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Preliminary Studies on Some Medicinal Plants in Girei, Adamawa State of Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

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ABSTRACT

Ten medicinal plants' parts (roots, stembarks, and leaves) were studied to assert their suitability for use in pharmaceutical industries as raw materials. The presence (qualitative analysis), concentration (quantitative analysis) and antimicrobial activities of such phytochemicals as alkaloids, tannins, saponins, steriods, phlobatannins, terpenoids, flavonoids and cardiac glycosides (CGs) were carried out on the extracts from the plants' leaves, stembarks and roots. Result indicates an interesting presence of all the phytochemicals in the medicinal plants (i.e. in either of the studied parts), although there are slight variation in the composition of the plant parts. Averagely, tannins shows the highest amount in all the plant studied, followed by alkaloids, while steriods, terpenoids, phlobatannins and cardacglycosides which together constitutes the general phenol shows the least amount. Antimicrobial test reveals the activities of the phytochemicals in the different plant parts, and these has justified the use of the plants in the synthesis of bioactive drugs and hence their medicinal significance for bioprospective and pharmaceutical productions.

Keywords: Medicinal; plants; phytochemicals; antimicrobial; sensitivity.

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1. INTRODUCTION

Traditional medicine refers to health practices, approaches, knowledge and beliefs incorporating plants, animals and mineral based medicines, spiritual therapies, manual techniques and exercises applied singularly or in combination to treat, diagnose and prevent illness or maintain well-being [1]. Since time immemorial, man has been using various parts of plants in treatment and prevention of many ailments [2]. According to the World Health Organization [3], a medicinal plant is any plant which contains substances that can be used for the therapeutic purposes or substances which are precursors for the synthesis. A plant becomes a medicinal plant only when its biological activity has been ethnobotanically reported or scientifically established [2,4].

Medicinal plants represent a rich source from which antimicrobial agents may be obtained and hence, this general name. These plants have been found useful in the treatment of various categories of human ailments and conditions in the different parts of the world, and also as a raw material in the production of many potent drugs. Therefore, the research on the effects of these local medicinal plants is essential, to enhance and optimize the medicinal use of these plants [5].

Cissus cornifolia, Waltheria indica, Anogeissus leiocarpus, Cissampelos owariensis, Borassus aethiopum, Abrus precatorius, Hallea stipulosa, Commiphora kerstingii, Mitracarpus hirtus and Grewia bicolor are extensively used in herbal medicine in Girei, Adamawa State, Nigeria. The various medicinal uses of these plants in Girei, Adamawa State as obtained from the traditional practitioners are detailed in Table 1.

Historically, a lot of formulations were based on plants, whether in simple form of plant parts or in the more complex form of crude extracts and mixtures. Today a substantial number of drugs are developed from plants which are active against a number of diseases. These involve the isolation of the active ingredient found in a particular medicinal plant and its subsequent modification. In the developed countries 25% of the medical drugs are based on plants and their derivatives and the use of medicinal plants is well known among the indigenous people in rural areas of many developing countries [2,6].

Table 1. Selected medicinal plants and their uses in Girei, Adamawa State, Nigeria

Scientific name	Native name	Traditional uses
Cissus cornifolia	Tsuuwaawunbiri	Treatment of pile, syphilis, dysentery, Gonorrhea, stomach disorder, vomiting, asthma, malaria, liver ailments, rheumatism and cancer.
Waltheria indica	Hankufaa	Treatment for wound, Toothaches, liver ailments, sores and cancer. Also stops bleeding and antipyretic.
Anogeissus leiocarpus	Markee	Treatment for cough, asthma, bronchial, hay fever, catarrh stomach pain, chest pains, sore throat, gonorrhea and some antiviral treatments. Leaf is edible.
Cissampelos owariensis	Judarkasa	Used as dewormer, fever and convulsions in children, treatment for ulcer, craw-craw, appendix.
Borassus aethiopum	Giginya	Treatment of diarrhea, pile, impotence, gonorrhea, arthritis stomach disorder, and Syphilis.
Abrus precatorius	Idonzakaraa	Treatment of malaria, Toothaches, liver ailment, rheumatism, diabetis and cancer.
Hellasti pulosa	Ganyengoria	Cures inflammation, asthma, Cough and ear ache.
Hella stipulosa	Ararrabi	Stops bleeding, treatment of sores and wounds, hay fever, stomach ache, vomiting, pile, dysentery, cancer, leaves are edible.
Mitracarpus hirtus	Googamaasu	Cures eczema, treatment of boils, measles and skin diseases. Leaves are edible and also asfeed for livestock.
Grewia bicolor	Markendutse	Treatment of cough, malaria fever and convulsion in Children. Leaves are edible.

