

ESTIMATION OF TOTAL PHENOL IN SOME MEDICINAL PLANTS OF MARATHWADA REGION IN MAHARASHTRA

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ABSTRACT

An attempt has been made here to investigate occurrence of total phenol in the leaves, bark and wood of *Butea monosperma* Lam, *Madhucaindica* Gmel, *Mimusopselengi* Linn and *Syzygiumcumini* Linn. are medicinally important plants of Marathwada region in Maharashtra. Comparative account of total phenol content of leaves, bark and wood of four species revealed that, *Madhucaindica* were rich (range 2.156 to 4.410 mg / g dry wt.) than *Butea monosperma* (range 1.987 to 4.138 mg / g dry wt.), *Mimusopselengi* (range 2.601 to 3.438 mg / g dry wt.) and *Syzygiumcumini* (range 1.621 to 3.330 mg / g dry wt.) in all seasons.

Key words: Total Phenol, Medicinal Plants, Marathwada region.

INTRODUCTION

There are many phenolic compounds which have gained importance as plant growth regulators in recent years. The phenolic compounds have been found to occur in micro-organisms, pteridophytes, gymnosperms and angiosperms. Earlier, most of the phenolic compounds are believed to be inhibitory in nature. From careful studies with the different concentrations of phenolic compounds it followed that many of them could stimulate physiological and biochemical processes at very low concentration.

Butea monosperma (Lam.) is an indispensable tree. Tribal's 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, fibre and for other miscellaneous purposes such as fish poison, dye, fodder, utensils, etc.¹. The bark is reported to possess antitumor and antiulcer activities. The root bark is used as an aphrodisiac, analgesic and antihelminthic whereas the leaves possess antimicrobial properties².

Madhucaindica is medicinally and commercially useful. The plant parts like stem bark, corolla lobes, seeds and seed oil are used in diabetes, burns, scalds, bronchitis, rheumatism, cough, piles, galactagogue skin diseases, tonsillitis, stomach-ache, aphrodisiac and respiratory diseases and have laxative, insecticidal and pesticidal properties³. 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 paratyph* and *Vibrio cholerae*⁴.

Mimusopselengi belongs to the family *Sapotaceae*. It is an evergreen tree, 5-8 m tall and is cultivated throughout our country as an ornamental tree. 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 cystorrhoea, diarrhea and

dysentery⁵. The seeds are used in constipation⁶. Different solvent extracts of bark, fruits (fleshy portion) and leaves of *Mimusopselengi* were screened for their antibacterial and antifungal activities against some pathogenic bacteria and fungi⁷.

Syzygiumcumini (Linn) Skeel showed an antimicrobial effect against enteric bacteria⁸. According to Ayurveda, its bark is acrid, sweet, digestive, and in good for sore throat, asthma, dysentery, blood impurities and to cure ulcers⁹. *Syzygiumcumini* is a medicinal plant, whose parts were pharmacologically proved to possess hypoglycemic, antibacterial, anti-HIV activity and anti-diarrhea effects¹⁰. An attempt is made to investigate the occurrence and seasonal variations of phenol in four medicinal important taxa (*Butea monosperma* Lam, *Madhucaindica* Gmel, *Mimusopselengi* Linn and *Syzygiumcumini* Linn.) of Marathwada region of Maharashtra.

MATERIALS AND METHODS

The plant material of *Butea monosperma* Lam, *Madhucaindica* Gmel, *Mimusopselengi* Linn and *Syzygiumcumini* Linn were collected from different places of Marathwada region in Maharashtra during different seasons viz. summer (April), monsoon (June) and winter (November). The ethanol extractable phenolic compounds were estimated by folin method¹¹.

Phenolic compounds were extracted by grinding 50 mg (dry weight) sample of tissue using a chilled pestle and mortar with an aliquot of chilled 80% (V/V) ethanol. The homogenate was centrifuged at 13000 rpm for 15 minutes. The supernatant was collected and residue pellet was extracted twice more as above. The supernatant of all three extractions was pooled and volume made up to 25 ml with 80% ethanol. A suitable aliquot of the ethanolic extract was diluted with distilled water to 8.5 ml and after adding 0.5 ml of Folin phenol reagent. The content were mixed well, three minutes later, 1 ml of saturated sodium carbonate solution (1 gm / 3 ml) of distilled water was

added and the mixture shaken thoroughly. Color was allowed to develop for 60 minutes and then read at 725 nm in spectrophotometer. Standard curve was prepared using chlorogenic acid / tannic acid / Gallic acid and all the concentrations were expressed in terms of mg / g of this compound.

RESULTS AND DISCUSSION

The concentration total phenol of *Butea monosperma* was ranging from 3.64 to 3.81 mg / g dry wt. in leaves. The total phenol content of bark of *Butea monosperma* exhibited maximum levels in summer (4.13mg / g dry wt.) over that of monsoon (3.92 mg / g dry wt.) and winter (4.01 mg / g dry wt.) (Table 1). The total phenol content of wood of *Butea monosperma* was not significantly different (as it ranges between 1.98 to 2.12 mg / g dry wt.) from other parts during various seasons. The repeated measuring of total phenol continuously for two years proved that there was no much difference in their different parts. The total phenol content of leaves of *Madhucaindica* was raised in summer (4.31 mg / g dry wt.) over that of monsoon (4.13 mg / g dry wt.) and winter (4.24 mg / g dry wt.). The total phenol content in bark of *Madhucaindica* was highest in summer (4.41 mg / g dry wt.) over that of winter (4.33 mg / g dry wt.) and monsoon (4.27 mg / g dry wt.). The total phenol content of wood of *Madhucaindica* was raised in summer (2.36 mg / g dry wt.) over that of winter (2.28 mg / g dry wt.) and monsoon (2.15 mg / g dry wt.).

