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Penetapan Kadar Fenol dan Flavonoid Total serta Uji Aktivitas Antioksidan Ekstrak NADES Berbasis Glukosa dan Poliol Daun Vitex pinnata Linn = Determination of Total Phenol and Flavonoid Content and Antioxidant Activity Test of Glucose and Polyol Based NADES Extracts of Vitex pinnata Linn. Leaf

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Abstrak

Daun laban (Vitex pinnata L.) mengandung senyawa fenol dan flavonoid yang berpotensi sebagai antioksidan. Penelitian ini bertujuan menentukan kombinasi terbaik dari pelarut Natural Deep Eutectic Solvent (NADES) berbasis glukosa–poliol untuk mengekstraksi senyawa fenol dan flavonoid total secara efisien dan ramah lingkungan menggunakan metode Ultrasound Assisted Extraction (UAE). Tiga kombinasi NADES (glukosa–gliserol, glukosa–xilitol, glukosa–sorbitol) dievaluasi berdasarkan kadar fenol total (TPC) dan flavonoid total (TFC) menggunakan spektrofotometer UV-Vis. Kombinasi glukosa–gliserol (1:3) menghasilkan TPC dan TFC tertinggi dan selanjutnya dioptimasi kondisi ekstraksinya menggunakan Response Surface Methodology (RSM) terhadap variabel waktu, rasio pelarut-serbuk, dan persentase air. Kondisi optimum diperoleh pada waktu 20,7 menit, rasio 20 mL/g, dan penambahan air 40%, dengan hasil TPC 399,860 mg EAG/g simplisia dan TFC 133,399 mg EK/g simplisia. Sebagai pembanding, maserasi etanol 70% menghasilkan TPC 294,043 mg EAG/g dan TFC 122,133 mg EK/g simplisia. Aktivitas antioksidan ekstrak optimum tergolong sedang dengan nilai IC50 metode DPPH dan ABTS masing-masing 107,227 µg/mL dan 113,155 µg/mL, serta nilai FRAP 23,784 g FeSO ekuivalen/100 g ekstrak. Hasil ini menunjukkan NADES-UAE lebih efektif mengekstraksi senyawa aktif dibanding maserasi etanol 70%.
.....Laban (Vitex pinnata L.) leaves contain phenol and flavonoid compounds that have potential as antioxidants. This study aims to determine the best combination of glucose-glycerol-based Natural Deep Eutectic Solvent (NADES) to extract total phenol and flavonoid compounds efficiently and environmentally friendly using the Ultrasound Assisted Extraction (UAE) method. Three NADES combinations (glucose-glycerol, glucose-xylitol, glucose-sorbitol) were evaluated based on total phenol (TPC) and total flavonoid (TFC) content using spectrophotometer UV-Vis. The glucose-glycerol (1:3) produced the highest TPC and TFC and further optimized the extraction conditions using Response Surface Methodology (RSM) on the variables of time, solvent-powder ratio, and water percentage. The optimum conditions were obtained at a time of 20,7 minutes, a ratio of 20 mL/g, and the addition of 40% water, with a TPC of 399,860 mg EAG/g dried powder and a TFC of 133,399 mg EK/g dried powder. For comparison, 70% ethanol maceration resulted in TPC of 294,043 mg EAG/g dried powder and TFC of 122,133 mg EK/g dried powder. The antioxidant activity of the optimum extract was classified as moderate with IC50 values of DPPH and ABTS methods of 107,227 µg/mL and 113,155 µg/mL, respectively, and FRAP value of 23,784 g FeSO equivalent/100 g extract. These results indicate that NADES-UAE is more effective in extracting active compounds than 70% ethanol maceration.