EXPLORING THE SIGNIFICANCE AND MEDICINAL POTENTIAL OF *IPOMOEA CAIRICA*, *CALLICARPA MACROPHYLLA*, *CORDIA OBLIQUA*, *ALOE BARBADENSIS*, AND *LANTANA CAMARA*: A COMPREHENSIVE REVIEW

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ABSTRACT

This review explores the medicinal potential of five plant species: *Ipomoea cairica*, *Callicarpa macrophylla*, *Cordia obliqua*, *Aloe barbadensis*, and *Lantana camara*. *Ipomoea cairica*, also known as Cairo morning glory, is a tropical vine with a rich history of use in traditional medicine. Its pharmacological properties, including anti-inflammatory, antioxidant, and antimicrobial effects, make it a promising candidate for developing novel therapeutics. *Callicarpa macrophylla*, a shrub native to Asia, has diverse pharmacological activities, including anti-diabetic, anti-inflammatory, and neuroprotective effects. *Cordia obliqua*, an evergreen tree native to tropical regions, has anti-diarrheal, anti-inflammatory, and wound-healing effects. *Aloe barbadensis*, also known as aloe vera, is renowned for its therapeutic properties and has been extensively studied for its applications in dermatology, wound healing, and gastrointestinal health. *Lantana camara*, despite being considered a noxious weed in some regions, has pharmacological compounds with significant antimicrobial, anti-inflammatory, and analgesic properties. The review critically evaluates existing literature on the pharmacological properties, phytochemical composition, and traditional uses of these plant species and explores avenues for future research and development to harness their full therapeutic potential for global health and well-being. Through this review, we aim to enhance understanding of the medicinal importance of these plant species, fostering further research and conservation efforts.

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INTRODUCTION

For thousands of years, people have been passing on their knowledge of herbs to one another. Green medicine is often believed to be healthier than synthetic products, which is the fundamental reason for the recent decade-long surge in interest in natural pharmaceuticals. Global demand for herbal products has been rising rapidly as a result of the massive rise in the usage of plant-based health products in both developed and developing nations in recent times. About 80% of people worldwide rely on traditional medicine to manage a variety of illnesses, according to the World Health Organization **(Padmaa*, et al.*, 2010).** But because of overcrowding, urbanization, and ongoing exploitation of these herbal reserves, the natural resources and the traditional knowledge associated with them are running out every day **(Pande *et al.*, 2007)**. The conventionally utilized medications in diverse indigenous medical systems are the subject of more and more inquiry in this day of contemporary medicine and science. In the armament of the current medical professional, they are gradually reclaiming their appropriate position **(Paprikar and Paprikar, 2021)**. In the field of human medicine, medicinal plants are essential **(Soni *et al.*, 2014)**. In India's predominantly rural and tribal villages, an estimated 7,500 plants are utilized in traditional medicinal practices. Of these, the general public either knows very little about or has never heard of the true medical benefits of nearly 4,000 plants. Approximately 1,200 plants are used by traditional medical systems like Ayurveda, Siddha, Amchi, Unani, and Tibetan **(Payyappallimana, 2010)**. According to estimates from the World Health Organization (WHO), about 80% of people living in underdeveloped nations get their primary medical treatment from traditional medicines, which are primarily plant-based pharmaceuticals **(Sharma et al., 2008; Kumar and Chandrashekar, 2011; Abdel-Azim et al., 2011)**. Many plant products are assessed based on their historic applications in the current era of medication development and identification of novel pharmacological compounds. In this regard, few plants which are being evaluated for their therapeutic efficacies are taken to evaluate in this review.

1. *Ipomoea cairica*

A member of the *Ipomoea cairica* (Convoluulace) family is Ipomoea palmate. This herb climbs and grows well in tropical and subtropical climates. In addition to its various common names, it goes by the term railroad creeper **(Srivastava and Rauniyar, 2020)**. The Ipomoea genus, with over 400 species worldwide, is the largest flowering plant family in the convolvulaceae. Its major bioactive components include lipoidal matters and phenolic compounds. Ipomoea palmate is used in treating various diseases and is found in tropical and subtropical regions. The genus includes food crops like sweet potato tubers and water spinach leaves. *Ipomoe amauritiana* is an ingredient in chyawanprash, an ancient Ayurvedic medicine known as "the elixir of life." Its medicinal applications include treating blood diseases, sterility, urinary infections, constipation, and gynecological disorders **(Ferreira et al., 2006; Gupta et al., 1971; Prasad et al., 2008).**

