Journal of Chemical and Pharmaceutical Sciences

Journal of Chemical and Pharmaceutical Sciences-JCHPS (2025) 18 (2): 47-55
Online ISSN: Online 2349-8552, Print ISSN: 0974-2115
Review Article | Pharmaceutical Sciences | MCI Approved | Peer-Reviewed | Referred | OA Journal |

Pharmacognosy, Phytochemistry and Pharmacological Profile of Tridax Procumbens (*Chrysanthemum Procumbens)*.

Asha Jyothi. V* and Meghana. K
Sarojini Naidu Vanitha Pharmacy Mahavidyalaya, Tarnaka, Hyderabad, India.

Received: 22 Jan 2025 / Accepted: 20 Mar 2025 / Published online: 01 Apr 2025
Corresponding Author Email:* **ashajyothivadlapudi@gmail.com

ABSTRACT

Many weeds also possess many medicinal properties Tridax procumbens is also one of them. Numerous ancient practices, such as Ayurveda, Siddha, and Unani medicine, have promoted the use of various herbal remedies including plant juices and extracts for treating illnesses, including infectious diseases. In the present paper its pharmacognosy, phytochemistry and pharmacological profile is provided in detail.

KEY WORDS: Tridax procumbens, Tridax, Medicinal plant, Coat buttons, Tridax weed.

INTRODUCTION:

Tridax procumbens Linn. (Tridax), belonging to the Compositae family, is commonly referred to as 'Ghamra' and is popularly known in English as 'coat buttons' due to the shape of its flowers. This plant has been extensively utilized in the Ayurvedic medicinal system to treat various health issues and is sometimes prescribed as "Bhringraj" by certain Ayurveda practitioners, which is a well-regarded treatment for liver-related conditions.[1]

Tridax procumbens was evaluated for its biological activity as part of one of the most comprehensive screenings of Indian plants. This screening involved assessments for antibacterial, anticancer, antifertility, antifungal, anti-helminthic, anti-protozoal, antiviral, and pharmacological effects; however, the specific results were not provided, and no additional fractionation for confirmation testing was performed, likely due to the perceived minimal biological activity. More recently, a range of plants was assessed in Nepal for their antimicrobial properties, but the findings regarding T. Procumbens were not promising.[2]

Numerous ancient practices, such as Ayurveda, Siddha, and Unani medicine, have promoted the use of various herbal remedies including plant juices and extracts for treating illnesses, including infectious diseases. According to Wynn (2001), 74% of plant-based medicines have contemporary uses that align with their historical, cultural, and sometimes ancient applications.[3]

Figure 1: tridax procumbens .[6]

Journal of Chemical and Pharmaceutical Sciences-JCHPS (2025) 18 (2): 47-55
Online ISSN: Online 2349-8552, Print ISSN: 0974-2115
Review Article | Pharmaceutical Sciences | MCI Approved | Peer-Reviewed | Referred | OA Journal |

HISTORY:

Tridax procumbens L. (T. Procumbens) is a member of the Asteraceae family and is recognized as an Ayurvedic herb in Asia, with a long history of traditional application. Historically, T. Procumbens has been utilized for centuries to treat injuries, skin conditions, and to prevent blood clotting in traditional medicine practices. The plant exhibits properties such as anticoagulant, antileishmanial, antioxidant, anticancer, immunomodulatory, insecticidal, anthelmintic, cardiovascular, antiseptic, and antimicrobial effects. [4]

Tridax procumbens, often referred to as coatbuttons or tridax daisy, is a flowering plant belonging to the Asteraceae family. It is primarily recognized as a common weed and pest species. This plant is native to the tropical areas of the Americas, including Mexico, but has been introduced to various tropical, subtropical, and mild temperate regions around the globe. In the United States, it is classified as a noxious weed and has pest status in nine. [5]

CLASSIFICATION:[6]

Kingdom	Plantae
Subkingdom	Tracheobionta
Division	Spermatophyta
Subdivision	MagnoliophytaClass Magnoliopsida
Subclass	Asteridae
Order	Asterales
Family	Asteraceae
Genus	Tridax

