

## RARE AND UNUSUAL FUNGI (BASIDIOMYCOTA) OF THE HURON MOUNTAINS, MARQUETTE COUNTY, MICHIGAN

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### ABSTRACT

Twenty-three species of fungi (Basidiomycota) which are uncommon or rarely encountered in the Lake States are reported from the forests of the Huron Mountains, Marquette Co., Michigan. Brief descriptions are given and references provided regarding the occurrence of these species in north-eastern North America and Michigan. The works of Dr. Alexander H. Smith are especially considered due to his extensive studies of mushrooms in the Lake States.

### INTRODUCTION

The forests of the Huron Mountains in Marquette Co., Michigan consist of approximately 20,000 acres (8,097 ha) of mixed conifer-hardwood owned by the Huron Mountain Club, the core of which is approximately 8,000 acres (3,239 ha) of old growth forest designated as the Reserve Area. Sugar maple (*Acer saccharum* Marsh.), white pine (*Pinus strobus* L.), and eastern hemlock (*Tsuga canadensis* (L.) Carr.) compose the dominant forest type throughout, inter-mixed with Canada balsam (*Abies balsamea* (L.) Mill.), paper birch (*Betula papyrifera* Marsh.), yellow birch (*Betula alleghaniensis* Britt.), red oak (*Quercus rubra* L.), quaking aspen (*Populus tremuloides* Michx.), big-tooth aspen (*Populus grandidentata* Michx.), basswood (*Tilia americana* L.), red maple (*Acer rubrum* L.), striped maple (*Acer pennsylvanicum* L.), red pine (*Pinus resinosa* Ait.), jack pine (*Pinus banksiana* Lamb.), white spruce (*Picea glauca* Moench), black spruce (*Picea mariana* (Mill.) B.S.P.), and several lesser species (Simpson et al. 1990). These forests lie along the south shore of Lake Superior (Fig. 1); elevations range from approximately 600 ft (183 m) at lake level to several peaks of 1,400–1,500 ft (427–472 m) one to two miles inland.

For the past eight years the author has conducted surveys of mushrooms in the Huron Mountains, concentrating mainly on mycorrhizal species fruiting in old growth stands of red pine (*Pinus resinosa* Ait.) (see *Reports to the Huron Mountain Wildlife Foundation*, Richter, 1996–2003, available through [www.hmwf.org](http://www.hmwf.org)). In the course of these surveys, and in adjacent habitats, mushrooms have been found that are not commonly collected in the Lake States. This is probably due to the relatively unbroken and extensive tract of old growth forest of the Huron Mountain Club lands.

There is a history of collecting and reporting of rare and unusual fungi in the Huron Mountains (e.g. Ammirati & Smith 1972, Weber 1972, Ginns 1994). At

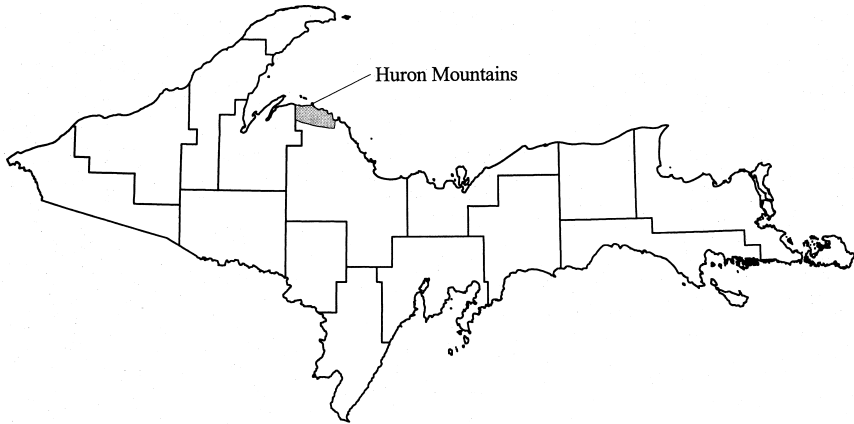


FIGURE 1. Location of the Huron Mountains in Marquette Co. in the Upper Peninsula of Michigan.

least two species of mushrooms are named for the Huron Mountains because they were either first collected there or found only in old growth habitat typical of the Huron Mountains. One of these is the mycorrhizal and hemlock-associated *Boletus huronensis* Smith & Thiers (Smith & Thiers 1971), and another is the saprotrophic and hemlock-associated, *Laetiporus huroniensis* Burdsall & Banik (Burdsall & Banik 2001).

