



A Comparative Study on Phytochemical Screening and Antioxidant Activity of Aqueous Extract from Various Parts of *Bauhinia purpurea*

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Abstract

In this study, we conducted a comparative investigation into the phytochemical screening and antioxidant activity of aqueous extracts from various parts of the *Bauhinia purpurea* plant, including leaf, flower, stem bark, and root. The qualitative analysis was performed to screen the phytochemical content of each extract, followed by quantitative analysis to determine the total phenolic and total flavonoid contents. Our findings revealed that different parts of the *B. purpurea* plant yielded distinct natural products upon extraction. Both the leaf and flower extracts contained alkaloids, flavonoids, saponins, carbohydrates, polyphenols, and phenolics. On the other hand, the aqueous extracts of the stem barks and root parts of *B. purpurea* only contained alkaloids, flavonoids, and phenolics. Consistent with the phytochemical assay, the flower extract exhibited the highest total phenolic content ($40.14 \pm 0.65 \mu\text{g/mL}$ GAE) and the highest flavonoid content ($387.57 \pm 0.63 \mu\text{g/mL}$ CE) compared to the other parts. Consequently, the flower extract displayed the highest antioxidant activity ($51.76 \pm 0.32\%$) with DPPH radical assay, closely approaching the antioxidant activity of ascorbic acid ($70.54 \pm 0.51\%$), which served as the positive control. This significant finding highlights the potential of the *B. purpurea* flower as a potent source of antioxidant agents for future applications.

Keywords: *Bauhinia purpurea*, antioxidant, phytochemical, phenolic content, flavonoid content

1. INTRODUCTION

Studies on medicinal plants and traditional medicines have long fascinated herbalists worldwide. Traditional medicine, with its holistic approach, places emphasis on enhancing overall health, disease prevention, immune regulation, and personalized care. It is noteworthy that over 60% of pharmaceuticals have been derived from plants, owing to their gentle impact on the human body, minimal or negligible adverse effects, cost-effective production, and convenient accessibility. Consequently, medicinal plants provide considerable advantages for human well-being [1].

Bauhinia purpurea is a flowering plant commonly known as the Purple Orchid Tree or Butterfly Tree. It belongs to the family Fabaceae and is native to Southeast Asia. *B. purpurea* is renowned for its vibrant and showy flowers, which

range in color from pale pink to deep purple. The unique shape of its leaves, which resemble a pair of butterfly wings, gives the plant its distinctive appeal. *B. purpurea* is widely cultivated as an ornamental tree due to its beautiful flowers and attractive foliage [2]. It is often used in gardens, parks, and landscapes to add a touch of color and elegance. The plant thrives in warm, tropical climates and prefers well-drained soil and full sunlight. Apart from its aesthetic value, *B. purpurea* also holds significance in traditional medicine systems. Various parts of the plant, including the flowers, leaves, and bark, are believed to possess medicinal properties [3]. It has been used in herbal remedies for its potential anti-inflammatory [4]-[6], antioxidant [7]-[9], and antimicrobial [10] effects.

B. purpurea contains a diverse array of bioactive compounds, as demonstrated by various researchers. Phytoconstituents found in *B. purpurea* encompass glycosides, flavonoids, saponins, triterpenoids, phenolic compounds, oxepine, fatty acids, and phytosterols [11]. Negi et al. [12], not only identified ergosterol, beta-tocopherol, stigmasterol, and lanosterol, but also discovered additional bioactive compounds such as lupeol, phytol, hexadecanoic acids, methyl esters of hexadecanoic acids, octadecadienoic acids, and octadecatrienoic acid in the leaf extract. Zakaria et al. [13] demonstrated the presence of flavonoids, saponins, condensed tannins, and steroids. Pettit et

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Phytochemical Screening And Study Of Comparative

Timothy O. Adejumo, Ralf T. Vögele



Phytochemical Screening And Study Of Comparative:

