

A review: Pharmacognostic, Phytochemical and Pharmacological study of *Tridax Procumbens*.

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Abstract

A weed that grows wild across India is *Tridax procumbens* Linn. The plant was introduced to tropical Africa, Asia, and Australia from tropical America, where it is native. Locals termed it "Ghamara," and in English, it is sometimes referred to as "coat buttons." Some Ayurvedic practitioners prescribe it as "Bhringraj" to promote hair development. The pharmacognostical investigations provide pharmacopoeial criteria like the physical constant and leaf constant. The results of the phytochemical screening indicated the presence of tannins, alkaloids, carotenoids, flavonoids, fumaric acid, and -sitosterol. Carotenoids, saponins, oleanolic acid, and ions like sodium, potassium, and calcium are abundantly present in it. Its blooms have been found to contain glucoluteolin, quercetin, and isoquercetin. It is well-known for a variety of pharmacological effects, including hepatoprotective, anti-inflammatory, wound-healing, antidiabetic, hypotensive, immunomodulating, anticancer, antioxidant, bronchial catarrh, dysentery, diarrhoea, and antimicrobial activity against both gram-positive and gram-negative bacteria. It also prevents hair loss and stimulates hair growth. Conjunctivitis may be treated with the use of the leaf juice's antiseptic, insecticidal, and parasiticidal capabilities. It can also be used as an insect repellent and to stop bleeding from cuts, bruises, and wounds. This study focuses on the plant *Tridax procumbens*' widespread phytochemical composition and pharmacological properties.

1. Introduction:

Being a notable supply of medicine for treating human disorders, medicinal plants are abundant in many active elements with therapeutic significance.^[1] Our dependence on medicinal plants as a natural therapy against fatal and infectious diseases has increased due to the permanent impacts of contemporary therapies and rising medication resistance^[2]. The usage of the plant to cure medical conditions is reported by roughly 40% of the population nowadays^[1]. The use of various herbal preparations including plant juices and extracts for ailments including infectious ones has long been recommended by many ancient traditions including those of Ayurveda, Siddha, and Unani. The current prescription for 74% of plant-derived medications matches their traditional, cultural, and occasionally even prehistoric applications. Hence, traditional medicine is a key source for the creation of new chemotherapeutic drugs that are less harmful and more affordable.^[3] *Tridax procumbens*. Family of

Linn. Compositae, also known as "Ghamra" and "coat buttons" in English because of the way the blossoms look, has been widely utilised in the Ayurvedic medical system to treat a variety of maladies. Some Ayurvedic practitioners also use it to make "Bhringraj," a well-known treatment for liver problems.^[4] Tropical Africa, Asia, and Australia have accepted it as a naturalised species. It is endemic to tropical America. Almost the entire country of India is covered by it. The medicinal properties of the plant's numerous components against bleeding, metabolic syndrome, hypertension, dysentery, and epilepsy have all been documented.^[5]

Pharmacognostical Investigation:

Synonym:

Hindi: Khal muriya, Ghamra

Sanskrit: Jayanti Veda.

English: Coat buttons.

Oriya: Dagadi pala

Marathi: Gaddi chemanthi

Tamil: Vettukaya thalai.



Figure 1: *Tridax Procumbens* Plant

Description: The flower of the plant has three-toothed ray florets and a yellow centre, like a daisy. The teethed, often arrowhead-shaped leaves have teeth. Its fruit is an achene that is rigid and coated with stiff hairs. The end of the pappus is white and gives the appearance of a plume. Scales or the word "pappus"

are used to describe the calyx. Up to 1500 achenes may be produced by a single plant, and each one has the potential to catch the wind in its pappus and go a fair distance. This is one of the reasons the plant is invasive. This plant grows in fields, meadows, croplands, disturbed areas, lawns, and along the side of the road in tropical or subtropical climates. [6]

