

Natural deep eutectic solvent nades sebagai pelarut ramah lingkungan untuk ekstraksi mangostin dari kulit buah manggis (*Garcinia Mangostana* L)

Felita Irene Sumarli, author

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Abstrak

[ABSTRAK

Natural Deep Eutectic Solvent (NADES) semakin banyak menarik perhatian sebagai alternatif ramah lingkungan pengganti pelarut organik konvensional yang toksik dan berbahaya bagi lingkungan. NADES memiliki volatilitas yang dapat diabaikan pada suhu ruang, solubilitas tinggi, toksisitas rendah, dan selektivitas yang dapat diatur. Pada studi ini, NADES dievaluasi kemampuannya untuk ekstraksi senyawa bioaktif α-mangostin dari buah manggis (*Garcinia mangostana* L.). Buah manggis dipilih karena kandungan senyawa bioaktifnya yang bermanfaat tinggi bagi kesehatan dan ketersediaannya yang cukup melimpah di Indonesia. NADES dibuat dengan mencampurkan garam ammonium kuartener dengan pendonor ikatan hidrogen dari berbagai senyawa yang terdapat di alam dalam berbagai variasi rasio. Pada NADES dilakukan uji polaritas, uji viskositas, analisa struktur kimia, dan analisa perilaku termal, untuk mengetahui karakteristik fisika dan kimianya. Ekstraksi dilakukan dengan metode shaking pada suhu ruang dan metode ultrasonikasi. Hasil ekstraksi diuji dengan high performance liquid chromatography (HPLC). Senyawa α-mangostin berhasil diekstrak dengan NADES, dengan hasil tertinggi diperoleh menggunakan NADES campuran kolin klorida dan 1,2-propanediol. Metode ultrasonik memberikan hasil lebih tinggi dalam waktu lebih singkat dibandingkan metode shaking, namun metode shaking memberikan reproduibilitas lebih baik. Studi ini memperlihatkan potensi NADES untuk aplikasi di bidang ekstraksi senyawa bioaktif dari alam

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ABSTRACT

Natural Deep Eutectic Solvents (NADES) have received considerable attention due to their potential as green solvent substituting conventional organic solvents which are high in toxicity and harmful to the environment. NADES have unique properties, such as negligible volatility at room temperature, high solubility for wide range of compounds, low toxicity profile, and adjustable selectivity. In this study, NADES were being evaluated for their application as extraction solvents for bioactive compound, α-mangostin, from mangosteen (*Garcinia mangostana* L.). Mangosteen is chosen as object of study due to its highly beneficial bioactive compounds for health and its high availability in Indonesia. NADES were made by mixing quaternary ammonium salt with hydrogen bond donor (HBD) in various ratios. Physicochemical properties of NADES are being investigated, including polarity test, viscosity test, chemical structure analysis, and thermal behavior analysis. Extraction was done by shaking in room temperature and ultrasonication. The extracts were analysed by High Performance Liquid Chromatography (HPLC). α-mangostin successfully extracted by NADES, with highest yield obtained by NADES composed of choline chloride and 1,2-propanediol. It was also observed that ultrasonication gives high extraction yield in shorter period of time compared to shaking method, although shaking method gives better reproducibility. This

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