

## Preliminary Phytochemical Screening and Qualitative Estimation of Herb (Moss Rose)

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**Abstract**-The four different varieties (white, yellow, pink and red) of *Portulaca grandiflora* (Moss Rose) were screened for their preliminary phytochemical estimation. These plants were extracted by diethyl ether, acetone and ethanol, respectively. The results showed that all the different extracts having considerable amount of all the phytochemicals except steroids and anthraquinone. Ethanolic extract of all plant varieties show maximum qualitative estimation while the extract prepared with diethyl ether shows minimum.

**Keywords:** *Portulaca grandiflora*, Phytochemical, Moss rose, Qualitative.

### Introduction

*Portulaca grandiflora* is a drought and heat tolerant annual native to hot, dry plains in India. This herbaceous plant in the purslane family (Portulacaceae) is cultivated throughout the world as a garden annual for its showy flowers that bloom all summer long with little care. Moss rose is a semi-succulent plant that stores water in its fleshy leaves and stems approximately 10-30cm high, leaves about 12-35 mm in length and 1- 4 mm in width, linear-subulate, thick, and fleshy and spirally arranged. The bright green leaves are oblong to cylindrical with pointed tips. Common names embrace nonvascular plant Moss rose in English, Nonia in Hindi, Pungmapansatpi in Manipuri and Gul-e-Shama in Urdu, portulaca, and Sun plant. (Dkhilet *al.*, 2011) Plant products still remain the principal source of pharmaceutical agents used in traditional medicine (Prince and Prabakaran, 2011). Phytochemicals are naturally occurring in the medicinal plants leaves, vegetables and roots that have defence mechanism and protect from various diseases (Ncube, N.S. *et al.*, 2008). Phytochemicals are primary and secondary compounds. Chlorophyll, proteins and common sugars are included in primary

constituents and secondary compounds have terpenoid, alkaloids and phenolic compounds (Krishnaiah *et al.*, 2007). Terpenoids are very important in attracting useful mites and consume the herbivorous insects (Kappers, 2005). The main objective of our research work was to analyse the presence or absence of different phytochemicals in the selected plants used for healing and curing of various diseases.

### Materials and Method

#### Plant materials

*P. grandiflora* or moss rose was obtained from Rama Nursery, Roorkee Road, Muzaffarnagar. The plants were harvested at maturity, and during or prior to their flowering period. Four varieties (orange, red, pink and white) of the same species were used in this study.

#### Preparation of plant extracts

Preparation of sample and extraction were carried out as described by Saha *et al.* with slight modifications. The whole fresh plant samples (stem, flower and leaf) were washed with distilled water and cut in to small pieces, shade-dried under for 1 week and followed by complete drying at 40 °C in oven. Then grinded to fine powder. 10 g of these dried sample from each variety was extracted separately with 100 mL of three different solvents: acetone, diethyl ether and ethanol for 24 h in ashaker at 100 rpm at temperature 30 °C. The extracts were filtered using Whatman filter paper and filtrates were used as an extract. Extracts were kept at 4 °C until the bioassay analyses.

#### Phytochemical screening (Qualitative method)

Preliminary phytochemical tests were carried out on the different extracts (acetone, diethyl ether and ethanol) of *Portulaca grandiflora* using standard procedures to identify the constituents as described by (Sofowara, 1993; Trease and Evans, 1989; Harborne, 1973 and 1984).

**Test for Tannins:** 1ml of every sample is boiled in 20 ml of distilled water in a test tube and then filtered separately. A couple of drops of 0.1% ferrous chloride are added and determined for brownish green or a blue-black colouration.

**Test for Saponins:** 2 ml of every sample is boiled in 20 ml of distilled water in a water bath and filtered separately. 10ml of the filtrate is mixed with 5 ml of distilled water and jolted smartly for a stable persistent froth. The frothing is mixed with three drops of olive oil and jolted smartly, then determined for the formation of emulsion.

**Test for Flavonoids:** 5 ml of dilute ammonia solution were added to a little of the liquid filtrate of every plant extract followed by addition of targeted  $H_2SO_4$ . A yellow colouration determined in every extract indicated the presence of flavonoids. The yellow colouration disappeared on standing.

**Test for Steroids:** 2 ml of acetic anhydride is added to 1ml of extract of every sample with 2 ml  $H_2SO_4$ . The colour modified from violet to blue in some samples indicating the presence of steroids.

**Test for Terpenoids (Salkowski test):** 5 ml of every extract is mixed in 2 ml of chloroform, and targeted  $H_2SO_4$  (3 ml) is vigorously added to create a layer. A venetian red colouration of the interface points out positive results for the presence of terpenoids.

**Test for Triterpenoids:** One ml of every extract is added to 1 ml of chloroform; 1 ml of acetic anhydride was added following the added of 2 ml of diluted  $H_2SO_4$ . Formation of blood-red violet colour indicates the presence of triterpenoids.

