Research Article

Estimation of Total Phenolic Content and Invitro Antioxidant Activity Of Bacopa monnieri

M.Sravan Prasad^{1*}, Manoranjan.S², G.Venkateshwarlu², CH.Madhu¹, A.Sambasivarao¹, Sujit ku. Patro³

1.Sri indu institute of pharmacy, Sheriguda, Ibrahimpatnam, R.R dist

2. Venkateshwara institute of pharmaceutical sciences, cherlapally, Nalgonda

3.Bhaskara college of pharmacy, Vijayanagaram dist

ABSTRACT:

The total phenolic content of aqueous extract of plant material of Bacopa monnieri belonging to family scrophulariaceae was assessed by using Folin ciocalteau reagentaccording to Singleton and Rossi using Gallic acid as a standard and vitro antioxidant activity determined according to the method of Oyaizu. hydrogen peroxide scavenging method.moreover Bacopa monnieri plant materials showed strong reducing power and significant antioxidant activity. The total phenolic content measured by Folin ciocalteau was found to be 58 mg GAE/ g .in hydrogen peroxide scavenging method the IC50 value was found to be 254.70 μ g/ml.

Key words: Bacopa monnieri, phenolic content, antioxidant activity, IC50 value

INTRODUCTION:

Bacopa monnieri(Indian Penny wort) commonly known as brahmiAnd Tella Mulaka in telugu is one of the species belonging family scrophulariaceae Bacopa monniera, amember of the Scrophulariaceae family, is a small, creeping herbwith numerous branches, small oblong leaves, and light purple flowers. In India and thetropics it grows naturally in wet soil,shallow water, and marshes. The herb can be foundat elevations from sea level to altitudes of 4,400 feet, and is easily cultivated if adequatewater is available. Flowers and fruit appear in summer and the entire plant is used medicinally. Traditionally, it was used as a brain tonic¹ to enhance memory development, learning,and concentration, and to provide relief to patients with anxiety² or epilepticdisorders³. The plant has also been used in India and Pakistan as a cardiac tonic,digestive aid⁴, and to improve respiratory function in cases of broncho constriction⁵. Recent research has

INTERNATIONAL JOURNAL OF PHYTOTHEARPY RESEARCH ISSN 2278 - 5701

focused primarily on Bacopa's cognitiveenhancing effects, specifically memory⁶, learning, and concentration and results support the traditionalAyurvedic claims.Research on anxiety⁷, epilepsy, asthma⁸, bronchitis and irritable bowelsyndrome⁹, and gastric ulcers+ also supports the Ayurvedic uses of Bacopa. Bacopa's antioxidant properties may offer protection from free radical damage in cardio vasculardisease and certain types of cancer.The aim of the study was to carry out the determination of total phenolic content in the aqueous extract of Bacopa monnieri and its antioxidant activity.

MATERIALS AND METHODS:

Preparation of plant extract :

The plant material of Bacopa monnieri were shade dried and then powdered withmechanical grinder to form a coarse powder. The powder was passed through sieve no 40 and was stored in an air tight container until further use. The powder was used for the extraction process .solvent was evaporated to dry ness and then subjected to determination of total phenolic content and antioxidant activity materials

Materials and chemicals:

210 UV **ElicoSL** visible spectrophotometer acetic acid . phosphate , disodium, hydrogen peroxide, Ascorbic Acid, acid (glacial), ,Gallic acid, sodium carbonate, folin ciocalteau reagent .distilled water Incubator. homogenizer, water bath, heating mantle, centrifuge, weighing balance. all the chemicals are obtained from S.D fine chemicals Mumbai. All the chemicals used in this research work are analytical grade.

Estimation of total phenolic content by gallic acid :

Total Phenolic content of the extract was determined by Folin ciocalteau reagent according to Singleton and Rossi using Gallic acid as a standard. 0.1ml (100 µg) of sample solution was made up to 3ml using distilled water. About 0.5ml of Folinciocalteau reagent was added and mixed thoroughly. Incubated for 3min at room temperature. After incubation 3ml of 20% Na2CO3 was added and mixed thoroughly, incubated in boiling water bath for 1 min. the absorbance was measured at 650nm. The concentration of total phenols was expressed in terms of mg of Gallic Acid equivalents per gram of extract

Hydrogen peroxide scavenging activity:

The H2O2 scavenging ability of the extract was determined according to the method of Ruch et al. A solution of H2O2 (40mM) was prepared in phosphate buffer (pH 7.4). 100, 200.300.400.500 µg/ml concentrations of extract in 3.4ml Phosphate buffer were added to H2O2 solution (0.6ml, 40mM). The absorbance value of the reaction mixture was recorded at 230nm. The percent of scavenging of H2O2 was calculated by using the following equation.

