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GREEN SYNTHESIS OF NANOPARTICLE FROM, TRIDAX PROCUMBENS: AN EMERGING STRATEGY IN PHARMACY"

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ABSTRACT

Wound healing is a biological process required effective therapeutic agents like anti-inflammatory and antimicrobial property.*Tridax Procumbens* are also known as dagdi pala. It's a really useful therapeutic plant. It is applied to the management of wound healing.*Tridax procumbens* contain flavonoids tannins terpenoids and alkaloids. They act as a stabilizing agents. These biodegradable nanoparticle are a prospective alternative for typical wound care therapies due to their enhanced antibacterial properties rapid healing and enhanced wound concentration. This emerging approach are contribute the cost effective and biocompatible wound care technique. It is also eco-friendly. It is commonly used in Indian Ayurveda system of medicine for the treatment of Diarrhea, wound healing, for the hair treatment. The leaf juice is used for checking blood from injuries and cuts.it helps to repair a tissue and it is also good for kidney health. The plant is regional to India, and tropical Africa. It is a wild herb species occurs over India. Traditionally *Tridax Procumbens* is applied in its raw form.

KEYWORDS: *Tridax Procumbens*, Pharmacology, Herbal medicine,Woundhealing, Nanoparticle.

INTRODUCTION:-

Medicinal plants are crucial to the healing process of wounds.Wound healing is a process in that injured tissue are repaired, also their function has been restored. Wound healing requires multiple cell types. The flowring plant *Tridax procumbens* an organisms of Tridax linn has multiple medicinal uses and remains an important weed.The herb has been treated to treat

Hepatotoxicity, bleeding, wound healing, diarrhea, epilepsy, hypertension, and metabolic syndrome.In Indian traditional medicine *Tridax procumbens* is widely utilized as an anticoagulant antifungal and insect inhibitor leaf extracts were additionally utilized for managing infectious skin problems.Tridax is traditionally use in its crude form.it is also fed to cat as a nutritive food.1 An injury to living tissue that compromises the integrity of the epithelium of the epidermis is referred to as a wound. A wound may cause the skin system to up or malfunction , which could further disrupt the anatomy , physiology and function of the skin.3The process of wound healing is a very intricate and complex phenomenon that replace the skins lost and devitalized tissue layers and cellular structure. 4The structure ,physiology and function of the skin mau be further disrupted by a wound that causes the skin system to open up or malfunction

.1The replacement of the skin lost and devitalized tissue layers and cellular structure occurs throught the incridibly complicated and hard process of wound healing.Hemostasis, the Activities that contribute to the mechanism of wound repair include the inflammatory phase, the proliferative or fibroblast phase (which involves collagen synthesis, neovasculature development, and re-epithelialization), and wound contraction, also referred to as tissue remodeling.*Tridax procumbens* (L) Linn. (Asteraceae), one of the medicinally significant grasses, is found throughout tropical and subtropical regions and thrives primarily during the wet seasons. It is a common weed that grows alongside commercially important crops.It inhabits waste areas, roadside ditches, and hedges in India. This plant is rich in saponin and carotenoids.5 Among the T. procumbens leaves include calcium, magnesium, potassium, sodium, and selenium. 26% crude proteins, 17% crude fiber, 39% soluble carbohydrates, 5% calcium oxide, luteolin, glucoluteolin, and quercetin are found in Tridax leaves.It has previously been used to check for cuts, bruises, and wounds as well as to treat bronchial catarrh, diarrhea, dysentery, malaria, and high blood pressure.It used to prevent hair loss as well. Its various attributes include antimicrobial, antibacterial, antiplasmodial, antihepatotoxic, antioxidant, and antidiabetic properties. Indian tribal people have long used the leaves to cure wounds.A paste made from the crushed mature leaves is administered topically to the surface of the wound. 7

