ISOLASI PIPERIN BUAH CABE JAWA (*Piper retrofractum fructus*) MENGGUNAKAN METODE EKSTRAKSI SOKLETASI DAN MASERASI SERTA UJI *IN SILICO* PIPERIN TERHADAP RESEPTOR KANKER PAYUDARA

INTISARI

Buah cabe jawa (*Piper retrofractum fructus*) adalah tanaman Indonesia yang dilaporkan mengandung piperin. Pada studi *in vivo* dan *in vitro* piperin dilaporkan memiliki potensi untuk pencegahan serta pengobatan kanker payudara. Penelitian ini bertujuan untuk mengetahui jumlah rendemen, karakter fisika kimia piperin buah cabe jawa hasil ekstraksi metode sokletasi dan maserasi dan untuk mengetahui afinitas piperin terhadap reseptor kanker payudara menggunakan metode *docking* molekuler.

Buah *P. retrofractum* diekstraksi dengan metode sokletasi dan maserasi menggunakan etil asetat. Hasil esktrak yang diperoleh dari ekstraksi metode sokletasi dan maserasi, diisolasi dan dilakukan pencucian kristal piperin menggunakan etanol 96%. Karakterisasi sifat fisika kimia piperin buah cabe jawa hasil ekstraksi sokletasi dan maserasi dilakukan dengan uji titik lebur, kromatografi lapis tipis, spektrofotometri Uv-Vis dan *Fourier Transform Infra Red Spectroscopy* (FTIR). Pada penelitian ini dilakukan analisis *molecular docking* metode autoDock piperin terhadap reseptor kanker payudara yaitu *Human Epidermal Growth Factor Receptor* (HER2), *Estrogen Receptor* (ERα dan ERβ).

Hasil menunjukkan bahwa metode sokletasi menghasilkan kadar piperin yaitu 0,1323% sedangkan ekstraksi buah cabe jawa (*Piper retrofractum fructus*) menggunakan metode maserasi yaitu 0,1009%. Kadar piperin tertinggi diperoleh dari hasil sokletasi. Karakteristik fisika kimia piperin buah *Piper retrofractum* hasil ekstraksi sokletasi dan maserasi sesuai dengan standar piperin. Pada analisis *in silico*, diperoleh *score docking* antara piperin terhadap reseptor kanker payudara yaitu HER2 adalah -7,17; ERα -6,21 dan ERβ sebesar -5,58. Penelitian ini menunjukkan bahwa afinitas piperin dengan HER2 lebih tinggi dibandingkan ERα dan ERβ.

Kata Kunci : Isolasi, Piperin, Metode Sokletasi, Metode Maserasi, Reseptor Kanker Payudara, *In Silico.*

ISOLATION PIPERINE OF LONG PEPPER FRUIT (*Piper retrofractum fructus*) USING BY SOXHLETATION AND MACERATION METHODS AND IN SILICO STUDY OF PIPERINE TO BREAST CANCER RECEPTOR

ABSTRACT

Long pepper fruit (*Piper retrofractum fructus)* is an Indonesian fruit which is reported contain piperine. *In vivo* and *in vitro* studies of piperine reported that the piperine have a potential effect for prevention and treatment of breast cancer. This research aims is to determine the rendement, chemical and physic properties of piperine from long pepper fruit that was extracted using soxhletation and maceration exctraction methods and to determine the affinity of piperine to breast cancer receptor using molecular docking.

P. retrofractum fructus was extracted using soxhletation and maceration. Ethyl acetate was used for the solvent. The extract that was obtained from the both extraction was purified using ethanol 96% to obtained the crystal of piperin. Characterization of piperine crystal was conducted by melting point, Thin Layer Chromatography (TLC), Ultra-violet Spectroscopy and Fourier Transform Infra Red Spectroscopy (FTIR). Molecular docking analysis of piperine for human breast cancer was conducted using autodock method. The receptor target of this molecular docking were Human Epidermal Growth Factor Receptor (HER2), Estrogen Receptor (ERα and ERβ).

The results showed that rendement of piperine from soxhletation was found to be 0,1323% and from maceration was found to be 0,1009%. Based on this result, the soxhletation was found to be more effective for piperine extraction. Characteristics chemical and physic of piperine from Piper retrofractum fructus accordance with the standards of piperine. In silico analysis, the obtained score docking of piperine to breast cancer receptor HER2 was -7,17; ERα -5.58 and ERβ -6,21. This study shows that the affinity of piperine with HER2 was highest compared ERα and ERβ.

Keywords: Isolation, Piperine, Soxhletation Method, Maceration Method, Receptors Breast Cancer, In Silico.