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Research Article

Biochemical Evaluation of Two Endangered Medicinal Taxa of Marathwada Region

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Abstract

The seasonal variation of protein and amino acid content have been investigated leaves , wood and bark of *Butea monosperma* Lam- (Palas) and *Syzygium cumini* Linn (Jambul). *Butea monosperma* Lam- (Palas) and *Syzygium cumini* Linn (Jambul) are the medicinally important plant of Marathwada region . Comparative account of protein content of leaves , wood and bark of showed higher level (range mg/g dry wt.) than (range mg/g dry/wt.).The leaves of showed high level of amino acid content (range mg/g/dry wt.) and wood of was lower amino acid content (range mg/g dry wt.) .

Key Words: Protein , amino acid , endangered , medicinal plant .

Introduction

Almost all the parts of the plant are being used since decades in medicine and for other purposes. These days herbal medicines are more popular than modern medicine because of their effectiveness, easy availability, low cost and for being comparatively devoid of side effects. Nature always stands a golden mark to exemplify the outstanding phenomenon of symbiosis and it has provided the storehouse of remedies to cure all ailments of mankind, only the thing is that there is a need to evaluate them scientifically.

Butea monosperma (Lamk.) is an indispensable tree. 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. About 45 medicinal uses are associated with the plant and out of these claims almost half the number of claims have been scientifically studied and reported. These observations are noteworthy for further studies on modern scientific lines. (Burli and Khade, 2007). Bark fibers are obtained from stem for making cordage. 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 (Anonymous 1988).

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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 .Flowers are soaked in water overnight and a cup of this infusion is drunk every morning against leucorrhoea till cure (Patil, *et.al.,* 2006).

Syzygium cumini showed an antimicrobial effect against enteric bacteria antibacterial activity. (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. Species of this family are often used for several medicinal purposes, including the treatment of diarrhea and pain (Caceres, *et.al.,* 1993). Experimental data also suggest the action of these species on inflammatory processes, respiratory diseases (Muruganandan, *et.al., 2001*), and allergic disorders (Kim, *et.al.,* 1998). The seeds have been reported to be useful as astringents in diarrhea as well as dysentery . Other parts of the plant have been reported to possess anti-diabetic (Chakraborty, *et.al.,* 1986).

Material and Methods

The protein was quantitatively estimated by the Lowry *et.al* (1951). 1gm plant material was homogenized with 10ml 80% ethanol. The extract was centrifuged at 5000rpm for 5 min and the supernatant was discarded. 5% 10 ml trichoroacetic acid (TCA) or perchloric acid (PCA) was add to residue and incubated at 80c for 20 minutes. The pallete was recentrifuged and the supernatant was discarded. Residue was washed with 10 ml distilled water and again recentrifuged. The supernatant was discarded. 2% 10 ml Na2co3 in 0.1 N NaoH was add to the residue and incubated for an hour at 30 c. Again centrifuged and residue was discarded. The final volume of supernatant was measured and it was used as a sample for protein.

1ml of aliquot of sample was taken and 5ml reagent C was added to it and mixed thoroughly. The sample was incubated for 10 minutes and 1ml of reagent D was added to it. The color intensity was read at 660nm using spectrophotometer. The protein concentration off an unknown sample was calculated using standard graph. Quantative estimation of protein in leaf, bark, wood and seed:

The estimation of total amino acid was adapted by Krishnamurthy *et al* (1989) method. 500mg plant material was grounded in mortar and pastle with few drops of cold 80% ethanol. Then 2.5 ml of distilled water and 10ml of boiling 80% ethanol were added to it. The extract was centrifuged for 15 minutes at 10,000 rpm. Residue was discarded. The supernatant was collected and total volume was made 15ml with distil water. 1ml of sample was taken in a test tube and 3ml alcoholic ninhydrin was added to it. Test tube was kept at 60c for 20 minutes. The test tubes were cooled and 1ml 50% ethanol was added. Read at 420nm in spectrophotometer. Glycine was used as stand rand.

