



SEARCH AND ISOLATION OF ENDOPHYTIC BACTERIA FROM MEDICINAL PLANTS AND DETERMINATION OF THEIR MORPHOLOGICAL AND CULTURAL PROPERTIES.

Shokhiddinova Mokhichekhra, Tojiyeva Maftuna, Tojiyev Bekhruz.

Faculty of Biology, National University of Uzbekistan named after M.Ulugbek, Tashkent, Uzbekistan

e-mail: shoxiddinovamoxichehra@gmail.com

Article history:	Abstract:
Received: 24 th October 2021 Accepted: 24 th November 2021 Published: 30 th December 2021	7 isolates were isolated from the roots, stems and leaves of the medicinal plant Kalanchoe degremona. MALDI TOF (MALDI TOF) was identified using mass spectrometry and in Pseudomonas puti, Bacillus amyloliquefaciens ssp. Plantarum was found to belong to the species Klebsiella pneumoniae, Bacillus subtilis.
Keywords: Endophytes, Bacteria, Melissa Officinalis, Plant-Microbial Interaction, Root, Stem, Leaf, Microbial Preparations, MALDI TOF Mass Spectrometry, Medicinal Plants.	

At present, one of the urgent tasks is to increase soil fertility and crop yields, ensure root development of plants and protect them from various phytopathogenic diseases. In this case, the role of endophytic microorganisms living in the internal tissues of plants, ensuring their growth and development, living in symbiosis with other organisms of the biosphere is great. Endophytic bacteria modulate hormone balance in plants, synthesize vitamins and indole 3 acetic acid, are directly involved in improving plant nutrient uptake, improve their immune system activity and soil fertility, protect against various phytopathogenic diseases and increase stress tolerance [1,5]. Therefore, plant-microbial symbiosis in agriculture, endophytic microorganisms that are part of the life activities of plants, that can coexist in their internal tissues, are of great interest to many researchers.

The main purpose of our study is to search for and isolate endophytic bacteria from the plant Kalanchoe degremona, to determine their morphological and cultural properties.

RESEARCH METHODOLOGY.

In the separation of endophytic bacteria from the medicinal plant Kalanchoe degremona, the surface part of the plant's roots, stems and leaves were sterilized, the internal tissues were removed and crushed. The materials under study were thoroughly mixed with separately sterilized distilled water. Bacterial suspensions were incubated in meat peptone agar (GPA) culture medium for 48 h at a 37°C thermostat and 7 isolates were isolated. Cultural-morphological features of active isolates of endophytic bacteria were carried out using a general microbiological method.

ANALYSIS AND RESULTS.

Endophytic microorganisms have been found to be more common in the roots, stems and leaves of plants [1-3]. Because of the abundance of nutrients required for microorganisms in the roots, stems and leaves and the convenience of living conditions for them, endophytic microorganisms located in the leaves and roots of the plant are able to dissolve and move in water through the outflows of plants. Because endophytic bacteria colonize ecological spaces with phytopathogenic microorganisms, they are promising agents for bio control of phytopathogens and they are microorganisms that form part of their life cycle within plants. Endophytic microorganisms live in the internal tissues of plants and colonize their roots. This indicates that endophytic bacteria are biodiverse in the internal tissues of plants. [1-5].

Accordingly, endophytic bacteria of medicinal plants found in the regions of the country were studied and medicinal plants such as zubtutum, dalachoy, chamomile, sachratki, kalanchoe, lemon, mint were taken as the object. In particular, the biochemical diversity of bacteria living in the internal tissues of plant stems, leaves, and roots was studied.

According to the results, a relatively higher incidence of endophytic bacteria was observed in the stems and leaves of kalanchoe degremona and saccharine plants than in other medicinal plants. Accordingly, Kalanchoe degremona, one of the medicinal plants, was taken as the object in our study, 7 endophytic bacterial isolates were isolated in the internal tissues of roots, stems and leaves, and grown in meat peptone (GPA) nutrient medium. Kalanchoe degremona has been found to occur differently in the roots, stems and leaves of the medicinal plant.