Quantitative Microscopy: The epidermis of the T.S. leaf is dorsiventral, single-layered on both sides, and cuticle is thick. T.S. that passes through the midrib area exhibits a little amount of dorsal size protuberance and a small amount of ventral side depression. Trichomes are multicellular (3-6 celled), simple, and more numerous on the dorsal side. Trichome has enlarged basal cells and resembles a claw due to this. Meristele is made up of a single centrally positioned collateral vascular bundle and several parenchymatous cells with dark substance. [7] T.S. going through the laminar zone reveals 5-7 celled mesophyll parenchyma that is mostly absent of intercellular gaps, followed by single-layered palisade cells immediately below the apparent epidermis. [8]



Fig 2: T.S of Leaf of *Tridax Procumbens*
A: upper epidermis B: palisade cells, C: mesophyll, D: lower epidermis, E: Vascular bundle

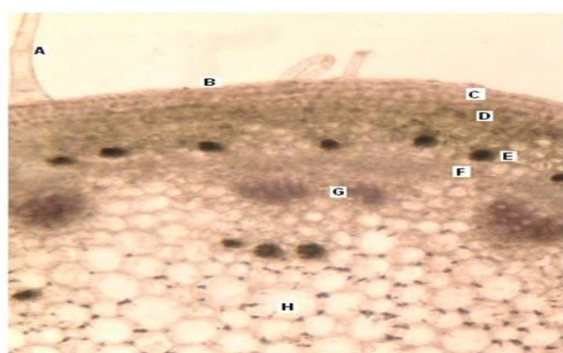


Fig 3: T.S of Root of *Tridax Procumbens*.
A: exodermis, B&C: phelloderm, D:pericycle, E: phloem, F: xylem, G: medullary rays

Physicochemical Evaluation: It shows the following physicochemical parameters. [9]

Table 1: Physicochemical parameters

Sample Identity	% LOD	% Total ash	Acid insoluble ash %	Water soluble Ash %	Water soluble extractive value %	Alcohol soluble extractive value %
Leaves	14	12.00	3.15	2.20	30.01	08.01

2. Phytochemical Review:

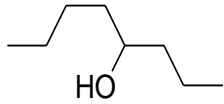
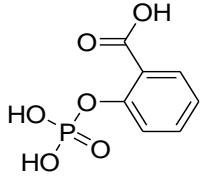
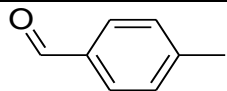
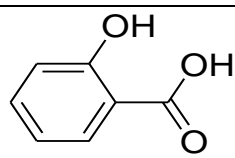
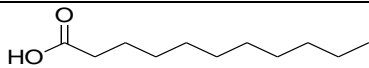
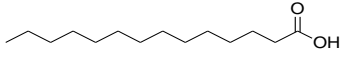
Preparation of Plant extract: 100 g of dried *Tridax procumbens* leaves were put in a Soxhlet device. At 64 °C for 24 hours, 500 cc of methanol was used for the extraction process. The extract was run through a 110 mm Whatman filter paper no. 41. To make the resultant solution dry and provide the methanol extract dryness, it was concentrated in a vacuum. For later usage, the extract was kept in a refrigerator at 4 °C.

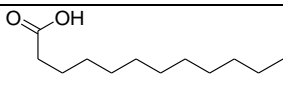
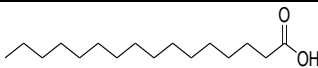
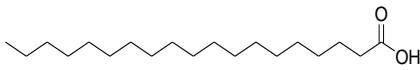
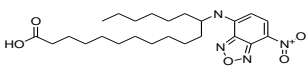
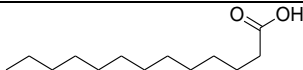
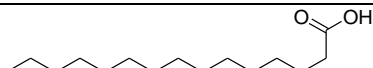
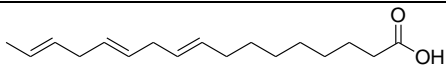
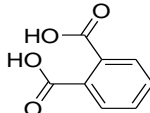
Preliminary Phytochemical Screening:

GC- MS Spectrum of Methanolic extract of *Tridax Procumbens*:

The GC/MS analysis revealed 8–9 chemicals that were mostly present in the extract and which explain the plant's medicinal potential. The pharmacological activity that has been shown to have the greatest therapeutic value *viz.*, antimicrobial ^[10], antiinflammatory ^[11], gene regulation activity ^[12], antiarthritic ^[13], anti-coronary and CNS depressant. ^[14]

Table: Chemical constituents.

