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PHARMACOGNOSY OF MEDICINAL PLANTS: PHYTOCHEMICAL PROFILING AND THERAPEUTIC APPLICATIONS

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Abstract:

Medicinal plants remain a cornerstone of global healthcare systems, contributing significantly to both traditional medicine and modern drug discovery. According to the World Health Organization, nearly 80% of the world's population relies on plant-based medicines for primary healthcare needs. More than 25% of modern pharmaceutical drugs are derived directly or indirectly from plant sources, and approximately 50,000–70,000 plant species are estimated to be used medicinally worldwide. Pharmacognosy, the study of crude drugs obtained from natural sources, integrates botanical, chemical, and pharmacological approaches to identify bioactive compounds and validate therapeutic claims. This chapter presents a comprehensive overview of pharmacognosy with emphasis on phytochemical profiling techniques and their therapeutic applications. Quantitative data on phytochemical classes, extraction efficiencies, and bioactivity correlations are discussed. Advanced analytical tools such as chromatography and spectroscopy have enabled precise characterization of secondary metabolites, accelerating the development of plant-based therapeutics. The chapter also highlights challenges, sustainability concerns, and future prospects in medicinal plant research.

Keywords: Pharmacognosy, Medicinal Plants, Phytochemical Profiling, Bioactive Compounds, Therapeutic Applications.

