

1962

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Recommended Citation

Merrill, W., & French, D. W. (1962). The Effect of O-Phenylphenol on the Growth of Some Fungi Occurring in Wood. *Journal of the Minnesota Academy of Science, Vol. 30 No.1*, 36-37.

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BOTANY

The Effect of O-Phenylphenol on the Growth of Some Fungi Occurring in Wood¹

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INTRODUCTION: It is often difficult or impossible to obtain cultures of wood rotting fungi from pieces of decayed wood placed on agar media, because other fungi present in the wood grow out rapidly and hide or suppress the fungus or fungi responsible for the decay. *Trichoderma viride* Pers. occurs very commonly in decayed wood, grows rapidly on agar media suitable for the isolation of wood-rotting fungi, and makes the isolation of wood decay fungi difficult. Russell (2) reported that O-phenylphenol added to the culture medium at the rate of 0.06 grams per liter would inhibit the growth of *Trichoderma* but permit wood rotting fungi to grow, although it did inhibit *Merulius lacrymans* (Wulf.) Fr., a fungus that causes brown rot. Denyer (1) tested 20 species of fungi and found that a medium containing O-phenylphenol had little or no inhibitory effect on fungi that cause white rot and on some of those that cause brown rot, but did inhibit some fungi that cause brown cubical rot.

Isolations by the authors from decayed wood from buildings, using a medium containing O-phenylphenol, and involving white and brown rots, often failed to yield any wood rotting fungi. For this reason it seemed desirable to determine the effect of O-phenylphenol in the medium upon the growth of some of the common fungi known to cause either white rot or brown rot.

MATERIALS AND METHODS: A medium of the following composition was prepared:

malt extract	30 g
peptone	5 g
agar	25 g
O-phenylphenol	0.06 g
water	1 liter

¹ Paper No. 4829, Scientific Journal Series, Minnesota Agricultural Experiment Station, St. Paul, Minnesota.

The medium was autoclaved, cooled to 50° C., the O-phenylphenol added, the medium poured into petri dishes and allowed to solidify. Pieces of inoculum approximately 5 mm. square from cultures grown 2 weeks on malt agar were transferred to the dishes, the dishes stored 14 days in diffuse light at 25° C., and notes were taken.

RESULTS: The fungi which grew on the medium containing O-phenylphenol are listed in Table 1; some of these grew more slowly on this medium than on the comparable medium not containing O-phenylphenol. Those fungi which did not grow on this medium are listed in Table 2. Those which grew very slowly on the medium or which grew only on the block of inoculum are listed in Table 3.

DISCUSSION: The O-phenylphenol completely inhibited (Table 2) or greatly suppressed (Table 3) the growth of about as many species of fungi that cause white rot as those that cause brown rot. None of the Ascomycetes or Fungi Imperfecti tested grew on this medium; both *Daldinia concentrica* (Bolt.) Ces. and de Not. and *Chaetomium globosum* Kunze are common Ascomycetes which can cause white rot of wood. The following fungi produced a red halo, as shown in Figure 1, in the agar around the inoculum block or around the growing colony: *Asterostroma cervicolor* (Berk. and Curt.) Masee, one isolate of *Coniophora puteana* (Schum. ex Fr.) Karst., *Coprinus comatus* Fr., *Fomes applanatus* (Pers. ex Wallr.) Gill., *Lenzites saepiararia* (Wulf. ex Fr.) Fr., *Panus rudis* Fr., *Polyporus compactus* Overh., and *Poria subacida* (Peck) Sacc.

CONCLUSION: Ortho-phenylphenol inhibited the growth of both white rotting and brown rotting fungi, and would seem to have limited value as an ingredient of an agar medium used for the isolation of many common fungi that cause decay of wood.

TABLE 1. Fungi which grew on medium containing O-phenylphenol.

Class and family	Species	Type of decay*
Basidiomycetes		
Agaricaceae	<i>Coprinus comatus</i> Fr.	-
	<i>Lentinus tigrinus</i> Bull. ex Fr.	W
	<i>Panus rudis</i> Fr.	W
	<i>Pholiota adiposa</i> Fr.	W
	<i>Pleurotus ostreatus</i> Jacq. ex Fr.	W
	<i>P. sapidus</i> Kalchb.	W
	<i>Schizophyllum commune</i> Fr.	W
Polyporaceae	<i>Favolus aveolaris</i> (D.C. ex Fr.) Quel.	W
	<i>Fomes annosus</i> (Fr.) Cke.	W
	<i>F. applanatus</i> (Pers. ex Wallr.) Gill.	W
	<i>F. geotropus</i> Cke.	W
	<i>F. pini</i> (Thore ex Fr.) Karst.	W
	<i>F. pinicola</i> (Swartz ex Fr.) Cke.	B
	<i>F. subroseus</i> (Weir) Overh.	B
	<i>Lenzites betulina</i> (L. ex Fr.) Fr.	W
	<i>Polyporus abietinus</i> Dicks. ex Fr.	W
	<i>P. anceps</i> Peck	W
	<i>P. cinnabarinus</i> Jacq. ex Fr.	W
	<i>P. compactus</i> Overh.	W
	<i>P. gilvus</i> (Schw.) Fr.	W
	<i>P. glomeratus</i> Peck	W
	<i>P. hirsutus</i> Wulf. ex Fr.	W
	<i>P. pargamenus</i> Fr.	W
	<i>P. tulipiferae</i> (Schw.) Overh.	W
	<i>P. versicolor</i> L. ex Fr.	W
	<i>Poria cocos</i> (Schw.) Wolf	B
	<i>P. incrassata</i> (Berk. & Curt.) Burt	B
	<i>P. punctata</i> (Fr.) Karst.	W
	<i>P. xantha</i> (Fr.) Cke.	B
Thelephoraceae	<i>Asterostroma cervicolor</i> (Berk. & Curt.) Massee	W
	<i>Corticium lividum</i> Pers.	W
	<i>Stereum ostrea</i> (Blume & Nees ex Fr.) Fr.	W

