Ethnobotany: Ethnopharmacology to Bioactive Compounds – Book Review

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Book Review

Ethnobotany: Ethnopharmacology to Bioactive Compounds, edited by José L. Martinez, Alfred Maroyi and Marcelo L. Wagner. Routlege. London, UK, 2023, pp 246, GBP £124.00 (Hardback), GBP £42.39 (paperback), GBP £42.39 (eBook), ISBN 9781032348148 (hardback), ISBN 9781032348155 (paperback), ISBN 9781003323969 (eBook).

As highlighted in *Ethnobotany: Ethnopharmacology to Bioactive Compounds*, edited by José L. Martinez, Alfred Maroyi, and Marcelo L. Wagner (2023), this book the examines the use of plants in traditional medicine, with an emphasis on the bioactive compounds found in medicinal plants. This study explored the potential of medicinal plants as sources of bioactive compounds for drug development. Several chapters have focused on the use of traditional plants that demonstrate biological activities related to the treatment of various diseases in humans and animals. This book serves as a significant reference in the fields of ethnobotany and pharmacology, offering insights into how traditional knowledge can support the development of new pharmaceuticals through ethnobotanical and pharmacological research.

Chapter 1 discusses the significance of medicinal plants in the agricultural and livestock systems, particularly in developing countries. These plants are not only utilized as food and medicine for humans but also as animal feed, providing dual benefits in enhancing efficiency and reducing livestock farming costs. The chapter highlights that approximately 30-35% of livestock losses are due to issues such as poor sanitation, lack of adequate feed, and water resources, which can be addressed through the use of medicinal plants as an alternative to synthetic feed and growth agents that are more environmentally sustainable. In addition to their medicinal benefits, medicinal plants have been shown to improve animal health and productivity, as well as enhance their resistance to diseases. Further research in the field of ethnoveterinary medicine is needed to explore the potential of these plants to improve food security and livestock health.

Chapter 2 of the discusses resveratrol, a bioactive compound found in plants such as black grapes. This chapter explored the ethnobotanical applications of resveratrol and its role in modern medicine, particularly in the context of global health and the COVID-19 pandemic. Research has indicated that resveratrol offers numerous health benefits, including antioxidant properties that help combat inflammation and oxidative stress. This chapter elaborates on how resveratrol can be used to treat various diseases, such as asthma, and details its mechanisms of action in the body. It also discusses clinical trial results that support its therapeutic potential. The chapter also highlights the significance of collaboration between ethnobotany, pharmacology, and clinical research in the development of plant based therapies.

Chapter 3 examines the medicinal and pharmacological significance of coffee, focusing on its bioactive compounds such as caffeine and chlorogenic acids. This highlights the therapeutic effects of coffee, particularly in preventing conditions such as diabetes, Parkinson's disease, and some cancers. This chapter emphasizes the global importance of coffee, particularly in Brazil, the world's largest coffee producer, and its historical use in folk medicine to treat various ailments. The chapter also explores the diverse chemical composition of coffee beans, which includes compounds contributing to its antioxidant, anti-inflammatory, and neuroprotective properties.

Chapter 4 explores the role of medicinal plants in managing type 2 diabetes, focusing on the bioactive compounds extracted from these plants and their mechanisms in regulating blood sugar levels. The chapter reviews various clinical trials that evaluate the effectiveness of these plants, providing valuable insights into how traditional knowledge can be integrated into contemporary medical practices.

Chapter 5 focuses on ethnobotany and phytochemistry of the *Phytolaccaceae* and *Petiveriaceae* plant families. It discusses various species within these families and emphasizes their traditional uses, chemical compounds, and biological activities. This highlights the medicinal uses of plants in these families, their bioactive compounds, and their pharmacological activities. This chapter offers insight into how these plants are utilized in different cultures for various therapeutic purposes.

