Title: **Establishment of an in vitro micropropagation protocol for farmer prefered cocoyam [colocasia esculenta (l) schott] and [xanthosoma sagittifolium (l) schott] cultivars grown inkenya**

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Abstract: Most of the world's food poor people live in sub Saharan Africa. For example in Kenya in 2004,48.4% of Kenya's population was considered as food poor. To meet this shortfall, a 55% increase in food production in Africa will have to come from intensification of production from land under cultivation. Several abiotic and biotic stresses limit crop production in Kenya. Exploitation of indigenous leafy vegetables adapted to the local environment will not only overcome both abiotic and biotic stresses but also improve food security,nutrition, and health of the rural poor. Cocoyam (Colocasia esculenta spp. And Xanthosoma sagittifolium spp) (L.) Schott) is an ancient crop grown throughout the humid tropics of Africa, the West Indies, the Pacific region and Asia for its edible corms and leaves, as well as for its traditional uses and is an important staple food for these developing countries as well as a principal root crop with great promise in generating income within the rural communities. Although cocoyam is an important staple in Africa, its production is constrained by diseases caused by fungi, bacteria, viruses and other pathogens. Tissue culture systems have assumed considerable importance as methods of producing disease-free plants .In vitro techniques offer an alternative, reliable method for the production of planting material, and the rates of multiplication have generally been modest. Currently there is no tissue culture system in place for cocoyam propagation for Kenyan cultivars. There is need therefore to develop a tissue culture system for regeneration of Kenyan cocoyam varieties.In This study applied tissue culture techniques to three Cocoyam varieties collected from major growing areas using their petioles and meristems as explants, that is, Kigoi (Colocassia esculenta L. Schott), Githungu (Xanthosoma sagittifollium L. Schott) and Ngirigacha (Colocassia esculenta L. Schott). The resultant plantlets were then exposed to green house and field conditions and performed well. Five variations of plant growth regulators namely (BAP and IAA) in combinations of 0.0 mg/L and 0.0 mg/L IAA; 2.0 mg/L BAP and 0.5 mg/L IAA; 4.0 mg/L BAP and 1.0 mg/L IAA; 6.0 mg/L BAP and 2.0 mg/L IAA and; 8.0 mg/L BAP and 3.0 mg/L IAA were titrated into Murashige and Skoog (MS) medium. Analysis for shoot and leaf formation, rooting, survival and corm production parameters illustrated that the highest yields were from meristems explants for BAP/IAA (mg/L) concentration (ratios) whereby Kigoi (6.0: 2.0) led in shoot formation, Githungu (without growth regulators PGR) in leaf formation and Ngirigacha (2.0:0.5) in root formation, plantlet survival and corm production. These concentrations were optimum for in vitro growth and production of corms in the three varieties. The micro-propagation protocol established in this study can be applied to laboratories in the regions efficiently, whereby it is hoped that the study findings will help to address the issue of food security.