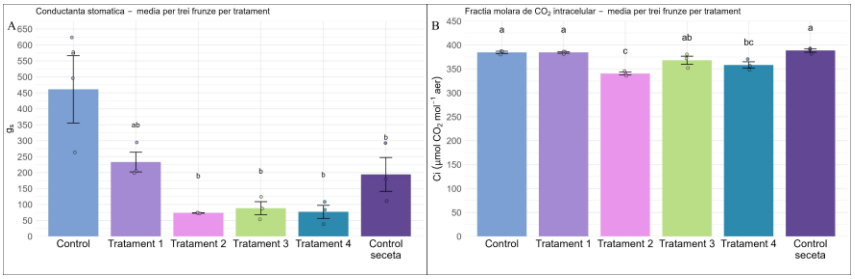
Executive summary of the activities carried out

The method of adsorption of the selected pollutants (ciprofloxacin and norfloxacin) from synthetic aqueous solutions, on prepared materials, including materials encapsulated in alginate, was optimized. Also, the conditions for growing common beans were established in order to evaluate their resistance to drought and salinity, in the presence of prepared absorbent materials. At the same time, preliminary tests were carried out to evaluate the effects of the prepared material on the quality of the soil and beans. It was found that the degree of removal increases with contact time. Determining the adsorption mechanism of the two antibiotics, in both cases, the predominant adsorption mechanism corresponded to pseudo-second-order kinetics, indicating a relatively low number of adsorption centers for the two pollutants.

Four different amounts of material were considered for plant growth, under controlled temperature and humidity conditions. Leaves were harvested 9 weeks after sowing and prepared for subsequent analyses. For each experimental variant, 3 individual replicates were used. Photosynthetic parameters were determined in vivo in the leaves of bean plants grown in soil, using CIRAS-4 (PPSystems™). From all the parameters recorded for bean plants grown under drought conditions, in the presence of A-ac/Alg, compared to control plants – drought and control under normal conditions, it was observed that the use of hydrogel in soil can reduce the need for irrigation water. This demonstrates a high potential for profitability for farmers, especially in water-scarce regions. Integrating such hydrogels into production systems could reduce irrigation and fertilizer costs, minimize crop losses under drought conditions, and thus contribute to more efficient resource use and improved profitability of agricultural production.



Photosynthetic parameters, intracellular CO_2 concentration (Ci, A) and stomatal conductance (gs, B) recorded for the leaves of bean plants, grown in soil under conditions of Control (water in optimal concentrations), Drought Control (in the absence of water), Treatment (1-4; in the absence of water, but the soil was supplemented with 4 different doses of adsorbent material).