

Fungi of Howard County, MD

Robert and Joanne Solem

Introduction

The material in this visual key pertains solely to Howard County, a small, rapidly-urbanizing central Maryland county. Most of the land lies within the Piedmont; only a narrow section east of I-95 is part of the Coastal Plain. Oak/hickory/beech forests predominate with extensive native pines only in the easternmost area. Planted blocks of conifers are found mostly along the two reservoirs on the southern and southwestern borders and in Patuxent River State Park on the western border.

Maps and more detailed information about any of the public sites can be found in the [site guides](#) on the Howard County Bird Club web page.

Scientific names are those shown in [Mycobank](#) and [Index Fungorum](#). Use of the most recent nomenclature may mean that scientific names are not identical to those in books. Previously used scientific names are shown under Synonyms in each species description. If there is a reasonable possibility that there is more than one similar species, the scientific name is followed by the phrase “[cluster],” “[complex],” or “[group].” Many species do not have widely used common names; others have multiple names. Usually, a maximum of two have been included.

Identifications are based on macro characteristics, spore prints when available, and, in some cases, chemical tests. Some species names are followed by the phrase “[or near]” when we were not confident of identification based on macro characteristics alone. In such cases, the species shown is the most likely, based on range. Species that have been identified by microscopic examination of spores (by Richard Orr or Robert Solem) are so indicated.

Fungi identification is notoriously complex. This key undoubtedly contains unintentional errors. We will continue to make corrections.

Layout

Each species appears on one page (photos on the left and description on the right).

Common Name Scientific name
 [Common Name 2] Family [or higher]

J F M A M J J A S O N D
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- Scientific Name:** As shown in *Index Fungorum*.
- Phenogram:** (above) shows fruiting times. Each month (J, F, ...) is divided into three 10-day periods. A hyphen (-) indicates a date from references; a plus (+) indicates a date from Howard County records.
- ID:** A short summary of characteristics helpful (or unique) in identifying the species by macro characteristics is shown. Only distinctive information is included here.
- Habitat:** Substrate, tree/plant species, and other preferences.
- Cap/Fertile Body:** Diameter of cap in inches and [metric]. Measurement of the thickness of flesh of the cap/fertile body is expressed in millimeters or as a ratio to the gills/pores/fertile depth.
- Gills/Pores/Fertile Surface:** Measurement in the text body is thickness of gills/pores/fertile surface, expressed as millimeters or ratio to cap/fertile body flesh.
- Spores:** Color. *Italics* mean authors have obtained a spore print. It may also include description of pores as seen under a microscope.
- Stalk:** First measurement is length, second is diameter.
- Frequency:** *Uncommon* – recorded from 1 or 2 county sites; *Occasional* 3-5; *Fairly common* 6-9; *Common* 10-14; *Very common* 15-19; *Abundant* 20+.
- Locations:** Five letter location in Howard County. See list at end.
- Notes:** Shows Mycobank number. Clarifying material.

- Synonyms:** Latin name(s) by which the species has been identified historically.
- References:** Bar. BBF. BRB. Bin. Kae. KUM. Kuo. Lin. McK. M&M. Myx. Pac. Phi. Rog. Roo. Rus.
- See “References” for expansion of trigraphs. Kuo and Rog are websites. Entries for non-web references are followed by page numbers for text, then the page number (or plate number) of the picture if it is not on the same page as the text.
- Photographs,** with identifying information, left side of each page. Complete names of photographers are shown on this page, lower right.

Acknowledgments

Of the many people who have provided assistance with this project, a few deserve special mention. Ricahrd Orr, Grazina McClure, Nancy Magnusson, and Bonnie Ott have been frequent, enjoyable, and invaluable companions in the field. Richard’s assistance with identifications and his generosity in sharing photographs have greatly enhanced the scope and appearance of this guide; his microscopic examination of selected spores has made some identifications possible. Bonnie leaves no log unturned or hill unclimbed in quest of new specimens or photographs. Grazina’s observational skills are exceptional; she has assisted with many identifications as well as sharing her enthusiasm for nature. Skilled photographers Wes and Sue Earp have also been enjoyable field companions. Lance Biechele was generous in sharing extensive field experience in identifying specimens. And finally, thanks to Nancy Magnusson, field companion for decades who has rolled logs, squinted at dung, waded rivers, canoed reservoirs, walked railroad tracks, and hiked innumerable miles sharing our joint passion for the natural world.

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Our thanks to Howard County Department of Recreation and Parks for access to parks and open space.

