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Tridax procumbens: A Traditional Medicinal Herb with Modern Therapeutic Potential

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ABSTRACT:

Tridax procumbens Linn belongs to the family Asteraceae. It has been extensively used in Indian traditional medicine for wound healing, as anticoagulant, in fungal infection, in diarrhea and dysentery, as antioxidant, antimicrobial, anti-inflammatory and immunomodulatory. Leaf extracts are used to treat infectious skin diseases in folk medicines. Plants contain phenols or their oxygen substituted derivatives which are mostly secondary metabolites. At least 12,000 have been isolated. These substances serve as plant defense mechanisms against predation by microbes, insects, herbivores. It also contains terpenoides and flavoring agents

KEYWORDS:

Medicinal plant, Natural remedy, Kidney stone formulation

INTRODUCTION

The accumulation of mineral and acid salts in the kidneys leads to kidney stones, a common urinary disorder that can cause pain, discomfort, and complications. Herbal remedies have long been appreciated for their safety and effectiveness in xtreating kidney-related conditions. In traditional Ayurvedic and folk medicine, the well-known medicinal plant Tridax procumbens, also known as Coat Buttons, has diuretic, anti-inflammatory, and antioxidant properties that support renal health Herbal medicines also known as Herbalism or Botanical medicines are used for their multi-target therapeutic or medicinal value. The knowledge of traditional treatments for a wide range of health issues, including those involving particular plants, was the basis for the creation of many of the modern medications. Ayurveda, Unani, and ancient Chinese medicine come primarily from common drugs.

In the local language, Ghamara, T. balbisioides and Tridax procumbens are members of the family Asteraceae or Compositae.. It is a plant that is mostly used in the traditional Indian system. It is a Central American annual or perennial weed that can be found everywhere in India, particularly in the Maharashtra, Madhya Pradesh, and Chhattisgarh regions. It has yellow composite flowers that are solitary, long-stemmed, heterogamous, and bisexual. It also has white flower heads and leaves that are petiolate, ovate, or lanceolate, very hairy, and have coarsely toothed teeth. Whole arial part is useful medicinally, leaves possess wound healing, insecticidal, antisecretory and hypotensive action while seeds are used to control bleeding [1]. Additionally, it possesses a number of pharmacological properties, some of which include, but are not limited to, immunomodulatory, anti-oxidant, anti-hepatotoxic, analgesic, antidiabetic, anti-inflammatory, antifungal, and antimicrobial activity

Plant Description :

Tridax procumbens is a hairy, branched, and small plant that typically grows between 30 and 60 centimeters in

height. Green and slender, the stems are covered in fine hairs. The leaves are obtuse, rough in texture, and toothed or lobed irregularly. The small, daisy-like flowers have yellow centers and white petals, resembling tiny buttons—hence the name “coat button.” Small brown achenes with a feathery pappus that aids in wind dispersal are the fruits.

LEAVES **FLOWER**

STEM **ROOT**

Propogation:

Sees is superior for widespread cultivation.when plants of uniform quality are required important for herbal formulations vegetative propogation is preferre Due to the rapid spread of tridax procumben regular monitoring is required to avoid weed competition

VERNICULAR NAMES

- English - Coat Buttons, Tridax Daisy
- Hindi - Jayanti Veda, Ghamra
- Marathi - Kambarmodi ,Dagadi pala
- Sanskrit - Jayanti, Tripushpa
- Tamil - Thata-pood
- Telugu - Gaddi Chemanthi
- Kannada - Bisale gida
- Malayalam - Thulukanpara
- Gujarati - Jayanthi, Dagadiyo
- Bengali - Tridhara
- Urdu - Ghamra
- Oriya (Odia) Bisalya kara

CLASSIFICATION TAXONOMICAL

- Kingdom : Plantae Viridiplantae are the
- Subkingdom : Division above:
- Spermatophytina Magnoliopsida is a
- Family : Asteranae are a superorder.
- Order : Asterales
- The Asteraceae family Tridax L-tridax is a genus. Tridax procumbens L. is the species

BOTANICAL DESCRIPTION (Morphology)

- Root : Taproot with fibrous branches
- Stem : Creeping, hairy, weak, branched
- Leaves : Opposite, simple, serrated, hairy
- Inflorescence : Capitulum (head) type
- Flowers : White ray florets + yellow disc florets
- Fruit : Cypsela with pappus
- Seed : Small, single seed

LASSICAL USES

In India, Tridax procumbens has traditionally been used as an insect repellent, anticoagulant, and for wound healing. Wounds are treated directly with the juice that is extracted from the leaves. In traditional medicine, its leaf extracts were used to treat infectious skin diseases. In Ayurvedic medicine, it is used to treat gastritis, heartburn, liver disorders, and hepatoprotection. In some parts of India, local healers also use tridax procumbens to treat cuts, blisters, and boils

PHYTOCHEMICAL CONSTITUENTS

Alkaloids

Alkaloids are nitrogen-containing compounds having pharmacological activities. Example: Tridaxin, β-sitosterol-related alkaloids

They contribute to anti-inflammatory and antimicrobial properties.

Flavonoids

Flavonoids are powerful natural antioxidants that protect tissues from oxidative stress. Quercetin, Luteolin, Apigenin, Kaempferol, Catechin

These compounds are responsible for antioxidant, anti-allergic, hepatoprotective and wound-healing actions.

