

POLIPLOIDISASI *Euglena gracilis* DENGAN INDUKSI KOLKISIN

Novia Noor Rachmawati

20/461071/BI/10622

Dosen Pembimbing : Prof. Dr. Budi Setiadi Daryono, M.Agr.Sc.
Dr. Eko Agus Suyono, M.App.Sc.

INTISARI

Euglena gracilis merupakan mikroalga yang mampu memproduksi berbagai hasil metabolit salah satunya lipid. Peningkatan biomassa dapat melalui poliploidisasi. Poliploidisasi dapat menggunakan agen mutagenik yaitu kolkisin. Tujuan dari penelitian ini untuk mengetahui kombinasi yang paling efektif pada konsentrasi dan waktu induksi untuk menginduksi poliploid pada *E. gracilis*. Selain itu, bertujuan untuk mengetahui perbandingan *survival rate*, konsentrasi DNA, dan karakter fenotipik *E. gracilis* hasil induksi kolkisin. Metode yang digunakan dengan perbedaan perlakuan konsentrasi kolkisin 0%; 0,1%; 0,5%; 1%; dan 5% dengan waktu inkubasi selama 24, 48, 72 jam. Pengamatan dilakukan dengan membandingkan *survival rate*, konsentrasi DNA, perubahan karakter fenotipik diantaranya luasan, panjang, dan lebar sel. Analisis data dilakukan melalui *one-way ANOVA (Analysis of Variance)* taraf signifikansi 5% dan analisis lanjut menggunakan uji DMRT (*Duncan Multiple Range Test*) melalui software IBM SPSS. Hasil menunjukkan konsentrasi 0,1% (24 jam); 0,5% (48 jam); dan 0,5% (72 jam) efektif dengan peningkatan *survival rate* dan konsentrasi DNA sebesar 3 kali lipat. Hal tersebut berkorelasi dengan peningkatan konsentrasi kolkisin yang menyebabkan efek toksik pada sel. Hasil karakter fenotipik luasan sel mengalami peningkatan dan berkorelasi dengan peningkatan konsentrasi DNA serta *survival rate* pada konsentrasi 0,1% (24 jam); 0,5% (48 jam); dan 0,5% (72 jam). Sementara itu, hasil *aspect ratio* menunjukkan bahwa tidak terjadi perubahan signifikan pada karakter morfologis *spherical*, *spindle*, maupun *elongated*.

Kata kunci: *E. gracilis*, kolkisin, poliploidisasi, *survival rate*, karakter fenotipik

POLYPLOIDY IN *Euglena gracilis* USING INDUCTION OF COLCHICINE

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Dr. Eko Agus Suyono, M.App.Sc.

ABSTRACT

Euglena gracilis is a microalgae capable for producing various metabolites, one of which is lipids. Increasing biomass can be done through polyploidization. Polyploidization can use mutagenic agents, such as colchicine. The purpose of this study to determine the most effective combination of concentration and induction time to induce polyploidy in *E. gracilis*. In addition, this research aims to compare the survival rate, DNA concentration, and phenotypic characters of *E. gracilis* after colchicine induction. The method was used with different treatments of colchicine concentrations from 0%, 0.1%, 0.5%, 1%, and 5% with incubation times of 24, 48, and 72 hours. Observations were made by comparing survival rate, DNA concentration, and changes in phenotypic characters, including cell area, length, and width. Data analysis was conducted through one-way ANOVA (Analysis of Variance) at a 5% significance level, and further analysis was performed using the DMRT (Duncan Multiple Range Test) test through IBM SPSS software. The results showed that concentrations of 0.1% (24 hours), 0.5% (48 hours) and 0.5% (72 hours) were effective, with threefold increases in survival rate and DNA concentration. This correlates with an increasing colchicine concentration, which has toxic effects on cells. The results of phenotypes characteristics of cell area increased and were associated with an increase in DNA concentration and survival rate at 24h, 48h and 72h concentrations. Meanwhile, the aspect ratio results showed that there were no significant changes in the morphological characteristics of spherical, spindle or elongated.

Key word: Colchicine, *E.gracilis*, polyploidization, survival rate, phenotype character