This work reports 23 species of mushrooms collected in the forests of the Huron Mountains that are otherwise rarely encountered in the Lake States. The works of Dr. Alexander H. Smith are especially referenced due to his extensive studies of mushrooms in the Lake States for his entire mycological career. References cited may differ regarding the frequency of occurrence of these species; however a criterion used in including a species is the author's experience of over twenty years of collecting in the western Lake States. Some anecdotal information based on the author's experience is also provided.

#### MATERIALS AND METHODS

Habitats within the Huron Mountain forests were visited in August and September from 1995 to 2003. Both mycorrhizal and saprotrophic fruiting bodies were collected; all are Basidiomycota. Photographs were taken in the field and representative specimens were returned to the laboratory for identification. Fruiting body characters were recorded in the fresh condition, as were spore color and spore size when necessary for identification; abbreviated descriptions are given here; height refers to entire length of fruiting body; pileus size refers to diameter. Specimens were assigned collection numbers, dried, and maintained in the author's collection (designated here as **hmc**) or deposited in the Herbarium of the University of Michigan (MICH). It is the author's intention eventually to deposit all collections in MICH. Subsequent observations of fruit bodies that are cited but not collected are given numerical occurrence codes: occasional (OC) = 1–3 fruiting bodies, frequent (FR) = 4–10 fruiting bodies, abundant (AB) >10 fruiting bodies. For location information "Site" refers to one of seven red pine dominated sites which were regularly surveyed for mycorrhizal species (Richter 1996–2003). To save space, locations of these sites are given below and are listed by Site and number in the species descriptions section; other collection locations are listed separately.

**Lowland sites**

- Site #1) North of Cranberry Bog; NE  $\frac{1}{4}$  of NW  $\frac{1}{4}$  of Sec 27  
Site #2) North of Cranberry Bog; SW  $\frac{1}{4}$  of NW  $\frac{1}{4}$  of Sec 27  
Site #3) North of Second Pine Lake; N  $\frac{1}{2}$  of NE  $\frac{1}{4}$  of Sec 28  
Site #4) North of Pine Lake; NE  $\frac{1}{4}$  of SW  $\frac{1}{4}$  of Sec 21

**Upland sites**

- Site #5) North Shore of Rush Lake; S  $\frac{1}{2}$  of NE  $\frac{1}{4}$  of Sec 19  
Site #6) North of Mountain Lake; SW  $\frac{1}{4}$  of NE  $\frac{1}{4}$  of Sec 30  
Site #8) Northeast of Ives Lake; SW  $\frac{1}{4}$  of SE  $\frac{1}{4}$  of Sec 34

Classification to family follows *Ainsworth and Bisby's Dictionary of the Fungi* (Hawksworth et al. 1995). Fungi are listed in alphabetical order.

**SPECIES DESCRIPTIONS*****Albatrellus caeruleoporus* (Pk.) Pouzar** (Scutigeraceae)

Synonym *Polyporus caeruleoporus* Pk.

22 Sep 1996, T51N, R28W, Sec 15; along Salmon Trout River near Burnt Dam, mixed conifers and hardwoods; single fruiting body; *hmc-96-030*.

Fruiting body fleshy, bright blue overall; height 6.5 cm; pileus 3.2 cm; angular pores descending central to off-center stalk; on ground; cited as mycorrhizal (Gilbertson & Ryvarden 1986); the genus is not well characterized ecologically or taxonomically (Ginns 1994); called a "pseudobolete" by Bessette et al. (1999); hyphal type indicates relationship with Agaricales or Hydnaceae (Gilbertson & Ryvarden, 1986); cited as infrequent by Bessette et al. (1997), and rare by Smith et al. (1981).

***Albatrellus ovinus* (Fr.) Kotl. & Pouzar** (Scutigeraceae)

Synonyms *Boletus ovinus* Schaeff., *Polyporus ovinus* Schaeff ex Fr.

21 Sep 2001, Site 3; four fruiting bodies; *hmc-01-018*.

Fruiting body fleshy, white to pinkish-buff overall; height 5.8–14.0 cm; pileus 6.0–11.4 cm; angular pores descending central stalk; on ground; this species is considered mycorrhizal, occurring throughout the circumboreal conifer zone (Gilbertson & Ryvarden 1986); (see above species for information on genus); referred to as uncommon in Michigan, with only four collections in herbaria, all from the Upper Peninsula (Ginns 1994); known as the "sheep polypore," and cited as infrequent by Bessette et al. (1995).

