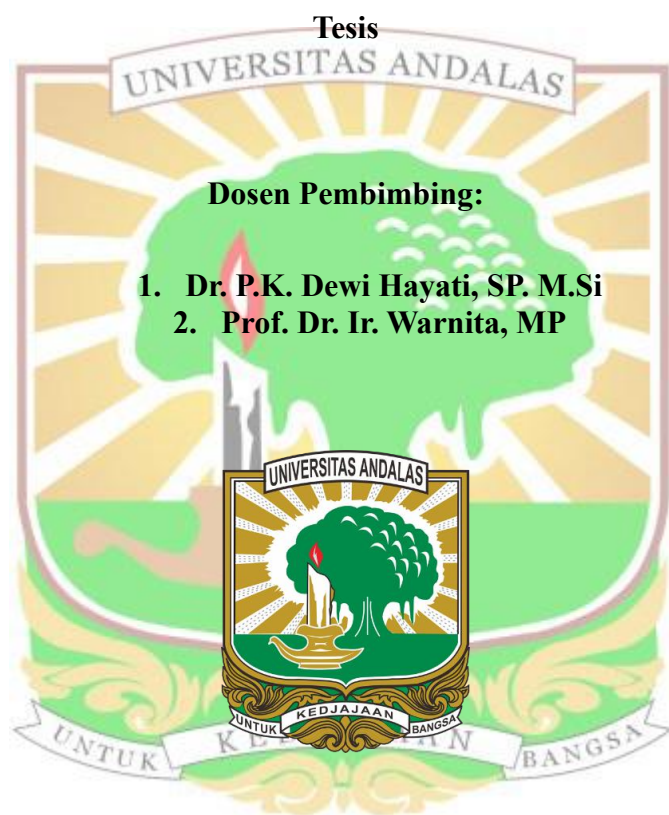


INDUKSI POLIPLOID TANAMAN SEMANGKA (*Citrullus lanatus* Thunb.) SERIF SAGA AGRIHORTI DENGAN SENYAWA KOLKISIN

**AMARILLA ASWAT
NIM. 2320241009**



**PROGRAM STUDI S2 AGRONOMI
FAKULTAS PERTANIAN
UNIVERSITAS ANDALAS
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RINGKASAN

Amarilla Aswat. Induksi Poliploid Tanaman Semangka (*Citrullus lanatus* Thunb.) Serif Saga Agrihorti dengan Senyawa Kolkisin. Dibimbing oleh Dr. P.K. Dewi Hayati dan Prof. Dr. Ir. Warnita.

Semangka tanpa biji (*seedless*) adalah jenis semangka yang sangat digemari oleh masyarakat saat ini. Benih maupun buah semangka *seedless* memiliki nilai ekonomi yang tinggi dibandingkan semangka berbiji. Balai Pengujian Standar Instrumen (BPSI) Tanaman Buah Tropika telah mengeluarkan varietas unggul semangka yaitu Serif Saga Agrihorti yang memiliki beberapa keunggulan, seperti rasa buah manis, produksi buah tinggi, warna daging buah merah cerah, bobot buah besar, namun memiliki jumlah biji yang banyak. Oleh karena itu, dilakukan perakitan varietas Serif Saga Agrihorti *seedless*. Semangka *seedless* dihasilkan melalui persilangan antara tetua betina tetraploid dan tetua jantan diploid. Tetua betina tetraploid dihasilkan melalui induksi poliploid menggunakan senyawa kimiawi seperti kolkisin.

Penelitian ini bertujuan untuk mendapatkan metode dan konsentrasi senyawa kolkisin terbaik terhadap pembentukan semangka poliploid dan mendapatkan tanaman *putative* tetraploid dari varietas Serif Saga Agrihorti. Penelitian dilakukan menggunakan metode percobaan tanpa rancangan yang dilaksanakan dari Maret hingga Juni 2024. Induksi poliploid dilakukan dengan dua metode yaitu penetasan larutan kolkisin pada tunas tanaman semangka yang dilakukan pada pagi dan sore hari selama tiga hari berturut-turut dengan diberikan dua tetes larutan setiap tanaman, dan perendaman benih dalam larutan kolkisin selama 24 jam dan 48 jam, serta konsentrasi kolkisin yang digunakan yaitu 0.2% dan 0.4%. Induksi poliploid dilakukan di Rumah Kawat dan pengamatan dilakukan di Laboratorium Kultur Jaringan Fakultas Pertanian Universitas Andalas.