Nowdays , metal nps are synthesized (using a bottom up approache) using green or biogenic technology since they are safe , quick, easy, economical and environmentally friendly. In fact,

this NP synthesis methods utilize very few chemicals, which reduce pollution, expenses, and energy needs. Generally speaking, NPs can be used in a variety of biological applications. Because of there ultra-small size and increased surface area, NPs are rapidly absorbed by cells, enabling appropriate interaction with biomolecules to trigger particular biological reaction. Apoptosis , oxidative equilibrium, immunological function , metabolic control and signal transduction are just a few of the cellular and enzymatic functions that are impacted by zinc, a trace metal. It has been discovered that giving diabetic individuals zinc supplements improve their glycemic control.11

Further more, zinc enhances insulin signaling via a number of pathways, such as increased phosphorylation of the insulin receptor, increased activity of PI3K, and inhibition of glycogen synthase kinase-3 (GSK-3). Additionally, it has been proposed that this metal can help with diabetes consequences such cardiomyopathy and nephropathy. These days a varitey of synthetic glucose -lowering drugs are accesible. However, there has been a lot of interest in using medicinal to treat DM because of their negative effects and high cost. It's interesting to note that Zno-NPs, a novel zinc delivery agent, have significant implications for the treatment of various treatment of various diseases, including diabetes mellitus.12

Fig.1 Tridax procumbens.

MATERIAL AND METHODOLOGY:

1) Material:

Plant material: A botanist collected fresh leaves of Tridax procumbens from surrounding areas and tested them.

Chemicals: Analytical grade silver nitrate (AgNO3) from a licenced vendor.Every other reagent that was utilized was analytical grade.

Equipment: UV visible spectrophotometer, Magnetic stirrer, hot air oven, centrifuge machine and microscope are used for the characterisation and synthesis

Preparation of Plant Extract:

The collected Tridax procumbens leaves were meticulously cleaned with tap water and then distilled water to remove dust and impurities.

The leaves were ground into a fine powder after being shade-dried for a few days to remove any last traces of moisture.

Ten grams of the powdered leaves were boiled in one hundred milliliters of distilled water for fifteen to twenty minutes.

The mixture was cooled before being filtered using Whatman no. 1 filter paper to create a clear extract that was stored at 4 degrees Celsius for subsequent use.

Synthesis of Nanoparticles

Green synthesis: Tridax procumbens extract in a measured volume(eg 10 ml) has been mixed with the 90 ml of 1 mM silver nitrate (AgNO3) solution while having stirried constantly.

To stop the photoreduction of silver ions , theb reaction mixture was left in the dark for 24 hours at room temperature.

The color change from pale yellow to brown showed the formation of silver nanoparticles.

Purification of nanoparticles:

The generated nanoparticles were centrifuged at 10,000 rpm for 15 minutes.

To get rid of contaminants,the pellets was cleaned to or three times using distilled water and ethanol.

For more study, the filtered nanoparticles were dried and placed into an airtight container.

Characterization of Nanoparticles:

UV-Visible Spectroscopy: The absorbance in the 300-700 nm wavelenght spectrum was used to observed the integrity and manufacture of nanoparticles.

FTIR Analysis: To determine which functional group is in charge of stabilizing and reducing nanoparticles.

XRD Analysis: To find out size and crystalline composition of nanoparticles. SEM / TEM: to study surface morophology and particle size distribution.

METHODOLOGY

A botanist collected and identified the plant, Tridax procumbens. It was assigned the number 1. The plant's mother tincture and leaf crude extract were then made and designated as Sample A. Following that, an in vitro investigation was conducted to compare the wound healing activities of Samples A and B in human dermal fibroblasts.

Sample collection

The whole Tridax procumbens plant was collected from its natural habitat. After being separated, the leaves were dried in the shade to remove any remaining moisture before being processed using a hot solvent. The solvent used in the investigation was ethanol.

Sample Processing

The dried whole plant was powdered and treated with ethanol in a conical flask and left undisturbed for 48 hrs. This mixture will be then subjected to filtration.

The filtrate in the boiling flask was heated for ten cycles until a colourless solvent was obtained in the extractor.

