WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
Coden USA: WJPRAP Impact Factor 8.63
Volume 15, Issue 11, 1345-1360. Research Article ISSN 2277–7105

SCREENING FOR LEAVES OF *IXORA COCCINEA* LINN FOR PHYTOCHEMICAL AND ANTIOXIDANT ACTIVITY: A PHARMACOGNOSTICAL AND EXPERIMENTAL STUDY

Chaithanya Sai D.[1]*, Nandhini R.[2], Rohini S.[3], Sandhiya K[4], Dr. Padma R.[5], Dr. Sathish A.[6]

[1,2,3,4]Undergraduate Research Scholar, GRD College of Pharmacy, Thiruvallur, Affiliated to The Tamil Nadu Dr. M.G.R Medical University, Chennai.

[5]Professor, GRD College of Pharmacy, Thiruvallur, Affiliated to The Tamil Nadu Dr. M.G.R Medical University, Chennai.

[6]Principal, GRD College of Pharmacy, Thiruvallur, Affiliated to The Tamil Nadu Dr. M.G.R Medical University, Chennai.

Article Received on 06 May 2026,
Article Revised on 26 May 2026,
Article Published on 01 June 2026

https://doi.org/10.5281/zenodo.20443657

***Corresponding Author**

Chaithanya Sai D.

Undergraduate Research Scholar, GRD College of Pharmacy, Thiruvallur, Affiliated to The Tamil Nadu Dr. M.G.R Medical University, Chennai.
chaithanyasai987@gmail.com

How to cite this Article: Chaithanya Sai D.[1]*, Nandhini R.[2], Rohini S.[3], Sandhiya K[4], Dr. Padma R.[5], Dr. Sathish A.[6] (2026). Screening For Leaves of Ixora Coccinea Linn for Phytochemical And Antioxidant Activity: A Pharmacognostical And Experimental Study. World Journal of Pharmaceutical Research, 15(11), 1345–1360.

ABSTRACT

Medicinal plants have long served as a primary source of therapeutic agents due to their safety, affordability, and diverse pharmacological properties. The present study focuses on the screening of leaves of *Ixora coccinea* Linn. (Rubiaceae) for phytochemical constituents and antioxidant activity. The plant, widely used in traditional systems, is known for its therapeutic applications including anti-inflammatory, antimicrobial, and wound-healing properties. Leaves were collected, authenticated, shade-dried, powdered, and subjected to successive extraction using solvents of increasing polarity. Preliminary phytochemical screening identified major compounds such as alkaloids, flavonoids, tannins, glycosides, and phenolics. Pharmacognostical evaluation and antioxidant assays confirmed significant activity. The findings support the traditional use of *Ixora coccinea* and highlight its potential as a natural antioxidant source.

KEYWORDS: *Ixora coccinea*; Phytochemical screening; Antioxidant activity; Pharmacognosy; Herbal medicine.

INTRODUCTION

Man and animals rely on plants for their survival, as plant diversity exceeds 500,000 species and plays a critical role in maintaining environmental equilibrium and ecosystem stability. Medicinal plants have historically served as a primary source for treating human diseases, with approximately 1.42 billion people (a quarter of the global population) depending on traditional medicines. Herbal medicine, the earliest form of healing originating from ancient Greece around 1600 BC, is experiencing a resurgence worldwide. In India, ethnobotanical data indicate that over 6,000 higher plant species—about 40% of the country's higher plant diversity—are utilized in both codified and folk healthcare traditions. As more individuals seek remedies free from the side effects of synthetic chemicals, medicinal herbs are increasingly transitioning from niche practices to mainstream acceptance.[1]

Recently, there has been significant interest in using eco-friendly, plant-based products for preventing and treating various human diseases. Due to the adverse effects of synthetic drugs, Western populations are increasingly seeking natural, safe, and effective remedies. Traditional medicine, particularly involving plant drugs, is prevalent among the majority of the world's population. India, with its rich and diverse cultural heritage, offers numerous plants with medicinal properties that could serve as effective alternatives to synthetic medications. The country's flora has been extensively explored for its herbs, which are readily available and possess various medicinal qualities. Compounds derived from primary metabolism, such as amino acids, carbohydrates, and proteins, are essential for sustaining life processes, while secondary metabolites like alkaloids, phenols, steroids, and terpenoids hold pharmacological, toxicological, and ecological significance.[2]

The prospects of herbal research in drug discovery highlight the enduring importance of plants in modern medicine, despite the availability of numerous synthetic pharmaceuticals. Many current therapeutic agents, such as artemisinin, quinine, and vincristine, originate from plant sources. Additionally, a variety of plant-derived drugs, like taxol and reserpine, remain irreplaceable in standard therapies. While some natural products face challenges such as low yield and poor absorption, structural modifications can enhance their efficacy, exemplified by the pro-drug vincristine derived from vinblastine. Current research shows that plant materials are the foundation of approximately 25-50% of Western drugs, often inspired by traditional

and folk medicinal practices. The increasing interest in phytochemical constituents aims to connect these compounds to their pharmacological activities, leading to the discovery of several bioactive compounds from medicinal plants.[3-4]

