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HASIL PENILAIAN SEJAWAT SEBIDANG ATAU PEER REVIEW
KARYA ILMIAH : JURNAL ILMIAH

Judul Jurnal Ilmiah (Artikel) : Identifikasi Molekuler Jeruk Nipis Tegal Berdasarkan Fragmen Gen 18s Ribosomal RNA
 Penulis Jurnal Ilmiah/ Jumlah penulis : Yumna Rahmadias Hanifa, Sri Pujiyanto, Rejeki Siti Ferniah, Hermin Pancasakti
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 a. Nama Jurnal : Jurnal Bioteknologi dan Biosains Indonesia
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 (jika ada)
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c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%)		7,50		7,50
d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)		7,50		7,50
Total = (100%)		25,00		24,61
Nilai pengusul = (40% x 24,61) = 9,844				9,844

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Semarang, 27 April 2023

Reviewer I



Prof Dr. Endah Dwi Hastuti, MSi.

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d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)		7,50		7,50
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Semarang, 28 April 2023

Reviewer II



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SSR MARKERS CHARACTERIZATION FOR TEMU IRENG (*Curcuma aeruginosa* Roxb.) GENERATED FROM EST OF *Curcuma longa*

Karakterisasi Marka SSR untuk Temu Ireng (*Curcuma aeruginosa* Roxb.) dari EST *Curcuma longa*

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ABSTRACT

Temu ireng (*Curcuma aeruginosa*) is used as a traditional herb medicine in Indonesia. Expressed Sequence Tags (EST) of *C. longa* was used because there were no genome data of *C. aeruginosa*. This study aimed to recognize the diversity of SSR characteristic and to develop a primer for *C. aeruginosa* genetic diversity. The EST was preprocessed and analyzed for the SSR motif. Primers were designed using SSR motifs excluding mononucleotide (≥ 20 bp) and analyzed based on gene ontology. The result showed that out of 12.675 EST used there were 3.005 contig and 548 perfect SSR motif with the motif frequency of 1/15,27 kb sequences achieved. AGG trinucleotide was mostly distributed (37,40%). There were 380 primers designed and 10 primers validated by PCR on three *C. aeruginosa* clones from Ponorogo, Cikarang, and Kebumen. The number of alleles detected was about 2 to 3 per locus. The polymorphic microsatellite markers produced from this study could be used for the analysis of genetic diversity of *C. aeruginosa* in Indonesia.

Keywords: *Curcuma aeruginosa*, *Curcuma longa*, EST, primer, SSR

ABSTRAK

Temu ireng (*Curcuma aeruginosa*) digunakan sebagai bahan baku obat herbal tradisional di Indonesia. Expressed Sequence Tags (EST) dari *C. longa* digunakan karena sampai saat ini belum adanya data genome dari *C. aeruginosa*. Penelitian ini bertujuan untuk mengetahui keragaman karakteristik SSR dan mengembangkan primer untuk prastudi keragaman genetik *C. aeruginosa*. EST dilakukan prapemrosesan dan dianalisis motif SSR. Primer didesain menggunakan motif SSR selain mononukleotida (≥ 20 bp) dan dianalisis berdasarkan ontologi gen. Hasil yang diperoleh dari 12.678 EST yang digunakan dihasilkan 3.005 contig dan 548 motif perfect SSR dengan frekuensi motif 1/15,27 kb sekuen. AGG trinukleotida merupakan yang paling banyak terdistribusi (37,40%). Sebanyak 380 primer didesain dan 10 primer divalidasi melalui PCR pada 3 klon *C. aeruginosa* asal Ponorogo, Cikarang, dan Kebumen. Jumlah alel yang terdeteksi sekitar 2 sampai 3 per lokus. Marka mikrosatelit polimorfik yang dihasilkan dari penelitian ini dapat digunakan untuk analisis keragaman genetik *C. aeruginosa* di Indonesia.

Kata Kunci: *Curcuma aeruginosa*, *Curcuma longa*, EST, primer, SSR



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ANALISIS KOMPARATIF MINERAL MIKRO DAN ANTI NUTRISI PADA BERAS ANTARA PADI REKAYASA GENETIK DAN TETUANYA

Comparative Analysis of Micro-Minerals and Anti-Nutrients in Brown Rice between Transgenic Rice and Its Non-Transgenic Counterpart

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ABSTRACT

Comparative analysis is important aspect in food safety of transgenic crops to determine the effect of transgene on nutritional and anti-nutritional contents. This research was aimed to determine the concentration of Fe, Zn, phytic acid, and anti-trypsin activity, then assess the equivalence between transgenic rice and non-transgenic rice. Fe and Zn concentration was carried out using energy-dispersive x-ray fluorescence spectrometry. Anti-nutritional phytic acid and anti-trypsin activity were performed using visible light spectrophotometry. The data obtained were statistically tested using Independent sample t-test. These results indicated that the concentration of Fe, Zn, phytic acid, and anti-trypsin activity in 6 transgenic rice events were equivalent to non-transgenic rice. In conclusion, the transgene did not affect Fe, Zn, phytic acid, and anti-trypsin activities in brown rice of 6 transgenic rice events carrying cry1B::cry1Aa fusion genes.

