

## FUNGI ASSOCIATED WITH DECAYED WOOD IN STORED WILLOW AND COTTONWOOD LOGS

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Fungal deterioration of willow (*Salix nigra* Marsh.) and cottonwood (*Populus deltoides* Bartr. ex Marsh.) pulpwood logs, during outdoor storage in Georgia, was investigated by Bois and Esllyn in 1966. As part of that study, isolations of fungi were made from decaying logs that had been stored for 17 or 48 wk. While a number of the fungi were identified, the majority were not. The present study was undertaken to attempt to complete identification of the unknown isolates because more wood products-associated Basidiomycetes are now identifiable in culture. Knowledge of the fungi frequently associated with deterioration of wood in different products is of value in that it can be used to choose test fungi for inclusion in decay control investigations.

Cultural identification techniques used were those described by Davidson *et al.* (1938, 1942). In addition, stock cultures of the Center for Forest Mycology Research, at the Forest Products Laboratory, were used as identification aids.

A total of 101 fungi, assumed to be wood-decaying species, were isolated from decaying cottonwood pulpwood. Forty-eight were isolated from logs stored for 17 wk, and 53 from those stored 48 wk (TABLE I). *Coprinus radians* (Desm.) Fr. and *Bjerkandera adusta* (Willd. : Fr.) Karst. predominated in cottonwood logs during both storage periods. *Chondrostereum purpureum* (Pers. : Fr.) Pouz., the fungus most commonly associated with both *Salix* and *Populus* spp. in the Delta region of Argentina (Wright and Deschamps, 1978), and *Phanerochaete flavido-alba* (Cke.) Rattan occurred more commonly than most species in logs stored for 17 wk; however, at 48 wk *C. purpureum* was not collected and *P. flavido-alba* was isolated only twice. Of the fungi reported here on cottonwood logs, Toole (1965) reported only *B. adusta* to be commonly found on cottonwood slash in Mississippi.

Decay fungi were isolated from 89 of the willow logs, 47 from logs stored for 17 wk and 42 from those stored for 48 wk (TABLE 11). Although nearly equal numbers of isolates were obtained from willow and cottonwood, a much greater diversity of fungi was associated with decayed wood of willow (TABLES I, 11). Additionally, the fungi most commonly isolated from willow logs differed appreciably from those obtained from cottonwood logs. *Schizophyllum commune* Fr. was isolated most frequently from willow logs stored for 17 wk and, together with *Stereum complicatum* (Fr.) Fr., was most common from such logs stored for 48 wk (TABLE 11). Henningsson (1968) found *Schizophyllum commune* in the upper layers of aspen pulpwood piles in logs exposed to direct sunlight and attributed its presence there to the tolerance of this fungus to high temperatures. In the present study no records were made of the position of the logs in the pulpwood pile from which *S. commune* was isolated.

Other principal fungi, i.e., those isolated from four or more willow logs, included *P. flavido-alba* and *B. adusta* at 17 wk and *Pleurotus sapidus* (Schulz. in Kalchb.) Sacc. at 48 wk.

All but one of the decay fungi isolated from each wood species, at 17 wk, belonged to the white-rot group (TABLES I, II). This preponderance of white-rot

<sup>1</sup>Maintained in cooperation with the University of Wisconsin.

