INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES
[ISSN: 0975-4725; CODEN(USA): IJPS00]
Journal Homepage: https://www.ijpsjournal.com

OPEN ACCESS

Review Article

Comparative Evaluation of Antimicrobial and Anti-inflammatory Activity of *Jatropha gossipyfolia*

Bhuvana Ezhil Rohini R*, Sujatha M, Abinaya V, Janani R, Kishore Kumar R, Ragu Semaraj T, Vaishnavi B

Department of Pharmaceutical Chemistry, Tagore College of Pharmacy, Rathinamangalam, Chennai, Tamil Nadu, India.

ARTICLE INFO

Published: 27 July 2026
Keywords:
Jatropha Gossypifolia, Anti-inflammatory, Anti-bacterial, flavonoids, alcoholic extract
DOI:
10.5281/zenodo.21627366

ABSTRACT

Scientific interest in plant-derived medicinal compounds has increased due to the rising prevalence of antibiotic resistance and the negative side effects of long-term usage of synthetic anti-inflammatory medications. Traditionally used to heal wounds, infections, and inflammatory conditions, Jatropha gossypifolia L. (Euphorbiaceae) has become a promising but little-studied medicinal resource. The available experimental data on the antibacterial and anti-inflammatory qualities of J. gossypifolia are carefully assessed and compared in this study, with a focus on methodological techniques, repeatability, and the degree of pharmacological support. Standardized in-vitro assays, such as agar well diffusion, disc diffusion, and minimum inhibitory concentration (MIC) determination against clinically relevant Gram-positive and Gram-negative bacterial strains, have been used primarily to study antibacterial activity. Numerous investigations document measurable inhibitory effects, especially from extracts of leaves, latex, and stem bark made with polar and semi-polar solvents. These results show moderate repeatability among experimental models and are typically measurable. The anti-inflammatory action, on the other hand, has mostly been evaluated in vitro using techniques like membrane stabilization assays and protein denaturation inhibition, with little in vivo validation using carrageenan-induced paw edema models. The assay type, extract preparation, and experimental design all seem to have a significant impact on the observed anti-inflammatory benefits. Flavonoids, phenolic compounds, diterpenoids, and other secondary metabolites frequently linked to antibacterial and anti-inflammatory properties are found, according to phytochemical analyses. Nevertheless, molecular pathways and direct compound–activity relationships are still not well understood. Comparative analysis indicates that whereas anti-inflammatory results are still preliminary and less reliable, antibacterial data is comparatively more consistent and methodologically standardized.

***Corresponding Author:** Bhuvana Ezhil Rohini R
Address: *Tagore College of Pharmacy, Rathinamangalam, Chennai, Tamil Nadu, India.*
Email ✉: rohiniramesh1987@gmail.com

Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

INTRODUCTION

Medicinal plants have been central to traditional Indian systems like Ayurveda and Siddha for centuries. One such plant, Jatropha gossypifolia — called "Kattamanakku" in Tamil — is a shrub widely used across Africa, the Americas, and India for its healing properties. Different parts of the plant serve different purposes. Leaf decoctions clean wounds, stem juice stops bleeding, and young stems treat fungal infections. The name "Jatropha" itself comes from Greek, meaning "doctor food," reflecting its medicinal roots. The plant contains alkaloids, flavonoids, tannins, steroids, and terpenoids, giving it antibacterial, anti-inflammatory, antioxidant, and anticancer properties. Studies show it may inhibit prostaglandin synthesis, making it relevant for conditions like rheumatoid arthritis. However, long-term use carries risks — particularly ethanolic leaf extracts, which may be toxic over time. Further research is needed to develop safer, standardized treatments from this plant.

1.1 Biological Source

It is found in tropical semi-arid parts of Africa and the Americas as well as nations with tropical, subtropical, and dry tropical weather (1). The plant is reported to have a number of therapeutic and insecticidal qualities. It is a bushy, social plant that grows up to 1.8 meters tall, has three to five lobes, and is about 20 centimeters long and wide. The leaves have long leaf tips that are covered with glandular hairs.(2)The seeds resemble greenish capsules. The new leaves are sticky, and the leaf tips are covered with thick, dark brown hairs. When its thin, frequently greenish bark is cut, a large amount of liquid sap is released. Each of the three-celled fruits has a single seed (3)

FIGURE: 1 fruit of *J. Gossipiifolia*

FIGURE: 2 *J.Gossipifolia*

1.2 Habitat

- Erect, branched perennial shrub
- Usually 1–3 meters in height
- Stem often reddish-purple and covered with fine hairs when young

1.3 Leaves

- Palmately lobed (usually 3–5 lobes)
- Dark green to purplish color, especially in young leaves
- Surface slightly hairy with visible veins
- Arranged alternately on the stem

