

## Exploring Bioactive Compounds in *Boswellia Sacra* through Innovative Particle Size Eco-Separation Methods

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### ABSTRACT

The extraction of bioactive compounds from plants, specifically from *Boswellia* resin, typically relies on methods using organic solvents based on polarity gradients. Although this approach allows for the production of extracts rich in bioactive ingredients, it has drawbacks, including the presence of solvent residues that may pose toxic risks. To operate in a dry natural environment and identify active compounds, we adopted an ecological method of particle size separation through differential sieving, following controlled grinding at temperatures below 40°C. This precaution aims to minimize thermal effects on bioactive compounds, including volatile ones, while enabling the production of extracts concentrated in quality and functionality markers. This method, validated by several previous studies, allows us to separate particle size families to isolate the most concentrated fractions, avoid the use of organic solvents, and preserve the interaction and synergy between active biomolecules. In this preliminary study, we isolated five particle size fractions from the resin of *Boswellia sacra* L. using controlled differential sieving. These fractions were subjected to phytochemical analyses, followed by toxicological and pharmacological assessments, in comparison with reference substances, including pure biomolecules and an extract from another variety, *Boswellia serrata* L. The objective is to characterize the most bioactive fractions in relation to their chemical composition and identify the activity supports, thereby contributing to a more precise targeting of biomolecules of interest.

