

Li Yang (UGA-48-19/23)

Title: Test the combined effect of high calcium and biocontrol on reducing aflatoxin contamination (Year 2).

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Brief & concise statement of objectives

1. Complete the screen of a collection of 65 CDBs for their effects to inhibit *A. flavus* fungi using a root radicle assay.
2. Use 16s sequencing to compare the microbiomes associated with healthy and fungal infected pods.

Results

1. Diversified CDBs in peanut fields in Georgia. "We surveyed the abundance and

diversity of CDBs in peanut fields in Georgia, focusing on three counties (Tift, Mitchel, and Sumter) across three regions with distinct soil types (Sandy-Loam, Deep sands, and clay). Our survey consisted of 15 peanut fields in production. From these fields, we isolated 174 CDBs and sequenced the 16s rRNA of 72 isolates. Our results showed that each field may contain 2 to 6 different CDB genera, with *Paenibacillus* present in almost all fields and some genera only found in a single field. This information highlights the diversity in the abundance and structure of CDBs across different peanut fields in Georgia, useful for designing a robust synthetic CDB community."

	Field 1	Field 2	Field 3	Field 7	Field 8	Field 9	Field 12	Field 13	Field 14
<i>Paenibacillus</i>	3	2	6	11	4	2	5		5
<i>Niallia</i>		1	4					2	
<i>Rossellomorea</i>		1	3			1		1	1
<i>Neobacillus</i>			1		1		1	2	
<i>Priestia</i>				1			1		1
<i>Alkalihalobacillus</i>							1	1	
<i>Arthrobacter</i>				1	1				
<i>Terribacillus</i>			2						
<i>Acinetobacter</i>							1		
<i>Bacillus</i>							1		
<i>Brevibacillus</i>				1					
<i>Buttiauxella</i>						1			
<i>Metabacillus</i>	1								
<i>Staphylococcus</i>					1				
Total Identified	4	4	16	14	7	4	10	6	7
Sequenced/ Total CDB Isolated	4/16	4/20	16/39	14/17	7/11	4/11	10/22	6/18	7/20

Figure 1: Taxonomy of CDBs isolated from 9 peanut growing fields in Georgia.

2. Distribution of CDB in soil

We treated peanuts growing in pots with a synthetic CDB community made up of the 7 top calcite-dissolving strains. When applied to soil, CDBs have a short lifespan and their numbers declined by 50% from day 0 to day 6 in bulk soil. However, this reduction was not observed in roots or pods, suggesting that CDBs can survive longer in plant tissues. This finding is consistent with our previous results, which showed that CDBs can persist on peanut seeds for up to 10 days.

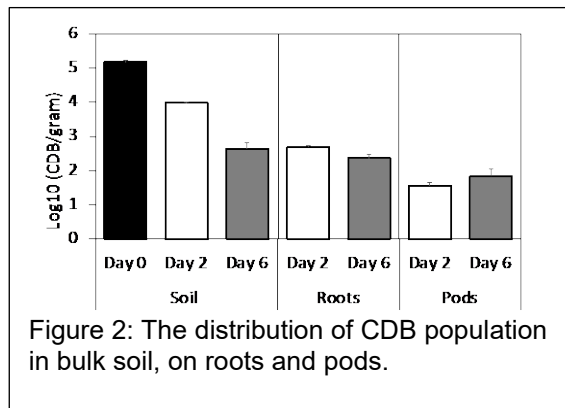


Figure 2: The distribution of CDB population in bulk soil, on roots and pods.