2. *Callicarpa macrophylla*

Callicarpa macrophylla Vahl., also known as Priyangu in Sanskrit and Hindi, is an important Ayurvedic drug used for treating various ailments. In the Ayurvedic system, it is also known as Phalawati for obstetric conditions and forms an ingredient in Lodhrasa for gyanocological and skin diseases. There are two varieties of the plant, Priyangu and Gandha Priyangu, with the latter being a fragrant variety. The plant is used in folk medicine for treating various disorders, including tumors, polydipsia, diarrhea, dysentery, diabetes, and fever **(Anonymous, 1992)**.*Callicarpa macrophylla* is an erect undershrub with elliptic leaves measuring 1.5-2.5 meters tall. The leaves are densely starate and tomentose, with a petiole measuring 4-12mm. The inflorescence is axillary and purplish, with a bell-shaped, persistent gamosepalous calyx covering almost half of the fruit. The fruit is globose, drupes or berries, white to yellowish-brown with or without a fruit stalk, and can be attached or attached. The fruit is smooth and brownish, with a centrally located bilocular carpel and four nutella embedded with a yellowish white seed. The fruit is edible and tastes sweet at first, bitterish later, and has a distinctive fragrance after slight bruising **(Anonymous, 2008; Gupta et al., 2008; Mudgal et al., 1997; Dangol, 2008; Mehta et al., 2010).**

3. *Cordia obliqua*

The Boraginaceae family, consisting of 2,700 species, is distributed globally in tropical, sub-tropical, and warmer regions. It comprises 130 genera and six sub-families, including Cordioideae. The genus Cordia, a group of evergreen trees and shrubs, has around 300 identified species worldwide. In India, there are 13 Cordia species form which *Cordia obliqua* Willd species, a medium-sized deciduous tree is found

in mid-Himalyas up to elevations of 1,470 meters. There are two forms of *Cordia obliqua* Willd., found in Himachal Pradesh, with the smaller fruit size being more common **(Parmar and Kaushal, 1982).** Known by many names, including Bahal in Odia, Lasora or Lessora in Hindi, and Clammy cherry in English, *Cordia obliqua* Willd. is a medium-sized deciduous forest tree in the Boraginaceae family **(Dhal et al., 2015; Gupta and Gupta, 2015)**. The traditional Indian medical systems of India, including Ayurveda, Siddha, Unani, and Folk, have utilized its plant parts to treat a variety of illnesses **(Gupta and Gupta, 2015; Naik et al., 2022).** Dental conditions, such as toothaches, are treated with the bark, root, fruits, and seeds **(Ganesan , 2008).** Cough, chest pain, persistent fever, joint pain, and spleen disease are all treated with the fruits **(Aimey et al., 2020; Dinda and Mukharjee, 2009; Kirtikar and Basu, 1918).** To treat flu, cough, and cold fever, an oral decoction of leaves along with common salt is given twice a day for a week **(Dhal et al., 2015)**. The pharmacological properties of this plant also include antibacterial, antioxidant, anti-inflammatory, analgesic, antimalarial, hepatoprotective, hypotensive, respiratory stimulant, and diuretic properties **(Aimey et al., 2020; Gupta and Gupta, 2015; Yadav et al., 2015)**.

4. *Aloe barbadensis*

Since ancient times, people have utilized and appreciated the benefits of aloe vera for its medical, cosmetic, and skin-care qualities. The Latin word "vera" means "true," and the Arabic word "Alloeh" means "shining bitter substance," is where the name Aloe vera originates. Aloe vera was considered the all-purpose cure by Greek scientists 2000 years ago. Aloe was known to the Egyptians as "the plant of im- mortality." In dermatology, aloe vera has been utilized for a variety of purposes today **(Surjushe et al., 2008).** The plant is distinguished by an abundance of fruit seeds, golden tubular blooms, triangular, fleshy leaves with serrated edges. Every leaf contains three layers: A transparent gel with 99% water content and the remaining portion made up of glucomannan, vitamins, lipids, and amino acids. The central layer of rubber is formed by a yellow core that contains glycosides and anthraquinones. A thick layer of protecting cells known as the slough produces both proteins and carbs. Its 1520 cells are in it. Water and starch are transported by the shell's xylem and phloem compartments. Aloe vera has seventy-five active components, which include minerals, carbohydrates, lignin, vitamins, enzymes, and saponins **(Heber, 2007).**

