INTISARI

Paparan sinar yang tinggi setiap tahun meningkatkan risiko hiperpigmentasi pada masyarakat Indonesia. Penanganan umumnya menggunakan inhibitor tirosinase untuk mengurangi produksi melanin berlebih, namun beberapa inhibitor komersial diketahui memiliki efek samping. Di sisi lain, permintaan pasar terhadap bahan alami terus meningkat sehingga meningkatkan eksplorasi inhibitor alami. *Acriopsis liliifolia*, spesies anggrek yang mudah ditemukan di Pulau Jawa, memiliki daun yang biasanya mengandung banyak metabolit sekunder dan menarik diteliti. Penelitian ini bertujuan mengidentifikasi potensi metabolit sekunder dari daun *A. liliifolia* sebagai inhibitor tirosinase. Metode yang digunakan meliputi uji mikrokimia menggunakan beberapa reagen dengan pengamatan pada mikroskop; *profiling* metabolit sekunder menggunakan LC-HRMS; uji aktivitas penghambatan tirosinase secara *in vitro*; dan studi *docking* menggunakan MOE. Uji mikrokimia menunjukkan daun *A. liliifolia* positif mengandung flavonoid, fenolik, terpenoid, dan alkaloid. Hasil *profiling* metabolit sekunder dengan LC-HRMS sejalan dengan uji mikrokimia dengan kelimpahan paling banyak pada *superclass* yaitu *lipid and lipid-like molecules* (36,2%); *class* yaitu *fatty acid* (20,0%); dan *subclass* yaitu *amino acids, peptides, and their analogs* (7,7%). Pada uji *in vitro* diperoleh nilai IC_{50} ekstrak metanol daun *A. liliifolia* 97.052,67 ± 14.862,55 ppm lebih besar dari asam kojat 191,41 ± 33 ppm. Meskipun masih perlu peningkatan apabila dibandingkan inhibitor tirosinase komersial, daun *A. liliifolia* bisa menjadi menjadi alternatif yang lebih aman dan minim efek samping. Studi *docking* menunjukkan *prolylleucine* (*S-score*: -8.738 kcal/mol) sebagai senyawa paling potensial terhadap reseptor 2Y9X, dan *vorinostat* (*S-score*: -17,956 kcal/mol) terhadap reseptor 5M8O. Kedua *S-score* tersebut lebih rendah dibanding kontrol yaitu asam kojat. Senyawa dengan afinitas terbaik ini dapat dijadikan *lead compound* untuk penelitian lanjutan dengan validasi *in vivo*.

Kata kunci: *Acriopsis liliifolia*, daun, *docking*, inhibitor tirosinase, LC-HRMS, metabolit sekunder, mikrokimia, *in vitro*.

ABSTRACT

High exposure to sunlight every year increases the risk of hyperpigmentation in Indonesian people. Treatment generally uses tyrosinase inhibitors to reduce excess melanin production, but some commercial inhibitors are known to have side effects. On the other hand, market demand for natural ingredients continues to increase, increasing the exploration of natural inhibitors. *Acriopsis liliifolia*, an orchid species that is easily found in Java, has leaves that usually contain many secondary metabolites and are interesting to study. This study aims to identify the potential of secondary metabolites from *A. liliifolia* leaves as tyrosinase inhibitors. The methods used include microchemical tests using several reagents with microscope observations; secondary metabolite profiling using LC-HRMS; *in vitro* tyrosinase inhibition activity test; and *docking* studies using MOE. Microchemical tests showed that *A. liliifolia* leaves were positive for flavonoids, phenolics, terpenoids, and alkaloids. The results of secondary metabolite profiling with LC-HRMS are in line with microchemical tests with the highest abundance in the *superclass*, namely lipid and lipid-like molecules (36.2%); class, namely fatty acids (20.0%); and *subclass*es, namely amino acids, peptides, and their analogs (7.7%). *In vitro* tests obtained the IC_{50} value of methanol extract of *A. liliifolia* leaves 97.052,67 ± 14.862,55 ppm greater than kojic acid 191,41 ± 33 ppm. Although it still needs improvement when compared to commercial tyrosinase inhibitors, *A. liliifolia* leaves can be a safer alternative with minimal side effects. *Docking* studies showed prolylleucine (*S-score*: -8,738 kcal/mol) as the most potential compound against the 2Y9X receptor, and vorinostat (*S-score*: -17.956 kcal/mol) against the 5M8O receptor. Both *S-score*s were lower than the control, namely kojic acid. This compound with the best affinity can be used as a lead compound for further research with *in vivo* validation.

Keywords: *Acriopsis liliifolia*, leaves, *docking*, tyrosinase inhibitor, LC-HRMS, secondary metabolites, microchemistry, *in vitro*.