Pharmacogn. Res.
A multifaceted peer reviewed journal in the field of Pharmacognosy and Natural Products
www.phcogres.com | www.phcog.net

ORIGINAL ARTICLE

In vitro Antioxidant Potential of *Euclea crispa* (Thunb.) Leaf Extracts

Chella Perumal Palanisamy, Devaki Kanakasabapathy[1], Anofi Omotayo Tom Ashafa

Phytomedicine and Phytopharmacology Research Group, Department of Plant Sciences, University of the Free State, QwaQwa Campus, Phuthaditjhaba 9866, South Africa, [1]Department of Biochemistry, Karpagam Academy of Higher Education, Coimbatore, Tamil Nadu, India

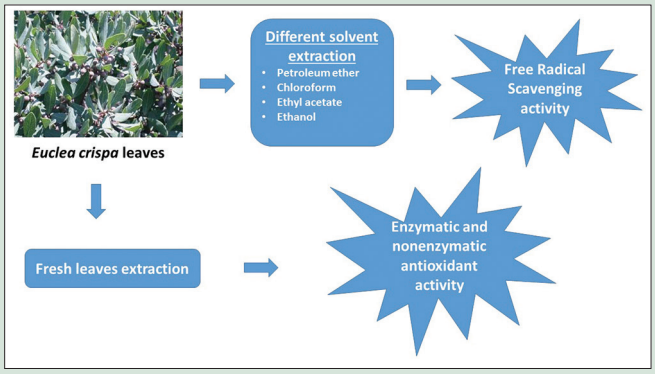
ABSTRACT

Background: *Euclea crispa* is a South African medicinal plant belonging to the family Ebenaceae. **Objectives:** The objective of this study was to analyze the *in vitro* antioxidant activity of different extracts of *E. crispa* leaves. **Materials and Methods**: 2, 2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging assay, reducing power assay, ferric reducing antioxidant power (FRAP) assay, hydroxyl scavenging assay, and nitric oxide scavenging assay were used to analyze free-radical scavenging activity. The superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPX), total reduced glutathione (TRG), and estimation of vitamin C assays were carried out to analyze the enzymatic and nonenzymatic antioxidants on a fresh leaf of *E. crispa*. **Results:** The DPPH radical scavenging assay (135.4 ± 0.7 μg/ml), hydroxyl scavenging assay (183.6 ± 0.9 μg/ml), and nitric oxide scavenging assay (146.2 ± 1.3 μg/ml) showed the significant half maximal inhibitory concentration (IC_{50}) values in ethanolic extract when compared to the ethyl acetate, chloroform, and petroleum ether extract of *E. crispa* leaves. Further, the ethanolic extract exhibited good reducing power assay and FRAP assay showed (the maximum absorption of 0.79 and 0.68 at 500 μg/ml, respectively) when compared to other solvent extracts. The fresh *E. crispa* leaves possess high content of enzymatic and nonenzymatic antioxidants such as SOD (41.3 ± 0.34 units/mg protein), CAT (124 ± 0.54 μmole of H_2O_2 consumed/min/mg protein), GPX (261.2 ± 0.42 μg of glutathione oxidized/min/mg protein), TRG (42.3 ± 0.16 μg/mg protein), and estimation of vitamin C (185 ± 0.39 μg/mg) assays. **Conclusion:** Based on the results obtained from this study, it can be concluded that the *E. crispa* leaves can be used for the preparation of antioxidative therapeutic agents. However, further studies are necessary to substantiate the current findings.

Key words: *Euclea crispa* leaves, enzymatic, free-radical scavenging activity, nonenzymatic antioxidant activity, solvent extractions

SUMMARY

- *E. crispa* leaf extracts have a variety of secondary metabolites, particularly alkaloids, steroids, flavonoids, tannins, phenols, glycosides, saponins, and terpenoids.
- The ethanolic extract of *E. crispa* leaves possess significant free radical scavenging activity when compared with ethyl acetate, chloroform, and petroleum ether extract
- The fresh *E. crispa* leaves displayed high content of enzymatic and nonenzymatic antioxidants.



Abbreviations Used: DPPH: 2, 2-diphenyl-1-picrylhydrazyl, FRAP: Ferric reducing antioxidant power, SOD - Superoxide dismutase, CAT: Catalase, GPX: Glutathione peroxidase, TRG: Total reduced glutathione, ROS: Reactive oxygen species, DNA: Deoxyribonucleic acid, EDTA: Ethylenediaminetetraacetic acid, TCA: Trichloroacetic acid, TBA: Thiobarbituric acid, NED: Naphthyl ethylenediamine dihydrochloride, IC50: Half maximal inhibitory concentration.

Correspondence:
Dr. Anofi Omotayo Tom Ashafa,
Department of Plant Sciences, University of the Free State, Qwaqwa Campus,
Phuthaditjhaba 9866, South Africa.
E-mail: ashafaaot@ufs.ac.za
DOI: 10.4103/pr.pr_123_17

Access this article online
Website: www.phcogres.com
Quick Response Code:

INTRODUCTION

Reactive oxygen species (ROS), such as singlet oxygen, superoxide anion, hydroxyl radical, and hydrogen peroxide, are frequently generated as byproducts of biological reactions or from exogenous factors. Every molecule of ROS leads to oxidative damaging effects on living cells including DNA if excess ROS are not eliminated by the antioxidant system.[1] ROS plays a major role in the formation of chronic and degenerative diseases including cancer, autoimmune, inflammatory, cardiovascular, neurodegenerative diseases, and aging. Radical scavenging antioxidants are mainly significant in protecting cells from the injury of free radical.[2] Thus, antioxidants with free-radical scavenging activities may have enormous significance in the prevention and therapeutics of diseases in which oxidants or free radicals are implicated.[3]

Recent investigations have shown that varieties of bioactive substances are present in medicinal plants which are widely used in the prevention and management of various diseases. The demand for natural food constituents has resulted in broad research on naturally occurring antioxidants which can deactivate highly reactive free radicals.[4] In this respect, flavonoids, alkaloids, terpenoids, and phenolic compounds which are usually found in medicinal plants have been reported to have high antioxidant activity as well as multiple biological effects.[5] Currently, the over-the-counter synthetic antioxidants might be unsafe if used over a prolonged period and its toxicity has also been criticized. It is generally assumed that frequent use of plant-derived phytochemicals

Cite this article as: Palanisamy CP, Kanakasabapathy D, Tom Ashafa AO. *In vitro* antioxidant potential of *Euclea crispa* (Thunb.) leaf extracts. Phcog Res 2018;10:296-300.