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Research Paper

Phytochemical and Proximate Analyses of *Psidium Guajava* Leaves

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ABSTRACT:- The phytochemical and proximate analyses of *Psidium guajava* leaves were determined using the methods of association of official analytical chemists (A.O.A.C). The quantitative analyses showed the concentrations (mg/100g) of the phytochemical constituents as flavonoids (0.40 ± 0.02), tannins (0.55 ± 0.01), glycosides (3.76 ± 0.08), alkaloids (0.04 ± 0.00), saponins (3.01 ± 0.01), phenols (0.28 ± 0.00) and steroids (0.09 ±0.00). The proximate composition (%) of moisture, ash, fat, fibre, protein and carbohydrate recorded 10.74 ± 0.08, 4.35± 0.21, 1.37 ± 0.36, 10.37 ± 0.05, 18.64 ± 0.05 and 54.53 ± 0.25 respectively. The plant showed higher levels of carbohydrate, glycosides and saponins, moderate levels of tannins, flavonoids, protein, moisture and crude fibre with relatively low levels of alkaloids, phenols, steroids, ash, and fat.

Keywords:- Phytochemicals, proximate analysis, *Psidium guajava*

I. INTRODUCTION

Psidium guajava commonly called guava has been employed in many parts of the world for a lot of its scientifically confirmed uses. These include antidiabetic, antinociceptive, antimutagenic, antispasmodic and antimicrobial. In folklore, it has been used in the treatment of different conditions including fever, typhoid fever, and malaria. In many villages in Nigeria, it is used often in children and infants for the treatment of diarrhoea (Alabi *et al*., 2010). It is a small tropical tree that grows up to 35feet tall; it is widely grown for its fruits in tropics. It is of about 133 genera and more than 3,800 species. The leaves and bark have many medicinal uses that are still employed today (Nwinyi *et al.*, 2008).

Phytochemicals are chemical compounds derived from plants that are non-nutritive secondary metabolic compounds occurring in different parts of plants. They are important as protective and disease fighting compounds which help the body to prevent or fight against diseases and so are required by the human body to sustain life. *Psidium guajava* contains broad spectrum of phytochemicals including polysaccharides, vitamins, essential oils, minerals, enzymes, proteins, and triterpenoid acids (Begum *et al.*, 2010). It is very rich in antioxidants and vitamins and also high in lutein (Joseph and Priyar, 2011). Their therapeutic use in prevention or fighting a number of diseases is the basis of their extensive use in traditional medicine. Some of the phytochemicals are water soluble while others are not (Adefagha and Obah, 2011).

Proximate analysis of food is the determination of the major components of food which include moisture, protein, fat, ash, crude fibre and total carbohydrate (Alfred and Patrick, 2005). Proximate analysis is a system of analysis of nutrients also termed "conventional analysis" in which the gross components (protein, fat, carbohydrate, ash etc.) of the food material rather than individual nutrients (amino acid, fatty acids, monosaccharides, mineral, etc.) are determined (Prohp *et al.*, 2006).

In view of its immense medicinal importance evidenced in the various studies and also corroborated in a review article by Kamath *et al.* (2008), there is a strong incentive for further research into the bioactive components of *Psidium guajava* plant considering the fact that the plant varies in nutrient content across cultivars (Shiruth *et al.*, 2013) and is readily available in the tropics within the reach of the local populace; hence this research was to determine the bioactive constituents and nutrient composition of *Psidium guajava* leaves.

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II. MATERIALS AND METHODS

Materials

The fresh leaves of *Psidium guajava* were gotten from Abakaliki, Ebonyi State, Nigeria.

Methods

Phytochemical and Proximate Analyses

The methods of Association of Official Analytical Chemists (A.O.A.C.) (1990) were used.

