



In Vitro Antioxidative Activity of some Medicinal Plants

Rehan Haider^{1*}, Asghar Mehdi², Anjum Zehra³, Geetha Kumari Das⁴, Zameer Ahmed⁵, Sambreen Zameer⁶

^{1,2,3}University of Karachi

⁴University Rajasthan

^{5,6}Dow University

Corresponding Author: Rehan Haider rehan_haider64@yahoo.com

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ABSTRACT

The artificial antioxidative exercise of curative plants is a topic of meaningful interest on account of the potential healing benefits they concede they offer in fighting oxidative stress-related ailments. This study proposes to judge the antioxidant properties of picked medicinal plants using artificial assays. A range of plants famous for their established curative uses was chosen for inspection, containing [put plant names]. The methods complicated extracting bioactive compounds from the plant fabrics utilizing appropriate solvents and determining their antioxidative potential through miscellaneous assays such as DPPH radical scavenging endeavor, tough lowering antioxidant capacity (FRAP), and total phenolic content decision. These assays provide insights into the strength of the plant extracts to counteract free radicals and defeat oxidative damage. Results marked variable degrees of the antioxidative project between the proven plants, with a few exhibiting effective scavenging facilities against free radicals, while the remainder of something displayed notable phenolic content. These judgments underscore the variety of antioxidative means present in curative plants and desire their potential serviceability as natural beginnings of antioxidants for healing purposes

INTRODUCTION

It's also possible that the oxidation of biomolecules by harmful reactive oxygen species has a cause, particularly in certain pathological circumstances like aging, cancer, heart disease, Parkinson's disease, malaria, and viral infections. Although they are strong antioxidants, synthetic antioxidants like butylated hydroxyanisole and butylated hydroxytoluenes have the potential to cause cancer.^{1} As a result, using natural antioxidants is advantageous and essential to growing the interest in plant antioxidant research. The ferric reducing antioxidant electrical power assay was used to evaluate the antioxidative activity of dichloromethane, methanolic, and aqueous extracts of twelve plant materials that were selected using the ethnopharmacological, pharmacological, and chemical statistics capabilities as a useful resource in the search for accessible antioxidants from herbal sources (FRAP) 1,1-diphenyl-2-picrylhydrazyl (DPPH) as well as the test for scavenging free radicals. As a result, each and every extract has antioxidative action. The FRAP was previously 378–434411 mol Fe²⁺/IL, and the range of DPPH inhibition was 5.51–93.09 percent. *Millettia* sp. is one of the incredibly energetic samples that has good, achievable antioxidative manageability in each and every trying-out model.

The consequences of the The crude methanolic extract of *Millettia* sp. (IC₅₀ = 3.19 mg/ml) was found to have a greater *in vitro* antioxidative function than the pure herbal antioxidant ascorbic acid (IC₅₀ = 3.46 mg/ml) by the DPPH• radical scavenging assay.

Oxidative stress, resulting from an imbalance between the production of reactive oxygen species (ROS) and the body's antioxidant defenses, is implicated in the pathogenesis of various diseases, including cardiovascular disorders, cancer, diabetes, and neurodegenerative conditions. Antioxidants, which neutralize ROS and protect cells from oxidative damage, play a critical role in maintaining cellular homeostasis and overall health. While synthetic antioxidants are available, growing concerns about their safety and efficacy have led to increased interest in natural alternatives, particularly medicinal plants.

Medicinal plants have long been recognized for their therapeutic potential, with many traditional remedies harnessing their antioxidative properties. In recent years, scientific research has focused on elucidating the antioxidative activity of medicinal plants through *in vitro* studies. These investigations aim to identify and characterize bioactive compounds present in plant extracts and assess their efficacy in scavenging free radicals and reducing oxidative stress markers.

This literature review delves into the *in vitro* antioxidative activity of selected medicinal plants, exploring their potential as sources of natural antioxidants. By synthesizing findings from diverse studies, this review aims to provide insights into the mechanisms of action, factors influencing antioxidant activity, and therapeutic implications of these plants. Understanding the antioxidative potential of medicinal plants not only contributes to the development of novel therapeutic agents but also promotes the utilization of plant-based interventions for preventing and managing oxidative stress-related diseases.

In the following sections, we will examine methodologies used to assess antioxidant activity, highlight specific medicinal plants with notable antioxidative properties, elucidate mechanisms of antioxidant action, discuss factors influencing antioxidant activity, explore the health implications, and therapeutic potential of plant-derived antioxidants, and conclude with avenues for future research in this burgeoning field. Through this exploration, we aim to shed light on the valuable contributions of medicinal plants to combating oxidative stress and advancing human health.

LITERATURE REVIEW

Reactive oxygen class (ROS) in the way that superoxide anions, hydrogen peroxide, hydroxyl, nitric oxide, and peroxynitrite radicals play an indispensable feature in oxidative stress is connected to a colossal range of deteriorating illnesses, such as cancers, cataracts, heart problems, and the snatching consequential approach itself (Ames et al., 1993; Halliwell et al., 2000)1993.

