SYSTEMATIC LITERATURE REVIEW : MEDIA KULTUR JARINGAN TANAMAN DALAM PRODUKSI KUERSETIN

SKRIPSI

GRACE IVANA CLARISSA
A 242 041

SEKOLAH TINGGI FARMASI INDONESIA
YAYASAN HAZANAH
BANDUNG
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Sebagai salah satu syarat untuk memperoleh gelar Sarjana Farmasi

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Disetujui oleh :

Pembimbing	**Pembimbing**
Himalaya Wana Kelana, M.Pd	**Dr. Syarif Hamdani, M.Si**

"Sebab Tuhan, Dia sendiri akan berjalan di depanmu, Dia sendiri akan menyertai engkau, Dia tidak akan membiarkan engkau dan tidak akan meninggalkan engkau; janganlah takut dan janganlah patah hati."

Ulangan 31: 8

SYSTEMATIC LITERATURE REVIEW : MEDIA KULTUR JARINGAN TANAMAN DALAM PRODUKSI KUERSETIN

ABSTRAK

Kuersetin adalah flavonoid dengan aktivitas antioksidan, antiinflamasi, dan antikanker, namun produksinya secara konvensional terbatas oleh faktor lingkungan. Kultur jaringan tanaman menjadi solusi untuk meningkatkan ketersediaan metabolit sekunder secara terkontrol dan berkelanjutan. Komposisi media kultur merupakan faktor kunci yang memengaruhi pertumbuhan jaringan maupun akumulasi metabolit sekunder. Kajian ini merupakan *Systematic Literature Review* berbasis PICOC menggunakan data dari ProQuest, PubMed, ScienceDirect, dan ResearchGate dari tahun 2014–2025. Data dianalisis dengan alur PRISMA untuk menentukan kombinasi media, ZPT, dan elisitor yang paling umum digunakan serta komposisi media menurut metode kultur dan jenis eksplan. Tiga puluh (30) studi yang ditelaah, media Murashige–Skoog (MS) mendominasi 90% penelitian, diikuti Gamborg B5 (6,67%) dan Schenk & Hildebrandt (3,33%). Kultur kalus menggunakan 2,4-D dan BAP menghasilkan produktivitas tertinggi 419,76 mg/g DW; kultur suspensi sel dengan NAA dan Kinetin mencapai 209,93 mg/g DW; kultur organ dengan biostimulator alami mencapai 64,9 mg/g DW; dan kultur akar rambut hasil transformasi *Agrobacterium* tanpa ZPT eksogen menghasilkan 48,24 mg/g DW. Penambahan elisitor seperti metil jasmonat (MeJA), UV-B, dan cahaya biru terbukti meningkatkan biosintesis kuersetin. Eksplan daun paling efektif untuk kultur kalus dan akar rambut, sedangkan nodus untuk kultur suspensi sel dan organ. Optimalisasi media memerlukan pendekatan spesifik berdasarkan jenis tanaman, metode kultur, dan eksplan.

Kata kunci : Kuersetin, Kultur jaringan, Media tumbuh, Eksplan, PICOC

SYSTEMATIC LITERATURE REVIEW : PLANT CULTURE IN VITRO MEDIUM FOR QUERCETIN PRODUCTION

ABSTRACT

Quercetin is a flavonoid with antioxidant, anti-inflammatory, and anticancer activities; however, its conventional production is limited by environmental factors. Plant tissue culture provides a controlled and sustainable approach to enhance the availability of secondary metabolites. The composition of the culture medium is a key factor influencing tissue growth and secondary metabolite accumulation. This study is a PICOC-based Systematic Literature Review using data from ProQuest, PubMed, ScienceDirect, and ResearchGate (2014–2025), analyzed using the PRISMA framework to determine the most common combinations of media, plant growth regulators (PGRs), and elicitors, as well as medium composition according to culture methods and explant types. Among thirty (30) reviewed studies, Murashige–Skoog (MS) medium dominated 90% of applications, followed by Gamborg (B5) (6.67%) and Schenk & Hildebrandt (SH) (3.33%). Callus cultures using 2,4-D + BAP achieved the highest productivity (419.76 mg/g DW); cell suspensions with NAA + Kinetin reached 209.93 mg/g DW; organ cultures with natural biostimulators produced 64.9 mg/g DW; and Agrobacterium-induced hairy roots without exogenous PGRs produced 48.24 mg/g DW. The addition of elicitors such as methyl jasmonate, UV-B, and blue light was found to enhance quercetin biosynthesis. Leaf explants were most effective for callus and hairy roots, while nodes supported cell and organ cultures. Optimization requires species-, culture-, and explant-specific approaches.

Keywords: *Quercetin, Tissue culture, Growth medium, Explants, PICOC*

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DAFTAR ISI

DAFTAR TABEL

DAFTAR GAMBAR

DAFTAR LAMPIRAN

Lampiran Halaman

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