

# NUTRITIONAL AND ANTIMICROBIAL PROPERTIES OF BOMBEX CEIBA BUD (SIMBA DODA)

Sheetal Bisht<sup>1</sup>, Bindu Naik<sup>2</sup>

<sup>1</sup>Scholar, Department of food science, Uttaranchal College of Applied & Life Sciences, Uttaranchal University, Dehradun, Uttarakhand, 248007

<sup>2</sup>Professor, Department of food science, Uttaranchal College of Applied & Life Sciences, Uttaranchal University, Dehradun, Uttarakhand, 248007,

## Abstract

Bombax ceiba healthful herb happiness to the Family- dilleniid dicot family additionally called Red vegetable silk tree (local name: Shimul) used as a folks medication for the treatment of varied diseases like an ejaculation, diarrhea, muscular injury, acne, cold, wounds, etc during this subcontinent. Different types of phytoconstituents like sugar, steroid, flavonoids, alkaloids, terpenoids, tannins & saponins at the side of their structure & their applications are reported from the leaf, bark, root, fruit, flower & seeds. These compounds have vital biological activities like medicament, antimicrobial.

The antimicrobial screening check was calculable by disc diffusion methodology. In antimicrobial activity investigation, methanolic crude extract of Bombax malabarica (Bud) showed gentle to moderate activity against the check bacterium. Two different concentrations: 300µg/disc & 600µg/disc of alcohol extract of Bombax malabarica bud was employed in medication check. That is compared to an antibiotic drug (30µg/disc) used as positive management during this study. The vary of zone of inhibition was determined in between 7-13 millimeter betting on the concentration of the extract.

**Key Words:** - Bombax ceiba, Phytochemical, Antimicrobial, Antioxidant.

## Introduction

Medicinal plants square measure a supply of nice amount everywhere the globe. Nature has presented on North American country a really made biological science wealth and an oversized range of numerous sorts of plants growing in numerous elements of the country. The Asian nation is one in each of the leading countries in Asia in terms of the wealth of mental object systems associated with the utilization of plant species. The Asian nation is additionally identified to harbors a chic diversity of upper plant species of that 7500 square measure referred to as healthful plants. The Dehradun is understood for its made bio-resources and ethnocultural diversity. the utilization of plants and plant merchandise as medicines can be copied for the back because the starting of human civilization. Uttarakhand is one in every one of the craggy states within the Indian Himalaya region. due to its harbors the best range of plant species identified for healthful properties

among all the Indian mountain chain states. Bombex dilleniid dicot genus belongs to the family of bombacaceae that is often referred to as Semal in Uttarakhand. Bombex dilleniid dicot genus could be a tall deciduous tree with distinctive woody thorns on the trunk and branches [1] is found in the Asian nation. This tree produces giant crimson colored flowers, that square measure ornithophilous. The flowers have a tough plant organ with stiff filaments and a well-protected ovary. Bombex dilleniid dicot genus bark paste is used to heal wounds. They conjointly use in simmering of its root in conjunction with another plant species as AN aphrodisiac [2]. The leaves of B. dilleniid dicot genus contain shamimin a C-flavonol glycoside that has vital efficiency as a hypotensive agent [3]. The young leaves, petioles and seed cake (with little or no or no gossypol) square measure used as glorious oxen feed. The immature coil referred to as Semargulla is consumed as a vegetable in the state, additionally to the flowers and fleshy coil. A paste of its petals is mixed with breast milk and is applied outwardly to cure red eyes and also the root of B. dilleniid dicot genus is employed as a tonic to heal waist pain [4]. The young thorns square measure used as a substituted for edible seed. WHO defines medicinal plants in the following way “A medicinal plant is any plant which in one or more of its organs, contains substances that can be used for therapeutic purposes or which is a precursor for synthesis of useful drugs” (Ghani, A. 1998 ; Khan, M. et al. 2001).

### **Medicinal Plant**

A plant that has been used for medical functions at just the once or another, and which, though not essentially a product or offered for promoting, is that the original material of seasoning medicines is referred as the healthful plant. Plant materials treated consistent with ancient procedures to enhance their safety and effectuality, to facilitate their clinical use, or to form healthful preparations. Finished, labeled pharmaceutical product in indefinite quantity forms that contain one or a lot of-of the following: powdery plant materials, extracts, pure extracts, or part pure active substances isolated from plant materials are seasoning healthful product.

### **Importance of Medicinal Plant**

Before the onset of the artificial era, the man was fully captivated with healthful herbs for interference and treatment of diseases. With the introduction of scientific procedures, the researchers were ready to perceive concerning unhealthful principles gift within the inexperienced flora. The scientists isolated active constituents of the healthful herbs and when testing some were found to be therapeutically active. Aconitine, Atisine, Lobeline, Nicotine, Strychnine, Digoxin, Atropine, analgesic square measure some common examples.

