

Phytochemical And Proximate Compositions Of The Leaves Of *Antiaris Africana*

Bright C. Onyekwere¹, Rosemary I. Uchegbu^{2*}, Ahamefula A. Ahuchaogu³ & Chintua E. Igara⁴

Department of Chemistry, Federal Polytechnic Nekede, Owerri. Imo State Nigeria.

Department of Chemistry, Alvan Ikoku Federal College of Education, Owerri. Imo State Nigeria.

Department of Pure and Applied Chemistry, Abia State University, Uturu, Abia State

Department of Science Laboratory Technology, Akanu Ibiam Federal Polytechnic, Unwana, Ebonyi State.

Abstract

Antiaris africana plant commonly known as “false iroko” tree is one of the medicinal plants used in the treatment of mental and nervous disorder such as epilepsy. It is also used to treat respiratory infections, syphilis and skin irritants in Nigeria. Analysis of the phytochemical properties of the leaves indicated the presence of tannins (45.86 ± 2.04 %), flavonoids (1.67 ± 0.11 %), saponins (4.56 ± 0.01 %) and cardiac glycoside (1.80 ± 0.02 %). Proximate composition and energy content of the leaves showed the presence of moisture (15.30 ± 0.22 %), ash (14.60 ± 0.80 %), crude fibre (38.28 ± 0.60 %), crude fat (9.08 ± 1.58 %), protein N \times 6.25 % (12.99 ± 0.65 %) and carbohydrate (9.81 ± 1.59 %). The presence of the phytochemical compounds and the nutritional values justify the use of the plant leaves as potent drug for treatment of different ailments traditionally.

Keywords: Phytochemicals, antioxidant, drugs, *Antiaris africana*

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I. Introduction

Phytochemicals are of great interest due to their beneficial effects on health of human beings and reports showed that they give immense health benefits to the consumers. They are also known to have great antioxidant potential. Epidemiological and animal trials suggest that the regular consumption of fruits, vegetables and whole grains rich in phytochemicals reduce the risk of various diseases linked with oxidative damage (Cieslik et al., 2006). Nigeria is blessed with many medicinal plants which are rich in phytochemicals and are used traditionally to treat different diseases. The plant *Antiaris africana* is a highly medicinal and a large attractive deciduous timber tree with blotchy grey and white bark. The wood is light in weight and soft. It is used for interior joinery, panelling, moulding, shuttering, furniture, strip flooring, boxes and crates, tool handles, toys and carvings. It is fairly commonly used domestically for light construction and canoes. It is locally popular for drum making. It has a wide usage both in industry (for timber making) and as traditional medicine.

Various parts of the plant leaves, stems and barks are used in the treatment of various diseases such as rheumatic and respiratory infection, epilepsy, skin irritant, syphilis etc. The bark extract is used in traditional medicine for the treatment of chest pains. The latex of the plant is used as a purgative. It is also used as a cure for leprosy and sore throat. The plant is used in Cameroon folk medicine to treat cancer. Decoctions of the leaves are applied in the treatment of syphilis. Tapsell *et al*, 2006 and Kuete,*et al*, 2009 reported that *Antiaris africana* is rich in antioxidant, anti-inflammatory, antimicrobial and anticancer phytochemicals. The leaves and roots are also used to treat mental illnesses. The plant is utilized traditionally in ethnomedicine for epilepsy, lumbago, skin irritant, purgative, nervous disorders (Keay, 1989).

In spite of the various uses of this plant as medicine, its constituents have not been fully documented. This present research will examine the phytochemical contents of the leaves of *Antiaris Africana* to ascertain its usefulness as potent drug.

II. Materials and Methods:

Plant Materials: The leaves of *Antiaris africana* were collected from the Botanical garden of Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria and Authentication of plant materials was done by Mr. Nduka Ibe of Taxonomy section, Forestry Department, Michael Okpara University of Agriculture, Umudike, Nigeria.

Sample Preparation: The fresh plant samples were washed and air dried on a laboratory bench on a period of two weeks. The leaves of the plant were milled into fine powder with Thomas Willey milling machine and then stored in air tight bottles for analysis. 2kg each of the sample were used.

Chemical Analysis: the phytochemical and proximate analyses were performed using the standard method as described in Uchegbu and Okwu, 2012. The gross food energy was estimated according to the method of Osbornand Voogt (1978) by using the equation.

$$FE = (\% CP \times 4) + (\% CHO \times 4) + (\% Fat \times 9).$$

Where FE = Food energy (in g / cal)

CP = Crude Protein

CHO = Carbohydrates.

2.4 Statistical analysis: All measurements were replicated three times and standard students t – test at P < 0.05 was applied to assess the difference between the means as described by Steel and Torrie (1980).

