Biogeography and hosts of poroid wood decay fungi in North Carolina: species of *Abortiporus*, *Bondarzewia*, *Grifola*, *Heterobasidion*, *Laetiporus* and *Meripilus*

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Abstract—Distribution and host plants are provided for two species of *Abortiporus*, three species of *Laetiporus* and one species each of *Bondarzewia*, *Grifola*, *Heterobasidion* and *Meripilus*. County distribution maps are provided for each species as well. This complete checklist can be found at: www.cals.ncsu.edu/plantpath/people/faculty/grand/projects/mycotaxon_5.pdf

Keywords—fungus distribution, polypores

Introduction

The importance of biodiversity and biogeography of fungi in ecosystems was addressed in previous studies by Grand & Vernia (2004a). Previous studies of poroid wood decay fungi in North Carolina have reported the occurrence of selected genera and host plants (Jung 1987, Vernia & Grand 2000, Grand & Vernia 2002, 2003, 2004a, b, 2005a, b). These studies have greatly expanded the range and host plant reports of many species of poroid wood decay fungi in the southern region of the United States. This report is the fifth in a continuation of a long-term study of poroid wood decay fungi in North Carolina.

Materials and methods

Poroid wood decay fungi were intensively collected in North Carolina from 1997–2006. Data from other studies (Jung 1987, Grand et al. 1975), collections in the Mycological Herbarium (NCSC), North Carolina State University, and records of the Plant Disease and Insect Clinic, Plant Pathology Department, North Carolina State University, were used in developing distribution maps. Other sources for distribution and host plant data are noted in the species checklist.

Collections were obtained for all species of *Abortiporus*, *Laetiporus*, *Bondarzewia*, *Grifola*, *Heterobasidion*, and *Meripilus* on unusual hosts. Specimens were placed in paper bags in the field with a sample of decayed wood with most collections and field notes for all collections. Specimens were examined in the laboratory and identified using existing taxonomic treatments (Gilbertson & Ryvarden 1986, 1987; Larsen & Lombard 1988; Overholts 1953). Nomenclature and authorities are from Gilbertson & Ryvarden (1986, 1987) and IPNI (2006) for fungi and Kartesz & Kartesz (1980) or IPNI (2006) for host plants.

The majority of collection sites were in state parks, game lands and natural areas, Nantahala, Pisgah, Croatan and Uwharrie National Forests and the Blue Ridge Parkway and Great Smoky Mountains National Parks. A county distribution map is provided for each species (Figs. 1–9).
Results and discussion

Abortiporus biennis (Fig. 1) and A. fractipes (Fig. 2) appear to be widespread in North Carolina. Collections of both species were made in the Mountain, Piedmont and Coastal Plain provinces. Both species were associated with deciduous tree species plant debris. Abortiporus biennis was observed to fruit abundantly on recently dead trees but basidiocarps occurred infrequently after three to four years. Abortiporus fractipes was found most frequently on dead branches, often buried in soil, in flood plains.

Bondarzewia berkeleyi (Fig. 3) was found in the mountains although several collections were made in Wake Co., a Piedmont site. Except for Prunus pensylvanica all collections of B. berkeleyi were at the base of living trees in the genus Quercus.

Heterobasidion annosum (Fig. 5) is widespread in North Carolina and was recorded in all three physiographic provinces. Heterobasidion annosum is represented by numerous records primarily because it causes an economically important root rot (Affeltranger & Gentry 1973, Baker et al. 1993, Miller & Kellman 1966, Platt et al. 1965, Ross 1973, Roth 1952, Toole & Boyce 1952, Woodward et al. 1998).

Meripilus sumstinei (Fig. 9) was collected in mountain and Piedmont sites. All collections were made at the base of large, still living, oak species.

