Medicinal Plants: Traditional Wisdom, Modern Drug Potential

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Introduction

This systematic review explores the ethnopharmacological landscape and phytochemical diversity of medicinal plants used in Bangladesh. It catalogs plant species, their traditional applications, and chemical constituents. The research highlights potential for new drug discoveries from this biodiversity, emphasizing preserving traditional knowledge and scientific validation[1].

This review consolidates knowledge on ethnopharmacological uses, phytochemical profile, and biological activities of Vitex doniana Sweet. It details traditional applications, identifies key secondary metabolites, and discusses documented pharmacological effects like antioxidant, anti-inflammatory, and antimicrobial properties, validating its traditional uses[2].

This systematic review examines medicinal plants traditionally used in Brazil for inflammatory conditions. It details indigenous knowledge, traditional preparations, and pharmacological evidence supporting anti-inflammatory effects. The review identifies key phytochemicals for these activities, offering insights for drug discovery from natural sources[3].

This systematic review compiles information on medicinal plants used in Nepal to manage metabolic disorders. It documents traditional knowledge, specific plants, preparation methods, and scientific evidence of efficacy. The study highlights promising plant-based therapies for conditions like diabetes and hyperlipidemia, identifying candidates for investigation[4].

This review synthesizes the ethnopharmacological significance, phytochemical composition, and biological activities of Erythrina abyssinica. It explores the plant's traditional uses, details its characteristic secondary metabolites, and evaluates scientific evidence for medicinal properties, including anti-inflammatory and antimicrobial effects, guiding future research[5].

This review synthesizes ethnopharmacological uses, phytochemical constituents, and validated anti-diabetic activities of genus Terminalia plants. It compiles traditional knowledge for diabetes management, elucidates phytochemistry, and evaluates scientific evidence for hypoglycemic potential, highlighting their role in anti-diabetic drug discovery[6].

This systematic review delves into the ethnopharmacological importance, phytochemical composition, and diverse biological activities of the plant genus Momordica. It covers traditional uses, identifies bioactive compounds like triterpenoids and phenolic acids, and discusses scientific validations for properties such as antidiabetic, antimicrobial, and anticancer effects, underscoring its therapeutic potential[7].

This review investigates the ethnopharmacological relevance, phytochemistry, and pharmacology of genus Polygala, focusing on traditional uses for central nervous system disorders. It compiles traditional knowledge, identifies key bioactive compounds like saponins and flavonoids, and examines scientific evidence supporting neuroprotective, anxiolytic, and antidepressant effects, offering insights for therapeutic strategies[8].

This review compiles ethnopharmacological applications, phytochemical constituents, and pharmacological activities of Sarcopoterium spinosum, concerning its traditional use in treating skin disorders. It explores historical uses, identifies bioactive compounds, and assesses scientific evidence supporting anti-inflammatory, antioxidant, and wound-healing properties, underscoring its potential for dermatological therapeutics[9].

This systematic review explores ethnopharmacological applications, phytochemical constituents, and diverse pharmacological properties of the genus Vernonia. It documents traditional uses for conditions like fevers to parasitic infections, identifies key bioactive compounds, and validates various activities including anti-inflammatory, antioxidant, and antimicrobial effects. The review emphasizes therapeutic potential and calls for further research[10].

Description

Research into ethnopharmacology and the phytochemical diversity of medicinal plants is a critical area for drug discovery. Studies systematically review traditional uses, chemical constituents, and validated biological activities. For instance, in Bangladesh, extensive research catalogs plant species, their traditional applications for various ailments, and their known chemical constituents, highlighting potential for new drug discoveries and the importance of preserving traditional knowledge [1]. Similarly, Brazil has seen comprehensive reviews of medicinal plants traditionally used for inflammatory conditions, detailing indigenous knowledge, preparations, and pharmacological evidence supporting anti-inflammatory effects, identifying key phytochemicals for new drug development [3]. Nepal also contributes significantly, with systematic reviews compiling information on medicinal plants used to manage metabolic disorders like diabetes and hyperlipidemia, documenting traditional knowledge and scientific evidence of efficacy, thus identifying candidates for further pharmacological investigation [4]. These regional studies exemplify the rich global biodiversity and traditional wisdom that can inform modern medicine.