Phytochemical are chemical compounds formed during the plants' normal metabolically processes [7]. These chemicals are often referred to as secondary metabolites of which there are several classes including alkaloids, flavonoids, crumarins, glycosides, gums, polysaccharides, phenols, tannins, terpenes and terpenoides [2]. In contrast to synthetic pharmaceuticals, many medicinal plants exert their beneficial effects through the additive or synergistic action of several chemical compounds acting at single or multiple targets sites associated with a physiological process [7].

According to Akinpelu and Onakoya [8] and Jeruto et al. [2], most of these phytochemical are produced through biosynthesis in the metabolic pathways. The primary metabolites are of major importance to plants. The secondary metabolites are medicinal and can also be obtained from various anatomical structures of plants. Plants are diverse in West Africa to the extent that hardly could there be any disease that cannot be tackled by these plants. Hence, they have been refered to as the sleeping giants [2].

The importance of medicinal plants, and the contribution of phytomedicine to the well-being of a significant number of the world's population, has attracted interest from a variety of disciplines [9]. This study therefore, aimed to investigates the phytochemical constituents of the selected plants, the variation in these phytochemicals in the different parts of the plants as well as the antimicrobial activities of these compounds, to contribute in bioprospecting the medicinal plants, and enhance their suitability for use in pharmaceutical industries.

2. MATERIALS AND METHODS

2.1 Collection and Identification of Plants Material

The leaves, stem-bark and root of the plants was collected within 7-11 am on the 10th of August, 2013 from an uncultivated land in Girei town on 9°21'00.6"N and 12°30'05.7"E, Adamawa State, Nigeria. The plants were identified by the Department of Forestry, Modibbo Adama University of Technology, Yola. The leaves, stem-bark and the roots were air-dried in the chemistry laboratory of the department for 2 weeks. The dried plant materials were grounded into fine powder using pestle and mortar. Each grounded sample was weighed and then stored in a dry container.

2.2 Sample Preparation

The aqueous extract of each sample was prepared by soaking 15 g of dried powdered sample in 100 ml ethanol for 24hrs in a beaker property covered with cotton wool. The extract was filtered using Whatman filter paper No 42 (125 mm).

2.3 Phytochemical Screening

Phytochemical screening for major constituents was undertaken using standard qualitative methods as described by Trease and Evans (1989), Sofowora (1993) and Harborne (1973), in Edeoga et al. [6] and Wakawa [10].

2.4 Test for Alkaloids

To 3 ml of the extract in a test tube, 1 ml of 1% HCl was added. The mixture was heated for 20 minutes cooled and filtered. About 2 drops of Mayer's reagent was added to 1 ml of the filtrate. A creamy precipitate indicates the presence of alkaloids.

2.5 Test for Saponins

Frothing test: 2 ml of the extract was vigorously shaken in a test tube for 2 minutes and observe for frothing.

Emulsion test: 5 drops of olive oil was added to 3 ml of the extract in the test tube and vigorously shaken, the absence of frothing and stable emulsion indicates the absence of saponins.

2.6 Test for Tannins

About 0.5 g of the dried powder sample was boiled in 20 ml of water in a test tube and then filter. A few drops of 0.1% ferricchloride was added and observe for brownish green or a blue-black coloration.

2.7 Test for Phlobatannins

The deposition of red precipitate when an aqueous extract of the plant was boiled with 1% aqueous hydrochloric acid was taking as evidence for the presence of phlobatannins.

2.8 Test for Flavonoids

To 3 ml of the extract, 1 ml of 10% NaOH was added. The absence of flavonoids shows yellow coloration.

2.9 Test for Steriods

To 0.5 g extract of the sample, 2 ml of acetic anhydride and 2 ml H_2S0_4 was added. The color change from violet to blue or green indicates the presence of steroids.

2.10 Test for Terpenoids

To 5 ml of the extract, 2 ml of chloroform was added and mixed, 3 ml of concentrated H_2S0_4 was carefully added to form layers and a reddish brown coloration of the interface was formed, indicating the presence of terpenoids.

2.11 Test for Cardiac Glycosides (CGs)

To 0.5 g of the extract dissolved in 2 ml of chloroform. Sulphuric acid was carefully added to form layers. A redish-brown colour at the interface indicates the presence of a steroidal ring.

2.12 Quantitative Analysis of Phytochemicals

The quantitative analyses of the phytochemicals were carried out using standard methods described by Monika et al. [11].

2.13 Antimicrobial Study

2.13.1 Collection of test organisms

The following organisms *Escherichia coli, Streptococcus pyro*gene, *Staphlocuccus aureaus*, *klebsiella pneumonia* and *salmonella enterice* were collected from the microbiology laboratory of the specialist hospital Jimeta, Yola with the help of the laboratory staff. Identification of the text organisms and the antimicrobial sensitivity test were carried out at the same hospital.

