



PHYTOCHEMICAL STUDY OF *Guiera senegalensis* (SABARA) IN SOKOTO.

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Abstract

Many traditional medicinal plants, including *Guiera senegalensis*, a shrub that grows well in sub-Saharan Africa, have been candidates for research because of their potential medicinal properties. To verify medicinal potentials, phytochemical compounds such as, tannins, alkaloids, flavonoids, saponins, terpenoids and phenols have been used as a method of screening of medicinal plants. Phytochemicals, Alkaloids, saponins, phlobatanins, glycosides, anthraquinones, and flavonoids were analyzed using standard procedures. According to the

result of this work, the three extracts (water, methanol, and petroleum) *Guiera senegalensis* contains

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the important metabolites contains, alkaloids, tannins, Glycosides, saponins, flavonoids, and anthraquinones. Toxicity and other safety studies are required to find out the safety of using *Guiera senegalensis*.

Introduction

Larger percentage of people on the planet earth relies on medicinal plants and other materials to quench their everyday health needs. 80% of the world population relies on plant derived medicine for their health care. Plant have continue to be a basis for the development

of new drugs because they houses a broad range of bioactive substances such as lipids, phytochemicals, pharmaceuticals, flavours, fragrances and pigments. Plant extracts are widely used in the food, pharmaceutical and cosmetics industries. (Ageda *et al.*, 2010; Aba and Egwari, 2011; Suman *et al.*, 2017)

Likewise, the medicinal flora in the tropical region has a vast of plants that provide raw materials for overhauling a range of medical problems and pharmaceutical requirements. Collectively, plants produce a remarkably diverse array of over 500,000 natural products also known as secondary metabolites (Fatope *et al.*, 2001). The medicinal value of these secondary metabolites is due to the presence of chemical substances that produce a definite physiological action on the biological system . Some of them include: alkaloids, glucosides, glycosides, steroids, flavanoids, fatty oils, phenols, resins, phosphorus and calcium for cell growth, replacement, and body building (Kubramawa *et al.*, 2008).

Several traditional medicinal plants, including *Guiera senegalensis* , a shrub that grows well in sub-Saharan Africa, have been candidates for research because of their perceived medicinal properties. To ascertain the perception and traditional uses , compounds such as, tannins, alkaloids, flavonoids saponins, terpenoids and phenols have been used as a method of screening of medicinal plants. In traditional medicine, *Guiera senegalensis* is use to cure for infections and infections, diseases and wounds, respectively. It have been used for treating jaundice , diabetes mellitus, hypertension, cough, arthritis, enteritis, diarrhea and malaria. Some uses it to treat inflammation of skin, leprosy, fever, and was helpful in high blood pressure and high blood sugar levels (Denou *et al.*, 2016; Shafei *et al.*, 2016).

Guiera senegalensis is called Sabara in Hausa. It is a shrub that grow to a height of 3 to 5 m depending on the habitat. The leaves which are 3 to 5 cm long and 1.5 to 3.0 cm broad are arranged opposite or sub opposite on the stem. It is widely distributed in the savannah region of west and central Africa, Nigeria, Senegal, Gambia, Mali, Niger, Burkina Faso and Ghana. (Denou *et al.*, 2016). Despite the wide use of *G. senegalensis* by locals ,the studies that unveil its chemical constituents in Sokoto state are limiting .Thus ,this paper determined the phytochemical

compositions of *G. senegalensis* as a candidate for therapeutic uses by locals or scientifically oriented professionals .

MATERIALS AND METHODS

Sample collection

The plant *Guiera senegalensis* was obtained from a farmland in Gwadabawa local government, Sokoto state , Nigeria and duly identified by a botanist .The leaves were separated from stems and dried under shed and kept at room temperature in polythene bag.

Extraction

The solvents used for extraction were , water, methanol, and petroleum ether .20g of the powdered sample was extracted with 200ml of methanol using Soxhlet apparatus.20g of the powered sample was extracted with 200ml of petroleum ether with Soxhlet apparatus for 6hrs .To give water extract, 20g of the powered sample was dissolved in 400ml of distilled water and allowed to stand for 24hours with occasional stirring .The content was then filtered.

Phytochemicals analysis

Phytochemicals, Alkaloids, saponins, phlobatanins, glycosides, anthraquinones, and flavonoids were analyzed using standard procedures described by Sofowora as reported by Njoku and Obi (2009) , and Lerato *et al.*, (2017) , and Zayyanu (2009).

