

Extraction, Phytochemical Screening and the Antimicrobial Activity of the Methanol Extract of *Bryophyllum pinnatum* leaves against *Candida Albicans* and *Salmonelatyphi*

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Abstract: The Methanol extract of *Bryophyllum pinnatum* was phytochemically screened for the active ingredients present. The extract was also tested for its inhibitory effect against *Candida Albicans* and *Salmonella Typhi*. The result showed that the extract contains Alkaloids, Tannins, Saponins, Cardiac Glycosides and Flavonoids. The extract was also found to inhibit the growth of both *Candida Albicans* and *Salmonella Typhi* with a minimum concentration of 20% v/v.

Key Word: Extraction, Phytochemical, Screening, *Bryophyllum pinnatum*

I. Introduction

Bryophyllum pinnatum is an erect, succulent, perennial shrub that is found mostly in the South-Eastern part of Nigeria. It is commonly known as 'ShukaHalinka' or 'Karan Masallachi' in Hausa and 'Tree of life', 'Life leaf', 'Air plant' or 'Miracle leaf' in English. The leaf is native to Africa but is now grown widely in tropical and sub-tropical areas. All parts of the plant can be used as a drug. A drug is simply defined as any chemical compound which exerts various physiological effects of therapeutic value on administration on the host. It should be localized at the site where it is required to act (Abayomi, 1991). This makes it possible to distinguish between a medicinal plant whose therapeutic constituents have been established scientifically, and plants that are regarded as medicines but have not yet been subjected to thorough scientific investigation. Medicinal plants occur naturally as weeds on waste land throughout the tropics of Africa, especially in Nigeria. Such plants that are popular as medicinal plants are effective against fungal and bacterial infection in man or skin infection such as dandruff, scabies as well as *Candida albicans*. The outer layer of human skin is constantly exposed to attacks by various micro-organisms that come into contact with it. Some of the micro-organisms range from the bacteria, fungi and molds. Each class has its conditions where it can flourish.

Bacteria

Bacteria can be defined as single cell, microscopic organisms that usually reproduce by binary fission. They can be described as aerobic, anaerobic or facultative depending on whether they flourish in an oxygenated environment or in both types of environment respectively. Bacteria cause impetigo, scaled skin, food poisoning, toxic shock syndrome, severe sore throat, stomach ulcers, pneumonia, and whooping cough (Curtis, 1993).

Fungi

Fungi are microscopic organisms that grow in damp environments which cause infection to human and animals. It can be found in spoiled bread, where there is moisture, oxygen and some organic matter. Fungi grow best at room temperature. They cause a lot of infections such as eczema, respiratory illness, skin rashes, memory problems (Curtis, 1993).

Molds

Mold is a microscopic organism that grows in damp environments. They can also be found in gardens, grasses, weeds and on grains like corn and wheat. Mold grows best when there are favourable environmental factors. These factors include the environment, food, moisture, temperature (Eugene, 1990). Molds can cause skin rashes, kidney cancer, esophagus cancer, leukemia, liver cancer, respiratory illness, and memory problems.

Aim of study

The aim of this study is to investigate the activity of the Methanol extract of *Bryophyllum pinnatum* against *Candida Albicans* and *Salmonella Typhi*.

II. Materials and Method

The *Bryophyllum pinnatum* leaves were obtained from Bauchi metropolis and were identified by a botanist in Abubakar Tafawa Balewa University, Bauchi, Nigeria. The *Bryophyllum pinnatum* leaves were sun

dried for days, after which they were pounded and sieved using a sieve of 212mm aperture. Powdered *Bryophyllum pinnatum* leaf sample (30g) was extracted using a soxhlet extractor using 250ml of Methanol at a temperature of 65°C for Six hours.

Phytochemical Screening of the Extracts

Tests for Alkaloids (Trease and Evans, 1989)

The presence of alkaloids in the plant extracted was determined by warming 2g of the extract with 20ml of 1% Tetraoxosulphate (VI) acid in a 250ml conical flask on a water bath for 2 minutes. It was intermittently shaken and then centrifuged. The supernatant was then pipetted off into a small conical flask. Then 0.1ml of the supernatant was introduced into a test tube, followed by one drop of Meyer's reagent. A cream precipitate formed showed the presence of Alkaloid.

Test for Flavonoids

To detect the presence of flavonoids, 2ml of the leaf extract was acidified with few drops of 1% hydrochloric acid and then dissolved in 5ml 20% Sodium hydroxide, which gave a canary yellow colour (Harbone, 1973).

Test for Tannins (Trease and Evans, 1989)

To detect the presence of tannins, 0.5g of the leaf extract was introduced into 20ml of distilled water and then boiled in a water bath. It was then filtered into test tube using filter paper. Few drops of 0.1% Iron (III) Chloride was then added to the filtrate in the test tube which formed a blue black colouration.

Test for Saponins (Trease and Evans, 1989)

The presence of saponins in the leaf extracts *Bryophyllum pinnatum* was tested by boiling 2g of the extract with 20ml of distilled water in a water bath. It was then filtered using a filter paper. 10ml of the filtrate was mixed with 5ml of distilled water and shaken vigorously for a stable persistent froth. 3 drops of olive oil was then added to the froth and then shaken vigorously again. The formation of an emulsion indicated the presence of Saponins.

III. Results

Table 1: Results for the Phytochemical Screening

Components	Methanol extract
Flavonoid	+
Tannin	+
Saponin	+
Anthraquinone	-
Steroid	-
Alkaloid	+
Glycoside	+

Hints: "+" indicates presence and "-" indicates absence

Table 2: Antimicrobial activity of The *Bryophyllum Pinnatum* against *Salmonella typhi* and *Candida albicans*

Extract concentration (%v/v)	<i>Candida albicans</i> (mm)	<i>Salmonella typhi</i> (mm)	Control
5	0.00	0.00	Nil
10	0.00	0.00	Nil
20	1.1	0.8	Nil
40	1.9	0.9	Nil
60	2.1	1.1	Nil
80	2.4	1.4	Nil
100	2.9	1.9	Nil

IV. Conclusion

The presence of the various active ingredients (phytochemical substances) and their inhibitory property against micro-organisms was determined as indicated in table 2 and 3 above. That confirmed that the therapeutic properties of *Bryophyllum pinnatum* against some diseases as reported in the literatures. At the end of the experimental analysis, it can be concluded that *Bryophyllum pinnatum* leaf is a potential source of phytochemical substances like Alkaloids, Flavonoids, Tannins and Saponins which are of great medicinal benefit to human beings, especially for the production of industrial products. From the percentage yield of 21.7% obtained was an appreciable quantity.

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