

**KARAKTER FENOTIP DAN DERAJAT PLOIDI KACANG TANAH
(*Arachis hypogaea* L. 'Lurik') HASIL SELEKSI DAN INDUKSI
KOLKHISIN**

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INTISARI

Isu ketahanan pangan cukup populis dan relevan dengan Indonesia yang memiliki pertumbuhan penduduk tinggi. Meskipun demikian, fokus sumber karbohidrat hanya bertumpu pada *cereal* dan *grain*. Padahal terdapat sumber pangan lain yang memiliki daya saing dan nilai gizi yang tinggi, misalnya kacang tanah (*Arachis hypogaea* L.), tetapi produksinya masih rendah. Teknik poliploidisasi dengan induksi kolkhisin merupakan salah satu solusi optimalisasi produktivitas tanaman. Penelitian ini bertujuan untuk mempelajari pengaruh aplikasi kolkhisin terhadap poliploidisasi kacang tanah (*A. hypogaea* L. 'Lurik') sekaligus mengamati karakter fenotip tanaman hasil induksi kolkhisin. Penelitian dimulai pada Juli 2017 di *green house* Ngombol, Purworejo, Jawa Tengah dengan tahapan pertama yaitu seleksi kultivar. Selanjutnya benih hasil seleksi diberi perlakuan perendaman kolkhisin dengan konsentrasi 0% (kontrol), 0,05%, 0,1%, 0,15%, dan 0,20% selama 3, 6, 12, dan 24 jam. Penanaman dan sampling organ tanaman dilakukan di lahan Dusun Mutihan, Sleman, D.I. Yogyakarta. Karakter fenotip yang diamati terdiri atas 24 parameter kualitatif dan 12 parameter kuantitatif. Selain itu dilakukan analisis kromosom metode *squashing* di Laboratorium Genetika dan Pemuliaan Fakultas Biologi UGM serta metode *flowcytometry* dilakukan di Laboratorium Patologi Klinik Fakultas Kedokteran UGM. Analisis data kuantitatif fenotip menggunakan uji statistik ANOVA Tukey dan *Independent Sample t-Test* dengan taraf $\alpha = 5\%$ menggunakan program IBM SPSS 19. Hasil penelitian membuktikan kolkhisin mampu menginduksi poliploidisasi dengan karakter jumlah daun, diameter batang, dan tinggi batang yang berbeda secara signifikan pada variabel konsentrasi. Analisis *flowcytometry* menunjukkan semua perlakuan memiliki ploidi mixoploid dengan sifat dominan diploid namun komposisi ploidi dan tinggi *peak* berbeda. Tanaman kontrol bersifat diploid ($2n=2x=40$) sementara perlakuan kolkhisin 0,05% selama 24 jam bersifat triploid ($2n=3x=60$).

Kata kunci : *Arachis hypogaea* L. 'Lurik', *flowcytometry*, kolkhisin, poliploid, *squashing*

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