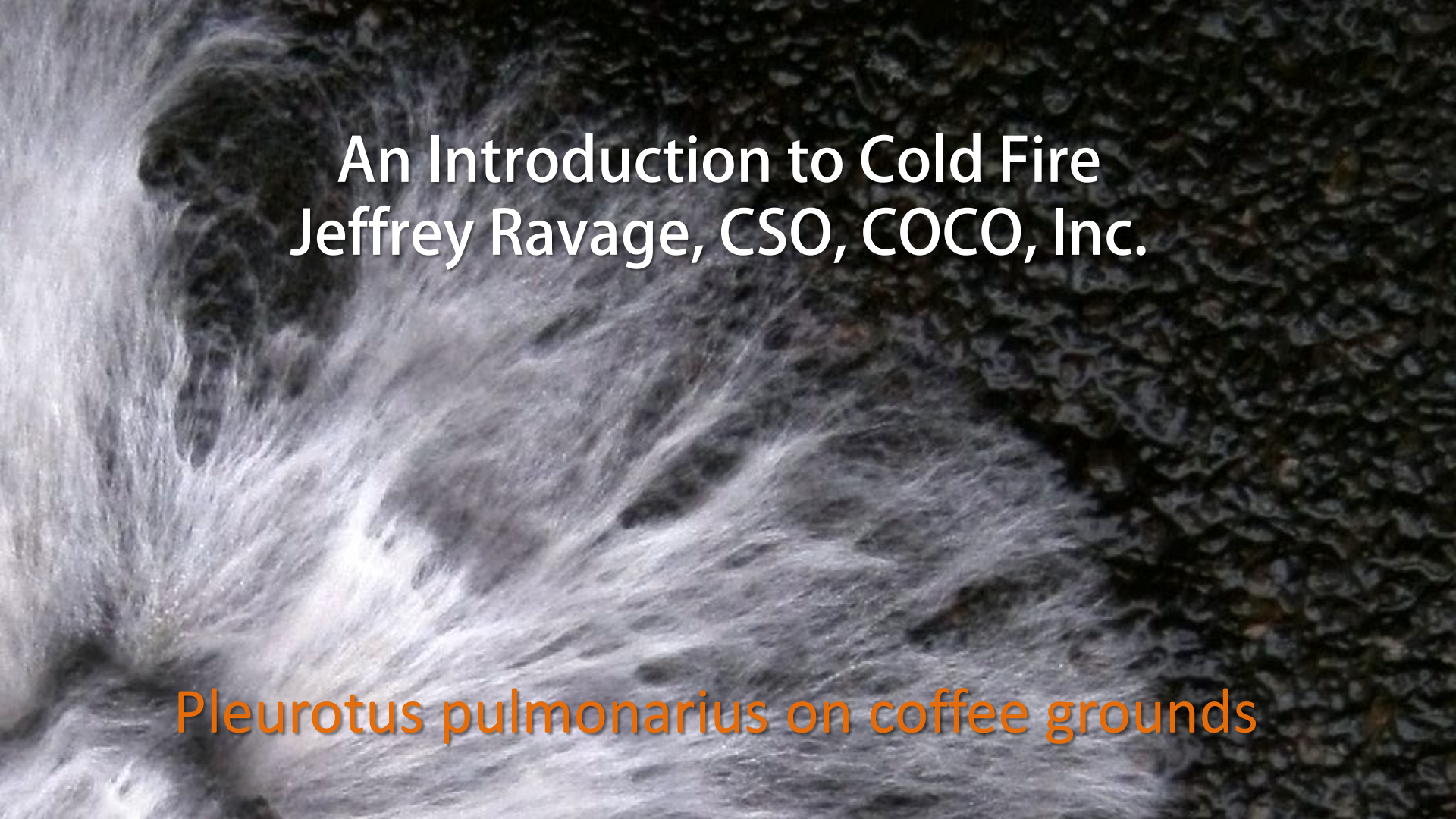
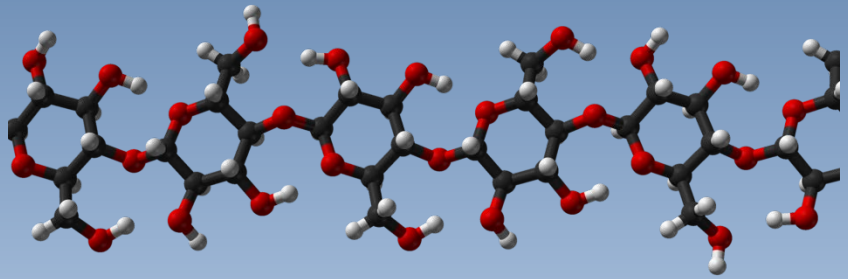

An Introduction to Cold Fire
Jeffrey Ravage, CSO, COCO, Inc.
Pleurotus pulmonarius on coffee grounds


