

Pharmacognostical and Phyto-Physicochemical Screening of *Magnolia Champaca* L.

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Introduction:

Hippocrates (460-380 BC), the father of medicine classified herbs according to their essential qualities; moist and dry, hot and cold and successfully developed a system of diagnosis and prognosis using herbs. Herbalism also termed as herbal medicines or phytomedicine or phytotherapy is the study of pharmacognosy and use of various medicinal plants. Plants with medicinal properties referred as medicinal plants or medicinal herbs have been discovered and used as traditional medicines worldwide. Medicinal plants are considered as safe for the treatment of various diseases and infections [1]. Plants synthesize thousands of chemical compounds with varying properties viz. defence, insecticidal, antioxidant, antifungal, antibacterial etc. the composition of secondary metabolites and essential oils differ in different plants and plant parts as well. Medicinal plants are considered as a storehouse of numerous bioactive compounds with varying therapeutic properties. According to world health organization (WHO), various kinds of drugs are obtained from medicinal plants and about 80% world's population depends on traditional medicines for primary healthcare needs [2].

The Plant: *Magnolia Champaca* L.

Magnolia champaca is a large evergreen tree of 18-21 m. It is a medium-tall tree attaining a height of 33-35 m. or more. The bark is light gray, smooth and about 2 cm. thick. *M. champaca* belongs to family Magnoliaceae and consist of 12 genera and 220 species containing evergreen trees and shrubs [3].

Taxonomic positions of the plant:

Kingdom: Plantae – Plants

Subkingdom: Tracheobionta -- Vascular plants

Super division: Spermatophyta -- Seed plants

Division: Magnoliophyta -- Flowering plants

Class: Magnoliopsida -- Dicotyledons

Subclass: Magnoliidae

Order: Magnoliales

Family: Magnoliaceae -- Magnolia family

Genus: *Magnolia* L.

Species: *Magnolia champaca* L.



Fig.1. Morphology of *M. champaca* L. Plant

(Source: https://en.wikipedia.org/wiki/Magnolia_champaca)

Macroscopic characteristic of Plant:

Roots: Branched taproot

Stem: Erect, free, aerial, branched and woody

Bark: Bark thick, rough, blaze light brown, young shoots silky

Leaves: Simple, alternate, stipulate, stipule convolute; petiolate, ovate, entire, acute, unicostate reticulate. The ends of the twigs are hairy. The medium sized oval leaves are lance

shaped and pointed at both ends, and green with fine hair on the lower surface. Leaves 13-25

cm × 5.0-9.0 cm, finely acuminate with undulated margin, pubescent underneath, glabrous, shiny above, lateral veins about 16 pairs, lanceolate with slender petiole..

Flowers: Bracteate, pedicellate, complete hermaphrodite, actinomorphic, hypogenous, large in size, axillary, solitary, pale to deep yellow with fragrant.

Inflorescence: Solitary, axillary.

Perianth: Usually 9 perianth leaves are sepalloid and inner 6 lobes are petalloid or all the

9-perianth lobes are petaloid.

Fruits: Elongated ball like, slightly bent, initially green in colour later turned to pale grey to rough. Fruits are in chain, aggregate of follicles, consist of long clusters of capsules, at maturity opens at the back by two valves.

Pharmacognostical Properties Of *Magnolia Champaca* L.

M. champaca possesses a large number of pharmacognostical activities viz. diuretic, anti-microbial, antiulcer, anti-diabetic, anti-inflammatory, burn-wound healing, anti-oxidant (free radical scavenging), analgesic, anti-cancer, cytotoxic, anti-hyperglycemic, Leishmanicidal, anti-infective, anti-fertility, anti-helminthic, cardioprotective, anti-fungal, carminative, astringent etc. The plant was traditionally been used to treat cough, bronchitis, diarrhea, hypertension, dyspepsia, rheumatism, fever and inflammation. various plant parts contains wide spectrum of secondary metabolites and essential oils. Dried root and bark: abscesses, purgative, inflammation, constipation, dysmenorrhea, stimulant, expectorant, astringent and febrifuge; Flowers and flower buds: ulcers, skin disease, wounds, antidote to snake and scorpion venom, foetid discharge from nostrils; Flower buds: herbal preparations for diabetes, Flower oil: cephalalgia, oedipthemia, Flowers: stimulant, antispasmodic, tonic, stomachic, bitter and cool remedies and are used in dyspepsia, nausea and fever; Fruits: ulcers, skin diseases and Leaves: colic.