To study the synthesize nanoparticles :

The process of producing new particles with sizes ranging from 1 to 100 nanometers is known as nanoparticle synthesis. They are mostly utilized in medicine, medication delivery, and diagnostics and have special optical, chemical, and biological qualities.

Green synthesis of nanoparticles :

Green synthesis reduces metal ions into nanopaticles using biological materials as plant extract, microbes, or enzymes. It is safe, economical, and environmentally friendly because it doesn't use a lot of energy or hazardous chemicals.

To study the utilize phytochemical :

What is phytochemical ?

Plants produce a variety of biologically active substances known as phytochemicals. They include a wide range of molecules such as

Flavonoids. Terpenoids. Phenolic acid. Saponins.

Alkaloidas. Tannins.

2. To study the characterize the synthesized nanoparticles:

3. To study the evaluate the biological activitys

4. To study the explore pharmaceutical application.

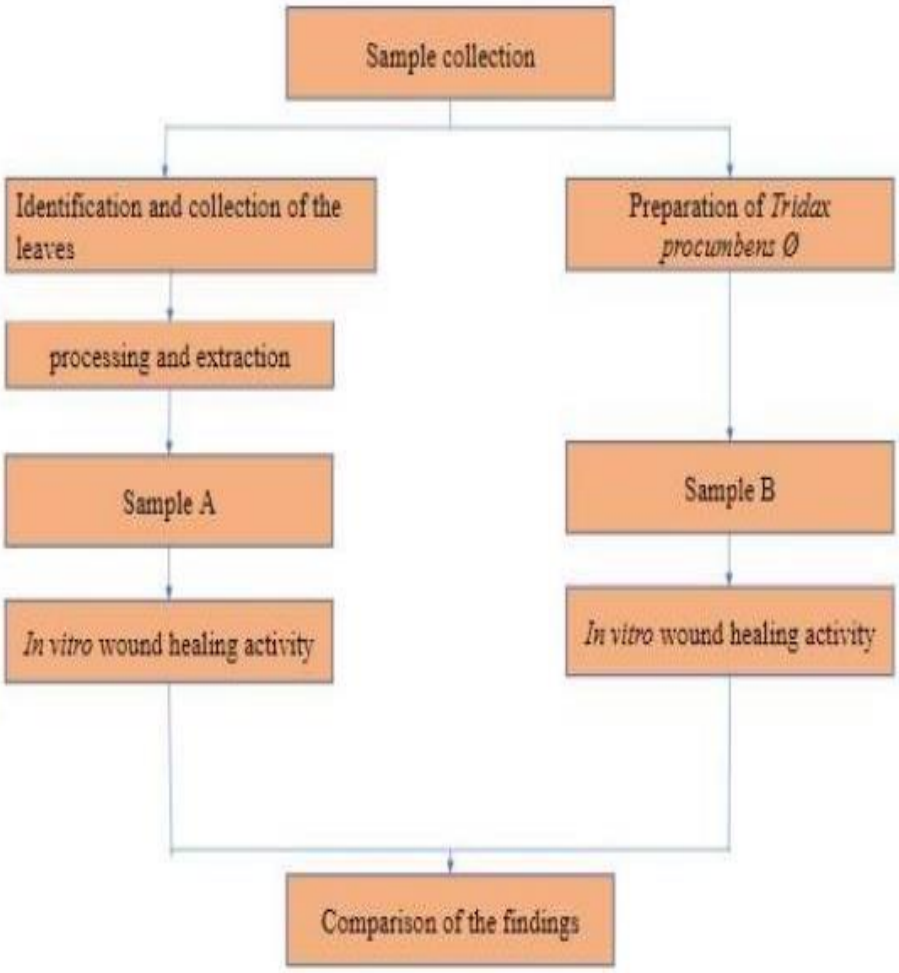

Fig:2 Detailed Methodology

Antimicrobial Activity of AgNPs

The MDR clinical isolates, which included E. coli, Shigella species, Aeromonas species, Pseudomonas aeruginosa, and Candida tropicalis, were inoculated using Mueller Hinton broth. The culture was maintained at 37°C until it attained 0.8 O.D. (8 McFarland's standard) absorbance at 600 nm. A modified version of the agar well diffusion method was used to investigate the antibacterial potential of AgNPs and TNPs. One milliliter of 0.5 McFarland inoculum was mixed with melted soft agar, placed on basal agar plates, and allowed to solidify. 20 µl of AgNP, TNP, and aqueous leaf extract were added to 6 mm wells created in

soft agar using a cork borer. It was kept at 4°C for 30 minutes.

