

PHYTOCHEMICAL SCREENING AND ANTIBACTERIAL ACTIVITY OF METHANOL EXTRACT OF *TRIDAX PROCUMBENS*

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ABSTRACT

The leaves of *Tridax procumbens* were collected, grounded and subjected to methanol for extraction with soxhlet apparatus. The extract was screened phytochemically for its chemical components. The presence of alkaloids, reducing compounds (carbohydrates), cardiac glycosides, flavonoids, saponins, terpenes and steroids was recorded. Antibacterial activity by disc diffusion method revealed that the methanol extract have a broad spectrum activity on gram positive, negative organisms respectively. The highest activity was shown in *S. typhi* and *S. flexneri* and least activity on *E. coli*.

KEY WORDS

Tridax procumbens, *Escherichia coli*, *Salmonella typhi*, *Shigella flexneri*

INTRODUCTION

Tridax procumbens Linn. (Asteraceae) is one of the medicinally important plants commonly found in subtropical countries growing primarily during raining season. It is a common weed in Tamilnadu present along with economically important crops (Suseela *et al.*, 2002). It inhabits waste places, road sides and hedges throughout India. The leaves of the plant are known to be used for the treatment of wound in traditional medicine (Collier 2001). The extracts of *T. procumbens* have been reported to have various pharmacological effects, antimicrobial activity, wound healing property and immunomodulatory activity on the experimental animals (Taddel and Rosas, 2000). Phytochemical constituents are the basic source for the establishment of several pharmaceutical industries (Savithamma *et al.*, 2011). Pathogenic microorganisms are always trying to develop resistance to the various commercial antibiotic drugs for their control

(Beegum and Devi, 2003). High cost and adverse side effects are commonly associated with popular synthetic antibiotics (such as hypersensitivity, allergic reactions, immunosuppression etc.) and are major burning global issues in treating infectious diseases (Schinor *et al.*, 2007). Hence, recent attention has been paid to biologically active extracts and compounds from plant species used in herbal medicines (Essawi and Srouf, 2000).

The present study was designed to study the preliminary phytochemical analysis and antibacterial activity of *Tridax procumbens*.

MATERIALS AND METHODS

Plant collection

The Leaves of *Tridax procumbens* were collected from kodaikanal region of dindigul district of Tamilnadu.

Preparation and Extraction of Plant material

The plant materials (leaves of *Tridax procumbens*) were air-dried at room temperature for 2 weeks and grinded to a uniform powder. The Methanol extract was prepared by soaking 10 g of powdered plant materials in 100 ml of methanol at room temperature for 48 h. Extract was filtered after 48 h, with Whatmann filter paper No. 42 (125mm) and then through cotton wool. The extract was concentrated using a rotary evaporator with the water bath set at 40°C.

Phytochemical screening

The methanol extract was screened for phytochemical constituents for the presence of saponins, tannins, alkaloids, flavonoids, anthraquinones, glycosides and reducing sugars (Sharma and Sharma, 2010).

Antibacterial assay

The agar disc diffusion method as described by (Parekh and Chanda, 2006) was used in the antibacterial screening procedure. Mueller-Hinton (MH) agar plates were prepared using petridishes. For the agar disc diffusion method, the disc was saturated with 100 µl of the test compound, allowed to dry and then placed on the upper layer of the seeded agar plate. Antibacterial activity was determined by

measuring the diameter of the zone of inhibition (mm) surrounding bacterial growth.

RESULTS AND DISCUSSION

The phytochemical screening of methanol extract of *T. procumbens* was presented in **Table 1**. *T. procumbens* leaves contains alkaloids, tannin, flavonoids, terpenoids, phenols, saponin, carbohydrate, glycosides, and cardiac glycosides. Flavonoids are known to be synthesized by plants in response to microbial infection. Tannins (commonly referred to as tannic acid) are also known as antimicrobial agents (Sharma and Sharma 2010). Tannins have been reported to prevent the development of microorganisms (Taddei, and Rosas-Romero 2000). The result of antibacterial activity of *Tridax procumbens* by disc diffusion method showed in the (**Table 2**). The methanol extract showed significant zone of inhibition against selected bacterial species. *S. flexneri*, *S. typhi*, *P. aeruginosa*, and *P. mirabilis* showed greater zone of inhibition than *Klebsiella pneumoniae* and *Escherichia coli* which showed lesser inhibition zone. Similar antibacterial activity has been reported (Janovska *et al.*, 2003).

Table1: Phytochemical analysis of T. procumbens

S.No	Test	<i>T. procumbens</i> (Leaf)
1.	Alkaloids	+
2.	Flavonoids	+
3.	Terpenoids	+
4.	Phenols	+
5.	Tannins	+
6.	Anthraquinone	—
7.	Free anthroquinine	—
8.	Saponin	+
9.	Carbohydrate	+
10.	Carotenoid	—
11.	Glycoside	+
12.	Cardiac glycoside	+

Table 2. Antibacterial activity of methanolic extract of *Tridaxprocumbens*

S.No	Organisms	(Zone of Inhibition mm)			
		<i>Tridaxprocumbens</i>			
		25µg	50µg	75µg	100µg
1.	<i>E. coli</i>	4	6	12	14
2.	<i>K. pneumoniae</i>	5	7	13	16
3.	<i>P. aeruginosa</i>	6	9	18	19
4.	<i>P. mirabilis</i>	5	10	15	18
5.	<i>S. flexneri</i>	6	12	19	22
6.	<i>S. typhi</i>	8	14	20	24

CONCLUSION

The study revealed that *Tridax procumbens* was rich in secondary metabolites particularly tannins and flavonoids which are responsible for antibacterial activity. Further, detailed investigation of the active compounds of the plant for the exact mechanism of action will contribute greatly to the development new pharmaceuticals.

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