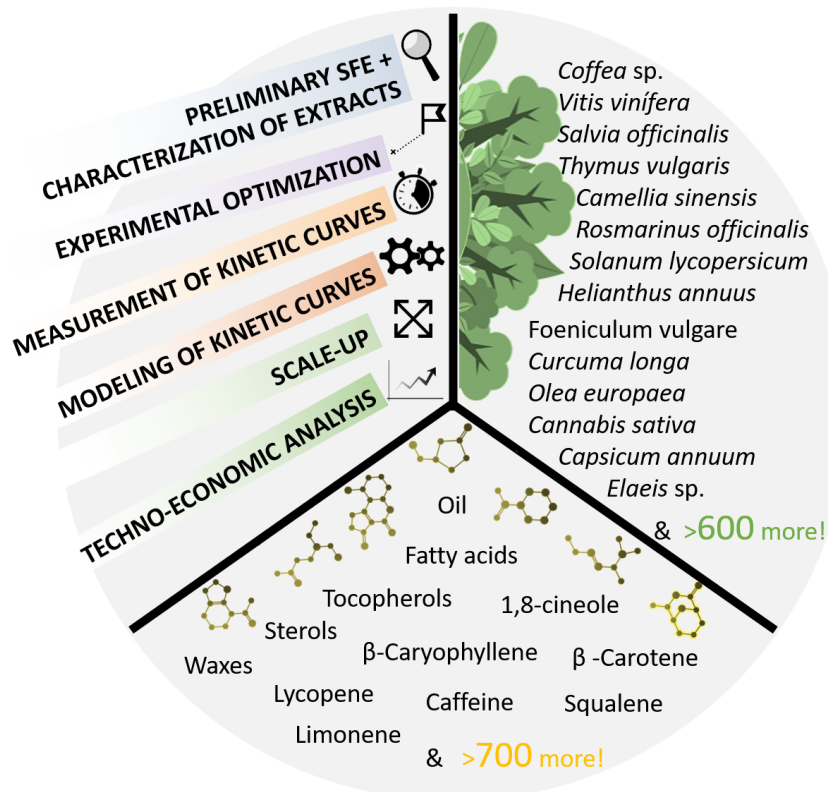# Supercritical fluid extraction of vegetal biomass from 2000 to 2020: systematization by stage of research, diversity of species, and features of solutes

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Although the research on supercritical fluid extraction of vegetal biomass has been underway since the middle of the 20th century, the publications on the field have mushroomed since 2000, ending up in an accumulated record of more than 1600 articles since then. While such growth heralds the progressive adoption and acknowledgement of SFE as a green technology vector for circular economy and biorefinery purposes, the overarching spectrum of publications calls for universal trends and bottlenecks to be identified.

One of the systematization opportunities is the assignment of SFE works by stages of research. We propose a framework comprising six progressive research stages: preliminary extraction and characterization of extracts; experimental optimization of operating conditions; measurement of kinetic extraction curves; phenomenological modeling of these kinetic curves; scale-up studies, and techno-economic analysis of industrial processes. For each of these, we identify specific goals and points of interest.

As far as vegetal species are concerned, we disclose the most popular plants extracted by SFE; the time distribution and average number of articles per species;

and correlations between researched species and their ubiquitous or specific occurrence.

From the perspective of the target solutes, we unveil the most recurrent compounds extracted by SFE; the distribution and average number of articles per target molecule; as well as determinant decisions on operating conditions to reach more challenging molecules.

Globally, the accomplished analysis has the industrial implementation in its horizon and aims to guide the research on SFE to better prepare the decades to come.

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