Carrot is one of the most important vegetable crops in the world. As any other plant roots, carrot roots are colonized by a wide variety of endophytes (fig. 1,2). However, knowledge of how these communities are assembled or how they interact with plants to affect plant fitness are not well understood.

Our goal: Determine how carrot genotype and soil management interact to influence endophyte structure and potential activity.

2-Methods

2.1-Carrot genotypes

- Organic
  - Karotan Europe
  - Exp Nb3999 Brazil/Europe
  - Exp OY191 Asia
  - Exp Y8519 Turkey
  - 2Exp B0252 Syria
  - Bresilia Barazil
  - Exp P6306 Asia
  - NSFF Europe
  - Red Core Chantenay Europe

- Conventional

2.2-Carrot samples

Nine carrot genotypes from wide genetic backgrounds were grown in conventional or organically managed crop systems and roots collected to quantify endophyte community structure.

Cultural fungal and bacterial endophytes were isolated and quantified using semi-selective media, and identified using low-throughput sequencing.

In vitro antagonistic test between culturable bacterial endophytes and *Alternaria dauci* (the causative pathogen of carrot leaf blight) on P.D.A media were investigated.

3-Results

3.1-Culturable endophyte diversity

Uncultured Ascomycota / Epicoccum spp.
Uncultured Phyllachoraceae/Colletotrichum
Colletotrichum coccodes.
Uncultured Engyodontium spp.
Uncultured *Stenotrophomonas* spp.
*Paenibacillus* spp.
*Rhizobium* giardinii
*Methylbacterium* spp.
Uncultured *Pseudomonas* spp.
*Pseudomonas* flourescens
*Pseudomonas* oleovorans
*Pseudomonas* brassicaearum
*Stenotrophomonas* maltophilia
Uncultured *Xanthomonas* spp.
*Xanthomonas* Oryzae
*Cladosporium cladosporioides*
*Uncultured Cladosporium*
*Bacillus megabacterium*
*Rhizobium etli*
*Xanthomonas campestris*

3.2: Endophytes abundance on R2A media for oligotrophic bacteria

<table>
<thead>
<tr>
<th>Entry</th>
<th>Conventional</th>
<th>Organic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exp 0191</td>
<td>3 X 10³</td>
<td>2.2 X 10⁰</td>
</tr>
<tr>
<td>Exp 6306</td>
<td>2.75 X 10⁴</td>
<td>8.0 X 10⁹</td>
</tr>
<tr>
<td>Turkey</td>
<td>2.1 X 10⁴</td>
<td>2.0 X 10⁸</td>
</tr>
<tr>
<td>Exp 3999</td>
<td>8.12 X 10⁷</td>
<td>2.0 X 10⁹</td>
</tr>
<tr>
<td>Karotan</td>
<td>4.3 X 10³</td>
<td>4.5 X 10⁸</td>
</tr>
<tr>
<td>NSFF</td>
<td>1.9 X 10⁵</td>
<td>4.5 X 10⁸</td>
</tr>
<tr>
<td>Brasilia - Brazil</td>
<td>1.8 X 10⁵</td>
<td>2.0 X 10⁸</td>
</tr>
<tr>
<td>Red Core</td>
<td>1.3 X 10³</td>
<td>6.5 X 10⁹</td>
</tr>
</tbody>
</table>

3.3 In vitro bacterial endophytes antagonism with *Alternaria dauci.*

Conventional

Most of the bacterial endophytes isolated form carrot roots grown under organic condition showed in vitro significant inhibition of *Alternaria dauci* growth on P.D.A. media comparing to control.

4-Conclusion & future directions

4.1-Conclusion

- Carrot endophytes are more abundant & diverse in roots grown under organic than conventional management practices.

4.2-Future directions

- Quantify other activity of cultural isolates, and further characterize diversity using high-throughput sequencing.
- Determine how endophyte community structure influences the plants ability to withstand biotic stress from pathogens.

5-Reference


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