***Amanita ceciliae* (Berk. & Br.) Bas** (Amanitaceae)

2 Aug 1995, T52N, R28W, Sec 32, Fisher Creek Trail, mixed conifers and hardwoods, single fruiting body, *hmc-95-001*; 29 Aug 1996, Site 7, occasional; 20 Sep 1996, Site 1, occasional; 18 Sep 1997, Site 3, occasional.

Fruit body fleshy; height 10.8–14.2 cm; pileus 5.8–9.2 cm, tannish-brown; gills white; volval patches on pileus and stem base gray; on ground; this species is mycorrhizal; reported from S, E, and NW U.S. but not reported from Michigan (Jenkins 1986, p.74); cited as infrequent by Phillips (1991); in section *Vaginatae*, which lacks a basal bulb; with floccose rather than membranous volva; this species reported as *A. inaurata* in 1996 and 1997 HMWF reports (Richter 1996, 1997), an invalid but often-used name for the species (Jenkins 1986).

***Amanita porphyria* (Alb. & Schw. ex Fr.) Secr.** (Amanitaceae)

20 Sep 1997, Site 1, three fruiting bodies, *hmc-97-02*; 19 Sep 2002, Site 4, occasional.

Fruiting body fleshy; height 9.4–12.6 cm; pileus 5.6–6.2 cm, brownish-gray with gray patches; gills off-white; basal bulb marginate; annulus gray; this species is mycorrhizal; found throughout continental NA; cited as infrequent by Phillips (1991), occasional to infrequent by Bessette et al. (1995); ashy color of volval remnants and annulus is distinctive and separates this from *A. brunnescens* (Jenkins 1986).

***Austroboletus gracilis* var. *gracilis* (Pk.) Wolfe** (Boletaceae)

Synonyms *Boletus gracilis* Pk., *Porphyrellus gracilis* (Pk.) Singer., *Tylopilus gracilis* (Pk.) Henn.

19 Sep 1997, T52N, R28W, Sec 30, N of Mountain Lake, mixed conifers and hardwoods, single fruiting body, *hmc-97-016*.

Fruiting body fleshy; height 9.0 cm; pileus 4.8 cm, chestnut brown; pores white; stipe reddish brown; on ground; this species is mycorrhizal (Both 1993); given the common name “the graceful bolete”, only three species are placed in the genus; *A. gracilis* is divided into three varieties; cited as seldom collected by Bessette et al. (1999); cited as not common by Smith et al. (1981).

***Boletopsis subsquamosa* (Fr.) Kotl. & Pouz.** (Boletaceae)

Synonyms *Polyporus subsquamosus* Fr., *Polyporus leucomelas* Pers., *Polyporus griseus* Pk., *Polyporus earlei* Underw. (Gilbertson & Ryvardeen 1986), and *Boletopsis grisea* (Pk.) Bondartsev & Singer.

21 Sep 2001, Site 3, single fruiting body, *hmc-01-019*.

Fruiting body fleshy; height 7.2 cm; pileus 12.4 cm, gray; angular white pores descending thick stalk; on ground; this species is probably mycorrhizal (Gilbertson & Ryvarden 1986) but little is known of its ecology; circumboreal, on ground, among conifers and hardwoods (Gilbertson & Ryvarden 1986); another of the “pseudoboletes” (Bessette et al. 1999); known as *kurotake* in Japan where it is considered an edible species (Lincoff 1981); more commonly found in the Pacific NW (Smith et al. 1981).

***Boletus morrissi* Pk.** (Boletaceae)

28 Aug 1999, T52N, R28W, Sec 30, N of Mountain Lake, hemlock dominant, three fruiting bodies, *hmc-99-021*.

Fruiting body fleshy; height 8.8–12.4 cm; pileus 5.4–9.0 cm, reddish brown; pores red; stipe yellow with red-brown scabers; on ground; this species is mycorrhizal; unique among the red-pored boletes for having reddening rather than bluing flesh when exposed to air (Both 1993); also with a scabrous rather than reticulate stalk; an E and S NA species (Both 1993, Snell and Dick 1970, Bessette et al., 1999); cited by Bessette et al. (1999) as infrequent; cited by Phillips (1991) as rather rare; not treated in *The Boletes of Michigan* by Smith and Thiers (1971).

