International Journal in Physical and Applied Sciences
Volume 10 Issue 10, Oct 2023 ISSN: 2394-5710 Impact Factor: 6.915
Journal Homepage: http://ijmr.net.in, Email:
irjmss@gmail.com Double-Blind Peer Reviewed Refereed Open Access International Journal

PHYTOCHEMICAL SCREENING AND ANTIOXIDANT ACTIVITY OF EXTRACTS OF CURCUMA LONGA AND CURCUMA AMAD

Binu Jacob, (Research Scholar)

Dr. Krishan Pal (Professor)

(Research Supervisor)

Glocal School of Science

Abstract

In order to cure illnesses caused by bacteria, researchers have been actively studying phytochemicals, also which are metabolites of plants that are notable for their defensive characteristics. The objective of the study is to screen the Phytochemical and antioxidant activity of Curcuma longa and Curcuma amada. The FolinCio-calteau reagent was employed to ascertain the total phenolics. Flavonoids were detected using the aluminum chloride colorimetric procedure. The Folin and Ciocalteu method was employed to generate standard curves for tannin. The research found that the chemical hexane, chloroform solution, and methanolic in stem extraction of Curcuma plant had the highest concentrations of phytochemicals. “Curcuma amada has been identified to include alkaloids, which phytosterols, terpenoids are dietary fibre, tannins, an amines, glycosides, and and quinones in order Curcuma amada shoes contains oils and flavonoids, as but no protein compounds or these substances were found. In Curcuma longa, the “Diphenyl picrial hydrazyl radical scavenging assay (DPPH)” demonstrates a higher concentration of hexane, chloroform, and methanol. In the "IRON REDUCTION TEST," methanolic concentrations of FRAP and PHENOLS were observed.

Keywords: Rhizome extracts, Curcuma longa, Curcuma amada, antioxidant activity

1. Introduction

The Zingiberaceae family is a crucial subset of rhizomatous aromatic and medicinal plants Lubricants and volatile oils major export commodities (Windarsih et al., 2021). The rhizomes and fruits often have stimulating, tonic, and fragrant properties; they could even have nutritional value (Zahara, 2020). Because of its high satrach content, some are eaten, while other kinds make a fluid that is both unpleasant and diuretic (Furmuly and Azemi, 2020). Among the many ayurvedic preparations that use A. galanga—the most important species in the Alpinia genus—is "Rasnadi powder" (Enemor et al., 2020). The Curcuma plant plant with the highest population density is C. longa (Sutar, et al., 2020).

The extract of this turmeric contains phytochemicals of greater biological significance (Annapurna et al., 2021). Consequently, various pharmaceutical, food, flavor, and cosmetic industries have adopted it as an effective ingredient and have developed value-added products for marketing purposes (Borah et al., 2020). The phytochemical analysis of extract reveals the presence of compounds such as curcuminoids, phenolics, flavonoids, and

alkaloids, which impart "a variety of medicinal properties, including anti-microbial, anti-cough, anti-inflammatory, anti-cancerous, anti-wounds, and aromatherapeutic agent" (Ray et al., 2019). It is also used as a plasticizer for resins, lacquers, and synthetic camphor, and is used in the industrial production of mouthwash (Guzman et al., 2020). Due to their abundance of anthocyanin (flavonoid) compounds, the food, cosmetics, and dye industries extensively exploit the rhizomes (Sunday et al., 2021). This species is extensively utilized in the pharmaceutical industry due to its exceptional phytochemical composition, which provides protection against certain chronic and least curable diseases, including Alzheimer's disease and other inflammatory bowel diseases (IBD) (Ray et al., 2019). The objective of the study is to assess the Phytochemical screening and antioxidant activity of Curcuma longa and Curcuma amada.

2. Material and Method

The plant materials utilized in this investigation were procured from Andhra Pradesh. The plant materials that were recently collected were desiccated in the shade and then milled to produce a coarse powder.

