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Oxi1 mutant plays an important role in Arabidopsis resistance against aphid (*Myzus persicae*)

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The interactions between plants and insect herbivores comprise a complex, co-evolved natural system. Arabidopsis mutants provide a powerful tool for studying plant-insect interactions as the phenotype of individual gene deletions can be studied with relative ease. Oxidative signal inducible (Oxi1) is a serine/threonine kinase required for oxidative burst-mediated signalling in Arabidopsis roots and full activation of MAPKs cascades. The expression of β -1,3-glucanase, important in the response to aphid feeding, are also investigated through the use of Gns1, Gns2 and Gns3 mutants. Oxi1 mutants showed resistance to aphids and delay the developmental rate in both adults and nymphs compared to the Col-0 wild type. β -1,3-glucanase genes Gns1, Gns2, Gns3 and Gns5 were not expressed in Oxi1 mutant. However, Gns2 was expressed to high levels in Col-0 in response to aphid feeding. Also, Gns2 was up-regulated in both Oxi1 null mutant in WS2 and WS2 background. Callose synthase GSL5 was down-regulated in both Oxi1 null mutant in WS2 and WS2 background. β -1,3-glucanase mutants Gns1, Gns2 and Gns3 were resistant to aphid feeding and aphid development in both adults and nymphs. Callose synthase is an important for plant resistance especially callose synthase GSL5. Expression of β -1,3-glucanase genes, especially Gns2, play an important role in plant susceptibility in response to aphid feeding. Oxi1 mutants showed resistance in response to aphid feeding. Potentially through the induction of callose deposition via MAPKs resulting in inducing ROS as an early response and signal transduction improves the resistance level of the plant.

Biography

Tahsin Shoala has completed his PhD at the age of 37 years from Newcastle University and he is currently an Assistant Professor at College of Biotechnology, Misr University for Science and Technology. He is the Chief Executive of MEDIC, Misr Entrepreneur Development Innovation Centre. He has published more than 5 papers in reputed journals and is running a number of research projects.

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