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Chemistry in Ethnopharmacology

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Editorial

Natural product biodiversity provides a large supply of drug discovery leads. Natural products are thought to be more likely to produce therapeutic hits because they have a higher number of stereo centres, which increases scaffold diversity provided by organic structures with more fused, bridging, and Spiro carbocyclic rings. The effective separation of resveratrol from grapes has highlighted the benefits of red wine consumption in supporting metabolic health, implying medicinal promise as a therapy for metabolic disorders. Natural products or their semisynthetic derivatives account for over 40% of all pharmaceuticals, 60% of anticancer drugs, and 80% of antimicrobials in clinical use. The emerging trends in pharmaceutical development are synthetic forms of natural products. Classic drugs that were once derived from natural products but have since become 'unnatural,' such as anticancer Taxol (derived from the Pacific yew tree) and antimalarial Artemisinin (derived from annual worn wood), can now be biosynthesized using a variety of advanced genetic, enzymology, and microbiology techniques. However, achieving such success based on the idea of "produce and test enough compounds until the perfect one is found" can take decades.

The issue persists, as many researchers have noted, because the chances of discovering the proper one among the enormous drug-like chemical space must be slim, similar to seeking for a needle in a haystack. Verdine predicted that the success of natural drug discovery relies on constructing libraries in a combinatorial fashion that is streamlined with developments in techniques such as cell culture, chemical extraction, high-throughput screening, and synthesis as early as the mid-1990's. With the use of ground breaking computational simulation and tailored biosynthesis, combinatorial chemistry is now perfected in drug development.

Ethno pharmacology has exploded in popularity since the year 2000. It investigates the therapeutic properties of plant compounds, including Traditional Herbal Medicines (THM) as a main delivery method. Herbal medicines have long been used as a complementary but distinct medicinal system all throughout the world. The majority of herbal medications are complicated combinations with a chemical composition that is largely unknown. Decoctions, infusions, and extracts of one or more plants may be used. Because the active components in many herbs and their physiological activities are still unknown, THM is primarily based on experience gained over thousands of years. The scientific community takes the lead in transforming the THM from an experiential to a scientifically validated environment. Screening, isolating, characterising, and standardizing an unlimited number of chemical compounds and variations using empirical methods is a difficult task that requires a lot of time and effort. The number of chemical structures that can be extracted from a single herb can range from tens to hundreds. Over 300 molecules have been found in a well-known medicinal mushroom called *Ganoderma lucidum*, with more than 100 molecules separated from each of the polysaccharides and triterpenes fractions as key bioactive components. The mushroom has been shown to have ant diabetic, antihypertensive, ant oxidative, antibacterial, immunomodulation, and ant tumorigenic properties, among others. These characteristics have broadened the scope of *G. lucidum* study, allowing researchers to look at disease-relevant mechanisms in relation to the structural and physiological behaviour of raw extracts or isolated chemicals, as well as the chemical profile and genomic signature.

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