- When crushed, leaves may produce a slight odor

1.4 Flowers

- Small, reddish-purple or dark pink flowers
- Arranged in clusters (cymes) at branch tips
- Unisexual flowers (male and female flowers on the same plant)

1.5 Fruits

- Three-lobed capsule (typical of Euphorbiaceae family)
- Turns green → brown/black when mature (4)

2. COLLECTION AND PREPARATION OF PLANT MATERIAL

A botanist gathers and authenticates fresh *Jatropha Gossypifolia* leaves (or other elements like stem bark/roots). After giving the plant material a thorough water wash to get rid of any dirt, it is shade-dried at room temperature. A mechanical grinder is then used to ground the dried material into a powder, which is subsequently kept in an air-tight jar for extraction.(5)

2.1 Solvent Extraction Methods

2.1.1 Maceration Method

This process involves soaking the powdered plant material in a closed container with an appropriate solvent, such as water, methanol, or ethanol 90% or 80%. For 48 to 72 hours, the mixture is left at room temperature with occasional stirring. Following extraction, the mixture is filtered via Whatman filter paper or muslin cloth. Evaporation concentrates the filtrate, which is then saved for additional research.(5)

2.1.2 Soxhlet Extraction Method

One method of continuous heat extraction is Soxhlet extraction. In Soxhlet extractor, take 10g of powdered *Jatropha Gossypifolia* is extracted using solvents such as petroleum ether, methanol (80%), ethanol (90%) or chloroform. The extraction process lasts for six to eight hours, or until the solvent turns colorless. A rotary evaporator is used to concentrate the resulting extract, which is then stored for examination.(5)

2.1.3 Alcoholic Extraction Method

Alcoholic extraction is widely used due to the ability of alcohol to extract both polar and moderately non-polar compounds. The powdered plant material is subjected to maceration or Soxhlet extraction using ethanol (95%) or methanol (80%) . The alcoholic extract is filtered and concentrated under reduced pressure. The dried extract is stored in a desiccator until use.(6)

2.1.4 Aqueous Extraction Method

In aqueous extraction, the powdered plant material is boiled with distilled water for a specific time or soaked overnight. The extract is filtered and concentrated by evaporation. (6)

2.2 Storage of Extract

Stored in airtight containers at 4 °C for further phytochemical and antibacterial studies.(7)

3. ANTI BACTERIAL ACTIVITY OF *JATROPHA GOSSYPIFOLA*

Table :1 Phytochemicals responsible for anti-bacterial (7)

Phytochemical	Plant Part Reported	Antimicrobial Role/ Mechanism	Microorganisms Affected
Flavonoids	Leaves, stems	Disrupt microbial cell membranes; inhibit nucleic acid synthesis	*Staphylococcus aureus*, *E. coli*, *Pseudomonas aeruginosa*
Tannins	Leaves, bark	Precipitate microbial proteins; inhibit enzymes	Gram-positive & Gram-negative bacteria
Alkaloids	Leaves, latex	Interfere with DNA replication and cell metabolism	Bacteria and fungi
Saponins	Leaves, roots	Increase cell membrane permeability causing leakage	*Candida albicans*, *E. coli*
Phenolic compounds	Leaves, bark	Oxidative damage to microbial cells	Broad-spectrum antibacterial activity
Terpenoids (Diterpenes e.g., Jatrophone)	Roots, latex	Disrupt membrane integrity; inhibit respiration	*Bacillus subtilis*, *Staphylococcus aureus*
Glycosides	Leaves	Inhibit microbial enzyme systems	Bacterial strains
Steroids	Leaves	Alter membrane fluidity and permeability	Gram-positive bacteria

3.1 Experimental Models Used

3.1.1Agar Well Diffusion Assay

This method was a initial technique for assessing the antibacterial activity of plant extracts is the agar well diffusion experiment. The chosen bacterial strains are uniformly injected into sterile nutrient agar or Mueller-Hinton agar plates. A sterile cork borer is used to punch wells into the agar that are all the same diameter.

