



Evaluation Of *Wedelia Biflora* (Linn) D.C For Anthelmintic And Antimicrobial Activity

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ABSTRACT

The alcoholic and aqueous extracts of roots of *Wedelia biflora* (Linn) D.C were screened for anthelmintic and antimicrobial activities. The anthelmintic activity was investigated against adult Indian earthworm, *Pheretima posthuma*, using Piperazine citrate as a reference standard. Both the extracts exhibited significant anthelmintic activity at higher concentration of 100mg/ml and moreover the ethanolic extract was found to be more potent than the reference control piperazine citrate. The results of Antimicrobial activity revealed that the ethanolic extract exhibited maximum activity against the tested organisms when compared to aqueous extract.

Key words: *Wedelia biflora*, preliminary phytochemistry, anthelmintic, anti-microbial studies.

INTRODUCTION

Helminthic parasites infesting man belongs to varied zoological species. In man they may be located in intestinal tract or other tissues. There are three categories of worm. The worms are responsible for malnutrition, anaemia, and ill health of the host.¹ *Wedelia biflora* (Linn) D.C (syn:- *Wedelia scandens*, Asteraceae) is a climbing perennial shrub found abundantly on waste lands. It is commonly called as sea daisy. The leaves are used to treat cuts, ulcers, sores and varicose veins. The decoction of roots is used in stomachache. The phyto-chemical screening of the root extracts revealed the presence of tannins and flavanoids.²⁻⁴ Hence we have proposed to investigate its anthelmintic and antimicrobial activity.

MATERIALS AND METHODS

Collection and Identification

Fresh roots of plant *W.biflora* was obtained from wild sources in the month of July - August. The plant was identified and authenticated by Dr. P. Jayaraman, Botanist (Plant Anatomy Research Centre) Chennai. A voucher specimen was deposited in the Department of Pharmacognosy, SRM College of Pharmacy, Chennai. (Herbarium.NoPARC/2008/190). The roots were cleaned, shade dried and coarsely powdered.

Preparation of the extracts

The coarse powder was exhaustively extracted with ethanol (70 % V/V) at 60-80°C using soxhlet apparatus. The solvent was then removed under reduced pressure which gave a brownish black color residue (13.35 %). Aqueous extract was prepared by macerating the root powder with chloroform water. The extract was filtered and concentrated under reduced pressure. (16.15 %)

Phytochemical screening

The dry extracts obtained were subjected to various chemical tests to detect the presence of various phyto-constituents.⁵⁻⁸

Preparation of test sample

Samples for the Anthelmintic study were prepared by dissolving the dried extracts in 1% gum acacia in normal saline (Vehicle). The extracts were dissolved in DMSO for antimicrobial activity.

Drugs and chemicals

Piperazine citrate was used as the reference standard for anthelmintic activity. Ampicillin trihydrate and Amphotericin B were used as standard for antibacterial and antifungal activity.

Study of anthelmintic activity

The anthelmintic activity of roots of *W.biflora* was determined by using the method of Mathew et al⁹. For the evaluation of anthelmintic activity *Pheretima posthuma* was used due to its anatomical and physiological similarity with intestinal roundworm parasite of human beings¹⁰⁻¹².

Eight groups of approximately equal size earthworms consisting of six earthworms in each group were released in 50ml of desired formulation. Each group was then treated with one of the following:

- Group 1: Vehicle (1% gum acacia in normal saline)
- Group 2: Piperazine citrate (1.5 mg/ml)
- Group 3: Ethanolic extract (25mg/ml)
- Group 4: Ethanolic extract (50 mg/ml)
- Group 5: Ethanolic extract (100 mg/ml)
- Group 6: Aqueous extract (25mg/ml)
- Group 7: Aqueous extract (50 mg/ml)
- Group 8: Aqueous extract (100mg/ml)

The time taken to paralyze and/or death of individual worms

**Table 1: Phytochemical screening of extracts of *Wedelia biflora***

Tested group	Ethanollic extract	Aqueous extract
Alkaloids	+	+
Saponins	-	-
Glycosides	-	-
Flavanoids	+	+
Tannins	+	+
Sterols		

