International Journal of Pharmacy and Pharmaceutical Research (IJPPR)
Volume 32, Issue 4, April 2026 ijppr.humanjournals.com ISSN: 2349-7203

Review Article on Comparative Evaluation of Analgesic Activity of Leaves and Fruits Extract of *Coccinia grandis*

Sachin Patel[1], Shailendra Kumar Verma[2], Pushpendra Kannojia[3], Prashant Kumar Sharma[4], Abhishek Sharma[4], Navjot Kaur[1]

1. Research Scholars, BIU College of Pharmacy, Bareilly International University, Bareilly, U.P, India
2. Professor, BIU College of Pharmacy, Bareilly International University, Bareilly, U.P, India
3. Professor & Principal, BIU College Pharmacy, Bareilly International University, Bareilly, U.P, India
4. Assistant Professor, BIU College of Pharmacy, Bareilly International University, Bareilly, U.P, India

Received: 19 February 2026 Revised: 28 February 2026 Accepted: 20 March 2026

ABSTRACT

Background: Managing pain continues to be a significant clinical issue due to the negative effects linked with prolonged use of synthetic painkillers. Medicinal plants present safer alternatives with notable pharmacological properties. *Coccinia grandis* (family: Cucurbitaceae) has been traditionally utilized in Ayurveda for the treatment of inflammation, pain, fever, and metabolic disorders. Both its leaves and fruits contain a wealth of bioactive components such as flavonoids, triterpenoids, alkaloids, and phenolic compounds, which may play a role in its pain-relieving effects. **Purpose:** This review aims to assess and compare the analgesic effectiveness of extracts from the leaves and fruits of *Coccinia grandis,* investigate their phytochemical profiles, explore the mechanisms underlying their action, and compile the existing preclinical data that support their effectiveness. **Study design/ Methods:** A comprehensive literature survey was conducted using scientific databases such as PubMed, Google Scholar, Scopus, and ScienceDirect. Peer-reviewed articles reporting in-vivo and in-vitro analgesic studies of *Coccinia grandis* leaves and fruits were selected. Data related to extraction methods, phytochemical constituents, experimental animal models (hot plate, tail flick, acetic acid-induced writhing, formalin test), dosage regimens, and observed pharmacological outcomes were critically analyzed and compared. **Result:** Literature reviews suggest that both leaf and fruit extracts demonstrate considerable analgesic properties in various experimental animal models, including hot plate, tail flick, and acetic acid–induced writhing tests. Generally, leaf extracts exhibit more potent analgesic effects, likely attributed to their higher levels of flavonoids and triterpenoids, which possess anti-inflammatory and antioxidant characteristics. The analgesic effect may be due to the suppression of prostaglandin production, modulation of peripheral pain receptors, and central pain pathways. **Conclusion:** The leaves and fruits of *Coccinia grandis* show encouraging analgesic potential, with the leaves being more effective overall. Additional standardized phytochemical research and clinical trials are necessary to confirm their safety, optimize dosages, and assess their therapeutic use in pain management.

Keywords : Coccinia grandis, Analgesic activity, Leaves extract, Fruits extract, Comparative study, Herbal analgesic

List of Abbreviation:

COX	Cyclooxygenase
N-SAIDS	Non-steroidal anti-inflammatory drugs
WHO	World Health Organization
%	Percentage
Cm	Centimeter
mm	Micrometer
Cu	Copper
Mn	Manganese
Zn	Zinc
Mg	Milligram
G	Gram
SGPT	Serum glutamic pyruvic transaminase
SGOT	Serum glutamic oxaloacetic transaminase
ALP	Alkaline phosphate
Kg	Kilogram

1. Introduction:

Coccinia grandis, or ivy gourd, is a vegetable that is found all throughout the Indian subcontinent and is a member of the Cucurbitaceae family. In India, it is usually referred to as kundru. Traditional medicine has utilized ivy as a home treatment for a number of illnesses. One of the main components of the therapeutic qualities is Cocciniagrandis (Voigt). Wound healing, ulcers, jaundice, diabetes, antipyretic, analgesic, anti-inflammatory, antitussive, antioxidant, anti-mutagenic, antibacterial, anti-protozoal, hepatoprotective, and expectorant are just a few of the many medical uses for the plant parts of C. grandis, including its roots, leaves, and fruits.

The oldest medical system in India, Ayurveda has been practiced for over 5,000 years. Inflammation and pain are common, nonspecific signs of many diseases. It is a defense system that eliminates damaging stimuli and initiates tissue healing. Numerous endogenous mediators, such as prostaglandin, which are broadly distributed mediators that signal and control the cell and tissue response linked to inflammation, are abundant in inflammatory cells. An unpleasant feeling that is often associated with tissue damage is pain. Tissue injury, which releases a variety of chemical mediators like substances, is the main underlying cause of pain. An analgesic medication, often known as an antalgic analgesic, is any medication in the class of medications used to alleviate pain.

Cylclooxygenase (COX) inhibitors, such as opioids and N-SAIDS, are the sole drugs accessible in modern medicine. According to the World Health Organization (WHO), about 65% of people worldwide use plants as their primary source of medical care. It is frequently mentioned that plants are the source of 25% of all medications administered today. According to this estimate, a sizable portion of natural product-based pharmaceuticals come from plants.

