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## Development of *Aloe barbadensis* incorporated ice cream and evaluation of antioxidant and anti-inflammatory properties

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*Aloe barbadensis* (Aloe Vera) is a perennial succulent plant and has been used for traditional medical purposes for thousands of years, because of its therapeutic properties. This research was carried out to determine antioxidant and anti-inflammatory activity and to formulate an Aloe gel incorporated ice cream. Methanolic extracts of Aloe Vera gel were used for the evaluation of antioxidant and anti-inflammatory properties. Physical and sensory properties of ice cream were also evaluated. Sensory properties were evaluated by preference test using 30 semi-trained panelists. Four types of ice cream were developed by adding 59.29 mg/mL of Aloe Vera gel in three different types as Aloe gel juice (prepared by grinding gel), cubes (prepared by cutting gel in to 2 cm x 2 cm x 2 cm cubes) and powder (prepared by freeze drying) including control without Aloe Vera gel. Total phenolic content, total flavonoid content, total antioxidant capacity, DPPH radical scavenging activity and singlet oxygen scavenging activity was evaluated under antioxidant activity and protein denaturation, proteinase inhibitory activity and lipoxygenase inhibitory activity under anti-inflammatory activity of the extracts of both fresh Aloe Vera and Aloe gel incorporated ice cream. Data were analyzed by using SPSS 16.0 software. Results revealed that the highest antioxidant activity and anti-inflammatory activity was obtained by Aloe Vera gel powder incorporated ice cream (AGPIIC). The total phenolic content and total flavonoid content of AGPIIC was  $69.67 \pm 2.02$   $\mu\text{mol GAE/g}$  of DW and  $0.24 \pm 0.01$   $\mu\text{mol RE/g}$  of DW respectively. Total antioxidant capacity of AGPIIC was  $1.27 \pm 0.08$  mmol AAE /g of DW whereas the singlet oxygen scavenging activity of AGPIIC was  $9.08 \pm 0.47$   $\mu\text{mol GAE/g}$  of DW. For the protein denaturation, trypsin inhibition and lipoxygenase inhibition of AGPIIC was obtained as  $3.56 \pm 0.39$  %/DW,  $2.47 \pm 0.20$  %/DW, and  $1.61 \pm 0.08$  %/DW respectively. But Aloe Vera gel cubes incorporated ice cream was selected as the most consumer acceptable ice cream in sensory analysis. Physical properties of ice cream were not significantly different to the control. In conclusion, Aloe Vera has shown significant antioxidant potential towards scavenging free radicals and some reactive oxygen species and also has shown anti-inflammatory activities towards protein denaturation and inhibition of lipoxygenase and trypsin. Therefore, it can be used as a natural source of functional ingredient for functional food formulations to combat chronic diseases such as irritable bowel syndrome and ulcerative colitis in the form of gel powder.

**Keywords:** Aloe Vera, antioxidant activity, anti-inflammatory activity, free radicals, phenolic, singlet oxygen