

A Comprehensive Review on Tridax Procumbens

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Abstract—Traditional medicine has utilized Tridax Procumbens (biological source: Asteraceae) Tridax procumbens, commonly known as coat buttons. The goal of this review is to present a thorough summary of Tridax Procumbens, nutritional, therapeutic, and medical qualities. The leaves, and Flowers are rich in biologically active compounds, including vitamins, minerals, and phytochemicals, which contribute to its diverse health benefits. According to studies, Tridax Procumbens contains immunomodulatory, antibacterial, anti-inflammatory, Wound healing properties, Antimicrobial, and antioxidant qualities, which could help treat a number of illnesses. The review highlights the potential health benefits of tridax procumbens. Additionally, Tridax Procumbens has been traditionally used to treat Wound healing, and skin conditions. The nutritional and healing properties of tridax procumbens are thoroughly examined in this paper, which underlines the plant's potential. The article also discusses the need for further research to fully explore the therapeutic potential of Tridax procumbens and to ensure its safe and effective use. Tridax procumbens is a promising plant with a variety of therapeutic, and medicinal qualities, making it a useful for human health and wellbeing. The various extracts of Tridax procumbens have been used as indigenous Medicine for a variety of diseases and disorders in human beings as well as animals. It has been Extensively used in Indian traditional medicine for wound healing, as anticoagulant, in fungal Infection, in as antioxidant, antimicrobial, anti-inflammatory and immunomodulatory. With growing scientific evidence Supporting its medicinal properties, T. procumbens holds significant promise as a natural remedy That could be integrated into modern healthcare. This review aims to contribute to the growing body of information about tridax procumbens health benefits. Review shows the importance of potential of T.Procumbens in Wound healing.

Index Terms—Tridax procumbens, Wound healing Activity, antimicrobial, phytochemicals.

I. INTRODUCTION

Tridax procumbens is a well-known medicinal herb belonging to the family Asteraceae and is valued for its wide range of traditional therapeutic applications. The plant is recognized by different local names in various cultures; it is known as Jayanti-Veda in Sanskrit and as Tikki-Kasa or Kamra in Hindi. Because of its small, attractive, daisy-shaped flowers, it is commonly referred to in English as Wild Daisy, Mexican Daisy, or Coat Buttons. In several regions of India, the plant is also popularly called Ghamara. Within the Ayurvedic system of medicine, Tridax procumbens has occasionally been used as a substitute for Bhringraj, particularly in herbal formulations designed to support hair growth and scalp health. India's long-established systems of traditional medicine, including Ayurveda, Siddha, and Unani, rely heavily on medicinal plants, and T. procumbens holds an important place among them for treating various health conditions. The accepted botanical name of the plant is Tridax procumbens [4,1]. Tridax procumbens is a perennial herb that grows close to the ground and is easily recognized by its coarse, hairy surface. It commonly occurs as a weed and is capable of flowering and producing fruits throughout the year, which contributes to its wide visibility in natural surroundings. The plant belongs to the family Asteraceae and is extensively distributed across India, where it can be found growing at altitudes reaching approximately 2400 meters above sea level. In addition to its abundant growth, Tridax procumbens has notable traditional significance. The leaves are frequently used as fodder for livestock and are also consumed as a nutritional supplement in certain local communities. In folk and traditional systems of medicine, leaf preparations are widely employed for the treatment of ailments such as catarrh, dysentery, diarrhea, wounds, burns, and anemia.

Furthermore, the plant is traditionally valued for its ability to promote hair growth [2].

Ethnobotanical surveys and phytochemical research have shown that *Tridax procumbens* is widely consumed as a leafy vegetable in Togo, where it is appreciated for both its nutritional value and therapeutic potential. The continued use of this plant is strongly rooted in traditional knowledge and is further supported by scientific evidence. Due to its richness in important macro- and micronutrients, *T. procumbens* is regarded as a promising plant resource for improving dietary quality and contributing to food security, particularly for communities that are at risk of nutritional deficiencies [3].

This review brings together available scientific literature describing the structural properties, phytochemical profile, and experimentally confirmed biological activities of *Tridax procumbens*. By considering findings from pharmacogenetic studies and laboratory-based investigations, the article underscores the significance of this plant as a valuable source of bioactive compounds and points to its potential application in the formulation of reliable and well-standardized herbal medicinal products [5].