***Boletus pinophilus* Pilat & Dermek** (Boletaceae)

Synonyms *B. pinicola* (Vitt.) Vent. and *B. edulis* var. *pinicola* Vitt.

27 Aug 1999, Site 4, two fruiting bodies, *hmc-99-012*.

Fruiting body fleshy; height 12.6–15.2 cm; pileus 7.8–9.8 cm light reddish brown; pores buff; stipe light reddish brown; on ground; this species is mycorrhizal; robust and similar to *B. edulis* Bull. but with reddish brown stipe which bruises darker brown; not listed in *The Boletes of Michigan* by Smith and Thiers (1971) or *How to Know the Non-gilled Mushrooms* by Smith et al. 1981, perhaps due to his not wanting to consider all the subspecies, varieties, and forms of *B. edulis*; Both (1993) cites it as rarely reported, although Bessette et al. (1999) report it as fairly common and widely distributed in NA; one of the best of the edible mushrooms (Snell & Dick 1970).

***Boletus projectellus* Murrill** (Boletaceae)

Synonyms *Ceromyces projectellus* Murr., *Boletellus projectellus* (Murr.) Singer.

31 Aug 1997, Site 1, single fruiting body, *hmc-97-004*; 20 Sep 1997, Site 1, five fruiting bodies, *hmc-97-021* and *-022*; 28 Aug 1998, Site 1, two fruiting bodies, *hmc-98-001*; 26 Aug 1999, Site 1, 15 fruiting bodies, *hmc-99-002*; 26 Aug 2000, Site 1, five fruiting bodies, *hmc-00-002*; 22 Sep 2000, Site 1, three fruiting bodies, *hmc-00-007* (Tissue Isolate DR-412); 23 Aug 2002, Site 3, single fruiting body, *hmc-02-004*; 19 Sep 2002, Site 1, occasional; 19 Sep 2002, Site 3, fre-



FIGURE 2. *Boletus projectellus* Murrill; *hmc-03-017a*; 17 Aug 2003, in lowland forests among jack pines and red pines, with which it is mycorrhizal.

quent; 19 Sep 2002, Site 4, frequent; 17 Aug 2003, Site 2, two fruiting bodies, *hmc-03-017a* (Fig. 2); 17 Aug 2003, Site 6, two fruiting bodies, *hmc-03-017b*.

Fruiting body fleshy; height 10.4–18.6 cm; pileus 5.8–11.2 cm dark red-brown; pores yellow; stipe light reddish brown with deep striations; on ground; this species is mycorrhizal; known best from the south shores of Lake Superior (Smith & Thiers 1971) but is otherwise found in the southeastern US (Bartelli and Smith 1964); a very attractive mushroom whose western North America counterpart is *B. mirabilis* Murr. (Bessette et al. 1999), with which it is sometimes confused; Smith and Thiers (1971) report *B. mirabilis* from Michigan, however Redhead (1989) has examined their collections and determined them to be *B. projectellus*; this species has the distinction of having the largest spores of any bolete, 18–33 × 7.5–12 μm (Bessette et al. 1999); mature spores from these collections measure 24–31 × 9–10 μm; Miller (1980) says infrequent, and also found under Virginia pine in Maryland.

***Boletus subluridellus* Smith & Thiers (Boletaceae)**

28 Aug 1999, T52N, R28W, Sec 30, N of Mountain Lake, hemlock dominant, single fruiting body, *hmc-99-022*.

Fruiting body fleshy; height 12.0 cm; pileus 8.6 cm, red; pores red bruising blue; stipe yellow bruising blue; on ground; this species is mycorrhizal; Bessette et al. (1999) says fairly common and Phillips (1991) says frequent, however the author

has rarely collected it; Smith et al. (1981) cite it as a southern Michigan species; incidentally, Both (1993) says the picture in Phillips (1991, p 230) is not this taxon.

***Cortinarius sphaerosporus* Pk.** (Cortinariaceae)

21 Sep 1996, Site 1, occasional; 21 Sep 2001, Site 2, occasional; 21 Sep 2001, Site 3, abundant.

Fruiting body fleshy; height 6.2–12.2 cm; pileus 2.4–5.8 cm, yellow, sticky; gills rusty-brown; stipe white with yellow-brown hairs; on ground; this species is mycorrhizal; cited as occasional by Smith et al. (1979) and uncommon by Phillips (1991); as with the following species, *Cortinarius* with slimy caps and stalks are applied to the subgenus *Myxacium* (Smith et al. 1979, Phillips 1991).

