

Verifying the premium value of selected African indigenous vegetables in target sites of the Lake Victoria basin

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Abstract

The purpose of this research was to verify the premium value in terms of nutritional and economic potential of selected African indigenous vegetable plants (AIVPs) along the Lake Victoria basin. Partial findings of this study being reported are on the smallholder farmer indigenous knowledge of vegetable production and utilisation in Jinja (Uganda) and Vihiga (Kenya). A survey was conducted to establish the status and level of utilisation of indigenous vegetable plants. whereby total of 163 households in each site were interviewed. Vegetables selected by smallholder farmers for production trials and nutrient quality analysis were *Cleome gyandra* (Saga, Eiyoby/Ejoby), *Amaranthus lividus* (Booga, Dodo), *Solanum scarbrum* (nakati) as indigenous vegetables. *Solanum melongena* (egg plant), *Daucus carota* (carrot), *Capsicum* spp. (pepper) were selected as the exotic vegetables. Laboratory analysis of these vegetables for phyto-nutrient characterisation is ongoing. The survey revealed that most farmers (90%) engaged indigenous vegetable farming for both food consumption and income generation. Most farmers regarded exotic vegetable farming as an income generation venture rather than home consumption. Most farmers were knowledgeable of the health and medicinal benefits of the indigenous vegetables.

Key words: African indigenous vegetable plants (AIVPs), farmers' knowledge; phyto-nutrients

Résumé

Le but de cette recherche était de vérifier la valeur additive en termes de potentiel nutritionnel et économique de certaines plantes de légumes indigènes africains (AIVPs) le long du bassin du lac Victoria. Les résultats partiels de cette étude sont signalés sur la connaissance indigène de petits agriculteurs concernant la production végétale et de son utilisation à Jinja (Ouganda) et à Vihiga (Kenya). Une enquête a été menée pour établir le statut et le niveau d'utilisation des plantes de légumes indigènes,

enquête par laquelle un total de 163 ménages dans chaque site ont été interviewés. Les légumes choisis par les petits exploitants pour les essais de production et l'analyse de la qualité des nutriments étaient *Cleome gyandra* (Saga, Eiyoby / Ejobyo), *Amaranthus lividus* (Booga, Doodo), *Solanum scarbrum* (nakati) comme légumes indigènes. *Solanum melongena* (aubergine), *Daucus carota* (carotte) et *Capsicum* spp. (poivre) ont été choisis comme légumes exotiques. L'analyse de laboratoire de ces légumes pour la caractérisation des phytonutriments est en cours. L'enquête a révélé que la plupart d'agriculteurs (90%) ont pratiqué la culture de légumes indigènes pour la consommation alimentaire et la génération de revenus. La plupart d'agriculteurs ont considéré la culture des légumes exotiques comme une entreprise de génération de revenus plutôt que la consommation domestique. La plupart d'agriculteurs ont été informés des avantages sanitaires et médicinaux des légumes indigènes.

Mots clés: Légumes indigènes africaine (AIVPs), connaissances des agriculteurs; phyto-nutriments

Background

African Indigenous Vegetable Plants (AIVPs) are at risk of extinction as they are being replaced by high-yielding commercial varieties (Chadha *et al.*, 2003). Most of them have a potential for income generation. Their failure to compete with exotic vegetables at present has been attributed to lack of public awareness of their nutritional value and the disappearance of their seed leading to unorganised and unsustainable cultivation (Kunwar *et al.*, 2006). AIVPs have also been neglected by scientific and development systems although they are important in local production and consumption systems. Most of them are weedy, semi-cultivated species or crops, and are scarcely known taxonomically much less their genetic diversity or reproduction biology (Mugula *et al.*, 2003). Therefore, without adequate research attention, there will be genetic erosion of AIVPs (Chadha *et al.*, 2003).

The research context for this work is based on the premium value of the vegetables, which is an all-embracing term, a summation of premium status along the vegetable value chain that ultimately culminates in a vegetable type being established in the market and contributing to income security and livelihood of the farmers.

Literature Summary

In attempts to increase the production and utilisation of AIVPs, various interventions for promoting their value are being adopted to enhance their status in the food sub sector. Weinberger and Msuya (2004) indicated that the AIVPs contain micronutrient levels as high as or even higher than those found in most exotic leafy Vegetables. Micronutrients and bioactive substances such as flavonoids, tannins, pectins and saponins impart a health promoting mechanism such as antioxidant activities that stimulate the immune system, or have antibacterial, antimutagenic or antiviral activities (Uusiku *et al.*, 2010). While no single vegetable provides all the nutrient requirements, a diversified diet is needed to meet daily micronutrient requirements.

Study Description

The study was conducted in purposively selected target sites of the Lake Victoria basin (Jinja district in Uganda and Vihiga district in Kenya). The main criteria used to select the areas was vegetable production already in progress in the areas; vegetable farming as a source of income; existence of indigenous plants produced in household backyard gardens or as wild plants hence availability of some seeds.

A survey was conducted in both sites to capture vegetable types produced and consumed, their contribution to income generation in the households, demand for such vegetables in the market, challenges involved in production and marketing, and indigenous nutrition knowledge. Households were randomly selected from target villages in each site. A total of 163 households were interviewed in each site. Total anti-oxidant activity and total pro-vitamin A carotenoid content analyses of farmer selected vegetables are on-going. Total pro-vitamin A carotenoid content is being measured by ultra violet spectroscopy and total antioxidant activity using DPPH and FRAP assays. Jinja farmer selected two exotic vegetables- *Coriandrum sativum*, dhanian and *Spinacia oleracea* L., Spinach and three indigenous species- *Cleome gyandra*, Saga/ Eiyobyoy/ Ejobyoy; *Amaranthus dubius*, dodo; *Solanum scarbrum*, black night shade. Vihiga-Kenya farmers selected *Solanum melongena*(egg plant) and *Capsicum annuum* (sweet pepper) as the exotic vegetables with *Cleome gyandra* (saga/ ejjobyoy), *Solanum scarbrum* (black night shade) and *Amaranthus caryophyllales* (livogoi/grain amaranth) as the indigenous species.

Statistical analyses for the survey data and the phyto-nutrient data are to be computed using the statistical package for social

scientists (SPSS). Tests for statistical significance are being computed using the LSD or tukey test at $p=0.05$.

Research Application

The survey findings revealed that Jinja farmers stated 15 and Vihiga farmers 9 vegetables that they regarded as indigenous among the vegetables they produced, which were being utilised and marketed in their respective communities.

The Jinja farmers utilised 60% of these indigenous vegetables while 40% were marketed. In the case of Vihiga farmers, 65% of the indigenous vegetables were consumed while 35% were produced for medicinal use. Most farmers in both sites reported that the exotic vegetables were not used for home consumption but rather more profitably sold for an income. Most farmers however, were knowledgeable of the health and medicinal attributes of the vegetables. Also noted was that most farmers (90%) engaged in vegetable production for income generation. The rest of the farmers (10%) had other income generating activities and mainly produced vegetables for home consumption.

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