Fig.1. Leaf and flower of *Tridax procumbens*

Table 1: Taxonomical classification

Kingdom	Plantae
Sub kingdom	Tracheobionta
Division	Spermatophyta
Subdivision	Magnoliophyta
Class	Magnoliopsida
Subclass	Asteridae
Order	Asterales
Family	Asteraceae – Aster family
Genus	<i>Tridax</i> L. – <i>tridax</i>
Species	<i>Tridax procumbens</i> L. – coat buttons

II. SPATIAL DISTRIBUTION

Tridax procumbens is widely distributed in tropical and subtropical zones and is commonly seen throughout different regions of India. Popularly known as coat buttons, the plant grows well in open and disturbed environments, including roadsides, abandoned lands, railway margins, riverbanks, embankments, grasslands, and sandy areas. Its ability to spread quickly is mainly due to its creeping growth nature and high seed-producing capacity, allowing it to persist as a troublesome weed. Among the nearly thirty species belonging to the genus *Tridax*, *T. procumbens* is recognized as one of the most prevalent and biologically significant species [4].

The plant is believed to have its origin in Mexico and parts of Central and South America, from where it slowly spread to various tropical regions of Africa and Asia. In India, it has been recorded in multiple states, including Andhra Pradesh, Maharashtra, Madhya Pradesh, Chhattisgarh, Gujarat, and Odisha. Apart from India, *Tridax procumbens* is widely distributed in countries such as Nepal, Nigeria, and China, where it shows vigorous growth, particularly during the monsoon season [4].

Sr.no	Country/ Regional language	Common Names	References
1	Marathi	Kambarmodi, jakhamjudi or tantani, Dagadi Pala	[4, 9, 15, 22]
2	Hindi	Ghamra	[4, 15]
3	Sanskrit	Jayanti Veda	[4, 15]
4	Telugu	Gaddi Chemanthi Gayapuaku,	[4, 15]
5	Tamil	Thatapoodu	[15]
6	Malayalam	Chiravanak	[15]
7	Spanish	Cadillo Chisaka	[9, 15]
8	French	Herbe Caille	[9, 15]
9	Chinese	Kotobukigiku	[15]
10	Oriya	Bisyhala karani	[9, 15]
11	Japanese	Kotobukigiku	[9, 15]
12	Thai	Gecko feet, Tin túkkæ	[15, 22]
13	Yoruba	Yunyun	[15]

14	English	Coat buttons, tridax daisy	[22]
15	Gujarati	Ghaburi	[22]
16	Kannada	Jayanthi	[22]
17	Guatemala	Bull grass, bull's herb	[22]
18	Bengali	Tridhara	[22]

III. PHARMACOGNOSTIC PROFILE

MORPHOLOGICAL CHARACTERISTICS:

Leaves are simple, opposite, entire, hairy & shortly petioled leaf stalk. It is 3-7cm long 45cm with Long irregularly toothed margin [15, 26]

A. Stem and root

Stems are cylindrical, rough, and covered with multicellular hairs measuring a few millimeters; tuberculations are present at the base. The root consists of a well-developed taproot system. The plant stem is erect to ascending, about 30–50 cm in height, branched, sparsely pubescent, and capable of producing roots at the nodes [4].

B. Leaves

The leaves have uneven, tooth-like edges and a distinct arrowhead appearance. They are simple in structure, range from ovate to lance-shaped, and occur in opposite pairs. Each leaf is about 3–7 cm long, with a wedge-shaped base and a short stalk. Fine hairs are present on both sides of the leaf surface [4].

C. Flowers

The plant develops a single flower head at the tip of the stem, borne on a long, thin, and smooth stalk. Each flower head is small, about 1–2 cm in diameter, and is composed of two clearly distinct types of florets. The center is filled with tiny, yellow, tubular florets that are bisexual, while the outer edge consists of flat, ribbon-shaped female florets that are usually white. This composite floral pattern, typical of the Asteraceae family, plays an important role in efficient reproduction and in attracting pollinating insects [5].

IV. PHYTOCHEMICAL PROFILE

Phytochemistry

Tridax procumbens has a long history of use in traditional healing systems in many parts of the world,

which has prompted considerable scientific interest in its chemical makeup. Researchers are increasingly focused on this plant because it may contain previously unknown bioactive compounds with potential value in the development of new medicines. Accordingly, the different extraction techniques used to obtain and study the various phytochemicals present in *T. procumbens* are discussed [11].

