



## QUALITATIVE PHYTOCHEMICAL SCREENING OF SOME MEDICINAL PLANTS OF NORTHERN KANO, NIGERIA.

'SANI HARUNA<sup>1</sup>, ABDULHAMID BALA<sup>1</sup>, AMINA UMARMUHAMMAD<sup>2</sup> AMINU S. MAITAMA<sup>1</sup>,

<sup>1</sup>Department of Forestry, Audu Bako College of Agriculture Dambatta, Kano.

<sup>2</sup>Department of Remedial and General Studies, Audu Bako College of Agriculture Dambatta, Kano.

### ARTICLE INFO

#### Keywords:

Phytochemical, Medicinal plant, Bio-active compounds, Extracts, Drugs

Correspondence author:

e-mail: [saniharuna27@gmail.com](mailto:saniharuna27@gmail.com)

Phone:

08039569565

### ABSTRACT

Screening for bioactive compounds in three different plant species of the study area Kano North, was carried out, with the aim to investigating the presence of phytochemicals/bioactive compounds in the plants under study. The research was conducted in the Biology and chemistry Lab, Audu Bako College of Agriculture, Dambatta in 2015. The plant materials used in the study were root from *Ziziphus mauritiana*, and stem of *Anogeissus leiocarpus* and *Perinaria macrophylla*. Plant extracts were obtained through cold percolation methods. Water, ethanol, chloroform were the solvents used to obtain the extracts of the plant materials. The bioactive compounds screened were, Alkaloid, Tannin, Saponin, Flavonoids, Steroids and Glycosides. The result of the bioactive compounds screened from three medicinal plants was presented in the table. The result revealed the presence of active compounds in the three plant material investigated. However, some of the active compounds were absent in some plant extracts. Tannin was found to be absent in both water and chloroform extracts of *Ziziphus mauritiana* and *Perinaria macrophylla*. Meanwhile, most of the compounds were found absent in chloroform extracts in all the plant materials. Presence of the bioactive compounds in the plant materials in this study could justify the medicinal property of the plants and in addition they can be used as promising candidates for the development of new drugs.

### INTRODUCTION

A medicinal plant is any plant which in one of its organs contains substances that can be used for therapeutic purpose or which are precursors for the synthesis of useful drugs (Haruna, 2011). They are also the richest bio-resources of drugs and traditional system of medicine, modern medicine, food supplement, pharmaceutical intermediate and chemical entities for synthetic of drugs (Alagesaboopathi and Swakumar 2011). Nearly 80 percent of the world population is dependent on the traditional medicine for primary health care. The knowledge of medicinal plants has been accumulated during the course of many centuries based on different systems. The medicinal plants are

useful for healing as well as for curing of human diseases because of the presence of phytochemical constituents (Nostro, et al., 2000). Phytochemicals are naturally occurring in the medicinal plants leaves, barks, and root that have defense mechanism and protect from various diseases (Abdulwaddood et al., 2013). Medicinal plants contain some bioactive compounds which provide definite physiological actions on the human body, and those bioactive substances include Tannins, flavonoids, Saponins, steroids, glycosides, terpenoids, anthraquinones, and other phenolic substances. These compounds are synthesized by primary or rather secondary metabolism of plants.

A large number of secondary metabolites belonging to several chemical classification have been shown to have inhibitory effect on all types of microorganism *In vitro*. (Vasu *et al.*, 2009, Criag and David 2011). This research paper will actually help to identify the chemical constituents present in the plant materials under study. The knowledge of this chemical constituents of plant will further be valuable in discovering the actual medicinal values and development of synthetic drugs.

## **MATERIAL AND METHODS**

### **Study area**

The study area is Kano north, located between latitude 10°-30°N and 13°-15°S. It has the Sudan savanna type of climate and vegetation that gives way to semi-arid condition. The minimum and maximum temperature ranges between 15.86°C and 33°C. Rainfall ranges from 500mm to 1200mm (Ahmad and Ahmad 2011) The area is part of Hausa land where ethno medicine is recognized and highly practiced (Deeni and Hussain 1991).

### **Plant materials.**

Fresh parts root and stem bark of the plant under study were collected. The selected plants were Stem bark of *Anogeissus leiocarpus* (COMBRETACEAE), Root of *Ziziphus mauritiana* (RHAMNACEAE) and stem bark *Perinaria macrophylla* (CHRYSOBALANACEAE).

