



IJPPR

INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH
An official Publication of Human Journals

ISSN 2349-7203



Human Journals

Research Article

July 2020 Vol.:18, Issue:4

© All rights are reserved by N T Pramathesh Mishra

Effect of Sodhana on Flavonoid and Phenolic Content of *Semecarpus anacardium*

	
N T Pramathesh Mishra*	
<i>Department of Biochemistry, MGIP, Dr. APJ Abdul Kalam Technical University, Lucknow, Uttar Pradesh, India</i>	
Submission:	23 June 2020
Accepted:	29 June 2020
Published:	30 July 2020



www.ijppr.humanjournals.com

Keywords: *Semecarpus anacardium* Linn, Sodhana, Flavonoid, Phenolic, bilvanol A & B

ABSTRACT

Shodhana is one “Samskara” process used for Samskarana of drugs. The term “shodhana” means purification. In Rasa-shastra the shodhana defines as a process of not only purification but also involves the detoxification and also enhancing the safety and efficacy of the drugs. The toxins of the plant/ part of the plant will be converted to safe, effective and lifesaving medicine by introducing them to shodhana. Shodhana processes are used to I. Remove toxic compounds. II. Decrease concentration of toxic constituents. III. Convert them to chemically modified compounds which are less toxic and/may be more potent. The synonyms of *Semecarpus anacardium* are Bhallata, Agni, Vahni, and Arsuvara. It is a potent drug for nervous debility, rheumatism, epilepsy, sciatica, asthma, chronic constipation, colic pain. Pericarp of the fruit contains, Tarry oil consisting of anacardic acid 90% and cardol 10%. Impure Bhallataka causes blisters, glossitis, diarrhoea, menorrhagia, ulcers, oedema, and burning sensation. The oil contains phenolic compounds. When exposed to air, the phenolic compound is oxidized to quinones. Putting oil under nitrogen can prevent the oxidation process. The two main phenolic compounds and glycosides are bilvanol A (monoepentadoxyl Catechol I), bilvanol B (diapentadoxyl Catechol II) and anacardoside (glycoside). The present study was undertaken to evaluate the effect of scavenging on the Flavonoid and phenolic contents of grains of *Semecarpus anacardium*. We found that after Sodhana process the Flavonoid content decreases whereas the phenolic content increases. So Sodhana process has a significant effect on Phenolic and Flavonoid content of *Semecarpus anacardium* Linn.

1.0 INTRODUCTION:

Ayurvedic medicine is an ancient medicinal system of health care that is native to the Indian subcontinent. It is now used by millions of people in India, Nepal, Sri Lanka, China, Tibet, and Pakistan daily. Now it is in practice for health care in European countries and many others. The word "Ayurveda" is a compound of the word *ayus* meaning "life" or "life principle", and the word *Veda*, which refers to a system of "knowledge".

There are many herbs used for various diseases not only for their active ingredients but also for minerals, vitamins, minerals, volatile oils, glycosides, alkaloids, alcohols and esters. Modern medicine is not available for memory loss, osteoporosis, and immune system disorders. [1]

Herbal remedies are used for over 80% of the world's population for basic health care. The chemicals in them are part of the physical activity of living organisms, so they are more suitable for the human body. These drugs are made from a variety of raw materials through an eco-friendly cardiovascular process and are a source of economic prosperity for the growing population. [2]

Plants and their secondary metabolites have a long history in Western medicine and in some systems of traditional medicine. In developed countries, the use of Ayurvedic drugs has increased rapidly in the late 20th century. According to Edwards [4], two-thirds of the 50,000 plants currently in use are still grown from natural habitats. Some of these are therapeutic and toxic. Plants contain poisons that pose a serious risk to illness, injury or death to humans and animals. There is considerable overlap between plants considered toxic and those with psychotropic properties, some of which are toxic. Some plants have toxic effects: *Asparagus* species, *Arum maculatum* and *Bregmancia* species. There are some toxic plants with therapeutic activity, such as *Semecarpus anacardium*. [5]

Semecarpus anacardium is commonly known as "Bhallatak". It has been used in Indian medical practice (Ayurveda) for hundreds of years. Due to its various medicinal properties it is now widely available for the various disease purpose, it has many components including phenolic compounds, flavonoids, carbohydrates, alkaloids, steroids, etc. [6]

