



QUALITATIVE PHYTOCHEMICAL SCREENING OF LEAVES AND STEM OF IPOMOEA CARNEA

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ABSTRACT

The undertaken study aims at the screening of leaves and stems of Ipomoea carnea for various active constituents. Leaves and stems of the plants were extracted with water and ethanol and the extract obtained was tested for the presence for chemical constituents. The result showed that the presence of alkaloids, carbohydrates, steriods and sterol, glycosides, saponins, flavonoids, phenolic compounds, triterpenoids in ethanolic and aqueous extracts of leaves and stem. The phytochemical screening for leaves and stem of ipomoea carnea has played an important role in the pharmacological activity of the plant. The results have shown that ethanolic and aqueous extract of the leaves and flower of Ipomoea carnea has higher concentration of flavonoids (which is responsible for pharmacological activity) compared to phenolic compounds.

KEYWORD: glycosides, saponins, flavonoids, phenolic compounds, triterpenoids.

INTRODUCTION

Common name of Ipomoea carnea is Bush Morning Glory, Morning Glory Tree, Besharam, Behaya and shameless. It belongs to the family Convolvulaceae.^[1] the plant well distributed in India and found particularly in Chhattisgarh and Madhya Pradesh. Preliminary phytochemical analysis show the presence of possible secondary metabolites, namely alkaloids flavonoids, terpenoids, cynogenic glycosides, phenolics, tannins and saponins.^{[2][3]} The flowers contain the maximum and the stem contains the minimum amount of phenols. The flavonoid content of the flowers was quite high compared to that of the leaves and the stem.^[4]

Other uses of Ipomoea carnea are

- Ipomoea carnea stem can be used for making paper.
- Stem is also used as fire wood.
- Leaves are used as fertilizer.
- The plants are also used for fencing.
- Colorful flowers of plant are often grown as ornamentals.
- The plant has various medicinal value.
- It has sedative and anticonvulsant properties.
- A glycosidic saponin of Ipomoea carnea has anticarcinogenic and oxytoxic properties.^[5]

COLLECTION, AUTHENTICATION AND EXTRACTION OF PLANT MATERIAL

The whole selected plant was collected from road side fencing shrub of Ipomoea carnea (Fam. Convolvulaceae). Fresh leaves and stem of selected plant was collected in the month of december from Jabalpur Madhya Pradesh, India. The leaves and stem was dried under shade then stored in air tight container for further studies. The plant was authenticated by the Taxonomist, Dr. A. B. Tiwari, Associate Professor, Department of Plant Physiology, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur, Madhya Pradesh, India.

Preparation of various solvent extract

The leaves and stems were washed under running tap water to remove the surface pollutants. Fresh leaves and stems of Ipomoea carnea were shade dried and powdered (by using pastle motor) then extracted with solvent system ethanol, aqueous medium and mixture of solvents, water.^[6] The plant possess various bioactive compounds such as glycosides, alkaloids, reducing sugars, flavonoids, fatty acid, esters, alcohol and tannins. The leaves of this plant showed the presence of thirteen compounds which include hexadecanoic acid, stearic acid, 1, 2 diethyl phthalate, n-octadecanol, octacosane, hexatriacontane, tetracontane, 3-diethylamino-1- propanol.^{[7][8]}

Qualitative Test for phytochemicals

The different extract of leaves of *Ipomoea carnea* were tested for various components by their specific tests viz. Mayer's test, dragendorff's test, wagner's test for alkaloids; gelatin test, ferric chloride test, vanillin hydrochloride test for tannins and phenolic compounds; million test, ninhydrin test, xanthoproteic test for proteins and amino acids, salkowski test, sulfur powder test for sterols and triterpenoids, molisch's test, benedict's test, barfoed's test, bromine water test for carbohydrates and foam test for saponins.^{[9][10] [11][12]}

a) Test for alkaloids

Dragendorff's reagent: 2 mL of acidic test solution in a test tube was neutralized with 10% ammonia solution. Dragendorff's reagent was added and turbidity or precipitate was observed as indicative of presence of alkaloids.

Hager's Test: Test solution was treated with few drops of Hager's reagent (saturated picric acid solution). Formation of yellow precipitate would show a positive result for the presence of alkaloids.

b) Test for Flavanoids

Ferric chloride test: Test solution when treated with few drops of Ferric chloride solution would result in the formation of blackish red color indicating the presence of flavonoids.

Lead acetate solution Test: Test solution when treated with few drops of lead acetate (10%) solution would result in the formation of yellow precipitate.

a) Test for Phenols and Tannins

Lead acetate test: 10 mg of extract was taken and 0.5 ml of 1% lead acetate solution was added and the formation of white precipitate indicates the presence of tannins and phenolic compounds.

Ferric chloride test: Five mg of extract was taken and 0.5 ml of 5% ferric chloride was added. The development of dark bluish black color indicates the presence of tannins.

