September, 2004

Biogeography and hosts of poroid wood decay fungi in North Carolina: species of *Ceriporia, Ceriporiopsis* and *Perenniporia*

L.F. GRAND AND C.S. VERNIA
larry_grand@ncsu.edu
Department of Plant Pathology, North Carolina State University, Raleigh, North Carolina 27695-7616.

Abstract – Distribution and host plants in North Carolina are given for 6 species of *Ceriporia,* 2 of *Ceriporiopsis* and 10 of *Perenniporia*. A county distribution map is provided for each of the taxa with seven reported for the first time in North Carolina. Numerous new fungus-host plant associations are reported. Species checklists and figures can be accessed at: http://www.cals.ncsu.edu/plantpath/Personnel/Faculty/Grand/mycotaxon_2.pdf
Keywords – fungus distribution, polypores.

Introduction

The importance of biodiversity and biogeography of fungi was addressed by Grand & Vernia (2004). Previous studies of poroid wood decay fungi in North Carolina provided information on the occurrence and host plants (Vernia & Grand 2000, Grand & Vernia 2002, 2003, Jung 1987). Grand and Vernia (2004) recently reported on the occurrence and host plants of species of *Phellinus* and *Schizopora*. This report is the second in a continuation of a long-term study of poroid wood decay fungi in North Carolina and deals with species of *Ceriporia, Ceriporiopsis* and *Perenniporia*.

Materials and methods

Details of study sites, collection and identification procedures were presented in Grand & Vernia (2004).

Species of fungi on plant hosts were intensively collected from 1997-2003 by the authors. Data from other studies (Grand et al. 1975, Jung 1987), collections in the Mycological Herbarium (NCU), North Carolina State University, records of the Plant Disease and Insect Clinic, Plant Pathology Department, NCSU were used in developing the distribution maps. Likewise, data from the BPI website (Farr et al. n.d.) provided some county data.

Collections were made of all uncommon species of *Ceriporia*, *Ceriporiopsis* and *Perenniporia*, unusual forms of these species and species on new or unusual hosts. Specimens were identified using existing taxonomic treatments (Breitenbach & Kraenzlin 1986, Gilbertson & Ryvarden 1986, 1987, Jung 1987, Lowe 1966, Lowe & Gilbertson 1961, Overholts 1953). Nomenclature and authorities are from Gilbertson & Ryvarden (1986, 1987) and Kirk & Ansell (1992) for fungi and Kartesz & Kartesz (1980) for host plants.

The majority of collection sites were in state parks, game lands and natural areas, Nantahala, Pisgah, Croatan and Uwharrie National Forests, the Blue Ridge Parkway and the Great Smoky Mountains National Park. A county distribution map is provided for each species (Figs. 1-18).

Results and discussion

Ceriporia reticulata (Pers.:Fr.) Domanski, *C. viridans* (Berk. & Broome) Donk, *Ceriporiopsis gilvescens* (Bres.) Domanski, *Perenniporia ellipsospora* Ryvarden & Gilb., *P. phloiophila* Gilb. & M. Blackwell, *P. robiniophila* (Murrill) Ryvarden and *P. tephrophora* (Mont.) Ryvarden are reported for the first time in North Carolina.

Only *Ceriporia alachuana* (Murrill) Hallenb. (Fig. 1), *Perenniporia medulla-panis* (Jacq.:Fr.) Donk (Fig. 12), *P. subacida* (Peck) Donk (Fig. 16) and *P. tenuis* (Fig. 17) were collected frequently enough to establish a distributional pattern in North Carolina.

The ranges of *C. reticulata* and *C. viridans* are extended considerably south and east, respectively, of those previously reported for these species (Gilbertson & Ryvarden 1986). The range of *Ceriporiopsis gilvescens* is extended considerably south of previous reports (Gilbertson & Ryvarden 1986). *Perenniporia tephrophora* was previously reported only from Louisiana.

Fifty-five new hosts are reported for the 18 species of *Ceriporia*, *Ceriporiopsis*, and *Perenniporia*. See list of species for specific fungus-host combinations.

List of species

Species of fungi reported for the first time in North Carolina are indicated by an asterisk and new fungus-host associations for the United States are indicated by a double asterisk. Counties are in parenthesis following host species.

Ceriporia alachuana (Murrill) Hallenb. (Fig. 1)
Substrate: ***Acer rubrum* L. (Granville, Swain), ***Ilex decidua* Walt. (Granville), ***Liriodendron tulipifera* L. (Graham), *Oxydendrum arboreum* (L.) DC. (Transylvania), ***Pinus echinata* Mill. (Halifax), ***P. taeda* L. (Beaufort, Moore, Wake), ***P. virginiana* Mill. (Rowan).

