Available online at www.pharmaresearchlibrary.com/jpbr

Research Article

Journal of Pharmaceutical and Biological Research
www.pharmaresearchlibrary.com/jpbr
JPBR, 2013: Vol.1(1): 1-4

Determination of water soluble Ash values of some Medicinal Plants of Genus *Sesbania*

Kadam V.B*[1], Momin R.K[2], Wadikar M.S[3], Tambe S.S[4]
[1]P.G.Department of Botany and Research Centre, K.T.H.M.College, Nashik-422 002
[2]Department of Botany, Milliya Arts, Science and Management Science Colleg, Beed
[3]Department of Botany, Vinayakrao Patil Science College, Vaijapur, Aurangabad
[4]Department of Botany, Pushpatai Hire Mahila College, Malegaon, India-432 003
*E-mail: drvbkadam@yahoo.com
Available Online: **27 November 2013**

ABSTRACT

The seasonal variation of total ash, water soluble ash and water insoluble ash have been investigated leaves , wood and bark of *Sesbania rostrata*, *Sesbania exaltata* and *Sesbania sesban* , which are medicinally important. Comparative account of total ash, water soluble ash and water insoluble ash content of bark of *Sesbania rostrata* showed high level of total ash (range from 8.96 % to 9.52 %) and low level of total ash of leaves of *Sesbania sesban* (range 7.06 % to %) .The water soluble ash showed higher level of bark of *Sesbania rostrata* (range 3.64 % to 3.98 %) and lower in wood of *Sesbania sesban* (range 0.59 % to 0.73 %). Comparative account of water insoluble ash of bark of *Sesbania rostrata* showed higher (range 5.32 % to 5.54 %) and lower in the wood of *Sesbania sesban* (range 1.28 % to 1.39 %).

Keywords: Total ash, water soluble ash, water insoluble ash, medicinal plant, *Sesbania*

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 (Nadkarni, 1976; Nudrat and Usha, 2005). These medicinal plants are subjected to various processes and are then administrated to the patients. Medicinal plants have been used as traditional treatments for numerous human diseases for thousands of years. Medicinal properties of plants are due to the active chemical constituents present in different parts of the plant (Mitscher et al, 1980). Medicinal plants continue to be an important therapeutic aid for the ailments of humankind. 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 afood. 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 pollutant sand 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). It is clear that mineral nutrition is important to maintain good health and because of that determination of As, Ca, Fe, Mg, Na, K, Zn, Ni, Co etc. have been added to *Ayurvedic Pharmacopoeia of India* (The *Ayurvedic Pharmacopoeia* of India, 1999).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(Kadam, 2009).

Today, there is a renewed interest in traditional medicine and increasing demands for more drugs from plant sources. This revival of interest in plant-derived drugs is mainly due to the current widespread belief that "greenmedicine" is safe and more dependable than the costly synthetic drugs, many of which have adverse side effects. Nature has bestowed upon us a very rich botanical wealth and a large number of diverse types of plants grow wild in different parts of our country. The seasonal variation of water soluble extractive alcohol soluble extractive and ether soluble extractive have been investigated in leaves, wood and bark of *Sesbania rostrata* , *Sesbania exaltata* and *Sesbania sesban. Sesbania rostrata* as an important dietary nutritive source in Southeast Asian country's. *Sesbania rostrata* are richest source of amino acid, minerals and antioxidants vitamins. This species is unique because it fixes nitrogen not only in its roots in the soil, but also in its aerial parts including stems and branches (Dutt et.al.,1983). Various parts of this plant are used in Indian traditional medicine for the treatment of diuretic, emetic, fevers, headaches, anemia, bronchitis, inflammation, leprosy, gout, rheumatism, anxiolytic, anticonvulsive and hepatoprotective (Pari and Uma, 2003). It also has anti inflammatory, analgesic and antipyretic activity (Momin et.al., 2012). Primarily used as green manure between rice crops (Shahjalal and Topps , 2000) .

Sesbania exaltata is a crop generally cultivated for its nutritive value to soil. It is cultivated in monsoon season almost throughout India and grows sandy, loamy and clay soils. It is an ideal green manure crop as it is quick-growing, succulent, and easily decomposable with low moisture requirements and produces maximum amount of organic matter and nitrogen in the soil. Seed flour is used in the treatment of ringworm, skin diseases and wounds. The mature seeds of this species are known to be cooked and eaten by the Indian tribal's (Brown, 1954). *Sesbania sesban* seeds considered stimulants and astringent. Leaves considered purgative, anthelmintic and anti inflammatory. Leaves showed a high crude protein content,25 to 30% and is a useful source of protein for ruminant diets and a source of supplement fodder for livestock. Study of the effect of *Sesbania sesban seed* powder on female albino rats showed inhibition of ovarian function, change of uterine structure and prevention of implantation with 100 % control of fertility (Shiv Pal Singh , 1990). The aqueous extracts of leaves in STZ-induced diabetic rats showed significant increase in serum insulin and HDL level and decreases in blood glucose , total cholesterol and triglycerides when compared to glibenclamide (Pandhare et.al.,2011*). Sesbania sesban* was referred to as milk shrub. Farmers were encouraged to feed *Sesbania* fodder to lactating cows to enhance milk secretion (Brown, 1954).

