

Calus Induction of Cacao Plant (*Theobroma cacao* L.) Clone MCC 02 with various concentrastions of 2,4-Dhicloropenoxyacetic Acid And Kinetin In Vitro

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ABSTRACT

*The cacao plant (*Theobroma cacao* L.) is an important commodity in Indonesia because in 2020, Indonesia ranked third in the world. Development faces obstacles, one of which is the use of low-quality seeds that result in suboptimal plant growth. Therefore, tissue culture is an alternative for producing high-quality cacao seedlings, with callus induction as the initial stage of whole plant formation. The addition of combinations of auxin and cytokinin can induce callus in cocoa plants. This study aims to determine the effect of 2,4-D, kinetin, and the combination of 2,4-D x kinetin on callus induction in MCC 02 cocoa clones. This study used a completely randomized design (CRD), consisting of two factors. The first factor was 2,4-D (0 mg/L; 0.5 mg/L; and 1 mg/L), and the second factor was kinetin (0 mg/L; 0.5 mg/L; 1 mg/L; and 1.5 mg/L). This study was conducted from July to October 2025 at the Tissue Culture Laboratory of the Jember State Polytechnic. The parameters of callus induction included the time of callus appearance (HSI), callus color (scoring), callus structure (scoring), percentage of callus explants (%), and fresh weight of callus (g). The research data were analyzed using analysis of variance (ANOVA). Significant differences between treatments were followed up with BNJ tests at the 5% level, while highly significant differences were further tested at the 1% level. The results showed that the combination of 2,4-D x kinetin was highly significant for callus color, significant for callus formation time and callus structure, while the percentage of callus formation produced insignificant values.*

Keywords: *Tissue culture, cocoa, kinetin, 2,4-D,Clone MCC 02*