

PL3. Bryophyte volatiles: chemical diversity, chemotaxonomic significance and biological activity

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Bryophytes are spore-forming plants, which occupy a position in the plant kingdom in between algae and pteridophytes. These are divided into three classes, mosses, liverworts, and hornworts [1]. Phytochemistry of bryophytes has been neglected for a long time because they are morphologically very small and it is difficult to collect a sufficient amount of plant material for study. The second problem is proper identification of plant material, which is especially challenging, because of their small size, their often microscopic or chemical distinguishing features [1-3]. Among the bryophytes, the chemical constituents of the Marchantiophyta and their biological activity have been studied in the most detail. Liverworts are characterized by the presence of oil bodies, unique organelles in which terpenoids and aromatic compounds are accumulated. Many of these compounds have unprecedented structures, and some, including the pinguisane-type sesquiterpenoids and sacculatane-type diterpenoids, have not been found in any other plants, fungi or marine organisms. A characteristic structural phenomenon of liverwort constituents is that most sesqui- and diterpenoids are enantiomers of those found in higher plants [1-3]. Constituents occurring in liverworts exhibit interesting biological activities, such as antibacterial, antifungal, cytotoxic, insect repellent, as well as some enzyme inhibitory and apoptosis-inducing activities [1,4]. The second very important direction of research concerning liverwort chemistry is the chromatographic fingerprinting of the volatiles present in these spore-forming plants, which can be used for identification and authentication of herbal samples, as well as for chemotaxonomic studies [2,3]. This lecture will cover the structures and biological activity of volatiles present in bryophytes, as well as chemotaxonomic studies. This lecture will also look at where bryophyte pharmacognosy may be directed in the future.

References:

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