ABSTRACT

Evelyn Edlyna, 24020121140199. The Potential of Black Rice (*Oryza sativa* L.) Anthocyanin Compounds as Anti-hypercholesterolemia Agents Through *In Silico* Inhibition of Pancreatic Lipase Enzymes. Supervised by Sunarno and Rizki Sandhi Titisari.

Hypercholesterolemia is a lipid metabolism disorder associated with increased lipid absorption due to excessive Pancreatic Lipase (PL) enzyme activity. Black rice (*Oryza sativa* L.) is a local rice variety known to contain bioactive compounds such as anthocyanins that have the potential to inhibit PL enzyme activity and improve blood lipid profiles, but the mechanism of interaction through an *in silico* approach is still limited. This study aims to analyze and prove the potential of anthocyanin compounds from black rice in inhibiting PL enzyme activity as an anti-hypercholesterolemia agent *in silico*. The methods used include data collection through the PubChem and RCSB databases, virtual screening, and molecular docking using the PyRx program. All anthocyanin compounds were found to comply with Lipinski's rules, had good bioavailability scores, and low toxicity values. All anthocyanin compounds formed hydrogen bonds with the PL enzyme at residues Ser195 and Val322, which play a crucial role in enzyme activity and stability. The compound petunidin *3-O*-glucoside showed the best inhibition potential with the highest binding affinity value, which was -9.2 kcal/mol. These results prove that the anthocyanin compound group has the potential as a candidate for anti-hypercholesterolemia drugs through the mechanism of PL enzyme inhibition *in silico*.

Keywords : *black rice, anthocyanin, anti-hypercholesterolemia, pancreatic lipase, in silico*