

**DETEKSI SINGLE NUCLEOTIDE POLYMORPHISMS (SNPs) GEN  
*OsFER2* PADA LIMA KULTIVAR PADI PUTIH DAN BERPIGMEN  
(*Oryza sativa* L.)**

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**INTISARI**

Beras merupakan sumber karbohidrat utama bagi separuh masyarakat dunia termasuk Indonesia. Selain kandungan karbohidrat yang tinggi, beras juga mengandung beberapa mineral seperti zat besi, seng, kalsium, kalium, magnesium, serta vitamin E dan vitamin C. Beras hitam diketahui memiliki kandungan antosianin dan Fe yang tinggi sehingga sering dikonsumsi sebagai pangan fungsional. Kadar Fe pada beras atau biji padi diregulasi oleh beberapa gen, salah satunya gen *OsFER2* yang menyandi protein ferritin. Penelitian ini bertujuan untuk membandingkan kadar Fe biji padi hitam, merah, dan putih serta hubungannya dengan *Single Nucleotide Polymorphisms (SNPs)* pada sekuen gen *OsFER2*. Kultivar padi yang digunakan yaitu Cempo Ireng, Pari Ireng, Hitam Kalsel, Merah Pari Eja, dan Ciherang yang ditanam pada kondisi lingkungan yang sama. Tahapan penelitian meliputi penanaman padi, pengukuran kadar Fe dengan Spektrofotometer Serapan Atom (SSA), isolasi DNA genom, amplifikasi gen *OsFER2*, elektroforesis, sekuensing, dan deteksi *SNPs*. Analisis data dilakukan dengan aplikasi MEGA11 dan BioEdit. Hasil yang diperoleh menunjukkan bahwa kadar Fe biji padi tertinggi terdapat pada Pari Ireng, diikuti oleh Cempo Ireng, Hitam Kalsel, Merah Pari Eja, dan Ciherang dengan kadar Fe berturut-turut 22,08; 17,35; 16,81; 13,91; dan 13,76 mg/kg. *SNPs* pada gen *OsFER2* terdeteksi sebanyak 6 buah terdiri dari 3 transisi dan transversi di intron 1 sekuen Merah Pari Eja dan 3 insersi di intron 2 sekuen Pari Ireng, Hitam Kalsel, dan Ciherang. *SNPs* yang terdeteksi terletak pada intron sehingga tidak mempengaruhi perbedaan kadar Fe biji padi.

**Kata kunci:** *Oryza sativa*, padi, *OsFER2*, *SNPs*.

**DETECTION OF *SINGLE NUCLEOTIDE POLYMORPHISMS (SNPs)* IN  
*OsFER2* GENE IN FIVE CULTIVARS OF WHITE AND PIGMENTED  
RICE (*Oryza sativa* L.)**

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**ABSTRACT**

Rice is the main source of carbohydrates for half of the world's people, including Indonesian. In addition to its high carbohydrate level, rice also contains several mineral such as iron, zinc, calcium, potassium, magnesium, as well as vitamin E and vitamin C. Black rice is often consumed as functional food as it has high content of iron and anthocyanins. Iron level in rice are regulated by several genes, one of which is *OsFER2* gene which encodes ferritin protein. This study aims to compare the Fe content of black, red, and white rice and its relationship with *Single Nucleotide Polymorphisms (SNPs)* in *OsFER2* gene sequence. The rice cultivar used were Cempo Ireng, Pari Ireng, Hitam Kalsel, Merah Pari Eja, and Ciherang which were planted in the same condition. The method was conducted by rice planting, measurement of Fe content with Atomic Absorption Spectrometry (AAS), genomic DNA isolation, *OsFER2* gene amplification, electrophoresis, sequencing, and detection of *SNPs*. Data analysis was performed using MEGA11 and BioEdit. The result shows that the highest Fe content was found in Pari Ireng, followed by Cempo Ireng, Hitam Kalsel, Merah Pari Eja, and Ciherang had Fe content respectively 22,08; 17,35; 16,81; 13,91; and 13,76 mg/kg. There are 6 *SNPs* in the *OsFER2* gene consist of 3 transitions and transversions in intron 1 of Merah Pari Eja sequence and 3 insertions in intron 2 of Pari Ireng, Hitam Kalsel, and Ciherang sequence. The detected *SNPs* are located in introns, therefore its do not affect the difference in Fe content of rice seeds.

**Keywords:** *Oryza sativa*, rice, *OsFER2*, *SNPs*.