The total phenol content of leaves of *Mimusopselengi* was higher in summer (3.23 mg / g dry wt.) over that of winter (3.17 mg / g dry wt.) and monsoon (3.04 mg / g dry wt.). Total phenol content of bark of *Mimusopselengi* ranged from 3.31 to 3.43 mg / g dry wt. . Comparatively wood of *Mimusopselengi* exhibited low concentration of phenol content (2.60 to 2.92 mg / g dry wt.). The total phenol content of leaves of *Syzygiumcumini* was higher in summer (2.94 mg / g dry wt.) over that of winter (2.87 mg / g dry wt.) and monsoon (2.83 mg / g dry wt.). Total phenol content of bark of *Syzygiumcumini* ranged from 3.23 to 3.33 mg / g dry wt. . Comparatively wood of *Syzygiumcumini* exhibited low concentration of phenol content (1.62 to 1.73 mg / g dry wt.).

The total phenol content of leaves of *Madhucaindica* was higher (ranged from 4.13 to 4.31 mg / g dry wt.) than *Syzygiumcumini*(ranged from 2.83 to 2.94 mg / g dry wt.) ,*Mimusopselengi* (ranged from 3.04 to 3.23 mg / g dry wt.) and *Butea monosperma* (ranged from 3.64 to 3.81 mg / g dry wt.). Comparatively bark of *Madhucaindica* was higher (ranged from 4.27 to 4.41 mg / g dry wt.) than *Syzygiumcumini*(ranged from 3.23 to 3.33 mg / g dry wt.), *Mimusopselengi* (ranged from 3.31 to 3.43 mg / g dry wt.) and *Butea monosperma*(ranged from 3.92 to 4.13 mg / g dry wt.). Comparatively phenol content of wood of *Mimusopselengi* was higher (ranged from 2.60 to 2.92 mg / g dry wt.) than *Syzygiumcumini*(ranged from 1.62 to 1.74 mg / g dry wt.), *Madhucaindica* (ranged from 2.15 to 2.36 mg / g dry wt.) and *Butea monosperma* (ranged from 1.98 to 2.12 mg / g dry wt.).

Table 1: Seasonal variations of total phenol content of different plant parts of *Butea monosperma* Lam, *Madhucaindica* Gmel, *Mimusopselengi* Linn and *Syzygiumcumini* Linn.

Plant parts	Season	TOTAL PHENOL (Mg / g dry wt.)			
		<i>Buteamonosperma</i>	<i>Madhucaindica</i>	<i>Mimusopselengi</i>	<i>Syzygiumcumini</i>
Leaves	Summer	3.812	4.319	3.235	2.945
	Monsoon	3.643	4.135	3.045	2.835
	Winter	3.714	4.245	3.175	2.875
Wood	Summer	2.122	2.367	2.601	1.734
	Monsoon	1.987	2.156	2.675	1.621
	Winter	2.066	2.289	2.925	1.675
Bark	Summer	4.138	4.410	3.438	3.330
	Monsoon	3.920	4.274	3.312	3.232
	Winter	4.017	4.334	3.382	3.278

REFERENCES

- Burli and Khade AB: A Comprehensive review on *Buteamonosperma* (Lam.) Kountze *Pharmacognosy Reviews*, 2007, Vol 1, Issue 2.
- Kasture VS, Deshmukh VK, Chopade CT, Anticonvulsive activity of *ButeaMonosperma* flowers in laboratory animals. *Pharmacol.Behav.*, 2002, 72: 965 -72.
- Kirtikar KR, Basu BD, Indian Medicinal Plants. Vol II (Periodical Experts, New Delhi), 1975, 1052-53.
- Trivedi, V.B., Kazmi, S.M. and Kazmi, S.N., Comparative bactericidal activity of two angiosperms. *Bulletin of Botanical Society, University of Sagar*, 1980, 27: 36
- Tambe SS, Shailaja D, Ahire PP, Kadam VB, Biochemical evaluation of some medicinal plants of Marathwada region in Maharashtra. *International J. of Pharma.Res. and Bio-Sci.* 1, 2012, (4) : 185 – 194.
- Nair R, Chanda SV, Antibacterial activities of some medicinal plants of the western region of India. *Turkish Journal of Biology*, 2007, 31: 231-236
- Abbas Ali, Abdul Mozid, Mst. SarminaYeasmin, AstaqMohal Khan and Abu Sayeed, An Evaluation of Antimicrobial Activities of *Mimusopselengi*Linn.*Research Journal of Agriculture and Biological Sciences*, 2008, 4(6): 871-874.
- Alanis AD, Calzada F, Cervanter JA, Torres,J, Ceballos,GM, Antibacterial Properties of some plants used in Mexican traditional medicine for the treatment of gastrointestinal disorders. *J.Ethnopharmacol.* 2005, 100: 153 – 157.
- Kirtikar KR, Basu BD, Indian Medicinal Plants, Bishen SinghMahendra Pal Singh, Debra Dun, 1980, Vol. 1-4.
- Kadam VB, Biochemical evaluation of three endangered medicinal taxa of SouthGujarat forest. *Journal of Phytological Research*, 2010, 13, (1) :85- 87 .
- Swan T, Hillis WE, The phenolic estimation of *Prunusdomestica* J. Sci. Food. Agri., 1959, 10: 63-68