www.sphinxsai.com

PharmTech

International Journal of PharmTech Research
CODEN (USA): IJPRIF ISSN : 0974-4304
Vol.2, No.3, pp 1699-1702, July-Sept 2010

Preliminary Pharmacognostical And Phytochemical Evaluation of *Portulaca quadrifida* Linn.

Syed Kamil Mulla[1] and Paramjyothi Swamy[2]*

[1, 2]Department of Biochemistry, Gulbarga University, Gulbarga-585106, Karnataka, India

*Corres.author: paramjyothiswamy@gmail.com, Mob : +919341806110
[1]Author :kamil_bio@rediffmail.com, Mob-+919164858511

Abstract: The whole plant material of *Portulaca quadrifida Linn.* was collected and powedered. The powdered material was subjected to successive soxhlet extraction with petroleum ether (40-60°), chloroform, ethanol and finally macerated with water so as to get respective extracts. Fluorescence characters of powdered material were analysed under ultraviolet light and under ordinary light, which signifies their characteristics. Physicochemical parameters such as total ash value, acid insoluble ash value and water soluble ash value were determined which were 9.76, 0.94 and 5.8% respectively. Moisture content, foreign organic matter, crude fibre content, alcohol soluble extractive and water soluble extractive were also determined. The percentage yield of petroleum ether, chloroform, ethanol and water were 2.8, 2.0, 2.4 and 12% respectively. Preliminary phytochemical analysis of different extracts was carried out. The results were positive for tannins,flavonoids and triterpenoids in petroleum ether extract. Chloroform extract showed positive test for tannins only, ethanolic extract exhibited positive test for alkaloids, flavonoids, triterpenoids, glycosides, tannins, amino acids and saponins where as aqueous extract was found to be positive for flavonoids, alkaloids, carbohydrates, glycosides, amino acids and saponins. These secondary metabolites are the active constituents of *Portulaca quadrifida Linn.* and may be responsible for its pharmacological activities.
Key words : *Portulaca quadrifida*, Pharmacognostic evaluation, Phytochemical analysis and Secondary metabolites .

Introduction

Herbal drugs play an important role in health care programs especially in developing countries. Ancient Indian literature incorporates a remarkably broad definition of medicinal plants to be potential sources of medicinal substances[1]. For centuries, plant and plant products have been used for treating various illnesses. Today, several medicinal plants and their products are still in use, being employed as home remedies, over the counter drugs as well as raw materials for the pharmaceutical industry and they represent a substantial proportion of the global drug market[2]. However a key obstacle, which has hindered the acceptance of the alternative medicines in the developed countries, is the lack of documentation and stringent quality control. There is a need for documentation of research work carried out on traditional medicines[3]. Therefore it has become extremely important to make an effort towards standardization of the plant material to be used as medicine. The process of standardization can be achieved by stepwise pharmacognostic studies[4]. These studies help in identification and authentication of the plant material. Correct identification and quality assurance of the starting materials is an essential prerequisite to ensure reproducible quality of herbal medicine which will contribute to its safety and efficacy[5]. *Portulaca quadrifida Linn.* belongs to the family portulacaceae. It is a small diffused, succulent, annual herb found throughout the tropical parts of India. It is used as a vegetable and also used for various curative purposes. It is said to be useful in asthma, cough, urinary discharges, inflammations and ulcers. A poultice of the plant is applied in abdominal complaints, erysipelas and haemorrhoids[6]. *Portulaca quadrifida Linn.* has been reported to possess antifungal activity against *Aspergillus fumigates* and *Candida* albicans[7]. The present study was designed to investigate the pharmacognostic and

phytochemical properties of *Portulaca quadrifida Linn.*

Materials and Methods

Collection of plant material and authentication : Fresh whole plants of *Portulaca quadrifida Linn.* were collected from the local fields of Gulbarga District of Karnataka, India. The plant specimen was identified and authenticated by Prof. Y.N. Seetaram Dept. of Botany, Gulbarga University, Gulbarga. A voucher specimen (No. HGUG-906) is preserved in the herbarium of Dept. of Botany, Gulbarga University, Gulbarga.

