Unraveling the mystery of compost teas used for organic disease and insect pest management

RESEARCH PROGRESS REPORT 2011

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What are compost teas?

- Watery extracts (teas) made from placing compost in a mesh bag and soaking in water
- Plant vs. animal (manure) based
- Aerated vs. non-aerated
- Amended or not amended


Compost Tea System
Growing Solutions
INCORPORATED
www.growingsolutions.com

Why compost teas?

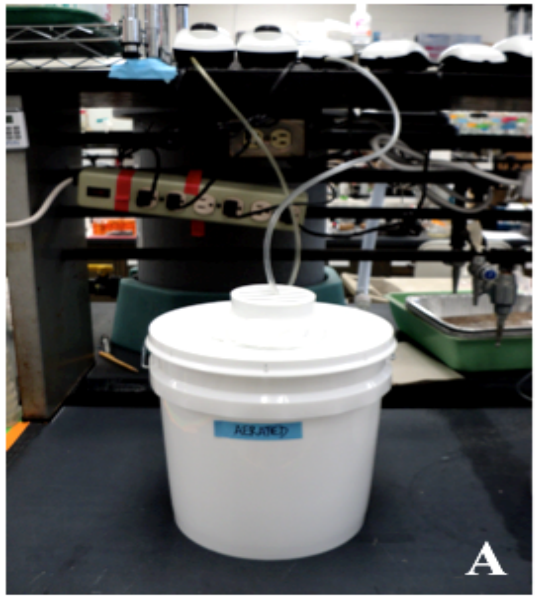
- Teas are microbial and nutrient rich
- Can be brewed on farm for minimal cost
- Can be brewed using local ingredients
- Have potential to provide disease and pest control

Why “not” compost teas?

- Can be variation from batch-to-batch and location-to-location
- Still a bit of a “black box”
- Mixed results from trials
  - How long to brew?
  - Aerate or not?
  - Amend or not?
  - Plant vs. manure (potential for human pathogens in manure based teas)

