

INTISARI

Kestabilan genetik dari tanaman hasil transformasi merupakan suatu komponen penting dalam pengembangan tanaman transgenik. Karakter target yang diintroduksi ke tanaman harus memiliki ekspresi gen yang stabil agar mampu diwariskan ke keturunannya seperti gen-gen endogenous lain. Pada studi sebelumnya, telah dilaksanakan transformasi genetik secara *in vitro* pada tanaman kenikir (*Cosmos sulphureus* Cav.) dengan menggunakan gen *SoSPS1*. Gen *SoSPS1* berperan sebagai pengkode enzim *sucrose-phosphate synthase* (SPS) yang bertugas sebagai enzim kunci dalam biosintesis sukrosa pada tanaman. Penelitian ini bertujuan untuk mengetahui kestabilan genetik serta pola segregasi dari populasi tanaman transforman gen *SoSPS1* pada generasi kedua. Penelitian diawali dengan seleksi 140 biji tanaman transforman yang diperoleh dari tanaman transforman generasi pertama pada kertas saring dengan penambahan antibiotik kanamisin 50 ppm dan dihasilkan 23 bibit tanaman putatif yang selanjutnya dianalisis PCR untuk mengkonfirmasi keberadaan gen *nptii* sebagai gen penanda seleksi. Diperoleh hasil yang menunjukkan 21 tanaman terkonfirmasi positif gen *nptii* dengan pola segregasi yang tidak mengikuti Hukum Mendel. Tanaman transforman gen *SoSPS1* menunjukkan perubahan karakter berupa keberadaan antosianin batang dan daun, tekstur daun, terbentuknya keragaman bentuk ujung daun, susunan pita. Panjang tangkai, jumlah pita, diameter pita, dan lebar pita juga menunjukkan peningkatan rerata karakter yang berbeda nyata dibandingkan dengan populasi tanaman tipe liar.

Kata kunci : kenikir, kestabilan genetik, gen *SoSPS1*, pola segregasi

ABSTRACT

Genetic stability of transgenic plants is one of the most crucial observation to produce a stable generation of transgenic plant. The gene of interest that has been introduced to target plants must be stable in order to be inherited to their progeny like any other endogenous genes. In the previous study, the transgenic yellow cosmos (*Cosmos sulphureus* Cav.) containing *SoSPS1* gene was successfully generated by in vitro genetic transformation method. *SoSPS1* is a *sucrose-phosphate synthase* coding gene from sugarcane that plays essential role as a key enzyme in sucrose biosynthesis. This research is conducted to analyze the stability and segregation pattern of second generation of transgenic plants population carrying *SoSPS1* gene. This research was started with a collection of 140 transgenic seeds obtained from the first generation transgenic plants. The seeds were germinated on the filter paper and soaked with 50 ppm kanamycin solution. The result showed that 23 kanamycin resistant plants were obtained and 21 plants were confirmed by polymerase chain reaction (PCR). Surprisingly, the result showed that the segregation pattern did not follow the Mendelian theory. Transgenic plants that were confirmed carrying *SoSPS1* gene showed different characters in leaf texture, leaf's lobe shape, arrangement of ray floret, and the presence of anthocyanins in stem and leaves. Increase of peduncle length, number of ray florets, diameter and width of ray floret characters are observed in the transgenic plants, while wildtype population was not presence.

Keyword : cosmos, genetic stability, *SoSPS1* gene, segregation pattern