

A Critical study on Physicochemical and Preliminary Phytochemical Parameters of *Bakul (Mimusops elengi Linn.)* stem bark and *Babool (Acacia arabica Willd.)* stem bark for their gum disorders

Dr. Shivkanya Sharma*¹ Dr. Rohit Johari²

¹M.D. Scholar, Deptt. Of Dravyaguna, Dayanand Ayurvedic College, Jalandhar

²Guide, Asso.Prof. Deptt. Of Dravyaguna, Dayanand Ayurvedic College, Jalandhar

Date of Submission: 27-06-2023

Date of Acceptance: 08-07-2023

I. Introduction:

Many indigenous societies have used medicinal plants for a long time as effective treatments for a wide range of illnesses. Traditional medical procedures are founded on beliefs and observations that extend back hundreds of years and precede the development and spread of modern medicine. These days, natural treatments are very popular. The main reason for this interest is based on the belief that herbal medications are risk-free, affordable, and free of side effects. Because more individuals are looking for cures and alternative methods of health care, medicinal plants have shifted from an isolated to widespread use. It is not surprising that 1.42 billion people, or one-fourth of the world's population, rely on traditional medicines to cure a variety of illnesses.¹

The lack of documentation and strict quality control, however, has been a major barrier to the acceptance of alternative medicines in developed nations. The results of research on conventional medications need to be documented. With this background, standardizing the plant material that will be utilized as medicine becomes incredibly vital. Physicochemical and preliminary phytochemical research can be used to standardize a procedure in an organized manner.² These investigations support the standardization and identification of plant material. To ensure reproducible quality of herbal medicine, which will contribute to its safety and effectiveness, correct identification and quality control of the starting ingredients are prerequisites that cannot be ignored.³

An evergreen tree in the Sapotaceae family is *Mimusops elengi Linn.* In Sanskrit and Marathi language it is called as *Bakulah* and *Bakul*, respectively. The plant is a massive tree that can reach heights of 40–50 feet and has dark grey bark. Its fragrant flowers bloom in the month of January to

March. It begins producing fruit between January and May. The fruit is an ovoid, yellow, 2.5 cm long berry. The leaves have analgesic and antipyretic properties. *Bakul (Mimusops elengi Linn.)* is used to treat skin wounds, has anti-ulcer properties, and helps women become more fertile. Gargling with its bark and roots helps to strengthen dental gums and reduces tooth inflammation.⁴⁻⁵

The other plant *Babool (Acacia Arabica Willd.)* It is a medium-sized, evergreen tree with a short trunk, a circular, spreading crown, and feathery foliage that may be found throughout India's drier regions. It typically grows to a height of 15 m and 1.2 m in girth, while trees up to 30 m tall and 3 m in girth have also been documented. The bark has extensive cracks running longitudinally and has a rough dark brownish to nearly black tint. The leaves range in length from 2.5 to 5 cm, are bipinnate with spinescent stipules, and have narrowly oblong pinnules. It blooms with fragrant, densely arranged, globose flowers that are golden yellow and have long stalks. The pods are 7.5–15.0 cm long and flat get compressed between the spherical seeds. In addition to blooming in December and January, flowers also bloom from June to September. There are 8 to 12 seeds in every single pod. In May and June its pods gets ripen. The bark of the *Babool (Acacia arabica Willd.)* is used to treat acute gonorrhoea, ulcers, and wounds. The pulp of tender leaves is administered for diarrhoea and dysentery, and its bark can also be gargled for spongy gums and sore throat.⁶⁻⁷⁻⁸ The bark of *Mimusops elengi Linn* was studied physicochemically and phytochemically in this research. In order to properly investigate authentic plant material for its traditional uses, the current research has been done with the goal of establishing physico-chemical and phytochemical parameter standards for *Bakul (Mimusops elengi Linn.)* Bark and *Babool (Acacia Arabica Willd.)* Bark.

II. Aims and objectives:

To study *Bakul* and *Babool* stem bark morphological and laboratorial study for their physicochemical and Preliminary phytochemical parameters for using it in various gum disorders.