Verification medication disposal process is necessary because high concentrations of chemicals can have a negative effect on the human body. These chemicals must be

neutralized to its normal content. So, this bright idea is very important. There are 2 types of Sodhana which are Samanya Sodhana and Vishesh- Sodhana. Without it we cannot use any toxic medicine. This is why we need purification methods for the removal of toxicity. The undesirable properties of such drugs are the presence of visible and unseen impurities, hardness, the presence of many types of substances, and the presence of toxic substances. [7]

Semecarpus anacardium seeds contain toxic and volatile oils in the thalamus. Oils are phenolic compounds. When exposed to air, the phenolic compound is oxidized to quinones. Putting oil under nitrogen can prevent the oxidation process. The two main phenolic compounds and glycosides are bilvanol A (monoepentadoxyl Catechol I), bilvanol B (diapentadyl Catechol II) and anacardoside (glycoside). This phenolic compound may be responsible for the vesicant response of Bhallatak. The main bioflavonoids are semicarflavonone, gediflavonone, gallo flavone, nal flavanone, semocarpetine and anacardo flavones[8]. These flavones have antioxidant activity to the Samachar flavanone and galloflavone group. Kernel analysis also reported.

OBJECTIVE:

- To perform sodhana of nuts of *Semecarpus anacardium* Linn. Following ayurvedic pharmacopoeia procedure.
- To extract the nuts of *Semecarpus anacardium* Linn. (Presodhit and Sodhit) by methanol.
- To estimate the flavonoid and phenolic content of both Presodhit and Sodhit *Semecarpus anacardium* nuts.

LITERATURE REVIEW

2.1 Plant Profile:

Scientific name: *Semecarpus anacardium* Linn

Family: Anacardiaceae

Common Name: Bibba (Marathi); Bhilawa, Bhallatak (Hindi)

Trade name: Rare Marking nut/ Dhobi nut.

2.2 Description:

Large deciduous tree, reaching 12 m to 15 m. leaves oblong to oblong. The tree is leafless in March and April, contains rough bark. The inner surface of the bark is red, and the exposed juice is dark. Timber is widely distributed in the hottest part of India. It is often found in the dry deciduous forests of central India [9]. It is especially found in Common deciduous forests of Eastern Maharashtra, Khandesi and Marathwada.

2.3 Part used:

Fruits: Bleeding, anti-inflammatory, anti-tumour. Used for rheumatoid arthritis and tumours and malignant growth.

Seeds: Bhilava nut shell used to identify it gives the liquid.

The bark is bleeding in nature. It excretes gum resin used for leprosy infection.

Stem: It is obtained by pressing, from which comes the varnish made of walnut juice and whipped juice.

Nut: It provides strong and bitter material used everywhere in India as a marker for washer machine garments, hence the name Dhobi Nut. It gives a darker colour to the cotton fabrics, but before applying, mixes it with lime water as a fixer.

Fruits are also used as a colour. They are used in Ayurvedic medicines for astringency, heat production, appetite, digestion, rejuvenation, erotic herbs, skin and rheumatism. The nuts eat the rest of the fleshy cups and the kernels of the nuts. Kernel oil is used as a lubricant and as wood protection against termites.[10]

2.4 Seed collection:

Collection method: Fruits (drupe) obliquely ovoid more than 1 cm girth and 2.5 cm length fleshy hydnocarp with attached nut/ seed. Kernel present inside hard shell is edible but sometimes causes cutaneous eruptions. Seeds of the fruit were collected between months of December to March.

2.5 Sodhana

In Ayurveda, Sodhana is a toxin process that turns a toxic drug into a variety of ailments is therapeutically effective. Various media are used to process herbal toxins, which is very interesting to understand using modern scientific methods. Analysis of media before and after spraying (purification/processing) provides a clear rationale behind selecting specific media for a particular drug condition [11].

Various Medias used for Sodhana

The media used for Sodhana are Cow's urine, Cow's milk, Coconut water, Cow's ghee, Lime water, Ginger juice, Brick powder, Triphala decoction, Panchapallava kwatha, Hot water, Goat's milk & Sour gruel.

