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Study of the Antifungal Potential of Leaf Extracts of *Tridax procumbens*

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ABSTRACT

Herbal medications come from a variety of sources, including plants. Most plants have the potential to develop bioactive elements that protect them from microorganisms such as bacteria and fungi, as well as insects. *Tridax procumbens* is a weedy plant found in the wild. *Tridax procumbens* leaves have been extracted using four different solvents: methanol, chloroform, aqueous, and ethanol. The purpose of this research was to determine the phytochemicals and antifungal activity of methanol, chloroform, aqueous, and ethanol extracts made from *Tridax procumbens* leaves. The antifungal activity was assessed using an agar well diffusion experiment against the tested fungal strain, with the zone of inhibition determined and compared to that of the standard antibiotic bavistin. The outcome of the present work have revealed aqueous, ethanol, methanol and chloroform extracts at concentrations ranging from 1mg/ml to 5mg/ml, highest inhibitory effect was observed in aqueous and chloroform extracti.e., 20mm at 5mg/ml against*Aspergillusparasiticus* and highest inhibitory effect was observed in ethanol and methanol extract i.e., 20mm at 5mg/ml against *Aspergillusturcosus.*Thus, this plant has many active compounds which can be used for the development of various potent drugs.

Key Words: Tridax procumbens agar well diffusion

Introduction

Herbal medicines are known to be as the ancient form of treatment. *Tridax procumbens Linn*. Belongs to the family compositae(Madhure et al 2017). It is commonly known as 'common button' or coat button. It is a wild and weed plant founds all over the India. The tallness of the plant is sometimes up to 60 cm high (Miya et al 2016). It is originated from ancient Greek as far as 1600 BC (Christudas et al 2012). Medicinal plants are now considered as rich source forhealing of wounds and health care system. In present time, many drugs have been isolating from these medicinal plants (Devprakash et al 2011). *Tridax procumbens*are generally used for wound treatment purpose and also it has various properties like antifungal , anticoagulant and insect repellent. The leaf extracted herbal solutions is directly applied to wounds to get cure instantly and also used for various skin diseases Krishnaveni (2018).

Material And Method:

- During the growing seasons fresh *Tridax procumbens* leaves were collected from Kota region, Bilaspur (C.G.). The samples were then left to shade dry at room temperature and grind into fine powder for chemical analysis. Before the initiation of extraction process the powder was stored in air sealed polythene bags.
- 20 gm of dried plant powder was taken and filled separating in the thimble and extracted. This process was prepared along with extracting methanol, chloroform, ethanol, aqueous, using a Soxhlet extractor. All the extracts obtained were given water bath to evaporate which further give dry residues. The dried extracts were than stored in airtight screw cap boxes, labelled and kept in refrigerator at 4^0C until next use.
- By using the reagents and chemicals the plant extract were qualitatively tested for the presence of chemical constituents. By dissolving the plant extract in DMSO, which is used as stocksolutions and further different concentrations were prepared.

Preparation of medium:

- In a conical flask 250 ml of PDA medium was prepared by using the distilled water and the PH was adjusted to the range of 5.6.Further theflask plugged with cotton strongly and sterilized in an autoclave at 120^0 C for 15 minutes.
- After sterilization, the agar medium is poured into petriplates and allowed to solidify at room temperature.

Antimicrobial activity:

Antimicrobial activity of the aqueous, ethanol, methanol and chloroform of the *Tridax procumbens*plant was determined by measuring the diameter (mm) of growth inhibition zone by agar well diffusion method. The microbial inoculums broth was taken aseptically and spread consistently on surface of pre solidifiedagar plate.

By using the sterile cork borer, 6 wells of approx. 6.0 mm diameter were aseptically punctured. Different concentrations of plant extract were poured in each well. Bavistin is used as +ve control while DMSO used as –ve control. Plates were placed in incubator at 37^0C for 24 hoursand antimicrobial activity was observed and calculated.

Microbial Strain:

The Fungal strain were used. These strain were constantly sub-cultured and maintained in PDA agar. The diameter of zone of inhibition (expressed in mm) was determined to test the sample of antifungal activity. The procedure was repeated thrice and the mean of the three experiments was recorded.

Result And Discussion:

In the present study the four different crude extract of *Tridax procumbens*were investigated for phytochemical and antimicrobial activity. *Tridax procumbens* is well known ayurvedic medicine.

