



Armillaria mellea, this one growing on a maple in the month of September, is an autumn-fruiting mushroom. Mushrooms that appear in the spring or summer are almost always not *A. mellea*. All images courtesy of the author.

HERE COME

BY CHRISTOPHER J. LULEY, PH.D.

the Basidiocarps: Seasonal Fruiting of Decay Fungi

Just like the seasonal progression of flowering in higher plants, the annual appearance of fruiting (production of mushrooms, conks, brackets and other fruiting structures) of wood-decay fungi is somewhat predictable. When decay fungi appear during the year can be a significant aid to identification. If nothing else, the timing of fruiting can help confirm the identity of many common wood-decay pathogens.

For example, *Armillaria mellea* (shoe-string root rot in the wide, taxonomic sense of the species) is an autumn-fruiting mushroom. Mushrooms that appear in the spring or summer are almost always not *A. mellea*. However, *Armillaria tabescens* (ringless Armillaria) is a common summer-fruiting mushroom that is an important tree pathogen. Another common example is *Ceriporus (Polyporus) squamosus*, commonly known as Dryad's saddle. *C. squamosus* is one of the first wood-decay fungi to fruit in the spring, appearing often in early May. At the end of the growing season, *Hypsizygus (Pleurotus) ulmarius* (elm oyster) is often the last fungus to fruit, and new mushrooms may be seen as late as November or December.

This synopsis represents my observations of the time during the growing season when wood-decay fungi typically first appear. Most of my observations are from western New York (USDA climatic zones 5 to 6), so one should adjust the annual progression as needed, depending on where you live. In warmer climates, fruiting sequences may mean less because temperature is less of a limiting factor in restricting or promoting

fruiting. In addition, in southern climates some fungi may fruit well into the winter or at least continue to produce and release spores from fruiting bodies formed during the growing season.

Weather patterns in any given year greatly influence the fruiting of decay fungi. In general, wetter years are better for more fruiting of the annual fungi (mushroom or fleshy fruiting produces spores for only a short time period in a single growing season, and must fruit again the next year to produce spores again). Some trees that harbor annual fungi may have mushrooms or conks one year but not the next. Common examples are *Ganoderma sessile* (aka *G. lucidum*) and *Laetiporus sulphureus*.

Some decay fungi seem to be more consistent, like the root- and butt-decayer – and edible – hen of the woods, *Grifola frondosus*. Remember that the perennial fungi, such as *Ganoderma applanatum* or *Phellinus (Fomes)* species, produce a new layer of pores on the same conk each year. The hard, woody brackets of perennial conks can persist on trees for many years. Some perennial conks can continue to produce a new pore layer and

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Ceriporus (Polyporus) squamosus, Dryad's saddle, on Norway maple in July.





***Ganoderma sessile* on red oak in September.**



***Grifola frondosa* on red oak in October.**



***Laetiporus* species on a stump in May.**

spores for 10 or more years.

Identification of wood-decay fungi is important. It provides an arborist with a lot of information, including the type of decay the pathogen causes (white, soft or brown rot), the potential progression of decay in the tree and the location where the decay is likely to be most advanced. For example, *Inonotus dryadeus* is an important and serious white-rot fungus that rots large-diameter woody roots and buttress roots. However, decay usually does not extend far, if at all, into the tree trunk, and one must test roots to determine how advanced the decay is.

Another example is *Grifola frondosus*. The white-rot fungus appears at the base of the tree and on buttress roots and seems to be relatively innocuous compared to other root- and butt-rot fungi.

One clearly needs to know how to distinguish *I. dryadeus* from *G. frondosus*.

Some trees with decay never develop fruiting structures on them. I recently wrote an article for *TCI Magazine* ("Sex and Decay Fungi," June 2020) detailing the need for wood-decay fungi to have two infections by spores for sexual reproduction and to complete their life cycle. However, infection by a single spore still may result in wood decay without producing a fruiting body or mushroom. Some decay fungi can spread and fruit by tree-to-tree root contact or by rhizomorphs (e.g., *Armillaria* sp.), and some decay pathogens, such as *Cerrena unicolor*, are spread by insects where transmission occurs during oviposition by horn-tailed wasps. Therefore, decay and fruiting can occur without spore infections, depending on the decay-fungus species present.



