Phytochemistry and Antioxidant activity of hydroalcoholic extract of *Bidens pilosa plant*

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Abstract— The development of drug resistance is becoming serious issue to fight against the various diseases. A number of plants have been used in traditional medicine for thousands of years. The present work is carryout to assess the in vitro antioxidant activity and phyto chemical screening of Bidens pilosa plant hydroalcoholic extract.The results of antioxidant activity and phytochemical screening of B. pilosa validate the view of its folk worldwide medicinal uses. This herb has a great beneficial therapeutic and medicinal property used for complement or alternative to pharmaceutical drugs in several diseases like inflammation, immunological disorders, digestive disorders, infectious diseases, cancers, metabolic syndrome, wounds etc. The present study provides preliminary information about its medicinal uses and gives guidance for basic and future research into this plant.

Indexed Terms-- Phytochemistry, Antioxidant activity, Extract, Concentrations.

I. INTRODUCTION

Medicinal herbs have played a prominent role in human health**.** *Bidens pilosa* has a variety of properties that are beneficial to humans**.** It is an erect, perennial plant with green leaves, white or yellow flowers and tiny black seeds**.** It is distributed worldwide and is widely used as a folk medicine an**d** extraordinary source of food and medicine. All parts of *B. pilosa* plant, the whole plant, the aerial parts (leaves, flowers, seeds, and stems) and the roots fresh or dried are used as ingredients in medicines. It is frequently prepared as a dry powder, decoction, maceration or extracts form [1]. *Bidens pilosa* plant have many common names including black-jack, beggarticks, hairy beggarticks, cobbler's pegs, devil's needles, hairy bidens, Spanish needle, farmers friend, Devils Pitchfork, hitch hikers and sticky beaks[2,3,4,5,6].The Hindi common name of this plant is "Kumra."

The generic name *Bidens* came from the Latin and means "two teeth", *bis* means double or two, and *dens* means tooth, which refers to the typical twin barbs at the tip of the achene. *Pilosa* refers to the soft hair appearance. Its leaves are opposite, petioled, pinnate, with 3–5 sharply serrated ovate leaflets, and are slightly hairy [7]. *B. pilosa* is easy to grow herb that is widely distributed all over the world. It is considered to be a rich source of food and medicine for humans and animals [8,9]

II. MATERIAL & METHODS

2.1 Collection of plant material

Aerial parts of *Bidens pilosa* were collected from local area of Bhopal (M.P.) month of March, 2022. Drying of fresh plant parts was carried out in sun but under the shade.

Figure 1: Collection of plant material

2.2 Extraction procedure

Following procedure was adopted for the preparation of extract from the shade dried and powdered stems [10]

2.3 Defatting of plant material

45.86 gram of powdered aerial parts of *Bidens pilosa* were coarsely powdered and subjected to extraction with petroleum ether by maceration. The extraction was continued till the defatting of the material had taken place.

2.4 Extraction by maceration

45.86 gram of powdered aerial parts of *Bidens pilosa* were extracted with hydroalcoholic solvent (Ethanol and Aqueous; 80:20v/v) by maceration method[11]. The extract was evaporated above their boiling points. Finally, the percentage yields were calculated of the dried extracts.

2.5 Determination of percentage yield

The percentage yield of yield of each extract was calculated by using formula:

$$\text{Percentage yield} = \frac{\text{Weight of extract}}{\text{Weight of powdered drug taken}} \times 100$$

2.6 Phytochemical screening

Phytochemical examinations were carried out of extracts as per the following standard methods[12].

1. Detection of alkaloids: Extracts dissolved individually in dilute Hydrochloric acid and filtered.

a) Hager's Test: Filtrates were treated with Hager's reagent (saturated picric acid solution). Alkaloids confirmed by the formation of yellow coloured precipitate.

2. Detection of carbohydrates: Extracts were dissolved individually in 5 ml distilled water and filtered. The filtrates were used to test for the presence of carbohydrates.

a) Fehling's Test: Filtrates were hydrolysed with dil. HCl, neutralized with alkali and heated with Fehling's A & B solutions. Formation of red precipitate indicates the presence of reducing sugars.

3. Detection of glycosides: Extracts were hydrolysed with dil. HCl, and then subjected to test for glycosides.

a) Legal's Test: Extracts were treated with sodium nitroprusside in pyridine and sodium hydroxide. Finding of pink to blood red colour indicates the presence of glycosides.

4. Detection of saponins

a) Froth Test: Extracts were diluted with distilled water to 20ml and this was shaken in a graduated cylinder for 15 minutes. Formation of 1 cm layer of foam indicates the incidence of saponins.

5. Detection of phenols

a) Ferric Chloride Test: Extracts were treated with 3-4 drops of ferric chloride solution. Formation of bluish black colour indicates the presence of phenols.

6. Detection of flavonoids

a) Lead acetate Test: Extracts were treated with few drops of lead acetate solution. Formation of yellow colour precipitate indicate the occurrence of flavonoids.

7. Detection of proteins

a) Xanthoproteic Test: The extracts were treated with few drops of conc. Nitric acid. Formation of yellow colour indicates the presence of proteins.