***Cortinarius trivialis* Lange** (Cortinariaceae)

21 Sep 1996; Site 6, occasional.

Fruiting body fleshy; height 5.4–9.8 cm; pileus 2.8–6.0 cm, tan, sticky; gills light rusty-brown; stipe orange-brown with glutinous rings; on ground; this species is mycorrhizal; cited as uncommon by Phillips (1991); Bessette et al. (1997) equate this species with *C. collinitus* Fr., considered common and found at many sites and years at the Huron Mountains surveys (Richter 1996–2003); Miller (1980) and Phillips (1991) separate *C. trivialis* from *C. collinitus* based on the make up of the stalk rings and smaller spore size, which these collections match closely.

***Laccaria trullisata* (Ellis) Pk.** (Tricholomataceae)

20 Sep 1997, Site 8, ten fruiting bodies, *hmc-97-023* (Fig. 3); 28 Aug 1998, Site 8, occasional; 25 Sep 1998, Site 8, frequent; 26 Sep 1999, Site 8, abundant; 21 Sep 2000, Site 8, occasional; 20 Sep 2001, Site 8, abundant.

Fruiting body fleshy, purple overall; height 6.0–14.4 cm; pileus 3.2–8.0 cm; stipe thickened at base; on ground; this species is mycorrhizal; a robust mushroom always found in deep sand; Redhead (1989) says its distribution is linked to ocean beaches and Great Lakes shores, but this collection is from an inland lake; the author has found it as far inland as central Wisconsin; Bessette et al. (1997) report it as fairly common, however Smith et al. (1979) say not commonly collected.

***Lactarius paradoxus* Beards. & Burl.** (Russulaceae)

28 Aug 1999, Site 6, single fruiting body, *hmc-99-023*.

Fruiting body fleshy, greenish-gray overall; height 6.2 cm; pileus 6.8 cm; gills exude red latex turning green; this species is mycorrhizal; cited by Bessette et al. (1997) as occasional; Smith et al. (1979) say “fairly abundant in southeast under



FIGURE 3. *Laccaria trulisatta* (Ellis) Pk.; *hmc-97-023*; 20 Sep 1997, in deep sand, often on beaches, among red oak and pines with which it is mycorrhizal.

cabbage palmetto, but less frequent to rare northward”; Helsler and Smith (1979) also assign this mushroom a more southerly distribution.

***Laetiporus huroniensis* Burds. & Banik (Coriolaceae)**

29 Aug 1998, T52N, R28W, Sec 20, W of Pine Lake, hemlock log, multiple overlapping fruiting bodies, *hmc-98-007* (this collection sent fresh to the Forest Products Lab, Madison, WI for species determination (see below)); 26 Sep 1998, T52N, R28W, Sec 20, W of Pine Lake, hemlock log, multiple overlapping fruiting bodies, *hmc-98-011* (deposited as *L. sulphureus* (Bull. ex Fr.) Bondarzew & Singer in MICH (#39051)) (Fig. 4); 24 Aug 2002, T52N, R28W, Sec 20, W of Pine Lake, hemlock log, multiple overlapping fruiting bodies, *hmc-02-011*.

Fruiting body fleshy to woody in age; pileus shelving, overlapping 12.0–25.0 cm wide × 6.0–12.0 cm deep; individual fronds 0.5–2.4 cm thick, yellow to orange, zoned; pores bright yellow; on wood; this saprotrophic species causes a brown rot of conifer wood especially hemlock; the species was newly described (Burd-sall & Banik 2001) and named for the Huron Mountains where some of the first collections were made (*hmc-98-007*, and in 1999 by M. Banik (Burd-sall & Banik 2001)); previously this species had been grouped with *L. sulphureus* which decays hardwoods, especially oak, which has also been observed by the author in the Huron Mountains; the only other documented collections of *L. huroniensis* are from old-growth hemlock in the Sylvania Wilderness, Gogebic Co., MI (Burd-sall & Banik 2001); the author has observed it in the same location in the





FIGURE 4. *Laetiporus huroniensis* Burdsall & Banik; *hmc-98-011* and MICH 39051; 26 Sep 1998; on downed eastern hemlock log where it causes a brown-rot decay; this sulfur-shelf mushroom was recently named a separate species, partly based on this collection.

