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Simon Schreier

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Characterization of *Phytophthora cinnamomi* from ornamental crops in South Carolina

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Introduction

*Phytophthora cinnamomi* Rands is a devastating pathogenic species of *Phytophthora*. It infects between 900 and 3,000+ hosts—many of which are ornamental plants. In the southeastern USA, it is the most common species causing root rot on woody nursery crops. As such, it is important to have an estimation of the diversity of *P. cinnamomi*. A better understanding of its genetic and morphological diversity will provide insight into the potential for this pathogen to adapt to current management strategies and could reveal cryptic groups within the species.

Methods

Cultures were grown either on non-agarized media or on agarized media with 100 ppm mfenoxam. Mycelium growth was rated visually from 0 to 6. A better understanding of its genetic and morphological diversity will provide insight into the potential for this pathogen to adapt to current management strategies and could reveal cryptic groups within the species.

Mating type

- Test isolates were paired with standard isolates of known mating type (A1 and A2) on super clarified V8A
- Isolates that produced oospores with the A1 standard were designated A2 and those that produced oospores with the A2 standard were designated A1

ITS sequence

- DNA was extracted and the ITS region was amplified
- MEGA 5.1 was used to align the sequences and build a neighbor-joining tree

Host-pathogen association

- Associations from this study group were compared to those in the literature
- Previously unreported host-pathogen associations were identified

Results

### Colony diameter and morphology

<table>
<thead>
<tr>
<th>Morphology type</th>
<th>Isolates (out of 142)</th>
<th>Colony diameter (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>no.</td>
<td>%</td>
</tr>
<tr>
<td>Aerial</td>
<td>120</td>
<td>85</td>
</tr>
<tr>
<td>Sparsely mycelial</td>
<td>17</td>
<td>12</td>
</tr>
<tr>
<td>Appressed</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Dwarf</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

### Mfenoxam sensitivity

<table>
<thead>
<tr>
<th></th>
<th>Sensitive</th>
<th>Resistant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>142</td>
<td>0</td>
</tr>
<tr>
<td>Mating type</td>
<td>129</td>
<td>13</td>
</tr>
</tbody>
</table>

Conclusions

This population of 142 *P. cinnamomi* isolates from ornamental crops is fairly homogenous in morphology and genetics. Only two clades were distinct from the main clade that contained 135 of the isolates. One clade consisted of a single isolate of *P. cinnamomi* var. *parvispora*, while the other clade contained a morphologically diverse set of four isolates. More genetic information is needed to measure the diversity of this population and to determine more meaningful relationships between morphology and genotype.