Sodium hydroxide test: Five mg of extract was dissolved in 0.5 ml of 20% sulphuric acid solution. Followed by addition of few drops of aqueous sodium hydroxide solution, it turns blue which indicates the presence of phenols.

d) Test for steroids and sterols

Salkowski's test: Five mg of extract was dissolved in 2 ml of chloroform and equal volume of concentrated sulphuric acid was added along the sides of the test tube. The upper layer turns red and lower layer turns yellow with green fluorescence, indicating the presence of the steroids and sterols compound, in the extract.

e) Test for Carbohydrates

Fehling's test: 5 ml of Fehling's solution was added to 0.5 mg of extract and boiled in a water bath. The formation of yellow or red precipitate indicates the presence of reducing sugar.

Benedict's test: 5 ml of Benedict's solution was added to 0.5 mg of extract and boiled in water bath. The appearance of red or yellow or green precipitate indicates the presence of reducing sugars.

f) Test for Saponins

Honey comb test: 0.5 mg of extract was taken in a test tube and few drops of 5% sodium bicarbonate solution was added. The mixture was shaken vigorously and kept for 3 minutes. Formation of honey comb like froth shows the presence of saponins.

Foam test: 0.5 mg of extract was diluted with 20 ml distilled water and shaken well in a graduated cylinder for 15 min. The formation of foam to a length of 1cm indicated the presence of saponins.

h) Test for Protein & amino acids

Biuret test: To 0.5 mg of extract equal volume of 40% NaOH solution and two drops of 1% copper sulphate solution was added. The appearance of violet colour indicates the presence of protein.

Ninhydrin test: About 0.5 mg of extract was taken and 2 drops of freshly prepared 0.2% ninhydrin reagent was added and heated. The appearance of pink or purple colour indicates the presence of proteins, peptides or aminoacids.

RESULTS

Phytochemical investigation

1. Preparation of plant solvent extracts

Fresh leaves of *Ipomoea carnea* were shade dried and powdered. defatted in soxhlet apparatus by using petroleum ether (60-80°C). The marc was dried and subjected to soxhlet extraction using ethanol as solvent for 72 hrs. Then extract was filtered, marc is air dried and subjected for maceration with distilled water for 72 hrs. After completion of extraction, solvent was distilled off under reduced pressure and concentrated extract was air dried.



Figure 1: Stem And Leaves Extract of Plant Ipomoea Carnea

Table 1: Phenolic content (mg catechol equivalent/g) and Flavonoid content (mg quercetin equivalent/g) in material.

Sample	Extract	Phenolic	Flavonoids
Ipomoea Carnea	Aqueous	1.60	2.0
	Ethanol	17.00	25.5
	Water + Ethanol (20:80)	43.00	84.00

2. Qualitative Test for phytochemicals

The results of phytochemical screening of the various extracts of Ipomoea Carnea leaves and stem revealed the presence of chief constituents flavonoids, phenolic compounds show in table.



Figure 2: Phytochemical Qualitative Test of Ipomoea carnea

Table 2: Various phytochemical qualitative test of ipomoea carnea

Sr.No	Phytoconstituents	Qualitative Test	Observation
1.	Test for alkaloids	1. Dragendroff's Test	+++
		2. Hager's Test	+++
2.	Test for Flavanoids	1. Ferric chloride test	+++
		2. Lead acetate solution Test	+++
3.	Test for Phenols and Tannins	1. Lead acetate test	+++
		2. Ferric chloride test	+++
		3. Sodium hydroxide test	++
4.	Test for steroids and sterols	1. Salkowski's test	+++
5.	Test for Carbohydrates	1. Fehling's test	+++
		2. Benedict's test	+++
6.	Test for Saponins	1. Honey comb test	+++
		2. Foam Test	+++
7.	Test for Protein & amino acids	1. Biuret test	+++
		2. Ninhydrin test	++

Addition of chief chemical constituents, the various extracts of *Ipomoea Carnea* (leaves and stem) includes presence of other chemical compounds alkaloids,

carbohydrates, steriods and sterol, glycoside, saponins, flavonoids, phenolic compounds and triterpenoids shown in Table 3.

Table 3: Presence of Other Chemical Compounds In Different Extracts of *Ipomoea Carnea*

S.no.	Other Constituents	Petroleum Ether And Hydroalcoholic	Chloroform
1.	Alkaloids	+	+
2.	Carbohydrates	+	+
3.	Tannins	+	+
4.	Glycosides	+	+
5.	Xantho Proteins	+	+
6.	Steroids	-	+
7.	Saponins	-	+
8.	Triterpenoids	-	+
9.	Reducing Sugar	-	+
10.	Stearic Acid	-	+
11.	Pigments	-	+

DISCUSSION

The preliminary phytochemical screening was carried out and result showed that the presence of alkaloids, carbohydrates, steriods and sterol, glycosides, saponins, flavonoids, phenolic compounds, triterpenoids in chloroform, ethanolic and aqueous extracts of leaves and stem. The phytochemical screening for leaves and stem of *Ipomoea carnea* have played important role in the pharmacological investigation. These observations clearly indicate the higher flavanoids concentration was obtained compare to phenolic compound in extract of plant *Ipomoea carnea* which is responsible for pharmacological activity.

Extractive values are also useful to evaluate chemical composition present in the crude drug and also help in the estimation of specific constituents soluble in particular solvents.

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