2.13.2 Preparation of the nutrient agar

This was carried out as described by Shagal et al. [12]. In this determination, 28 g of the nutrient agar powder was dissolved in 1000 ml of distilled water in a conical flask and was autoclaved for 15 min at 121°C and then, it was allowed to cool to 47°C and dispensed into plates, the plates were used in culturing and sensitivity test for organism.

2.13.3 Antimicrobial sensitivity test

The stocks were maintained on nutrient agar plate and cultured for incubation at 37°C prior to each antimicrobial testing. The discs were prepared using whatman filter paper; kept in vials-bottles and sterilized in an oven at about 121°C for 15 min. prepared discs containing the various extracts were carefully placed on the inoculated plates using sterilized forcaps in each case [12]. The plates were then turned upside-down and inoculate at 37°C for 24 hours in an incubator. The result was taken by considering growth and inhibition of the test organisms as sensitive and non-sensitive.

3. RESULTS AND DISCUSSION

Qualitative analysis of the phytochemicals in the roots of the medicinal plants using ethanol as solvent is presented in Table 2. The use of ethanol as extraction solvent has been shown to be more effective than distilled water [2,13,14], and this is based on the difference in polarity, hence the difference in the solubility of the phytochemicals [12]. From the Table 2, alkaloids, tannins and saponins are shown to be present in all the plants roots, steroids are present in all except *W. indica, A. leiocarpus* and *G. bicolor,* phlobatanins are present in *W. indica, A. leiocar pus, A. precatorius* and *H. Stipulosa,* terpenoids are in all except *H. Stipulosa,* flavonoids are in all except *C. oweriensis* and finally cardiac glycosides which are also present in all the roots except that of *A. precatorius.* This result is comparable to that reported by Sofowora [15] and Olajuyigbe et al. [16].

Table 3 presents qualitative analysis of the phytochemical constituents of the sterm-bark of the medicinal plant with ethanol as solvent. Unlike in the roots, alkaloids, tannins, saponins and flavonoids are shown to be present in all the plants stem bark. Steroids are also present in all the stem barks except those of *B. aethiopum, A. precatoius, C. kershingii,* and *G. bicolor.* Phlobatanins are present in all except *A. precatorious, H. stipulosa, C. kerstingii* and *G. bicolor*, terpenoids are also in all except *A. leiocarpus, A. precatorious* and *M. hirtus* and finally cardiac glycosides which are shown to also be present in all except *A. leiocarpus, B. aethiopum* and *H. stipulosa. There are variations in this results compared to that of* Kubmarawa et al. [5] *and this can be attributed to the different time and locations of sample collection. Although. It agrees with* Olajuyigbe et al. [16].

Table 4 presents qualitative analysis of the phytochemical constituents of the plant leaf samples using ethanolic extraction. Similar to the

stem barks, alkaloids, tannins, saponins and flavonoids are shown to be present in all the plants leaves. Steroids are present in all except *A. precatorious, H. stipulosa, C. kerstingii and M. hirtus,* phlobatanins are present in all except *C. cornifolia, C. owariensis, B. aethiopum* and *C. kerstingii*, terpenoids in all except *G. bicolor*, while cardiac glycosides' presence has been shown in all the plants' leaves except *A. leiocarpus, C. owariensis, H. stipuloso* and *C. kerstingii*. Result is comparable with the study by Ekeanyanwu et al. [17], Olajuyigbe et al. [16], Abhilasha and Kuntal, [18] and Musa et al. [19].

The presence of alkaloids in all the plants is of great interest as it has been found that most modern medicines use it in the treatment of malaria, diarrhea and gastrointestinal complaints, contains high percentage of alkaloid. Drugs containing alkaloid can have a calming effect on psychotic or hypertensive patient without necessarily induced sleep, and can also be used to treat psychiatric and palpitation, cough, tumors and as a pain reliever [20].

Steroids are of great interest in pharmacy due to its active requirement in sex hormones [21]. This can be attributed to the reason why the leaves of these plants are fed as vegetables to expectant and breast feeding mothers, as steroidal structure serves as potent starting material in synthesis of these hormones in the offspring [22].

Flavonoids and cardiac glycosides have been reported to be effective in lowering the risk of certain hormone related cancer and coronany heart diseases [7,23,24]. They can also prevent tooth decay and reduced the occurrence of common illnesses, like flu bacteria and memory problem [25].

The use of terpenoids as anti-bacteria agent in drugs used in the treatment of wounds and injuries has been widely reported [6,26,27]. Terpenoids have been shown to be a constituent of many herbal plants used in the treatment of malaria and cancer and has also been found to be active against fungi, some viruses and protozoa [28].

Tannins and Saponins have been reported to be active as anti-inflamatory and anti-ulcer and also as a pugative [6,23,29]. Saponins are also included in the formulations used in the treatment of wound, cough, asthma, hay fever and generally as antimicrobial and antiviral application [9].

Phlobatanins has been marked for its active requirement in sex hormones and its favorable activities in growth stimulation [6,23,29].

