ABSTRAK

Kanker payudara menjadi salah satu penyakit yang banyak ditakuti oleh kaum perempuan. Terapi yang biasa digunakan berupa kemoterapi seperti tamoxifen dan trastuzumab telah digunakan untuk pengobatan pasien kanker payudara, namun mempunyai efek samping yang merugikan. Bahan alam dipercaya mempunyai keamanan yang lebih baik sehingga penemuan obat dari bahan ini dapat menambah kandidat obat baru yang dapat mengobati kanker payudara dengan efektif dan mempunyai efek samping yang ringan. Penelitian ini merupakan eksperimental murni dengan rancangan penelitian *post-test only control randomized group design* yang bertujuan menguji efek sitotoksik partisi etil asetat daun asoka terhadap sel kanker payudara T47D dan keamanan terhadap sel Vero menggunakan MTT assay serta efek penghambatannya terhadap MMP-9 dengan metode FRET-*based* MMP-9 *assay*. Hasil penelitian menunjukkan aktivitas penghambatan terhadap MMP-9 sebesar 94% dengan nilai EC_{50} terhadap T47D sebesar 371,5 µg/ml. Sedangkan nilai CC_{50} pada sel normal adalah 427,7 µg/ml. Indeks Keamanan diperoleh sebesar 1,15. KG-SM digunakan untuk memprediksi massa molekul senyawa yang terkandung dalam partisi. Senyawa 1,2-benzenedicarboxylic acid, diisooctyl ester dan squalene diidentifikasi dengan persen area sebesar 75,91%; 12,91%; 7,06% dan waktu retensi 24,76; 20,585; 24,446. Senyawa ini diperkirakan bertanggungjawab terhadap efek sitotoksik yang rendah terhadap sel T47D namun aktif terhadap MMP-9. Kesimpulannya, partisi etil asetat daun asoka kemungkinan lebih selektif terhadap sel kanker *triple negative* yang bersifat metastatik daripada non-metastatik.

Kata Kunci: Kanker payudara, MMP-9, T47D, *Ixora coccinea* L., MTT *assay*, asoka

ABSTRACT

Breast cancer is a disease that is feared by many women. Therapies commonly used in chemotherapy such as tamoxifen and trastuzumab have been practiced to treat breast cancer patients, unfortunately, the presence of adverse side effects reduced the patient's life quality. Natural ingredients are believed to have better safety, so that the discovery of drugs from these ingredients can add new drug candidates that leads to the effective breast cancer treatment along with milder side effects. This study is a true experimental study with a post-test only randomized control group design, which aims to investigate the cytotoxicity effect of ethyl acetate partition of Ixora coccinea *leaves against T47D non-metastatic breast cancer cells, and normal Vero cells using MTT assay method. Beside, the inhibition activity against MMP-9 was carried out using FRET-based assay. The results showed that the partition exhibited 94% inhibition against MMP-9 with* EC_{50} *values 371,5 µg/ml. On the other hand, the* CC_{50} *values on the normal cell was* 427,7 *µg/ml. The Selectivity Index was obtained of 1,15, which indicated that the partition was less selective against normal cells. GC-MS was used to predict the molecular mass of compounds contained in the partition. 1,2-benzenedicarboxylic acid, diisooctyl ester and squalene were identified with the percentage area are 75.91%;12.91%; and 7,06% and the retention time are 24,76; 20,585; and 24,446 min. These compounds could be responsible for that mild cancer cytotoxic effect, but rather active to MMP-9. In conclusion, the ixora ethylacetate partition could be more selective to the triple negative cancer cell which is metastatic than the non-metastatic ones.*

Keywords: *breast cancer, MMP-9, T47D, Ixora coccinea L., MTT assay,* asoka