MERIT RESEARCH JOURNALS
www.meritresearchjournals.org

Merit Research Journal of Food Science and Technology (ISSN: 2354-2527) Vol. 8(2) pp. 024-032, September, 2023
Available online http://www.meritresearchjournals.org/fst/index.htm

DOI:10.5281/zenodo.8398741

Original Research Article

Phytochemical and Antimicrobial Analysis of *Bauhinia Racemosa* leaves

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Abstract

Phytochemical analysis of plant extracts plays a crucial role in identifying and quantifying the bioactive compounds present in plants. This study aimed to perform a comprehensive qualitative and quantitative analysis of phytochemicals in *Bauhinia Racemosa* plant extract. The qualitative analysis involved identifying various classes of phytochemicals, such asphenols, flavonoids, saponins, alkaloids, tannins and terpenoids. Different chemical tests were employed to confirm the presence of these compounds. The color change or precipitation observed during the tests indicated the presence of specific phytochemicals. In addition to qualitative analysis, a quantitative analysis was performed to determine the concentration of the key phytochemicals present in the plant extract such as Flavonoids, alkaloids and saponins. The results obtained from the qualitative analysis revealed the presence of phenols, flavonoids, saponins, alkaloids, tannins, terpenoids, phlobatannins, anthraquinones, glycosides and steroids in the plant extract. Moreover, the quantitative analysis demonstrated the predominant presence and concentration of specific phytochemicals. This study not only provides valuable information about the phytochemical composition of the *Bauhinia Racemosa* plant extract but also contributes to the understanding of its potential therapeutic or pharmacological properties. The findings of this analysis can be further utilized for developing drugs, functional foods, or dietary supplements with specific phytochemical profiles. This study also revealed that the *Bauhinia racemosa* leave extracts can serve as an antifungal and antibacterial agent.

Keywords: Alkaloids, *Bauhinia Racemosa*, Phytochemicals, Saponins, Tannins

INTRODUCTION

A member of the Caesalpiniaceae family is *Bauhinia racemosa*. It exists in China, Ceylon, and India. There are numerous reported uses of plant parts in traditional medicine, including the use of flowers as diuretics. Dysentery is treated with dried leaves, dried flowers, and dried buds. In cases of liver inflammation, root bark is administered (Kumar et al., 2005). It is Both a tonic and a sexual stimulant, among other seeds. According to (Nirmal et al., 2011), the leaves have anti-diabetic effects. The plant is utilized in scorpion string and snake bite. In addition to these bio-compounds, at least two flavonols (kaempferol and quercetin) and two coumarins (scopoletin and scopolin) were isolated from the plant's leaves (Fatima et al., 2021). Chemical bio constituents such as -sitosterol and -amyrin were isolated from the stem bark. The bark of *B. racemosa* was used to extract stilbene (resveratrol) (Shaikh et al., 2021). The ethanol extract of *B. racemosa* leaves exhibits analgesic, antipyretic, anti-inflammatory, and antispasmodic effects, as well as antibacterial activity and an antihistaminic impact, according to general phyto-pharmacological screening of the plant(Gupta et al., 2005). According to (Akhtar and Ahmad, 1995), the plant's young flower buds exhibited antiulcer, hypotensive, and hypothermic activities.

Phytochemicals are bioactive substances that exist

naturally in plants and are also referred to as secondary metabolites. Due to their potential medicinal and health benefits, these chemicals have drawn increasing attention. According to (Dias, 2012) phytochemicals are in charge of many bioactivities in plants, including antioxidant, anti-inflammatory, antibacterial, and anti-cancer properties. Plant extracts are excellent sources of phytochemicals and identifying and characterizing these substances requires careful qualitative and quantitative study of the extracts. While quantitative analysis establishes the quantity of a particular phytochemical present in the extracts, qualitative analysis identifies other types of phytochemicals. For the purpose of identifying and screening promising plant-based compounds for use in drug discovery and nutraceutical applications, these analyses offer useful information (Granner, 1996). For a number of reasons, it is crucial to analyze phytochemicals in plant extracts both qualtatively and quantitatively. In the beginning, it aids in comprehending the chemical make-up and bioactive potential of plants and their extracts. Second, it helps in judging the caliber and validity of herbal remedies and items made from plants. Thirdly, it offers useful information for establishing links between structure and activity and comprehending the mechanisms of action of phytochemicals (Dias, 2012).

