

## Antibacterial potential of *Tridax procumbens* L. against Human pathogen.

Doli J. Jain, Suchita K. Rajurkar

Department of Botany Deogiri Collage Aurangabad (M.S.)

Corresponding Author: Doli J. Jain

---

Date of Submission: 01-03-2019

Date of acceptance: 18-03-2019

---

### I. INTRODUCTION

Plants and its parts are rich source of bioactive molecule which offers a new source of antibacterial agent. In recent years *Tridax procumbens* plants have been reported Antibacterial activity of the methanol, chloroform, ethanol, & aqueous extract (Suryakant et al. 2017). *Tridax procumbens* medicinal herb and used by many ethano-medical practitioners, In India *Tridax procumbens* is employed as indigenous medicine. It has been found to possess significant medicinal properties against Dysentery, Diarrhoea, Stomach ache and Liver disorder. It also shows Antidiabetic and anti-inflammatory actions. (Jain 2012). *Tridax procumbens* plant is found all over India, belonging to family-Asteraceae. It is commonly known as **coat button**. It has been extensively used in Indian traditional medicinal system. The all parts of this plant contains number of secondary metabolite and have positive effect on pathogenic bacteria. (Veena Gayathri et al 2015). *Tridax procumbens* extract have been reported antibacterial activity against gram positive organism. (V. Bharathi et al 2012) The present study has been undertaken to establish the antibacterial potential of *Tridax procumbens*. However, the wide-spread use of this methodology for antimicrobial susceptibility testing required flow spectrophotometer equipment in various laboratories.

### II. MATERIAL AND METHOD

1. **Collection of plant material:** The fresh plant of *Tridax procumbens* were collected from different sites of Aurangabad and local village.
2. **Methanol extract:** 40 gm powder of fresh and shade dry Root stem and leaves extracted by Soxhlet extraction process.
3. **Test organism:** The authentic culture of human pathogenic bacteria viz. *Salmonella typhimurium*, *Pseudomonas aeruginosa*, *Shigella flexneri*, *E. coli* and *Staphylococcus aureus* were obtained from the department of Microbiology, Deogiri College, Aurangabad, Maharashtra. In vitro antibacterial assay of plant and fungal extract was carried out by using 96-well plate method.
4. **96 – well plates method:** About 100 µl sterile Mueller-Hinton broth medium was loaded into each well along with 2 µl serial diluted human pathogenic bacteria suspension, next 2, 4, 6, 8, and 10 µl concentrations of methanol extracted plant and fungal extract was added to each well of 96-well plate. Control was prepared by nutrient broth and bacterial suspension without adding extract. The prepared experimental 96-well plate was sealed with parafilm and incubated in incubator at 37°C for 24 hours. Finally optical density (OD) at 540 nm was measured on the spectrophotometer of each sample (Ataee, et al., 2012)

### III. Results

Minimum inhibitory concentration (MIC) of the methanol extract was evaluated by 96 well plate method followed by optical density at 450 nm was measured among the 5 serial dilution for each pathogenic bacteria were tested. In which root, leaves and stem showed significant activity. 2 µl concentration of root extract for *Salmonella typhimurium*, *Pseudomonas aeruginosa* and *Shigella flexneri* was most significant. 4 µl concentration was effective for *P. aeruginosa* evaluating antibacterial activity also showed MIC at .6 µl concentration and .10 µl concentration. (Table –I). The stem of *Tridax procumbens* were showed effective control at 2, 4, 6, 8 and 10 µl respectively for *E. coli*, *Shigella flexneri*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Salmonella typhimurium*. (Table –II). MIC for leaf extract was 2, 4, 10 µl for *Shigella Flexneri*,

*Pseudomonas aeruginosa*, *E. coli* and *Salmonella typhimurium*. (Table- III) Increase Concentration of root extract inhibits growth of bacteria. *S. aureus* shows more inhibition as compare to other bacteria. Increase and decrease Concentration of root extract inhibits growth of *S. typhi* bacteria. (table- I) similar results was observed in *E. coli*. Increase Concentration of stem extract was most effective for *Salmonella typhimurium* and *Shigella flexneri*. (table-II). Leaf extract 10µl *Salmonella typhimurium* and 2 µl for *Shigella flexneri*. (table III)

