



## PHYTOCHEMICAL AND PROXIMATE ANALYSIS OF *ASPILLIA KOTSCHYI* (SCH.BIPEX, HOCHST) OLIV

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### ABSTRACT

*The phytochemical and proximate composition of *Aspillia Kotschyi* belonging to *Compositae* family which is commonly used as medicinal plant in Nigeria was determined on both the Methanolic and Petroleum spirit extracts of the plant material. The Methanolic extract of the plant revealed the presence of carbohydrates, cardiac glycosides, flavonoids, triterpene, and alkaloids. The Petroleum spirit extract showed the presence of only carbohydrates and alkaloid. Proximate composition analysis shows moisture content of 5.7%, total ash of 4.03%, crude protein 10.39%, fibre 9.06%, Fat value 0.83%, and Nitrogen free extract of 70.19%. The results of this study suggest some merit in the popular use of *Aspillia kotschi* in herbal medicine.*

*Key words:* *Aspillia kotschyi*, Phytochemical, Proximate composition.

### 1. INTRODUCTION

Plants have occupied a very important position in human life for a very long time. They provide food, medicine, fibre and fodder for domestic animals. So many plants have promising nutritive values which could nourish the ever increasing human population, but remain underutilized due to lack of awareness and technologies for their utilization. Many of them are even more resilient, adaptive and tolerant to adverse climatic conditions than the conventional foods. The need to explore these underutilized (lesser) wild foods in order to enhance availability of foods and create a balance between population growth and agricultural productivity, particularly in developing countries like Nigeria is imperative. Plants in general contribute to the mineral, vitamin and fibre contents of diets. Among the plants, vegetables are excellent sources of minerals and contribute to the recommended dietary allowance (RDA) of the essential nutrients. Plant based drugs have been used against various diseases since time immemorial. The primitive man used herbs as therapeutic agents and medicaments, which they were able to produce easily. Nature has provided abundant plant wealth for all living creatures. These plants possess medicinal virtues. The most important values of some plants have been published but a large number of them remain unexplored. So there is need to explore

their uses and conduct pharmacognostic and pharmacological studies to ascertain their therapeutic properties [1].

*Aspillia kotschyi* belongs to the family *compositae* which is also known as *Asteracea*. The common names of this plant in Nigeria are “Ja majina” i.e. To draw up mucus in hausa or “Jinin barewa”. Historically *Aspillia africana* was used in Mbaise and most Igbo speaking parts of Nigeria to prevent conception suggesting potential contraceptive and anti-fertility properties [2]. The plant is an erect herb to 1.3 m high with purple or brownish-red flowers .

In other parts of the world such as Congo, the leaf-sap is used as eye-drops for eye complaints. It is also used as ear-drops, and is rubbed on the chest and made into a tisane to drink for chest-affections. In Gabon the plant is used to soothe headache and in Uganda a decoction of leaves is taken for gonorrhoea [3].

### 2. MATERIALS AND METHODS

#### 2.1 Collection, identification and preparation of plant materials

The plant was collected from Ajide forest of Okpokwu Local government Area of Benue State Nigeria in March 2015. The plant was identified and authenticated at the Herbarium Unit of Biological Sciences Department, Ahmadu Bello University Zaria Nigeria by Mallam

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Namadi Sunusi. Voucher specimen number 2956 was given to the plant. The fresh plant leaves were washed thoroughly and carefully with distilled water and air dried for five days. The dried plant materials were pulverized to powder using pestle and mortar in the laboratory.

## 2.2 Extraction of plants Materials

About 100 g of the powdered plant material was carefully weighed and loaded into a soxhlet extractor. The powdered plant material was extracted separately with redistilled Methanol and Petroleum spirit (60-80°C) using soxhlet extraction and cold maceration method [4]. The extract was then concentrated in vacuo using rotary evaporator at about 40°C and finally was [subsequently] subjected to air drying to give dried extracts for further analysis.

## 3. PRELIMINARY PHYTOCHEMICAL SCREENING

The methanolic and petroleum spirit extract of *Aspillia Kotschyi* plant was used to determine the presence of phytoconstituents such as alkaloids, cardiac glycosides, anthraquinones, steroids, triterpenes and reducing sugars [5]. Other phytochemical examination of various class of phytoconstituents was performed; flavonoid by Shinoda test; saponins by froath test; alkaloids; glycosides by legal's test [6].

