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Terpenes as Starting Compounds for Other Types of Molecules Including Alkaloids

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8.1 Introduction

Terpenoids are the naturally occurring largest and diverse group of organic compounds that are utilized as starting materials for the production of other types of molecules including alkaloids [1]. Terpenoids are mostly obtained from plant sources and few of them have been produced from other sources like fungus, marine organisms, insects and sponges [2]. Terpenoids are isolated from all parts of the plant such as flowers, leaves, twigs, stems, seeds, roots, wood, fruits or bark etc [3]. These compounds are accumulated in secretory cells, holes, trenches, glandular trichomes, or epidermic cells. Monoterpenes and sesquiterpenes are mainly present in essential oils of the medicinal plant and the larger molecular weight terpenes such as triterpene, are present in balsam and resin. The monocyclic monoterpenes are commonly used as building blocks for the synthesis of polycyclic terpene and are also utilized for the transformation of other compounds [4]. Monoterpenes are also applied for the synthesis of chiral selenium and tellurium compounds. Terpenoids are utilized as suitable starting materials for the manufacture of natural aroma chemicals in the food and pharmaceutical industries [5]. The study of these secondary metabolites provides better opportunities for researchers to design and develop new drug candidates from natural sources against several disease conditions such as cancer, Alzheimer's, malaria, inflammation, depression, tuberculosis, parkinsonian, fungal and viral infections etc [6]. Due to structural diversity, these compounds are of great interest to study their phytochemistry, synthesis and pharmacological activities [7].

8.2 Monoterpenes as Starting Compounds

Monoterpene and its derivatives represent a large group of naturally occurring organic compounds which consist of two isoprene units linked in a head-to-tail fashion in their structures [8]. Monoterpene derivatives with heteroatom like oxygen atoms are known as monoterpenoids. These compounds are used as a renewable source of starting materials for producing

biologically active compounds (antibacterial, antiviral, anticonvulsant, antidepressant, anti-Alzheimer, anti-Parkinsonian, analgesic and anti-inflammatory) [9].

Patrusheva et al demonstrated the synthesis of chiral oxygen-containing heterocycles with diverse structures by reactions of monoterpenoids with carbonyl compounds (R-CHO).

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