Project objectives

- Develop a bioassay for evaluating disease and insect pest suppression by compost teas
- Evaluate grower-produced compost teas to examine the variability
- Evaluate the effects of substrate, brewing method, brewing time, addition of biocontrol agents, and adjuvants on disease and insect suppression
- Examine the mechanism of disease and insect suppression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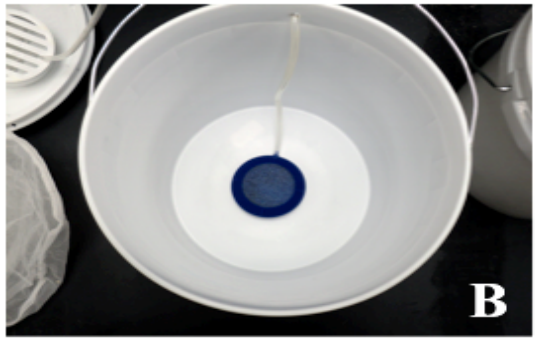
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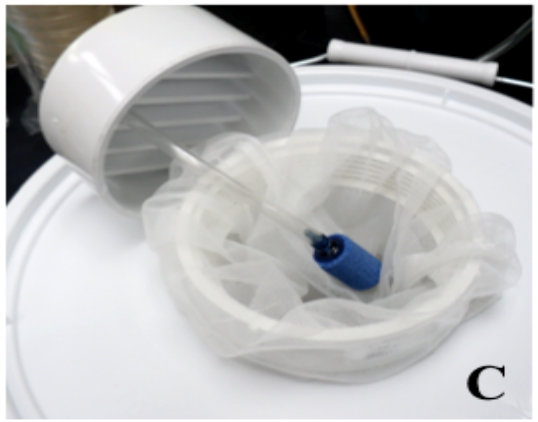
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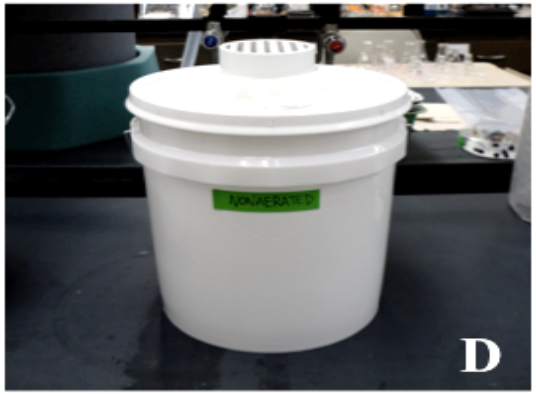
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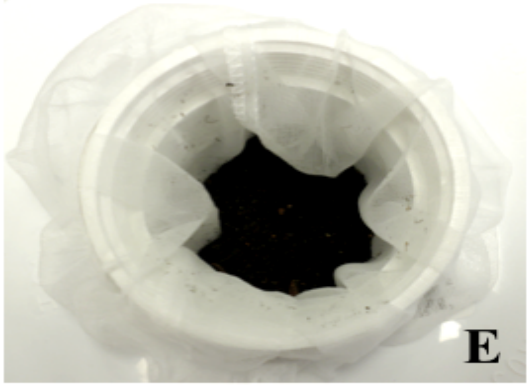
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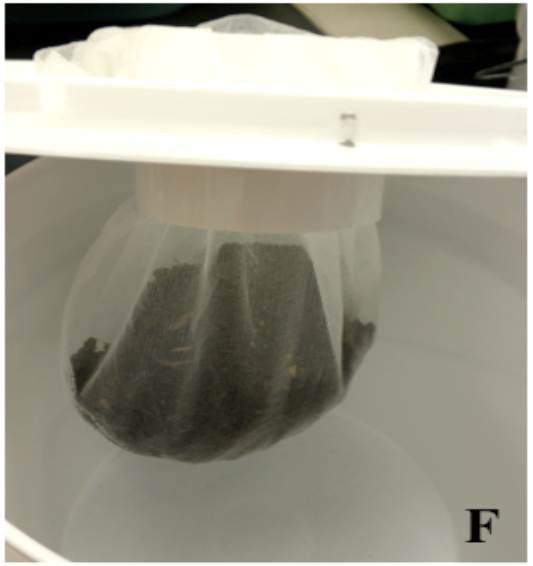