Preliminary Phytochemical Screening

The stem and root of *Tridax procumbens* were extracted using benzene and diethyl ether, and these extracts were then analyzed qualitatively using standard laboratory methods. The analysis revealed the presence of several key phytochemical groups, including flavonoids, steroids, terpenoids, tannins, saponins, alkaloids, phenols, carbohydrates, proteins, and glycosides [7, 21, 10].

A. Test for Alkaloids

For the detection of alkaloids, 2 mL of the plant extract was mixed with an equal volume of concentrated hydrochloric acid. Mayer's reagent was then added slowly, drop by drop. The appearance of a white precipitate confirmed the presence of alkaloids in the extract.

B. Test for Flavonoids

For the detection of flavonoids, 0.1 mL of the plant extract was diluted with 5 mL of distilled water. Then, 0.3 mL of sodium nitrate was added, and the mixture was allowed to stand at room temperature for 5 minutes. Afterward, 3 mL of 10% aluminum chloride solution was introduced and incubated for 6 minutes. Finally, 2 mL of sodium hydroxide (NaOH) was added. The development of a yellow coloration indicated the presence of flavonoids in the extract.

C. Test for Glycosides

The presence of glycosides was examined using a conventional qualitative method. For this, 1 mL of concentrated sulfuric acid (H₂SO₄) was placed at the bottom of a test tube. In a separate container, 5 mL of the plant's aqueous extract was combined with 2 mL of glacial acetic acid (CH₃CO₂H) containing a drop of ferric chloride (FeCl₃). This mixture was then carefully added on top of the sulfuric acid to form a distinct layer. The formation of a brown ring at the interface of

the two layers confirmed the presence of cardiac glycosides in the extract [14].

D. Test for Saponins

Saponins were tested by mixing 2 mL of the plant filtrate with 1 mL of distilled water and shaking the mixture vigorously for 3 seconds. After letting it stand for a few minutes, 3 drops of olive oil were added and the mixture was shaken again. The appearance of a stable emulsion confirmed the presence of saponins in the extract.

E. Foam Test for Saponins

Saponins were detected by mixing 1 mL of the plant extract with 2 mL of distilled water in a test tube and shaking it vigorously for a few minutes. The appearance of a stable foam, about 1 cm tall, which persisted for 10 minutes or more, confirmed the presence of saponins in the sample [12].

F. Test for Terpenoids:

Terpenoids were identified by mixing 1 mL of the plant extract with 2 mL of chloroform. Carefully, 5 mL of concentrated sulfuric acid (H₂SO₄) was added along the sides of the test tube. The development of a reddish-brown layer at the interface indicated the presence of terpenoids in the extract.

G. Test for Phenols

The phenolic content of the sample was assessed by treating 2 mL of the extract with 0.5 mL of ferric chloride (FeCl₃, w/v) solution. The appearance of a clear color change signified a positive result, confirming the presence of phenolic compounds in the sample.

Phytoconstituents

Results reported in multiple studies indicate that the plant possesses a wide variety of phytochemical components. Preliminary screening has confirmed the presence of alkaloids, carotenoids, saponins, flavonoids, and tannins, which collectively emphasize its therapeutic and medicinal significance [9].

1. Alkaloids

Alkaloids comprise a wide range of naturally derived organic compounds that are notable for their strong biological and therapeutic effects. Several alkaloids are associated with important medicinal actions,

including analgesic, antimicrobial, and antidiarrheal properties. From a chemical standpoint, they are nitrogen-based compounds predominantly obtained from plant sources and are known to exert distinct physiological effects in humans [9].

Previous research has clearly established the presence of alkaloids in *Tridax procumbens*. A comprehensive phytochemical study of its aqueous leaf extract reported the identification of thirty-nine different alkaloids, with akuamidine (73.91%) and voacangine (22.33%) being the most abundant constituents (Ikewuchi, 2012). Along with alkaloids, the extract was also found to contain other important secondary metabolites, including sterols and tannins [9].

Subsequent studies revealed that alkaloids isolated from the pedicles and buds of *T. procumbens* demonstrated significant antimicrobial activity. These compounds were effective against *Proteus mirabilis* and *Candida albicans*, while alkaloids obtained specifically from the buds also showed inhibitory effects against *Escherichia coli* and *Trichophyton mentagrophytes*. Quantitative estimation showed that the total alkaloid content was 32.25 mg/g dry weight in the pedicles and 92.66 mg/g dry weight in the buds. Overall, these findings highlight the strong therapeutic potential of *Tridax procumbens* [9].

