

**ANALISIS MOLEKULER TERHADAP INDIVIDU TERPILIH GENERASI M5
BERDASARKAN JUMLAH BUAH WIJEN
(*Sesamum indicum* L.)**

INTISARI

Wijen merupakan salah satu sumber minyak nabati yang mempunyai manfaat kesehatan karena kandungan asam lemak tak jenuh dan anti oksidan alaminya. Induksi mutasi bertujuan untuk meningkatkan keragaman genetik pada tanaman menyerbuk sendiri dan telah dilakukan pada wijen lokal dengan iradiasi sinar gamma ^{60}Co 100 – 800 Gy. Pada generasi M2 dan M3 telah dilakukan seleksi untuk ketahanan terhadap cekaman salinitas serta seleksi berdasarkan jumlah buah pada generasi M4 dan M5 untuk diketahui keragaman genetik beberapa karakteristik morfologi. Bahan genetik pada penelitian ini terdiri dari 22 galur individu terpilih pada generasi M5 hasil seleksi berdasarkan jumlah buah pada generasi M4. Tujuan penelitian ini adalah mengetahui keragaman genetik pada individu-individu terpilih dan pada perlakuan dosis iradiasi sinar gamma berdasarkan penanda *Random Amplified Polymorphic DNA* (RAPD). Pengamatan molekuler dilaksanakan di Laboratorium Genetika dan Pemuliaan Tanaman Fakultas Pertanian UGM yang meliputi isolasi DNA sebanyak 164 sampel serta analisis PCR menggunakan 15 primer RAPD. Hasil analisis keragaman genetik menunjukkan bahwa koefisien kemiripan genetik berkisar antara 0,29-0,85. Keragaman dalam individu terpilih menyumbang terbesar yaitu 66%, sedangkan keragaman antar perlakuan dan antar individu terpilih menyumbang 16% dan 18%. Berdasarkan persentase lokus polimorfik, pada individu terpilih polimorfisme paling tinggi adalah galur 19 sebesar 61,60% sedangkan terendah adalah galur 34 sebesar 23,21%. Pada perlakuan dosis iradiasi sinar gamma, perlakuan 100 Gy menghasilkan polimorfisme tertinggi sebesar 89,45% dan perlakuan 600 Gy terendah yaitu sebesar 40,51%.

Kata kunci : wijen, mutasi induksi, keragaman genetik, RAPD

MOLECULAR ANALYSIS OF SELECTED INDIVIDUALS BASED ON NUMBER OF CAPSULES IN M5 GENERATION OF SESAME (*Sesamum indicum* L.)

ABSTRACT

Sesame is one of major oilseed crops which had health benefits for its content of unsaturated fatty acids and natural anti-oxidants. Induced mutation is used to increase genetic variation in self-pollinated plants. Induction of mutation is done in local sesame with dose of gamma ray irradiation ^{60}Co 100 - 800 Gy. In M2 and M3 generations, they had been screened to salinity stress and selection based on number of capsules per plant in M4 and M5 generation to gathered information of genetic variability of some morphological characteristics. The genetic material in this study consisted of 22 selected individual lines of M5 generation based on the number of capsules in M4 generation. The aims of this research were to determine genetic variation in selected individuals and on the treatment of gamma ray irradiation doses based on Random Amplified Polymorphic DNA (RAPD) marker. Molecular observations were conducted at the Laboratory of Genetics and Plant Breeding of the Faculty of Agriculture UGM which included DNA isolation of 164 individual plants and PCR analysis using 15 RAPD primers. The results of genetic variation analysis showed that the genetic similarity coefficient ranged from 0.29 to 0.85. Genetic variation within selected individuals accounted for 66% of total variation, while genetic variation among gamma rays dose treatments and among selected individuals consecutively 16% and 18%. Based on the dose of gamma ray irradiation, genetic variation within treatment was 85% higher than among treatments (15%). The highest polymorphism was in line 19 with 61.60% while the lowest was line 34 with 23.21%. In the treatment of gamma ray irradiation doses, 100 Gy treatment resulted in the highest polymorphism with 89.45% and the lowest was 600 Gy treatment with 40.51%.

Keywords: sesame, induced mutation, genetic variation, RAPD