PL.16. PHYTOECDYSTEROIDS: CHEMISTRY, BIOLOGY AND THEIR APPLICATIONS

N.Sh. Ramazonov[1], U.Yu. Yusupova[1]

[1]S.Yu. Yunusov Institute of the Chemistry of Plant Substance, Academy of Science of the Republic of Uzbekistan, 100170, Tashkent, 77 M. Ulugbek str.,
*Corresponding Author. E-mail: ramazonovn@list.ru

Ecdysteroids are a class of steroids of natural origin that are structurally similar to the molting hormones of arthropods and have high biological activity.
Ecdysteroids are among the most widely distributed steroid compounds in nature. They are found in more than 90% of species of the animal world, namely in arthropods, the number of species of which reaches 1 million, as well as in some other invertebrates.
The role of these compounds in the body of lower animals, where they regulate a number of extremely important life processes as hormones, is well known. When assessing the role of ecdysteroids in the life of plants, one should keep in mind the close ecological relationship and interdependence between the plant world and insects. Unlike plants, most invertebrates do not have an enzyme apparatus for the complete synthesis of steroids. The necessary material for the construction of cell membranes and insect hormones in the form of sterols is supplied by plants.
Ecdysteroids in both the animal and plant worlds, as has now been established, play an extremely important role in regulating vital processes in their organisms, despite the fact that they are far apart from each other in evolutionary terms. This circumstance led to a significant scope of scientific research, during which important results were obtained that have both fundamental theoretical and practical significance.
In recent years, in the field of chemistry and pharmacology of plant steroids, most of the work has been devoted specifically to phytoecdysteroids, as the most original and promising group of compounds with metabolic activity.
Numerous studies have established that phytoecdysteroids are quite common secondary metabolites of plants; more than 550 compounds of this series have already been identified. Based on them, more than 300 ecdysteroid-containing substances have been created, on the basis of which biologically active additives and preparations are developed for use in various areas of human activity.
Since a combination of any individual modifications can occur, one can theoretically expect the existence of more than 1000 different structures. It can be assumed that the phytoecdysteroids identified to date represent only a small fraction of those compounds that exist in nature.

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