Yalla Reddy K. *et al.* / *International Journal of Phytopharmacology*, 1(1), 2010, 43-46.

ISSN 0975 – 9328

International Journal of Phytopharmacology

Journal homepage: www.onlineijp.com

IJP

ANTIOXIDANT PROPERTIES OF METHANOLIC EXTRACT OF *OXALIS CORNICULATA*

***K. Yalla Reddy, [1]A. Saravana Kumar, [1]S. Mohana Lakshmi, [1]Surendar Angothu**

*,[1] Sree Vidyanikethan College of Pharmacy, Tirupati, Andhra Pradesh, India.

ABSTRACT

The whole plant *oxalis corniculata* (Oxalidaceae) has been used traditionally in folk medicine for treating anaemia wounds, cancer, piles. The methanolic extract of *oxalis corniculata* (MEOC) have been proven experimentally to possess antioxidant activity in *invitro* methods. MEOC showed effective response on 2,2-Diphenyl-1-picryl-hydrazyl radical (DPPH) method for determining the free radical scavenging activity. The plant contain majorly c-glycosyl flavones and rich in Vit-C. The concentration of plant extract required for 50% inhibition of DPPH radical scavenging effect (IC_{50}) were recorded as 30 µg/ml and 37 µg/ml for MEOC and standard ascorbic acid. These results suggest that the MEOC possess antioxidant activity compared to ascorbic acid.

Key words: *Oxalis corniculata*, DPPH, Vit-C, Antioxidants, Scavenging activity.

INTRODUCTION

Antioxidants may be defined as radical scavengers. Which protect the human body against free radicals. Free radicals may cause pathological conditions like anaemia, asthma, arthritis, inflammation, neuro degeneration, parkinson's disease, mongolism, ageing and dementias (Makari *et al*., 2008, Polteraita *et al*., 1997, Zetola *et al*., 2002, Augustin *et al*., 2005). Free radicals are generated as part of the body's normal metabolic process, and the free radical chain reactions are usually produced in the mitochondrial respiratory chain, liver mixed function oxidases, atmospheric pollutant, drugs and metal catalysts (Naznin Ara and Hasan Nur, 2009). Free radicals cause oxidative damage to lipids, proteins and nucleic acids (Shui and Leong, 2004) antioxidants are added to a variety of foods to prevent the lipid oxidation. Which is responsible for the development of off-flavours and the undesirable chemical compounds in food (Angelo, 1996).

Plants are potent biochemical factories. Plants based natural constituents can derived from any part of the plant. Antioxidant drugs which are potential acting and prevention of pathological conditions. The continous antioxidant dose plays a preventive role against cancer and ageing by removing reactive oxygen species (ROS) in biological systems (Sgembato *et al*., 2001). The most of the antioxidant compounds are flavanoids, isoflavones, coumarines, lignans, anthocyanins, flavones and isocatechins. These antioxidant compounds are obtain from natural foods and vit-C and E, carotene and tocopherol.

*Corresponding author

K.Yallareddy

Email ID: yallareddy777@gmail.com

The plant *oxalis corniculata* (creeping wood sorrel) also called procumbent yellow sorrel belongs to family oxalidaceae. It is very popular perennial herb that is distributed in world wide. The leaves of wood sorrel are quite edible with a tangy taste (Lee Allen Peterson, 1977).

The entire plant is rich in vitamin-C. The plant *oxalis corniculata* leaves having three major C-glycosylflavones are reported. These are isoorientin, isovitexin and swertisin etc., (Hiroki Mizokami *et al*., 2008). Oxalis corniculata used in wound healing (Taranalli *et al*., 2004), Abortifacient antimplantation (Sharangouda and Patil *et al*., 2007). Antibacterial activity (Satish *et al*., 2008) anti fungal activity (Iqbal *et al*., 2002) relaxant activity (Achola *et al*.,1995) and other traditionally used in anaemia, dyspepsia, cancer, piles, dementia, convulsionis (Madhava Chetty *et al*., 2008).

In this study the methanolic extract of *oxalis corniculata* (MEOC) showed the potent antioxidant activity. In the DPPH free radical scavenging method and reducing power method. In this two methods using ascorbic acid as standard sample.

MATERIALS AND METHODS

Plant material

The whole plant of *oxalis corniculata* was collected from Talakona forest, Chittoor district of Andhra Pradesh, India, in the month of September 2009. The plant was authenticated by Prof. P. Jayaraman, Director of National Institute of Herbal Science, W. Tambaram, Chennai. The voucher specimen (PARC/2009/343) of the plant was deposited at the college, for further reference.