5. *Lantana camara*

Lantana wild sage, also known as L. camara var. aculeata Moldenke, is a low, erect woody perennial shrub with stout recurved prickles and a strong black currant odor. In India, seven or eight species have been reported, including L. camara, L. indica, L. veronicifoila, and L. trifolia **(Rajendran & Daniel, 2002).** Three varieties of L. camara have been reported from India: L. camara var. aculeata Moldenke, L. camara var. mista Bailey, and L. camara var. nivea Bailey. L. camara is of hybrid origin and is a polyploid complex, composed of polyploids ranging from 2x to 7x. There is significant variability in morphological features such as habit, thorniness, leaf, flower, inflorescence, and fruit size among different populations. Differentiating between varieties and types is difficult due to morphological differences. Most varieties have recurved prickles on the stem, but under cultivation, they become less prickly, less vigorous, and set seeds less freely. Dwarf types have been developed for growing in hanging baskets and as a hedge along house borders **(Kumar & Subramaniam, 1986).** *Lantana camara* Linn. is a flowering ornamental plant in the Verbenaceae family, also known as Lantana, Wild Sage, Surinam Tea Plant, Spanish flag, and West Indian lantana. Introduced in India before the 19th century, it is distributed throughout India in moderate to high summer rainfall and well-drained sloping sites. Most variants prefer fertile organic soils, but some can survive on siliceous sands and sandstone-derived soils. Native to tropical regions, *Lantana camara* has dozens of strains and varieties with highly variable appearances **(Ganesh et al., 2010; Kumar et al., 2010)**.

TAXONOMICAL CLASSIFICATION OF PLANTS

Classification	***Ipomoea cairica***	***Callicarpa macrophylla***	***Cordia obliqua***	**Aloevera**	***Lantana camara***
Kingdom	Plantae	Plantae	Plantae	Plantae	Plantae
Division	Streptophyta	Angiospermae	Magnoliophyta	Magnoliophyta	Magnoliopsida
Order	Solanales	Lamiales	Lamiales	Liliales	Lamiales
Family	Convolvulacea	Verbanaceae	Boraginaceae	Aloaceae	Verbenaceae

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Class	Equisetopsida	Dicotyledons	Asteridae	Liliidae	Asteridae
Genus	Ipomoea	Callicarpa	Cordia	Aloe L	Lantana
Species	*Ipomoea cairica*	Macrophylla	Obliqua Willd	Aloe Barbadenis Mill, or Aloe vera (L.) Burm.F	*Lantana camara*

MORPHOLOGY OF PLANTS

Ipomoea cairica, commonly known as mile-a-minute vine, is a perennial vine belonging to the Convolvulaceae family. It exhibits a twining growth habit, with slender stems that can reach lengths of up to 10 meters. The leaves are alternate, heart-shaped, and usually measure about 5-10 cm in length. The flowers of *Ipomoea cairica* are trumpet-shaped, ranging in color from pink to purple, and appear in clusters. The fruit is a capsule containing numerous small seeds **(Singh et al., 2013; Stephen and Bopaiah, 2014; Srivastava and Shukla, 2015)**. *Callicarpa macrophylla*, or the large-leaved beautyberry, is a deciduous shrub native to East Asia. It grows up to 3 meters tall and is characterized by its opposite, serrated leaves that can reach lengths of 10-20 cm. The small, pink to purple flowers are arranged in terminal clusters, followed by clusters of purple berries that persist into the winter months **(Munir, 1982; Leeratiwond et al., 2009; Paprikar and Paprikar, 2021; Shankar et al., 2014)**. *Cordia obliqua*, commonly known as the clammy cherry, is a small to medium-sized tree found in tropical and subtropical regions. It has simple, ovate leaves with serrated margins and measures about 5-12 cm in length. The flowers are white to pale yellow, borne in axillary clusters. The fruit is a small, round berry that turns black when ripe **(Ravikumar et al., 2011; Harisha et al., 2013; Aimey et al., 2020)**. *Aloe barbadensis*, or aloe vera, is a succulent plant native to the Arabian Peninsula but cultivated worldwide for its medicinal properties. It forms rosettes of thick, fleshy leaves that can reach lengths of up to 50 cm. The leaves are green with white spots and serrated margins. The flowers are tubular, yellow, and borne on erect stalks **(Tyler, 1993; Surjushe et al., 2008; Heber, 2007; Nagansurkar et al., 2024)**. *Lantana camara*, or common lantana, is a flowering plant native to the Americas but widely naturalized in tropical and subtropical regions. It is a shrub that can grow up to 2 meters tall and is characterized by its opposite, serrated leaves. The flowers are small and clustered, ranging in color from yellow and orange to pink and purple, often with multiple colors on the same cluster. The fruit is a small drupe containing four seeds. These morphological descriptions are based on botanical literature and field observations**.**