The process of bioassay-guided fractionation for isolating these compounds is time-intensive, often relying on the availability of plant materials. Phytochemical screening is crucial in identifying new therapeutically important compounds, such as alkaloids, phenolics, and terpenoids. Advancements in pharmacognosy have improved crude drug standardization techniques, reinforcing the historical significance of medicinal herbs in various indigenous medical systems. Traditional medicinal plants are increasingly recognized for their potential as safer alternatives to synthetic drugs, often with fewer side effects. As a result, they are regarded as vital sources for new and effective therapeutic agents. The untapped chemical diversity of plants represents a promising avenue for drug development, with over half of modern clinical drugs deriving from natural products. This emphasizes the pivotal role of plant exploration in future pharmaceutical advancements.[5-8]

Antioxidants play a crucial role in protecting cells from damage caused by free radicals, which are by-products of metabolic processes. While free radicals are necessary for certain bodily functions, excessive amounts can lead to oxidative stress, contributing to diseases such as cancer, cardiovascular conditions, and degenerative health issues including diabetes and Alzheimer's disease. Major sources of free radicals include pollution, fried foods, and cigarette smoke. Reactive oxygen species (ROS) and reactive nitrogen species (RNS) are generated in metabolic pathways and can be enhanced by pathological conditions, leading to oxidative stress. Key processes for ROS generation include the activity of NADPH oxidase and Fenton and Haber Weiss reactions. Antioxidants, such as superoxide dismutase (SOD) and glutathione (GSH), serve as protective agents against oxidative damage, scavenging free radicals and neutralizing harmful effects.[9-13]

Lipid peroxidation, which occurs within aerobic cells, results from interactions between molecular oxygen and unsaturated fatty acids, creating lipid radicals and other harmful products. Maintaining a balance between the production of free radicals and antioxidants is essential for thwarting oxidative stress. Antioxidants can be found in various foods, particularly fruits and vegetables, and include phytochemicals like flavonoids and polyphenolics, which plants use for their own protection against oxidative damage. The antioxidant capacity of compounds is often measured using assays like DPPH, TBARS, and

SOD activity, with DPPH being favored for its simplicity and reproducibility. Various phytochemicals such as curcumin and gallic acid have been identified to exhibit antioxidant activities.[14-15]

Herbs offer effective natural remedies with a high safety profile, particularly evident in India's diverse medicinal plants due to favorable climatic conditions. Although numerous herbal drugs exist, only a few have been systematically studied. The increasing interest in folk medicine highlights the potential of natural products as drug leads, particularly from plants like *Ixora coccinea*, known in Ayurveda for various therapeutic applications. This plant demonstrates a range of pharmacological activities including hepatoprotective, immunomodulating, wound healing, and antioxidant properties, making it significant for further research. The current study focuses on evaluating the antioxidant activity of *Ixora coccinea* leaves, aimed at identifying new active principles beneficial to phytochemists and pharmacologists.

PLANT PROFILE AND REVIEW OF LITERATURE

Ixora coccinea Linn., belonging to the Rubiaceae family, is commonly referred to as Jungle Geranium, Flame of the Woods, and West Indian Jasmine, among other vernacular names. It is native to Southern India, Bangladesh, and Sri Lanka, flourishing in tropical and subtropical climates, particularly in regions like South Florida, where it is cultivated as an ornamental shrub. In India, the plant is widespread, especially in Southern states such as Kerala, Tamil Nadu, Maharashtra, and Karnataka, and in parts of the Northeast like Assam. This evergreen shrub is characterized by its multi-branched, dense growth and prefers moist, acidic, fertile, organically rich, well-drained loam for optimal development. The plant thrives in full sun but tolerates light to partial shade, and it is sensitive to temperatures below 50°F (10°C). Regular, moderate watering is essential to maintain moist soil conditions.[16-18]

Fig. 1: *Ixora coccinea* Linn. –Leaves

Botanically, *Ixora coccinea* features dark green, glossy, leathery leaves that grow in opposite pairs, typically measuring 3-6 inches in length. The leaves have entire margins and come to a rounded or pointed tip, often with a cordate base. They are known for their distinctive stipules that have awn-like tips. The parts utilized for various medicinal purposes include the roots, leaves, flowers, stems, and the entire plant, which is employed in the treatment of different ailments.