Sr. No	Compound name	Mol. Formula	Mol. Weight	Chemical Structure
1.	4- Octanol	C ₈ H ₁₈ O	130	
2.	Fosfosal	C ₇ H ₇ O ₆ P	218	
3.	Benzaldehyde,4-Methyl	C ₈ H ₈ O	120	
4.	Salicylic acid	C ₇ H ₆ O ₃	138	
5.	Undecanoic acid	C ₁₁ H ₂₂ O ₂	186	
6.	Tetradecanoic acid	C ₁₄ H ₂₈ O ₂	228	

7.	Dodecanoic acid	$C_{12}H_{24}O_2$	200	
8.	N-Hexadecanoic acid	$C_{16}H_{32}O_2$	256	
9.	Eicosanoic acid	$C_{20}H_{40}O_2$	312	
10.	Octadecanoic acid	$C_{18}H_{36}O_2$	284	
11.	Tridecanoic acid	$C_{13}H_{26}O_2$	214	
12.	Pentadecanoic acid	$C_{15}H_{30}O_2$	242	
13.	9,12,15-Octadecatrienoic acid	$C_{18}H_{30}O_2$	278	
14.	Phthalic acid	$C_8H_6O_4$	348	

3. Pharmacological Review:

Antifungal Activity:

Researchers have looked into antifungal action. Different ways of extracting *Tridax procumbens* have been used to find the best way to stop the growth of fungi. Extracts of the plant's leaves have been shown to be effective against dermatophytes, with 17 to 25 mm. zone inhibition range. But the writers don't say what bioactive chemicals give the plant its antifungal qualities. The writers say that these molecules might

be fatty acid products or parts, but they don't show any proof for this claim. ^[15]

Antibacterial Activity:

Antibacterial properties of *Tridax procumbens* have been shown. In a rural areas it is used in bacterial illness and its extracts effective against different microorganism. N hexane extracts are used against *E. coli*, *Klebsiella sp.*, *Salmonella group C*, and *Salmonella paratyphi*. *Bacillus cereus*, *Mycobacterium smegmatis*. Were all successfully eradicated by the

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ethyl acetate extract. ^[16] *Staphylococcus aureus* and *Streptococcus pneumoniae* are two Gram-positive bacteria that are very active against *Tridax procumbens* essential oil extract. Although there seems to be considerable evidence for this species' antibacterial activity, additional in-depth study is required because of certain variations in the way the tests were performed. ^[17]

Anti inflammatory and Analgesic activity:

For this investigation Male C57 BL6/J mice and male Sprague-Dawley rats were used. Two analgesic and one inflammatory in vivo pain models were used. The dorsal horn of the spinal cord appears to be the site of tissue and functional changes that cause the late phase of moderate pain in the formalin test, which begins about 20 minutes after formalin injection and lasts for about 40 to 60 minutes. Administration of extract showed a significant inhibition in the late phase. Similar to this, *Tridax procumbens* extract substantially and dose-dependently decreased the abdominal writhing in the acetic acid-induced abdominal constriction test. Induced Hyperalgesia by CFA In rats given CFA injections, oral *Tridax procumbens* extract treatment markedly decreased mechanical hyperalgesia. As a result, it has been shown that *Tridax procumbens* significantly reduces inflammatory pain models, central, peripheral. This is due to presence of flavonoid and sterol. Which suggests that the *Tridax procumbens* extract may be employed as a potent painkiller. This protective effect may be attributable to the flavonoid and sterol present, which suggests that the *Tridax procumbens* extract may be employed as a potent painkiller. ^{[18] [19]}

Antihyperuricemia and Antioxidant activity:

A medicinal plant called *Tridax procumbens* L. is used as a beverage to cure liver disorders, diarrhoea, dysentery, and bronchial catarrh. In this investigation, we assessed *Tridax procumbens*' potential as a treatment for hyperuricemia and oxidative stress. By using column chromatography ethyl acetate extract of this plant was divided into several fractions, using methanol and chloroform as eluents. Then, each fraction was tested for its ability to inhibit xanthine oxidase (XO), serve as an antioxidant, and have antibacterial properties. The highest antioxidant activity was measured by the ABTS (2,2'-azino-bis (3-ethylbenzothiazoline-6-sulfonic acid) and DPPH (2,2-

diphenyl-2-picrylhydrazyl) assays (IC₅₀ = 0.51 and 1.04 mg/mL, respectively). The F45-47 fraction had the strongest XO inhibitory activity, as determined by the results (IC₅₀ = 133. F4-5 fraction effective against *Escherichia coli*, *Staphylococcus aureus*, *Bacillus subtilis*. Fatty acids, glycerides, and flavonoids were shown to be the main constituents of the F45-47 fraction by gas chromatography-mass spectrophotometry (GS-MS) and liquid chromatography-electrospray ionization-mass spectrophotometry (LC-ESI-MS) analyses. In the F48-50 fraction, glycerides, triose sugar alcohols, and fatty acids predominated, while sterols made up the bulk of the F4-5 fraction. According to this investigation, *T. procumbens* significantly inhibited the XO inhibitory, antioxidant, and bactericidal properties. Fatty acids, flavonoids, and sterols found in this plant may be responsible for several biological functions. ^{[20] [21]}

Antiparasitic Activity:

An active component known as (3,S) 16,17 Didehydrofalcariol (anoxylipin) was isolated from *Tridax procumbens* by a bioassay-guided fractionation process using a methanol extract. ^[22] This process was used to test whether or not the plant may be used to treat disorders brought on by protozoal infections, such as malaria, dysentery, colic, and vaginitis. When employing crude extracts from the entire plant, *Tridax Procumbens* seemed to exhibit anti-leishmanial efficacy. ^[23] The extracts were evaluated in aqueous, chloroform, ethyl acetate, and ethanolic mediums. There is evidence that the aqueous and ethanolic extracts from the species have anti-plasmodial capabilities; a research employing the tetrazolium based colorimetric test indicated that *Tridax procumbens* could prevent red blood cells from damage caused by *P. falciparum*. *Tridax Procumbens* has remarkable promise as a treatment for a disease that is responsible for the deaths of millions of people all over the globe. ^[24]

Antimicrobial Activity:

There have been antimicrobial tests, but further research is required to confirm some of the findings. *Tridax procumbens* has antibacterial qualities that have been sensitive to a variety of bacterial and fungal species. More recently, it was shown that the stem and leaf callus was helpful in the creation of silver nanoparticles that had some antibacterial action against *E. coli*, *V. cholera*, *A. niger*, and a flavus. ^[24] However,

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since its activity was less than that of silver nitrate, these findings cannot be considered definitive. Against *Bacillus faecalis*, *Tridax procumbens* leaf extracts in petroleum, ether, and ethanol shown antibacterial action. [25] According to reports, alkaloids are most likely to blame for this action. Chloroform extract's was susceptible to the antibacterial activity, although more thorough controls and method descriptions are required for future investigations. When used sparingly, alpha- and beta-pinenes, which are included in *Tridax procumbens* essences, may aid in the treatment of bacterial and fungal illnesses. [26] The antibacterial effectiveness of this species has produced some inconsistent findings. There is evidence for this species' potential to be an antimicrobial, thus additional research in this field is necessary. However, several investigations did not contain substantial biological activity when compared to the antibiotic control [27]

Bioactivity studies:

There is a new review of *Tridax procumbens*' biological activities available. This plant shows activity against bacteria, yeasts, and fungi. *Escherichia coli* was actively inhibited by the flower's n-hexane extract. whole aerial portions proved effective against *Mycobacterium smegmatis*, *Escherichia coli*, *Salmonella* group C, and *Salmonella paratyphi*, the same extract of the. *Bacillus cereus* and *Klebsiella* species could not survive the ethyl-acetate extract of the flowers. While the aqueous extract exhibited no antibacterial action, the aerial parts extract shown efficacy exclusively against *Mycobacterium smegmatis* and *Staphylococcus aureus*. None of the examined extracts had any effect on the fungus *Aspergillus flavus*, *Aspergillus niger*, *Mucor* sp and *Trichophyton rubrum*, nor did they have any effect on the yeasts *Candida albicans*. [28] [16]