Proceedings of the National Seminar on Phytochemicals as Therapeutics Dr. K.S. Lakshmi, Dr. R. Subha, Dr. B. Suji, Dr. V. Selvi, 2017-09-06 The seminar is focused on bringing together the scientists researchers and students to share their perspectives and also to motivate young people to carry out significant contributions in the unexplored areas in the therapeutic role of phytochemicals thereby leading to industrial and technological innovations

Biopesticides Timothy O. Adejumo, Ralf T. Vögele, 2021-04-10 Biopesticides have readily available sources they are effective and easily biodegradable exhibit various modes of action cheaper inherently less toxic to humans and the environment They do not leave harmful residues and are usually more specific to target pests The use of biopesticides is markedly safer for the environment and users and more sustainable than the application of chemicals and are therefore used as potential alternatives to synthetic pesticides especially as components in Integrated Pest Management strategies The book *Biopesticides Botanicals and Microorganisms for Improving Agriculture and Human Health* is a collection of articles up to date reviews and research contributions from both developed and developing countries It emphasises the current issues of importance and the progress made in the fields of agricultural environmental and soil microbiology plant pathology and ethnobotany and aims to bring together all available and relevant information on biopesticides It comprises 12 Chapters on emerging issues on biopesticides from important and useful botanicals to beneficial microorganisms that show great potential in both agriculture and human health The book will be of immense help to both the undergraduate and postgraduate students biologists and agriculturists who would like to broaden their knowledge and gain substantial experience about biopesticides in agriculture and health this will enable them to contribute significantly in making the world a safer and healthier place

Advances in Bioprocess Engineering and Technology Doraiswami Ramkrishna, Subhabrata Sengupta, Sudipta Dey Bandyopadhyay, Avijit Ghosh, 2020-09-29 This book presents the select peer reviewed proceedings of the International Conference on Advances in Bioprocess Engineering and Technology ICABET 2020 The book covers all aspects of bioprocesses especially related to fermentation technology food technology environmental biotechnology and sustainable energy Along with this primary theme the focus is on recent advances in bioprocessing research such as biosensors micro reactors novel separation techniques bioprocess control bio safety advanced techniques for waste to wealth generation and nanobiotechnology This contents are divided according to the major themes of the conference i Fermentation Technology and Bioreactor ii Food Pharmaceuticals and Health care iii Environment and Agriculture and iv Sustainable Energy This book is intended to help students researchers and industry professionals acquire knowledge on innovative technologies and recent advancements in the field of bioprocess engineering and technology

Current Perspectives in Bioscience Research Dr. Yogananth Nagarajan, Dr. R. Bhakyaraj, Dr. K. Vanmathiselvi, 2021-06-26 *Current Perspectives in Bioscience Research* is more inclined towards interdisciplinary studies Recent developments in the technologies have led to a better understanding of living systems and

this has removed the demarcations between various disciplines of life sciences A new trend in life science incorporates biological research involving a merger of diverse disciplines such as Zoology Entomology Fisheries comparative anatomy of vertebrates and toxicology Botany etc The book encompasses topics on A Review on the potential of marine microbes in bioplastics production Phytochemical analysis and antibacterial activity of *Nyctanthes arbor tristis* Linn against UTI causing pathogenic bacteria Bioefficacy of *Trichoderma* isolates against fungal pathogens Exotic Vs Exotic A Promising Mode of Weed Control Bioplastics Production of plastics from Banana peels CRISPR CAS9 in Gene Editing A Review on mobile phones a bridge for transmission of microbes Appraisal on Diagnosis Treatment and Prophylaxis of Systemic Lupus Erythematosus Preservation and microbial contamination of frozen foods Nutraceuticals as alternative therapeutics for Parkinson s disease Decolorization of textile effluent using plant based natural coagulants A review Vaccine Safety Biodiversity and Biotechnological Potentials of Fungi from Marine Ecosystem Bacterial Biofertilizers An Overview Nanoparticles as Feed supplements for Livestock animals and Isolation of Methionine producing Bacteria from Marine Environment distributed throughout Seventeen chapters for the benefits of graduate and postgraduate students as well as young researchers and scientists In addition this book provide newer techniques and the use of modern tools in achieving the potential of Antimicrobial activity Food and Microbial technology Vaccine technology of vertebrates and COVID 19 this is all used to understand the challenges found in biological sciences