While healthful plants square measure the particular plants themselves, plant medicines square measure preparations made of those plants. Plant medicines square measure the foremost wide used medicines within the world nowadays. Associate in Nursing calculable eighty % (80%) of the world's population employs herbs as primary medicines. And whereas apothecary's shop shelves within the USA square measure furnished

largely with artificial remedies, in different elements of the planet things is sort of completely different. In elements of Europe, as an example, pharmacies dispense herbs prescribed by physicians

### **WHO's Policy on Herbal Medicines**

The World Health Organization is absolutely alert to the importance of flavoring medicines to several of its Member States and supports the utilization of healthful plants and their product. In early 1978, the planet Health Assembly, the WHO organization, adopted a resolution on drug policies and management of healthful plants, that recognized the importance of healthful plants within the health care system. the planet Health Assembly projected coordinating efforts through the preparation of a listing of healthful plants, the event of criteria and strategies for proving the security and effectualness of healthful plant product, and therefore the dissemination of relevant info. In 1987, 1988 and 1989, 3 additional resolutions were adopted covering the identification, evaluation, preparation, cultivation, utilization, regulation and conservation of healthful plants.

### **Plant Information**

#### **The Plant Family- Bombacaceae**

Bombacaceae (Bombax, *Adansonia digitata* or Kapok family) could be a tiny family of flowering plants that contains concerning twenty-eight genera and two hundred species. Plants of this family square measure perennial, deciduous and woody trees. They occur naturally throughout the tropical and subtropic regions of the globe, particularly in tropical America. several species grow to become massive trees, reaching a height of seventy m. in addition, a number of these plants have substantial girth, thus referred to as "bottle trees" and their trunks square measure sometimes with buttresses at the bottom. Besides the nice significance of dilleniid dicot family plants as ornamentals because of their massive branches and brilliantly coloured flowers, many genera square measure economically and commercially necessary, manufacturing timber, edible fruits, vegetable oils or helpful fibers, e.g., silk floss trees (*Chorisia* spp.) and Kapok (fibers of dilleniid dicot genus fruits). The family is additionally noted for a few of the softest hardwoods commercially listed, particularly balsa. The Baobabs (*Adansonia* spp.) square measure necessary icons ensure components of Africa and Australia, noted for their vastly stout trunk development that could be a mechanism for enhancing water storage. Moreover, members of dilleniid dicot family found many folkloric healthful uses in several countries because of their antipyretic, analgesic, medicament, astringent, stimulant, diuretic, and antimicrobial properties (Refaat, J. et al. 2012)



**Fig 1.1:** *Bombax ceiba* tree

### **Taxonomical classification**

Kingdom: Plantae

Division: Magnoliophyta

Class: Magnoliopsida

Order: Malvales

Family: Malvaceae (Bombacaceae)

Genus: Bombax

Species: ceiba

Binomial name: *Bombax ceiba* L.; *Bombax malabaricum* D.C.

### **Morphology**

#### **Flowers**

The bright red flowers, that seem in a Gregorian calendar month to March, are giant and conspicuous on the leafless trees. It presents a strikingly exceptional sight in winter and spring once the typically clean branches are coated with giant, fleshy, red flowers. Birds are drawn to them, and are in all probability chargeable for their fecundation. These flowers kinda scarlet carpet on the bottom for few weeks (2-3 weeks) once dropping.



The flower of red silk-cotton tree square measure terribly showy, enticing and visual from long distances additionally. as a result of its lovely and enticing flowers, folks prefer to plant it because the decorative plant within the arboretum, garden or because of the avenue species. Flowers square measure various, large, 10-12.5 cm across. It clustered towards the ends of branches at the time of flowering. it's the thick, fleshy and cup formed Sepals. It bears typically five petals in one flower that square measure seven.5-15 cm long rectangular, recurvate on top of, and fleshy, of bright crimson (rarely yellow or orange) color

#### **Habitat and Distribution**

The flower of red God tree unit really showy, attractive and visual from long distances in addition. as a result of its beautiful and attractive flowers, people value more highly to plant it as a result of the ornamental plant inside the facility, garden or attributable to the avenue species. Flowers unit numerous, large, 10-12.5 cm across. It clustered towards the ends of branches at the time of flowering. it is the thick, fleshy and cup-shaped Sepals. It bears generally 5 petals in one flower that unit seven.5-15 cm long rectangular, curving on prime of, and fleshy, of bright crimson (rarely yellow or orange) color

#### **Asia-Temperate**

China: China -Fujian, Guangdong, Guangxi, Guizhou, Jiangxi, Sichuan, Yunnan

Eastern Asia: Taiwan

#### **Asia-Tropical**

Indian Subcontinent: Bhutan; India; Nepal; SriLanka

Indo-China: Cambodia; Laos; Myanmar; Thailand; Vietnam

Malesia: Indonesia; Malaysia; Papua New Guinea; Philippines

#### **Australasia**

Australia: Australia - Northern Territory, Queensland, Western Australia (Chaudhary, P.H. et. al. 2012; Rameshwar, V. et al. 2014).

#### **Chemical Constituents in flower**

These contain  $\beta$ -sitosterol,  $\beta$ -sitosteril- $\beta$ -D-glucoside, polysachharide-Dgalactose, hentriacontane, hantriacontanol, traces of essential oil, kaempferol, quercetin, Larabinose, L-rhamnose.