Preparation of extract

The whole plant of *oxalis corniculata* wash with water for removing the soil material from the roots, and dried under shade. The dried plant material was grounded into fine powder. Powder (200g) are extracted with methanol using soxhlet extraction process. The extract was concentrated to a dark blackish residue. The crude extract was used for further investigation for potential antioxidant properties.

MEASUREMENT OF THE ANTIOXIDANT ACTIVITY

DPPH Radical scavenging test

The free radical scavenging activity of the methanolic extracts of *oxalis corniculata* (MEOC) was determined by using 2,2 Diphenyl-1-picryl hydrazyl radical (DPPH) using UV-Spectrometry (Mathiesen *et al*., 1995) at 517nm. The DPPH solution was prepared in 95% methanol. The MEOC was mixed with 95% methanol to prepare the stock solution (10mg/100ml or 100µg/ml). From the stock solution 2ml, 4ml, 6ml, 8ml and 10ml of this solution were taken in five test tubes and by serial dilution with same solvent were made the final volume of each test tube up to 10ml whose concentration was then 20µg/ml, 40µg/ml, 60µg/ml, 80µg/ml and 100µg/ml respectively. Freshly prepared DPPH solution (0.004% w/v) was added in each of their test tubes. Containing MEOC (20µg/ml, 40µg/ml, 60µg/ml, 80µg/ml and 100µg/ml) and after 10 min, the absorbance was taken at 517nm. Using a spectrophotometer (SHIMADZU UV-1700, UV-visible spectrophotometer). Ascorbic acid was used as a reference standard. It is dissolved in distilled water to make stock solution with the same concentration of MEOC control sample was prepared without extract and reference ascorbic acid. 95% methanol was used as blank % scavenging of the DPPH free radical was measured using following equation.

% DPPH radicals-scavenging = [(Absorbance of control – Absorbance of test Sample) / (Absorbance of control)] x 100.

Reducing Power Method

The assay of reducing power method (Koleva *et al*., 2002, Makari *et al*., 2008) is one to determine the antioxidant activity. In this 1 ml of plant extract of MEOC solution mixed with 2.5 ml phosphate buffer (0.2M, pH 6.6) and 2.5 ml potassium ferricyantide [K_3Fe (CN6)] (10g/l), the mixture was incubated at 50°C for 20 minutes. 2.5 ml of Trichloroacetic acid (100g/l) was added to mixture. Which was centrifuged at 3000 rpm for 10 min. Finally 2.5 ml of the supernatant solution was mixed with 2.5 ml of distilled water and 0.5 ml $FeCl_3$ (lg/L) and absorbance measured at 700nm in UV-visible spectrophotometer (SHIMADZU UV-1700, UV-visible spectrophotometer). Ascorbic acid was used as standard and phosphate buffer used as blank.

