

Evaluating The Importance Of Artisanal Fisheries In Nutrition For Selected Fisher Households In South Coast Kenya

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Background

Globally, fish is important as a source of animal protein. Along the Kenyan coast, artisanal fishery contributes significantly to human nutrition. Fish diet provides micronutrients such as minerals which contribute to the overall health of numerous fisher households with limited alternative sources of livelihood. However, in many developing coastal countries there is still a high deficiency for Potassium, Magnesium, Zinc, Iron and Iodine as important minerals in the diet of most homes of artisanal fishers. Fish diet is a potential remedy to this mineral deficiencies for human wellbeing and development. Few studies in Kenya have evaluated the composition of minerals in marine fish. This study therefore, quantified the levels of selected minerals in four most consumed fish species caught in the artisanal fishery of south coast Kenya from two different fishing areas. These fish species include *Siganus sutor* a demersal which was most consumed by fisher households in Msambweni fishing area where basket trap is the major fishing gear, and *Sphyaena forsteri*, *Sphyaena obtusata* and *Decapterus macarellus*, all pelagic commonly consumed in Vanga area where large nets are used for fishing. Results showed that the levels of mineral differed in the studied fish species, and these levels were affected by the seasons and area fished. This study hypothesized that the composition of minerals in fish was not affected by the fishing seasons, fish species consumed and the fishing area.

Method

A total of 120 fish specimens which included 60 specimens in northeast monsoon (NEM) and southeast monsoon (SEM) seasons were sampled from the artisanal fishers of Msambweni and Vanga representing basket trap and large nets fishery types. These fish specimens represented the most consumed fish species of *Signus sutor* in Msambweni and *Sphyaena forsteri*, *Sphyaena obtusata* and *Decapterus macarellus* in Vanga. Sampled specimens were measured for individual TL (cm) and weight (g), gutted, cleaned, wrapped in aluminium foil to maintain freshness, labelled, and transported to the laboratory in polystyrene cooler boxes topped with ice. In the laboratory, mineral levels of K, Mg, Zn, Fe and I were quantified from the fish specimens using Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES) according to the Association of Official Analytical Chemists (AOAC) analysis method. Seasonal differences in fish sample sizes and mineral content were analysed by 1-way ANOVA using STATISTICA version 7 statistical software.

Results

In all the four fish species studied, the minerals of K and Mg were higher in

composition and lower in Zn, Fe and I. Fish mineral content varied widely across the selected fish species and between the seasons. Mineral levels of K, Mg, Zn and I were significantly higher during the wet and cool SEM season while Fe was significantly higher during the dry and warm NEM season ($p < 0.05$ in all cases). Iodine level in *S. obtusata* and Fe level in *S. sutor* were not affected by seasons. *Siganus sutor* was the richest source of K and I minerals at levels of 410.21 mg/100g and 57.6 µg/100g, respectively during the SEM season. *Sphyræna fosteri* recorded the highest levels of Mg (72.29 mg/100g) during the SEM season and Fe (3.63 mg/100g) during the NEM season. *Decapterus macarellus* had the highest levels of Zn (5.84 mg/100g) during the SEM season. Sizes of the fish specimens also differed between seasons where *S. forsteri*, *S. obtusata* and *D. macarellus* were significantly larger in the SEM season and sizes of *S. sutor* were larger in NEM season ($p < 0.05$ in all cases).

Conclusion

This study confirms the importance of artisanal fishery in the provision of nutrition in the diet of fishers' households for the selected minerals of K, Mg, Zn, Fe and I which are important for the overall human health and development. Fish mineral content varied depending on fish species and seasons. The SEM season recorded higher levels of minerals than the NEM season. This study therefore, recommends that fisher households should include in their diets diverse fish species so as to access adequate types and amounts of the recommended minerals for overall good health and development.