#### IV. DISCUSSION

Plants are a promising tool for pharmaceutical science. The review describes information of production of useful secondary metabolite and antibacterial activity. (Veena Gyatri, Krishaswamy *et al* 2015 ) In this study Methanol extracted of plant was prepared. All extract of Root, Stem and, Leaves were used for antibacterial test by 96 well plate methods. (Ataee, *et al* 2012) Control was prepared by nutrient broth and bacterial suspension without adding extract. According to optical density at 540 nm it was observed that Root extract 2 µl and 10 µl was most effective for *S. typhi*, *S. flexneri*, *P. aurignosa*. 6 µl was most effective for *E. coli*. (Table- I) Stem extract of 10 µl was effective for *S. typhi* (Table- II) ( Suryakant, Dr. Sudhanshu Dhar Dwivedi, Sheeraz Ahmad 2017) methanol leaf extract of *Tridax procumbens* shows best result against *Pseudomonas*, and *Klebsiella sp.* According to ( R. Dhanabalan, A. Doss, *et al* 2008 ) methanol extracts of this plant was investigated by agar disc and well-diffusion method against bovine mastitis causing *Staphylococcus aureus* strains. In present study leaf extract is not shown significant activity (.Ankitajain *et al* 2015) methanol and aqueous extract of the plant was effective against *E. coli* and *Bacillus subtilis*. ( Ahmad Mir S-Mahmood Dar 2016) The ethanolic extract of this plant showed highest zone of inhibition against *Escherichia coli* and *Staphylococcus aureus*. The plant part extract of this plant showed highest zone of inhibition against *Klebsiella pneumoniae*. A total of 5 pathogenic bacteria were incubated at 37°C for 24 hours and anti bacterial activity was determine. antimicrobial results that inhibits the pathogenic bacteria 2µl concentration of Methanol extract of root was most effective for *Salmonella typhimurium*, *Pseudomonas aeruginosa* and *Shigella flexneri*. 2µl concentration of stem were significant for *E. coli*. (Graph –A) This paper describe although the high potential of root and stem.

**Table I** Antibacterial activity of *Tridax procumbens* root extract

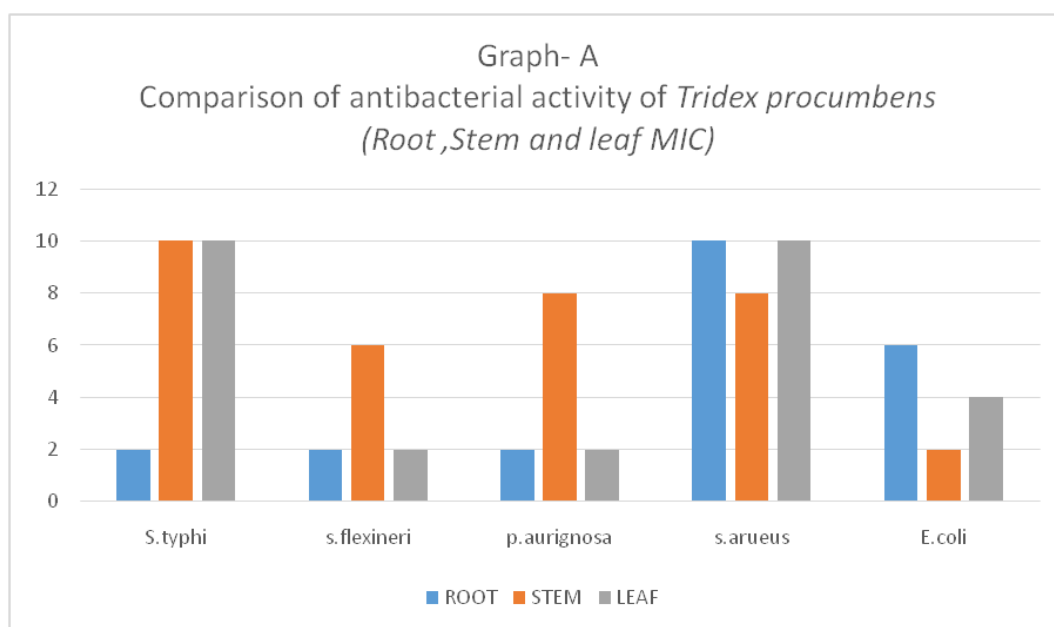
Sr.no	Tridax root extract	Bacterial concentration( 2µl)				
		<i>S. typhi</i>	<i>S. flexneri</i>	<i>P. aurignosa</i>	<i>S. aureus</i>	<i>E. coli</i>
1	2µl	0.00	0.00	0.00	0.02	0.01
2	4µl	0.01	0.01	0.00	0.01	0.01
3	6µl	0.02	0.00	0.02	0.01	0.00
4	8µl	0.01	0.02	0.01	0.05	0.01
5	10µl	0.00	0.00	0.01	0.00	0.00
	MIC	2,10µl	2,6,10µl	2,4µl	10µl	6,10µl

**Table II** Antibacterial activity of *Tridax procumbens* stem extract

Sr.no	Tridax stem extract	Bacterial concentration( 2µl)				
		<i>S. typhi</i>	<i>S. flexneri</i>	<i>P. aurignosa</i>	<i>S. aureus</i>	<i>E. coli</i>
1	2µl	0.07	0.07	0.07	0.09	0.06
2	4µl	0.08	0.09	0.07	0.08	0.09
3	6µl	0.07	0.06	0.07	0.08	0.09
4	8µl	0.07	0.07	0.06	0.07	0.08
5	10µl	0.04	0.06	0.08	0.09	0.11
	MIC	10 µl	6,10µl	8 µl	8 µl	2 µl

**Table III** Antibacterial activity of *Tridax procumbens* leaf extract

Sr.no	Tridax leaf extract	Bacterial concentration( 2µl)				
		<i>S.typhi</i>	<i>S.flexineri</i>	<i>P.aurignosa</i>	<i>S.arueus</i>	<i>E.coli</i>
1	2µl	0.14	0.09	0.13	0.16	0.16
2	4µl	0.15	0.12	0.16	0.17	0.14
3	6µl	0.14	0.13	0.14	0.18	0.17
4	8µl	0.20	0.20	0.20	0.19	0.20
5	10µl	0.13	0.13	0.18	0.14	0.16
	MIC	10 µl	2 µl	2 µl	10 µl	4 µl



#### V. ACKNOWLEDGEMENT

This research work was funded by U.G.C.and Dept. of Botany Deogiri Collage,Aurangabad Maharashtra.author also acknowledge Dept. of microbiology for cultural availability.

