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# Review On: Anti-Inflammatory Herbal Cream

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**A B S T R A C T:**

Annona reticulata (Ramphal), also known as custard apple, is a tropical fruit-bearing tree with a long history of traditional medicinal use. This review article comprehensively examines the medicinal properties and health benefits associated with various parts of the Annona reticulata (Ramphal) tree, including its fruit, leaves, seeds, and bark. The fruit of Annona reticulata is rich in vitamins, minerals, and antioxidants, and have been traditionally used to treat various ailments such as diabetes, inflammation, and microbial infections. Scientific studies have highlighted its antioxidant properties and potential therapeutic effects against diabetes and inflammatory conditions. The leaves of the Annona reticulata tree have been utilized in traditional medicine for their hypoglycemic and antimicrobial properties. Research on related species suggests potential benefits for managing diabetes and combating microbial infections. Annona reticulata seeds, have often been overlooked, but they show activity as antimicrobial agents based on limited research. Studies have explored their potential effectiveness against certain bacteria and fungi, suggesting their utility in traditional medicinal practices. The bark of the Annona reticulata tree has been traditionally used for its antipyretic, antidiabetic, and antimicrobial properties, although scientific research specifically on Annona reticulata bark is lacking. While traditional uses of Annona reticulata parts suggest potential health benefits, further scientific research is necessary to validate these claims and elucidate their mechanisms of action. Understanding the medicinal properties of Annona reticulata could contribute to the development of novel therapeutic agents for various health conditions.This review article explores the effectiveness of antimicrobial creams in addressing microbial infections and supporting skin health. It examines the mechanisms underlying microbial growth on the skin and the diverse range of antimicrobial agents utilized in cream formulations. Special emphasis is placed on the antimicrobial properties of various plants. Through comprehensive analysis, the article underscores the potential of antimicrobial creams as natural alternatives for managing skin infections and enhancing dermatological well-being.

**Keywords:** Annona reticulata (Ramphal),Anti-Inflammatory agent, Anti-microbial agent and herbal materials, cream.

## Introduction:

Annona reticulata, commonly known as custard apple or bullock's heart, is a tropical fruit tree revered for its deliciously sweet and creamy fruits. Belonging to the Annonaceae family, this evergreen tree is native to the tropical regions of the Americas, particularly the Caribbean, Central America, and parts of South America. The fruit is known for its sweet and creamy flesh, whichis often compared to a combination of mango and banana flavors. [1] The custard apple tree is characterized by its medium to large-sized canopy, with glossy, dark green leaves that provide ample shade. Its flowers are unique, with three outer fleshy petals and three smaller inner petals, often greenish-yellow orreddish in color. The fruit, which typically matures in late summer to fall, is a compound fruit composed of numerous individual segments, each containing a glossy, black seed surrounded by soft, white, custard- like pulp. Cultivated for centuries by indigenous peoples and later by European settlers, custard apple has gained popularity worldwide not only for its exceptional taste but also for its nutritional and medicinal properties. The fruit is rich in essential vitamins and minerals, including vitamin C, vitamin B6, potassium, and magnesium, making it a valuable addition to a healthy diet. Beyond its culinary uses, custard apple has a long history of traditional medicinal use. Various parts of the tree, including the fruit, leaves, seeds, and bark, have been employed in herbal remedies for ailments ranging from digestive disorders to skin conditions. Additionally, scientific studies have identified bioactive compounds in custard apple, such as annonaceous acetogenins, flavonoids, and phenolic compounds, which exhibit antioxidant, anti-inflammatory, and anticancer properties [2].

In addition to its cultural and culinary significance, custard apple holds promise for sustainable agriculture and agro forestry practices. The tree is relatively low-maintenance, adaptable to a range of soil types, and can thrive in both tropical and subtropical climates. Its fruits provide a valuable source of income for farmers in many regions and contribute to biodiversity conservation efforts by providing habitat and food for wildlife [3]. Overall, Annona reticulata stands as a testament to the richness of tropical biodiversity, offering not only delectable fruits but also ecological, cultural, and economic benefits to communities around theworld [4].

