

## HISTORY OF STUDY OF ENDOPHYTIC MICROORGANISMS

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**Abstract:** *This article provides information about the history, methods and practical importance of endophytic microorganisms. The history of the study of endophytic microorganisms helps us to illuminate the future prospects of these bacteria today.*

**Key words:** *Food safety, their antimicrobial, antifungal and antagonistic properties, separation of secondary metabolites, biologically active substances, interactions with plants.*

**Introduction:** As a result of the development of the pharmaceutical industry in the world, the demand for medicinal plants is increasing. 750 species of more than 4,500 plants belonging to the local flora are considered medicinal, 112 of them are registered for use in scientific medicine, of which 70 species are actively used in the pharmaceutical industry. The symbiotic and antagonistic relations of plants and microorganisms have been studied by scientists on a global scale, establishing the relationship between plants and microorganisms, and talking about their various medicinal properties. It has been found that endophytic microorganisms spend a certain life cycle in plant tissues, improve the plant's immune system, and have a broad-spectrum effect against various pathogenic microorganisms and pest insects. To date, studying the chemical and microbiological composition of medicinal plants and evaluating their biotechnological potential, obtaining biopreparations based on them determines the relevance of the topic. Plants can have microorganisms that live on

them, but do not have any type of activity and do not cause obvious symptoms. These microorganisms are known endophytes. The parasites that host these plants and the relationships between them are of great importance. It has all the characteristics of endophytic microorganisms and the host plants of these fungi we will tell you the important aspects of their relationship. The most important thing to study is the relationship between the endophytic microorganism and the host plant. This type of relationship can vary from mutualism to pathogenesis.

**Literature review on the topic:** In the relationship between two organisms, we can see the production of potentially toxic secondary metabolites. This means that some endophytic fungi can produce virulence factors. On the other hand, the plant increases the production of mechanical and biochemical defenses. The relationship between virulence of a microorganism pathogen and enhanced defense by the plant implies that the two have a balanced antagonistic relationship. This means that both produce a mutually beneficial relationship. This balance depends on the intensity of virulence of the fungus, the level of protection of the plant. These aspects have different changes depending on the influence of environmental factors and the stage of development of both organisms. At the Institute of Microbiology of the Academy of Sciences of Uzbekistan, based on microbiological biotechnology, it was possible to prepare feed for livestock from plant waste (stalks, straw, straw and waste); in some countries (Brazil) extraction of sugar or alcohol from cellulose with the help of special microbes, extraction of methane gas from cow dung (especially in China, Brazil and European countries) has a very high economic effect. Membranes and immobilized enzymes can be used to produce equipment for measuring and controlling various processes. In this field, UzMU biol. and the faculty of chemistry (B. O. Toshmuhamedov, O. K. Toshmuhamedova, A. I. Gagelgans, M. M. Rahimov, etc.) contributed greatly. Cell Biotechnology is based on the artificial growth and reproduction of plant, animal and human cells similar to those of microorganisms. Artificial cultivation of human and animal cells Industrial production of rare biological drugs, antibodies and protein hormones allowed. The production of highly sensitive

diagnostic tools based on monoclonal antibodies (antibodies produced by a single primary cell generation) has been launched for the detection of plant, animal and human diseases.

**Result and discussion:** Many scientists have conducted scientific research on the study of endophytic microorganisms and their separation. Including Z. Abbas, S. Saggi, M. Sakeran, N. Zidan, H. Rehman, S. Arora, P. Patel, M. Vanza, T. Cook, K. Brown, J. Boyle, G. Strobel, D. Scientists such as Tusch, A. Lajoix, E. Hosy, J. Azay-Milhau, K. Ferrare, D. Jahannault, H. Yu, L. Zhang, L. Li, C. Zheng, L. Guo, in his scientific works, he describes the composition of endophytes of various medicinal and agriculturally important plants, their antimicrobial, antifungal and antagonistic properties, the separation of secondary metabolites, biologically active substances, their interactions with the plant and its promising aspects in biotechnology learned. In particular, Dr. D.T. of the University of Johannesburg in South Africa on the analysis of endophytes and phytochemistry of *Cichorium intybus*. Ndinteh, W. B. Mavumengwana and their students have done great scientific work. Also, A. Amirita, P. Swetha, N.S. Vasanthi, K.P. Many scientific researches about endophytes are known by scientists like Kannan. These researches are important because they will achieve great achievements in the field of endophyte biotechnology on an industrial scale, have promising projects and find effective solutions to the problems observed in the earth's ecological, food safety, and agricultural sectors. Scientific research in this field is also being conducted in Uzbekistan. Information on identification, cultivation, introduction, preparation of raw materials, biochemical composition of medicinal plants was provided by a number of scientists (K.Z. Zakirov, H.A. Abduazimov, P.Kh. Yoldoshev, N.K. Abubakirov, A.Ya. Butkov, I.K. Komilov, K.Kh. Khojimatov, I.I. Malsev, I.I. Granitov, A.G. Kurmukov, I.V. Belolipov, R.L. Khazanovich, M.B. Sultanov, F.S. Sadriddinov, P.K. Zokirov, S.S. Sahobiddinov, Kh.Kh. Kholmatov, Yu.M. Murdakhayev, B.Yo. Tokhtaev) were noted in the research results. In particular, endophytes are being studied today by the scientists of the Microbiology Research Institute under the Academy of Sciences of Uzbekistan.

**Conclusion:** Today, endophytic microorganisms are widely studied around the world, and scientists have collected a lot of information about it. The role and properties of endophytic microorganisms in the growth and development of plants are of great practical importance. In particular, endophytic microorganisms were first described by the German botanist John Link in 1809. Although its role in plants was unknown at first, later French scientist Beecham proposed to call it "microorganism", and finally in 1887 Victor Galipp discovered bacteria found in plant tissues. Endophytic microorganisms, like other biological concepts, are based on many scientific studies that have been confirmed over time. The term "endophyte" is "endo" inside and "phyton" is plant means The term "endophyte" was first used in 1866 by Henrich Anton De Bary, who defined endophytes as any microorganisms living in plant tissues, i.e. fungi, bacteria. In 1986, Carroll described endophytic organisms as fungi that live in plant tissues and cause various infections. In 1991, Petri defined endophytes as fungi, bacteria, actinomycetes, and mycoplasmas. In addition, he defined them as any microorganisms that have their own life cycle in the leaves, branches, and stems of the plant and do not harm the plant, and showed the symbiotic relationship of endophytes with the plant.

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