INTISARI

Kestabilan genetik dan ekspresi yang konsisten pada tanaman hasil transformasi merupakan indikator penting untuk kesuksesan transformasi genetik. Tanaman transgenik dikatakan stabil jika gen yang diinsersikan pada tanaman induk ditemukan kembali pada tanaman generasi berikutnya. Penelitian ini bertujuan untuk mengetahui kestabilan gen nptII dan penampakan morfologi tanaman kosmos kuning hasil transgenik pada generasi ketiga (T3). Gen nptII merupakan gen yang memiliki resistensi atau tahan terhadap antibiotik kanamisin. Uji kestabilan genetik dilakukan melalui dua metode, yaitu menggunakan analisis molekuler dan fenotiping terhadap ciri-ciri morfologis tanaman berdasarkan karakter kualitatif dan kuantitatif. Karakter kualitatif diperoleh dengan menggunakan panduan karakterisasi UPOV, sedangkan data-data karakter kuantitatif dianalisis dengan Uji Beda Nyata Jujur Tukey dengan taraf 5 % dan segregasi dengan Uji Chi Kuadrat. Penelitian diawali dengan seleksi awal 73 biji tanaman transforman yang diperoleh dari tanaman transforman generasi kedua di media antibiotik kanamisin 50 ppm dan dihasilkan 28 bibit tanaman putatif. Kemudian dilakukan analisis PCR untuk mengkonfirmasi keberadaan gen nptII dengan ukuran 500 bp. Hasil penelitian menunjukkan bahwa 9 tanaman menunjukkan positif gen nptII dengan persentase kestabilan sebesar 32,14%. Gen nptII diturunkan dengan mengikuti pola segregasi 1:1. Tanaman transforman gen nptII menunjukkan perbedaan perbedaan yang nyata pada beberapa karakter morfologi yang berbeda nyata dengan tipe liarnya seperti tinggi tanaman, jumlah daun, panjang daun bagian bawah, lebar daun tengah, tangkai daun, panjang terminal daun, panjang tangkai, diameter bunga, panjang pita, dan lebar pita.

Kata kunci: kosmos kuning, kestabilan genetik, gen nptII, segregasi.

ABSTRACT

Genetic stability and consistent expression in transformed plants are important indicators for successful genetic transformation. Transgenic plants are said to be stable if the inert genes in the parent plant are rediscovered in the next generation of plants. This study aims to determine the stability of the nptII gene and the morphological appearance of transgenic yellow cosmos plants in the third generation (T3). The nptII gene is a gene that has resistance to the antibiotic kanamycin. Genetic stability tests are carried out through two methods, namely molecular analysis and phenotyping of plant morphological characteristics based on qualitative and quantitative characteristics. Qualitative characters were obtained using the UPOV characterization guide, while quantitative character data were analyzed by Tukey's Honest Significant Difference Test with a level of 5% and segregation by the Chi Square Test. The research began with an initial selection of 73 transformant plant seeds obtained from second-generation transformant plants in 50 ppm kanamycin antibiotic media and produced 28 putative plant seeds. Then PCR analysis was carried out to confirm the presence of the nptII gene, which has a size of 500 bp. The results showed that 9 plants showed a positive nptII gene with a stability percentage of 32.14%. The nptII gene is derived by following a 1:1 segregation pattern. Plant transformant gene nptII shows marked differences in several morphological characters that differ markedly from their wild type, such as plant height, number of leaves, lower leaf length, middle leaf width, petiole, leaf terminal length, stalk length, flower diameter, band length, and band width.

Keywords: yellow cosmos, genetic stability, nptII gene, segregation.