Phytochemical and Antioxident Profiling of Caralluma Tuberculata Extract

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ABSTRACT

The current study revolves around the phytochemical and antioxidant profile of caralluma fimbriata. The plant is known to have potent health benefits which include Diabetes, rheumatism, leprosy, dysentery, constipation, stomach pain, etc. This plant contains several compounds; glycosides, flavonoid, saponins and triterpenes. Caralluma tuberculata was reduced to powder and was extracted with methanol and ethanol. The extract was then analysed for phytochemical screening and antioxidants analysis. The present study demonstrates the presence of Anthraquinones, Beta-cyanin, Cardiac Glycosides, Caumarins, Flavanoids, Saponins, Tannins, Terpenoids, Alkoloids, Glycosides, Emodins, Reducing sugars. Total Phenolic Content and Total Flavonoid Content was high in methanol extract i.e., 6.41 ± 0.320 g quercetin/ 100gm and 6.95 ± 0.347 g GAE/ 100gm at 6 hours of extraction, respectively. DPPH profile shown high concentrations in methanol extract at 6 hours of extraction i.e., 35.9 ± 0.005 ug/ml.

Keywords: Caralluma Tuberculata, Phytochemicals, Antioxidants, DPPH, TPC, TFC.

INTRODUCTION

Word CARALLUMA is derived fromArabic phrase QARH-AL-LUHUM which means WOUND IN THE FLESH.C. Tuberculata is the botanical name of the specimen. So many common names are being used for carallumatuberculata; choongan, chunga, and pamankay in Pashto language. It belongs to the family ASCLEPIADACEAE which resides almost 2500 species. Caralluma is a gathering of succulent plant groups discovered wild in Pakistan, India, Afghanistan, Africa, Saudi Arabia, Southern Europe, Spain, Sri Lanka and others. In Pakistan extensively grown in Punjab, NW Frontier & Baluchistan provinces of Pakistan. More than two hundred caralluma species are known. Portions of the caralluma species explored by the innovators are: C. indica, C. fimbriata, C. attenuata, C. tuberculata, C. edulis, C. adscendens, C. stalagmifera, C. umbellata, C. lasiantha and C. penicillata. All the members of this class majorly contains phytochemicals that include; glycosides, flavonoid, saponins and triterpenes. It is considered as a very nutritious herb which many people use to control blood pressure and to treat acne as well. It is also known to have glucose lowering effects that helps in treating diabetes. It can be eaten as raw fleshy leaves but is mostly cooked with meat to reduce the bitter taste it as. The current study reflects the phytochemicals it contain and the antioxidant profile of it.

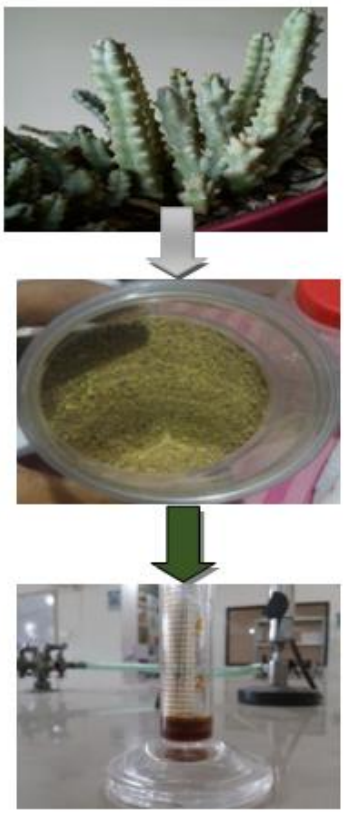
METHODOLOGY

Procurement and sample preparation

Carallumatuberculata sample was collected in summer season by means of Imtiaz Supermarket, Gulshan branch, Karachi, Pakistan and afterwards was cleaned, trimmed and dried to get the powered sample.

Extraction And Fractionation

The powdered sample was soxhlet extracted with 70%. The extraction was done twice, including the two extractions together and washing the fluid concentrate with hexane in an isolating channel. The dissolvable layer was then ran or turning evaporator under decreased weight at 50 to 55 degree centigrade, getting the last concentrate; which is to be embodied subsequent to cooling.



Phytochemical screening

A qualitative assessment of phytochemicals was performed, which included screening of the stated ones; Tannins, Anthraquinones, Reducing Sugar, Flavanoids, Phlobatanins, Terpenoids, Cardiac Glycosides, Caumarins, Anthocyanins & Betacyanins, Glycosides, Alkaloids, Saponins, Emodins, Steroids.

