

iFAST: The International Forum on Advanced Environmental Sciences and Technology

A series of distinguished seminars by eminent scientists

8 a.m. CDT; 9 a.m. EDT; 1 p.m. GMT; 9 p.m. Beijing

Wednesday, Oct. 27, 2021



James Ivor Prosser
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<http://www.abdn.ac.uk/biologicalsci/staff/details/j.prosser>

Jim Prosser is an emeritus professor in environmental microbiology in the School of Biological Sciences at the University of Aberdeen. He was awarded a bachelor of science degree in microbiology by Queen Elizabeth College, University of London, in 1972 and a doctoral degree by the University of Liverpool, in 1975. Prosser then carried out postdoctoral research in Liverpool before moving to a lectureship at the University of Aberdeen, where he held a personal chair prior to retirement in 2020. His research focuses on the ecophysiology, diversity and ecosystem function of soil microorganisms, with particular emphasis on ammonia oxidizers. This research has uncovered novel microbial groups involved in biogeochemical cycling processes and situations in which niche specialization impacts on process rates. He has demonstrated the role of pH and ammonia supply on ammonia oxidizer communities, the influence of community composition on ecosystem function, including nitrous oxide emissions, and the implications for nitrogen fertilizer strategies. This research has involved the development of molecular techniques to characterize natural communities of soil microorganisms, and their activities, and the use of model systems to address ecological questions. He is a Fellow of the Royal Society, the Royal Society of Edinburgh, the Royal Society of Biology and the American Academy of Microbiology and was awarded an Order of the British Empire for services to Environmental Science in 2013. He has an honorary degree from the University of Ljubljana, is a distinguished international professor at the College of Arts and Sciences and has served on the editorial boards of several microbial ecology journals. He is also a director of NCIMB Ltd., a microbiological services spin-out company from the University of Aberdeen.

Niche specialization in microbial communities: lessons learned from ammonia oxidizers

The concept of niche specialization and differentiation provides the basis for, arguably, the majority of studies of microbial community ecology. It is attractive in linking evolutionary theory and ecology and is the rationale for descriptive, correlation-based studies that implicitly, if not explicitly, assume links between phylogeny, function and environmental characteristics. Similarly, analysis of the ecophysiology, biochemistry and omics of environmental isolates, and of genes, transcripts, metagenomes and metatranscriptomes in extracted nucleic acids, aims to increase understanding of community ecology by establishing links between functions or predicted functions and the characteristics of the source environment. Niche theory has been developed in animal and plant community ecology, where its benefits, limitations and alternatives have been well studied. However, its direct application to archaeal and bacterial community ecology presents a number of challenges that potentially limit its value in understanding, explaining and predicting the composition of microbial communities, the influence of environmental change and the consequences for ecosystem processes. These challenges will be discussed with respect to niche specialization in ammonia oxidizers, the different approaches that have been used in studying their community ecology and the lessons that have been learned that may guide future studies.



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Zoom webinar ID: 934 8142 2012 (<https://zoom.us/j/93481422012>)

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