

Comparison of Antibacterial Activity Against Food-Borne Bacteria of *Alpinia galanga*, *Curcuma longa*, and *Zingiber cassumunar*

Waranee Prakatthagomol, Jakkapan Sirithunyalug and Siriporn Okonogi*

Faculty of Pharmacy, Chiang Mai University, Chiang Mai 50200, Thailand.

*Corresponding author. E-mail: sirioko@chiangmai.ac.th.

ABSTRACT

*The aim of this study was to compare the antibacterial action of *Alpinia galanga* Linn., *Curcuma longa* Linn. and *Zingiber cassumunar* Roxb. against food-borne bacteria and to search for the most effective fraction from these plants. The crude extracts and the essential oils of the plant rhizomes were used as test fractions. Several strains of food-borne bacteria were used as test microorganisms. The crude ethanolic extract of *A. galanga* inhibited *Corynebacterium* sp., *Staphylococcus aureus* and four strains of *Escherichia coli*. *C. longa* and *Z. cassumunar* inhibited only *Corynebacterium* sp. The essential oils of the two plants exhibited dramatically stronger antibacterial activity than their crude extracts. The antibacterial activity of only 40 µg of *A. galanga* essential oil was as effective as 15,000 µg of its crude extract in inhibiting *E. coli*. The essential oil of *Z. cassumunar* inhibited *E. coli* and *Pasteurella multocida*, whereas its crude extract did not. The essential oils of *A. galanga* and *Z. cassumunar* offered the highest potential for further investigating their minimum inhibitory and bactericidal concentrations. The antibacterial action of the oils appears to be a bactericidal effect. Of the plants studied, *A. galanga* was the most effective at inhibiting food-borne bacteria. The antibacterial activity of the essential oil of *A. galanga* was two times higher than that of *Z. cassumunar*.*

Keywords: *Alpinia galanga*, *Curcuma longa*, *Zingiber cassumunar*, Food-borne bacteria, Essential oil, Extract

INTRODUCTION

Food safety is a highly important issue for both consumers and the food industry, particularly with the rising number of cases of food-associated infections. The food manufacturing industry is continually working to control the pathogen level in food products. The most effective way to minimize food-contaminated microorganisms is to add an effective antimicrobial agent into food products. While both chemical and natural agents are used today, consumers increasingly demand natural agents as additives as they are considered healthier, less toxic, and more natural tasting.