Proximate and Mineral Compositions of 
*Bryophyllum pinnatum* Leaves

B. U. Nwali, A. N. C Okaka, C. E. Offor, P. M. Aja* and U. E. Nwachi

Department of Biochemistry, Ebonyi State University Abakaliki, P.M.B. 053 Abakaliki, Ebonyi State Nigeria

**ABSTRACT**

The proximate and mineral compositions of *Bryophyllum pinnatum* leaves were evaluated in both dry and fresh samples to determine the ash, carbohydrate, fat and oil, crude fibre, protein, moisture and mineral contents using the standard method of Association of Analytical Chemist (AOAC) and Atomic Absorption Spectrophotometric (AAS) method. The result showed that *Bryophyllum pinnatum* contain (1.21 ± 0.07 and 0.8 ± 0.03%) ash, (72.92 ± 1.08 and 4.46 ± 0.52%) carbohydrate, (1.38 ± 0.06 and 1.15 ± 0.05%) fat, (6.02 ± 1.06 and 0.95 ± 0.06%) fibre, (5.38 ± 0.10 and 1.61 ± 0.02%) protein, and (13.01 ± 1.03 and 91.03 ± 0.55%) moisture in dry and fresh samples respectively. The result also revealed that potassium (3.49 ± 0.01 and 3.74 ± 0.04 %) and calcium (4.99 ± 0.01 and 6.82 ± 0.04 %) were the major minerals present in the samples. This indicated that *Bryophyllum pinnatum* leaf is a good source of human nutrition and should be included as dietary supplement.

**Keywords:** *Bryophyllum pinnatum*, Carbohydrate, Protein and Minerals.

**INTRODUCTION**

*Bryophyllum pinnatum*, a medical plant is used to cure diseases and heal injuries.26 *Bryophyllum Pinnatum* belongs to the family of *Grassulaceae* an erect, succulent, perennial shrub that grows about 1.5m height and reproduced from seeds and also vegetatively from leaf bubbils. It is an introduced ornamental plant that is now growing as weed around plantation crops.23 *Bryophyllum pinnatum* is used in traditional way for treatment of earache, burns, abscesses, ulcer, insect bites, diarrhea and lithiasis23. In South Eastern Nigeria, this herb is used to facilitate the dropping of the placenta of a newly born baby.10 The plant leaf is mildly exposed to heat and the juice extracted and applied to the baby’s placenta on daily basis. The crushed leaves as well as the extracted juice are mixed with palm oil...
and rubbed on abscesses. It is usually applied externally.

*Bryophyllum pinnatum* is widely distributed especially in Philippines and it is known as "miracle leaf". The bufadienolides which are active components of *Bryophyllum pinnatum* possess antibacterial, anti-humorous and insecticidal actions. In Nigeria like any other developing nation, only few of these herbs have their bioactive compounds identified. On the other hand, some plants with good bioactive properties have useful minerals and food value for human and animal consumption.

This study was designed to investigate the proximate and mineral compositions of *Bryophyllum pinnatum* leaves on dry and fresh samples.

**MATERIALS AND METHODS**

The leaves of *Bryophyllum pinnatum* were collected from Abakaliki near Grace Court Hotels in Ebonyi State, Nigeria. The leaves of *Bryophyllum pinnatum* were identified by a taxonomist Prof. J.C. Okafor in the department of Applied Biology, Ebonyi State University, Abakaliki, Nigeria. The leaves were destalked, washed and dried at room temperature. The dried and fresh leaves were pulverized with an electric blender. They were then labeled, stored in containers and kept in refrigerator ready for analysis. Proximate and mineral analyses were carried out on dried and wet samples of *Bryophyllum pinnatum*.

**Proximate Analysis**

Proximate analysis was carried out according to the standard method of Association of Official Analytical Chemist (AOAC, 2005) to determine the carbohydrate, protein, ash, crude fibre, moisture, and fat and oil contents.

**Selected minerals**

Cu, Fe, Mg, Ca, Zn, Na, K, Ni, Cd and Pd were determined using Atomic Absorption Spectrophotometer (AAS) based on Association of Official Analytical Chemist.