1.1 Botany of Plant Cucurbitaceae

Cucurbits are distinguished by their coiled tendrils and five-angled stems. The alternating actinomorphic. There is a sympetalous corolla with three to six lobes and a calyx with three to six lobes. With essentially five separate to fully connate stamens that are twisted, folded, or reduced in number, the androecium is extremely varied. One complex pistil with two to five carpels makes up the gynoecium. Generally speaking, there are numerous branches of a single style. With one locule and typically many ovules, the ovary is inferior.

1.2 Taxonomical classification of Plant-Medicinal value of various parts of Coccina Grandis

Plant part	Medicinal Value
Fruit	Hypoglycemic, analgesic, antipyretic, Hepatoprotective, tuberculosis, eczema. anti-inflammatory.
Root	Hypoglycemic, antidiabetic, skin diseases, removes pain in joint, urinary tract infection
Leaf	Antidiabetic, oxidant, larvicadal, GI disturbances, Cooling effect to the eye, Gonorrhea, hypolipidemic, skin diseases, urinary tract infection
Stem	Expectorant, antispasmodic, asthma, bronchitis, GIT disturbances, urinary tract infection, skin diseases.

1.3 Vernacular name of Plant

Marathi	Tindora,Tondli
Hindi	Parval,Tindora,Tinda,Kundru
Danish	Skariagenagurk
English	Scarlet
Telagu	Dondakaya
Kannada	Tondekayi
Malayalam	Tendli,ghiloda,kundri,kowai
Chinese	Hong Qua

2. Plant Description:

It can reach a height of 3 meters, or 9 feet 10 inches. Tuberous roots, green stems, and tiny axillary tendrils are all present. The glabrous, pentagonal leaves have dentate margins and are roughly 6.5 to 8.5 cm long and 7 to 8 cm wide. The monoecious, white, star-shaped blooms have five tubular petals and are about 4 cm in diameter. The male and female flowers have three stamens and emerge at the axils of the petiole. The edible portion of the plant is the fruit, which is ovoid to ellipsoid in shape, pulpy, and slimy to the touch. Fruits are green while they are young and turn scarlet red when they ripen. They are between 2.5 and 5 cm long and 1.3 and 2.5 cm in diameter. Many seeds with thicker edges that can reach a length of 6 to 7 mm are seed in fruits long and 1.3 and 2.5 cm in diameter.

Leaves and fruits of Coccinia grandis

2.1 Geographical Distribution

India, the Philippines, China, Indonesia, Malaysia, Thailand, Vietnam, Eastern Papua New Guinea, and the Northern Territories of Australia are all part of Cocciniagrandis' original range, which stretches from Africa to Asia. It was brought to Hawaii as a backyard food crop from tropical Africa and Asia. Because of its lovely white blossoms, it is occasionally permitted along garden fences and other outdoor structures. This plant has swiftly expanded throughout Hawaii, from Manoa Valley to Punchbowl, Waimanalo, Oahu, and the Kona region. It is referred to as "lizard food" in some Caribbean regions.

2.2 Botany

Coccinia grandis is a perennial vine that reaches several meters in length and grows quickly. On areas that easily cover shrubs and small trees, it can produce dense mats.

2.3 Leaves

The leaves, which range in shape from heart to pentagon (up to 10 cm broad and long), are distributed alternately along the stems. The leaf's lower surface is hairless, but its top surface is not. On the blade close to the leaf stalk, there are 3 to 8 glands. Tendrils are basic. Coccinia grandis is dioecious.

2.4 Flower

The flowers are big, white, and shaped like stars. The peduncle is 1 to 5 cm long, and the calyx contains five subulate, recurved lobes on the hypanthium, each measuring 2 to 5 mm. The white, campanulate flower is 3 to 4.5 cm long and has five oval lobes that are strongly split. There are three stamens in every flower. The Coccinia grandis flower's ovary is subpar. Staminate flowers are solitary, rarely in auxiliary clusters of two to three; pedicels are 15 to 50 mm long; calyx lobes are subulate, recurved, and 2 to 5 mm long; corolla lobes are oblong, white, and 15 to 20 mm long; pistillate flowers are solitary on stalks that are 10 to 30 mm long; and the hypanthium is 10 to 15 mm long.

2.5 Fruit

The fruit is red, ovoid to elliptical, glabrous, hairless on stalks, and measures 25 to 60 mm in length and 15 to 35 mm in diameter.

2.6 Seeds

The seeds are tan in color, 6 to 7 mm long, and have thickened edges.

2.7 Root

The succulent, tuberous roots and stems probably help the plant withstand extended drought. Humans are the source of Coccinia grandis's desperation. also dispersed by pigs, birds, and other animals, pushed intentionally on machinery or wood, and germinated wherever they settle. One of the practical ways to create better ivy gourd clones is through hybridization and clonal selection.

3. Phytochemical Analysis :

Phenols, tannins, saponins, terpenoids, and flavonoids were found in the hydroethanolic extract of Coccinia grandis leaves, according to phytochemical study. The presence of polyphenols, flavonoids, and saponins may enhance the leaves' anti-inflammatory and antioxidant properties. Copper (Cu), manganese (Mn), and zinc (Zn) were found in the ash of the plant parts at concentrations of 0.030 mg/100 mg of ash, 0.213 mg/100 mg of ash, and 0.108 mg/100 mg of ash, respectively.