Table 1: Taxanomical classification of tridax procumbens

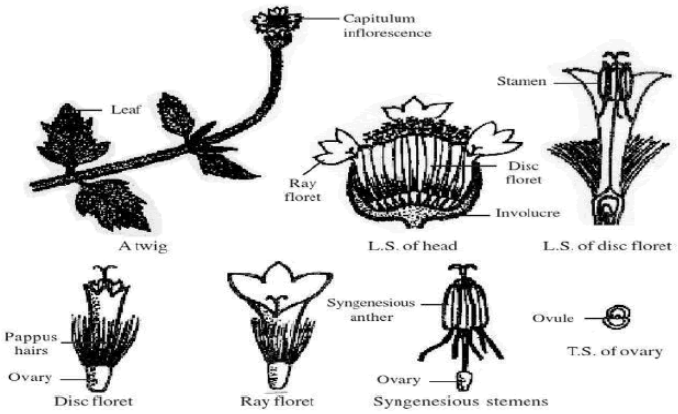
PHARMACOGNOSY:

The macroscopic and microscopic characteristics of tridax procumbens are well described in multiple literature. [7-8]

Macroscopical characteristics:

Characteristics	Description
Common name	Coat buttons,tridax daisy
Family	Asteraceae
Habit	Perennial,prostrate or Ascending herb
Height	30-60cm
Stem	Slender, branched and Covered with fine hair
Leaves	Simple, opposite, ovate to lanceolate; serrated margins; green and hairy.
Flower	Yellow tubular disc or pale yellow ray florets;about 1cm wide.
Inflorescence	Single flower heads on a long, slender, hairy peduncle.
Fruit	Dry, one seeded achene with a pappus of barbed hairs.
Root system	Tap root

Journal of Chemical and Pharmaceutical Sciences-JCHPS (2025) 18 (2): 47-55
Online ISSN: Online 2349-8552, Print ISSN: 0974-2115
Review Article | Pharmaceutical Sciences | MCI Approved | Peer-Reviewed | Referred | OA Journal |



Macroscopic characters of leaf, flower, stem and root

Figure 2: Macroscopic characteristics of tridax procumbens .[7]

Microscopic characteristics:

The transverse section of the leaf reveals a single-layered epidermis on both sides, which is coated with a thick cuticle. The dorsal side has a greater number of covering trichomes that are simple and multicellular. The leaves contain both glandular and non-glandular trichomes. Anomocytic stomata are found on both the upper and lower surfaces of the leaves. Quantitative microscopic analyses of the leaf have also been performed, including the palisade ratio, vein islet number, vein termination number, stomatal count on the lower surface, stomatal index on the upper surface, and stomatal index on the lower surface. The transverse section of the petiole displays a single-layered epidermis that is covered with cuticle, along with multicellular trichomes and vascular bundles, with xylem encircled by phloem. The transverse section of the root shows cork, cortex, xylem, phloem, medullary rays, and pith. [8]

PHYTOCHEMISTRY:

Tridax procumbens includes flavone glycosides, chromoneglycosides, sterols, and polysaccharides that feature a Beta-1,6-D-galactan primary structure. The unsaponifiable fraction obtained from the petroleum ether extract indicated the presence of campesterol, stigmasterol, and beta-sitosterol, as identified through GC-MS. The ethyl acetate-soluble fraction of the hexane extract produced a novel bithiophene known as tri-bisbithiophene, along with four terpenoids: taraxasteryl acetate, beta-amyranone, lupeol, and oleanolic acid. A novel flavonoid (Procumbenetin) extracted from the aerial portion of T. Procumbens has been identified as 3,6-dimethoxy-5, 7, 2', 3', 4'-pentahydroxy flavones, 7-O-beta-3-glucopyranoside. Eight new compounds obtained from Tridax procumbens have been characterized as methyl 14-oxooctadecanoate, methyl 14-oxononacosanoate, 3-methylnonadecylbenzene, heptacosanyl cyclohexanecaprylate, 1(2,2-dimethyl-3-hydroxypropyl)-2-isobutyl phthalate, and 12-hydroxytetracosan-15-one, 32-methyl-30-oxotetratriacont-31-en-1-ol and 30-methyl-28-oxodotriacont-29-en-1-oic acid were characterized through spectral analysis and chemical investigations. Nine previously known compounds isolated for the first time from the plant were identified as dotriacontanol, β-amyrone, Δ12-dehydrolupen-3-one, β-amyrin, lupeol, fucosterol. [9]

