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Phytochemical Screening of Halophytic Plant *Heliotropium curassavicum L.*

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ABSTRACT

According to the World Health Organization, plants are a source of compounds that have the ability to combat disease, antimicrobial, antiviral and antifungal activities. The most important of these bioactive constituents of plants are alkaloids, tannins, flavonoids and phenolic compounds. Halophytes are salt tolerant plants. They contain high amount of secondary metabolites or phytoconstituents. Correlation between the phytoconstituents and the bioactivity of plant is desirable to know for the synthesis of compounds with specific activities to treat various health ailments and chronic diseases as well. The study of the halophytic plant for the preliminary screening of different phytoconstituents is important. Here, I have done preliminary phytochemical screening of Halophytic plant *Heliotropium Curassavicum L.*

Keywords : Halophytes, Phytochemical Screening, Secondary Metabolites, *Heliotropium curassavicum L.*

I. INTRODUCTION

Halophytes are a group of higher plants that grow in saline conditions (Strogonov BP. 2011; Kanakiya A. et al., 2018). They are able to tolerate salt concentration, are good sources for human food including vegetables, pickels, salad, fodder for camels, sheep, goats, wood for building material, biofuel, chemicals, landscaping, dune, etc (Lieth H. 1998; Kanakiya A. et al., 2018). Halophytes, distributed from coastal regions to inland deserts, have traditionally been used for medicinal and nutritional purposes. They sunthesize many bioactive molecules and are well equipped with powerful antioxidant system (Ksouri R. et al., Kanakiya A. et al., 2018).

Heliotropium curassavicum L. is a sand binder salt marsh and a perennial herb which can take from a prostrate creeper along the ground to a somewhat erect shrub approaching 0.5m (1.6ft) in height and contains smooth nutlet fruits found in Southeast Asia, America and Europe. *Heliotropium curassavicum* had been traditionally used for ulcers, wounds; local inflammations cure gonorrhea, erysipelas, enema constipation, edema, bacterial infections cancer and diabetes (V. Katalinic et al.).

Halophytic plant *Heliotropium curassavicum L* collected from natural habitat.

II. MATERIALS AND METHODS

2.1 Collection of plant materials

Halophytic plant *Heliotropium curassavicum L* were collected from Gulf of Khambhat, Khambhat region, Gujarat. Whole plant were collected and further used to study the therapeutic values and preliminary phytoconstituents screening of the plant.

2.2 Preparation of Extracts

For the determining the presence of phytoconstituents of the plant sample the sample were weighted. The plant sample was uniformly shade dried and it was powdered by using a blender and sieved in to coarse powder. It was extracted with four different solvents such as acetone, methanol, petroleum ether and hexane. For the extraction I had choose Soxhlet extraction method.

2.3 Preparation of Soxhlet Extraction

Soxhlet extraction is only required where the desired compound has a limited solubility in a solvent, and the impurity is insoluble in that solvent. If the desired compound has a high solubility in a solvent then a simple filtration can be used to separate the compound from the insoluble substance. The advantage of this system is that instead of many portions of warm solvent being passed through the sample, just one batch of solvent is recycled. This method cannot be used for thermolabile compounds as prolonged heating may lead to degradation of compounds.

2.4 Phytochemical Analysis

The preliminary qualitative phytochemical investigation of *Heliotropium curassavicum L* extract in different solvents was performed to detect the phytoconstituents such as alkaloids, flavanoids, phenols, tannins, Saponins, carbohydrates/sugar, glycosides, steroids and proteins was performed by the standard procedure as described by Trease and Evans 1989, Harborne, 1973.

III. RESULTS AND DISCUSSION

Phytochemical Screening of *Heliotropium curassavicum L.* was carried out using different tests described below:

TABLE I. Preliminary Screening Analysis for different Phytoconstituents

Phytoconstituents	Test	Observation
Alkaloids	**Mayers Test** (1ml extract + 2ml mayers reagent) **Dragndroff Test** (1ml extract + 1-2 ml Dragndroff reagent) **Wagner's Test** (1ml extract + Wagner's reagent)	Dull white precipitate Orange-red precipitate Reddish brown precipitate
Flavonoids	**Alkaline Reagent Test** (few ml extract + few drops of NaOH + dil. HCL **Zinc Hydrochloride Reduction Test** (few ml extract + Zn dust + conc. HCL) **Pew Test** (1ml extract + pieces of metallic magnesium + 2 drops of conc. HCL)	Yellow color turns colorless Red color precipitates Brownish color precipitates
Phenols	**Ferric chloride Test** (few ml of extract + 5ml distilled water + few drops of 5% ferric chloride solution) **Lead acetate Test** (few ml extract + 3ml 10% Lead acetate soln.) **Potassium Dichromate Test** (few ml extract + potassium dichromate soln) **Alkaline Reagent Test** (few ml extract + sodium hydroxide NaOH)	Blue-green coloration Bulky white precipitate Precipitation shows presence of tannins and phenolic compounds Yellowish red precipitation
Tannins	**Lead acetate Test** (few ml extract + 3ml 10% Lead acetate soln.) **Potassium Dichromate Test** (few ml extract + potassium dichromate soln)	Bulky white precipitate Precipitation shows presence of tannins and phenolic compounds
Saponins	**Frothing Test** (few ml extract + 5ml distilled water + shake vigorously till froth remains persistent. 3 drops olive oils.	Formation of emulsion.
Steroids	**Libermann Buchard Test** (few ml extract + few drops of acetic anhydride. Boil + cool. + add conc. Sulphuric acid.)	Brown-ring formed

	Libermann sterol Test (few ml extract + 1ml glacial acetic acid + 1 drop conc. Sulphuric acid)	A play off roles from red, violet, blue to green.
Glycosides	**Keller-Killani Test** (few ml extract + 5 ml water + glacial acetic acid + 1 drop of 5% ferric chloride soln + conc. sulphuric acid)	Reddish brown ring, violet ring below brown ring or green ring below red ring.
Sugar/ Carbohydrates	**Fehling's Test** (1ml extract + 1ml fehling A + 1ml fehling B soln) **Benedict's Test** (0.5 ml extract + 0.5 ml benedicts' reagent, heat.)	Brick red color precipitation Reddish brown precipitates
Protein /Amino acids	**Millon's Test** (2ml extract + few drops of millon's reagents) **Ninhydrin Test** (2ml extract + 2 drops ninhydrin soln)	White precipitates Purple color precipitation

TABLE II

Result of phytochemical analysis of *Heliotropium curassavicum L.* plant in four different solvents

Phytoconstituents	Acetone	Methanol	Petroleum ether	Hexane
Alkaloids	+	+	-	-
Flavanoids	-	-	-	-
Phenols	+	+	+	+
Tannins	+	+	+	+
Saponins	-	-	+	+
Steroids	+	+	+	+
Glycosides	-	-	-	-
Sugar / Carbohydrates	-	-	-	-
Protein / Amino acids	+	+	-	-

IV. CONCLUSION

Screening of *Heliotropium curassavicum L.* clearly revels that the maximum classes of phytoconstituents are present in it. Phytoconstituents like alkaloids, phenols, tannins, steroid and protein are present in both acetone and methanol solvent but they absent in petroleum ether and hexane. So, it could be concluded that the methanol and acetone are better solvents for the preliminary screening of *Heliotropium curassavicum L.*

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