**Test for Alkaloids:** Mayer's test: To a couple of (one) ml of every extract, a drop of Mayer's chemical agent was added. A creamy or white precipitate indicated the presence of alkaloid.

**Test for Anthraquinones:** 5ml of every extract solution was hydrolysed with diluted  $H_2SO_4$  extracted with benzene. 1 ml of dilute ammonia is added in this solution. Pink coloration indicated the positive response for anthraquinones.

**Test for Polyphenols:** Plant product (4 ml) is added to every extract (1ml) and also the ensuing resolution is transferred in

take a look at tubes and warmed in a water bath (15 minutes). 3 drops of freshly ready ferrous cyanide resolution were added to the extract solution. Formation of a blue colour indicated the presence of polyphenols.

**Test for Glycosides (Keller-Killani test):** Five ml of every extract was treated with 2 ml of glacial acetic acid containing one drop of ferrous chloride resolution. This is often underlaid with 1 ml of targeted  $H_2SO_4$ . A brown ring of the interface indicates a deoxysugar characteristic of cardenolides. A violet ring appeared below the brown ring, whereas within the carboxylic acid layer, a green ring could be observed step by step throughout the skinny layer.

## Results and Discussion

This study revealed that the presence of all the phytochemicals considered as active medicinal chemical constituents except anthraquinone and steroids as shown in table. Important medicinal phytochemicals such as terpenoids, triterpenoids, flavonoids, alkaloids, tannins, glycosides, polyphenol and saponin were present in considerable amount of all the samples. The phytochemical screening and qualitative estimation of all four plants studied showed that the whole plant (leaves, stem and flower) was rich with important phytochemicals. Ethanol extract of all the four varieties showed maximum presence while diethyl ether showed minimum effect with all varieties. Moss rose varieties were found rich with polyphenol, alkaloids, glycosides and saponin content. Saponins are therapeutically important because they lower bad fats in the body and have anticancer potentials. Saponins help in lowering cholesterol which will subsequently reduce the risk of cardiovascular diseases such as hypertension which usually leads to stroke. Saponins are known to produce inhibitory effect on Inflammation (Olayinka Temitayo Ogunmefun, 2018). Terpenoids are reported to have anti-inflammatory, anti-viral, anti-malarial, inhibition of cholesterol synthesis and anti-bacterial (Mahato and Sen, 1997).

Plants having alkaloids are used in medicines for reducing headache and fever. These are attributed for antibacterial and analgesic properties (Pietta, 2000). Alkaloids are useful as central nervous system (CNS) stimulants in pharmacological application. Alkaloids also find its usefulness as pain relievers. In industries anthraquinones are used for washing of bowels (laxatives) and in dye

production. Flavonoids function to reduce the risk of coronary heart diseases and possess anticoagulant, anti-inflammatory, and aphrodisiac properties (Olayinka Temitayo Ogunmefun, (2018).

**Table- Preliminary Phytochemical screening and qualitative estimation of the four varieties (red, yellow, white and orange) of *Portulaca grandiflora* whole plant extracted with different extracts (acetone, di ethyl ether and ethanol)**

S.No.	Phytochemicals	plant varieties	Acetone	Di Ethyl Ether	Ethanol
1	Tannins	Red	+	+	+++
		Yellow	+	+	++
		Pink	+	+	++
		White	+	+	+++
2	Saponins	Red	++	++	++
		Yellow	+	++	++
		Pink	+++	++-	++
		White	+++	++	++
3	Flavonoids	Red	++	+	+++
		Yellow	++	+	+++
		Pink	+	+	++
		White	++	+	++
4	Steroids	Red	+	-	-
		Yellow	-	-	-
		Pink	-	-	-
		White	-	-	-
5	Terpenoids	Red	++	+	+
		Yellow	+	+	++
		Pink	+	+	++
		White	++	++	++
6	Triterpenoids	Red	++	++	+++
		Yellow	+	+	+++
		Pink	+	++	++
		White	++	++	++
7	Alkaloids	Red	+++	+	+++
		Yellow	++	+	++
		Pink	+++	+	+++
		White	++	+	+++
8	Anthraquinones	Red	-	-	-
		Yellow	-	-	-
		Pink	-	-	-
		White	-	-	-
9	Polyphenols	Red	++	++	++
		Yellow	++	++	+
		Pink	+	++	++
		White	++	+++	+++
10	Glycosides	Red	++	+	+++
		Yellow	+	+	+++
		Pink	++	++	++
		White	+++	+	+++

**Conclusion**The selected plants varieties of moss rose plant is the rich source of the secondary metabolites i.e., alkaloids, flavonoids, terpenoids, and glycosides etc. Medicinal plants play a vital role in preventing various diseases. The phytochemical analysis of these plants is also important and have commercial interest in both research institutes and pharmaceuticals companies for manufacturing of the new drugs for treatment of various diseases.

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