— R&JS

Photographers

<i>J. Culler – Jeff Culler</i> <i>S. Earp - Sue Earp</i> <i>W. Earp – Wesley Earp</i> <i>J. Friedhoffer – Jeff Friedhoffer</i> <i>D. Gillum – David Gillum</i> <i>J. Harris – John Harris</i> <i>K, Heffernan – Kevin Heffernan</i> <i>L. Hunt – Linda Hunt</i> <i>K. Lillie – Katharine Lillie</i> <i>N. Magnusson – Nancy Magnusson</i> <i>G. McClure – Grazina McClure</i>	<i>H. Metzman – Helen Metzman</i> <i>S. Muller – Sue Muller</i> <i>R. Orr – Richard Orr</i> <i>B. Ott – Bonnie Ott</i> <i>K. Schwarz – Kurt Schwarz</i> <i>J. Solem – Joanne Solem</i> <i>R. Solem – Robert Solem</i> <i>K. Tufts – Katherine Tufts</i> <i>J. Tveekrem – June Tveekrem</i> <i>A. VanSchoor – Anthony Van Schoor</i>
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References

Each of the available fungi guides has advantages and disadvantages. All require a certain amount of basic knowledge of biology and a willingness to learn mycological terminology. Books (in alphabetical order by abbreviation) are listed first; they are followed by two web sources.

- | <u>Abbreviation</u> | <u>Reference</u> |
|---------------------|---|
| Aro: | Arora, D. 1986. <i>Mushrooms Demystified: A Comprehensive Guide to Fleshy Fungi</i> (2nd. ed.) Ten Speed Press, Berkeley, CA. The first edition covered only California. Well-developed keys and comprehensive descriptions covering the entire United States. Many scientific names have changed. |
| Bar: | Barron, G. 1999. <i>Mushrooms of Northeast North America</i> . Lone Pine Publishing, Auburn, WA. Although it is limited to north-eastern North America, it includes many of those species likely to be found in central Maryland; it also contains a section on slime molds (a group missing from most other guides). A disadvantage is that gilled mushrooms are divided into sections by spore color. |
| BBB: | Beug, M. W., A. E. Bessette, and A. R. Bessette. 2014. <i>Ascomycete Fungi of North America: A Mushroom Reference Guide</i> . University of Texas, Austin TX. Comprehensive keys and species entries covering all of North America, including microscopic features. Comments include similar species and extensive description; color photos for those may be included in the keys. |
| BBF: | Bessette, A. E., A. R. Bessette, and D.W. Fisher. 1997. <i>Mushrooms of Northeastern North America</i> . Syracuse University Press, Syracuse, NY. One of the most complete guides (quite formidable for the beginner). Useful keys, concise descriptions, numerous photographs. |
| BBRT: | Bessette, A. E., A. R. Bessette, W. C. Roody, and S. A. Trudell. 2013. <i>Tricholomas of North America: A Modern Field Guide</i> . University of Texas Press, Austin, TX. Limited to the genus <i>Tricholoma</i> ; it is the first popular guide to this large group. Separate keys for eastern and western North America. Color photographs. |
| BHB: | Bessette, A. E., D. B. Harris, A. R. Bessette. 2009. <i>Milk Mushrooms of North America: A Field Identification Guide to the Genus Lactarius</i> . Syracuse University Press, Syracuse, NY. Comprehensive keys, excellent photographs. |
| Bin: | Binion, D. E. <i>et al.</i> 2008. <i>Macrofungi Associated with Oaks of Eastern North America</i> . West Virginia University Press. Morgantown, WV. A specialized reference that is valuable for Howard County. |
| Bni: | Baroni, Timothy J. 2017. <i>Mushrooms of the Northeastern United States and Eastern Canada</i> . Timber Press, Portland, Or. Fungi are arranged by overall appearance (gilled, boletes, etc.) and gilled mushrooms are arranged by spore color. |
| BRB1: | Bessette, A. E., W. C. Roody, and A. R. Bessette. 2000. <i>North American Boletes: A Color Guide to the Fleshy Pored Mushrooms</i> . Syracuse University Press, Syracuse, NY. Comprehensive guide to boletes. |
| BRB2: | Bessette, A. E., W. C. Roody, and A. R. Bessette. 2016. <i>Boletes of Eastern North America</i> . Syracuse University Press, Syracuse, NY. Revised guide to boletes with new keys, descriptions, and photographs. |
| BRSB: | Bessette, A. E., W. C. Roody, W. E. Sturgeon, and A. R. Bessette. 2012. <i>Waxcap Mushrooms of Eastern North America</i> . Syracuse University Press, Syracuse, NY. Limited to <i>Hygrocybe</i> and <i>Hygrophorus</i> . No keys. Half page color photographs which show good detail. |
| BRBD: | Bessette, A. E., W. C. Roody, A. R. Bessette, and D. L. Dunway. 2007. <i>Mushrooms of Southeastern United States</i> . Syracuse University Press, Syracuse, NY. Includes many of the same species that are in <i>Mushrooms of Northeastern North America</i> , but has additional useful material. |
| KUM: | Kuo, M. and A. S. Methven. <i>Mushrooms of the Midwest</i> . 2014. University of Illinois Press. Urbana, Chicago, and Springfield, IL. Extensive identification keys and introduction for amateur mycology. Mushrooms are arranged alphabetically by scientific name. Uses up-to-date scientific names. Many of the species also occur in the East. |
| Lae: | Læssøe, T. and G. Lincoff. 2002. <i>Mushrooms</i> . Dorling Kindersley, Inc., New York, NY. Originally published in England as a guide to their fungi and edited by Lincoff for U.S. market. |
| Lin: | Linhoff, G. H. 1981. <i>National Audubon Society Field Guide to North American Mushrooms</i> . Alfred A. Knopf, New York NY. One of the earliest (and still authoritative) guides. Its disadvantage for local study is that it covers all of North America; increasingly, many of the Latin names used have been superseded. |

