

ABSTRAK

Marsya Sabrina Nurdiantoro. 2026. Pengaruh Berbagai Konsentrasi Sukrosa dengan Penambahan Paclobutrazol terhadap Pertumbuhan Kentang (*Solanum tuberosum* L.) secara *In vitro*. Dibawah bimbingan Liberty Chaidir dan Budy Frasetya Taufik Qurrohman.

Produksi kentang (*Solanum tuberosum* L.) nasional cenderung menurun akibat penggunaan umbi turunan yang rentan akumulasi patogen antar generasi, sehingga diperlukan penyediaan bibit unggul melalui perbanyakan *in vitro*. Penelitian ini bertujuan mengetahui pengaruh berbagai konsentrasi sukrosa dengan penambahan Paclobutrazol terhadap pertumbuhan kentang secara *in vitro* serta menentukan konsentrasi yang paling efektif. Penelitian menggunakan Rancangan Acak Lengkap (RAL) dengan 6 perlakuan (kontrol 30 g L⁻¹ sukrosa, serta kombinasi sukrosa 30, 60, 90, 120, dan 150 g L⁻¹ dengan Paclobutrazol 3 mg L⁻¹) dan 5 ulangan selama 12 minggu setelah induksi (MSI), dengan data dianalisis secara deskriptif menggunakan nilai rata-rata. Berdasarkan rata-rata hasil pengamatan, Paclobutrazol cenderung menekan tinggi planlet dibandingkan kontrol. Kombinasi sukrosa 30–60 g L⁻¹ dengan Paclobutrazol (perlakuan B dan C) menunjukkan rata-rata pertumbuhan yang paling tinggi, terutama pada jumlah daun, panjang akar, dan jumlah akar. Sebaliknya, rata-rata pertumbuhan planlet menurun pada konsentrasi sukrosa di atas 60 g L⁻¹ (perlakuan D, E, dan F), ditandai keterlambatan pembentukan tunas dan akar, berkurangnya jumlah serta panjang akar, dan rendahnya persentase eksplan hidup, yang diduga akibat cekaman osmotik. Berdasarkan rata-rata tersebut, kombinasi sukrosa 30–60 g L⁻¹ dengan Paclobutrazol 3 mg L⁻¹ menunjukkan hasil terbaik untuk mendukung pertumbuhan kentang secara *in vitro*.

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Kata kunci: Kentang, kultur *in vitro*, paclobutrazol, pertumbuhan planlet, sukrosa

ABSTRACT

Marsya Sabrina Nurdiantoro. 2026. Effect of Various Sucrose Concentrations with The Addition of Paclobutrazol on The Growth of Potato (*Solanum tuberosum* L.) In Vitro. Supervised by Liberty Chaidir and Budy Frasetya Taufik Qurrohman.

National potato (*Solanum tuberosum* L.) production tends to decline due to the continued use of derivative tubers that are susceptible to the accumulation of pathogens across generations, thereby necessitating the provision of superior seed stock through in vitro propagation. This study aimed to determine the effect of various sucrose concentrations combined with the addition of Paclobutrazol on the in vitro growth of potato and to identify the most effective concentration. The study employed a Completely Randomized Design (CRD) with six treatments (a control of 30 g L⁻¹ sucrose, together with combinations of 30, 60, 90, 120, and 150 g L⁻¹ sucrose with 3 mg L⁻¹ Paclobutrazol) and five replications over 12 weeks after induction (WAI), with the data analyzed descriptively based on mean values. Based on the mean values of the observed parameters, Paclobutrazol tended to suppress plantlet height relative to the control. The combination of 30–60 g L⁻¹ sucrose with Paclobutrazol (treatments B and C) exhibited the highest mean growth, particularly in leaf number, root length, and root number. Conversely, mean plantlet growth declined at sucrose concentrations above 60 g L⁻¹ (treatments D, E, and F), as indicated by delayed shoot and root formation, reduced root number and length, and a low percentage of explant survival, which was presumably attributable to osmotic stress. Based on these mean values, the combination of 30–60 g L⁻¹ sucrose with 3 mg L⁻¹ Paclobutrazol produced the most favorable outcomes for supporting the in vitro growth of potato.

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Keywords: Potato, in vitro culture, paclobutrazol, plantlet growth, sucrose