ANTIBACTERIAL ACTIVITY TEST OF ESSENTIAL OIL CUBEBE FRUIT (*Piper cubeba L.f.*) FOR THE BACTERIA SHIGELLA FLEXNERI BY IN VITRO AND IN SILICO

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ABSTRACT

Infectious diseases are still a major cause of morbidity and mortality, one of which is an infection of the digestive tract. Infections caused by bacteria known as bacillary dysentery. The most common cause of diarrhea is Shigella, especially *Shigella flexneri* and *Shigella dysenteriae*. Cubeb plant (*Piper cubeba L*.) empirically used to treat colitis and dysentery. This study aims to determine the content and the potential of the main compounds in the volatile oil cubeb fruit *(Piper cubeba L.f.)* against *Shigella flexneri*, also recognizing the great affinity for DNA gyrase protein in bacteria *Shigella flexneri* by in silico. This research was a laboratory experimental method by in vitro and in silico. Data analysis was performed with the classification test Inhibition Zone Diameter (DZI) according to Clinical and Laboratory Standards Institute, one way ANOVA, and Autodock test. From the analysis, Gas Chromatography-Mass Spectrometry (GC-MS) based on the five highest peaks found in cubeb fruit are *alpha cubebene, copaene, germacrene D, 1H-cycloprop[e]azulene* and *spatulanol.* The minimum inhibitory levels cubeb fruit essential oil (*Piper cubeba L.f.*) that required to inhibit the bacteria *Shigella flexneri* is 10%. The average value DZI (Inhibition Zone Diameter) obtained from each concentration of essential oils of cubeb fruit (*Piper cubeba L.f.*) that can inhibit the bacteria *Shigella flexneri* is at a concentration of 10% was 8 mm; concentration of 20% is 8,5 mm; concentration of 40% is 9.5 mm; concentration of 80% is 11 mm. *In silico* result is *1H-cycloprop[e]azulene* as dominant Compounds in cubeb fruit have the highest affinity towards protein DNA gyrase in bacteria *Shigella flexneri* with a bond energy value -7,3 kcal / mol.

Keyword : Essential oil, Cubebe, *Shigella flexneri*, Antibacterial test, Molecular docking