RESULTS

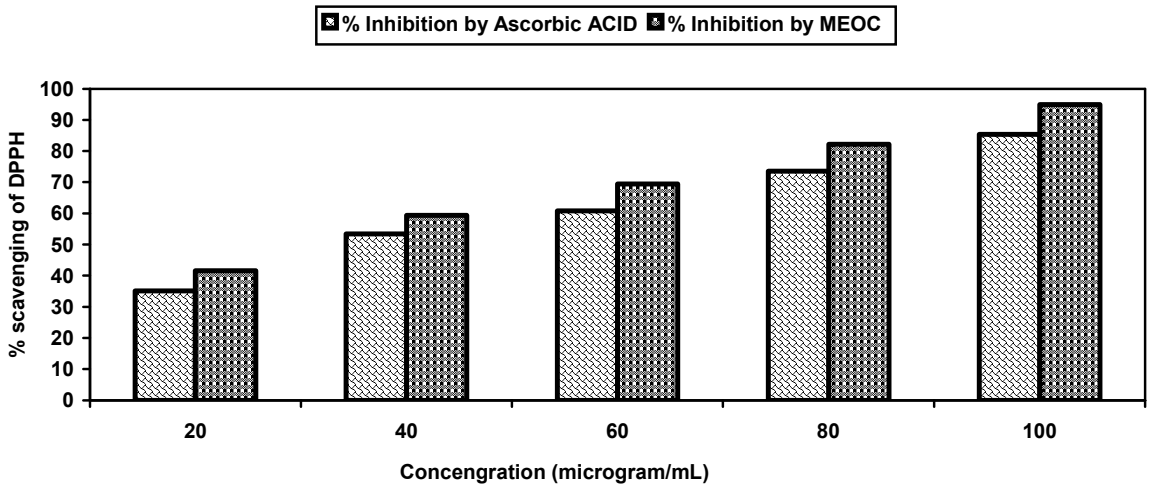

Fig. 1: DPPH radical scavenging activity of methanolic extracts of *oxalis corniculata* (MEOC) added to methanolic solution of DPPH and radical scavenging activity was measured as 517 nm as compared to standard Ascorbic acid. Values are the average of triplicate experiments and represented as mean ± standard deviation.

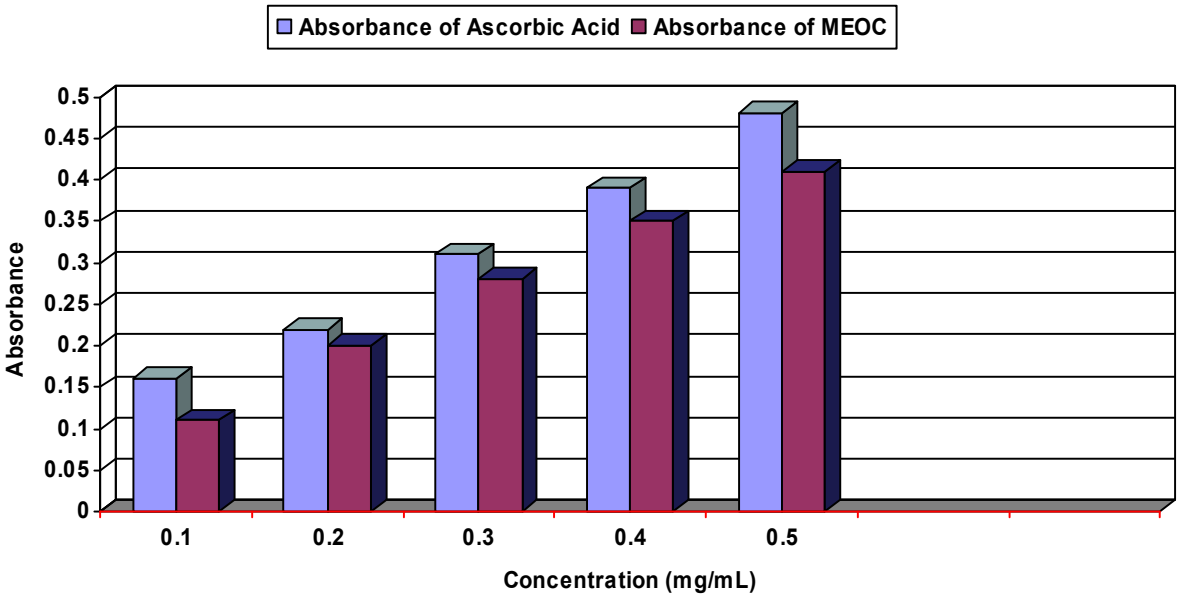

Fig. 2: Reducing power of methanolic extract of *oxalis corniculata* (MEOC) of as compared to Ascorbic acid. Values are the average of triplicate experiments and represented as mean ± standard deviation.

DISCUSSION

In this present study the methanolic extract of whole plant *oxalis corniculata* were investigated by using DPPH scavenging test and reducing power method. The whole plant of MEOC showed by there two methods effectively when compared with reference standard ascorbic acid. In the DPPH scavenging method is based on the capability of DPPH radical to decolorize in the presence of antioxidants. The DPPH radical is considered to be model of a stable lipophilic radical a chain reaction in lipophilic radicals was initiated by the lipid autooxidation antioxidants react with DPPH reducing a

number of DPPH molecules equal to number of their hydroxyl groups. Therefore, the absorption at 517 nm was proportional to the amount of residual DPPH (Xu *et al*., 2005). In figure-1. The MEOC exhibited a significant dose dependent inhibition of DPPH activity. The IC50 values of the MEOC and reference standard ascorbic acid were found to be 30 μg/mL and 37 μg/mL respectively.

