

# Pharmacognostic and Phytopharmacological Overview on *Bombax ceiba*

Pankaj Haribhau Chaudhary<sup>1\*</sup>, Mukund Ganeshrao Tawar<sup>2</sup>

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## ABSTRACT

Plants have been an important source of medicines since the beginning of cultivation. There is a growing demand for plant-based medicines, health products, pharmaceuticals, food supplements, cosmetics etc. *Bombax ceiba* Linn. (Bombacaceae) is a tall tree buttressed at the base that is widely distributed throughout India, Ceylon and Malaya, upto 1500 m of altitude. Many parts of the plant (root, stem bark, gum, leaf, prickles, flower, fruit, seed and heartwood) are used by various tribal communities and forest dwellers for the treatment of a variety of ailments. The plant literature survey shows the plant possesses astringent, cooling, stimulant, diuretic, aphrodisiac, demulcent and tonic effects and also helps in dysentery. It also possesses important pharmacological activity such as aphrodisiac, anti-inflammatory and hepatoprotective activity in addition to anticancer

and anti-HIV activity, anti-*Helicobacter pylori*, antiangiogenic, analgesic and antioxidant activity and hypotensive, hypoglycemic and antimicrobial activity. It is reported to contain important phytoconstituents such as naphthol, naphthoquinones, polysaccharides, anthocyanins, shamimin and lupeol.

**Key words:** *Bombax ceiba*, Ethnobotanical uses, Phytochemistry, Pharmacological activities.

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## INTRODUCTION

Natural products are an important source of new compounds leading to drugs in all major disease areas. They represent a pool of structures that have been optimized by evolution to interact with proteins and other molecules.<sup>1</sup> The starting materials for about one-half of the medicines we use today come from natural sources. The future of higher plants as sources of medicinal agents for use in investigation, prevention and treatment of diseases is also very promising.<sup>2</sup>

Natural products have provided some of the important lifesaving drugs used in the armamentarium of modern medicine. However, among the estimated 250,000-400,000 plant species, only 6% have been studied for biological activity and 15% have been investigated phytochemically. This illustrates the need for planned activity guided phyto-pharmacological evaluation of herbal drugs.

This article aims to provide an overview of the chemical constituents present in various parts of *Bombax ceiba* and their ethnobotanical and pharmacological actions. It has been claimed in Ayurveda, that *Bombax ceiba* possesses proven medicinal properties and is the ingredient of many formulations.

## HABITAT AND DISTRIBUTION

*Bombax ceiba* Linnaeus belongs to the family Bombacaceae which contains about 26 genera and nearly 140 pantropical species. It is commonly known as Semal, Simbal, Simul, Indian kapok, Katsavar, Indian bombax or Red Silk cotton tree. It is widely found in temperate Asia, Tropical Asia, Africa and Australia. In India, it can be found at altitudes upto 1500 m. In peninsular India, the tree is very common in the dry as well as moist deciduous forests and near rivers. The tree is a strong light-demander and fast growing. It grows best on deep sandy loams or other well-drained soils, particularly in valleys, in regions receiving 50 to 460 cm annual rainfall well distributed throughout the year.<sup>3</sup>

## MORPHOLOGY

Semal is a lofty, deciduous tree up to 40 m tall with horizontally spreading branches and young stems covered with hard prickles. (Figure 1)

**Bark**- grey brown or silver grey colored with hard sharp conical prickles

**Leaves** - are large, spreading, glabrous, leaflets lanceolate, 3-7 and margin entire

**Flowers** - are red numerous, appearing when the tree is bare of leaves, stamens many arranged in five bundles of 9-12 each and an inner bundle of 15.

**Fruits** - The fruits are brown capsule-like upto 15 mm long, filled with numerous black seeds.

**Seeds** - are smooth, black or grey embedded in long white wool, which are irregular obovoid in shape, smooth and oily with dense silky hair.

**Gum** - Light brown to opaque or dark brown called as semul gum.<sup>4</sup>

## TAXONOMICAL CLASSIFICATION

**Kingdom:** Plantae

**Division:** Magnoliophyta

**Class:** Magnoliopsida

**Order:** Malvales

**Family:** Bombacaceae

**Genus:** *Bombax*

**Species:** *ceiba*

**Binomial name:** *Bombax ceiba* L.; *Bombax malabaricum* D.C.; *Salmalia malabarica* (D.C.) Schott and Endl.<sup>5</sup>

## TRADITIONAL USES

Ayurveda, the traditional Indian medicine, describes the excellence of plants by combining both the Pharmacognosy (properties) and Pharmacology (action). These traditional parameters reflect not only the quality but also efficacy of the plants. Some of its medicinal uses and formulations as mentioned in Ayurveda are being described here.