MATERIAL AND METHODS

Method recommended in pharmacopoeia of India (Anonymous, 1966), and British Pharmacopoeia (Anonymous, 1973) were followed for determining Ash value andpercentage 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 water soluble Ash:

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

RESULTS AND DISCUSSION

Sesbania rostrata **–** The total ash of leaves range from (6.88 % to 7.54 %) higher level of total ash show at summer (7.54 %) than monsoon (6.88 %) and winter (7.34 %). Total ash of bark showing higher level at summer 9.52 % as compared to monsoon 8.96 % and winter 9.29 %. Total ash of wood content show higher level at summer 4.20 % than winter 3.97 % and monsoon 3.67 %. The percentage of total ash were found to be in the increasing order of bark < leaves< wood. The range of water soluble ash content of leaves was ranging from (2.80 % to 3.22 %) among different season tested (Table). Wood show lower level of water solubility ash content (range from 1.55 % to 1.80 %) Higher level show at summer 1.80 % than winter 1.75 % and monsoon 1.55 % . Bark show higher level of water soluble ash at summer 3.98 % as compared to monsoon 3.64 % and winter 3.88 %. The percentage of water soluble ash were found to be in the increasing order of bark < leaves < wood. Water insoluble ash of leaves was higher at summer 4.34 % as compared to monsoon 4.08 % and winter 4.22 % . The range of percentage of water insoluble ash of bark show higher (5.32 % to 5.54 %) than leaves (4.08 % to 4.34 %) and wood (2.12 % to 2.40 %). In wood water insoluble ash show higher level at summer 2.40 % than winter 2.22% and monsoon 2.40 %, while in bark highest water insolubility of ash at summer 5.54 % than winter 5.41 % and monsoon 5.32 %. The percentage of water insoluble ash content were found to be in increasing order of bark < leaves < wood (Table.1). *Sesbania exaltata* - The percentage of total ash content of leaves show highest level at summer 6.02 % as compared to monsoon 5.53 % and winter 5.80 %. In bark total ash content observed higher level at summer 7.89 % as compared to winter 7.66 % and monsoon 7.34 % , while in wood total ash rages from (2.33 % to 2.70 %) highest level observe

at summer 2.70 % than monsoon 2.33 % and winter 2.54 %. The percentage of total ash content were found to be in increasing order of bark < leaves < wood. The water soluble ash of leaves was measures in summer (2.53 %), monsoon (2.23 %) and winter (2.40 %). The water soluble ash of wood was highest at summer (0.94 %) than winter (0.86 %) and monsoon (0.78 %). The water soluble ash of bark ranges from(2.61 % to 2.97 % , higher being in summer 2.97 % as compared to monsoon 2.61 % and winter 2.82 % . The percentage of water soluble ash were found to be in the increasing order of bark < leaves < wood. The water insoluble ash content of leaves was measure in summer (3.49 %), monsoon (3.30 %) and winter (3.40 %) and found its maximum in summer. The bark show water insoluble ash range from (4.73 % to 4.92%). The higher level being observed in summer 4.92 % as compared to monsoon 4.73 % and winter 4.84 % , While in wood show low water insolubility of ash, it measure at monsoon 1.55 % ,winter 1.68 % and summer 1.76 % . The percentage of water insolubility were found to be in the increasing order of bark < leaves < wood (Table.1).

Sesbania sesban **-** The total ash of leaves range from (5.23 % to 5.67 %) higher level of total ash show at summer (5.67 %) than monsoon (5.23 %) and winter (5.43 %). Total ash of bark showing higher level at summer 7.40 % as compared to monsoon 7.06 % and winter 7.27 %. Total ash of wood content show higher level at summer 2.12 % than winter 2.02 % and monsoon 1.87 %. The percentage of total ash were found to be in the increasing order of bark < leaves< wood. The range of water soluble ash content of leaves was ranging from (2.04 % to 2.30 %) among different season tested (Table). Wood show lower level of water solubility ash content (range from 0.59 % to 0.73 %) Higher level show at summer 0.73 % than winter 0.67 % and monsoon 0.59 %. Bark show higher level of ash soluble at summer 2.42 % as compared to monsoon 2.36 % and winter 2.40 %. The percentage of water solubility ash were found to be in the increasing order of Bark < leaves < wood. Water insoluble ash of leaves was higher at summer 3.37 % as compared to monsoon 3.19 % and winter 3.26 %. The range of percentage of water insoluble ash of bark shows higher (4.70 % to 4.98 %) than leaves (3.19 % to 3.37 %) and wood (1.28 % to 1.39 %). In wood water insoluble ash show higher level at summer 1.39 % than winter 1.35 % and monsoon 1.28 %, while in bark highest water insolubility of ash at summer 4.98 % than winter 4.87 % and monsoon. 4.70 %. The percentage of water insoluble ash content were found to be in increasing order of bark < leaves < wood (Table.1)

