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Ethnobotanical Leads for Drug Discovery: Bridging Traditional Medicine and Modern Pharmacology

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Abstract

For millennia, traditional medicine systems across the globe have relied on plants to treat a wide array of ailments. These ethnobotanical practices—rooted in indigenous knowledge and cultural heritage—have guided the use of medicinal plants for healing, prevention, and wellness. In recent decades, modern pharmacology has increasingly turned to ethnobotany as a source of novel drug leads. By integrating traditional wisdom with scientific rigor, researchers are uncovering bioactive compounds that hold promise for treating diseases ranging from infections to cancer.

***Keywords:** Medicinal plant use; Phytochemistry; Natural product screening*

Introduction

Ethnobotany involves the study of how people use plants for medicinal, nutritional, and cultural purposes. It serves as a powerful tool for identifying plants with therapeutic potential. These discoveries underscore the value of traditional knowledge in guiding pharmacological research. Recent advances in genomics, metabolomics, and bioinformatics have revolutionized natural product research [1].

These tools accelerate the identification of promising drug candidates and reduce reliance on labor-intensive fractionation methods. Used in Ayurveda for stress and inflammation, Ashwagandha contains withanolides with anti-cancer and neuroprotective properties. Withaferin A has shown strong binding affinity to cancer-related targets in molecular docking studies [2].

Traditionally used for infections and digestive issues, barberry contains berberine, an alkaloid with antimicrobial and anti-

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inflammatory effects. It has been validated through phytochemical and pharmacological studies. Turmeric's active compound, curcumin, exhibits anti-inflammatory, antioxidant, and anticancer properties. Its interaction with COX-2 and other inflammatory mediators has been confirmed through in silico and in vitro studies [3].

Addressing these challenges requires ethical engagement, interdisciplinary collaboration, and robust policy frameworks. Ethnobotanical research must respect the intellectual property rights of indigenous communities. Ethical ethnobotany ensures that traditional knowledge holders are recognized and empowered. For example, standardized extracts of Hypericum perforatum (St. John's Wort) are used in Europe for mild depression, based on traditional use and clinical validation. The Nagoya Protocol on Access and Benefit-Sharing provides guidelines for equitable collaboration [4].

Preserving plant diversity ensures a continued source of therapeutic compounds and supports ecological resilience. These innovations can unlock new therapeutic pathways and foster a more inclusive model of healthcare. Drug discovery from plants must be balanced with conservation. Overharvesting of medicinal species can threaten biodiversity [5].

Conclusion

Ethnobotanical knowledge offers a rich and largely untapped reservoir of drug leads. By bridging traditional medicine with modern pharmacology, researchers can discover novel treatments while honoring cultural heritage. This integrative approach not only advances science but also promotes ethical collaboration, biodiversity conservation, and global health equity.

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