**FIG. 1: ANNONA RETICULATA (Ramphal).**

## Herbal drug profile :

***Scientific classification of the plant :***

- Kingdom: Plantae
- Order: Magnoliids
- Family: Annonaceae
- Genus: Annona
- **Species:** Annona reticulata

**FIG. 2: Annona reticulata (L) plant.**

***Pharmacology of the plant :***

- Antipyretic activity
- Anthelmintic activity
- Antiulcer activity
- anti-inflammatory activity
- Antiproliferative activity
- antimicrobial activity

***Annona reticulata (Ramphal) roots***

**FIG. 3: Annona reticulata (Ramphal) roots.**

The roots of the Ramphal tree contain bioactive compounds such as alkaloids, tannins, and flavonoids, which contribute to their medicinal properties. Traditional uses of Ramphal rootsinclude their use as antimicrobial agents for treating infections and as antitussive agents for managing respiratory conditions.

Studies have reported the antibacterial and antifungal properties of Ramphal root extracts against various pathogenic microorganisms, supporting their traditional use in folk medicine. Additionally, the roots are sometimes used to alleviate symptoms of asthma and bronchitis detailed medicinal uses of each constituent found in Annona reticulata roots can provide valuable insights into its potential therapeutic benefits.

**Alkaloids:**

**Antimicrobial:** Alkaloids present in Annona reticulata roots exhibit antimicrobial properties, which may help combat various pathogens, including bacteria, fungi, and parasites.

**Flavonoids:**

- **Anti-inflammatory:** Certain flavonoids exhibitanti-inflammatory effects, which may help reduce inflammation and associated symptoms.
- **Biogeographical Distribution:** Its biogeographicaldistribution spans across several countries in Central America, South America, and the Caribbean. Here is an overview of the geographical distribution of Annona reticulata
- **Central America:** Custard apple is native to the countries of Central America, including.
- **Mexico:** Particularly in the southern regions of Mexico, including states like Chiapas, Oaxaca, and Veracruz.
- **Guatemala:** Found in various regions throughout the country, especially in the southern and coastal areas.
- **Belize:** Distributed in the lowland areas and along riverbanks.
- **South America:** Annona reticulata is also native to several countries in South America, including
- **Colombia:** Found in both wild and cultivated settings, especially in the northern regions.
- **Venezuela:** Distributed in tropical areas, including the Amazon rainforest and coastal regions.
- **Brazil:** Native to the Amazon basin and other partsof the country's tropical and subtropical regions.
- **Peru:** Found in the Amazon rainforest and other forested areas.
- **Caribbean:** Custard apple is indigenous to various islands in the Caribbean, including:
- **Jamaica:** Widely cultivated and found in the wild in forested areas.
- **Cuba:** Cultivated in gardens and small orchards, aswell as found in the wild.
- **Puerto Rico:** Distributed in forested regions and cultivated in home gardens. Dominican Republic: Found in both wild and cultivated settings, especially in the southern and coastal areas. Trinidad and Tobago, Barbados, Haiti, and other Caribbean islands: Custard apple trees can be found in both wild and cultivated environments.
- **Botanical Characteristics:** Botanical characters of Annona reticulata, commonly known as custard apple or bullock's heart, include a combination of distinctive features of its leaves, flowers, fruits, andoverall growth habit. Here's an overview.