The wells are filled with extract from *Jatropha Gossypifolia* in varying quantities. After that, the plates are incubated for 18 to 24 hours at 37°C. The diameter of the zone of inhibition surrounding each well, which represents the microorganism's susceptibility to the extract, is used to measure the antibacterial activity.(8)

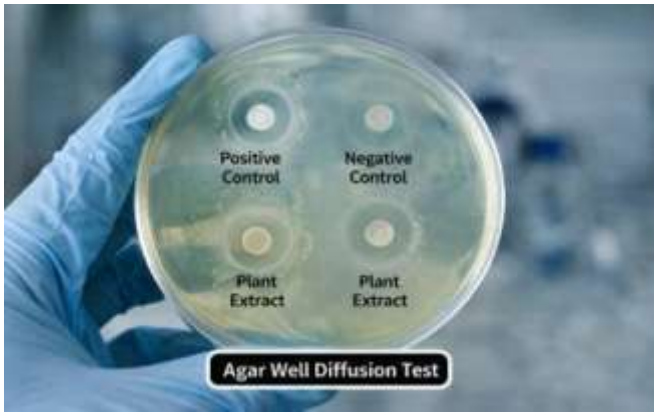

FIGURE 3: Agar Well Diffusion

3.1.2 Disc Diffusion Method

The disc diffusion method is another widely used technique to assess antibacterial efficacy. Sterile filter paper discs are filled with known concentrations of *Jatropha Gossypifolia* extract and placed on agar plates previously inoculated

with test microorganisms. Standard antibiotic discs may be used as positive controls, while solvent-loaded discs serve as negative controls. After incubation at 37 °C for 18–24 hours, the zones of inhibition around the discs are measured in millimeters. Larger inhibition zones indicate stronger antibacterial activity.(9)

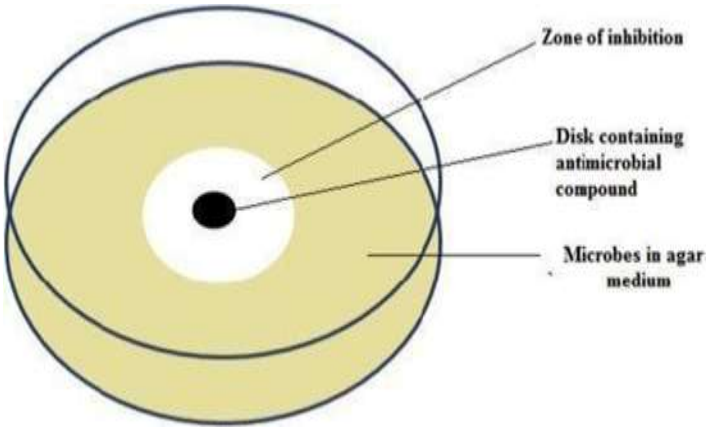

FIGURE 4: Disc Diffusion

3.1.3 Minimum Inhibitory Concentration (MIC) Determination

Minimum Inhibitory Concentration (MIC) determination provides quantitative information about the lowest concentration of the plant extract required to inhibit visible microbial growth. MIC is commonly determined using broth dilution methods. Serial dilutions of *Jatropha Gossypifolia* extract are prepared in nutrient broth and inoculated with standardized bacterial suspensions. After incubation at 37 °C for 24 hours, the tubes are examined for turbidity. The lowest concentration showing no visible growth is recorded as the MIC value, indicating the potency of the extract .(10) *figure5*

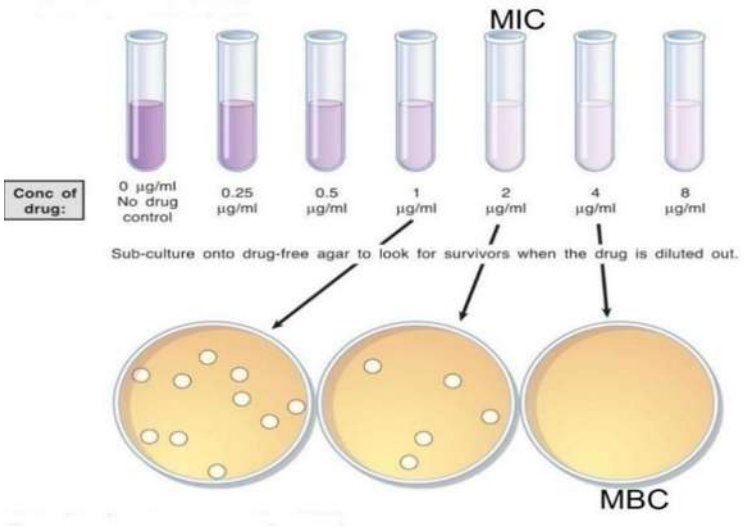

FIGURE 5: Minimum Inhibitory Concentration

3.2 Target Microorganisms

3.2.1 Gram-Positive Bacteria

Staphylococcus aureus is a Gram-positive bacterium frequently used in antibacterial studies due to its clinical significance. It is responsible for a wide range of infections, including skin, wound,

and systemic infections. Gram-positive bacteria possess a thick peptidoglycan cell wall, which makes them suitable models for evaluating the antibacterial potential of herbal extracts such as *Jatropha Gossypifolia*.(11)

3.2.2 Gram-Negative Bacteria

Escherichia coli is a representative Gram-negative bacterium commonly employed in antimicrobial screening. It is associated with gastrointestinal and urinary tract infections.

