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IN-VITRO ANTIOXIDANT AND PHYTOCHEMICAL SCREENING OF ETHANOLIC EXTRACT OF *ALPINIA PURPURATA*

Justi Jovitta. C*, Sreenivasan Aswathi and S. Suja

Department of Biochemistry, Dr. N.G.P Arts and Science College, Kalapatti road, Coimbatore-641 048, Tamil Nadu, India

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Correspondence to Author:

Justi Jovitta. C

Department of Biochemistry, Dr. N.G.P Arts and Science College, Kalapatti road, Coimbatore-641 048, Tamil Nadu, India

ABSTRACT

Plants containing bioactive substances have increasingly become the object of research studies, opening alternative paths for therapeutic treatments or revealing substances that could later be explored and synthesized to produce pharmaceutical, cosmetic and agrochemical formulations. *Alpinia purpurata* have strong effect on H_2O_2 induced oxidative damages. The extract of *Alpinia purpurata* showed a higher antioxidant activity. The results suggest that the plants extract prevent oxidative damage in normal cells probably because of their antioxidant characteristics.“Phytochemicals or phytoconstituents” are becomingly known for their antioxidant activity.

INTRODUCTION: Medicinal plants have been used to cure disease since antiquity. Plants still constitute one of the major sources of drugs in modern as well as traditional medicine throughout the world. Plants belonging to Zingiberaceae (Ginger family) are known for number of medicinal properties. Rhizome extract of some members of the medicinal Zingiberales are widely used in dietary intake as well as in traditional systems of medicine. Several species of *Alpinia* are used as flavoring agents, while several others are used as ingredients in traditional medicine formulation.

Alpinia purpurata is one of the species cultivated in gardens for ornamental purposes for its attractive and long-lasting flowers. These plants are important sources of raw material for many useful products: foods, spices, medicines, perfumes, dyes and fiber paper. *A. Purpurata* (red inflorescence) is an herbaceous perennial plant (vielli. K. Schum). Investigations of phytochemical compounds have been important tools to study plant classification and evolution.

Medicinal plants has played an important role in the treatment of cancer and most clinical applications of plant secondary metabolites and their derivatives over the half century have been applied towards combating cancer. Of all available anticancer drugs between 1940 and 2002, 40% were natural products or natural product derived, with another 8% considered natural product mimics. These changes contribute to cancer, artherosclerosis, cardiovascular diseases, ageing and inflammatory diseases. All human cells protect themselves against free radical damage by enzymes such as superoxide dismutase (SOD) and catalase, or compounds such as ascorbic acid and glutathione.

MATERIALS AND METHODS:

General: Commercial chemical was obtained from Merck® and Sigma. Recordings were made in a UV–Spectrometer Shimadzu UV-2200. All reagents used, including solvents, were of analytical grade and procured from Ponmani & Co., Coimbatore, Tamil Nadu.

Plant material: Fresh plant material was collected from Thrissur Agricultural Form "FRESH CUT", Thrissur, Kerala, India. Efforts were made to collect the plant in rhizomes and flowering conditions for the correct botanical identification. The plant material was brought to the laboratory and identified with the help of Agriculture university of Coimbatore, Tamil Nadu State.

Preparation of Plant Extract: The roots were cut into pieces and shade dried at room temperature. The dried roots were subjected to size reduction to a coarse powder by using mixy. Coarse powder from the shadow dried roots of *Alpinia purpurata* was extracted to exhaustion with ethanol using a soxhlet apparatus.

The extract that obtained was dried at room temperature. The ethanol extract was completely dried and used for the in vitro antioxidant and anti tumor activities.

Qualitative analysis of Phytochemical Constituents of Plant Extract: Identification of phytochemical in the plant extracts are found by using the following tests. Chemical tests were carried out on the ethanolic extracts of the plant using standard procedures, to identify the constituents.

EVALUATION OF ANTIOXIDANT ACTIVITY

1. Estimation of protein.
2. DPPH Radical Scavenging Activity
3. Ferric Reducing ability of plant (FRAP) as Measuring Antioxidant Power
4. Estimation of Superoxide Dismutase.

RESULTS AND DISCUSSION: The results of this study on "Phytochemical, antioxidant activity of ethanolic extract *Alpinia purpurata*" are discussed under the following sequence.

Phytochemical Analysis of Ethanolic Extract of *Alpinia pururata*: The phytochemical analysis was done to screen the presence of compounds present in the ethanolic extract of *Alpinia purpurata*. The results obtained for phytochemical analysis of ethSanolic extract of *Alpinia purpurata* is presentd in the following **table 1**.

