

Physicochemical Analysis of *Alocasia Sanderiana W.Bull*

¹P. Selvakumar, ²Devi Kaniakumari, ³V. Loganathan

^{1,3} Department of Chemistry, Periyar University, Salem, Tamilnadu, India.

² Department of Chemistry, Quaid-E-Millath Govt. College for women, Chennai, India.

Abstract

The present investigation reveals standardization which includes moisture content, total ash, acid insoluble ash, water soluble extractive value and loss on drying of *Alocasia Sanderiana W.Bull* ethanolic leaf, stem and root tuber extracts. Total ash value is useful in determining authenticity and purity of drug and also these values are important quantitative standards. Total ash value of plant material indicated the amount of minerals, and earthy materials present in the plant material. Analytical results showed the total ash higher value was 3.30% w/w in ethanolic root tuber extract of *alocasia sanderiana*. Percent weight loss on drying or moisture content of ethanolic leaf, stem and root tubers extracts is 63.69%, 73.35% and 75.63%. The less value of moisture content could prevent bacterial, fungal or yeast growth. Leaf ethanolic extracts having less value compared stem and root tuber extracts. Ethanolic leaf extracts shows more antimicrobial activity. The higher amount of acid-insoluble siliceous matter present in the tuber extracts of *A.Sanderiana* was 0.95w/w%. The water-soluble extractive value indicated the presence of sugar, acids, and inorganic compounds. The ethanolic root tuber extract have higher value of water soluble extractive values.

Keywords: Total Ash Value, Acid insoluble ash, Water insoluble ash, Water soluble extractive, Loss on drying, Physico-Chemical Analysis, *Alocasia Sanderiana*

1. Introduction

Alocasia sanderiana W.Bull is a plant in the Araceae family. *Alocasia Sanderiana W.Bull* is also known as the kris plant because of the resemblance of its leaf edges to the wavy blade of the kalis dagger (also known as kris plant). It is a tropical perennial with upright shiny, V-shaped and deeply lobed leaves. The plant can be up to 6 ft (2m) tall and large in its native habitat. However, cultivated specimens are smaller. It possesses leaves that are evergreen, pelted, V-shaped, deeply lobed, and a glossy deep-green with large silvery white veins. They are about 12-16 in (30-40cm) long and 6-8 in (15-20cm) wide, with red-green undersides. The leaf stem is about 2 ft (60cm) long. The rhizome of *A.Sanderiana* is vertically placed and is known as root stock. Female flowers are grouped at the lower part of the inflorescence, whereas the male flowers are at the top. According to literature report, *alocasia* is a kris plant native to tropical and subtropical Asia to Eastern Australia. *Alocasia* genus consists of about 79 species of which 28 are cultivated variety. *Alocasia sanderiana W.Bull* plant extract used in nanosilver particles to fight and prevent bacteria in vitro [1] and *Alocasia sanderiana W.Bull* endemic plant available in Tamilnadu [2, 3, 4], India [5]. The various species of *alocasia* plants are used in the treatment of dysentery and leucorrhoea and they have anti-inflammatory, wound healing [6], cytotoxic [7, 8, 9], antimicrobial [10, 11, 12, 13, 14], Antioxidant [15, 16, 17, 18, 19], antidiabetic [20, 21], anticancer [22] and antitumor properties [23, 24, 25]. This plant my previous study shows antimicrobial, antioxidant, anti-inflammatory, antidiabetic activity of different parts like leaf, stem, and root tubers ethanolic extracts of *alocasia sanderiana W.Bull* plant. The aim of the present study is to evaluate the physico-chemical analysis [26, 27] of different parts like leaf, stem, and root tubers of *alocasia sanderiana W.Bull* plant ethanolic extracts.

2. Materials and methods

2.1. Materials

All chemicals and solvents are of analytical reagent grade and procured from HI MEDIA and SD FINE chemicals. The healthy and disease free plant parts leaf, stem and root tubers of *alocasia sanderiana* were collected from southern region of Coimbatore, Tamilnadu, India, in the month of January 2012. The botanical identification was authenticated by a botanist. The fresh plant parts of each leaf, stem and root were washed with tap water and then rinsed with distilled water. Washed plant material was air dried in the laboratory at room temperature for 5-8 days or until they were easily broken by hand. Once completely dried, plant parts were grounded to a fine powder using an electronic blender. Plants were stored in a closed container at room temperature until required.

2.2. Preparation of ethanolic crude extract

The powdered plant parts leaf, stem and root of each material were mixed with sufficient quantity of ethanol solvent. It was kept in rotary shaker at 100rpm for 48 hrs. At the end of 48 hrs, each extract was filtered through Whatman No.1 filter paper and the filtrates were concentrated at room temperature in order to reduce the volume. The paste like extracts were stored in pre-weighed screw capped bottles and the yield of extracts were weighed. These screw capped bottles were kept in refrigerator at 4 °C for future use. Each extract was individually reconstituted using minimal amounts of the extracting solvent prior to use.