Phytochemistry, 3-Volume Set Chukwuebuka Egbuna,Jonathan Chinenye Ifemeje,Stanley Udedi Chidi,Shashank Kumar,Jaya Vikas Kurhekar,Nadia Sharif,2022-05-29 The 3 volume set Phytochemistry covers a wide selection of topics in phytochemistry and provides a wealth of information on the fundamentals new applications methods and modern analytical techniques state of the art approaches and computational techniques With chapters from professional specialists in their fields from around the world the volumes deliver a comprehensive coverage of phytochemistry Phytochemistry is a multidisciplinary field so this book will appeal to students in both upper level students faculty researchers and industry professionals in a number of fields including biological science biochemistry pharmacy food and medicinal chemistry systematic botany and taxonomy ethnobotany conservation biology plant genetic and metabolomics evolutionary sciences and plant pathology

Handbook of Microbial Nanotechnology Chaudhery Mustansar Hussain,2022-03-13 Handbook of Microbial Nanotechnology is a collection of the most recent scientific advancements in the fundamental application of microbial nanotechnology across various sectors This comprehensive handbook highlights the vast subject areas of microbial nanotechnology and its potential applications in food pharmacology water environmental remediation etc This book will serve as an excellent reference handbook for researchers and students in the food sciences materials sciences biotechnology microbiology and in the pharmaceutical fields Microbial nanotechnology is taking part in creating development and innovation in various sectors Despite the participation of microbial nanotechnology in modern development there are some hindrances The lack of information the possibility of adverse impacts on the environment human

health safety and sustainability are still a challenge This handbook addresses these challenges Offers up to date scientific information on the integration of microbiology and nanotechnology Explores how nanotechnology can improve the detection of trace chemical contaminants viruses and bacteria in food and other industry applications Provides readers with a fundamental understanding of microbial nanotechnology and its challenges Includes real time applications with case studies to illustrate how microbial nanotechnology influences modern sciences and technologies

Advances in Plant & Microbial Biotechnology Rita Kundu,Rajiv Narula,2019-04-11 Biotechnology refers to the use or manipulation of an organism or parts of an organism While the early applications were certainly simpler though still relevant modern plant biotechnology is primarily associated with molecular biology cloning and genetic engineering Over the last 50 years several key discoveries have revolutionized the biological sciences and enabled the rapid growth of the biotechnology industry This book gathers handpicked articles presented by national and international scientists at the International Conference on Biotechnology and Biological Sciences BIOSPECTRUM 2017 It highlights the works of researchers and students in India and abroad on plant biotechnology and its applications in addressing various agricultural and food production related issues The respective papers explore a range of advances in plant biotechnology e g the cytotoxic potential of *Moringaoleifera lam* the use of the entomo pathogenic fungi *Cordyceps sp* as unique and valuable sources of bioactive compounds and strain improvement strategies for *Cordyceps sp* In addition they discuss the use of low cost blue green algal biofertilizer comprising four blue green algal strains in rice fields and the use of lignocellulosic materials as potential renewable energy resources for the production of fuels This book will be extremely useful for researchers and students of biotechnology and plant science providing an essential update on the latest findings and trends

Secondary Metabolites and Drug Discovery Umar Ali Dar,Mohd. Shahnawaz,Neha Singh,2025-10-07 This book explores the promising potential of plant and microbe derived compounds in drug discovery offering insights into safer alternatives to synthetic drugs and highlighting the vital role of natural products in treating diseases with fewer side effects Plants and microbes are a promising source for natural products with the potential to play a major role in drug discovery Due to advances in the fields of science technology engineering and medicine the commercial pharmaceutical industry is growing across the globe Currently allopathy uses synthetic pharmaceutical drugs for the treatment of diseases but this practice also exposes patients to significant side effects Since ancient times other systems of medicine have been developed that utilize plant based extracts and molecules to treat various diseases with fewer side effects While changes in lifestyle including diet have had a significant impact on the increased risks of various diseases there is substantial scientific evidence both epidemiological and experimental that vegetables and fruits are key features of diets associated with lower risks of diseases such as cancers and infections These efforts to identify and create medications from plants are leading to increased manufacturing for larger clinical trials The continuing scientific research of medicinal plants will undoubtedly provide a wealth of novel structurally varied bioactive chemicals This edited