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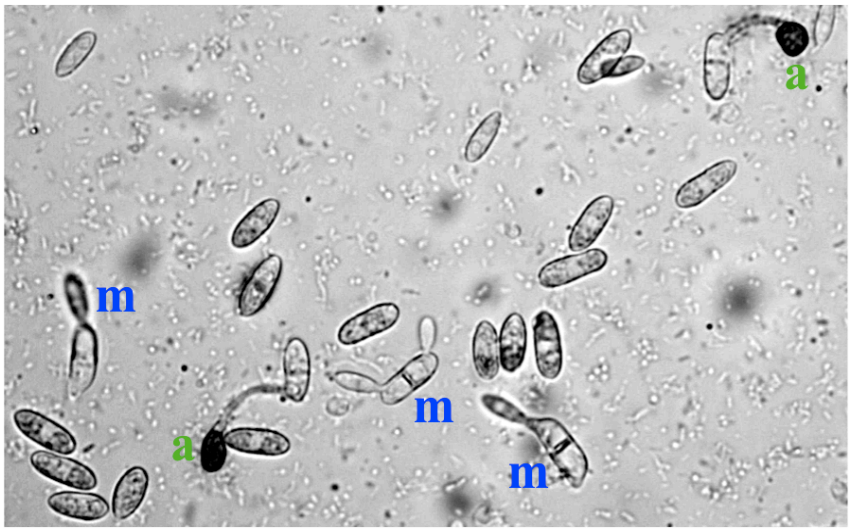
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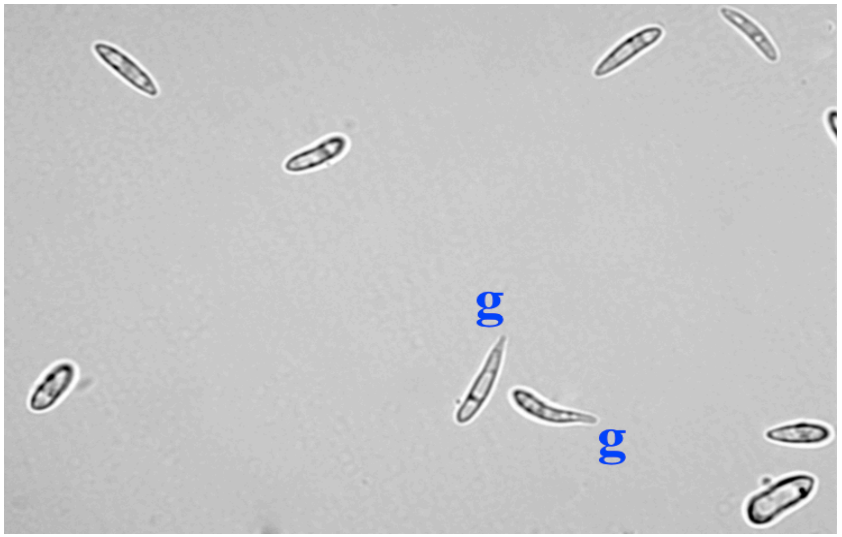
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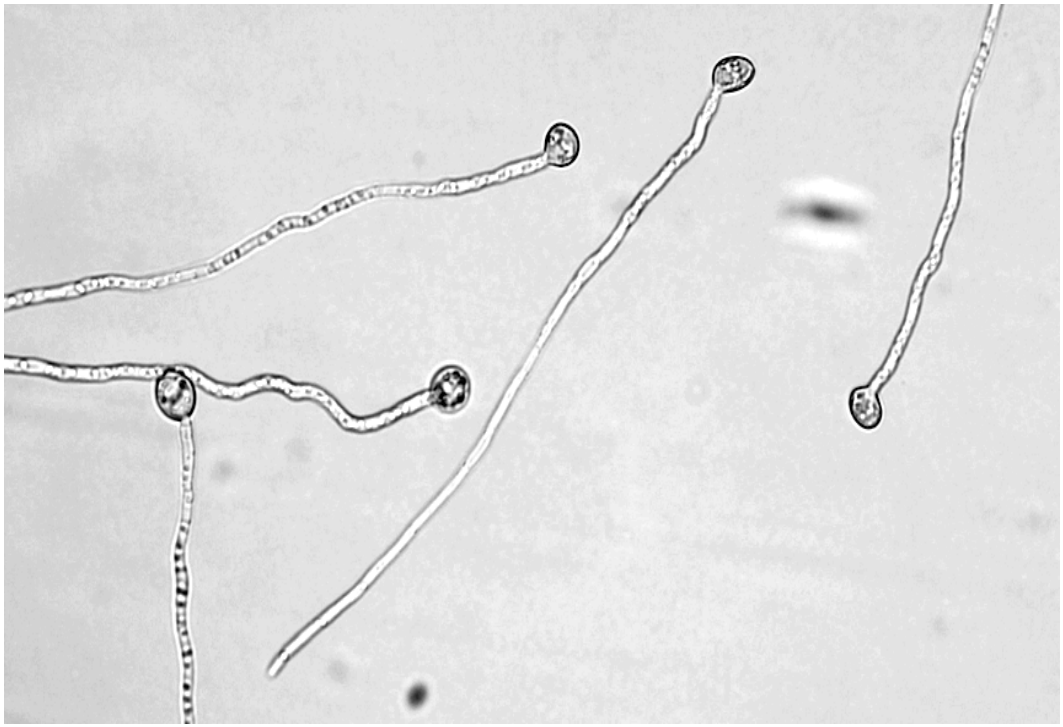
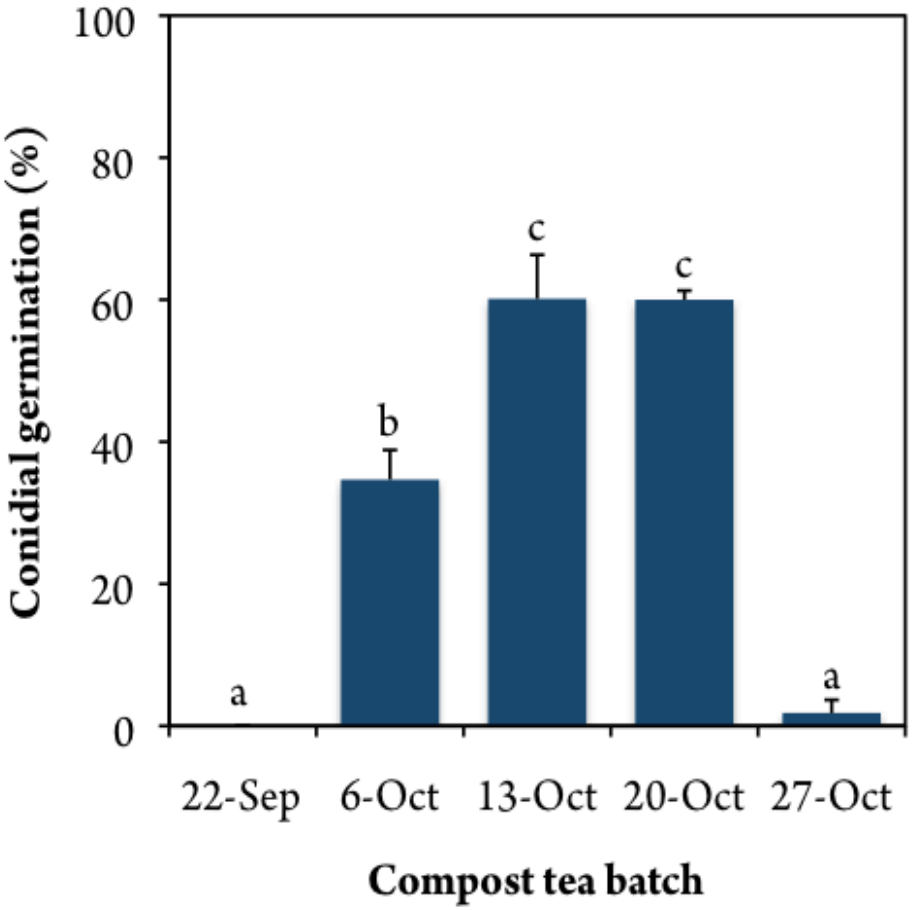
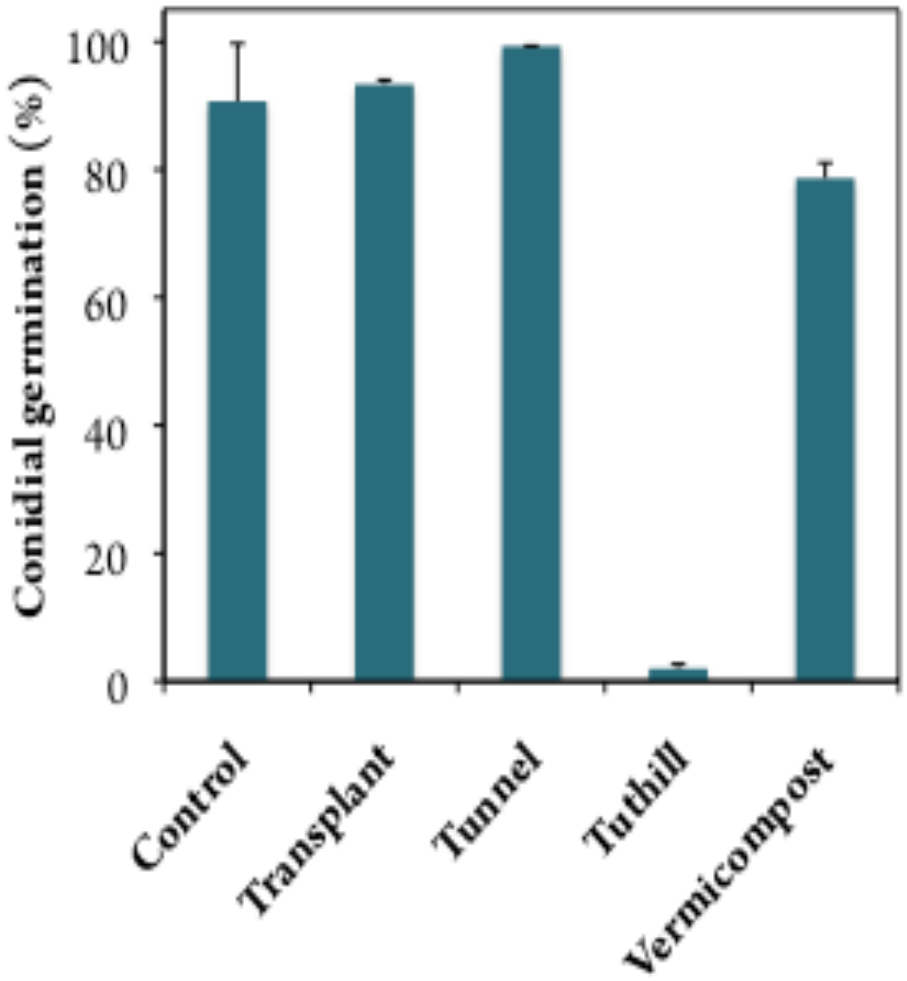