2. Flavonoids

Recent investigations have revealed that *Tridax procumbens* contains a diverse array of flavonoids, with a total of twenty-three distinct compounds identified and an overall flavonoid content of approximately 65 g/kg. Among these, kaempferol and catechin, along with their associated derivatives—such as (–)-epicatechin, (+)-catechin, (–) epigallocatechin, (+)-gallocatechin, (–) epigallocatechin-3-gallate (EGCG), and (–) epicatechin-3-gallate—account for about 17.59% and 26.3% of the total flavonoid composition, respectively. The remaining 56.11% consists of sixteen additional flavonoids, including biochanin, apigenin, naringenin, daidzein, quercetin, butein, robinetin, baicalein, nobiletin, genistin, ellagic acid, myricetin, baicalin, isorhamnetin, and silymarin. This broad and varied flavonoid profile highlights *Tridax procumbens* as a valuable natural source of bioactive compounds with significant therapeutic potential [9].

PHARMACOLOGICAL ACTIVITY

Pathophysiology of Wound Healing

Wound healing is a coordinated and complex biological response that enables the body to recover from tissue injury. It progresses through several interrelated stages, with each phase involving distinct cellular actions and molecular processes that collectively support proper tissue repair and regeneration [8].

Hemostasis:

Right after an injury occurs, the blood vessels around the affected area narrow to limit blood loss. Simultaneously, platelets gather at the site of damage and form a temporary clot that effectively stops bleeding. This immediate defensive reaction is crucial for stabilizing the wound and preparing it for the subsequent stages of healing.

Inflammation:

Following hemostasis, the wound enters the inflammatory phase. During this stage, immune cells—including neutrophils and macrophages—migrate to the injury site to eliminate debris, dead cells, and potential pathogens. At the same time, various cytokines and growth factors are released, which help coordinate and control the progression of the subsequent healing phases.

Proliferation:

In the proliferation stage, the wound is actively repaired as new tissue develops to replace the injured area. Fibroblasts infiltrate the site and generate collagen, which forms an essential part of the extracellular matrix and provides structural stability. Concurrently, angiogenesis occurs, forming new blood vessels that deliver oxygen and nutrients vital for tissue regeneration and growth.

Remodeling (Maturation):

The remodeling or maturation phase represents the final stage of wound healing and can extend over several months to years. During this period, the newly formed tissue undergoes reorganization and reinforcement. Collagen fibers are carefully realigned and cross-linked to strengthen the tissue, while surplus scar tissue is gradually minimized, leading to a more durable and functional repair.

Factors Affecting Wound Healing:

Wound healing is influenced by multiple factors, such as the type and seriousness of the injury, the individual's overall health—particularly conditions like diabetes or malnutrition—and external elements including infections or mechanical stress on the wound. Providing appropriate wound care, which includes keeping the area clean and moist, supporting proper nutrition, and addressing any underlying health concerns, is essential for achieving effective and timely healing [8].

Effects of *Tridax procumbens* on Wound Healing

Tridax procumbens has exhibited significant wound healing activity in experimental studies. The plant has been shown to alleviate the inhibitory effects of dexamethasone a drug known to delay wound repair by preventing slowed epithelialization and reduced tensile strength, while preserving normal anticontraction and antigranulation responses. Both aqueous and ethanolic extracts of *Tridax procumbens* effectively enhanced wound tensile strength in Wistar rats using excision and incision models. Moreover, key biochemical indicators of tissue repair, including hydroxyproline, collagen, and hexosamine, were substantially elevated, reflecting improved tissue regeneration. Traditionally *Tridax cumbens*, frequently used in combination with *Areca catechu*, has been employed in Ayurvedic medicine for its antibacterial, antifungal, anti-inflammatory, and wound-healing properties, as well as for other therapeutic applications [19].

Antimicrobial Activity

The antimicrobial potential of *Tridax procumbens* was evaluated against a variety of Gram-positive and Gram-negative bacteria commonly associated with wound infections. The bacterial strains tested included *Staphylococcus aureus*, *Proteus* spp., *Escherichia coli*, *Streptococcus* spp., *Pseudomonas* spp., and *Klebsiella* spp. The study employed the agar well diffusion method, where organic solvent extracts of the plant, at concentrations ranging from 1 mg/mL to 50 mg/mL, were introduced into wells in Mueller–Hinton agar plates pre-inoculated with the bacterial cultures. Following incubation at 37°C for 24 hours, the zones of inhibition were measured in millimeters to assess the antibacterial efficacy of the extracts [17].