Ixora coccinea is highly regarded in traditional medicine, particularly in Ayurveda and various folk practices in Asia and Africa. Its flowers are commonly used in remedies for women's health issues, such as leucorrhoea and menstrual irregularities, and are often combined with other medicinal plants for applications like wound healing and treating respiratory ailments. The roots aid digestive health, addressing nausea and anorexia, while leaves and stems are used for poultices on sprains and boils. In Sri Lanka and Southeast Asia, the plant treats fever and skin conditions, with berries consumed by children for improved digestion. Its broad medicinal applications are also recognized in African and Caribbean folk medicine for skin conditions and gastrointestinal issues.[19]

The phytochemical review of *Ixora coccinea* highlights various phytochemical constituents such as flavonoids (including kaempferol and quercetin), triterpenoids, tannins, and several fatty acids. The leaves produced significant compounds like ursolic acid and lupeol, while the roots revealed β-amyrin and quercetin. Phytochemical investigations identified sixty components in the essential oil, predominantly triterpenes. Notably, a new triterpene, ixorene, was isolated from the leaves. The study also described two novel peptides with potential anticancer properties and other bioactive activities, including inhibition of superoxide anion generation. Overall, *Ixora coccinea* exhibits a range of chemical bioactivities, supporting its traditional medicinal uses.[20-23]

The pharmacological and biological review by P. Roja *et al.* discusses various therapeutic activities of *Ixora coccinea*. The plant exhibits antioxidant, anti-inflammatory, chemopreventive, antinociceptive, anti-mutagenic, and anti-diarrheal effects. Sunitha Dontha *et al.* report its strong anthelmintic activity against Indian earthworm *Pherituma posthuma*, highlighting the superiority of chloroform extracts over others. They also evaluated the ethyl acetate and methanol extracts for *in vitro* antileishmanial activity against *Leishmania donovani*, noting significant growth inhibition. Furthermore, hydroalcoholic extracts demonstrated anti-asthmatic effects in a rat model by reducing eosinophilia and improving

airway responsiveness (AHR). Additionally, antinociceptive potential was evidenced through various tests, reflecting notable activity at certain doses. Anisha Devendran *et al.* reviewed the antioxidant properties of *Ixora coccinea*, finding that its hydromethanolic extract showed significant scavenging activity with an IC50 of 100.53 µg/ml, outperforming ascorbic acid.[24,25]

METHODOLOGY

Collection and Authentication of Plant Materials

The leaf material of *Ixora coccinea* Linn (Rubiaceae) was collected from the wetlands of Pudur, Thiruvallur, India, near GRD College of Pharmacy, during September and October. Authentication was conducted by Dr. A. Kanagarajan at Siddha Anna Govt. Hospital, Chennai. Approximately 10 g of leaf material was thoroughly washed, shade dried for 15 days, and then ground into a uniform powder using a mechanical grinder, passing it through a sieve number 40. The powdered drug was stored in an airtight container at room temperature for further studies.

Pharmacognostical Studies

(a) Plant anatomical studies

Preparation of specimens involved cutting healthy plant samples and fixing them in FAA (formalin, acetic acid, and ethyl alcohol). After 24 hours, specimens were dehydrated using a TBA series and infiltrated with paraffin wax until saturation, then cast into blocks. Sectioning was performed with a Rotary Microtome, yielding sections 10-12 µm thick. De-waxing followed the customary Johansen procedure, and sections were stained using the Toluidine blue method, producing distinct colors for various cell components, such as pink for cellulose and blue for lignified cells. Additional staining methods included safranin, fast-green, and potassium iodide for starch. To study stomatal morphology and other features, paradermal sections and cleared leaves were prepared using 5% sodium hydroxide or Jeffrey's maceration fluid. Glycerin mounted preparations facilitated observation of cleared materials, and powdered samples were also cleared and stained for analysis of different cell components.

(b) Powder Microscopy

A pinch of the powdered sample was mounted on a microscopic slide with a drop of 50% glycerol after clearing with saturated solution of chloral hydrate. Sample was treated with iodine solution to confirm the presence of starch grains. Characters were observed using

Nikon ECLIPSE E200 trinocular microscope attached with Zeiss ERc5s digital camera under bright field light. Photomicrographs of diagnostic characters were captured and documented.

Extraction of Plant Material

The dried powdered leaves material of 20 gm of 3 different portions were extracted successively with 150 ml of different solvents with increasing polarity starting with petroleum ether (60° - 80°C) then followed by petroleum ether extract, chloroform, hydro alcoholic extract, ethyl acetate extract, ethanol extract, and aqueous extract by using maceration apparatus for 36 hours at room temperature. The extracts were filtered while hot and concentrated at 45°C using rotary vacuum evaporator. The obtained extracts were vacuum dried and stored in desiccators for further investigation of preliminary phytochemical analysis and antioxidant activity.

