

**Research Paper :**

**Phenolics compound in *Simarouba Glauca***

**S.C. FATTEPURKAR, M.S. PATIL, D.C. GAWAI, M.K. ZENDE AND J.N. LONDHE**

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See end of the article for authors' affiliations

Correspondence to:

**S.C. FATTEPURKAR**  
Department of Post  
Harvest and Food  
Technology, College of  
Agricultural  
Biotechnology, Loni,  
AHMEDNAGAR (M.S.)  
INDIA

**ABSTRACT**

Simarouba an evergreen tree commonly known as paradise tree is native of EL- Salvador. The leaves and bark of Simarouba have long been used as a natural medicine in the tropics. The total phenolic content of different plant parts viz. leaves, bark, petioles and stem with different age group of one month old and one year old were evaluated. The ascending phenolic content value of one month old plant parts were stem, bark, leaves, petiole and stem, leaves, bark, petioles in one year old plant parts. Generally highest total phenolic in petioles of one month 1840 mg/100g and 3560 mg/100g in one year old. One year old plants petioles and bark having highest content of total phenolics content. The seed kernel of one month and one year having 0.676mg/100g and 2500mg/100g of phenol compound respectively.

**Key words :** Phenolics, Simarouba, Petioles, Stem, Bark

**S***imarouba glauca*, is an edible oil seed bearing tree, which is well suited for warm, humid, tropical regions. The average per hectare yield of Simarouba is : Seed 4 tons, Oil 2.6 tons, cake 1.4 tons. Simarouba bark tea is still the first line of defense for amebic dysentery and diarrhea among the natural products available. It's also a good natural remedy for viruses. There the bark (and occasionally the root) is boiled in water to yield a powerful astringent and tonic used to wash skin sores and to treat dysentery, diarrhea, stomach and bowel disorders, hemorrhages, and internal bleeding. Clinical research has shown good antiviral properties with simarouba bark (against herpes, influenza, polio, and vaccinia viruses). The bark has been traditionally used in herbal medicine systems externally for wounds and skin sores. Simarouba root-bark contains a bitter principle identical with quassin, aresinous matter, a volatile oil having the odour of benzoin, malic acid, gallic acid in very small proportion, total phenolic compound in very large quantity, an ammoniacal salt, calcium malate and oxalate, some mineral salts, ferric oxide, silica, ulmin, and lignin. Simarouba was 91.8% effective against intestinal amebas in humans. The seeds of simarouba showed active anti-amebic activities in humans. Simarouba's ability to kill the most common dysentery-causing organism, *Entamoeba histolytica*, as well as two diarrhea-causing bacteria, *Salmonella* and *Shigella*. Simarouba is antimalarial properties (water extract of the bark as well as the root). Most of the medicinal properties are because of plant rich in phenolic content. Looking to the scanty information available on chemical composition of simarouba plant the present

investigation was undertaken to study phenolic content in *Simarouba glauca* plant parts like leaves, petioles, seed kernel, bark and compare the phenolic contents in young parts with older parts. Another area of research on simarouba and its plant chemicals has focused on cancer and leukemia.

**MATERIALS AND METHODS**

An experiment was conducted during 2009-2010 at college of Agricultural Bio-Technology, Loni, Ahmednagar. The seeds and seedling are taken from All India co-ordinated Research Network on Underutilized Crops, Mahatma Phule Krishi Vidyapeeth, Rahuri.

Total phenols estimation can be carried out with Folin-Ciocalteu reagent (FCR) by Bray and Torpe 1954. Phenols react with an oxidizing agent phosphomolybdate in FCR under alkaline condition and result in the formation of a blue colour complex, the molybdenum blue which is measured calorimetrically. Weigh exactly 0.5 to 1 gm of the sample and grind it with a pestle and mortar in 10 times volume of 80% ethanol. Centrifuge the homogenate at 10,000 rpm for 20 min. Save the supernatant. Reextract the residue with fine limits the role of 80% ethanol. Centrifuge and pool the supernatant. Evaporate the supernatant to dryness. Dissolve the residue in a known volume of distilled water (5ml). Pipette out different aliquots (1ml) into test tubes. Make up the volume in each tube to 3ml with water. Add 0.5ml of FCR. After 3 min, add 2 ml of 20% sodium carbonate solution to each tube. Mix thoroughly, place the tubes in boiling waterbath for exactly 1 min. cool and measure the absorbance at 650

nm against a reagent blank. Prepare a standard curve using different concentrations of Catechol

## RESULTS AND DISCUSSION

The data on the proximate composition of plant parts of simarouba is presented in Table 1. The result on

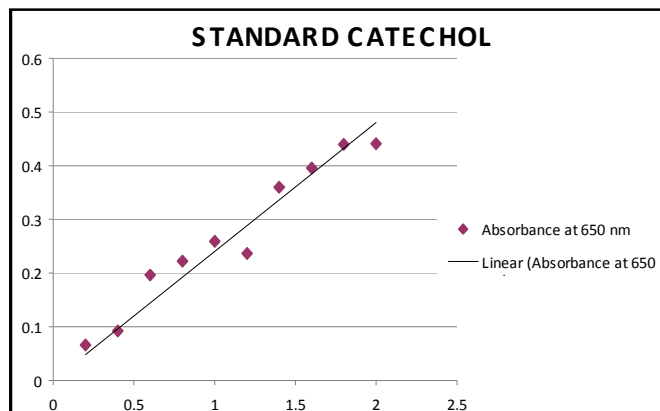
in young plant parts (1 month) and 800-3560 mg/100g in old plant parts (1 year).

