

ABSTRAK

Pendahuluan: Melanin merupakan pigmen yang memberikan warna pada kulit manusia dan merupakan fotoprotektor alami bagi tubuh saat kulit terpapar sinar UV. Namun, kelebihan melanin (hiperpigmentasi) akibat paparan sinar UV maupun pasca inflamasi dapat menyebabkan masalah estetika dan menjadi masalah psikososial pada beberapa orang. *Skin lightening agent* yang beredar di pasaran biasanya bekerja dengan cara menghambat aktivitas enzim tirosinase yakni enzim kunci pada jalur biosintesis melanin. Penelitian ini dilakukan untuk membuktikan apakah senyawa uji yakni senyawa C-4-Hidroksi -3Metoksifenilkaliks[4]Resorsinarena (CHMFKR) mempunyai aktivitas menghambat pembentukan melanin melalui penghambatan enzim tirosinase. **Metode:** Penelitian ini menggunakan *mushroom tyrosinase* sebagai enzim tirosinase, 3,4 dihidroksifenilalanin (L-DOPA) sebagai substrat, dan hidrokuinon sebagai kontrol positif. Aktivitas enzim tirosinase diukur menggunakan *microplate reader* dengan panjang gelombang 490 nm untuk mengukur produk dopakrom yang terbentuk. Aktivitas penghambatan enzim tirosinase ditentukan dengan menghitung nilai *inhibitory concentration* 50% (IC_{50}) yaitu konsentrasi senyawa yang dapat menghambat aktivitas enzim tirosinase sebesar 50%. **Hasil:** Hasil uji ANOVA menunjukkan adanya perbedaan bermakna pada kelompok kontrol negatif vs kelompok sampel uji ($p < 0,05$). Hal ini menandakan bahwa pemberian CHMFKR memberikan efek penghambatan terhadap enzim tirosinase. Nilai IC_{50} senyawa CHMFKR yang diperoleh yaitu 502,38 $\mu\text{g/mL}$ sedangkan nilai IC_{50} hidrokuinon sebesar 4163,47 $\mu\text{g/mL}$. **Kesimpulan:** Berdasarkan hasil tersebut, dapat disimpulkan bahwa senyawa CHMFKR mempunyai aktivitas penghambatan enzim tirosinase.

Kata kunci: C-4-Hidroksi-3Metoksifenilkaliks[4]Resorsinarena, enzim tirosinase, melanin, IC_{50}

ABSTRACT

Introduction: Melanin is a pigment that gives color to human skin and is a natural photoprotector for the body when exposed to UV light. However, excess melanin (hyperpigmentation) due to UV exposure and postinflammation can cause aesthetic problems and become a psychosocial problem in some people. Skin lightening agents on the market usually work by inhibiting the activity of the tyrosinase enzyme, a key enzyme in the biosynthetic pathway of melanin. This study was conducted to prove whether the test compound namely C-4-hydroxy-3-methoxyphenyl-calix[4]-resorcinarene (CHMFKR) had the activity of inhibiting the tyrosinase enzyme *in vitro*. **Methods:** This study used mushroom tyrosinase as a tyrosinase enzyme, 3,4 dihydroxyphenylalanine (L-DOPA) as a substrate, and hydroquinone as a positive control. Tyrosinase enzyme activity was measured using a microplate reader with 490 nm of wavelength to measure the dopakrom product formed. Tyrosinase enzyme inhibition activity was determined by calculating the value of inhibition concentration 50 (IC₅₀), which is the concentration of a compound that can inhibit tyrosinase enzyme activity by 50%. **Results:** The results of the ANOVA test showed there were significant differences between the control group VS CHMFKR groups ($p < 0,05$). This indicates that there is inhibitory activity of the tyrosinase enzyme by CHMFKR. The IC₅₀ value of CHMFKR compound was 502,38 µg/mL while IC₅₀ hydroquinone was 4163,47 µg/mL. **Conclusion:** Based on the result of this study, it can be concluded that the CHMFKR compound had the activity of inhibiting the tyrosinase enzyme.

Keywords: C-4-Hydroxy-3Methoxyphenylcalix[4]Resorcinarene, tyrosinase enzyme, melanin, IC₅₀