## 4. PROXIMATE ANALYSIS

The proximate compositions of the plant samples was determined by adopting the official method of analysis by Association of Official Analytical Chemists [7]. The total free Nitrogen content in the extracts was determined as total Kjeldahl nitrogen by microkjeldhal method. The crude proteins were obtained also according to the Association of Official Analytical Chemists [7] procedure. The moisture and ash were determined from the plant materials using weight difference method [8 and 9]. Crude fibre was estimated from the extracts by loss in weight on ignition of dried residue following digestion of fat free samples. Crude fat was determined by extracting the samples with petroleum ether in a soxhlet extractor. All the proximate values were reported in percentages [10].

## 5. RESULTS AND DISCUSSION

The results of phytochemical analysis of the two extracts of *Aspillia kotschyi* plant is shown in Table 1 below. This showed that the petroleum ether extract of the plants contained carbohydrates, and alkaloids while the methanolic extracts of the plant revealed the presence of carbohydrates, cardiac glycosides, flavonoids, triterpene, and alkaloid. The presence of

these secondary metabolites has contributed to its medicinal value as well as physiological activity [11]. Flavonoid which was detected has a wide range of pharmacological effects including antioxidant, anti-inflammation, antiplatelet, anti-allergic, cytotoxicity and reduce risk for heart disease [12]. The identified phytoactive compound in the plant are well known for their pharmacological activities ranging from antibacterial and antifungal [5].

Table 1: Phytochemical analysis of *Aspillia Kotschyi* Plant extracts

Phytochemical constituent	Aspillia Pet ether Extract	Aspillia Methanolic Extract
Carbohydrates	+	+
Glycosides	-	-
Anthraquinones	-	-
Cardiac glycosides	-	+
Saponins	-	-
Tannins	-	+
Flavonoids	-	-
Steroids	-	+
Triterpene	+	+
Alkaloid		

Key ( + ) = positive ( - ) = negative

Table 2: Proximate analysis of *Aspillia Kotschyi* Plant

Components	Aspillia Methanolic Extract
Crude protein value (%)	10.39
Crude Fibre Value (%)	9.06
Crude fat Value (%)	0.83
Nitrogen Free extract (%)	70.19
Ash (%)	4.03
Moisture (%)	5.7

Table 2 showed the proximate analysis of the crude sample of *Aspillia Kotschyi* plant which indicated the percentage of moisture as (5.7%) and ash content of (4.03%), while the plant methanolic extract proximate analysis showed that, it contains crude protein (10.39%), crude fibre (9.06%), crude fat (0.83%), free nitrogen (70.19%). From the results crude protein has the highest value while crude fat has the least. The crude protein and crude fibre contents are higher in the methanolic extract of *Aspillia Kotschyi*. The plant methanolic extract showed higher crude protein content. Nutritionally *Aspillia Kotschyi* plant is beneficial as protein contain amino acids utilized by the cells of the body to synthesize all the numerous proteins required for the function of the cell and also to furnish energy [13]. From the results also one can see that the fibre content in the plant material showed that nutritionally this is of beneficial effect since it had been reported that food fibre aids absorption of trace

elements in the gut [14] and reduce absorption of cholesterol [15]. Crude fibre is also very essential for the digestion of food materials in the food canal of animals [16]. The total fat content in *Aspilia kotschyi* if further analyzed may contain fatty acids as well as vitamins as it contains moderate percentage of fat. Also from the results Ash content of 4.03% dry matter (DM) was obtained. Ash in food contributes for residue remaining after all the moisture has been removed as well as organic material (fat, protein, carbohydrates, vitamins, organic acids etc) have been incinerated at a temperature of about 500°C. Ash content is generally taken to be a measure of mineral content of original food [17]. The percentage of moisture content obtained in the plant is 5.7%. The moderate moisture content provides for an activity of water soluble enzyme and coenzyme needed for metabolic activities of the plant [18].

## 6. CONCLUSION

From this work it is shown that, the presence of those phytochemicals justify the use of the plant in curing certain diseases. The presence of flavonoids which are hydroxylated phenolics in the plant might be responsible for the therapeutic effectiveness against a wide array of microorganisms, probably due to their ability to complex with extracellular and soluble proteins and to complex with the bacterial cell wall. Moreover the study also shows that plant examined is good source of fibre.

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