Phytochemical Studies

General screening of the raw plant powder, alcoholic and aqueous extracts of the plant material is carried out for qualitative determination of the groups of organic compounds present in them.[26]

***In vitro* Antioxidant Studies**

Free radicals, generated during normal bodily functions and from environmental sources, can lead to oxidative stress, tissue injury, and diseases such as cancer, Alzheimer's, and cardiovascular conditions. The balance between pro-oxidants and antioxidants is crucial for health. Plant-derived antioxidants, particularly polyphenols and terpenoids, play significant roles in neutralizing free radicals. This study examines the antioxidant activity of various extracts from Ixora coccinea, known for its medicinal properties, which includes flavonoids and phenols that may effectively scavenge free radicals and mitigate related diseases.[27-30]

(a) Scavenging of hydrogen peroxide

Hydrogen peroxide is the least reactive molecule among reactive oxygen species and is stable under physiological pH and temperature in the absence of metal ions. It can be generated through a dismutation reaction from superoxide anion by superoxide dismutase. It can generate the hydroxyl radical in the presence of metal ions and superoxide anion.

$$O2^{-} + H2\ O2 \longrightarrow OH^{\cdot} + OH^{-} + O2$$

30 mg of each of the extracts and the standards, ascorbic acid and rutin were accurately weighed and separately dissolved in 10 ml of methanol. These solutions were serially diluted

with methanol to obtain the lower dilutions. A solution of hydrogen peroxide (20 mM) was prepared in phosphate buffered saline (PBS, pH 7.4). Various concentrations of 1 ml of the extracts or standards in methanol were added to 2 ml of hydrogen peroxide solutions in PBS. The absorbance was measured at 230 nm, after 10 min against a blank solution that contained the extracts in PBS without hydrogen peroxide.[31]

(b) Measurement of reducing power ability activity

The reducing power was investigated by the Fe^{3+}-Fe^{2+} transformation in the presence of the extracts as described by Fejes, *et al.* Chemicals and Reagents involved are Potassium ferricyanide (K_3FeCN_6, 1%), Trichloro acetic acid (TCA, 10%), Ferric chloride ($FeCl_3$) solution (0.1%) and Phosphate buffer pH 6.6.The Fe^{2+} can be monitored by measuring the formation of Perl's Prussian blue at 700 nm. One ml of the extract (50-800 µg/ml), 2.5 ml of phosphate buffer (pH 6.6) and 2.5 ml of 1% potassium ferricyanide were incubated at 50°C for 30 min and 2.5 ml of 10% trichloroacetic acid was added to the mixture and centrifuged for 10 min at 3000 g. About 2.5 ml of the supernatant was diluted with 2.5 ml of water and is shaken with 0.5 ml of freshly prepared 0.1% ferric chloride. The absorbance was measured at 700 nm. Butylated hydroxy toluene (50-800 µg/ml) was used as the standard. All tests were performed in triplicate and the graph was plotted with the average of the three determinations.[32]

RESULTS AND DISCUSSION

Pharmacognostical Studies

(a) Macroscopic Characters

The leaves are dark green, glossy, leathery, oblong/oval, and grow in opposite pairs, usually 3-6 inches long, with entire margins, a rounded or pointed tip, and often a cordate base, forming a dense, attractive evergreen foliage for hedges or containers, known for their distinctive stipules with awn-like tips. Arrangement: Opposite pairs or whorled on the stem. Shape: Oblong, elliptic, or obovate. Size: Typically 3-6 inches (up to 10 cm) long. Texture: Leathery and glossy. Color: Dark green. Margin: Entire (smooth).Apex (Tip): Rounded, mucronate (ending in a small point), or shortly tapering. Base: Cordate (heart-shaped) to Rounded. Petiole: Sessile (no stalk) to short-petiolate. Stipules: Sheathing at the base with triangular, awn-tipped lobes.

(b) Powder microscopy

The powder is green in colour with no characteristic odour and taste; shows characters like unicellular covering trichomes, surface view of lower epidermis with paracytic stomata, surface view of upper epidermis, palisade and spongy parenchyma cells, parenchyma cells, vessels with spiral thickenings, fibers, tracheid and cluster crystals.

Fig. 2: Powder microscopy of *Ixora coccinea* leaf (a) Covering trichomes (b) Lower epidermis with paracytic stomata (c) Epidermis in sectional view (d) Upper epidermis in surface view (e) Palisade cells (f) Spongy parenchyma (g) Parenchyma cells (h) Fibre bundle (i) Tracheids (j) Spiral vessels (k) Cluster crystals (l) Cluster crystal under polarizer.

Phytochemical Studies

Determination of physiochemical constants is important for the purpose of evaluation of crude drugs. The quality parameters of the crude drugs as raw materials were established with the help of several official determinations based on physical and physiochemical studies. These studies were aimed at ensuring standardisation of herbal drugs under investigations. Several physiochemical parameters were established for the plant.[33-35]

Table 1: Qualitative phytochemical analysis of the raw powder and extracts of the leaves of plant.