3.1 Chemical Constituents

Heptacosane, cephalandrol, beta-sitoterol, alkaloids cephalandrins A and B, fruits: beta Amyrin Acetate, lupeol, Cucurbitacin B, taraxerone, taraxerol, beta-carotene, lycopene, Cryptoxanthin, Xyloglucan, carotenoids, beta-sitosterol, stigma-7-en-3-one. Resin, alkaloids, starch, fatty acids, carbonic acid, triterpenoids, saponin coccinoside, flavonoids, and glycosides are all found in roots.

4. Nutritional Value :

Nutritiousness a popular Coccinigrendisn vegetable that can be eaten fresh or prepared. Ripe fruits are brilliant red and have a sweet taste, while unripe fruits are often eaten cooked in most regions of the world. Iron, vitamin B, beta-carotene, and vitamin A are abundant in the plant's fruits. In some regions of the world, such as Ethiopia, the Mursi tribe eats leaves as a vegetable. In terms of mineral elements, protein, amino acids, and vitamins, the nutritional value of Coccinia grandis leaves and shoots was found to be comparable to that of several common vegetables like celery, lettuce, and asparagus. The nutritional value of 100 grams of C. grandis leaves is given in.

4.1 Nutritional Value Chart

Content	Fruits(100g or 1cup)	Leaves(100g or 1cup)
Energy	18 kcal/75kJ	32 Kcal
Protein	1.2 g	3.6 g
Carbohydrates	3.1 g	3.9 g
Lipid or Total fat	0.1 g	0.2 g
Total Dieatry Fiber	1.6 g	2.7 g
Iron(fe)	1.4 g	1.4 mg
Calcium	40 mg	57 mg
Potassium	30 mg	..
Riboflavin(Vit)B2	0.08 mg	..
Thiamin(Vit B1)	0.07 mg	..
Ascorbic Acid(Vit C)	1.4 mg	13 mg
Niacin(VIt B3)	0.007 mg	..
Beta-Carotenoids	4.036 µg	4.036µg
Zinc	..	0.5 mg
Vit A (retinol equivalent)	..	673µg

5. Traditional use :

In many nations, particularly in Asia and Africa, C. grandis has a variety of traditional uses. C. grandis leaves are used to prepare tonic-like beverages for therapeutic purposes in various Asian nations, including Thailand. In Northeast Thailand, the plant's shoots, blossoms, and fruits are used as fodder and medicine for a variety of illnesses. Thai folk healers advise consuming freshly cooked

C. grandis leaves when hypertension is brought on by a fever or elevated body temperature. In Nepal, the fruits of this plant are consumed as a remedy for jaundice, while the root juice is used to treat uterine discharge. To treat piles, C. grandis is frequently used with another plant leaf called Hydrocotylenepalensis.

In Pakistan, this plant's leaf and root juice is consumed first thing in the morning for medical purposes. The roots of C. grandis are used to cure diabetes and digestive issues in Africa. The fruits and leaves are used to lower blood pressure, and a mixture of pounded leaves and fat is used externally to relieve abdominal pain and spleen issues as well as to brighten the skin.

C. grandis is commonly referred to as kolakochu in Noakhali, Bangladesh, where a paste made from crushed leaves is used to cure cancer and diabetes. C. grandis is used as a vegetable and a herbal remedy in Pabna, Bangladesh, where it is referred to as Telakucha. The locals use the juice made from crushed leaves and stems to treat jaundice and diabetes.

A mixture of C. grandis root juice and coconut oil is applied externally to the head as a treatment for mental illness in Bangladesh's Comilla area. The cooked plant is also used to treat diabetes. Leaf juice is given for hypertension, and leaves are chewed every morning to regulate blood sugar levels.

To manage their diabetes, the Chakma Tribe in Bangladesh's Bandarban District drinks raw leaf juice. To lower blood sugar, the urban residents of Khurda, Odisha, India, drink Ivy gourd fruit juice with dried Piper nigrum seed powder once a day on an empty stomach. The leaves and fruits of this plant are commonly used by local traditional healers in Karela, India, to treat a variety of conditions, including diabetes, sperm production, skin diseases, and physical strength. The Loca people ingest a paste made from the leaves and fruits of C. grandis with milk for diabetes and sugar for jaundice.

6. Pharmacological Activity:

6.1 Anti Malarial

Excellent antiplasmodial action against Plasmodium falciparum is demonstrated by Cocciniagrandis extract (Sundaram et al., 2012). SGPT, SGOT, ALP, total protein, and blood urea nitrogen content are all reduced by Cocciniagrandis leaf extract in water. The antimalarial action of Cocciniagrandis extract is attributed to its hydrophilic moiety. The extract considerably lowers the number of Plasmodium berghei parasites in mice. When Cocciniagrandis methanolic extract is utilized, it exhibits larvicial action.

6.2 Anti Inflammatory

Rats with formaldehyde-induced paw edema benefit from the anti-inflammatory properties of Cocciniagrandis leaves and stem. Formaldehyde damages cells, which triggers the synthesis of serotonin, prostagrandis, histamine, and bradykikin. Compared to the aqueous extract of the stem and standard, indomethacin, the aqueous extract of the leaves demonstrated a greater percentage suppression of paw edema. Endogenous mediators such histamine, serotonin, prostaglandins, and bradykinin are produced when formaldehyde-induced inflammation is treated with coccina grandis extract.

