

Medicinal and Aromatic Plants: Chemical Goldmines

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Medicinal and aromatic plants are an important source of raw materials for traditional as well as modern medicines. Medicinal and Aromatic plants synthesise variety of secondary metabolites with remarkable structural diversity, which have been subsequently exploited by humans for their beneficial role in a diverse array of applications. Secondary metabolites are classified as: alkaloids, glycosides, tannins, phenolic compounds, volatile oils, terpenoids, saponins, steroids, resins and bitter principles. Many of these secondary metabolites (mixture, true isolates and chemically modified derivatives/analogues) of plants are commercially important and find use in fragrance, flavouring and pharmaceutical formulations worldwide. Phytochemical exploration of prodigious number of plant species carried out in past led to the isolation of many drugs/ potential drug intermediates of high therapeutic value. Because of the broad structural diversity in secondary metabolites and their wide ranges of pharmacological activities; medicinal and aromatic plants still considered as valuable sources of novel compounds having potential for the development of new pharmaceuticals; and therefore are known as the 'Chemical Goldmines' of novel products and applications [1,2]. Recent developments in the separation/ extraction of the active constituents from these 'chemical goldmines' offer huge opportunities for their industrial utilization as valuable sources for new molecules for perfumery, flavour and drug development. Due to worldwide consumer-driven trends towards herbals, essential oils and related products the demands and price of these products rising consistently in national and international market [3,4]. For making full use of these natural chemical goldmines it is necessary to develop agrotechnology, post harvest technology, processing & manufacturing technology, along with highlighting other issues related to patenting, marketing and extension of these plants. The content of active secondary metabolites in MAPs shown to be depend considerably on several extrinsic and intrinsic factors, including soil and climatic conditions, plant ontogenesis phases, season of harvest and storing conditions [5]. Because of these multiple factors the concentration and consequently the therapeutic effect and industrial use of active ingredients in the final herbal product varies; therefore the standardization of plant drugs, in term of active molecules, is crucial and requisite for quality,

reproducible therapeutic efficacy and for safe use of these plants. To improve the safety and consistency of these chemical goldmines, additional focus is required to define the pharmacology, stability, and bioavailability of these products for further use [6]. Research to study the biochemical pathways and associated enzymes, biosynthesis of the constituents of desired interest, mode of action at target sites, potential toxicity of constituents used in drug development, principle of synergy among the active constituents and improved production of secondary metabolites in bioreactors under controlled conditions present exciting frontiers for future research. Conservation of diversity, genetic improvement and biotechnological studies on MAPs are also of considerable significance [1-4, 7,8]. The potential of lesser known/ under explored medicinal and aromatic plants needs further research, so that these natural chemical goldmines can be explored and better utilised in future.

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