ABSTRACT

STUDY ON GENETIC CHARACTER AND PRODUCTION OF RICE BASED ON MORPHOLOGY AND MOLECULAR

By

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This study was aimed to (1) studied genetic diversity, heritability and stability of M_3 generation, MSP 13 (non-mutant), Inpari 32, and Ciherang rice based on morphology and molecular markers. (2) determine yield of MSP 13 generation M_3, MSP 13 (non-mutant), Inpari 32, and Ciherang rice. This research was conducted at Sidomulyo Village, Sidomulyo District, South Lampung Regency with an altitude of 44 meters above sea level and at UPT Integrated Laboratory and Technology Innovation Center (LTSIT) University of Lampung from July to December 2022. Then, observations of starch granule size was conducted at the Integrated Laboratory of the Technology Innovation Center University of Lampung. This experiment was arranged in Completely Randomized Block Design (CRBD) with six replications. Data were analyzed by using Rstudio software (Version 2015). The results showed that (1) Based on morphological characteristics, all observed variables showed low genetic diversity. In line with molecular SSR which showed a similar polymorphism pattern in genotypes M_3 and MSP 13, as well as in Inpari 32 and Ciherang. (2) Characteristics of tillers number, plant height, flowering age, productive tillers number, panicle length, number of grains per panicle, weight of filled grain per clump, and grain yield have high heritability values. Meanwhile, third genotype, namely Ciherang, Inpari 32 and MSP 13, have high stability compared to M_3. (3) Yield of M_3 genotype is lower compared to the other three genotypes, namely Ciherang (8.9 tons/ha), Inpari 32 (8.56 tons/ha), and MSP 13 (8.24 tons/ha).

Keywords: *rice, genetics, molecular, heritability, stability*

ABSTRAK

STUDI KARAKTER GENETIK DAN PRODUKSI PADI SAWAH BERDASARKAN MORFOLOGI DAN MOLEKULER

Oleh

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Penelitian ini bertujuan untuk (1) mengkaji keragaman genetik, heritabilitas dan stabilitas padi MSP 13 generasi M_3, MSP 13 (non mutan), Inpari 32, dan Ciherang berdasarkan morfologi dan marka molekuler. (2) mengetahui hasil produksi padi MSP 13 generasi M_3, MSP 13 (non mutan), Inpari 32, dan Ciherang. Penelitian ini dilaksanakan di Desa Sidomulyo, Kec. Sidomulyo, Kab. Lampung Selatan dengan ketinggian 44 meter diatas permukaan laut (mdpl) dan di UPT Laboratorium Terpadu serta Sentra Inovasi Teknologi (LTSIT) Universitas Lampung pada Juli-Desember 2022. Penelitian ini disusun menggunakan rancangan acak kelompok lengkap (RAKL) dengan enam ulangan sebagai kelompok. Analisis data menggunakan software Rstudio (Versi 2015). Hasil penelitian menunjukkan bahwa (1) berdasarkan karakter morfologi melalui metode luas simpangan baku sebagian besar variabel menunjukkan keragaman dan heritabilitas yang tinggi. Sementara itu, genotipe Ciherang dan Inpari 32 mempunyai stabilitas yang tinggi dibandingkan dengan MSP 13 dan M_3. Sejalan dengan molekuler SSR yang menunjukkan pola polimorfisme mirip pada genotipe M_3 dan MSP 13, juga pada Inpari 32 dan Ciherang. (2) Hasil produksi terbaik yaitu pada genotipe Ciherang sebanyak 8,9 ton/ha, yang kemudian disusul dengan Inpari 32 (8,56 ton/ha), MSP 13 (8,24 ton/ha), dan M_3 (8,05 ton/ha).

Kata kunci : padi, keragaman genetik, molekuler, heritabilitas, stabilitas