



DETERMINATION OF SOLUBLE EXTRACTIVE OF SOME MEDICINAL PLANTS OF GENUS SESBANIA OF MARATHWADA REGION IN MAHARASHTRA

R.K.MOMIN AND KADAM V.B.*

Department of Botany, Milliya Arts, Science and Management Science College, Beed, India.

***P.G.Department of Botany & Research Centre, K.T.H.M.College, Nasik – 422002, India**

ABSTRACT

The seasonal variation of water soluble extractive alcohol soluble extractive and ether soluble extractive have been investigated in leaves, wood and bark of *Sesbania grandiflora*, *Sesbania bispinosa* and *Sesbania cannabina*. Comparative account of water soluble extractive of leaves, wood and bark of *Sesbania grandiflora* was showed high level (range 4.2 to 5.8 %) than *Sesbania bispinosa* (range 3.3 to 5.6 %) and *Sesbania cannabina* (range 2.3 to 3.6 %) in all seasons. Alcohol soluble extractive of leaves of *Sesbania grandiflora* showed higher (range 6.15 to 6.85 %) and lower in bark of *Sesbania cannabina* (range 2.85 to 3.7 %). Ether soluble extractive of leaves of *Sesbania grandiflora* showed higher (range 4.3 to 4.55 %) and lower in bark of *Sesbania cannabina* (range 1.85 to 2.8 %).

Key words : water, alcohol and ether soluble extractive, medicinal plant , *Sesbania*

INTRODUCTION

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 search for eternal health and longevity and for remedies to relieve pain and discomfort drove early man to explore his immediate natural surroundings and led to the use of many plants, animal products, and minerals, etc. and the development of a variety of therapeutic agents. Today, there is a renewed interest in traditional medicine and an 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 “green medicine” 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.

Several reports suggested that the ethanolic extract of the bark of *Sesbania grandiflora* prevented acute gastric injury in rats. The leaf juice of *Sesbania grandiflora* showed significant antiulcer activity (Ojha JK and Dwivedi KN 1996) .In vivo studies, *Sesbania grandiflora* administration showed potential anticancer [Doddola S 2008, anxiolytic (Laladhas KP 2009), hepatoprotective in rats (Kasture et.al.2002), antimicrobial and analgesic and antipyretic activity was evaluated.

Sesbania grandiflora commonly known as agathi as been uses as an important dietary nutritive source in southeast Asian country's (Ferantinos, 1990-91). *Sesbania grandiflora* are richest source of amino acid, minerals and antioxidants vitamins (Govindan and Shanmugasundaran 1987,) It also has anxiolytic and anticonvulsive,(Kasture et.al 2002) anti inflammatory, analgesic and antipyretic activity(Tamboli , 2000) Beside *S. grandiflora* is mentioned as a potent antidotes for tobacco and smoking related diseases. *Sesbania grandiflora* has hypolipidemic property on cigarette smoke exposed rats (Ramesh and Hazeena begum 2006). Legume

seeds are valuable source of protein, oil, carbohydrates, minerals and vitamins. They are playing an important role in human nutrition mainly in developing countries (Yanez *et al.*, 1995). In the present study, *Sesbania bispinosa* shows high content of crude protein (31.08 %)

MATERIALS AND METHODS

- **Determination of water soluble Extractive** -1gm of air dried drug, coarsely powdered was macerated with 100ml of distilled water in a closed flask for twenty four hours shaking frequently. Solution was filtered and 25 ml of filtrated was evaporated in a tarred flat bottom shallow dish, further dried at 100⁰ C and weighted .The percentage of water soluble extractive was calculated with reference to the air dried drugs.
- **Determination of alcohol soluble extractive** -1 gm. of air dried drugs, coarsely powdered was macerated with 100 ml. alcohol in closed flask for 24 hrs with frequent shaking. It was filtered rapidly taking precaution against loss of alcohol. 25ml of filtrate was then evaporated in a tarred flat bottom shallow dish, dried at 100⁰C and weighted. The percentage of alcohol soluble extractive was calculated with reference to air dried drug.
- **Determination of Ether- soluble Extractive** -1gm of air dried drug, coarsely powdered was macerated with 100 ml of ether in a closed flask

for twenty four hours with frequent shaking. It was filtered rapidly, taking precautions against loss of ether. 25 ml of filtrate was then evaporated in a tarred flat bottom shallow dish, dried at 100⁰C and weighted. The percentage of ether soluble extractive was calculated with reference to the air dried drug.

RESULTS AND DISCUSSION

Different plant species would obviously have different chemical profile. Chemical present in the plant material could be dissolved in different solvent for the purpose of further analysis. Therefore, three solvents –Water, alcohol and ether were selected to determine the soluble substance, this was again carried out in three seasons viz. Summer, Monsoon and Winter continuously for two years.