Chapter 6 focus on the comparative ethnobotany of plants, such as *Tabernaemontana* L. (Apocynaceae) and *Tabernanthe iboga* Baill. (Apocynaceae). These species are known for their psychoactive properties, and have been used in traditional medicine and religious rituals. This chapter emphasizes that the use of these plants is not solely determined by their chemical composition, but is also influenced by cultural, historical, and geographical factors. While having psychoactive effects, the alkaloids they contain are employed in different ways, depending on the cultural context.

Chapter 7 focuses on the use of *Huperzia* L. (Lycopodiaceae) by healers in the Saraguro community in the Southern Ecuadorian Andes. This chapter highlights the role of plants in local healing traditions, where they are used to treat both physical and spiritual ailments. These plants contain bioactive compounds, such as alkaloids (lycopodine, lycodine) and flavonoids (tricin and selgin), which have anti-inflammatory, antioxidant, and enzyme inhibitory properties. It focuses on bioactive compounds, particularly alkaloids, isolated from these plants and their potential to treat Alzheimer's disease. This chapter emphasizes the collaboration between indigenous knowledge and scientific research in explore plant-based treatments.

Chapter 8 focuses on various species of *Alepidea* F. Delaroche. (Apiaceae) is used in traditional medicine to treat various human diseases and health disorders. Species of *Alepidea* F. Delaroche. (Apiaceae) have been utilized in traditional medicine for the treatment of various ailments, including digestive disorders, respiratory infections, and other health issues. This chapter also highlights that these plants contain bioactive compounds such as alkaloids, flavonoids, and terpenoids, which exhibit antibacterial, antifungal, anti-inflammatory, and antioxidant activities.

Chapter 9 discusses the genus *Salvia* L. (Lamiaceae), particularly its bioactive compounds, and their potential applications in cancer treatment. This genus is known for various secondary metabolites such as terpenoids, flavonoids, and phenolic compounds, which possess pharmacological benefits. Several *Salvia* L. (Lamiaceae) species have been used in traditional medicine and have shown significant anticancer effects. This chapter also highlights the importance of varying the chemical composition of *Salvia* L. (Lamiaceae), which can influence the anticancer efficacy of its plant extracts.

Chapter 10 explores the molecular foundations of ethnobotany and the functional roles of flavonoids. Flavonoids are recognized for their diverse biological activities, encompassing antioxidant, anti-inflammatory, antibacterial, and antiviral properties, which render them highly promising candidates for pharmaceutical development. This chapter elaborates on the application of advanced analytical methodologies, such as mass spectrometry, nuclear magnetic resonance (NMR), and liquid chromatography, in the identification and characterization of flavonoids. These techniques enable researchers to analyze the structural intricacies of these compounds with greater precision and uncover previously unidentified bioactive substances. This chapter also highlights the importance of metabolomics for studying the overall biochemical profiles of plants. The use of these advanced techniques requires efficient data processing, therefore modern computational tools such as machine learning and chemometrics are essential for interpreting complex data.

This book emphasizes that ethnobotany is an interdisciplinary field that integrates anthropology, botany, and pharmacognosy, among others, to understand the relationship between humans and plants. This knowledge is invaluable

not only for preserving traditional uses but also for future applications in the medical field. This book highlights the role of flavonoids, a group of compounds found in plants, known for their antioxidant, anti-inflammatory, and antimicrobial properties. These bioactive compounds are potential candidates for drug development, and new technologies are being developed to better understand their chemical structures and biological effects.

The utilization of modern techniques such as metabolomics is strongly advocated, as it allows for the integration of various methods to provide a more holistic and thorough analysis of natural compounds. The main objective of applying such integrated approaches is to establish a direct correlation between the molecular structure of flavonoids and their potential health benefits. This understanding is vital for the development of these compounds into therapeutic agents, thereby advancing their application in contemporary medical practices. By linking the molecular characteristics of flavonoids with their bioactive properties, researchers can enhance the effectiveness of these compounds in medical treatments.

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