

Analisis Morfologi dan Molekular Padi Transgenik cv. Nipponbare yang Membawa Gen CONSTANS (CO) Terkait Umur Pembungaan = Morphology and Molecular Analysis of Transgenic Rice cv. Nipponbare containing CONSTANS (CO) Gene Related to Flowering Time

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Abstrak

Tanaman padi merupakan penghasil beras yang merupakan makanan pokok mayoritas masyarakat dunia. Produksi tanaman padi di Indonesia masih belum optimal. Metode rekayasa genetika dengan mengintroduksi gen CONSTANS (CO) dari tanaman *Arabidopsis thaliana* ke dalam tanaman padi kultivar Nipponbare digunakan untuk usaha peningkatan produktivitas padi. Gen CO diketahui mampu menginduksi terjadinya pembungaan pada tanaman. Penelitian bertujuan untuk mengetahui integrasi gen AtCO, pengaruh gen terhadap karakter agronomi, dan ekspresi dari gen AtCO pada tanaman padi Nipponbare transgenik generasi T2 dengan analisis morfologi dan molekular.

Hasil pengamatan morfologi menunjukkan bahwa tanaman padi transgenik memiliki karakter agronomi yang lebih baik dibandingkan dengan tanaman padi kontrol, namun tidak menunjukkan adanya perbedaan umur berbunga yang signifikan. Hasil pengamatan dengan teknik Polymerase Chain Reaction (PCR) menunjukkan 169 dari 227 tanaman padi transgenik memiliki integrasi gen higromisin dan CO. Ekspresi gen CO terdeteksi rendah pada 3 dari 4 sampel padi transgenik dengan teknik Reverse Transcription PCR (RT-PCR). Hasil teknik southern blotting yang dilakukan pada 16 sampel padi transgenik menunjukkan masing-masing 6 salinan T-DNA dari 13 sampel padi transgenik.

.....Rice is a staple food which is consume by the majority of world's population. Rice production in Indonesia has not been optimal yet. A method of genetic engineering by introducing CONSTANS (CO) gene of *Arabidopsis thaliana* into the rice Nipponbare cultivar was used to improve rice productivity. CO gene known to induce early flowering time in plant. The aims of the experiment were to study the AtCO gene integration, the influence of AtCO gene on agronomic traits, and the expression of AtCO gene in transgenic rice Nipponbare AtCO T2 generation by morphological and molecular analysis.

Morphological observations showed that transgenic plant's agronomic traits were better than controls, but there is no significant difference in flowering time between transgenic rice Nipponbare plants and controls. Observations with Polymerase Chain Reaction (PCR) technique showed that 169 of 227 transgenic rice Nipponbare plants have hygromycin and CO gene integration. CO gene expression detected in 3 of 4 transgenic rice plants samples using Reverse Transcription PCR (RT-PCR) technique. The southern blotting technique in 16 samples of transgenic plants showed that 13 samples have multi-copies transgen integration (6 copies).