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IDENTIFICATION OF CO-DOMINANT DNA MARKER TIGHTLY LINKED TO *Tm-2* LOCUS IN TOMATO

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ABSTRAK

Tm-2 adalah gen yang mengendalikan ketahanan terhadap tomato mosaic virus (ToMV) pada tomat (*Lycopersicon esculentum*) dan berasal dari *Lycopersicon peruvianum.* Pada penelitian ini digunakan dua galur tomat yang mempunyai latar belakang genetik yang sama GCR26 dan GCR36, akan tetapi keduanya dapat dibedakan oleh adanya gen *Tm-2* pada GCR36. Melalui *analisis random amplified-polymorphic DNA* (RAPD) terhadap dua galur tomat tersebut di atas diketahui adanya primer RAPD yang menghasilkan fragmen spesifik untuk GCR236. Selanjutnya fragmen tersebut sekuennya dianalisis, dan dari hasil analisis sekuen tersebut dibuat sepasang primer *sequence charactrized amplified region* (SCAR) yang merupakan marka DNA kodominan yang bisa membedakan baik genotipe homozigot gen *Tm-2.* Oleh karena fragmen dihasilkan terkait dengan *Tm-2*, maka primer SCAR tersebut merupakan sarana yang dapat digunakan untuk pemulian tanaman tomat bagi pembentukan varietas tahan virus.

ABSTRACT

Tm-2 is a gene conferring resistance to tomato mosaic virus (ToMV) in *Lycopersicon esculentum*, and originated from *Lycopersicon peruvianum,* a wild relatives of tomato. A random amplified-polymorphc DNA (RAPD) screening was employed with genomic DNA from ToMV-susceptible (GCR26) and resistant tomato (GCR236) near isogenic lines (NILs). A polymorphic band links to ToMV resistant line was detected; furthermore the fragment was cloned and sequenced. A pair of primer was designed from the most-end of fragment sequence. PCR ampilification of genomic DNA with these primers resulted in single polymorphic band between susceptible and resistant tomato lines. This sequence characterized amplified region (SCAR) primer proved as codominant marker that enables to distinguish a homozygous and a heterozygous individual plant in segregating populations, and proveded a comvenient and rapid assay for selection during breeding programs and hybrid seed production, respectively.

Key word: DNA marker, TM-2 gene, Resistance to ToMV

INTRODUCTION

Tomato mosaic, tobamovirus (ToMV) is the most common mosaic disease in tomato (*Lycopersicon esculentum* (L) Mill.). This virus systemically infects tomato, and causes light and dark green mosaic, bright yellow mottling, fern-leaf growth, or necrosis of leaves, stems, and fruit, which seriously affect fruit yield quality (Broadbent, 1964). A breeding program from early 1940s started in Hawaii (Frazier *et al.*, 1964) was introduced ToMV-resistance of wild-relatives including *L. hirsutum* and *L. peruvianum* into *L. esculentum.* In the backcross generations, *Tm-1* originated from *L hirsutum* and *Tm-2* originated

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