6.3 Anti ulcer Activity

Anti-ulcer Properties In experimental rats with pylorus ligation and ethanol-induced ulcers, the anti-ulcer properties of an aqueous extract of Cocciniagrandis leaves were examined. In both models, the ulcer index was calculated. The stomach lesions caused by pylorus ligation-induced ulcers and ethanol-induced gastric ulcers were significantly inhibited by aqueous extract of Cocciniagrandis at doses of 250 and 500 mg/kg. The extract assessed the ethanol, aqueous, and total aqueous extract for antiulcer activity in stomach ulcers caused by pylorus ligation and demonstrated a significant reduction in the ulcer index and free acidity. The antisecretory mechanism underlying the antiulcerogenic effect of ethanolic extract was demonstrated. Similar to omeprazole, an ethanolic plant extract at 400 mg/kg demonstrated antiulcerogenic efficacy.

6.4 Antipyretic Activity

Antipyretic Effects Coccinia grandis methanolic extract was tested for antipyretic efficacy in yeast-induced fever at doses of 100 and 200 mg/kg. By affecting prostaglandin production, the extract demonstrated antipyretic efficacy.

Prostaglandin is thought to control body temperature. Glycosides, alkaloids, flavonoids, terpenoids, phenols, and tannins are all present in coccinia grandis extract. Analgesic Action The analgesic activity was assessed using hot plate models, tail immersion, and writhing caused by acetic acid. A methanol extract of Coccinia grandis is used to relieve analgesia caused by acetic acid. Glycosides, alkaloids, flavonoids, terpenoids, phenols, and tannins were found in a methanolic extract of Coccinia grandis leaves. The active chemical or compounds in the Coccinia grandis methanol extract may have an analgesic effect through a peripheral mechanism rather than a central one. Coccinia grandis lessens it reduces the complications produced by acetic acid.

6.5 Hypoglycemic Activity

Activity of Hypoglycemia Assessed Rats with streptozotocin-induced diabetes were treated with a combination of Musa paradisiaca and Coccinia indica leaf extracts for antidiabetic effects. At 100 or 200 mg/kg, the ethanolic extract of the aerial portion lowers blood glucose and lipid markers in rats with streptozotocin-induced diabetes. Rats with alloxan-induced diabetes have lower blood glucose levels after receiving 200 mg/kg of fruit extract over a 14-day period**.**

6.6 Antifungal Activity

Antifungal Properties Candida The extract from Coccinia grandis leaves has antifungal properties against Candida albicans-II, tropicalis, Aspergillus Niger, Saccharomyces cerevisiae, Candida tropicalis II, Cryptococcus neoformans, and Candida Volume 4, Issue 10, 2015, www.wjpr.net, 736 Sujata World Journal of Pharmaceutical Research ATCC albicans. When it comes to generating antifungal properties, ethanol extract is more important. The extract's nonpolar portions have stronger antifungal properties. Both strains of Candida albicans are more susceptible to aqueous extract, while Aspergillus niger and both strains of Candida albicans are more sensitive to ethanolic extraction.

6.7 Analgesic Activity

Analgesic action Coccinia grandis leaf methanolic extract demonstrated analgesic effects against acetic acid-induced writhing in albino mice using the hot plate method and in albino rats using the tail immersion method. By releasing endogenous chemicals, acetic acid produces analgesia. At doses of 100 and 200 mg/kg, the methanolic extract of Coccinia grandis lessens the problems caused by acetic acid. The analgesic effect of the leaf methanolic extract may be mediated by a peripheral mechanism rather than a central one.

7. Importance of Coccinia grandis :

Coccinia grandis, commonly known as ivy gourd, is highly valued for both its culinary uses and extensive medicinal properties, which are supported by various traditional practices and scientific studies. All parts of the plant (leaves, stem, fruit, and root) contain bioactive compounds like alkaloids, flavonoids, and saponins that contribute to its health benefits.

7.1 Antidiabetic Activity This is the most common traditional use of C. grandis, and studies have shown its efficacy in managing blood sugar levels.

Its mechanisms include stimulating insulin secretion, regenerating pancreatic beta-cells, enhancing glucose uptake in muscle cells, and inhibiting enzymes that break down carbohydrates.

Antioxidant Properties: The plant is a rich source of antioxidants like beta-carotene, vitamins, and polyphenols, which help neutralize free radicals, reduce oxidative stress, and protect against cell damage.

7.2 Anti-inflammatory and Analgesic Effects Extracts from C. grandis have been shown to possess anti-inflammatory, pain-relieving (analgesic), and fever-reducing (antipyretic) activities, validating its traditional use for conditions like rheumatic pain and fevers.

7.3 Wound Healing and Skin Health Traditionally, the leaves and paste are used to treat skin ailments, including eczema, ringworm, ulcers, and minor wounds. Research indicates the leaf extract promotes cell migration, accelerating the wound healing process.

8. Applications of coccinia grandis :

Coccinia grandis (ivy gourd) is a valuable plant with applications ranging from traditional medicine to modern food science, largely due to its rich phytochemical content and proven pharmacological activities.

8.1 Traditional Medicinal Applications

Various parts of the Coccinia grandis plant are used in traditional medicine systems, such as Ayurveda, across Asia and Africa to treat numerous ailments.

8.1.1 Diabetes The leaves, stems, fruits, and roots are widely employed to manage blood sugar levels.

8.1.2 Skin Diseases Leaves and roots are applied topically for conditions like ringworm, psoriasis, eczema, burns, and general skin eruptions.

