

P187

Antihyperglycemic Effect of Stem-Bark Powder from Paper Mulberry
(*Broussonetia kazinoki* Sieb.) on Type 2 Diabetic Otsuka
Long-Evans Tokushima Fatty (OLETF) Rats

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The effect of paper mulberry (*Broussonetia kazinoki* Sieb.) stem-bark (PM stem bark) on the concentrations of glucose, lipids, and those enzyme activities as liver injury-markers in the serum of genetically diabetic Otsuka Long-Evans Tokushima fatty (OLETF) rats was investigated. Both non-diabetic Long-Evans Tokushima Otsuka (LETO) rat and diabetic OLETF rat (30 week-old) were fed with a semisynthetic diet that with or without 50 g/kg PMSB powder for 8 weeks and were compared. The OLETF control group showed a high amount of daily water intake in comparison to that in LETO. The concentrations of glucose, fructosamine, total lipid, triglyceride, total cholesterol, and HDL-cholesterol, and the activities of aspartate aminotransferase (AST) and alanine aminotransferase (ALT) in the serum were higher in the OLETF control rats than that in the LETO control rats. However, PM stem barkingestion decreased those serum levels of glucose, fructosamine, triglyceride, total cholesterol, and the activity of ALT within the OLETF rats, but not in the LETO rats. The concentration of serum insulin was also significantly increased by the PM stem bark provision in the OLETF rat group compared to the OLETF control group. The result suggested that PM stem bark might have a hypoglycemic effect in the OLETF rats, and the increased blood insulin level would be an important regulation factor for improving hyperglycemia in the current animal model.

Key Words: Paper mulberry, *Broussonetia kazinoki* Sieb, antihyperglycemia type 2, diabetes, Otsuka Long-Evans Tokushima fatty (OLETF) rats

P188

Protective Effect of Administrated Glutathione-enriched *Saccharomyces cerevisiae* FF-8 against Carbon Tetrachloride (CCl₄)-Induced Hepatotoxicity and Oxidative Stress in Rats

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The present work is aimed to evaluate the protective effect of glutathione-enriched *Saccharomyces cerevisiae* FF-8 on carbon tetrachloride-induced hepatotoxicity and oxidative stress in rats. The activities of liver markers (alanine aminotransferase, aspartate aminotransferase, alkaline phosphatase, lactate dehydrogenase), lipid peroxidative index (thiobarbituric acid-reactive substances), and the antioxidant status (reduced glutathione) were used to monitor those protective roles of *S. cerevisiae* FF-8. The liver marker enzymes in plasma and the lipid peroxidation index in the liver were increased when carbon tetrachloride was treated but these were significantly decreased by *S. cerevisiae* FF-8 treatment. The hepatic concentration of glutathione in the current glutathione-enriched *S. cerevisiae* FF-8 strain fed animal was approximately twice as high as the normal, but this was slightly increased in response to carbon tetrachloride+glutathione-enriched *S. cerevisiae* FF-8 strain. The increased liver triglyceride concentration due to the carbon tetrachloride treatment was significantly decreased by glutathione-enriched *S. cerevisiae* FF-8 and the reduced level reached to that of normal group. Administration of *S. cerevisiae* FF-8 in normal rat did not show any signs of harmful effects. Therefore, the current findings suggests that *S. cerevisiae* FF-8 could be an effective antioxidant with no or negligible side-effects and it might be useful for the purpose of protection treatment of hepatotoxicity and oxidative stress in carbon tetrachloride-treatment in rat.

Key words: *S. cerevisiae* FF-8, glutathione, carbon tetrachloride(CCl₄), hepatotoxicity, rat