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# PHYTOCHEMICAL SCREENING OF HALOPHYTIC PLANT SUAEDA FRUTICOSA (L.) FORSSK. EX J.F.GMEL.

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## ABSTRACT

*Plants have been valuable and indispensable sources of natural products for the healthof human beings and they have a great potential for producing new drugs. Halophytesare salt tolerant plants. They survive in different salt concentration. Halophytes are good in secondary metabolite like alkaloids, flavanoids, phenols, tannins, saponins, carbohydrate and proteins. Suaeda fruticosa is halophytic plant. It has a higher amountof secondary metabolites. Also they act as an antioxidant, antibacterial and cancerousand antimicrobial. With the preliminary screening we analyses the presence orabsence of secondary metabolites. It is used in various diseases and also it serves as an ethnomedicinal plant.*

**Keywords:** *Suaeda fruticosa, halophytes, secondary metabolites, preliminary analysis.*

## INTRODUCTION

The word “Halo” means saline and “Phyte” means plant in origin. Halophytes represent salt-tolerant species that thrive in the inhospitable habitats of inland and coastal salt marshes, dunes, beaches, deserts and salt flats. They are adapted to survive under extreme conditions, representedby temperature, salinity and moisture. (Anbarasi *et al.*, 2015; Anbarasi *et al.*, 2018). Halophytes are rich in secondary metabolite like Alkaloids, Flavanoids, Phenol, Tannin, Saponins, Carbohydrates, and Protein etc. Halophyte acts as antioxidant, antibacterial, antimicrobial. Thereis increasing commercial interest in establishing halophyte plantation for the purpose of extractinghigh value phytochemicals, such as antioxidants, for application in food, health, and medicine (Ksouri *et al.,* 2012; Lopes *et al.*, 2016; Jitan *et al.*, 2018)

*Suaeda fruticose* (L.) Forssk. ex J.F.Gmel, a member of the *Chenopodiaceae* family, is a halophyticmedicinal plant and is highly salt-tolerant. Seed and leaves of the plant have been classified as safefor human consumption or forage, and are used as a phytoremediation tool (Mzoughi, *et al.,* 2018;Ahmed. *et al.,* 2015; Saleh. *et al.,* 2019). *Suaeda fruticosa* is known for being rich in a bioactive compound; a recently isolated polysaccharide from the plant demonstrated antioxidant, anti- filamentry, antinociceptive, hypoglycaemic and antihyperlipidaemic properties in vitro and ex vivoassays (Ullah. *et al.,* 2012; Skehan. *et al.*, 1990; Saleh. *et al.,* 2019). The shoots and leaves of the plant are rich in phenols, flavonoids, tannins, alkaloids, saponins, proanthocyanins and carotenes, indicating an impressive pharmacological spectrum as compared to other halophytes in the same family, such as *Salsola kali (*Saleh. *et al.,* 2019). Juice and decoction from the *Suaeda fruticosa* leaf have been used to treat fever, flu, skin disease, rheumatism, and helminthiasis livestock diseases (Molina-Calle *et al.,* 2017; Sun. *et al.,* 2015; Saleh. *et al.,* 2019).


Photo.: Collection of *Suaeda fruticosa* from the natural habitat at gulf of Khambhat, Gujarat

MATERIALS AND METHODS

**Collection of plant materials**

Halophytic plant *Suaeda fruticosa* 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.

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.

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 solubilityin 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.

Phytochemical Analysis

The preliminary qualitative phytochemical investigation of *Suaeda fruticosa* 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.

## RESULTS

Phytochemical Screening of *sueada fruticosa* was carried out using different tests described below:

| Phytoconstituents | Test | Observation |
|---|---|---|
| **Alkaloids** | **Mayers Test** (1ml extract + 2ml mayers reagent) | Dull white precipitate |
| | **Dragndroff Test ( 1ml extract + 1-2 ml Dragndroff reagent)** | Orange-red precipitate |
| | **Wagner's Test (1ml extract + Wagner's reagent)** | Reddish brown precipitate |
| **Flavonoids** | **Alkaline Reagent Test (few ml extract + few drops of NaOH + dil. HCL** | Yellow color turns colorless |
| | **Zinc Hydrochloride Reduction Test (few ml extract + Zn dust + conc. HCL)** | Red color precipitates |
| | **Pew Test ( 1ml extract + pieces of metallic magnesium + 2 drops of conc. HCL)** | Brownish color precipitates |
| **Phenols** | **Ferric chloride Test (few ml of extract + 5ml distilled water + few drops of 5% ferric chloride solution)** | Blue-green coloration |
| | **Lead acetate Test (few ml extract + 3ml 10% Lead acetate soln.)** | Bulky white precipitate |
| | **Potassium Dichromate Test (few** | |

| | | |
|---|---|---|
| | **ml extract + potassium dichromate soln)**<br><br>**Alkaline Reagent Test (few ml extract + sodium hydroxide NaOH)** | Precipitation shows presence of tannins and phenolic compounds<br><br>Yellowish red precipitation |
| **Tannins** | **Lead acetate Test (few ml extract + 3ml 10% Lead acetate soln.)** | Bulky white precipitate |
| | **Potassium Dichromate Test (few ml extract + potassium dichromate soln)** | 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.)**<br><br>**Libermann sterol Test (few ml extract + 1ml glacial acetic acid + 1 drop conc. Sulphuric acid)** | Brown-ring formed<br><br>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)**<br><br>**Benedict's Test (0.5 ml extract + 0.5 ml benedicts' reagent, heat.)** | Brick red color precipitation<br><br>Reddish brown precipitates |
| **Protein /Amino acids** | **Millon's Test (2ml extract + few drops of millon's reagents)** | White precipitates |

| | | |
|---|---|---|
| | **Ninhydrin Test (2ml extract + 2 drops ninhydrin soln)** | Purple color precipitation |

Result of phytochemical analysis of *Suaeda fruticosa* plant in four different solvents

| **Phytoconstituents** | **Acetone** | **Methanol** | **Petroleumether** | **Hexane** |
|---|---|---|---|---|
| **Alkaloids** | + | + | - | + |
| **Flavanoids** | + | + | - | + |
| **Phenols** | + | + | - | + |
| **Tannins** | + | + | + | + |
| **Saponins** | + | + | + | + |
| **Steroids** | + | + | + | + |
| **Glycosides** | + | - | - | + |
| **Sugar/Carbohydrates** | - | - | - | - |
| **Protein/ Amino acids** | + | + | - | - |

## CONCLUSION

Screening of *Suaeda fruticosa* clearly revels that the maximum classes of phytoconstituents are present in it. Phytoconstituents like alkaloids, flavanoids, phenols, tannins, steroid and protein arepresent 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 screeningof *Suaeda fruticosa*.

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