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## CHEMICALS ANALYSIS OF *Ananas comosus* LEAVES

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### **Abstract**

The *Ananas comosus* are fruits with medicinal properties, commonly grown in South America. The study was undertaken to estimate its mineral contents (mg/g) potassium (14.15), magnesium (12.00), sodium (11.40), calcium (8.50), manganese (0.14), copper (0.23), iron (0.43), zinc (1.32), bioactive compositions phenol (11.3%), saponins (5.63%), flavonoids (6.68%), tannins (0.45mg/g), alkaloids (5.19mg/g) and glycosides (3.35mg/kg), antioxidant properties (mg/g) such as vitamin B1 (2.39), vitamin B2 (0.40) and vitamins C (1.79) and the nutritional values (%) carbohydrate (52.53), crude fats (15.68), moisture content (14.48), protein content (7.58), crude fibre (6.75), ash content (2.99). The presence of bioactive compounds coupled with some micro and macro minerals elements in the fruit leaves, if consumed in sufficient amount, will contribute to nutritional requirements for good health in man. The plant leaves may also serve as source of pharmaceutical formulation and food supplements.

**Keywords:** *Ananas comosus*, bioactive compositions, antioxidant properties

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### **INTRODUCTION**

*Ananas comosus* popularly known as pineapple is a tropical plant with an eatable fruit (Morton, 2011), it is the most prudent, important plant in the

family of *Bromeliaceae* (Coppeans, 2003). It is a native of South America, where it has been farmed for many centuries. *Ananas comosus* grows as a small shrub, the individual flower of the unpollinated plant fuse to form a multiple fruit. The plant is normally propagated from the offset, produced at the top of the fruit (Morton, 2011 ) or form a side shoot and typically matured within a year. The flesh and juice of the *Ananas comosus* are used in cuisines around the world. In many tropical countries, it is prepared and sold on road sides as a snack. It is sold whole or in halves with a stick inserted. Chunks of *A. comosus* are used in desserts such as fruit salad, as well as in some savory dishes, including pizza toppings, or as a grilled ring on a hamburger. Traditional dishes that uses *A. comosus* include hamonado, afritada, kaeng som pla, and Hawaiian haystack. Crushed *A. comosus* is used in yogurt, jam, sweets, and ice cream. The juice of the *A. comosus* is served as a beverage, and it is also the main ingredient in cocktails such as the pina colada and in the drink tepache. (Vergara, 1999).

The aim of this research work is to evaluate chemical composition of *Ananas comosus* leaves for its nutritional values.

## **MATERIALS AND METHODS**

Leaf samples of *Ananas comosus* were obtained from *Ananas comosus* vendor at Iree market, Osun State. The fresh leaves were washed with distilled water to remove sand and other unwanted particles. The sample was air-dried for about a month. The dried sample was grounded using grinding machine to produce a fine composite powder. The fine powder was kept in an air-tight container for further analyses.

## **METHOD**

The proximate, phytochemicals and mineral analysis was carried out according to the method described by Gideon *et al.*, (2018).

The vitamins was carried out using (Okwu and Josiah, 2006) methods

The proximate analysis was done by gravimetric method, according to AOAC (1990)

## RESULTS AND DISCUSSIONS

**Table 1: Proximate analysis of *Ananas comosus* Leaves (%)**

Parameters	Compositions
Ash content	2.985
Moisture content	14.477
Crude fat content	15.677
Crude fibre content	6.745
Protein content	7.580
Carbohydrate content (By Difference)	52.534
Energy value (kj/g)	1601.9955

**Table 2: Minerals analysis of *Ananas comosus* Leaves (mg/Kg)**

Parameters	Compositions
Sodium	11.395
Potassium	14.150
Magnesium	12.000
Calcium	8.502
Zinc	1.321
Copper	0.2325
Manganese	0.136
Iron	0.431

**Table 3: Vitamins analysis of *Ananas comosus* Leaves (mg/g)**

Parameters	Compositions
Vitamin C	1.787
Vitamin B1	2.388
Vitamin B2	0.401

**Table 4: Qualitative phytochemical analysis of *Ananas comosus* Leaves**

Parameters	Constituents
Tannins	+ve
Phenols	+ve
Alkaloids	+ve
Flavonoids	+ve

Terpenoids	-ve
Saponins	+ve
Steroids	-ve
Anthraquinones	-ve
Glycosides	+ve

+ve= presence of constituent, -ve= absence of constituent

**Table 5: Quantitative phytochemical analysis of *Ananas comosus* Leaves**

Parameters	Compositions
Total phenols (%)	11.3
Saponins (%)	6.687
Flavonoids (%)	0.452
Tannins (mg/g)	0.452
Alkaloids, (mg/g)	5.189
Glycosides, (mg/kg)	3.3475

## Discussion

The proximate composition of *Ananas comosus* leaves was obtained in table 1 (%).The result showed that carbohydrate has the highest value of (52.53), crude fats (15.68), moisture content (14.48), protein content (7.58),crude fibre (6.75), ash content (2.99) in that order. Ash content is a measure of mineral content of the plant (Gideon *et al.*, 2018). Food that provide more than 12% of their caloric value from proteins are very rich good source of proteins (Gideon *et al.*, 2018).