Types of Sodhana

It is mainly two types i.e. Samanya Sodhana and Vishesh Sodhana. [12]

1. Samanya (General):

It is commonly applied to the medicines of the Maharasa, Uparasa, Ratna and Dhatu categories. There are some types of waste that are similar to the Drugs Shares group. Therefore, with the help of peer review, public waste can be eliminated. E.g. mineral-equivalence.

2. Vishesh (specific):

This is especially true for drugs that contain high concentrations of chemicals. Each drug in the group may contain different types of contaminants.

Role of the media in the Shodhana of Bhallatak

(*Semecarpus anacardium* Linn.):

Mainly and commonly used media for Bhallatak Shodhana is brick powder. The oily part of the nut is toxic and its degree of removal is proportional to its safety margin. To test this, the *Semecarpus anacardium* nuts were treated with brick powders (traditional method of Ayurveda), silica gel and hexane solvent for various time periods. Though the oily part of

Semecarpus nuts is having the blister causing property, it is proved for its anti- cancerous property (*Semecarpus anacardium* Linn.): [13].

3.0 METHODOLOGY:

Collection

I have collected the nuts of *Semecarpus anacardium* from local market of Bhubaneswar.

Identification

The nuts of *Semecarpus anacardium* was identified by Dr. Pratap Kumar Panda, Taxonomist of RPRC Bhubaneswar.

➤ Sodhana

The Sodhana procedure of Bhallatak includes soaking the fruits in Gomūtra, Godugdha and rubbing it on brick gravels respectively. After removing the thalamus portions, the fruits are kept either in Gomūtra (for 7 days) or Godugdha (for 7 days), which are finally washed with water. The seeds are then shifted to a bag containing brick gravels (for 3 days), rubbed thoroughly and dried. During the process of Śodhana of Bhāllataka, coconut oil is applied on the exposed body parts of the persons involved in the processing to reduce the chances of dermatitis.

Extraction/Maceration

250 gm of presodhit and Sodhit nuts will be subjected for extraction in 250 ml of methanol for 18 hr. and the extracts shall be evaporated to dryness. The dried extracts shall be weighed, and percentage yield will be calculated.

Flavonoid content Estimation

Material Used:

- Quercetin in methanol
- Plant extract in methanol
- 10% Aluminium chloride

- 1M Pottasium acetate
- Distilled water

Procedure:

- Colorimetric method will be used for determination of test extract.
- 1.5 ml of methanol will be mixed with methanolic solution of plant extract and to it, 0.1ml of 10% Alluminium chloride will be added.
- For 30 min mixture wii be kept at room temperature.
- 415nm of the reaction mixture will be measured against the blank without test drugs.
- Calibration curve will be prepared by taking Quercetin solution in methanol.

Phenolic content Estimation

Material Used:

- Gallic acid (100-500 mcg/ml of methanol)
- Processing water
- Distilled water
- Folin
- 7% Sodium carbonate solution



Procedure:

- Methanolic extract of the nuts will be determined by using Folin.
- Reaction mixture will be prepared by using 50µl of methanol solution of extract, 3ml of distilled water, and 250µl of Folin and 75µl of 7% sodium carbonate solution.
- Absorbance at 765nm will be obtained against blank after 2hrs, by replacing extract with distilled water.

- The total phenolic content will be determined by using calibration curve of gallic acid standard; which is expressed as mg.
- Gallic acid equivalent per gm dry weight of sample.

4.0 RESULTS AND DISCUSSION:

Flavonoid Content of both presodhit and Sodhit nut extracts were calculated as mg equivalent quercetin. For this, a standard curve was prepared using pure quercetin (fig- 1, tab-1). Sodhana decreases the flavonoid content (Table-2).

Phenolic Contents of both Sodhit and presodhit nut extract were calculated mg equivalent to Gallic acid. For this a standard curve is prepared by using pure Gallic acid (fig-2, tab-3). Sodhana increases phenolic content (Table-4).