Results and discussion

Butea monosperma Lam- (Palas) -

The Protein content of leaves was higher (2.194) in summer over than winter(2.067) and monsoon (1.738).Range of protein content of wood was from(1.4195 to 1.659mg/gm).The protein content of stem was very low in all season. The range in wood was from 1.109 to 1.311 and show higher in summer. The protein content showed increasing order of stem <bark<leaf. (Table 1).

Syzygium cumini Linn (Jambul) -

The ranges of protein content of leaves were from of 2.488 to 2.875mg/gm. Highest was being observed during summer 3.813mg/gm over that of winter 3.646 and monsoon 3.377. The protein content of stem was comparatively low from 2.453 to 2.961 and shows higher in summer (2.961). The percentage of protein content were increasing in order as stem<Bark<leaf (Table 1).

Butea monosperma Lam- (Palas) -

The amino acids content of leaves was 0.62mg/gm in summer .0.56mg/gm in winter and 0.52mg/gm in monsoon. Higher being observed during summer i.e 0.62mg/gm. The range of amino acids content of bark 0.45mg/gm to 0.49mg/gm. Maximum concentration of amino acids was noted during summer 0.49mg/gm .The range of amino acid content of stem was from 0.23mg/gm to 0.37mg/gm. It was comparatively lower than winter (0.32mg/gm) and monsoon (0.23mg/gm), it show higher in summer 0.37mg/gm respectively. Generally, the concentration of amino acids were found to be in increasing order of stem<bark< leaf.

Syzygium cumini Linn (Jambul) -

The amino acids content of leaves from 0.68mg/gm to 0.89mg/gm.The summer show higher 0.89mg/gm. As compared to winter 0.75mg/gm and monsoon 0.68mg/gm.The stem show amino acids ranged from 0.40mg/gm to 0.471mg/gm summer showing higher 0.471mg/gm as compared to winter 0.43 mg/gm and monsoon 0.40mg/gm .While in Bark show low amino acids as comparatively leaves and bark in summer show higher (0.37mg/gm) than winter and monsoon show similar(i.e 0.37mg/gm). The percentage of amino acids content was found is in increasing order Bark< Stem< leaves.

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Table No. 1: Seasonal variation of some organic constituent's level of different plants parts of *Butea monosperma* and *Syzygium cumini*

Plant parts	Season	Protein (mg/g dry wt.)						Amino acid (mg/g dry wt.)					
		Butea monosperma			*Syzygium cumini*			*Butea monosperma*			*Syzygium cumini*		
		1 year	2 year	Mean	1 year	2 year	mean	1 year	2 year	Mean	1 year	2 year	Mean
Leaves	Summer	2.091	2.194	2.1425	2.824	2.926	2.875	0.60	0.645	0.625	0.828	0.97	0.899
	Monsoon	1.929	1.738	1.8335	2.559	2.486	2.522	0.55	0.502	0.526	0.697	0.678	0.687
	Winter	2.04	2.067	2.0535	2.631	2.545	2.588	0.542	0.584	0.563	0.734	0.776	0.755
Wood	Summer	1.354	1.311	1.3325	2.605	2.961	2.783	0.354	0.391	0.372	0.452	0.49	0.471
	Monsoon	1.329	1.128	1.2285	2.46	2.453	2.456	0.264	0.214	0.239	0.414	0.396	0.405
	Winter	1.263	1.109	1.186	2.606	2.783	2.694	0.342	0.314	0.328	0.454	0.412	0.433
Bark	Summer	1.683	1.636	1.6595	3.821	3.813	3.817	0.48	0.507	0.493	0.352	0.39	0.371
	Monsoon	1.421	1.418	1.4195	3.084	3.377	3.230	0.47	0.434	0.452	0.388	0.352	0.37
	Winter	1.607	1.596	1.6015	3.854	3.646	3.75	0.472	0.436	0.454	0.37	0.37	0.37