Gram-negative bacteria have an outer membrane that often confers resistance to many antimicrobial agents. Therefore, evaluating the activity of *Jatropha Gossypifolia* against *E. coli* helps in understanding its broad-spectrum antibacterial potential.(12) *figure*

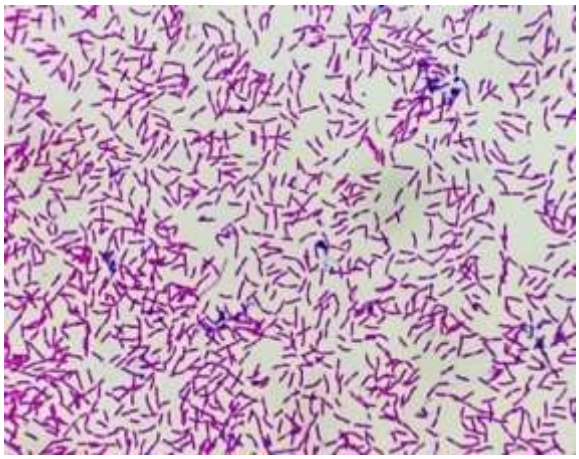

FIGURE 6: Escherichia coli

4. ANTI-INFLAMMATORYACTIVITY OF *JATROPHA GOSSYPIFOLA*

Table : 2 Phytochemicals responsible for anti-inflammatory(13)

Phytochemical group	Specific compounds reported	Part of plant	Role in anti-inflammatory activity
Flavonoids	Quercetin, Kaempferol, Luteolin	Leaves, stems	Inhibit prostaglandin synthesis, suppress inflammatory mediators (COX, LOX pathways)
Phenolic compounds	Gallic acid, Ferulic acid	Leaves	Antioxidant action reduces oxidative stress–induced inflammation
Diterpenoids	Jatrophone, Jatropholones	Roots, stems	Strong inhibition of nitric oxide (NO) and cytokine production
Triterpenoids	β-amyrin, Lupeol	Leaves, bark	Stabilize lysosomal membranes and reduce edema
Saponins	Steroidal and triterpenoid saponins	Leaves, roots	Suppress inflammatory cell infiltration and mediator release
Tannins	Condensed tannins	Leaves, bark	Astringent effect; reduce capillary permeability and swelling
Alkaloids	Jatrophine-type alkaloids	Roots, stems	Modulate inflammatory signaling pathways
Glycosides	Flavonoid glycosides	Leaves	Enhance anti-inflammatory and antioxidant synergy

4.1 In-vitro Models Reported

The anti-inflammatory potential of *Jatropha Gossypifolia* has mainly been evaluated using laboratory-based (in-vitro) experimental models. These models help to understand how plant extracts may reduce inflammation at the cellular or protein level before moving to animal or clinical studies. Two commonly reported methods are the protein denaturation assay and the membrane stabilization assay.(13)

4.1.1 Protein Denaturation Assay

Inflammation in the body is often associated with the denaturation (structural damage) of proteins.

When proteins lose their natural structure due to stress, heat, or chemicals, they can trigger inflammatory responses.

In the protein denaturation assay, the extract of *Jatropha Gossypifolia* is tested for its ability to prevent or reduce protein denaturation under controlled laboratory conditions. If the plant extract inhibits protein denaturation, it suggests that it may possess anti-inflammatory properties.

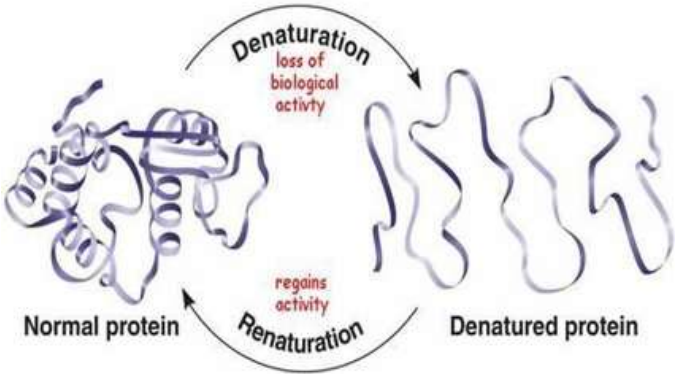

FIGURE 7: Schematic representation of potein denaturation assay using BSA and plant extract

