Mathematical modeling of pink pepper (*S. terebinthifolius* Raddi) supercritical CO_2 extraction

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Schinus terebinthifolius, known as pink pepper, is a native Brazilian species. The scientific interest of this species is due to its therapeutic potential, its antioxidant activity, antimicrobial, fungicidal, insecticidal, besides the use of its essential oils in pharmaceutical applications, agricultural production systems as natural defenses, among others. Extraction of essential oils from natural products with the use of supercritical fluids has shown to be a very promising technique, because it allows obtain products with better quality, there is no generation of chemical residues and avoids the use of solvents. The experimental unit consists basically of a 32 mL extractor, a high pressure pump and a micrometric valve to sample removal and CO_2 flows of approximately 23.5 mL/ min. Different operational conditions were investigated (67 to 223 bar and 36º to 64º C) based on an experimental design. The objective of this work was to obtain appropriated mathematical model for the extraction curves: essential oil yield versus extraction time, from the experimental data. Some mathematical models were found in the literature to describe the behavior of these extractions. From the studies models the one that was more suitable for the experimental data obtained was the model proposed by Sovová (1994), which has provided a good reproducibility and shown to be efficient in the representation of supercritical fluid extraction of essential oil of pink pepper. The results show that conditions with high pressures (200 bar) and low temperatures (40° C) provide the best yields of essential oil extraction of pink pepper (*S. terebinthifolius*).