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A review on Pharmacognostical, Phytochemical & Pharmacological Investigation of Lagerstroemia Speciosa

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Introduction:
Regardless of this logical period, natural medication despite everything assumes a significant job as an elective medication, absent a lot of logical technique based proof upheld up. As far as country, it additionally shows its sparkle in europe. The endorsed drugs are sold nearby with basic oil or a home grown teas [1]. *Lagerstroemia speciose* is a type of tree which have develope in tropical or subtropical areas [2]. *Lagerstroemia speciosa* leaves used to treat diabetes, fevers, edema, urinary dysfunction and digestive disorders. Jarul (common name) extract are also known to have anti-oxidata, anti-obesity, cytotocic-activity, anti-gout effect [3]. The plant Lagerstroemia is a small or a medium size tree (20-30 m), the size of leaves 8-14 cm long or 3-7 cm broad, the size of flowers 20-30 cm and the flower petals size 2-3 cm[4].

General Information:

Common Name: Crepe Myrtle [5], In English- Pride of India [6], In Hindi- Jarul [7]

Botanical Name: Lagerstromia speciose (Lytharceae) [8]

Family: Lythraceae [9]

Order : Myrtales [10]

Genus: Lagerstroemia [11]

Species: L. speciose [12]

Size of Tree: 20 m. (66ft) [13]

Flower colour : Pink & Lavender pink [14]

Taxonomical Classification [15]
Class- Magnoliopsid
Family- Lythraceae
Species- *Floribunda*
Genus- Lagerstroemia
Kingdom- Planta, Vegetal
Subkingdom- Viridaeplantae

Morphology [16]

Leaves- alternate or petiolate

Flowers- flexibly, actinomorphic

Stem- subalate, puberulous

Petals- purple or white, slenderly

Stigma- capitate

Seeds- obpyramidal

Local Name of *Lagerstroemia specios* [17]

Origin	Local name
India	Ajhar, Challa, Arjuna, Jarul
Malaysia	Bongor biru
Burma	Gawkng
Indonesia	Bungur
Thailand	Chuangmuu, Ta-Bak

Origin and Geographical Distribution:

Geographical Location: India, Kerala[18]. Congenital to India & Asia,distributed various tropics and sub-tropics. [19]

Plant Description: Qween's crepe myrtle is a fsat growing tree, usually grows 15 metres and some time the growing ratio of this tree up to 25-26 metres. The tree is harvested for the use of medicine. This tree is amazingly showy of flowering trees. Commonly this plant is cultivated for garden uses and some time its used as a ornamental and for the reason of brightly coloured flower its seeded on the rode side. The leaves turn red colour before falling in winter.[20]

Cultivation: A plant of the wet, swamp tropics and subtropics, where it is found at rises up to 400 meters. It grows in day periods when the temperature are 18-35℃ [21]. Flourishes in a situation in full sun on a wide scope of clammy, very much depleted soils[22]. The tree has been effectively developed in urban regions where air contamination, poor waste, compacted soil, and additionally dry season are normal.

Other Health Benefits of *Lagerstroemia specios*: Blood pressure control, Diarrhra treatment, Facilitates bowel movement, Kidney disorder [23].

Pharmacognistical study:

Macroscopy Study: Shape, Surface, Size, Characteristic, Odour, Taste, Colour and Texture. [18]

Microscopy Study: Study of epidermal cells, Trichomes, Stomata, Xylem [19].

Powder Study: Similar to microscopy study. Dried powder is taken. [20]