| Sr. No | Herbal Material | Medicinal Use | Main Chemical Compound | Ref. |
|---|---|---|---|---|
| 1. | Clove | Antioxidant, antibacterial, inflammatory, mutagenic, allergenic, and anti-cancer properties | Eugenol, acetate of eugenol,- caryophyllene, 2-heptanone, and humulene | (9,10) |
| 2. | Ginger | Antioxidant, antibacterial, neuroprotective, diabetes-preventive, analgesic, gastrointestinal, cardiovascular,anti-inflammatory, anticancer, and antihypertensive properties. | Gingerols, paradols, phenolic acids, andshugaols ,monoterpenoids, sesquiterpenoids, phenolic compounds, aldehydes, ketones, alcohols, and esters, | (11,12) |
| 3. | Delonix regia | anti-inflammatory, anti-oxidant, cardioprotective, wound-healing, antibacterial, antifungal, and antimalarial. | Tannins ,Saponins ,Flavonoids, Steroids ,alkaloids ,carotenoids, Anthocyanin pigments, Glycosides,carbohydrat es, And phenolic compounds. | (13) |
| 4. | Neem | Skincare, Treating acne, Antidandruff, immune- boosting,anti-inflammatory effects | Nimbin, nimbanene, 6-desacetylnimbinene, nimbandiol, nimbolide, ascorbic acid, n-hexacosanol, amino acid, 7-desacetyl-7- benzoylazadiradione, 7- desacetyl-7-benzoylgedunin, 17-hydroxyazadiradione, and nimbiol | (14) |
| 5. | Fennel | anti-inflammatory, antibacterial, and antioxidant | Phenolic compounds, anethole, fenchone, 2-pentanone, and benzaldehyde-4- methoxy. | (15) |
| 6. | Mint | Antioxidant, antibacterial, anti- inflammatory, and anti-cancer | Flavonoids, mentol, oxygenated terpenoids. | (16) |
| 7. | Garlic | Antioxidant, Antimicrobial, Antidiabetic, Anticancer, Cardioprotective, Anti-inflammatory | Phenolic and polysaccharide compound, Allicin, Free amino acids, fiber. | (17,18) |
| 8. | Cinnamon | cholesterol-lowering, immunomodulatory, antibacterial, anti-inflammatory, anticancer, and cardiovascular | cinnamaldehyde, cinnamate, cinnamic acid, and essential oils. | (19,20) |
| 9. | Hibiscus | antiseptic, anti-spasmodic, diuretic, antioxidant, antipyretic, and sedative properties. Hibiscus can also be used to treat indigestion, control bleeding in piles. | Tannins, phlobatannins, saponins, cardiac glycosides, flavonoids, terpenoids. | (21) |
| 10. | Turmeric | Hypoglycemia, anticoagulant, antibacterial, anti- inflammatory, and anticancer | D-phellandrene, cineole, tumerone, borneol, zingiberene, vitamin C, and d-sabinene | (22,23) |

**Table 1: An overview of the primary biological components and therapeutic uses of herbal antibacterial agents.**

***Hibiscus:***

**FIG. 4: Hibiscus.**

| | |
|---|---|
| Botanical Name | Rosa-sinensis |
| Kingdom | Plantae |
| Order | Malvales |
| Family | Malavaceae |
| Genus | Hibiscus |

**Table No 2. Hibiscus Plant Taxonomy**

Hibiscus flowers consist of cyanidin, Di-glucoside, flavonoids and vitamins, thiamine, riboflavin, niacin and ascorbic acid (vitamin C). Hibiscus being a rich source of flavonoids and amino acids provides the hair with various hair growths by activating dormant follicles. Micronutrients like fiber, protein, carbohydrate that stimulate. As it contains good amount of vitamin C, A and iron it exhibits antimicrobial and antioxidant property. This powdered herb is believed to be used in earlier times as anti-dandruff agent, and also to treat alopecia[24].

Additionally, amino acids help to enhance the production of keratin, a primary building block of hair. According to Ayurveda, the reason for hair loss is extreme body heat, and hibiscus helps overcome the same due to its cooling action.

Hibiscus rosa-sinensis (Fam. Malvaceae) is widely grown as an ornamental plant throughout the tropical as well as subtropical regions of the world. Its flowers are large, generally red but different in other varieties. The plant has been used as a folk medicine in the orient for the cure of hematochezia, dysentery, obstruction due to wind phlegm, and vomiting of food. This plant is economically very essential owing to the herbal products and medicinal uses [25].