Antimicrobial Screening Test:

The agar diffusion method is commonly employed to assess the antimicrobial potential of a substance by determining its ability to suppress bacterial growth. In this approach, the selected bacterial strain is uniformly spread over the surface of an agar plate. The test samples are then applied, allowing them to diffuse into the agar. The presence of clear zones around the samples, where bacterial growth is inhibited, indicates their antimicrobial activity.

About 100 μL of each test fraction was added to agar plates that had been previously inoculated with the bacterial cultures. The plates were first refrigerated for 30 minutes to allow the samples to diffuse properly, and then incubated at 37 °C for 18 hours. Following incubation, the antimicrobial activity was assessed by measuring the zones of inhibition around the samples. A 10% methanol solution was used as the negative control, while ciprofloxacin (30 $\mu\text{g}/\text{disc}$) served as the standard reference drug [21].

Antibacterial Activity:

Tridax procumbens has shown significant antibacterial properties. Its activity was tested against *Pseudomonas aeruginosa*, a well-known hospital-acquired pathogen commonly isolated from patients with ventilator-associated pneumonia. The bacterial strains were collected from clinical samples such as tracheal secretions and bronchoalveolar lavage. The study revealed that the ethanolic extract of *T. procumbens* exhibited strong antibacterial effects against *P. aeruginosa*, with the highest zone of inhibition observed at a concentration of 5 mg/mL [9].

Anti-diabetic Activity:

Diabetes is a metabolic condition marked by chronically elevated blood sugar levels due to inadequate insulin production, reduced insulin sensitivity, or both. As the incidence of diabetes continues to rise worldwide, there is increasing interest in exploring safe and effective herbal remedies. Tridax procumbens has emerged as a promising candidate, with studies showing that its aqueous, methanolic, and ethanolic extracts can significantly reduce blood glucose levels.

In experimental models, alloxan-induced diabetic Wistar rats treated orally with Tridax procumbens extracts for seven days showed a marked reduction in blood glucose levels. Alloxan damages pancreatic

β cells, causing cell death and impaired insulin production. Administration of *T. procumbens* extracts promoted regeneration of these β -cells, improved glucose uptake in peripheral tissues, and enhanced overall glucose control. Among the various extracts tested, the petroleum ether extract demonstrated relatively weaker antidiabetic activity [18].

Further studies have shown that Tridax procumbens not only aids in regulating blood glucose levels but also enhances lipid metabolism, boosts antioxidant activity, and supports capillary function under diabetic conditions. The plant's antidiabetic properties are primarily linked to bioactive compounds like dihydroxy-olide, present in the hexane extract. This compound helps limit intestinal glucose absorption and assists in controlling post-meal blood sugar surges, especially in individuals with type II diabetes [18].

In these experiments, blood glucose levels were generally measured using a glucometer. Tridax procumbens has been shown to inhibit crucial carbohydrate-digesting enzymes, such as α -amylase and α -glucosidase, which are responsible for converting complex carbohydrates into absorbable glucose. Among the various extracts, methanolic extracts demonstrated strong α -amylase inhibition, whereas petroleum ether and chloroform extracts exhibited weaker effects. The enzyme-inhibitory activity of the ethanolic extract is believed to be largely due to the presence of quercetin, highlighting the plant's potential in regulating blood glucose levels [18].

The extract obtained from the entire Tridax procumbens plant lowers blood glucose primarily by increasing glucose uptake and utilization in peripheral tissues. It activates glycogenic and glycolytic pathways, thereby improving overall glucose metabolism. Simultaneously, the extract suppresses glycogen breakdown and gluconeogenesis, working together to effectively reduce blood glucose levels [4]. Alcoholic and aqueous extracts of Tridax procumbens Linn. Leaves have been shown to lower blood glucose levels. In experiments with alloxan-induced diabetic rats, oral administration of the methanol extract—whether for short-term or extended periods—produced a significant reduction in fasting blood glucose. Importantly, the extract did not alter blood glucose levels in healthy, non-diabetic rats [12].

