

**STUDIES ON SEASONAL INFLUENCE OF ASH VALUES OF VARIOUS PLANT PARTS
OF AEGLE MARMELLOS (L) CORREA****Vasantrao B. Kadam***P. G. Department of Botany and Research Centre, M. V. P. Samaj's, K. R. T. Arts, B. H. Comm. and A. M. Science
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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, acid insoluble ash and acid 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 bark range from (10.615 % to 12.465 %). Comparative account of acid insoluble ash contents of *Aegle marmelos* showed higher level in bark range from (7.755 % to 9.200 %) than leaves, wood and root. Comparative account of acid soluble ash contents of *Aegle marmelos* showed higher level in root (range 4.010 % to 5.055 %) than leaves (range 3.050 % to 3.250 %), bark (range 2.860 % to 3.265 %) and wood (4.190 % to 5.000 %).

KEYWORDS: Total ash, Acid insoluble ash, Acid soluble ash, *Aegle marmelos*.**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 (Hammer et.al, 1999). 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 (Kadam et.al. 2013; Kadam et.al. 2016). 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 (Maffei M., 2003). Despite the remarkable progress in the preparation of synthetic drugs, over 25% of prescribed medicines in industrialized countries are derived directly from plants (Newman et.al, 2000).

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. Pushpendra, et al., (2012) evaluated the medicinal uses and pharmacological activity of the plant *Aegle marmelos* (L.) Corr. in India. 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. Remya, et al., (2009) investigated antifertility effect of leaves of *Aegle marmelos*. Dhankar, et al., (2011) reported the biological and phytochemical evaluation in the literature for the importance of *Aegle marmelos*. 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 by Ariharan, et al., (2013).

MATERIALS AND METHODS

Method recommended in Pharmacopoeia of India (Anonymous, 1966), and British Pharmacopoeia (Anonymous, 1973) 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 600-650 °C. The ash formed was white and free from carbon. It was cooled and weighed on the ash less filter paper.

Determination of acid insoluble ash- The acid was boiled for 5 minutes with 25 ml of dilute hydrochloric acid. Insoluble matter collected in crucible or on an ash less filter paper and washed with hot water, ignited and weight. Percentage of acid insoluble ash was calculated with reference to the air dried drug.

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 acid was tested.

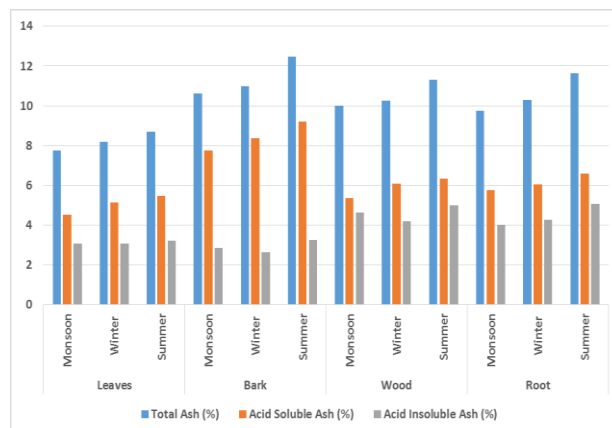
In the determination total amount of ash and inorganic soluble were found in many herbal systems of treatments. Ash is used inorganic salts are medicinally important because plant parts not contain organic material. The total ash content of leaves ranges from

7.745 % to 8.680 % and higher in summer sample (8.680 %) than winter (8.185 %) and monsoon (7.745 %) were found. Total ash content of bark was higher at summer (12.465 %) than winter (11.000 %) monsoon (10.615 %). Wood sample also showed highest at summer (11.325 %) than winter (10.255 %) and lower in monsoon (9.985 %). The total ash content of root ranges from 9.750 % to 11.645 % and higher in summer sample (11.645 %) than winter (10.300 %) and monsoon (9.750 %) were found. The percentage of total ash was found in the increasing order wood < root < bark < leaves (Table No. 1 and Graph No.1)

The acid soluble ash content of leaves was ranged from 4.435 % to 5.470 % and higher at summer (5.470 %) than winter (5.150 %) and lower in monsoon (4.535 %). Bark sample also showed higher at summer (9.200 %) than winter (8.365 %) and lower in monsoon (7.755 %). The percentage of acid solubility showed in wood was higher in summer (6.325 %) than winter (6.065 %) and lower in monsoon (5.345 %). The percentage of acid solubility showed in root was higher in summer (6.590 %) than winter (6.035 %) and lower in monsoon (5.740 %). The percentage of ash solubility in acid was observed in the increasing order from root < wood < bark < leaves (Table No 1 and Graph No.1). The acid insolubility of ash content in leaves was observed highest in summer (3.210 %) than monsoon (3.050 %) and winter (3.085 %). In bark sample also showed higher at summer (3.265 %) than winter (2.635 %) and monsoon (2.860 %). The acid insolubility of ash content in root was observed highest in summer (5.055 %) than monsoon (4.010 %) and winter (4.265 %). Where as in wood showed higher content of acid insolubility of ash in summer (5.000%) than winter (4.190 %) and in monsoon (4.645 %). The percentage of acid insolubility was observed in increasing order from wood < root < bark < leaves (Table No.1 and Graph No. 1)

Table No. 1: Determination of ash values of *Aegle marmelos*.

Plant Parts	Season	Total Ash (%)			Acid Soluble Ash (%)			Acid 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	7.68	7.81	7.745	4.77	4.62	4.535	2.91	3.19	3.05
	Winter	8.10	8.27	8.185	5.11	5.09	5.150	2.99	3.18	3.085
	Summer	8.60	8.76	8.680	5.52	5.42	5.470	3.08	3.34	3.210
Bark	Monsoon	10.83	10.40	10.615	7.90	7.61	7.755	2.93	2.79	2.860
	Winter	11.20	10.80	11.000	8.31	8.42	8.365	2.89	2.38	2.635
	Summer	12.60	12.33	12.465	9.18	9.22	9.200	3.42	3.11	3.265
Wood	Monsoon	9.80	10.17	9.985	5.38	5.31	5.345	4.49	4.86	4.645
	Winter	10.30	10.21	10.255	6.03	6.10	6.065	4.27	4.11	4.190
	Summer	11.22	11.43	11.325	6.43	6.22	6.325	4.79	5.21	5.000
Root	Monsoon	9.80	9.70	9.750	5.67	5.81	5.740	4.13	3.89	4.010
	Winter	10.20	10.40	10.300	5.90	6.17	6.035	4.30	4.23	4.265
	Summer	11.67	11.62	11.645	6.50	6.68	6.590	5.17	4.94	5.055



Graph 1: Determination of ash values of *Aegle marmelos*.

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