Mini Review

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Biological Action of Sesterterpens. The Mini-Review

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ABSTRACT

In the mini-review the literary data about a biological activity of the least studied group of the natural compounds named by sesterterpenes is cited. In the given article, the biological activity separately for acyclic, mono-, bi-, tri- and tetracyclic structures is generalized. For each subgroup the experimental data of biological activity for unique or several most typical sesterterpenes structures are resulted.

Keywords: Sesterterpenes; Pharmacological Properties

Introduction

Sesterterpenes represent the small terpenes group, which is allocated from different organisms and possesses by various biological properties, including such as anti-inflammatory, anti-microbes and anti-tubercular. Some sesterterpenes possess by multipurpose properties. For example, manoalid possesses by anti-inflammatory and anti-microbes actions [1,2]. According to Plemenkov [3] existing types with a biological action has being classified as two groups: native and gotten. In turn he divided the native properties on ecological, which include the properties of the first level providing the ability to live of an organism (for example, hormones) and also on the properties of the second level, which are carrying out functions of the chemical communications (for example, pheromones) and also on the benefit performance properties, which are used by the person for own needs: perfume, solvents, medicinal substances of a wide action spectrum etc. Separately he has allocated the gotten properties, which exist by the directed chemical updating of terpenes to produce the substances possessing the target pharmacological or other functions. It is necessary to notice that sesterterpenes are the poorly studied class of terpenes substances origins before their availability is limited. Behind some exception, they are received from marine organisms.

Therefore, the some complexities to obtain them are aroused. A biological activity of sesterterpenes in this fact is studied; first, pour but to use them directly in the practical purposes, i.e. according to the benefit performance properties by them. It is important that many sesterterpenes can suppress the growth of cancer cages *in vitro*, and it is the cause why they are considered as perspective candidates on antineoplastic preparations [1,2,4]. However, their functional mechanisms are insufficiently studied for today. Sesterterpenoids usually contain carbon skeletons C-25. Nevertheless, some its connections contain from C-21 to C-24 and they are grouped on the subgroup named nor-sesterterpenoids [1,2]. At present, all of them have been allocated from land mushrooms, lichens, the higher plants, insects and various marine organisms, but especially from

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marinesponges [2,5]. According to the degree of a cyclization, the molecular structures are classified on 5 subgroups, such as acyclic, mono-, bi-, tri- and tetracyclic [2,4,6].

In each subclass, the substances possessed by a different cytotoxic activity have been revealed. Besides, for acyclic sesterterpenes one found the antiprotozoan activity [7,8], for the mono- and bicyclic sesterterpenes – one found the anticancer activity [9,10], for the tricyclic sesterterpenes – one found the anticancer and antibacterial activity [11,12], for the tetracyclic sesterterpenes – one found the anticancer and antibacterial activity [13-15], also the antitubercular activity [16] and antivirural [17] activity and ichtiotoxic activity [18] has been revealed. For example, two acyclic sesterterpenes Ircinins-1 and-2 were isolated from Ircinia oros, the antiprotozoan activities of them [8] where found out *in vitro*. The monocyclic sesterterpene Acantholide A was isolated from Hyrtius communis [9], – it possesses by anticancer action and it inhibits the HIF-1 activity [IC50 of 7.1 μM (Cl of 6.7-7.8 μM)]. Bicyclic sesterterpene Phorone B was isolated from Clathria gombawuiensis [19], - it possesses by the anticancer action and it was moderately active against the K562 and A549 cell-lines. Tricyclic sesterterpene Coscinolacton A was isolated from Coscinoderma sp [9], – it is awake against a line of cancer cells K562 and A549 with moderate cytotoxicity [IC50=0.95, 5M].

Another tricyclic sesterterpene Ophiobolin W was isolated from Aspergillus ustus [12], – it possesses by the inhibiting activity against Escherichia coli, Staphylococcus aureus and Artemia salina. Tetracyclic sesterterpene perisomalien A was isolated from Periploca somaliensis [20], and the cytotoxic activity of its metabolites was assessed towards MCF-7, HepG2, and HCT-116, which possessed the most potent effect towards HepG2 with IC50s 26.7 μM. Another tetracyclic sesterterpene Ansellone C was isolated from Clathria gombawuiensis [21], – it possesses by the moderate antibacterial action against gramme-positive and gramme-negative bacteria. Thus, because a raw-material base is low available, the biological researches of sesterterpenes were made to study their pharmacological properties of anticancer and antimicrobial directions pour but to apply them as possible proximately in practice.

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