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# AMERICAN JOURNAL OF PHARMTECH RESEARCH

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## Review on Marine Sponge: Derived Natural Products and formulations

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4. Department of Pharmaceutical Chemistry, Faculty of pharmacy, P. R. Pote Patil College of Pharmacy, Amravati-444604

### ABSTRACT

Sponges are the rich sources of bioactive natural products from marine habitats. Since many sponges harbor diverse bacterial communities, it has long been suspected that many sponge-derived compounds are of microbial origin. The present review gives a comprehensive overview of the source, taxonomy, country of origin or geographical position, chemical class, and biological activity of sponge-derived new natural products. Also this review aims at describing some of the most highly cited reviews of the last decade on sponge-derived bioactive compounds and the most promising substances extracted and isolated from marine sponges for pharmaceutical applications. Present study gives new developments in the field of marine sponge metabolite research and important findings for bioactive compounds from in vitro, in vivo and clinical studies for therapeutic drug applications.

**Keywords:** Marine drug, Sponges, phylum Porifera.

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## Formulation and Characterization of Solid Lipid Microparticles

Adnya D. Bahurupi<sup>1\*</sup>, Prashant J. Burange<sup>1</sup>, Mukund G. Tawar<sup>1</sup>, Shital R. Ingole<sup>1</sup>  
*1. Department of Pharmaceutics, Faculty of pharmacy, P. R. Pote Patil College of Pharmacy,  
Amravati-444604*

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### ABSTRACT

The aims of review are the latest research development of the lipid based carriers according to the recent relevant literatures. Each preparation of the lipid based microparticles (SLMs) has advantages and disadvantages. The SLMs is an excellent drug delivery system and has broad prospects in the pharmaceutical field. This review discusses the advantages, therapeutic application of SLMs, various techniques of preparation, and different routes of administration, material use and characterization of solid lipid microparticles.

**Keywords:** SLM, Production technique, Lipid based carrier, Pharmaceutical application.

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## Review Article

## Phytochemical Information and Pharmacological Activities of Eggplant (*Solanum Melongena L.*): A Comprehensive Review

Ms. Sohani B.Solanke<sup>1\*</sup> Dr. M.G.Tawar<sup>2</sup><sup>1</sup>Dr.Rajendra Gode Institute of Pharmacy, Amravati- 444602 India<sup>2</sup>P. R. Pote Patil College of Pharmacy, Amravati-444602

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Ms. Sohani B.Solanke

**Abstract:** The eggplant (*Solanum melongena L.*) is a herbaceous, vegetable crop with coarsely lobed leaves, white to purple flowers, fruit is berry and are grown around the world mainly for food representing one of the best dietary sources of biologically active polyphenolic compounds, vitamins, antioxidants and medicinal requirements. The plant contains flavonoids, tropane, glycoalkaloids, arginine, lanosterol, gramisterol, aspartic acid as important constituents. Metabolomics and metabolic profiling are important platforms for assessing the chemical composition of plants and breeders are increasingly concerned about the nutritional and health benefits of crops. The plant is reported to have analgesic, antipyretic, antioxidant, anti-inflammatory, antiasthmatic, hypolipidemic, hypotensive, antiplatelet, intraocular pressure reducing, and CNS depressant and anaphylactic reaction inhibitory activities. In this review, an overview mainly on the historical background, phytochemistry and pharmacology are discussed.

**Keywords:** Eggplant, *Solanum melongena L.*, brinjal, vegetable crop.

### 1. INTRODUCTION

The therapeutic efficacy of herbal medicines in India leads to the evolution of Ayurveda. Apart from Ayurveda, the traditional system of medicine, throughout the length and breadth of the country used many common plants/plant products as household remedies. *S. melongena* var. esculentum is an economic flowering plant belonging to the family Solanaceae which contains 75 genera and over 2000 species (Biology of Brinjal, 2011) and are grown mainly for food and medicinal purposes (Igwe *et al.*, 2003). Eggplant fruit popularly known as aubergine (UK), melanzana, garden egg, brinjal, Baingan (India) and is one of the most important vegetable crops grown on over 1.7 million ha worldwide. It is an important crop of subtropics and tropics and grown extensively in India, Bangladesh, Pakistan, China, Nepal, Philippines and Srilanka accounts for about 75% of eggplant production.

The name eggplant derives from the shape of the fruit of some varieties, which are white and shaped very similarly to chicken eggs. The color, size, shape of the eggplant fruit vary significantly with the type of eggplant cultivar. (Kwon *et al.*, 2007) Phytochemical

studies have yielded flavonoids, alkaloids, tannins and steroids. (Kwon *et al.*, 2007) It is widely distributed in India for its fruit. Various parts of the plant are useful in the treatment of inflammatory conditions, cardiac debility, neuralgias, and ulcer of nose, cholera, bronchitis and asthma. Besides, having many traditional uses, *S. melongena* is reported to exhibit many important pharmacological actions.