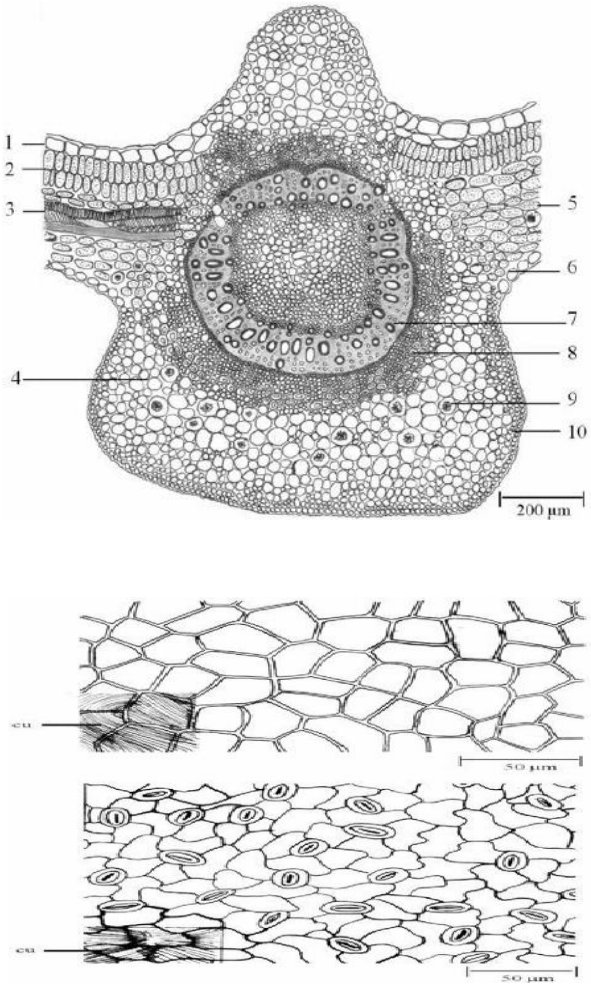
Macroscopic evaluation[21]

The morphological assessment for the distinguishing proof of L. speciose was portrayed. L. specious is a tall free that can grow up to 20 to 25 m in tallness, however it blossoms while it is still a bush. Its bark is smooth darker or dim in shading, smooth and strip in meagre drop. The leaves are around 11 to 26 cm long and 7 to 12 cm wide and are comprehensively praise or elliptical fit as a fiddle. The develop leaves are smooth. There are 10 to 15 sets of side veins, circled at the edge and very conspicuous underneath. Old leaves are orange-red in shading. The blossoms are 5 to 7.5 cm in distance across and brilliant pink to purple in shading. The Natural product is 1.5 to 2.5 cm in size and globose fit as a fiddle.

In organoleptic assessment, proper parameters like smell, size, taste, shade and shape of the leaves and leaf powder were contemplated. Perceptibly, the shade of their leaves was appeared in olive green to yellowish darker. The almost impeccable leaves were 7 to 15 cm wide and 10 to 28 cm long. The petiole was 1 cm long. The state of leaves was extensively, praise or elongated. There were a few pieces of leaves. Some of rough medication from conventional drugstore were cleaved in little pieces. The smell was somewhat trademark and the taste was marginally harsh. Leaf powder is green and yellowish dark coloured in shading with trademark smell and marginally unpleasant in taste.

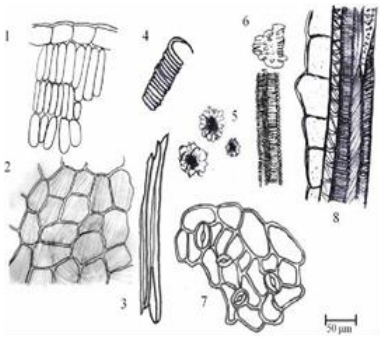
Microscopic evaluation[22]

Minute qualities were analysed both in transverse segments and in the powder. The transverse area of the midrib demonstrated parenchyma, collenchymas, phloem, xylem and parenchyma containing calcium oxalate precious stones. The transverse area of the midrib demonstrated that epidermal cells were rectangular to round fit as a fiddle, with partitioning cells happening consistently. Some epidermal cells contained circular bunches of rosette total calcium oxalate precious stones, and a few cell were developed and adhesive. The adhesive cells would in general into the mesophyll and some of the time seemed, by all account, to be underneath the upper epidermis. Cells of the upper epidermis were about twice as extensive as those of the lower epidermis. The mesophyll was well separated and made out of a twofold palisade layer that made the lamina and light layers 4 to 6 cells thick. The lamina in the sectional perspective on the leaves indicated an upper epidermis in which a few cells contained adhesive, palisade and supple parenchyma, and lower epidermis. The upper epidermal cells were polygonal cells. The cell length was around equivalent to the width or twice as long as the straight divider. The lower epidermal cell were sporadically moulded, and their divider were somewhat twisted. The anomocytic stomata were just found in lower epidermis. The leaf powder were olive-green shading with a marginally harsh taste. The powdered medications showed a portion of the equivalent minute attributes.