## Antioxidant Activity Test

Antioxidant compounds in food play a vital role as a health protective issue. Scientific proof suggests that antioxidants scale back the chance for chronic diseases together with cancer and heart condition. Primary sources of present antioxidants square measure whole grains, fruits, and vegetables. Plant-sourced food antioxidants like ascorbic acid, vitamin E, carotenes, phenoplast acids, phytate, and phytoestrogens are recognized as having the potential to scale back unwellness risk. Most of the inhibitor compounds during a typical diet square measure derived from plant sources and belong to numerous categories of compounds with a good kind of physical and chemical properties. Some compounds, like gallates, have sturdy inhibitor activity, whereas others, like the monophenols square measure weak antioxidants. the most characteristic of associate inhibitor is its ability to entice free radicals. extremely reactive free radicals and element species square measure gift in biological systems from a good kind of sources. These free radicals could oxidize nucleic acids, proteins, lipids or DNA and may initiate disease. inhibitor compounds like phenoplast acids, polyphenols and flavonoids scavenge free radicals like peroxide, hydroperoxide or macromolecule peroxy and therefore inhibit the aerophilic mechanisms that result in chronic diseases. There square measure variety of clinical studies suggesting that the antioxidants in fruits, vegetables, tea, and vino square measure the most factors for the ascertained effectuality of those foods in reducing the incidence of chronic diseases together with a heart condition and a few cancers.

## Antimicrobial Screening

The main objective of acting the medicinal drug screening is to see the susceptibleness of the infective microorganisms to check compound that, successively is employed to the choice of the compound as a therapeutic agent. In general, antimicrobial screening in-vitro is undertaken in the following 2 steps:

- **Primary Assay**

It is primarily a qualitative or semi-qualitative check that indicates the sensitivity or resistance of microorganisms to the compound. but this system can't be wont to distinguish between organic process and antiseptic agents. the first assay is often performed in vitro by disk diffusion assay methodology, that includes:

**a) Plate Diffusion check**

**b) Streak check**

The plate diffusion check utilizes totally different concentrations of a check compound absorbed on sterile paper disks on constant plate whereas the streak check permits the determination of the medicinal drug result of a check compound on many microorganisms at the same time and is appropriate for the estimation of the spectrum of the activity. However, the plate diffusion check is usually used.

- **Secondary Assay**

It quantifies the relative efficiency like minimum repressive concentration (MIC). all-time low concentration of AN antimicrobial agent needed to inhibit the expansion of the microorganisms in vitro is stated as minimum repressive concentration (MIC). it's done by serial dilution technique (Reiner, R. 1982).

## REFERENCES

1. Brock, J, Top END Native Plants- A Comptehensive Guide to The Tree and Shrubs of The Top End of The Northen Territory, Australlia, Reed New Holland, Darwin, Australia, 354, PP, 2001.
2. Anisuzzaman, M. A. H. M. M. Rahman, M. Harun or Rashid, An ethnobotanical study of Madhupur, Tangail. Journal of Applied Sciences Research, 3(7), Page N. 519-530, 2007.
3. Saleem, R. M. Ahmed, S. A. Hussain, Hypotensive, Hypoglycaemic and Toxicology Studies on the Flavonol C-Glycoside Shamimin from Bombax ceiba, Plant Medica, 65(4), Page. N. 331-334, 1999.
4. Srivastava, K. Ethnobotanical studies of some important ferns, Ethnobotanical leaflets, 11, Page N. 164-172, 2007.
5. Lin J, Opak War, and Geheeb-Keller M. Preliminary screening of some traditional Zulu medicinal plants for anti-inflammatory and antimicrobial activities. Journal of Ethnopharmacology, P. No. 68: 267–274, Year 1999.
6. Iswaran,V, A Laboratory Handbook for Agreecultural Analysis. New Delhi Today and Tomorrow's Prienters and Publisher, P. No. 209222, Year 1980.
7. Ward G. M, Chemical Methods of plant Analysis; Canada: Department of Agriculture Publication, P. No. 1064, 19-20, Year 1962.
8. Negi, Y. S, Rawat M. S. M, Pant-Joshi G, and Badoni S, Biochemical Investigation of Fruits of Some Common Ficus Species J. Food Science and Technology, P. No. 25; 582-584, Year 1992.
9. Jayaraman J. Laboratory Manual in Biochemistry. New Dehli, India: Wiley Estern Ltd, 56.
10. Quality Control Methods for Medicinal Plant Materials. World Health Organization, Geneva, P. No. 559:10-24, Year 1998.
11. P. K. Mohanty, Neha Chourasia, Preliminary Phytochemical Screening of Cajanus cajan Linn. Asian J. Pharm. Tech. Vol. 1: Issue 2, P. No. 49-52, Year 2011.
12. Kokate C. K. Purohit A. P. and Gokhale S. B, Pharmacognosy, Nirali prakashan 33 edition, P. No. 108-109, Nov. 2005.