Kultur Jaringan Lima Klon dan Empat Progeni Hasil Persilangan Terbuka Tanaman Teh (Camellia sinensis
(L.) O. Kuntze) var. assamica
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# INTISARI

Tanaman teh (*Camellia sinensis* (L.) O. Kuntze) var. *assamica* merupakan komoditas perkebunan bernilai ekonomi tinggi yang dimanfaatkan sebagai bahan baku minuman, farmasi, dan kosmetik. Penyediaan bahan tanam unggul hasil pemuliaan masih menjadi kendala karena perbanyakan konvensional berlangsung lambat, sedangkan kultur jaringan berpotensi mempercepat multiplikasi tanaman secara massal. Penelitian ini bertujuan untuk mengetahui pengaruh BAP dan $GA_3$ terhadap respon tunas pucuk, embrio asal biji, dan kotiledon berbagai genotipe teh melalui kultur *in vitro* serta menentukan kombinasi zat pengatur tumbuh (BAP dan $GA_3$) yang paling efektif dalam mendukung pertumbuhan kultur *in vitro*. Penelitian dilaksanakan di Laboratorium Kultur Jaringan Fakultas Pertanian Universitas Gadjah Mada pada bulan Juni–Maret 2026. Penelitian menggunakan lima klon teh (PGL 1, PGL 4, PGL 12, GMB 7, dan TRI 2024) serta empat progeni hasil penyerbukan terbuka (PS1, SKM, TRI 2025, dan SA 40). Eksplan yang digunakan meliputi tunas pucuk, embrio asal biji, dan kotiledon. Tahap multiplikasi tunas menggunakan rancangan acak lengkap faktorial 3 faktor dengan faktor pertama yaitu Klon (PGL 1, PGL 4, PGL 12, GMB 7, dan TRI 2024) serta progeni klon (PS1, SKM, TRI 2025, dan SA 40), faktor kedua yaitu konsentrasi BAP (1, 2, dan 3 mg/L), faktor ketiga yaitu konsentrasi $GA_3$ (0 dan 0,5 mg/L), masing-masing diulang lima kali. Variabel yang diamati meliputi tinggi tunas, panjang akar, jumlah daun, panjang internodus, jumlah tunas, dan jumlah akar. Data dianalisis menggunakan analisis ragam (ANOVA) dan analisis GLM (*Generalized Linear Model*), uji lanjut Tukey taraf 5%, dan analisis korelasi. Hasil penelitian menunjukkan bahwa keberhasilan regenerasi secara *in vitro* dipengaruhi oleh jenis eksplan, genotipe, dan kombinasi zat pengatur tumbuh. Kombinasi BAP dan $GA_3$ memberikan pengaruh nyata terhadap eksplan embrio biji, terutama tinggi tunas, jumlah daun, dan pembentukan akar. Kombinasi 2–3 mg/L BAP dengan 0,5 mg/L $GA_3$ menghasilkan respons pertumbuhan terbaik, sedangkan media tanpa $GA_3$ menghasilkan pertumbuhan yang lebih rendah. Eksplan kotiledon menunjukkan respon berupa somatik embrio pada media dengan hormon BAP tanpa $GA_3$.

**Kata kunci:** *Camellia sinensis*; Kultur Jaringan; BAP; $GA_3$.

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# ABSTRACT

Tea (*Camellia sinensis* (L.) O. Kuntze) var. *assamica* is a high-value plantation commodity used as a raw material for beverages, pharmaceuticals, and cosmetics. The availability of superior planting materials developed through plant breeding remains a challenge because conventional propagation is slow, whereas tissue culture offers the potential for rapid and large-scale plant multiplication. This study aimed to investigate the effects of BAP and $GA_3$ on the responses of shoot tip, seed-derived embryo, and cotyledon explants from different tea genotypes under *in vitro* culture conditions, as well as to determine the most effective combination of plant growth regulators (BAP and $GA_3$) for promoting *in vitro* growth. The study was conducted at the Tissue Culture Laboratory, Faculty of Agriculture, Universitas Gadjah Mada, from June 2025 to March 2026. The plant materials consisted of five tea clones (PGL 1, PGL 4, PGL 12, GMB 7, and TRI 2024) and four progenies derived from open pollination (PS1, SKM, TRI 2025, and SA 40). The explants used were shoot tips, seed-derived embryos, and cotyledons. The shoot multiplication stage employed a three-factor factorial completely randomized design. The first factor was genotype, comprising five clones (PGL 1, PGL 4, PGL 12, GMB 7, and TRI 2024) and four progenies (PS1, SKM, TRI 2025, and SA 40). The second factor was BAP concentration (1, 2, and 3 mg/L), and the third factor was $GA_3$ concentration (0 and 0.5 mg/L), with five replicates for each treatment combination. The observed variables included shoot height, root length, number of leaves, internode length, number of shoots, and number of roots. Data were analyzed using analysis of variance (ANOVA), a generalized linear model (GLM), Tukey's test at the 5% significance level, and correlation analysis. The results showed that successful *in vitro* regeneration was influenced by explant type, genotype, and plant growth regulator combinations. The combination of BAP and $GA_3$ had a significant effect on seed-derived embryo explants, particularly on shoot height, number of leaves, and root formation. The combination of 2–3 mg/L BAP and 0.5 mg/L $GA_3$ produced the best growth responses, whereas the medium without $GA_3$ resulted in lower growth. Cotyledon explants exhibited a response in the form of somatic embryos on media containing BAP without $GA_3$.

**Keywords**: *Camellia sinensis*; Tissue Culture; BAP; $GA_3$