Carrying out phytochemical, antifungal, and anti-microbial analysis on plant extracts is of significant importance for several reasons not limited to identifying and characterizing the chemical constituents present in the plant extract. This information is crucial for determining the potential bioactive compounds responsible for the observed antimicrobial and antifungal activities. Plant extracts have long been a source of natural products with antimicrobial and antifungal properties. Analyzing the extract provides valuable insight into potential lead compounds that can be developed into new drugs or used as templates for the synthesis of novel antimicrobial agents. Performing antimicrobial and antifungal analysis helps in determining the inhibitory effects of the plant extract against specific micro-organisms. This knowledge aids in understanding the underlying mechanisms and interactions between the extract and the microorganisms, offering insights into potential target sites and pathways involved.

EXPERIMENTAL PROCEDURES

Materials

A weighing scale, laboratory glassware, heating mantle, Soxhlet extractor, distillation set, water bath, beaker, Buchner funnel, filter paper, Whatmann number 1 paper, volumetric flask, oven, conical flask, and atomic absorption spectrometer were used during the course of this study. Hydrogen trioxide (HNO_3), concentrated sulfuric acid (H_2SO_4), glacial acetic acid, ferric chloride, lead acetate, sodium hydroxide, potassium mercuric chloride solution, distilled water, hydrogen peroxide (H_2O_2), ammonium thiocyanate (NH_4SCN), and potassium permanganate ($KMnO_4$) are some of the chemicals used in chemical reactions.

Methods

Sample collection and preparation

The *B. Racemosa* leaves were gathered from the plant's native environment in Taraba state, Nigeria's Wukari local government region. The plant part (leaf) was newly harvested, transported to the laboratory for identification, completely rinsed with running water, and then cleaned with distilled water. To aid drying in the shade, the leaves were cut into small pieces, and drying was continued for two weeks to reduce the moisture content. The plant components were thoroughly ground into a fine powder using a mechanical blender after drying. The powder was then maintained in the desiccator for analysis and stored in sealed containers with the appropriate labeling.

Sample extraction

Serial exhaustive extraction is the technique utilized for extraction (Wakirwa et al., 2013). In order to assure effective extraction of a wide range of chemicals such as alkaloid, tannins, terpenes, etc. if present in the leaves, this requires serial extraction with solvents in sequence of their increasing polarity from hexane to ethanol (i.e. from non-polar to more polar). The leaf extracts were prepared by soaking 200g of 400ml hexane for four days while stirring frequently to dissolve any solubilized materials. The resultant mixture was filtered through Whatman No. 1 filter paper, evaporated, and concentrated into solid extracts using a rotatory evaporator, and then stored at room temperature for an overnight period to remove any solvent. In order of increasing polarity, this procedure was repeated for the chemicals chloroform, ethyl acetate, acetone, and ethanol in that sequence. The extracts were kept safe until required for analysis.

Qualitative phytochemical analysis

The extracts of each solvent were used to examine the presence of different phytochemical components.

Test for flavonoids

A few drops of $FeCl_3$ solution were applied to the extract

(Ferric chloride test). Flavonoids are present when a blackish red color is formed (Kubmarawa et al., 2007).

Test for phenols and tannins

Test for ferric chloride. The presence of phenolic compounds and tannins was detected when 2 ml of a 5% neutral ferric chloride solution were added to 1 ml of extract (Kubmarawa et al., 2007).

Test for terpenoids

Salkowski's test was conducted, and 2 ml of chloroform were added to 1 ml of the solvent extract. After that, 3 ml of concentrated H_2SO_4 was carefully added, forming a layer. The presence of terpenoids was revealed by the interface's reddish-brown coloring (Bladt and Wagner, 1996).

Test for alkaloids

To perform the Mayer's test, two drops of the potassium mercuric iodide solution were applied to 2 g of the plant sample extract. Alkaloids are present when a white, creamy precipitate appears (Kubmarawa et al., 2007).

Test for phlobatannins

The mixture was heated after 2 ml of aqueous extract and 2 ml of 1 % HCl were added. Phlobatannins were proven to exist by the red precipitate's deposition (Oluyege et al., 2019).

