

GUS Gene Expression in Somatic Embryo of Oil Palm (*Elaeis guineensis* Jacq.)

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ABSTRACT--- *Oil palm is an oil producing plant, which produce 5 to 7 tons of oil/ acre/ year. In this study, we carried out transformation of oil palm by GUS gene. The expression of GUS gene was obtained in 25 minutes soaking and 5 minutes vacuum infiltration method. The colour of GUS gene expression is blue.*

1. INTRODUCTION

Transformation method is important in an experiment of genetic transformation. In oil palm, transformation method by *Agrobacterium tumefaciens* has been performed in zygotic embryo (Muad, 2000). According to Parveez et al., (1998), transformation in oil palm has been carried out in embryogenic callus.

In this study, we used somatic embryo of oil palm for transformation. GUS gene expression was performed for confirming a transformant.

2. MATERIAL AND METHOD

Material

Somatic embryo of oil palm was used in this study. Somatic embryogenesis of oil palm was performed according to Mariani et al. (2014b)

Method

Transformation

Somatic embryo of oil palm was inoculated in culture solution of *Agrobacterium tumefaciens* with 10 ml of embryo development medium I (Mariani et al., 2014b)

For 25 minutes followed by vacuum infiltration for 5 minutes. Then, the somatic embryo was cocultivated in the dark for 3 days on embryo development medium II (Mariani et al., 2014b) supplemented with 100 µM of acetosyringone. The *Agrobacterium* was eliminated by sterile water for 15 minutes, 350 ppm of cefotaxime solution for 15 minutes, sterile water for 10 minutes, 350 ppm of cefotaxime solution for 10 minutes and sterile water for 10 minutes, consecutively. Thereafter, GUS gene expression was carried out in somatic embryo by a method of Jefferson et al. (1987).

3. RESULT AND DISCUSSION

The vascular plant, like all sexually reproducing organisms, begin its existence as a single cell (Steeves and Sussex, 1994). A somatic embryo of oil palm, is developed from a single cell as well (Mariani et al., 2014a).

We performed transformation of oil palm used GUS gene. The material was somatic embryos of oil palm in globular stage. A GUS gene was expressed in the somatic embryo (Figure 1). It shows high activity of the GUS gene expression.

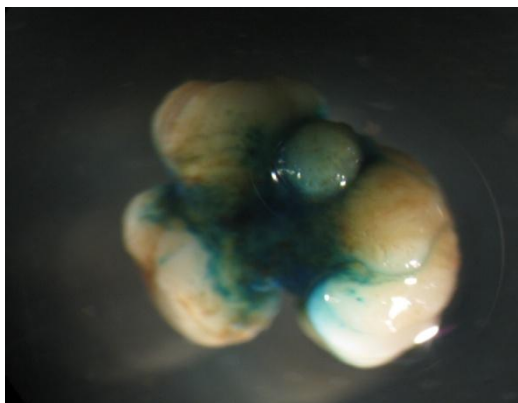


Figure 1. The GUS gene expression in a somatic embryo of oil palm.

The explant part which expressed GUS gene shows blue colour. It indicate that there was resipitation as hydrolysis of chromogenic X-gluc substance by β -glucuronidase enzyme. The enzyme was produced by GUS gene and resulted 5,5'-dibromo-4,4'-dichloro-indigo substance (blue colour) in transformant plant cell. GUS assay is easy, sensitive, not expensive, safe, only use simple tool amd very easy for observing (Jefferson et al., 1987).

The cocultivation in this method by dipping the explant for 25 minutes, is good. It is because suspension of *Agrobacterium tumefaciens* has been mixed with *Acetosyringone*. The *Acetosyringone* has enough time to phosphorylate inner membrane protein of Vir A well. Subsequently, Vir A protein will phosphorylate Vir G protein and transcription of others Vir genes occurred.

In conclusion, our method could be used in transformation of oil palm.

4. ACKNOWLEDGMENT

This study is supported by RU-ITB. We thankful to Dwi Erytrina, BSc. and Mrs. Tita Puspita for assisting in tissue culture.

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