Excess consumption of fats in human leads to cardiovascular diseases, aging and cancer (Gideon *et al.*, 2018). Moisture content could be attributed to time and the year of spoilage

The mineral analysis for *Ananas comosus* leaves was revealed in table 2 (mg/g). The result showed that it has macro element of potassium which has the highest value of (14.15), magnesium (12.00), sodium (11.40), calcium (8.50) and also have a micro elements which manganese have the smallest value of (0.136), copper (0.233), iron (0.431), zinc (1.321).

Zinc is an indispensable trace element in the body (Dosa *et al*; 2013). It is required for numerous enzymatic and cellular process including protein synthesis and intercellular signaling. In addition, it functions as antioxidant and anti-inflammatory agent (Shannon *et al*; 2011; Maret 2013; Cruz *et al*; 2015; Bonaventura *et al*; 2015). It also plays a significant role in aging (Stefanidou *et al*; 2016), normal growth and development. Likewise, it aids testicular maturation, neurological function, wound healing and immune-competence (European Food Safety Authority (EFSA) European Food Safety Authority, 2006). Thyroid function and glucose metabolism (Zargar, 1998) as well as endocrine system (Mahdizadeh *et al*; 2014) are not left out.

The level of manganese quantities in the sample was (0.13). Manganese has been reported to play essential role in various enzymatic activities in numerous species. Insufficient intake of manganese can result in adverse effects such as impaired growth, skeletal abnormalities, reproductive deficits ataxia of the new born and defect lipid and carbohydrate metabolism (European Food Safety Authority, 2006)

The level of iron quantities in the sample was (0.43). Iron is important for adequate body metabolic process; there should be a balance between intake of iron and those that are lost through normal body physiological process.

Iron is an essential element that has important metabolic functions such as oxygen transport and storage as well as many redox reactions. Insufficient intake results in deficiency, leading to anemia, adverse outcome of pregnancy, impaired psychomotor development and cognitive performance and reduced immune function (European Food Safety Authority, 2006).

The level of sodium and potassium quantities in the sample was 11.40 and 14.15mg/kg respectively. This implies that the sample could be a good source of these essential elements. Sodium and potassium do play essential roles in cell metabolism and enzymatic function. However, the observed higher content of potassium over sodium in this sample suggests that it could be helpful in controlling hypertension. This is because, the

consumption of food and drinks that are rich in potassium have been linked to reduction of high blood pressure.

The level of copper quantities in *Ananas comosus* was (0.233). Copper is an essential micronutrient which is useful for several biological functions in human ( Deepak, 2011). It is a constituent of many enzymes such as tryrosinase, cytochrome oxidase, peptidyl and glycyamidating monoxidase, caeruloplasmin and other ferroxidases (Uauy *et al*; 1998) as well as Cu/Zn superoxide dismutase (Uauy *et al*;1998).

The vitamin analysis of *Ananas comosus* level was revealed in table 3. Vitamin B1 (Thiamine vitamin) has the highest value among the vitamins analyzed in the sample, which is part of an enzymes that are needed for body metabolism. They are also very important in aiding nerve functioning. Vitamin C (Ascorbic acid) is an antioxidant synthesis of collagen, carnitine, amino acid, hormones. The immune function enhances absorption of non-heme iron i.e from plant food. Vitamin B2 (Riboflavin) with the value of (0.410mg/g) is required as part of enzymes needed by the body for energy metabolism as well as normal vision and skin health. (Margaret, 2022).

Plants with antioxidants, phytochemicals are beneficial to the health as they can protect against free radicals and retard progress of some chronic diseases (Orimadegun *et al*; 2018). The majority of these type of plants are rich source of phenolic substances and possess anti-cancerous, antiviral and antibacterial properties (Manach *et al*; 2004).

Flavonoids have been reported to be one of the major constituents of *Ananas comosus* leaves. They are vital in the scavenging of oxygen derived from free radicals. The vitro studies have shown that flavonoids poses anti-inflammatory, anti-allergic, anti viral, anti-carcinogenic properties (Middleton, 1998). Flavonoid prevents injury from free radicals by reacting with the reactive oxygen species. Thus stabilizing the reactive oxygen species, scavenging super oxides and peroxy nitrates, inhabiting oxidation of low density lipoprotein (LDL) thereby protecting against atherosclerosis (Nweze and Nwafor, 2014). The quantitative analysis of *Ananas comosus* leaves showed on table 5 that total phenol has the highest value of (11.3%),

saponins (6.69%), alkaloids (5.19mg/g), glycosides (3.35mg/g), tannins (0.4mg/g).

## CONCLUSION

Consumption of vegetables and fruits rich in mineral, proximate, vitamins and phytochemicals have been associated with the reduction in oxidative stress that is associated with health disorder. Information received from this research work showed that *Ananas comosus* leaves contained both macro and micro mineral elements. Therefore, consumption of the boiled leaves of *Ananas comosus* will help in improving general health status.

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