*B = brown-rotting fungus W = white-rotting fungus
 - = undetermined or not a wood-rotting fungus

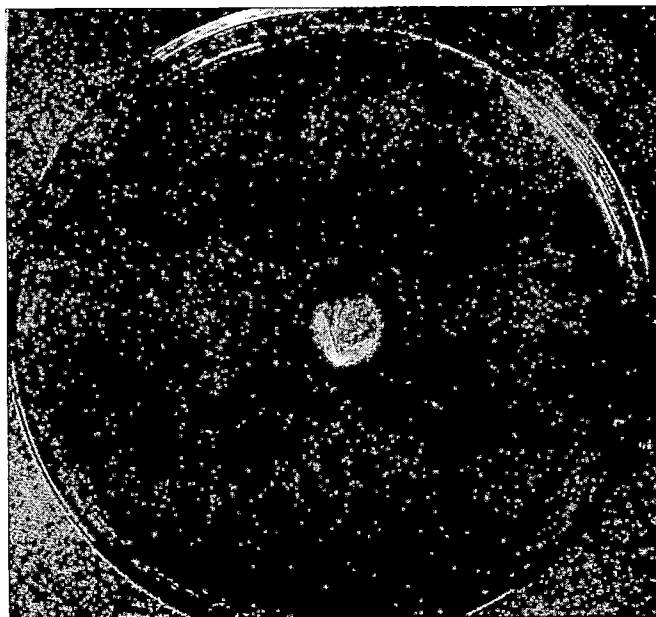


FIGURE 1: Red diffusion zone around the inoculum block of *Poria subacida* (Peck) Sacc. on malt agar containing 0.006 per cent O-phenylphenol.

TABLE 2. Fungi which did not grow on medium containing O-phenylphenol.

Class and family or order	Species	Type of decay*
Basidiomycetes		
Agaricaceae	<i>Lentinus lepideus</i> Fr.	B
Boletaceae	<i>Boletus castaneus</i> Bull.	-
Polyporaceae	<i>Fomes conchatus</i> (Pers. ex Fr.) Gill.	W
	<i>Polyporus arcularius</i> Batsch ex Fr.	W
	<i>P. adustus</i> Willd. ex Fr.	W
	<i>P. graveolens</i> (Schw.) Fr.	W
	<i>P. dryophilus</i> var. <i>vulpinus</i> (Fr.) Overh.	W
	<i>Poria vaillantii</i> (Fr.) Cke.	B
	<i>Trametes heteromorpha</i> (Fr.) Bres.	B
	<i>T. serialis</i> Fr.	B
Thelephoraceae	<i>Coniophora puteana</i> (Schum. ex Fr.) Karst.	B
	<i>Corticium radiosum</i> Fr.	B
	<i>Stereum sanguinolentum</i> (Alb. & Schw. ex Fr.) Fr.	W
Ascomycetes		
Sphaeriales	<i>Ceratocystis piceae</i> (Münch) Bakshi	-
	<i>Chaetomium globosum</i> Kunze	W
	<i>Daldinia concentrica</i> (Bolt.) Ces. & de Not.	W
Fungi imperfecti		
Moniliales	<i>Trichoderma viride</i> Pers.	-
Sphaeropsidales	<i>Coniothyrium</i> sp. Sacc.	-

*B = brown-rotting fungus W = white-rotting fungus
 - = undetermined or not a wood-rotting fungus

TABLE 3. Fungi which grew only on the inoculum block or very slowly on a medium containing O-phenylphenol.

Class and family	Species	Type of decay*
Basidiomycetes		
Polyporaceae	<i>Daedalea quercina</i> L. ex Fr.	B
	<i>Fomes everhartii</i> (Ell. & Gall.) von Schrenk	W
	<i>Lenzites saepiaria</i> Wulf. ex Fr.) Fr.	B
	<i>L. trabea</i> Pers. ex Fr.	B
	<i>Polyporus sulfureus</i> Bull. ex Fr.	B
	<i>Poria andersonii</i> (Ell. & Everh.) Neuman	W
	<i>P. monticola</i> Murr.	B
	<i>P. subacida</i> (Peck) Sacc.	W
Thelephoraceae	<i>Stereum complicatum</i> (Fr.) Fr.	W
	<i>S. frustulatum</i> (Pers. ex Fr.) Fckl.	W
	<i>S. gausapatum</i> (Fr.) Fr.	W

*B = brown-rotting fungus W = white-rotting fungus

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