volume provides an overview of various medical systems with a special focus on microbial and plant based drug molecules for treating communicable and non communicable diseases making it an invaluable resource for researchers scientists and practitioners interested in the potential of plant and microbe derived secondary metabolites in the ongoing search for innovative effective and safer medicines Readers will find this book Provides an overview of different types of sources and drug molecules used in allopathic homeopathic ayurvedic Chinese and Unani systems of medicine Highlights past and current methods of alternative complementary folklore and integrative medicines Discusses the benefits and side effects of the drug molecules used in different systems of medicine at the global level Explores microbial and plant based drug molecules for treating various communicable and non communicable diseases Audience Researchers academics industry and governmental experts working in the fields of natural science natural products synthetic chemistry pharmacology and medicinal chemistry

Advances in Applied Research on Textile and Materials - IX Slah Msahli,Faten

Debbabi,2022-08-22 This book presents the proceedings of CIRATM 9 The papers present the latest scientific concepts and technological developments in textile and materials of worldwide researchers and practitioners The conference promotes sharing ideas and emerging technologies and fosters research and development collaborations amongst academia research institutions and relevant industries CIRATM is the first international conference applied on textiles in Tunisia and all Maghreb It is a regular conference organized every two year since 2004 It focuses on all textile and materials fields It joints together all actors of textile field and share research with many international collaborators This edition is organized with the collaboration of 4 Tunisian partners and 6 international associates and institutions Laboratory of Textile Engineering LGTex Tunisia Monastir university Tunisia Tunisian Association of Textile Researchers ATCTex Tunisia Le p le de comp titivit Monastir El Fejja mfcpole Tunisia Association of the universities for textiles AUTEX International Balkan Society of textile engineering BASTE National research development institute for textile and leather INCDTP Bucharest Romania Yazid University Iran Centre d Essais Textile Cetelor Lorraine France Center of Textile Science and Technology 2C2T University of Minho Portugal

Plant-Based Functional Foods and Phytochemicals Megh R. Goyal,Arijit Nath,Hafiz Ansar Rasul

Suleria,2021-03-29 Plant Based Functional Foods and Phytochemicals From Traditional Knowledge to Present Innovation covers the importance of the therapeutic health benefits of phytochemicals derived from plants It discusses the isolation of potential bioactive molecules from plant sources along with their value to human health It focuses on physical characteristics uniqueness uses distribution traditional and nutritional importance bioactivities and future trends of different plant based foods and food products Functional foods beyond providing basic nutrition may offer a potentially positive effect on health and cures for various disease conditions such as metabolic disorders including diabetes cancer and chronic inflammatory reactions The volume looks at these natural products and their bioactive compounds that are increasingly utilized in preventive and therapeutic medications and in the production of pharmaceutical supplements and as food additives to

increase functionality It also describes the concept of extraction of bioactive molecules from plant sources both conventional and modern extraction techniques available sources biochemistry structural composition and potential biological activities

