PENGEMBANGAN BAHAN AJAR MATERI FOTOSINTESIS PADA MATA KULIAH EKOFISIOLOGI TUMBUHAN BERBASIS RISET

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ABSTRACT

Ecophysiological responses of rubber (*Hevea brasiliensis* Mull. Arg. clone PB 260) that cultivated in ex-mining bauxite soil with application of organic manure were observed at Natural Biology Education Laboratory, University of Riau during January to June 2013. The purpose of this research was looked for a kind and mixture organic manure ratio to the ex-mining bauxite soil that gave the best photosynthesis rate and chlorophyll content. The result used to enrich learning substances such as module in photosynthesis topic and developed by using ADDIE model. The chicken and cow manure were used as source of organic matter in this single factor ex-situ experiment. Three ratios of organic manure : ex-mining bauxite soil (w/w) has been applied i.e control (ex-mining bauxite soil only), (1:1), and (1:2) were arranged according to Complete Randomize Design. The parameters that observed were photosynthesis rate, chlorophyll *a*, *b* and total chlorophyll content, and soil pH. The data were analyzed by using one-way ANOVA and advance test by using Duncan Multiple Range Test (DMRT) in level of 5%. The results show that the mixture ratio 1:2 of cow organic manure and ex-mining bauxite soil gave the best ecophysiological responses of rubber clone PB 260 particularly photosynthesis rate (10,21 μmol CO_2 m^{-2} s^{-1}), total chlorophyll content (42,50 μg mL^{-1}), and increasing of soil pH gave by mixture ratio 1:1 of chicken organic manure and ex-miniing bauxite soil. Learning substances that produced were teaching materials, validated by validator. and the module valued valid.

Keywords: *chicken and cow organic manure, chlorophyll content, ex-mining bauxite soil, learning substance, photosynthesis rate.*