III. RESULTS

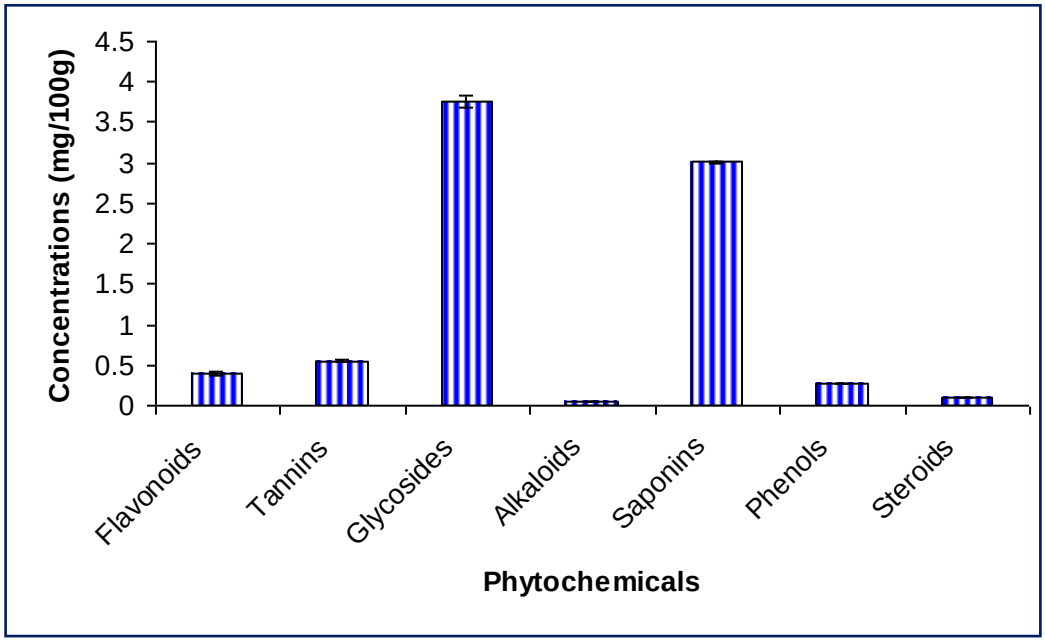

Fig. 1: Phytochemical composition of *Psidium guajava* leaves

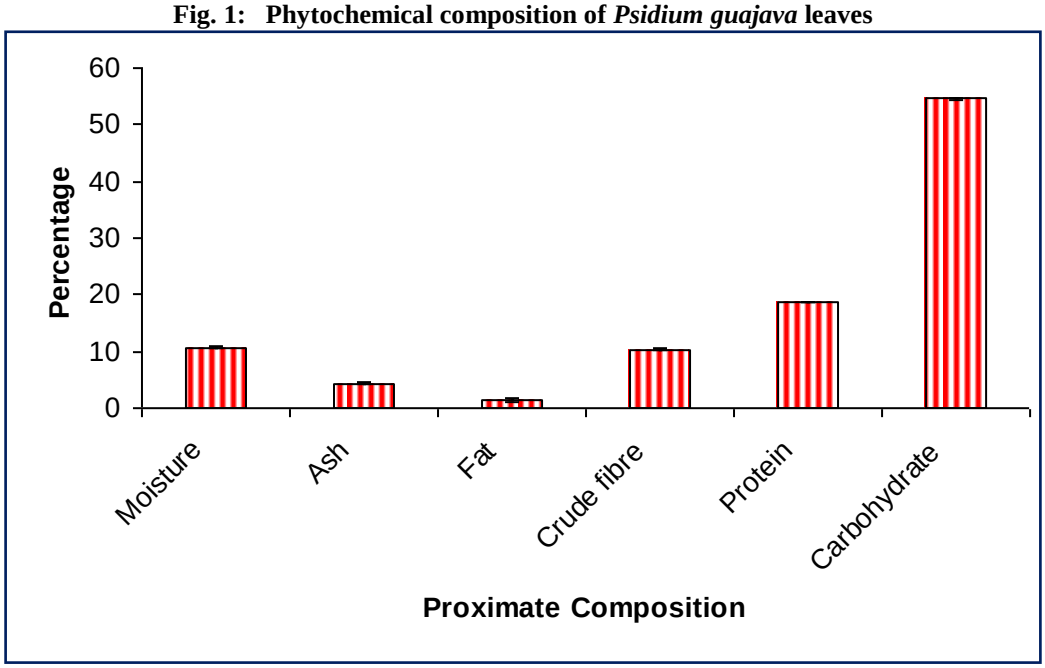

Fig. 2: Proximate composition of *Pisidium guajava* leaves.

IV. DISCUSSION

The phytochemical analysis of the powdered leaves of *Psidium guajava* showed high concentrations of saponins, glycosides, moderate concentrations of flavonoids and tannins, low alkaloids, phenols, and steroids (Fig. 1). The constituents include alkaloids, phenolics, steroids, tannins, flavonoids, glycosides and saponins. This agrees with earlier studies which also found that not all phytochemicals are present in all plant parts in

large amount and that those present differ according to the type of the extracting methods used (Olayemi, 2011). The presence of steroids in *Psidium guajava* leaves is of great importance as they are of interest in pharmacy due to their relationship with such compounds as sex hormones. Steroids increase protein synthesis, promoting growth of muscles and bones (Rossier, 2009). Saponins were also detected in *Moringa oleifera* leaves and they have been shown to possess some beneficial (cholesterol lowering) properties (Bamishaiye, 2011). The *Psidium guajava* leaves also contained alkaloids in low level (Fig. 1) which are nitrogen-containing naturally occurring compounds, commonly found to have antimicrobial properties due to their ability to intercalate with DNA; they are very low in concentration when compared with those of *Moringa oleifera* (Olayemi, 2011).

The proximate analysis of the *Psidium guajava* leaves showed high percentage carbohydrate content, moderate levels of protein, moisture and crude fibre with low levels of ash and fat (Fig. 2). The low moisture content of the leaves would hinder the growth of micro-organisms and the storage life would be high (Adefagha and Obah, 2011). The protein content of the *Psidium guajava* compared favourably with *Amaranthus caudatus* (20.59%) and cassava leaves (*Manihot utilisima* leaves (24.88%) as indicated by Eze and Obinwa (2014). The low amount of fat showed that it is not a good source of lipids. Accumulation of fats can cause arteriosclerosis and aging (Shaheen *et al*., 2013). The high protein and low fat characteristic of *Psidium guajava* leaves have been previously reported by Adefagha and Obah (2011).

The plant showed higher levels of carbohydrate, glycosides and saponins, moderate levels of tannins, flavonoids, protein, moisture and crude fibre with relatively low levels of alkaloids, phenols, steroids, ash, and fat.

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