

ABSTRACT

Fahreza Ivannova Trisnandya, 24020220130054, **Antibacterial, Antioxidant, and Cholesterol-Binding Activities of *Monascus purpureus* Pigments.** Under the guidance of Endang Kusdiyantini and Arina Tri Lunggani.

Monascus purperus is a species of fungi that can produce pigments and has long been used for food additives, such as natural dyes, flavors, and as a food preservative to maintain color, taste in food and has properties in the health sector. *Monascus sp.* produces pigments through the polyketide biosynthesis pathway which is divided into three types of pigments, namely red, yellow, and orange. This pathway also produces lovastatin or monacholine K as an inhibitor of cholesterol synthesis and monascidin A as an antibacterial. In addition, there are anthocyanins from the flavonoid group that have strong antioxidants, namely dimeric acid and 3-hydroxy-4-methoxy-benzoic acid. This study aims to evaluate the potential antibacterial activity, antioxidant, and cholesterol binding ability of *Monascus purpureus* grown and produced pigments on liquid modified media for 14 days. Antibacterial activity was tested through antibacterial assay on *Escherichia coli* and *Staphylococcus aureus* bacteria, antioxidant activity was assessed using DPPH (1,1-diphenyl-2-picrylhydrazyl) assay, and cholesterol binding assay was conducted to evaluate the ability of pigments to bind cholesterol in vitro. The results showed that the value of intracellular pigments was higher than extracellular pigments with the order of yellow, orange, and red pigments based on the color category from highest to lowest value. In the antioxidant test, the highest value was achieved with an IC₅₀ value of 45.33 ppm which was classified as strong and the lowest value was 258.92 ppm. In the antibacterial test, *M. purperus* pigment was superior in inhibiting *Staphylococcus aureus* bacteria with the highest inhibition of 10.8 mm which is considered strong, compared to *Escherichia coli* with the highest inhibition of 6.85 mm which is considered moderate. In addition, the cholesterol binding ability is very strong with the highest inhibition percentage obtained which is 87.52% and the lowest is 80.65.

Keywords: *Monascus purpureus* pigment, Antibacterial, Antioxidant, Anticholesterol