Determination of Minimum Inhibitory Concentration

The minimum inhibitory concentration (MIC) and minimum bactericidal/fungicidal concentration (MBC/MFC) of TNPs were found using the microdilution method. A culture of 0.8 O.D. was used to calculate the MIC and MBC/MFC. TNP was used in two-fold broth dilutions (5 mg/ml, 2.5 mg/ml, 1.25 mg/ml, 0.625 mg/ml, 0.325 mg/ml, 0.1625 mg/ml, and 0.08125 mg/ml). The study's positive control was Mueller Hinton broth medium containing bacterial culture, while the negative control was uninoculated broth diluted with two times TNP. The temperature was 37°C during the 24-hour incubation period. The MIC was calculated using turbidity at 660 nm on the ELISA reader. The experiment was carried out in three sets. A microtiter plate containing ten microliters of culture was laid out on.

Advantage of Green synthesis:

1. Safe for the environment and non-toxic.
2. Inexpensive and easy technique
3. Scalable for large-scale manufacturing
4. Biocompatible and suitable for pharmaceutical application.

Fig:3 Dried leaves of *Tridax procumbens*

Wound healing assay

Male rabbits weighing between 450 and 500 g were used in the wound healing experiment. Five groups of rabbits were randomly selected, with three animals in each group: the negative control group, which received no therapy, and the positive control group, which received povidone treatment.

iodine); experimental groups (treated with plant extract at 12.5 mg/mL, 25 mg/mL, and 50 mg/mL). Each animal in each group had its dorsal skin shaved and washed with betadine while under anesthesia. A surgical blade was used to cut one open full-thickness wound, measuring about 1.0 × 1.0 cm, all the way to the subcutaneous adipose tissue. The wounds in the experimental and control groups received daily topical treatment after 24 hours.
Area of wounds was measured every day, from the first day to 12th day. Data were analyzed

Bleeding time assay

With certain adjustments the effect of plant extracton bleeding time was ascertained using the earlier methodology of Ikese et al. (2015). Male rabbits were utilized in the experiment; there were five groups, identical to those used in the wound healing assay, with vitamin K serving as the sole positive control. Each animal's ear flap was shaved and sterilized using cotton dipped in 70% ethanol. A sterile lancet was then used to cut the rabbit's ear flap around 3 nm deep. After the first drop of bleeding was removed, the laceration site was directly treated with drops of various therapies, including vitamin K, plant extract (50 mg/ml, 25 mg/ml, and 12.5 mg/ml), and control (no treatment). The duration of each treatment was recorded using a stop watch, starting at the moment the drug was administered and concluding with the measurement of the biological activity of tridax procumbens bleedig and the quantity of bleeding drops. The means of the computed bleeding times were compared using the t-test.

Diabetics foot disease

The plant Tridax procumbens contains flavonoids. frequently used as a hair tonic, antifungal, insect repellant, wound healer, bronchial catarrh, diarrhea, and dysentery in Indian traditional medicine. Wound healing, antiviral, antioxidant, antibacterial, insecticidal, and anti-inflammatory properties are among the possible medical uses for Tridax procumbens.According to some reports from tribal areas of India, the leaf juice can be used as a hai tonic, to stop bleeding, and to cure new wounds. Tridax procumbens is a natural treatment for injuries caused by diabetes. Tridax procumbens has long been used to treat wounds in India because it contains phyrochemicals with anticoagulant and antifungal properties.