Test for anthraquinones

In order to perform the Borntrager's test, a small amount of the extract was shaken vigorously with 10 ml of benzene and then filtered. The filtrate was then given 5 ml of a 10% ammonia solution while being agitated. According to (Oluyege et al., 2019), the presence of free anthroquinones is indicated by the creation of a pink, red, or violet color.

Test for saponins

The analysis method used the froth test, in which the extracts were diluted with distilled water to a volume of 20 ml and then agitated in a graduated cylinder for 15 minutes. The presence of saponins is shown by the production of foam (Kubmarawa et al., 2007).

Test for steroids

Aqueous H_2SO_4 was added after treating 1ml of the extract with acetic acid. Steroids are present when a coloration turns red (Bladt and Wagner, 1996)

Test for glycosides

Keller Killiani test was carried out. A solution of 0.5 ml, containing glacial acetic acid and 2-3 drops of ferric chloride, was mixed with 2 ml of extract. Later, 1 ml of concentrated H_2SO_4, was added along the walls of the test tube. The appearance of deep blue colour at the junction of two liquids indicated the presence of cardiac glycoside (Chaudhary et al., 2010).

Quantitative phytochemical analysis

Flavonoids, saponins, and alkaloids are commonly selected for the phytochemical analysis due to their abundance in plants which are the secondary metabolites. They have been studied for their antioxidant (Oluyege et al., 2019)., anti-inflammatory, antimicrobial, and anticancer activities, among others (Kubmarawa et al., 2007). Their pharmacological activities make them particularly interesting for drug discovery and development. By analyzing these compound classes, researchers can identify novel or unique structural motifs that may be useful as lead compounds for drug development or as markers for species identification.

Determination of flavonoids

A 250 ml conical flask containing 10 grams of raw leaf powder was then filled with 100 ml of 70% methanol. The solution was mixed with a magnetic stirrer for three hours, and then filtered through Whatman paper number 1. The leftover powdered substance was similarly filtered after being extracted once more with 70% methanol. Both filtrates were combined, put into a crucible, evaporated to dryness at 600°C, and then weighed (Afolayan et al., 2013).

Determination of saponins

100 ml of 20% ethanol and 10 grams of powder sample were added to a 250 ml conical flask. The mixture was continuously stirred while being heated in a hot water bath at 55 °C for 5 hours. The mixture was passed through Whatman Paper No. 1 to separate the supernatant liquid. The solid residue was heated similarly for roughly 5 hours while being combined with 20% ethanol. After being filtered, the mixture was combined

with the previously filtered solution. The mixed, filtered solution was heated to a temperature of 90 °C while being cooled to 20% of its original volume. 10 ml of diethyl ether was added to the concentrated sample in a 250 ml separating funnel, and it was firmly agitated before being added. After carefully separating the aqueous layer, the solution was poured down. The cleansing procedure was repeated. A 5% aqueous NaCl solution in 10 milliliters of water was used to wash 60 milliliters of n-butanol extracts twice. In order to semi-dry the remaining solution, it was heated in a water bath at 50 °C until the solvent evaporated. The sample was then dried in an oven. This saponin content was calculated by the following equation. Equation (2) was used to calculate the saponin product, which is the residual residue (Adegoke et al., 2017).

$$\text{Saponin \%} = \frac{Final\ weight\ of\ residue}{Initial\ weight\ of\ the\ sample} \times 100 \quad \text{Equation ... (2)}$$

Determination of alkaloids

Five grams sample of leaves powder was taken into a 250 ml beaker and 250 ml of 20 % ethanoic acid in ethanol was added to it. Magnetic stirrer was used to mix the solution for 10 hours at room temperature. The solution was filtered using Whatman paper number 1 and the resultant was placed on a hot water bath (60℃) until the extract volume turns 1/4th of its initial volume. Concentrated NH_4OH was added drop wise which form thick precipitate. NH_4OH was added till the formation of the precipitate was complete. The whole solution was allowed to settle down. The precipitate was collected by filtration, dried in an oven and weighted. Equation (3) was used to determine the alkaloid (Adegoke et al., 2017).

$$\text{Alkaloid \%} = \frac{Final\ weight\ of\ residue}{Initial\ weight\ of\ the\ samp} \times 100 \quad \text{Equation ... (3)}$$

Determination of Minimum Inhibitory Concentration (MIC)