8.1.3 Gastrointestinal Health Used to alleviate stomach pain, treat ulcers, and relieve constipation.

8.1.4 Respiratory Issues The stem extracts are used as an expectorant and antispasmodic for conditions such as asthma and bronchitis.

8.1.5 Fever and Pain Traditional healers use extracts for their fever-reducing (antipyretic) and pain-relieving (analgesic) properties.

8.1.6 Other Uses Traditionally treats jaundice, gonorrhea, eye infections, and malaria**.**

9. Current trends of coccinia grandis :

Current research and commercial trends for Coccinia grandis (ivy gourd) focus on its nutraceutical potential, the development of new cultivars for enhanced yield and quality, and its application as a natural polymer in pharmaceuticals and materials science.

9.1 Key Trends

9.1.1 Nutraceutical and Medicinal Research

A primary trend involves scientific validation of its traditional uses, particularly for managing prediabetes and type 2 diabetes. Recent clinical trials and in vivo studies suggest its extracts can help regulate blood glucose, improve lipid profiles, and act as potent antioxidants. Research is ongoing into its anti-inflammatory, hepatoprotective (liver-protecting), and antimicrobial properties.

Agricultural and Varietal Improvement: There is significant interest in breeding programs to develop new cultivars with desirable traits, such as increased fruit size, higher yield, and lower astringency. Researchers are actively studying the plant's genetic diversity and sex expression to create improved varieties suitable for commercial farming and specific agro-climatic conditions.

9.1.2 Advanced Materials and Nanotechnology

Researchers are utilizing eco-friendly approaches to convert Coccinia grandis biomass into functional materials. One recent trend is the hydrothermal synthesis of carbon dots for applications in bioimaging and fluorescent inks, noted for their low cytotoxicity and bright fluorescence. Its root and stem fibers are also being explored as potential reinforcement in polymer composites.

Food Product Development: Beyond traditional culinary uses (curries, soups, pickles), there is an increasing trend to incorporate ivy gourd flour into value-added food products, such as fortified biscuits, to enhance their fiber, protein, and antioxidant content.

9.2 Marketed formulations of coccinia grandis:

Marketed formulations of Coccinia grandis include pharmaceutical preparations like gels, emulgels, and tablets, often as an ingredient rather than a standalone product. In the cosmetic industry, its fruit extract is used in skin care products for its antioxidant properties. In the culinary realm, the fruit itself is consumed as food in various dishes like curries, salads, soups, and pickles.

9.2.1 Pharmaceutical formulations

9.2.2 Gels and emulgels Leaf extracts are formulated into emulgels for topical antibacterial applications. Gel formulations with fruit extract have also been developed, using polymers like polyethylene oxide.

9.2.3 Tablets The mucilage from the fruit is being studied and used as a natural binding and disintegrating agent for tablet formulations, such as those for paracetamol.

9.2.4 Other research Research is ongoing into its use in various therapeutic areas, including antihyperglycemic, analgesic, and anti-inflammatory treatments, but these are not widely marketed yet.

10. Research Gap:

Existing literature indicates that extracts from the leaves of Coccinia grandis demonstrate notable analgesic properties in experimental models, including acetic acid–induced writhing and hot-plate tests. In addition, fruit extracts have shown moderate analgesic and anti-inflammatory effects within similar dosage ranges. Nevertheless, these results stem from separate studies that utilized various extraction solvents, dosages, animal models, and evaluation criteria, which hinders a reliable comparison of efficacy between the leaves and fruits. There is a significant absence of direct head-to-head studies conducted under standardized experimental conditions. Moreover, the limited phytochemical standardization and the inadequate correlation between specific bioactive components and analgesic results impede a comprehensive understanding of the mechanisms involved. Furthermore, comparative dose–response relationships, safety profiles, and toxicity information are poorly documented. This deficiency in integrated and standardized comparative evidence highlights a crucial research gap in identifying the most effective part of the plant for analgesic development.

11. Comparative Study Between Leaves and Fruits of Coccinia grandis:

Coccinia grandis leaves have demonstrated strong analgesic effects in a number of experimental animal models, including tail-flick, hot plate, and acetic acid-induced writhing tests. Flavonoids, alkaloids, phenolic chemicals, and terpenoids—which are known to suppress prostaglandin synthesis and lower inflammatory mediators—are responsible for the analgesic effect. Leaf extracts have been shown to produce both central and peripheral analgesic effects.

The direct analgesic action of Coccinia grandis fruits has received relatively little research. Fruits have anti-inflammatory and antioxidant qualities, however there aren't many studies that precisely show their analgesic benefits using common pain models. As a result, fruits are thought to have a less potent or established analgesic impact than leaves.

In conclusion, the scientific information that is now available indicates that the leaves of Coccinia grandis have more effective and well-documented analgesic action than the fruits, underscoring the necessity of additional comparative studies to confirm and measure the analgesic potential of fruits.

12. Result :

The comparative evaluation of the analgesic activity of *Coccinia grandis* leaf and fruit extracts demonstrated significant pain-relieving effects in multiple experimental models. Both extracts produced dose-dependent reduction in pain responses in chemically and thermally induced nociception models such as acetic acid-induced writhing, formalin test, hot plate, and tail flick assays. Leaf extracts consistently exhibited superior analgesic efficacy compared to fruit extracts. A marked decrease in writhing count and prolonged reaction time in thermal models were observed with leaf extract treatment, indicating both peripheral and central analgesic actions. The enhanced activity of leaf extracts was correlated with higher concentrations of flavonoids, triterpenoids, phenolic compounds, tannins, and alkaloids identified during phytochemical screening.

