Review Article **ISSN: 2349 – 4492**

Asian Journal of Research in Biological and Pharmaceutical Sciences

Journal home page: www.ajrbps.com

TRIDAX PROCUMBENS: A MEDICINAL GIFT OF NATURE

Sujit S. Kale[1]* and Amol S. Deshmukh[2]

*[1]Department of Pharmacy, SMBT Institute of D. Pharmacy, Nandi Hills, Dhamangaon, Nasik, India.
[2]Department of Pharmacy, SMBT College of M. Pharmacy, Nandi Hills, Dhamangaon, Nasik, India.

ABSTRACT

Nature has been a source of medicinal agents for thousands of years and an impressive number of modern drugs have been isolated from natural resources. Traditional medicine is an important source of potentially useful new compounds for the development of chemotherapeutic agents. The essential values and uses of some plants have been worked out and published, but many of them remain unexplored to date. Therefore, there is a necessity to explore their uses and to conduct pharmacognostic and pharmacological studies to discover their medicinal properties. *Tridax procumbens* (L.) is a spreading annual herb found throughout India but unfortunately it is one of the neglected plants. Hence, the present review aims to open new avenues for the improvement of medicinal use of *Tridax procumbens* (Compositae) for various ailments and to bring the anti-diabetic medicinal plant to the scientists' notice, and raise awareness and add value to the resource. This review attempts to highlight the available literature on Tridax procumbens (L.) A study had found anti-cancer properties of *Tridax procumbens* against human prostate epithelial cancer cell line PC 3. Also pharmacological activities like hepatoprotective activity, antidiabetic activity, antiinflammatory, wound healing, antidiabetic activity, hypotensive effect, immunomodulating property, bronchial catarrh, dysentery, diarrhoea and to prevent falling of hair, promotes the growth of hair, and antimicrobial activity against both Gram-positive and Gram-negative bacteria.

KEYWORDS

Tridax procumbens (L.), Flavonoids and Herbs.

Author for Correspondence:

Sujit S. Kale,
Department of Pharmacy,
SMBT Institute of D. Pharmacy,
Nandi Hills, Dhamangaon, Nasik, India.
Email: sujitskale@rediffmail.com

INTRODUCTION

Tridax procumbens, commonly known as coat buttons or tridax daisy, is a species of flowering plant in the daisy family. It is best known as a widespread weed and pest plant. It is native to the tropical Americas but it has been introduced to tropical, subtropical, and mild temperate regions worldwide. Traditionally, *Tridax procumbens* has been in use in India for wound healing, as

anticoagulant, antifungal and insect repellent. It is were known to treat infectious skin diseases in folk medicines. It is a well-known ayurvedic medicine for liver disorders or hepato-protective nature besides gastritis and heart burn. A study was carried out to verify the claims wherein tribal inhabitants of Udaipur district, Rajasthan were using the plant for treatment of diabetes. It was concluded that the results were comparable to that of reference standard Glibenclamide and the *Tridax procumbens* flower extract showed antidiabetic properties.

Chemical constituents

A new flavonoid (procumbenetin), isolated from the aerial parts of *Tridax procumbens*, has been characterised as 3,6-dimethoxy-5,7,2',3',4'-pentahydroxyflavone 7-O-β-D-gluco- pyranoside on the basis of spectroscopic techniques and by chemical means. *Tridax procumbens*; Flavonoids Plant, commonly used in Indian traditional medicine as anticoagulant, hair tonic, antifungal and insect repellent, in bronchial catarrh, diarrhoea, dysentery, and wound healing. Previously isolated constituents Alkyl esters, sterols, pentacyclic triterpenes, fatty acids and polysaccharides. New isolated constituent 3,6-Dimethoxy-5,7,2',3',4'-pentahydroxyflavone 7-O-β- D-glucopyranoside, named procumbetin Z yield: 0.016% on dried basis[1].

