CURRICULUM VITAE

CONTACT INFORMATION

Name: Xiaokang Dai
Gender: male
Date of Birth: JAN.13, 1994
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Sichuan Agricultural University
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EDUCATION

09/2020-Present Ph.D
College of forestry, Sichuan Agricultural University
Major: Forest Protection
09/2017-06/2020 Master
College of forestry, Sichuan Agricultural University
Degree: Agriculture Bachelor
Major: Forest Cultivation

PARTICIPATE IN RESEARCH PROJECT

2016-2020
Participated in the field investigation of Pingchang,Xuanhan, Zitong, Nanjiang, Enyang, and Dechang county germplasm resources, and the collection and identification of internal specimens
2018
Participated in the second survey of China's national key protected wild plant resources, and organized leading teams to conduct field observation, survey, collection and data report sorting for several times
2020-2022
Technical guidance of Wanlixing plant disease in Liangshan Prefecture
2022.04
Drone spraying and control of leaf diseases of Horsetail pine in Hanyuan

SKILLS

English: Good reading, writing, and oral English communication skills;

Computer: Proficient in the use of SPSS, Sigmaplot, ArcGIS, Photoshop, CAD; Basic operation in the use of canoco for windows; Skillful in using MS-Office and other relevant software.

Research:

Plant diversity survey; Plant identification; Specimen making

Possess excellent skills in the leaf function analysis on plant communities (mainly based on carbon, nitrogen and phosphorus analysis) and related soluble sugar, protein and enzyme activity analysis;

Skilled in analyzing composition components: carbon, nitrogen and phosphorus, carbohydrates, enzymes, volatile oil, ash, alcohol-soluble extracts, non-volatile ether extracts

Possess excellent skills in the dynamic analysis on compositions of litter and soil;

Soil physicochemical properties: pH, Soil bulk density, Soil porosity, Soil water-holding capacity, N, P, K, C, Ca, etc;

Soil microorganism: soil microbial biomass C, N, P;

Soil enzymes: Soil Urease, Acid phosphatase, Invertase, Cellulase, Catalase, Peroxidase and Polyphenol oxidase activities;

Plant disease isolation and identification capabilities

Well-developed interpersonal skills;

Interests: running, biking, climbing, reading, basketball.

Others: Chinese Driving License

PUBLICATIONS AND PAPER SUBMITTED

1. **Xiaokang Dai, S**hujiang Li, Lin Li, Wenjian Wei, Shuying Li, Tiantian Lin, and Tianhui Zhu. Brown leaf spot of *Jacaranda mimosifolia* Caused by *Colletotrichum karstii* in Sichuan, China. Plant Disease. (First Look)

2. **Xiaokang Dai**, Maosong Feng, Congde Huang, et al. Soil stoichiometry and bamboo shoot yield characteristics of Chimonobambusa utilis at different altitudes in the southern edge of Sichuan Basin. Journal of Sichuan Agricultural University, 2020, 38(1):43-51. (*in Chinese with English abstract*)

3. Wenyu Bai, Liehua Tie, Maosong Feng, Juan Lai, **Xiaokang Dai**, Jiaxiang Gao. Photosynthetic and chlorophyll fluorescence characteristics of alder grafted seedlings of different species. Journal of Sichuan Agricultural University, 2020, 38(6):670-676+692. (in Chinese with English abstract)

SCHOLARSHIPS AND HONORS RECEIVED

2018-2019, National Third-class Academic Scholarship;

2020-2021, National Third-class Academic Scholarship;

2021-2022, National Second-class Academic Scholarship;

SUPERVISOR

Tianhui Zhu, PhD

Professor

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RESEARCH IN PhD

My main research is on root rot of fir trees. It is a tree of Fir family and Fir genus. Fir is an important fast-growing commercial forest species in southern China. According to the results of the 9th National Forest Inventory, the area of fir plantation forest in China reached 9.867 million hm^2 and the accumulation volume reached 75.5 million m^3, accounting for 1/4 and 1/3 of the total area and accumulation volume of plantation forest in China respectively, both ranking -. The geographical span of fir distribution is large, spanning the entire subtropical, tropical northern edge, warm temperate southern edge and other climatic zones in China, covering 19 provinces and regions, and has been introduced and cultivated in more than 10 countries in America, Europe, Southeast Asia, Africa, Oceania and other regions.