Antifungal Activity:

Tridax procumbens has shown notable antifungal properties in several studies. Extracts from the whole plant were effective against phytopathogenic fungi such as *Aspergillus niger*, while leaf extracts demonstrated activity against *Fusarium oxysporum*. Essential oils obtained from the plant also displayed antifungal effects against *Candida albicans*, *Candida tropicalis*, and *Candida parapsilosis*, producing inhibition zones of around 12–15 mm. Studies on the plant's bioactive compounds revealed that flavonoids isolated from *T. procumbens* possess strong antifungal activity, showing effectiveness against *Aspergillus niger*, *Aspergillus flavus*, *Candida albicans*, and *Trichophyton* species, with *Candida albicans* being the most sensitive. Methanolic extracts from different parts of the plant—including leaves, stems, flowers, and roots—also exhibited significant antifungal activity, particularly against *Candida albicans* (MTCC 227 and MTCC 3017), with inhibition zones ranging from 8 to 13 mm at a concentration of 100 mg/mL [6]. Among the extracts tested, the methanolic root extract of *Tridax procumbens* showed the highest antifungal activity against *Candida tropicalis* and *Candida glabrata*, while the methanolic leaf extract was especially effective against *Candida albicans* and *Candida tropicalis*. These findings suggest that the root extract is rich in potent bioactive compounds and could serve as a promising natural source for future anti-candidal treatments. Utilizing plant-based antifungal agents such as *T. procumbens* may help reduce reliance on synthetic fungicides and limit their potential side effects. Overall, this plant holds considerable promise as a safe and effective option for managing *Candida* infections [9].

Anti-inflammatory Activity:

The anti-inflammatory effects of *Tridax procumbens* have been explored using *in vivo* models, notably the carrageenan-induced paw edema method in rats. The plant extracts were found to significantly reduce inflammation, highlighting their strong anti-inflammatory potential. Research also focused on isolating and identifying the bioactive compounds responsible for these effects and evaluating their ability to inhibit cyclooxygenase enzymes (COX-1 and COX-2) *in vitro*. Quercetin was recognized as a key compound contributing to the anti-inflammatory activity. Beyond reducing inflammation, the extracts

demonstrated protective effects on the gastrointestinal tract and helped stabilize mast cells. These combined findings emphasize the promise of *Tridax procumbens* as a natural therapeutic option for managing inflammatory conditions [4].

Research has demonstrated that *Tridax procumbens* extract can effectively reduce inflammation in rats using the carrageenan-induced paw edema model. The extract showed significant anti-inflammatory activity on its own, and when administered alongside the standard drug ibuprofen, it further enhanced inflammation control. Oral treatment with the water-soluble leaf extract also provided analgesic effects, as indicated by a decrease in abdominal writhing in rats. Both alcoholic and hydroalcoholic extracts of the plant displayed considerable anti-inflammatory activity, with edema inhibition ranging from about 11% to 17% [12].

V. CONCLUSION

Tridax procumbens, belonging to the Asteraceae family, is a versatile medicinal plant widely recognized for its health-promoting properties. Traditionally, it has been used to support wound healing, encourage hair growth, and manage ailments such as diarrhea, dysentery, burns, and anemia. In some regions, the plant is also consumed as a leafy vegetable, highlighting its nutritional value. Phytochemical analyses have shown that *Tridax procumbens* is rich in bioactive compounds, including alkaloids, flavonoids, saponins, terpenoids, phenols, and glycosides, which contribute to its wide-ranging therapeutic effects.

Scientific studies have demonstrated that *Tridax procumbens* aids wound repair by boosting collagen synthesis, elevating hydroxyproline levels, and promoting tissue regeneration. The plant also exhibits notable antimicrobial and anti-inflammatory activities. In addition, it shows promising antidiabetic effects by enhancing glucose metabolism, supporting the regeneration of pancreatic β -cells, inhibiting carbohydrate-digesting enzymes, and maintaining lipid and antioxidant balance. Its broad-spectrum antimicrobial properties further emphasize its medicinal relevance.

Overall, *Tridax procumbens* represents a valuable plant in both traditional and modern healthcare. Its diverse chemical composition and validated biological activities make it an excellent candidate for developing

herbal medicines and nutritionally beneficial products. Further research, including clinical trials, is necessary to establish standardized preparations and determine optimal dosages to fully harness its therapeutic potential.

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