Varietas yang digunakan yaitu Serif Saga Agrihorti dan setiap perlakuan digunakan 15 benih semangka yang ditanam. *Selfing* dilakukan dengan menyilangkan bunga betina dan bunga jantan pada tanaman *putative* tetraploid yang sama. Karakter yang diamati meliputi diameter batang, panjang dan lebar daun, panjang dan lebar stomata, diameter polen, viabilitas polen, umur berbunga jantan dan betina, umur panen, bobot buah, diameter buah, jumlah biji, dan ukuran panjang dan lebar biji. Data dianalisis menggunakan uji *t* tidak berpasangan (*unpaired t-test*) dengan bantuan *software* STAR (*Statistical Tools for Agricultural Research*). Uji *t* dilakukan untuk membandingkan penampilan antara tanaman *putative* tetraploid dan tanaman diploid.

Berdasarkan hasil yang diperoleh, dapat disimpulkan bahwa pemberian kolkisin dengan beberapa metode dan konsentrasi kolkisin yang berbeda memberikan pengaruh yang beragam terhadap pembentukan semangka poliploid. Metode perendaman benih semangka dalam kolkisin merupakan metode terbaik dalam induksi poliploid semangka dibandingkan dengan metode penetasan. Diperoleh 4 genotipe *putative* tetraploid yaitu K0.2-P1-2; K0.2-P1-9; K0.2-P2-2; dan K0.4-P1-4 berdasarkan pengamatan morfologi diameter polen, ukuran stomata, dan ukuran biji.

SUMMARY

Amarilla Aswat. Induction of Polyploid Watermelon Plants (*Citrullus lanatus* Thunb.) Serif Saga Agrihorti with Colchicine Compound. Supervised by Dr. P.K. Dewi Hayati and Prof. Dr. Ir. Warnita.

Seedless watermelon is currently a highly favored type of watermelon among consumers. Both seedless watermelon seeds and fruits have a higher economic value compared to seeded watermelons. The Tropical Fruit Plant Instrument Testing Center (BPSI) has released a superior watermelon variety called Serif Saga Agrihorti, which boasts several advantages, such as sweet fruit taste, high yield, bright red flesh color, and large fruit size. However, this variety has a high seed count. Consequently, efforts have been made to develop the seedless Serif Saga Agrihorti variety. Seedless watermelons are produced through crossing a tetraploid female parent with a diploid male parent. Tetraploid female parents are created through polyploid induction using chemical agents such as colchicine.

This study aims to obtain the best method and concentration of colchicine compounds for the formation of polyploid watermelon and to obtain putative tetraploid plants from the Serif Saga Agrihorti variety. The research was conducted using an experimental method without a design conducted from March to June 2024. Polyploid induction was carried out by two methods, namely dripping colchicine solution on the shoots of watermelon plants which was carried out in the morning and evening for three consecutive days with two drops of solution given to each plant and soaking the seeds in colchicine solution for 24 hours and 48 hours, and the concentration of colchicine used was 0.2% and 0.4%. Polyploid induction was carried out in the Screen House and observations were made at the Tissue Culture Laboratory of the Faculty of Agriculture, Andalas University.

The variety used was Serif Saga Agrihorti, with 15 watermelon seeds planted for each treatment. Self-pollination was performed by crossing female and male flowers within the same putative tetraploid plant. Observed traits included stem diameter, leaf length and width, stomatal length and width, pollen diameter, pollen viability, flowering time (male and female), harvesting time, fruit weight, fruit diameter, seed count, and seed size. Data were analyzed using an unpaired t test with the aid of STAR (Statistical Tools for Agricultural Research) software. The t-test was used to compare the traits of putative tetraploid plants with diploid plants.

The results showed that colchicine application using different methods and concentrations had varying effects on the formation of polyploid watermelons. The seed-soaking method was found to be more effective for polyploid induction in watermelons compared to the dripping method. Four putative tetraploid genotypes were identified: K0.2-P1-2, K0.2-P1-9, K0.2-P2-2, and K0.4-P1-4, based on morphological observations of pollen diameter, stomatal size, and seed size.