Root rot is a soil-borne disease caused by microorganisms that infest the root system of plants. The disease causes root rot, gradual weakening of water and nutrient absorption, and eventually total plant death, mainly in the form of yellowing and wilting of the entire plant foliage. The root rot fungus usually spends the winter in the soil and in the disease residue, with less incidence in winter. The disease starts to appear in March and April, and reaches its peak in May. Early summer rains, much high moisture in the soil, acidic environment and poor aeration make the peach roots suffocate and the pathogens grow vigorously. Root rot is a serious hazard. Root rot exists in apple, soybean, panax pseudoginseng, walnut, pepper and other plants, so research on root rot has been more comprehensive and extensive. Research on root rot has focused on three aspects: first, isolation and identification of root rot pathogens; second, analysis of soil microbial communities of root rot plants; and third, biological control of root rot.

My main research is in these areas：

(1) To analyze the relationship between plant growth and soil physicochemical properties by comparing the differences in physiological indicators, soil physicochemical properties, soil enzyme activity and other important environmental factors between healthy and root-rot affected plants

To investigate the dynamic characteristics of physiological indicators, soil physicochemical properties, soil enzyme activities and other important environmental factors between healthy and root-rot affected plants, to evaluate the macroscopic effects of root rot on plants, and to provide basic data for subsequent studies on the effects of environmental factors on the inter-root microbial community.

(2) Dynamic synergistic relationships between inter-root microbial-fine root-soil C/N of healthy and root-rot affected plants

Summarizing previous studies, it was found that C/N is an important factor in soil properties affecting the subsurface microbial community. By measuring the carbon and nitrogen contents of inter-root microorganisms, fine roots, and inter-root soil, the dynamic synergistic changes in C/N stoichiometry characteristics at the microbial-fine root-soil level were investigated to reveal the distribution patterns and interactions mechanisms of carbon and nitrogen nutrients at the root-soil level, as well as to provide basic data for subsequent specific studies on the subdivision of microbial communities within and between roots.

(3) Impact of soil-borne disease invasion on inter-root microbial communities

High-throughput sequencing technology was used to characterize the inter-root microbial communities of healthy and diseased plants, and to derive the composition, structure and diversity of healthy and diseased inter-root microbial communities.

(4) Driving force analysis of environmental factors on inter-root microorganisms of soil-borne diseases

Using RDA redundancy analysis, the influence of soil factors and other important environmental factors on inter-root microorganisms was studied with inter-root microbial communities. To reveal the complex response mechanisms of inter-root microorganisms to environmental factors during the infestation of soil-borne diseases.

(5) Response mechanisms of inter-root microorganisms affected by soil-borne diseases based on functional characteristics, molecular ecological network models and phylogenetic features

The functional family characteristics of bacteria and fungi were predicted by Tax4Fun and FUNGuild tools,

molecular ecological network models were constructed, and phylogenetic trees were built for bacteria and fungi to analyze more comprehensively and systematically the ecological impact mechanisms of soil-borne diseases on inter-root microorganisms based on (4).

(6) Construction of synthetic community was extremely simplified

A synthetic community consisting of 10 strains of high-abundance bacteria and 3 strains of low-abundance bacteria enriched in diseased roots was constructed (SCI). In addition, we selected nine strains of bacteria with reduced abundance and four strains were randomly selected in diseased roots to construct synthetic community II (SCII) as a control. In addition, using a combination of PacBio sequencing and plant selection, we simplified the complex synthetic community (SCI) into a simple four-strain synthetic community (SCIII) to confer resistance to root rot.

(7) The individual and combined roles of these four bacteria in SCIII for Fusarium acnes growth, plant growth promotion, host plant-induced systemic resistance (ISR) activation, and root rot control were investigated.

I also studied foliar diseases and published journal “Brown leaf spot of *Jacaranda mimosifolia* Caused by *Colletotrichum karstii* in Sichuan, China” in Plant disease.