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Pharmacognostic evaluation of *Amorphophallus campanulatus* tubers

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Abstract

Pharmacognostic evaluation of *Amorphophallus campanulatus* tubers for extractive value, total ash content, solubility, crude fibre content , fluorescence analysis were analysed. High extractive value was found in hydro alcohol (50%), total ash valve was found to be 6.2%w/w, and the solubility was found more in ethanol 9.2%w/w than compared with water. Fluorescence analysis of powder was carried by treating with acid and alkali.

Key-Words: Pharmacognostic evaluation, *Amorphophallus campanulatus*, Extractive value, Phytochemical standards

Introduction

Traditional plant medicines serve as a source of various types of active principle & WHO estimates 70% of the world population still relies on the herbal medicines. Out of the total 2,25,000 species of plants, only less than 10% have been studied so far for their medicinal uses[1]. India has rich flora of herbal plants and ancient medical system are several hundred years old (Sukumar, E., 1989). *Amorphophallus campanulatus* (Roxb.) blume belonging to the family Araceae, commonly known as elephant root or suram etc, It consists of dried mature tubers of large perennial, subscandent shrub, found through out India and occasionally cultivated in gardens. The tuber is a flattened rough sphere weighing as much as 5-15 kg. Outer surface dark brown and inner surface is pale yellow and starchy. And this is used traditionally for the treatment of tumors, piles, Abdominal pain, and enlargement of spleen, asthma and also in rheumatism[3,4,5]. Most of the studies showed that in Siddha medicine *Amorphophallus campanulatus* is used in the treatment of piles. *Amorphophallus campanulatus* is distributed in Bengal, Uttar Gujarat, Maharashtra, & Ceylon and North India.

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Material and Methods

The crude *Amorphophallus campanulatus* tubers were procured from Rithu bazar market, Mehdipatnam, Hyderabad, and authenticated in Department of Pharmacognosy, Anwarul uloom College of Pharmacy, New Mallepally, Hyderabad. The *Amorphophallus campanulatus* tubers were cut into proper size and dried in sun light with proper care. The dried plant tuber was blended in to coarse powder for study.

Total Ash

The ash content of the crude drug is generally taken to be the residue remaining after incineration. It usually represents the inorganic salts naturally occurring in the drug and adhering to it, but it may include inorganic matter added for the purpose of adulteration. Ash value varies with narrow limits in case of the individual drug but varies considerably in case of different drugs.

Determination of Total Ash

About 2g of powdered drug was accurately weighed in a silica crucible, which was previously ignited and weighed. The powdered drug was spread as a fine layer on the bottom of the crucible. The crucible was incinerated at a temperature not exceeding 450°C until free from carbon. The crucible was cooled and weighed for constant weight.

Water Soluble Ash

The ash obtained in the determination of total ash was boiled for 5 minutes with 25 ml of water. The insoluble

matter was collected on an ash less filter paper and washed with hot water. The insoluble ash was transferred into a tarred silica crucible and ignited for 15 minutes at a temperature not exceeding 450°C. The weight of the insoluble matter was subtracted from the weight of total ash. The difference in weight was considered as the water soluble ash.

Determination of Acid Insoluble Ash

The ash obtained as described in the determination of total ash was boiled with 25 ml of hydrochloric acid for 5 minutes. The insoluble ash was collected on an ash less filter paper and washed with hot water; the insoluble ash was transferred into pre-weighed silica crucible and ignited for 15 minutes at a temperature not exceeding 450°C. The weight of the insoluble matter was subtracted from the weight of total ash. The difference in weight was considered as the acid insoluble ash.

Loss on Drying

About 5g of the powdered crude drug was accurately weighed in a tarred dish and dried in an oven at 100-105°C. It was cooled in a desiccator and again weighed repeat the procedure till constant weight come. The loss on drying was calculated with reference to the amount of the dried powder taken.

Crude Fiber Content

About 2g of powdered drug was extracted with diethyl ether. The residue was transferred to the digestion flask containing 200mL of 0.225N sulphuric acid fitted with the condenser and heated. After 30 min the contents were filtered, washed with boiling water until the washings were basic. The residue was transferred to the flask with 200mL of sodium hydroxide solution (0.13N). The flask was connected with the reflux condenser and boiled for 30 min, then filtered through ash less filter paper (Whatmann No. 41) followed by washed with water until free from alkali; it was washed with 15mL of alcohol. The filter paper was transferred to a crucible and ignited at 450^0C. It was cooled in a desiccator and weighed. The loss in weight represents crude fiber content (Trease & Evans).

Water Soluble Extractive

About 5g of air-dried coarsely powdered drug was macerated with 100 ml of Chloroform water (99.5ml of water + 0.5ml of Chloroform) in a closed flask for 24 hours, shaking frequently during the first 6 hours and allowed to stand for 18 hours. It was then filtered rapidly, 25ml of the filtrate was evaporated to dryness in a tarred flat-bottomed shallow dish dried at 105^0C and weighed.

Ethanol Soluble Extractive

About 5g of air-dried coarsely powdered drug was macerated with 100 ml of 90% ethanol in a closed flask for 24 hours, shaking frequently during the first 6 hours and allow standing for 18 hours. It was then filtered rapidly, 25 ml of the filtrate was evaporated to dryness in a tarred flat-bottomed shallow dish dried at 105^0C and weighed.

Extractive values

The solvents obtained commercially (LR – Grade Extra pure) were purified by distillation methods prior to use for extraction and for Phytochemical investigation. Required quantity of powder was weighed and then it was successively extracted with various solvents of varying polarity [e.g. n-Hexane, Chloroform, Ethyl acetate, Ethanol, Hydro Alcohol (50%)] by using cold maceration technique for 72, 48 and followed by 24hrs. The solvents were filtered and recovered by distillation at 75 to 80^0C. The extracts were dried under desiccator and percentage yield was calculated.

Fluorescence Analysis

Fluorescence analysis of the powder was observed in day/visible light and UV light (Long wavelength – 365 nm and Short wave length – 265 nm). The drug powder was treated with various solvents and was subjected to fluorescence analysis in daylight and in UV light.

Results and Discussion

Results for all ash values, crude fibre content, loss on drying, extractive value were recorded in Table1 and fluorescence analysis were recorded in table2.

The extractive value, percentage yield of crude drug in hydro alcohol(50%) was found to be 4.24%w/w. The yield is more when compared with other solvents. The total ash was found to be 6.20%w/w. The solubility of crude drug in ethanol was found to be 9.2%w/w and in water 5.4%.

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Table 1: Physicochemical Standards of *Amorphophallus campanulatus* tuber

Parameter	%w/w
Total Ash	6.20
Acid Insoluble Ash	1.32
Water Soluble Ash	0.72
Crude Fiber Content	3.2
Loss on Drying	5.2
Solubility Values	
Ethanol	9.2
Water	5.4
Extractive Values	
Hexane	0.25
Chloroform	0.75
Ethyl acetate	0.56
Ethanol	2.58
Hydro alcohol (50%)	4.24

Table 2: Fluorescence Analysis of *Amorphophallus campanulatus* tuber

Treatment	Day Light	UV Light
Drug Powder + Distilled Water	Creamish White	Light Violet
Powder + 1N NaOH	Pinkish Grey	Light Green
Powder + 1N HCl	Grey Colour	Light Violet
Powder + 50% H_2SO_4	Pale Yellow	Light Violet
Powder + Methanol	Pale Yellow	Light Blue
Powder + 50% HNO_3	Yellowish Brown	Light Green
Powder +1N NaOH(al) + Methanol	Brown Colour	Light Green