ISSN: 2277-8713
V. B. Kadam, IJPRBS, 2012: Volume1 (3):337-346 *IJPRBS*

RESEARCH ARTICLE

INTERNATIONAL JOURNAL OF PHARMACEUTICAL RESEARCH AND BIO-SCIENCE

A Path for Horizing Your Innovative Work

DETERMINATION OF ASH VALUES OF SOME MEDICINAL PLANTS OF MARATHWADA REGION IN MAHARASHTRA

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Accepted Date: 20/06/2012 **Publish Date: 27/06/2012**

Abstract: The seasonal variation of total ash, acid soluble ash and acid insoluble ash have been investigated leaves, wood and bark of *Butea monosperma, Madhuca indica and Syzygium cumini* , which are medicinally important plants. Comparative account of total ash, acid soluble ash and acid insoluble ash content of bark of *Butea monosperma* showed high level of total ash (range 14.15 to 17.6 %) and low level of total ash of wood of *Madhuca indica* (range 5.05 to 6.85 %). The acid soluble ash showed higher level of bark of *Butea monosperma* (range 6.3 to 6.65 %) and lower in leaves of *Syzygium cumini* (range 0.8 to 2.75 %). Comparative account of acid insoluble ash of bark of *Butea monosperma* showed higher (range 9.6 to 13.5 %) and lower in the wood of *Syzygium cumini* (range 3.1 to 5.15 %).

Keywords: Total ash, acid soluble ash, acid insoluble ash, medicinal plant

INTRODUCTION

The phytochemical constituents and medicinal properties of most of the medicinal plants were recorded in the last few decades by a number of workers (Joshi, 2000; Nudrat and Usha, 2005). These medicinal plants are subjected to various processes and are then administrated to the patients. The survey and documentation of medicinally important plants in each and every place is very much important for easy identification of local traditional healers, conservation and sustainable utilization.

All human beings require a number of complex organic/inorganic compounds in diet to meet the need for their activities. The important constituents of diet are carbohydrates, fats, proteins, vitamins, minerals and water (Indrayan et al., 2005). Plants are the rich source of all the elements essential for human beings. Qualitative or quantitative determination of mineral elements present in plants is important because the concentration and type of minerals present must often be stipulated on the label of a food. The quality of many foods depends on the concentration and type of minerals what they contains, also play a very significant role against a variety of degenerative diseases and processes, they may also prevent and reduce injury from environmental pollutants and enhance the ability to work and learn, some minerals are essential to a healthy diet (e.g. Calcium, Phosphorus, Potassium and Sodium) where as some can be toxic (e.g. Lead, Mercury, Cadmium and Aluminium). The use of mineral element is found to have been developed and used widely to cure several health problems. The amount and composition of ash remaining after combustion of plant material varies considerably according to the part of the plant, age, treatment etc. The constituents of the ash also vary with time and from organ to organ. Ash usually represents the inorganic part of the plant.

Butea monosperma is commonly known as Flame of forest, belongs to the family Fabaceae (Patil, *et.al*, 2006). Tribals use its flowers and young fruits. The plant is used in Ayurvedic, Unani and Siddha medicine for various ailments. Almost all the parts of the plant namely root, leaves, fruit, stem bark, flowers, gum young branches are used as medicine, food, fiber and for other miscellaneous purposes such as fish poison,

dye, fodder, utensils, etc. (Burli and Khade, 2007). Leaves are good for the disease of the eye. Leaf is an appetizer, astringent, carminative, anthelmintic, aphrodisiac, tonic, lessens inflammation and lumbago, cures boils and piles.

Stem bark extract of *Madhuca indica* is inactive against Ranikhet disease virus, *Bacillus subtilis, Staphylococcus aureus, Salmonella typhi, Escherichia coli and* vaccinia virus. The methanolic extracts of flowers, leaves, stem and stem bark of *M. longifolia* have been reported to possess antibacterial activity against *Bacillus anthracis, B. pumilus, B. subtilis, Salmonella paratyphi, Vihrio cholerae, Xanthomonas campestris* and *X malvacearum* (Trivedi, *et.al.,* 1980). Seed Oil is used as ointment, in rheumatism and to prevent crack in the skin in winter. It is used for edible purposes culinary, hair oil, illumination, lighting, keeps body glossy and warm. The oil extracted from the seeds can also be applied locally in skin diseases. Flowers of the Madhuca are effective in increasing the flow of milk in nursing mothers.