Beyond regional surveys, detailed reviews focus on specific plant species and genera, validating their historical uses. Vitex doniana Sweet, for example, has been

subject to a review that consolidates current knowledge on its ethnopharmacological uses, phytochemical profile, and biological activities. This includes detailing traditional applications and identifying key secondary metabolites, alongside discussing documented pharmacological effects such as antioxidant, anti-inflammatory, and antimicrobial properties, thus validating its traditional uses and suggesting future research avenues [2]. Erythrina abyssinica's ethnopharmacological significance, phytochemical composition, and a range of biological activities have also been synthesized. This review explores its traditional uses across cultures, details characteristic secondary metabolites, and evaluates scientific evidence for various medicinal properties, including anti-inflammatory and antimicrobial effects, highlighting its therapeutic potential [5]. Another important genus, Momordica, has been reviewed for its ethnopharmacological importance, phytochemical composition, and diverse biological activities, covering traditional uses for various ailments, identifying key bioactive compounds like triterpenoids and phenolic acids, and discussing scientific validations for antidiabetic, antimicrobial, and anticancer effects [7].

Targeted reviews also illuminate the potential of specific plant groups for particular health concerns. The genus Terminalia, belonging to the Combretaceae family, has been reviewed for its ethnopharmacological uses, phytochemical constituents, and validated anti-diabetic activities. This work compiles traditional knowledge regarding their application in managing diabetes and related symptoms, elucidates the phytochemistry responsible for therapeutic effects, and evaluates scientific evidence supporting their hypoglycemic potential, highlighting their role in natural anti-diabetic drug discovery [6]. For central nervous system disorders, the genus Polygala L. has been investigated, compiling traditional knowledge, identifying key bioactive compounds like saponins and flavonoids, and examining scientific evidence supporting neuroprotective, anxiolytic, and antidepressant effects, offering insights for new therapeutic strategies [8].

The scope of ethnopharmacological research also extends to dermatological therapeutics. Sarcopoterium spinosum, for instance, has had its ethnopharmacological applications, phytochemical constituents, and pharmacological activities compiled, particularly concerning its traditional use in treating various skin disorders. This exploration identifies bioactive compounds and assesses scientific evidence supporting its anti-inflammatory, antioxidant, and wound-healing properties, underscoring its potential as a source for dermatological treatments [9]. Lastly, the genus Vernonia (Asteraceae) undergoes a systematic review of its ethnopharmacological applications, phytochemical constituents, and diverse pharmacological properties. It documents traditional uses for conditions ranging from fevers to parasitic infections, identifies key bioactive compounds, and validates various activities including anti-inflammatory, antioxidant, and antimicrobial effects, emphasizing therapeutic potential and calling for further research into specific species [10]. Collectively, these studies demonstrate a robust effort to bridge traditional knowledge with modern scientific inquiry, paving the way for innovative natural product-based drug development.

Conclusion

The systematic reviews highlight the immense ethnopharmacological significance, phytochemical diversity, and biological activities of medicinal plants across various regions and specific genera. Research from Bangladesh identifies numerous plant species used traditionally for ailments, showcasing their potential for new drug discoveries and emphasizing the importance of preserving indigenous knowledge. Similarly, studies in Brazil focus on plants for inflammatory conditions, and in Nepal, for metabolic disorders like diabetes and hyperlipidemia, detailing traditional uses and validating efficacy through scientific evidence. Specific plant genera such as Vitex doniana, Erythrina abyssinica, Terminalia, Momordica, Polygala, Vernonia, and Sarcopoterium spinosum are extensively reviewed. These reviews consolidate current knowledge on traditional applications, identify key bioactive compounds like triterpenoids, phenolic acids, saponins, flavonoids, and sesquiterpene lactones, and document their pharmacological effects, including antioxidant, anti-inflammatory, antimicrobial, neuroprotective, anxiolytic, antidepressant, and antidiabetic properties. The findings consistently underscore the therapeutic potential of these natural sources, validating traditional uses and paving the way for further pharmacological investigations, drug development, and the creation of novel therapeutic strategies.

Acknowledgement

Conflict of Interest

None.

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