

Some Vitamins Present in Garlic (*Allium sativum* L) Grown in Southeastern Nigeria

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ABSTRACT

Garlic, a spice widely consumed in Nigeria, is mostly grown in the northern part of the country. It is a rich source of phytochemicals and vitamins. Vitamins, which are group of organic nutrients, are required in small quantities for multiple biochemical reactions involving growth, survival and reproduction of the organism. Vitamins function as coenzymes (or prosthetic group) in enzymatic reactions and, mostly, are not synthesized by the body; hence must be supplied through diets. In Nigeria, garlicks grown in the northern and the southern parts are believed not to be the same nutritionally. And economic emancipation has encouraged southeasterners in Nigeria to cultivate their garlicks and reduce its importation from the north. Hence, this study was carried out to investigate the vitamin content of garlic grown in the southeastern Nigeria. Analysis was carried out using the method of Association of Analytical Chemists. Result obtained shows that garlic contains 0.80 mg/g vitamin A, 0.63 mg/g vitamin B1, 0.96 mg/g vitamin B2, 0.59 mg/g vitamin B6, 0.72mg/g vitamin B9, 0.86 mg/g vitamin C, 0.45 mg/g vitamin D, 0.75 mg/g vitamin E and 0.72 mg/g vitamin K. It was concluded that garlic is nutritionally rich as it contains most essential vitamins needed for healthy biochemical reactions that enhance proper body growth and development.

Keywords: Garlic, *Allium sativum*, Vitamin, Phytochemicals, Nutrients.

INTRODUCTION

Garlic (*Allium sativum* L), which is one of the onion family Alliaceae, is an edible and medicinal herb grown for various purposes. In Nigeria, it is a popular culinary spice due to its flavour. Garlicks and most plants are rich sources of organic bioactive molecules [1]. Rural dwellers in the southeastern part of Nigeria depend on these plants for their primary health care needs [2]. Traditional medical practitioners use garlic extracts or their active ingredients as chemotherapies [3]. And *A. sativum* L. has been shown to reduce cardiovascular risk factors [4], especially blood pressure [5], hyperlipidaemia and atherosclerosis [6]. Garlic also inhibits platelet aggregation and enhances fibrinolytic activity, reducing clots on damaged endothelium [7].

Chemical compositions of garlic have been reported to vary significantly with its variety, origin, growing location, season, climate, and cultivation practice [8]. This has been discovered in Nigeria because garlicks grown in the northern parts of the country differ in taste from those grown in the southeastern parts. Vitamins are essential organic nutrients required in very small amount for normal metabolism [9]. They help in maintaining metabolic integrity of the body and possess diverse functions as coenzymes, hormones, antioxidants, mediators of cell signaling, and regulators of cell and tissue growth and differentiation [10].

Aim of Study

This study was aimed at evaluating the vitamins in *Allium sativum* which may contribute to its therapeutic use as a medicinal bulb.

MATERIALS AND METHODS

Sample Collection and Preparation

Fresh turmeric samples bought at Ogbete Main Market Enugu State, Nigeria were identified by Prof Eze, a taxonomist in the Applied Biology and Biotechnology Department, ESUT. Samples were washed in clean running water, allowed to dry, ground and packaged for analysis.

Determination of Vitamin content of Garlic

The following vitamins A, C, E, B1, B2, B3, B6, B9, D, K were determined in the dried samples of garlic used for the study.

Vitamin contents of the sample were determined using the modified methods of AOAC (2010).

Determination of β -Carotene Concentration

The β -carotene concentration in the sample was determined by weighing five gram (5g) of the sample. A twenty millilitre (20ml) volume of petroleum spirit was added to the weighed sample. The mixture was put on a shaker for five (5) minutes. Afterwards, the supernatant was decanted into another test-tube and the absorbance read at 450 nm.

Result of the Vitamin Content of Garlic

Table 1: Result of the vitamin content of garlic is as indicated in the Table below:

Vitamins	Concentration (mg/ml)
Vitamin A	0.80±0.10
Vitamin B1	0.63±0.11
Vitamin B2	0.96±0.07
Vitamin B6	0.59±0.15
Vitamin B9	0.72±0.20
Vitamin C	0.86±0.09
Vitamin D	0.45±0.10
Vitamin E	0.75±0.09
Vitamin K	0.72±0.17

Values are Means \pm SD of triplicate experiments

DISCUSSION

Vitamins are essential organic nutrients required in very small amount for normal metabolism. They assist in maintaining metabolic integrity of the body and they have diverse functions, as coenzyme, hormones, antioxidant, mediators of cell signaling and regulators of cell and tissue growth and differentiation [11].

The present study was carried out to evaluate the vitamin content of garlic. From the result obtained, garlic contains 0.80 mg/ml vitamin A, 0.63 mg/ml vitamin B1, 0.96 mg/ml vitamin B2, 0.59 mg/ml vitamin B6, 0.72 vitamin B9, 0.86 mg/ml vitamin C, 0.45 mg/ml vitamin D, 0.75 mg/ml vitamin E and 0.72 mg/ml vitamin K.

According to this study, vitamins A, C and B2 (0.80mg/ml, 0.86mg/ml and 0.96mg/ml) were present in higher amounts compared to vitamins D and B6 (0.45mg/ml and 0.59mg/ml).

Vitamin B2 (Riboflavin) is the precursor for these coenzymes: flavin mononucleotide (FMN) and flavin

adenine dinucleotide (FAD). Coupled to their enzymes, they are involved in a wide range of redox reactions.

Vitamin C is required for the maintenance of normal connective tissue as well as for wound healing. Vitamin C also is necessary for bone remodeling due to the presence of collagen in the organic matrix of bones. Vitamin D is a steroid hormone that functions to regulate specific gene expression following interaction with its intracellular receptor.

Calcitriol functions primarily to regulate calcium and phosphorous homeostasis. The K vitamins exist naturally as K1 (phylloquinone) in green vegetables and K2 (menaquinone) produced by intestinal bacteria and K3 is synthetic menadione (vicasol). When administered, vitamin K3 is alkylated to one of the vitamin K2 forms of menaquinone. The major function of the K vitamins is in the maintenance of normal levels of the blood clotting proteins, factors II, VII, IX, X and protein

C and protein S, which are synthesized in the liver as inactive precursor proteins. Conversion from inactive to active clotting factor requires a posttranslational modification of

specific glutamate residues. This modification is a carboxylation and the enzyme responsible requires vitamin K as a cofactor [12].

CONCLUSION

The data collected shows that garlic is nutritionally rich as it contains most essential vitamins needed for body growth and development. It is hereby recommended that further studies be

carried out for the scientific development and industrial and clinical applications of garlic in the improvement of nutrition and health.

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