Antimicrobial activity of lactic acid bacteria isolated from cocoa fermentation in West Sumatra, Indonesia against some pathogenic bacteria

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Abstract

In this study we achieved to antimicrobial activities of LAB from fermented cocoa beans in West Sumatra Indonesia garden against to pathogenic bacteria (E.coli NBRC 14237, Staphylococcus aureus NBRC 13276, Bacillus subtilis BTCCB, Salmonella typhi, and Listeria monocytogenes). Sixty-six isolates of lactic acid bacteria (LAB) were isolated from fermented cocoa beans in West Sumatra Indonesia. LAB isolates are divided from three varieties that were Criollo, Forsterio and Trinitario variety, and at 2 and 3 day fermentation. The influence of antimicrobial activities were obtained by using paper test diffusion method against some members of pathogenic bacteria involved (E.coli NBRC 14237, Staphylococcus aureus NBRC 13276, Bacillus subtilis BTCCB, Salmonella thypii, and Listeria monocytogenes). The results show that, Sixty six isolates LAB from samples of two and three days fermented cocoa beans the LAB can inhibits these bacteria by develop a zones around the paper test which contain these LAB. The Screening of Antimicrobial of potential isolates showed that six isolates named Gr2.3, Gr3.7, R2.4, R3.1, Hb2.11 and Hb3.3 were found more potential against to pathogenic bacteria than sixty isolates other. The diameters of inhibition zones were varied it ranged between 10 to 13 mm. Hb3 isolate was the highest against to five pathogenic bacteria that was 13.00 mm till 48 hours.

Keywords: Lactic Acid Bacteria, Fermented cocoa beans, Antimicrobial activity.

Introduction

Modern Human life at this time not got out several of food the other one is chocolates, the chocolates is called also cocoa. Cocoa is produced from fermented cocoa beans, fermentation helps in improving quality (aroma, taste and flavor) to cocoa as those which existed in marketing. It was made powder cocoa and used to make much food and beverage product, milky, bread, and the other food.

Lactic acid bacteria are a large part of microorganism living fruit fermentation, vegetable, flesh fermentation and other food. Lactic acid bacteria not only help in improving quality of food, there are also at human and animal that good for against growth pathogenic bacteria in digestion process of human and animal. This lactic acid bacteria is called also probiotic. The preservative activity of these bacteria are due to their ability to produce a variety of antimicrobial substances as a natural competitive means to overcome other microorganisms sharing the same niche, among them, ethanol, formic acid, acetone, hydrogen peroxide, diacetyl and bacteriocins (Olivera et al. 2008). The antimicrobial spectrum against competing natural flora was frequently includes spoilage bacteria and food-borne pathogens such as L. monocytogenes and S. aureus (Lucke, 2000.) and (Bromberg, 2004).

The aim of this research was to study the effect of the cell free culture LAB as an antimicrobial feature to inhibit growth of some pathogenic bacteria. Innovative approaches have been tried as alternative to antibiotics in treating gastrointestinal diseases and these include using bio-therapeutic agents such as live bacterial forms or their products (Ray and Bunya, 2007). In food preservation and safety, the indigenous micro flora has advantages in suppressing undesirable microorganisms (Vescovo