

**Poster Presentation**

## Hydrolysate and Ethanolic Extract of Tubtim-Chumphae Rice Bran Improve Insulin Resistance in High Fat-High Fructose Diet Fed Rats

Jiraprapa Ponglong<sup>1,2</sup>, Laddawan Senggunprai<sup>1</sup>, Panot Tungsutjarit<sup>1,2</sup>, Ronnachai Changsri<sup>3</sup>, Tunvaraporn Proongkhong<sup>3</sup>, Supawan Thawornchinsombut<sup>4</sup>, Patchareewan Pannangpetch<sup>1,2\*</sup>

<sup>1</sup>Department of Pharmacology, Faculty of Medicine, Khon Kaen University, Khon Kaen

<sup>2</sup>Cardiovascular Research Group, Khon Kaen University, Khon Kaen

<sup>3</sup>Chumphae Rice Research Centre, Khon Kaen

<sup>4</sup>Department of Food Technology, Faculty of Technology, Khon Kaen University, Khon Kaen

\*E-mail: patc\_pan@kku.ac.th (Corresponding author)

**Background and objective:** The consumption of high fat and high fructose diet (HFFD) can lead to insulin resistance and type 2 DM. We have found that hydrolysate of Jasmin rice bran could decrease insulin resistance in high fat diet-induced insulin resistant rats. Tubtim-chumphae rice is a hybrid Thai rice cultivar RD69 (กข 69 พันธุ์ที่มีขุมแพ) with red colored pericarp. We aimed to investigate the effect of Tubtim-chumphae rice bran on insulin resistance in HFFD fed rats.

**Methods:** Hydrolysate of rice bran (HRB) was prepared using hydrothermolysis followed by enzymatic digestion. Ethanolic extract of rice bran (ERB) was prepared using 50% ethanol-water. Male Sprague-Dawley rats were fed HFFD (40% lard, 20% fructose) for 10 weeks, followed by concomitant administrations of distilled water or HRB 250 mg/kg/day or ERB 250 and 500 mg/kg/day or pioglitazone 10 mg/kg BW/day for further 4 weeks. Rats fed normal chow and distilled water was served as normal control. At the end of all treatments, fasting blood glucose (FBG), oral glucose tolerance test (OGTT), lipid profile and serum insulin were measured. Homeostatic model assessment of insulin resistance (HOMA-IR) was also evaluated.

**Results:** At week 14, control HFFD rats had significantly ( $P<0.05$ ) high FBG, triglyceride, insulin secretion and HOMA-IR score together with impaired OGTT as compared to normal control rats. These parameters indicate the insulin resistance in HFFD rats. The administrations of HRB 250 mg/kg or ERB 250 and 500 mg/kg or pioglitazone 10 mg/kg significantly decreased FBG, triglyceride, insulin secretion and HOMA-IR score with improved OGTT as compared to HFFD control rats.

**Conclusion:** The results suggest that HRB and ERB improve insulin resistance in HFFD rats.

**Key words;** insulin resistance, rice bran, type 2 DM