Result

Table 1 : preliminary test for alkaloids

Plant extract	Result
Water extract	-
Methanol extract	+
Petroleum ether extract	+

+ indicates presence of metabolite, indicates absence of metabolite

Table 2 : Result of Salkowaski test for cardiac glycosides

Plant extract	Result
Water extract	-
Methanol extract	+
Petroleum ether extract	+

+ indicates presence of metabolite, indicates absence of metabolite

Table 3:Result of Lieberman test for steroidal nucleus

Plant extract	Result
Water extract	+
Methanol extract	+
Petroleum ether extract	+

+ indicates presence of metabolite, indicates absence of metabolite

Table 4 : Result of Keller-killiani test for deoxysugar

Plant extract	Result
Water extract	+
Methanol extract	+
Petroleum ether extract	+

+ indicates presence of metabolite, indicates absence of metabolite

Table 5: Result of Frothing test with water for saponin glycosides

Plant extract	Result
Water extract	-
Methanol extract	+
Petroleum ether extract	+

+ indicates presence of metabolite, indicates absence of metabolite

Table 6: Result for condensed tannins (catehol) test with ferric chloride solution

Plant extract	Result
Water extract	+
Methanol extract	+
Petroleum ether extract	+

+ indicates presence of metabolite, indicates absence of metabolite

Table 7 : Test with sodium nitrate

Plant extract	Result
Water extract	-
Methanol extract	+
Petroleum ether extract	+

+ indicates presence of metabolite, indicates absence of metabolite

Table 8 : Result of test for anthraquinones

Plant extract	Result
Water extract	+
Methanol extract	+
Petroleum ether extract	+

+ indicates presence of metabolite, indicates absence of metabolite

Test for flavonoids and flavoids glycosides

Table 9 : Result of test for flavoid aglycone

Plant extract	Result
Water extract	-
Methanol extract	-
Petroleum ether extract	-

+ indicates presence of metabolite, indicates absence of metabolite

Table 10: Result of test for flavonoid compounds

Plant extract	Result
Water extract	+
Methanol extract	+
Petroleum ether extract	+

+ indicates presence of metabolite, indicates absence of metabolite

Table 11: Result of test for phlobatinins

Plant extract	Result
Water extract	-
Methanol extract	-
Petroleum ether extract	-

+ indicates presence of metabolite, indicates absence of metabolite

Table 12: Summary of chemical analysis of leaves of Guira senegalensis

Plant extract	Alkaloids	Tannins	C.Glycosides	Saponnins	Flavonoids	Anthraquinones	Phlobatinins
Methanol extract	-	+	+	+	+	+	-
Petroleum ether extract	+	+	+	+	+	+	-
	+	+	+	+	+	+	-

+ indicates presence of metabolite, indicates absence of metabolite

DISCUSSIONS

According to the result of this work ,the three extracts(water, methanol, and petroleum ether) *Guiera senegalensis* contains the important metabolites contains ,alkaloids, tannins. Glycosides ,saponins, flavonoids, and anthraquinones .This finding is consistent with the past results from other studies from various parts of the world and it is in agreement with the wide range traditional use of the plant.Parable,,of the consistent findings are in Shafei *et al.*, (2016), Denou(216), Salihu and Usman (2015).Biochemically, glycosides are natural cardioactive metabolites used in the treatment of congestive heart failure , and cardiac arrthmia.Steroids are important for reducing cholesterol level ,regulating immune response , and immune enhancement (Lerato *et al.*, 2017).

Anthraquinones are typical metabolites structurally relate to anthracene 9,10-diones and their glycosides .They are widely used in medicine , such as laxative , carthartic , anti-inflammatory, anticancer, and vasorelaxant actions (Chien *et al.*,2014). Long-term use can cause haematuria, albuminia. In rare cases nephropathy ,oedema, and accelerated bone deterioration (Abusaura, n.d).Alkaloids are applicable as painkillers, and to treat certain cancer (Abdulahi, 2012).Flavonoids are anticancer ,antiallergic, antioxidant, antiviral, and anti-inflammatory effects (Abdullahi, 2012). Tannins are compounds with antioxidant, antiseptic, anticancer, antidiarrheal, and heavy metals precipitation activities (Khanbabae and Ree, 2001).Saponins have health benefits on blood cholesterol level ,cancer, bone and immune system trigger (Abdullahi, 2012).Flavonoids glycosides exhibits anti-inflammatory ,antiviral, antioxidant , antimicrobial, and radioprotection actions (Zhu *et al.*, 2005).

Traditionally, *G.senegalensis* have also a wide range uses in many countries such as Sudan Nigeria, Mali, Burkina Faso, Niger , Senegal. It is used to treat leprosy, expurgation, diuresis, impotence, colic and diarrhea, syphilis, rheumatism, respiratory and gastrointestinal issues (Denou *et a.*, 2016). It is also used for milk stimulation (especially in nursing mothers), ,used as blood tonic ,to increase fertility , and to increase weight (Garba *et al.*, 2006).

Conclusion

This study shows that *Guiera senegalensis* contains important secondary metabolites namely ,alkaloids, tannins. Glycosides ,saponins, flavonoids, and anthraquinones.Thus unveil its potential for therapeutic applications .Thus, and it may be the reason behinds it wide applications among the locals .

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