Ceriporia reticulata* (Pers.:Fr.) Domanski (Fig. 2)
Substrate: ***Cornus florida* L. (Wake), ***Ilex opaca* Ait. (Carteret), ***Ilex vomitoria* Ait. (New Hanover), ***Liriodendron tulipifera* (Wake), ***Pinus taeda* (Johnston).

Ceriporia spissa (Schwein.:Fr.) Rajchenb. (Fig. 3)
***Cornus florida* (Gaston), ***Quercus laevis* Walter (Columbus), ***Q. rubra* L. (Buncombe), unknown hardwood (Haywood) (Jung 1987).

Ceriporia tarda (Berk.) Ginns (Fig. 4)
Cornus florida (Gaston), ***Quercus nigra* L. (Wake), ***Q. prinus* L. (Orange)

Ceriporia viridans* (Berk. & Broome) Donk. (Fig. 5)
***Acer rubrum* (Wake)

Ceriporia xylostromatoides (Berk.) Ryvarden & I. Johans. (Fig. 6)
***Fagus grandifolia* Ehrh. (Swain), *Juniperus virginiana* L. (Robeson), ***Liriodendron tulipifera* (Graham), *Pinus taeda* (Beaufort), ***Rhododendron maximum* L. (Macon).

Ceriporiopsis gilvescens* (Bres.) Domanski (Fig. 7)
Fagus grandifolia (Wake), ***Picea rubens* Sarg. (Swain), ***Pinus echinata* (Pasquotank), ***P. taeda* (Carteret).

Ceriporiopsis subvermispora (Pilat) Gilb. & Ryvarden (Fig. 8)
Quercus sp. (Granville), ***Pinus echinata* (Wake), ***P. taeda* (Franklin, Halifax), *Rhododendron* sp. (Yancey) (Jung 1987), ***Tsuga canadensis* (L.) Carr. (Macon).

Perenniporia compacta (Overh.) Gilb. & Ryvarden (Fig. 9)
Liquidambar styraciflua L. (Wake), *Quercus coccinea* Muench. (Transylvania), *Q. prinus* (Wilkes), *Quercus* sp. (Buncombe).

Perenniporia ellipsospora* Ryvarden & Gilb. (Fig. 10)
***Fagus grandifolia* (Graham), ***Pinus taeda* (Franklin, Wake), ***P. virginiana* (Stokes), ***Rhododendron catawbiense* (Macon).

Perenniporia fraxinophila (Peck) Ryvarden (Fig. 11)
Fraxinus americanus L. (Yadkin), ***Quercus phellos* L. (Granville).

Perenniporia medulla-panis (Jacq.:Fr.) Donk (Fig. 12)
***Acer rubrum* (Burke, Macon), *Cornus florida* (Durham), ***Liriodendron tulipifera* (Graham), ***Oxydendrum arboreum* (Wake), ***Pinus taeda* (Johnston, Wake), ***P. virginiana* (Orange), ***Prunus serotina* Ehrh. (Wake), *Quercus alba* (Wake), ***Q. incana* W. Bartram (Richmond), ***Q. prinus* (Surry, Transylvania), ***Rhododendron maximum* (Macon), *Robinia pseudoacacia* L. (Wilkes).

Perenniporia ohiensis (Berk.) Ryvarden (Fig. 13)
Castanea dentata (Marsh.) Borkh. (Grand 1985), *Robinia pseudoacacia* (Avery, Surry), unidentified hardwood (Avery, Haywood).

Perenniporia phloiophila* Gilb. & M. Blackwell (Fig. 14)
Quercus virginiana Mill. (New Hanover).

Perenniporia ronbiniophila* (Murrill) Ryvarden (Fig. 15)
Robinia pseudoacacia (Buncombe, Haywood).

Perenniporia subacida (Peck) Donk. (Fig. 16)
Abies fraseri (Prush) Poir. (Grand, 1985), *Cornus florida* (Chatham), ***Elaeagnus pungens* Thunb. (Surry), *Juniperus virginiana* (Wake), ***Liriodendron tulipifera* (Swain), ***Pinus echinata* (Wake), ***P. rigida* Mill. (Graham), *P. taeda* (Anson, Durham), *P. virginiana* (Transylvania), *P.* sp. (Orange), ***Quercus alba* L. (Durham, Wayne), ***Q. rubra* (Randolph), *Q.* sp. (Wake), undetermined substrate (Yancey) (Jung 1987).

Perenniporia tenuis (Schwein.) Ryvarden (Fig. 17)
***Acer saccharum* Marsh. (Graham), *Fagus grandifolia* (Graham), ***Liquidambar styraciflua* (Anson), ***Liriodendron tulipifera* (Stokes), ***Pinus taeda* (Wake, Wayne), ***Quercus alba* (Wake), ***Q. marilandica* Muench. (Moore), ***Q. prinus* (Orange), ***Q. rubra* (Wake), *Tsuga canadensis* (Graham).

Perenniporia tephrophora* (Mont.) Ryvarden (Fig. 18)
***Platanus occidentalis* L. (Wake).

