

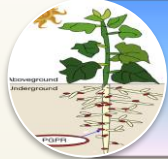
Biological Control of Bacterial Wilt by Constructing Tobacco Rhizosphere Microbial Community at the Seedling Stage

(AP05)

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Outline



Background and Objective



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Main Results



Summary and Conclusion

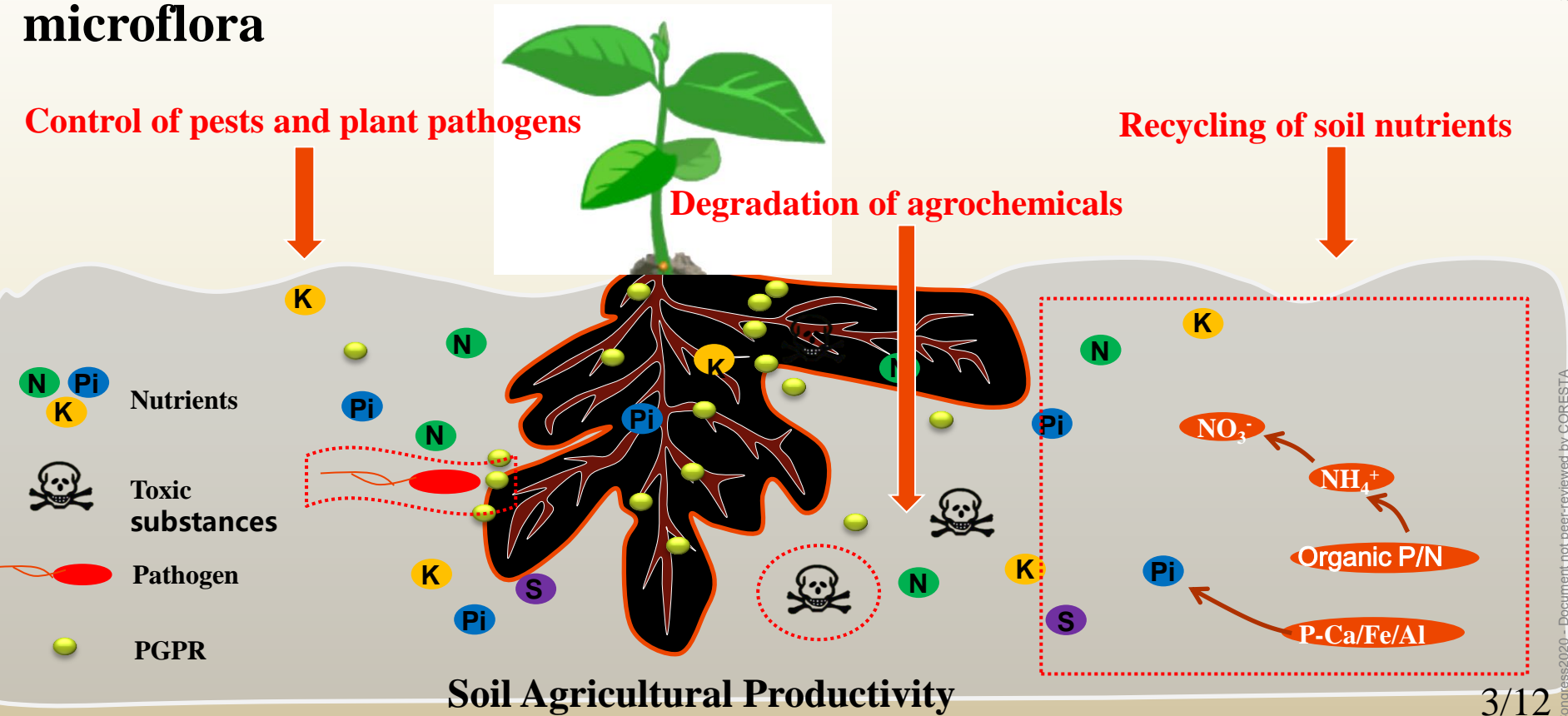
1. Background and Objective

1.1 The rhizosphere is a critical area for the construction of soil microflora

Control of pests and plant pathogens

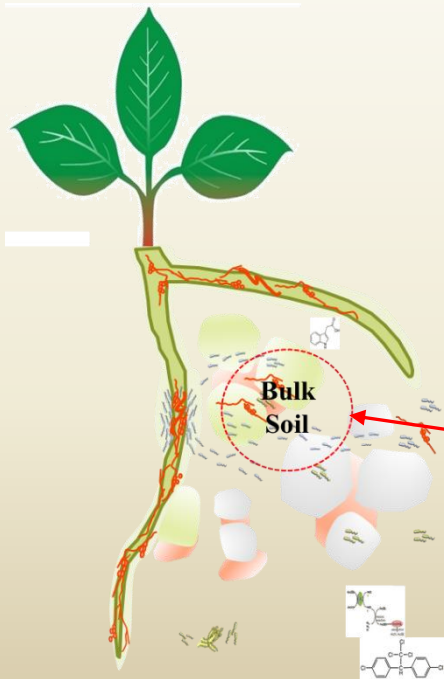
Recycling of soil nutrients

Degradation of agrochemicals

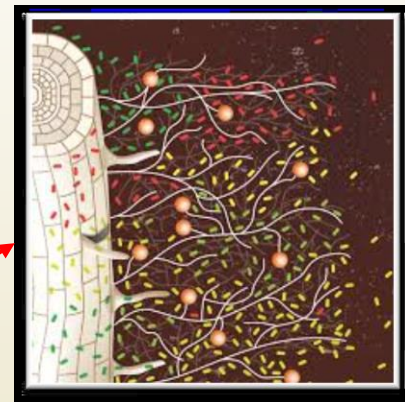
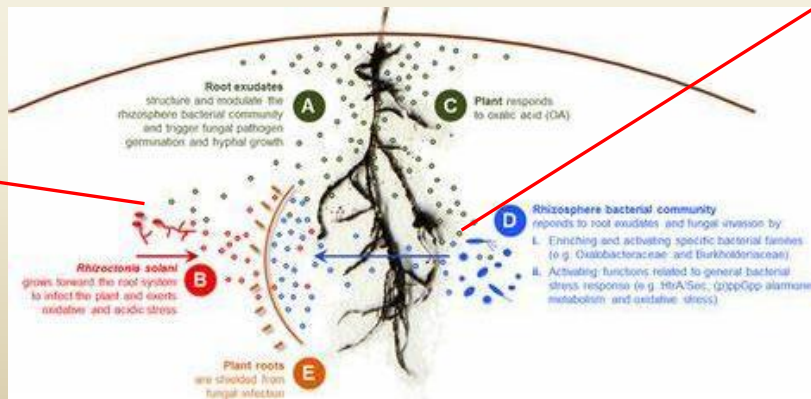