III. Material and methods:

To study microscopic and macroscopic characters of natural sample of *Bakul* (*Mimusops elengi* Linn.) and *Babool* (*Acacia arabica* Willd.) (1 kg of each plant sample was collected).

1. Procurement and collection of Plant and its useful part-

General collection procedure

In spring season, the flow of sap is at a maximum and bark detached from the wood. Stem bark of *Bakul* (*Mimusops elengi* Linn.) was collected from

Jalandhar, Punjab and Stem bark of *Babool* (*Acacia Arabica* Willd.) was collected from Una (Himachal Pradesh).

2. Preparation of samples-

After identification, both samples, viz., *Bakul* (*Mimusops elengi* Linn.) and *Babool* (*Acacia Arabica* Willd.) were powdered for carrying out tests.

3. Place of work

Pharmacognostical, Physicochemical, Preliminary Phytochemical parameters of *Bakul* (*Mimusops elengi* Linn.) and *Babool* (*Acacia Arabica* Willd.) were carried out at CSIR (Council of Scientific and Industrial Research- IHBT (Institute of Himalayan and Bioresource Technology), Palampur (Himachal Pradesh).

IV. Results and observations:

1. PHYSICOCHEMICAL PARAMETERS

Physicochemical parameters of *Bakul* (*Mimusops elengi* Linn.)-

TABLE NO. 1

Sr. No.	PARAMETERS (%w/w)	BAKUL (<i>Mimusops elengi</i> Linn.)	REFRENC RANGE
1.	TOTAL ASH VALUE	5.23	5.18-6.12
2.	ACID INSOLUBLE ASH	0.27	0.16-0.32
3.	WATER SOLUBLE ASH	2.52	2.45-2.59
4.	ALCOHOL SOLUBLE EXTRACTIVE	7.82	7.74-7.98
5.	WATER SOLUBLE EXTRACTIVE	5.46	5.42-5.57
6.	pH	9.12	7.93-9.76
7.	MOISTURE CONTENT/ LOSS ON DRYING	4.37	4.21-4.42

Physicochemical parameters of *Babool* (*Acacia Arabica* Willd.)-

TABLE NO. 2

Sr. No.	PARAMETERS (%w/w)	BABOOL	REFRENC RANGE (<i>Babool</i>)
1.	TOTAL ASH VALUE	8.07	8.03-8.14
2.	ACID INSOLUBLE ASH	1.038	1.19-1.046
3.	WATER SOLUBLE ASH	0.849	0.842-0.883
4.	ALCOHOL SOLUBLE EXTRACTIVE	15.79	15.51-15.83
5.	WATER SOLUBLE EXTRACTIVE	9.21	8.98-9.34

6.	pH	8.93	7.82-9.42
7.	MOISTURE CONTENT/ LOSS ON DRYING	5.38	4.94-5.47

2. PRELIMINARY PHYTOCHEMICAL PARAMETERS

TABLE NO. 3

Sr. No.	PARAMETERS	BAKUL	BABOOL
1.	ALKALOIDS	-	+
2.	PHENOLS	+	+
3.	FLAVONOIDS	+	+
4.	SAPONINS	+	+
5.	GLYCOSIDES	+	+
6.	TANNINS	+	+



Fig. no. 1
Methanol Solution of plant samples
Bakul and Babool



Fig no. 3
Methanolic extract of both
plant samples



Fig. no. 2
Preparation of extract through
Rotavapor

V. Discussion and conclusion:

Physicochemical and Preliminary phytochemical study was done as per standard methods mentioned above and observations were recorded and mentioned in tabulated form.

a) Physicochemical parameters:

Total Ash value of *Bakul* was around 5.23 and as for *Babool* it was 8.07 where reference range for both is not more than 6.12-8.14. Acid insoluble ash of *Bakul* was 0.27 and for *Babool* it was 1.038 where reference range for both is not more than 0.32-1.046. Water soluble ash of *Bakul* was 2.52 and for *Babool* it was 0.849 where reference range for both is not more than 2.59-0.883. Alcohol soluble extract present in *Bakul* was 7.82 and in *Babool* was 15.79 where reference range for both was not less than 7.74-15.51. Water soluble extract present in *Bakul* was 5.46 and in *Babool* was 9.21, where reference

range was not less than 5.42-8.98. pH value of *Bakul* was 9.12 and *Babool* was 8.93. Moisture content/Loss on drying of *Bakul* was 4.37 and *Babool* was 5.38.