Acknowledgements

The authors thank Drs. Elwin Stewart and Rich Baird for suggestions and comments that improved the manuscript. Financial support for this project was provided, in part, by generous grants from the Highlands Biological Station (Highlands, NC). A special thanks is given to Tom Howard and the staff of the North Carolina State Parks system for permission to collect in the parks and natural areas of North Carolina; the geographically extensive lands so well-maintained by this staff continues to provide us with biologically diverse collecting areas.

Literature cited

Breitenbach J, Kraenzlin F, eds. 1986. Fungi of Switzerland. Vol. 2: Non-gilled fungi. Verlag Mykologia, Lucerne. 412 pp.

Farr DF, Rossman AY, Palm ME, McCray EB. (n.d.) Fungal Databases, Systematic Botany & Mycology Laboratory, ARS, USDA. Retrieved October 4, 2003, from http://nt.ars-grin.gov/fungaldatabases/

Gilbertson RL, Ryvarden L. 1986. North American Polypores. Vol. 1 *Abortiporus - Lindtneria*. Fungiflora, Oslo. Pp. 1-433.

Gilbertson RL, Ryvarden L. 1987. North American Polypores. Vol. 2 *Megasporoporia - Wrightoporia*. Fungiflora, Oslo. Pp. 437-885.

Grand LF. 1985. North Carolina Plant Disease Index. North Carolina Agric. Res. Serv. Tech. Bull. 240:1-157.

Grand LF, Menge JA, Bond JJ. 1976. Partial checklist of fungi from Highlands, North Carolina and vicinity. J. Elisha Mitchell Sci. Soc. 91:221-229.

Grand LF, Vernia CS. 2002. New taxa and hosts of poroid wood-decay fungi in North Carolina. Castanea. 67:193-200.
Grand LF, Vernia CS. 2003. Noteworthy Collections, North Carolina, *Cryptoporus volvatus* (Peck) Shear. Castanea. 68:88-89.
Grand LF, Vernia CS. 2004. Biogeography and hosts of poroid wood decay fungi in North Carolina: species of *Phellinus* and *Schizopora*. Mycotaxon. 89:181-184.
Jung HS. 1987. Wood-rotting *Aphyllophorales* of the southern Appalachian spruce-fir forest. Bibl. Mycol. 119:1-260.
Kartesz JT, Kartesz R. 1980. A synonymized checklist of the vascular flora of the United States, Canada, and Greenland. University of North Carolina Press, Chapel Hill. 688 pp.
Kirk PM, Ansell AE. 1992. Authors of fungal names. A list of authors of scientific names of fungi with recommended standard forms of their names, including abbreviations. Index of Fungi Supplement. CAB International, Kew, Surrey, Great Britain. 95 p.
Lowe JL. 1966. *Polyporaceae* of North America. The genus Poria. State Univ. N.Y. Coll. For. Tech. Publ. 90:1-183 pp.
Lowe JL, Gilbertson R. 1961. Synopsis of the *Polyporaceae* of the Southeastern United States. J. Elisha Mitchell Sci. Soc. 77:43-61.
Overholts LO. 1953. The *Polyporaceae* of the United States, Alaska and Canada. University of Michigan Press, Ann Arbor. 466 pp.
Radford AE, Ahles HE, Bell CR. 1968. Manual of the Vascular Flora of the Carolinas. University of North Carolina Press, Chapel Hill. 1183 pp.
Vernia CS, Grand LF. 2000. Polypores of a North Carolina Piedmont forest. Mycotaxon. 74:153-159.

Fig. 1. Distribution of *Ceriporia alachuana* in North Carolina

Fig.2. Distribution of *C. reticulata* in North Carolina

Fig. 3. Distribution of *C. spissa* in North Carolina

Fig. 4. Distribution of *C. tarda* in North Carolina

Fig. 5. Distribution of *C. viridans* in North Carolina

Fig. 6. Distribution of *C. xylostromatoides* in North Carolina

Fig. 7. Distribution of *Ceriporiopsis gilvescens* in North Carolina

Fig. 8. Distribution of *C. subvermispora* in North Carolina

Fig. 9. Distribution of *Perenniporia compacta* in North Carolina

Fig. 10. Distribution of *P. ellipsospora* in North Carolina

Fig. 11. Distribution of *P. fraxinophila* in North Carolina

Fig. 12. Distribution of *P. medulla-panis* in North Carolina

Fig. 13. Distribution of *P. ohiensis* in North Carolina

Fig. 14. Distribution of *P. phloiophila* in North Carolina

Fig. 15. Distribution of *P. robiniophila* in North Carolina

Fig. 16. Distribution of *P. subacida* in North Carolina

Fig. 17. Distribution of *P. tenuis* in North Carolina

Fig. 18. Distribution of *P. tephrophora* in North Carolina