Analgesic and anti-inflammatory activity

An analgesic may be defined as a drug bringing about insensibility to pain without loss of consciousness[2]. Lyophilized extract of *Tridax procumbens* was found to be potent analgesic. In accordance to the present study, it has been observed that *Tridax procumbens* has marked beneficial effects against centrally, peripherally and inflammatory pain models. This protective action may be attributed towards the presence of flavanoid and sterols. We would like to conclude that it is worthwhile to think, to use *Tridax procumbens* as drugs and further studies should be initiated to establish exact mechanism of action and elaborative phytochemical investigations to find out which active constituents responsible for analgesic activity. These reports may serve as a foot step in the research of potent analgesic drug[3].

used in diarrhoea and dysentery. Its leaf extracts

Antioxidant activity

Antioxidants may be defined as compounds that inhibit or delay the oxidation of other molecules by inhibiting the initiation or propagation of oxidizing chain reactions[4]. *Tridax procumbens* plant extracts were evaluated for *in vitro* antioxidant activities. DPPH method provides a good assessment for evaluation of *in vitro* antioxidant activity. It is based on reaction between antioxidant (AH) with nitrogen centered free radical i.e. DPPH (1, 1- diphenyl, 2-picryl hydrazyl). The Ethyl acetate and n-Butanol fractions from methanolic extract have shown significant activity which is comparable to the activity of Ascorbic acid. Fractionation of the parent extract reduced the complexity of material and provided more accurate idea related to the Phytochemicals, responsible for antioxidant activity of *Tridax procumbens*[5].

Antibacterial activity

The herb *Tridax procumbens*, found growing commonly in tropical countries, is endowed with antibacterial properties. Our study demonstrated that this activity was associated only with the ethanolic extract and was prominently seen only against *Pseudomonas aeruginosa* strains. Multi drug resistant nosocomial strains of *Pseudomonas* isolated from ventilator associated pneumonia, urinary tract infection as well as blood stream infection showed significant sensitivity to *Tridax* extracts. Our study corroborates the efficacy of *Tridax* as an anti pseudomonal agent and its value as a source of formulations for treatment of nosocomial infections caused by *Pseudomonas aeruginosa*[6].

Antidiabetic activity

Dried aqueous, alcoholic, and petroleum ether (60-80°C) extracts of leaves of *Tridax procumbens* were subjected for hypoglycaemic activity in Wistar rats (150-200 g). Blood sugar level was determined using digital glucometer. Experimental studies revels that the aqueous and alcoholic extracts from *Tridax procumbens* leaves (200 mg/kg) orally administered for 7 days produced a significant decrease in the blood glucose level in the model of alloxan-induced diabetes in rats. Petroleum extract exhibits very

weak anti-diabetic activity. It also proves the traditional claim with regard to *Tridax procumbens* for its anti-diabetic activity[7].

Antimalarial activity

The aqueous and ethanolic extracts of PA and TP have antiplasmodial activity against chloroquine-resistant *P. falciparum* parasites. The extracts have considerably low toxicities to human RBCs. These results lend support to claims of herbalists that decoctions of either TP or PA are useful medicines. These notwithstanding, more comprehensive animal toxicity studies need to be carried out on the plants, especially since humans are currently using them to treat malaria and other diseases[8].

Anticancer activity

Tridax procumbens is a semi prostate annual or short lived perennial herb. The wide spread nature and contribution of the plant in medicine has been identified. The phytochemicals in dried leaves of *T. procumbens* has been investigated. *T. procumbens* compounds were tested for cytotoxicity against human lung cancer by MTT assay. The compounf of Rf value 0.66 showed 90% reduced cell viability. NMR, MS and IR spectra revealed the compound as Lupeol. The anticancer potential of the Lupeol against human lung cancer has been evaluated by colonogenic survival determination, cell cycle control, Cell based assay for inhibition of COX-2 activity and DNA fragmentation analysis, an amount of 320 µg/ml concentration of Lupeol compound exhibited potential anticancer property[9].

Antifungal activity

Tridax procumbens L. Disc diffusion assay was performed against two pathogenic fungal strains (*Aspergillus flavus* and *Aspergillus niger*). Minimum inhibitory concentrations (MIC), minimum fungicidal concentrations (MFC) and total activity were also evaluated for determination of antifungal potential of each active extract. The flavonoid extracts showed remarkable activity against *A. niger* whereas alkaloid extracts were found inactive against both the test fungi. Excellent antifungal potential was recorded for free flavonoid of stem and bound flavonoid of stem and flower *A. niger*. Study indicated that *T. procumbens* can be used as a source of formulations of antifungal drug for treatment of diseases caused by *A. niger*[10].