Wood is a carbohydrate

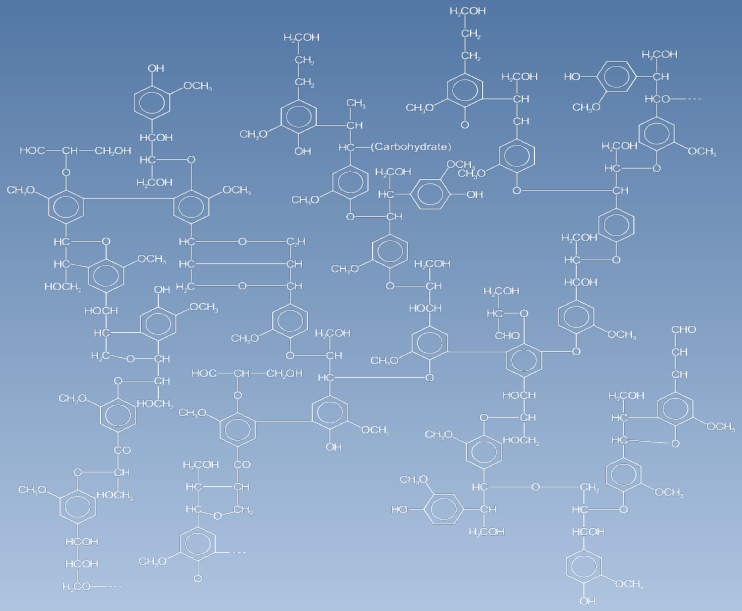
Cellulose



Cellulose

$C_6H_{10}O_5$

Lignin



Lignin

$C_9H_{10}O_2$,$C_{10}H_{12}O_3$,$C_{11}H_{14}O_4$

Hot Fire

Pyrolysis

A Second-Order Phase Transformation

- Thermal Decomposition of organic materials at elevated temperatures in the absence of oxygen

Involves change of chemical composition and physical phase

Endothermic

Irreversible

Cellulose ($C_6H_{10}O_5$) -> Methane, Guaiacol, Phenols, Cresols, pyrocatechols, Methylated compounds

Combustion

A First-Order Phase Transformation

- Thermal Transformation of organic materials at elevated temperatures in the presence of oxygen

Involves change of chemical composition and physical phase

Exothermic

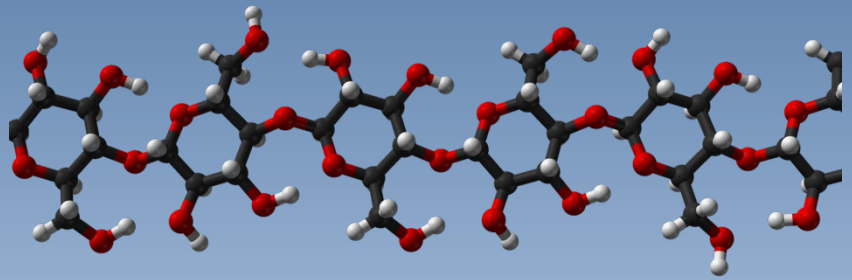
Irreversible

Cellulose ($C_6H_{10}O_5$) -> CO_2, CO, CH_4, H_2O + Heat & Ash

Cold Fire

Saprotrophs and Detritivores

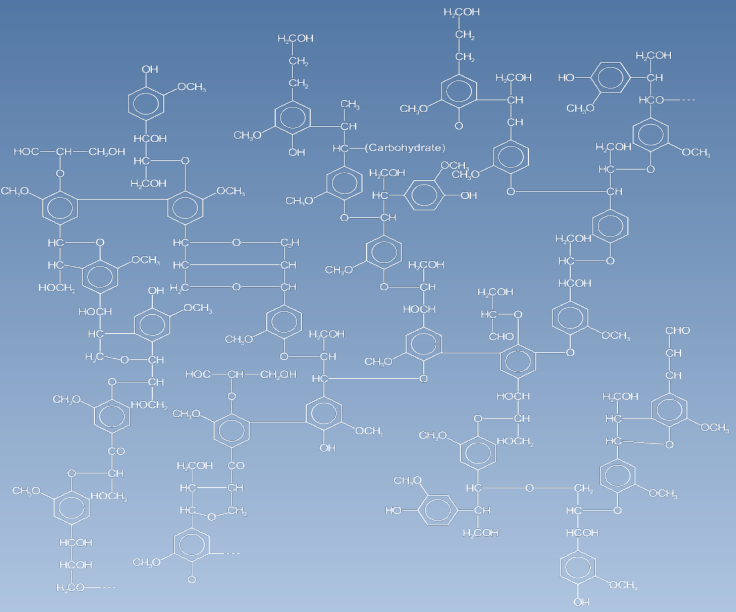
Brown Rot



Cellulose

$C_6H_{10}O_5$

White Rot



Lignin

$C_9H_{10}O_2$,$C_{10}H_{12}O_3$,$C_{11}H_{14}O_4$

Cold Fire

A Second-order Phase Transformation

- Enzymatic Transformation of organic materials at ambient temperatures in the presence of oxygen

Involves change of chemical composition and physical phase

Isothermic

Irreversible

Cellulose ($C_6H_{10}O_5$) -> CO_2, H_2O + Energy, Chitin ($C_8H_{13}O_5N$) Sugars and ash.

Results-Berrian Mountain

Chip Composition Stages

Results-Berrian Mountain

Chip Composition Stages

Results-Berrian Mountain

Compost Profile

Metric	Raw wood chips (n=1)	Berrian Compost (n=2)	Conifer O.A. *
C:N	169:1	39.5:1 (s=7.77)	35.5
Ph	4.94	6.8 (s=0.289)	5.7
N	0.279%	0.247% (s=0.024)	0.24%
P	0.010%	0.0335% (s=0.0091)	0.005%
K	0.021%	0.055% (s=0.0077)	0.026%
Org. Matter	89.2%	13.5% (s=4.666)	8.8%

* From: (Buck & St Clair, 2012)

https://coldfireproject.com

SCAN ME