Huron Mountains but not collected it 24 Aug 1999, 26 Aug 2000, 23 Aug 2001, 22 Aug 2002; the common name for this mushroom is the “sulphur shelf,” the most commonly eaten polypore (Gilbertson & Ryvarden 1986); *L. huroniensis* has been eaten and enjoyed by the author and others on several occasions with no ill effects, although the sulphur shelf *sensu lato* has been reported to cause sickness when collected from conifer wood (Bessette et al. 1997).

***Oligoporus obductus* (Berk.) Gilb. & Ryv. (Coriolaceae)**

Synonym *Osteina obducta* (Berk.) Donk.; *Polyporus osseus* Kalchbr.

20 Sep 1997, T52N, R28W, Sec 34, N edge of Third Pine Lake, hemlock woods, single large, joined clump of fruiting bodies, *hmc-97-021* (Fig. 5).

Fruiting body fleshy but hard in age; height 5.3–13.0 cm; joined surface of pileus 26.0 × 15.0 cm in total, tan to light red-brown; pores off-white to buff, descending joined stipes; on ground; this is a saprotrophic species causing a brown rot of conifer wood (Gilbertson & Ryvarden 1986); although this collection was fruiting out of the ground it was likely decaying hemlock roots; known as the bone polypore (Phillips 1991) because of its hardness when dried; more common in W North America on Douglas fir (Gilbertson & Ryvarden 1986); this mushroom is

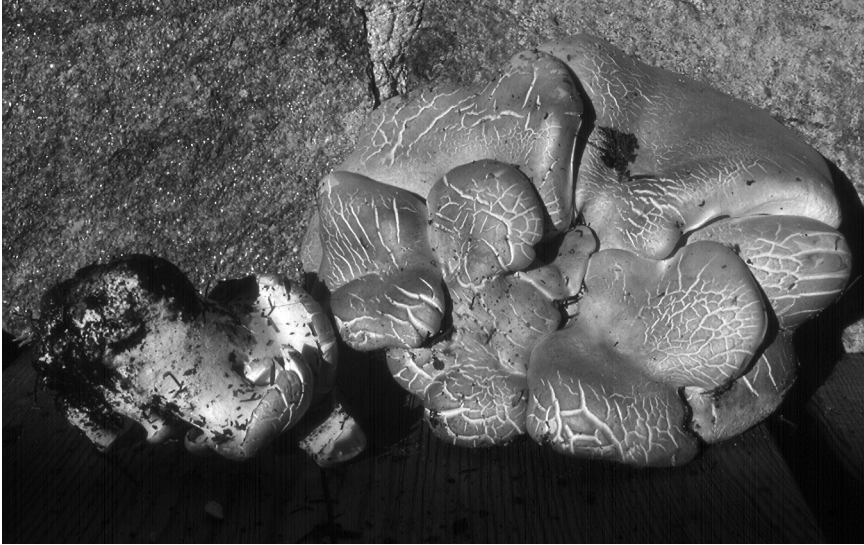


FIGURE 5. *Oligoporus obductus* (Berk.) Gilb. & Ryv.; *hmc-97-021* and MICH 39086; 20 Sep 1997; on ground in hemlock forest, where it causes a brown-rot decay of conifer wood.

poorly represented in mushroom field guides; this collection deposited in MICH (#39086) as *Osteina obducta* (Berk.) Donk.

***Pleurotus dryinus* (Pers ex Fr.) Kummer** (Tricholomataceae)

26 Aug 2000, T52N, R28W, Sec 34, N of Third Pine Lake, on well decayed maple log, five large (10–20 cm diam.) fruiting bodies, *hmc-00-005*; 25 Aug 2002, T52N, R28W, Sec 30, N of Mountain Lake, on aspen log, many (> 20) fruiting bodies, three collected, *hmc-02-012*, (Fig. 6).

Fruiting body fleshy, dull white to yellowish-gray overall; height 8.2–20.0 cm; pileus 5.4–17.8 cm; gills slightly descend off-center stipe; on wood; this saprotroph causes a white-rot of hardwoods; known as the “veiled oyster mushroom” due to the presence of a membranous superior ring on the stalk (Bessette et al. 1997); the true oyster mushroom, *Pleurotus ostreatus* (Jacq. ex Fr.) Kumm., is much more common and one of the most widely collected mushrooms for eating. However, *P. dryinus* is not a quality edible; Bessette et al. (1997) say occasional; Smith et al. (1979) say not common; these fruiting bodies (as observed with fresh specimens of other *Pleurotus* spp.) were infested with “pleasing fungus beetles” (Erotylidae), named for their striking bright red and black elytrae.



