



# The Royal Society of Western Australia

RSWA Monthly Talks

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## Why do we find our richest flora on our poorest soils?

### Professor Hans Lambers

School of Plant Biology, University of Western Australia

**Monday 15<sup>th</sup> August 2016**

**7.00 pm Kings Park Administration Building, Fraser Ave**

South-western Australia is a global biodiversity hotspot, where the greatest plant diversity is found on the most severely phosphorus-impoverished soils in kwongan (or kwongkan). Mycorrhizas are known to enhance plant phosphorus (P) acquisition, but non-mycorrhizal plant families (*e.g.*, Proteaceae) feature most prominently on the poorest soils, and these families are uncommon on soils containing more P. Almost all Proteaceae produce carboxylate-releasing cluster roots, which are capable of mobilising scarcely available P and micronutrients, including manganese. They effectively 'mine' these nutrients, as opposed to 'scavenging' them from the soil solution further away from the root surface, as mycorrhizas do. In addition to efficient acquisition of phosphorus from soil, south-western Australian Proteaceae species also use the acquired phosphorus very efficiently in photosynthesis. They also show a tremendous capacity to remobilise phosphorus from senescing leaves and contain a large amount of P in their seeds. The traits referred to here help explain the ecological success of non-mycorrhizal species on severely P-impoverished soils in south-western Australia. These same traits may also have allowed non-mycorrhizal families to diversify in these severely nutrient-impoverished environments. A very exciting question that remains to be explored further is why species with a superior P-acquisition strategy coexist with ones that are less effective at acquiring soil P. We have some answers, but future research will explore this in greater detail.

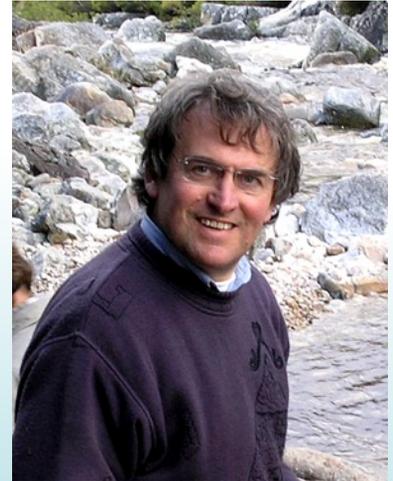


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## Biography

### Prof. Hans Lambers



Hans' key areas of research have been plant respiration, plant growth analysis, and plant mineral nutrition. He invariably aims for integration of the fields of physiology and biochemistry at whole plant and vegetation levels. In research begun subsequent to his emigration to Australia in 1998, his group contributed significantly to our understanding of the mineral nutrition of Australian plants, especially Proteaceae, and crop legumes. The high level of this work is internationally highly regarded and has led his appearance on the very first ISI list of highly-cited authors in plant and animal science.

In his work after his move to UWA, his team discovered why fertilisation with phosphorus so readily leads to "phosphorus toxicity" in several species of the Proteaceae. Apart from numerous primary papers and authoritative reviews, he also edited 12 books in all his key research areas, and he has trained many successful young researchers, at undergraduate level, as PhD students and as Postdoctoral Researchers. His primary research appears in leading journals, and he has written several invited reviews as well as a major textbook in plant physiological ecology which has been translated into Chinese and Persian.

In 2006, Hans established the Kwongan Foundation for the conservation of Australia's biodiversity. With a team of scientists in WA, he uses this Foundation to secure Unesco World Heritage Listing for Australia's Southwest Biodiversity Hotspot.

More at: <https://www.facebook.com/kwonganfoundation/>

Among others, his Honorary Professorship at China Agricultural University, Beijing, China (2002), and election as Fellow of the Royal Netherlands Academy of Arts and Sciences (KNAW) (2003) and the Australian Academy of Science (2012) all testify to his international standing.