ABSTRACT

NURLIANA. The Prospect of Aceh Traditional Foods as a Healthy Food: The Exploration of Antimicrobial Compounds from Pliek u oil and Pliek u. Under direction of MIRNAWATI SUDAWANTO, LISDAR MANAF IDWAN SUDIRMAN and AGATHA WINNY SANJAYA

Pliek u oil has been used as cooking oil and medicine for skin diseases, wound, fever, headache and abdominal pain. Pliek u has been consumed as spices and ingredient of hot sauce (sambal), and also used for poultry feed. This research was undertaken to detect the antimicrobial activity of Aceh traditional fermented coconut (pliek u oil and extracts of pliek u). The research was supposed to support the function of this food, especially pliek u, as a new source of antimicrobial compounds and a healthy food. Antimicrobial activity of pliek u oil and extracts of pliek u were evaluated against Bacillus subtilis, Staphylococcus aureus, Escherichia coli, Salmonella Enteritidis, Bacillus cereus, Pseudomonas aeruginosa, Pseudomonas fluorescens and Candida albicans. Among antimicrobial extracts tested, crude ethanol extract (EEP) obtained from pliek u extracted by ethanol was the most active against all microbial strains. The ethanol extract (EERP) obtained from pliek u previously extracted by hexane was only active against bacterial strains and crude hexane extract (EHP) was only active against C. albicans. EEP showed antimicrobial activity at a minimal inhibitory concentration (MIC) and a minimal microbicidal concentration (MMC) at 2.5-10 mg/ml and 10-80 mg/ml, respectively. The LC_{50} value of EEP concentration was 3.36 mg/ml by Artemia salina L bioassay. The antimicrobial activity of EEP was stable at 100°C, 121°C for 15-60 minutes, 28°C (room temperature) and 10°C (refrigerator temperature) for 1-6 months and at pH of 3-11. EEP at 3.36 mg/ml (LC_{50}) reduced significantly the number of S. aureus and E. coli in 2-12 hours compared to the control. The effect of EEP was detected on the number of microbe of faeces, liver and kidney structure of mice. Single dose of EEP each 370 and 733 mg/kg body weight were administered orally to the mice. On the fourth day, their body, liver and kidney weight were measured. Liver and kidney organ were made into preparate into HE staining. The result showed that there was no effect of crude EEP treatments on the number of microbe of faeces and no change on the weight of liver and kidney per body weight. Histopathological observation on the mice liver and kidney revealed minor and middle damage at single dose of EEP treatments. The damage of liver and kidney were not significantly differ (P>0.05) compared to control. EEP and EERP separated into four and three bioautographic with different Rfs 0.93, 0.71, 0.19 and 0.10 and 0.77, 0.63 and 0.4 respectively, which were all shown to be active against S. aureus. Identification of components of EEP and EERP were detected by GC-MS represented 22 (99.89%) and 9 components (99.80%), respectively. The main constituents of EEP were carboxylic acid (43.64%), esters (30.99%), aliphatic hydrocarbon (22.45%) and alcohol (2.81%), while the main constituents of EERP were alcohol (45.13%), esters (14.89%), carboxylic acid (4.25%) and other components (35.53%). The research concluded that EEP showed strong antimicrobial activity, stable and not toxic extract at concentration 370-733 mg/kg body weight of mice.

Keywords: Aceh traditional food, coconut, pliek u, antimicrobial activity, active compounds