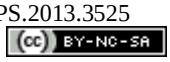
Journal of Applied Pharmaceutical Science Vol. 3 (05), pp. 131-133, May, 2013
Available online at http://www.japsonline.com
DOI: 10.7324/JAPS.2013.3525
ISSN 2231-3354 

Short Communication

The Antioxidant Potentials and Phytochemical Properties of the Hexane, Ethyl acetate and Ethanolic Extracts of *Securinega virosa* (*Euphorbiaceae*) Leaves

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ARTICLE INFO

Article history:
Received on: 21/01/2013
Revised on: 09/03/2013
Accepted on: 13/05/2013
Available online: 30/05/2013

Key words:
Antioxidants activity, Phytochemical screening, *Securinega virosa*, Ethanolic extract, Flavonoids.

ABSTRACT

The study was undertaken to evaluate the phytochemical properties and antioxidant potentials of hexane, ethylacetate and ethanolic leaf extracts of *Securinega virosa*. The phytochemical screening was carried out by standard procedures, while the antioxidant activity of the extracts were measured in terms of hydrogen donation or radical scavenging ability using the stable radical,1,1-Diphenyl-1-picrylhydrazyl (DPPH).The phytochemical screening revealed the presence of saponins, alkaloids, flavonoids and Balsams in hexane extract.Phenols, carbohydrates and Balsams in ethyl acetate extract.Tannins, saponins, phenols, alkaloids, flavonoids, carbohydrates and cardenolide in ethanolic extract. The hexane, ethylacetate and ethanolic leaf extracts of Securinega virosa have very good antioxidant activities, with ethanolic extract having the best activity. The activities may be due to the presence of flavonoids and phenols. The leaf extracts of *Securinega virosa* have high antioxidant activities, with the ethanolic extract having the greatest antioxidant activity than the hexane and ethyl acetate extracts.

INTRODUCTION

Securinega virosa is widely distributed throughout Malaya, China, tropical Africa, Australia and India, (Dalziel,1986).This is one of the great African medicinal plant described as a true "cure all", of which all parts are used as remedies, particularly the root (Neuwinger,1996). The leaves are used in the treatment of stomachache, rheumatism, diarrhea, epilepsy, diabetes,body pain and fever (Neuwinger,1996). The family name of the plant is Euphorbiaceae.

The plant is also known as common bushweed. Antioxidants are radical scavengers which protect the human body against free radicals that may cause pathological conditions. Plants phytochemicals produce definite physiological actions in the human body. The medicinal values of plants lie in the component of their phytochemicals. Phytochemicals are secondary metabolites produced by plants (Hill, 1992). Research interest has been directed to the use of natural phytochemical for the formulation of antioxidant based drugs (Mondon,et al,1999). The majority of the active antioxidant compounds are flavonoids, flavones , isoflavones, anthocyannins, cumarins, lignans, catachins, phenols and isocatachins.

Flavonoids and flavones are widely distributed secondary metabolites with antioxidant and antiradical properties (Polterait,1997; Prior,2003; Makari,et al,2008; Augustin, et al,2005; Trease and Evans,1989). The aim of the investigation was to evaluate the phytochemical properties and antioxidant potentials of hexane, ethylacetate and ethanolic leaf extracts of *Securinega virosa.*

MATERIALS AND METHODS

Collection of sample

The leaves of *Securinega virosa* were obtained from Sheda Science and Technology Complex (SHESTCO), Sheda, Abuja, Nigeria, during the rainy season. The leaves were rinsed with water and air dried in the laboratory for two weeks.

They were ground with Excella mixer grinder and sieved with amesh of size 0.5mm.The powdered samples obtained were stored in clean air tight containers at ambient temperature until when needed for use.

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Preparation of Extracts

The powdered leaf sample was extracted using hexane, ethylacetate and ethanol. 200g of the powdered leaf sample was packed in a muslin cloth and inserted into the soxhlet extractor and hexane was used as the extraction solvent for a period of eight hours. At the end of the period, the solvent was recovered by rotary evaporator. Ethylacetate and ethanol was also used as the extraction solvents for a period of another eight hours for each solvent. At the end of the periods, the solvents were recovered by rotary evaporator and the extracts were collected. The extracts were then transferred to a desicator and allowed to cool before they were analysed.

Phytochemical screening of extracts

The phytochemical screening was carried out on the hexane, ethylacetate and ethanolic extracts using the methods described by Uzama, (2009) and Sofowora, (1993).

Antioxidant activity of the leaf extracts

The radical scavenging activities of the leaf extracts against 1,1-Diphenyl-1-picrylhydrazyl radical were determined by UV spectrophotometer at 517nm.

The following concentrations of the extracts were prepared,0.05,0.1,0.5,1.0,2.0 and 5.0mg/ml in methanol. Vitamin C was used as the antioxidant standard at concentrations of 0.02, 0.05, 0.1, 0.5 and 0.75mg/ml. 1ml of the extract was placed in a test tube and 3ml of methanol was added followed by 0.5ml of 1mM DPPH in methanol. A blank solution was prepared containing the same amount of methanol and DPPH. The radical scavenging activity was calculated using the following formula: % inhibition = $[\{A_b - A_a\}/A_{b]} \times 100$, where A_b is the absorption of the blank sample (without the extract) and A_a is the absorption of the extract.

