

Vitamin and Mineral Contents of *Gongronema latifolium* Leaves

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Abstract: Vitamin and mineral contents of the dried leaves of *Gongronema latifolium* were determined using spectrophotometric analysis. The biochemical investigation of vitamins revealed that the leaves contained both water and fat soluble vitamins. The results showed that retinol was the most predominant followed by ascorbic acid at the concentrations 36.25 ± 0.15 and 29.04 ± 0.01 mg/100g respectively. The levels of these vitamins may be the reason for their usefulness in the therapeutic applications. Other vitamins present were thiamin, riboflavin, niacin and tocopherol. The results also showed that *Gongronema latifolium* leaves contained calcium, sodium, phosphorus, potassium, magnesium, manganese, iron and zinc. Potassium was the most predominant mineral followed by magnesium and calcium with concentrations 97.18 ± 0.01 , 91.24 ± 0.01 and 71.13 ± 0.01 mg/100g respectively.

Key words: Vitamin • Minerals and *Gongronema latifolium* leaves

INTRODUCTION

Vitamins are organic substances present in minute amounts in natural food. They are essential for health and shows specific health disorders when absent from the diet or when present in insufficient amount due to derangement of some metabolic processes. The organic nature distinguishes them from the trace elements and minute amount distinguishes them from essential amino acid. In other words these vitamins have the capacity of preventing certain diseases [1]. Vitamins are also chemically unrelated organic compounds that cannot be synthesized by humans and therefore, must be supplied by the diet. Nine vitamins (folic acid, cobalamin, ascorbic acid, pyridoxine, thiamine, niacin, riboflavin, biotin and pantothenic acid) are classified as water-soluble vitamins, while four vitamins (vitamins A, D, K and E) are termed fat-soluble [2]. In contrast to water-soluble vitamins, only one fat-soluble vitamin (vitamin K) has a co-enzyme function. These vitamins are released, absorbed and transported with dietary fat [3].

Mineral is a naturally occurring substance that is solid and inorganic representable by a chemical formula, usually abiogenic and has an ordered atomic structure. It is different from a rock, which can be an aggregate of minerals or non-minerals and does not have a specific chemical composition. Finally, the requirement of an ordered atomic arrangement is usually synonymous to

being crystalline; however, crystals are periodic in addition to being ordered, so the broader criterion is used instead [4].

It is an established fact that many diseases were treated successfully in traditional medical practices [5]. Also the practice of Aromathrapy is successful in Nigeria. This is evidenced by the fact that herbal products and preparations are available for sale in some markets and on the streets. In recent times, traditional medical practice has been subjected to scientific studies [6]. These studies have been on the pharmacology and toxicology of the extracts from the plants [7].

Gongronema latifolium, commonly called bush buck in English, "Madumaro" in Yoruba and "Utazi" in Igbo belongs to the family of Apocynaceae. It is a succulent plant that has antioxidant potential. It is a rainforest plant, climbing shrub up to 5m long. A decoction of leaves or leafy stems is commonly taken to treat diabetes and high blood pressure [8]. Some medicinal plants used by traditional medicine practitioners have adverse effects; some affecting liver functions, kidney functions and others inhibit the synthesis of some important major cellular components [9].

The relevance of *Gongronema latifolium* in humans constitute the need to analyze its chemical constituents, hence this work was aimed at investigating the vitamin and mineral compositions of *Gongronema latifolium* leaves.



Fig. 1: Leaves of *Gongronema latifolium* [10].

MATERIAL AND METHODS

Materials: The fresh leaves of *Gongronema latifolium* were obtained from Izzi Local Govt. Area, Ebonyi State, Nigeria. All chemicals and reagents were of analytical grade.

Methods: The vitamin concentrations were determined by the methods of Okwu and Josiah [11] while the mineral concentrations were determined using the atomic absorption spectrophotometer.

RESULTS

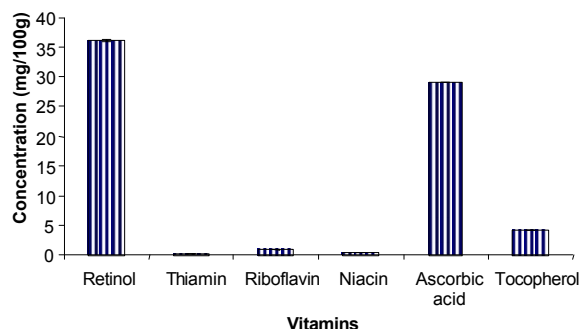


Fig. 2: The vitamin content of *Gongronema latifolium* leaves.

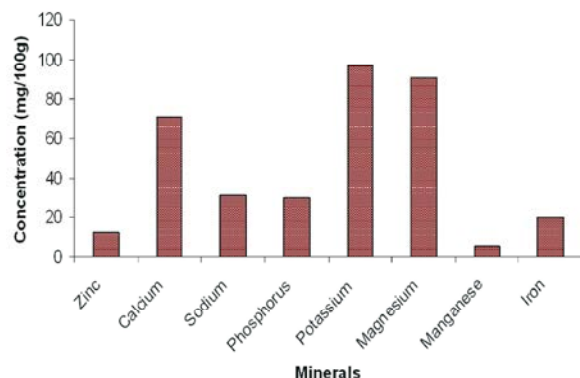


Fig. 3: The mineral content of *Gongronema latifolium* leaves.

RESULTS AND DISCUSSION

Gongronema latifolium leaves contained substantial concentrations of retinol and ascorbic acid (Fig. 2). Vitamins are organic substances which are essential for health, required in very small quantities and must be provided in diet because the body cannot synthesize them [12]. *Dissotis rotundifolia* leaves contain high levels of retinol and low level of ascorbic acid [13]. They are vital for the healthy growth and development of the body. Some vitamins act as coenzymes which help certain enzymes to perform their functions [8]. Vitamins have been applied in the treatment of certain diseases as their deficiency cause malformation, retarded growth, night blindness, blood coagulation, beriberi etc [9]. Vitamin C and E are very important antioxidants which protect the cell membranes from oxidative damage caused by free radical [8]. Deficiencies of these vitamins predispose the red cell membranes to damage leading to haemolysis [4]. Riboflavin and niacin are necessary for oxidative phosphorylation and for coenzyme formation respectively [4]. Vitamin C has an antioxidant property and is therefore required for the maintenance of normal connective tissues, wound healing and also facilitates the absorption of dietary iron from the intestine [7].

Gongronema latifolium leaves also contained substantial amounts of trace elements that are useful for health (Fig. 3). They include zinc, sodium, manganese, iron, phosphorus and high levels of potassium, magnesium and calcium (Fig. 3). Most green vegetables, legume seeds, peas, beans and nuts are rich in magnesium.. Ibrar *et al.* [3] reported that the hypoglycemic potential of *Blighia unijugata* might be due to the presence of fair amounts of trace elements including manganese.

In conclusion, the results showed that the leaves of *Gongronema latifolium* have both water and fat soluble vitamins and contains some minerals which account for its nutritional value.

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