Lysyl Oxidase Activity:

Tridax procumbens, a native medication, was investigated for its effects on rats' growing granulation tissue. At intervals of 4 days up to 32 days after wounding, subcutaneously collected granuloma tissue that had grown on the dead space wound was excised, drug-treated animals had higher lysyl oxidase activity, protein content, specific activity, and breaking strength in comparison to controls. After day 8, it was noticed that drug-treated animals' lysyl oxidase activity had decreased. The medication may be acting in

two different ways, first as a stimulant during the early stages of wound healing and then as a depressant during the latter stages. [29]

In vitro activity against promastigotes of *Leishmania Mexicana*:

It has been shown that *Tridax procumbens* crude extracts and fractions have potent antileishmanial effects. Using bioactivity-guided fractionation, a potent leishmanicidal metabolite (1) was isolated for the first time from *Falcaria vulgaris* Bernh. (Umbelliferae) and identified as (3S)-16,17-didehydrofalcariinol by spectroscopic analysis. Additionally, this substance has been isolated from several Asteraceae plants. An oxylipin is a kind of oxygenated lipid found in plants that responds to physical injury from animals or insects, stress, and pathogen assault. (3S)-16,17-Didehydrofalcariinol (1) is one of these oxylipins. These chemicals are sometimes referred to as polyacetylenes since they often have many C-C triple bonds in their structure. These triple bonds have the ability to stabilise radicals and/or carbocations produced at nearby sites in the molecule. [30] For instance, falcariinol has the ability to create a very stable carbocation. When subjected to the circumstances found in biological materials, polyacetylenes react easily with amino groups in proteins and other nucleophilic sites in biomolecules. These metabolites are mostly generated by plants from the families Asteraceae as well as fungus. Phytoalexins, which are another way of synthesising polyacetylenes, have been shown to have antifungal, insecticidal, cytotoxic, nematocidal, antimycobacterial, antimicrobial, neurotoxic, antiprotozoal, and hemolytic properties. [31] C17-polyacetylenes isolated from *Cussonia zimmermannii* Harms have only been reported to be very effective against leishmaniasis in one publication. This work showed that the metabolite (3S)-16,17-didehydrofalcariinol (1), isolated from *Tridax procumbens*, had biological action on the promastigote form of *Leishmania mexicana* but had no impact on mammalian cells. [32]

Wound Healing Activity:

In order for a wound to heal, there is a complicated interaction that must take place between epidermal and dermal cells, the extracellular matrix, regulated angiogenesis, and plasma-derived proteins. This interaction is directed by a variety of cytokines and growth factors. *Tridax* was able to block the anti-

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epithelialization and tensile strength-depressing effects of dexamethasone, which is a recognised healing suppressant drug. This was accomplished without impacting the anti-contraction and anti-granulation actions of dexamethasone. An increase in lysyl oxidase activity was seen with the use of an aqueous extract as well, but to a smaller extent than with the use of a whole plant extract [33]. Furthermore, similar to normal rats, it has been proven that the plant's leaf extract hastens wound healing in rats who have been immunocompromised by steroid treatment. In this case, we use a wound healing model known as the alive space wound healing model. The plant upregulates its lysyl oxidase, protein, and nucleic acid levels in the granulation tissue, most likely as a response to the increased glucosamine glycan content. [34] [35]

Hepatoprotective Activity:

The effectiveness of *Tridax procumbens* in lowering the oxidative stress in the liver that causes liver damage as well as the hepatoprotective activities of various extracts have been assessed using a variety of models. [36] Treatment of drug-induced disorders such as viral hepatitis, drug overdose, and lipid peroxidation from reactive oxidative species might benefit from the ethanol extract's chloroform insoluble fraction. In a separate study, it was revealed that the ethanol extract of the insoluble chloroform extract decreased the hepatotoxic activity of the CCl₄-treated livers of rats by reducing the enzyme levels. [37] When *Tridax procumbens* ethanolic extract was administered orally at varying concentrations, hepatoprotection was observed. Treating liver damage brought on by Paracetamol was examined in studies on male albino rats. Aspartate aminotransferase, Alanine aminotransferase, Alkaline phosphatase, and Bilirubin levels were shown to decrease when the ethanolic extract from *Tridax procumbens* was given orally at various doses, leading to hepatoprotection. [38] Male Wistar Albino Rats were protected from hepatotoxicity by floral extracts in petroleum ether, methanol, and chloroform water, with the highest protection being provided by the methanolic extract. The most impact. Aqueous leaf extracts have been demonstrated to have hepatoprotective effects in rats owing to their antioxidant properties and active free radical scavenging. In rats with hepatitis produced by D-Galactosamine Lipopolysaccharide, an ethanolic extract from *Tridax procumbens* leaves that was separated with chloroform shown excellent hepatoprotective efficacy. [39] According to the