PHARMACOLOGY:

WOUND HEALING ACTIVITY:

The ability to heal wounds quickly is called wound healing activity.[32] Wound healing is a complicated process that unfolds in multiple phases, characterized by a series of precisely coordinated biochemical and cellular activities. This process can generally be divided into three main stages: inflammation, proliferation, and remodeling. The involvement of different inflammatory cells is essential for the repair process.[33]

Journal of Chemical and Pharmaceutical Sciences

Journal of Chemical and Pharmaceutical Sciences-JCHPS (2025) 18 (2): 47-55
Online ISSN: Online 2349-8552, Print ISSN: 0974-2115
Review Article | Pharmaceutical Sciences | MCI Approved | Peer-Reviewed | Referred | OA Journal |

The healing properties of fresh Tridax procumbens leaves for skin wounds are well recorded in local literature. In Indian villages, farmers typically crush the fresh leaves and apply the juice to the skin wound.In a model of excision wounds, the juice from fresh leaves of T. procumbens was administered intraperitoneally to rabbits. A mixed response was observed; on one hand, there was an increase in re-epithelialization of the wound, while on the other hand, there was a delay in scar contraction and granulation. It was suggested that the extract of T. procumbens primarily promotes healing but may also exert a corticotropic effect. This corticotropic influence might indirectly slow down the healing process by boosting the natural secretion of cortical hormones, which are known to inhibit all stages of wound healing. [10]

HEPATOPROTECTIVE ACTIVITY:

Agents that decrease the hepatic cellular damage are known as hepatoprotective activity.[34] Hepatitis is a common disease in the world especially in the developing countries. Tridax procumbens Linn. (Compositeae), a common weed across India, is used in traditional medicine for treating various conditions, including jaundice. It is frequently utilized in traditional Indian medicine for its properties as an anticoagulant, antifungal, and insect repellent; as well as for treating bronchial catarrh, diarrhea, and dysentery.

The hepatoprotective effects have been established. We recently reported the antioxidant properties of Tridax procumbens. However, there are currently no studies available regarding the protective capabilities of Tridax procumbens against hepatitis induced by experimental means in rats. Therefore, the purpose of this study is to further examine the hepatoprotective effects of Tridax procumbens while correlating biochemical and histological changes in the context of d-GalN/LPS-induced hepatitis in rats. [11]

ANTIFUNGAL ACTIVITY:

The antifungal properties of T. procumbens have been studied. Various extraction techniques have been employed to determine the optimal zone of inhibition against several fungal strains, including Microsporum fulvum, Microsporum gypseum, Trichophyton mentagrophytes, Trichophyton rubrum, Candida albicans, and Trichosporon beigelii. Extracts from the aerial parts of this plant have demonstrated effectiveness against dermatophytes, with inhibition zones measuring between 17 to 25 mm, and the dichloromethane (DCM) fraction displaying the most significant response. However, the authors do not identify the specific bioactive compounds that contribute to the antifungal effects. The authors posit that these compounds might be fatty acid derivatives and constituents, but they do not provide any supporting evidence for this claim. [12]

ANTI BACTERIAL ACTIVITY:

Agents that stop the growth or kill the antibacterial agents.[35] Numerous researchers have reported on the antibacterial effects of medicinal plants, but the focus on this research has increased significantly over the last thirty years. In this study, both the methanol and ethyl acetate extracts demonstrated significant effectiveness against certain pathogenic bacteria. In plants, secondary metabolites, like flavonoids, play a crucial role in combating various pathogenic organisms. Additionally, plant-derived antibacterial agents possess numerous therapeutic benefits with minimal or no adverse effects. Furthermore, research has shown that the leaves of Tridax procumbens contain pentacyclic triterpenes.Previous research indicated that T. procumbens extracted with ethanol exhibited antibacterial properties, while the water extract did not demonstrate any antibacterial effects . The difference in antibacterial activity observed between the alcoholic and aqueous extracts highlights the fact that different solvents possess varying abilities to extract phytochemicals due to their polarity and solubility. [13]

MEDICINAL VALUE:

T. procumbens demonstrates a broad range of biological properties. The ethyl acetate extract from this plant displayed significant allelopathic and larvicidal effects. In terms of pharmaceutical properties, the methanol and ethanol extracts showed anti-hyperglycemic, anti-fungal, anti-leishmanial, and hepatoprotective effects, whereas the

ethyl acetate extract exhibited anti-inflammatory, anti-cyclooxygenase, and antioxidant properties. The acetone extract of this herb revealed anticoagulant, anti-hepatic, and antibacterial activity. [14]

LEISHMANICIDAL ACTIVITY:

The methanolic extract of T. procumbens demonstrated an inhibitory effect on the growth of Leishmania mexicana promastigotes, the pathogen responsible for cutaneous leishmaniasis, with a 50% Inhibitory Concentration (IC50) of 3 µg/ml, indicating its potential anti-leishmanial properties .[15]

HEMOSTATIC PROPERTIES:

Different extracts, such as ethanolic, fresh leaf, and petroleum extracts from the leaves of Tridax procumbens, were evaluated for their hemostatic effects by measuring the clotting time in blood samples from 10 human participants using Lee White's method conducted *in vitro*. Among these extracts, the ethanolic variant demonstrated a significant effect by consistently decreasing the clotting time across all volunteers' blood samples. Additionally, the aqueous leaf extract also exhibited improved blood clotting activity, suggesting its potential as an effective hemostatic agent.[16]

ANTI INFLAMMATORY ACTIVITY:

The most potent fraction of T. procumbens linked to its anti-inflammatory effects is the Ethyl Acetate (ETA) fraction, which contains moderately polar natural compounds such as alkaloids and flavonoids. These alkaloids and flavonoids have the ability to neutralize Reactive Oxygen Species (ROS) that play a role in the development of inflammation and associated diseases in biological systems. The leaves of Tridax procumbens were evaluated for their contractile response to strong gastrointestinal constrictors. [17]

ANTIOXIDANT ACTIVITY:

The study assessed the free radical scavenging ability of ascorbic acid and fractions of Tridax procumbens using DPPH. The antioxidant effectiveness of the methanol extract fractions is indicated by the IC50, which represents the concentration of the fractions that results in a 50% reduction in DPPH radical production. [18]

HYPOTENSIVE ACTIVITY:

The research investigated the influence of leaf infusions on blood circulation in sedated animals. The findings indicated that the infusions significantly reduced mean arterial blood pressure, and higher doses led to a decrease in heart rate without altering it. [19]

MECELLANEOUS:

TOXICITY:

In contrast to the common perception that natural options are always safe, herbal remedies can lead to serious toxic effects and even fatalities. St John's wort has shown significant and potentially harmful interactions with various conventional medications. Certain traditional Chinese medicines, like Chan Su, Dan Shen, and ginseng, may disrupt digoxin immunoassay results. Healthy individuals who use herbal products may experience abnormal laboratory test outcomes. For instance, individuals consuming kava may show elevated levels of liver enzymes. Often, these irregular lab results indicate the toxic nature of these herbs. [20]

ALLERGIES:

TP demonstrated anti-inflammatory properties by reducing ROS production and lowering the activity of NF-κB/ERK signaling both *in vitro* and in a vivo model of asthma. Therefore, TP could be considered a potent anti-inflammatory agent for OVA-induced allergic asthma. [21]

Journal of Chemical and Pharmaceutical Sciences-JCHPS (2025) 18 (2): 47-55
Online ISSN: Online 2349-8552, Print ISSN: 0974-2115
Review Article | Pharmaceutical Sciences | MCI Approved | Peer-Reviewed | Referred | OA Journal |

INTERACTIONS:

Numerous investigations have been carried out regarding the pharmacological properties of T. procumbens, with most of the research focused on extracts rather than individual compounds.