Antifungal activity:

Antimicrobial activity of the aqueous,ethanol, methanol, and chloroform extract of *Tridax procumbens* plant was studied by agar well diffusion method and the result were characterized by recording diameter (mm) of zone of inhibition around the well (Table 1, 2,3&4). The extracts were tested against both the fungi (*Aspergillus turcosus*and *Aspergillus parasiticus)*

In antifungal test, using leaf extracts of *Tridax procumbens* against both***Aspergillusturcosus*** *and* ***Aspergillus parasiticus***significant zone was observed in aqueous, ethanol, methanol and chloroform extracts at concentrations ranging from 1mg/ml to 5mg/ml, highest inhibitory effect was observed in aqueous and chloroform extract i.e., 20mm at 5mg/ml against***Aspergillus parasiticus*** and highest inhibitory effect was observed in ethanol and methanol extract i.e., 20mm at 5mg/ml against ***Aspergillusturcosus.***

Table 1:-ANTIFUNGAL ACTIVITY AT DIFFERENT CONCENTRATION OF *TRIDAX PROCUMBENS* AGAINST *ASPERGILLUS PARASITICUS*

Aqueous extract		**Ethanol extract**	
Conc.	***ZOI (mm)***	***Conc.***	***ZOI (mm)***
P C (50mg/ml)	22	P C (50mg/ml)	22mm
N C	-	N C	-
1 mg/ml	-	1 mg/ml	-
2 mg/ml	-	2 mg/ml	-
3 mg/ml	19mm	3 mg/ml	-
4 mg/ml	19mm	4 mg/ml	-
5 mg/ml	20mm	5 mg/ml	18mm

PC- Positive control (Bavistin),
NC- Negative
control (DMSO), ZOI- zone of inhibition

Table 2:- ANTIFUNGAL ACTIVITY AT DIFFERENT CONCENTRATION OF *TRIDAX PROCUMBENS* AGAINST *ASPERGILLUS PARASITICUS*

Methanol extract		**Chloroform extract**	
Conc.	**ZOI (mm)**	**Conc.**	**ZOI (mm)**
P C (50mg/ml)	22mm	P C (50mg/ml)	22mm
N C	-	N C	-
1 mg/ml	-	1 mg/ml	-
2 mg/ml	-	2 mg/ml	-
3 mg/ml	18mm	3 mg/ml	-
4 mg/ml	19mm	4 mg/ml	20mm
5 mg/ml	19mm	5 mg/ml	20mm

Table 3 :ANTIFUNGAL ACTIVITY AT DIFFERENTCONCENTRATION OF *TRIDAX PROCUMBENS* AGAINST *ASPERGILLUSTURCOSUS*

Methanol extract		**Chloroform extract**	
Conc.	***ZOI (mm)***	***Conc.***	***ZOI (mm)***
P C (50mg/ml)	21mm	P C (50mg/ml)	21mm
N C	-	N C	-
1 mg/ml	-	1 mg/ml	-
2 mg/ml	-	2 mg/ml	-
3 mg/ml	18mm	3 mg/ml	-
4 mg/ml	19mm	4 mg/ml	18mm
5 mg/ml	20mm	5 mg/ml	19mm

PC- Positive control (Bavistin),
NC- Negative control
(DMSO), ZOI- zone of inhibition

Table 4:-ANTIFUNGAL ACTIVITY AT DIFFERENT CONCENTRATION OF *TRIDAX PROCUMBENS* AGAINST *ASPERGILLUSTURCOSUS*

Aqueous extract		**Ethanol extract**	
Conc.	***ZOI (mm)***	***Conc.***	***ZOI (mm)***
P C (50µg/ml)	21mm	P C (50µg/µl)	21mm
N C	-	N C	-
1mg/ml	-	1 mg/ml	-
2 mg/ml	-	2 mg/ml	-
3 mg/ml	-	3 mg/ml	-
4 mg/ml	19mm	4 mg/ml	19mm
5 mg/ml	19mm	5 mg/ml	20mm

PC- Positive control (Bavistin),
NC- Negative control
(DMSO), ZOI- zone of inhibition