The reducing power method based on the capability of a reducing the compound due to presence of reductants which are breaking the free radical chain by donating hydrogen atom. The whole plant of MEOC exhibited the antioxidant activity due to presence of reductants (i.e., antioxidants). The reduction of Fe3+/Ferricyanide complex to ferrous form. In this main principle is increasing the absorbance of the reaction mixture indicates the antioxidant activity that leads to reducing power of the samples. In Figure-2 MEOC was very potent and the power of extract was increased with quantity of sample. By comparing the reference standard ascorbic acid the MEOC showed potent antioxidant activity.

CONCLUSION

In the current study, the methanolic extract of *oxalis corniculata* showed potent antioxidant activity compare to reference standard ascorbic acid. Majority the free radicals may cause pathological conditions leads to several diseases which can be prevented by antioxidants. The medicinal plants showed antioxidant property for prevention of pathological conditions. The results suggests that the MEOC showed significant antioxidant activity may be rich in vit-C and c-glycosyl flavones. The natural plant extracts will help to develop new drug entities for antioxidant therapy.

REFERENCE

Achola KJ, Mwangi JW, Munenge RW. Pharmacological activity of oxalis corniculata. *Pharmaceutical biology*, 33 (3), 1996, 247-249.

Angelo AJ. lipid oxidation in food. *Critical reviews in food science and nutrition*, 35, 1996, 175-224.

Augustin S, Clavdine M, Christine M, Christian R. Dietarypolyphenols and the prevention of diseases. *Rev. Food sciences*, 2005, 287-306.

Hiroki MizoKami, Kaoritomita-yokotani, Kunijiro Yoshitama. Flavanoids in the leaves of *oxalis corniculata* and sequestration male grass blue butterfly, pseudozizeeria maha. *J Plant Res.,* 121, 2008, 133-136.

Iqbal MCM, Mejalagham S, Wijesekara KB, Abeyrantne KP. Antifungal activity from water extracts of some common weeds. *Pakisthan Journal of biological sciences*, 4 (7), 2002, 843-845.

Koleva I I, Van Beek TA, Linssen JPH, De Groot A, Evstatieva LN. Screening of plant extracts for antioxidant activity, a comparitive study on three testing method. *Phytochemical analysis*, 13, 2002, 8-17.

Lee Allen Peterson, Edible wild plants, Houghton Mifflin company, New York City, 1977, 104.

Madhavachetty K, Sivaj JK, Tulasi Rao K. Flowering plants of Chittoor district, Andhra Pradesh, India, Student offset printers, Tirupati, 1st edition, 2008, 54-55.

Makari HK, Haraprasad N, Patil HB, Ravi Kumar. In vitro antioxidant activity of the hexane and methanolic extracts of *cordial wallichi* and *celastrus peniculata*. *The internet J. Aesthetic and antiaging medicine*, 1, 2008, 1-10.

Mathiesen L, Malterud KE, Sund RB. Antioxidant activity of fruit exudate and methylated dihydrochalcones from myrice gale. *Plenta Med*., 61, 1995, 515-518.

Naznin Ara, Hasan Nur. In vitro antioxidant activity of methanolic leaves and flowers extracts of *lippia alba. Research journal of medicine and medical agencies*, 4 (1), 2009, 107-110.

Polterait O. Antioxidants and free radical scavengers of natural origin. *Current org. Chem*., 1, 1997, 415-440.

Satish S, Raghavendra MP, Raveesha KA. Evaluation of the antibacterial potential of some plants against human pathogenic bacteria. *Advances in biological research*, IDOSI, 2 (3-4), 2008, 44-48.

Sgembato A, Ardito R, Faraglia B, Boninscgna A, Wolf FI, Cittadini A. Resveratrol, a natural phenolic compound inhibits cell proliteration and prevents oxidative DNA damage. *Mutation research*, 496, 2001, 171-180.

Sharangouda K, Patil SB. Anti implantation and abortifacient activities of oxalis corniculata in albino rats. *Nigerien journal of natural products and medicine*, 11, 2007, 58-60.

Shui GH, Leong LP. Analysis of polyphenolic antioxidants in star fruit using liquid chromatograjhy and mass spectrometry. *J Chromatogr A.,* 1022, 2004, 67-75.

Taranalli AD, Tipare SV, Kumar S. Wound healing activity of oxalis corniculata whole plant extract in rats. *Indian Journal of pharmaceutical sciences,* 66 (4), 2004, 444-446.

Zetola M, Lima TCM, Sonaglio D et al., CNS activities of liquid and spray-dried extracts from *lippia alba* verbenaceae (Brazihian false Melisa). *J. Ethnopharnacology*, 82, 2002, 207-215.