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Preliminary phytochemical analysis of cactus stem extract

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ABSTRACT

The phytochemical screening of aqueous solution of *Opuntia Cochenillifera* and *Cereus Repandus* revealed the presence of certain important secondary metabolites. The preliminary phytochemical screening of the selected stems were found to possess Proteins, Tannins, Carbohydrates, Phenols, Flavonoids, Saponins, Glycosides, Steroids, Terpenoids and Alkaloids. It was concluded that this study clearly indicated that aqueous extract showed an elaborate qualitative analysis of the stem extract.

Keywords— *Opuntia Cochenillifera* (OC), *Cereus Rapandus* (CeR), Phytochemicals.

1. INTRODUCTION

Phytochemistry is the study of phytochemicals, which are derived from plants^[1]. Phytochemicals are responsible for medicinal activity of plants, these are non-nutritive and biologically active compounds which contain a broad spectrum of chemical structures that have protective and preventive properties. Thus conducting preliminary phytochemical screening of plant is an important aspect in determining the chemical constituents in plant material^[2] such as vitamins, terpenoids, tannins and other metabolites which are rich in antioxidant activity^[3,4,5]. In the present study phytochemical analysis of *Opuntia Cochenillifera* (Figure 1) *Cereus Rapandus* (Figure 2) has been reported.



Figure 1. *Opuntia Cochenillifera*



Figure 2. *Cereus Rapandus*

The Taxonomic Classification of the two plants are given in Table 1.

Table 1. Taxonomic Classification of *Opuntia Cochenillifera* and *Cereus Rapandus*

Botanical name	<i>Opuntia cochenillifera</i>	<i>Cereus repandus</i>
Kingdom	Plantae	Plantae
Order	Caryophyllales	Caryophyllales
Family	Cactaceae	Cactaceae
Genus	Opuntia mill	Cereus
Species	Opuntia Cochenillifera	C-Repandus
Binomial name	Opuntia Cochenillifera	Cereus Rapandus

Division	Magnoliophyto	Cereae
Class	Magnoliopsida	Magnoliopsida

2. MATERIALS AND METHODS

2.1 Collection of Plant Material

Study was carried out using *CereusRepandus* (CeR) and *OpuntiaCochenillifera* (OC) stem extract. Stem were collected from Karumathampatti, Coimbatore District, Tamilnadu, and N.Panjampatti, Dindigul District, Tamilnadu respectively, cleaned and shade dried and ground into powder using an electronic blender, sieved and the fine powder was stored in air tight container.

2.2 Preparation of the Extract

25 gm of dried *OpuntiaCochenillifera* /*Cereus Repandus* stem powder was boiled in 500 ml of distilled water with reflux condenser for 3 h and was kept overnight to extract its phytonutrient. The extract was filtered and the filtrate volume was made up to 500 ml using distilled water [7]. The stem extract was used to analysis the different phytochemical preliminary tests.

2.3 Preliminary Phytochemical Investigation

Preliminary tests were analyzed for both primary metabolites and secondary metabolites such as Protein, Carbohydrates, Flavonoids, Glycosides, Alkaloids, Tannins, Saponins, Phenolic compound using the following standard procedure [8].

2.4 Preliminary Phytochemicals screening

- **Test for Alkaloids:** To the filtrate in the test tube, 1 mL of Dragendroff's reagent was added drop by drop. Formation of a reddish-brown precipitate indicated the presence of alkaloids.
- **Test for Phenol:** The stem extract was dissolved in 2 mL of distilled water and 10 % ferric chloride solution was added. The formation of dark green colour precipitate indicated the presence of phenols.
- **Test for Flavonoids:** The plant extract was treated with 2 mL of 2%NaOH solution. The formation of an intensive yellow colour was an indication of the presence of flavonoids.
- **Test for Proteins:** To the extract,1 mL of 40% NaOH solution and two drops of 1 %copper sulphate solution was added. The formation of violet colour indicated the presence of protein.
- **Test for Carbohydrate:** To 2 mL of stem extract 2 mL conc.H2SO4 was passed carefully along the sides of the test tube. Appearance of violet ring at the inner phase of the test tube indicated the presence of carbohydrate.
- **Test for Terpenoids:** To 1mL of extract, tin (one bit) thionylchloride were added. Appearance of pink colour indicated the presence of triterpenoids.
- **Test for Saponins:** The extract was diluted water and shaken well for 15 minutes formation of foam indicated the presence of saponins.
- **Test for Glycosides:** A small amount of extract was dissolved in 1 mL water and then aqueous NaOH was added. The formation of a yellow colour indicated the presence of glycosides.
- **Test for Quinones:** To 1mL of the extract 1mL of dil. NaOH was added. The formation of red colour confirmed the presence of quinines.
- **Test for Coumarins:** To 1 mL of extract, 1mL of sodium hydroxide was added. The presence of coumarins was indicated by the formation of yellow colour.

3. RESULTS AND DISCUSSION

3.1 Phytochemical Screening

Phytochemical analysis of the *OpuntiaCochenillifera* and *CereusRepandus* stem revealed that aqueous extract was found to show the presence of Alkaloids, Phenol, Flavonoids, Protein, Carbohydrate, Terpenoids, Saponins, Glycosides, Quinones, Cumarins, Phytosterols.The results of the preliminary phytochemical analysis are Table 2.

Table 2. Phytochemical Screening of Stem Extract of *OpuntiaCochenillifera* and *Cereus Repandus*

Compounds	<i>Opuntia cochenillifera</i>	<i>Cereus repandus</i>
Alkaloids	-	+
Phenols	-	-
Flavonoids	-	-
Proteins	+	-
Carbohydrates	+	+
Terpenoids	-	-
Saponins	-	+
Glycosides	+	+
Quinones	+	+
Coumarins	++	++
Phytosterols	-	-

“+” active compound present, “-“ active compound absent

4. CONCLUSION

The present study deals with qualitative phytochemical analysis of aqueous extracts prepared from *OpuntiaCochenillifera* and *CereusRepandus* stem which revealed the presence of phytochemicals such as Alkaloids, Phenol, Flavonoids, Protein, Carbohydrate, Terpenoids, Saponins, Glycosides, Quinones, Cumarins, and Phytosterols.

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