DISTRIBUTION OF PLANTS

Ipomoea cairica is extensively naturalized in eastern Australia's warmer coastal regions, namely in the coastal provinces of Queensland and New South Wales. Additionally, on rare occasions, naturalized on Lord Howe Island, Norfolk Island, Christmas Island, and the coastal regions of southern South Australia and Southwest Australia. Additionally recognized as naturalized in New Zealand, the southern United States, Central America, South America, and many Pacific islands (such as Fiji, New Caledonia, Niue, the Solomon Islands, Tonga, and Hawaii) **(Brasileiro et al., 2006)**. C. macrophylla is a plant found globally in India, China, Bhutan, Myanmar, South East Asia, and Nepal. It is cultivated in drained sandy, loamy, and clayey soils with acidic and alkaline nature, with the hardy zone being primarily found at altitudes of the Himalayas. It is also found near swampy areas, waste lands, and roadsides. Plant propagation occurs by seed on February **(Sheat, 1965; Shi et al., 2013).** In almost all of the warmer regions of India and Ceylon, *Cordia obliqua* is abundantly dispersed. moreover discovered in many other regions of the globe, including tropical Australia, the Philippines, New Guinea, Hainan, Formosa, and Java **(Kirtikar and Basu, 1918).** Aloe vera is grown for agricultural purposes in many countries throughout the world, including the USA, Australia, Bangladesh, China, Mexico, India, Jamaica, Spain, where it grows even well inland, Kenya, Tanzania, and South Africa **(Singh et al., 2019).** *Lantana camara*, a widely distributed species, grows abundantly at elevations up to 2000 m in tropical, subtropical, and temperate climates. Its name is likely derived from the West Indian. *Lantana camara* typically grows in clusters smaller than or equal to 1 m in diameter in its native habitat in tropical America. It has attained naturalization in about 60 nations and is still growing in several islands, including Yap, the Galapagos, Palau, Saipan, Tinian, the Solomon Islands, and the Futuna Islands. *Lantana camara* is susceptible to frosts, low temperatures, and

saline soils, and does not have an upper temperature or rainfall limit **(Srivastavsa and Singh, 2011; Pour et al., 2009; Barreto et al., 2010; Pitasawat et al., 1998).**

COMPREHENSIVE HABITATS OF PLANTS

The habitat preferences of *Ipomoea cairica*, *Callicarpa macrophylla*, *Cordia obliqua*, *Aloe barbadensis*, and *Lantana camara* exhibit distinct variations reflective of their ecological niches. *Ipomoea cairica*, commonly known as Cairo morning glory, thrives in tropical and subtropical regions, often found along coastal areas or disturbed habitats like roadsides and waste areas. *Callicarpa macrophylla*, with its preference for moist, well-drained soils, tends to inhabit forest understories or slopes in subtropical and temperate zones. *Cordia obliqua*, also called the clammy cherry, favours tropical and subtropical climates, often seen in lowland forests or along riverbanks. *Aloe barbadensis*, renowned for its medicinal properties, flourishes in arid and semi-arid environments, particularly in sandy soils of hot climates. *Lantana camara*, notorious for its invasiveness, colonizes a wide range of habitats, from disturbed areas to grasslands, and is particularly dominant in tropical and subtropical regions. These observations are based on ecological studies and botanical surveys conducted in various regions, highlighting the diverse habitat preferences among these plant species **(Wood et al., 2015; Wood et al., 2018; Brown & Green, 2019; Chen et al., 2018; Radha and Laxmipriya, 2015; Kathuria et al., 2022).**

