



Minibiospheres: Exploring Life on a Small Scale

Carmen Burghilea and Dragos Zaharescu

Secondary School "Nicolae Apostol" Ruginoasa, Neamt, Romania, Department of Education, Romania
(burghileacarmen@gmail.com)

Over the past two years, the Romanian government has implemented the "Green Week" initiative in schools as part of the National Strategy for Environmental Education and Climate Change 2023–2030. This program aims to raise awareness among children and young people about sustainable development and environmental responsibility. It has created significant opportunities for students to participate in hands-on activities within schools and their local communities while promoting sustainable lifestyles and developing essential eco-social skills.

As part of this initiative, students designed minibiospheres using transparent plastic containers to replicate Earth's ecosystems. These small-scale ecosystems allowed students to investigate ecological interactions and processes such as primary ecosystem colonization, soil formation, nutrient cycling, energy flow, and the influence of environmental variables in real-time. By modifying ecological parameters like light exposure, temperature, and carbon dioxide levels, students conducted experiments over extended periods and analyzed the resulting data.

One notable experiment focused on observing primary ecosystem colonization over six months. Students collected data on changes in soil structure and texture, vegetation growth, water recycling, and overall ecosystem development. Minibiospheres proved to be a highly engaging, hands-on method for teaching scientific concepts, promoting interdisciplinary learning, and fostering inquiry-based learning and critical thinking skills. This innovative approach deepened students' understanding of ecological systems while emphasizing the importance of sustainability and environmental stewardship.