SEPARATION OF ENDOPHYTIC BACTERIA ISOLATES FROM THE MEDICINAL PLANT INULA HELENIUM AND STUDY OF THEIR ENZYME SYNTHESIS PROPERTIES.

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https://doi.org/10.5281/zenodo.16940223

Abstract. A total of 14 bacterial isolates were isolated from the medicinal plant black andes. The isolated active endophytic bacterial isolates were identified using MALDI-TOF MS, 3 of which belonged to Bacillus amyloliquyefaciyens, 5 to Bacillus subtilis, 2 to Klebsiyella oxytoca, and 4 to Pseudarthrobacter oxydans. It has been established that the Bacillus subtilis-5 strain synthesizes more enzymes such as α-amylase, lipase, and protease.

Keywords: Black elecampane, Inula helenium, medicinal plant, gastrointestinal inflammation, endophytic bacteria, isolate, MALDI-TOF MS method, identification, amylase, protease, lipase, Bacillus subtilis.

Log in. Black andes (Inula helenium) is one of the widely used medicinal plants in folk medicine, and its roots, leaves, petioles, and flowers are an effective remedy against respiratory diseases, gastrointestinal diseases, and inflammation. The essential oils and secondary metabolites contained in it are used to combat cough, improve digestion, and fight microbes [1-3]. Nevertheless, it is recommended to use this medicinal plant with caution and moderation.

Currently, the use of endophytic bacterial isolates isolated from medicinal plants is used to improve plant nutrition, protect them from various phytopathogens, and create biological preparations to increase agricultural crop yields [4-5]. In particular, endophytic bacteria isolated from medicinal plants can be used as probiotic preparations containing live bacteria that interfere with protecting normal intestinal flora from pathogenic bacteria causing various diseases, antibiotics, improper nutrition, chemical preparations, and conditionally pathogenic microbes that multiply as a result of organism weakening due to various infections can be used to prevent dysbacteriosis [3-5].

Objective of the research: To isolate endophytic bacterial isolates from the medicinal plant Inula helenium and study their enzyme-synthesizing properties.

Research and Methods. The isolation of endophytic bacterial isolates from the medicinal plant was carried out using classical microbiological methods, the enzyme-forming property was determined by the GOST standard.

Received results and their analysis. It is known that based on the isolation of endophytic bacteria that synthesize secondary metabolites from medicinal plants and their enzyme-synthesizing properties, they can be used as probiotic preparations containing live bacteria. Accordingly, in this study, endophytic bacteria in the internal tissues of black andiz, one of the medicinal plants found in some regions of our republic, were studied. In particular, the biodiversity of bacteria living in the internal tissues of the plant's petioles, flowers, leaves, and roots was studied.

According to the obtained results, a total of 14 endophytic bacterial isolates were isolated from the petioles, flowers, leaves, and roots of black andiz and grown on a meat peptone (GPA) medium. Taking into account the biodiversity of endophytic bacteria in the internal tissues of plants, it was established that they are found differently in the roots, flowers, petioles, and leaves of the medicinal plant black andiz. It was found that endophytic bacteria live in leaves - 35%, roots - 22%, petioles - 28%, flowers - up to 15%.

The isolated active endophytic bacterial isolates were identified using MALDI-TOF MS. According to the results obtained, it was established that 3 Bacillus amyloliquefaciens, 5 Bacillus subtilis, 2 Klebsiella oxytoca, 4 Pseudarthrobacter oxydans bacteria belong to them.

When screening isolated isolates based on enzyme-synthesizing properties, it was found that the 5th isolate of Bacillus subtilis strains isolated from leaves synthesizes more enzymes such as α-amylase, lipase, protease, which inhibit the growth and development of pathogenic bacteria and break down cell walls, compared to other strains.

Conclusion. A total of 14 bacterial isolates were isolated from one of the medicinal plants Black andiz. Isolated endophytic bacterial isolates were identified using MALDI-TOF MS. As a result, it was established that 3 of the isolated bacteria belong to the bacterial species Bacillus amyloliquefaciens, 5 to Bacillus subtilis, 2 to Klebsiella oxytoca, and 4 to Pseudarthrobacter oxydans. It was found that the Bacillus subtilis-5 strain synthesizes more enzymes such as α-amylase, lipase, protease.

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