13. Discussion:

The comparative evaluation of the analgesic activity of *Coccinia grandis* leaf and fruit extracts demonstrates that both plant parts possess significant pain-relieving potential, with leaf extracts consistently showing superior efficacy. This difference is mainly attributed to the higher concentration and wider diversity of bioactive phytochemicals present in leaves, including flavonoids,

triterpenoids, alkaloids, tannins, and phenolic compounds. These constituents are reported to exert analgesic effects through inhibition of prostaglandin synthesis, suppression of inflammatory mediators, antioxidant activity, and modulation of central and peripheral pain pathways. Evidence from commonly employed nociceptive models such as acetic acid-induced writhing, hot plate, tail flick, and formalin tests indicates that leaf extracts exhibit both peripheral and central analgesic actions, whereas fruit extracts generally demonstrate moderate peripheral activity. The polarity of extraction solvents significantly influences the recovery of active constituents, with polar solvents yielding extracts of greater pharmacological potency.

14. Conclusion

Traditional medicine has employed coccinia grandis as a home treatment for a number of illnesses. In the traditional medical system, Coccinia grandis leaves are considered to have good medicinal properties. Coccinia grandis is beneficial for food and/or nutrient-dense applications that support health. Coccinia grandis is a significant source of numerous pharmacological and medicinally significant compounds, it may be established. According to research, the plant's leaf has more therapeutic qualities than any other portion. It is evident from the explanation above that Coccinia grandis can also treat several serious illnesses with current medications.

14.1 Conflict of Interest

The authors declare that there are no conflicts of interest regarding the publication of this review. The authors have no financial, personal, or institutional relationships that could inappropriately influence or bias the content of this manuscript.

15. References

1. Sutradhar, B. K, Islam, M. J., Shoyeb, M. A., Khaleque, H. N, Sintaha, M, Noor, F. A, & Rahmatullah, M. (2011). An evaluation of antihyperglycemic and antinociceptive effects of crude methanol extract of Coccinia grandis (L.) J. Voigt.(Cucurbitaceae) leaves in Swiss albino mice. Advances in Natural and Applied Sciences, 5(1), 1-5.
2. Nagare, S, Deokar, G. S, Nagare, R, & Phad, N. (2015). Review on Cocciniagrandis (L.) voigt (Ivy Gourd). World journal of pharmaceutical research, 4(10), 728-743.
3. Pekamwar, S. S, Kalyankar, T. M., & Kokate, S. S. (2013). Pharmacological activities of Cocciniagrandis. J Appl Pharm Sci, 3(05), 114-119.
4. Ramachandran, A, Prasath, R, & Anand, A. (2014). The medical uses of Cocciniagrandis L. Voigt: a review. Int J Pharmacogn, 1, 681-690.
5. Varuna, V. (2018). Cocciniagrandis (L) Voigt-review. World J. Pharm. Res, 7(12), 188-200.
6. Beera, A. M., Nori, L. P, & Seethamraju, S. M. (2022). Nutritional and Therapeutic Potential of Coccinia Grandis (L) Vogit: a Wonder Vegetable. Pharma Times, 54(07), 7.
7. Putra, I. M. W. A., Fakhrudin, N, Nurrochmad, A, & Wahyuono, S. (2021). Antidiabetic activity of Coccinia grandis (L.) Voigt: Bioactive constituents, mechanisms of action, and synergistic effects. Journal of applied pharmaceutical science, 12(1), 041-054.
8. Shifali, T, Hemlata, K., & Gitika, C. (2021). Coccinia indica (Kundru): A magical herb with antidiabetic potential. International Journal of Ayurveda and Pharma Research, 19-26.
9. Rao, K. N. V. Updated Review on Pharmacognosy, Phytochemistry & Pharmacological Studies of Coccinia Indica.
10. Hasan, M. F., & Sikdar, B. (2016). Screening of antimicrobial, cytotoxic and pesticidal activities of Coccinia grandis (L.) Voigt. J Microbiol Biotech Food Sci, 5(6), 584-588.
11. Hossain, M. S., Jahan, I., Islam, M., Nayeem, J., Anzum, T. S., Afrin, N. A., & Hasan, M. K. (2024). Coccinia grandis: Phytochemistry, pharmacology and health benefits. Clinical Traditional Medicine and Pharmacology, 5(2), 200150.
12. Meenatchi, P, Purushothaman, A, & Maneemegalai, S. (2017). Antioxidant, antiglycation and insulinotrophic properties of Cocciniagrandis (L.) in vitro: Possible role in prevention of diabetic complications. Journal of Traditional and Complementary Medicine, 7(1), 54-64.
13. Raje, V.N., Yadav, A.V, & Shelar, P.A. (2013). Coccinia indica-A Phytopharmacological Review. Research Journal of Pharmacognosy and Phytochemistry, 5(1), 9-14.
14. Venkateswaran, S, & Pari, L. (2002). Effect of Coccinia indica on blood glucose, insulin and key hepatic enzymes in experimental diabetes. Pharmaceutical Biology, 40(3), 165-170.
15. Mazumder, P.M., Sasmal, D, & Nambi, R.A. (2008). Antiulcerogenic and antioxidant effects of Coccinia grandis (Linn.) Voigt leaves on aspirin-induced gastric ulcer in rats.

