

Optimasi Ekstraksi Daun Komfrey (*Symphytum officinale*) dengan IL-UAE dan Uji Antiinflamasi dengan Metode Penghambatan Denaturasi Protein = Optimization of Comfrey Leaf Extraction (*Symphytum officinale*) by IL-UAE and Anti-inflammatory Test with Protein Denaturation Inhibition Method

Andika Purnomo, author

Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=20527223&lokasi=lokal>

Abstrak

Retrorsin N-oksida dan allantoin merupakan senyawa yang terkandung dalam daun komfrey. Penelitian ini bertujuan untuk mendapatkan parameter kondisi optimum ionic liquidultrasound assisted extraction (IL-UAE) daun komfrey terhadap kadar retrorsin N-oksida dan allantoin dengan KLT-densitometri, serta uji anti-inflamasi secara in vitro dari ekstrak daun komfrey yang optimum. Daun komfrey diekstraksi dengan 8 jenis IL dengan ultrasound assisted extraction (UAE) dan dilakukan skrining terhadap kadar fenol total, retrorsin N-oksida dan allantoin. Ionic liquid terbaik dari hasil skrining dilakukan optimasi respon surface methodology (RSM) dengan desain Box-Behnken terhadap tiga faktor dan tiga level untuk menentukan kondisi ekstraksi yang optimum terhadap kadar retrorsin N-oksida dan allantoin. Hasil optimasi terbaik dari ionic liquid kemudian dilakukan uji aktivitas antiinflamasi in-vitro dengan Bovine Serum Albumin (BSA). Hasil dari skrining IL, diperoleh [HMIM]Cl sebagai ionic liquid terbaik dengan nilai rata-rata kadar fenol total 8,037 µg/g serbuk, retrorsin N-oksida 36,539 µg/g serbuk dan allantoin 663,98 µg/g serbuk. Hasil optimasi ekstraksi dari [HMIM]Cl diperoleh kadar retrorsin N-oksida tertinggi pada run ke12, yaitu 11,9007 µg/g serbuk dan kadar allantoin tertinggi pada run ke 6 yaitu 306,396 µg/g serbuk. Hasil optimasi ekstraksi dari [HMIM]Cl memberikan kondisi optimum pada rasio pelarut dengan serbuk 17,65 mL/g, konsentrasi [HMIM]Cl 1,09 mol/L, waktu ekstraksi 31,9 menit, didapatkan kadar retrorsin N-oksida serta allantoin masing masing sebesar 4,85 µg/g serbuk dan 161,987 µg/g serbuk. Efisiensi ekstraksi IL-UAE sedikit lebih rendah dibandingkan dengan metode konvensional maserasi dan UAE dengan pelarut metanol dalam menarik senyawa fenol dan allantoin. Aktivitas anti-inflamasi didapatkan IC50 masing – masing untuk ekstrak metanol UAE, maserasi, [HMIM]Cl dan residu sebesar 127,661 g/mL, 137,061 g/mL, 129,667 g/mL dan 171,066 g/mL.

.....Retrorsin N-oxide and allantoin are compounds contained in comfrey leaves. The aim of this study was to obtain the optimum condition parameters for ionic liquid-ultrasound assisted extraction (IL-UAE) of comfrey leaves against retrorsin N-oxide and allantoin levels by TLC-densitometry, as well as an in vitro anti-inflammatory test of optimum comfrey leaf extract. Comfrey leaves were extracted with 8 ionic liquids by ultrasound assisted extraction (UAE) and screened for total phenol, retrorsin N-oxide and allantoin levels. The best ionic liquid from the screening was carried out by optimizing the response surface methodology (RSM) with the Box-Behnken design against three factors and three levels to determine the optimum extraction conditions for retrorsin N-oxide and allantoin levels. The best optimization results from the ionic liquid were then tested for anti-inflammatory activity in vitro with Bovine Serum Albumin (BSA). The results of the screening of ionic liquids, obtained [HMIM]Cl is the best ionic liquid with total phenol content with an average value of total phenol content of 8,037 g/g powder, retrorsin N-oxide 36,539 g/g powder and allantoin 663,98 g/g powder. The results of optimization of extraction from ionic liquid

[HMIM]Cl obtained the highest levels of retrorsin N-oxide in the 12th run, namely 11.9007 g/g powder and the highest allantoin content in the 6th run, which was 306.396 g/g powder. The results of the optimization of the extraction of the ionic liquid [HMIM]Cl gave optimum conditions at the ratio of solvent to powder 17,65 mL/g, concentration of [HMIM]Cl 1,09 mol/L, extraction time 31,9 minutes, the concentration of retrorsin N-oxide was obtained. and allantoin respectively 4,85 g/g powder and 161,987 g/g powder. The extraction efficiency of IL-UAE is slightly lower than conventional maceration and UAE methods with methanol as a solvent to extract phenolic and allantoin compounds. Anti-inflammatory activity obtained IC50 for UAE methanol extract, maceration, [HMIM]Cl and residue 127,661 g