

***Optimization of Cocoa Explant (*Theobroma cacao* L.) Sterilization Technique  
Using Red Ginger Rhizome by In Vitro  
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**ABSTRACT**

*Cocoa (*Theobroma cacao* L.) is an economic resource for some Indonesian people. However, every year the area of cocoa land has decreased. In addition, the production of superior and quality cocoa seeds must be fulfilled. This limitation is a start in the development and preservation of cocoa plant germplasm through in vitro propagation. The success of the in vitro culture technique is determined by the aseptic and sterile condition of the explants. This conditions are obtained by good and correct sterilization techniques, such as the use of natural chemical sterilants, bio antiseptic of red ginger rhizome. Red ginger rhizome is known to contain secondary metabolites, namely flavonoids and saponins which act as antibacterial and antifungal in suppressing contamination of cocoa explants. This research aimed to determine of the most optimal concentration of red ginger rhizome bio antiseptic as a natural chemical sterilant in suppressing contamination and the effect of explant selection on the success of sterilization techniques on cocoa explants. This study used a Completely Randomized Factorial Design (RALF) which consisted of 2 factors. The first factor is the origin of explants from young cocoa leaves (A1) and cacao flower crowns (A2). The second factor was the concentration of bio-antiseptic red ginger rhizome 0% (K1), 10% (K2), 15% (K3), 20% (K4), and 25% (K5). The research data were analyzed for analysis of variance (ANOVA), then a follow-up test for BNT  $\alpha = 5\%$ . The results of the analysis showed that A2K4 was the best treatment combination with 100% live explants and 0% browning.*

*Keywords: cocoa, sterilization technique, red ginger rhizome bio antiseptic, in vitro*