research, liver parenchymal cell regeneration may have been triggered by pretreatment with the plant extract. After receiving treatment with galactosamine lipopolysaccharide, the rats that were-pretreated also returned their lipid levels to normal. Only administering the *Tridax procumbens* extract to rats resulted in little to no detrimental effects, indicating that rats are not particularly poisonous to the plant. It appears that the flavonoids were what caused the hepatoprotective effect. Future studies are necessary to fully understand *Tridax's* potential hepatoprotective effects. [40] [41]

Antidiabetic activity:

An intriguing finding is that *Tridax procumbens* possesses anti-diabetic characteristics. Diabetes has become an epidemic on a global scale. Ethylene extracts from the whole *Tridax procumbens* plant were fed to streptozotocin-induced diabetic Male Wistar albino rats. According to the research, the extract has similar anti-diabetic properties to the type 2 diabetes medication glibenclamide. The medication works by boosting the pancreas's capacity to generate insulin. This investigation used two doses of *Tridax Procumbens* whole plant extract (250 mg/kg and 500 mg/kg), along with appropriate controls. In comparison to the controls, the test revealed significant anti-diabetic activity. Additionally, the extracts had a favourable impact on hyperlipidemia linked to diabetes mellitus. [42] A further research found that methanolic extracts of *Tridax procumbens* were more effective in treating Alloxan-induced diabetic male albino rats than the widely used medication Glibenclamide. Rats received dosages of 250 or 500 mg/kg of plant extracts and 10 mg/kg of glibenclamide, respectively. After six hours of therapy, different doses of the plant extract reduced the rats' blood glucose levels effectively than the standard medication. The plant's extracts also helped the Alloxan-induced diabetic rats' fasting blood glucose levels. Additionally, there was no proof that the methanolic extracts from *Tridax* had any negative side effects on animals that had been given diabetes. It was also investigated how the plants affected the rats' body weight. By using different extracts of methanol, ether and chloroform of *Tridax Procumbens* Alpha-amylase and alpha-glucosidase enzyme rates were both decreased, exhibiting a significant reduction, similar to those of typical medications used to treat diabetes by slowing the enzymes. [43] These studies together highlight the significant pharmacological potential of *Tridax* in the treatment of diabetes and the need of

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more investigation and human clinical trials to fully understand the impact.

Antihypertensive Activity:

For persons aged 20 and older, hypertension, or high blood pressure, is defined as any measurement with a systolic pressure above 140 mmHg and a diastolic pressure over 90 mmHg. Individuals with hypertension were also defined by the CDC as those who were using prescription drugs to reduce their blood pressure. The National Centre for Health Statistics reports that from 2009 to 2012, 30% of Americans over 20 had high blood pressure. [44] *Tridax procumbens* has a long history of usage in treating hypertension in nations like Benin and others. A research was conducted to examine its antihypertensive efficacy because of its long history. An unrefined aqueous extract of the plant was processed via the aerial portions to produce fractions of cyclohexane, micellar, dichloromethane, and ethyl acetate. The dose of 20 mg/kg dose of N (G) Nitro L Arginine Methyl Ester given to the rats to cause hypertension for seven days, and then they received a second seven-day treatment with various extracts. Rats' mean arterial pressure was most successfully decreased by the dichloromethane and ethyl acetate fractions. [45] According to the research, captopril, a popular medication, had a similar impact on rats as the results. Alkaloids and flavonoids were present in both the dichloromethane and ethyl acetate fractions, suggesting that these phytochemicals may be the cause of the decrease in blood pressure. There are various theories as to how flavonoids could be involved in vasorelaxation, which helps reduce blood pressure. This is only one of the theories. Additionally, flavonoids are thought to have a diuretic impact, which might help to explain some of the plant's antihypertensive properties. [46]