% of scavenging = [(A of control – A of sample) / A of Control] X 100

Where A of control is the absorbance of the control reaction (containing all reagents except test compound) and a sample is the absorbance of the test compound. Test was carried out in triplicate.

INTERNATIONAL JOURNAL OF PHYTOTHEARPY RESEARCH ISSN 2278 - 5701

RESULTS AND DISCUSSION:

The total phenolic content was estimated by Gallic acid was found to be 58 mg GAE/ g.

THE aqueous extract of Bacopa monnieri plant material showed prominent IC50 value of 254.70 μ g/ml by hydrogen peroxide method. The method used here are genuine and simple (Figure 1 and 2).



Figure 1: Total phenolic content



Figure 2:Hydrogen peroxide scavenging of Bacopa monnieri aqueous extract and satndard.

CONCLUSION

Antioxidants were believed to be a panacea for many disorders in the early years of their discovery. Their importance still remain the same even several years later , when their discovery has been superseded by numerous noteworthy contributions.The phytochemical screening of aqueous extracts of Bacopa monnieri showed the presence of phenols which are considered to be responsible for

INTERNATIONAL JOURNAL OF PHYTOTHEARPY RESEARCH ISSN 2278 - 5701

antioxidant activity. Therefore Bacopa monnieri was considered to possess antioxidant activity. The literature clearly suggests that Bacopa monnieri has been widely used as potent antioxidant as demonstrated in ethno medicine. In order to evaluate the veracity of the traditional use of Bacopa monnieri, in vitro antioxidant activity of aqueous extracts of bacopa monnieri were conducted. The investigations on Bacopa monnieri plant extracts were found to yield substantial positive data pointing towards the evidence of antioxidant activity. The data obtained from hydrogen peroxide radical assay scavenging, clearly suggested that the antioxidant activity of Bacopa monnieri was dose dependent. It can also be noted that the extract of Bacopa monnieri was found to scavenge the free radicals such as peroxides, super oxides and hydroxyl radicals. Finally our studies concluded that Bacopa monnieri has antioxidant activity and therefore it can be used as an antioxidant along with the other suggested and proven therapeutic remedies such as nervine tonic, cardiotonic, cognitive enhancer and alterative.

REFERENCES:

1. Sen S, Chakraborty R, Sridhar C, Reddy Y S R, De B. Free radicals, antioxidants, Diseases and phytomedicines : Current status and Future prospect. International Journal of Pharmaceutical Sciences Review and Research. 2010; 3(1): 91-100.

2. Machlin L J and Bendich A. Free radical tissue damage: protective role

of antioxidant nutrients. Symposium presented by the American Institute of nutrition at the 71 Annual meeting of the Federation of American Societies for Experimental Biology; 1987 April 2; Washington, DC.

3. Valko M, Leibfritz D, Moncol J, Cronin M T D, Mazur M, Telser J. Free radicals and antioxidants in normal physiological functions and human disease. The International Journal of Biochemistry and Cell Biology. 2007(39) 44-84.

4. Kumar V, Abbas A K, Fausto N Cellular Adaptations, cell injury and cell death. In: Robbins and Cotran, editors. Pathologic basis of disease. Philadelphia: Saunders; 2009. p. 15-18.

5. Harsh Mohan, Cell Injury and cellular Adaptations. In: Textbook of Pathology. New Delhi: Jaypee Brothers medical publishers; 2010. p. 21-34.

6. Scheibmeir H D, Christensen K, Whitaker H S, Jegaethesan J,Clancy R, Pierce J D. A review of free radicals and antioxidants for critical care nurses. Intensive and Critical Care Nursing. 2005; 21: 24-28.

7. Sireesha K. Evaluation of Adaptogenic activity of Ocimum Sanctum by in vivo and invitro methods. M.Pharm. Thesis, Dept of Pharmacology, Roland Institute of Pharmaceutical Sciences, Berhampur, Orissa. (2006).27-31.

8. Cardoso S, Santos R X, Carvalho C, Correia S, Santos S N, Moreira P I. Mitochondrial uncoupling proteins and oxidative stress: Implications for

INTERNATIONAL JOURNAL OF PHYTOTHEARPY RESEARCH ISSN 2278-5701

Diabetes and Neurodegeration. Free Rad. Antiox. 2011; 1(2): 4-14.

9. Wu D and Cederbaum A I. Alcohol, Oxidative Stress, and Free Radical Damage. Alcohol Research & Health. 2003; 27(4): 277-284.

10. Agarwal, HCLD and Gupta S. The role of free radicals and antioxidants in female infertility and assisted reproduction. US Genito – Urinary Disease. 2006; 60-65.