### **Plant collection**

The plants were collected from Diggol, and Kwadage villages of Dambatta local government area and Kaburma of Dawakin Tofa local government area. Plants were taxonomically identified and authenticated in the herbarium of Forestry Department Audu Bako College of Agriculture, Thomas, Dambatta. Plant materials used for phytochemical analysis were stem barks for *Anogeissus leiocarpus* and *Perinaria macrophylla*, while root was used from *Ziziphus mauritiana*. Each sample of the Plant materials was dried under shade and milled to a fine powder. (Venkataet *al.*, 2010)

### **Extraction method**

Plant extracts were obtained by cold percolation method (Veeramuthu *et al.*,

2006). Ethanol, water and chloroform were the solvents used in the extraction method. For all the solvents 50g of the dried plant materials were percolated in 500ml of the solvents in a 500ml capacity flask. The mixtures were agitated intermittently and kept for two weeks for ethanol and chloroform, while aqueous was kept for only one week to avoid fungal contamination. The mixtures were filtered through Whatman No1 filter paper, the filtrate were evaporated to dryness using a water bath at 60°C for water and ethanolic extract, while chloroform extract was allowed to dry overnight at an ambient temperature, the residues were stored at 4°C for subsequent use.

### **Phytochemical analysis.**

The qualitative phytochemical analysis was carried out using the standard method of (Onwukaemeet *al.*, 2007), (Alagesaboopathi and Swakumar 2011) and (Abdulwadoodet *al.*, 2013).

**Test for Alkaloids:** 1ml of HCL acid was added to 3ml extracts in a test tube, about two drops of Meyers reagent to one ml of the extracts was added, creamy and turbid precipitate is an indication of the presence of alkaloids.

**Test for Tannin:** Ferric chloride few drops was added to 1ml of the extract, presence of blue black and blue green precipitate indicated the presence of tannin.

**Test for Saponins:** This was carried out by frothing test, 2ml of the extracts was vigorously shaken in the test tube for two minutes, presence of frothing in the test tube indicates positive test.

**Test for Flavonoids:** A piece of magnesium ribbon was added to 1ml of the extract followed by the addition of hydrochloric acid drop wise, a magenta coloration indicates the presence of flavonoids.

**Test for Glycosides:** 10ml of H<sub>2</sub>SO<sub>4</sub> was added to 1ml of the extracts and the mixture was heated in boiling water for 15 minutes. 10ml Fehling's solution was added and the mixture boiled. A brick red precipitate is confirmatory for the presence of glycosides.

**Test for steroids:** two ml of acetic acid anhydride was added to 0.5 of the plant materials with two ml of H<sub>2</sub>SO<sub>4</sub> the color changes from violet to blue green indicating the presence of steroids.

**Test for terpenoids:** five ml of each plant material was mixed in 2ml of chloroform and concentrated H<sub>2</sub>SO<sub>4</sub> (3ml) was added to form a layer. A reddish coloration of the interface is formed showing positive result.

**RESULT:**

The present finding on the plant materials investigated revealed the presence of medicinally bioactive compounds. The result of the phytochemical screened from the

plant materials is presented in the table below. The result shows that all the bioactive compounds were found present in the plant extracts. The compounds include alkaloid, tannin, saponin, steroids, glycosides and flavonoids. However, certain compounds were found to be absent in some extracts of the plant materials. However, some of the active compounds like alkaloids and glycoside were found present in all the extractsabsent. Tannin was found to be absent in both water and chloroform extracts of *Ziziphusmauritiana* and *Perinariamacrophylla*. Meanwhile, most of the compounds were found absent in chloroform extracts in all the plant materials.

Table 1: Phytochemical components from the plants extracted using various solvents  
Presence of various active compounds/plant

Solvents/active compounds	<i>A.leiocarpus</i>	<i>Z. Mauritiana</i>	<i>P. macrophlla</i>
Ethanol	alkaloids +	+	+
	Tannins +	+	+
	Saponins +	+	+
	Flavonoids +	+	+
	Steroids +	+	+
	Glycosides +	+	+
Water	Alkaloids +	+	+
	Tannins +	-	-
	Saponins +	+	+
	Flavonoids +	-	+
	Steroids +	+	-
	Glycosides +	+	+
Chloroform	Alkaloids +	+	+
	Tannins -	-	-
	Saponins +	+	-
	Flavonoids -	-	-
	Steroids -	-	-
	Glycosides +	+	+

Keys: + Present- Absent

**DISCUSSION:**

Screening for bioactive compound was conducted on the extract of the plant materials. The investigation revealed that the plants contain the compounds which are known to exhibit medicinal as well as physiological activity (Sofowara 1993). Analysis of the extracts revealed the presence of phytochemicals such as tannins, flavonoids, saponins, glycosides, steroids, and alkaloids. The phenolic substances are

one of the largest and most ubiquitous group of plant metabolites (Yadav and Munin 2011). They possess biological properties such as antiapoptosis, antiaging, anticarcinogenanti inflammation, cardiovascular protection and improvement of endothelial functions. Natural antioxidant mainly come from plant in the form of phenolic compound such as flavonoids, phenolic acid e.t.c (Yadav and munin).