Total Alkaloid content was estimated. Flavonoids were detected using the aluminum chloride colorimetric procedure. The Folin and Ciocalteu method was employed to generate standard curves for tannin.

To assess the abundance of cardiovascular glycosides, the Keller-Killiani test was used.

The Liebermann-Burchard response was used to assess the presence of steroids. Following a treatment with the acetic acid in a chloroform solution, the unrefined powdery substance of every species was drained down onto the testing tube's sides containing a few drops of a highly concentrated H2SO4. It was shown that terpenoids were present by a blue-green ring.

The Making method was used to determine if saponins that were present.

The FolinCio-calteau reagent was employed to ascertain the total phenolics.

The hydrogen atoms or donor electron capacity of the respective oils was measured by fading the purple-colored DPPH methyl solvent. The spectrophotometric test makes use of the 2, 2'-diphenylpicrylhydrazyl (DPPH) drastic, and a stable reaction. The crucial oils' impact on power was determined using the method described by Oyaizu.

3. Result and Discussion

"Preliminary qualitative phytochemical screening"

In order to determine if bioactive ingredients were present, a preliminary quantitative phytochemical screening was performed on the crude material collected from four plants. Tables 1–2 reveal the results of the analyses conducted to identify various compounds, including phenols, the phytosterols benzodiazepines (Dragendroff, Mayer, Reinhardt),

flavonoids, all terpenoids are tannins, an amino acid, animal oils, glucose, quinones, as saponins as well as cardiovascular glycosides.

"Table 1: Phytochemical Constituents Present in Different Extracts of Curcuma longa"

S. No	**"Name of the" "Phytochemicals"**	**"Extracts of *Curcuma longa*"**		
		Hexane Extract	**Chloroform Extract**	**Methanol Extract**
1	"Phenols"	+	+	+
2	"Phytosterols"	+	+	+
3	"Terpenoids"	+	+	+
4	"Glycosides"	+	+	+
5	"Saponins"	-	-	-
6	"Flavonoids"	-	-	-
7	"Tannins"	-	+	+
8	"Carbohydrates"	+	+	+
9	"Alkaloids"	+	+	+
10	"Amino acids"	-	-	-
11	"Oils"	-	-	-
12	"Quinones"	-	-	-

"Steroids, terpenoids, glycosides, tannins, alkaloids, phenols, and carbohydrates were identified in Curcuma longa. However, the extracts did not contain saponins, flavonoids, quinines, amino acids, or lipids, as illustrated in Table 4.1".

Table 2: "Phytochemical Constituents Present in Different Extracts of Curcuma amada"

S. No	"Name of the" "Phytochemicals"	Extracts of *Curcuma longa*		
		"Hexane Extract"	Chloroform Extract	Methanol Extract
1	"Phenols"	-	-	+
2	"Phytosterols"	+	+	+
3	"Terpenoids"	+	+	+
4	"Glycosides"	+	+	+
5	"Saponins"	-	-	-
6	"Flavonoids"	+	+	+
7	"Tannins"	-	+	+
8	"Carbohydrates"	+	+	+
9	"Alkaloids"	+	+	+
10	"Amino acids"	-	-	-
11	"Oils"	-	+	+
12	"Quinones"	-	+	+

"The presence of alkaloids, phytosterols, terpenoids, carbohydrates, tannins, anthraquinones, glycosides, and quinones was revealed in Curcuma amada. Oils and flavonoids are present in Curcuma amada, but saponins and amino acids were not detected"

