

Titlul proiectului: Obținerea de noi biomateriale fitosintetizate cu potențial antimicrobian

Acronim: S.E.B.A.

Etapă 4. Diseminarea pe scară largă a rezultatelor

Activitatea 4-1 Management proactiv.

Indicator de rezultat: desfășurarea proiectului în condiții optime

Activitatea 4-2. Diseminarea pe scară largă a rezultatelor prin elaborarea rapoartelor științifice corespunzătoare etapelor și a lucrărilor științifice

Indicator de rezultat

- Participarea la 2 simpozioane
- Elaborare: de lucrări științifice, a unui capitol din carte și a unei disertații



antioxidants



Review

Application of *Polypodiopsida* Class in Nanotechnology–Potential towards Development of More Effective Bioactive Solutions

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THE EFFECT OF SPORES EXTRACTS WITH GREEN SYNTHESIZED BIMETALLIC NANOPARTICLES ON *CUCUMIS SATIVUS* L.

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The development of nanotechnologies represents a promising way to improve sustainable agriculture because nanoparticles can be used as fertilizers, fungicides, herbicides, insecticides, can reduce the stress caused by various factors (salinity) or can be used for seed priming. Green synthesis is an important method to produce nanoparticles due to the lack of toxic waste and because is relatively simple and cheap. However, nanoparticles have unique properties that influence their bioavailability, bioaccumulation, and toxicity. Because of this ecotoxicological research, which studies the effect of nanoparticles on plants are important. In this study, we determined the effect of spore extracts with green synthesized bimetallic nanoparticles on cucumber. For obtaining the extracts, we used spores from two species of ferns (*Asplenium scolopendrium* and *Dryopteris filix-mas*)

**(B-07) CHARACTERIZATION IN TERMS OF
COMPOSITION AND PHYTOTOXICITY OF AQUEOUS
SPORES EXTRACTS**

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In this study, we used aqueous extracts of fern spores (*Asplenium scolopendrium* and *Dryopteris filix-mas*) and solutions of AgNO₃ and HAuCl₄ for the synthesis of bimetallic nanoparticles Au:Ag in different proportions (1:1 and 1:10). For the characterization of the extracts with or without bimetallic nanoparticles we applied Fourier transform infrared spectroscopy (FTIR). The spectral measurements were made using a FTIR Jasco 6300 spectrometer with an ATR accessory equipped with a diamond crystal (Pike Technologies). Phytotoxicity was tested using *Pisum sativum* seeds. Each extract was tested in 2 dilutions: 1:10 and 1:100, and for Control we used distilled water. The parameters that we determinate were the growth of root and stem and fresh biomass.

In extracts with nanoparticles, the carbonyl group at 1635 cm⁻¹ shows an increased intensity as a result of the capture/reduction of the metals. It was also confirmed that the carbonyl group from the

Triticum test

*Chapter 5. The use of Triticum test in the evaluation
of the materials' phytotoxicity*

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FACULTATEA DE ȘTIINȚE, EDUCAȚIE FIZICĂ ȘI
INFORMATICĂ
MONITORIZAREA ȘI PROTECȚIA MEDIULUI

**Testarea fitotoxiciții
extractelor cu nanoparticule
bimetalice (Au-Ag)
fitosintetizate, obținute din
sporii unor specii de ferigi**

Coordonator științific:

Conf. univ. dr. Liliana Cristina Soare

A.C.S. dr. Oana-Alexandra Drăghiceanu

Absolvent:

Doruța Nicoleta Andrei-Bătut