

Wood Decay Fungi

Pests and Diseases of American Samoa

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Fungi compose about 4% of the known species of life on earth and about 8% of estimated unknown species. In spite of their importance, less than 5% of the estimated 1.5 million fungi have been identified. This fact sheet is an inventory of wood decay fungi in American Samoa to date.

Fungi that break down woody plants into their basic elements are a critical part of the tropical ecosystem (Fig. 1). Without them, dead trees and shrubs would cover the soil and decompose very slowly. New seedlings not only need a clear path to the sunlight, they need the nutrients locked away in dead plants: Rotted wood enriches the soil for plant growth and improves its structure.



Figure 1. *Earliella scabrosa*, often found consuming small branches. Spores are formed in pores on the underside of fruiting bodies (inset).

Wood decay fungi also damage living trees. In the tropics, millions of hectares of plantations are affected, as are fruit trees and woody landscape plants. Trees with internal decay (Fig. 2) often lose limbs or blow over in strong winds. They are a hazard around people and buildings.



Figure 2. Heartrot fungi (*Pleurotus* spp.) growing from an old tree wound (left) and emerging from a recently killed fruit tree (right).

Ecology and Life Cycle

Wood refers to both the dead xylem cells in the center of the tree responsible for structural support (heartwood), and the living xylem cells beneath the bark that carry water and nutrients up the tree (sapwood). Most wood rot fungi degrade the heartwood. Brown rot fungi have enzymes that break down polysaccharides, but leave most of the brown-colored lignin. In American Samoa most fungi cause white rot, degrading lignin along with the polysaccharides, leaving wood spongy and bleached. Pathogenic fungi attack sapwood and can kill the tree (Fig. 3).



Figure 3. The pathogen *Ganoderma australe*, with its white pore surface, has already killed the right half of this multi-trunked tree (fallen).

Most wood decay fungi are in the class Basidiomycetes. They form spores on narrow gills (Fig. 2), or in pores on the underside of fruiting bodies (Figs. 1, 3). Fungi in the class Ascomycetes produce their spores in sacs (Fig. 4). Wood rot fungi enter trees either as spores landing in wounds, or by root-to-root contact. After spores germinate, thread-like strands of the fungus body called hyphae colonize the heartwood. At some time after the wood is well colonized, the fungus forms fruiting bodies (conks, mushrooms) that produce more spores.

Wood Decay Species

Limited information exists on wood decay fungi in American Samoa. To date, only 70 species, in 40 genera, and 16 families have been reported (Table 1). Basidiomycetes account for 62 of these species, in 36 genera, and 13 families.

Table 1. Wood decay fungi of American Samoa (from McKenzie 1996, Brooks 2004).

ASCOMYCETES

Cookeina sulcipes (Berk.) O. Kuntze
Daldinia concentrica (Bolton:Fr.) Ces. & De Not.
Hypoxylon deustum (Hoffm.) Greville
Hypoxylon hypomiltum Mont.
Hypoxylon sp. Bull.:Fr. nom. cons.
Xylaria cubensis (Mont.) Fries
Xylaria sp. J. Hill ex Schrank, nom. cons.

BASIDIOMYCETES

Amyloporus (?) *campbellii* (Berk.) Ryv.
Antrodiella semisupina (Berk. & Curt.) Ryv. comb. nov.
Antrodiella sp. Ryv. & Johan.
Auricularia polytricha (Mont.) Sacc.
Auricularia sp. Bull.
Cerenna sp. S.F. Gray
Ceriporia sp. Donk
Corioloopsis floccosa (Jungh.) Ryv.
Cotylidia aurantiaca (Pers.) Weldon
Daedalia sp. Pers.:Fr.
Earliella scabrosa (Pers.) R.L. Gilbertson & Ryv.
Echinochaete russiceps (Berk. & Broome) Reid
Echinochaete sp. D.A. Reid
Elmerina sp. Bres.
Favolus spathulatus (Jungh.) Bres.
Favolaschia pustulosa (Jungh.) Singer
Flavodon flavus Ryv.
Ganoderma australe (Fr.) Pat.
Ganoderma lucidum (W. Curtis:Fr.) P. Karst.
Ganoderma resinaceum Boud.
Ganoderma sp. P. Karst.
Hexagonia apiaria (Pers.) Fries
Hexagonia tenuis (Hook.) Fries
Hyphoderma rude (Bres.) Huorest. & Ryv.
Hypocrea incarnata Pat. & Har.
Lenzites elegans (Fr.) Pat.
Lenzites vespacea (Pers.) Ryv.
Lenzites sp. Fr.
Microporus affinis (Fr.:Blume & Nees)
Microporus vernicipes (Berk.) Kunt.
Microporus sp. Kuntz
Mycorrhaphium steroides (Cooke) Maas G.
Nigroporus durus (Jungh.) Murr.
Phanerochaete salmonicolor (Berk. & Broome) Julich
Phellinus lamaensis (Murrill) R. Heim
Phellinus noxius (Corner) G. Cunn.
Phellinus sp. Quel.
Phillipsia domingensis (Berk.) Berk.
Pleurotus sp. (Fr.) P. Kumm., nom. cons.
Podoscypha involuta (Klotzsch) Imazeki
Podoscypha nitidula (Berk.) Pat. in Duss
Polyporus (?) *grammocephalus* Berk.
Polyporus philippinensis Berk.
Polyporus sp. P. Mich. ex Adans.:Fr., sensu Donk.
Pseudohydnum sp. P. Karst.
Pycnoporus sp. P. Karst.
Rigidoporus cystidioides (Lloyd) Corner
Rigidoporus defibulatus (Reid) Corner
Rigidoporus microporus (Fr.) v. Overeem

Schizophyllum commune Fr.:Fr.
Stereopsis radicans (Berk.) Reid
Stereum sp. J. Hill ex Pers.
Trametes hemitephra (Berk.) Corner
Trametes hirsuta (Wulfen:Fr.) Quel.
Trametes marianna (Pers.) Ryv.
Trametes menziesii (Berk.) Ryv.
Trametes modesta (Fr.) Ryv.
Trametes versicolor (L.:Fr.) Pilat
Trametes sp. Fr.
Tremella cinnabarina (Mont.) Pat.
Tremella fuciformis Berk.
Tremella sp. Pers.:Fr., nom. cons.



Figure 4. Small, black spots on this *Hypoxylon* sp. are spore-forming perithecia. Inside perithecia (insert) are many sacs, each containing 8 spores.

Wood Decay Management

- Avoiding damage to tree bark will reduce wood decay in plantations and landscapes. Wounds caused by saws, knives, machinery, or fire, create pathways for fungi to enter wood.
- Cut diseased or damaged branches cleanly, close to, but not flush with the bark.
- Prune when branches are small to avoid large wounds.
- Destroy dead trees, branches, and their fruiting bodies.
- Keep trees healthy so they can defend against disease.

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References

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