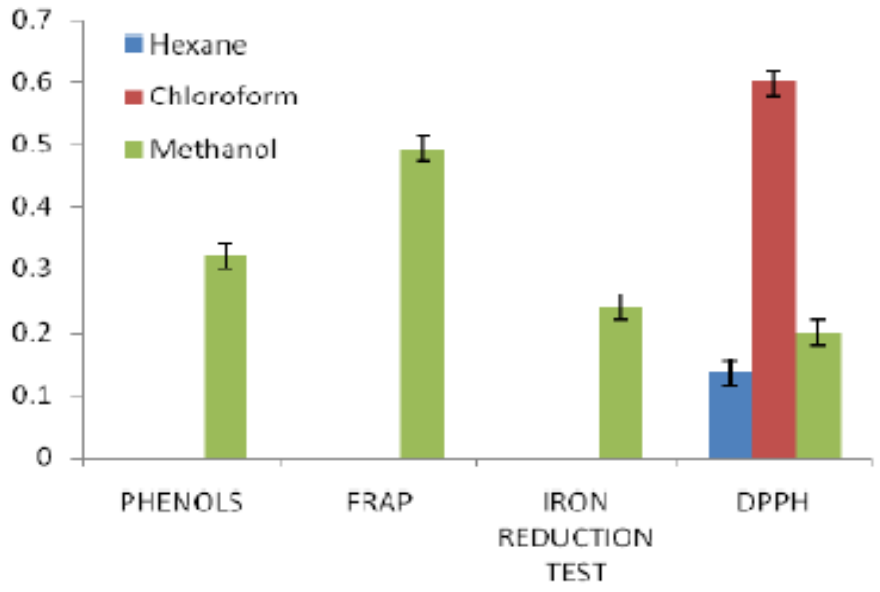

Fig. 1: "The correlation between solvent extracts of PHENOLS, FRAP, IRON REDUCTION TEST and DPPH activity"

"In Curcuma longa, the Diphenyl picrial hydrazyl radical scavenging assay (DPPH) exhibits a higher concentration of hexane, chloroform, and methanol. In the IRON REDUCTION TEST", methanolic concentrations of PHENOLS and FRAP were observed, while hexane and chloroform concentrations were entirely absent. The determinations of the plant extract (µg/ml) are represented on the y-axis.

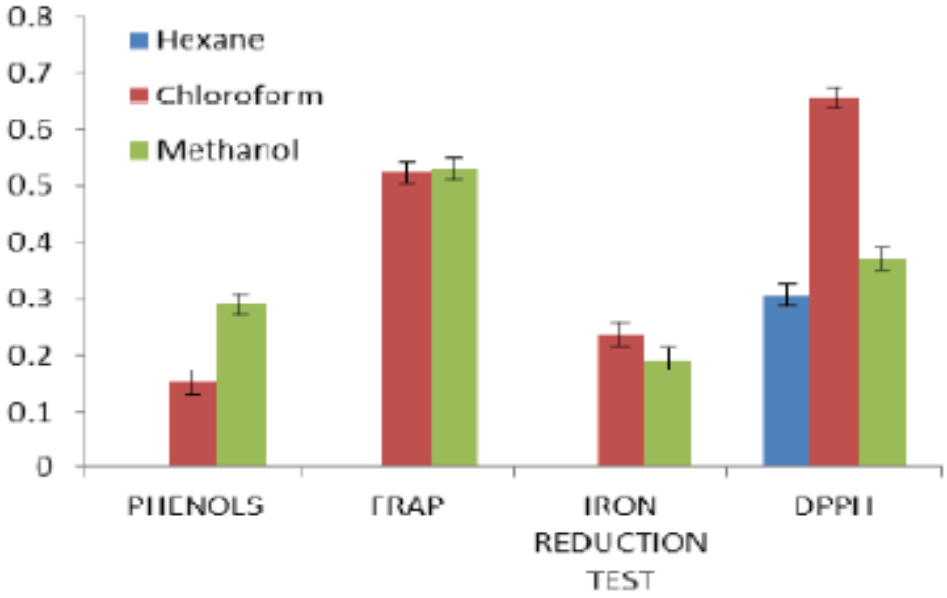

Fig 2: "The correlation between solvent extracts of Phenols, FRAP, Iron reduction test and DPPH activity"

The concentrations of extracts are graphed in Fig. 4.1 in relation to the enzymatic and non-enzymatic antioxidant levels. The results of the Curcuma amada study indicated that the "Diphenyl picrial hydrazyl radical scavenging assay (DPPH)" has a higher concentration of "hexane, chloroform, and methanol than the Iron reduction test, FRAP, and phenols". For phenols, hexane concentrations are entirely absent in the FRAP and iron reduction test. "There was a strong correlation between antioxidant activity (DPPH)," iron reduction test, and FRAP, which lends credence to the notion that phenols are a significant contributor to the antioxidant properties of plant extracts.