Drying and size reduction of plant : The whole plant material of *Portulaca quadrifida Linn.* was subjected to shade drying for about 10 weeks. The dried plant material was further crushed to powder and the powder was passed through the mesh 22 and stored in air tight container for further analysis.

Determination of fluorescence character : Fluorescence characters of powdered plant material with different chemical reagents were determined under ordinary and ultraviolet light[8].

Determination of physicochemical parameters : The dried plant material was subjected for determination of physicochemical parameters such as total ash value, acid insoluble ash value, water soluble ash value, moisture content, foreign organic matter, crude fibre[9], alcohol soluble extractive and water soluble extractive[10].

Extraction of powdered plant material : The shade dried powdered plant material was subjected to sequential soxhlet extraction using the solvents of different polarity such as petroleum ether ($40\text{-}60^0$), chloroform, ethanol and finally macerated with water so as to get respective extracts. Cold maceration was also done using ethanol and water . The extracts were filtered individually, evaporated to dryness and the percent yields of all the extracts were determined. All the extracts were then stored in a refrigerator till further analysis.

Preliminary phytochemical analysis : Preliminary qualitative phytochemical analysis of all the extracts was carried out by employing standard conventional protocols[11].

Results and Discussion

The results of fluorescent studies of the powdered plant material using different chemical reagents are given in Table-1. Fluorescence is an important phenomenon exhibited by various chemical constituents present in plant material. Some constituents show fluorescence in the visible range in many natural products (e.g., alkaloids like berberine), which do not visibly fluoresce in day light. If the substances themselves are not fluorescent , they may often be converted into fluorescent derivatives by applying different reagents hence some crude drugs are often assessed qualitatively in this way and it is an important parameter of pharmacognostical evaluation[12]. Results for physicochemical parameters are given in Table-2. The total ash value, acid insoluble ash value and water soluble ash value were found to be 9.76, 0.94 and 5.8% respectively. The total ash value was relatively high which may be due to high content of carbonates, phosphates, silicates and silica. Ash value is useful in determining authenticity and purity of drug and also these values are important quantitative standards[13]. Percent weight loss on drying or moisture content was found to be 8.75%. The less value of moisture content could prevent bacterial, fungal or yeast growth[14]. Foreign organic matter in the powdered plant material was 8.6%, this may be contributed to the wildness of the plant leading to its contamination in the course of its collection. Crude fibre content of the plant material was found to be 32%. Determination of crude fibre is useful in distinguishing between similar drugs or in the detection of adulteration. It also helps to remove the more resistant parts of plant organs which can be used for microscopic examination. Alcohol sluble and water soluble extractive values were found to be 6.4 and 10.33% respectively. The percent yields of different extracts are given in Table-3. The percent yields of pet.ether, chloroform, ethanol and aqueous extracts were found to be 2.8, 2.0, 2.4 and 12% respectively.The percent yield of alcohol and aqueous extracts by cold extraction were found to be 2.2 and 9.8% respectively. The results of preliminary phytochemical analysis of different extracts are given in Table-4. Secondary metabolites were found in good proportion in ethanolic and aqueous extracts when compared with pet.ether and chloroform extracts. These secondary metabolites may be responsible for various pharmacological effects of ethanolic and aqueous extracts of *Portulaca quadrifida Linn.*

Conclusion

Portulaca quadrifida Linn. powder was subjected for preliminary Pharmacognostic standardization including phytochemical screening. The present investigation adds to the existing knowledge of *Portulaca quadrifida Linn*. and will be quite useful for development of a formulation for treating various ailments.

Table-1. Fluorescence characters of *Portulaca quadrifida* Linn.

S No.	Solvent used	Under ordinary light	Under ultra violet light
1	PPM	Green	Light green
2	PPM 1+ M NaOH	Yellowish brown	yellow
3	PPM + CH_3COOH	Yellowish green	Brown
4	PPM + 1 M HCL	Brown	Green
5	PPM + Dil HNO_3	Yellowish green	Light yellow
6	PPM + CH_3OH	Green	Orange red
7	PPM + 50% HNO_3	Orange red	Greenish brown
8	PPM + 1 M H_2SO_4	Light brown	Dark brown
9	PPM + 25% NH_3	Brown	Dark brown
10	PPM + 5% $FeCl_3$	Redish brown	Brown

PPM-Powdered plant material

Table-2. Physicochemical properties of *Portulaca quadrifida* Linn.

