PHENOTYPE AND PLOIDY LEVEL CHARACTER OF PEANUT (*Arachis hypogaea* L. `Lurik`) PRODUCT SELECTION AND COLCHICINE INDUCTION

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ABSTRACT

Food security is a popular and relevant issue for Indonesia that has a massive population growth. Unfortunately, the main focus of carbohydrate source only stands on cereal and grain. Even though, there is another food source with high nutritional value such as peanut (*Arachis hypogaea* L.). However, peanut production is still low. Therefore, polyploidization technique with colchicine induction is one of the solutions for optimalization of crop productivity improvement. This research aims to learn the effect of colchicine application on peanut (*A. hypogaea* L. `Lurik`) polyploidization as well as to observe the phenotypic character of the plant induced by colchicine. The study began on July 2017 at the Ngombol greenhouse, Purworejo, Central Java for cultivar selection. Furthermore, the seeds are soaked by colchicine with concentrations of 0%, 0.05%, 0.10%, 0.15%, and 0.20% for 3, 6, 12, and 24 hours. Planting and sampling of plant organs is done in Mutihan field, Sleman, D.I. Yogyakarta. Phenotype character that being observed consists 36 parameters (24 qualitative and 12 quantitative). In addition, chromosome analysis by squashing method was conducted at Genetics and Breeding Laboratory, Faculty of Biology UGM and the flowcytometry method was observed at Clinic Pathology Laboratory in Faculty of Medicine UGM. Data of quantitative parameters were analyzed by ANOVA Tukey statistic test and Independent Sample t-Test with $\alpha = 5\%$ using IBM SPSS 19 program. The research result shows that colchicine can induce polyploidization. Total leaf, stem length, and stem diameter are significantly different at concentration variable. Flowcytometry analysis shows that all treatments are mixoploid with the diploid ploidy as the dominant trait. Nevertheless, the ploidy composition and peak position in y axis is different. Control plant has diploid trait (2n=2x=40) while the 0.05% with 24 hours soaking treatment is triploid (2n=3x=60).

Keywords: *Arachis hypogaea* L. `Lurik`, colchicine, flowcytometry, polyploidy, squashing