

The Influence of the Variety and Harvesting Date on Haskap Composition and Anti-Diabetic Properties

Authors : Aruma Baduge Kithma Hansanee De Silva

Abstract : Haskap (*Lonicera caerulea* L.), also known as blue honeysuckle, is a recently commercialized berry crop in Canada. Haskap berries are rich in polyphenols, including anthocyanins, which are known for potential health-promoting effects. Cyanidin-3-O-glucoside (C3G) is the most prominent anthocyanin of haskap berries. Recent literature reveals the efficacy of C3G in reducing the risk of type 2 diabetes (T2D), which has become an increasingly common health issue around the world. The T2D is characterized as a metabolic disorder of hyperglycemia and insulin resistance. It has been demonstrated that C3G has anti-diabetic effects in various ways, including improvement in insulin sensitivity, and inhibition of activities of carbohydrate-hydrolyzing enzymes, including alpha-amylase and alpha-glucosidase. The goal of this study was to investigate the influence of variety and harvesting date on haskap composition, biological properties, and antidiabetic properties. The polyphenolic compounds present in four commercially grown haskap cultivars, Aurora, Rebecca, Larissa and Evie among five harvesting stages (H1-H5), were extracted separately in 80% ethanol and analyzed to characterize their phenolic profiles. The haskap berries contain different types of polyphenols including flavonoids and phenolic acids. Anthocyanin is the major type of flavonoid. C3G is the most prominent type of anthocyanin, which accounts for 79% of total anthocyanin in all extracts. The variety Larissa at H5 contained the highest average C3G content, and its ethanol extract had the highest (1212.3±63.9 mg/100g FW) while, Evie at H1 contained the lowest C3G content (96.9±40.4 mg/100g FW). The average C3G content of Larissa from H1 - H5 varies from 208 - 1212 mg/100g FW. Quercetin-3-Rutinoside (Q3Rut) is the major type of flavonol and highest is observed in Rebecca at H4 (47.81 mg/100g FW). The haskap berries also contained phenolic acids, but approximately 95% of the phenolic acids consisted of chlorogenic acid. The cultivar Larissa has a higher level of anthocyanin than the other four cultivars. The highest total phenolic content is observed in Evie at H5 (2.97±1.03 mg/g DW) while the lowest in Rebecca at H1 (1.47±0.96 mg/g DW). The antioxidant capacity of Evie at H5 was higher (14.40±2.21 µmol TE/ g DW) among other cultivars and the lowest observed in Aurora at H3 (5.69±0.34 µmol TE/ g DW). Furthermore, Larissa H5 shows the greatest inhibition of carbohydrate-hydrolyzing enzymes including alpha-glucosidase and alpha-amylase. In conclusion Larissa, at H5 demonstrated highest polyphenol composition and antidiabetic properties.

Keywords : anthocyanin, cyanidin-3-O-glucoside, haskap, type 2 diabetes

Conference Title : ICFSN 2018 : International Conference on Food Security and Nutrition

Conference Location : Vancouver, Canada

Conference Dates : September 17-18, 2018