

3<sup>rd</sup> International Conference and Exhibition on  
**Advances in Chromatography & HPLC Techniques**  
July 13-14, 2017 Berlin, Germany

**Ultra-performance liquid chromatography-mass spectrometry, a tool to estimate the treatment effect of the water extract of *Polygonum cuspidatum* (Hu Zhang) in diet-induced hypercholesterolemic rats**

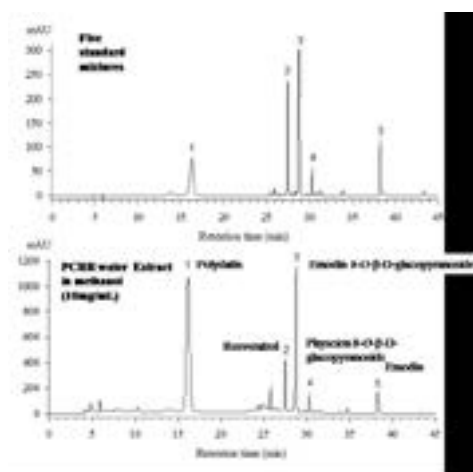
Shun-Wan Chan<sup>1,2,3</sup>, Huan Zhang<sup>1,2</sup>, Tung-Ting Sham<sup>1</sup>, Yam-Fung Ng<sup>1</sup>, Tsun-Ka Kwok<sup>3</sup>, Chi-Lui Rose Wong<sup>3</sup>, Hei-Man Tang<sup>3</sup>, Chi-On Chan<sup>1,2</sup> and Daniel Kam-Wah Mok<sup>1,2</sup>

<sup>1</sup>The Hong Kong Polytechnic University, Hong Kong

<sup>2</sup>State Key Laboratory of Chinese Medicine and Molecular Pharmacology, China

<sup>3</sup>Technological and Higher Education Institute of Hong Kong, Hong Kong

The dried roots of *Polygonum cuspidatum* Sieb. et Zucc. (HZ, Hu Zhang in Chinese) have been used for the treatment of hepatitis, scald and hyperlipidemia in oriental counties. However, the effects of water extract of HZ on lipid-lowering activity still remains in a black box due to lack of appropriate methods. The present investigations described the major components of HZ water extract using high-performance liquid chromatography with diode-array detection (HPLC-DAD) and ultra-performance liquid chromatography with orbitrap mass spectrometry (UPLC-Orbitrap-MS). Additionally, the effects of HZ water extract on serum in rats fed with high fat diet (HFD) was analyzed using metabolomics approach by ultra-performance liquid chromatography quadrupole time of flight-mass spectrometry (UPLC-QTOF-MS). The major components of HZ water extract have been identified as polydatin, emodin, resveratrol, emodin 8-O- $\beta$ -D-glucopyranoside, physcion O- $\beta$ -D-glucopyranoside and piceatannol (Fig. 1). Data from serum analysis showed that the supplementation of HZ extract significantly lowered the levels of total cholesterol. Multivariate statistics revealed that treatment of HZ significantly elevated serum levels of chenodeoxycholate, deoxycholate, their glycine-conjugated bile acids and glycocholate level when compared with HFD model, indicating that the underlying cholesterol-lowering mechanism of HZ might be associated with bile acid biosynthesis. In order to verify the mechanism, bile acid biosynthesis related proteins, including cytochrome P450 7A1 (CYP7A1) and mitogen-activated protein kinase (MAPK) [P38, extracellular regulated protein kinase (ERK) and c-Jun N-terminal kinase (JNK)] pathway were investigated using Western blot assay. The expressions of these proteins were found to be up-regulated by HZ treatment, supporting that the cholesterol-lowering effect of HZ is associated with bile acid metabolisms.



**Figure 1:** HPLC chromatograms of main identified compounds of PCR water extract.

## Biography

Shun-Wan Chan is an Associate Professor in the Department of Food and Health Sciences, Faculty of Science and Technology, Technological and Higher Education Institute of Hong Kong. His research is focused on studying the molecular mechanisms of functional foods on preventing chronic diseases, such as cardiovascular diseases and diabetes mellitus. His research interests in food science also include food safety, food microbiology and toxicology.

swchan@vtc.edu.hk