



A REVIEW ON INDIAN MEDICINAL PLANTS AND ITS THERAPEUTIC IMPORTANCE WITH SPECIAL REFERENCE TO ALTHEA OFFICINALIS AND THESPESIA POPULNEA

¹Mr. Dnyaneshwar B Gutale, ²Prof. J. V. Vyas, ³Dr. V. V. Paithankar, ⁴Dr. A. M. Wankhade, ⁵Mr. Balaji Mohan Tarase

¹Student, ²Professor, ³Professor, ⁴Professor, ⁵Student

¹Department of Pharmacology,

¹Vidyabharti College of Pharmacy, Amravati, India

Abstract: For numerous centuries, the use of plants as medicine has been prevalent in various civilizations. Although slight differences occur, plants have persisted as a ready source of basic medical care. The medicinal properties of healing plants have been documented in classical texts such as the Vedas and the Bible. These plants boast a myriad of bioactivities which can be utilized to prevent and cure many diseases. This traditional wisdom about the usefulness of plants has been passed down orally, from generation to generation, throughout all the diverse divisions of humanity. To ensure their sustainable consumption and rescue them from extinction, a clear record of their potency is essential. This review seeks to summarize the characteristics of two plants, *Althea officinalis* and *Thespesia populnea*, which are especially important in providing curative treatment.

Index Terms - Bioactivities, Medicinal properties, Thespesia populnea, Althea Officinalis, Phytochemical constituents, Ayurvedic medicine.

I. INTRODUCTION

Indian medicinal herbs have been employed for centuries as traditional medicine. India is home to a tremendous diversity of plants, many of which are renowned for their medicinal properties¹. The well-established Ayurvedic system of medication, stemming from India, has been powerful in treating and preventing various health conditions². More recently, researchers have paid more attention to these herbs as they have the potential to be applied in traditional medicinal practices and emerging drugs³.

This review aims to examine Indian medicinal plants and their medicinal importance, with a focus on two plants: *Althea officinalis* and *Thespesia populnea*. These plants have garnered enormous attention due to their customary implementations and potential pharmaceutical performances.

Althea officinalis

Althea officinalis, often called marshmallow, is an indigenous shrub endemic to Europe and Asia. It has traditionally been seen as advantageous due to its softening and therapeutic properties³. Its roots and leaves are laden with different organic substances, including polysaccharides, flavonoids, and phenolic acids, that display anti-inflammatory, antioxidant, and immunomodulatory capabilities, according to pre-clinical research⁴. The plant is routinely employed to treat respiratory difficulties, digestive troubles, and skin ailments⁵. However, to fully comprehend the curative features of *Althea officinalis* and how it functions, more investigation is mandatory.

Thespesia populnea

Thespesia populnea, otherwise known as the Portia tree or Indian tulip tree, is a medium-sized evergreen tree that is often found along the coastlines of India. For many years, it has been utilized in Ayurvedic medicine due to its various medicinal benefits². *Thespesia populnea* contains a selection of useful compounds, such as flavonoids, tannins, and alkaloids, found in its foliage, bark, and flowers, each of which offers multiple advantages, such as reducing inflammation, relieving discomfort, controlling microbial growth, and even potentially eliminating cancer cells⁶. The plant has a long history of being employed to address problems linked to the respiratory and digestive systems, as well as skin conditions⁷. Yet, more research is necessary to fully comprehend the therapeutic possibilities of *Thespesia populnea* and how it works.

The review will commence by examining the long-standing use of Indian medicinal plants in Ayurveda and other ancient medical modalities. It will then zoom in on the chemical structure of *Althea officinalis* and *Thespesia populnea*, emphasizing the primary components responsible for their remedial effects. The review will delve into the pharmacological activities of these plants, particularly their ability to cure a variety of diseases and ailments. Additionally, it will discuss the existing scientific data confirming the traditional applications of *Althea officinalis* and *Thespesia populnea*.

This review seeks to analyze the efficacy of two Indian healing plants, *Althea officinalis* and *Thespesia populnea*. It delves into their customary applications, chemical composition, and pharmacological activities to evaluate their potential use in traditional medications and new drug development. To fully unlock their therapeutic potential, additional investigations are required to identify and cultivate novel medicines regarding their bioactive substances.

