Formulation of Nanoparticles from Coffee Peel Extract (Coffea Arabica L.) in the Form of Self-Nano Emulsifying Drug Delivery System (SNEDDS) as Antibacterial Klebsiella Pneumonia

ADITYA SEWANGGARA AMATYAWANGSA WICAKSANA
NIM 15612202

ABSTRACT

Drugs used for bronchitis are still less efficient and effective in their treatment. Therefore, one solution is to formulate in nanoparticle preparations with original Indonesian raw materials and potentially coffee skin. Coffee skin is one of the waste products contain flavonoids which have the ability to inhibit the growth of Klebsiella pneumonia bacteria causing chronic bronchitis. This study aims to develop drug preparations for the treatment of chronic bronchitis caused by the bacterium Klebsiella pneumonia with raw coffee peel extract ingredients in the form of nanoparticles. The extraction method was used in the maceration method with 96% ethanol. Identification of the active compounds contained in the extract was carried out by phytochemical analysis and TLC. Determination of flavonoid content was used UV-Visible spectrophotometry method. Then coffee peel extract was conducted nanoparticles using the Self-Nano emulsifying Drug Delivery System (SNEDDS). The nanoparticles were analyzed for particle size, polydisperse index, zeta potential, in vitro tests by determining the antibacterial activity of Klebsiella pneumonia. Identification of active compounds in extracts showed that coffee bark extract contained flavonoids of 6.82%. Nanoparticles with SNEDDS method with oil ratio: surfactant mixture is 10:70:20 (F1) produce the smallest size. Based on the in vitro test, it is known that SNEDDS coffee skin extract preparations can inhibit the growth of Klebsiella pneumonia bacteria with relatively strong inhibitory power. It can be concluded that the coffee peel extract nanoparticles are efficacious as chronic bronchitis drugs.

Keywords: bronchitis, flavonoids, maceration, nanoparticles