TABLE 1: Quantitative Determination of Phytochemical Composition of the leaves of *Antiaris africana*

S/N	PARAMETERS	COMPOSITION(%)
1.	Tannin	45.86 ± 1.2046
2.	Flavonoid	1.67 ± 0.1155
3.	Saponin	4.56 ± 0.6111
4.	Cardiac glycoside	1.80 ± 0.0224

Data are means of triplicate determinations ± standard error

Table 2: Proximate Composition and Energy Content of the Leaves of *Antiaris africana*

S/N	PARAMETERS	COMPOSITION
1.	Moisture %	15.30 ± 0.2230
2.	Ash %	14.6 ± 0.80
3.	Crude fibre %	38.28 ± 0.60
4.	Crude fat %	9.07 ± 1.58
5.	Protein N x 6.25%	12.99 ± 0.6451
6.	Carbohydrate % Food Energy g/cal	9.81 ± 1.5988 172.83

Data are means of triplicate determinations ± standard error

The phytochemical composition of the leaf extract of *Antiaris africana* indicated the presence of flavonoid, terpenoid, saponin, tannin, cardiac glycoside and the absence of alkaloid and steroid. The quantitative phytochemical analysis is very useful in the evaluation of some active biological components of some plants. Flavonoid content of the sample is 1.67 %. Flavonoids are hydroxylated phenolic substances synthesized by plants in response to microbial infection. Several reports have shown that flavonoid possesses antioxidant, anti-inflammatory, anti-microbial, cardioprotective and neuroprotective effects also anti-allergenic, anti – atherogenic, anti-thrombotic and vasodilatory effects (Uchegbu and Okwu, 2012). The tannin content of the sample is 45.86 % which is the most abundant phytochemical in the plant extract. Tannins are useful in medicine because of its astringent properties. The presence of tannin in the leaf extract of *Antiaris africana* makes it responsible for binding and precipitating protein and other organic compounds including amino acids and alkaloids. The saponin content of the sample is 4.56 %. saponins is a known anti-nutritional phytochemical that possesses the potential to reduce the uptake of certain nutrients including cholesterol and glucose at the gut through intraluminal physiochemical interaction suggesting a possible use in the treatment of diabetes and cardiovascular related disease. Terpenoid presence reveals its importance in relationship with sex hormones. Cardiac glycosides content of the sample was determined to be 1.80 %. They are of optimal importance pharmaceutically because they have the ability of stimulating heart muscles.

Table 2 shows the proximate composition of the leaf extract of *Antiaris africana*. The result obtained shows a moderate moisture content (15.3%) by weight. Too much moisture in any sample can make the sample viable for micro-organism growth. The moisture content of any food is an index of its water activity and it is used as a measure of stability and susceptibility to microbial contamination. The ash content value obtained (14.6 %) the proportion of ash content is the reflection of mineral content present in the leaf (Omotoso, 2005); Nnamani *et al*, 2009). The result suggests a high deposit of mineral elements in the leaf of *Antiaris africana*.

The crude fibre content of the sample was determined to be 38.28 %. This helps in the maintenance of human health and has been known to reduce cholesterol level of the body. A low fibre diet has been associated with heart disease, cancer of the colon and rectum, obesity, appendicitis, diabetes and even constipation (Lajide, 2008). Hence *Antiaris africana* leaves can be recommended as a viable crude fibre source in the diet as a result of its high fibre content even when compared with 7.09 % of *Moringa oleifera* leaves (Ogbe and John, (2012) , 6.5% of bitter leaves (Akindahunsi and Salawu, (2005). The fat content value was 9.07 %. This moderate fat content of the sample suggests that the plant can serve as oil vegetable. The observed crude protein content was determined to be 12.99 %. It was reported that diet is nutritionally satisfactory if it contains high calorie value and a sufficient amount of protein. Any plant foods that provide about 12% of their caloric value from protein are considered good sources of protein. The result showed a low carbohydrate content value of 9.81 % . This low carbohydrate content suggests that the leaves of *Antiaris africana* cannot be considered as a potential source of energy.

III. Conclusion

Phytochemicals as well as medicinal plants, have remained the most abundant source of health care and life improvement for ages. Many synthetic drugs have been developed as the prototype of the natural phytochemicals, and these serve as lead compounds for the synthetic drugs. The leaf of *Antiaris africana* is highly promising in terms of nutrition. Phytochemical constituents of the plant showed high content of tannin. Tannins are useful in medicine because of their astringent properties. The crude fibre content of the leaf of *Antiaris africana* is high thus helps in the maintenance of human health and has been known to reduce cholesterol level of the body

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