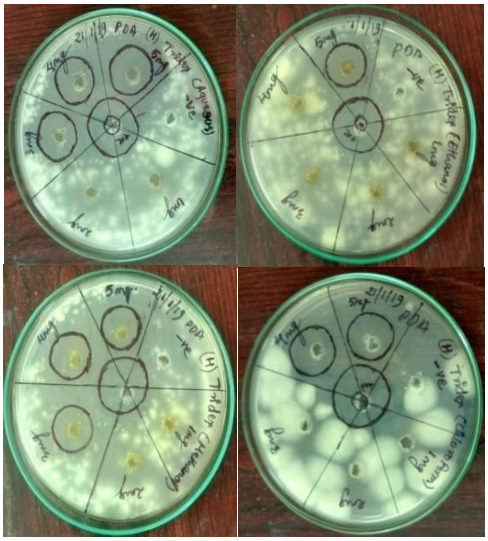

Fig I:- *Antifungal activity of different extracts of Tridax procumbens against* Aspergillus parasiticus
(a) ethanol extract, (b) aqueous extract,
(c) methanol extract, (d) chloroform extract,

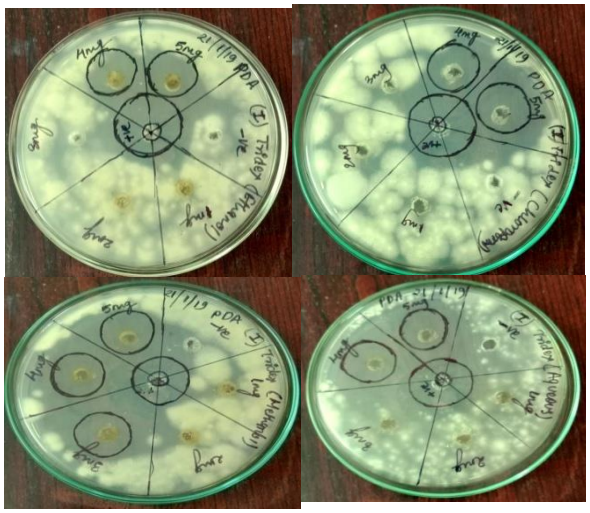

Fig 2:- *Antifungal activity of different extracts of Tridax procumbens against Aspergillusturcosus (a) ethanol extract, (b) chloroform extract, (c) aqueous extract, (d) methanol extract*

CONCLUSION

The Plant extracts' antimicrobial action has been studied since ancient time. The extracts of *Tridax procumbens* reduced the development of all of the microbes tested in this study, however their effectiveness varied. Plants continue to be the most prevalent source of antimicrobials (Kushwaha et al 2018). Many aromatic herbs have long been used in folk medicine and to increase the shelf life of foods due to their ability to fight bacteria, fungus, and yeast . Biologically active chemicals derived from natural sources have always piqued the curiosity of infectious disease researchers. Alkaloids, flavanoids, glycosides, and a variety of other aromatic chemicals are secondary metabolites in plants that have helped to ease pathogenic and environmental stress. Since of a multitude of secondary metabolites, plant based drugs have heeling property which has no side effects Lee and Park (1999). This research has opened the door to the idea of using this plant in the creation of drugs for human consumption to treat wound infections and other ailments.

REFERENCES

1. Madhure, A. K., Kalambe, N. A., & Bhokare, D. D. (2017). Antifungal activity of extract from the leaves of Tridax procumbens Linn. International Journal of Researches in Biosciences, Agriculture and Technology, 5(2), 962-964.
2. Miya, M. F., Islam, Z., Shahriyar, S., Khan, M. R. H., & Reza, M. S. (2016). Antifungal potential of Tridax procumbens leaves. Asian Journal of Medical and Biological Research, 1(3), 686-689.
3. Christudas, S., Kulathivel, T. M., & Agastian, P. (2012). Phytochemical and antimicrobial studies of leaves of Tridax procumbens L. Asian Pacific Journal of Tropical Bioscience, 2(1), S159-S161.

4. Devprakash, K. K., Srinivasan, T., & Subburaju Singh, S. K. (2011). Antimicrobial activity of alcoholic and aqueous extracts of Vetiveria zizanioides. Journal of Pharmacy Research, 4, 1343-1344.
5. Krishnaveni, V. (2018). Evaluation of phytochemical and antibacterial activity on Tridax procumbens extract for wound care applications. International Journal of Green Pharmacy, 12(3), S597.
6. Kushwaha, P., Yadav, S. S., & Singh, V. (2018). Phytochemical screening and GC-MS studies of methanolic extract of Tridax procumbens. International Journal of Pharmaceutical Sciences and Research, 10(5), 2492-2496.
7. Lee, K. I., Rhee, S. H., & Park, K. Y. (1999). Anticancer activity of phytol and eicosatrienoic acid identified from perilla leaves. Journal of Ethnopharmacology, 28, 1107-1112.