T. procumbens has the ability to effectively suppress the growth of microorganisms that cause spoilage and foodborne illnesses. The diverse array of bioactive phytochemicals in T. procumbens shows a synergistic effect in its antimicrobial properties. In numerous studies documented, extracts are often treated with harmful solvents such as hexane, petroleum ether, and chloroform, which may contribute to cytotoxic effects. Consequently, microbes may be eliminated at relatively lower concentrations. [22]

MARKET VALUE:

The global market value of tridax procumbens has experienced significant growth in recent years, driven by increasing consumers awareness of its health benefits and its potential in developing value -added products. [23]

Tridax procumbens, commonly referred to as “coat buttons,” is a perennial species belonging to the Asteraceae family and hails from Central and South America. For centuries, this plant has been utilized to create various products like oils, teas, and skin poultices, among others. [24]

Tridax procumbens is often considered a weed in many regions of the African continent and is recognized for its medicinal properties. [25]

Journal of Chemical and Pharmaceutical Sciences

Journal of Chemical and Pharmaceutical Sciences-JCHPS (2025) 18 (2): 47-55
Online ISSN: Online 2349-8552, Print ISSN: 0974-2115
Review Article | Pharmaceutical Sciences | MCI Approved | Peer-Reviewed | Referred | OA Journal |

SUMMARY TABLE:

Summary table of tridax procumbens plant as described below in table 3. [15,26-30]

S.No	PLANT PART	ACTIVITY	EXTRA T	MODEL	STANDARD DRUG	DOSE	PARAMETERS	MECHANISM	STATUS P VALUE	AUTHOR, YEAR, REFERENCE
1	Leaves	Wound healing activity	Aqueous crude extract	*In vivo*, (excision wound model)	Cipladine	Not specified	Reducing power DPPH assay	Inhibition of promastigotes growth	<0.05	Martin quintal et -al 2010,[15]
2	Fresh leaves juice	Hepatoprotective	Alcoholic extract	*In vitro*, (ccl4 induced liver injury)	Silymarin	Not specified	H2o2 radical scavenging assay	Improves anti-oxidant defense system of liver	<0.001	Vinoth prabhu, 2011,[26]
3	Root	Anti-inflammatory	Methanolic extract	*In vitro*	Diclofenac	25-100 m g/kg	Paw edema volume % inhibition	Inhibition of protein denaturation	Not specified	Priyanka yadav, Deepak Singh, 2011,[27]
4	Flower	Anti-oxidant activity	Methanolic extract	*In vitro*	Streptomycin	Not specified	%free radical scavenging activity.	Counteract Reactive oxidative species	<0.05	Kiran bhaidas Rathod, 2024,[28]
5	Aerial part	Anti-pyretic	Methanolic extract	*In vitro* (brewers yeast-1 induced pyrexia)	Griseofulvin	5mg/kg	DPPH zone of inhibition.	Reduce number of writhes produced by acetic acid and NaCl	Not specified	Sunil christudas, TM Kulavathivel, 2012,[29]
6	Whole plant	Immunomodulator	Ethanolic, benzene extract	*In vitro*	Gentamycin	3-5mg/kg	DPPH assay	Not fully elucidated	<0.001	Vinod gubbiveeranna, S.Nagaraju, 2016,[30]

s

REFERENCE:

1. Shankul Kumar, Anuradha prasad, I. V. Iyer, santosh vaidya, Pharmacognostical, phytochemical and pharmacological review on tridax procumbens Linn, 20 July 2012, 3(4):747-751.
2. Taddei and A. J. Rosas-romero. bioactivity studies of extracts from tridax procumbens. vol, 7(3), 235-238.
3. Chitra Pai, ujjawala Kulkarni, Manjusha borde, sowmya murali, P.Mrudula, and yashwant Deshmukh. Antibacterial activity of tridax procumbens with special reference to nosocomial.
4. V. Zambare, G S Chakraborty and sk Banerjee.Pharmacognostic studies of potential herb-tridax procumbens sambar.et al, (2010), vol.1(9):58-62.
5. Ambulkar, pranit. "Avanti"-tridax procumbens Linn the new healing herb of Ayurveda.2012, LSBN 9783659243851.
6. P. Ghosh, S.Biswas, M.Biswas, A.Dutta, S.Sil, S.Chatterjee. Morphological, ethno biological and phyto pharmacological attributes of tridax procumbens Linn (Asteraceae).2019,vol.6, issue.2, pp 182- 191.
7. Salahuddin, S.Fuloria, S.Pahwa, S.kumari, and S.K Gupta, studies on morpho -micro- anatomical evaluation of the leaves of tridax procumbens Linn (Asteraceae), 2010, J.Sci.res.2(3),613- 619.
8. Varsharani V.Ingole, Pravin C.mhaske, Sushma R.Katade, photochemistry and pharmacological aspects of tridax procumbens Linn. 2012, vol 2, issue 1, 100199.
9. Surender agarwal, Deepak mohale and G.S.Talele. Pharmacological activities of tridax procumbens (Asteraceae).2010, 2(2): 72-78.
10. B.yaduvanshi, Rajani mathur, SR Mathur, T.Velpandian. Evaluation of wound healing potential of topical formulation of leaf juice of tridax procumbens Linn in mice. 2011 may- june; 7(3): 303-306.
11. Vilwanathan ravikumar, Kanchi subramanian shivashangari, thiruvengadam devaki.Hepatoprotective activity of tridax procumbens against D-galactoseamine/lipopolysaccharide- induced hepatitis in rats.volume101,issue1-3, 2005, pages55-60.
12. Samantha beck, Heather mathison, Toma tocbrov, esli-armando calderon- Juarez, Olga R.kopp. A review of medicinal uses and pharmacological activities of tridax procumbens Linn. Journal of olant studies vol-7, 2018, ISSN 1927-D461.
13. Asad Syed, natarajan benit, Abdullah A. Alyousef, Mohammed, Mohammec. *In vitro*, antibacterial, anti-oxidant potentials and cytotoxic activity of the leaves of tridax procumbens. Vol 27, issue 2, Feb 2020, pages 757-761.
14. Yusuf andriana, tran dang yuan, tran ngoc quy, truong ngoc minh, trying Mai van, tran duc viet. Antihyperuricemia, ani oxidant and anti-bacterial activities of tridax procumbens Linn. 2019 Jan 10, 8(1):21.
15. Martin-quintal, Moo-puc R, gonzalez-salazar F, Chan bacab MJ, Torres-Tapia LW, Peraza Sanchez SR.*In vitro* activity of tridax procumbens against promastigotes of leishmania maxicana.2009;122(3);463-467.
16. Kale MA, Shahi SR,Somani VG, Shamkuwax PB, Dhake AS.Hemostatic activity of the leaves of tridax procumbens Linn. Int journal green pharm 2008;2(1).
17. 17.Debolina Dattaray.Traditional uses and pharmacology of plant tridax procumbens: A review:2022,13(7):476-482.
18. 18.Rafiq Penjari, Shraddha Vaishnav, Dr.Gangurde Avinash B, Prashant shevale, sonawane Khyati, Dr.Vinod bairagi. A review of: Tridax procumbens: medicinal uses and pharmacological activity, phytochemical screening. July 2024, vol 11, issue 3.
19. 19.Omedine K, Loetita M, Ismeal H, Alphonse S.Hypotensive activity of tridax procumbens hydro ethanolic extract: roles of transport of sodium and potassium in rat wister.2018;8(1):289-302.
20. 20. G.Mecina,V.H.M. Santos, A.R. Andrade, A.L.Dokkedal, L.C.Saldanha, L.P.Silva, R.M.G.Silva.Phyto toxicity of tridax procumbens Linn. Volume 102, January 2016, pages 130-136.
21. 21. Kusum devi, sakshi soni, vineetatripathi, Richa Pandey, Baisakhi Moharana. Ethanolic Extract of tridax procumbens mitigated pulmonary inflammation via inhibition of NF-KB/p65/ERK mediated signalling in an allergic asthma model.volume 99, may2022,154008.
22. 22. Varsharani V. Ingole, Pravinc.mhaske, sushma R. Katade. Photochemistry and pharmacological aspects of tridax procumbens Linn:A. systematic and comprehensive review. volume 2, issue 1, Feb 2022, 100199.
23. 23. Satheesh and Fanta, S.W. Food science and technology. 2020,6(1), 181125.
24. 24. J.D.Habila, I.A.Billo, A.A.Dzikwi, H.Musa and N.Abubakar. Total phenolics and anti-oxidant activity of tridax procumbens Linn, 2010, vol 4(3), pp 123-126.
25. 25. Funmilayo adelwomo and oluwole oladeji. A review on tridax procumbens: A weed with immense phytochemical and pharmacological activities, 2018, ISSN 2237-4027, 7:2017001.

