

The First Transcriptome Assembly of Marama Bean: An African Orphan Crop

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Abstract : Orphan crops are underresearched and underutilized food plant species that have not been categorized as major food crops, but have the potential to be economically and agronomically significant. They have been documented to have the ability to tolerate extreme environmental conditions. However, limited research has been conducted to uncover their potential as food crop species. The New Partnership for Africa's Development (NEPAD) has classified Marama bean, *Tylosema esculentum*, as an orphan crop. The plant is one of the 101 African orphan crops that must have their genomes sequenced, assembled, and annotated in the foreseeable future. Marama bean is a perennial leguminous plant that primarily grows in poor, arid soils in southern Africa. The plants produce large tubers that can weigh as much as 200kg. While the foliage provides fodder, the tuber is carbohydrate rich and is a staple food source for rural communities in Namibia. Also, the edible seeds are protein- and oil-rich. Marama Bean plants respond rapidly to increased temperatures and severe water scarcity without extreme consequences. Advances in molecular biology and biotechnology have made it possible to effectively transfer technologies between model- and major crops to orphan crops. In this research, the aim was to assemble the first transcriptomic analysis of Marama Bean RNA-sequence data. Many model plant species have had their genomes sequenced and their transcriptomes assembled. Therefore the availability of transcriptome data for a non-model crop plant species will allow for gene identification and comparisons between various species. The data has been sequenced using the Illumina Hiseq 2500 sequencing platform. Data analysis is underway. In essence, this research will eventually evaluate the potential use of Marama Bean as a crop species to improve its value in agronomy. data for a non-model crop plant species will allow for gene identification and comparisons between various species. The data has been sequenced using the Illumina Hiseq 2500 sequencing platform. Data analysis is underway. In essence, this research will eventually evaluate the potential use of Marama bean as a crop species to improve its value in agronomy.

Keywords : 101 African orphan crops, RNA-Seq, *Tylosema esculentum*, underutilised crop plants

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