- M&S: Marrone, Teresa and Walt Sturgeon. 2016. *Mushrooms of the Northeast*. Adventure Publications, Cambridge, MN. Very current pocket-sized guide with good comparisons.
- McK: McKnight, K. H. and V. B. McKnight. 1987. *A Field Guide to Mushrooms: North America*. Houghton Mifflin Company, Boston, MA. A Peterson Field Guide. It depends on finding a drawing on a color plate and then looking up the text elsewhere. An increasing number of Latin names have been superseded.
- M&M: Miller, O.K. and H.H. Miller. 2006. *North American Mushrooms: A Field Guide to Edible and Inedible Fungi*. Globe Pequot Press, Guilford, CT. It is quite complete and useful.
- Myx: Stephenson, S. L. and H. Stempen. 1994. *Myxomycetes: A Handbook of Slime Molds*. Timber Press, Portland, OR. Dated but useful field guide to common slime molds of eastern U.S.
- Pac: Pacioni, G., G. Lincoff. U. S. ed. 1981. *Guide to Mushrooms*. Simon and Schuster, Inc., New York, NY. Originally published in Italy and based on fungi found there; edited by Lincoff for U.S. market.
- Phi: Phillips, R. 2010. *Mushrooms and Other Fungi of North America*. Firefly Books, Buffalo, NY. Printed version of much that is on his web page "Rogers Mushrooms," with color illustrations for each species. Comprehensive photographic views, concise descriptions, and keys.
- Roo: Roody, W. C. 2003. *Mushrooms of West Virginia and the Central Appalachians*. The University Press of Kentucky, Lexington, KY. This guide includes many fungi found in central Maryland and has a key helpful for field use.
- Rus: Russell, B. 2006. *Field Guide to Wild Mushrooms of Pennsylvania and the Mid-Atlantic*. The Pennsylvania State University Press, University Park, PA. Mushrooms are divided by fruiting season. Useful text. Limited number of species described.
- Kuo: Kuo, M. 2000-2010. MushroomExpert.Com <<http://www.mushroomexpert.com>>. It is almost impossible to remain current with changes in nomenclature without recourse to material published on the web. Kuo is an excellent source of information and useful keys. He uses current taxonomy and has extensive web references to other material.
- Rog: Phillips, R. 2001-2010. RogersMushrooms <<http://www.rogersmushrooms.com>>. Along with Kuo, a comprehensive source on the web. Phillips also has extensive listings of European fungi (a number of which also occur in North America).
- [Other]: Other web references used in the species accounts will have the full URL.

Glossary



- **poisonous: do not use taste to identify!**
- <= up to, not exceeding
- acid sharp, bitter, harsh
- aethalium relatively large fruiting body formed from plasmodium (slime molds)
- age mature, often with changes in color (see *stain*) or texture
- annular zone indistinct ring of fibrils on stalk
- apex top
- apothecium open cup-shaped fruitbody w/ exposed hymenium (plural *apothecia*)
- appressed lying flat on the surface
- areolate surface covered with a network of cracks
- anastomosing ... fusing to form a network
- attached joined to stalk (*adnate*)