Tridax procumbens's Wound Healing Properties:

The study's findings show that both ethanolic crude extract and *Tridax procumbens Ø* can heal wounds.Understanding Tridax procumbens' therapeutic potential in the context of wound care has advanced significantly with the effective demonstration of these qualities. Fibroblast

migration and proliferation are essential for wound granulation and re-epithelialization during the healing process. The ability of *Tridax procumbens* to stimulate these processes suggests that it may be used as a natural remedy to enhance wound healing.Arnica montana, a well-known homoeopathic treatment that works well for exterior wounds in the L929 cell line, has also improved this study in the past. Four samples were used in the study: Arnica montana crude extract (Sample A), Arnica montana (Sample B), a placebo, and a negative control at intervals of six, twelve, and twenty-four hours. In comparison of the findings, the wound healing activity of all the four samples was a

very slow progress at 6th hour. Subsequently, all four samples showed slower improvement at the 12-hour mark compared to earlier observations. In contrast to the placebo, which acted extremely slowly, samples A and B showed excellent outcomes at the 24-hour mark regarding the closure of the wound.

At the 24-hour mark, sample A was exhibiting a greater healing effect than sample B. [9].

The study's findings show that *Tridax procumbens* and ethanolic crude extract both have the ability to cure wounds. Understanding *Tridax procumbens'* therapeutic potential in the context of wound care has advanced significantly with the effective demonstration of these qualities. Fibroblast migration and proliferation are essential for wound granulation and re-epithelialization during the healing process. The potential of *Tridax procumbens* as a natural treatment to improve wound healing is suggested by its capacity to activate these processes.

Fig:5 Hot solvent extraction of *Tridax procumbens* using Soxhlet Apparatus

Calculation and time duration:

Weight of dry powder of sample taken in linen bag =10.039g Initial time= 10.45 am

I cycle - 10.54-11.10 am

II cycle - 11.11-11.19 am

III cycle - 11.20-11.28 am

IV cycle - 11.29-11.37 am

V cycle- 11.48- 11.58 am

VI cycle- 11.59 am-12.08 pm

VII cycle - 12.09-12.18 pm

VIII cycle- 12.19-12.27pm

IX cycle - 12.28-12.36 pm

DISCUSSION

The study's discussion part offers insightful information about how to prepare Tridax procumbens and its crude extract for wound healing utilizing a scratch assay as the experimental method.

Here, we examine the findings' importance and how they affect our understanding of wound healing in general.

RESULT

The creation of T. procumbens silver nanoparticles is easy to monitor since the reaction mixture's color shifts from greenish brown to dark brown. The reduction of silver ions to silver nanoparticles is what causes the color shift [13].

Phytochemical screening

Several qualitative photochemical tests were conducted to evaluate several phytoconstituents in the Tridax procumbens leaf extract.

The results are shown in Table 1. These are shown qualitatively as either negative (-) or positive (+).

Synthesis and characterization of green silver nanoparticles

T. procumbens leaf extract was utilized to produce green synthesis of silver nanoparticles using a simple and eco-friendly method.

Microwave radiation enhanced the reaction.

CONCLUSION

In conclusion, the findings of this study support the ability of Tridax procumbens and its crude extract to promote fibroblast migration and proliferation, providing significant new information on their potential for wound healing.The study evaluates the effectiveness of Tridax procumbens 's medicinal potential. Future research aiming at realizing Tridax

procumbens' full therapeutic potential in wound care and other areas will build on these findings.

All things considered, this study advances our knowledge of natural remedies and their possible uses in wound healing, providing a promising avenue for further research in the fields of molecular biology and phytomedicine.The current results confirm that the scratch test for wound healing is a practical and affordable technique that provides robust and repeatable results for the migration and proliferation of fibroblasts in an artificially injured area. The wound-healing capabilities of The ethanolic crude extract of Tridax procumbens was effectively shown. The findings may serve as a springboard for additional research that aims to clarify the molecular mechanisms and signaling pathways underlying the migration and proliferation of fibroblasts stimulated by Tridax procumbens preparations [10].