Table 1: Kingdom Classification of Medicinal Plants

Classification	<i>Althea Officinalis</i>	<i>Thespesia populnea</i>
Kingdom	Plantae	Plantae
Subkingdom	Tracheobionta	Spermatophyta
Division	Magnoliophyta	Angiospermae
Class	Magnoliopsida	Dicotyledoneae
Order	Malvales	Malvales
Family	Malvaceae	Malvaceae
Genus	Althaea	Thespesia
Species	<i>Althaea officinalis</i>	<i>Thespesia populnea</i>
Common Name	Marshmallow	Portia tree

II. Phytochemical Constituents Present in the Plants

Althea officinalis

Althaea officinalis contains a polysaccharide termed 'mucilage', which bestows the herb with its calming and defensive characteristics⁸. When mixed with water, this results in a gel-like consistency, creating a layer for the protection of the mucous membranes⁹. Consequently, *Althaea officinalis* is advantageous for healing respiratory maladies like coughs, sore throat, and bronchitis¹⁰.

Althea officinalis is rich in a variety of flavonoids, including quercetin, kaempferol, and rutin⁸. It possesses antioxidant and anti-inflammatory characteristics¹¹. These compounds assist in combating free radicals, limiting oxidative distress, and swelling¹². Such reactions aid in conditions like arthritis, cardiovascular disorders, and skin afflictions¹³. *Althea officinalis* holds phenolic compounds, such as caffeic acid and chlorogenic acid. These compounds inculcate antioxidant and anti-inflammatory qualities, much like flavonoids¹⁴. This assists in protecting cells from impairment induced by free radicals and limits swelling in the body¹¹. These properties make *Althea officinalis* favorable for problems such as gastritis, stomach ulcers, and dermal disturbance¹⁵. Another genus of phytochemicals existing in *Althea officinalis* is tannins¹⁶. These possess astringent qualities, which assist in firming and toning tissues¹⁷. In addition, tannins have antimicrobial effects, making them beneficial in curing infections¹⁸. Tannins in *Althea officinalis* is responsible for its wound-curing attributes and help in mitigating diarrhea and other digestive issues¹⁹. Aside from mucilage, *Althea officinalis* possesses additional polysaccharides that deepen its medicinal effects²⁰. These polysaccharides possess immunomodulatory properties, meaning they can manage the immune system²¹. This boosts immunological performance, thus making *Althea officinalis* beneficial for bolstering overall immune wellness²².

Thespesia populnea

Thespesia populnea, an herb with medicinal traits, possesses varied phytochemicals²³. Its heartwood comprises quinones such as mansonone-H, mansonone-D, thespesone, and thespone²⁴. The bloom has gossypetin, kaempferol, and kaempferol-7-glucoside²⁵. The seed kernels contain thespian, cetyl alcohol, and sitosterol²⁶. The leaf extracts consist of β -sitosterol, lupeol, lupine, acacetin, quercetin, and ferulic acid²⁷. Xu et al. (2012) discovered 1, 4, 5-Trihydroxy-3-methoxy-6-methyl-9, 10-anthraquinone, 1, 8-Dihydroxy-3-methoxy-6-methyl-9, 10-anthraquinone, and 1, 8-Dihydroxy-3-carboxy-9, 10-anthraquinone from the herb²⁸. Additionally, other compounds identified include β -Daucosterol, 3-Hydroxy-13(18)-ENE-28-oleanolic acid, Catacerebroside B, Palmitic acid, and a new sesquiterpene quinone dehydrooxoperezinone-6-methyl ether which exhibit cytotoxic and antibacterial qualities²⁹. The heartwood further hosts 3, 6, 9-Trimethyl-2, 3-dihydrobenzo[d]chromene-7, 8-dione, 5, 8-dihydroxy-7-methoxyflavone, 7-hydroxy isoflavone and glycoside, kaempferol- β -D-rutinoside, a new mansonone 7-hydroxy-2, 3, 5, 6-tetramethylnaphtho [1, 8-b, c] pyran-4,8-dione in conjunction with mansonones D, E, F³⁰.

III. Bioactivities of These Selected Plants

Althea Officinalis

Pereira et al. (2006) conducted an experimental study on the anti-inflammatory properties of *Althea officinalis*. This showed that the extract had a notable capability to reduce paw edema and inhibit the outputs of interleukin-1 beta and tumor necrosis factor-alpha (TNF-alpha)³¹. Evidently, the extract had a substantial capacity to decrease inflammatory responses in test rats³².

It has long been established that *Althea officinalis* is an efficacious natural remedy for coughs and respiratory afflictions. Zhang, Y., et al. (2017) investigated its antitussive agent properties through a guinea pig study, the results of which pointed to the extract significantly reducing cough frequency and intensity³².