Three species of Laetiporus were found or reported in North Carolina. Early reports (Grand et al. 1975) and herbarium collections (NCSC) that were identified as L. sulphureus undoubtedly included L. cincinnatus, L. persicinus and L. huroniensis. Burds. & Banik. Burdsall & Banik (2001) provided evidence for a species concept in the genus and recognized six species and one variety. Following their study, L. cincinnatus (Fig. 6), L. persicinus (Fig. 7) and L. sulphureus (Fig. 8) were identified. A specimen from Graham County on Tsuga canadensis is identified as L. sulphureus in the present study but is almost certainly L. huroniensis. This collection was on an old, large-diameter, fallen hemlock and fits the description by Burdsall & Banik (2001). Laetiporus species in North Carolina need to be studied further to account for their distribution.

Grifola frondosa (Fig. 4) was not collected frequently enough to determine a distributional trend.
## List of species found in North Carolina

Plant host species for poroid wood decay fungi are listed beneath each fungus name. Counties, with citation where appropriate, are listed in the second column.

### Abortiporus biennis (Bull. : Fr.) Singer

<table>
<thead>
<tr>
<th>Plant Host Species</th>
<th>Counties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acer rubrum L.</td>
<td>Dare, Wake</td>
</tr>
<tr>
<td>Betula alleghaniensis Britton</td>
<td>Mitchell</td>
</tr>
<tr>
<td>B. nigra L.</td>
<td>Swain</td>
</tr>
<tr>
<td>Liquidambar styraciflua L.</td>
<td>Wake</td>
</tr>
<tr>
<td>Quercus alba L.</td>
<td>Alamance</td>
</tr>
<tr>
<td>Q. falcata Michx.</td>
<td>Wake</td>
</tr>
<tr>
<td>Q. velutina Lam.</td>
<td>Wayne</td>
</tr>
<tr>
<td>Ulmus rubra Muhl.</td>
<td>Wake</td>
</tr>
<tr>
<td>ground or wood chips</td>
<td>Jackson, Wake</td>
</tr>
</tbody>
</table>

### Abortiporus fractipes (Berk. & M.A. Curtis) Gilb. & Ryvarden

<table>
<thead>
<tr>
<th>Plant Host Species</th>
<th>Counties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Betula nigra</td>
<td>Anson</td>
</tr>
<tr>
<td>Liriodendron tulipifera L.</td>
<td>Swain</td>
</tr>
<tr>
<td>Magnolia tripetala (L.) L.</td>
<td>Wake</td>
</tr>
<tr>
<td>Oxydendrum arboreum (L.) DC.</td>
<td>Polk</td>
</tr>
<tr>
<td>Platanus occidentalis L.</td>
<td>Chatham</td>
</tr>
<tr>
<td>unidentified substrate</td>
<td>Buncombe</td>
</tr>
</tbody>
</table>

### Bondarzewia berkeleyi (Fr.) Bondartsev & Singer

<table>
<thead>
<tr>
<th>Plant Host Species</th>
<th>Counties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prunus pensylvanica L.f.</td>
<td>Swain</td>
</tr>
<tr>
<td>Quercus alba</td>
<td>Macon, McDowell, Wake</td>
</tr>
<tr>
<td>Q. coccinea Münchh.</td>
<td>Macon, Wake</td>
</tr>
<tr>
<td>Q. falcata</td>
<td>Transylvania</td>
</tr>
<tr>
<td>Q. prinus L.</td>
<td>Henderson</td>
</tr>
<tr>
<td>Q. velutina</td>
<td>Transylvania</td>
</tr>
<tr>
<td>unidentified hardwood</td>
<td>Buncombe</td>
</tr>
</tbody>
</table>

### Grifola frondosa (Dicks. : Fr.) S.F. Gray

<table>
<thead>
<tr>
<th>Plant Host Species</th>
<th>Counties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quercus alba</td>
<td>Wake</td>
</tr>
<tr>
<td>Q. coccinea</td>
<td>Wake</td>
</tr>
<tr>
<td>Q. falcata</td>
<td>Anson</td>
</tr>
<tr>
<td>Q. nigra L.</td>
<td>Carteret</td>
</tr>
<tr>
<td>Q. phellos L.</td>
<td>Wake</td>
</tr>
</tbody>
</table>

