

Technology Offer

CSIC/RN/002

Extraction process of bioactive compounds from cocoa bean shells



Process capable of extracting high-value bioactive compounds from cocoa bean shells using green technologies, through more efficient and sustainable processes, applicable to the Food, Cosmetic, Chemical and Pharmaceutical Industries.

Intellectual Property

Priority Patent applied

Stage of development

TRL 4

Intended Collaboration

Licensing and/or co-development

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Market need

Cocoa bean shells are by-products typically used for low-value applications, despite containing several bioactive compounds. Current solutions for their use often yield only one product or fraction, failing to capture the full range of bioactive compounds.

Conventional methods for obtaining bioactive compounds generally use water, acetone, hexane or alcohols, leading to selectivity issues and high solvents and energy consumption. Furthermore, these methods can degrade thermosensitive compounds and require additional purification steps. Moreover, these methods pose risks to health, sustainability and operation safety.



Proposed solution

The process consists on a selective extraction and fractionation of high-value bioactive compounds from cocoa bean shells, which have stimulating, antioxidant and anti-inflammatory properties.

It comprises a first step of cocoa bean shells defatting, a second step of extraction of methylxanthines and phenolic compounds, and a third step of liquid-liquid extraction, allowing the separation of compounds.

It utilizes environmentally friendly and highly selective technologies, resulting in more efficient and sustainable extraction due to use non-toxic, recoverable and renewable solvents, and it can be used in various industrial sectors.

Competitive advantages

- Sustainable, non-toxic, and energy-efficient method.
- Process with fractionation and selective extraction capabilities.
- Stable for thermosensitive compounds.
- Produces purer and more specific fractions, easily applicable to the Food, Cosmetic, Chemical and Pharmaceutical industries.