ROOT DECAY IN URBAN TREES: BERKELEY'S POLYPORE

Photograph 5: The apparently healthy crown of the tree with numerous mushrooms of **B. berkeleyi** *fruiting on woody roots as shown in Photograph 2. All images courtesy of the author.*

By Christopher J. Luley

It is September and your client has a two-foot-diameter, 30-pound mushroom growing from the base of their oak (Photograph 1 and 1a). They are wondering what it is doing to the tree *and* why you can't identify this gigantic and obtrusive fungus in their backyard. It can only be one pathogen, Berkeley's polypore (*Bondarzewia berkeleyi*, previously named *Polyporus berkeleyi*).

Photograph 1: A large specimen of **Bondarzewia berkeleyi** *at the base of a laurel oak.* **B. berkeleyi** *always fruits at the base of the tree or from woody roots.*

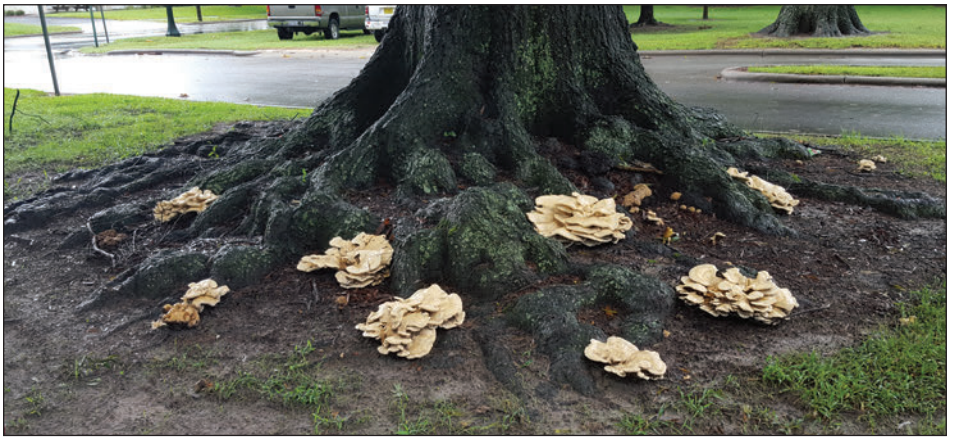
Identification

Berkeley's polypore is probably the largest of all the decay fungi that fruit on urban trees. It is most common east of the Rockies. A different *Bondarzewia* species is reported from western conifers. Besides its large size (often two feet or more in diameter), it is relatively easy to identify

Decay Fungi Series

This is the first article in a series from Christopher J. Luley that will run in *TCI Magazine* this year on decay fungi species found in urban trees.

Photograph 1a: Berkeley's polypore is the largest of the annual decay fungi that may be found around urban oaks. Individual specimens have been reported up to 40 pounds and 2 or more feet in diameter.



Photograph 2: Numerous mushrooms of B. berkeleyi *growing from the roots of an oak in September.*

given the following characteristics:

- Mushrooms attached to exposed or buried roots or the base of trees. Also fruiting from old stumps. Primarily found on oaks but also reported from chestnut and cherry in the east (Photograph 2).
- Overlapping rosettes of one to five or more, 6- to 25-cm (3-10 inch) wide lobes with a single, mostly central stem or stipe (Photograph 3).
- Top cream or tan to gray or white, with faint to more apparent zonation (Photograph 3); cap may be finely hairy or not.
- Angular pores that are easily visible with the naked eye and that run down the length of the individual lobes (Photograph 4, next page).
- Drying cream or tan or darker and not bruising black when touched or turning black when deteriorating (Photograph 4a, next page).

Berkeley's polypore might be confused with a couple of other common annual fungal species that decay urban trees such as *Grifola frondosa*, *Laetiporus cincinnatus* and *Meripilus sumstinei*. However, none of these fungi are as large or have the group of characteristics of *B. berkeleyi* outlined above. *G. frondosa* has brown or tan fronds that are much smaller; *L. cincinnatus* has much smaller pores that can hardly be seen with the naked eye and is yellow to reddish on top; and *M. sumstinei* bruises and fades black and has much smaller fronds and pores.

Photograph 3: B. berkeleyi *showing the large fronds typical of this fungus and lighter color of some specimens.*

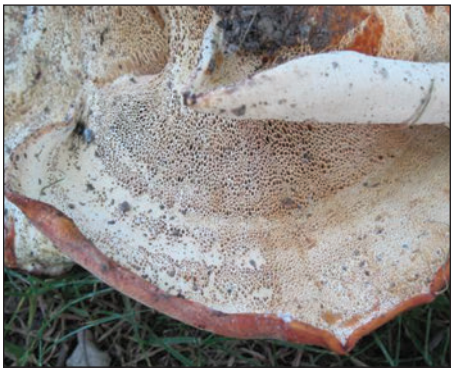
Importance

There is not a lot of information on *B. berkeleyi* and its impact on urban trees. I have observed numerous mushrooms of this fungus on the roots and base of individual trees with crowns in normal condition (Photograph 5, facing page). The literature reports that the pathogen causes a white stringy rot as it decays the wood and initially leaves rays intact. Internal cavities or hollows are reported as the decay progresses. The wood of recently cut trees is reported to have the odor of anise that can be detected from 20 to 30 feet away.

Decay of the fungus is in the roots and lower trunk or butt and usually does not progress higher than four feet up the trunk from ground level. As the decay progresses, oaks infected with *B. berkeleyi* may become "butt swelled" or have the symptom known as bottle butt. Trees with long-standing infections are reported to have extensive decay and internal cavities, suggesting that trees may progressively pose an elevated risk of failure with time.

Managing infected trees

Trees with Berkeleyi's polypore should at a minimum be sounded for decay with a mallet. Advanced testing with resistance



Photograph 4: Large pores of* B. berkeleyi *on a drying specimen. The pores of this fungus are easily seen with the naked eye.

drilling or tomography (sound waves) may be warranted where decay is progressing in buttress roots or butts. However, *B. berkeleyi* can also develop on smaller-diameter woody roots (Photograph 2). This poses a difficult situation for arborists because there is no good means to test trees for decay or make decisions on the likelihood of failure when decay is developing in smaller-diameter woody roots. Pull testing or monitoring tree movement in winds with electronic sensors may hold some potential for evaluating this type of root decay, although these are seldom practiced in North America.

Crown reduction is one alternative to removing trees with decay in the roots and base. This is a general recommendation that should be approached cautiously unless some assessment of decay has been made. Crown condition cannot be used as a means to assess internal decay. Removing live crown during reduction has the potential to reduce the tree's growth and its ability to contain infections.

B. berkeleyi is reported as edible when young, but may become bitter as it ages. As with any mushroom on the ground or on trees, positive identification is essential before consumption.

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***Photograph 4a: A drying specimen of* B. berkeleyi. *Note that the fungus is turning darker color but not black, as occurs with* M. sumstinei.**

TreeRot.com, a website dedicated to decay fungi of urban trees. This article was based on a portion of his presentation, "Root Rot, Really?" made at TCI EXPO 2015 in Pittsburgh. To listen to an audio recording of that entire presentation, go to this article in the online version of this issue and click here.