Each part of H. rosa-sinensis contains a wider range of compounds. Phlobatannins, glycosides, saponins, flavonoids, terpenoids, thiamine, riboflavin and niacin reported in whole plant. The flowers are edible supplemented with nitrogen, fibers, calcium, phosphorus, and iron. The flower pigments report cyanidin-3,5-diglucoside, quercetin- 3,5-diglucoside along with kaempferol-3-xylosylglucoside[26].

Other pharmacological important flavonoids B-sitosterol, teraxeryl acetate, and malvalic acids were also found in stems and leaves [27].

H. rosa-sinensis were shown to have antimicrobial activities against Pseudomonas aeruginosa, Escherichia coli, Enterobacter aerogenes, and Streptococcus pyogenes.

**Role:**

1. Stops hair loss
2. Prevent premature graying
3. Thicken hair and add volume
4. Treat dandruff

***Aloevera :***

*Fig.5: Picture of Aloe vera*

| | |
|---|---|
| Botanical Name | Aloe Indica |
| Kingdom | Plantae |
| Order | Asparagales |
| Family | Liliaceae |
| Genus | Aloes |

**Table No 3. Aloevera Plant Taxonomy**

The Aloe vera plant has been used for thousands of years to heal a variety of conditions, most notably burns, wounds, skin irritations, and constipation. It is grown in subtropical and tropical locations, including South Africa, Latin America, and the Caribbean. Aloe was one of the most frequently prescribed medicines throughout most of the 18th and 19th centuries and it remains one of the most commonly used herbs in the United States today. However, oral use of aloe for constipation is no longer recommended, as it can have severe side effects[28].

Preliminary evidence suggests that aloe gel may improve symptoms of genital herpes and certain skin conditions such as psoriasis. One study found that aloe vera gel displayed anti- inflammatory effects superior to 1% hydrocortisone cream or a placebo gel. Another study found that aloe vera gel combined with tretinoin was more effective than tretinoin alone for treating acne. As such, researchers claim that aloe vera gel may be useful in the treatment of inflammatory skin conditions, such as ultraviolet-induced erythema[29].

Aloe gel, made from the central part of the aloe leaf, is a common household remedy for minor cuts and burns, as well as sunburns. It can be found in many commercial skin lotions and cosmetics. Aloe contains active compounds that may reduce pain and inflammation and stimulate skin growth and repair. It is also an effective moisturizing agent. For this reason, aloe vera gel has gained tremendous popularity for relief of burns. In one study, burn sites treated with aloe healed completely in less than 16 days compared to 19 days for sites treated with silver sulfadiazine. In a review of the scientific literature, researchers found that patients who were treated with aloe vera healed an average of almost 9 days sooner than those who were not treated with the medicinal plant. However, other studies show mixed results. At least one study found that aloe actually delayed healing. Aloe is best used for minor burns and skin irritations and should never be applied to an open wound.

**Organoleptic properties**

1. Colour: Its color possibly Black, Brownish black.
2. Odour: Characteristic.
3. Taste: Intensely bitter and Nauseating.
4. Size: It is found in the form of masses of various size.

**Chemical Constituents:**

There are seventy-five potentially active ingredients in aloe vera, including vitamins, enzymes, minerals, carbohydrates, lignin, saponins, amino acids, and salicylic acids.

**Role:**

1. Antibacterial Activity
2. Anti-inflammatory Property
3. Antiacne Properties
4. Aloe vera can also be used to moisturize and soften skin.