TABLE I

FUNGI ISOLATED FROM DECAYED WOOD OF COTTONWOOD PULPWOOD STORED FOR 17 OR 48 WK

Species	Type <sup>a</sup> of associated rot	Number of logs infected at:	
		17 wk	48 wk
<i>Bjerkandera adusta</i> (Willd.:Fr.) Karst.	white	10	7
<i>Chondrostereum purpureum</i> (Pers.:Fr.) Pouz.	white	6	0
<i>Coprinus lagopus</i> var. <i>sphaerospora</i> Kuehn. et Joss.	?	0	1
<i>Coprinus radians</i> (Desm.) Fr.	white	11	12
<i>Oxyporus latemarginatus</i> (Dur. et Mont. in Mont.) Donk	white	2	0
<i>Peniophora</i> spp.	white	4	2
<i>Phanerochaete flavido-alba</i> (Cke.) Rattan	white	4	2 <sup>b</sup>
<i>Pleurotus cystidiosus</i> O. K. Miller	white	0	1
<i>Schizophyllum commune</i> Fr.	white	2	0
<i>Stereum complicatum</i> (Fr.) Fr.	white	1	0
<i>Xylaria</i> sp.	white	2	4
Non-identified spp.	white	5	12
Non-identified spp.	brown	1	7
Non-identified spp.	?	0	5
Total isolates		48	53

<sup>a</sup> Type of decay based upon published reports and/or phenoloxidase reaction on gallic and tannic acid media.

<sup>b</sup> Also isolated from two logs stored for 2 yr.

TABLE II

FUNGI ISOLATED FROM DECAYED WOOD OF WILLOW PULPWOOD STORED FOR 17 OR 48 WK

Species	Type <sup>a</sup> of associated rot	Number of logs infected at:	
		17 wk	48 wk
<i>Bjerkandera adusta</i>	white	4	1 <sup>b</sup>
<i>Chondrostereum purpureum</i>	white	2	0
<i>Coriolus versicolor</i> (L.:Fr.) Quéf.	white	3	2
<i>Corticium alutaceum</i> (Schröd.) Bres. sensu Lyman	brown	1	0
<i>Cylindrobasidium album</i> (Atk. et Burt) J. Erikss. et Hjortst.	white	2	0
<i>Hericium erinaceum</i> (Bull.:Fr.) Pers.	white	0	1
<i>Hydnochaete olivacea</i> (Schw.:Fr.) Banker	white	2	0
<i>Oxyporus latemarginatus</i>	white	2	1
<i>Peniophora cinerea</i> (Fr.) Cke.	white	3	1
<i>Peniophora</i> spp.	white	3	3
<i>Phanerochaete flavido-alba</i>	white	5	2 <sup>b</sup>
<i>Pleurotus sapidus</i> (Schulz. in Kalchb.) Sacc.	white	0	4
<i>Polyporus arcularius</i> Batsch:Fr.	white	1	0
<i>Polyporus supinus</i> Swartz:Fr.	white	1	0
<i>Schizophyllum commune</i>	white	10	6
<i>Spongipellis pachyodon</i> (Pers.) Kotl. et Pouz.	white	1	0
<i>Stereum complicatum</i>	white	2	7
<i>Stereum</i> sp.	white	0	1
<i>Xylaria</i> sp.	white	1	0
Non-identified spp.	white	4	7
Non-identified spp.	brown	0	6
Total isolates		47	42

<sup>a</sup> Type of decay based upon published reports and/or phenoloxidase reaction on gallic and tannic acid media.

<sup>b</sup> Also isolated from one log stored for 2 yr.

fungi early in the storage period agrees with observations by Fritz (1954) that poplar pulpwood is first invaded by *C. purpureum*, then followed by other white-rot fungi—all during the first summer of storage. *Coprinus radians*, listed tentatively by Bois and Eslyn (1966) as a brown-rot fungus, is now considered a white-rot fungus (TABLE I). This decision was based on observations of the pulpwood logs from which *C. radians* was isolated and the results of chemical analyses of wood decayed in the laboratory by a pure culture of this fungus.

In logs stored for 48 wk, the incidence of brown-rot fungal isolations increased seven-fold in cottonwood (TABLE I) and six-fold in willow (TABLE II). This apparent succession of white by brown-rot fungi is puzzling because the number of logs containing visible brown-rot dropped from highs of 33% in cottonwood and 44% in willow stored for 17 wk to 13% and 14%; respectively, in such logs when stored for 48 wk (Bois and Eslyn, 1966). During both storage periods, white-rot was visibly present in 97–100% of all test logs.

Key Words: white-rot, brown-rot, Basidiomycetes, pulpwood.

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