1. Background and Objective

1.2 Microbial construction in the seedling stage is more efficient than that in the field



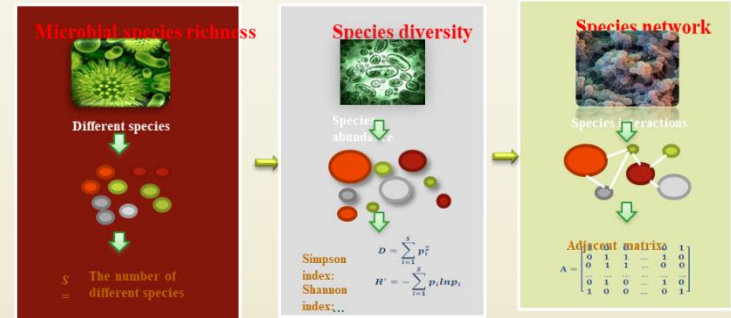
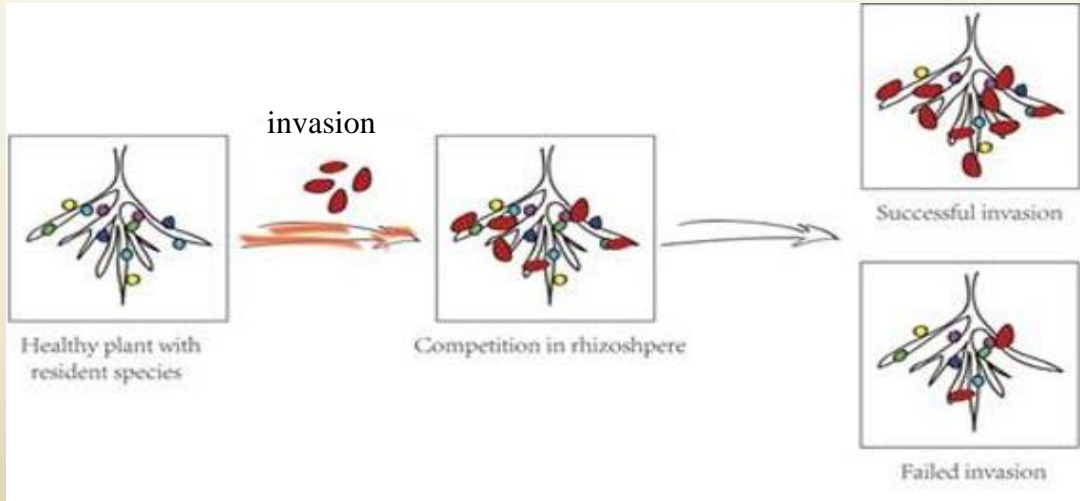
“Rhizosphere talk” happened between plant root and biology in the rhizosphere soil.



1. Background and Objective

1.3 Exogenous microorganisms are more likely to colonize the rhizosphere and occupy key sites in the rhizosphere in the seedling stage

From parts to interactions

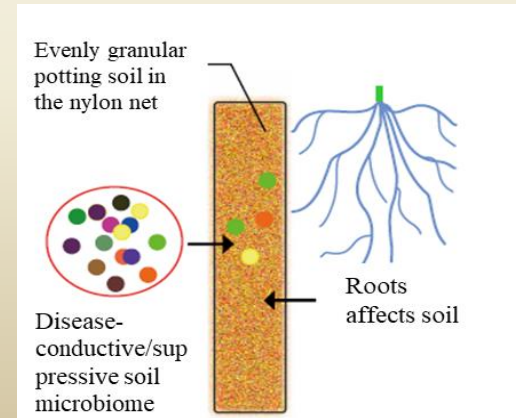
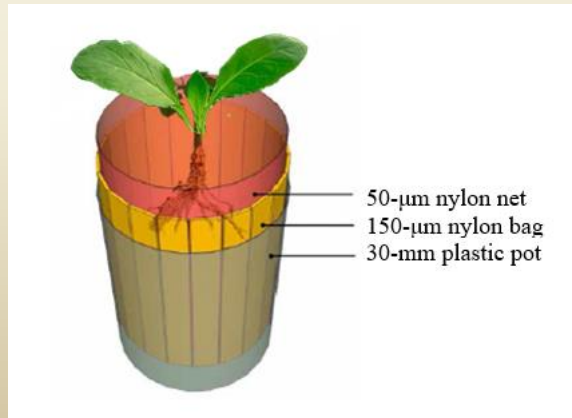


Conventional methods: Shannon diversity indexes

- Species number
- Abundance of each species
- Ignore interactions among different species

2. Experimental Design

Mark	Treatments
Cn+Cp	Conducive-soil in both seedling and pot experiment
Cn+Sp	Conducive-soil in seedling and suppressive-soil in pot experiment
Sn+Cp	Suppressive-soil in seedling and conducive-soil in pot experiment
Sn+Sp	Suppressive-soil in both seedling and pot experiment



