
PHYTOCHEMICAL SCREENING AND ANTIBACTERIAL ACTIVITY OF *Acorus calamus* L. EXTRACTS

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Abstract. *Staphylococcus aureus* and *Escherichia coli* are among the most common species of gram-positive and gram-negative bacteria, which cause vaginitis, in infertile women. The Calamus rhizome (*Acorus calamus* L.) is an Indonesian plant that has antibacterial properties that can be used to treat vaginitis and increase fertility. The aim of this study was to determine the phytochemical and antibacterial activity of the calamus rhizoma in polar, semi-polar and non-polar solvents in the growth of *S. aureus* and *E. coli*. The antibacterial activity test was in the form of inhibitory test using the Kirby-Bauer, Minimum Inhibition Concentration (MIC) and Minimum Bactericidal Concentration (MBC) by microdilution method with multilevel dilution (concentrations 50; 25; 12.5; 6.25; 3.13; 1.56; 0.78; and 0.39%). The screening results showed that ethanol and *n*-hexane extract contained alkaloids and triterpenoids, while chloroform extract was only triterpenoid. Chloroform extract produced the largest inhibition zone diameter of *S. aureus* and *E. coli* (7.26 and 3.28 mm), followed by ethanol extract (5.90 and 3.07 mm) and *n*-hexane extract (5.33 and 2.95 mm). The concentrations of 0.39 and 0.78% were the values of MIC and MBC for all three extracts, indicating that the extract of the calamus rhizome with several solvents in this study had the same antibacterial activity.

Keywords: *Acorus calamus*, antibacterial activity, phytochemical screening

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INTRODUCTION

Staphylococcus aureus is one of the normal flora in the female reproductive tract. *Escherichia coli* can be a pathogen when it reaches tissues outside the digestive tract. Both contribute to reproductive tract infections. Under certain conditions, the normal flora can cause disease or infection, when the substrate changes or bacteria move into suitable habitat (Conway & Cohen, 2015). Pino et al. (2019) and Bhandari & Prabha (2015) report that

predominant vaginal normal flora is lactobacilli (95%), besides that there is also a small amount (5%) of wide variations of *S. aureus* and *E. coli*. If the Lactobacillus population decrease, the population of other bacteria such as *S. aureus* and *E. coli* will increase and can become pathogens in the reproductive tract.

One infection caused by *S. aureus* and *E. coli* is vaginitis. Vaginitis is the contamination of the female reproductive tract. The number of bacteria in the normal vaginal ecosystem is 10⁵ to 10⁶/gram vaginal secretions,