



Evaluation of *Basella Alba* Extracts for Antioxidant and Anthelmintic Activity

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ABSTRACT

The objective of this work was to assess the antioxidant and anthelmintic potential of various extracts of plant *Basella alba*. Medicinal plants were the effective foundation of many pharmacological activities. Among those the plants of anthelmintic action have achieved a great interest due the capability of the plant and its compound to treat a disease that causes major economic loss and reduced livestock production. Based on the literature findings in present study it was planned to assess the antioxidant and anthelmintic potential of various extracts of *Basella alba*. The findings were showed the significant results which claims the effectiveness of the plant extracts.

Keywords: Extract, Antioxidant, Anthelmintic

Introduction

Plants, which establish a major component of foodstuffs in humans, have formed the basis of various traditional medicine systems and folk medicines that have been practiced for thousands of years during the course of human history. As the global use of herbal medicinal products endures to grow and many more new products are introduced into the market, public health issues, and concerns adjacent their safety are also increasingly recognized.[1] Today, oxidative stress has attracted the attention of researchers. An imbalance between free radicals and antioxidants leads to oxidative damage of proteins, fat, nucleic acids, and carbohydrates. Antioxidants have protected the body from the damaging effect of the free radicals. [2] The pathogenic infection causes the severe effect of mortality and other problems that were uncontrolled due to the anthelmintic resistance that is developed in the host organism. Even though, many synthetic drugs were manufactured, they produce more side effect than that of the treatment efficacy. [3] Natural

antioxidants have a variety of biochemical actions such as inhibition of the production of ROS and scavenging of free radicals. In the present study, the plant *Basella alba*, is used which is an annual or perennial climbing herb with red or green vines and leaves. The leaves are thick, fleshy, pointed at the tip, and arranged alternately along the vine. Flowers are white, pink, or red in short spikes and are located in the leaf axils. The fruits are round and soft, and can be red, white, or black in colour. The seeds are round and black. The roots are cooked and used against diarrhoea. Paste of the root is used as a rubefacient while paste of leaves is used externally as treatment for boils and sores. The leaves and stems are cooked and eaten for their laxative properties. The leaf juice is a demulcent, used in cases of dysentery. Hence, the need for the exploration of the plants for the treatment has attained a great interest and this work assesses the plant extracts that were capable of reducing the helminthic infection with significant antioxidant potential.

Experimental work

Collection of plant material

The plant leaves of *Basella alba* were collected from available graphical sources. The plant drugs were identified, collected and stored for further use.

Preparation of plant material

The collected *Basella alba* plant was washed with tap water. The plant leaves were crushed into small pieces and air-dried thoroughly under shade (at room temperature) for 1 month to avoid direct loss of phytoconstituents from sunlight. The shade dried materials were powdered using the pulverizer and sieved up to 80 meshes. It was then homogenized to fine powder and stored in air-tight container for further analysis.

Preparation of plant extracts

Collected moderately coarse plant powder of *Basella alba* was used for the preparation of various extracts. The plant leaves powder of the *Basella alba* was extracted with petroleum ether, methanol and water using as solvent respectively by continuous hot extraction. The residue was evaporated by filtration through filter paper and the aqueous extract was concentrated used on a rotary evaporator to get solid yield extract.

Evaluation of antioxidant activity of plant extracts

150 μ l DPPH solution was added to 3 ml methanol and absorbance was taken immediately at 516 nm for control reading. Different volume levels of test sample (100, 120, 140, 160, 180 and 200 μ l) were screened and made 200 μ l of each dose level by dilution with methanol. Diluted with methanol with up to 3 ml. 150 μ l DPPH solution was added to each test tube. Absorbance was taken at 516 nm in UV-visible spectrophotometer (Shimadzu, UV-1700, Japan) after 15 min using methanol as a blank. [4]

Evaluation of Anthelmintic activity of plant extracts

The plant extracts of *Basella alba* were evaluated for anthelmintic activity in *Pheretima*

posthuma (earth worm) of nearly equal size (6 \pm 1 cm). *Pheretima posthuma* is used due to its anatomical and physiological resemblance with the intestinal roundworm parasite of human beings. Because of easy availability of earthworms, they have been used widely for the initial evaluation of the anthelmintic compounds. The worms were acclimatized to the laboratory condition before experimentation. The earthworms were divided into five groups of six earth worms in each and placed in eight Petri dishes containing the extract solutions or the reference drugs as mentioned below;

- Group -1: Received distilled water which served as the control
- Group-2: Received Albendazole suspension at a dose of 10mg/ml which served as the standard
- Group-3: Received Petroleum ether extract at a dose of 100mg/ml
- Group -4: Received Methanolic extract at a dose of 100mg/ml
- Group-5: Received Aqueous extract at a dose of 100mg/ml

All Petri dishes were kept under room temperature. The living or viable worms were kept under close observation. Observations were made for time taken to complete paralysis (PT) and death (DT) for individual worms. Each worm was frequently applied with external stimuli which stimulates and induce movement in earthworms, if alive. Paralysis was said to occur when the worms do not revive even in normal saline. Death was concluded when the worms lose their motility followed with fading of the body colour. [5,6]

Results and Discussion

Evaluation of Antioxidant activity of *Basella alba* by DPPH free radical scavenging activity

The various extract produced significant DPPH radical scavenging activity from 10 μ g/ml. Antioxidant activity of *Basella alba* was found to be increase with increasing concentration of pet- ether and methanol extracts. DPPH antioxidant assay is based on the ability of DPPH, a stable free radical to decolorize in the

presence of antioxidant. The antioxidant activity of *Basella alba* was compared with standard (ascorbic acid). The obtained result indicated that methanol extract has better antioxidant activity than pet-ether extract. The IC₅₀ of pet-

ether extract, methanol extract and aqueous extract is 18µg/ml, is 20µg/ml and is 22µg/ml respectively. The findings were shown in table 1. The anthelmintic activity of plant extracts shown significant findings as shown in table 2.

Table 1: Evaluation of Antioxidant activity of *Basella alba*

Concentration(µg/ml) and % inhibition						
Groups	10 ^a	20 ^a	30	40	50	IC ₅₀ (µg/ml)
Ascorbic acid	45.80±0.21 ^b	67.91±0.32 ^b	88.2±0.31	94.64±0.51	98.23±0.33	10
Pet- ether	39.61±0.62	51.11±0.32	79.12±0.14	85.23±0.45	90.28±0.66	18
Methanol	40.68±1.2	54.23±0.01	77.67±0.41	83.89±0.19	92.1±0.34	20
Aqueous	41.10±1.0	53.15±0.05	72.67±0.26	88.25±0.10	94.2±0.57	22

a= concentration, b= % inhibition

Table 2: *In-vitro* anthelmintic activity of different extracts of *Basella alba*

S.N.	Groups	Concentration mg/ml	Time taken for Paralysis (in mins Mean)	Time taken for Death (in mins Mean)
1	Control (Distilled water)	-----	00	00
2	Standard (Albendazole)	100	28±0.25	57±0.20
3	Pet ether extract	100	39±0.25	70±0.10
4	Methanolic Extract	100	29±0.25	62±0.30
5	Aqueous Extract	100	32±0.25	65±0.50

Conclusion

The findings showed that methanolic extract (100 mg/ml concentration) possess significant antioxidant and comparable anthelmintic activity with standard drug. The results show that the plant has the potential to be used as anthelmintic. Therefore, further study must be carried out so that the general people can get actual benefit from this important medicinal plant.

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