

Optimization of Extraction of Pyrrolizidine Alkaloids From Plant Material

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Various techniques of extraction of pyrrolizidine alkaloids (PAs) from comfrey have been developed and compared. Different extraction media: methanol, ethanol, 1% methanolic solution of tartaric acid, 2.5% HCl solution, 5% CH₃COOH solution, alkaline chloroform–methanol mixture at various temperatures (room temperature, 50–60°C, solvent's boiling point) have been used in various extraction techniques (percolation, electric basket, ultrasonic water bath) and various extraction times. Total concentration of pyrrolizidine alkaloids (PAs) was estimated from UV–VIS spectrophotometric studies according to Dann–Mattocks procedure. For the most promising extraction techniques one determined recoveries of monocrotaline added to crude pre-extracts. Extraction and co-extraction processes were investigated using UV–VIS spectra of the adducts of 3,4-dehydro-PAs and Ehrlich's reagent. The best result of PAs extraction from comfrey was obtained using 1% methanolic solution of tartaric acid and electric basket technique at the temperature 100 ± 5°C for 2 h. Possible applications of the method have been discussed.