The minimum inhibitory concentration (MIC) of the extract was determined using tube dilution method. Serial dilution of the extract was carried out in test tubes using Mueller Hinton Broth (MHB) and potato Dextro Broth (PDB) as diluents. The lowest concentration showing inhibition (clear zone) for each organism when the extract was tested during sensitivity test was serially diluted in test tubes containing Mueller Hinton Broth (MHB) and potato Dextro Broth (PDB). Each tube containing the broth and the extract was incubated with the standardized organisms. A tube containing sterile broth (MHB and PDB) without any organism been used as a control. All tubes were then incubated 37^{o}C for 24 hrs. After incubation period, the tube was examined for the presence or absence of growth using turbidity as a criterion. The lowest concentration (dilution) in the series without any visible signs of growth was considered to be the minimum inhibitory concentration (MIC) (Rios and Recio, 2005).

RESULTS AND DISCUSSION

Qualitative Phytochemical Analysis

Preliminary phytochemical screening was carried out on the leaf of *B. racemosa* which revealed the presence of medicinally important bioactive compounds such as alkaloid, terpenes, steroids, anthraquinone, flavonoids, tannins, glycosides phlobatannins and saponins, the presence of phytochemical compounds in *B. racemosa* were evaluated in the leave using different solvents which includes Hexane, chloroform, ethyl acetate, acetone and ethanol sequentially in order of increasing polarity. Result obtained for qualitative screening of phytochemical leaf extracts of *B. racemosa* in five different solvents are presented in Table 1 and Figure 1 respectively.

In this research, the preliminary phytochemical screening of leaf extracts of *B. racemosa* showed the absence of flavonoids in ethanol extract (alkaline test), but presence in all extract. Phenols were present in all the leaf extracts. Terpenes were present in all extract excepts in hexane and ethyl-acetate extract, alkaloid and saponins were present in all the extract. Steroids were present in all extracts except in acetone and ethanol, anthraquinone was present in hexane, chlorofoam, ethyl acetate and acetone but absent in ethanol. Glycosides were present in all the extract except ethyl acetate, tannins were present in all the extract except in hexane. Phlabotannins was absent in hexane, ethyl acetate and acetone extracts but presenting chloroform and ethanol. The phytochemical analysis of crude yield of *B. racemosa* showed that alkaloids, phenol and flavonoids were present in all extracts except that flavonoids was absent in ethanol (alkaline test using NaOH).

The bioactive components extracted from the leave of B. racemosa include; terpenes, flavonoids ,alkaloid, steroid, glycosides, saponins, phenols phlabotannins, anthraquinone and alkaloid which were all detected in chloroform extract, however these component were all present in most of the extracts except for the absence of terpenes in hexane and ethyl acetate extracts , steroid and anthraquinone were both absent in acetone and ethanol extract, glycoside was absent in ethyl acetate, and phlabotannins was absent in hexane, ethyl acetate, and acetone extracts.

These components are naturally occurring in most plant materials, and are well known to be bactericidal, pesticidal or fungicidal in nature thus conferring the

Table 1. Qualitative phytochemical results of *Bauhinia Racemosa*

S/N	Phytochemicals	Tests	HE	CE	EAE	AE	EE
1	Flavonoids	Alkaline reagent test					
		(a) Extract+ $NaoH_{(aq)}$	+	+	+	+	_
		(b) Lead acetate test	+	+	+	+	+
2	Terpenoids	Salkowski Test Extract + chloroform + conc. H_2SO_4	_	+	_	+	+
3	Alkaloids	Mayers	+	+	+	+	+
		Wagner	+	+	+	+	+
4	Steroids	Extract + acetic acid + H_2SO_4	+	+	+	_	_
5	Anthraquinone	Extract + 10ml benzene then filter. Filtrate + 5ml of 10% $NH_{3(aq)}$.	+	+	+	+	_
6	Saponins	Froth test	+	+	+	+	+
		Foam test	**+**	**+**	**+**	**+**	**+**
7	Glycoside	Extract H_2O+ $NaOH_{(aq)}$	+	+	_	+	+
8	Tannins	Extract+ few drops 1% $FeCl_3$	_	+	+	+	+
9	Phlabotannins	Extract + 1% HCl in boiling water	_	+	_	_	+

Keys: Absence of phytochemical (-)**,** Presence of phytochemical (**+**), Hexane extract (**HE**)**,** Chloroform extract (**CE**)**,** Ethyl acetate extract (**EAE**), Acetone extract (**AE**)**,** Ethanol extract (**EE**).