Table No. 1: Absorbance of Quercetin at Different Concentrations

Sr. No.	Concentration	Absorbance
1	0	0
2	2	0.234
3	4	0.448
4	6	0.658
5	8	0.869

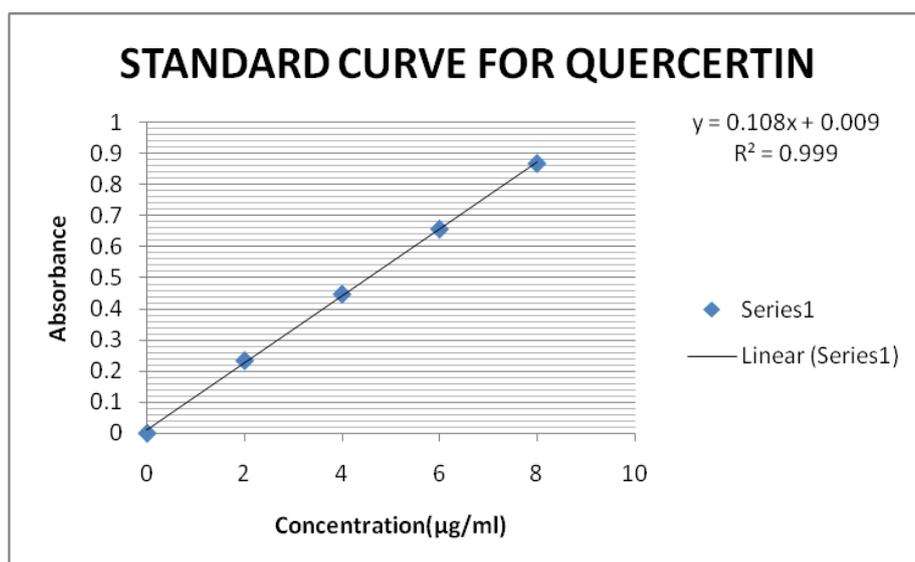


Figure No. 1: Standard Curve for Quercetin

Table No. 2: Flavonoid content of presodhit and Sodhit *Semecarpus anacardium*

	µg of Quercetin / mg of extract (w/w)
Preshodhit	5.882
Shodhit	4.364

Table No. 3: Absorbance of Gallic Acid at Different Concentrations

Sr. No.	Concentration (µg/ml)	Absorbance (nm)
1	0.9	0.0444
2	1.5	0.0511
3	3.14	0.0572
4	6.6	0.0786
5	12.4	0.1134
6	25	0.1944

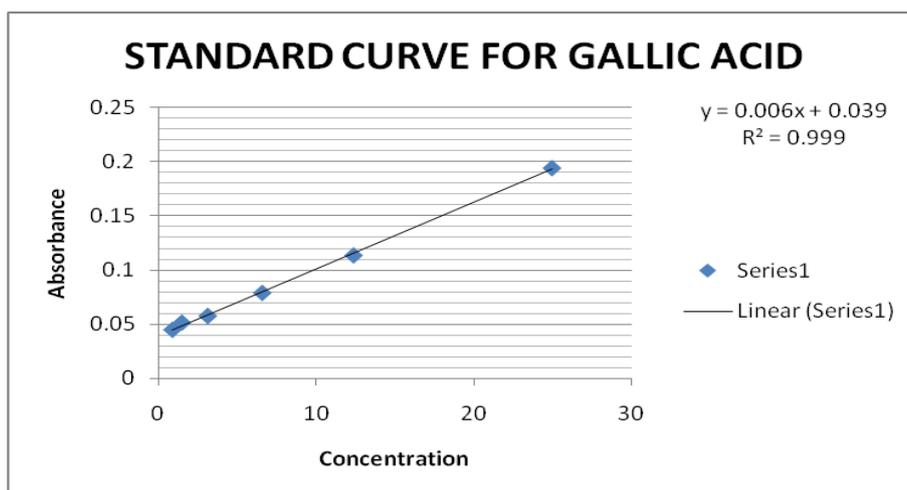


Figure No. 2: Standard Curve for Gallic Acid

Table No. 4: Phenolic content of presodhit and Sodhit *Semecarpus anacardium*

	µg of Gallic acid/mg of Extract
Shodhit	574.166
Preshodhit	539.166

Such changes in chemical constituent of *Semecarpus anacardium* may be attributed to process of Sodhana [14].

