

10th World Congress on

NUTRITION & FOOD SCIENCES

May 29-31, 2017 Osaka, Japan

Enhancement of anti-hyperglycemic activity of Jeju onion (*Allium cepa* L.) extract by heat-treatment process, and purification of bioactive compoundsYu-Ri Kang¹, Jong-Wook Lee², Sung-Cheul Kim² and Young-In Kwon¹¹Hannam University, South Korea²Kunpoong Bio, South Korea

Onion (*Allium cepa* L.) is one of the most widely used vegetable as food or medicinal plant due to its health benefits. It has been reported that onion and its extracts have antibacterial, antidiabetic and antioxidant activity. In our previous study, we confirmed that inhibitory activities of some onion cultivars against rat intestinal α -glucosidase and porcine pancreatic α -amylase were increased by heat-treatment process (121°C, 30 min). In this study, heat-treated sample was purified by cation-exchange and gel-permeation chromatography. Its structural characteristics were investigated by nuclear magnetic resonance (NMR) spectroscopy (1H, 13C, H-H COSY, HSQC, TOCSY, and NOESY). Furthermore, we investigated anti-hyperglycemic activity of heat-treated Jeju onion (*Allium cepa* L.), which is one of the yellow onion species grown in Jeju (Korea), in normal Sprague-Dawley (SD) rat model. Heat-treated sample was purified by column chromatography using cation exchange resin to obtain a purified product of a powdered form. To confirm the structure and purity of the sample, purified sample was subjected to NMR analysis, LC-MS/MS, and HPLC system. The structure was elucidated on the basis of extensive spectroscopic analysis, including 1D, 2D NMR and ESI-MS. Non-heated onion had no significant change in postprandial blood glucose levels compared to control group in normal Sprague-Dawley (SD) rat model. Meanwhile, heat-treated onion significantly decreased the postprandial blood glucose levels 8.7% at 30 min ($p < 0.01$) when compared to control group. These results suggest that development of heat-treatment process with onion may provide useful dietary strategy for managing postprandial hyperglycemia.

Biography

Yu-Ri Kang is a Doctoral Student at Hannam University, Daejeon, Korea and her research productivity as a graduate student is outstanding. She had very balanced experiences on both study (Hannam University, Korea; Exchange program from Framingham State University, Framingham, USA, 2013 and 2015) and research field (number of manuscript and poster presentation). Her major study field is bioactive polyphenols from natural plant foods inhabited in Jeju and US area and emerging issues in modern Food Science studies, especially in US.

kang0606@hotmail.com

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