b) Preliminary Phytochemical parameters:

Alkaloids were absent in *Bakul* (*Mimusops elengi* Linn.) and but present in *Babool* (*Acacia arabica* Willd.). Phenols were present in both *Bakul* (*Mimusops elengi* Linn.) and *Babool* (*Acacia arabica* Willd.). Flavonoids were present in both *Bakul* (*Mimusops elengi* Linn.) and *Babool* (*Acacia arabica* Willd.). Saponins were present in both *Bakul* (*Mimusops elengi* Linn.) and *Babool* (*Acacia arabica* Willd.). Glycosides were present in both *Bakul* (*Mimusops elengi* Linn.) and *Babool* (*Acacia arabica* Willd.). Tannins were present in both *Bakul* (*Mimusops elengi* Linn.) and *Babool* (*Acacia arabica* Willd.).

VI. Conclusion:

The research study conducted reveals similarities in Physicochemical and Preliminary Phytochemical parameters. The presence of phenols in both of the drugs shows anti-inflammatory action for using it in various gum related disorders.

References:

- [1]. K Jeyaprakash, M Ayyanar, KN Geetha, T Sekar. Asian Pacific Journal of Tropical Biomedicine, 2011, S20S25.
- [2]. K Kaur, AK Gupta, S Ahmad, P Alam. International Journal of Research in Pharmaceutical and Biomedical Sciences, 2011, 2(4), 1670-1677.
- [3]. D Saha, SK Pahari, T Maity, D Sur. International Journal of Pharma Sciences and Research, 2010, 1(11), 473475.
- [4]. Gopalkrishnan B, Shimpi SN. Seeds of *Mimusops elengi* Linn. Pharmacognosy and phytochemical studies. International Journal of Pharmacognosy and Phytochemical Research, March-May. 2010;3:13-7.
- [5]. A Jena, D Saha, B Biswal, SB Jana, A Koley, D Sur, A Battacharya. International Journal of Research in Pharmaceutical and Biomedical Science, 2011, 2(1), 2229-3701.
- [6]. Kadam PV, Deoda RS, Shivatare RS, Yadav KN, Patil MJ. Pharmacognostic, phytochemical and physiochemical studies of *Mimusops Elengi* Linn stem bark (Sapotaceae). Der Pharmacia Lettre. 2012;4(2):607-13.
- [7]. Roqaiya M, Begum W, Jahufer R. *Acacia arabica* (Babool)-a review on ethnobotanical and Unani traditional uses as well as phytochemical and pharmacological properties. Int J Pharm Phytopharmacol Res. 2015 May 1;4:315-21.
- [8]. Farzana MU, Al Tharique I. A review of ethnomedicine, phytochemical and pharmacological activities of *Acacia nilotica* (Linn) willd. Journal of Pharmacognosy and Phytochemistry. 2014;3(1):84-90.
- [9]. Rajvaidhya S, Nagori BP, Singh GK, Dubey BK, Desai P, Jain S. A review on *Acacia Arabica*-an Indian medicinal plant. International Journal of pharmaceutical sciences and research. 2012 Jul 1;3(7):1995.
- [10]. Mohammad R, Shariq S, Roohi Z, Malik I. Bark of *Acacia arabica*-A nature's gift: an overview. International Research Journal of Medical Sciences. 2014;2(5):20-4.
- [11]. Sharma B, Dey AN, Kumari A, Pala NA. Documentation of medico-religious plants of Doars region of West Bengal. International Journal of Forest Usufructs Management. 2014;15(2):3-15.
- [12]. The Ayurvedic Pharmacopoeia Of India, 1, Government of India Ministry Of Health and Family Welfare Department Of Ayush, Part 1, Volume 1, page 29-30.