Q-AOS 九州大学 アジア・オセアニア研究教育機構 ブラウンバッグセミナー

Brown Bag Seminar No.219

2026 1.21 (wed.) 12:10 ~ 12:50

12:10-12:15 ◆ Introduction
12:15-12:40 ◆ Seminar (Presentation)
12:40-12:50 ◆ Q&A

Online (Zoom)
Scan here for Registration

https://us02web.zoom.us/webinar/register/WN_D0ctY5R0RRKOEYHtIrrbRw

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Community Ecology of Soybean Rhizobia and Mitigation of N_2O Emissions

Key Words

Soybean
Rhizobium
Symbiotic N fixation
N_2O mitigation
Denitrification

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I am Yuichi Saeki, from Yatsushiro City in Kumamoto Prefecture, Japan. I completed the doctoral course in the Graduate School of Agriculture at Kyushu University in March 1996 and received my Ph.D. in Agriculture. From 1996 to 1997, I worked as a postdoctoral fellow at the University of Texas, USA. Fortunately, in 1997 I was appointed as an Assistant Professor in the Faculty of Agriculture at the University of Miyazaki, Japan.

From 2001 to 2002, I participated in the "Hanoi Agricultural University Strengthening Project" in Vietnam as a JICA-dispatched expert, where I was engaged in strengthening the university's research and educational capacity. After returning to Japan, I continued to work at the University of Miyazaki, becoming an Associate Professor in 2005, and a full Professor in 2012, a position I still hold today. Currently, I serve as the Dean of the Graduate School of Agriculture and Engineering at the University of Miyazaki, where I am involved in managing the doctoral program.

For about 30 years, I have been conducting research on "the community ecology of soybean-nodulating rhizobia along environmental gradients." In recent years, I have also been studying the community ecology of legume-nodulating rhizobia in the Philippines and Japan. I am honored to have received the Young Scientist Award from the Japanese Society of Soil Science and Plant Nutrition in 2008, and the Kyushu Branch Academic Award from the same society in 2017.

I have contributed to several books, including the sections "Useful Microorganisms I: Nitrogen-Fixing Bacteria" in Soil Microbiology (Asakura Publishing, Japan), "Microorganisms that Support Plant Growth" in the Encyclopedia of Environment and Microorganisms (Asakura Publishing, Japan), and "Converted Fields and Soybean Production" in the Encyclopedia of Japanese Soils (Asakura Publishing, Japan).

My hobbies include fishing, playing the guitar, astrophotography, keeping tropical fish, and spending time with my Shiba Inu. I look forward to speaking with you.

Soybean-nodulating rhizobia infect soybean roots to form root nodules, which are symbiotic organs. Once inside the nodules, the bacteria obtain energy from the host soybean and fix atmospheric nitrogen, supplying the host with ammonia. Through this symbiotic nitrogen fixation, soybeans can grow healthily even under low-nitrogen conditions.

Rhizobia inhabiting soils exhibit different genotypes along environmental gradients. In converted paddy fields, the rhizobial species that become dominant show high nitrogen-fixing activity and possess all the enzymes required for nitrate respiration (denitrification), making them beneficial strains that do not emit nitrous oxide (N_2O), a potent greenhouse gas. By utilizing such advantageous rhizobia, it becomes possible to achieve soybean production that maintains yield while avoiding greenhouse gas emissions.

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