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Title
Bioprospecting for promising native plant species from Mampuján, Colombia: Application of the circular economy for the benefit of farmers
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Abstract

This project aims to explore the biotechnological potential of native plant species from Mampuján, Bolívar (Colombia), a historically marginalized territory affected by armed conflict and displacement. Leveraging local biodiversity and ancestral knowledge, the initiative combines ethnobotanical surveys, STEM education, and technologies 4.0 to promote circular bioeconomy and social restoration. Approximately 100 promising plants will be identified through community knowledge and remote sensing via drone-assisted diagnosis. A subset will undergo taxonomic validation and extraction of essential oils or hydroethanolic extracts for chemical characterization and antimicrobial testing.

The antimicrobial activity of extracts will be evaluated against *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Moniliophthora roreri*, and *Fusarium* spp., using Kirby-Bauer and Minimum Inhibitory Concentration methods. Gas chromatography-mass spectrometry (GC-MS) will determine chemical profiles and extraction efficiency. Results will inform the creation of a publicly accessible repository on promising species with potential pharmacological and agroindustrial applications. Moreover, the project prioritizes the empowerment of girls and adolescents (NNA) by integrating ancestral knowledge into scientific education, fostering social justice and environmental stewardship.

This work aligns with national science missions including “Science for Peace” and “Bioeconomy and Territory,” and contributes to Sustainable Development Goals (SDGs 1, 5, 8, 15). By facilitating knowledge exchange and capacity-building in circular economy practices, the project seeks to reduce economic disparity, strengthen local agroindustry, and provide tools for sustainable regional development. Ultimately, it positions bioprospecting as a path for socio-ecological resilience and health-oriented innovation within post-conflict communities.
Keywords

Bioprospecting; Antimicrobial activity; Circular economy; Ethnobotany; Environmental justice; STEM education; GC-MS; Plant extracts; Post-conflict communities; Sustainable agriculture

Type

Poster / Talk (consider me for oral presentation)

Submission history

14/06/2025

This abstract is part of a broader biotechnological research project funded under the Colombian national program *Orquídeas: Women in Science*, focused on empowering Afro-Colombian communities in post-conflict areas through circular bioeconomy and scientific education. We kindly request that this context be considered when evaluating the relevance and societal impact of the work. The project emphasizes gender equity, traditional knowledge integration, and antimicrobial potential of native plant species.

17/06/2025

Submission rejected

MDPI check decision:

MDPI check comments: