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## **Crop improvement and tolerant to yam virus yam (yvY) through agrobacterium mediated gene transfer to bring positivity result in specific gene mutation of yam (*Dioscorea rotundata*) for crop adaptability**

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Genetic transformation of yams asexually propagated has been widely used as a tool for yams improvement and as a vital part of the development of functional genomics resources, there has been no report of any existing *Agrobacterium*-mediated transformation of yam (*Dioscorea* spp.) with evidence of stable integration of YVY. *Dioscorea* is an important crop in the tropics and subtropics providing food security and income to million people. However, yam production remains constrained by increasing levels of field and storage pests and diseases. A major constraint to the development of biotechnological approaches for yam improvement has been the lack of an efficient and robust transformation and regeneration system. In this study, we developed an *Agrobacterium*-mediated transformation of *Dioscorea rotundata* using lateral buds as explants. Two cultivars of *D. rotundata* were transformed using *Agrobacterium tumefaciens* harboring the binary vectors containing selectable marker and reporter genes. After selection

with appropriate concentrations of antibiotic, shoots were developed on shoot induction and elongation medium. The elongated antibiotic-resistant shoots were subsequently rooted on medium supplemented with selection agent. Successful transformation was confirmed by polymerase chain reaction, Southern blot analysis, and reporter genes assay. Expression of YVY gene in transgenic plants was also verified by reverse transcription polymerase chain reaction analysis. Transformation efficiency varied from 7.4 to 17.3% depending on the cultivars, selectable marker genes, and the *Agrobacterium* strain used for transformation. It took 4-6 months from Agro-infection to regeneration of complete transgenic plant. Here we report an efficient, fast and reproducible protocol for *Agrobacterium*-mediated transformation of *D. rotundata* using lateral buds as explants, which provides a useful platform for future genetic engineering studies in this economically yam resistance to virus.

### **Biography**

Mr Mathenge currently a Postgraduate student Kenyatta University Kenya working on *Erysiphe pisi* on garden pea. He joined research group under Cgiar group and kirk trust fund 7yrs ago. He has 15 publications on plant science. He emerges best in Africa award in several presentations on molecular plant pathology under Global conferences on crop improvement. Under the grants he has supported 16 young scientists through research funding and trainings.