Analysis of Total Antioxidant Compounds

Total Polyphenol Content

The total phenolic content will be determined by employing Folin–Ciocalteu assay. The results were expressed as mg gallic acid equivalent (mg GAE)/g dry extract.

Total Flavonoid Content

To quantify total flavonoid content the aluminium Chloride Colorimetric assay will be performed. The results were expressed as mg quercetin equivalent (mg QE)/g dry extract

Estimation of Antioxidant Activity

DPPH Radical Scavenging Assay

For assessment of antioxidant property the method employed will consist of method of 2,2diphenyl-picrylhydrazyl (DPPH) assay. This examination is based on the hypothesis that a hydrogen benefactor is an antioxidant. It gauges intensifies that are radical scroungers. DPPH demonstrates a solid ingestion most extreme at 517 nm.

RESULTS & CONCLUSION

The extract was analyzed for TPC, TFC and DPPH analysis. The specie is high in antioxidants and various phytochemicals. The result for all stated parameters is given in tables below.

Phytochemical Analysis

Family of compounds	**Ethanol extract**
	STEM
Anthocyanin	--
Anthraquinones	+
Beta-cyanin	+
Cardiac Glycosides	+
Caumarins	+++
Flavanoids	+
Phlobatanins	--
Saponins	+++
Tannins	+++
Terpenoids	+++
Steroids	--
Alkoloids	+++
Glycosides	+
Emodins	+++
Reducing sugars	+

Total phenolic content (g quercetin/ 100gm) of Caralluma Tuberculata extracts.

Extraction Time	3 Hours	6 Hours	9 Hours
Methanol	6.12 ± 0.183	6.41 ± 0.320	5.94 ± 0.059
Ethanol	5.41 ± 0.162	5.67 ± 0.283	4.95 ± 0.049

Total flavonoid content (g GAE/ 100gm) of I Caralluma Tuberculata extracts

Extraction Time	3 Hours	6 Hours	9 Hours
Methanol	4.50 ± 0.045	6.95 ± 0.347	5.57 ± 0.167
Ethanol	3.20 ± 0.032	5.47 ± 0.164	6.77 ± 0.338

Total antioxidant activity (DPPH activity IC_{50}) (ug/ml) of Caralluma Tuberculata extracts.

Extraction Time	3 Hours	6 Hours	9 Hours
Methanol	27.6 ± 0.002	35.9 ± 0.005	31.2 ± 0.003
Ethanol	20.0 ± 0.002	30.5 ± 0.005	26.9 ± 0.004

REFERENCES

1. Rauf, A., Jan, M., Rehman, W., & Muhammad, N. (2013). Phytochemical, phytotoxic and antioxidant profile of Carallumatuberculata NE Brown. Wudpecker Journal of Pharmacy and Pharmacology, 2(2), 21-25.
2. Adnan, M., Jan, S., Mussarat, S., Tariq, A., Begum, S., Afroz, A., & Shinwari, Z. K. (2014). A review on ethnobotany, phytochemistry and pharmacology of plant genus C aralluma R. Br. Journal of Pharmacy and Pharmacology, 66(10), 1351-1368.
3. Bourhia, M., Slighoua, M., Ibnemoussa, S., Bari, A., Ullah, R., Amaghnouje, A., ... & Bousta, D. (2020). Phytochemical study on antioxidant and antiproliferative activities of Moroccan Caralluma europaea extract and its bioactive compound classes. Evidence-Based Complementary and Alternative Medicine, 2020.
4. Ahmad, B. A. S. H. I. R., Abbas, S. J., Hussain, F., Bashir, S. H. U. M. A. I. L. A., & Ahmad, D. (2014). Study on Carallumatuberculatanutritional composition and its importance as medicinal plant. Pak. J. Bot, 46(5), 1677-1684.
5. Khan, M. A., Maqsood, K. H. A. N., &Uslu, O. S. (2008). Carallumatuberculata-An important medicinal plant to beconserved.
6. Noreen, S. (2017). A mini review on a Carallumatuberculata NE Br. uncommon and wild succulents but having exciting pharmacological attributes. Pure and Applied Biology (PAB), 6(2), 748-761.
7. Rehman, R., Chaudhary, M., Khawar, K., Lu, G., Mannan, A., & Zia, M. (2014). In vitro propagation of Carallumatuberculata and evaluation of antioxidant potential. Biologia, 69(3), 341-349.