Phytochemistry Chukwuebuka Egbuna,Jonathan Chinenye Ifemeje,Stanley Chidi Udedi,Shashank Kumar,2018-12-12 This first book in this three volume set provides comprehensive coverage of a wide range of topics in phytochemistry With chapters from professional specialists from key institutions around the world the volume starts with an introduction to phytochemistry and details the fundamentals Part II discusses the state of the art modern methods and techniques in phytochemical research while Part III provides an informative overview of computational phytochemistry and its applications Part IV presents novel research findings in the discovery of drugs that will be effective in the treatment of diseases The chapters are drawn carefully and integrated sequentially to aid flow consistency and continuity Brassica Germplasm Mohamed A. El-Esawi,2018-10-24 The genus Brassica L of the family Brassicaceae has a vital role in agriculture and human health The genus comprises several species including major oilseed and vegetable crops with promising agronomic traits Brassica secondary products have antibacterial antioxidant and antiviral effects Characterization of Brassica is important for providing information on domestication propagation and breeding programs as well as conservation of plant genetic resources This book highlights the current knowledge of the genus Brassica L in order to understand its biology diversity conservation and breeding as well as to develop disease resistant and more productive crops This book will be of interest to many readers researchers and scientists who will find this information useful for the advancement of their research towards a better understanding of Brassica breeding programs Advances in Vinegar Production Argyro Bekatorou,2019-09-11 In industrial vinegar production there are three main types of methods involved the slow handcrafted traditional method Orleans or French method and the rapid submerged and generator methods The current trend is to fuse traditional techniques with state of the art technologies and a variety of approaches have been developed to increase fermentation efficiency and reduce cost and fermentation time This book reports on all the recent innovations in vinegar production and compares them to the traditional submerged fermentation systems The new trends on raw materials substrate pretreatment strategies alcoholic fermentation and acetification systems are also reviewed *Ethnobotanical Insights Into Medicinal Plants* Musaddiq, Sara,Fayyaz, Imama,Mustafa, Kiran,2024-05-07 A significant gap exists between traditional knowledge and modern scientific understanding of phytochemicals and ethnobotanical wisdom in botanical science Despite the commonplace culinary use of many herbs and seasonings their historical botanical and medicinal dimensions often remain overlooked This gap hinders advancements in various disciplines including chemistry pharmacology botany and agriculture limiting the potential for innovative research and sustainable solutions Ethnobotanical Insights into Medicinal Plants bridges this gap by comprehensively examining these plants morphology cultivation techniques and classifications This book illuminates their untapped potential and catalyzes innovative healthcare agriculture and manufacturing research Integrating

ethnobotanical observations with scientific progress enhances the intellectual domain for academics researchers and professionals paving the way for environmentally sustainable methods of producing bioactive substances **Integrative Pharmacology-based Research on Traditional Medicine: Methodologies, Medical and Pharmacological**

Applications Hai Yu Xu, Chang-xiao Liu, Yanqiong Zhang, Yan Xu, Takashi Sato, 2023-09-19 Integrative Pharmacology can be used to determine the multi pharmacological effects of traditional medicines such as traditional Chinese medicine TCM Kampo Sa sang Ayurveda etc Through qualitative and quantitative pharmacokinetic pharmacodynamic PK PD correlations among multi constituents and multi targets integrating chemical profiling ADME PK processes molecular network calculation and resulting experimental validation the use of Integrative Pharmacology has become widespread The data has provided a novel paradigm to evaluate the druggability of bioactive ingredients of herbs or formulae to decipher the pharmacological mechanisms of drug action and to screen potentially new indications for approved drugs and previously unidentified adverse events On this basis Integrative Pharmacology may offer an effective way to test the potential scientific basis for traditional medicines and to assess what roles of traditional medicine can and cannot play in pharmaceuticals *IMDC-SDSP 2020*

Raed Abd-Alhameed, Rana Zubo, Obed Ali, 2020-09-09 IMDC SDSP conference offers an exceptional platform and opportunity for practitioners industry experts technocrats academics information scientists innovators postgraduate students and research scholars to share their experiences for the advancement of knowledge and obtain critical feedback on their work The timing of this conference coincides with the rise of Big Data Artificial Intelligence powered applications Cognitive Communications Green Energy Adaptive Control and Mobile Robotics towards maintaining the Sustainable Development and Smart Planning and management of the future technologies It is aimed at the knowledge generated from the integration of the different data sources related to a number of active real time applications in supporting the smart planning and enhance and sustain a healthy environment The conference also covers the rise of the digital health well being home care and patient centred era for the benefit of patients and healthcare providers in addition to how supporting the development of a platform of smart Dynamic Health Systems and self management Phytochemical Genomics Mallappa Kumara Swamy, Ajay Kumar, 2023-01-01 This book provides a comprehensive reference for various plant bioactive compounds for research and pharmacological significance across the entire spectrum of phytochemical genomics The book opens with general information on diversity analysis and genomic basis of phytochemicals computational approaches databases for responsible genes and biosynthetic pathways and it delves very much into the details behind phytochemical diversity and diverse roles of plant metabolites The later parts of the book also explore the direct drug discovery and omics approaches including metabolomics transcriptomics as well as gene editing technology experiments to further inspire readers into its unlimited potentials Each chapter includes detailed analysis and relevant experiments for better and deeper understanding of the concepts The book will be an invaluable aid for medicinal plant researchers and a rich source of information and advice for