8. Detection of diterpenes

a) Copper acetate Test: Extracts were dissolved in water and treated with 3-4 drops of copper acetate solution. Formations of emerald green colour indicate the presence of diterpenes [13].

1.5 *In-vitro* antioxidant activity of *Bidens pilosa* extract by using DPPH method

DPPH scavenging activity was measured by the spectrophotometer [14]. Stock solution (6 mg in 100ml methanol) was prepared such that 1.5 ml of DPPH in methanol solution gave an initial absorbance. Decrease in the absorbance in presence of sample extract at different concentration (10- 100 µg/ml) was noted after 15 minutes. 1.5 ml of DPPH solution was taken and volume made till 3 ml with methanol, absorbance was taken immediately at 517 nm for control reading. 1.5 ml of the test sample of different concentration were put in a series of volumetric flasks and final volume was adjusted to 3 ml with methanol. Three test samples were taken and each processed similarly. Finally the mean was taken. Final decrease in absorbance was noted of DPPH with the sample at different concentration after 15 minutes at 517 nm.

$$Calculation\ of\ \%\ Reduction\ \frac{\text{Control Absorbance} - \text{Test absorbance}}{\text{Control Absorbance}} \text{ X } 100$$

III. RESULT & DISCUSSION

3.1 Yield of *Bidens pilosa* plant extract

Table No. 1: % Yield of extract of *Bidens Pilosa*

S. No.	Extract	% Yield (W/W)
1.	Hydroalcoholic	5.63%

3.2 Result of Phytochemical screening

Table No. 2: Result of Phytochemical screening of *Bidens pilosa* plant extract

S. No.	Constituents	Hydroalcoholic extract
1.	Alkaloids Hager's Test:	+ve
2.	Glycosides Legal's Test:	-ve
3.	Flavonoids Lead acetate Test:	+ve
4.	Diterpenes Copper acetate Test:	+ve
5.	Phenol Ferric Chloride Test:	+ve
6.	Proteins Xanthoproteic Test:	+ve
7.	Carbohydrate Fehling's Test:	-ve
8.	Saponins Froth Test:	+ve

(+)ve=positive, (-ve)=negative

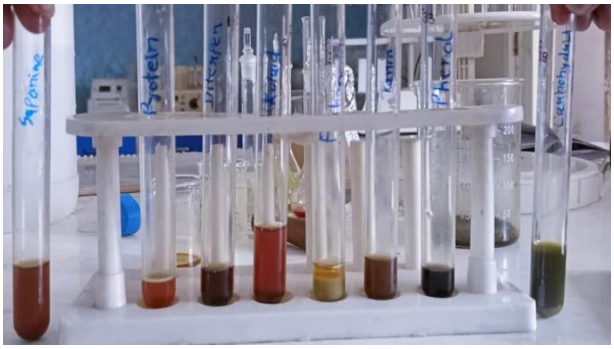

Figure 2: Photograph of Phytochemical screening of *B.pilosa* extract

3.3 Results of antioxidant activity using DPPH method

Table No. 3: % Inhibition of ascorbic acid and extract of *Bidens pilosa* using DPPH method

S. No.	Concentration (µg/ml)	% Inhibition	
		Ascorbic acid	Hydroalcoholic extract
1	10	30.42	8.65
2	20	59.11	12.75
3	40	67.48	30.51
4	60	75.25	45.74
5	80	77.58	49.56
6	100	79.63	56.21
IC 50		18.69	80.61

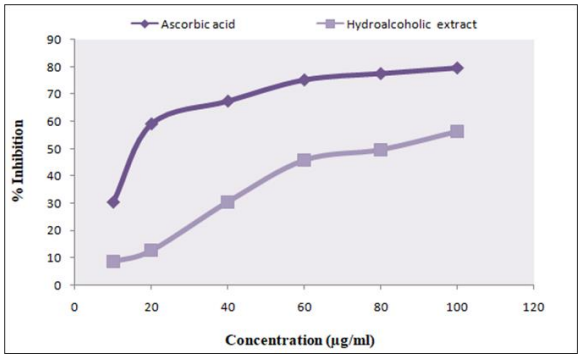

Figure 3: % Inhibition of ascorbic acid and extract of *Bidens pilosa* by using DPPH method

CONCLUSION

Plants have formed the foundation of complicated traditional medicine systems for thousands of years for saving our life.Plants or plant parts used medicinally in treatment of several diseases. Plants also used for extraction for pure compounds either for direct medicinal use or the synthesis of several medicinal compounds. The present study shows the presence of alkaloids,flavanoids,phenols and saponins and other phyto-constituents, which are used in medicinal purpose. All the phyto-constituents gives very useful information about the medicinal compound present in this plant.This research work also shows the effective antioxidant activity against standard Ascorcic acid of this plant. The overall work definitely provide the valuable information about its importance of this plant. The information provided here highlights the valuable usefulness of *B. pilosa* and its isolated

compounds which are used in pharmaceutical industries and offers insight into possible future research on this plant.

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