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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		**Fig. 1**
Acer rubrum L.	Dare, Wake	
Betula alleghaniensis Britton	Mitchell	
B. nigra L.	Swain	
Liquidambar styraciflua L.	Wake	
Quercus alba L.	Alamance	
Q. falcata Michx.	Wake	
Q. velutina Lam.	Wayne	
Ulmus rubra Muhl.	Wake	
ground or wood chips	Jackson, Wake	
Abortiporus fractipes (Berk. & M.A. Curtis) Gilb. & Ryvarden		**Fig. 2**
Betula nigra	Anson	
Liriodendron tulipifera L.	Swain	
Magnolia tripetala (L.) L.	Wake	
Oxydendrum arboreum (L.) DC.	Polk	
Platanus occidentalis L.	Chatham	
unidentified substrate	Buncombe	
Bondarzewia berkeleyi (Fr.) Bondartsev & Singer		**Fig. 3**
Prunus pensylvanica L.f.	Swain	
Quercus alba	Macon, McDowell, Wake	
Q. coccinea Münchh.	Macon, Wake	
Q. falcata	Transylvania	
Q. prinus L.	Henderson	
Q. velutina	Transylvania	
unidentified hardwood	Buncombe	
Grifola frondosa (Dicks. : Fr.) S.F. Gray		**Fig. 4**
Quercus alba	Wake	
Q. coccinea	Wake	
Q. falcata	Anson	
Q. nigra L.	Carteret	
Q. phellos L.	Wake	
Heterobasidion annosum (Fr. : Fr.) Bref.		**Fig. 5**
Abies fraseri (Pursh) Poir.	Ashe, Avery, Burke, Cumberland, Onslow, Wake, Washington, Watauga	
Camellia sp.	New Hanover, Onslow	
Chamaecyparis thyoides (L.) Britton et al.	Buncombe (Toole & Boyce 1952)	
Juniperus conferta Parl.	Wake	

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

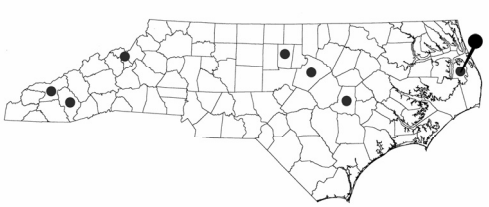

Fig. 1. Distribution of *Abortiporus biennis* in North Carolina.

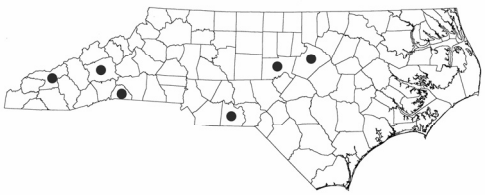

Fig. 2. Distribution of *A. fractipes* in North Carolina.

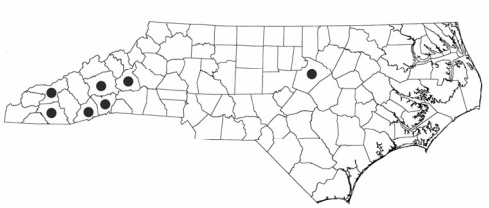

Fig. 3. Distribution of *Bondarzewia berkeleyi* in North Carolina.

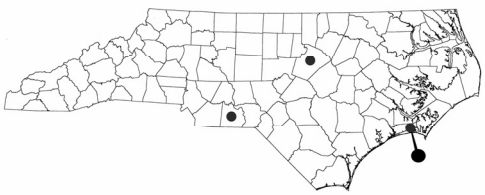

Fig. 4. Distribution of *Grifola frondosa* in North Carolina.

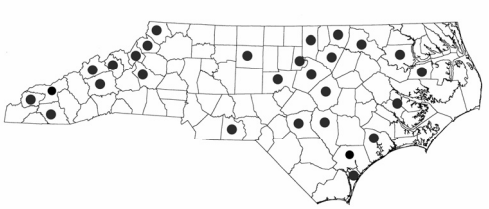

Fig. 5. Distribution of *Heterobasidion annosum* in North Carolina.

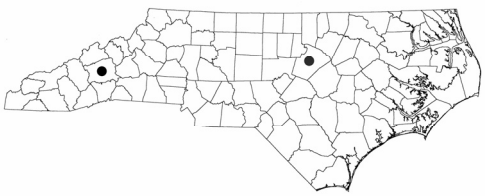

Fig. 6. Distribution of *Laetiporus cincinnatus* in North Carolina.

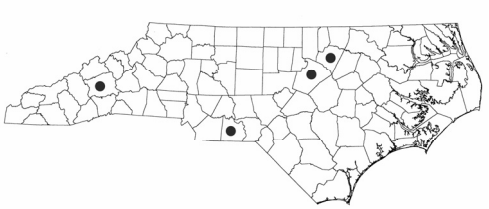

Fig. 7. Distribution of *Laetiporus persicinus* in North Carolina.

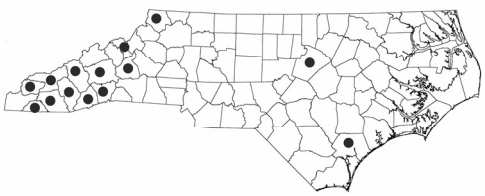

Fig. 8. Distribution of *Laetiporus sulphureus* in North Carolina.

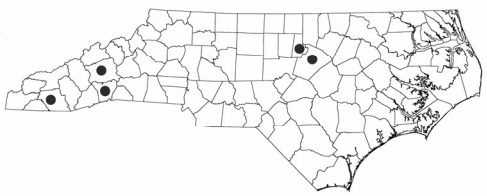

Fig. 9. Distribution of *Meripilus sumstinei* in North Carolina.

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