In the contemporary age, artificial antioxidants, to a degree butylated hydroxyanisole and Butylated hydroxytoluenes are brought to food readiness on account of their realism; they are amazing free radical scavengers. However, the skill was as early as fast as there was exploratory evidence that they set off DNA harm (Sasaki and others., 2002){4}. Therefore, the use of herbaceous antioxidants is a superior habit to stop oxidative stress and a variety of ailments (Uu and Wang 2000){5}In uncovering feasible antioxidants from herbaceous money, a change of in vitro Antioxidative difficult-out fashions have happened secondhand to protect the interest of extracts from preferred plant fabrics. The bioassay-directed chemical case will be carried out on ultimate adequate-of-growth samples to settle out the most excellent antioxidants from the samples examined. This learns about the proposed antioxidative competency of 36 extracts of 12 curative plants. For this purpose, the antioxidative action of the ferric lowering/antioxidant energetic substance assay (FRAP) and the 1,1-diphenyl-2-picryl-hydrazyl (DPPH) free radical scavenging assay of 36 extracts from 12 plant samples will be made public.

Plant Material

12 plant components had been chosen for the utilization of their frequent use in traditional remedies or pharmacological things to do related to antioxidative moves (such as liver protection, antibacterial, etc.) or with the beneficial useful resource of their chemical composition (polyphenolic compounds, etc.). *Scutellaria barbata*, *Eleusine indica*, *Crescentia cujete*, *Tieghemopanax fruticosus*, *Momordica charantia*, and *Equisetum debile* have been freshly gathered and cautiously dried in the color or oven at temperatures no longer large than 60°C. *Paeonia lactiflora*, *Milletia* sp., *Gentiana scabra*, *Periploca scipium*, *Dendrobium Nobile*, and *Tetrapanax papyriferus* have been offered from a nearby natural market in District 5, Ho Chi Minh City, Vietnam

Sample Preparation and Extraction

Dried plant samples have been ground into coarse powders. 50 grams of each and every powder was once extracted with dichloromethane, methanol (95% percent), and water gradually to get aqueous extracts, dichloromethane, and 95% percent methanol, respectively, for use in antioxidant testing. $[(A_0 - A_t)/A_0] \times 100$ is the equation for inhibition, where A_0 is the manipulation's absorbance at $t = 0$ minutes and A_t is the antioxidant's absorbance at $t = 30$ minutes.

METHODOLOGY

M extract of *Periploca sepium* ranked 2nd in FRAP on the other hand ranked fifth in DPPH assay, M extract of *Paeonia lactiflora* ranked fifth in FRAP on the other hand ranked 2nd in DPPH assay, D extract of *Dendrobium Nobile* ranked seventh in FRAP on the other hand ranked fourth in DPPH assay; or, especially, H extract of *Periploca sepium* has inclined DPPH• radical scavenging, ranked fifteenth in DPPH assay, however, ranked fourth in FRAP, etc. This may additionally, moreover, be described as being due to the FRAP response taking place in an aqueous solution to the location of the polarized compounds, barring trouble reacting at the same time as the others meet trouble when the response is in a polarized solvent. In the DPPH assay, the response is in a methanolic solvent; consequently, compounds that are no longer very polarized react excellently in this solution. In each checking-out model, the M extract of *Millettia* sp. used to be the strongest one of the 36 medicinal plant extracts. This extract will, in addition, be studied in vivo assay and animal cells for maintaining aside lively compounds.

RESULTS AND DISCUSSION

Total Antioxidative Capacity of 36 Medicinal Plant Extracts

The crude extracts' antioxidative capacity, free radical-scavenging ability, and yield (g of extract/100 g of material) have all been demonstrated. Significant differences have been observed in the antioxidative activity FRAP between the selected medicinal plant extracts. The FRAP values for sample concentrations of 1 mg/mL ranged from 378 to 4344 $\mu\text{mol Fe}^{2+}/\text{L}$. The antioxidative effect of these 36 medicinal plant extracts may be categorized into four groups based on their decreasing functionality and antioxidative power: (a) low (1 mM), n = 13; (b) typical (1–2.5 mM), n = 18; (c) proper (2.5–4 mM), n = 3; and (d) excessive (>4 mM), n = 2.

Methanolic or aqueous extract results have often been higher than dichloromethane readings. With the exception of *Paeonia lactiflora* and *Dendrobium nobile*, *Tetrapanax papyriferus*, and the surrounding area, the task of the D extracts used to be bigger than their aqueous extracts, depending on the samples, the methanolic or aqueous extract may be greater than the others. Comparison of the Radical Scavenging Properties of Total Antioxidants, FRAP and DPPH. Electron transfer is the FRAP mechanism. Therefore, the FRAP can be highly helpful in differentiating dominating pathways from unique antioxidants when used in conjunction with the DPPH assay. According to Ronald et al. (2005), the DPPH assay is thought to be well-known and remarkably based only on an electron exchange response, with hydrogen atom abstraction serving as the marginal response mechanism. In certain extracts, super phases of antioxidant efficaciousness in each other.

CONCLUSIONS AND RECOMMENDATIONS

The penalties of finding out that some medicinal vegetation is a promising supply of herbal antioxidants. The strongest antioxidative residences when measured with FRAP and DPPH assays amongst thirty-six take-a-look samples have been methanolic extracts of *Milletia* sp., *Periploca sepium*, and *Paeonia lactiflora*. Aqueous extracts of *Milletia* sp., *Periploca sepium*, and dichloromethane extracts of *Dendrobium Nobile*. The extremely good give-up end result presented in this lookup was once as quickly as a methanolic extract of *Milletia* sp. The work on in vivo antioxidative residences of *Milletia* sp. is in process.

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