Table 2. Anthelmintic activity of extracts of *Wedelia biflora*

S.No	Test substance	Concentration (mg/ml)	Time taken for paralysis (min)	Time taken for death (min)
1	Control		-	-
2	Piperazine citrate	15	19.50	52
3	Ethanollic extract	25	22.00	85.65
4	Ethanollic extract	50	20.17	41.66
5	Ethanollic extract	100	10.00	27.00
6	Aqueous extract	25	25.00	62.00
7	Aqueous extract	50	22.00	45.00
8	Aqueous extract	100	9.00	28.00

Results expressed as Mean \pm SEM of six observations**Table 3: Antimicrobial activity of extracts of *Wedelia biflora***

Test substance	Conc. (mg/ml)	Zone of inhibition (mm)*			
		<i>S.aureus</i>	<i>P.aeruginosa</i>	<i>E.coli</i>	<i>C.albicans</i>
Ethanollic extract	25	15.4	21.2	17.4	-
Ethanollic extract	50	18.3	24.6	20.3	-
Ethanollic extract	100	29.2	30.2	26.5	-
Aqueous extract	25	17.5	14.1	12.2	-
Aqueous extract	50	19.1	15.9	14.3	-
Aqueous extract	100	20.2	22.1	17.4	-
Ampicillin trihydrate	1	30.0	31.2	26.5	-
Amphotericin B	1	-	-	-	24.6

* - an average of triplicate, - no zone of inhibition

was observed. Paralysis was noted when the worms did not revive in the normal saline solution. Death was concluded when the worms lost their motility followed by fading away of their body color.

Antimicrobial activity

The crude ethanollic and aqueous extracts of *W. biflora* were tested for Antimicrobial activity by cup plate method¹³. The extracts were dissolved in dimethylsulphoxide (DMSO) at a concentration of 25mg/ml, 50mg/ml, 100mg/ml. Ampicillin trihydrate (1mg/ml) was used as reference standard for antibacterial study, Amphotericin B (1mg/ml) in DMSO served as reference standard for the antifungal activity. The solvent control used was DMSO. Various microorganisms like *Staphylococcus aureus*, *Pseudomonas aeruginosa*, and *Escherisia coli* and *Candida albicans* were used for the study.

RESULTS AND DISCUSSION

The preliminary phytochemical investigation revealed the presence of alkaloids, flavanoids and tannins in ethanollic extract and tannins, alkaloids in aqueous extract. As shown in Table 2, the alcoholic and aqueous extract of roots of *W.biflora* has significant anthelmintic activity at higher concentration. Both the extracts showed anthelmintic activity in dose- dependent manner at 100mg/ml. The alcoholic extract caused paralysis in 10 min and death in 27 min, while the aqueous extract showed paralysis in 9 min and death in 28 min against *Pheretima posthuma*. The standard piperazine citrate showed the same at 19.5 min and 52 min. Moreover the ethanollic extract was more potent than the aqueous extract even though both the extracts showed significant anthelmintic activity.(Table 1)Phytochemical analysis of both the extracts revealed the presence of tannins in them. Earlier studies have correlated the anthelmintic activity due to the presence of tannins¹⁴. So it is possible that tannins contained in the extract of *W.biflora* may be responsible for the anthelmintic activity.

The antibacterial potency of both ethanollic and aqueous extract of *W.biflora* against the tested organisms is given in Table 3. The ethanollic root extract exhibited maximum activity against *Pseudomonas aeruginosa* (30.2mm) followed by *staphylococcus aureus* (29.2), *E.coli* (26.5) at 100mg/ml and it was inactive against *Candida* species. Moreover the ethanollic root extract of *wedelia biflora* exhibited significant antibacterial activity when compared to aqueous extract and standards. In all of them zone of inhibition increases with increase in drug concentration exhibiting concentration dependent activity.

Many plant species were found to have broad spectrum antibacterial activity due to the presence of flavonoids, tannins and sesquiterpene lactones¹⁵. Our phytochemical studies revealed the presence of these constituents and hence the broad spectrum antibacterial activity of *W.biflora* root extracts may be due to the individual or combined effect of the above mentioned chemical components.

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