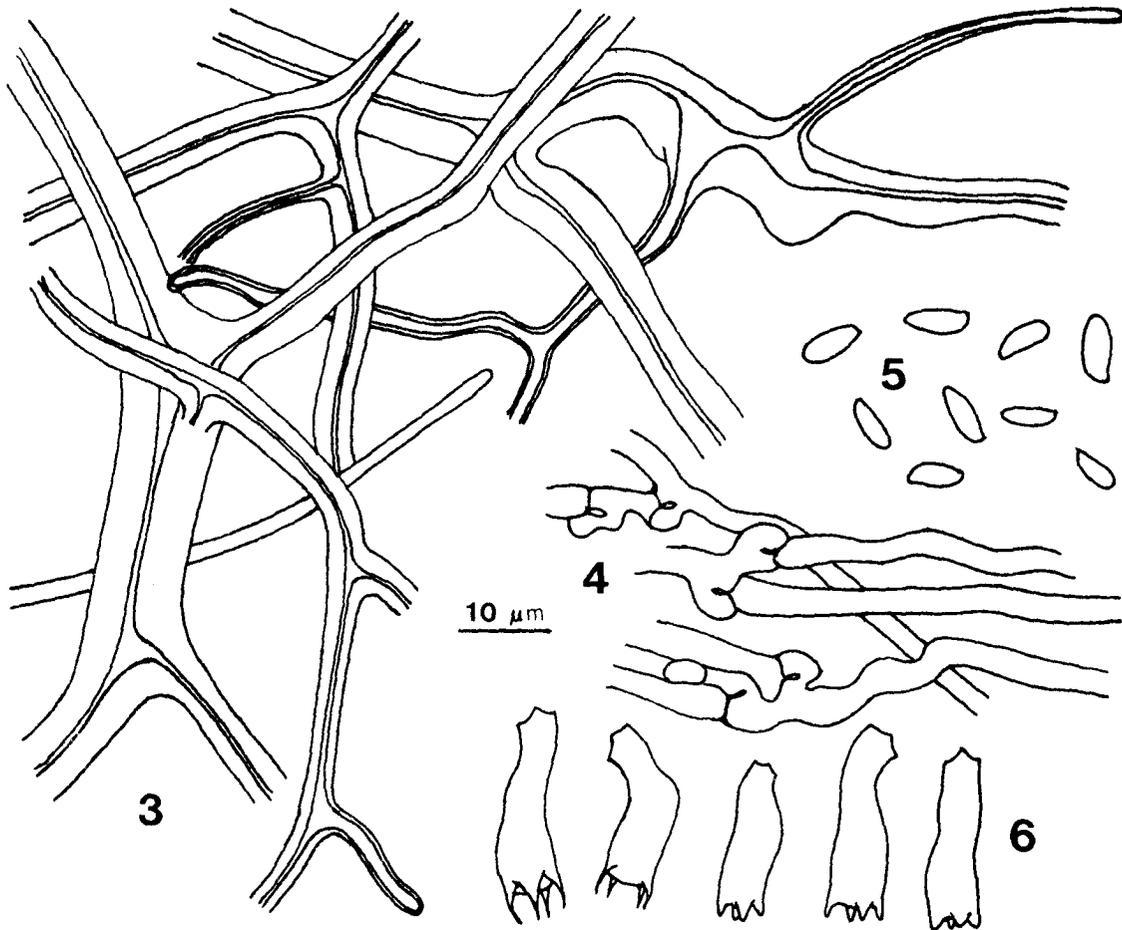
perticies initium griseis, brunneola lutescens cum brunneis striis. Pori 4–5 inter mm. Contextus dimitici. Hyphae gloeoplerae 7–12(–18) μm diam.; hyphae skeletae 2.5–7 μm diam. Basidiosporae late cylindricae, 6.5–9 \times 2.5–3 μm .

Holotypus. U.S.A. Michigan: Marquette County, Big Bay, Huron Mountains, Huron Mt. Club. Mt. Lake Rd., ad lignum *Acer saccharum* Marsh., 26 VIII 1976, Harold H. Burdsall, Sr. & Harold H. Burdsall, Jr., HHB 9230 (CFMR).

Etymology. In honor of Dr. Josiah L. Lowe.

Basidiocarp annual, pileate from a poorly developed stipe, with several to many imbricate pilei; in aggregation to 29 cm broad: individual pilei 7–17 cm broad, laterally stipitate, depressed

at attachment, dimidiate, margin inrolled, very thin on older specimens; pilear surface pale creamy gray at first, becoming brownish yellow with brown streaks radiating from the attachment, margin darker especially on drying, pore surface white at first, becoming pale yellow to tan, smooth at first but irregularly cracked in older and especially in dried specimens; pores 4–5/mm, mostly circular but angular in some areas, especially near the stipe; context white, becoming tan in older and dried specimens, tough and flexible, to 1.5 cm thick near stipe attachment; tubes to 4 mm long, decurrent on stipe; stipe poorly developed or imbedded in substrate, 2.5–7.5 cm long \times 2.5–5 cm broad, sometimes fused



FIGS. 3-6. Microscopic characteristics of *Polyporus lowei*. 3. Skeleto-binding hyphae of context. 4. Generative hyphae of pore trama. 5. Basidiospores. 6. Basidia.

together, surface pale brown at first, soon becoming dark brown to nearly black; odor of almonds, especially from broken base and rotted wood at attachment.