The presence of these phytochemicals in the parts of the medicinal plants analysed indicates or suggests that the plants have potentials in pharmaceutical applications both domestically and industrially.

3.1 Quantitative Analysis of Phytochemical Constituents

The results of the quantitative analysis of some phytochemical constituent of the plants' parts (i.e root, stem-bark, and leaf) are presented in Tables 5, 6 and 7. Table 5 present the quantitative analysis of the plant root extract of the medicinal plant. The results of quantitative analysis on five major groups of phytochemical constituents in the medicinal plants showed that *C. cornifolia* have the highest yield of alkaloids, which is 1.08% and the least yield is in *H. stipulosa* which is 0.24%. *W. indica* have the highest yield for phenols (0.82%), while the least yield recorded was in *A. precatorious* (0.3%). The highest yield for tannins is in *A. leiocarpus* which is 15.20% and the least yield was recorded in *H. stipulosa* which is 6.02%. For flavonoids, *C. kerstingii* recorded the highest yield which is 0.96% and least yield is in *A. precatorious* which is 0.86%. *A. leiocarpus* have the highest yield for saponins (3.72%) while *C. owariensis* recorded the least yield (1.02%).

Table 6 present the quantitative analysis of the plant stem-bark extract of the medicinal plants. The results of the quantitative analysis of plants' stem-barks extract revealed that for alkaloids, *A. leiocarpus* recorded the highest with 1.02%, *W. indica* 0.92%, *C. Kerstingii* 0.65% while *H. stipulosa* recorded the least yield which is 0.03%. For phenols, *C. cornifolia* recorded 0.41%, *G. bicolor* 0.20% while *C. owariensis* recorded the least yield (0.02%). *C. Cornifolia* recorded highest for tannins (10.76%), *A. leiocarpus* (9.10%), *C. owariensis* (8.42%) while *M. hirtus* recorded the least yield (4.92%). *W. indica* yielded 0.67% for flavonoids, *C. kerstingii* 0.62%, *A. leiocarpus* 0.56% and *C. owariensis* recorded the least yield (0.16%). For saponins, *H. stipulosa* recorded the highest yield (2.65%) and *B. aethiopum* recorded the least yield (0.03%).

Table 7 present the quantitative analysis of the plant leaves extract of the medicinal plant. The results of the quantitative analysis of plant leaf

extract revealed that for alkaloids *C. cornifolia* have the highest yield of 0.72% while *C. owariensis* recorded the least yield of 0.41%. For phenols, *C. kerstingii* have the highest yield of 0.78%, *W. indica* 0.71% while *M. hirtus* recorded the least yield of 0.25%. *A. leiocarpus* have the highest yield for Tannins which is 10.10%, while *B. aethiopum* recorded the least of 4.2%. *C. oweriensis* have the highest yield of tannins (8.10%) and *C. cornifolia* recorded the least yield of 0.42%. The result is comparable to that of Ekeanyanwu et al. [17]. *C. cornifolia* have the highest for Saponins (2.26%), while *H. stipulosa* recorded the least yield which is 0.65%. The results specifically *A. precatorius* are comparable to the study by Abhilasha and Kuntal, [18].

Table 2. Qualitative analysis of the phytochemicals in the medicinal plants' roots using ethanol as solvent

Plants	A	T	S	St	P	Te	Fl	CGs
Cissus cornifolia	+	+	+	+	-	+	+	+
Walthera indica	+	+	+	-	+	+	+	+
Anogeissus leiocarpus	+	+	+	-	+	+	+	+
Cissampelos oweriensis	+	+	+	+	-	+	-	+
Borassus acthiopum	+	+	+	+	-	+	+	+
Abrus precatorius	+	+	+	+	+	+	+	-
Hellea stipulosa	+	+	+	+	+	-	+	+
Commiphora kerstingi	+	+	+	+	-	+	+	+
Mitracarpu shirtus	+	+	+	+	-	+	+	+
Grewia bicolor	+	+	+	-	-	+	+	+

Key:+ Presence of constituent, - Absence of constituent, A – Alkaliods, T – Tannins, S – Saponins, St – Steroids, Ph – Phlobatanins, Te – Terpenoids, Fl – Flavanoids, CGs - Cardiac Glycosides

Table 3. Qualitative analysis of the phytochemicals in the medicinal plants' stem-bark using ethanol as solvent

Plants	A	T	S	St	P	Te	Fl	CGs
Cissus cornifolia	+	+	+	+	+	+	+	+
Walthera indica	+	+	+	+	+	+	+	+
Anogeissus leiocarpus	+	+	+	+	+	-	+	-
Cissampelos oweriensis	+	+	+	+	+	+	+	+
Borassus acthiopum	+	+	+	-	+	+	+	-
Abrus precatorius	+	+	+	-	-	-	+	+
Hellea stipulosa	+	+	+	+	-	+	+	-
Commiphora kerstingi	+	+	+	-	-	+	+	+
Mitracarpu shirtus	+	+	+	+	+	-	+	+
Grewia bicolor	+	+	+	-	-	+	+	+

