Preliminary Phytochemical Qualitative and Quantitative Screening of *Tridax Prcumbens L.*

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Abstract

In present study the phytochemical analysis of Plant powder is carried out by extraction method. The classical chemical procedure for obtaining constituents from dried plant tissues is to continuously extract powdered material in soxhlet apparatus. The observations of phytochemical extracts like moderately polar extract of terpenoids and phenolics, basic extract of alkaloids, polar extract of quaternary alkaloids and n-oxides, neutral extract of fats and waxes and fibers is used for calculation of percent extraction. After complete phytochemical profile of given plant material fractionation of crude extract is desirable in order to separate the main classes of constituents.

Keywords: Tridax Procumbens L, Phytochemical screening, Qualitative & qualitative analysis.

Introduction

Plant constituents of medicinal importance form an extensively diverse group of chemical compounds showing greater variation in solubility and stability (1). These are fixed oils, fats and waxes, phenols, Tannins, Proteins, alkaloids, Carbohydrates, glycosides, Volatile oils, Resins and Resin Combinations(2,3,4). The classical chemical procedure for obtaining constituents from dried plant tissues is to continuously extract powdered material in soxhlet apparatus (5,6). The observations of phytochemical extracts like moderately polar extract of terpenoids and phenolics, basic extract of alkaloids, polar extract of quaternary alkaloids and n-oxides, neutral extract of fats and waxes and fibers is used for calculation of percent extraction(7,8). After complete phytochemical profile of given plant material fractionation of crude extract is desirable in order to separate the main classes of constituents.

The phytochemicals can be broadly classified as fixed oils, fats and waxes (lipids), phenols, Tannins, proteins, alkaloids carbohydrates glycosides volatiles oils, resin and combinations(9,10). The precise mode of extraction depends on the tenure and type of the substance isolated. The classical chemical procedure for obtaining constituents from dried plants tissues is to continuously extract powdered material by Soxhlet apparatus with a range of solvents.

Materials and methods

Sample collection and preparation:

Collection of the material*:* Whole plant of *Tridax procumbens L.*(Asteraceae) was collected from the Avsari forest park, Ambegaon, Dist Pune, Maharashtra. The material was identified and authenticated by Joint Director, Botanical Survey of India (Ministry of Environment & Forest), Pune, Maharashtra, India. A botanical specimen is preserved for further reference. The plant was cleaned and dried under shade for 8-10 days. The dried plant was then crushed into powder using an electronic mixer. The powdered sample was stored in airtight plastic container at room temperature for further analysis.

Extraction of Plant Material

Preparation of organic solvent extracts:

5 g of air dried powder were taken in 50 ml of respective solvent. Plugged with cotton wool and then shake it for 24 hours on a rotary shaker. After 24 hours the supernatant liquid was collected and then the solvent was evaporated to make the final volume into one-fourth of the original volume these extracts can be used as sample for analysis. In some cases solvent is completely removed by the use of Rota evaporator if required and dried mass can used for further analysis. The solvents used to perform extraction are Methanol, Ethanol, Chloroform, Petroleum Ether, Diethyl Ether, Ethyl Acetate, Hexane. These samples can be used for the further phytochemical tests or studies (11).

Preparation of Aqueous extract:

5g of air dried powder was added to distilled water and boiled for 4 hours. The supernatant was collected and concentrated to make the final volume into one-fourth of the original volume. It was then used as aqueous sample for further tests or studies (12).

Phytochemical Screening

Chemical tests were carried out on the aqueous extract, solvent extract and on the powdered specimens using standard procedures to identify the constituents present in the plants. (7)(8)(9).

Qualitative Analysis

Alkaloids (Wagner's Reagent Test): About 2 ml of chloroform was measured in a test tube to which few drops of Wagner's reagent and 1 ml of the sample filtrate was added. A reddish brown precipitate indicated the presence of alkaloids.

Flavonoids (Alkaline Reagent Test): About 2 ml of NaOH was added to 2 ml of the sample filtrate, yellow colour which becomes colourless on addition of dilute acid indicates the presence of flavonoids.

Carbohydrates (Molish test): The extract (0.5 g) was dissolved in 2 ml of ethanol and added with 1 ml of distilled water and filtered. To this solution, 2-3 drops of α-naphthol were added followed by 1 ml of H2SO4. The formation of violet coloured ring was observed at the interface of two layers which indicates presence of Carbohydrates.

Saponins (Froth Formation Test): 1 g of the sample was weighed into a conical flask in which 50 ml of sterile distilled water was added and boiled for 5 minutes. The mixture was filtered and 2.5 ml of the filtrate was added to 10 ml of sterile distilled water in a test tube. The test tube was stoppered and shaken vigorously for about 30 seconds. It was then allowed to stand for half an hour. Honeycomb froth indicated the presence of saponins(13).

Tannins ($FeCl_3$ Test)(14): To a portion of the extract diluted with water, 3 - 4 drops of 20% ferric chloride solution is added. A blue –black, green, blue precipitate color indicated presence of Tannins.

Anthraquinones: 1 ml of the plant filtrate was shaken with 10 m1 of benzene; the mixture was filtered and 5 ml of 10% (v/v) ammonia was added, then shaken and observed. A pinkish solution indicates a positive test.

Steroids (Salkowaski Test): 2ml of acetic anhydride was added to 0.5 g ethanolic extract of each sample with 2 ml H2S04. The colour changed from violet to blue or green in some samples indicating the presence of steroids.