MEDICINAL PROPERTIES AND TRADITIONAL USES

1. *Ipomoea cairica*:

Traditional Uses: *Ipomoea cairica*, commonly known as mile-a-minute vine or railway creeper, has been used traditionally in various cultures for its medicinal properties. In traditional Chinese medicine, it is used to treat conditions such as rheumatism, swelling, and fever. The leaves are often made into poultices for treating wounds and skin infections. Additionally, the plant has been used as a diuretic and for its laxative properties **(Anitha, 2014).**

Medicinal Properties: Studies have shown that *Ipomoea cairica* possesses antioxidant, antimicrobial, anti-inflammatory, and analgesic properties. These properties are attributed to the presence of various phytochemicals such as flavonoids, alkaloids, and phenolic compounds **(Chen et al., 2018)**.

2. *Callicarpa macrophylla*:

Traditional Uses: *Callicarpa macrophylla*, also known as large-leaved beautyberry, has been used traditionally in Ayurvedic and folk medicine systems. In Ayurveda, it is utilized for its astringent, antipyretic, and anti-inflammatory properties. The leaves and roots of the plant are often used in various formulations to treat skin disorders, fevers, and gastrointestinal ailments.

Medicinal Properties: Research suggests that *Callicarpa macrophylla* possesses antioxidant, anti-inflammatory, and antimicrobial properties. These effects are attributed to the presence of bioactive compounds such as flavonoids, phenolic acids, and terpenoids **(Arya et al., 2023; Mona, 2016)**.

3. *Cordia obliqua*:

Traditional Uses: *Cordia obliqua*, commonly known as clammy cherry or fragrant manjack, has a long history of traditional use in various cultures. In traditional medicine, different parts of the plant such as leaves, roots, and fruits are used to treat conditions like coughs, colds, fever, dysentery, and skin infections. The plant is also used for its wound healing and analgesic properties **(Oza and Kulkarni, 2017)**.

Medicinal Properties: *Cordia obliqua* exhibits various pharmacological properties including antioxidant, antimicrobial, anti-inflammatory, and analgesic activities. These effects are attributed to the presence of phytochemicals such as alkaloids, flavonoids, and tannins **(Jamkhande et al., 2013)**.

4. *Aloe barbadensis*:

Traditional Uses: *Aloe barbadensis*, commonly known as aloe vera, is perhaps one of the most well-known medicinal plants globally. It has been used traditionally for centuries in various cultures for its therapeutic properties. Aloe vera gel, extracted from the leaves, is used topically to soothe burns, wounds, and skin irritations. Internally, it has been used for its laxative effects and to promote digestive health.

Medicinal Properties: Aloe vera is rich in bioactive compounds such as polysaccharides, anthraquinones, and vitamins, which contribute to its wide range of medicinal properties. These properties include wound healing, anti-inflammatory, antimicrobial, and immunomodulatory effects **(Surjushe et al., 2008; Eshum and He, 2004; Sahu et al., 2013).**

5. *Lantana camara*:

Traditional Uses: *Lantana camara*, commonly known as lantana or wild sage, has been used

traditionally in folk medicine for its various medicinal properties. In traditional systems of medicine, it has been used to treat conditions such as respiratory infections, fever, skin disorders, and digestive issues. Different parts of the plant, including leaves, stems, and roots, are utilized for their therapeutic benefits.

Medicinal Properties: *Lantana camara* exhibits a range of pharmacological properties including antimicrobial, anti-inflammatory, antidiarrheal, and antioxidant activities. These effects are attributed to the presence of phytochemicals such as terpenoids, flavonoids, and alkaloids **(Maroyi, 2021; Naphade et al., 2023).**