3. Physicochemical studies

3.1. Determination of Total Ash Value

Weigh an empty silica crucible along with lid, previously ignited for one hour. Transfer 1 gm of sample into the crucible and cover the crucible with lid and again weigh it. Ignite the crucible for 3

hrs around 450°C temperature. Ignite for successive one-hour periods where ignition to constant weight is indicated. Upon the completion of each ignition, cover the crucible and allow it to cool in a desiccator to room temperature before weighing.

$$\text{Ash Value} = \frac{\text{Residue wt}}{\text{Sample wt}} \times 100$$

3.2. Determination of Acid insoluble Ash Content

Ash obtained from the total ash was boiled with 25ml of 2N HCl for a few minutes. Filtered through an ash less filter paper. The filter paper was transferred into a tarred silica crucible. Incinerated at 450 °C in a muffle furnace until free from carbon. The crucible was cooled and weighed. Percentage of acid insoluble ash was calculated.

3.3. Determination of Water insoluble ash

Ash obtained from the total ash was boiled with 25 ml of distilled water for a few minutes and filtered through an ash less filter paper. The filter paper was transferred into a tarred silica crucible. Incinerated at 450 °C in a muffle furnace until free from carbon. The crucible was cooled and weighed. Percentage of water-soluble ash was calculated.

3.4. Determination of Water soluble extractive value

About 1gm of air-dried extracts was taken with 100 ml of chloroform water in a closed flask for 24 hrs shaking frequently during the first 6 hrs and then allowed to stand for 18 hrs. Thereafter, it was filtered rapidly taking precautions against loss of the water. The 25mL filtrate was evaporated to dryness in a tarred flat bottomed shallow dish, dried at 105 °C weighed. The percentage of the water soluble extractive value was calculated.

3.5. Determination of Moisture Content

1 g of each sample were placed in pre-weighed flat porcelain dish, dry in the oven at 100° C ±5°C till the constant weight was obtained. The loss of weight was calculated.

$$\text{Moisture Content} = \frac{\text{Weight loss}}{\text{Sample wt}} \times 100$$

Physicochemical studies like total ash, acid insoluble ash, water insoluble ash, water soluble extractive value and loss on drying at 105 °C were carried out as per the WHO guidelines for individual leaf, stem and root tubers extract of *alocasia sanderiana* values are recorded in the Table 1.

Table 1: Physico-Chemical Parameters of ethanolic extracts of *Alocasia Sanderiana W.Bull*

S. No	Test Parameters	Leaf extract %	Stem extract %	Root tuber extract %
1	Odour	Pleasant	Pleasant	Pleasant
2	Total Ash Value (w/w %)	2.23	2.97	3.30
3	Acid insoluble ash (w/w %)	0.77	0.91	0.95
4	Water insoluble ash (w/w %)	1.71	1.62	1.85
5	Water soluble extractive (w/w %)	17.11	18.22	22.97
6	Loss on drying (w/w %)	63.69	73.35	75.63

4. Results and discussion

Physico-Chemical parameters

Results of quantitative analysis for total ash, acid insoluble ash, water insoluble ash, water soluble extractive, loss on drying at 105°C values are tabulated in Table 1. Total ash value is useful in determining authenticity and purity of drug and also these values are important quantitative standards. Total ash value of leaf, stem and root tuber value of 2.23, 2.97 and 3.30%. Total Ash value of plant material indicated the amount of minerals, and earthy materials present in the plant material. Analytical results showed the total ash higher value was 3.30% w/w in ethanolic root tuber extract of *alocasia sanderiana*.

Percent weight loss on drying or moisture content of ethanolic leaf, stem and root tubers extracts is 63.69, 73.35 and 75.63%. The less value of moisture content could prevent bacterial, fungal or yeast growth. Leaf ethanolic extracts having less value compared stem and root tuber extracts. The higher amount of acid-insoluble siliceous matter present in the tuber extracts of *A.Sanderiana* was 0.95% w/w. The water-soluble extractive value indicated the presence of sugar, acids, and inorganic compounds. The ethanolic root tuber extract have higher value of water soluble extractive values.

5. Conclusion

Total ash value is useful in determining authenticity and purity of drug and also these values are important quantitative standards. Total ash value of plant material indicated the amount of minerals, and earthy materials present in the plant material. Analytical results showed the total ash higher value was 3.30%

w/w in ethanolic root tuber extract of *alocasia sanderiana*. Percent weight loss on drying or moisture content of ethanolic leaf, stem and root tubers extracts is 63.69%, 73.35% and 75.63%. The less value of moisture content could prevent bacterial, fungal or yeast growth. Leaf ethanolic extracts having less value compared stem and root tuber extracts. Ethanolic leaf extracts shows more antimicrobial activity. The higher amount of acid-insoluble siliceous matter present in the tuber extracts of *A.Sanderiana* was 0.95 w/w%. The water-soluble extractive value indicated the presence of sugar, acids, and inorganic compounds. The ethanolic root tuber extract have higher value of water soluble extractive values.

From the ethanolic extracts of *A.Sanderiana*, two new compounds have been isolated. The characterization and structural conformation of the new compounds are in progress.

6. References

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