KANDUNGAN METABOLIT DAN AKTIVITAS ANTIOKSIDAN PADA KALUS DAN PLANLET TANAMAN TEBU (*Saccharum officinarum* L.)

SKRIPSI

diajukan untuk memenuhi sebagian syarat untuk memperoleh gelar Sarjana Sains
Program Studi Biologi

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Sebuah skripsi yang diajukan untuk memenuhi salah satu syarat untuk memperoleh gelar Sarjana Sains pada Program Studi Biologi Fakultas Pendidikan Matematika dan Ilmu Pengetahuan Alam

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Dengan ini saya menyatakan bahwa skripsi dengan judul **"Kandungan Metabolit dan Aktivitas Antioksidan pada Kalus dan Planlet Tanaman Tebu (*Saccharum officinarum* L.)**" ini beserta seluruh isinya adalah benar-benar karya saya sendiri. Saya tidak melakukan penjiplakan atau pengutipan dengan cara-cara yang tidak sesuai dengan etika ilmu yang berlaku dalam masyarakat keilmuan. Atas pernyataan ini, saya siap menanggung risiko/sanksi apabila di kemudian hari ditemukan adanya pelanggaran etika keilmuan atau ada klaim dari pihak lain terhadap keaslian karya saya ini.

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ABSTRAK

Tebu (*Saccharum officinarum L.*) telah banyak digunakan untuk mengobati berbagai penyakit karena kandungan metabolit yang dimilikinya. Kultur jaringan merupakan salah satu metode yang dapat digunakan untuk memproduksi metabolit dan merupakan alternatif bioteknologi sebagai bentuk strategi konservasi. Dalam memenuhi kebutuhan nutrisinya maka diperlukan teknik subkultur. Perbedaan media kultur dan subkultur yang berulang dapat mempengaruhi kandungan metabolit dan aktivitas antioksidan yang dihasilkan. Penelitian ini bertujuan untuk mendapatkan informasi mengenai kandungan metabolit serta aktivitas antioksidan pada kalus tebu yang dikultur pada media yang sama dan pada planlet tebu yang dikultur pada media berbeda dengan frekuensi subkultur yang berbeda. Kalus dan planlet tebu diambil dari Balai Pengembangan dan Produksi Benih Perkebunan (BPPBP) Jawa Barat, dan diekstrak menggunakan metode maserasi dengan pelarut etanol p.a 70%. Metabolit dianalisis dengan menggunakan *Gas Chromatography Mass-Spectrometry* (GC-MS) dan aktivitas antioksidan dianalisis menggunakan metode 2,2-difenil-1-pikrilhidrazil (DPPH). Hasil penelitian menunjukkan kalus subkultur ke-3 dan ke-4 yang dikultur pada media MS + 2,4-D mengandung 2 metabolit, planlet subkultur ke-10 yang dikultur pada media MS + Kinetin + Air Kelapa mengandung 5 metabolit, dan planlet subkultur ke-11 yang dikultur pada media MS + Kinetin + TDZ mengandung 7 metabolit. Aktivitas antioksidan pada kalus dan planlet tebu tergolong kategori sangat lemah. Penelitian ini menunjukkan adanya perbedaan kandungan metabolit dan aktivitas antioksidan pada kalus yang dikultur pada media sama dan planlet yang dikultur pada media berbeda dengan frekuensi subkultur berbeda.

Kata Kunci : Kalus, Planlet, Metabolit, Antioksidan, Subkultur.

METABOLITE CONTENT AND ANTIOXIDANT ACTIVITY IN CALLUS AND PLANTLETS OF SUGARCANE (*Saccharum officinarum* L.)

ABSTRACT

Sugarcane (Saccharum officinarum L.*) has been widely used to cure various diseases due to its metabolite content. Tissue culture is one method that can be used to produce metabolites and is an alternative biotechnology as a form of conservation strategy. In order to meet its nutritional needs, subculture techniques are needed. Differences in culture media and repeated subcultures can affect the metabolite content and antioxidant activity produced. This study aims to obtain information regarding metabolite content and antioxidant activity in sugarcane callus cultured on the same media and on sugarcane plantlets cultured on different media with different subculture frequencies. Sugarcane callus and plantlets were taken from Balai Pengembangan dan Produksi Benih Perkebunan (BPPBP) Jawa Barat, and extracted using the maceration method with 70% p.a. ethanol solvent. Metabolites were analyzed using Gas Chromatography Mass-Spectrometry (GC-MS) and antioxidant activity was analyzed using the 2,2-diphenyl-1-picrylhydrazyl (DPPH) method. The results showed that the 3rd and 4th subculture callus cultured on MS + 2,4-D media contained 2 metabolites, the 10th subculture plantlet cultured on MS + Kinetin + Coconut Water media contained 5 metabolites, and the 11th subculture plantlet cultured on MS + Kinetin + TDZ media contained 7 metabolites. Antioxidant activity in sugarcane callus and plantlets classified as very weak category. This study showed differences in metabolite content and antioxidant activity in callus cultured on the same media and plantlets cultured on different media with different subculture frequencies*.

Keywords*: Callus, Plantlet, Metabolite, Antioxidant, Subculture.*

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