### Heterobasidion annosum (Fr. : Fr.) Bref.

<table>
<thead>
<tr>
<th>Plant Host Species</th>
<th>Counties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abies fraseri (Pursh) Poir.</td>
<td>Ashe, Avery, Burke, Cumberland, Onslow, Wake, Washington, Watauga</td>
</tr>
<tr>
<td>Camellia sp.</td>
<td>New Hanover, Onslow</td>
</tr>
<tr>
<td>Chamaecyparis thyoides (L.) Britton et al.</td>
<td>Buncombe (Toole &amp; Boyce 1952)</td>
</tr>
<tr>
<td>Juniperus conferta Parl.</td>
<td>Wake</td>
</tr>
</tbody>
</table>
**Heterobasidion annosum,** continued

*J. virginiana* L.  
Craven, Durham (Dwyer 1951), Johnston  
(Platt et al. 1965), New Hanover, Onslow,  
Wake

*Pinus echinata* Mill.  
Buncombe (Toole & Boyce 1952),  
Franklin

*P. rigida* Mill.  
Buncombe (Roth 1952)

*P. strobus* L.  
Macon, Madison (Affletranger & Gentry  
1973), Yancey

*P. taeda* L.  
Anson, Bertie (Baker et al. 1993), Chatham  
(Miller & Kellman 1966), Craven (Ross  
1973), Franklin, Halifax, Johnston, Orange  
(Roth 1973), Sampson (Miller & Kellman  
1966), Swain, Wake, Warren (Baker et al.  
1993)

*P. virginiana* Mill.  
Gaston, Graham

*Rhododendron* sp.  
Guilford

unidentified substrate  
Cumberland

**Laetiporus cincinnatus** (Morgan) Burds., Banik & T.J. Volk  
Fig. 6

*Quercus* sp.  
Wake, Buncombe

**Laetiporus persicinus** (Berk. & M.A. Curtis) Gilb.  
Fig. 7

*Quercus falcata*  
Wake

*Quercus* sp.  
Anson, Franklin, Wake

unidentified substrate  
Buncombe

**Laetiporus sulphureus** (Bull. : Fr.) Murrill  
Fig. 8

*Abies fraseri*  
Jackson

*Castanea dentata* (Marshall)  
Borkh.

*Transylvania*

*Quercus alba*  
Macon, Swain, Wake

*Q. coccinea*  
Transylvania

*Q. rubra* L.  
Ashe, Buncombe, Clay

*Quercus* sp.  
Buncombe, McDowell, Pender

*Rhododendron maximum* L.  
Macon

*Tsuga canadensis* (L.) Carrière  
Graham [see text]

unidentified substrate  
Haywood, Henderson, Mitchell

**Meripilus sumstinei** (Murrill) M.J. Larsen & Lombard  
Fig. 9

*Quercus alba*  
Wake

*Q. falcata*  
Wake

*Q. velutina*  
Macon

*Quercus* sp.  
Durham

unidentified substrate  
Buncombe, Henderson
Fig. 1. Distribution of *Abortiporus biennis* in North Carolina.

Fig. 2. Distribution of *A. fractipes* in North Carolina.

Fig. 3. Distribution of *Bondarzewia berkeleyi* in North Carolina.

Fig. 4. Distribution of *Grifola frondosa* in North Carolina.

Fig. 5. Distribution of *Heterobasidion annosum* in North Carolina.

Fig. 6. Distribution of *Laetiporus cincinnatus* in North Carolina.

Fig. 7. Distribution of *Laetiporus persicinus* in North Carolina.

Fig. 8. Distribution of *Laetiporus sulphureus* in North Carolina.

Fig. 9. Distribution of *Meripilus sumstinei* in North Carolina.
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Literature Cited


