



INTISARI

Catharanthus roseus (L.) G. Don dikenal dengan tapak dara merupakan tanaman obat penghasil senyawa alkaloid seperti vinkristin dan vinblastin sebagai antikanker yang memiliki nilai ekonomi sangat tinggi dan diproduksi dengan kadar yang sangat kecil. Metabolit sekunder vinkristin dan vinblastin bisa diproduksi melalui kultur *in vitro* seperti kultur kalus dan kultur suspensi sel. Salah satu upaya yang dilakukan untuk mampu meningkatkan produksi vinkristin yaitu penggunaan berbagai elisitor. Penelitian ini bertujuan untuk mengetahui pengaruh pemberian asam metil jasmonat dan triptofan dengan berbagai konsentrasi terhadap pertumbuhan kalus, menganalisis produksi kandungan vinkristin dan menetapkan kadar vinkristin yang mampu meningkat pada kultur suspensi sel daun tapak dara.

Penelitian ini menggunakan eksplan daun tapak dara yang ditanam pada media Murashige-Skoog (MS) padat yang dilengkapi dengan penambahan zat pengatur tumbuh 2,4 D 1 mg/L dan kinetin 4 mg/L. Kalus disubkultur selanjutnya dilakukan kultur suspensi pada media MS cair dengan pemberian asam metil jasmonat dan triptofan dengan berbagai konsentrasi. Pertumbuhan kalus dilakukan dengan menimbang bobot basah dan bobot kering kalus. Kandungan vinkristin dan penetapan kadarnya dianalisis dengan menggunakan *High Performance Liquid Chromatography* (HPLC).

Pertumbuhan kalus pada kultur suspensi sel, perlakuan X₅₀Y₃₀₀ (triptofan 50 mg/L dan asam metil jasmonat 300 µM) menghasilkan bobot basah tertinggi sebesar 1,094 g, sedangkan bobot kering tertinggi terdapat pada perlakuan X₇₅Y₂₀₀ (triptofan 75 mg/L dan asam metil jasmonat 200 µM) sebesar 0,166 g. Hasil analisis HPLC menunjukkan pemberian asam metil jasmonat dan triptofan dengan berbagai konsentrasi pada kultur suspensi sel daun tapak dara mampu menghasilkan senyawa vinkristin. Pada perlakuan X₅₀Y₁₀₀, X₇₅Y₁₀₀, X₁₀₀Y₁₀₀, X₅₀Y₂₀₀, X₇₅Y₂₀₀ dan X₇₅Y₃₀₀ mampu meningkatkan kadar vinkristin, tetapi perlakuan X₁₀₀Y₂₀₀, X₅₀Y₃₀₀, dan X₁₀₀Y₃₀₀ mengalami penurunan kadar vinkristin. Kadar vinkristin tertinggi terdapat pada perlakuan X₅₀Y₂₀₀ (triptofan 50 mg/L dan asam metil jasmonat 200 µM) yaitu sebesar 49,311 ppm.

Kata kunci : *Catharanthus roseus* (L.) G. Don, vinkristin, kultur suspensi sel, asam metil jasmonat, triptofan



ABSTRACT

Catharanthus roseus (L.) G. Don known as tapak dara is a medicinal plant that produces alkaloid compounds such as vincristine and vinblastine as anticancer agents which have very high economic value and are produced in very small concentrations. Vincristine and vinblastine secondary metabolites can be produced by in vitro culture such as callus culture and cell suspension culture. One of the efforts made to be able to increase the production of vincristine is the use of various elicitors. This study aims to determine the effect of administration of methyl jasmonic acid and tryptophan with various concentrations on callus growth, analyze the production of vincristine content and determine the levels of vincristine that can increase in cell suspension cultures of tapak dara leaves.

This study used tapak dara leaf explants grown on solid Murashige-Skoog (MS) media supplemented with the addition of growth regulators 2.4 D 1 mg/L and kinetin 4 mg/L. The callus was subcultured and then suspended in suspension culture on liquid MS medium by administering methyl jasmonic acid and tryptophan with various concentrations. Callus growth was carried out by weighing the wet weight and dry weight of the callus. The vincristine content and assay were analyzed using *High Performance Liquid Chromatography* (HPLC).

Callus growth in cell suspension cultures, treatment X₅₀Y₃₀₀ (tryptophan 50 mg/L and 300 μM methyl jasmonic acid) produced the highest wet weight of 1.094 g, while the highest dry weight was found in treatment X₇₅Y₂₀₀ (tryptophan 75 mg/L and methyl jasmonic acid 200 μM) of 0.166 g. The results of the HPLC analysis showed that treated with methyl jasmonic acid and tryptophan with various concentrations in cell suspension cultures of tapak dara leaves were able to produce vincristine compounds. The treatments X₅₀Y₁₀₀, X₇₅Y₁₀₀, X₁₀₀Y₁₀₀, X₅₀Y₂₀₀, X₇₅Y₂₀₀ and X₇₅Y₃₀₀ were able to increase vincristine levels, but treatments X₁₀₀Y₂₀₀, X₅₀Y₃₀₀, and X₁₀₀Y₃₀₀ decreased vincristine levels. The highest levels of vincristine were found in treatment X₅₀Y₂₀₀ (tryptophan 50 mg/L and methyl jasmonic acid 200 μM) which was 49.311 ppm.

Keywords : *Catharanthus roseus* (L.) G. Don, vincristine, cell suspension culture, methyl jasmonic acid, tryptophan