- Prepare different concentrations of the plant extract (e.g., 100, 200, 300, 400, 500 µg/mL).
- Add 1 mL of 1% BSA (Bovine Serum Albumin) solution to each test tube.
- Add 1 mL of plant extract to the respective tubes.
- For control, add distilled water instead of extract.
- For standard, add Diclofenac sodium solution.
- Adjust pH to 6.3 using phosphate buffer.
- Incubate the mixtures at 37°C for 20 minutes.
- Heat the tubes at 57°C for 20 minutes in a water bath.
- Cool the samples to room temperature.
- Measure absorbance at 660 nm using a spectrophotometer. (13)

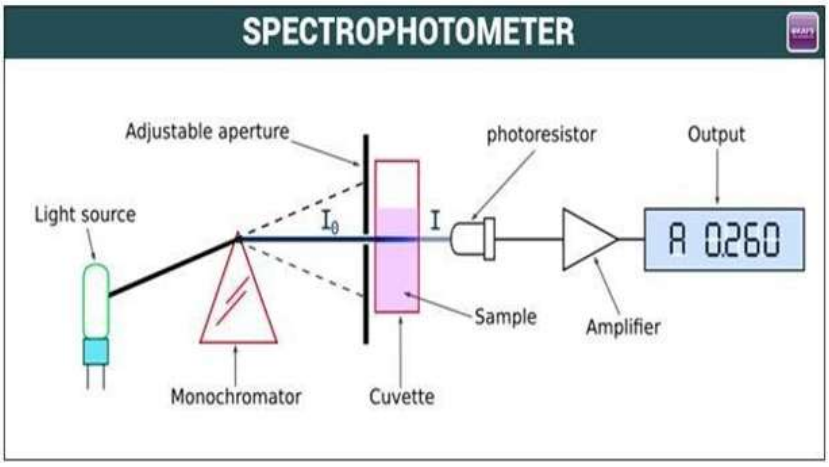

Figure 8: Measurement of absorbance using spectrophotometer at 660nm

4.1.2 Membrane Stabilization Assay

The membrane stabilization assay is based on the principle that inflammation involves the release of lysosomal enzymes from damaged cells. Stabilizing the cell membrane helps prevent the release of these inflammatory mediators.

In this method, human or animal red blood cells (RBCs) are exposed to stress conditions such as heat or hypotonic solution. The ability of *Jatropha Gossypifolia* extract to protect the RBC membrane from rupture (hemolysis) is measured. If the extract prevents hemolysis, it indicates membrane stabilization activity, which is comparable to the action of standard anti-inflammatory drugs.

Jatropha Gossypifolia extracts can significantly protect red blood cells from damage, indicating potential anti-inflammatory activity. This protective effect may be due to bioactive constituents that help strengthen cellular membranes and reduce inflammatory responses.(14)

4.2 In-Vivo Models Reported

4.2.1 Carrageenan-Induced Paw Edema Model

Experimental Animals

Healthy adult albino rats (150-200g) were used for the study. The animals were kept under standard laboratory conditions. All experimental procedures were carried out following ethical guideline.

Grouping of Animals

The animals were divided into the following groups, with each group containing six animals:

- **Group I** – Normal control (received saline)
- **Group II** – Standard drug (e.g., diclofenac)
- **Group III** – Test group (received *Jatropha Gossypifolia* extract)

Preparation of Test Extract

The plant extract of *Jatropha Gossypifolia* was prepared using a suitable solvent and administered at a selected dose based on previous studies.

Induction of Inflammation

Acute inflammation was induced by injecting 0.1 mL of 1% carrageenan solution into the sub-plantar region of the left hind paw of each rat.

Drug Administration

The standard drug and plant extract were administered orally one hour before carrageenan injection. The control group received normal saline.

Measurement of Paw Edema

The paw volume was measured using a plethysmometer before carrageenan injection and at regular intervals (1, 2, 3, and 4 hours) after injection.

Percentage inhibition = $(Vc - Vt)/Vc \times 100$

Vc = Mean paw volume of control group

Vt = Mean paw volume of treated group (15)

5. COMPARATIVE EVALUATION

5.1 Methodological Comparison:

There are noticeable variations in the standardization, output parameters, and reproducibility of the methodological approaches used to assess *Jatropha Gossypifolia's* antibacterial and anti-inflammatory properties. Studies on *Jatropha Gossypifolia's* antibacterial

efficacy frequently use comparatively standardized experimental models, such as disc diffusion, agar well diffusion, and minimum inhibitory concentration (MIC) experiments. These techniques are commonly used and correspond to standard procedures, which facilitates the comparison of findings from various investigations. The results, which offer precise and quantifiable proof of antibacterial efficacy, are presented as quantifiable characteristics like zone of inhibition and MIC values. (16)