Immuno-enhancement Activity:

In order to treat certain disorders, the immune system has been helped to normalise using a variety of biological chemicals. It has been shown that a *Tridax procumbens* adaptogen increases the body's general resistance to infections. [47]

Swiss Albino mice treated with immunomodulators found in *Tridax procumbens*, which have been demonstrated to stimulate the immune system, were used in a number of mouse studies to examine the

influence of *Tridax* on immune system stimulation. In order to assess cell-mediated immunity, the Delayed type hypersensitivity in the extract-fed mice was compared to that in the control animals. Additionally, a study on neutrophil adhesion revealed that both the DTH response and the proportion of neutrophils increased in a dose-dependent manner. [28] The authors contend that there was sufficient data to start clinical studies with immunocompromised individuals. But before starting clinical trials, we believe that more thorough research should be carried out. It is unclear that which constituents are immunosuppressants and immunostimulators. To clarify this, various extraction and fractionation techniques must be used, and each solution must then be tested to identify the constituents and their activity. [48]

Immunomodulatory Activity:

On Albino rats given *Pseudomonas aeruginosa* doses, ethanol extracts of *Tridax* leaves show immunomodulatory effects. They also prevent the growth of the same. Ethanol insoluble fraction of the *Tridax* aqueous extract shows rise in the leukocyte count, and spleen antibody-secreting cells has also been linked to the. Increased haemagglutination antibody titer and stimulation of the humoral immune response were also noted. *Tridax* affects the immune systems of cells as well as humoral immune systems, the study also finds. [49]

Antiobesity Activity:

In an atherogenic diet-induced obesity paradigm, Extract of this plant substantial decrease in total cholesterol, triglycerides, total protein, free fatty acids, and also increase in high-density lipoprotein cholesterol in the treated rats. Significant antiobesity action was discovered in *Tridax Procumbens*. [50]

Anticancer Activity:

Cancer is a multifaceted illness. Research on *Tridax procumbens*' anticancer properties has just lately been conducted. On PC3 prostate epithelial cancer cells, unprocessed floral extracts in aqueous and acetone were evaluated. The aqueous extract showed very little antitumor action. Acetone extract of this plant effective against cancer after 24 hour period treatment. The viability was evaluated by using MTT assay. Acetone extract was effective and the controls are not explicitly mentioned in the article since the

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authors don't describe the toxicity study. As a consequence, the results are inconclusive. Additionally, there is no mention of the selectivity index in this study and no comparison of the findings to conventional medicinal medications. [51] When *Tridax procumbens* was used, there was a significant reduction in the development of tumour nodules in the lungs. This was likely because of the reduced ability of monoterpenes (alpha and beta pinenes) to stimulate the growth of new blood vessels. Additionally, P53 and caspase expression levels increased, suggesting that the oils from these plants may be able to trigger apoptosis. *Tridax procumbens* has shown promise in the treatment of cancer, according to a number of studies, but further study is needed to fully understand the molecular mechanisms at play. Additionally, none of the research on anticancer activities adhered to the right procedures for this kind of study, hence the results are inconclusive. [52]

4. Conclusion:

In Ayurveda, this plant has historically been used medicinally to cure a wide range of illnesses. According to scientific evidence, *Tridax procumbens* demonstrates a variety of biological functions, including anti-inflammatory, antiparasitic, antibacterial, analgesic, antidiabetic, wound healing activity, antihypertensive, and hepatoprotective, as well as a variety of chemical constituents, including alkaloids, flavonoids, tannins, and carotenoids. *Tridax procumbens* underwent pharmacognostic investigations, fluorescence investigations, and photochemistry investigations. These studies demonstrate the wide variation in these medications' active ingredients. Choosing genuine medications will be greatly aided by the values presented in this study. The current study gives important insight into the medical potential of this herbal medication by concentrating on its chemical components, therapeutic applications, and pharmacological activity.

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