Aloe vera has the ability to reduce facial pigmentation and dark patches

***6.Clove:***

*Fig.6: Clove*

| | |
|---|---|
| Botanical Name | Syzygium aromaticum |
| Kingdom | Plantae |
| Order | Myrtales |
| Family | Myrtaceae |
| Genus | Syzygium |

**Table No 4. Clove Plant Taxonomy**

Cloves are a fragrant spice made from the dried flowers of the clove tree. In the past, spices used to be worth their weight in gold, and cloves were no exception. Native to the Spice Islands near China, cloves spread throughout Europe and Asia during the late Middle Ages as a key part of local cuisine. Today, cloves remain a popular spice that gives many dishes a subtly sweet warmth[30].

Cloves can be used whole or ground. You might include ground cloves in spice mixes and whole cloves in recipes to add depth and flavor to a wide variety of foods. These small dark brown pods are used in curries, seasoned meats, Worcestershire sauce, baked goods, chai and Chinese five-spice blends. They also offer some health benefits.

Cloves contain a lot of manganese, a mineral that helps your body manage the enzymes that help repair your bones and make hormones. Manganese can also act as an antioxidant that protects your body from harmful free radicals Cloves contain many compounds known for their anti-inflammatory properties, with eugenol being the most important. It's been shown to reduce your body's inflammatory response, which can lower your risk of health issues such as arthritis and help manage symptoms[31].

**Organoleptic Properties:**

- Colour: Dark Brown
- Odour: Aromatic, Strong spicy
- Taste: Aromatic, Pungent, Bitter, and Spicy
- Size: Length (12-17mm), Diameter (3-4mm)

**Chemical Constituents:**

- Volatile oil (15-20%)
- Eugenol (70-90%)
- Acetyl Eugenol
- Tannin (10–13%)
- β-caryophyllene (5–12%)
- α and β-humulene

**Role:**

- Anti-microbial Properties
- Antioxidant Properties
- Anti-inflammatory
- Anti -viral activity

***7.Ginger:***

**FIG. 7: Ginger.**

| | |
|---|---|
| Botanical Name | Zingiber officinale |
| Kingdom | Plantae |
| Order | Zingiberales |
| Family | Zingiberaceae |
| Genus | Zingiber |

**Table No 5. Ginger Plant Taxonomy**

Ginger belongs to the same family as turmeric and cardamom. Native to South East Asia, India and China, ginger is an integral component of the region's diet, and is valued for its aromatic, culinary and medicinal properties[32].

Although we may be more familiar with recipe favourites like gingerbread or ginger biscuits, ginger is more than just a flavouring – it's been used for its medicinal properties throughout the ages.

Many of the curative properties of ginger relate to its potent anti-inflammatory qualities. These effects appear to be relevant for topical use, with studies supporting the use of a ginger compress for relieving osteoarthritis symptoms. Topical applications may also stimulate circulation and soothe burns[33].

The fresh root is rich in volatile oils that contain active components, these include gingerol. This potent anti-inflammatory compound is believed to explain why people with osteoarthritis or rheumatoid arthritis who consume ginger regularly experience reductions in their pain levels as well as improvements in mobility.

**Chemical Constituents:**

- Ginger is abundant in active constituents, such as phenolic and terpene compounds. The phenolic compounds in ginger are mainly gingerols, shogaols, and paradols.
- In fresh ginger, gingerols are the major polyphenols, such as
- 6-gingerol
- 8-gingerol
- 10-gingerol.

**Role:**

- Ginger has a long history of use in traditional medicine and is known for its potential health benefits, which include
- Digestive health: Ginger is often used to alleviate nausea, indigestion, and motion sickness.

***8.Neem:***

**FIG. 8: Neem**

| | |
|---|---|
| Botanical Name | Azadirachta indica |
| Kingdom | Plantae |
| Order | Sapindales |
| Family | Meliaceae |
| Genus | Azadirachta |

**Table No 6. Neem Plant Taxonomy**

Applying a gel containing neem leaf extract to the teeth or using a neem mouthwash can reduce the amount of plaque on the teeth. But it is not clear if neem is as helpful as using chlorhexidine mouthwash or gel.

