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

1Iloh Emmanuel O., 1Onyema-iloh O.B., 2Aghafor K.N. and 3Omogo Sunday E.

1Department of Pure and Industrial Chemistry Chukwuemeka Odumegwu Ojukwu University. P. M. B. 02 Uli Anambra State, Nigeria.
2Department of Biochemistry Ebonyi State University, Abakaliki, Ebonyi State, Nigeria
3Department of Biochemistry, College of Medicine, University of Lagos, Nigeria

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 50cm3 with 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

<table>
<thead>
<tr>
<th>Test of Sample</th>
<th>Observation</th>
<th>Sample Observation</th>
<th>Observation Inference</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALKALOIDS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Wagner’s Reagent</td>
<td>Reddish-brown precipitate</td>
<td>+++</td>
</tr>
<tr>
<td></td>
<td>Mayer’s Reagent</td>
<td>Milky precipitate</td>
<td>+++</td>
</tr>
<tr>
<td>FLAVONOIDS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a.</td>
<td>Ferric chloride</td>
<td>Greenish-brown ppt</td>
<td>+++</td>
</tr>
<tr>
<td>b.</td>
<td>Lead acetate test</td>
<td>Yellow colouration in lead acetate layer</td>
<td>+++</td>
</tr>
<tr>
<td></td>
<td>Sodium hydroxide</td>
<td>Precipitate formed</td>
<td>++</td>
</tr>
<tr>
<td>TANNINS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Acid test</td>
<td>Red colouration of precipitates</td>
<td>+++</td>
</tr>
<tr>
<td>B</td>
<td>Lead acetate test</td>
<td>G elatinous ppt formed</td>
<td>+++</td>
</tr>
<tr>
<td>SAPONIN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frothing test</td>
<td></td>
<td>Persistent frothing formed</td>
<td>+++</td>
</tr>
<tr>
<td>Emulsion test</td>
<td></td>
<td>Emulsion formed during Froth</td>
<td>+++</td>
</tr>
<tr>
<td>GLYCOSIDES</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fehling’s solution</td>
<td>Slight brick-red precipitate formed</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td>RESINS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Precipitate test</td>
<td></td>
<td>Precipitate formed</td>
<td>++</td>
</tr>
<tr>
<td>Colour test</td>
<td></td>
<td>Slight pink</td>
<td>-</td>
</tr>
<tr>
<td>STEREOIDS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reddish brown layer formed at the interface</td>
<td>+</td>
</tr>
</tbody>
</table>

+++ = present in High Concentration
+++ = present in Moderate Concentration
- = Absent

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.

*Corresponding Author: Iloh Emmanuel O.
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.
REFERENCES

[14]. Amalu Paul, C., Chukwuze, Fabian and P.C. Ugwu Okechukwu, 2014. Antimicrobial Effects of Bitter Kola (Garcinia kola) nut on Staphylococcus aureus,

*Corresponding Author: Iloh Emmanuel O.