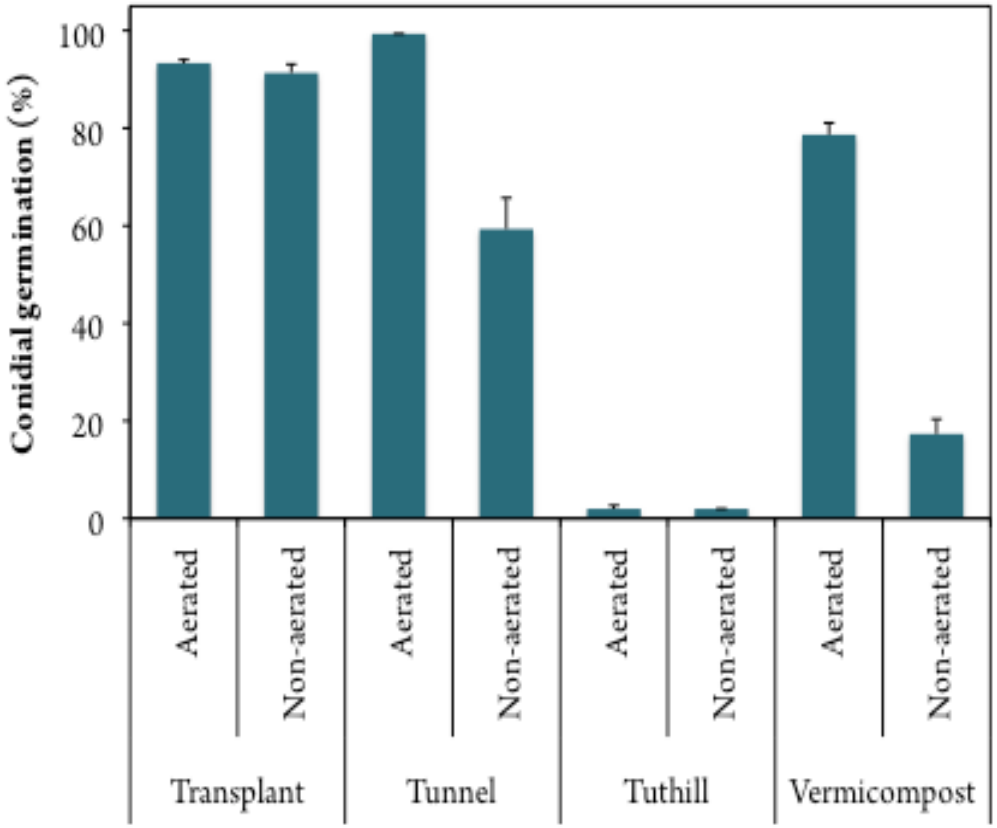
Disease suppression can vary between batches