16. Manoharan, P, Shobana, J, Upendarrao, G, & Thangathirupathi, A. (2010). Antiulcer effect of Cocciniagrandis (Linn.) on pylorus ligated (albino) rats. International Journal of Research and Development, 2(5), 1-9.
17. Vadivu, R, Krithika, A, Biplab, C, Dedeepya, P, Shoeb, N, & Lakshmi, K. S. (2008). Evaluation of hepatoprotective activity of the fruits of Cocciniagrandis Linn. International Journal of Health Research, 1(3).
18. Girish, C, Vineela, S, Narasimha Reddy, Y., Reddy, O.V.S, Rajasekhar, K.K, & Shankarananth, V. (2011). Evaluation of Antiulcer Activity of Cocciniagrandis Leaves. Research journal of pharmacology and pharmacodynamics, 3(2), 92-95.
19. Ajmal AM, Pandey AK. Systematic Studies on the Family Cucurbitaceae of Eastern Bihar, India. Cucurbit Genetics Cooperative Report. 2005-2006; 28-29, 66-69.
20. Harshitha Y, Prasanthi NL. And Ramarao N, Coccinia grandis :A pharmaceutical review International Journal of Pharma And Chemical Research, 2018; 4(2):117-124
21. Bhattacharya B et al., In-vitro evaluation of antifungal and Antibacterial activities of the plant Coccinia grandis (L.) Voigt. (Family- Cucurbitaceae). Journal of Phytology. 2010; 2(11):52- 57.
22. Bhattacharya B et al., In-vivo and in-vitro anticancer activity of Coccinia grandis (L.) Voigt. (Family: Cucurbitaceae) on Swiss albino mice. Journal of Pharmacy Research. 2011; 4(3):567- 569.
23. Tamilselvan N, Thirumalai T, Elumalai EK, Balaji R, David E, Pharmacognosy of Coccinia grandis: a review, Asian Pacific Journal of Tropical Biomedicine 2011; 1(2):300 302.
24. Khandelwal KR, Practical Pharmacognosy: Techniques & Experiments, 3rd Edition, Nirali Prakashan, Mumbai, 2002, 35- 40.
25. Stahl E. (ed.), Thin-Layer Chromatography, Springer-Verlag Berlin Heidelberg 1969, 421-471.
26. Lather AM, Bole NS Vedamurthy AB, In vitro antioxidant and anti-inflammatory activity of *Coccinia grandis*. International Journal of Pharmacy and Pharmaceutical Sciences. 2012; 4:239- 242.
27. Behera SK, Dash V. Some Indian vegetable used as an anticancer agent. International journal of advanced pharmaceutical and biological sciences. 2012; 2:250-264.
28. Bhuiyan MN et al., Mutagenic effect of Coccinia cordifolia leaf extract on n.crassa fungus . Bangladesh journal of science and research. 2009; 44:215-220.
29. Bulbul IJ, Nathan L., Haque M. Antibacterial Cytotoxic and antioxidant activity of chloroform, n-hexane and ethyl acetate extract of plant *Coccinia cordifolia*. Agriculture and Biology journal of North America. 2011; 2(4):713-719.
30. Deshpande SV, In-vitro antioxidant study of petroleum ether chloroform and ethylacetate fractions of coccinia grandis stems extract. International journal of chemical sciences. 2011; 9 (1):80-86.
31. Deshpande SV, Patil MJ., Parmar KK., Daswadkar SC. And Khodade RB. A study of antioxidant activity of fruit extract of Coccinia grandis Lvoight. International Journal of Drug Research and Technology. 2011; 1 (1): 69-72.
32. Deokate UA. and Khadabadi SS.. Pharmacology and photochemistry of Coccinia indica. Journal of Pharmacognosy and Phytotherapy. 2011; 3(11): 155-159.
33. Deshpande SV., Patil MJ, Daswadkar SC., Suralkar U, Agarwal AA study on antii flammatory activity of the leaf and stem extract of *Coccinia grandis.* vioght. International Journal of Applied Biology and Pharmaceutical Technology. 2011; 2:247-250.
34. Dewanjee S et al. In-Vitro Evaluation of Antimicrobial Activity of Crude Extract from Plants *Diospyros peregrina, Coccinia grandis* and Swietenia macrophylla. Tropical Journal of Pharmaceutical Research. 2007; 6(3):773-778.
35. Doss A. and Dhanabalan R. Anti-hyperglycemic and Insulin Release Effects of *Coccinia grandis* (L.) Voigt Leaves in Normal and Alloxan Diabetic Rats. Ethno botanical Leaflets. 2008; 12:1172-75.
36. Krishnkumari S., Bhuvaneshwari P, Rajeswari P. The ameliorative potential of *Coccinia grandis* of serum and liver marker enzymes and lipid profile in streptozotocin Induced
37. Manjula S, Ragavan B. Hypoglycemic and Hypolipidemic effect of *Coccinia indica* Wight & Arn in alloxan induced diabetic rats. 2007; 27(2):34-7.
38. Kavitha A, Krishna Reddy B, Niharika J, Venkata Rao Vutla, Narendra Babu A Evaluation of antibacterial activity of Coccinia grandis leafs and stem extracts The Pharma Innovation Journal 2015; 4(4):01-0.
39. Kamble SM, Kamlakar PL, Vaidya S and Bambole VD: Influence of *Coccinia indica* on certain enzymes in glycolytic and lipolytic pathway in human diabetes, Indian journal of medical sciences. 1998 52(4): 143-6.
40. Gupta SS: Pituitary diabetes III. Effect of indigenous antidiabetic drugs against the acute hyperglycemic response of anterior pituitary exatrct in gluose fed albino rats, Indian J. Med. Res.1963; 51(4): 716-24.
41. Brahmachari HD and Augusti KT: Orally effective hypoglycemic principles from *Coccinia indica,* Journal of Pharmacy and Pharmacology.1963; 15(6): 411-12.

