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Research Paper

Preliminary Photochemical and Antibacterial Screening of the Leaf Extracts of Gongronema Latifolium (Utazi)

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ABSTRACT:- Antibacterial and phytochemical screening of the ethanol, n-hexane and water extracts of *Gongronema latifolium* were analysed to substantiate its effectiveness in the treatment of many bacterial infection in the traditional medicinal practice. The results showed that distilled water extract showed highest minimum inhibitory concentration against the growth of *Escherichia Coli* (24mm), *Pseudomonas aerugenosa* (26mm), *Staphylococcus aureus* (13mm) when compared with the minimum inhibitory concentration (MIC) of the other two extracts n-hexane and ethanol. The results of the phytochemicals revealed the presence of flavonoids, saponins, alkaloids, tannins and resins.

Keywords:- *Gongronema Latifolium* Antibacterial Phytochemistry and Medicinal Plant.

I. INTRODUCTION

Medicinal plants are plants which contain substances that could be used for therapeutic purposes or which are precursors for the synthesis of useful drugs [1-3].Medicinal plants since time immemorial have been used in virtually all cultures as a source of medicine. Over 5000 plants are known to be used for medicinal purposes in Africa but only few have been describe or studied [4-6]. Natural product from plants is another potent source for the discovery of excellent biological activities[7]. *Gongronema latifolium*, from the *asclepiadaceae* family, is commonly found in the South Eastern part of Nigeria, has been widely used in folk medicine as spice and vegetables and for maintaining healthy blood glucose levels [8]. The extract of *Gongronema latifolium* has been used to cure various diseases such as diabetes and high blood pressure [9-15].

II. MATERIALS AND METHODS

Collection of Plant Materials and Extraction Preparation: Leaves of *Gongronema Latifolium* were collected at Uli town located in Ihiala Local Government of Nigeria, Anambra State, Nigeria. It was identified by a botanist in Spring Board Research Institute, Awka. They were washed to remove particles and dried at room temperature. Later the leaves were ground using a clean mortar and pestle to reduce them to coarse particles. The ground leaf was divided into three parts. The first sample was soaked in 500cm3 of distilled water for 24h, which was then filtered with a filter paper and the excess water removed by concentrating to 50cm 3with the aid of water bath. Also the two remaining samples were extracted with ethanol and n-hexane respectively. After which the water, ethanol and hexane concentrated crude extracts were used for the study.

Qualitative and Quantitative Phytochemical Analysis: Qualitative and quantitative phytochemical analyses were carried out using the methods of Trease and Evans (1989) and Harborne (1998).

III. RESULTS

The phytochemical analysis of the plant reveals the presence of flavonoids, saponins, alkaloids, tannins and resins. Qualitative analysis was carried out to ascertain the presences of the different phytochemicals in the leaves before quantitative analysis were carried out. The methods used and their corresponding inferences are shown in tables 1 and 2.

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Table 1: Phytochemical Analysis of the Coarse Leaf before Extraction

	Test of Sample	ObservationSample	Observation Inference
S/N 1	ALKALOIDS		
A	Wagner's Reagent	Reddish-brown precipitate	+++
	Mayer's Reagent	Milky precipitate	+++
2	FLAVONOIDS		
a.	Ferric chloride	Greenish-brown ppt	+++
b.	Lead acetate test	Yellow colouration in lead acetate layer	+++
	Sodium hydroxide	Precipitate formed	++
3	TANNINS		
A	Acid test	Red colouration of precipitate	+++
B	Lead acetate test	Gelatinous ppt formed	+++
	SAPONIN		
	Frothing test	Persistent frothing formed	+++
	Emulsion test	Emulsion formed during Froth	+++
	GLYCOSIDES		
	Fehling's solution		
Test	Slight brick-red precipitate formed	++	
	Sulphuric acid test	Brick-red ppt formed	-
	RESINS		
	Precipitate test	Precipitate formed	++
	Colour test	Slight pink	+
	STEROIDS	Reddish brown layer formed at the interface	+

+++ = present in High Concentration

++ = present in Moderate Concentration

- = Absent

Table 1: Phytochemical Analysis of the Coarse Leaf before Extraction
Test of Sample Observation Sample Observation Inference

Table 2: Qualitative Phytochemical of *Gongronema Latifolium*(Utazi)

Parameters	N- Hexane	Ethanol Extract	Distilled Water
Alkaloids	++	+	+
Flavonoids	+	++	-
Saponins	++	+	+
Tannins	+	-	+
Steroids	-	++	-
Phenols	--	+	-
Terpenoids	--	+	+

Note: '++' represents presence of the constituents in moderate concentration '+' represents presence in slight concentration '-' represents absence of the constituent.

Table 3: Quantitative Estimate of Phytochemical constituents of Leaves *Gongronema Latifolium* (Utazi) Leaves

Phytochemicals	Composition (%), mg/kg
Alkaloid	1.66%
Tannin	2.4%
Flavonoid	5.84%
Phytate	1.6672%
Saponin	0.8%
Cardiac Glycoside	1.4%
Heamaglutinin	142.9447 mg/kg
Oxalate	0.1296 mg/kg
Phenol	13.0912 mg/kg

Table 4: Diameter Zones of inhibition of the extracts against the test organisms.

Extract	*Pseudomonas aerugenosa*	*E.coli*	*Staphylococcus aureus*	*Salmonella Sp.*
Ethanol	8mm	15mm	10mm	Nill
N-hexane	Nill	Nill	Nill	Nill
Distilled water	26mm	24mm	13mm	Nill

IV. DISCUSSION

Distilled water extract showed highest minimum inhibitory concentration against the growth of *Escherichia Coli* (24mm), *Pseudomonas aerugenosa* (26mm), *Staphylococcus aureus* (13mm) when compared with the minimum inhibitory concentration (MIC) of the other two extracts - N-hexane and Ethanol. From this result, it was observed that distilled water extract of *Gongronema Latifolium* could be used to combat/inhibit the growth of these test organisms aforementioned. This showed that distilled water extract of the sample could be most effective against the growth of *Escherichia coli, Staphylococcus aureus* and *Pseudomonas aerugenosa* when in minute quantity. They have the ability to mop-up free radicals and inhibit the growth of micro-organisms especially when used generally at high concentration since they contain bioactive compounds such as tannins and flavonoids. These results suggest that extracts from these plants may be used to treat many diseases.

N-hexane extract showed no minimum inhibitory concentration value against the growth of *Escherichia coli, Salmonella sp, Staphylococcus aureus* and *Pseudomonas aerugenosa*. Ethanol extract showed the least minimum inhibitory concentration value against the growth of *Escherichia coli* (8mm), *Staphylococcus aureus* (10mm) and *Pseudomonas aerugenosa* (8mm) in a little quantity when compared to the other two solvent.

V. CONCLUSION

The results of this analysis has shown that the leaf extracts of *Gongronema latifolium* were rich in phytochemicals and could be used as antibacterial agents as shown in the MIC results of the water extract.

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