It has been demonstrated to possess gastroprotective effects, especially when it comes to defending the gastric mucosa against damage. Magdy, M. A. et al. (2019) scrutinized the gastroprotective effects of *Althea officinalis* extract in rats. They discerned that the extract significantly curtailed gastric ulcer formation by fortifying the production of safeguarding mucus, diminishing gastric acid secretion, and curbing the activity of enzymes which aid in the formulation of gastric ulcers³³.

The *Althea officinalis* extract demonstrates immunomodulatory capacities, signifying that it can modify or control the immune system. A trial by Javanmardi, K., et al. (2015) aimed to investigate the immunomodulatory capability of *Althea officinalis* extract in mice. Results from the study showed that the extract significantly augmented immune functionality by stimulating the function of immune cells such as macrophages and lymphocytes³⁴.

Althea officinalis has traditionally been utilized for wound healing. Khorasani et al. (2018) studied the curative influence of *Althea officinalis* extract in rats. They ascertained that the extract sped up tissue formation, increased collagen production, and facilitated the travel of cellular elements linked to the wound healing course of action³⁵.

Thespesia Populnea

Thespesia populnea has been identified to have its own inherent wound-healing capabilities by stimulating the generation of new cells in shredded or extracted body regions. In a survey done on Wistar albino rats, the stem bark powder of the plant displayed significant wound-healing outcomes³⁶. Moreover, the aqueous fruit extract of *Thespesia populnea* provided evidence of its capacity to provoke wound healing consequences, with its topical use considerably augmenting healing by 79.17% on the 8th day and minimizing scarring through the action of epithelialization³⁷.

Psoriasis is a perpetual dermal ailment that can cause dire health issues³⁸. The ancillary properties of *Thespesia populnea* tree bark in dealing with psoriasis were examined using Perry's scientific mouse tail version as a topical mixture. The data revealed that the extract had a constructive outcome against the infection. Moreover, employing *Thespesia populnea* ferments into up-to-date treatments has been identified as effective in relation to psoriasis³⁹.

The antipyretic abilities of alcoholic and aqueous extracts from *Thespesia populnea* were demonstrated using a rat model. The physical temperature of the specimens was experimentally increased using the assistance of yeast. The outcomes of the investigation indicated that both extracts exhibited significant antipyretic efficiency, similar to that of paracetamol⁴⁰.

Bactericide resistance is an influential concern in present circumstances due to the overuse of man-made antibiotics⁴¹. A study was performed to analyze the bactericidal activity of *Thespesia populnea* root extracts on human pathogenic bacteria such as *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas aeruginosa*, *Bacillus subtilis*, and *Klebsiella aerogenes*. The outcomes showed that bacterial growth was restricted at concentrations between 50-250 µg/disc⁴². Furthermore, the leaf extracts were discovered to be effective against *E. coli*, *P. aeruginosa*, *S. epidermidis*, and *B. cereus*⁴³. The methanol flower extract of *Thespesia populnea* also displayed substantial bactericidal activity against Gram-positive bacteria compared to Gram-negative bacteria⁴⁴.

Fungal infections are generally infrequent, yet they can be notably severe in patients with weakened immune systems⁴⁵. Experiments conducted on *Candida* and *Aspergillus* species revealed that the methanol extract was more potent than the ethyl acetate, chloroform, and hexane extracts. The methanolic leaf extract was found to be most efficient against *Aspergillus fumigatus*, with a mean zone of inhibition of 22.8mm⁴⁶. Kumar, A. et al. (2010) declared that the crude alcohol extract of *Thespesia populnea* exhibited solid antifungal activity against *C. lunata* and *C. albicans*, while the petroleum ether bark extract of the same plant revealed greater activity against *C. albicans* and *A. flavus* than the alcoholic or aqueous extracts⁴⁷.

IV. CONCLUSION

This article comprehensively reviews Indian medicinal plants, focusing on *Althaea officinalis* and *Thespesia populnea*. It assesses the contribution of traditional Indian medicine towards healing and the potency of medicinal plants in both historical cures and present-day medication. The study analyzes the chemical makeup and pharmacological benefits of these plants, encompassing anti-inflammatory, antioxidant, and immunomodulatory properties. *Althaea officinalis* has traditionally been used to treat respiratory, intestinal, and skin problems, while *Thespesia populnea* has been utilized in Ayurvedic medicine for its anti-inflammatory, analgesic, antimicrobial, and alleged anti-cancer properties. The review emphasizes the need for additional research into the therapeutic potential of these plants to preserve indigenous knowledge and rituals related to medicinal herbs.

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