PHYTOCHEMICAL CONSTITUENTS OF PLANTS

Ipomoea cairica, *Callicarpa macrophylla*, *Cordia obliqua*, *Aloe barbadensis*, and *Lantana camara* are plants known for their diverse phytochemical constituentsshare certain chemical constituents that contribute to their medicinal or biological properties. These plants harbour a plethora of secondary metabolites such as alkaloids, flavonoids, phenolics, terpenoids, and saponins. Alkaloids, such as ergotamine and ergine, are found in *Ipomoea cairica*, contributing to its pharmacological activities. In *Ipomoea cairica*, phytochemical analyses have revealed the presence of alkaloids, flavonoids, and terpenoids, which exhibit antioxidant and antimicrobial activities **(Yadav and Agarwala, 2011; Das et al., 2018)**. *Callicarpa macrophylla* is rich in phenolic compounds and flavonoids like quercetin and kaempferol, known for their antioxidant and anti-inflammatory properties, contributing to its traditional medicinal uses **(Bisht et al., 2020)**. *Cordia obliqua* is renowned for its diverse secondary metabolites including alkaloids, flavonoids, and terpenoids, which exhibit various pharmacological activities such as antimicrobial, anti-inflammatory, and antioxidant effects. Along *Cordia obliqua* is rich in phenolic compounds such as ellagic acid and gallic acid, conferring its antioxidant and antimicrobial properties **(Jain et al., 2012; Sawant et al., 2018)**. *Aloe barbadensis*, commonly known as Aloe vera, is abundant in bioactive compounds like polysaccharides, anthraquinones, and phenolic compounds, *Aloe barbadensis*, renowned for its therapeutic benefits, contains polysaccharides like acemannan, along with anthraquinones such as aloin, which confer its therapeutic properties such as wound healing, anti-inflammatory, and immunomodulatory effects **(Boudreau and Beland, 2006; Salehi et al., 2018)**. *Lantana camara* contains terpenoids like lantadene A and B, known for their antimicrobial and insecticidal activities. *Lantana camara* contains alkaloids, flavonoids, and terpenoids among other compounds, contributing to its medicinal uses in traditional medicine for treating various ailments including inflammation, pain, and microbial infections **(Kumar et al., 2013; Battase and Attarde, 2021)**. These shared chemical constituents underscore the diverse biological activities exhibited by these plants, making them significant sources of natural remedies and pharmaceutical leads. These phytochemical constituents not only endow these plants with medicinal properties but also play crucial roles in ecological interactions, including defence against herbivores and pathogens, and attraction of pollinators and seed dispersers.

COMMON PHARMACOLOGICAL EVALUATION OF PLANTS

Ipomoea cairica, *Callicarpa macrophylla*, *Cordia obliqua*, *Aloe barbadensis*, and *Lantana camara* are plant species known for their diverse pharmacological activities, which have been extensively studied for their medicinal properties. According to numerous literatures survey Common pharmacological activities shared among these plants include antioxidant, anti-inflammatory, antimicrobial, and anticancer properties. Antioxidant activity is a significant pharmacological feature exhibited by these plants, attributed to the presence of polyphenolic compounds such as flavonoids and phenolic acids. These compounds scavenge free radicals and inhibit oxidative stress, thereby protecting cells from damage and reducing the risk of chronic diseases such as cancer, cardiovascular diseases, and neurodegenerative disorders **(Arora et al., 2013; Ralte and Lallianrawna, 2014; Dudharejia and shah, 2009** are some cases that define the anti oxidant activities of plants. Anti-inflammatory properties are also notable in these plants, primarily due to the inhibition of pro-inflammatory mediators such as cytokines and prostaglandins. This activity is crucial in the management of various inflammatory conditions like arthritis, asthma, and inflammatory bowel disease. **Yadav et al., 2012 b; Ferreira et al., 2006; Lin et al., 2008; Vazquez et al., 1996; Kulichenko et al., 2023** detailed some studies that define the anti inflammatory activities of plants. Furthermore, the antimicrobial activity of these plants makes them valuable in traditional medicine for treating infections caused by bacteria, fungi, and viruses. This antimicrobial effect is mediated by various secondary

metabolites present in these plants, which disrupt microbial growth and inhibit their proliferation. Moreover, several studies have reported the anticancer potential of these plants, indicating their ability to inhibit the growth of cancer cells and induce apoptosis. These anticancer effects are attributed to the presence of phytochemicals that target multiple pathways involved in cancer progression, making them promising candidates for the development of novel anticancer therapies. **Raghu et al., 2004; Karpagam et al., 2019; Lin et al., 2008; Ghatage et al., 2023** have performed studies that define the anti cancer activities of plants. Overall, *Ipomoea cairica, Callicarpa macrophylla*, *Cordia obliqua*, *Aloe barbadensis*, and *Lantana camara* demonstrate significant pharmacological activities, including antioxidant, anti-inflammatory, antimicrobial, and anticancer properties, which validate their traditional uses in folk medicine and highlight their potential for the development of new therapeutic agents.

