54th FEFCO

Forest Ecosystem Function Colloquium (FEFCO) は、地域や地球全体のレベルで森林生態系の機能とその持続的活用法を統合的に理解することを目的とし、研究者間の学術交流を推進します。

第54回森林生態系機能コロキウムは、プリンストン大学のPo-Ju Ka博士にご講演いただきます。どなたでも参加できますので、多くの皆様のご参加をお待ちしております。京都大学農学研究科熱帯環境学研究室がホストを務めます。

54th FEFCO

2021/5/20 16:30 - 18:00

via zoom (for registration, please fill out following form https://forms.gle/BvF7S95hHUB9P78y5)

Dr. Po-Ju Ke

(Department of Ecology and Evolutionary Biology, Princeton University, postdoctoral researcher, in Prof. Jonathan Levine's lab)

Predicting the effects of plant-soil microbe interactions on plant community dynamics

Reciprocal interactions between plants and soil microbes (i.e., plant-soil feedback, PSF) are increasingly recognized as a process structuring plant communities. However, as the impacts that soil microbes have on plants vary greatly across different systems, it is challenging to integrate results into a general predictive theory. Moreover, current theories assume simplified microbial dynamics and constant interaction strength between plants and soil microbes, overlooking the temporal complexity embedded within plant-soil microbe interactions. In this talk, I will first show how we can use the concepts of stabilizing (i.e., increasing species' niche differences) and equalizing (i.e., decreasing species' competitive hierarchies) from modern coexistence theory to contextualize the diverse effects of soil microbes on plant coexistence. In the second part, I will focus on how the temporal dimensions of PSF regulate the pathways through which soil microbes influence plant competitive outcomes. Using a >20-year soil conditioning chronosequence, I present evidence that soil microbial communities are progressively changing as plants continue to condition the soil, and such turnover of soil microbes translate into temporally varying PSF strength. With a patch occupancy model, I further show that the conditioning and decay rates of PSF, as well as the specific plant demographic transition affected by soil microbes, predict whether soil microbes act primarily as stabilizing or equalizing forces. Taken together, I demonstrate how we can work towards a framework to better predict the outcomes of plant-soil microbe interactions in their natural context.

Forest Ecosystem Function Colloquium
京都大学・森林生態系機能コロキウム