According to him, up to 44.2% of endophytic bacteria were found in the stems, 33.1% in the roots and 22.7% in the leaves.

When the cultural-morphological properties of the active isolates isolated from the stems, leaves and roots of the medicinal plant *Kalanchoe degremona* were studied using a general microbiological method, some of the isolates were rod-shaped, up to 1.5 x 3 mm, some up to 0.6 x 0.8 mm, spores oval, gram-positive, some were found to be grammatical, mobile.

When the meat is grown on peptone agar, the colonies are round, rod-shaped, with smooth or serrated edges, the middle of the colony is convex, some are transparent or white in color, some are white-milky or pale brown, and when grown in a starch-peptone medium, their colonies are round. or rod-shaped, the edges were found to be uneven (Fig. 1).

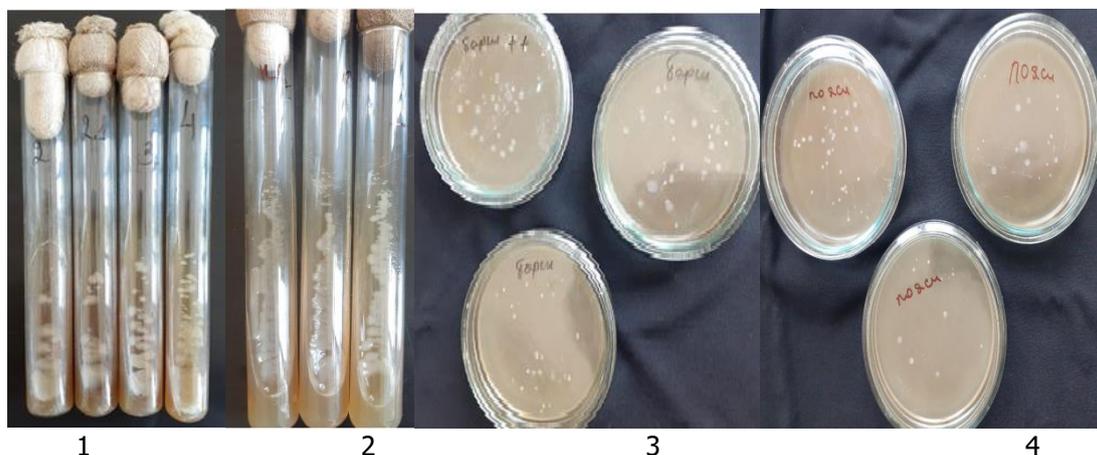


Figure 1. *Kalanchoe degremona* is a medicinal plant isolates isolated from stems (1 and 4) and leaves (2 and 3).

It is known from the literature that *Pseudomonas* sp., *Alcaligenes* sp., *Enterobacter* sp., *Acinetobacter* sp. and *Bacillus* sp. such bacteria improve the phosphorus nutrition of plants, synthesize phytohormones, vitamins, indole acetic acid, plants infected with endophytes become more resistant to disease and give high yields. For example, *Pseudomonas* synthesizes indoliluxic acid in the puti and has a positive effect on plant growth and development, while *Bacillus subtilis* produces gibberellin, which has also been studied to have a positive effect on plant life [1, 5]. Therefore, active isolates isolated from the roots, stems, and leaves of the *Kalanchoe degremona* medicinal plant were identified using mass spectrometry. The results of the study show that according to the morphological characteristics of the isolated isolates, the isolates were identified using the mass spectrometry method MALDI TOF (MALDI TOF) and in *Pseudomonas puti*, *Bacillus amyloliquefaciens* ssp. *Plantarum*, *Klebsiella pneumoniae*, *Bacillus subtilis*. Hence, the results obtained indicate the biodiversity of endophytic microorganisms living in the internal tissues of plants.

LITERATURE

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