FIGURE 6. *Pleurotus dryinus* (Pers. ex Fr.) Kummer; *hmc-02-012*; on downed aspen log, where it causes a white-rot decay.

***Pulveroboletus ravenelii* (Berk. & Curt.) Murr. (Boletaceae)**

Synonyms *Boletus ravenelii* Berk. & Curt., *Suillus ravenelii* (Berk. & Curt.) Kuntze.

22 Sep 1996, T51N, R28W, Sec 15, along Salmon Trout River near Hogback Falls, mixed conifers and hardwoods, single fruiting body, *hmc-96-032*.

Fruiting body fleshy, bright yellow overall; height 13.2 cm; pileus 5.6 cm; pores bruise blue; stipe with powdery veil remnants; this is a mycorrhizal species; striking in its color and known as the powdery sulfur bolete (Bessette et al. 1999); Smith and Thiers (1971) say it is most abundant in SE U.S., but in Michigan most frequent along the south shore of Lake Superior; Bessette et al. (1999) and Snell and Dick (1970) cite it as occasional; this is the only collection of the species the author has ever made.

***Russula redolens* Burlingham (Russulaceae)**

19 Sept 2002, Site 8, single fruiting body, *hmc-02-013*.

Fruiting body fleshy; height 7.4 cm; pileus 5.2 cm, greenish-gray; gills and stipe white; on ground; this is a mycorrhizal species; the *virescens* group of the genus *Russula* is poorly represented in the mushroom literature; perhaps often misidentified or grouped with *R. virescens* Fr.; the latter has a white spore deposit and slightly larger spores than *R. redolens*, which has a cream deposit (Phillips

1991); Phillips (1991) says rather uncommon; this is the author's only collection of this species.

***Sarcodon underwoodii* Banker** (Thelephoraceae)

28 August 1999, Site 8, single fruiting body, *hmc-99-025*.

Fruiting body fleshy; height 6.8 cm; pileus 8.8 cm, brown with radiating scales; teeth light brown descending darker brown stipe; on ground; a likely mycorrhizal species, as with other hydneous fungi occurring on the ground, although research confirming this is lacking; it is poorly represented in the mushroom guides; very similar in appearance to the more common *S. imbricatus* (L. ex Fr.) Karst., also collected in the Huron Mountains (Richter 1996–2003), which has slightly larger and less strongly-warted spores (Phillips 1991, Bessette 1997); Phillips (1991) says rare; Bessette et al. (1997) say uncommon.

***Scleroderma septentrionale* Jeppson** (Sclerodermataceae)

30 Aug 1996, T52N, R28W, Sec 21, W of mouth of Pine River, shore of Lake Superior, paper birch, red oak, white and red pine, eight fruiting bodies, *hmc-96-014*; 20 Sep 1997, Site 8, two fruiting bodies, *hmc-97-026*; 25 Sep 1998, Site 8, occasional; 22 Sep 2000, Site 1, 12 fruiting bodies, *hmc-00-010*; 17 Sep 2003, T52N, R28W, Sec 21, W of mouth of Pine River, shore of Lake Superior, paper birch, red oak, white and red pine, four fruiting bodies, *hmc-03-019*.