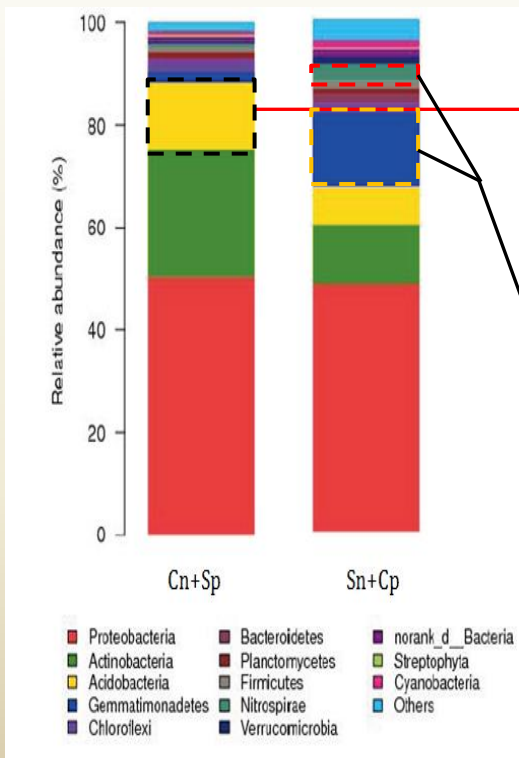
3. Main Results

3.1 Control efficiency and yield in different treatments

Treatment	Disease incidence (%)			Control efficacy (%)			Yield (kg/667m ²)
	30 d	60 d	90 d	30 d	60 d	90 d	
Cn+Cp	90.0 a	100.0 a	100.0 a	-	-	-	59.20±3.9d
Cn+Sp	51.2 b	71.3 a	100.0 a	56.3±1.8c	30.8±2.2c	0.90±0.2c	103.0±4.2c
Sn+Cp	23.3 c	36.7 b	36.7 b	89.5±5.6b	78.6±1.7b	78.6±1.7b	131.7±8.7b
Sn+Sp	0.0 d	0.0 c	0.0 c	100.0a	100.0a	100a	146.0±9.8a

3. Main Results

3.2 Microbial community and function genes difference

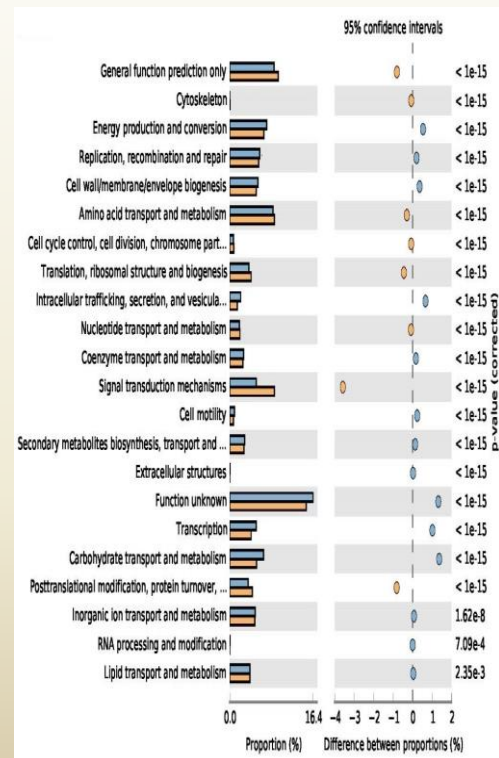


Phylum community

Acidobacteria posed a threat to soil acidification.

Gemmatimonadetes, Nitrospirae et al. have relative low abundance of antibiotic-resistance genes, which indicate that the soil is relative healthy.

