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A Path for Horizing Your Innovative Work

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

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Abstract: The seasonal variation of water soluble extractive alcohol soluble extractive and ether soluble extractive have been investigated in leaves, wood and bark of *Butea monosperma, Madhuca indica and Syzygium cumini*. Comparative account of water soluble extractive of leaves, wood and bark of *Syzygium cumini* was showed high level (range 1.85 to 5.8 %) than *Butea monosperma* (range 1.5 to 4.3 %) and *Madhuca indica* (range 1.95 to 4.6 %) in all seasons. Alcohol soluble extractive of leaves of *Syzygium cumini* showed higher (range 4.05 to 6.7 %) and lower in bark of *Madhuca indica* (range 1.85 to 2.7 %). Ether soluble extractive of leaves of *Syzygium cumini* showed higher (range 2.75 to 4.65 %) and lower in wood of (range 1.2 to 1.95 %)

Keywords: Water, Alcohol and ether soluble extractive, Medicinal plant

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 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.

Butea monosperma is commonly known as Flame of forest, belongs to the family Fabaceae (Patil, *et.al.* 2006) it is locally called as Palas, Palash, Mutthuga, Bijasneha, Dhak, Khakara, Chichra, Bastard Teak, Bengal Kino and Nourouc and is common throughout India. Bark fibers are obtained from stem for making cordage (Kirtikar and Basu, 1935). Stem bark powder is used to stupefy fishes. Young roots are used for making ropes (Anonymous, 1988). Green leaves are good fodder for domestic animals. Leaves are used for making platters, cups, bowls and beedi wrappers (Ambasta, 1994). Leaves are also used for making Ghongda to protect from rains and are eaten by buffaloes and elephants. Tribals use flowers and young fruits as vegetables. Flowers are boiled in water to obtain a dye (Patil, 2006).Purified alcoholic extract at lower dose level and ether and water extracts at higher dose level have been found to exhibit significant antiestrogenic activity in immature mice, while ethyl acetate extract containing butrin and isobutrin exhibited poor activity (Shah, *et.al.*,1990). The bark is reported to possess antitumor and antiulcer activities. The root bark is used as an aphrodisiac, analgesic and

antihelmintic whereas the leaves possess antimicrobial property (Kasture, *et.al,* 2000).

The oil of *Madhuca indica* contains oleic acid, palmitic acid, linoleic acid and myristic acid; seeds contain morwin. Stem bark extract of *Madhuca indica* is inactive against *Bacillus subtilis, Staphylococcus aureus, Salmonella typhi, Escherichia coli* and *Agrohacterium tumefaciens*. It has no antifungal properties against *Candida alhicans, Cryptococcus neoformans, Trichophyton mentagrophytes, Microsporun canis* and *Aspergillus niger,* historically mahua has been the single largest indigenous source of natural hard fat in soap manufacture both by the small scale and organized sector. Madhuca flowers are useful in bronchitis and coughs. Vapors of boiling Madhuca leaves are useful in relieving the pain of orchitis or the inflammation of testicles. A decoction of the bark can be given internally in rheumatic diseases. The oil extracted from the seeds can also be applied locally on the affected area. A decoction of the bark can also be taken in diabetes mellitus with beneficial results.

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. The jambul fruit is regarded in traditional medicine as a specific against diabetes because of its effect on pancreas. The fruit as such, the seeds and fruit juice are all useful in the treatment of this disease. The seeds contain glucose Jamboline which is believed to have the power to check the pathological conversation of starch into sugar in cases of increased production of glucose. In Ayurvedia, the inner bark of jambul tree is also used in the treatment of diabetes (Timbola, *et.al.* 2001)

MATERIALS AND METHODS

Determination of water soluble Extractive

1gm of air dried drug, coarsely powered 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 100^0 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 100^0C 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 100^0C 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.

