

SMALL-SCALE ISOLATION AND MASS SPECTROMETRY-BASED ANALYSIS OF BIOACTIVE METABOLITES FROM RARE MEDICINAL PLANTS

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Millions of people worldwide (an estimated 60-80% of the total population) depend upon medicinal plants for their healthcare needs. The vast majority of medicinal plants grow wild, while only approximately 4% are cultivated. As a consequence, numerous important species have been threatened by extinction and the access to natural sources of biologically active compounds compromised. The clubmoss *Huperzia squarrosa* synthesizes a wide range of alkaloids, one of which, huperzine A, is currently being investigated for its cholinesterase inhibitory activity and potential use in treatment of Alzheimer's disease. *Tripterygium regelii* is a vine known for anti-inflammatory and immunosuppressive properties. One of the terpenoid constituents, triptolide, is presently in clinical trials for the treatment of rheumatoid arthritis. Both plants grow very slowly and have been extensively exploited in their natural habitats in China. Isolation protocols for huperzine A and triptolide have been optimized for utilization of very small amounts of starting material (as low as 10 mg of fresh tissue). Spectrometric detection of bioactive metabolites in extracts obtained from various plant organs was achieved using a Rapid Resolution HPLC-QToF-MS system. Total RNA extractions were performed from the tissues actively synthesizing the target metabolites. These samples were subjected to Illumina next-generation sequencing and a preliminary analysis of these data sets will be presented.