**RESULT**

The result of proximate composition of *Bryophyllum pinnatum* leaves revealed that carbohydrate values were the highest and ash had the least values in both samples as shown in table 1 below. Table 1: Proximate Composition of *Bryophyllum pinnatum* Leaves in both dry and Fresh Samples. (See Table 1)

The results of the mineral contents of *B. pinnatum* leaves showed that calcium level in the samples were the highest while Pb and Zn levels were shown to be the least as shown in table 2 below. Table 2: Mineral Compositions of *Bryophyllum pinnatum* Leaves in both dry and fresh Samples. (See Table 2)

**DISCUSSION**

The result of proximate compositions obtained in table 1 showed that *Bryophyllum pinnatum* leaves have appreciable level of carbohydrates and proteins, fat and oil, crude fibre, ash contents in dry sample than fresh samples. This confirms *Bryophyllum pinnatum* as a good source of these nutrients and possible dietary value. The mineral contents of *Bryophyllum pinnatum* leaves were also investigated in both dry and wet samples. The result showed that Ca, K, Mg, Na, Zn, Cd, Ni, Pb and Fe were present in both samples. Calcium was the most abundant mineral in *Bryophyllum pinnatum* as obtained in table 2. Normal extra cellular calcium concentrations are necessary for blood coagulation and for integrity, intracellular cement substances. Thus, the potential of *Bryophyllum pinnatum* to stop bleeding and...
its use in treating wounds could be as a result of its high calcium content\(^2\). Also a high potassium content obtained in result in table 2 also which showed that \(B. \ pinnatum\) plays a vital role in normal cell function including neuro-transmission, muscle contraction, and maintaining acid-base balance\(^2\). Lower sodium content of \(Bryophyllum pinnatum\) might be as a result of the effect of drying in sample except in moisture content where high levels of proximate and mineral compositions in the dry sample than fresh sample except in moisture content where high level was recorded in fresh sample. This might be as a result of the effect of drying in dried sample.

CONCLUSION

The result of this study showed that \(Bryophyllum pinnatum\) is a good source of carbohydrate, crude fibre, protein, calcium and potassium in both dry and fresh leaves of the plant.

REFERENCES


### Table 1. Proximate chemical composition of *Bryophyllum pinnatum* leaves in both dry and wet samples

<table>
<thead>
<tr>
<th>Name of Nutrient</th>
<th>Dry sample</th>
<th>Wet sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ash content</td>
<td>1.21 ± 0.07</td>
<td>0.80 ± 0.03(%)</td>
</tr>
<tr>
<td>Fat and Oil</td>
<td>1.28 ± 0.06</td>
<td>1.15± 0.05(%)</td>
</tr>
<tr>
<td>Protein</td>
<td>5.38 ± 0.10</td>
<td>1.61 ± 0.02(%)</td>
</tr>
<tr>
<td>Crude Fibre</td>
<td>6.02± 1.06</td>
<td>0.95 ± 0.06(%)</td>
</tr>
<tr>
<td>Carbohydrate</td>
<td>72.92 ± 1.08</td>
<td>4.46 ± 0.52(%)</td>
</tr>
</tbody>
</table>

Data are mean ± standard deviation of triplicate determination on both dry and fresh sample.

### Table 2. Mineral composition of *Bryophyllum pinnatum* leaves in both dry and wet samples

<table>
<thead>
<tr>
<th>Minerals</th>
<th>Dry sample</th>
<th>Wet sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron</td>
<td>0.18± 0.01</td>
<td>0.12 ± 0.01</td>
</tr>
<tr>
<td>Zinc</td>
<td>0.26 ± 0.01</td>
<td>0.22 ± 0.02</td>
</tr>
<tr>
<td>Copper</td>
<td>0.03 ± 0.01</td>
<td>0.02 ± 0.01</td>
</tr>
<tr>
<td>Magnesium</td>
<td>0.42 ± 0.01</td>
<td>0.25 ± 0.01</td>
</tr>
<tr>
<td>Sodium</td>
<td>0.32 ± 0.02</td>
<td>0.06 ± 0.01</td>
</tr>
<tr>
<td>Potassium</td>
<td>3.49± 0.01</td>
<td>3.74 ± 0.04</td>
</tr>
<tr>
<td>Calcium</td>
<td>4.99 ± 0.01</td>
<td>6.82 ± 0.03</td>
</tr>
<tr>
<td>Nickel</td>
<td>0.08± 0.01</td>
<td>0.05 ± 0.01</td>
</tr>
<tr>
<td>Cadmium</td>
<td>0.23± 0.01</td>
<td>0.34 ± 0.01</td>
</tr>
<tr>
<td>Lead</td>
<td>0.03 ± 0.01</td>
<td>0.34 ± 0.01</td>
</tr>
</tbody>
</table>

Data are mean ± standard deviation of triplicate determination on both dry and fresh samples.