

Antioxidant Potential, Anti bacterial activity and Phytochemical Tests of *Ipomoea pes caprae*

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Abstract

The present study was performed to evaluate the medicinal properties of commonly used Siddha plant *Ipomoea pes caprae*. Three different extracts (hexane, methane, and water) are prepared from the leaves and subjected to various screening such as Preliminary phytochemical screening, anti bacterial activity and antioxidant activity. Preliminary phytochemical screening of the crude extracts revealed the presence of flavonoids, tannins, Quinones and phenolics. DPPH assay showed *Ipomoea pes caprae* has potent antioxidant activity and anti bacterial property. IC₅₀ values was also done by Broth dilution assay to exhibit shifts in the susceptibility of bacterial populations to antibiotics. It shows that phytoconstituents contribute the various kinds of medicinal properties.

Key words:-Antioxidant, DPPH,*I.pescaprae*, Phytochemical.

1. Introduction

Siddha an ancient system of medicines is unique to the Tamil Siddha system has the usage of plants, animals, minerals & metal products. Siddha Science born out of the institution of Siddha sages is now being subjected to scientific study and comparison and as a result the world is enabled to rediscover and appreciate the astounding foresight and

infallible vision of siddhars. *Ipomoea pes caprae* is widely used in traditional medicine. The plant is mucillaginous and is considered astringent, tonic, alterative, diuretic and purgative. Poultices made from the leaves are commonly used to treat skin affections, ulcers, boils, swelling, sting and wounds [1]. In the present study is to evaluate the antioxidant and antibacterial activity of medicinal plant. *Ipomoea pes caprae* belongs to *Convolvulaceae* family and is widely distributed in tropical and subtropical countries. Recent research with important bioactive compounds in many plants and food sources has received much attention [2]. Free radicals and reactive oxygen species are byproducts in aerobic organism and have aroused significant interest among scientists in the past decade. It might be cure several human disease [3]. Of various kinds of natural antioxidants, flavonoids and phenolic compounds have received much attention. Therefore, antioxidants with free radical scavenging activities may have great relevance in the prevention and therapeutics of diseases in which oxidants or free radicals are implicated[4]. In this respect, polyphenolic compounds, like flavonoids and phenolic acids, commonly found in plants have been reported to have multiple biological effects, including antioxidant activity[5]. In the recent years interest in the study of antioxidant activity of plant extracts and isolation from plants has grown due to the fact that the free radicals have been related to degenerative diseases [6].

Material and Methods

The aerial parts of the fresh leaves and stem of *Ipomoea pes caprae* was collected from the sandy beaches of Kanyakumari. They were washed and air dried over a period of one month. The dried samples were milled into a fine powder by pounding manually with a clean, sterile mortar, stored in sterile cellophane bags in a cool dry place till further use.

Information about *Ipomoea pes caprae*

Common Name Tamil / English	Botanical Name / Family	Phyto Chemistry	Actions	Uses in Siddha
Attukkal/ Musattalai/ Beach morning glory, Goat's foot, creeper, horse's foot print	<i>Ipomoea pes caprae</i>	Tannins, Saponins Flavonoids Phe nol	Anti - Inflammatory, Anti -Spasmodic activity, Anti - Venom activity, Anti Platelet , Purgative and Diuretic.	Skin Diseases Ulcer, Boils, Swelling, Sting, and Wounds

100gram of aerial parts of the plant extracted in a soxhlet sequentially with 1000ml hexane, methanol and water. The process was run for 24hours after which the sample was concentrated using reduced pressure distillation under vacuum pump and freeze dried to powdered form. The dried extracts were weighed and kept in labeled sterile specimen bottles.

Extracts were primarily tested with four different bacterial strains in different concentrations. Bacterial strains were obtained from the Microbial Type Culture Collection (MTCC), Institute of Microbial Technology, and Chandigarh, India. *Bacillus subtilis*, *Clostridium perfringens*, *Escherichia coli*, *Klebsiella pneumoniae*, used as test organisms for investigating antimicrobial activity by the *Well diffusion assay* [7].

2.1 Preliminary phytochemical investigations

The major secondary metabolites of tannins, flavonoids, phenol, quinones, and glycosides were screened according to the common phytochemical methods [8].