TABLE 1: PHYTOCHEMICAL ANALYSIS OF ETHANOLIC EXTRACT OF *ALPINIA PURPURATA*

TESTS	OBSERVATION
ALKALOIDS	
1. Dragendroffs test	-
2. Wagner's test	-
3. Mayer's test	-
FLAVONOIDS	+
SAPONINS	+
CARBOHYDRATES	
1. Fehling's test	+
2. Benedict's test	+
3. Molischs test	+
PROTEINS	
1. Millions test	+
PHENOLS	
1. Ferric chloride test	-
2. Lead acetate test	-
3. Liebermann's test	-
STEROIDS	
1. Libermanns-Burchards test	-
2. Salkowski's reaction	-
GLYCOSIDES	+
RESINS	+
TANNINS	
1. Ferric chloride test	+
2. Lead acetate test	+
THIOLS	-
TERPENOIDS	+
CARDIAC GLYCOSIDES	
1. Keller-killani test	+

+: Positive; - : Negative

The phytochemical analysis revealed the presence of Alkaloids, Flavonoids, Saponins, Carbohydrates, proteins, phenols, resins, Glycosides and tannins with the absence of steroids and thiols.

***In-vitro* Antioxidant Activity of Ethanolic Extract of *Alpinia purpurata*:**

Estimation of Protein: The results for estimation of protein performed are presented in following **table 2**.

TABLE 2: ESTIMATION OF PROTEIN IN THE ETHANOLIC EXTRACT OF *ALPINIA PURPURATA*

TEST	AMOUNT OF PROTEIN (µg)
Sample	70

The protein content of ethanolic extract of *Alpinia purpurata* was estimated by Lowry's method. The protein content of the rhizome extract of mango ginger was contained 38µg per ml. This showed the rhizome extract of mango ginger lower protein content when compare to the *Alpinia purpurata*.

From the estimation, the protein concentration present in the ethanolic extract of *A. purpurata* is 70µg/ml. These show the ethanolic extract of *Alpinia purpurata* contained the high protein content in the rhizome extract.

DPPH Scavenging Activity: The results for DPPH scavenging activity performed are presented in following **table 3**.

TABLE 3: DPPH SCAVENGING ACTIVITY OF AQUEOUS EXTRACT OF *ALPINIA PURPURATA*

Concentration of extract in µg	% of DPPH scavenged
20	18.62
40	26.08
60	32.93
80	45
100	68.93

These shows increased concentrations of extract possess increased scavenging activity. The radical scavenging and antioxidant potential the plant extracts were determined by the ability of plant extracts to scavenge the stable free radical DPPH and convert into Diphenyl picryl hydrazine. The degree of decolorization from purple to yellow color was measured spectrophotometrically at 517nm.

The aqueous extract of *Cucumido amada* contains high antioxidant activity than chloroform and methanolic extracts. The ethanolic extract of *A. purpurata* shows 69% of DPPH antioxidant activity. The other rhizome extracts of *Cucumido amada* contained 60% of scavenging activity. This shows the *Cucumido amada* contained less scavenging activity compare to that of *A.purpurata*. These shows increased concentrations of extract possess increased scavenging activity.

FRAP Assay: The reducing power has been determined by FRAP assay and the following result was obtained. It is presented in the **table 4**.

TABLE 5: FRAP ASSAY FOR AQUEOUS EXTRACT OF *ALPINIA PURPURATA*

Concentration of standard (µg)	Absorbance
20	0.17
40	0.34
60	0.51
80	0.68
100	0.85

The absorbance test is 0.34. From the table we get the concentration of 40µg/ml. So the ethanolic extract of *A. purpurata* revealed the ferric reducing concentration of 40µg/ml. The ethanolic extract of *A. purpurta* shows high ferric reducing power. The rhizome extract of *Smilax campestris* contains less amount of antioxidant capacity. The Smilax extracts shows 32µg/ml of ferric reducing power. When compare to ethanolic extract of *A. purpurata* this extract contain less antioxidant activity. The results showed that the ethanolic extract of *Alpinia purpurata* possess high ferric reducing antioxidant power.

Superoxide Dismutase Activity: The enzymatic antioxidant acrivity was determined by Superoxide dismutase and the following result was obtained. It is presented in the table 5.