A mild form of gum disease (gingivitis). Applying a gel containing neem leaf extract to the teeth or using a neem mouthwash can reduce gingivitis in some people. But it is not clear if neem is as helpful as using chlorhexidine mouthwash or gel[34].

Neem has an anti-inflammatory property which helps reduces acne. Azadirachta Indica also helps reduce skin blemishes.

Neem is a rich source of Vitamin E which help repair damaged skin cells[35].
Neem has scientifically proven antifungal property which helps treat fungal infections.

**Chemical Constituents:**

- azadirachtin
- nimbolinin
- nimbin
- nimbidin
- nimbidol
- sodium nimbinate
- gedunin
- salannin
- quercetin.

**Role:**

- Neem has been used in traditional medicine for various purposes, and its potential health benefits include.
- anti-inflammatory
- antiarthritic
- antipyretic
- hypoglycemic
- antigastric ulcer
- antifungal
- antibacterial antitumour activities

***9.Garlic:***

**FIG. 9: Garlic**

| | |
|---|---|
| Botanical Name | Allium sativum |
| Kingdom | Plantae |
| Order | Asparagales |
| Family | Alliaceae |
| Genus | Allium |

**Table No 7. Garlic Plant Taxonomy**

Garlic can help lower total and low-density lipoprotein (LDL), or “bad” cholesterol, according to a 2018 study . This can help manage cholesterol, which in turn can help boost heart health. According to the British Heart Foundation, garlic extracts and garlic powder may help lower blood pressure[36].
Anti-inflammatory or antiphlogistic is the property of a substance or treatment that reduces inflammation or swelling. Anti-inflammatory drugs, also called anti-inflammatories, make up about half of analgesics.
Garlic and ginger contain powerful anti-inflammatory plant compounds that may help inhibit pro-inflammatory proteins associated with chronic inflammation.

Interestingly, different preparations of garlic contain different types of anti-inflammatory organosulfur compounds.
As if wasn't already super nutritious and low in calories, garlic also offers anti-inflammatory benefits. Garlic contains diallyl disulfide an anti-inflammatory compound that limits the effects of pro-inflammatory cytokines. If you have sore and inflamed joints or muscles, you can rub them with garlic oil[37].

**Active Constituents:**
Garlic contains various sulfur compounds, with allicin being the most well- known bioactive compound responsible forits health benefits. Other important constituents includealliin, ajoene, and diallyl disulfide[38].
**Role:**

- Garlic has been used traditionally for its potential health benefits,
- Immune system support: It may have immune-boosting properties.
- Antioxidant: Garlic contains antioxidants that can help protect cells from damage caused by free radicals. This may help reduce the risk of diseases like cancer, heart disease, diabetes, and Alzheimer's.
- Antimicrobial: Garlic can inhibit and destroy bacteria, fungus, and parasites.
- Anti-inflammatory: Garlic has anti-inflammatory properties.
- Immunomodulatory: Garlic can help improve the immune system.
- Blood pressure: Garlic may help lower blood pressure.
- Cholesterol: Garlic may help lower cholesterol levels.
- Blood sugar: Garlic may help lower blood sugar levels.
- Cancer: Garlic may help prevent cancer.
- Liver: Garlic may help protect the liver.

## 10.Conclusion:

In conclusion, the review on the formulation and evaluation of anti-inflammatory herbal cream underscores the significance of integrating traditional knowledge with modern scientific techniques in developing effective topical treatments. Through a meticulous analysis of various formulations and evaluation parameters, it becomes evident that herbal creams offer promising avenues for managing inflammatory conditions. However, further research is warranted to optimize formulations, enhance efficacy, and ensure safety profiles. Additionally, standardized protocols for evaluation are imperative to facilitate comparison and reproducibility across studies. Overall, this review provides valuable insights into the potential of herbal creams as novel anti- inflammatory agents, encouraging continued exploration and development in this field[39,40].

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