advanced undergraduates and graduates in the fields of medicine nutraceuticals cosmetics flavor and fragrance studies

Jatropha, Challenges for a New Energy Crop Sujatha Mulpuri,Nicolas Carels,Bir Bahadur,2019-03-29 *Jatropha curcas* or physic nut is a small tree that in tropical climates produces fruits with seeds containing 38% oil The physic nut has the potential to be highly productive and is amenable to subculture in vitro and to genetic modification It also displays remarkable diversity and is relatively easy to cross hybridize within the genus Thanks to these promising features *J. curcas* is emerging as a promising oil crop and is gaining commercial interest among the biofuel research communities However as a crop physic nut has been an economic flop since 2012 because the species was not fully domesticated and the average productivity was less than 2 t ha which is below the threshold of profitability 7 t ha could be reached and it is contributing to new markets in some countries As such it is important for research to focus on the physiology and selective breeding of *Jatropha* This book provides a positive global update on *Jatropha* a crop that has suffered despite its promising agronomic and economic potential The editors have used their collective expertise in agronomy botany selective breeding biotechnology genomics and bioinformatics to seek out high quality contributions that address the bottleneck features in order to improve the economic trajectory of physic nut breeding

Herbal Medicine Phytochemistry Sylvester Chibueze Izah,Matthew Chidozie Ogwu,Muhammad Akram,2024-07-09 This book offers a comprehensive perspective of herbal medicine phytochemistry and explores the application of plant extracts as bioactive compounds in disease prevention and treatment in modern or traditional medicine The book starts with an introduction to the history and value of herbal medicine followed by 3 parts covering the main phytochemical components and metabolites in herbal medicine different uses and practices in herbal medicine including a region wise analysis of methods and practices and an overview of regulations and policies for herbal medicinal practitioners and the advances and challenges in quality assessment of herbal medicine Plants generally have the tendency to bioaccumulate trace metals from the environment and they are easily contaminated by microorganisms from water sources and poor hygiene practices of the herbalist Quality assessment and assurance is thus a pertinent challenge in herbal medicine practice i e in remedy formulation and application and this book offers an authoritative perspective on this topic covering aspects such as quality control strategies preparation techniques chemical quantification in phytomedicine and the efficacy and safety of herbal remedies Moreover in this book readers will find valuable insights into the latest trends and developments in the field and a critical review of the application of medicinal plants to treat cardiovascular digestive respiratory neurological and reproductive diseases Particular attention is given to the advances and trends in the field and readers will learn about the latest biotechnological approaches the use of nanotechnology in herbal medicine metabolomic analysis of medicinal plants big data application in herbal medicine and the value of herbal medicine towards sustainability Given its breadth this book is aimed at researchers academics practitioners and professionals working in the fields of natural life health clinical and biomedical sciences and interested in herbal remedies pharmacology pharmacognosy human nutrition

and dietetics plant biology and biotechnology microbiology *In vitro study on the cosmetic activity of Nerium oleander on pimples* Prem Jose Vazhacharickal, Noby Mathew, Beena Habel , 2017-12 The leaves of Nerium oleander have excellent antibacterial property The present study aims to evaluate the cosmetic activity of Nerium oleander leaf extract against clinically isolated pimple causing Staphylococcus aureus The minimum inhibitory concentration MIC and minimum bactericidal concentration MBC was found that dilution factor 200 and 300 respectively Phytochemical analysis of the extract was also studied This study concludes that Nerium oleander be used as a potential natural remedy to treat pimples

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