Immunomodulatory Activity

Ethanol insoluble fraction of aqueous extract of *Tridax procumbens* has been reported for immunomodulatory activity. It significantly increases the phagocytic index, leukocyte count and spleenic antibody secreting cells. The immunomodulatory activity of Ethanolic extracts of leaves of *Tridax procumbens* Linn. have been also studied in Albino rats with *Pseudomonas aeruginosa*, which has ability to inhibit the proliferation of this microorganism[11].

CONCLUSION

Tridax procumbens Linn. is widely distributed weed found everywhere in India, America, Tropical Africa, Asia, and Australia. All plant parts have noble pharmacological activities. The reported work includes study of pharmacological activities like hepatoprotective effect, immunomodulating property, promising wound healing activity, antidiabetic, hypotensive effect, antimicrobial, insect repellent activity, anti-inflammatory and antioxidant, bronchial catarrh, dysentery, diarrhea. The plant also prevents falling of hairs and used as hair growth promoter. This plant is used as bioadsorbent for removal of harmful Cr (VI) from the industrial waste water.

ACKNOWLEDGEMENT

All authors are would like to thanks SMBT Institute of D. Pharmacy and M.Pharmacy, Nandi Hills, Dhamangaon, Nasik, India for continuous support and encouragement throughout this research work.

CONFLICT OF INTEREST

None declared.

BIBLIOGRAPHY

1. Nazeruddin G M, Pingale S S, Shaikh S S. Pharmacological Review of *Tridax Procumbens* L, *Pelagia Research Library, Der Pharmacia Sinica*, 2(4), 2011, 172-175.

2. Deshmukh A S, Morankar P G, Kumbhare M R. Review on Analgesic Activity and Determination Methods, *Pharmtechmedica*, 3(1), 2014, 425-428.
3. Prabhu V V, Nalini G, Chidambaranathan N, Kisan S S. Evaluation of Anti-Inflammatory and Analgesic Activity of *Tridax Procumbens Linn* Against Formalin, Acetic Acid and CFA Induced Pain Models, *International Journal of Pharmacy and Pharmaceutical Sciences*, 3(2), 2011, 126-130.
4. Morankar P G, Deshmukh A S, Kumbhare M R, Kale S S. Antioxidant Activity of *Couroupita guianesis* AUBL, *Pharmtechmedica*, 3(2), 2014, 464-468.
5. Agrawal S S, Talele G S, Surana S J. Antioxidant Activity of Fractions from *Tridax procumbens, Journal of Pharmacy Research*, 2(1), 2009, 71-73.
6. Pai C, Kulkarni U, Borde M, Murali S, Mrudula P and Yashwant Deshmukh. Antibacterial Activity of Tridax procumbens with Special Reference to Nosocomial Pathogens, *British Journal of Pharmaceutical Research*, 1(4), 2011, 164-173.
7. Bhagwat D A, Killedar S G, Adnaik R S. Anti-diabetic activity of leaf extract of *Tridax procumbens, International Journal of Green Pharmacy*, 2008, 126-128.
8. Opong R A, Nyarko A K, Dodoo D, Gyang F N, Koram K A, Ayisi N K. Antiplasmodial Activity of Extracts of Tridax Procumbens And Phyllanthus Amarus in *In Vitro* Plasmodium Falciparum Culture Systems, *Ghana Medical Journal*, 45(4), 2011, 143-150.
9. Sankaranarayanan S, Bama P, Sathyabama S, Bhuvaneswari N. Anticancer Compound Isolated From The Leaves of *Tridax Procumbens* Against Human Lung Cancer Cell A-549, *Asian Journal of Pharmaceutical and Clinical Research*, 6(2), 2013, 91-96.
10. Jindal A, Kumar P. *In Vitro* Antifungal Potential of *Tridax Procumbens L*. Against Aspergillus Flavus And Aspergillus Niger, *Asian Journal of Pharmaceutical and Clinical Research*, 6(2), 2013, 123-125.
11. Mahajan R, More D. Evaluation of Anticoagulant Activity Aqueous and Ethenolic Extracts and Their Isolated Phytochemicals of Some Medicinal Plants, *International Journal of Pharmacy and Pharmaceutical Sciences*, 4(4), 2012, 498-500.

Please cite this article in press as: Sujit S. Kale and Amol S. Deshmukh. Tridax Procumbens: A Medicinal Gift of Nature, *Asian Journal of Research in Biological and Pharmaceutical Sciences*, 2(4), 2014, 159-162.