***Butea monosperma* Lam:** The summer collection of leaves showed higher content (4.3%) of water soluble extractive as compared to winter (3.6. %) and monsoon (3%). However, the summer sample of bark exhibited higher at summer (3.4 %) as compared to winter and Monsoon (Table-5a) .In Wood Summer shows higher content of extractive (2.25%) as compared to winter (1.75%) and Monsoon (1.15%). In summer collection of leaves (5.3%), bark (3.55%) and (2.35%) appeared significantly at 0.1% and 1% higher for alcohol soluble extractive over of monsoon and winter (Table.1)

The range of ether soluble extractive in leaves ranged from 3.95 % to 2.95 %.Highest concentration being observed during summer season (3.95%) Ether soluble extractive of bark showed the ranged of (2.6 % to 3.15%) for three seasons tested. The wood seemed to be having concentration of (1.25% to 2.25%) ether soluble extractive when compared to leaves, and bark during two seasons examined. Generally, it was observed that the summer of leaves (3.95%), bark (3.15%) and wood

(2.25%) showed significantly higher percentage of ether soluble extractive over that of monsoon and winter. The range of water alcohol and ether soluble extractive were found to be in increasing order of Wood< Bark<leaves, (Table 1)

***Madhuca indica* Gmel:** The water soluble extractive from leaves were comparatively raised in summer (4.6%) over that of monsoon (3.25%) and winter (3.55%) 1.95% to 2.55% of soluble extractive percentage was notice in wood during the different season tested (Table-1). In bark extractive percentage ranges from 2.2 % to 3.4 %, summer show higher 3.4% as compared to winter (2.2%) and monsoon (2.7%). Leaves extracted with alcohol showed the concentration of 3.25 % to 4.85 %. During various seasons tested (Table 1) leaves appeared at significantly (at 1% levels based on't' test)

At higher level 4.85% in alcohol soluble extractives. The summer bark accumulated maximum levels of soluble matter (i.e. 2.7%) over that of monsoon (1.85%) and winter (2.15%). The wood seemed to be comparatively low of alcohol soluble extractive (2.2 % to 3.25%). The amount of ether soluble extractive is comparatively lower than the alcohol and water soluble extractive (Table 1). The ether soluble extractive percentage in leaves ranged from 2.3 % to 3.45 %.The bark ether soluble extractive maximum at summer (2.8%) as compared to winter (2.3%) and monsoon (1.6%). The wood exhibited low percentage of ether soluble extractive (1.2% to 1.95%) The range of water, alcohol and ether soluble extractive were found to be in increasing order of Wood< Bark<leaves. (Table 1)

***Syzygium cumini* Linn:** The water soluble extractive content was measured in the leaves of three seasons for two years (Table-5c) and found that the leaves stored (5.8%) significant concentration (significantly at 1% and 5%) of extractives during summer. When compared to monsoon (4.25%) and winter (4.65%). Similarly, summer bark were able to maintain higher levels of water soluble extractive during summer (4.25%) 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 (1.85%) to (2.4 %).

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 (significant

at 1% levels based on 't' test comparison) of alcohol soluble matter (6.7 % and 4.75% respectively) when compared to other season (Table 1) . 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 that the leaves and bark showed higher concentration (ranging from 4.65% to 3.8%) of ether soluble extractive over wood, which was similar to the water and alcohol extractive studies. The wood had comparatively showed very low level of 0.85% to 1.7% 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)

Table 1

Determination of Extractive percentage of *Butea monosperma, Madhuca indica and Syzygium cumini.*

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**	4.3	4.6	5.8	5.3	4.85	6.7	3.95	3.45	4.65
	Monsoon	3	3.25	4.25	3.85	3.25	4.05	2.95	2.3	2.75
	Winter	3.6	3.55	4.65	4.4	4.15	5.25	3.25	2.55	3.25
WOOD	**Summer**	2.25	2.55	2.4	2.35	3.25	3.3	2.25	1.95	1.7
	Monsoon	1.5	1.95	1.85	1.85	2.2	1.8	1.25	1.2	0.85
	Winter	1.75	2.3	2.15	2.1	2.75	2.5	1.85	1.5	1.2
BARK	**Summer**	3.4	3.4	4.25	2.25	2.7	4.75	3.15	2.8	3.8
	Monsoon	2.75	2.2	2.85	2.7	1.85	3	2.6	1.6	1.95
	Winter	3.15	2.7	3.25	3.55	2.15	3.75	2.9	2.3	2.3

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

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