RESULTS AND DISCUSSIONS

Phytochemical analysis

The results of the phytochemical analyses are shown in Table1.This revealed the presence of saponins, flavonoids and Balsams in the hexane extract.Phenols, carbohydrates and Balsams were present in the ethyl acetate extract, while tannins, saponins, phenols, alkaloids, flavonoids, carbohydrates and cardenolides were present in the ethanolic extract.

The compounds phenols, alkaloids and cardenolide detected in the extracts are known to possess medicinal properties and health promoting effect.

Antioxidant potentials

The antioxidant activities of hexane, ethyiacetate and ethanol extracts determined are represented in figure1. All the leaf extracts of Securinega virosa have high antioxidant activities within the concentration range of 0.5mg/ml – 5.0mg/ml, but the ethanolic extract has the greatest antioxidant potential than the hexane and ethyl acetate extracts, while the ethyl acetate extract has greater activity than the hexane extract. The Securinega virosa leaf extracts were a little bit lower in activity than the standard antioxidant, ascorbic acid (Vit.C).

The presence of phenols and flavonoids in the leaf extracts may have been responsible for the observed antioxidant activities.

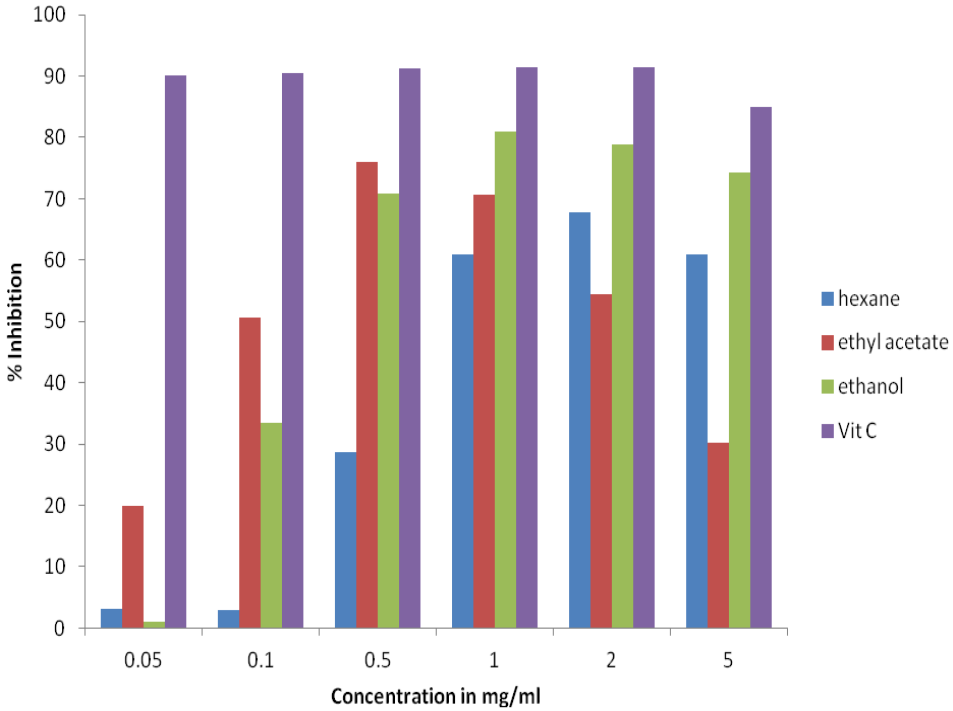

Fig. 1: Antioxidant activity of Securinega virosa leaf extracts compared with a standard antioxidant (Vit.C).

Table. 1: Phytochemical analysis of the leaves of Securinega virosa in different solvent extracts.

Phytochemical Constituent	Hexane Extract	Ethyacetate Extract	Ethanol Extract
Tannins	-	-	+
Steroids	-	-	-
Triterpenoid	-	-	-
Glycosides	-	-	-
Saponins	+	-	+
Phenols	-	+	+
Alkaloids	+	-	+
Terpenoids	-	-	-
Flavonoids	+	-	+
Carbohydrates	-	+	+
Phlobatannins	-	-	-
Volatile oil	-	-	-
Balsams	+	+	-
Antraquinones	-	-	-
Cardenolide	-	-	+

- = Absent and + = Present

CONCLUSION

The study showed that Securinega virosa leaf extracts have very good antioxidant activities which may be due to the presence of phenols and flavonoids in the extracts.

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How to cite this article:

Uzama Danlami, Bwai Machan David,Orijajogun Omohu Joyce,Olajide Olutayo and Sunday Asuquo Thomas., The Antioxidant Potentials and Phytochemical Properties of the Hexane, Ethyl acetate And Ethanolic Extracts of *Securinega virosa* (*Euphorbiaceae*) Leaves. J App Pharm Sci. 2013; 3 (05): 131-133.