ASIAN JOURNAL OF PHARMACEUTICAL AND CLINICAL RESEARCH

INNOVARE ACADEMIC SCIENCES
Knowledge to Innovation

Vol 9, Issue 3, 2016

Online - 2455-3891
Print - 0974-2441

Research Article

PHYTOCHEMICAL AND HIGH-PERFORMANCE LIQUID CHROMATOGRAPHY ANALYSIS OF EXTRACT OF *PORTULACA QUADRIFIDA* LINN.

VERMA SC[1]*, KALYAN HAZRA[2], MANISH DEVGAN[3], MADDI RAMAIAH[4], BIRESH KUMAR SARKAR[2]

[1]Pharmacopoeia Commission for Indian Medicine and Homoeopathy (Ministry of AYUSH, Government of India) PLIM Campus, Sector-23, Ghaziabad - 201 002, Uttar Pradesh, India. [2]Department of Ayurvedic Pharmaceutical Research, National Institute of Ayurvedic Pharmaceutical Research, Patiala, Punjab, India. [3]Department of Pharmacy, R.P. Educational Trust Group of Institutions, Karnal, Haryana, India. [4]Department of Pharmacognosy, Hindu College of Pharmacy, Guntur, Andhra Pradesh, India.
Email: scvpharma@gmail.com

Received: 22 January 2016, Revised and Accepted: 03 February 2016

ABSTRACT

Objective: *Portulaca quadrifida* L. is an herbal medicinal plant known for its therapeutics values in urinary and inflammatory disorders. Leaves are useful in dysentery; the plant can also act as an antihelminthic. The current study dealt to provide details information about *Portulaca quadrifida* L. including pharmacognostic and phytochemical analysis.

Methods: Current investigation involve quality control characterization of plant *Portulaca quadrifida* L. The plant extract evaluated for phytochemical and chromatographic analysis. HPLC fingerprint was carried out, which can be used for correct identification of the plant.

Results: The plant extract contains alkaloids, tannins, terpenoid and steroid. The present study provides evidence that solvent extract of *Portulaca quadrifida* L. contain medicinally important bioactive compounds.

Conclusion: The present study provides evidence that solvent extract of plant contains medicinally important bioactive compounds and this justifies the use of plant species as traditional medicine for treatment of various diseases.

Keywords: *Portulaca quadrifida* L., Phytochemical, Medicinal plant, High-performance liquid chromatography.

INTRODUCTION

Indian ancient system of medicine defines plants and their parts as important sources of herbal remedies. *Portulaca quadrifida L.* is an important medicinal herb belonging to the family Portulacaceae. It is small and erected herb. The plant is laxative, cures fevers, asthma, cough, urinary disorders, and inflammations and also used for dysentery. The various studies proved that *P. quadrifida L.* possesses potent antifungal, muscle relaxant, and anticonvulsant activity [1-3].

In spite of the numerous medicinal of the medicinal plant, the herbal industry suffering many problems regarding quality control standardization of plant material, thus the present investigation of *P. quadrifida L.* plant carried out to establish a pharmacognostic and high-performance liquid chromatography (HPLC) fingerprint profile of the plant.

METHODS

Plants of *P. quadrifida L.* were collected locally washed thoroughly and dried for further studies. The plant was grinded into powder after complete drying and used for further analysis.

Phytochemical screening [4-6]

Powdered sample was moistened with ammonia and evaporated to dryness. Dried sample was extracted with chloroform and filtered. After filtration, the chloroform layer extracted with dilute sulfuric acid using a separating funnel and the aqueous layer was separated out. Dried extract was stored in the refrigerator for future use.

Test for alkaloid

About 3 ml aqueous extract was stirred with 3 ml of 1% HCl on a steam bath. Mayer and Wagner's reagent was then added to the mixture. The turbidity of the resulting precipitate was taken as evidence for the presence of alkaloid.

Test for tannins

About 2 ml of the aqueous extract was stirred with 2 ml of distilled water, and few drops of $FeCl_3$ solution were added. Formation of green precipitate was observed as the presence of tannins.

Test for saponins

About 5 ml of aqueous extract was shaken vigorously with 5 ml of distilled water in a test tube and warmed. The formation of stable foam was observed as the presence of saponins.

Test for flavonoids

To 1 ml of aqueous extract, 1 ml of 10% lead acetate solution was added. The formation of a yellow precipitate was observed as an indicator for flavonoids.