FUTURE DIRECTIONS IN RESEARCH AND UTILIZATION

The future directions in research and utilization of *Ipomoea cairica*, *Callicarpa macrophylla*, *Cordia obliqua*, *Aloe barbadensis*, and *Lantana camara* hold promising potential across various domains ranging from medicine to environmental conservation. In the realm of pharmacology, these plant species offer a plethora of bioactive compounds with therapeutic properties that warrant further investigation. For instance, *Ipomoea cairica*, known for its antioxidant and antimicrobial properties, could be explored for its potential in developing novel drugs to combat microbial infections and oxidative stress-related diseases. Similarly, *Callicarpa macrophylla*, with its reported anti-inflammatory and anti-cancer activities, presents an avenue for the development of anti-inflammatory agents and cancer therapeutics **(Li et al., 2020)**. *Cordia obliqua*, recognized for its anti-diabetic and hepatoprotective properties, merits research attention for its potential in managing diabetes and liver disorders. *Aloe barbadensis*, widely known for its medicinal properties, including wound healing and anti-inflammatory effects, could be further studied for its applications in skincare, wound management, and gastrointestinal health **(Radha and Laxmipriya, 2015).** Additionally, *Lantana camara*, despite its invasive nature, contains compounds with antimicrobial and insecticidal properties, suggesting its potential in developing eco-friendly pesticides and antimicrobial agents. Furthermore, exploring the ecological implications of these plant species, particularly *Lantana camara*, could provide insights into biodiversity conservation and invasive species management strategies. Collaborative interdisciplinary research efforts integrating botany, pharmacology, ecology, and biotechnology will be instrumental in unlocking the full potential of these plant species for the benefit of humanity and the environment. By harnessing their bioactive compounds responsibly, these plants could contribute significantly to addressing global health challenges, fostering sustainable practices, and preserving biodiversity.

AS A SKIN CANCER EFFICIENT MULTIDISCIPLINARY DOSAGE

One promising avenue lies in the exploration of natural compounds derived from plants, which possess potential anticancer properties. Among these botanicals, *Ipomoea cairica*, *Callicarpa macrophylla*, *Cordia obliqua*, *Aloe barbadensis*, and *Lantana camara* have garnered considerable attention due to their bioactive constituents with demonstrated anticancer activities. Researchers are increasingly investigating the therapeutic potential of these plants either individually or in combination to combat skin cancer. *Ipomoea cairica*, for instance, contains flavonoids and polyphenols known for their antioxidant and anti-inflammatory properties, which could help mitigate UV-induced damage and inhibit cancer cell proliferation **(Lin et al., 2008).** *Callicarpa macrophylla* is rich in phenolic compounds with reported cytotoxic effects against cancer cells, suggesting its potential as a natural chemotherapeutic agent **(Niu et al., 2020)**. *Cordia obliqua* exhibits antioxidant and antimicrobial properties attributed to its phytochemical composition, which may contribute to preventing skin cancer development **(Rahman and Hussain, 2015; Wiart, 2022).** *Aloe barbadensis*, commonly known as aloe vera, has been extensively studied for its wound healing and anti-inflammatory properties **(Karapagam et al., 2019)**, and recent research indicates its potential in skin cancer prevention and therapy due to its bioactive compounds like aloin and aloe-emodin. *Lantana camara*, although known for its toxicity, contains bioactive compounds such as lantadene A and lantadene B, which have shown cytotoxic effects on cancer cells, suggesting a possible role in skin cancer treatment **(Raghu et al., 2004)**. Utilizing these botanicals in combination could offer synergistic effects, enhancing their anticancer properties while minimizing adverse effects. However, further research is needed to elucidate

the mechanisms of action, optimize formulations, and assess safety profiles before clinical application. This multidisciplinary approach integrating traditional knowledge with modern scientific methodologies holds promise in advancing skin cancer research and developing effective therapeutic interventions.

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