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Careya arborea (Kumbhi): An Overview of Morphological and Medicinal Aspects

Paresh Dhuri[1], Dadaso Shinde[2], Udaysinha Patil[2], Pravin Chavan[3]*
[1],[2]Department of Chemistry
[1]Dapoli Urban Bank Senior College Dapoli-Ratnagiri, Maharashtra, India.
[2]Shri Pancham Khemraj Mahavidyalaya Sawantwadi, Maharashtra, India.
[3] Doshi Vakil Arts College and G.C.U.B. Science and Commerce Goregaon-Raigad, Maharashtra, India.
[3] chemistryp141286@gmail.com

Abstract : *In Ayurveda, the wild guava, or Careya arborea Roxb, is known as Padmaka or Kumbhi. It belongs to the Lecythidaceae family. This tree is known for its winter-red leaves, thick, dark grey bark, and enormous, striking flowers. This plant has significant therapeutic value and is the source of most plant parts used in traditional medical systems. Antibacterial, astringent, demulcent, anticancer, antipyretic, antipruritic, hepatoprotective, antimicrobial, antioxidant, CNS effect, antileishmanial, antidiarrheal, anticoagulant, analgesic, antitumor, and cytotoxic properties have all been reported. The chemical components found in plants determine their pharmacological activity. An overview of recent findings about the pharmacogenetic and pharmacological activities of the plant Careya arborea is provided in this article.*

Key Words: Careya arborea, Phytoconstituent, Pharmacological activity, Pharmacogenetic study.

I. INTRODUCTION

In Ayurveda, the various bhasmas prepared from the various metals and plants were used as medicine that means the metals and plants are forming a complex structure which can be used as a medicine and stabilized by the other ingredient present in the plants. With this view of this we plan to synthesize the nanoparticles of various metals with the plant bark extract that can be used to treat the various disease [1]. The synthesis of nanoparticles through biogenic methods involves the use of a variety of natural resources that include all forms of plants. During the synthesis of nanoparticles by biological route, active enzymes/biomolecules (active metabolites/phytochemicals) of the biotic source act as reducing and capping agents, The usage of biotic sources not only reduces the risk of toxicity of the obtained particles to the environment but can also be produced in a large scale [2].

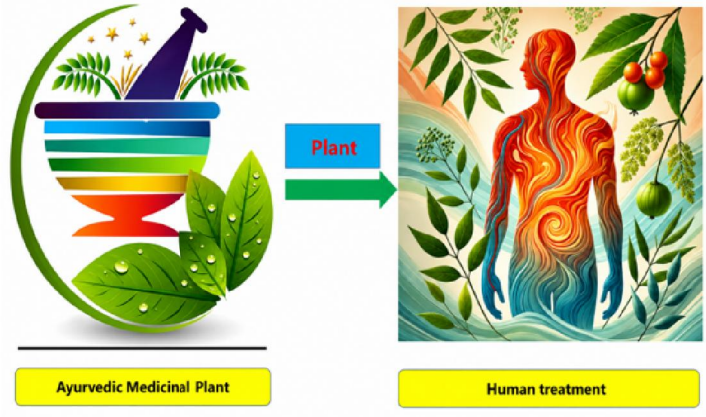


Figure 1. Ayurvedic Medicinal Plants Act as Sources for Human Treatment

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In Ayurveda, the various bhasmas made from various metals and plants were used as medicine, which implies the metals and plants are producing a complex structure that can be used as a medicine and stabilised by the other ingredients present in the plants. With this aim, we seek to synthesise the nanoparticles of various metals using the plant bark extract, which can be used to cure different illnesses.[1] Biogenic methods of nanoparticle synthesis demand utilisation of diverse natural resources, involving all species of plants. In biological route synthesis of nanoparticles, active enzymes/biomolecules (active metabolites/phytochemicals) of the biotic source function as reducing and capping agents. Not only does the use of biotic sources reduce the risk of toxicity of the obtained particles in the environment, but they can also be produced on a large scale [2]. Common names: Careya arborea (C. arborea) Roxb. (Lecthyidaceae): Kumbhi (Hindi), Wild Guava (English). It is a medium-sized deciduous tree, abounding in the Peninsula, India, Sri Lanka and Malaysia [3]. The plant is easily identified by its enormous, showy blooms, thick, dark grey bark, and winter crimson leaves. It blooms in March–April. Traditionally, the stem bark of C. arborea has been used for the treatment of tumours, bronchitis, skin diseases, epileptic fits, astringents, antidotes to snake venom, abscesses, boils and ulcers. Fruits are used as a decoction as a digestive aid [4]. A paste of the leaves and blossoms is used for certain skin problems. It is also used to treat diarrhoea, dysentery with bloody stools and earache. The pulp and the leaf paste are poulticed to quickly cure wounds, and the root is effective in treating tuberculosis and skeletal fractures. C. arborea is claimed to have in vitro cytotoxic activity, anticancer impact, N-nitrosodiethylamine-induced hepatocarcinogenesis, CNS depressant, anticoagulant and antioxidant action [5]. Use of Leaf Extract as Indicator in Acid-Base Titration. Qualitative chemical investigations indicated the presence of terpenoids, flavonoids, alkaloids, saponins and tannins in the stem bark of C. arborea Roxb [6].

II. CAREYA ARBOREA: (KUMBHI)

Careya arborea is a species of tree in the family Lecythidaceae. It is native to Afghanistan, Indochina and the Indian Subcontinent. Its Hindi name is Kumbhi and its English name is Slow Match Tree [7]. Lecythidaceae is a family of tropical trees including 450 species and around 20 genera. Most of the family occurs in the damp regions of tropical South America, but several genera occur in Africa and Asia [8].