S. No	Constituents	Raw powder		Petroleum ether Extract	Chloroform Extract	Hydroalcoholic Extract	Ethyl acetate Extract	Ethanol Extract	Aqueous Extract
		Alcoholic	Aqueous						
1	Alkaloids	+	+	-	+	+	-	+	+
2	Glycoside	+	+	-	-	+	-	+	+
3	Flavonoids	+	+	-	+	+	+	+	+
4	Tannin	+	+	-	-	+	-	+	+
5	Terpenoids	+	+	-	+	+	+	+	+
6	Steroids	+	+	-	+	+	+	+	+
7	Saponin	+	+	-	-	+	-	+	+
8	Phenols	+	+	-	+	+	+	+	+
9	Resins	-	-	-	-	-	-	-	-
10	Protein	+	+	-	-	+	-	-	+
11	Carbohydrate	-	-	-	-	+	-	-	+
12	Starch	+	+	-	-	+	-	-	+
13	Gum	-	-	-	-	+	-	+	+
14	Fixed oil	-	-	+	-	-	-	-	-
15	Mucilage	-	-	-	-	+	-	-	+

+ Present − Absent

In vitro Antioxidant Studies

(a) Hydrogen Peroxide Scavenging Activity

Scavenging activity of hydrogen peroxide in *Ixora coccinea* Linn., showed remarkable antioxidant activity but was much less than the standard Ascorbic acid antioxidant activity. The composition of hydrogen peroxide into water may occur according to the antioxidant compounds. As the antioxidant component present in the extract are good electron donors, they may accelerate the conversion of hydrogen peroxide to water.[38]

Fig. 3: Hydrogen peroxide scavenging experiment.

Table 2: Hydrogen Peroxide Scavenging Activity.

Concentration µg/ml	Ascorbic acid	Chloroform extract of *Ixora coccinea*
10	36.24 ± 0.003	11.18 ± 0.134
20	44.5 ± 0.004	26.97 ± 0.007
30	53.23 ± 0.01	39.47 ± 0.028
40	64.66 ± 0.005	46.05 ± 0.014
50	75.25 ± 0.004	48.68 ± 0.007

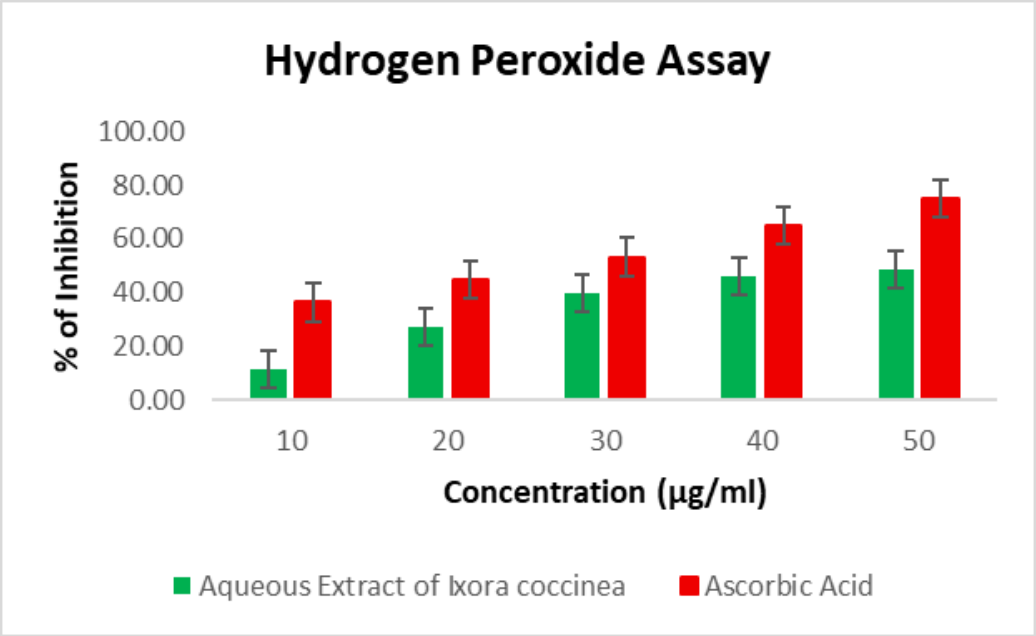

Fig. 4: Hydrogen peroxide Scavenging Activity of the Chloroform Extracts of *Ixora coccinea*.