- base lower part of stalk
- bell-shaped having a convex shape that resembles a bell
- ca. approximately
- calyculus persistent cup-like structure formed by base of peridium (slime molds)
- canescence whitish or grayish bloom on cap or stalk
- cap upper part of fruiting body (*pileus*)
- central at or near the middle of the cap or stem
- close gills spaced farther apart than crowded
- cluster fungi arising from the same spot, typically touching and often attached at the base
- collar ring at stalk apex into which gills are inserted
- compressed flattened
- conic shaped more or less like an inverted cone

conidia..... asexual reproductive spores formed in fungi on special branches of the mycelium (singular, conidium)
 convex.....curved or rounded outward
 cortex.....thick covering over spore mass of aethallium (slime molds)
 cortina.....veil with silky/cobwebby texture
 crenulate.....scalloped
 crossveins.....tiny veins connecting adjacent gills
 crowded.....gills very close together
 cuticle.....outermost layer of cap
 cylindrical.....stalk is same or nearly same diameter throughout its length
 decurrent.....gills descend stalk
 deliquesce.....liquify, e.g., gills of Coprinus
 depressed.....sunken center of cap
 disc.....central area of a mushroom cap
 distant.....gills very widely spaced; farther apart than subdistant
 duff.....partially decayed matter on the forest floor
 eccentric.....off-center
 entire.....without notches or indentations
 evanescent.....present briefly, then disappearing
 fairy ring.....circular or arched zone of multiple fruiting bodies arising from a mycelium expanding outward from a central point
 fibril/fibriloid....tiny fibers/having tiny fibers
 fimbriate.....minutely fringed
 fibril/fibrillose ..thread-like fibers
 fibrous.....covered with hair-like structures
 flat.....generally level or plane
 floccose.....having tufts of soft hairs (flocculence)
 free.....gills not attached to stalk
 fulvous.....reddish-cinnamon
 funnel-shaped ..shaped like an inverted cone
 fusiform.....spindle-shaped
 gelatinous.....viscous, rubbery
 gill.....plate-like structure on fertile side of cap of some mushrooms
 glabrous.....smooth
 gleba.....spore-bearing tissue (in puffballs)
 granular.....resembling tiny grains
 grooved.....margin of cap has perpendicular furrows or channels (striate, lined)
 ground.....soil with organic matter under forests or turf; bare or covered with duff, debris, mulch, grass, etc.
 group.....many fruiting bodies in a small area but separated (gregarious)
 hyaline.....colorless and clear
 hygrophanous ..color change of mushroom tissue (cap) as it loses or absorbs water
 hypha.....long tube-like elements making up body (mycelium) of a filamentous fungus (plural *hyphae*)
 indented.....having a tooth-like edge
 inrolled.....bent inward (incurved)
 KOH.....potassium hydroxide
 lateral.....attached to margin of cap
 latex.....fluid exuding from cut or broken surfaces of some mushrooms
 lobed.....margin with a roundish projection
 margin.....edge of cap
 marginate.....distinct edge or ridge on top of bulb (stalk base)
 mycelium.....mass of hyphae (thread-like fungal cells), usually in substrate
 NH₄OH.....ammonia
 notched.....has indentation at the point of attachment on the stalk (*adnexed*)
 obligate.....required mycorrhizal host
 obtuse.....rounded or blunt
 off-center.....to one side (eccentric)
 partial veil.....covers gills or pores of some mushrooms. Remains may show as remnants on the margin of the cap or as a ring
 peridiole.....tiny, egg-like structure that contains spores
 peridium.....middle layer of spore case (puffballs); covering of spore mass (slime molds)
 perithecium.....minute, flask-shaped structure containing sac-like structures producing spores (plural, *perithecia*)
 pileipellis.....outer layer of cap
 plasmodium.....multinuclear mass of protoplasm of slime molds (plural: *plasmodia*)
 pleated.....having folds of definite widths on margin
 pore.....open end of tubes of boletes or polypores

pruinose covered with a fine powder
punctate marked w/ tiny points, dots, scales, or spots
recurved having margin curled upward (or curled over)
reticulate having a raised net-like covering/pattern
rhizomorph thick strands of thread-like filaments growing together at the base of the fruiting body
ribbed having vertical ridges
ring remains of the partial veil on stalk
scaber granular point on stalk, particularly on *Leccinum*
scalloped having curved projections cut along the margin
scaly covered with projections or torn portions of a surface
scattered several fruiting bodies not close together
sclerotium hard knot of fungal tissue
scorbiculate has small pothole-like depressions, e.g., stalks of some *Lactarius*
scurfy roughened with scales
setae sharply pointed sterile cells projecting from a fruiting body
secondary gills.. short gills attached only to margin of cap or only to stalk or collar
septum cross-wall, usually in reference to spore or hypha (plural *septa*)
solitary generally only one fruiting body in area
spindle-shaped. wide in the middle, then tapering at both ends.
spongy squishy or porous

