IN VITRO STUDY OF *Curcuma sumatrana* Miq. GROWTH ON MODIFIED MURASHIGE AND SKOOG MEDIA AND THE ADDITION OF GLUTAMINE

UNDERGRADUATE THESIS

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ABSTRACT

Curcuma sumatrana Miq. (*Zingiberaceae*) is an endemic plant species from West Sumatera. This species has a small population size and limited distribution area in the natural habitat, so *in vitro* propagation for conservation efforts is needed. Basal media composition and supplementation of amino acid are the important keys for successful of plant propagation using *in vitro* technique. In this research, modification of macronutrient on Murashige-Skoog (MS) media and supplementation of glutamine (amino acid source) were tested. Interaction between these treatments was observed to improve the growth of shoot explants. This research was carried out experimentally using a completely randomized design in factorial, i.e., modification of MS macronutrients (full-, half-, and quarter-strengths) and supplementation of glutamine (0, 50, and 100 $mg.L^{-1}$). The results show that MS full had a significant effect on the increment of plantlet height (6.73 and 10.34% higher than MS half, and MS quarter, respectively). Supplementation of 50 $mg.L^{-1}$ glutamine into MS media tend to had significant effect on the first day of root emergence, length of the longest roots, and chlorophyll content of plantlet. MS media supplemented with 50 $mg.L^{-1}$ glutamine are tend to had significant effect on the increment of plant height, first day of root emergence, chlorophyll content (MS full), and the length of the longest root (MS half). In addition, supplementation of basal media with 50 $mg.L^{-1}$ glutamine improve shoot multiplication and growth.

Keywords: *Curcuma sumatrana*, Glutamine, Growth, MS modification, Shoots, Sumatran endemic species

ABSTRAK

Curcuma sumatrana Miq. (*Zingiberaceae*) merupakan salah satu jenis tumbuhan endemik Sumatera Barat. Spesies ini mempunyai ukuran populasi yang kecil dan wilayah sebaran yang terbatas di habitat aslinya, sehingga diperlukan perbanyakan *in vitro* untuk upaya konservasi. Komposisi media basal dan penambahan asam amino merupakan kunci penting keberhasilan perbanyakan tanaman secara *in vitro*. Pada penelitian ini dilakukan pengujian modifikasi makronutrien pada media Murashige-Skoog (MS) dan penambahan glutamin (sumber asam amino). Interaksi antara perlakuan ini diamati untuk meningkatkan pertumbuhan eksplan tunas. Penelitian ini dilakukan secara eksperimental dengan menggunakan rancangan acak lengkap faktorial yaitu modifikasi makronutrien MS (kekuatan penuh, setengah, dan seperempat) dan penambahan glutamin (0, 50, dan 100 $mg.L^{-1}$). Hasil penelitian menunjukkan bahwa MS penuh berpengaruh nyata terhadap pertambahan tinggi planlet (masing-masing lebih tinggi 6,73 dan 10,34% dibandingkan MS setengah dan MS seperempat). Penambahan 50 $mg.L^{-1}$ glutamin pada media MS cenderung memberikan pengaruh nyata terhadap hari pertama munculnya akar, panjang akar terpanjang, dan kandungan klorofil planlet. Media MS yang diberi penambahan 50 $mg.L^{-1}$ glutamin cenderung memberikan pengaruh nyata terhadap pertambahan tinggi tanaman, hari pertama munculnya akar, kandungan klorofil (MS penuh), dan panjang akar terpanjang (MS setengah). Selain itu, penambahan media basal dengan 50 $mg.L^{-1}$ glutamin meningkatkan perbanyakan dan pertumbuhan tunas.

Kata Kunci: *Curcuma sumatrana*, Glutamin, Modifikasi MS, Pertumbuhan, Spesies endemik Sumatra, Tunas