Future prospects

1] Optimization of synthesis parameters.

2] Advanced characterization.

3] Pharmacological Application.

4] Clinical validation.

5] Integration with nanomedicine.

6] Toxicity and safety evaluation.

7]Scale up production.

8]Industrial Application.

9] Mechanism study.

10] Interdisciplinary collaboration.

Knowledge Gained

1] Understanding of green synthesis Principle 2] Role of Tridax Procumbens.

3] Characterization Skills.

4] Pharmaceutical Application.

5] Environmental and safety benefits.

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REFRENCES

1. Talekar, Y. P., Das, B., Paul, T., Talekar, D. Y., Apte, K. G., & Parab, P. B. (2012). Evaluationof wound healing potential of aqueous and ethanolic extracts of Tridax procumbens Linn in Wistar Rats. *Asian Journal of Pharmaceutical and Clinical Research*, *5*(4), 141-145.
2. Shrivastav, A., Mishra, A. K., Abid, M., Ahmad, A., Fabuzinadah, M., & Khan, N. A. (2020). Extracts of Tridax procumbens linn leaves causes wound healing in diabetic and Non-diabetic laboratory animals. *Wound Medicine*, *29*, 100185.
3. Yaduvanshi, B., Mathur, R., Mathur, S. R., & Velpandian, T. (2011). Evaluation of wound healing potential of topical formulation of leaf juice of Tridax procumbens L. in mice. *Indian Journal of Pharmaceutical Sciences*, *73*(3), 303.
4. Ravindran, J., Arumugasamy, V., & Baskaran, A. (2019). Wound healing effect of silver nanoparticles from Tridax procumbens leaf extracts on Pangasius hypophthalmus. *Wound Medicine*, *27*(1), 100170.
5. Muthukumar, B., Nandini, M. S., Elumalai, P., Balakrishnan, M., Satheeshkumar, A., AlSalhi,M. S.,... & Malik, T. (2023). Enhancement of cell migration and wound healing by nano-herb ointment formulated with biosurfactant, silver nanoparticles and Tridax procumbens. *Frontiers in Microbiology*, *14*, 1225769.
6. Ambulkar, S., Ambulkar, P., Deshmukh, M. P., & Budhrani, A. B. (2020). Experimental evaluation of wound healing activity of various dosage forms of Tridax procumbens. *Indian Journal of Forensic Medicine & Toxicology*, *14*(4), 6579-6584.
7. Dattaray, D. (2022). Traditional uses and pharmacology of plant Tridax procumbens: a review. *Systematic Reviews in Pharmacy*, *13*(5), 511-517.
8. Sher, V., & Nadda, A. K. (2024). Formulation of Herbal Cream using Tridax Procumbens.
9. Udupa, A. L., Kulkarni, D. R., & Udupa, S. L. (1995). Effect of Tridax procumbens extracts on wound healing. *International Journal of Pharmacognosy*, *33*(1), 37-40.
10. Shrivastav, A., Mishra, A. K., Abid, M., Ahmad, A., Fabuzinadah, M., & Khan, N. A.

(2020). Extracts of Tridax procumbens linn leaves causes wound healing in diabetic and Non-diabetic laboratory animals. *Wound Medicine*, *29*, 100185.