Terpenoids: To about 5 ml of sample filtrate was mixed with 2 ml of chloroform .and 3 ml of concentrated H2SO4 was carefully added to form a layer . A reddish brown colour at the interface was observed for terpenoids.

Phenols: 0.5 gm of the extract was dissolved in 2 ml of ethanol and added with water. To this 2 ml of FeCl3 was added and observed the formation of green or blue colour for presence of Phenols.

Reducing Sugars: To 0.5 ml of plant extracts 1 ml of water and 5 - 8 drops of Fehling's solution was added and heated over water bath. Brick red precipitate indicates the presence of reducing sugars.

Cardiac glycosides (Keller-Killani test): 5 ml of each extracts was treated with 2 ml of glacial acetic acid containing one drop of ferric chloride solution. This was under layer with 1 ml of concentrated sulphuric acid. A brown ring of the interface indicates a deoxysugar characteristic of cardenolides. A violet ring may appear below the brown ring, while in the acetic acid layer, a greenish ring may form just gradually throughout thin layer.

Proteins and Amino acids: Biuret test: 3 ml test extract added with 4% NaOH and few drops of 1% CuSO4 solution shows violet or pink Colour indicates presence of Proteins and Amino acids.

Quantitative Analysis

In quantitative screening study the phytochemical analysis of Plant powder is carried out by extraction method. The classical chemical procedure for obtaining constituents from dried plant tissues is to continuously extract powdered material in soxhlet apparatus. The observations of phytochemical extracts like moderately polar extract of terpenoids and phenolics, basic extract of alkaloids, polar extract of quaternary alkaloids and n-oxides, neutral extract of fats and waxes and fibers is used for calculation of percent extraction. After complete phytochemical profile of given plant material fractionation of crude extract is desirable in order to separate the main classes of constituents.

Results and Discussion

Analysis of preliminary phytochemical screening was performed to detect the indication of active constituents from the different crude extracts of whole plant of *Tridax Procumbens L.* is represented in table:1. The results showed that the active constituents viz. Flavanoids, Terpenoids, steroid, Tannins, Phenols, Proteins are present in different extracts of *Tridax Procumbens L*. The following tables and figures shows details about quantitative and qualitative screening results.

Table. 1. Quantitative Phytochemical Analysis of *Tridax Procumben L*

Sr. No	PARAMETERS	% COMPOSITION
1	Terpenoids & Phenolics	**5.54067%**
2	Basic extract(Most Alkaloids),	**2.3673%**
3	Polar extract (Q. Alkaloids & N-oxides)	**17.3223%**
4	Neutral Extract (fats and waxes)	**1.6733%**
5	Fibers.	**73.0963%**

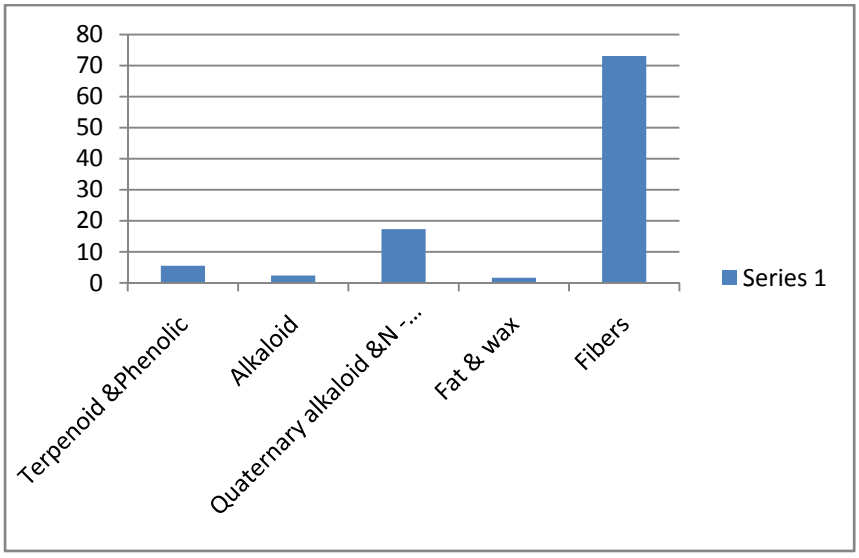

Fig. 1. Percentage of Phytochemicals in *Tridax Procumben L.*

Table 2. Qualitative Phytochemical Analysis of *Tridax procumbens L.* (Whole Plant) in different extract

	Methanol	Ethanol	Chloro form	Pet Ether	Diethyl Ether	Ethyl Acetate	Hexane	Aqueous
Alkaloids	+	-	-	-	-	-	-	+
Flavonoids	+	+	+	+	+	+	+	+
Carbohydrates	+	-	-	+	+	+	+	+
Saponins	-	-	-	-	-	-	-	-
Tannins	+	+	+	+	+	+	+	+
Anthraquinone	-	-	-	-	-	-	-	-
Steroids	+	+	-	+	+	+	-	+
Terpenoids	+	+	+	+	+	+	+	+
Phenols	+	+	-	-	-	-	-	+
Reducing Sugars	-	-	-	-	-	-	-	-
Cardiac Glycosides	-	-	-	-	-	-	-	-
Proteins	+	+	+	+	+	+	+	+

(+) indicates presence while (–) indicates the absence of the components

Conclusion

The observations of phytochemical analysis shows plenty of availability of terpenoids and phenolics, basic extract of alkaloids, polar extract of quaternary alkaloids and n-oxides, neutral extract of fats and waxes and fibers is used for calculation of percent extraction. The plant material fractionation of crude extract consist of major constituents of Q. Alkaloids and N-oxides as compare to other constituents.

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