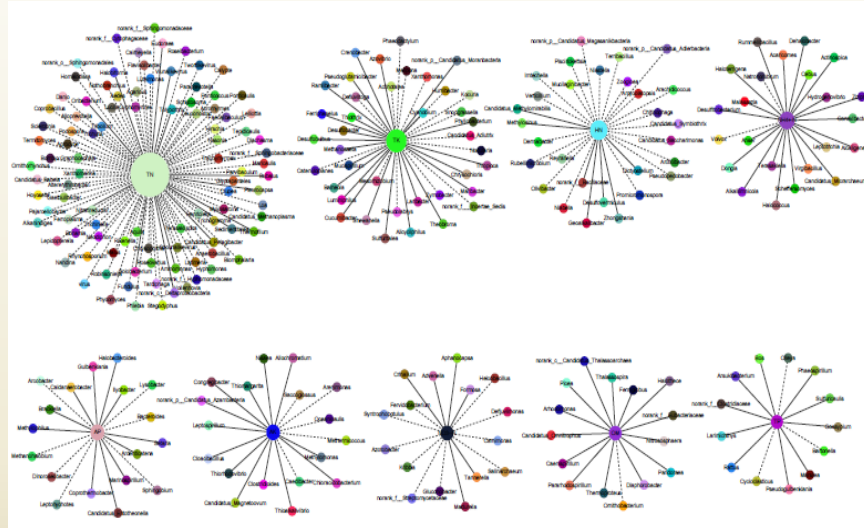
The metabolic genes of general function prediction was different Sn+Cp and Cn+Sp.



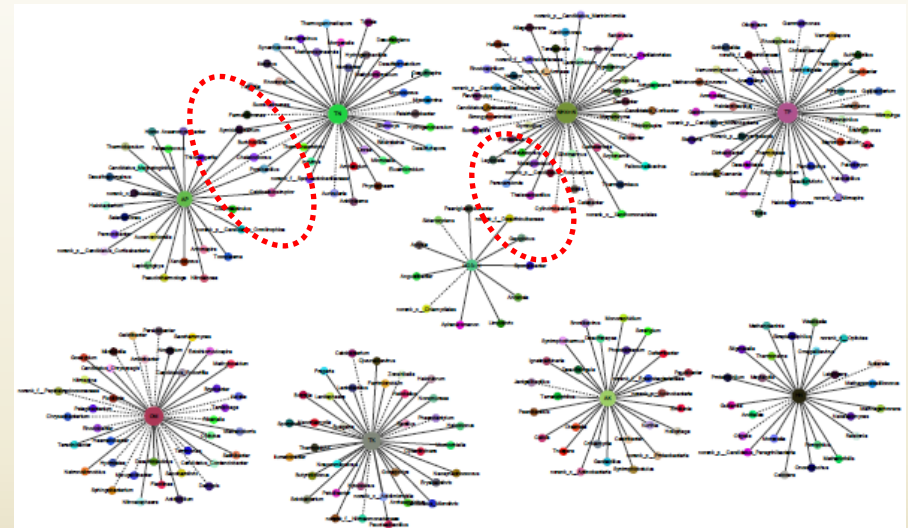
Metabolic genes

3. Main Results

3.4 Correlation between soil microbial community and soil texture



Cn+Sp



Sn+Cp

A better organized or a better operational community with more functionally interrelated members

4. Summary and Conclusion

The use of disease-suppressing soil microorganisms to construct tobacco rhizosphere microbial communities at seedling stage can significantly reduce the occurrence of bacterial wilt, improve soil microbial structure and function.

The association between microbial community and multiple physical and chemical indicators in disease-suppressing soil is closer, providing a probability to avoid the microbial imbalance caused by physical and chemical indicators. This will achieve biological prevention and control.

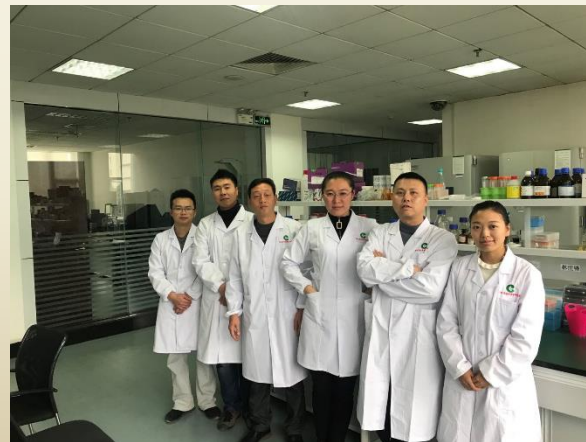
Acknowledgements



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Dr. Liu Yanxia



Welcome to Colorful Guizhou!