The thick, dark grey bark of this tree is distinctive. The tree reproduces organically, by seed and coppice; The large, showy flowers and leaves turn red in the winter. It is a deciduous tree, 9 to 18 m in height. Leaves, obovate to obovate-elliptic, globous, clustered at branch terminals [9]. The flowers are produced in dense, stiff terminal spikes and are yellowish white. The fruits are large, green, globose and succulent. Bark is dark grey and fractured. The grain of the wood is of medium coarseness; the timber is strong, heavy and lasting. The sapwood is white, and the heartwood is reddish. The tree flowers between April and May. Fruiting: June and July (fruit ripens). The tree reproduces by scattering its seeds, which are disseminated when it begins to rain [10].



Figure 2. Careya arborea Plant

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III. TAXONOMIC CLASSIFICATION

Kingdom: Plants (Plantae), Clade: Tracheophytes (Vascular plants), Clade: Angiosperms (Flowering plants), Clade: Eudicots, Clade: Asterids, Order: Ericales, Family: Lecythidaceae, Genus: Careya, Species: C. arborea

IV. GEOGRAPHICAL DISTRIBUTION

It is common in India, Sri Lanka and the Malaya Peninsula and is sometimes grown in gardens and along roadsides. It is found in the districts of Belgaum, Bellary, Chikmagalur, Chitradurga, Coorg, Hassan, Mysore, North Kanara, Shimoga and South Kanara in Karnataka [11].

V. BIOLOGICAL STUDY OF CANEYA ARBOREA

Antioxidant and cytotoxicity study

Careya arborea is used in traditional medicine for the treatment of tumours and other diseases. The crude 50% methanol extract, chloroform and ethyl acetate extracts showed potent cytotoxicity against the malignant RD, HEp-2 and HELA cell lines. They were found to be safe on the normal Vero cell line. In vitro antioxidant screening revealed high antioxidant activity of the methanol and aqueous extracts against a number of oxidants. The concentration of total phenols was found to be high in these extracts. The results validate the ethnomedical uses of the herb and suggest high cytotoxic and antioxidant activity [12].

Anticoagulant activity

Formation of thrombus in blood vessels is a serious consequence, such as myocardial or cerebral infarction (thrombotic diseases). Thrombolytic drugs are used to dissolve blood clots that have already formed in blood vessels, while antithrombotic drugs are intended to prevent thrombosis. Herbal treatments have been used since ancient times to cure a range of ailments. Many plants used in various traditional systems of medicine to cure thromboembolic diseases have exhibited anticoagulant or antithrombotic activity [13].

Antioxidant and hepatoprotective activity

The present study was designed to evaluate the hepatoprotective and antioxidant activity of methanolic extract of Careya arborea stem bark in wister albino rats. The effect of MECA and silymarin on serum transaminase, alkaline phosphates, bilirubin, uric acid and total protein was studied in rats with carbon tetrachloride-induced hepatotoxicity. MECA is claimed to have substantial hepatoprotective and antioxidant activities [14].

Anticoagulant activity

Serious consequences of the thrombus that is formed in blood arteries include thrombotic diseases such as myocardial or cerebral infarction. Thrombolytic drugs are used to dissolve blood clots that have already formed in blood vessels, while antithrombotic drugs are intended to prevent thrombosis. Herbal treatments have been used since ancient times to cure a range of ailments. Many plants used in different traditional medicinal systems for the treatment of thromboembolic disorders have exhibited anticoagulant or antithrombotic activity [15].

Anti-diarrheal activity

The methanol extract of Careya arborea Roxb. significantly reduced castor oil-induced diarrhoea in mice. This effect supports the historic use of the plant in the area for the prevention of diarrhoea.[15]

Table 1: Traditional uses of Careya arborea Roxb [13].

Part used	Traditional uses
Whole plant:	Astringent, demulcent, antipyretic, antipruritic; in cough, cold and eruptive fevers; smallpox. Snake bite.
Fruits:	Cold and cough. Digestion promoter.
Flowers:	Aphrodisiac Acrid; cures 'Kapha', demulcent in cough and cold. Tonic. Vaginal ruptures, Fever. Colic and loose motions. Cold and Cough.

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Seeds:	Colic and loose motions.
Leaves:	Fever and swellings. Ulcers and skin diseases.)
Stem bark:	Constipation. Diarrhoea. Skin diseases.
Root:	Astringent.
Bark:	Washing and cleaning abscesses, boils, ulcers and diarrhoea Ear pain. Skin diseases. Antipyretic, antipruritic and eruptive fever. Smallpox and stomach disorders. Wound healing and body pain. Astringent and demulcent, Cough and Cold; Alexiteric, anthelminthic and in urinary discharges, Rheumatic pain and diarrhoea. Eye complaints, Abortifacient.

VI. CONCLUSION

The use of herbal medicinal plants from prehistoric times to the present is unique to our lives and has provided us with information on the use of plants or plant products as therapeutic agents in the treatment of various ailments due to their phytoconstituents. Careya arborea Roxb.: A valuable medicinal plant. A detailed survey of the literature revealed its pharmacological potential as a potent conventional drug. The drug is enhanced with sterols, terpenoids, tannins and flavonoids. The plant has several pharmacological effects such as anticancer, analgesic, anticoagulant, hepatoprotective, diuretic, antioxidant and antidiarrheal activities. But a more systematic pharmacological study is needed to develop better formulations.

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