(b) Measurement of reducing power ability activity

Shows the reductive capabilities of the extracts in comparison to the standard, Ascorbic acid. In this the antioxidant activity, the reducing power increased with increasing amount of the extracts. The Hydroalcoholic extract of leaves of *Ixora coccinea* showed the highest reducing ability (absorbance 0.981) than other extracts tested. However, the activity was less than the standard, Ascorbic acid (absorbance 0.461). The Hydroalcoholic extract of leaves *Ixora coccinea* also showed reductive ability.[39, 40]

The transformation of Fe^{3+} into Fe^{2+} in the presence of various extracts was measured to determine the reducing power ability. The reducing ability of a compound generally depends on the presence of reductones (antioxidants), which exert the antioxidant activity by breaking the free radical chain by donating a hydrogen atom. The antioxidant principles present in the

extracts caused the reduction of Fe^{3+}/ ferricyanide complex to the ferrous form, and thus proved the reducing power ability.

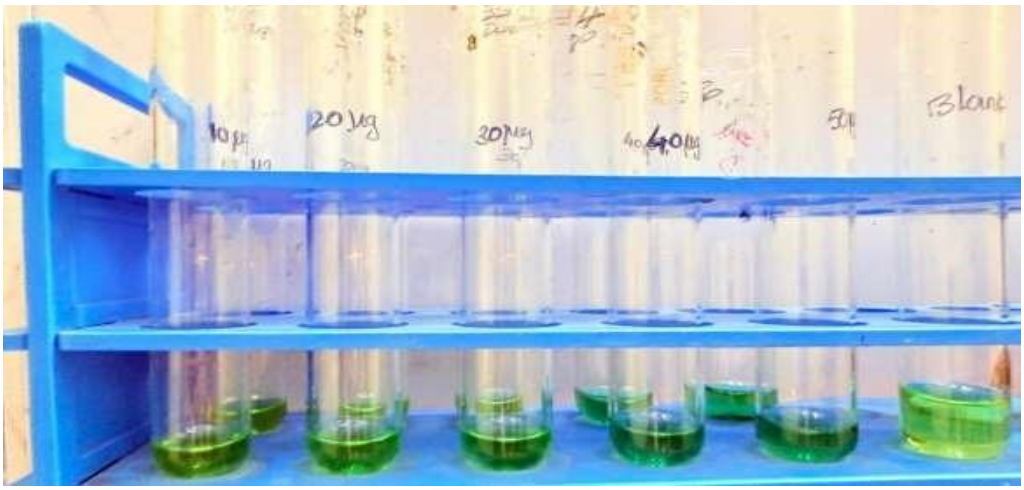

Fig. 5: Reducing power assay experiment.

Table 3: Reducing Power Assay Potassium Ferricyanide Method.

Concentration µg/ml	Standard-Ascorbic acid Absorbance	Hydroalcoholic extract Absorbance
10	0.09	0.214
20	0.145	0.405
30	0.261	0.603
40	0.372	0.759
50	0.461	0.981