5.0 SUMMARY AND CONCLUSION:

The thalamus portions were removed and purified (shodhit) by soaking with Gomutra, Godugdha and rubbing it on brick gravels. Then the nuts are kept either in Gomutra (for 7 days) or Godugdha (for 7 days), which are finally washed with water. The seeds are then shifted to a bag containing brick gravels (for 3 days), rubbed thoroughly and dried. 250 gm of presodhit and Sodhit nuts were subjected for extraction in 250 ml of methanol for 18 hours and the extracts were evaporated to dryness. The phenolic and flavonoid content of both presodhit and Sodhit methanolic extract were estimated by extrapolating them from the standard curve of Gallic acid and Quercetin respectively. We found that after Sodhana process the Flavonoid content decreases whereas the phenolic content increases. So Sodhana process has a significant effect on phenolic and flavonoid content of *Semecarpus anacardium* Linn.

6.0 REFERENCES:

1. Kokate CK, Purohit AP, Gokhale SB. Pharmacognosy. 4th edition, Nirali Prakashan, Pune, 2009, 43
2. Rivera JO, Loya AM, Ceballos R. Use of Herbal Medicines and Implications for Conventional Drug Therapy Medical Sciences. *Alternative & Integrative Medicine*. 2(6), 2013, 130-135.
3. Kumar N, Nautiyal S. An Inventory of Medicinal Wealth of Jhil-Mil Jheel Conservation Reserve, *International Journal of Herbal Medicine*. 1(2), 2013, 1-8.
4. Edwards R. No Remedy In Sight For Herbal Ransack. *New Scientist*. 181(2429), 2004, 10-11.
5. Vijayalakshmi T, Muthulakshmi V, Sachdanandam P. Toxic studies on biochemical parameters carried out in rats with Serankottai nei, a siddha drug–milk extract of *Semecarpus anacardium* nut. *Journal of Ethnopharmacology*. 69 (2000), 1999, 9–15.
6. Premalatha B. *Semecarpus anacardium* Linn. Nuts—a boon in alternative medicine, *Indian Journal of Experimental Biology*. 38 (12), 2000, 1177–1182.
7. Umang G, Khambholja K, and Patel R. Effect of Sodhana process on quantity phytoconstituents of *Semecarpus anacardium* Linn. *International Journal of Pharmacy & Life Sciences*. 2 (6), 2011, 805-807.
8. Jain P, Sharma HP. A Potential Ethnomedicinal Plant: *Semecarpus Anacardium* Linn. – A Review. *International Journal of Research in Pharmacy and Chemistry*. 3(3), 2013, 564-572.
9. Gedam P H, Sampathkumaran PS, Sivasamban MA. Composition of bhillawanol from *Semecarpus anacardium*. *Indian Journal of Phytochem*. 13, 1974, 513-515.
10. Raut AK, Sawant NS, Badre AS, Amonkar AJ, Vaidya ADB. Bhallatak (*Semecarpus anacardium* Linn.)—A Review. *Indian Journal of Traditional Knowledge*. 6 (4), 2007, 653-659.
11. Ilanchezhian R, Roshy Joseph C, Acharya R. Importance of Media in Sodhana (Purification / Processing) of Poisonous Herbal Drugs, *Ancient Science of Life*. 30(2), 2010, 54-57.
12. Tripathi YB, Pandey N, Tripathi P. Purification of nuts of *Semecarpus anacardium* Linn., A Herbal Drug For Arthritis. *Current science*. 94(8), 2008, 1062- 1065.
13. Morbale MS, Herwade A S. Concept of shodhan [purification process], *International Ayurvedic Medical Journal*.3 (9), 2015, 2726-2728.
14. Morbale MS, Herwade A S. Concept of shodhan [purification process], *International Ayurvedic Medical Journal*.3 (9), 2015, 2726-2728.



Author Name – N T PRAMATHESH MISHRA

Corresponding Author

*Author Affiliation: ASSISTANT PROFESSOR,
DEPARTMENT OF BIOCHEMISTRY, MGIP, DR APJ
ABDUL KALAM TECHNICAL UNIVERSITY, LUCKNOW,
UTTAR PRADESH, INDIA, 227101*