Table 2. Quantitative phytochemical result of *Bauhinia Racemosa*

S/nTest	Concentration	% Yield
1 Flavonoids	0.4234	16.93
2. Saponins	0.1230	4.92
3 Alkaloid	0.211	8.44

Figure 1. Histogram showing quantitative phytochemical result

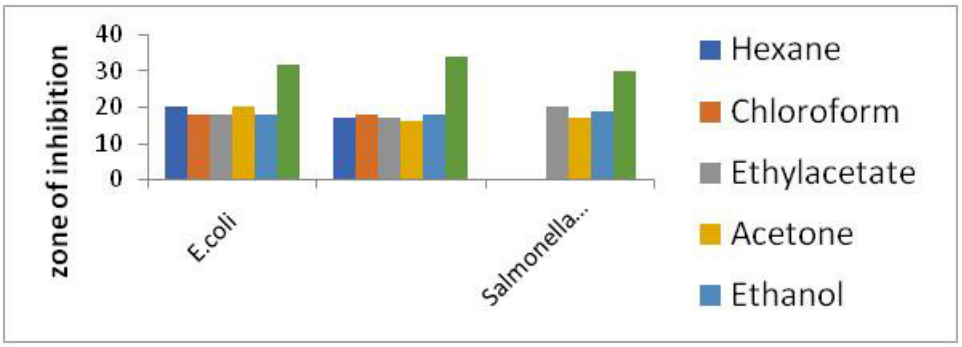

Figure 2. Histogram showing the anti-bacterial test result.

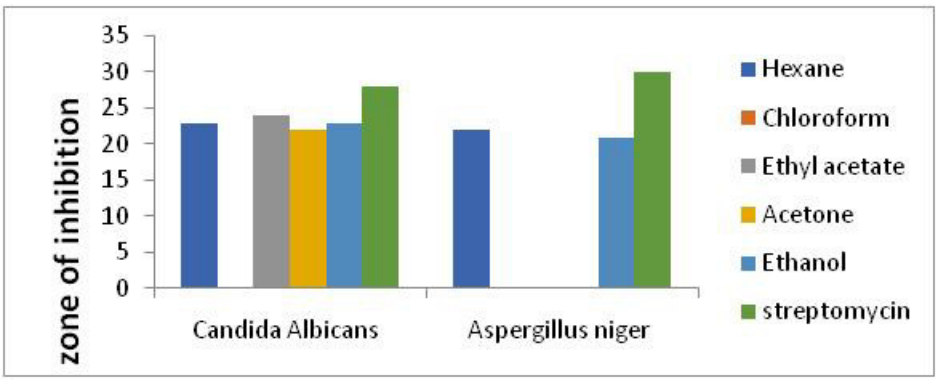

Figure 3. Histogram showing the anti-fungal test result.

Table 2. Antibacterial result of crude extracts of *Bauhinia racemosa* leaves

Test Organism	Dilution factor conc. (mg/ml)	HE BR MZI	CE BR MZI	EAE BR MZI	AE BR MZI	EE BR MZI	Positive control streptomycin	Negative control DMSO
E-Coli	200	18.00	18.00	20.00	20.00	18.00	32.00	00.00
	100	16.00	17.00	19.00	19.00	17.00	28.00	00.00
	50	14.00	18.00	17.00	19.00	15.00	28.00	00.00
	25	12.00	15.00	15.00	17.00	13.00	27.00	00.00
Straph aureus	200	18.00	18.00	16.00	17.00	17.00	34.00	00.00
	100	16.00	15.00	15.00	15.00	15.00	31.00	00.00
	50	14.00	14.00	13.00	13.00	13.00	29.00	00.00
	25	12.00	13.00	11.00	13.00	10.00	28.00	00.00
Salmonella Spp.	200	19.00	00.00	17.00	00.00	20.00	30.00	00.00
	100	16.00	00.00	16.00	00.00	18.00	28.00	00.00
	50	14.00	00.00	14.00	00.00	17.00	28.00	00.00
	25	12.00	00.00	13.00	00.00	15.00	26.00	00.00

Key: Minimum zone of inhibition (**MZI**), Hexane extract (**HE**)**,** Chloroform extract (**CE**)**,** Ethyl acetate extract (**EAE**), Acetone extract (**AE**)**,** Ethanol extract (**EE**), Bioassay result (**BR**), Dimethyl sulfoxide (**DMSO**).