Terpenoids and Steroids

Terpenoids and steroids are plant metabolites with anti-inflammatory and immunomodulatory actions.

β-sitosterol, Lupeol, Oleanolic acid, Amyrin, Saponins

Contribute to anti-inflammatory, hepatoprotective and hair-growth promoting effects.

Phenolic Compounds

Phenolics possess strong antioxidant and antiseptic properties Caffeic acid, Ferulic acid, Gallic acid, Tannins

Promote wound healing, antimicrobial and free radical scavenging effects.

Glycosides

Flavonoid and steroid glycosides

Enhance bioactivity, wound healing and liver protection.

Fatty Acids

Essential fatty acids support cell regeneration and tissue healing. Palmitic acid, Oleic acid, Linoleic acid

PHARMACOLICAL ACTIVITIES

1. WOUND HEALING

In Ayurveda and folk medicine, Tridax procumbens has traditionally been used to treat cuts, wounds, ulcers, and other skin injuries. Scientific studies confirm that the plant possesses significant wound-healing properties due to the presence of phytochemicals like flavonoids, alkaloids, tannins, terpenoids and phenolic compounds.

2. ANTI-INFLAMMATORY ACTIVITY

Due to the presence of flavonoids (particularly quercetin), alkaloids, tannins, saponins, and triterpenoids, Tridax procumbens is said to have significant anti-inflammatory properties. These phytoconstituents play an important role in suppressing the inflammatory response. The plant acts by inhibiting the synthesis and release of inflammatory mediators such as prostaglandins, histamine and bradykinin. Additionally, it reduces the production of inflammatory cytokines by interfering with the COX and LOX pathways, which are involved in the metabolism of arachidonic acid.

3. ANTIOXIDANT ACTIVITY

Tridax procumbens possesses strong antioxidant activity due to the presence of flavonoids (quercetin), phenolic compounds, tannins, carotenoids, and ascorbic acid. These phytochemicals play a crucial role in neutralizing free radicals and preventing oxidative damage to cells and tissues.

4. HEPATOPROTECTIVE ACTIVITY

Due to the presence of antioxidant compounds, flavonoids, tannins, alkaloids, carotenoids, and hepatoprotective (liver-protective) compounds, Tridax procumbens exhibits significant liver-protective activity. The liver's tissues are shielded from oxidative stress and chemical damage by these phytochemicals.

5. ANTIDIABTICE ACTIVITY

Tridax procumbens exhibits significant antidiabetic activity due to the presence of flavonoids, alkaloids, tannins, saponins, and phenolic compounds. These bioactive molecules play a crucial role in regulating blood glucose levels and improving insulin function.

6. CARDIOPROTECTIVE ACTIVITY

Due to the presence of bioactive phytochemicals like quercetin, flavonoids, tannins, carotenoids, alkaloids, and phenolic compounds, Tridax procumbens has a significant cardioprotective effect. These constituents help protect the heart against oxidative stress, lipid abnormalities, and tissue damage.

7. ANTIMICROBIAL ACTIVITY

Due to the presence of essential oils, flavonoids, alkaloids, tannins, saponins, and flavonoids, Tridax procumbens has significant antimicrobial activity. These phytochemicals inhibit the growth of a variety of bacteria, fungi, and pathogenic microorganisms and have natural properties that kill germs.

8. ANTIULCER ACTIVTY

Due to its abundance of flavonoids, tannins, saponins, alkaloids, and phenolic compounds, Tridax procumbens has significant anti-ulcer activity. These components safeguard the gastric mucosa and prevent ulcer formation.

TRADITIONAL USES

Tridax procumbens, more commonly referred to as coat button or gavti tagar, is a well-known Indian folk medicine herb. For centuries, tribal communities, rural healers, and Ayurvedic village practitioners have used it extensively. Due to its wound-healing, anti-bleeding, and anti-infective properties, the plant is highly prized. Traditionally, the fresh leaves of Tridax procumbens are crushed to extract juice, which is applied directly on cuts, wounds, and bruises to stop bleeding and accelerate healing. Due to its natural antiseptic and anti-inflammatory action, it is used for skin infections, sores, ulcers, boils, and insect bites. Leaf paste's traditional dermatological value is demonstrated by the fact that local healers also use it to treat eczema and fungal infections. In rural medicine, Tridax procumbens is also consumed orally as leaf juice or decoction to manage fever, diabetes, and stomach disorders such as diarrhea and dysentery. The plant is used as a liver tonic and blood purifier by tribal communities. It also has a long-standing traditional use in hair care, where leaf extract is mixed with coconut oil and applied to the scalp to promote hair growth, control dandruff, and reduce hair fall

CONCLUSION

Due to its numerous therapeutic properties, Tridax procumbens is a valuable medicinal plant that is utilized extensively in both traditional and folk medicine. It has significant wound-healing, anti-inflammatory, antioxidant, antimicrobial, hepatoprotective, anti-diabetic, cardioprotective, and anti-ulcer properties due to the presence of important phytochemicals like flavonoids, tannins, alkaloids, and saponins. Numerous traditional claims are supported by scientific studies, indicating its potential for use in herbal formulations. As a result, Tridax procumbens is a promising natural medicinal resource with a wide range of pharmacological advantages and potential for pharmaceutical applications in the future.

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