Fruit body a rigid puffball; total length 7.2–14.4 cm; 2.0 to 8.0 cm diam., dull-yellow; pseudostipe short and fibrous to long and deeply rugose; this is a mycorrhizal species (Richter & Bruhn 1989); a rather unattractive puffball found in deep sand; reported as *S. meridionale* in 1996 and 1997 HMWF reports (Richter 1996, 1997); there is much confusion in the literature surrounding the name of this species; Smith (1951) illustrates specimens that are clearly this species referring to them as *S. aurantium* Pers. “form from sand dunes”; in a monograph of the genus, Guzmán (1970) refers to it as *S. macrorrhizon* Wall.; Smith et al. (1981) in their 1973 edition use the latter name as well, but in the later edition use *S. meridionale* Demoulin & Malençon, apparently in response to a correction published by Demoulin (1974); Jeppson (1998) described the northern variation with slightly larger spores as *S. septentrionale* Jeppson; Guzmán and Ovrebo (2000) greatly clarify the differences between *S. meridionale* and *S. septentrionale* and reassign earlier determinations of some of Richter's (1992) northern Michigan collections to the latter species; descriptions based on immature collections of fruiting bodies also adds to confusion within the genus, as spore measurements taken from these are not representative of the species; diameter of spores of the collections from the Huron Mtns. measure (n=10, including spines) 12–18  $\mu\text{m}$ , 15–22  $\mu\text{m}$ , 12–17  $\mu\text{m}$ , 12–19  $\mu\text{m}$ , respectively for the four collections (with spines 1–3  $\mu\text{m}$ ); these measurements conform nicely to Guzmán and Ovrebo (2000) *S. septentrionale*; the species is rarely reported in the mushroom literature, although the earlier name, *S. meridionale* appears in Bessette et al.



FIGURE 7. *Tricholoma magnivalare* (Pk.) Redhead; *hmc-01-027*; 20 Sep 2001; among jack pines and red pines, with which it is mycorrhizal.

(1997) and Smith et al. (1981); the most common of the genus is known as the pigskin poison puffball, *S. citrinum* Pers. (Lincoff 1981, Bessette et al. 1997).

***Tricholoma magnivalare* (Pk.) Redhead** (Trichlomataceae)

Synonym *Armillaria ponderosa* Pk.

21 Sep 1996, Site 1, single fruiting body, *hmc-96-026*; 19 Sep 1997, Site 4, three fruiting bodies, *hmc-97-015a*; 19 Sep 1997, Site 6, two fruiting bodies, *hmc-97-015b*; 19 Sep 1997, Site 8, frequent; 25 Sep 1998, Site 8, occasional; 26 Sep 1999, Site 8, frequent; 20 Sep 2001, Site 1, occasional; 20 Sep 2001, Site 6, occasional; 20 Sep 2001, Site 8, three fruiting bodies, *hmc-01-027*, (Fig. 7); 21 Sep 2002, Site 4, two fruiting bodies, *hmc-02-022*; 21 Sep 2002, Site 5, single fruiting body, *hmc-02-023*; 21 Sep 2002, Site 8, occasional.

Fruiting body fleshy; height 5.8–11.0 cm; pileus 6.2–18.4 cm, white to light yellowish-brown; gills white; stipe yellow-brown with veil; likely a mycorrhizal species, and cited as such by Redhead (1989), although as far as is known, pure culture synthesis to confirm this is lacking, probably due to the inability of the fungus to grow in culture; numerous attempts to culture fresh fruit body tissue from these collections have been unsuccessful; a robust, firm, cream-colored mushroom with a sharp fragrance; more common in western North America (Miller 1980, Redhead 1989); cited as uncommon in the northeast (Bessette et



FIGURE 8. *Volvariella bombycina* (Schaeff. ex Fr.) Singer; *hmc-02-009*; 23 Aug 2002; on a downed maple log, where it causes a white-rot decay.

al. 1997); edible and known as the American Matsutake or White Matsutake, collected in the west under Douglas fir and Ponderosa pine for export to Japan (Redhead 1989, Bessette et al. 1997); in northern Michigan it is as highly prized and as sought after by collectors in the fall as the morel mushroom is in the spring; *Armillaria ponderosa* Pk., is the name used in early HMWF reports (Richter 1996, 1997).

***Volvariella bombycina* (Schaeff. ex Fr.) Singer (Pluteaceae)**

23 Aug 2002, T52N, R28W, Sec 27, SW of Cranberry Bog, maple log, two fruiting bodies, *hmc-02-009*, (Fig. 8).

Fruiting body fleshy; height 8.2–12.6 cm; pileus 5.4–9.2 cm, silky-white, fibrillose; gills off-white; stipe white, enclosed at base by a membranous, light brown volva remaining intact when mature; on wood; a strikingly beautiful mushroom causing a white-rot of hardwoods; Burdsall (1974) reported it from the Huron Mountains on maple near Ives Lake (col. #8241); Dr. William Manierre (personal communication) also found it near Mountain Lake 28 Aug 1989; Miller (1980) says rare; Bessette et al. (1997) say occasional; Lincoff (1981) says not common; curiously it is not included in Phillips (1991), perhaps due to its rarity; this is only the second time the author has encountered it.

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