TABLE 5 ESTIMATION OF SUPEROXIDE DISMUTASE

Concentration of extract in µg	Inhibition rate % of superoxide dismutase
20	37.2
40	40.1
60	45.1
80	52.0
100	54.9

Superoxide radical is a highly toxic species, which is generated by numerous biological and photochemical actions. The rhizome extract of *Curcuma amada* showed the 40% of superoxide dismutase antioxidant activity. When compare to this the ethanolic extract of *Alpinia purpurata* showed 55% of superoxide dismutase antioxidant activity.

The present study showed that the ethanolic extract of *Alpinia purpurata* possess high enzymatic antioxidant activity.The results showed that the ethanolic extract of *Alpinia purpurata* possess high enzymatic antioxidant activity.

DISCUSSION: The traditional medicine has derived its root from natural plant products for the treatment and prevention of the various diseases. *Alpinia purpurata* have been employed on medicine for over a thousand of diseases. All cells are exposed to oxidative stress and thus oxidation and free radicals may be important in carcinogenesis at multiple tumor sites. *Alpinia purpurata* contains vitamins, phytochemicals and antioxidants that promote health and help in fighting against diseases.

This study was planned with the topic of "An effect of phytochemical, antioxidant activity of *Alpinia purpurata*. The plant rhizome was extracted by using soxhlat. The extract was taken and used for the phytochemical, antioxidant activity.The phytochemical constituents of ethanolic extract of *Alpinia purpurata* showed the presence of active constituents such as flavonoids, saponins, tannins, terpenoids, glycosides, carbohydrates, proteins.

The antioxidant activity of *Alpinia purpurata* shows the high antioxidant power in the SOD, DPPH, and also Ferric reducing power (FRAP assay) assay. Further study can be designed with the DNA Fragmentation, Apoptosis and the flow cytometer analysis can be made to identify the stage of inhibition is identified.

CONCLUSION: It may be concluded from this study that the ethanolic extract of *Alpinia purpurata* contain high antioxidant activity because of the presence of high amount of flavonoid phytochemical. In addition, the results confirm the use of the plant in traditional medicine. The ethanolic extracts can be subjected to isolation of the therapeutic and carry out further pharmacological evaluation.

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REFERENCES:

1. Suri. R.K, Chaudhari. D.C and Jaffer.R, 1992. Commercialy important medicinal plants from forest J.Eco.Bot. Phytochemistry. 3(2): 129-140.
2. Ibrahim.H , Khalid.N , Sand Hussain.k, 2007. Cultivated ginger of peninsular Malaya: Utilization, profile, and micropropagation. Gardens bulletin Singapore (1&2):71-88.
3. Tomlinson. P; Tkotz. H, 1990. Flavonols and sterol glycosides in root of *Alpinia officinarum* Hance. Zeitschrift fur Naturforschung part B-chemie Biochemie Biophysik Biologie und Verwandten Gebiete, 27:3, 323-4.
4. Kaplan.M.A.C;Gottlied.O.R, 1982. Plant systematics and phylogeny. XVI. Iridoids as systematics markers in dicotyledons. Biochemical Systematics and Ecology, 10:329-47.
5. Marcy,H.K., Hariprasadh, H.S., Patil, k.,2005. In vitro antioxidant activity of the Hexane and Methanolic extracts of Cordia Wallichii and Celastrus Paniculata. The internet J. Aesthetic and antiaging Medicine, 1:1-10.
6. Niki,U.J., Nair,J., 2002. Ortho- and meta- tyrosine formation from phenylalanine in human saliva as a marker of hydroxyl radical generation during betel quid chewing. Carcinogenesis. 16:1195-8.
7. Harbourne. H, 2003. London: Taylor and Francis: Phytochemicaldictionary: A handbook of bioactive compounds from plants.
8. Lowry. 1995. Estimation of total protein.
9. Shimada. 1992. Estimation of DPPH radical Scavenging activity.
10. Pulido. 2000. Estimation of Ferric reducing ability of plant (FRAP Assay).
11. Kumar.V.P, Chauhan. N.S, Padh.H, Rajani. M, 2006. Estimation of superoxide dismutase activity. Search for antibacterial and antifungal agents from selected Indian medicinal plants. Journal of ethnopharmacology.107:182-188.
12. Policegourdra., 2007. Estimation of protein in rhizome extracts of *cucuma amada* .
13. Mensor. 2001. Estimation of DPPH scavenging activity in aqueous extracts of *cucuma amada* .
14. Lussi. 1992. Ferric reducing ability of rhizome extracts of *smilax campestris.*
15. Winterbourn.C.A; Harborne.J.B, 1977. The leaf flavonoids of the Zingiberales. Biochemical Systematics and Ecology, 5:3, 221-9.

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