Table 3. Antifungal result of crude extracts of *Bauhinia racemosa* leaves.

Test Organism	Dilution factor Conc. (mg/ml)	HE BR MZI	CE BR MZI	EAE BR MZI	AE BR MZI	EE BR MZI	Positive control streptomycin	Negative control DMSO
Candida albicans	200	23.00	00.00	22.00	23.00	24.00	28.00	Fulcins
	100	21.00	00.00	20.00	21.00	23.00	26.00	-ve control
	50	19.00	00.00	18.00	18.00	19.00	24.00	00.00
	25	17.00	00.00	17.00	17.00	17.00	23.00	00.00
Aspergillus niger	200	21.00	00.00	00.00	22.00	00.00	30.00	00.00
	100	19.00	00.00	00.00	20.00	00.00	28.00	00.00
	50	17.00	00.00	00.00	18.00	00.00	26.00	00.00
	25	16.00	00.00	00.00	16.00	00.00	24.00	00.00

Key: Minimum zone of inhibition (**MZI**), Hexane extract (**HE**)**,** Chloroform extract (**CE**)**,** Ethyl acetate extract (**EAE**), Acetone extract (**AE**)**,** Ethanol extract (**EE**), Bioassay result (**BR**), Dimethyl sulfoxide (**DMSO**).

antimicrobial property to plant (Bladt and Wagner, 1996). They are also known to show medicinal activity and also exhibiting physiological activity, curative activity against several bacteria.

Since *B. racemosa* contain alkaloid hence, it has the potential to act as antarrhythmic, anticholinergic, as stimulant, adenosine receptor antagonist, cough medicine, analgesic, remedy for gout, antiprotozoal agent, vasodilator, antihypertensive, antipyretics, anti-malarial antihypertensive, muscle relaxant and antitumor. However, synthetic and semi-synthetic drugs are structural modifications of the alkaloids, which were designed to enhance or change the primary effect of the drug and reduce unnecessary side-effects (Chaudhary et al., 2010). Flavonoids, particularly flavan-3-ols and proanthocyanidins, have been associated with decrease in the risk of cardiovascular disease preventing narrowing of the blood vessels, also decrease cholesterol oxidation through their high antioxidant activity. This implies that *B. racemosa* has the potential to serve as anti - inflammatory, antiallergenic, antiviral, and anticancer properties. *B. racemosa* lower cholesterol and reduce the risk of heart disease. The presence of saponins in *B. racemosa* can help lower cholesterol and reduce the risk of heart disease. The immune function benefits from these plant compounds as well. The risk of developing certain forms of cancer or getting tumors will be decreased by eating more saponins. Eating more saponins will boost the immune function and fight off fungal infections (Nath Dhawan, 1974). Glycosides has been found to be useful in treatment of several illness for instance cardiac glycoside have long been used as important ingredient for arrow poison and drugs (Bladt and Wagner, 1996). *B. racemosa* can be used in treatment of illness since it contains glycosides as important ingredient for arrow poisons and drugs. Chances are the strain has traceable levels, a terpene also found in leaves that has anti-bacterial, anti-fungal, anti-inflammatory, and antiseptic properties, B. racemosa can serve as an anti-bacterial, anti-fungal, anti-

inflammatory, and as an antiseptic.

Quantitative Phytochemical Analysis

The quantitative result obtained from quantitative phytochemical analysis shows that flavonoids had the highest yield of 16.96%, followed by alkaloid (8.44 %) while saponins had the least percentage yield of 4.93%.

The concentration of flavonoids in a leaf extract can vary depending on several factors, including the plant species, growth conditions, and extraction methods. However, in general, flavonoids tend to occur in higher concentrations compared to alkaloids and saponins in leaf extracts due to biological Functions, Solubility, Distribution in Tissues; Flavonoids are typically found in various plant tissues, including leaves, flowers, fruits, and stems. This wide distribution increases the chances of obtaining a higher concentration of flavonoids in leaf extracts compared to alkaloids and saponins, which may be more concentrated in other plant parts (Chaudhary et al., 2010).