Syzygium cumini Skeels (or *Eugenia jambolana*) belonging to the family of Myrtaceae is a large evergreen tree. It has been valued in Ayurveda and Unani system of medication for possessing variety of therapeutic properties. *Syzygium cumini* showed an antimicrobial effect against enteric bacteria antibacterial activity. (Rani and Khullar, 2003; Alanis, *et.al,* 2005) . *Syzygium cumini* extracts possess a broad spectrum of activity against a panel of bacteria responsible for the most common bacterial diseases. These promissory extracts open the possibility of finding new clinically effective antibacterial compounds.

Mimusops elengi belongs to the family *Sapotaceae*. It is an evergreen tree. The fruits are used in chronic dysentery, constipations; flowers are used as snuff to relive headache, lotion for wounds and ulcers. Barks are used to increase fertility in women and known to have antiulcer activity (Shah, *et. al.,* 2003). They are rich source of tannin, saponin, alkaloids, glucoside, and ursolic acid. The bark is used as a gargle for odontopathy, ulitis and ulemorrhagia. Fruits are used as astringent, coolant and anthelmintic. The tender stems are used as tooth brushes, and in cystorrhea, diarrhea and dysentery. The seeds are used in constipation (Nair and Chanda, 2007).

MATERIALS AND METHODS

Method recommended in pharmacopoeia of India (Anonymous, 1966), and British Pharmacopoeia (Anonymous, 1973) were followed for determining Ash value and 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^{0}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 25ml 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

As values were determine 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 and hydrochloric acid was tested in the present study.

***Butea monosperma* Lam (**Palas**)**

The total ash content of leaves ranges from 13.35% to 14.45%. Higher level during summer (14.45%), than winter (13.95%) and monsoon (13.35%).The total ash content of bark was higher level at summer (17.6%) than monsoon (15.3%) and winter (14.15%). The total ash content of wood was higher level at monsoon (8.15%) than summer (8.3%) and winter (8%) respectively. The percentage of total ash found to be in the increasing order wood<leaves< bark**.** The range of water soluble ash content of leaves was ranging from 3.4% to 3.7% highest solubility observed at winter 3.7%. Than summer 3.65% than monsoon3.4%.Bark showed higher level of water soluble ash at monsoon 4.65% over than summer and winter (4.55%) and wood showed lower level of water soluble ash at both in monsoon and winter 2.7% than summer 2.35%.

The percentage of ash solubility in water to be increasing order as wood< leaves< bark. The range of water insolubility ash content is highest them bark and wood it ranges from 9.9% to 10.25% , winter shows higher (10.25%) as compared to summer(10.8%) and monsoon(9.9%) In bark show higher level of water insolubility at summer 13.05% than monsoon 10.65% and winter 9.6%.The wood shows low water insolubility than leaves and bark it ranges from 5.3 to 5.95% summer season has higer value i.e 5.95% than other season. The percentage of water insolubility to be in the increasing order of wood< leaves< bark. (Table .1)

Madhuca indica Gmel (Mahua)

Total ash content in leaves it ranges from 6.1% to 8.1% highest being observed in winter 8.1% than monsoon 7.15% and summer 6.1%.The bark had higher totals ash content at winter 16.65% as compared to monsoon 16.45 and summer 13.85. In wood total ash content higher at 16.25% than summer 14.61% and winter 12.5%.The percentage of total ash were found to be in the increasing order of leaves< wood< bark.n The water solubility of ash in leaves ranges from 2.6% to 4%. Monsoon (4%) show high ash solubility in water as compared to winter 2.8% and summer 2.6% respectively.