2.2 Antioxidant activity (DPPH assay) [9].

The Radical Scavenging Activity of different extracts was determined by using DPPH assay. The decrease of the absorption at 517nm of the DPPH solution after the addition of the antioxidant was measured in a cuvette containing 2.960 µl of 0.1mm ethanol DPPH solution mixed with 20 to 200µg/ml of plant extract and vortexes thoroughly. The setup was left in dark at room temperature and the absorption was monitored after 20 minutes. Ascorbic acid was used as references. The ability of the plant extract to scavenge DPPH radical was calculated by the following equation:

$$\% \text{ of DPPH Radical Scavenging Activity (\% RSA)} = \frac{(\text{Abs. Control} - \text{Abs. sample})}{\text{Abs. control}} * 100$$

Abs. control is the absorbance of DPPH radical + ethanol; Abs. sample is the absorbance of DPPH radical + plant extract. Measurements were performed in triplicates. Absorbance values were corrected for radicals decay using blank solutions.

3. Results

3.1 Phytochemical Tests

The preliminary phytochemical screening tests for the crude methanol extract of *Ipomoea pescaprae* were revealed the presence of tannins, flavonoids, quinones and phenols. Tannins were present predominantly and flavonoids, quinones, phenols were present in moderate in *I. pescaprae*. Tannins were present in large quantity.

Table 1: Phytochemical screening of crude methanol extract of aerial parts of *I. pescaprae*

Phytochemical compounds	<i>I.pescaprae</i>
Alkaloids	+
Flavonoids	++
Phenols	++
Tannins	+++
Glycosides	-
Reducing sugars	++
Proteins	+
Saponins	-
Quinones	++
Steroids	++
Amino acids	+
Terpenoids	+

3.2 IC50 Determination

IC50 values were also done by the Broth dilution assay against the Gram positive organism *Staphylococcus aureus* in different concentrations to indicate shifts in the susceptibility of bacterial populations to antibiotics (Table 2). So, further works concentrate only in most active methanol extracts of plant. Inhibitory concentration 50 was done by broth dilution assay to determine the amount of antibiotic that the patient will receive to treat diseases. IC50 values of *Ipomoea pescaprae* was 50.75 (500 μ g).

Table 2. IC50 Determination of Broth Dilution Assay

Concentration (μg)	Inhibition (%) <i>I.pescaprae</i>
100	30.16
200	37.25
300	42.28
400	45.13
500	50.75
600	57.10
700	62.14
800	69.33
900	75.26
1000	81.52

3.3 Antibacterial activity

The methanol extracts of *Ipomoea pes caprae* was found to be active against *Escherichia coli* and *Clostridium perfringens*, where as water extract was found to be active against *Klebsiella pneumoniae*, *Bacillus subtilis* hexane extract was found to be active only against *Bacillus subtilis* at very high concentration

Table 3 : Anti bacterial activity of crude aerial part of *Ipomoea pes caprae*

Name of the extract	Conc. of extract (μg)	Zone of Inhibition (mm)			
		Micro organisms			
		E.c	K.p	B.s	C.p
Hexane	250	-	-	-	-
	500	-	-	-	-
	750	-	-	-	-
	1000	-	-	12	-
Methanol	250	11	-	-	11
	500	13	-	12	12
	750	15	-	15	15
	1000	17	-	17	17
Water	250	-	10	10	-
	500	-	11	11	-
	750	-	13	13	-
	1000	-	15	15	-