11. Ahmed, S. S., Alqahtani, A. M., Alqahtani, T., Alamri, A. H., Menaa, F., Mani, R. K.,... & Kavitha, K. (2022). Green synthesis, characterizations of zinc oxide nanoparticles from aqueous leaf extract of Tridax procumbens Linn. and Assessment of their anti-hyperglycemic activity in streptozoticin-induced diabetic rats. *Materials*, *15*(22), 8202.
12. Pungle, R., Nile, S. H., Makwana, N., Singh, R., Singh, R. P., & Kharat, A. S. (2022). Green synthesis of silver nanoparticles using the Tridax Procumbens plant extract and screening of its antimicrobial and anticancer activities. *Oxidative Medicine and Cellular Longevity*, *2022*(1), 9671594.
13. Pardeshi, B. M., & Bhiungade, V. I. N. O. D. (2016). Tridax procumbens: A medicinal gift of nature for healing diabetic wound. *International Journal of Chemical and Physical Sciences IJCPS*, *5*, 107-112.
14. Rani, R., Sharma, D., Chaturvedi, M., & Yadav, J. P. (2020). Green synthesis of silver nanoparticles using Tridax procumbens: their characterization, antioxidant and antibacterial activity against MDR and reference bacterial strains. *Chemical Papers*, *74*(6), 1817-1830.
15. Olukunle, O. J., & Abatan, O. M. (2010). The Effects of Aqueous Leaf Extract of Tridax procumbens on the haematological and serum biochemical parameters of wistar albino rats. *ASSET: An International Journal (Series B)}*, *7*(2), 122-127.
16. Wagh, S. S., & Shinde, G. B. (2010). Antioxidant and hepatoprotective activity of Tridax procumbens Linn, against paracetamol induced hepatotoxicity in male albino rats. *Advanced studies in Biology*, *2*(3), 105-112.
17. Naqash, S. Y., & Nazeer, R. A. (2011). Anticoagulant, antiherpetic and antibacterial activities of sulphated polysaccharide from Indian medicinal plant Tridax procumbens L.(Asteraceae). *Applied biochemistry and biotechnology*, *165*(3), 902-912.
18. Lokesh Prasad, M. S., Gurunath, K. P., Chandrasekar, S. B., Umashankar, C., & Pawar, A. T. (2017). Formulation and evaluation of herbal formulations (Ointment, Cream, Gel) containing Tridax procumbens and Areca catachu. *Journal of Scientific and Innovative Research*, *6*(3), 97- 100.
19. Sophia, A., Faiyazuddin, M., Alam, P., Hussain, M. T., & Shakeel, F. (2022). GC–MS characterization and evaluation of antimicrobial, anticancer and wound healing efficiency of combined ethanolic extract of Tridax procumbens and Acalypha indica. *Journal of Molecular Structure*, *1250*, 131678.

20. Gubbiveeranna, V., & Nagaraju, S. (2016). Ethnomedicinal, phytochemical constituents and pharmacological activities of Tridax procumbens: A review. *Int J Pharm Pharm Sci*, *8*(2), 1-7.
21. Kaushik, D., Tanwar, A., & Davis, J. (2020). Ethnopharmacological and phytochemical studies of Tridax procumbens Linn: a popular herb in ayurveda medicine. *Int J of Eng Res and Tech (IJERT)*, *9*(09), 758-768.
22. Satpute, S. B., & Balap, A. R. (2024). Evaluation of Wound Healing Activity of Polyherbal Gel Containing Azadirachta indica, A. Juss. and Tridax procumbens L. Extracts. *Pharmacognosy Research*, *16*(4).
23. Pandey, A., & Tripathi, S. (2014). A review on pharmacognosy, pre-phytochemistry and pharmacological analysis of Tridax procumbens. *PharmaTutor*, *2*(4), 78-86.
24. Sonawane, A., Srivastava, R. S., Sanghavi, N., Malode, Y., & Chavan, B. (2014). Anti-diabetic activity of Tridax procumbens. *Journal of Scientific and Innovative Research*, *3*(2), 221- 226.
25. Fatima, F., Aldawsari, M. F., Ahmed, M. M., Anwer, M. K., Naz, M., Ansari, M. J.,... & Jafar, M. (2021). Green synthesized silver nanoparticles using tridax procumbens for topical application: Excision wound model and histopathological studies. *Pharmaceutics*, *13*(11), 1754.
26. Raju, S. K., Sekar, P., Sankarganesh, M., Bhat, A. R., Ahmed, M., Ahmed, S., & Zbancioc, A. M. (2025). Synthesis, Characterization, Formulation and Wound Healing Activity of Silver Doped Zinc Oxide Bimetallic Nanoparticles Using Tridax procumbens Leaf Extract. *Journal of Molecular Structure*, 142813.
27. Andriana, Y., Xuan, T. D., Quy, T. N., Minh, T. N., Van, T. M., & Viet, T. D. (2019). Antihyperuricemia, antioxidant, and antibacterial activities of Tridax procumbens L. *Foods*, *8*(1), 21.
28. Owoyemi, O. O., Oladunmoye, M. K., & Owoyemi, O. O. (2017). Phytochemical screening and antibacterial activities of Bidens pilosa L. and Tridax procumbens L. on skin pathogens. *Int J Mod Biol Med*, *8*(1), 24-46.
29. Prabhu, V. V., Nalini, G., Chidambaranathan, N., & Kisan, S. S. (2011). Evaluation of anti- inflammatory and analgesic activity of Tridax procumbens Linn against formalin, acetic acid and CFA induced pain models. *Int J Pharm Pharm Sci*, *3*(2), 126-30.
30. Kethamakka, S. R. P., & Deogade, M. S. (2014). Jayanti veda (Tridax procumbens)-unnoticed medicinal plant by Ayurveda. *Journal of Indian System of Medicine*, *2*(1), 6-22.

