

A Review Article On “(Limonia Acidissima L.)”

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Abstract: *Limoniaacidissima* is the only species within the monotypic genus *Limonia*. It is also known as wood apple belonging to family Rutaceae. In today's era herbs play vital role in every industry due to their different properties. This article mainly shows the importance of *LimoniaAcidissima* L. in cosmetics. This article also shows its Pharmacological activities and Medicinal uses. *LimoniaAcidissima* L. also known as Wood Apple belonging to family Rutaceae. Different parts of *LimoniaAcidissima* L. show different properties like essential oil obtained from the leaves of *LimoniaAcidissima* L. shows anti-bacterial activity because of carvacrol and cyclodecandine constituents. Shell shows anti-fungal activity against gram positive and gram-negative bacteria because of Psoralene. Pulp of the *LimoniaAcidissima* L is good for skin because of its higher moisture content. The other main constituents of *LimoniaAcidissima* L are saponins, flavonoids, amino acids, beta carotene, tannins, carbohydrates, vitamin B, triterpene. These constituents are responsible for some cosmetic properties hence *LimoniaAcidissima* L. can be used in cosmetic products.

Keywords: *LimoniaAcidissima* L., Antifungal, Exfoliation, Shell, Cosmetic Uses, Antibacteria.

I. INTRODUCTION

LimoniaAcidissima L. is one of many herbs used medicinally and cosmetically. Different parts of *LimoniaAcidissima* L. are responsible for different medicinal and cosmetic properties. *LimoniafruitAcidissima* L "[1]" used as a substitute for Bael in diarrhea and dysentery. The fruit is widely used in India as a liver and heart tonic. In its immature state, as an effective means of stopping diarrhea and dysentery and treating severe coughs, sore throats and illnesses. of gums. Crabapple leaves and stem bark have been studied for their antitumor and antibacterial properties, and the pulp has anti-inflammatory and antipyretic properties. "[2]" The fruit contains saponins, flavonoids that confer antioxidant properties. Plays an effervescent and antifungal role. Glycosides, tannins, some coumarins and tyramine derivatives are also used. Separated from *Limonia* fruit. The pericarp of *Limoniaacidissima* contains an antifungal compound, namely psoralen. xantoxin, 2,6-dimethoxybenzoquinone, ostenol "[3]" Fruit peels can also be used for peeling.

Plant Profile





Kingdom	Plantae
Sub-Kingdom	Tracheobionta
Superdivision	Spermatophyta
Division	Magnoliophyta
Class	Magnoliopsida
Sub-Class	Rosidae
Order	Sapindales
Family	Rutaceae
Genus	Limonia L.
Species	L. acidissima
Synonyms	Feroniaele phantum Correa, Feronia limonia (L.) Swingle, Schinus limonia L.

II. MARPHOLOGY

The tree of *LimoniaAcidissima* L. is a moderate sized, deciduous, erect tree with a few upward reaching branches bending outward near the summit where they are subdivided into slender, branchlets drooping at the tips throughout India” [4]”

It is a slow growing tree up to 9m tall, grows all over India in dry and warm areas up to 450m elevation, often tree with rough, spiny bark. The spines are axillary, short, straight, 2-5 cm long on some of the zigzag twigs” [5]”

DESCRIPTION OF DIFFERENT PARTS OF LIMONIA ACIDISSIMA L.:

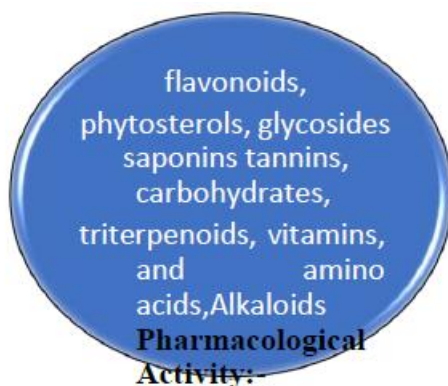
The leaves of *LimoniaAcidissima* L. are deciduous, alternate, dark-green, leathery, 3 to 5 inch long. Often minutely toothed, blunt or notched a dull- red or greenish, born in small, loose, terminal or lateral panicles.

The fruit is round to oval 5-12.5 cm wide with a woody, amazingly hard rind which can be difficult to crack. The fruit is greyish -white, it has a scurfy rind about 6 mm thick.

The pulp of *LimoniaAcidissima* L. is sticky, brown, and aromatic. It is odorous, resinous, astringent, acid or sweetish, with numerous small, white seeds scattered through it. There are two forms, one with large, sweet fruits and the other with small, acid fruits. *LimoniaAcidissima* L. is an aromatic plant.

The rind is greyish-white in colour and 6 mm thick. It has woody and extremely hard outer shell (called as rind) which is very difficult to crack open. Hammer is used to crack the hard rind of wood-apple fruit” [5]”.