4. Conclusion:

The Diphenyl picrial hydrazyl radical scavenging assay (DPPH) in Curcuma longa demonstrates a higher concentration of hexane, chloroform, and methanol. PHENOLS and FRAP were observed to have methanolic concentrations in the "IRON REDUCTION TEST."

The current study's findings suggest that among the plant's curcuma longa and amada were the most effective.

5. References

1. Windarsih, G., Utami, D. W., & Yuriyah, S. (2021). Morphological characteristics of Zingiberaceae in Serang District, Banten, Indonesia. *Biodiversitas Journal of Biological Diversity*, *22*(12).
2. Zahara, M. (2020). Identification of morphological and stomatal characteristics of Zingiberaceae as medicinal plants in Banda Aceh, Indonesia. In *IOP Conference Series: Earth and Environmental Science* (Vol. 425, No. 1, p. 012046). IOP Publishing.
3. Furmuly, A. M., & Azemi, N. (2020). A Review on Golden Species of Zingiberaceae Family Genus Curcuma. *Science Proceedings Series*, *2*(2), 133-138.
4. Enemor, V. H. A., Ogbodo, U. C., Nworji, O. F., Ezeigwe, O. C., Okpala, C. O., & Iheonunekwu, G. C. (2020). Evaluation of the nutritional status and phytomedicinal properties of dried rhizomes of turmeric (Curcuma longa). *Journal of biosciences and medicines*, *8*(8), 163-179.
5. Sutar, J., Monalisa, K., Pati, K., Chauhan, V. B. S., & Behera, S. (2020). Qualitative and quantitative phytochemical analysis and antioxidant activity of Curcuma amada Roxb: an important medicinal plant. *Plant Arch*, *20*(2), 193-196.
6. Annapurna, A. S., Abhirami, D., & Umesh, T. G. (2021). Comparative study of phytochemicals and bioactivities of the leaf extracts of Curcuma amada and Curcuma karnatakensis. *South African Journal of Botany*, *142*, 441-450.
7. Borah, A., Kumar, D., Paw, M., Begum, T., & Lal, M. (2020). A review on ethnobotany and promising pharmacological aspects of an endangered medicinal plant, Curcuma caesia Roxb. *Turkish Journal of Botany*, *44*(3), 205-213.
8. Ray, A., Jena, S., Haldar, T., Sahoo, A., Kar, B., Patnaik, J., ... & Nayak, S. (2019). Population genetic structure and diversity analysis in Hedychium coronarium populations using morphological, phytochemical and molecular markers. *Industrial Crops and Products*, *132*, 118-133.
9. Guzman, L., Nerio, L. S., Venturini, W., Macias, J. P., Donoso, W., & Forero-Doria, O. (2020). Antiplatelet and antibacterial activities of Essential Oils obtained from rhizomes and leaves of Hedychium coronarium J. Koening. *Anais da Academia Brasileira de Ciências*, *92*(2), e20190615.

Sunday, E. A., Nnedimma, N. C., Peter, W. G., & Orlando, G. B. (2021). Screening for Pharmacological Compounds and Antioxidant Activity of Hedychium coronarium J. Koenig. *Asian Journal of Research in Botany*, *5*(4), 34-47.

DECLARATION

I as an author of this paper / article, hereby declare that paper submitted by me for publication in the journal is completely my own genuine paper. If any issue regarding copyright/ patent/ other real author arises. The publisher will not be legally responsible. If any of such matters occur publisher may remove my content from the journal website/ updates. I have resubmitted this paper for the publication, for any publication matters or any information intentionally hidden by me or otherwise, I shall be legally responsible.