Water solubility of ash content of bark was ranging from 6.3% to 6.65%. highest being observed at winter 6.65% as compared to summer 6.55% and monsoon 6.3%. In wood summer show water solubility of ash at high level 4.9% as compared to monsoon 3.6% and winter 2.55%. The percentage of water solubility of ash were found to be in the increasing order of leaves< wood< bark. (Table 1). The water insolubility of ash in leaves show higher level in winter 5.85% as compared to summer 3.55% and monsoon 3.15%. The bark water insolubility of ash ranges from 7.25%to 10.1%. Higher insolubility observed at monsoon 10.1% than winter 10%and summer 7.25%. The wood show highest water insolubility of ash as compared to bark and leaves it ranges from 9.7% to 12.65% .Higher insolubility observed in monsoon 12.65% than 9.95and summer 9.7%. The percentage of water insolubility of ash is increasing order of leaves< bark< wood. (Table 1)

***Syzygium cumini* Linn (**Jambul**)**

Total ash content of leaves was ranging from 6.5% to 7.65% among different season tested while summer leaves show high level of total ash 7.65% as compared to monsoon

7.4% and winter 6.5%. While in bark total ash ranges from 6.3% to 8.8%. Highest level of total ash observed at summer 8.8% than monsoon7.8% and winter 6.3% .the wood total ash ranges from 5.3% to 6.85%. Higher level of total ash observed at summer 6.85% than monsoon 5.3% and winter 5.05% **.** The percentage of total ash were found in the increasing order wood< bark< leaves. The range of water solubility of ash content of leaves ranging from 0.8 to 2.75% highest level of water solubility observed at monsoon 2.75% as compared to winter 1.8% and summer 0.8%. Wood ash show lower level of water solubility ash content i.e. from 1.7% to 2.2% while Bark show highest level of water solubility ash content 2% to 3.15% higher ash solubility observed at winter 3.15% as compared to monsoon 2% and summer2.55%. The percentage of water solubility of ash were found to be in the increasing order of wood< leaves< bark.

The water insolubility of ash of leaves ranging from 4.65% to 6.85%.Summer show highest water insolubility of ash (6.85%) than winter (4.7%) than monsoon (4.65%).Bark show highest level of water insolubility of ash in summer (6.25%) than monsoon (5.8%) than winter (3.45%) .Wood ash water insolubility show ranges from (3.1% to 5.15%) higher level observed at summer 5.15% than monsoon 3.1 and winter 3.5% . The percentage of water insolubility of ash were found be in the increasing order of leaves< wood<Bark. (Table.1)

Table 1
Determination of Ash Values of some medicinal plants of Marathwada Region in Maharashtra.

		Total ash (%)			Acid soluble (%)			Acid insoluble (%)		
Plant parts	Season	**Plant 1**	**Plant 2**	**Plant 3**	**Plant 1**	**Plant 2**	**Plant 3**	**Plant 1**	**Plant 2**	**Plant 3**
LEAVES	**Summer**	14.45	6.1	7.65	3.65	2.6	*0.8*	10.8	3.55	6.85
	Monsoon	13.35	7.15	7.4	3.4	4	*2.75*	9.9	3.15	4.65
	Winter	13.95	8.1	6.5	3.7	2.8	*1.8*	10.25	5.85	4.7
WOOD	**Summer**	8.3	14.6	6.85	2.35	4.9	*1.7*	5.95	9.7	5.15
	Monsoon	8.15	16.25	5.3	2.7	3.6	*2.2*	5.45	12.65	3.1
	Winter	8	12.5	5.05	2.7	2.55	*1.55*	5.3	9.95	3.5
BARK	**Summer**	17.6	13.8	8.8	4.55	6.55	*2.55*	13.05	7.25	6.25
	Monsoon	15.3	16.4	7.8	4.65	6.3	*2*	10.65	10.1	5.8
	Winter	14.15	16.65	6.3	4.55	6.65	*3.15*	9.6	10	3.45

Plant1- ***Butea monosperma***, Plant 2- ***Madhuca indica***, Plant 3- ***Syzygium cumini.***

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