Characterization of a novel, ubiquitous fungal endophyte from the rhizosphere and root endosphere of *Populus* trees

Contact: CE Hamilton (cehdoework@gmail.com) or CW Schadt (schadtcw@ornl.gov); 865-576-3982

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**Background**

- Recent studies have identified unknown *Atractiella* sp. prominently enriched within the root endosphere of *Populus* and other woody species but little is known about their ecology.
- Limited available evidence suggests that they have variable life history strategies: from a saprophytic life-strategy in some plants to a potential mycorrhizal-like role in others.

**Science**

- We examined variation in growth rate, patterns of nitrogen utilization, and competitive interactions of multiple newly described *Atractiella rhizophila* isolates from the roots of *Populus* hosts to determine it’s role in the *Populus* microbiome.
- *Atractiella* grows best in nitrate-rich environments. This suggests that *Atractiella* is a poor competitor with other fungi, however it’s high abundance in the plant host rhizosphere may indicate other unknown resource partitioning mechanisms are at play.
- *Atractiella*, as well as other fungal genera when grown together, showed arrested development, and the competitor fungi adjusted morphologically by creating zones of inhibition.
- Metabolite profiling of *Atractiella* grown with other fungal genera indicated increased levels of glycosides, which is involved in plant-pathogen interactions.

**Significance**

- This study elaborated on the ecology of *Atractiella* and increased our understanding on how a poor competitor in a diverse microbiome remains viable and abundant.


### Table 1: Average Colony Diameter per Species (mm)

<table>
<thead>
<tr>
<th>Species</th>
<th>Diameter (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Atractiella</em></td>
<td>50.00</td>
</tr>
<tr>
<td><em>Fusarium</em></td>
<td>60.00</td>
</tr>
<tr>
<td><em>L. chartarum</em></td>
<td>70.00</td>
</tr>
</tbody>
</table>

Total colony diameter with the focal fungus indicated underneath each grouping.