stain change in color in age or by cutting or bruising; may be instantaneous, slow, or delayed
stalk structure supporting the cap or head of the fruiting body (*stipe*)
streak long, narrow mark
striate grooved
stuffed filled with soft tissue, often disappearing in age
subdecurrent gills extending part way down stalk
subdistant gill spacing between close and distant
subfusiform somewhat spindle-shaped
subiculum felty or cobwebby mat of hypae covering substrate
taper reduce diameter of stalk (upward or downward)
teleomorph sexual or perfect state of a fungus; has spores formed through meiosis
tomentose bent and matted, pliant hairs, forming a woolly coating
umbo pointed or rounded elevation in center of cap
universal veil completely encloses immature stage of some mushrooms; may form scales or patches on cap, or a volva at the base of the stalk
upturned having margin curved upward
veil see partial veil or universal veil
viscid sticky, slimy, tacky
volva cup-like sac surrounding stalk at base; the remains of the universal veil
zonate having concentric bands of different colors or textures

Location

<u>Pentagraph</u>	<u>Location</u>		
AVORG	Avalon/Orange Grove (PRSP)	MBRKP	Meadowbrook Park
ALRGL	Alpha Ridge Landfill	MCLUR	Residence on Mt. Albert Road
ALRGP	Alpha Ridge Park	MPENA	Middle Patuxent Environmental Area
ANNRK	Annapolis Rock (PATRP)	MPRED	Eden Brook (Middle Patuxent River) – see GONRA
BENBR	Benson Branch watershed	MPRKR	Kindler Road (Middle Patuxent River) – see GONRA
BIGBR	Big Branch (TRIRS)	MCHPV	Morning Choice Trail, Orange Grove (PVSP)
BOLPL	Bollman Place, Corridor Industrial Park	MTPLT	Mount Pleasant (Howard County Conservancy)
BONOT	Residence on Manahan Drive	MURHL	Murray Hill Road open space
BRNBR	Browns Bridge (ROGOR)	NOFPK	North Farm Park
CASCT	Cascade Trail, Orange Grove (PVSP)	NOLAP	North Laurel Park
CASFD	Castleford Drive (bog)	ORRBB	Residence on Durham Rd – East
CEDLP	Cedar Lane Park	OTHER	Other sites
CENPK	Centennial Park	PAFEI	Patapsco Female Institute
DANPV	Daniels Road (PVSP)	PATBT	Patuxent Branch Trail
DFWMA	David Force Wildlife Management Area	PRSP	Patuxent River State Park
DORWD	Dorsey Woods	PIGTL	Pigtail (TRIRS)
EBERT	Residence on Hallmark Road	POPPK	Poplar Springs Park
FARMS	Various locations	PVSP	Patapsco Valley State Park
FHWLP	Font Hill Wetland Park	RIVHL	River Hill (including Earp's and Harris's)
FOXCH	Fox Chase wetlands	RKBRP	Rockburn Branch Park
FRANF	Franciscan Friars	ROBNC	Robinson Nature Center
FULSA	Fulton South Area Park	ROGOR	Rocky Gorge (Duckett) Reservoir (includes Scotts Cove)
GATWY	Gateway Business Park	SAVPK	Savage Park
GONRA	Gorman Stream Valley Natural Resource Area	SLMLP	Schooley Mill Park
GUIPK	Guilford Park	SVMLT	Savage Mill Trail
GWACP	Gwynn Acres Path (includes Plumtree Path)	SYRIV	Sykesville/River Road (PVSP)
HAMVL	Hammond Village (including Solem's)	TRIRS	Triadelphia Reservoir
HENPV	Henryton Road (PVSP)	TUFTS	Residence on Duvall Road
HIRIP	High Ridge Park	UMDCF	University of Maryland Central Farm
HOLLO	Hollofield (PVSP)	WARPP	Warfields Pond Park
HOUCH	Houchen's (Woodbine Morgan Road)	WATFD	Waterford Farm (Jennings Chapel Road)
HOWCH	Howard Chapel Road (PRRP)	WATLP	Waterloo Park
HTWMA	Hugg-Thomas Wildlife Management Area	WFRDP	West Friendship Park
JACPD	Jackson Pond	WILLK	Wilde Lake
KALIL	Residence on Roxbury Mill Road	WINFM	Wincopia Farm (Gorman Road)
LONGC	Long Corner (PRSP)	WINTR	Wincopin Trails
MANWD	Manor Woods Elementary School	WSKPV	Woodstock Road (PVSP)
MARPV	Marriottsville Road (PVSP)	WSTRP	Western Regional Park