Table.1 Determination of Ash Values of *Sesbania rostrata*, *Sesbania exaltata* and ***Sesbania sesban***

Plant parts	**Season**	**Total ash (%)**			**Water soluble (%)**			**Water insoluble (%)**		
		Plant 1	**Plant 2**	**Plant 3**	**Plant 1**	**Plant 2**	**Plant 3**	**Plant 1**	**Plant 2**	**Plant 3**
Leaves	Summer	**7.54**	**6.02**	**5.67**	**3.22**	**2.53**	**2.30**	**4.34**	**3.49**	**3.37**
	Monsoon	**6.88**	**5.53**	**5.23**	**2.80**	**2.23**	**2.04**	**4.08**	**3.30**	**3.19**
	Winter	**7.34**	**5.80**	**5.43**	**3.12**	**2.40**	**2.17**	**4.22**	**3.40**	**3.26**
Wood	Summer	**4.20**	**2.70**	**2.12**	**1.80**	**0.94**	**0.73**	**2.40**	**1.76**	**1.39**
	Monsoon	**3.67**	**2.33**	**1.87**	**1.55**	**0.78**	**0.59**	**2.12**	**1.55**	**1.28**
	Winter	**3.97**	**2.54**	**2.02**	**1.75**	**0.86**	**0.67**	**2.22**	**1.68**	**1.35**
Bark	Summer	**9.52**	**7.89**	**7.40**	**3.98**	**2.97**	**2.42**	**5.54**	**4.92**	**4.98**
	Monsoon	**8.96**	**7.34**	**7.06**	**3.64**	**2.61**	**2.36**	**5.32**	**4.73**	**4.70**
	Winter	**9.29**	**7.66**	**7.27**	**3.88**	**2.82**	**2.40**	**5.41**	**4.84**	**4.87**

Plant 1-*Sesbania grandiflora,* **Plant 2**-*Sesbania bispinosa and* **Plant 3**-*Sesbania cannabina*

REFERENCES

1. Anomymous, 1966: Pharmacopoeia of india.New Delhi, Goverment of India.
2. Anonymous, 1973: British Pharmacopoeia. By Her Majesty's stationary office, London,U.K
3. Brown, W.H. (1954) Useful plants of the Philippines. *Republic of Philippines Department of Agriculture and Natural Resources Technical Bulletin* NO. 10 , Vol. 2
4. Dutt, A.K., Pathania, U. and Kumar, V. (1983) Growth of Sesbania sesban.Nitrogen Fixing Tree. *Research Report* 1, 5 - 6.
5. Indrayan, A.K., Sharma, S., Durgapal, D., Kumar, N. and Kumar, M., 2005: Determination of nutritive value and analysis of mineral elements for some medicinally valued plants from Uttaranchal. Current Sci 89, 1252-1255.
6. Kadam , V.B. (2009) "Determination of ash values of three endangered medicinal plants of South G ujarat Forest ". *Plant Archives*, 9 (1) , 27 – 29 .
7. Mitscher, L.A., Park, Y.H. and Clark, D.1980: Antimicrobial agents from higher Research Article, Vol 2/Issue 2/Apr-Jun

8. Momin R.K., Sumia Fatima, Ahire P.P. and Kadam, V.B. (2012) Biochemical evaluation of some medicinal plants of genus Sesbania of Marathwada region in Maharashtra. *DAV International Journal of Science*, 1 (2): 72 – 75.
9. Nadkarni, K.M.1976. *Indian Materia Medica* Vol.I & II. Popular Prakashan Pvt. Ltd. Mumbai.
10. Nudrat Z, Sayed and Usha Mukundan.2005. *Medicinal and aromatic plants of India* Part I, In: Khan and Khanum, A (eds). Ukaaz Publications, Hyderabad
11. Pandhare, R.B., Sangameswaran, B., Mohite, P.B. and Khanage, S.G(2011) Antidiabetic Activity of aqueous extract of *Sesbania sesban* in Streptozotocin induced Diabetic rats. *AJMB Archives*, 3, 1
12. Pari,L. and Uma,A. (2003) Protective effect of *Sesbania grandiflora* against Erythromycin estolate induced hepatotoxicity. *Therapie*, 58: 439-443
13. Shahjalal, M and Topps, J.H. (2000) Feeding Sesbania leaves as a sole feed on growth and nutrient utilization in goats. *Asian – Australian Journal of Animal Science*13, 487-489.
14. Shiv Pal Singh (1990) Fertility control of female through *Sesbania sesban* seeds.*The journal of research and education in Indian medicine*, 9 (4): 27 – 32.