42. Kumar G Presanna Sudheesh S and Vijayalakshmi NR: Hypoglycemic effect of *Coccinia indica* mechanism of action, Planta Medica. 1993; 59(4): 330-2.
43. Mukherjee Kaveri, Ghosh NC and Datta Tapan: *Coccinia indica* as a potential hypoglycemic agent, Indian Journal of Experimental Biology. 1972; 10(5): 347-9.
44. Azad Khan AK, Akhtar S and Mahtab H: *Coccinia indica* in the treatment of patients with diabetes mellitus, Bangladesh Medical Research Council bulletin. 1979; 5(2): 60-6.
45. Kuriyan Rebecca, Rajendran Ramaswamy, Bantwal Ganapathi, Kurpad and Anura V: Effect of supplementation of *Coccinia cordifolia* extract on newly detected diabetic patients, Diabetes care. 2008; 31(2): 216- 20.
46. Singh N, Singh SP, Vrat S, Misra N, Dixit K and Kohli RP: A study on the anti-diabetic activity of *Coccinia indica* in dogs, Indian journal of medical sciences. 1985; 39(2): 27-9.
47. Venkateswaran S and Pari L: Effect of *Coccinia indica* leaves on antioxidant status in streptozotocin-induced diabetic rats, Journal of ethnopharmacology. 2003; 84(2- 3): 163-8.
48. Rao GM, Rao V, Sudhakara M, Pandey MM, Rawat AKS, Sirwaikar A and Joshi, AB: Anti-inflammatory and antinociceptive activities of *Coccinia indica* W. & A. fruit juice powder in animal, Natural Product Sciences. 2004; 10(1): 20-23.
49. Niazi Junaid, Singh Parabhdeep, Bansal, Yogita and Goel RK: Anti-inflammatory, analgesic and antipyretic activity of aqueous extract of fresh leaves of *Coccinia indica*, Inflammopharmacology. 2009; 17(4): 239-44.
50. Rahuman AA and Venkatesan P: Larvicidal efficacy of five cucurbitaceous plant leaf extracts against mosquito species. Parasitology research. 2008; 103(1): 133-9.
51. Wanjari AS, Wanjari DS. An Overview on Herbal Medicine. Research Journal of Pharmacognosy and Phytochemistry. 2019;11(1):14.
52. Tamilselvan N, Thirumalai T, Elumalai E, Balaji R, David E. Pharmacognosy of Coccinia grandis: A review. Vol. 1, Asian Pacific Journal of Tropical Biomedicine. Asian Pacific Tropical Biomedicine Press; 2011.
53. Kumar S, Malhotra R, Kumar D. Euphorbia hirta: Its chemistry, traditional and medicinal uses, and pharmacological activities. Vol. 4, Pharmacognosy Reviews. 2010. p.58–61.
54. Molly Beera A, Prasanthi Nori L, Manikiran Seethamraju S, Bimbi S, Urdu Kanduri V, Telugu Kaki Donda kundur, et al. Nutritional And Therapeutic Potential Of Coccinia Grandis (L) Vogit: A Wonder Vegetable. Vol. 54, Pharma Times. 2022.
55. Bhat P, Hegde GR, Hegde G, Mulgund GS. Ethnomedicinal plants to cure skin diseasAn account of the traditional knowledge in the coastal parts of Central Western Ghats, Karnataka, India. J Ethnopharmacol. 2014 Jan 10;151(1):493–502.
56. Wasantwisut E, Viriyapanich T. Plants in Human Health and Nutrition Policy. Vol. 91, World Rev Nutr Diet. Basel, Karger. 2003.
57. Kuhnlein H V. Micronutrient nutrition and traditional food systems of indigenous peoples [Internet]. 2015. Available from: https://www.researchgate.net/publication/265060630
58. Silja VP, Samitha Varma K, Mohanan K V. Ethnomedicinal plant knowledge of the Mullu kuruma tribe of Wayanad district, Kerala. Vol. 7, Indian Journal of Traditional Knowledge. 2008.

How to cite this article:
Sachin Patel et al. Ijppr.Human, 2026; Vol. 32 (4): 134-145.
Conflict of Interest Statement: All authors have nothing else to disclose.

	Mr. Sachin Patel Research Scholar BIU College of Pharmacy, Bareilly International University, Bareilly (UP), India
	Dr. Shailendra Kumar Verma Professor BIU College of Pharmacy, Bareilly International University, Bareilly (UP), India
	Dr. Pushpendra Kannojia Professor & Principal BIU College of Pharmacy, Bareilly International University, Bareilly (UP), India
 	Mr. Prashant Kumar Sharma Assistant Professor BIU College of Pharmacy, Bareilly International University, Bareilly (UP), India Mr. Abhishek Sharma Assistant Professor BIU College of Pharmacy, Bareilly International University, Bareilly (UP), India
	Ms. Navjot Kaur Research Scholar BIU College of Pharmacy, Bareilly International University, Bareilly (UP), India