26. 26. Vinoth Prabhu V, Nalani G, Chidambaranathan N, Sudarshan kisan S. Evaluation of antiinflammatory and analgesic Activity of tridax procumbens Linn against formalin, acetic acid and CFA induced pain models.2011, Int J Pharma pharma sci, 3(2):126-130.
27. 27. Priyanka yadav, Deepak Singh, S.Nayak.Microscopic studies of tridax procumbens Linn. International journal of biomedical research, 2011, vol.2, No.9, 508-517.
28. 28. Kiran Bhaidas Rathod, Yogesh war Rajendra chaudari, Kaushal Madhukar Chavan, Anuj Sunil Kumar more, Vishal Vijay patil.A research analysis of tridax procumbens Linn:historical background, botanical characteristics, soap formulation , and evaluation parameters. 2024, vol.9, issue 7, ISSN :2456-418tridax
29. 29. Sunil christudas [ab], TM.Kulathivel[a], P.AgasP.Agc.Phytochemical and anti-bacterial studies of leaves of tridax procumbens Linn. 2012, vol.2, issue 1, pages S159-S161.
30. 30. Vinod gubbiveeranna, S.Nagaraju.Ethanomedicinal, phytochemical constituents and pharmacological activities of tridax procumbens:A review.2016, Int J Pharm pharm sci 8(2), 1-7.
31. 31. Asha Jyothi. V, B. Fathima, Phytochemical evaluation & pharmacological screening of wound healing & antioxidant activity of *plumbago zeylanica*. 2013, Vol. 5, No. 3, 5879-5891.
32. 32. Asha Jyothi. V, Giridhar Vedantam and Butool Fathima, Summary of wound healing activity, Ijpbcs | Volume 13| Issue1| Jan-Mar2024| 01-08.
33. 33. V. Asha Jyothi and K. Amtul Raouf Qazi, Hepatoprotective Activity: Recent Update, Ijpbcs | Volume 14| Issue 2 | Apr-Jun 2025 | 01-19.
34. 34. A. Pradeepkumar, Kethireddy sravani, J. Ramya, V. Asha Jyothi, Anti-bacterial activity of various extracts of gymnema sylvestre and embelia ribes, IJPT | June-2011 | Vol. 3 | Issue No.2 | 2440-2451.
35. 35. Ashajyothi. V, Dr. Rao. S. Pippalla and Dr. Satyavati D, Antioxidant Activity of Few Phytoestogens By Dpph Assay, Ijpt | Nov-2013 | Vol. 5 | Issue No.3 | 5868-5872.