Key:+ Presence of constituent, - Absence of constituent, A – Alkaliods, T – Tannins, S – Saponins, St – Steroids, Ph – Phlobatanins, Te – Terpenoids, Fl – Flavanoids, CGs - Cardiac Glycosides

Table 4. Qualitative analysis of the phytochemicals in the medicinal plants' leaves using ethanol as solvent

Plants	A	T	S	St	P	Te	Fl	CGs
Cissus cornifolia	+	+	+	+	-	+	+	+
Walthera indica	+	+	+	+	+	+	+	-
Anogeissus leiocarpus	+	+	+	+	+	+	+	-
Cissampelos oweriensis	+	+	+	+	-	+	+	-
Borassus acthiopum	+	+	+	+	+	+	+	+
Abrus precatorius	+	+	+	-	+	+	+	+
Hellea stipulosa	+	+	+	-	+	+	+	-
Commiphora kerstingi	+	+	+	-	-	+	+	-
Mitracarpu shirtus	+	+	+	-	+	+	+	+
Grewia bicolor	+	+	+	+	+	-	+	+

Key:+ Presence of constituent, - Absence of constituent, A – Alkaliods, T – Tannins, S – Saponins, St – Steroids, Ph – Phlobatanins, Te – Terpenoids, Fl – Flavanoids, CGs - Cardiac Glycosides

Table 5. Quantitative analysis of plants' roots extract (%)

Plants	Alkaloids	Phenols	Tannins	Flavonoids	Saponins
Cissus cornifolia	1.08	0.22	6.25	0.32	2.10
Waltheria indica	0.91	0.82	11.76	0.95	2.01
Anogeissus leiocarpus	0.87	0.13	15.20	0.75	3.72
Cissampelos oweriensis	0.41	0.81	13.10	0.00	1.02
Borassus aethiopum	0.43	0.12	12.23	0.54	1.52
Abrus precatorius	0.80	0.03	15.00	0.86	2.25
Hellea stipulosa	0.24	0.07	6.02	0.14	3.10
Commiphora kerstingii	0.82	0.14	12.23	0.96	1.75
Mitracarpu shirtus	0.65	0.11	9.46	0.75	1.63
Grewia bicolor	0.56	0.05	12.01	0.60	1.42

Table 6. Quantitative analysis of plants' stem-bark extract (%)

Plants	Alkaloids	Phenols	Tannins	Flavonoids	Saponins
Cissus cornifolia	0.21	0.41	10.76	0.41	2.13
Waltheria indica	0.92	0.14	6.20	0.67	2.01
Anogeissus leiocarpus	1.02	0.10	9.10	0.56	2.62
Cissampelos oweriensis	0.26	0.02	8.42	0.16	1.00
Borassus aethiopum	0.34	0.06	6.52	0.32	0.03
Abrus precatorius	0.20	0.11	7.22	0.43	2.11
Hellea stipulosa	0.03	0.04	5.20	0.22	2.65
Commiphora kerstingii	0.65	0.16	6.72	0.62	1.42
Mitracarpu shirtus	0.31	0.05	4.90	0.45	0.12
Grewia bicolor	0.46	0.20	6.54	0.51	0.95

Table 7. Quantitative analysis of plants' leaves extracts (%)

Plants	Alkaloids	Phanols	Tannins	Flavonoids	Saponins
Cissuscornifolia	0.72	0.32	8.10	0.42	2.26
Waltheria indica	0.51	0.71	9.30	0.62	2.41
Anogeissus leiocarpus	0.44	0.34	10.10	0.64	1.63
Cissampelos oweriensis	0.41	0.28	8.10	0.72	2.22
Borassus aethiopum	0.61	0.62	4.20	0.55	0.81
Abrus precatorius	0.50	0.36	4.54	0.46	0.72
Hellea stipulosa	0.52	0.60	5.32	0.67	0.65
Commiphora kerstingii	0.71	0.78	6.12	0.50	2.44
Mitracarpu shirtus	0.65	0.25	5.10	0.44	0.62
Grewia bicolor	0.56	0.35	7.20	0.60	2.40

Generally, the results of the quantitative analysis have shown a significant presence of alkaloids, flavonoids, tannins, phenols and saponins in the major parts of the plants. And this have further confirmed their effective medicinal applications as widely reported [4,8,22,30-32].

3.2 Antimicrobial Sensitivity Test

The antimicrobial sensitivity test's result obtained for the medicinal plants' roots, stem bark and leaves, using ethanol as the solvent, are presented on Tables 8, 9 and 10 respectively.

