Agri-2014
OMICS Group Conferences
Accelerating Scientific Discovery
2nd International Conference on
Agricultural & Horticultural Sciences
February 03-05, 2014 Hyderabad, India

Stacking of Antimicrobial genes in potato transgenic plants confers increased resistance to bacterial and fungal pathogens

M. Mercedes Rivero

Rosario Agrobiotechnology Institute (INDEAR), Argentina

Abstract

Solanum tuberosum plants were transformed with three genetic constructions expressing the *Gallus gallus* lysozyme, *Nicotiana tabacum* AP24 osmotine *and Phyllomedusa sauvagii* dermaseptin and with a two-transgene construction expressing the AP24 and lysozyme sequences. Re-transformation of dermaseptin-transformed plants with the AP24/lysozyme construction allowed selection of plants simultaneously expressing the three transgenes. Potato lines expressing individual transgenes or two- and three-transgene combinations were assayed for resistance to *Erwinia carotovora* using whole-plant and tuber infection assays. Resistance levels for both infection tests compared consistently for most potato lines and allowed selection of highly resistant phenotypes. Higher resistance levels were found in lines carrying the dermaseptin and lysozyme sequences, indicating that these proteins are the major contributors to antibacterial activity. Similar results were obtained in tuber infection tests conducted with *Streptomyces scabies*. Plant lines showing the higher resistance to bacterial infections were challenged with *Phythophtora infestans*, *Rhizoctonia solani* and *Fusarium solani*. Considerable levels of resistance to each of these pathogens were evidenced employing semi-quantitative tests based in detached-leaf inoculation, fungal growth inhibition and in vitro plant inoculation. On the basis of these results, we propose that stacking of these transgenes is a promising approach to achieve resistance to both bacterial and fungal pathogens.

Biography

M. Mercedes Rivero, biologist specialized in agrobiotechnology, completed her P.hd from Buenos Aires University. She has worked at Buenos Aires University for 15 years in the Plant Biology-Biodiversity and Physsiology-Molecular & Cellular Biology Departments. She is an expert on plant genetic transformation as she has been trained at very well-known Argentinean and international centers on Plant Biotechnology as the International Center of Tropical Agriculture (CIAT) and the Plant Transformation Facility of Iowa State University (PTF; ISU). She has participated in several projects on applied agro biotechnology and worked in research at the Inst. of Genetic Engineering and Molecular Biology (CONICET) from 2000 to 2007 as responsible an consultant professional on several national and international projects on plant transformation. Her project on potato genetic transformation has been recently renowned by the Argentinean Minister of Science and Technology (MiCyT) for the innovative concept of her research. For the last 6 years she has became the Head of the Plant Transformation Laboratory of the Institute of Agro-biotechnology (INDEAR) located in Rosario, Argentine. She has published several scientific papers and contributed in different book chapters on agro biotecnology concepts. In recent she leads several projects on soybean and alfalfa transformation at INDEAR.