In contrast, a range of experimental models, such as protein denaturation and membrane stabilization assays, are used to evaluate the anti-inflammatory properties of Jatropha Gossypifolia. These models lack uniform methodologies and vary significantly between investigations. Assay type, extract concentration, and experimental circumstances can all affect the results, which are often reported as % inhibition. The reproducibility of anti-inflammatory results is typically worse than that of antibacterial research because of this heterogeneity. While anti-inflammatory research is still very inconsistent and method-dependent, assessments of *Jatropha Gossypifolia's* antibacterial effectiveness generally show greater reproducibility and methodological consistency. (17)

5.2 Relative Strength of Evidence

Compared to its anti-inflammatory activity, *Jatropha Gossypifolia's* antibacterial activity has more preliminary evidence. Research has consistently shown that both Gram-positive and Gram-negative bacteria are susceptible to antibiotic actions. Standardized and generally recognized techniques such disc diffusion, agar well diffusion, and minimum inhibitory concentration (MIC) assays are frequently used in these studies.

The antibacterial outcomes are typically more consistent throughout several research since these techniques yield quantifiable and repeatable results.On the other hand, there is little and data fluctuations to support *Jatropha Gossypifolia's* anti-inflammatory properties.

Few in-vivo studies are available, and the majority of research relies on in-vitro testing such membrane stability and protein denaturation.The kind of extract, concentration, and experimental model utilized frequently affect the outcomes.(18)

The data for anti-inflammatory efficacy is still suggestive rather than definitive because of these variances and the lack of thorough in-vivo confirmation. Overall, *Jatropha Gossypifolia's* antibacterial actions are backed by more consistent and measurable evidence under present experimental circumstances, even though both activities show promise.(19)

5.3 Phytochemical Overlap and Comparative Evaluation

In traditional medicine, *Jatropha Gossypifolia* is a common medicinal herb used to cure wounds, inflammation, and infections. According to phytochemical analyses, this plant contains a number of bioactive substances, most frequently flavonoids and phenolic compounds. Research on medicinal plants is well aware of these phytochemical groups' links to antibacterial and anti-inflammatory properties. Because of their capacity to impede microbial development and disrupt bacterial cell processes, flavonoids and phenolics are often proposed as contributing components in studies pertaining to *Jatropha Gossypifolia*'s antibacterial action.(20)

These same families of chemicals are also utilized in anti-inflammatory studies to reduce inflammatory responses, perhaps through

membrane stability and antioxidant propertiesCommon chemical ingredients may have numerous biological actions, as suggested by the occurrence of overlapping phytochemicals in both types of investigations.

Comparatively speaking, *Jatropha Gossypifolia's* antibacterial activity seems to be supported by more reliable experimental data, primarily from standardized in-vitro tests. On the other hand, there is comparatively little evidence of anti-inflammatory activity, and it varies according to the assay.(21)

6. LIMITATIONS OF EXISTING STUDIES ON *JATROPHA GOSSYPIFOLA*

6.1 Predominance of in-vitro experiments

In-vitro experimental models including agar diffusion, protein denaturation, or membrane stabilization assays have been used in studies on *Jatropha Gossypifolia*. Although these techniques are helpful for preliminary screening, they are not a faithful representation of the intricate biological processes that take place in living things. Results obtained in vitro are unable to predict how plant components will be absorbed, metabolized, or eliminated by the body. Because of this, the plant's true medicinal potential may vary in in vivo settings. This restricts many reported findings' therapeutic applicability.(22)

6.2 Absence of mechanism-based investigations

However, *Jatropha Gossypifolia's* antibacterial and anti-inflammatory properties do not account for the extract's interactions with inflammatory pathways or microbial cells. To determine the molecular targets and biological pathways involved, mechanism-based research is crucial. The prospects for medication development and scientific understanding are limited in the absence of such studies. There is still a significant research void in this area.(23)

6.3 No standardized extract preparation protocols

The techniques used to make extracts of *Jatropha Gossypifolia* vary widely. Different plant components, solvents, extraction durations, and concentrations are used in different investigations. Biological activity and phytochemical composition vary as a result of this lack of uniformity. As a result, it becomes challenging to compare study results. Reproducibility and result validation depend on standardized extraction procedures.(23)

6.4 Safety and toxicity data

Safety evaluation is a critical aspect of medicinal plant research, yet toxicity studies on *Jatropha Gossypifolia* are limited. Many studies focus only on biological activity without assessing potential adverse effects. Since some species of *Jatropha* are known to contain toxic compounds, the lack of toxicity data raises concerns regarding safe usage. Comprehensive acute and chronic toxicity studies are required before considering therapeutic applications. (24)

