

## Poster

### Bioinformatics Resources for Application of Molecular Breeding in Orphan Root Crops

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#### **Abstract**

Modern breeding of root and tuber staple food crops is the most practical strategy to address the challenges of small holding farmers in developing nations. The rapid advance of genomics technologies can enable breeders to design cost-effective and efficient breeding strategies by exploiting the ability of molecular plant breeding to increase favorable gene action and efficiency of selection. The rapid growth of sequencing and genotyping technology and the parallel growth of bioinformatics and online biological resources can successfully be harnessed for innovative breeding approach to accelerate the process of variety development. Root crop scientists in developing countries, however, are not in a position to utilize the existing tools due to lack of information on the existence or the usefulness of such tools. In view of moving towards molecular breeding, we indicate web based, free access, integrated resources for building basic bioinformatics skills. Selected online resources for self-paced tutorials and other skill building opportunities are outlined. Particular emphasis was made to comparative genomics techniques to develop genomic resources for molecular breeding. The first step towards variant discovery is the mining of data in public databases. Subsequently the retrieved data would be analyzed to compare nucleotides, perform similarity search, deduce protein sequences, and understand the function of the protein. The ultimate goal is to identify and validate nucleotide variants associated with key traits for development of user-friendly molecular markers. It should be noted that investment in bioinformatics capacity building is more affordable and feasible in light of accessibility of cutting edge Information and Communication Technology (ICT) in all corners of the world. To gain the benefit of genomics and bioinformatics, African research institutions should consider investing in human resources and infrastructure development in addition to forging strong partnerships with advanced research institutes.

**Key words:** *Bioinformatics; cassava; molecular breeding; genomics; genotyping; marker*