

Characterization of Pancreatic Lipase Inhibitors from Leaves of Beach Morning Glory (*Ipomoea pes-caprae*)

By Mr. Song Zhixuan

Biotransformation of Coffee Flavor with Lactic Acid Fermentation by *Lactobacillus rhamnosus*

By Ms. Wang Chenhui

Abstract

Obesity is a worldwide health concern, and many diseases are correlated with the obese body condition. Pancreatic lipase (PL) plays an important role in fat metabolism, and inhibitors of PL have been proved effective for obesity treatment. In this study, over 300 plant samples from Singapore botanic garden were screened for PL inhibitory activity using a high-throughput screening method. *Ipomoea pes-caprae*, commonly named beach morning glory, showed highest PL inhibition among the samples. Dichloromethane extract of *I. pes-caprae* leaves was fractionated and isolated under bioassay-guided method, revealing several resin glycosides as potent LP inhibitors. Pescaprein I-IV, Stoloniferin II-III, Aquaterin III, and Simonin V were identified in *I. pes-caprae*, and Pescaprein III demonstrated a dose dependent inhibitory activity against LP ($IC_{50} = 11.0 \pm 0.7 \mu M$). Orlistat Equivalence (OE) was introduced to cancel run-to-run difference of IC_{50} results, and kinetic studies elucidated that Pescaprein III had a competitive inhibition mechanism against PL, with $V_{max} = 14.6 \mu M/min$ and $K_m = 47 \mu M$, respectively.

The present study has shown that resin glycosides are a group of potent PL inhibitors. In addition to *Ipomoea pes-caprae*, resin glycosides in *Ipomoea batatas* (sweet potato) will also be studied, in the hope to develop functional food with anti-obesity effect.

About the Speaker

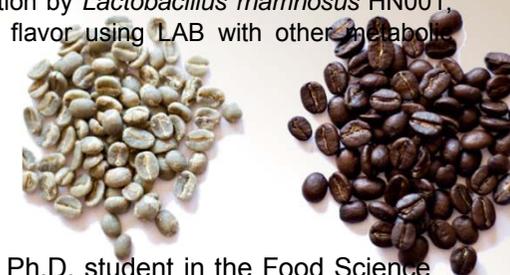


Mr. SONG Zhixuan is a PhD candidate under professor Huang Dejian Group since in Aug 2016. He obtained his Bachelor of Science degree in Chemistry and Biology from Tsinghua University, Beijing, China, 2016.

His research focus are on exploring bioactive natural products and developing functional food.

Abstract

Biotransformation of coffee flavor through controlled microbial fermentation has attracted much research interests, yet the species of fermenting microorganisms demonstrated to be suitable for such application are limited. The current study is aimed to explore the feasibility and effects of lactic acid bacteria (LAB) fermentation of coffee green bean for coffee flavor biotransformation. The obtained results showed that the fermentation by *Lactobacillus rhamnosus* HN001, particularly the one with glucose supplementation, effectively transformed flavor-related constituents in green coffee beans. The modification of green bean constituents translated into modulation of coffee volatiles upon roasting. The levels of furfurals and pyrazines in supplemented-fermented coffee were significantly elevated and reduced, respectively, resulting in roasted coffee with stronger caramelic and burnt characteristics but weaker nutty note. Lactic acid fermentation of green coffee beans is a new strategy for coffee flavor modulation, creating novel aroma characteristics. Future work will includes exploring the effect of fermentation pH in flavor modulation by *Lactobacillus rhamnosus* HN001, and investigating biotransformation of coffee flavor using LAB with other metabolic activities, such as proteolysis.



About the Speaker



Ms. Chenhui WANG is a Ph.D. student in the Food Science and Technology programme at National University of Singapore, under the supervision of Assoc. Prof LIU Shao Quan. Her research is focused on the modification of coffee flavor through biotransformation.

Host: Dr. Liu Shao Quan **Date:** 29th Oct, 2018
Time: 12 to 1 pm **Venue:** Seminar Room S16-04-30

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