#### Taxonomical Hierarchy

Kingdom: Plantae  
 Subkingdom: Viridiaeplantae  
 Infrakingdom: Streptophyta  
 Division: Tracheophyta  
 Subdivision: Spermatophytina  
 Infradivision: Angiospermae  
 Class: Magnoliopsida  
 Subclass: Asteridae  
 Order: Solanales  
 Family: Solanaceae  
 Genus: Solanum L.  
 Species: *Solanum melongena* Linn.

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## **Development and Validation of Analytical Instrumental Method for Pharmaceutical Products**

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### **ABSTRACT**

Development, and production of pharmaceutical products. The authorized test methods that result from HPLC, UV processes are used by quality control laboratories to make sure the Identity, characteristics, purity, potency, and performance of drug products. Analytical methods development ought to be validated to give reliable data for regulatory submissions. This review gives information regarding various stages involved in development and validation of analytical methods like UV, HPLC. Rapid increase in pharmaceutical industries and production of drug in various parts of the world has brought a rise in demand for new analytical techniques in the pharmaceutical industries. As a result, analytical method development has developed into the basic activity of analysis. Recent development in analytical methods has been result from the advancement of analytical instruments.

**Keywords :** Keywords: High performance liquid chromatography (HPLC); (LOQ) UV-visible spectrophotometer. limit of detection (LOD); Limit of quantitation

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# Development and Characterization of Hydrogel Containing Resveratrol by using $3^2$ Factorial Design

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Department of Pharmaceutics, P. R. Pote Patil College of Pharmacy, Amravati-444602

## ABSTRACT:

The primary goal of this study was to create a controlled-release dosage form utilizing a cellulose-based hydrogel that was cross-linked with propylene glycol. Hydrogels were made by cross-linking the polymer Chitosan Hydrochloride with propylene glycol, a suitable cross-linking agent. According to an IR and DSC analysis, there is no indication of interaction between the medication, polymers, and other excipients. The hydrogel gave good swelling and controlled release properties due to the cross-linking process. Design-Expert 11.0 was used in this study to create a 32 complete factorial design with two central points. This study chose the concentration of Polyethylene Glycol(X1) and reaction time (X2) as independent factors. In contrast, drug content, swelling index, and  $t_{75}$  % cumulative drug release were chosen as dependent variables. The effect of Polyethylene Glycol concentration on drug content and  $t_{75}$  % CDR was non-significant based on the findings. However, the influence of Polyethylene Glycol concentration on the swelling index was substantial, indicating that as Polyethylene Glycol concentration rose, the swelling index of the hydrogel decreased. Again, the effect of response time on drug content and  $t_{75}$  of % CDR was substantial, implying that as reaction time rose, drug content and  $t_{75}$  of % CDR of hydrogel increased. However, the effect of response time on the swelling index was not statistically significant. Drug content, swelling index, and  $t_{75}$  of % CDR of run BB1 are the best based on all responses. This run's drug content, swelling index, and  $t_{75}$  % CDR are 99.5 %, 276.64 %, and 3.5 hrs. So BB1 was used to test the improved formulation, which produced the best in vitro release of 94.24 % in 6 hrs. Different kinetic models were fitted to the in vitro data, which showed the best model was Higuchi with the non-friction mode of drug release. Stability data showed that the formulations were stable during the study period. From the study, it was concluded that the prepared hydrogel could provide a sustained release effect with better bioavailability which will surely enhance its absorption throughout the body

**KEY WORDS:** Resveratrol, Hydrogel, Factorial Design, Cross-linking, Controlled-Release Dosage Form

## I. INTRODUCTION:

There is no precise control over drug release in traditional dosage forms, and the supplied dose of medication reaches the systemic circulation immediately. Designing oral controlled medication delivery systems should be to provide more predictable and improved drug bioavailability. Among all the methods that have been investigated for the systemic delivery of medicines via various pharmaceutical products of varied dose forms, the oral drug delivery system has made significant progress as the most commonly used drug administration. Hydrogels are hydrophilic, three-dimensional polymeric networks capable of absorbing vast quantities of water or biological fluids. The networks are made up of homopolymers or copolymers and are insoluble owing to chemical crosslinks (tie-points, junctions) and physical crosslinks such as entanglements and crystallites. The latter is responsible for network structure and physical security.



# Development and Characterization of Hydrogel Containing Resveratrol by using $3^2$ Factorial Design

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