Antimicrobial and antifungal Activities

The result of the antimicrobial activity as shown in table 2 and figure 2, highlighted the activities of the extracts; hexane, chloroform, ethyl acetate, acetone and ethanol derived from the leave of *B racemasa* which were tested on five clinical isolates*; E. coli, Straph aureus, Salmonella spp, Candida albicans, Aspergillus niger,* streptomycin and fucias were used as control drugs in antimicrobial susceptibility testing. They served as reference drugs to validate the effectiveness of other antibiotics against bacterial strains. Extract that do not inhibit antifungal activity on certain bacterial, had zero zone of inhibitory (00.00 mm) as represented in table 3 and Figure 3 respectively.

The result *revealed* that the extracts hexane, chloroform, ethyl acetate, acetone and ethanol exhibited antibacterial activity against *E. coli and Straph aureus.* It was also observed that the ethyl acetate and acetone extracts were more effective in promoting antibacterial activity at dilution factor of 100 mg/l. and 25 mg/ml with minimum zone of inhibitions of 19mm and 15:17mm respectively. The antibacterial activity against Salmonella spp. was as a result of the hexane, ethyl acetate, and ethanol extracts, while chloroform and acetone extracts exhibited no antibacterial activity at all dilution factor concentrations.

The antifungal result of the *B. racemosa* leaves crude extracts as enumerated in table 3 showed that the hexane, ethyl acetate, acetone and ethanol extracts displayed antifungal activities against *Candida albicans* with the ethanol and hexane extracts having the highest minimum zones of inhibitions of 24.00mm and 23.00mm at 200mg/ml dilution factor concentrations. These extracts also showed similar minimum zone of inhibitions at lower dilution factors of 100, 50 and 25 mg/ml concentrations respectively. On the contrary, the chloroform extract exhibited no antifungal activities against *Candida albicans* at all dilution factor concentrations. It was also observed that only hexane and acetone extract exhibited antifungal activities against *Aspergillus niger* isolate as seen from table 3.

Minimum Zone of Inhibitory

The crude extracts of acetone extract exhibited antifungal activity against *E. coli, Straph aureus, Candida albicans and Aspergillus niger* with a diameter that ranged between 13 – 23 mm with the highest zone of inhibition of 23mm followed by 22mm at minimum inhibitory concentration at 400 mg/ml, but did not show inhibition on *Salmonella spp.* Chloroform extract exhibited antifungal activity against only two organism *E. coli,* and *Straph aureus*,with a minimum zone of inhibition ranges from 13-18mm but did not show inhibition on *Salmonella spp, Candida albicans and Aspergillus niger*. Ethanol extract exhibited antifungal activity against almost all the test organisms except on *Aspergillus niger*, with the minimum zone of inhibition ranging from 10-24 mm with the highest demonstration on *Candida albicans* (24mm), ethyl acetate just like the ethanol extract exhibited antifungal activity against *E. coli, Straph aureus, Salmonella spp, Candida albicans* with the minimum zone of inhibition ranging from 11-22mm with the highest demonstration on *Candida albicans* (22mm). However, hexane extract show demonstration on all the test organisms E. *coli, Straph aureus, Salmonella spp, Candida albicans and Aspergillus niger* ranging from 12-21mm with the highest effect on *Aspergillus niger* (21 mm). The least activity is observed in ethanol extract with 10mm zone of inhibition against *Straphaureus,* followed by 11mm observed in ethyl acetate extract on *Staph. aureus* which occured at 25mg/ml minimum inhibitory concentration. Streptomycin had the highest demonstration against both bacterial and fungi respectively ranging from 24-34mm.

CONCLUSION

Phytochemical analysis of plant extracts is of great significance in various aspects of plant biology, medicine, and human health. It provides insights into the intricate chemical composition and functions of plants, aids in understanding traditional medicinal practices, supports quality control in herbal products, and enhances the understanding of the potential health benefits associated with plant consumption. Therefore, continued research in phytochemical analysis is crucial for unlocking the full

potential of plants and their benefits to humanity. The phytochemical screening of crudes yields of the chemical constituents of *B.racemosa* showed that alkaloids, steroids, phenols and flavonoids are present in all the leave extracts. However, *B. racemosa* can be used as anti- inflammatory, antispasmodic, anti-analgesic and diuretic properties which can be attributed to their high flavonoids, alkaloids, glycosides, flavonoids and steroids. It was also observed that the leave extract derived from *B.racemosa* can serve as an antifungal and as an antibacterial agent.

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