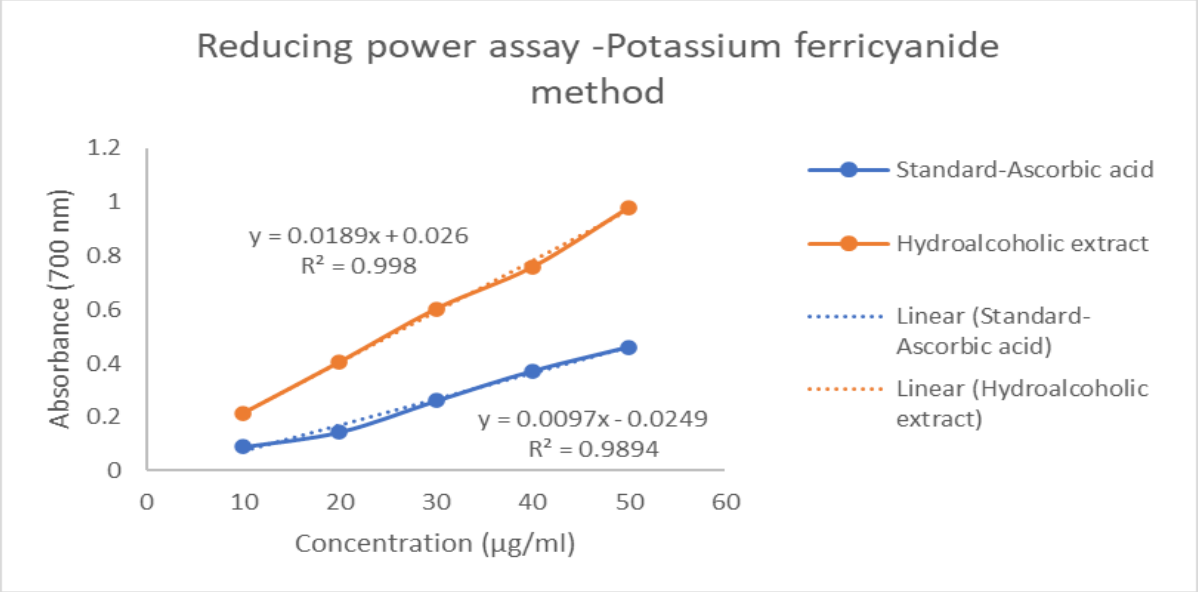

Fig. 6: Reducing power assay of the Hydroalcoholic Extracts of *Ixora coccinea.*

CONCLUSION

The study on the phytochemical properties of plant extracts revealed the presence of key compounds such as flavonoids, terpenoids, phenols, alkaloids, glycosides, saponins, tannins, carbohydrates, and proteins. In vitro tests demonstrated that the antioxidant activity of the various leaf extracts was significant when compared to a standard drug. Notably, the hydroalcoholic and chloroform extracts of *Ixora coccinea* Linn. exhibited strong antioxidant properties, likely due to the high concentrations of flavonoids and phenols. This suggests that these compounds may serve as potential candidates for new pharmaceutical antioxidants. Overall, the research highlights the pharmacognostical, phytochemical, and biological significance of the plant's leaves, providing valuable insights for future studies.

REFERENCES

1. Rajaram S, Sawant and Ashvin G Godghate. Preliminary Phytochemical Analysis of Leaves of Ixora coccinea. International Journal of Science, Environment & Technology, 2013; 2(3): 388-394
2. Dibyajyothi saha, Swathi Paul. Pharmacognostic Studies of Aerial Parts of Methanolic Extract of Ixora coccinea. Asian J. Pharm. Tech., 2012; 2(3); 107-109.
3. Karuna S. Verma, M.K. Thakur and Sulekha Pathak. Physicochemical TLC And Antioxidant Studies of Ixora coccinea. Leaves. International Journal of Animals, Veterinary, Fishery and Allied Sciences, 2014; 1(1): 41-48.
4. Gottlieb OR. Micromolecular evolution, systematics and ecology. Berlin: Springer-Verlag, 1982: 789.
5. Rao KC, Sangeetaa W. Alternate sweeteners. Vatika, 1993; 4: 193.
6. Schmeltz I. Naturally occurring insecticides. In: Jacobson M, Crosby DG, editors. Naturally occurring insecticides. New York: Dekker, 1971; 99-136.
7. Cassady JM, Chang CJ, McLaughlin JE. Recent advances in the isolation and structural elucidation of antineoplastic agents in higher plants. In: Beal JL, Reinhard E, editors. Natural products as medicinal agents. Suppl. Planta Medica. Stuttgart: Hippokrates Verlag, 1981; 93-124.
8. Naranjo P. Farmacologia y medicina tradicional. In: Samaniego E, Escaleras R, editors.
9. Fundamentos de Farmacologia Medica. Quito: Univ. Central, 1981.
10. Satya Bama S, Jayasurya Kingsley S, Sankaranarayanan S, Bama P. Antibacterial Activity of Different Phytochemical Extracts from The Leaves of Ixora coccinea.:

Identification And Mode of Action of The Terpenoid Compound As Antibacterial. International Journal of pharmacy and pharmaceutical sciences, 2012; 4(1): 557-564.

11. Ikpefan, E.O, Fajana A, Olowojoba J. Cytotoxic And Growth Inhibitory Effects of The Methanol Extracts of Ixora coccinea. (Asteraceae). Journal of Pharmacognosy And Phytochemistry, 2013; 2(1): 26-32.
12. N.Savithramma, M. Linga Rao and G.Bhumi. Phytochemical Screening of Thespesia populnea (L.) Soland and Ixora coccinea L. Journal of chemical pharmaceutical Research 2011; 3(5): 28-34.
13. Sharma B, Kumar P. Extrction and pharmacological Evaluation of Some extracts of Ixora coccinea and Capparis deciduas. International Journal of Applied research in Natural Products, 2008-2009 Dec-Jan; 1(4): 5-12.
14. Jain Ankitha And Amitha Jain. Ixora coccinea(L.): A Weed With Immense Medical Importance: A Review. International Journal of Pharma And Bio Sciences, 2012 Jan-Mar; 3(1): 554-552.
15. Prasanna S Pande, Vivek D Mane, Mayur N Mishra and S P Rothe. Antioxidant Activity of Phytoconstituents Isolated from Leaves of Ixora coccinea. International Journal of Pharm. Tech. Research., 2013Oct-Dec; 5(4): 1640-1644.
16. Veeresham C, Asres k. Antioxidants of Plant Origin. Indian J. Nat. Prod., 2000 Dec; 21(4): 3.
17. G. M. Nazeruddin, Shirish S. Pingale and Samir S. Shaikh. Pharmacological Review of Ixora coccinea L. Der Pharmcia Sinica, 2011; 2(4): 172-175.
18. Manish Sutar, Komal Malvankar and Sonia Singh. Pharmacognostical and Phytochemical Investigation of Leaves of A Weed Ixora coccinea Nanjo F, Goto K, Seto R, Suzuki M, Sakai M, Hara YO. Scavenging effects of tea catechins and their derivatives on 1,1-diphenyl2-picryl hydrazyl radical. Free. Radic. Biol. Med., 1996; 21: 895-902.
19. Baliga MS, Kurian PJ. Ixora coccinea Linn; Traditional uses, phytochemistry and pharmacology. Chinese Journal of Integrative Medicine, 2012; 18: 72-9.
20. Naidu, Permalsamy S, Kalusalingam A, Abdullah Khan, Malini LC. A Review On Ethnobotany, Phytochemistry and pharmacology of Ixora coccinea. NeuroQuantology, 2022, 20(14): 135.
21. Yasmeen M, Prabu B. Evaluation of the hypoglycemic and Hypolipidemic activities of the aqueous extract of the leaves of I. coccinea L. in Diabetic rats, J. clin. Diagno. Res., 2011; 5(7): 1381-1384.