31. Johnson, D. B., & Gorle, A. (2012). Evaluation of Ethanolic Extract of Tridax procumbens Linn on Wound Healing in Rats. *Research Journal of Pharmacy and Technology*, *5*(2), 239-242.
32. Bagewadikar, M. P., Tiwari, B. D., Narayankar, M. S., Parshetti, M. P., More, M. M., Mugale,
33. M. R.,... & Kulkarni10, M. A. Formulation and Evaluation of Wound Healing Cream Using Extracts of Azadirachta Indica and Tridax Procumbens.
34. Christudas, S., Kulathivel, T. M., & Agastian, P. (2012). Phytochemical and antibacterial studies of leaves of Tridax procumbens L. *Asian pacific journal of tropical Biomedicine*, *2*(1), S159-S161.
35. Sher, V., & Nadda, A. K. (2024). Formulation of Herbal Cream using Tridax Procumbens.
36. Chopade, V., & Kamble, D. (2021). Application of green silver nanoparticles synthesized using leaf extract of Tridax procumbens for preparation of clinical antimicrobial bandages. *Int J Pharmaceutical Investigation*, *11*(1), 10-13.
37. Agrawal, S. S., Talele, G. S., & Surana, S. J. (2009). Antioxidant activity of fractions from Tridax procumbens. *Journal of Pharmacy Research*, *2*(1), 71-73.
38. Jhample, S. B., Gajdhane, S. B., Kasabe, P. J., Bhagwat, P. K., & Dandge, P. B. (2015). Phytochemical screening and in vitro antimicrobial activity of Tridax procumbens L. *Research Journal of Life sciences, Bioinformatics, Pharmaceutical, and Chemical Sciences*, *1*(1), 42-51.
39. Pareek, H., Sharma, S., Khajja, B. S., Jain, K., & Jain, G. C. (2009). Evaluation of hypoglycemic and anti-hyperglycemic potential of Tridax procumbens (Linn.). *BMC complementary and alternative medicine*, *9*(1), 48.
40. Zainullah, M., Setiana, M. D., Fatimah, V. N., Fitriana, I., & Kurniawan, R. (2024). Characterization The Flavonoids Extract of Tridax Procumbens l. Leaves and Betel Lime asMaterials for Open Wound Analgesic Ointment. *International Journal of Applied Sciences and Smart Technologies*, *6*(2), 229.
41. Saini, A., Soni, H. K., & Gupta, P. (2016). A Review on Tridax procumbens. *Imperial Journal of Interdisciplinary Research*, *2*(8), 308-319.
42. Cheriyan, S., Shin, H., Razack, S. A., Kang, M., Boopathi, T. S., Kang, H. W., & Mani, K. (2025). In-vitro and in-vivo studies of Tridax procumbens leaf extract incorporated bilayer