



Antifungal activity of extract from the leaves of *Tridax procumbens* Linn

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Abstract

Bipolaris sorokiniana is the causal agent of common root rot, leaf spot disease, seedling blight, head blight, and black point of wheat and barley. The fungus is one of the most serious foliar disease constraints for both crops in warmer growing areas and causes significant yield losses. *Curvularia eragrostidis* resulted infection on several grass weed. The aim of the present study was to investigate the antifungal activity of the aqueous and ethanolic extracts from the leaf of *Tridax procumbens* Linn. The antifungal activity of *T. procumbens* Linn extract was determined by agar well diffusion method against fungi *Bipolaris sorokiniana* and *Curvularia eragrostidis*. The presence of carbohydrates, proteins, tannins, steroids, alkaloids, flavonoids and purines in the leaf extract of *T. procumbens* Linn were reported by phytochemical analysis. The aqueous alcohol extract was more effective against *Bipolaris sorokiniana* than *Curvularia eragrostidis*. The results in the present study suggests that *T. procumbens* Linn leaf can be used for treating diseases caused by tested fungi.

Keywords

Tridax procumbens Linn, antifungal activity, *Bipolaris sorokiniana*, *Curvularia eragrostidis*.

1. Introduction

The demand of plant based therapeutics seems to be increasing in current scenario due to the growing recognition that they are natural products, having no side effects, easily available at affordable price and sometimes the source of health care available to the poor. Medicinal plants have occupied an important position in the socio-cultural, spiritual and medicinal arena of rural and tribal lives of India [1]. The major area of drug from medicinal plants includes disease conditions for which modern drugs are either available or unsatisfactory. The large number of synthetic drugs produced from pharmaceutical industries from time to time has led to develop resistant micro-organism that become global issue in the treatment of infectious diseases. At present, there is continuous need of exploration and development of cheaper and effective plant based drugs with better bioactive potential and least side effects [2]. The inappropriate use of agrochemicals especially fungicide were found to possess adverse effects on ecosystem and a possible carcinogenic risk than insecticides and herbicides together. Pathogens resistance to fungicides has rendered certain fungicide ineffective. There may a need to develop new management system to reduce the dependence on the synthetic agrochemicals [3]. *Tridax procumbens* is a common annual weed in the West Africa sub-region and tropical zones of the

world like India belongs to the family of Asteraceae and commonly known as 'Gaddi chamanthi' in Telugu, in Ayurvedic as Jayanthi, in Sidda/Tamil as Vettukkaaya-thalai, in Folk as Akala kohadi and in English as Coat buttons/Mexican Daisy, because of the appearance of its flowers and is an ethno botanically important medicinal plant [4]. The plant has been considered as a gregarious weed, distributed throughout the tropics and sub tropics. Traditional medical practitioners and tribal people use the leaves of the plant as the remedy against several ailments. Pharmacological studies have shown that *T. procumbens* possess properties like- anti inflammatory, hepatoprotective, wound healing, immunomodulatory, antimicrobial, antiseptic, hypotensive and bradycardiac effects [5]- [8]. In the present study our focus is to evaluate the role of bioactive molecule present in the leaves of *T. procumbens* Linn against fungi *Bipolaris sorokiniana* and *Curvularia eragrostidis*.

2. Materials and Methods

2.1 Plant materials

The *Tridax procumbens* Linn plants (Figure 1) were collected from Amravati district of Maharashtra (Figure 2) by uprooting the whole plant and then the leaves were removed very carefully. The cleaned leaves were shade dried for one week. The authentication of the plant was done by the botanist author.



Figure 1 *Tridax procumbens* Linn



Figure 2 Map of District Amravati study site.

2.2 Extraction of plant material

The cleaned *T. procumbens* leaves were allowed for the complete shade drying and then made to fine powder with a mechanical grinder and stored in an airtight container. A powdered plant parts were extracted successfully with the aqueous and organic solvents ethanol by using Soxhlet apparatus. The extraction was carried out for 24 hours at room temperature with mild shaking. The extracts were filtered and concentrated at 45°C using rotary vacuum evaporator. The obtained extracts were vacuum dried and used for further investigation. The dried extracts were dissolved in Dimethyl Sulphoxide (DMSO) and subjected to antifungal activity.

2.3 Phytochemical Study

The phytochemical screening of *T. procumbens* Linn reported the presence of alkaloids, tannins, steroids, prines, carbohydrates and proteins [9] - [10].

2.4 Antifungal Assay

The well diffusion method was used to determine the antifungal activity of *T. procumbens* Linn extract [11]. The fungi used for the test were *Bipolaris sorokiniana* and *Curvularia eragrostidis* (Figure 3). Solutions of 50, 100 and 150 ppm of the compounds in DMSO were used for the studies. These discs were placed on the already seeded plates and incubated at 35°C for 24h. The diameter (mm) of the inhibition zone around each disc was measured using a zone reader and the results are recorded.

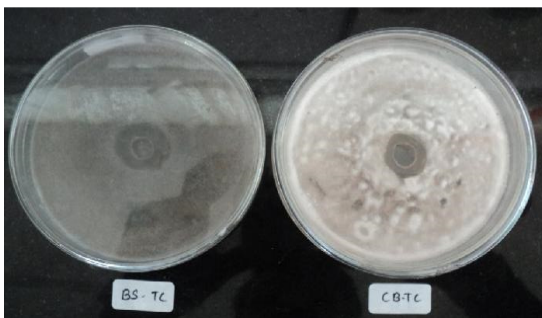


Figure 3 Antifungal activity of *T. procumbens* Linn extract against *Bipolaris sorokiniana* (Code BS-TC) and *Curvularia eragrostidis* (Code CB-TC).

3. Results and Discussion

The antifungal activity of *T. procumbens* Linn was presented in Table 1. The ethanolic extract was showing better antifungal activity against *Bipolaris sorokiniana* and *Curvularia eragrostidis* than aqueous extract.

The bioactivity of plant extract is attributed to phytochemical constituents. In the present study, the antifungal activity was evaluated against fungi *Bipolaris sorokiniana* and *Curvularia eragrostidis*. The zone of inhibition varied suggesting the varying degree of efficacy. The antifungal activity of the leaves may be due to the presence of various active phytochemicals. The results in the present study reveals that *T. procumbens* Linn leaves can be used for treating diseases caused by tested fungi. From the above results, it is concluded that the ethanolic leaf extract of *Tridax procumbens* Linn shows potent Antifungal activity as compared to aqueous extract.

Conclusion

The fungus causes disease in crop plant, which affects on yield. Plants are natural source for remedy of fungal diseases. *T. procumbens* is come about widely in nature. This antifungal study was carried out with an objective to investigate antifungal potentials of leaves of *Tridax procumbens* Linn. The ethanolic extract of *T. procumbens* shows better activity than aqueous extract against both fungi.

Table 1 Antifungal activity of *T. procumbens* Linn.

Extract	Fungi					
	Diameter of inhibition zone (mm)					
	(Concentration in ppm)					
	<i>Bipolaris sorokiniana</i>			<i>Curvularia eragrostidis</i>		
	50	100	150	50	100	150
Aqueous	10	14	17	8	11	13
Ethanollic	13	20	24	10	15	18

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