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Use of the *Arabidopsis* MAGIC population to identify genes involved in phosphate use efficiency

Azizah Nahari
The University of Edinburgh, UK

Limitation of crop productivity by phosphate (Pi) is widespread and will probably increase in the future. A better understanding of phosphate use efficiency (PUE) is required for engineering nutrient-efficient. In this study, we designed a hydroponic system for a specific reason which is to avoid complication from differences in Pi uptake. The current experiment examined 213 of the total 527 MAGIC lines under high and low phosphate conditions in hydroponic system, and the results generated considerable variance with regard to various PUE elements and growth features (namely, RFW, SDW, SPC, and flowering time). By using QTL mapping, we have identified QTLs involved in PUE. Having examined the broad 213 MAGIC population, considerable variance in PUE and its constituent features has been recorded. This is indicative of the manifest variance in PUE for the examined lines. It is significant to note that, at the level of the species, lines under the low Pi condition displayed greater PPUE when considered in relation to those under the high condition. Furthermore, the association with regard to PPUE and the features of SDW and Pi content was determined as positive for all lines under the low Pi condition. Notably, these findings provide valuable insight regarding individual lines and the degree to which they can grow effectively in high and low Pi conditions. Additionally, it has identified lines characterised by dissimilar PUE values that could be appropriate for utilisation in breeding schemes with the intention of enhancing the features in novel cultivars.

Biography

Azizah Nahari is a PhD student in her last year from the University of Edinburgh. She has a Master's degree from King Abdulaziz University. She is working as a Lecturer at King Abdulaziz University School of Biological Science.

a.nahari@sms.ed.ac.uk

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