The ascending value of phenolic content in young plant parts(1 month old) and old plant parts(1 year) were observed as stem, bark, leaves, petiole and stem , leaves ,bark, petioles respectively. The seed kernel was observed

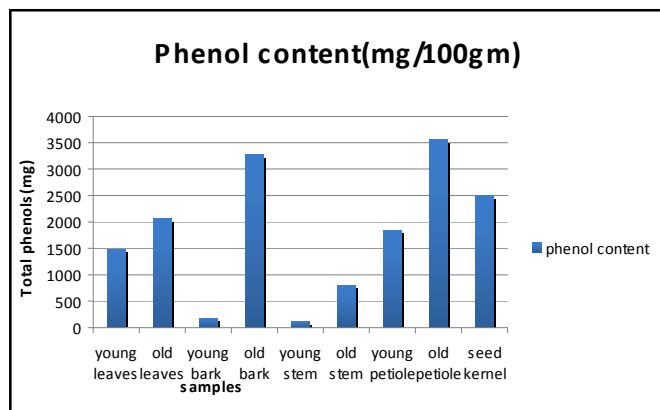
**Table 1 : Total phenol in different plant samples**

Sr. No.	Sample	Age	Absorbance (nm)	Total Phenolic (by graph) mg/100g
1.	Leaves	Young(1 month)	0.398	1480
		Old(1 year)	0.545	2060
2.	Bark	Young(1 month)	0.048	180
		Old(1 year)	0.895	3280
3.	Stem(without bark)	Young(1 month)	0.031	120
		Old(1 year)	0.216	800
4.	Petiole	Young(1 month)	0.494	1840
		Old(1 year)	0.969	3560
5.	Seed Kernel	-	0.676	2500

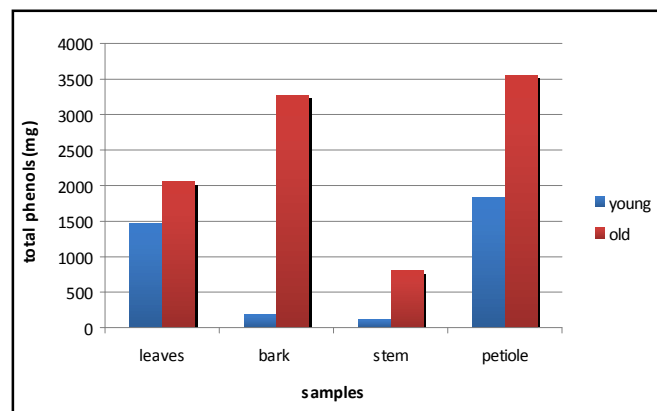
phenolic content in the simarouba plant revealed that the phenolic content was in the range of 120-1840 mg/100g



**Fig. 1 : Standard graph for catechol**



**Fig. 2 : Phenol content in different samples**



**Fig. 3 : Comparison of young and old samples**

to have 2500 mg/100g of phenolic content. Govindraju *et al.*(2009) reported that the phenolic content in Simarouba seed meal was 0.95 gm/100g .

The phenolic content of young(one month old) plant parts and old plant parts(one year) as leaves, bark, stem, petiole were 1480,180, 120, 1840 and 2060, 3280, 800,3560 mg/100g respectively.

The maximum phenolic content 1840 mg/100g was observed in petiole whereas the minimum 120 mg/100gm was observed in stem of one month old. Whereas in one year old plant the maximum value of phenolic content 3560 mg/100gm was observed in petiole and the minimum in stem without bark (800mg/100g). Above values indicate that petioles and bark are more useful for medicinal purpose.

**Conclusion :**

Thus the results of the present investigation on phenolic content in different plant parts of one month old and one year old indicated wide variability. The highest phenolic content in petiole 1840 mg/100g was found in one month old plant and 3560 mg/100g in one year old plant. This information on phenolic content in simarouba plant can be utilized by plant breeders in further varietal improvement programmers' and by the pharmacists for development of new herbal medicines.

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**Authors' affiliations:**

**M.S. PATIL, D.C. GAWAI, M.K. ZENDE AND J.N. LONDHE**, Department of Post Harvest and Food Technology, College of Agricultural Biotechnology, Loni, AHMEDNAGAR (M.S.) INDIA

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