Table 8 presences the result of the root extracts. The result shows that all the organisms tested are sensitive to the extract from *W. indica, A. leiocarpus, C. owariensis, C. kerstingii,* and *G. bicolor*. The extract from *C. cornifolia* shows non-sensitive against *Staphlococcus aureus* and *Streptococcus pyrogenes*, *B. aethiopum* shows non-sensitive against *Staphlococcus aureus,* and *Escherichia coli*, *A. precatorious* shows non sensitive agsinst *Streptococcus pyrogenes* and *Klebsiella pneumoniae*, *H. stipulosa* shows non-sensitive against *Streptococcus pyrogenes* and *Klebsiella pneumoniae*, and *M. hirtus* shows non sensitive against *Streptococcus pyrogenes* and *Klebsiella pneumoniae*. The result is comparable to those obtained by Mann et al. [33].

Table 8. Antimicrobial sensitivity test for the medicinal plants' root parts using ethanol as solvent

Plants	*Staplocuccus aureaus*	*Escherichia coli*	*Steptococcus pyrogene*	*Salmonella enterice*	*Klebsiella pneumoniea*
Cissus cornifolia	-	*	-	*	*
Walthera indica	*	*	*	*	*
Anogeissus leiocarpus	*	*	*	*	*
Cissampelos oweriensis	*	*	*	*	*
Borassuse acthiopum	-	-	*	*	*
Abrus precatorius	*	*	-	*	-
Hellea stipulosa	*	*	-	*	-
Commiphora kerstingi	*	*	*	*	*
Mitracarpus hirtus	*	*	-	*	-
Grewia bicolor	*	*	*	*	*

*Key: * Sensitive, - non-sensitive*

Table 9. Antimicrobial sensitivity test for the medicinal plants' stem-bark using ethanol as solvent

Plants	*Staplocuccus aureaus*	*Escherichia coli*	*Steptococcus pyrogene*	*Salmonella enterice*	*Klebsiella pneumoniea*
Cissus cornifolia	-	*	-	*	*
Walthera indica	-	*	*	*	*
Anogeissus leiocarpus	*	*	*	*	*
Cissampelos oweriensis	-	*	-	*	*
Borassuse acthiopum	-	-	*	*	*
Abrus precatorius	*	*	*	-	-
Hellea stipulosa	*	*	-	-	-
Commiphora kerstingi	*	*	*	*	*
Mitracarpus hirtus	*	-	*	-	*
Grewia bicolor	*	*	-	-	*

*Key: * Sensitive, - non-sensitive*

Result for the stem-bark extracts is presented in Table 9. The result shows that all the organisms tested are sensitive to the extracts from *A. leiocarpus* and *C. kerstingii*. *C. Cornifolia* shows non-sensitive against *Staphlocuccus aureaus* and *Streplocuccus pyrogenes, W. indica* shows non-sensitive against *Staphlocuccus aureaus* only, *C. owariensis* shows non-sensitive against *Staphlocuccus aureaus* and *Staplococcus pyrogenes*, *B. aethiopum* shows non-sensitivie against *Staplocuccus aureaus* and *Escherichia coli*, *A. precatorious* shows non-sensitivity against *Salmonella enterica* and *Klebsiella pneumoniae, H. stipulosa* shows non-sensitive against *Streptococcus pyrogenes*, *Salmonella enterica*, and *Klebsiella pneumoniae*, *M. hirtus* shows non-sensitive against *Escherichia coli* and *Salmonella enterica*, and *G. bicolor* shows non-sensitive against *Straplococcus pyrogenes* and *Salmonella enterica*. The result is comparable with that of Kubmarawa et al. [5] and Olajuyigbe et al. [16] (specifically for *W. indica).*

Table 10. Antimicrobial sensitivity test of the medicinal plants' leaves using elthanol as solvent

Plants	*Staplocuccus aureaus*	*Escherichia coli*	*Steptococcus pyrogene*	*Salmonella enterice*	*Klebsiella pneumoniea*
Cissus cornifolia	*	*	-	*	*
Walthera indica	*	*	-	-	*
Anogeissus leiocarpus	-	*	*	*	-
Cissampelos oweriensis	-	*	-	*	*
Borassuse acthiopum	-	-	*	*	*
Abrus precatorius	*	-	-	*	*
Hellea stipulosa	-	*	-	*	*
Commiphora kerstingi	*	*	*	-	*
Mitracarpus hirtus	-	-	-	*	*
Grewia bicolor	-	*	-	*	*

