DEVELOPMENT OF PHARMACOLOGICAL PREPARATIONS BASED ON THE ANALYSIS OF BIOLOGIKAL ACTIVITY OF KARACOLINE ALKALOID AND ITS DERIVATIVES

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Annotation: *In the years before our era, attention was paid to substances obtained from natural products. However, in recent times, the views on natural sources, such as alkaloids or other medicinal products, have decreased significantly. These substances protect the plant organism from various predators. There are harmful and useful types of alkaloids, but their benefits are more significant than their harm. A clear example of this is the caracolin alkaloid, which is currently being observed by scientists. Its antioxidant and has anti-cancer properties. In recent years, studies have been conducted on the pharmacoecological benefits of caracolin alkaloid and its derivatives.*

Keywords: *alkaloid development, natural products, drug-likeness ethnopharmacology, drug discovery, biodiversity, GBIF (Global Biodiversity Information Facility), modeling,caracoling alkaloid.*

Access. Drug discovery strategies have changed considerably over the last decades. Selecting candidates for drug developments using computational design and empirical rules has resulted in a broad discussion about their success. "Maximal chemical diversity" and "druggability" questions, for example, are tackled through the works of Lipinski which involves log P, molecular weight and hydrogen bond acceptors and donors to predict pharmacokinetic properties for lead compounds. Other metrics for lead selection include ligand efficiency, rotatable bond, and polar surface area for absorption predictions. Screening libraries used in drug discovery are anything but diverse, since the rules of chemical synthesis filter out many diversified promising lead compounds.

Even though natural products have been a source of medicine dating back to at least 2600 BC with a huge impact on modern medicine Discovery, many of the current empirical rules and filters lack the considerations for molecules with diversified properties, especially in natural products like alkaloids basic, cyclic organic compound containing nitrogen in the ring systems. While many alkaloids are classified according to their molecular skeletons, classification based on botanical origins are also used. Alkaloids provided unique lead compounds for medicine. They have basic properties, in which they are water soluble under acidic conditions and lipid soluble under neural and basic conditions. This is especially important for dissolution in protonated form and membrane permeation in deprotonated form.

Analyses. Alkaloids are mainly biosynthetically derived from amino acids resulting in variety of chemical structures, mostly isolated from plants. Alkaloids can be found in about 20% of plant species in small qualities and their production (including in biotechnology), extraction and processing remain major areas of research and development. Alkaloid biosynthetic pathways can be manipulated genetically for example in order to achieve higher production levels of alkaloids. Caracolin alkaloid and its derivatives have been shown to have various biological activities, including cognitive enhancement, anti-inflammatory, neuroprotective, antioxidant, and antitumor effects. These unique properties make caracolin alkaloid and its derivatives a promising source for drug production.

There is a need for drug discoveries from natural sources to result in a more diversified medicine portfolio for human use. Furthermore, natural products are more likely to resemble endogenous metabolites and biosynthetic intermediates compared to synthetic compounds which can be recognized as substrate by active transporters. Despite the changes in discovery strategies and most notably the emergence of medicines derived from molecular biology, there remains a need to develop natural product-based medicines which has shown great success as a strategy. Alkaloids play an essential role in both human medicine and in an organism’s natural defence. Alkaloids make up approximately 20% of the known secondary metabolites founds in plants. In plants, alkaloids protect plants from predators and regulate their growth. Therapeutically, alkaloids are particularly well known as anaesthetics, cardioprotective, and anti-inflammatory agents. Well-known alkaloids used in clinical settings include morphine, strychnine, quinine, ephedrine, and nicotine. Recently, there is a resurgence of interest in bioactive natural products, driven both by a very proactive development in the field of traditional medicines (ethnopharmacology) as well as their potential in drug discovery. As of 25 October 2020, 27,683 alkaloids were included in the Dictionary of Natural Products (DNP) with 990 hits of newly reported or reinvestigated alkaloids from nature between 2014 to 2020.

In recent years, scientists have been conducting research on the pharmacological advantages of caracolin alkaloid and its derivatives in order to create new and high-quality medicines. For example, the alkaloid caracolin and its derivatives have been studied for potential use in the treatment of Alzheimer's disease due to their cognitive abilities. In addition, their anti-inflammatory and antioxidant properties have potential therapeutic effects for a number of diseases and disorders, including cancer, Parkinson's disease, and stroke. Despite the promising results of preclinical studies, further research is needed to fully understand the potential clinical applications of caracolin alkaloid and its derivatives. There are also difficulties in the development of drugs based on these compounds, such as their low bioavailability and the possibility of toxic effects with the use of high doses.

Caracoline alkaloid and its derivatives have shown promising biological activity that may motivate the development of new pharmacological drugs. However, more

research is needed to fully understand their therapeutic potential and overcome the problems associated with their use. Caracolin alkaloid and its derivatives have been found to have several potential pharmacological applications due to their cognitive enhancing, anti-inflammatory, neuroprotective, antioxidant and anticancer properties. These compounds have been extensively studied for their potential use in the development of new and more effective drugs. For example, studies have shown that the alkaloid caracolin and its derivatives may have beneficial effects in the treatment of Alzheimer's disease by improving cognitive function. In addition, their anti-inflammatory and antioxidant properties help in the treatment of a number of diseases such as Parkinson's disease and cancer.

Conclusion. However, the development of drugs based on caracolin alkaloid and its derivatives may cause problems such as low bioavailability and the risk of toxic effects at high doses. Therefore, further research is needed to better understand the potential clinical applications and to overcome the problems associated with their use. Caracolin alkaloid and its derivatives have great potential as pharmacological agents for various health conditions. However, more research is needed to fully explore their therapeutic effects and optimize their use in drug development.

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