Cuticle 125-150 μm thick, composed of generative hyphae 2.5-4 μm diam., hyaline, thin-walled, nodose-septate, distributed in a refractive matrix. Context dimitic, composed of generative, skeleto-binding hyphae and scattered gloeoplerous hyphae; generative hyphae difficult to observe, 3-6 μm diam., hyaline, thin-walled, regularly branched, smooth, nodose-septate; gloeoplerous hyphae not easily observed except in young specimens, 7-12 (-18) μm diam., hyaline, thin-walled, occasionally branched, smooth, nodose-septate, constricted at septa, staining strongly in phloxine, bright yellow in Melzer's reagent; skeleto-binding hyphae (Corner, 1981),

2.5-10 μm diam., hyaline, smooth, regularly branched with short broad antler-like branches or longer, narrow, more undulating type, only slightly thick-walled in the narrow ones but walls to 5 μm thick in wide ones; tube trama composed of only generative hyphae arranged more or less parallel to the axis; basidia 18-25 \times 6-8 μm , broadly clavate to nearly cylindrical, hyaline, thin-walled, 4-sterigmate, nodose-septate at basal septum; basidiospores broadly cylindrical, 6.5-9 \times 2.5-3 μm , hyaline, thin-walled, smooth, not reacting with Melzer's reagent.

SPECIMENS EXAMINED. U.S.A. MICHIGAN: Marquette Co., on *Acer saccharum*, H. H. Burdsall 7912, 9223, 9230 (holotype) (all CFMR); *Ammirati* 2000 (MICH); Pellston Hills, on hardwood log, A. H. Smith 67024 (MICH).

SPECIMENS OF RELATED SPECIES EXAMINED U.S.A. (as

Polyporus coronadensis). ARIZONA: Cochise Co., on *Quercus hypoleucoides* A. Camus, K. J. Martin 110 (holotype ARIZ); Pima Co., on *Q. hypoleucoides*, R. L. Gilbertson 11295 (ARIZ) (as *Polyporus admirabilis*). MAINE: On *Malus. C. A. Burt s.n.* (lectotype, designated here with, NYS) (as *Polyporus underwoodii*). CONNECTICUT: Cornwall, Aug 1890. *Underwood 768* (holotype NY). MASSACHUSETTS: Berkshire Co., on old willow, 10 Aug 1897, A. M. Vail (NY). NEW YORK: Shaghticoke, on living elm. H. J. Bunker 1461 (NY); on willow, H. J. Banker 1450 (NY).

REMARKS. *Polyporus lowei* appears to fruit only occasionally because it has seldom been collected in northern Michigan despite the heavy collecting in this area. It occurs on hardwoods and may be restricted to sugar maple.

Several species of stipitate polypores may be confused with *P. lowei*; however, none of them is commonly collected. The most similar species is *P. cororadensis*, which is large, is microscopically similar to *P. lowei*, and produces an almond odor when fresh. *P. coronadensis* differs microscopically in possessing skeletal hyphae to 6 μ m wide and in lacking gloeoplerous hyphae, although the latter are not easily observed in *P. lowei* except in young specimens. In addition, *P. lowei* appears to be restricted in occurrence to maple in the Lake States whereas *P. coronadensis* occurs on oak in the Southwest. *Polyporus admirabilis* Peck is similar to *P. lowei* macroscopically but differs in possessing larger pores (2–3 per mm) and narrower skeletal hyphae. *Polyporus underwoodii* Murr. is smaller and thinner with a narrow central stipe and pores 3–4 per mm. *Polyporus badius* (Pers.: S. F. Gray) Schw. (= *P. picipes* Fr.) is distinguished by its more fragile aspect, central stipe, and darker color. Like *P. lowei*, *P. squamosus* is large, but it possesses distinct squamules on the pileus, a distinct stipe, and much larger angular pores. *Polyporus elegans* Bull.: Fr., which also occurs in the area, usually reaches only 4–5 cm diam. and occurs singly.

Description of Culture

KEY PATTERNS. A-P-S-1-4-10, B-P-S-1-4-10.
SPECIES CODE. 2. 3r. 7. 35. 36. 39.47. 54.

GROWTH CHARACTERISTICS. Growth rate on MEA slow, forming a mat 31–43 mm in diam. in 14 days; mycelium creamy white with a faint cast of Light Buff. appressed, very thin subfelty-pulverulent, becoming more pulverulent as it ages, homogeneous. azonate: margin fimbriate. indis-

tinct; odorless; at 6 weeks reverse discoloration near Tawny-Olive; oxidase reactions positive, moderately strong to strong, making no growth on gallic and tannic acid media.

HYPHAL CHARACTERISTICS. All hyphae staining in phloxine, septate with a few simple clamps, 2.2–5(–7) μ m diam.; central mat almost completely composed of arthroconidia (oidia) developed by fragmentation of hyphae, many of which do not stain with phloxine, 4–18.5 μ m diam., and short segments of hyphae to 23 μ m long.

TEST-TUBE CULTURE. In 28 days mat not covering slant and partially covering agar cylinder, Tilleul-Buff to Vinaceous-Buff, appressed, subfelty-pulverulent in scattered patches with agar discoloration showing through between the patches, reverse discoloration Bone Brown.

TEMPERATURE RELATIONS. Average mat diam. grown in triplicate on MEA in the dark, measured at the end of 16 days at 13 constant temperatures: 14°C, 15.5 mm; 16°C, 17.7 mm; 18°C, 29.7 mm; 20°C, 35.7 mm; 22°C, 45.0 mm; 24°C, 52.3 mm; 26°C, 51.3 mm; 28°C, 48.7 mm; 30°C, 32.3 mm; 32°C, 18.3 mm; 36°C, 40°C, and 44°C, no growth. Optimum, 24°C; not killed at 36°C and 40°C; killed at 44°C.

CULTURE EXAMINED. HHB 9230, polysporous isolate from the holotype collection (CFMR).

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