

## **Evaluation of phenolic constituent, antioxidant and antibacterial activities of sugarcane molasses towards foodborne pathogens**

### **ABSTRACT**

The employment of chemical synthetic as an antimicrobial agent in inhibiting microbial growth has become a major concern due to adverse health impact, food safety crisis and the pressure on food manufacturers. Essential bioactive compound in sugarcane molasses, a by-product from a sugar refinery process could be effective as an alternative antimicrobial substance. However, their antimicrobial properties are not understandable. This study aimed 1) to detect the total phenolic compounds present in sugarcane molasses extract and 2) to determine the antioxidants and antibacterial activities of sugarcane molasses extract towards foodborne pathogens. The phenolic compounds of sugarcane molasses extract were determined by UHPLC-MSMS. Antioxidant activities were estimated by a total phenolic compound assay and a 1,1-diphenyl-2-picrylhydrazyl (DPPH) assay. Meanwhile, antibacterial activities were carried out via disc diffusion, minimum inhibition concentrations (MICs) and minimum bactericidal concentrations (MBCs) assays. In this study, several extracted compounds were identified in sugarcane molasses extract and included gallic acid, phenylvaleric acids, quinic acid, tannic acid and 6-C-glucosyl-8-C-arabinosyl apigenin or arabinoysl-glucosylapigenin. The sugarcane molasses extract showed high total phenolic compounds with values of 7.6 mg GAE/g extract. Meanwhile, antioxidant activities of sugarcane molasses extract were also found high and the 50% inhibitory concentration (IC<sub>50</sub> value) was about 0.79 mg QE/g. The inhibition zone against four foodborne pathogens, *Staphylococcus aureus*, *Listeria monocytogenes*, *Escherichia coli* and *Salmonella enterica* serovar Typhimurium ranged from 8.82±0.3 mm to 25.05±1.6 mm. Meanwhile, the MICs of sugarcane molasses extract ranged from 3.125% to 6.25% v/v and MBCs were 6.25% to >12.5% v/v. In conclusion, sugarcane molasses extract is rich in phenolic compounds and has the potential to be applied as the natural antioxidant and antibacterial compounds.

**Keyword:** Sugarcane molasses; Antioxidant; Antibacterial; Phenolic compound; Foodborne pathogens