

INTISARI

Patch transdermal merupakan bentuk sediaan yang dapat menghantarkan obat melalui kulit dan menghasilkan efek sistemik. Penelitian mengenai herbal *patch* telah banyak dilakukan untuk mengatasi berbagai macam penyakit. Pada penelitian ini akan dilakukan optimasi formula matriks *patch* transdermal ekstrak etanol 70% bunga Rosela dan uji transpor *in vitro* formula optimum serta melihat pengaruhnya terhadap kematian sel 3T3L-1.

Formulasi sediaan dibuat dalam bentuk matriks *patch* transdermal dengan polimer PVA:HPMC:CMC Na. Skrining dosis ekstrak etanol 70% bunga Rosela dalam matriks *patch* transdermal dilakukan dengan cara menghitung IC₅₀ dari ekstrak. Optimasi polimer menggunakan *software Design Expert* versi 7.1.5 metode *Simplex Lattice Design*. Evaluasi formula meliputi ketebalan (mm), variasi bobot (%), susut pengeringan (%), *drug content* (%), dan sifat fisik *patch*. Formula optimal dilakukan uji transpor *in vitro* dengan menggunakan membran kulit tikus dan membran *millipore*. Sampel hasil uji transpor *in vitro* dilakukan pengujian pada sel 3T3L-1 untuk melihat persen kematian sel. Analisis statistika persen kematian sel 3T3L-1 dilakukan dengan ANOVA satu jalan pada taraf kepercayaan 95%.

Hasil penelitian menunjukkan ekstrak etanol 70% bunga Rosela memberikan pengaruh pada pengurangan jumlah sel 3T3L-1 dengan nilai IC₅₀ 11,16 mg/mL. Analisis statistika persen kematian menunjukkan adanya perbedaan yang signifikan antar tiap dosis. Formula optimum matriks *patch* transdermal diperoleh perbandingan PVA:HPMC:CMC Na yaitu 4,833 % : 1 % : 0,662 % b/v dengan nilai *desirability* 0,792. Evaluasi matriks *patch* transdermal dari formula optimum diperoleh nilai ketebalan 0,3033±0,01 mm, variasi bobot 0,0856±0,002%, susut pengeringan 8,67±0,71 %, *drug content* 45,06±3,364 %, dan sifat fisik *patch* 15,6±3,114. Hasil uji transpor formula optimum secara *in vitro* melewati membran kulit tikus maupun *millipore* tidak terdeteksi sehingga perlu dilakukan pengembangan formulasi lebih lanjut untuk mengoptimalkan hasil uji transpor *in vitro*.

Kata kunci: Ekstrak etanol 70% bunga Rosela, matriks, optimasi, sel 3T3L-1

ABSTRACT

*Transdermal drug delivery system can deliver drugs through the skin therefore produce systemic effects . Research on herbal patches had been done to treat various diseases. The purposes of this study were (1) to optimize combination of PVA : HPMC : CMC Na as matrix in transdermal patch formula loaded with 70% ethanolic extract of *Hibiscus sabdariffa* L.;(2) to observe the optimal formula's transport behavior in vitro, and to observe its cytotoxic effect to wards 3T3L-1 cells.*

*Formulation transdermal matrix patch with a combination of PVA:HPMC: CMC Na polymers. Screening dose of 70% ethanol extract of *Hibiscus sabdariffa* L. in the matrix transdermal patch to calculate the IC_{50} of the extract. Concentration of PVA : HPMC : CMC Na were optimized using Simplex Lattice Design Method on Design Expert 7.1.5 software. All formulas were evaluated for its thickness (mm), weight variation (%), moisture content (%), drug content, and physical properties as optimization parameters. The optimal formula was then observed for its transport behavior in both skin membrane and millipore membrane in vitro. Also its cytotoxic effect toward 3T3L-1 cells using MTT assay. 3T3L-1 cell death percentage was analiyzed using one way Anova at 95% confidance level.*

*The results showed 70% ethanol extract of *Hibiscus sabdariffa* L. was reducing the number of 3T3L-1 cells with IC_{50} values of 11,16 mg/mL. Statistical analysis percentage 3T3L-1 cell death showed a significant difference in variation dose. The most optimal formula transdermal matrix patch with a combination of PVA: HPMC: CMC Na polymers was 4,833%: 1%: 0,662% w/v with desirability value 0,792. Evaluation transdermal matrix patch of the optimum formula obtained value thickness $0,3033 \pm 0,01$ mm, weight variation $0,0856 \pm 0,002\%$, moisture content $8,67 \pm 0,71$ %, drug content $45,06 \pm 3,364$ %, and physical properties $15,6 \pm 3,114$. The result of the optimum formula transport across a membrane in vitro mouse skin or Millipore undetectable so it need further development formula to optimize the in vitro transport .*

Keywords: *Hibiscus sabdariffa* L ethanol 70% extract, matrix, optimization, cell 3T3L-1