Test for terpenoids

About 2 ml of the organic extract was dissolved in 2 ml of chloroform and evaporated to dryness. 2 ml of concentrated sulfuric acid was then added and heated for about 2 minutes. Development of a grayish color was observed as the indicator for the presence of terpenoids.

Tests for glycosides: Liebermann's test

About 2 ml of the organic extract was dissolved in 2 ml of chloroform, and then 2 ml of acetic acid was added to it. The solution was cooled in ice then sulfuric acid was added carefully. A color change from violet to blue to green was observed as the indicator for the presence of a steroidal nucleus.

Table 1: Phytochemical constitute of the extract of *Portulaca quadrifida* L.

Phytoconstituents	Inference
Alkaloid	Present
Tannins	Present
Saponins	Absent
Flavanoid	Present
Terpenoid	Present
Glycosides	Present
Steroid	Present

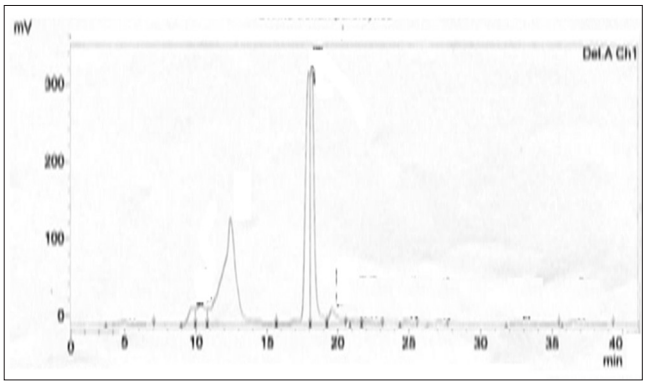

Fig. 1: High-performance liquid chromatography of plant extract

Tests for steroids

Development of a greenish color was observed when 2 ml of the organic extract was dissolved in 2 ml of chloroform and treated with sulfuric and acetic acid.

HPLC analysis

Sample preparation

The extract was prepared in HPLC grade solvent. Then, the sample was sonicated using ultrasonicator for 10 minutes. Then, the extract was filtered and injected into the HPLC column using mobile phase of 30:70 (acetonitrile:0.1% phosphoric acid).

RESULT AND DISCUSSION

The results confirm the presence of constituents which are known to exhibit medicinal as well as physiological activities. The results of phytochemical analysis of the extract are summarized in Table 1. The results revealed the presence of medicinally active constituents such as tannins, alkaloid, terpenoids, and steroids. While saponins were found to be absent. HPLC fingerprinting analysis summarized in Fig. 1 and showed three different peaks of the significant area. The alkaloids contained in plants may be responsible for central nervous system activity. The results obtained in this study thus suggest that the identified phytochemical compounds may be the bioactive constituents responsible for the efficacy of the plants. The presence of some of these compounds has also been confirmed to have various pharmacological activities. The study also established quality control parameters of the plant including analytical and phytochemical standardization.

CONCLUSION

Current investigation involves quality control characterization of plant *P. quadrifida L.* The plant extract evaluated for phytochemical and chromatographic analysis. The plant extract contains alkaloids, tannins, terpenoid, and steroid. The present study provides evidence that solvent extract of *P. quadrifida L.* contains medicinally important bioactive compounds, and this justifies the use of plant species as a traditional medicine for treatment of various diseases.

REFERENCES

1. Bhagwat GG, Chaulang GM, Ghodke DS, Patil KS, Yeole PG, Ganjiwale RO. Pharmacognostic Study of Plant *Euphorbia hirta* L. J Pharm Res 2008;1(1):39-43.
2. Hoffman BR, Delasalas H, Blanco K, Wilderhold N, Lewis RE, Williams L. Screening of antibacterial and antifungal activities of ten medicinal plants from Ghana. Pharm Biol 2004;42(1):13-7.
3. Kamil MS, Ahmed LT, Paramjyothi S. Neuropharmacological effects of ethanolic extract of *Portulaca quadrifida* Linn. In mice. Int J PharmTech Res 2010;2(2):1386-90.
4. Alagesaboopathi C, Sivakumar R. Antimicrobial properties of various extracts of *Andrographis neesiana* Wight - An endemic medicinal species from India. Int J PharmTech Res 2011;3(1):27-31.
5. Trease GE, Evans WC. Pharmacognosy. 11th ed. London: Bailliere Tindall; 1989. p. 45-50.
6. Usher G. A Dictionary of Plants Used by Man. New Delhi, India: C.B.S Publishers and Distributors; 1984. p. 220.