S No.	Parameters	Values obtained(%w/w)
1	Total ash value	9.76
2	Acid insoluble ash	0.94
3	Water soluble ash	5.8
4	Moisture content	8.75
5	Foreign organic matter	8.6
6	Crude fibre content	32
7	Alcohol soluble extractive	6.4
8	Water soluble extractive	10.33

Table-3. Colour, nature and percent yields of extracts of *Portulaca quadrifida* Linn.

S No.	Extract	Solvents	Colour	Nature	% Yield(w/w)
1	Sequential	Pet.ether	Yellowish green	Semisolid	2.8
2		Chloroform	Green	Solid	2.0
3		Ethanol	Light green	Semisolid	2.4
4		Water	Dark brown	Solid	12
5	Cold	Ethanol	Dark green	Semisolid	2.2
		Water	Brown	Solid	9.8

Table-4. Preliminary phytochemical analysis of different extracts of *Portulaca quadrifida* Linn.

Phytoconstituents	Pet.ether	Chloroform	Ethanol	Aqueous
Alkaloids	−	−	+	+
Flavonoids	+	−	+	+
Saponins	−	−	+	+
Tannins	+	+	+	−
Glycosides	−	−	+	+
Carbohydrates	−	−	_	+
Amino acids	−	−	+	+
Triterpenoids	+	−	+	−

+ = Present, − = Absent.

References

1. Shankar D. and Ved D.K. (2003). Indian Forester. 129, 275-288.
2. World Health Organization Geneva, Quality control methods for medicinal plant materials, Type set in Hong kong, Printed in England, ISBN 92 415 45100 (NLM classification QV 766).
3. Dahanurkar S.A., Kulkarni R.A. and Rege N.N. (2000). Ind.J. Pharmacol., 32 ; 81-118.
4. Ozarkar K.R. (2005). Studies on anti-inflammatory effects of two herbs *Cissus quadrangularis Linn*. and *Valeriana wallichi* DC using mouse model. Ph.D. Thesis, University of Mumbai, Mumbai.

5. Thomas S., Patil D.A., Patil A.G. and Naresh Chandra, (2008). Pharmacognostic evaluation and physicochemical analysis of *Averrhoa carambola L.* fruit. J of Herb Med and Toxicol. 2(2), 51-54.
6. Kirtikar and Basu (2001). Indian Medicinal Plants. Dehra Dun, Uttaranchal,India, Vol-2 ; 333-335.
7. Hoffman B.R., Delas Alas, Blanco K., Wilder hold N., Lewis R.E., Williams L. (2004). Screening of antibacterial and antifungal activities of ten medicinal plants from Ghana. Pharm. Biol., 42(1), 13-17.
8. Chase C.R. and Pratt R.J.(1949). Fluorescence of powdered vegetable drugs with particular reference to development of a system of identification. J. Amer.Pharm.Assoc. 38, 324-331.
9. Raghunathan (1976). Pharmacopoeia standards for Ayurvedic formulations. Central Council for Research in Indian Medicine and Homeopathy, E-25, Defence colony, New Delhi.
10. Usha S., Pannine J. and Sharma H.P (1984). Pharmacognostic studies on *Artemisia scoparia* Waldst and Kit, proc. Indian Acad. Sci.(Plant science), 93, 151-164.
11. Trease E.G., Evans W.C (1978). Pharmacognosy. 11th Edition, Balliere Tindall, London. 115-222.
12. Ansari S.H (2006).Essentials of pharmacognosy. 1st Edn. Birla Publications Pvt. Ltd. New Delhi.
13. Kokate C.K., Purohit A.P. and Gokhale S.B (2006). Pharmacognosy. 34th Edn. Nirali Prakashan, Pune, India.
14. African pharmacopoeia (1986). General methods for analysis. 1st Edn. Vol.2 (OAU/STRC) Lagos.p-123.

*****