

# Combining Ability of Sweet Potato [*Ipomoea batatas* (L.) Lam] Genotypes for Beta Carotene and Dry Matter Content in Southern Guinea Savanna, Nigeria

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## Abstract

Roots of orange fleshed sweet potato varieties currently available in Nigeria contain high quantities of  $\beta$ -carotene or pro-vitamin A but have high moisture content. These varieties have been found to be a cheap and important remedy for vitamin A deficiency. The cream or white fleshed varieties on the other hand, have sweet taste with high dry matter content, giving a dry texture, a quality trait preferred in Nigeria. The objectives of this study were to examine the quantitative inheritance of important traits in sweet potato by means of a diallel analysis with a view to estimating the GCA and SCA components of genetic variance, and to determine the associated type of gene action controlling  $\beta$ -carotene content and root dry mass. A diallel crosses experiment using six parental sweet potato genotypes crossed in all possible combinations were carried out. Resultant thirty progenies were evaluated for beta carotene ( $\beta$ -carotene) and dry matter content in Landmark University, Omu Aran, Kwara State, Nigeria during the cropping season of 2012 and 2013. The 30 F<sub>1</sub> progenies along with their parental lines were planted in the same field trial. The trial was laid out in 6 x 6 triple lattice in two replications. Highly significant ( $P \leq 0.01$ ) differences were observed among the genotypes for all the tested traits. The average  $\beta$ -carotene content for the progenies was 2.86 (mg/100 g f.w.) while the dry matter content was 31.89%. The cross combination 199024.2 x Excel recorded the highest beta carotene (14.37 mg/100 g f.w) and dry matter content (40.10%), this candidate is therefore suggested for further evaluation.

**Key words:** Diallel analysis, Dry matter, Southern Guinea Savanna, Sweet potato, Vitamin A,  $\beta$ -carotene.

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