

A Review of Antimicrobial Analysis of *Tridax procumbens* L. Various Extracts on Waterborne Bacterial Pathogens

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Abstract: The present review focussed on the bactericidal effect of *Tridax procumbens* L. against water borne bacterial pathogens. The bacterial species used in the present review were *Escherichia coli*, *Vibrio cholerae*, *Salmonella typhimurium* and *Klebsiella pneumoniae*, which cause serious diseases like Diarrhoea, Cholera, Salmonellosis, Pneumonia, etc. Clinical and Laboratory Standard Institute recommended broth microdilution method, was used in this study for assessing the antibacterial efficacy of the plant extract. Results depicted were reviewed in the form of IC50 (mg/ml) and MIC (mg/ml) values. On the basis of this review it can be interpreted that *Tridax procumbens* L. proved to be a very potential source of antibacterial agent against some water borne bacterial diseases.

Keywords: *Tridax* plants, antibacterial susceptibility, diarrhoea, microdilution, pathogens

1. Introduction

The use of plants, both the wild and domesticated species has been recorded since ancient times in almost all major civilizations. Ayurveda has been known to be practiced in the Indian subcontinent since long. The specimen under review in this particular experiment has also come to notice due to its already predominant use as home strung recipe for infections. Hence the present review was carried out on *Tridax procumbens* Linn. revealed the presence of bioactive constituents of medicinal value. Plants have been used in traditional medicine for several thousand years. The knowledge of medicinal plants has been accumulated in the course of many centuries based on different medicinal systems such as Ayurveda, Unani and Siddha. In India, it is reported that traditional healers use 2500 plant species and 100 species of plants serve as regular sources of medicine. During the last few decades there has been an increasing interest in the study of medicinal plants and their traditional use in different parts of the world. Documenting the indigenous knowledge through ethnobotanical studies is important for the conservation and utilization of biological resources.

Tridax procumbens (L.) is a spreading annual herb found throughout India. The plant is a native of tropical America and naturalized in tropical Africa, Asia, and Australia. Local people known it as "Ghamara," in English popularly called "Coat Buttons" and is dispensed for "Bhringraj" by some of the practitioners of Ayurveda. The plant has many pharmacological applications such as hepatoprotective activity, anti-inflammatory, wound healing, anti-diabetic activity, hypotensive effect, immunomodulating property, bronchial catarrh, dysentery, and diarrhea and to prevent falling of hair, promotes the growth of hair, and antimicrobial activity against both Gram-positive and Gram-negative bacteria. The leaf juice possesses antiseptic, insecticidal and parasiticidal properties, as a remedy against conjunctivitis and is used also to check hemorrhage from cuts, bruises and wounds insect repellent. It is also used as biocarbon absorbent for removal of excess fluoride. Hence, the present review aims to open new avenues for the

improvement of medicinal use of *T. procumbens* for various ailments.

With every passing day, there is an increased incidence of antimicrobial resistance against various antimicrobial compounds. The treatment of waterborne bacterial infections requires special consideration that may otherwise lead to bigger problems in the future. The Multiple Drug Resistant (MDR) bacteria have further aggravated the situation. Under such circumstances, identifying a plant extract as a potential source of antimicrobial compound is of immense value. The therapeutic properties of this medicinal plant was well accepted by our ancestors and nowadays also being scientifically proven as well. Extracts or phytoconstituents derived from various parts of *Tridax* for prevention and cure of several diseases provide therapeutic modalities with broad spectrum antimicrobial activities against various water borne pathogenic microorganisms. Medicinal plants like *Tridax*, the ancient period magical chemotherapeutic drugs and natural treasure to prevent or cure various waterborne diseases and ailments are very interesting and play crucial role in safeguarding various health related issues. Traditionally, *Tridax procumbens* has been in use in India for wound healing, as anticoagulant, antifungal and insect repellent.

Waterborne diseases are those diseases that spread through contaminated fresh water. These are caused by pathogenic groups of microorganisms like bacteria, viruses, protozoans etc. Many of these are intestinal parasites, or invade the tissues or circulatory system through walls of the digestive tract. Waterborne diseases can have a significant impact on the economy, locally as well as internationally. Infection commonly results during bathing, washing, drinking, in the preparation of food, or the consumption of food thus infected. Various forms of waterborne diarrheal disease probably are the most prominent examples, and affect mainly children in developing countries; according to the World Health Organization, such diseases account for an estimated 4.1% of the total daily global burden of disease, and cause about 1.8 million human deaths annually.

2. Chemical and Antimicrobial properties of *Tridax procumbens* L

Chemical Constituents : The Flavonoid procumbetin has been isolated from the aerial parts of *Tridax procumbens*. Other chemical compounds isolated from the plant include alkyl esters, sterols, pentacyclic sterols, pentacyclic triterpenes, fatty acids and polysaccharides.

Antimicrobial Constituents - The plant extracts from stem and whole plant showed higher inhibitory activity against the tested waterborne pathogens. Phytochemical screening of the plant revealed the presence of tannins, flavonoids, saponins and alkaloids. This review gives an insight to the use of plants as antimicrobial agents.

Various Extracts - The objective of the present review was made on crude ethanolic, methanolic and chloroform extracts of leaves, stem and flower of *Tridax procumbens*. Perform the phytochemical screening of ethanolic, methanolic and chloroform extracts of leaves, stem and flower for *Tridax procumbens*. The extracts were reviewed for its activity against both Gram positive and Gram negative bacteria by agar well diffusion method and their Minimum inhibitory concentration.

3. Conclusion

In this review an attempt was made for the study of herbal drug against waterborne bacteria such as *Escherichia coli*, *Salmonella typhimurium*, *Vibrio cholera* and *Klebsiella pneumoniae* in order to inhibit growth and pathogenesis of bacteria. On the basis of the above results, we can lead the formulation also for the purification of water against such types of bacteria and diseases caused by them. In conclusion, this review was to scientifically validate the use of plant in traditional medicine.

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