*Key: * Sensitive, - non-sensitive*

The result for the medicinal plants leaf extracts is presented in Table 10. *C. cornifolia* shows non-sensitive against *Straplococcus pyrogenes* only, *W. indica* shows non-sensitive against *Staplococcus pyrogene* and *Salmoniella entrice*, *Anogeissus leiocarpus* shows non-sensitive against *Staphlococcus aureus and Klebisiella pneumoni*. *C. Oweriensis show non-sensitive against Staplococcus aureus and Straplococcus pyrogenes. B. aethiopum* shows non-sensitive against *Staphlococcus aureus* and *Escherichia coli. Abrus precatorius* shows non-sensitive against *Escherichia coli* and *Straplococcus pyrogenes. H. stipulosa* shows non-sensitive against *Staphlocuccus aureus* and *Straplococcus pyrogenes*. *C. kerstingii* shows non-sensitive against *Salmonella enterica* only. *M. hirtus* shows non-sensitive against *Staphlocuccus aureus, Escherichia coli* and *Straplococcus pyrogenes* while *G. bicolor* showed non-sensitive against *Staphlocuccus aureus* and *Straplococcus pyrogenes*. Result is comparable with the study by Musa, [34] (specifically for *C. kerstingii*).

Antimicrobial sensitivity test has shown the active effects of the medicinal plants' extracts on some micro-organisms, and hence their potentials in antimicrobial use. These activities may therefore be attributed to the presence of the different phytochemicals as report gave by Edeoga et al. [6], Krishnaiah et al. [35], and Shagal et al. [12]. This has also account for the wide use of these plants especially in traditional medicines as antimicrobes in microbial diseases [6,35].

4. CONCLUSION

The medicinal functionality of most medicinal plants especially in Africa were discovered by trial and error and this is not enough for the pharmaceutical industry. Even though they were found as remedy to various ailments they offset another as other components of the plant which may be responsible for this are being administer along with the active component. Overdose or underdose of the active component may also offset unpleasant conditions in the body. To this end, this work has therefore revealed the availability, quantity, and the activities of phytochemicals, which are the active medicinal components in the three major parts of ten plants traditionally known to be medicinal. This is expected to enlighten the traditional users on the use of the plants (i.e. the different parts), to obtain a quick, effective and efficient resultant action. The work also comprehensively confirm the medicinal functionality of the plants and hence their bioprospect and pharmaceutical recommendation.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Muazu J, Kaita AH. A Review of traditional plants used in treatment of epilepsy among the Hausa/Fulani tribes of northern Nigeria. Africa Journal of Traditional, Complementary and Alternative Medicine. 2008;5(4):337-340.
2. Jeruto P, Mutai C, Catherine L, Ouma G. Photochemical constituents of some medicinal plant used by the nandis of south nandi district, Kenya. Journal of Animal and Plant Sciences. 2011;9(3):1201-1210.
3. World Health Organisation (WHO). Trace elements in human health and nutrition. Switzerland WHO Publication; 2008.
4. Olaleye MT. Cytotoxicity and antibacterial activity of Methanolic extract of *Hibiscus Sabdanffa.* Journal of Med. Plants Res. 2007;1(1):009-013.
5. Kubmarawa D, Ajoku GA, Enwerem NM, Okorie DA. Preliminary photochemical and antimicrobial screening of 50 medicinal plants from Nigeria. Africa Journal of Biotechnology. 2007;6(14):1690-1696.
6. Edeoga HO, Okwu DE, Mbaebie BO. Phytochemical constituents of some Nigeria medicinal plants. African Journal of Biotechnology. 2005;4(7):685-688.
7. Okwu DE, Josiah C. Evaluation of chemical compositions of two Nigerian Medicinal Plants. Africa Journal of Biotechnol. 2006;5(4):357-361.
8. Akinpelu DA, Onakoya TM. Antimicrobial activities of medicinal plants used in folklore remedies in South-western. African Journal of Biotechnol. 2006;5:1078-1081.
9. Bhalodi M, Shukla S, Saluja AK. Antioxidants Activity of the flowers of Ipomoea aquaticaforsk. Journal of Pharmacognosy magazine. 2005;4:226-239.
10. Wakawa HY, Ibrahim ME, Dahiru D. Photochemical and antimicrobial screening of selected Anti-Diabetic plants in Nigeria. Agriculture, Business and Technology Journal. 2010;8(2):56-63.
11. Monika G, Shweta T, Anuradha S, Sudhakar G. Qualitative and quantitative analysis of phytochemicals and pharmacological value of some dye yielding medicinal plants. Oriental Journal of Chemistry. 2013;29:45-481.
12. Shagal MH, Kubmarawa D, Tadzabla K, Dennis KI. Evaluation of photochemical and antimicrobial potentials of roots, stem-bark and leaves extracts of *Eucalyptus camaldulensis*. Journal of Pure and Applied Chemistry. 2012;6(5):74-77.
13. Ayoola GA, Coker HAB, Adesegun SA, Adepoju BAA, Obaweya K, Ezennia EC, Atangbayila TO. Phytochemical screening and antioxidant activities of some selected medicinal plants used for malaria therapy in southwestern Nigeria. Tropical Journal of Pharmaceutical Research. 2008;7(3):1019-1024.
14. Hassan M, Kubmarawa D, Nkafamiya II, Ataitiya H. Phytochemical and antimicrobial evaluation of extracts of *Pilisotigma reticulatum*. International Journal of Physical Science. 2011;3(5):37-41.
15. Sofowora. Medicinal plants and traditional medicine in Africa. spectrum book ltd., Ibadan. 2008;289.
16. Olajuyigbe OO, Babalola AE, Afolayan AJ. Antibacterial and phytochemical screening of crude ethanolic extracts of *Waltheria indica* Linn. African Journal of Microbiology Research. 2011;5(22):3760-3764.
17. Ekeanyanwu RC, Udeme AA Onuigbo AO, Etienajirhevwe OF. Anti-diabetic effect of ethanol leaf extract of *Cissampelos owariensis* (lungwort) on alloxan induced diabetic rats. African Journal of Biotechnology. 2012;11(25):6758-6762.
18. Abhilasha S, Kuntal K. Analysis of phytochemical constituents and Pharmacological properties of *Abrus precatorius l.* International Journal of Pharma and Bio Sciences. 2013;4(1):91-101.
19. Musa AM, Yaro AH, Usman H, Magaji MG, Habu M. Phytochemical and some Neuropharmacological studies on the methanolic leaf extract of *Cissus cornifolia* [*Vitacenae*] in mice. International journal of Pharmacology. 2008;4(2):145-148.
20. Akinmoladun AC, Ibukun EO, Afor E, Obuofor ME, Farombi EO. Phytochemical constituent and antioxidant activity of extract from the leaves of *Ocimum gratissimum.* Journal of Science Res. Essay. 2007;2:163-166.
21. Krishnaiah D, Sarbatly R, Bono A. Phytochemical antioxidants for health and Medicine – A move towards nature.