Keywords: anti-trypsin, cry1B::cry1Aa, micro-mineral, phytic acid, substantial equivalence

ABSTRAK

Analisis komparatif adalah salah satu aspek penting dalam keamanan pangan tanaman produk rekayasa genetik (PRG) untuk mengetahui pengaruh transgen terhadap kandungan nutrisi dan anti nutrisi. Pada penelitian ini dilakukan analisis komparatif konsentrasi mineral mikro Fe, Zn, asam fitat, dan aktivitas anti tripsin pada beras pecah kulit dari 6 galur padi PRG pembawa fusi gen cry1B::cry1Aa terhadap padi non-PRG Rojolele tetuanya. Analisis konsentrasi mineral mikro Fe dan Zn menggunakan metode *energy-dispersive x-ray fluorescence spectrometry* (ED-XRF) dengan 3 ulangan. Analisis konsentrasi anti nutrisi asam fitat dan aktivitas anti tripsin dilakukan menggunakan metode spektrofotometri sinar tampak dengan 8 ulangan. Data yang diperoleh diuji secara statistik menggunakan *Independent sample t-test*. Hasil yang diperoleh menunjukkan konsentrasi mineral mikro Fe, Zn, asam fitat, dan aktivitas anti tripsin pada beras dari 6 galur padi PRG pembawa fusi gen cry1B::cry1Aa setara dengan padi non-PRG Rojolele tetuanya. Kesimpulannya bahwa transgen tidak mempengaruhi kandungan mineral mikro Fe, Zn, asam fitat, dan aktivitas anti tripsin pada beras dari 6 galur padi PRG pembawa fusi gen cry1B::cry1Aa.

Kata Kunci: anti tripsin, asam fitat, cry1B::cry1Aa, kesepadanan substansial, mineral mikro



PENGUJIAN POTENSI ALERGENITAS COAT PROTEIN OF SUGARCANE MOZAIC VIRUS PADA TANAMAN TEBU TRANSGENIK

Assesment of Potential Allergenicity of Coat Protein of Sugarcane Mozaic Virus in Transgenic Sugarcane

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ABSTRACT

Sugarcane resistant to sugarcane mosaic virus (SCMV) was developed by overexpression of gene for coat protein (CP). Therefore, this study aimed at investigating the potential allergenicity of CP-SCMV in transgenic sugarcane. Allergenicity was assessed by analysis in silico and in vitro. In silico analysis using AllergenOnline FASTA alignment of full-length CP-SCMV amino acid showed that the protein had no similarity with allergen protein. However, the alignment using 80 mer CP-SCMV showed over 35% similarity, but this result was considered as false positive. In silico analysis on digestion capability of protease found the cutting sites of CP-SCMV by pepsin, trypsin and chymotrypsin. This result was further confirmed by in vitro gastrointestinal digestion in that CP-SCMV was digested by pepsin and trypsin. Although CP-SCMV was less degraded by in vitro heat treatment and quantitatively underwent slight decrease after 30-minute heating on 90 °C, the protein might lose its function. These results indicated that CP-SCMV was considered having no potential allergen in transgenic sugarcane resistant to SCMV.

Keywords: allergenicity, coat protein SCMV, in silico, in vitro, transgenic sugarcane

ABSTRAK

Tebu tahan *sugarcane mosaic virus* (SCMV) dirakit melalui overekspresi gen untuk *coat protein* (CP). Oleh karena itu, penelitian ini bertujuan menguji alergenitas CP-SCMV pada tebu transgenik. Pengujian alergenitas dilakukan melalui analisis *in silico* dan *in vitro*. Hasil analisis *in silico* dengan pensejajaran AllergenOnline FASTA *full-length* asam amino CP-SCMV menunjukkan tidak ada kesamaan dengan protein alergen. Namun demikian pada pensejajaran 80 mer, CP-SCMV mempunyai kemiripan di atas 35% dengan alergen, tetapi hasil ini memiliki kecenderungan positif palsu. Analisis *in silico* terhadap kemampuan cerna protease ditemukan adanya sisi pemotongan CP-SCMV oleh enzim pensin, *trypsin* dan *chymotrypsin*. Hasil ini dikonfirmasi lebih lanjut dengan analisis *in vitro* pencernaan gastrointestinal yang menunjukkan bahwa CP-SCMV terdegradasi oleh pepsin dan *trypsin*. Walaupun hasil analisis *in vitro* menunjukkan CP-SCMV kurang dipengaruhi oleh perlakuan panas dan hanya sedikit berkurang pada pemanasan 90 °C selama 30 menit, tetapi mungkin fungsi protein telah rusak. Hasil penelitian ini menyimpulkan bahwa CP-SCMV pada tanaman tebu transgenik tahan virus tidak berpotensi sebagai alergen.

Kata Kunci: alergenitas, coat protein SCMV, *in silico*, *in vitro*, tebu transgenik