

GROWTH, PHOTOSYNTHESIS AND RbCL DNA ALTERATION OF SPATHOGLOTTIS PLICATA RESULTED FROM IN VITRO CULTURE OF SEED IRRADIATED WITH X-RAY

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ABSTRACT

Seeds irradiation with X-rays besides triggering mutation may also potentially cause physiological changes in the resulting plants. The purpose of this study was 1) to observe the growth and photosynthesis of *S. plicata* plants resulted from seed in vitro culture which was irradiated and 2) to detect changes of RubisCo plastidom genes which were closely associated with the production of CO₂ fixation enzyme. *S. plicata* sprouts at the age of 10-12 months from X-ray irradiated seeds in vitro culture with dose of 0-24 rad were acclimatized and planted in the experiment garden. The growth of plants that survived at the age of 24-30 months was observed which includes number of leaves, leaf length and width, plant height, and number of tillers. Chlorophyll content was measured using Winterman and De Mots method, while the photosynthesis rate was measured utilizing Li-Cord portable photosynthetic apparatus. Changes detection in RubisCo chloroplast genes (RbcL) was analyzed from the results of DNA transcript sequences compared to RbcL DNA transcripts of Wild Type (WT) plants. The results showed that growth *S. plicata* plants resulted from seeds irradiation was slower with a reduction of 12-20%, but the chlorophyll contents and photosynthesis rate tend to increase. From the analysis of RbcL DNA transcripts through sequencing and alignment showed point mutations (nucleotide changes) at positions 13 and 17 in the form of substitutions and insertions. The increase of photosynthetic capacity was allegedly associated with changes in the translation result of Rubisco enzyme.

Kata Kunci: *Growth, Photosynthesis, RbcL, Spathoglottis plicata, X-rays*