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Phytochemical analysis of *Borreria stachydea* and *Cassia absus*

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ABSTRACT

Green leafy vegetables consumption has been associated with decreased risk of persistent metabolic diseases. In this present work, the phytochemical constitution of Borreria stachydea and Cassia absus belonging to rubiacea and leguminosae families respectively were investigated. The two plants methanolic and petroleum ether extracts were analyzed for alkaloids, tannins, saponins, steroids, terpenoids, flavonoids, glycosides and phenolic compounds. The study results showed that the petroleum ether extract of the two plants contained: glycosides and steroids while the methanolic extracts of the two plants revealed the presence of carbohydrates, glycosides, cardiac glycosides, saponins, and flavonoids. Tannins were also observed to be present in the methanolic extract of Borreria stachydea only. The implications of the results were discussed.

Keywords: Phytochemical, *Borreria Stachydea, Cassia Absus*

INTRODUCTION

Medicinal plant species has pharmacologically important phytochemical. The primitive man used herbs as therapeutic agents and medicament, which they were able to procure easily. The nature has provided abundant plant wealth for all living creatures which possess medicinal virtues. Phytochemicals are bioactive constituents of plants. Some plants possess some useful phytochemicals which are of high medicinal values to human and veterinary animals, some which are alkaloids, tannins, flavonoids, saponins and phenolic compounds [1]. Plant materials contain thousand of chemicals which act against diseases and infections of humans and animals when properly used. Plant contains different types of compounds such as resins, rubbers, gums, waxes, dyes, flavors, fragrances, proteins, amino acid; bioactive peptides, sugars, flavonoids and biopesticides [2].

Plants generally contain compounds (such as saponins, tannins, oxalates, phylates, trypsin inhibitors and cyanogenic glycosides) known as secondary metabolites, which are biologically active [3]. *Borreria stachydea* belongs to the Phylum: magnoliophyte, Class: manoliopsida and a member of the *Rubiaceae* family. It is found in Nigeria, Ghana, Sudan, Malaysia, India and several other nations of the world. The plant is an erect hairy and weedy herb, about one feet in height with mauve. A poultice of the whole plant is used to heal leg ulcer, wounds, urinary tract infections and was found to be highly antioxidative in nature. *Borreria* is relatively large genus of herbs or half-shrubby plants. This genus consists of about 100 species distributed throughout the tropics [4]. In northern Nigeria *Borreria stachydea* is popularly known as “alkamar tururuwa” while fulanis called it “fairare”.The plant is used in northern Nigeria medicinally for urinary troubles, gonorrhea and for women in childbirth, as to regulate the menses [5].

Cassia absus Linn is of the family *leguminosae* and subfamily *caesalpinonodea*e is a useful medicinal plant. It is regarded as a blood tonic, bitter astringent for the bowels and applied locally to heal ulcers [6]. It is useful in the disease of eyes such as purulent conjunctivitis and opthalmia [7]. All the species of *cassia* have bright yellow flowers of characteristics shape. *C. abus* Linn is popularly known as "fidili" in Hausa and in English is called "jasmeejaz" it is found in tropical Asia, Australia, Africa and throughout India. Its leaves are hot, bitter and acrid: astringent to the bowels. Its seeds possess diuretic and stimulant properties. The seeds are used in the treatment of ringworms, opthalmia and skin affections [8].

EXPERIMENTAL SECTION

Collection, Identification and Preparation of Plant Materials

The plants were collected from Ajide forest Okpokwu Local government Area of Benue State, Nigeria in March 2015.The two plants were identified and authenticated at the Herbarium Unit of Biological Sciences Department of Ahmadu Bello University Zaria Nigeria by Mallam Namadi.. Voucher specimen number were given to the plants, *Borreria Stachyde*a 2756 and *Cassia absus* 3106 respectively. The fresh plants leaves were washed thoroughly and carefully rinsed with distilled water and air dried for five days. The dried plants materials were pulverized mechanically pounding them using wooden mortar and pestle.

Extraction of Plant Materials

100g each of the two powdered plants materials were carefully weighed and loaded into a Soxhlet extractor. Each powdered plant material was separately extracted with Methanol and Petroleum spirit ether for 72 hours. The extracts were concentrated in vacuum at 40^{O}C using rotary evaporator and finally were subjected to air drying to give dried extracts for further analysis.

Preliminary Phytochemical Screening

The methanolic and petroleum sprit extract of *Borreria stachydea* and *CassiaAbsus* plants were used to determine the presence of pyhtoconstituents such as alkaloids, cardiac glycosides, anthraquinones, steroids triterpenes and reducing sugars by the method of Trease and Evans (1989). Other phytochemical examination of various class of phytoconstituents was performed flavonoid by Shinoda test; saponins by Froath test; alkaloids; glycosides by legal's test [9].

RESULTS AND DISCUSSION

The results of phytochemical analysis of the two extracts of *Borreria stachydea* and *Cassia absus* plants are shown in Table 1 below. This showed that the petroleum ether extract of the two plants contained glycosides and steroids while the methanolic extracts of the two plants revealed the presence of carbohydrates, glycosides, cardiac glycosides, saponins, and flavonoids. Tannins were also observed to be present in the methanolic extract of *Borreria stachydea* only. The presence of these secondary metabolites has contributed to its medicinal value as well as physiological activity [10].

Table 1: Phytochemical Analysis of *Borrreria stachydea* and *Cassia absus* Plant extracts

Phytochemical constituent	*Borrreria stachydea* Petroleum sprit extract	*Borrreria stachydea* Methanolic extract	*Cassia absus* Petroleum sprit extract	*Cassia absus* Methanolic extract
Carbohydrates	+	+	+	+
Glycosides	+	+	+	+
Anthraquinones	-	+	-	-
Cardiac glycosides	-	+	-	+
Saponins	-	+	-	+
Tannins	-	+	-	-
Flavonoids	-	+	-	+
Steroids	+	-	+	-
Triterpene	-	-	-	-
Alkaloid	-	-	-	-

***Key** = (+) = Positive, (-) = Negative*

Various studies showed that saponins although non toxic can generate adverse physiological responses in animals that consume them. Presence of those phytochemicals justifies the use of the plant in curing certain diseases.

Saponins act as an immune booster, lowers blood cholesterol and anti- intestinal cancer agent [11]. The presence of flavonoids which are hydroxylated phenolic in the two plants might be responsible for their therapeutic effectiveness against wide array of microorganisms, probably due to their ability to complex with extracellular and soluble proteins and to complex with the bacterial cell wall. Flavonoids compound are potent water soluble antioxidants and free radical scavengers, that prevent oxidative cell damage and have strong anticancer activity [12][13].

CONCLUSION

Phytochemical analysis revealed that the two plants contain similar constituents which are useful for medicinal properties. However more analysis such as thin layer chromatography, GC-MS, NMR, need to be done to ascertain the actual components of the plants.

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