22. Mukesh CS, Smita S. Preliminary phytochemical and Antimicrobial investigations of the aqueous extract of Ixora coccinea L. and Commelina benghalensis L. on Gram- Positive and Gram negative microorganisms. Middle East J. Sci. Res., 2010; 6(5): 436-439.
23. Sunitha D, Hemalatha K, Bhagavanraju M. Phytochemical and pharmacological Profile of Ixora: a review. Int. J. Pharm. Sci.-Res., 2015; 6(2): 567-584.
24. Nagaraj B, Krishnamurthy N,Liny P, Divya T, Dinesh R. Biosynthesis of gold nanoparticals of Ixora coccinea Flower extract and Their Antimicrobial activities. Int. J. Pharm. Bio. Sci., 2011; 2(4): 557-565.
25. P. Roja, et al. M. Nandhini, B. Deepthi, Kranthiguptha, Masaramraju. St. paul s school of pharmacy, Turkyamjal, Rangarendi district, Telangana, 501510.
26. Rastogi S, Govindarajan R. Chemical Standardization of herbal drugs.
27. Raaman N. Phytochemical Techniques. New Delhi: New India Publishing Agency, 2006: 18-24.
28. Wealth of India. A Dictionary of Indian raw materials and industrial products. Ci-Cy. New Delhi: Publication and Information Directorate CSIR, 1992; 3: 296,297.
29. Kirtikar KR, Basu BD. Indian Medicinal Plants. 2nd ed. Vol 3. Dehradun: International Book Distributors, 1999; p. 1741,1742,2163,2164.
30. Warrier PK, Nambiar VPK, Ramankurtty C. Indian Medicinal Plants. Vol 2. Chennai: Orient Longman, 1994; p. 262-64.
31. Nadkarni's KM. Indian Materia Medica. Vol 1. Bombay: Popular Prakashan, 1976; p. 41920,292.
32. Directorate CSIR, 1986. p. 152,110. The Useful Plants of India. New Delhi: Publication and Information
33. Thakkar NH, Bhatt SP. Herbal medicine: Impression or moment. Adv Pharmacol Toxicol, 2008; 9(1): 9-10.
34. Shrikumar S, Ravi TK. App8roaches towards development and promotion o herbal drugs. Phcog Rev, 2007 Jan-May; 1(1): 9-10.
35. Bandyopadhyay U, Das A, Bannerjee RK. Reactive oxygen species: Oxygen damage and pathogenesis. Curr. Sci, 1999; 77(5): 658-66.
36. Ranju Pal, Kundlik Girhepunje, Nidhi Shrivastav, Mohammed Misbah Hussain & Thirumoorthy N. Antioxidant & free radical scavenging activity of ethanolic extract of Morinda citrifolia, Annals of Biological Research, 2011; 2(1): 127-131.
37. Prieto P, Pineda M, Aguilar M. Spectrophotometric quantitation of antioxidant capacity through the formation of a phosphomolybdenum complex: specific application to the

determination of vitamin E. Anal. Biochem, 1999; 269: 337-41 Mondal SK, Chakraborty G, Gupta M, Mazumder Uk. In vitro antioxidant activity of Diospyros malabarica Kostel. Bark. Indian J Exp Biol, 2006 Jan; 44: 39-44.

38. Mensor LL, Memezes FS, Leitao GG, Reis AS, Dos Santos TC, Coube CS. Screening of Brazilian plant extracts for antioxidant activity by the use of DPPH free radical method. Phytother. Res., 2001; 15: 127-30.
39. Sreejavan N, Rao MNA. Nitric oxide scavenging by curcuminoids. J. Pharm., Pharmacol., 1997; 49: 105-07.
40. Manish Sutar, Komal Malvankar and Sonia Singh. Pharmacognostical and phytochemical investigation of leaves of Ixora coccinea. International Journal of Current Pharmaceutical Research, 2013; 5(1): 29-33.