

Construction of PHB and PHBV transformation vectors for bioplastics production in oil palm

ABSTRACT

The construction of transformation vectors carrying bioplastic biosynthetic genes driven by constitutive and oil palm mesocarp-specific promoters was completed. Four planned transformation vectors were produced. The poly-3-hydroxybutyrate (PHB) producing constructs carried the *phbA*, *phbB* and *phbC* genes, while the polyhydroxybutyrate-co-valerate (PHBV) producing constructs carried the *bktB*, *phbB*, *phbC* and *tdcB* genes. Each of these genes was fused with the transit peptide (Tp) of the oil palm acyl-carrier-protein (ACP) for targeting into the plastids of plant cells. All vectors carry the phosphinothricin acetyltransferase gene (*bar*) driven by an ubiquitin promoter as plant selectable marker. The matrix attachment region from tobacco (RB7MAR) was also included for stabilization of the transgene expression and to minimize the gene silencing due to positional effects. All constructs were verified by restriction analysis, polymerase chain reaction (PCR) and DNA sequencing.

Keyword: Constitutive promoters; Plastid; Poly-3-hydroxybutyrate (PHB); Polyhydroxybutyrate-co-valerate (PHBV); Tissue-specific promoter; Transformation vectors