The pharmacognostical activities are subjected to preparation of plant parts extracts by using various solvent systems, ethanol, methanol, dichloromethane, aqueous (water), hexane, ethyl acetate, hydro-alcoholic etc.

Phyto-Physicochemical Screening Of *Magnolia Champaca* L.

Phytochemical evaluation of various plant parts of *Magnolia champaca* is the step next to extraction of different constituents found in extract, carbohydrates, alkaloids, amino acids, saponins, steroids, glycosides, flavonoids, phenols, proteins, oils, triterpenoids etc. extensive studies has been undertaken on chemical composition of *M. champaca* seeds and flowers [4]. The leaf of *M. champaca* constitute wide spectrum of compound composition [5-15] viz. Naphthalenemethanol 7.70%, Acetic acid 6.68%, 2, 3-Butanediol 6.46%, Phenol 6.25%, Andrographolide 4.56%, 5-Dodecyne 3.61%, Pimaric acid 3.08%, Ortho-Formylphenoxyacetic acid 2.80%, Succinamic acid 2.78%, Benzoic acid 2.66%, Methyl β -D-galactopyranoside 2.45%, 2-Propanone, 1-hydroxy- 1.93%, Trimethoxyvinylsilane 1.81%, Androstane-3%, 17-diol, 17-methyl- 1.59%, Cyclooctane, (methoxymethoxy) 1.52%, 1, 2-Benzenediol 1.44%, Propane, 1-bromo-2-methyl- 1.34%, Octadecatrienoic acid 1.19%, 1-Pentyl-hexobarbital 1.13%, Hydroquinone 1.12%, 1-Alanine, N-isobutoxycarbonyl-, butyl ester 1.01%, Benzofuran, 2, 3-dihydro 0.96%, (E)-3(10)-Caren-4-ol 0.91%, 1-Alanine, N-allyloxycarbonyl-, undec-10-enyl ester 0.83%, Heptenoic acid 0.73%, Imidazole-5-pentanoic acid 0.70%, Bisnor-7-desoxycholic acid 0.68%, 2, 5-Dimethoxy-4-(methylsulfonyl) amphetamine 0.67%, Valeric acid 0.65%, 2-Furanmethanol 0.64%, 5-Eicosyne 0.63%, Tromethamine 0.55%, 2-Cyclopenten-1-one, 2-hydroxy- 0.54%, Glycerin 0.50%, 1-Pentyl-hexobarbital 0.50%, Pholedrine 0.47 and 11 unidentified

compounds 22.97%.

The flower composition of *M.champaca* is 9,12-Octadecadienoic acid, methyl ester, (E,E)- 39.55 %, 2-Propanone, 1-phenoxy 25.50%, Benzofuran, 2,3-dihydro- 9.89%, 5,8,11,14-Eicosatetraenoic acid, methyl ester, (all-Z)- 7.05%, Butanoic acid, 2-methyl-3-oxo-, ethyl ester 4.10%, 7-Oxabicyclo[4.1.0]heptanes, 1-methyl-4-(2-methyloxiranyl)- 3.69%, 7-Oxabicyclo[4.1.0] heptanes, 1-methyl-4-(2-methyloxiranyl)- 2.95%, Oleic acid 2.79%, Camphorsulfonic acid 1.98% and 3 unidentified compounds 2.50% [16].

Conclusion:

Natural remedies used traditionally worldwide due to low cost, safety and lack of side effects. Extensive literature survey proved that, *Magnolia champaca* is a rich source of ethnomedicines found to be effective against various diseases in ayurveda and unani system of medicines; as it is having wide range of phyto-chemicals. Along with ethnomedical and pharmacological properties, *M. champaca* acts as an antioxidant and free radical scavenger in the ethanolic, methanolic and aqueous extracts. *M. champaca* also exhibits an antibacterial activity against various gram positive and gram-negative bacteria.

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