7. FUTURE DIRECTIONS

7.1 Integrated Evaluation Of Antibacterial And Anti-Inflammatory Effects

Antibacterial and anti-inflammatory qualities have been independently established by *Jatropha Gossypifolia*. However, inflammation and microbial infection happen continuously and are chemically linked in many infectious disorders. Thus, integrated experimental methods that assess both antibacterial and anti-inflammatory effects within the same study model should be the main focus of future research.(24)

7.2 Isolation and Characterization of Active Constituents

Preliminary phytochemical screenings have identified flavonoids, terpenoids, alkaloids, phenolics, and other secondary metabolites in *J. Gossypiifolia*,. Future investigations should prioritize bioassay-guided fractionation to isolate specific active molecules responsible for antibacterial and anti-inflammatory effects. Advanced analytical techniques such as HPLC, LC-MS, GC-MS, and NMR spectroscopy can aid in structural characterization. Identifying and characterizing these bioactive constituents would increase the possibilities for developing standardized herbal formulations or even noveldrug leads. (24)

7.3 Toxicity and Pharmacokinetic Profiling

According to systematic toxicological evaluations, *J. gossypifolia* may show dose-dependent toxicity. Determining safe treatment windows requires acute, subacute, and chronic toxicity investigations. Furthermore, less is known about pharmacokinetic profiling, which includes absorption, distribution, metabolism, and excretion (ADME) research. Dosage optimization, formulation development, and reducing potential side effects will all depend on an understanding of how the active chemicals function within the body. Clinical translation is still in its early stages without comprehensive safety and pharmacokinetic data.(25)

7.4 Utilization of *Jatropha Gossypifolia* as a Value-Added Product from an Invasive Species

J. Gossypiifolia is regarded as an invasive plant in a number of areas, frequently creating environmental issues. Its proven bioactive potential, however, presents a chance to turn an environmental issue into a useful biological resource. In order to produce value-added goods like herbal extracts, phytopharmaceutical compounds, natural antibacterial agents, or anti-inflammatory topical formulations, future study could examine sustainable harvesting, plant management, and biotechnological applications. This strategy, which repurposes invasive plant species into profitable goods while also supporting in ecosystem management, is consistent with the concepts of sustainable development and the circular bioeconomy.(25)

Further studies are warranted to evaluate:

- Standardization of extraction and experimental protocols
- Bioassay-guided isolation and structural characterization of active compounds
- Detailed mechanism-based molecular studies
- Comprehensive toxicity and safety profiling
- Pharmacokinetic investigations
- Well-designed in-vivo and clinical-level validation studies
- Development of standardized herbal formulations or phytopharmaceutical products

8. CONCLUSION

Jatropha Gossypiifolia shows promising antibacterial and anti-inflammatory activities. Among these, antibacterial activity has stronger and more consistent experimental support, as it is evaluated using standardized methods that provide measurable and reproducible results. In comparison, anti-inflammatory activity has been reported in several studies, but the findings are more variable and depend on the type of assay used.

However, most of the existing evidence is preliminary and limited to in-vitro studies using crude extracts. There is a lack of standardized research designs, detailed mechanism studies, and toxicity evaluations. Therefore, further systematic and well-controlled investigations are necessary to confirm the therapeutic potential of Jatropha gossypiifolia.

Future research should focus on systematic and standardized experimental designs, including compound isolation, mechanism-based studies, and well-controlled in-vivo evaluations. Such approaches will help establish clearer evidence regarding the therapeutic potential of Jatropha gossypiifolia and support its possible development as a value-added medicinal resources.