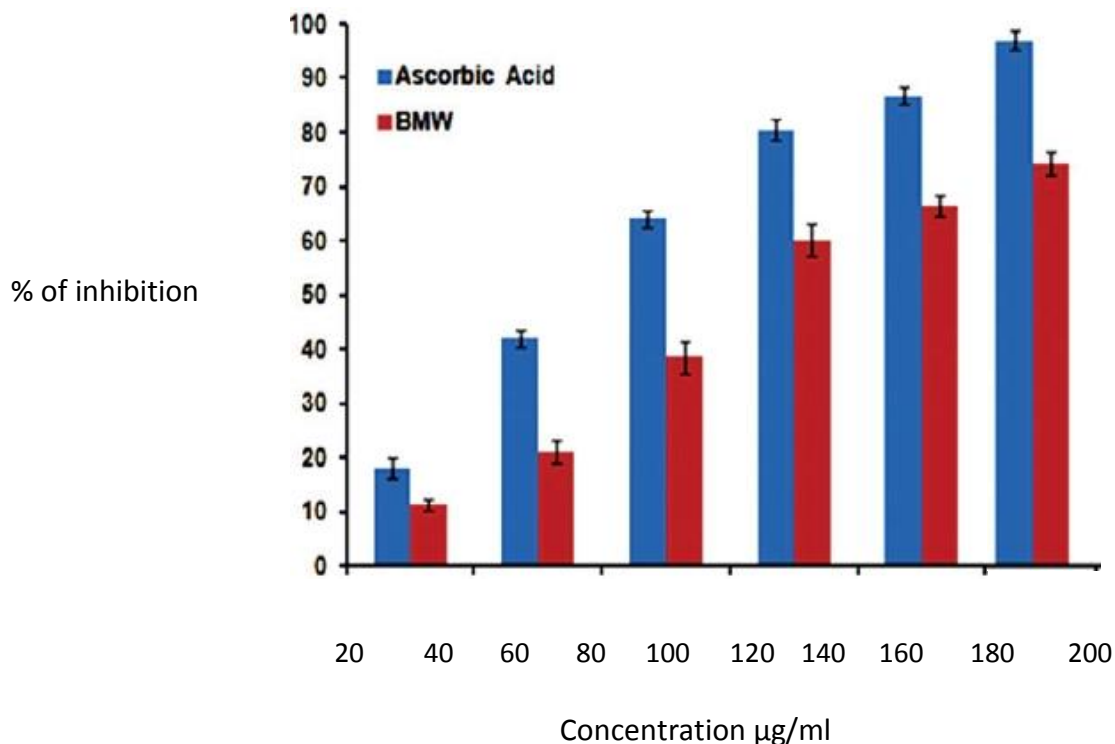
3.4 Antioxidant Activity

The results of the antioxidant activity of methanolic extract of aerial parts of *Ipomoea pes caprae* determined by DPPH assays at different concentrations are given in graph 1. It was evident that aerial part of *Ipomea pes caprae* show moderate antioxidant activity when compared to with standard antioxidant L-ascorbic acid whose antioxidant activity at different concentrations like 100 to 200 μg were 65%, 80%, 85%, and 95%.

Radical Scavenging Activity of *Ipomea pes caprae*

Graph 1:

Ipomea pescaprae
Standard



4. Discussion

The preliminary phytochemical analysis showed. The presence of tannins phenols, flavnoids steroids, and quinones in considerable quantity. The usage of tannins in treating wounds and arrest bleeding. More over the presence of alkaloids and quinones can be attributed to the usage of *Ipomoea pes caprae* in allergies as the anti-histamine properties of alkaloids and quinones are well known the presence of tannins flavnoids alkaloids glycosides and phenols has potentially significant application against human pathogens, including those that causes entric infections. This activity was substantiated by the anti-bacterial activity result as the methonolic and water extracts were found to be active against *Escherichia coli*, *Klebsiella Pneumoniae*, *Bacillus subtilis*, *Clostridium Perfringens*.

The potent, anti oxidant activity of *Ipomoea pes caprae* can be due to the presence of these phytochemicals in methanolic and water extract over all, *Ipomoea pes caprae* usage in siddha system can be used as better lead for development of new drugs.

5. Conclusion

The result of the present study very clearly indicate that ***Ipomoea pes caprae*** can be used as antioxidant and also it is used in traditional medicine for skin affection, ulcers, boils, swelling, sting and wounds. Radical scavenging effect of *I. pes caprae* increases with increasing concentration and maximum better antioxidant activity.

List of Abbreviations

DPPH - 1, 1-diphenyl-2-picrylhydrazyl

IC50 - Inhibitory Concentration

E.C- *Escherichia coli*

K.P - *Klebsiella Pneumoniae*

B.S - *Bacillus subtilis*

C.P - *Clostridium Perfringens*

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