***Inonotus dryadeus* on oak in July.**



***Ganoderma applanatum* on maple in August.**



Cerrena unicolor on boxelder in December.

Perennial fungi, sap rots and holdovers

Conks of perennial fungi remain on the tree year-round, although they only produce spores for a definitive time period. There are several very common perennial conks, such as *Ganoderma applanatum* (artist's conk), *Phellinus robiniae* (ubiquitous decay fungus of black locust) and *Phellinus igniarius*, the common cause of heart rot on a wide range of hardwoods.

The fungi that cause a sap-rot type of decay on large, open wounds seemingly can develop most anytime during the growing season. The fruiting structures are tough and small enough that they often persist for more than one year. They can fruit quickly after colonizing a wound. For example, *Schizophyllum commune* can form fruiting bodies after only

several weeks of colonizing a wound.

Also be aware that several of the annual fungi have fruiting bodies that are tough and woody enough that they commonly persist into the next year but do not produce spores the following year. *Ganoderma sessile*, *Climacodon septentrionalis* (northern tooth) and *Niveoporfomes (Polyporus) spraguei* are common examples of annual decay fungi with persistent conks. And there are a small number of fungi that are usually annual but may be perennial for short periods, such as *Daedalea quercina*.

Seasonal-fruiting fungi

Following here is a summary and description of the progression of annual, fruiting wood-decay fungi on living urban trees.



Climacodon septentrionalis on sugar maple in August.



Cowpie fungus, Phaeolus schweinitzii, on larch in August.



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***Hericium* species on beech in September.**

Polyporus squamosus (Dryad's saddle). May and throughout the growing season. Usually from larger wounds on Norway maple, horse chestnut and a wide range of other deciduous species.

Pleurotus species (oyster mushroom, including several species). Early season (May, though less common) and summer/fall fruiting is common; also one of the last fleshy fungi to be seen fruiting in the fall. Maples, poplars, elm, boxelder and other hardwoods.

Laetiporus species (sulfur shelf, aka chicken of the woods). Typically a summer- or autumn-fruiting fungus, but may be seen as early as late May. Oaks, ash, black cherry and other hardwoods.



***Phellinus robiniae* on black locust in February.**



***Hericium* species on silver maple in October.**

Phaeolus schweinitzii (cow-pie fungus). July and onward. Common root and butt rotter on larch, spruce and pine. Often seen fruiting from the ground or butt on urban conifers.

Bondarzewia berkeleyi (Berkeley's polypore). Usually appearing first in July; the largest of the fleshy fungi causing a root rot and butt rot. Oaks primarily, but also other hardwoods.

Armillaria tabescens (ringless Armillaria). Appearing as early as mid-July, often fruiting from larger-diameter roots away from the base of the tree. Maples and other hardwoods.

Climacodon septentrionalis (northern tooth). Starting in mid- to late July. Very



***Hypsizygus ulmarius* on boxelder in September.**

common on maples.

Niveoporofomes (Polyporus) spraguei (no common name). Starting in July. Common root and butt rot on oak, black cherry and other hardwoods.

Hypsizygus (Pleurotus) ulmarius (elm oyster). July into late fall (December). Very common on boxelder and elm.

Inonotus dryadeus (warted polypore). Starting in late July. Important and common root decay on oaks and sometimes other hardwoods.

Ganoderma (lucidum) sessile (reishi). Starting in August and into the fall. Important and very common root and butt decay and root pathogen of maples,



***Armillaria tabescens* from silver maple in July.**



Berkeley's polypore on a stump in July.

oaks, beech, honey locust and other hardwoods.



Ischnoderma resinoseum on elm in September.

Hericium species (lion's mane). September into the fall. Maple, beech and other hardwoods, often fruiting from old pruning cuts.

Armillaria mellea (shoestring root rot). Early September and into the fall. Common mushroom on oaks, maples and other hardwoods.

Grifola frondosa (hen of the woods). Early September and into the fall. Most common on oaks.

Ischnoderma resinoseum (resinous polypore). Reported as a saprophyte in the literature, but can be found on declining trees. Early fall.

Cerrena unicolor (mossy maze polypore). Late summer into the fall. Canker and sap rot, common on maples and other hardwoods.

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