Biotechnol. Mol. Biol. Rev. 2007;1(4):97-104
22. Chellaniah M, Muniappan A, N agappan R, Savarimuthu L. Medicinal plants used by Traditional healers in Kancheepuram District of Tamil Nadu, India. Journal of Ethnobiol. Ethnomed. 2006;2:43-52.
23. Rahaman O. Phytochemical screening tests and medicinal value of plants Active Properties. 2010;1-6.
24. Fahey JW. *Moringa oleifera*: A review of the medicinal evidence for it's nutritional, therapeutic, and prophylactic properties. Trees Life Journal. 2005;15(1):1-15.
25. Lotito SB, Frei B. Consumption of flavonoid-rich foods and increased plasma antioxidant capacity in human. Journal of free Radical Biol. 2006;4112:1727-1746.
26. Banerjee D, Chakrabin S, Hazra AK, Banerjee S, Ray J, Mukherjee B. Antioxidant activity and total phenolics of some mangroves in Sundarbans. Africa Journal of Biotechnology. 2008;7:805-810.
27. Sawarkar HA, Khadabadi SS, Wandhare MD, Farooqui IA, Deokate UA. The antioxidant activity of the leaves of *Barleria grandiflora.* Journal of Herbal Medicine and Toxicology. 2009;3(2):63-66.
28. Naznin A, Hassan N. Antioxidant activity of methanolic leaves and flowers extracts of *Lappia alba.* Journal of Medicine and Medical Sciences. 2009;4(1):107-110.
29. Souza SMC, Aquino LC, Milach Jr. AC, Bandaira MA, Nobre ME, Viana, GS. Anti inflammatory and anti ulcer properties of tannins from myracrodruon urundeuva allemao in rodents. Journal of Phytotherapy Research. 2006;2(3):220-225.
30. Conrick J. Neem: The miraculous healing herb. Beverly Hills: America. Inc. USA; 2007.
31. Schuier M, Sies H, Billek B, Fischer H. Cocoa related flavonoids inhibits CFTR-mediated chloride transport across T84 Human Color Epithelia. J. Nutrit. 2005;135(10):2320-2325.
32. Nayak SB, Raju SS, Orette FA, Rao AVC. Effects of *Hibiscus rosasinensis L* on Wound Heeling Activity. International Journal of Extrem. Wounds. 2007;6(2):78-81.
33. Mann A, Barnabas BB, Daniel II. The effect of methanolic extracts of *Anogeissus leiocarpus* and *Terminalia avicennioides* on the growth of some food–borne Microorganisms. Australian Journal of Basic and Applied Sciences. 2010;4(12):6041-6045.
34. Musa AA. Antioxidant and antibacterial activity of *Commiphora kerstingii* Engl. stem bark extract. Research Journal of Phytochemistry. 2008;2:106-111.
35. Krishnaiah D, Devi T, Bono A, Sarbatly R. Studies on phytochemical constituents of six Malaysian medicinal plants. Journal of Medicinal Plants Research. 2009;3(2):067-072.

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