Chemical Constituent



Wound Healing - Albino rates of either sex was used to check the wound healing activity by screening with methanol extract of fruit pulp of *Limonia Acidissima* L. In the excision wound model, the wound contracted progressively when treated with the extracts and required a mean period of 16.0 ± 0.8 days for optimum healing. Incision wound model showed increased wound breaking strength and decreased epithelisation period when treated with MELA (Methanol extract of fruit pulp). Different extracts of *Limonia Acidissima* L. possess significant dose dependent wound healing activity.” [6]”

Antibacterial Activity

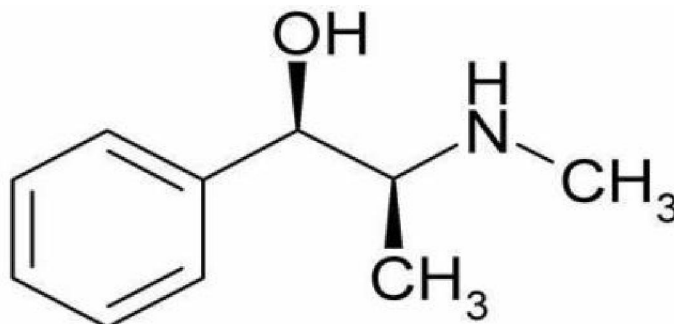
The methanol extracts of *Limonia Acidissima* L. plant parts were tested against *Escherichia coli* and *Staphylococcus aureus* using disc diffusion method. The extracts from different parts showed varying degrees of anti-microbial activity. Generally, extracts of all plant parts effectively controlled the growth of both gram negative and gram-positive bacteria. Among the 5 components of *L. acidissima* (bark, leaf, shell, pulp, seed) studied, the pulp extract showed greater inhibitory effect on both microorganisms “[7]”.

Anti-fungal Activity - The different extracts (petroleum ether, chloroform, methanol and aqueous) of *limonia Acidissima* L. fruit pulp exhibited antifungal activity against some pathogenic fungus” [8]”.

Effect of Active Constituent

Alkaloids –

The name of alkaloids derives from the “alkaline” and it was used to describe any nitrogen-containing base. They are usually organic bases and form salts with acids and when soluble gives alkaline solutions. Alkaloids are a group of naturally occurring chemical compounds that contains mostly basic nitrogen atoms. This group also includes some related compounds with neutral and even weakly acidic properties” [9]

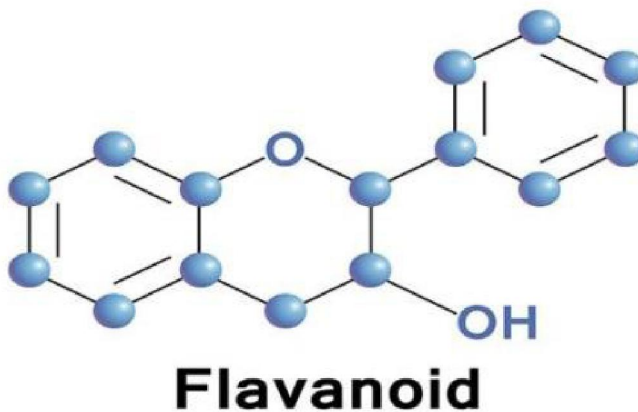


Cosmetics-

- Alkaloids are responsible for anti-bacterial and anti-fungal activity.
- Pyridine alkaloids have been found to present strong antimicrobial properties and have antioxidant activities due to their ability to act as scavenger of free radicals, hydrogen donation or electron or metal chelating activity“[10]”
- Alkaloid gives warming effect that can be made use of in foot care for instance.
- Alkaloids fights against wrinkle.
- Alkaloids also helps in Skin-tightening” [11]”

Flavonoids –

Flavonoids are polyphenolic compounds that are present in nature. Flavonoids are secondary plant metabolites share the chromane ring with tocopherols, these compound show antioxidant activity. In this activity major mechanism is induce direct scavenging of oxygen and nitrogen free radical, inhibition of oxyradical producing enzymes,iron chelation and reduction of leukocyte adhesion to the blood vessel wall during tissue inflammation and reperfusion”[12].



Cosmetics -

Flavonoids are important for skin aging activity. Flavonoids like kaempferol delay skin aging by contrasting enzyme that break down the extracellular matrix, such as collagenase, elastases and hyaluronidases “[12]”

- Flavonoids provide the best Antioxidant activity and protect the product from rancidity. The pulp of Limonia.
- Acidissima L. contains ascorbic acid which is responsible for antioxidant activity.Flavonoids also give anti-bacterial, anti-microbial and anti-fungal properties. Quercetin has been reported tocompletely inhibit the growth of Staphylococcus aureus“[13]”

III. CONCLUSION

The main aspect of this article is to focus on the cosmetic properties of the wood apple. Different parts of wood apple are responsiblefor different activities and we can use those activities in cosmetics application. Essential oil extract from leaves of wood apple givesanti-bacterial activity, so we can use it in the cosmetic product as needed. We can also use the antibacterial extract against fivegram positive and six-gram negative bacteria which is mentioned in the above topic. Mainly the shell can be used for the exfoliationpurpose in skin care cosmetics.

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