Flavonoids are water soluble antioxidants which prevents oxidative cell damage and is potent anticancer (Ramada *et al.*, 2006). Saponin was also found to be present in all the plant extracts. It has been reported that saponins has the activity of precipitating and colligating red blood cells, it also foams in aqueous solutions, and has bitterness and hemolytic activity (Alagesaboopathi 2011). The plant extract was also found to contain tannins which has been reported to be responsible for antidiarrheal activity (Alagesaboopathi 2011). Usman and Osuji (2007) reported that tannins has been widely used topically to sprains, bruises and superficial wound. There was also the presence of Alkaloids in the investigation made on the plant materials. Alkaloids have been associated with medicinal uses for centuries and one of the biological properties is their cytotoxicity. Many studies have reported that antibacterial activity of alkaloids and glycosides are known to lower blood pressure (Del-Rio *et al.*, 1997). Presence of steroids was also observed and it has been reported to have antibacterial properties and are very important due to their relationship with compounds such as

sex hormones. The medicinal properties of plants are perhaps due to the presence of various secondary metabolites which are non-nutritive plant compound and are known to have medicinal activity against several pathogens and could suggest the use traditionally for the treatment of various diseases (Usman and Osuji 2007).

#### **CONCLUSION**

From this finding it is revealed that, medicinally important constituents are present in the plant materials studied. Many studies have confirmed that identified phytochemicals are bioactive. Therefore the extracts from these plants could be considered as a good source in the development of new drugs and also recommended in the traditional medicine practice. It is suggested that more research be carried out to test the bioactivity or efficacy so as to contribute immensely towards the development of drugs. In addition research should also be conducted to determine the actual amount of each constituent (quantitative analysis) and to elucidate the possible mechanism of action of each compound.

#### **REFERENCES:**

- Abdulwadood, M.G. Sayed, B.J. Muhammad, N.Ajmal, K. Rhuksana, G. Phytochemical analysis of medicinal Plants occurring in local area of mardan. *Biochem.Anal.Biochem* 2:4
- Ahmad, U.A. and Ahmad, M.M. (2011). Morphological identification of malarial vectors within anopheles species in parts of Kano State. Nigeria. *Bayero journal of pure and applied sciences* 2(4).
- Alagesaboopathi, C. (2011). Phytochemical screening and antibacterial potential of *Andrographis ovate* Clarke. *African journal of biotechnology* vol. 10(25), Pp 5033-5036.
- Alagesaboopathi, C. and Sivakumar, R. (2011). Phytochemical screening studies on the leaves and stem of *Andrographis neesiana* Weight. An endemic medicinal plants of India. *World applied Science journal* 12(3): 307-311.
- Criag, G.M. and David, J. N. (2001). Natural products drug discovery in the next millennium. *Journal of pharm. Biol.*
- Deeni, Y. and Hussaini, H. (1999). Plant in Kano, ethno medicine: screening for antibacterial activity. *Pharmaceutical Biology* vol. 29 no 1.
- Del-Rio, A., Obddullilio, B. G., Casfillo, J., Main, F.G., Ortunno A. (1997). Uses and properties of citrus flavonoids. *J. Agric food chem.* 45:4505-4515.
- Haruna, S, (2011). A survey of major ethno medicinal plants of Kano North senatorial districts and evaluation of some for antibacterial activity. *Msc.Thesis unpublished* Pp 4:

- Nostro, A. Germano, M.P. Dagelo, V. and Marino, A. (2000). Extraction method and bioautography for evaluation of medicinal plants antimicrobial activity. *App. Microb.* 30:379-384
- Onwukaeme, D. N. Ikwegbweha, T. B. Asonye C. C. (2007). Evaluation of phytochemical constituents and effect of exudates of *Pycanthus Angolensis* Wedl Warb (myristicaceae) on corneal ulcer in rabbits. *Tropical journal of pharmaceutical research.* 6(2):725-730.
- Ramadas, K., Ranchandra, Y.L., Padamalatha, S. (2006). Antimicrobial activity of the leaf extracts of *Asapragus racemosus*. *Giobious*, 33:279-280.
- Sofowara, A. (1993). Medicinal plant and traditional medicine in Africa. *Spectrum books l.t.d. Ibadan, Nigeria*, Pp 191-289.
- Usman, H. and J.C. Osoji (2007). Phytochemical and *in-vitro* antimicrobial assay of the leaf extract of *Newbouldia leavis*. *Afr. J. trad. CAM.* 4(4):476-480
- Vasu, K., Goud, J. V., Surya, A., Sigara, C. (2009). Biomolecular and phytochemical analysis of three aquatic Angiosperm. *Afr. J. microbiol. Res.* 3(8):418-421.
- Veeramuthu, D. (2006) Antimicrobial activity of some ethno medicines used by Paliya tribe from Tamil India. *Entomology research institute, Loyola college India* 6:35
- Venkata, S. SKantam, R.Y Nagendra, L. and Satyanaranara, K. (2010). *International journal of pharmacy and biosciences* vol. 1(4).
- Yadav, R. N., and Munin, A. (2011). Phytochemical analysis of some plants. *Journal of phytology* 3(12): 10-14.