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Green techniques in comparison to conventional ones in the extraction of Amaryllidaceae alkaloids: Best solvents selection and parameters optimization

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Highlights

- Efficiency of green solvents; natural deep eutectic solvents (NDES) and surfactant-assisted extraction (SAA) for alkaloids extraction is compared.
- *Crinum powellii* bulbs were used as representative example of plant material.
- A validated HPTLC method is developed for quantitation of three alkaloids markers.
- Results revealed NDES were significantly more efficient in alkaloid extraction.
- Box–Behnken design was employed to optimize the effect of process variables.

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Abstract

An undisputed trend in sample preparation at present is to meet the requirements of green chemistry especially in the field of natural products. Green technology continuously pursues new solvents to replace common organic solvents that possess inherent toxicity. Over the past two decades, non-ionic surfactants have gained enormous attention from the scientific community. The micelle-mediated extraction and cloud-point preconcentration (CPE) methods offer a convenient alternative to the conventional extraction systems**.** Recently, natural deep eutectic solvents (NDESs) have emerged as green and sustainable solvents for efficient extraction of bioactive compounds or drugs. They are generally composed of neutral, acidic or basic compounds that form liquids of high viscosity when mixed in certain molar ratio. The presented