ARRIN ROSMALA. Variability Induction on Stem Cutting and Callus Culture of Handeuleum (*Graptophyllum pictum* L. Griff) Through Gamma Rays Irradiation. Supervised by NURUL KHUMAIDA and DEWI SUKMA.

Handeuleum is a medicinal plant that is being used by Indonesian people for infection prevention after getting birth, body weight reduction, hemmoroids, abscess, ulcer healing, and prevention of plaque development on teeth. In handeuleum biomass production, *Doleschallia bisaltidae* attack can reduce its biomass yield up to 70%. That’s the reason to find handeuleum varieties which have better phytochemistry and resistance to pest. Since handeuleum cannot produce seeds, it always propagated vegetatively cause handeuleum has narrow variability. One of the ways to improve handeuleum variability is through mutation induction with gamma irradiation which can be applied both in vivo and in vitro. This aim of this study is to improve variability of handeuleum through irradiation gamma rays in vivo (i.e. stem cutting of handeuleum accession Bogor) and in vitro (i.e. callus culture of handeuleum accession Kalimantan and Papua). The results indicate that gamma irradiation caused the diversity toward of cuttings handeuleum Bogor accession and callus culture handeuleum Kalimantan and Papua accession. The GR50 values of irradiation on handeuleum stem cuttings could be observed on plant height, total number of leaves, leaf length, and leaf weight. Generally irradiation treatment dose 15 Gy, 30 Gy, and 45 Gy have higher value than control (0 Gy) at growth, leaves morphology, leaves anatomy of paradermal, and pigment content (anthocyanine, chlorophyll, and carotenoid) except leaves anatomy of paradermal variable. On the contrary at treatment dose irradiation 60 Gy, 75 Gy, 90 Gy, and 105 Gy on the same variables have lower value than control. Irradiation caused change in phytochemistry content, isozyme pattern (peroxidase (PER); esterase (EST); and acid phosphatase (ACP)), and phenotypic variability. Dose irradiation 45 Gy results the most putative mutant variation. Variability on experiment callus culture of handeuleum accession Kalimantan and Papua seen at callus variance value of relative rate growth, the most value is result by dose 25 Gy.

Key Word: daun ungu, mutation induction, phytochemistry, isozyme, phenotypic variability.