Sesbania grandiflora -The summer collection of leaves showed higher content (5.8%) of water soluble extractive as compared to winter (5.55 %) and monsoon (5.25%). However, the summer sample of bark exhibited higher at winter (4.7 %) as compared to summer and Monsoon (Table) .In Wood Summer shows higher content of extractive (4.55%) as compared to winter (4.3%) and Monsoon (3.55%). In summer collection of leaves (6.85%), bark (4.7 %) and wood (5.25%) appeared significantly at 10% higher for alcohol soluble extractive over of monsoon and winter (Table.1)

Table 1- Determination of Extractive percentage of *Sesbania grandiflora*,*Sesbania bispinosa* and *Sesbania cannabina*.

Plant parts	Season	Water soluble extractive (%)			Alcohol soluble Extractive (%)			Ether soluble extractive (%)		
		Plant 1	Plant 2	Plant 3	Plant 1	Plant 2	Plant 3	Plant 1	Plant 2	Plant 3
Leaves	Summer	5.8	5.6	3.6	6.85	6.85	4.85	4.45	3.95	3.15
	Monsoon	5.25	5.15	3.25	6.25	6.15	3.75	4.3	3.3	2.55
	Winter	5.55	5.45	3.45	6.15	6.3	4.15	4.55	3.55	2.8
Wood	Summer	4.55	3.7	2.55	5.25	4.25	3.25	3.85	2.9	2.85
	Monsoon	3.55	3.3	2.5	4.2	3.7	3.2	3.6	2.75	2.75
	Winter	4.3	3.5	2.3	4.75	3.75	3.25	3.15	2.15	2.15
Bark	Summer	4.4	4.4	2.8	4.7	4.7	3.7	2.8	2.8	2.8
	Monsoon	4.2	4.2	2.3	3.9	3.85	2.85	2.75	2.6	1.85
	Winter	4.7	4.7	2.5	4.15	4.15	3.15	2.85	2.85	2.7

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

The range of ether soluble extractive in leaves ranged from 4.3 % to 4.55 %. Highest concentration being observed during winter season (4.55%). Ether soluble extractive of bark showed the ranged of (2.75% to 2.85%) for three seasons tested. The wood seemed to be having concentration of (3.15% to 3.85%) ether soluble extractive when compared to leaves, and bark during two seasons examined. Generally, it was observed that the winter of in leaves (4.55%), in wood summer (3.85%) and barks (2.85%) and showed significantly higher percentage of ether soluble extractive. The range of extractive percentage in water, alcohol and ether were found to be increasing order bark< wood, leaves. (Table.1)

Sesbania bispinosa -The water soluble extractive from leaves were comparatively raised in summer (5.6%) over that of winter (5.45%) and monsoon (5.15%). 3.3% to 3.7% of soluble extractive percentage was notice in wood during the different season tested (Table 5b). In bark extractive percentage ranges from 4.2 % to 4.7%, winter show higher 4.7% as compared to summer (4.4%) and monsoon (4.2%). Leaves extracted with alcohol showed the concentration of 6.15 % to 6.85 %. During various seasons tested (Table.1). At higher level 6.85% in alcohol soluble extractives. The summer bark accumulated maximum levels of soluble matter (i.e. 4.7%) over that of monsoon (3.85%) and winter (4.15%). The wood seemed to be comparatively low of alcohol soluble extractive (3.7 to 4.25%)

The amount of ether soluble extractive is comparatively lower than the alcohol and water soluble extractive (Table 5b). The ether soluble extractive percentage in leaves ranged from 3.3 %

to 3.95%. The bark ether soluble extractive maximum at winter (2.85%) as compared to summer (2.8%) and monsoon (2.6%). The wood exhibited percentage of ether soluble extractive (2.15% to 2.9%) The range of water, alcohol and ether soluble extractive were found to be in increasing order of Wood< Bark<leaves. (Table. 1) **Sesbania cannabina** -The water soluble extractive content was measured in the leaves of three seasons for two years and found that the leaves stored (3.6%) of extractives during summer. When compared to monsoon (3.25%) and winter (3.45%). Similarly, summer bark were able to maintain higher levels of water soluble extractive during summer (2.8%) over than of other season (Table 1) . the wood exhibited ,comparatively low percentage of water soluble matter as compare to bark and leaves it ranges from (2.3 to 2.55 %).

The alcohol soluble studies conducted in different season of two year period gave a clue that the summer collection of leaves and bark were the richest source of alcohol soluble matter (4.85 and 3.7 % respectively) when compared to other season (Table 5c) . Like water extractive of wood, the alcohol soluble matter of wood had low concentration among other plant parts tested in various seasons. It was commonly observed in ether extractive percentage that the leaves and wood showed higher concentration i.e. (3.15 to 2.85%) of ether soluble extractive over bark, (Table.1). The bark had comparatively showed low level of 1.85% to 2.8% of ether soluble extractive. The range of water, alcohol and ether soluble extractive were found to be in increasing order of Wood< Bark<leaves. (Table .1)

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