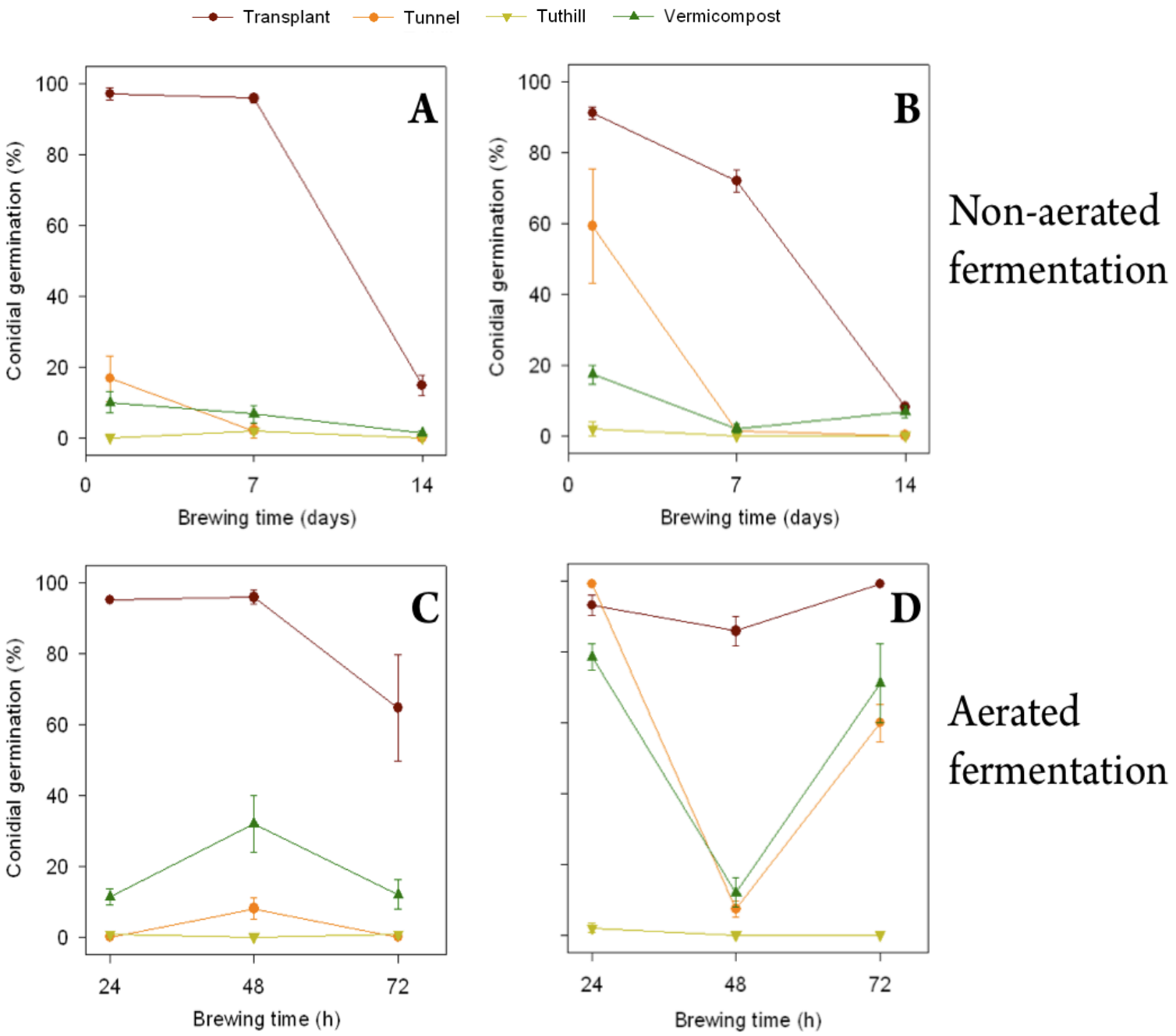


Disease suppression can vary between composts

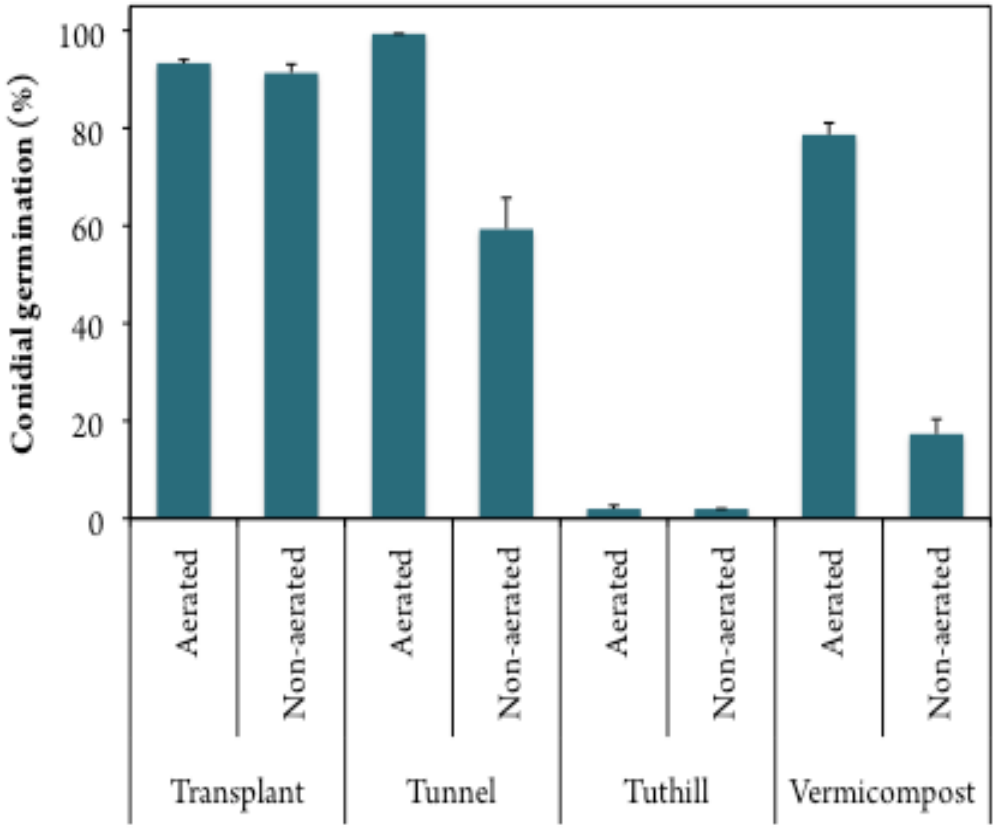


Effects of brew method: aerated vs. non-aerated

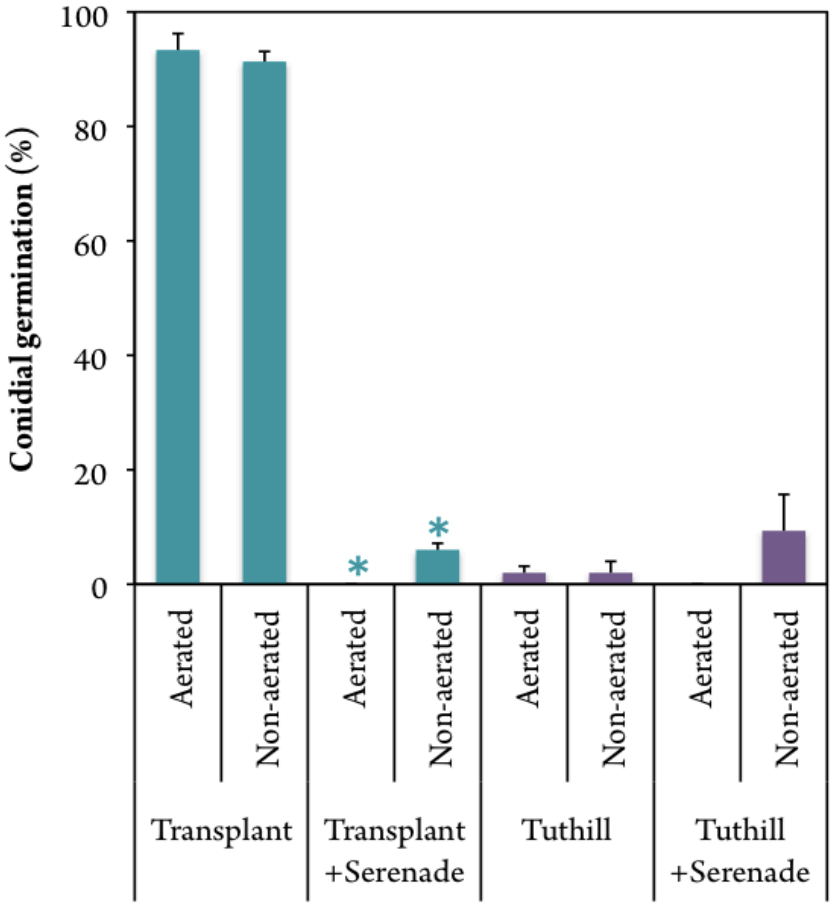



Transplant
Tunnel
Tuthill
Vermicompost
A
B
C
D
Conidial germination (%)
Brewing time (days)
Brewing time (h)
0
7
14
24
48
72
20
40
60
80
100
Non-aerated fermentation
Aerated fermentation

Effects of brew method: aerated vs. non-aerated



Effects of adding *Bacillus subtilis* before brewing



Development of a plant bioassay

Future work

- Continue development of the bioassay, especially using plants and detached leaves
- Continue evaluation of grower-produced compost teas to examine the variability
- Identify microbial groups in 3 effective compost teas
- Continue determining effects of brewing time, addition of biocontrol agents, and adjuvants on suppression of disease and insects
- Add insect control to evaluations

Acknowledgments

- The CERES Trust Fund
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- Annemiek Schilder, Laura Avila Miles, John Biernbaum, Matt Grieshop

Comparison of different Vermicompost teas