REFERENCES

1. `Félix-Silva JU, Gomes JA, Barbosa LM, Pinheiro IT, Soares LA, Silva-Júnior AA, Zucolotto SM, Fernandes-Pedrosa MD. Systemic and local anti-inflammatory activity of aqueous leaf extract from Jatropha gossypiifolia L.(Euphorbiaceae). Int J Pharm Pharm Sci. 2014;6(6):142-5.
2. Saini V, Mishra R, Mandloi S, Yadav N. Analysis of the phytochemical content of Jatropha gossypifolia. L. Chem Eng Process. 2015;35:99-104.
3. Burkill HM. The useful plants of West Tropical Africa. Vol. 1. Families AD. 1985.
4. Heard TA, Dhileepan K, Bebawi F, Bell KL, Segura R. Jatropha gossypiifolia L.–bellyache bush. Biological control of weeds in Australia. 2012 Mar 5:324-33.
5. Azmir J, Zaidul IS, Rahman MM, Sharif KM, Mohamed A, Sahena F, Jahurul MH, Ghafoor K, Norulaini NA, Omar AK. Techniques for extraction of bioactive compounds from plant materials: A review. Journal of food engineering. 2013 Aug 1;117(4):426-36.
6. Sasidharan S, Chen Y, Saravanan D, Sundram KM, Latha LY. Extraction, isolation and characterization of bioactive compounds from plants' extracts. African journal of traditional, complementary and alternative medicines. 2011;8(1).
7. Mukherjee PK. Quality control of herbal drugs: an approach to evaluation of botanicals. Business horizons; 2002.
8. Singh MK, Bindhu OS. Plant latex: A rich source of haemostatic proteases. InHerbal medicine in India: indigenous knowledge, practice, innovation and its value 2019 Sep 11 (pp. 143-153). Singapore: Springer Singapore.
9. Aiyelaagbe OO, Oguntuase BJ, Arimah BD, Adeniyi BA. The antimicrobial activity of Jatropha multifida extracts and chromatographic fractions against sexually transmitted infections. J Med Sci. 2008 Feb 15;8(2):143-7.
10. Chen H, Zhang J, He Y, Lv Z, Liang Z, Chen J, Li P, Liu J, Yang H, Tao A, Liu X. Exploring the role of Staphylococcus aureus in inflammatory diseases. Toxins. 2022 Jul 6;14(7):464.
11. Basavaraju M, Gunashree BS. Escherichia coli: an overview of main characteristics. Escherichia coli-old and new insights. 2022 Nov 11:1-21.
12. AMOO IA. Antimicrobial activity of Nigerian medicinal plants. Journal of Intercultural Ethnopharmacology. 2017 Jan 1.
13. Mizushima Y, Kobayashi M. Interaction of anti-inflammatory drugs with serum proteins, especially with some biologically active proteins. Journal of Pharmacy and Pharmacology. 1968 Mar;20(3):169-73.
14. Singh PK. Master of Science In Biotechnology (Doctoral dissertation, Indira Gandhi National Tribal University).
15. Winter CA, Risley EA, Nuss GW. Carrageenin-induced edema in hind paw of the rat as an assay for antiinflammatory drugs. Proceedings of the society for experimental biology and medicine. 1962 Dec;111(3):544-7.
16. Imada N. Antibacterial Activity of Ethanol Extract Red (Jatropha gossypifolia) Leaves Against Bacterial Skin Infections by Agar Diffusion. MICROBIOLOGY. 2024;4(2).

17. Jain AP. Preliminary screening of hydrogel containing Martynia annua extract for anti-inflammatory activity. Asian Journal of Pharmaceutics (AJP). 2021;15(04).
18. Okiti AF, Osuntokun OT. Antimicrobial, phytochemical analysis and molecular docking (In-silico Approach) of Tithonia diversifolia (Hemsl.) A. Gray and Jatropha gossypiifolia L on selected clinical and multi-drug resistant isolates. Journal of Advances in Microbiology. 2020Jun 23;20(6):1-8.
19. Viswanathan MB, Ananthi JD, Venkatesan N. Review on Jatropha. International Journal of Research and Innovation in Social Science. 2018;2(8):2454-6186.
20. Górniak I, Bartoszewski R, Króliczewski J. Comprehensive review of antimicrobial activities of plant flavonoids. Phytochemistry reviews. 2019 Feb 15;18(1):241-72.
21. Majrashi TA, Alshehri SA, Alsayari A, Muhsinah AB, Alrouji M, Alshahrani AM, Shamsi A, Atiya A. Insight into the biological roles and mechanisms of phytochemicals in different types of cancer: targeting cancer therapeutics. Nutrients. 2023 Mar 31;15(7):1704.
22. Dhale DA, Birari AR. Preliminary screening of antimicrobial and phytochemical studies of Jatropha gossypifolia Linn. Recent research in science and technology. 2010 Oct 18;2(7).
23. Sasidharan S, Chen Y, Saravanan D, Sundram KM, Latha LY. Extraction, isolation and characterization of bioactive compounds from plants' extracts. African journal of traditional, complementary and alternative medicines. 2011;8(1).
24. Devappa RK, Makkar HP, Becker K. Jatropha toxicity—a review. Journal of toxicology and environmental health, Part B. 2010 Aug 18;13(6):476-507.
25. Mariz SR, Borges AC, Melo-Diniz MF, Medeiros IA. Possibilidades terapêuticas e risco toxicológico de Jatropha gossypiifolia L.: uma revisão narrativa. Revista Brasileira de Plantas Medicinais. 2010;12:346-57.

HOW TO CITE: Bhuvana Ezhil Rohini R, Sujatha M, Abinaya V, Janani R, Kishore Kumar R, Ragu Semaraj T, Vaishnavi B, Comparative Evaluation of Antimicrobial and Anti-inflammatory Activity of Jatropha gossipyfolia, Int. J. of Pharm. Sci., 2026, Vol 4, Issue 7, 5223-5235. https://doi.org/10.5281/zenodo.21627366