

'Dry and Starchy' Orange-fleshed Sweetpotato Farmer varieties: Implications for fighting Vitamin A Deficiency in East and Central Africa

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Abstract

Sweetpotato is a major staple and co-staple root crop for millions of the rural people in Africa. Recently, it has been demonstrated to be of human health importance by combating vitamin A deficiency. This paper is a summary review of recent findings on the orange-fleshed sweetpotato (OFSP) farmer varieties (FV) from East Africa (EA) and their potential contribution to combat vitamin A deficiency (VAD) in Africa. Between 2000 and 2006, scientists from East and Central Africa collected several OFSP varieties from farmers' fields together with the white- and cream-fleshed sweetpotato (WFSP) farmer varieties. Subsequent characterization studies using selected EA and exotic germplasm revealed critical findings for the future use of OFSP FV in Africa. Overall, molecular characterization showed that EA germplasm is distinct from non-African germplasm. It also showed that OFSP FV and WFSP FV from EA are very closely related. The two findings address suspicions that OFSP FV are of exotic origin. The OFSP FV differed from exotic OFSP on root dry matter (DM), starch and sucrose properties. Whereas the exotic OFSP are characteristically 'sweet and moist' (DM 25.0%, starch 50.0% and sucrose 10.3%), OFSP FV had characteristically high DM (33.0%), high starch (65.0%) and similar to the WFSP FV. It is these qualities that make sweetpotato a staple crop in Africa. However, root β -carotene content (BC) of some OFSP FV ['Ejumula', 240ppm; 'Carrot C', 259 ppm; 'Mayai', 264 ppm; and 'Zambezi', 233 ppm] nearly equaled that of 'Resisto' (271ppm), one of the popular OFSP cultivars in USA. These were shown to meet 400% of recommended daily allowance (RDA) with 250 g serving to a 5-8 year old child. Other light orange-fleshed FV like 'ARA244 Shinyanga', 'K-118', 'K-134', 'K-46', 'PAL161', 'Sowola6', 'SRT52', and 'Sudan' had lower root BC than 'Resisto' and were shown to meet between 50-90% RDA of the child. In conclusion, OFSP FV from EA might show similar adaptation to sub-Saharan African environments as their sister WFSP and have a big potential to alleviate VAD. Also, breeding for acceptable high DM and high starch OFSP varieties for African consumers seems possible.

Key words: orange-fleshed sweetpotato, farmer varieties, and vitamin A deficiency.