

Studies on Seasonal Influence of ash values of various plant parts of *Aegle marmelos* (L) Correa

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Abstract: Indian Bael or *Aegle marmelos* is a spiritual, religious and medicinal plant, native of India and Bangladesh and spread throughout South East Asia. Bael has many benefits and uses such as to cure tuberculosis, hepatitis, dysentery, constipation, peptic ulcer, piles, cancer, blood purifier, skin rash, breast milk, useful in worm infestation and stomach related problems. The seasonal variation of total ash, water insoluble ash and water soluble ash content have been investigated from leaves, bark, wood and root of *Aegle marmelos*. Comparative account of total ash contents of *Aegle marmelos* showed higher level in leaves range from (12.950 % to 13.750 %). Comparative account of water insoluble ash contents of *Aegle marmelos* showed higher level in leaves range from (10.425 % to 11.125 %) than bark wood and root. Comparative account of water soluble ash contents of *Aegle marmelos* showed higher level in bark (range 3.800 % to 5.475 %) than leaves (range 2.525 % to 3.295%), wood (range 2.150 % to 2.600 %) and root (2.100 % to 2.475 %).

Keywords: Total ash, water insoluble ash, water soluble ash, *Aegle marmelos*.

I. INTRODUCTION

Traditional systems of medicine, modern medicines, nutraceuticals, food supplements, folk medicines, pharmaceutical intermediates and chemical entities for synthetic drugs are directly or indirectly dependent on plants [1]. Plants are the richest resource of drugs. Plants are an important part of our everyday diet, their constituents and nutritional value has been intensively studied for decades. In addition to essential primary metabolites (e.g., carbohydrate, lipid, protein and amino acids), higher plants are also able to synthesize a wide variety of low molecular weight compounds, the secondary metabolites [2,3]. Beyond this pharmaceutical approach to plants, there is a wide tendency to utilize herbal product to supplement the diet, mainly with the intention of improving the quality of life and preventing the diseases [4]. Despite the remarkable progress in the preparation of synthetic drugs, over 25% of prescribed medicines in industrialized countries are derived directly from plants [5].

Bael has great religious significance. In Hindu tradition, the leaves and the fruit of the plant are offered to god during prayer, especially god Shiva. Its leaves are also used to worship Parvati and Viva Rupra. The fruit is used in religious ceremonies and rituals and its mentioned is also seen in Vedas and Mahabharata. Plants are an important part of our everyday diet, their constituents and nutritional value has been intensively studied for decades. *Aegle marmelos* (L.) Corr. is slow growing, medium sized tree, 25 to 30 feet tall. The stem is short, thick, soft, flaking bark and spreading, sometimes spiny branches, the lower ones dropping. There are sharp, axial one inch long spikes on this tree. The leaflets are oval or lancet shaped, 4-10 cm long, 2-5 cm wide. Leaves composed of 3-5 leaflets in it. The lateral leaflets are without petiole and the terminal one has a long one.

The petiole is 1 to 2.5 inch long. Mature leaves emit a peculiar fragrance when bruised. Flowering occurs in April and May. Evaluated the medicinal uses and pharmacological activity of the plant *Aegle marmelos* (L.) Corr. in India [6]. The *Aegle marmelos* (L.) Corr. is beneficial in different health problems like cancer, heart related diseases, diabetes, increase in cholesterol level, constipation, respiratory infection, diarrhea and dysentery. The aim of the study was to improve axillary branching by using nodal sector of plant. Investigated antifertility effect of leaves of *Aegle marmelos* [7]. Dhankar reported the biological and phytochemical evaluation in the literature for the importance of *Aegle marmelos* [8]. They reported it has used in ethnomedicine as a antidiabetic, antiulcer, antioxidant, antimalarial, anti-inflammatory, anticancer, radio protective, antihyperlipidaemic, antifungal, antibacterial and antiviral activities. *Aegle marmelos* plant was used in the treatment of wide range of diseases in all Ayurveda, Siddha and folk medicines [9].

II. MATERIALS AND METHODS

Method recommended in Pharmacopoeia of India [10] and British Pharmacopoeia [11] were followed for determining ash value percentage method. Preparation of Ash -3gm of drug was incinerated in a Silica crucible over the burner. The charred material was heated in muffle furnace for six hours at 60 – 65 °C. The ash was found white and free from carbon. It was cooled and weighed on the ash less filter paper.

Determination of Water-Insoluble Ash -The water was boiled for 5 minutes with 25 ml of dilute water. Insoluble matter collected in crucible or an ash less filter paper and washed with hot water, ignited and weighed. Weight of the insoluble matter was subtracted from the weight of ash. The difference in weight represents the water soluble ash. Percentage of water soluble ash was calculated with reference to the air dried drug.

III. RESULTS AND DISCUSSION

Ash values were determined with a purpose to find out the total amount of inorganic solutes present in the medicinal plant material. Quite a few herbal therapies make use of ash. It is very obvious that ash of any plant does not contain any organic material and therefore. Inorganic salts are used medicinally. It is also interesting to know about the different solubility of the components of ash. Therefore, the solubility of ash in water was tested. In the determination total amount of ash and inorganic soluble were found in many herbal systems of treatments. Ash is used inorganic salts are medicinally important because plant parts not contain organic material. The total ash content of leaves ranges from 12.950 % to 13.750 % and higher in summer sample (13.750%) than winter (12.950 %) and monsoon (13.450 %) were found. Total ash content of bark was higher at summer (14.900 %) than winter (12.475 %) monsoon (11.500 %). Wood sample also showed highest at summer (7.400 %) than winter (7.200 %) and lower in monsoon (7.150 %). The total ash content of root ranges from 6.700 % to 8.650 % and higher in summer sample (8.650 %) than winter (7.150 %) and monsoon (6.700 %) were found. The percentage of total ash was found in the increasing order wood < root < bark < leaves (Table No. 1 and Fig. No.1)