Microscopic Characteristics. 1) upper epidermis; 2) palisade parenchyma; 3) group of vascular bundles; 4) parenchyma; 5) spongy parenchyma; 6) lower epidermis; 7) xylem vessel; 8) phloem tissue; 9) rosette aggregate calcium oxalate crystal in a parenchyma cell; 10) collenchymas. [23]

Surface view. 1) upper epidermis showing striated cuticle; 2) Lower epidermis with anomocytic stomata.[24]



Microscopic characteristics of powder L. speciose. 1) Part of the lemina in section view, showing the upper epidermis; 2) upper epidermis in surface view; 3) group of lignified fiber; 4) spiral vessel; 5) rosette aggregate crystals of calcium oxalate; 6) reticulate vessel; 7) lower epidermis in surface view; 8) fibrovascular tissue or parenchyma cell.[23]

Phytochemical Investigation[25]

- Phytochemical screening yielded saponins, phenolic compound and flavonoids. Phytochemical screening yielded phenolic compounds, flavonoids, and saponins.
- Study have isolated: ellagitannin Lagerstroemin, gallotannins and corosolic acid.
- Penta-O-galloyl-glucopyranose recognized as the most intense of the gallotannins, with a higher glucose transport stimulatory action than Lagerstroemin. Notwithstanding invigorating glucose take-up in fat cells, it additionally has against adipogenic properties.
- Phytochemical studies and screening on leaves have yielded sugar, anthraquinone, saponins, flavonoids, glycosides, steroids, proteins, starch, tannins, organic acid and other metabolites.
- Phytochemical screening of methanol crude extract of roots yielded saponins, reducing sugar, alkaloids and flavonoids.[26]
- GC-MS hydro distillation analysis of essential oils from L. speciosa floers yielded 0.085% with 45 compounds. Major volatiles in the flowers were αβ-bisabolene(5.97), β-pinene (8.45), α-pinene (10.38), α-terpinol (12.76), limonene (2.60), trans-β-ocimene (1.33) etc.[27]

Phytoconstituents	Tests	Observation
Anthraquinone Glycosides	Borntrager's test	+
Cardiac glycosides	Killer-Killani test	+
Flavonoids	Bate-smith-Metcalf test	+
Saponins	Froth test	+
Tannins	Ferric chloride test	+
Sugars	Fehling's test	+
Alkaloids	Mayer's test, Dragendorff's	-
Proteins	Millon's test	+

Pharmacological Study

Antioxidant / Leaves: A hydro alcoholic extract of leaves of L. speciose to show antioxidant activity in the nitric oxide model. [28]

Antibacterial activity / Leaves: A methanolic extract of leaves yielded saponins, anthraquinones, tannins and flavonoids. The extract show high antibacterial activity against the bacteria of S. aureus or a P. aeruginosa.[29]

Antiviral activity / Human Rhinovirus / Ellagic Acid: Study show the antiviral activities of tannin ellagic acid from leaves of L. speciose. Ellagic acid does not interact with HRV-4. Ellagic acid also inhibited RNA replication of HRV-4. [30]

Anti-inflammatory activity: Study showed that anti inflammatory activities from the ethanol extract and ethyl acetate extract of Lagerstroemia speciose. [31]

Antinociceptive activity and Anti-diarrhoeal activity / Dried fruits: Study shoed that, dried fruits antinociceptive activities in animal models and the result showed significant inhibition in acetic acid induce in mice. [32]

Cytotoxic activity / Essential oil of Fruits: GC-MC study showed the hydrocarbon in fruits essential oil. Represented 82.14 %, methyl benzene 18.2 %, methyl cyclohexane 60.9 % of total essential oil. [33]

Anti-diabetic: Study showed that tannin are responsible for insulin of the plant extract and corosolic acid does not possess insulin. [34]

Anti-obesity activity/ Polyherbal Formulation: A polyherbal formulation containing G. cambogia, G. Sylvester and the result was similar to sibutramine.[35]

Acute Toxicity Study / Non-Toxic: Toxicity impact of ethanol concentrates of Lagerstroemia in 30 make grown up Dawley rats. The crude ethanol extract is non toxic. [36]

Hypertension: Its also used in the treatment of blood pressure, renal and immune system benefits.

Plant Activity	Plant Part	Drug
Anti-Oxidant	Leaves	Alcoholic Extract
Anti-Bacterial	Leaves	Methanol Extract
Anti-Viral	Leaves	Tannin ellagic acid
Anti- inflammatory	Leaves	Ethyl acetate extract
Cytotoxic activity	Fruit	Essential oil
Anti-diabetic	whole Plant	Plant Extract