

JILU CHE

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RESEARCH INTEREST

Plant-microbe interactions, Screening and application of functional microorganisms

EDUCATION

- Ph.D Candidate in Forestry

September 2021 - Present

Nanjing Forestry University

- Supervisor: Prof. Weilin Li

- Master of Science (M.Sc.(Agr.)) in Forestry

September 2014 - June 2017

Zhejiang Agriculture and Forestry University

- Supervisor: Prof. Shuquan Yu
- Thesis: *Heavy Metal Enrichment Efficiency of Urban Green Tree of Cinnamomum Camphora in Different Pollution Degrees*

- Bachelor of Science (B.Sc.(Agr.)) in Landscape

September 2009 - June 2014

North West Agriculture and Forestry University

RESEARCH EXPERIENCE

Institute of Soil Science, Chinese Academy of Sciences

September 2020 - August 2021

Research Associate

Adviser: Prof. Xin Song

- Working towards sustainable remediation of soil with microbial coupling thermal treatment and phytoremediation. We focus on the exploration of microorganisms that degrade PAHs and plants that bioaccumulate PFASs, which contribute to sustainable remediation.

Nanjing Agriculture University

September 2017 - August 2020

Research Associate

Adviser: Prof. Qingsheng Cai

- Exploring plant responses to cadmium stress and functional genes in plant responses to cadmium stress; screening for Cd-tolerant PGPR. Explore the methods of molecular breeding or exogenous addition to alleviate cadmium stress to plants.

PROJECTS

- Cd-tolerant PGPR screening and its effect on Switchgrass

Cd in soils inhibits plant growth, therefore it is important to screen Cd-tolerant PGPR to overcome the inhibition. We first collected contaminated plant and its rhizosphere soil samples, then isolated multiple strains that have growth-promoting characteristics (IAA production, ACC deaminase activity and phosphate solubilization activity) and are Cd-tolerant. After that, we inoculated them into Switchgrass seedlings and verified their promoting effects.

- Exploring the physiological and molecular mechanisms of switchgrass response to cadmium stress

Switchgrass can be used for revegetation of Cd-contaminated soil. Candidate functional genes for cadmium tolerance in switchgrass were analysed based on transcriptomic data. Previous study highlighted the indispensable role of HSF/HSP network in switchgrass Cd tolerance. This study selects the target gene and construct the target gene expression vectors in Arabidopsis and Switchgrass to identify the gene function and explore the regulatory mechanism under cadmium stress.

- Heavy metal enrichment efficiency of urban green trees in different pollution degrees

This program aims at studying phytoremediation of heavy metals in soil. We worked on the urban green trees under different levels of heavy metal pollution. Plant organs (leaf, branch and trunk) and plant

rhizosphere soil were collected, and heavy metal element concentration were analyzed by ICP-OES. The results show that trunks of *Cinnamomum camphora* enrich significantly more Pb and Ni than the other organs, and have the potential to be an alternative option for heavy metal contaminated soil remediation.

- Heavy metals accumulation and risk assessment in river surface sediments

This project is to investigate heavy metals pollution in surface sediment of the Lower Ou River and coastal urban river. To this end, we evaluated the concentrations of multiple heavy metals (Cr, Co, Ni, Cu, Zn, As and Pb) in collected samples. We then analyzed the characteristics, explored source of heavy metals, and assessed potential ecological risks.

PUBLICATIONS

- Root Niches of Blueberry Imprint Increasing Bacterial-Fungal Interkingdom Interactions along the Soil-Rhizosphere-Root Continuum,

Jilu Che, Yaqiong Wu, Hao Yang, Shaoyi Wang, Wenlong Wu, Lianfei Lyu, Weilin Li, *Microbiology Spectrum*, 2023, 11(3):1-15.

- Long-term cultivation drives dynamic changes in the rhizosphere microbial community of blueberry,

Jilu Che, Yaqiong Wu, Hao Yang, Shaoyi Wang, Wenlong Wu, Lianfei Lyu, Weilin Li, *Frontiers in Plant Science*, 2022, 13:962759.

- Mechanisms of biostimulant-enhanced biodegradation of PAHs and BTEX mixed contaminants in soil by native microbial consortium,

Mukhtiar Ali, Xin Song, Qing Wang, Zhuangxia Zhang, *Jilu Che*, Xing Chen, Zhiwen Tang, Xin Liu, *Environmental pollution*, 2023, 318:120831.

- Utilization of biochar prepared by invasive plant species *Alternanthera philoxeroides* to remove phenanthrene co-contaminated with PCE from aqueous solutions,

Xin Liu, Qing Wang, Xin Song, Kang Li, Mukhtiar Ali, Changlong Wei, *Jilu Che*, Siwei Guo, Xuedan Dou, *Biomass conversion and biorefinery*, 2022, 2190-6815.

- Characteristics of Heavy Metal Enrichment Efficiency in Different Organs of Urban Green Tree *Cinnamomum Camphora*,

Jilu Che, Shuquan Yu, Hui Liu, Wenxin Qiu and Yating Wen, *Chinese Journal of Applied Ecology*, 2017, 28(09):2907-2916. (In Chinese)

- Pollution Characteristics, Sources and Potential Ecological Risk of Heavy Metals in Surface Sediment from the Lower Ou River,

Jilu Che, Shuquan Yu, Xin Zhang, Peng Qi, Licheng Liang and Jiajun Yu, *Ecological Science*, June 2017, 36(04):176-184. (In Chinese)

- Effects of Soil Heavy Metal Content on Heavy Metal Accumulation Characteristics in the Upper Part of *Magnolia Grandiflora* L,

Hui Liu, Shuquan Yu, *Jilu Che*, Wenxin Qiu and Yating Wen, *Journal of Northeast Forestry University*, 2018, 46(01):31-39. (In Chinese)

- The Effects of Land Use on Soil/Sediment Heavy Metal Pollution and Ecological Risk Assessment at Dongtou Islands, Zhejiang, China.,

Xin Zhang, Shuquan Yu, Qinglin Li, Chao Zhang, Linghuan Li and *Jilu Che*, *Ecological Science*, 2016, 35(05):126-135. (In Chinese)

- Pollution Characteristics and Potential Ecological Risk of Heavy Metals in Urban Surface Water Sediments from Yongkang,

Peng Qi, Shuquan Yu, Chao Zhang, Licheng Liang and Jilu Che,
Environmental Science, 2015, 36(12):4486-4493. (In Chinese)