The Water soluble ash content of leaves was ranged from 2.345 % to 3.295 % and higher at summer (3.295 %) than winter (2.525 %) and lower in monsoon (2.345 %). Bark sample also showed higher at summer (5.475 %) than winter (4.575 %) and lower in monsoon (3.800 %). The percentage of water solubility showed in wood was higher in summer (2.600 %) than winter (2.500 %) and lower in monsoon (2.150 %). The percentage of water solubility showed in root was higher in summer (2.475 %) than winter (2.300 %) and lower in monsoon (2.100 %). The percentage of ash solubility of water was observed in the increasing order from root < wood < bark < leaves (Table No 1 and Graph No.1). The insolubility of ash content in leaves was observed highest in monsoon (11.125 %) than summer (10.455 %) and winter (10.425 %). In bark sample also showed higher at summer (9.425 %) than winter (7.900 %) and monsoon (7.700 %). The insolubility of ash content in root was observed highest in summer (6.175 %) than monsoon (4.600 %) and winter (4.850 %). Where as in wood showed higher content in monsoon (5.000%) than winter (4.700 %) and in summer (4.800 %) The percentage of water insolubility was observed in increasing order from wood < root < bark < leaves (Table No.1 and Fig. No. 1).

Table No: 1 -Determination of Ash Values of *Aegle marmelos*

Plant Parts	Season	Total Ash (%)			Water Soluble Ash (%)			Water Insoluble Ash (%)		
		1 st Year	2 nd Year	Mean	1 st Year	2 nd Year	Mean	1 st Year	2 nd Year	Mean
Leaves	Monsoon	13.30	13.60	13.450	2.09	2.60	2.345	11.25	11.00	11.125
	Winter	12.90	13.00	12.950	2.30	2.75	2.525	10.60	10.25	10.425
	Summer	13.60	13.90	13.750	3.09	3.50	3.295	10.51	10.40	10.455
Bark	Monsoon	11.40	11.60	11.500	3.65	3.95	3.800	07.75	7.65	7.700
	Winter	12.05	12.90	12.475	4.80	4.35	4.575	07.25	8.55	7.900
	Summer	14.50	15.30	14.900	5.65	5.30	5.475	08.85	10.00	9.425
Wood	Monsoon	7.00	7.30	7.150	2.00	2.30	2.150	5.00	5.00	5.000
	Winter	7.20	7.20	7.200	2.40	2.60	2.500	4.80	4.60	4.700
	Summer	7.50	7.30	7.400	2.70	2.50	2.600	4.80	4.80	4.800
Root	Monsoon	6.95	6.45	6.700	2.00	2.22	2.100	4.95	4.25	4.600
	Winter	7.30	7.00	7.150	2.30	2.30	2.300	5.00	4.70	4.850
	Summer	8.34	8.95	8.650	2.55	2.40	2.475	5.80	6.55	6.175

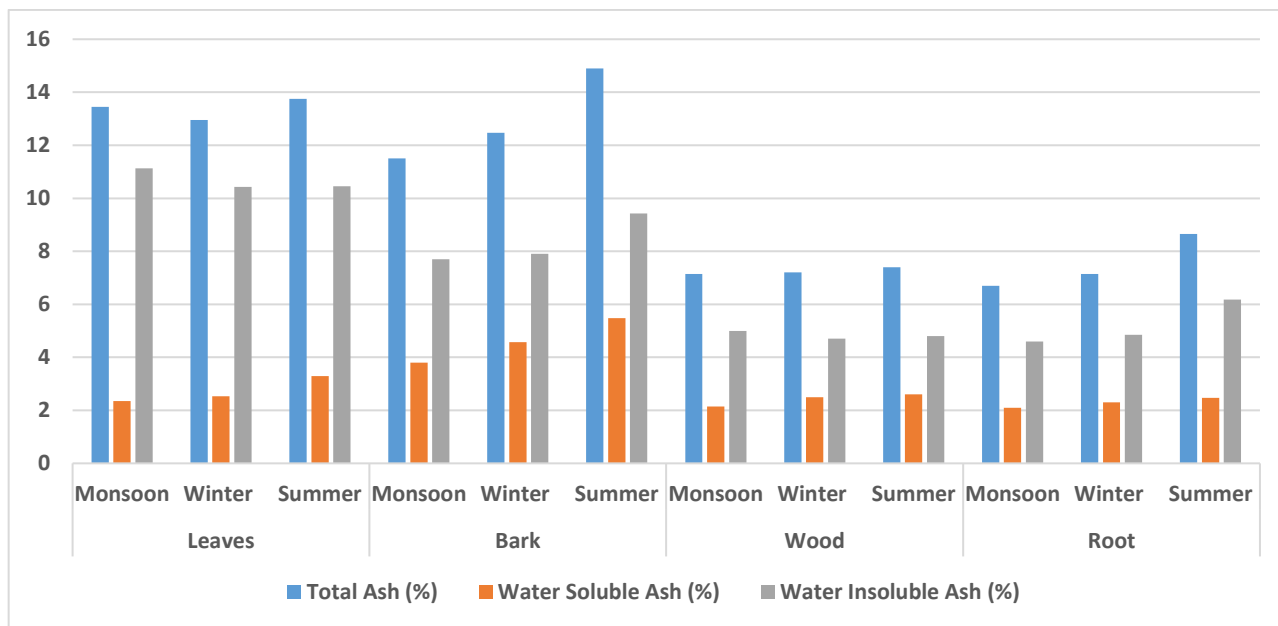


Fig.: 1 - Determination of Ash Values of *Aegle marmelos*

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