#### REFERENCES

- [1]. Shahnawaz Ahmad Mir, Zubair JanShafia MirAyazMahmood Darand GouriChitale ( 2017)A Concise Review on Biological Activity of Tridaxprocumbens Linn . Organic chemistry current research.
- [2]. Ankita Jain , DV Rao , AmlaBatra and Amita Jain (2012),Study on antibacterial potential of *Tridax procumbens* (L.) against clinical isolates.
- [3]. **Sheeraz Ahmad Suryakant, Dr. SudhanshuDharDwivedi( 2008)**, Antibacterial Activity of Extract Obtained from *TridaxProcumbens*against Different Pathogenic Bacteria ,*Ethnobotanical Leaflets*,Vol- 12, pp.1090-1095.
- [4]. R. Dhanabalan, A. Doss, M. Jagadeeswari, S. Balachandar, E. Kezia, V. Parivuguna,C.M. Reena Josephine, R. Vaidheki and K. Kalamani ( 2008)*Ethnobotanical Leaflets 12: 1090-95. 2008.In vitro* Phytochemical Screening and Antibacterial Activity of Aqueous andMethanolic Leaf Extracts of *Tridaxprocumbens*against Bovine Mastitis Isolated *Staphylococcus aureus*.
- [5]. Ahmad Mir S,Mahmood Dar A Mir S Shabeer Ahmad M and Chitale (G 2016)Analysis of Phytochemistry and Antimicrobial activity of *Tridax proumbens* Lnn
- [6]. VadiveluBharath I Varalakshmi Badrinarayanan (2012) Antibacterial activity of *Tridaxprocumbens* Linn <https://www.researchgate.net/publication/284571005>
- [7]. Suryakant, Dr. SudhanshuDharDwivedi, Sheeraz Ahmad(2017)International Journal of Advanced Research in Chemical Science (IJARCS) Volume 4, Issue 1, January 2017, PP 27-32 ISSN 2349-039X

- (Print) & ISSN 2349-0403 (. Antibacterial Activity of Extract Obtained from *Tridax Procumbens* against Different Pathogenic Bacteria
- [8]. V. Bharathi<sup>1</sup>, B. Varalakshmi<sup>1</sup>, S. Gomathi<sup>1</sup>, A. Shanmuga Priya<sup>1</sup>, T. Karpagam<sup>1</sup> Shrimati (2012) Antibacterial activity of *Tridaxprocumbens* Linn. International Journal of Pharma Sciences and Research ISSN : 0975-9492 Vol 3 No 4 April 2012
- [9]. Pawar B.T. (2014) Antibacterial activity of leaf extracts of *Tridaxprocumbens* against *Xanthomonascampestrispv. Mangiferaeindicae* RJCES Vol 2 [6] December 2014
- [10]. Mr. Anil Saini<sup>1</sup>, Mr. Harish Kumar Soni<sup>2</sup> & Mr. Parvesh Gupta<sup>3</sup> (2016) A Review on *TridaxProcumbens* .Imperial Journal of Interdisciplinary Research (IJIR) Vol-2, Issue-8, 2016 ISSN: 2454-1362, <http://www.onlinejournal.in> Imperial Journal of Interdisciplinary Research (IJIR) Page
- [11]. VeenaGayathriKrishnaswamy\* and Christina(2015) Antibacterial Activity of different parts of *Tridaxprocumbens* against Human Pathogens. ISSN: 2347-3215 Volume 3 Number 6 (June-2015) pp. 211-218 [www.ijcrar.com](http://www.ijcrar.com) international journal of current research and academic review
- [12]. Muzafar Sheikh (2012) Studies on Some Plant Extracts for Their Antimicrobial Potential against Certain Pathogenic Microorganisms Article in American Journal of Plant Sciences · January 2012 DOI: 10.4236/ajps.2012.32025
- [13]. MounyrBalouiri n, MoulaySadiki, SaadKoraichiIbnsouda (2016) Methods for in vitro evaluating antimicrobial activity: A review Journal of Pharmaceutical Analysis 6(2016)71–79
- [14]. B.Sharma, P.kumar (2008 ) extraction and pharmacological evaluation of some extraction of *Tridax procumbens* and *Capparis decidua* International journal of applied research in natural products. [suchitarajurkar@yahoo.com](mailto:suchitarajurkar@yahoo.com)