

Pakorn Tangpong 2009: Effects of Acute and Chronic Gamma Irradiation on *In Vitro* Culture of *Anubias congensis* N.E. Brown. Master of Science (Applied Radiation and Isotopes), Major Field: Applied Radiation and Isotopes, Department of Applied Radiation and Isotopes. Thesis Advisor: Assistant Professor Peeranuch Jompuk, Ph.D. 100 pages.

In Vitro culture of *Anubias congensis* N.E. Brown. plantlets were irradiated with gamma rays for acute treatments of 0 20 40 60 80 and 100 Gy at the dose rate of 264 Gy/hr. After gamma irradiation for 60 days, survival percentage of plantlets decreased as irradiation doses increased. The calculated LD₅₀₍₆₀₎ for the acute irradiation was 32.12 Gy. With the increased of radiation treatments, the number of shoots, number of leaves and number of roots per plantlet in the M₁V₁ generation of *A. congensis* N.E. Brown. were decreased and significantly differences (p<0.05) among treatments. Some abnormalities observed in the M₁V₁ generation exposed to acute irradiation were genetically transferred to the M₁V₃ generation which included undulate leaf margins, narrow leaves, spotted leaves and dwarfism. For comparing the experiment between the single dose and two times split doses of gamma irradiation, the results indicated that at total doses of 15 and 20 Gy, the survival percentage of plantlets were lower in single dose treatment than two times split doses treatments. However, the percentage of variations in M₁V₁ generation was higher in single dose treatment than another one. When comparing subculture and non-subculture of plantlets after gamma irradiation, the survival percentages of subculture treatments were less than non-subculture treatments in which the number of shoots, number of leaves and number of roots were not significantly differences. The chronic irradiation treatments were ranged from 0 to 120.30 Gy with the dose rate of 0.71 Gy/hr. The LD₅₀₍₆₀₎ of these treatments was not possible to calculate because of all treatments had 100 percent survival. The number of shoots per plantlet was decreased only at 105.66 and 120.30 Gy. Five potential mutant lines of *A. congensis* N.E. Brown. were selected by 4 and 1 lines from acute and chronic treatments, respectively. All mutation characters were propagated through tissue culture. Moreover, random amplified polymorphic DNA (RAPD) technique could be used to identify the mutant lines from the original variety.

Student's signature

Thesis Advisor's signature