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Effect of Zinc-enriched Yeast FF-10 Strain on the Alcoholic Hepatotoxicity in Alcohol Feeding Rats

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The possible protective effect of yeast FF-10 strain isolated from tropical fruit rambutan on acute alcoholic liver injury in rats was evaluated. Highly zinc-containing strain, yeast FF-10 strain isolated from tropical fruit rambutan, and zinc concentration in this strain was 30.6 mg%. The activities of liver marker enzymes, alanine aminotransferase (ALT), aspartate aminotransferase (AST) and γ-glutamyl transpeptidase (γ-GTP), and the concentrations of blood alcohol, acetaldehyde, and lipids were used to monitor those protective roles of FF-10 strain. The activities of serum ALT, AST and γ-GTP were highly increased when alcohol was treated, relative to the normal rats. Also, a highly significant increase in the blood alcohol and acetaldehyde levels by alcohol treatment was observed. Administration of FF-10 strain markedly prevented alcohol-induced elevation of the activities of serum ALT, AST and γ-GTP, and the levels of blood alcohol and acetaldehyde, and these reduced levels reached to that of normal rats. As compared with alcohol treated control rats, the FF-10 strain supplementation showed highly decreased the triglyceride concentration in serum. Alcohol treatmentinduced the marked accumulation of small lipid droplets, hepatocytes necrosis and inflammation, but FF-10 strain administration attenuated to alcohol-induced accumulation of small lipid droplets and hepatocyte necrosis in the liver. In addition, testosterone concentration in serum was decreased in alcohol treatment, but this reduction was significantly increased by yeast FF-10 strain supplementation in alcohol feeing rats. Therefore, the current finding suggests that zinc-enriched yeast FF-10 strain isolated from tropical fruit rambutan may have protective effect against alcohol-induced hepatotoxicity.

Key words: FF-10 strain, Zinc, alcohol, hepatotoxicity, rat

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Catalase from the White-spotted Flower Chafer, *Protaetia brevitarsis*: cDNA Sequence, Expression, and Functional Characterization

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Catalase, which is one of the key enzymes of the cellular antioxidant defense system, prevents free hydroxyl radical formation by breaking down hydrogen peroxide into oxygen and water. Here, we show the cloning and characterization of a catalase gene in a coleopteran insect. This gene was isolated by searching the white-spotted flower chafer *Protaetia brevitarsis* cDNA library, and the gene itself encodes a protein of 505 amino acids in length, named *PbCat*. *PbCat* shows high similarities to the insect catalase genes known to date. The recombinant PbCat, which is expressed as a 56-kDa polypeptide in baculovirus-infected insect Sf9 cells, shows the highest activity at 30 °C and pH 7.0. Northern and Western blot analyses revealed the presence of PbCat in all tissues examined, showing its ubiquitous expression. *P. brevitarsis* larvae in which H_2O_2 was overloaded, showed a marked up-regulation in PbCat expression. Moreover, *P. brevitarsis* larvae showed an apparentincrease in PbCat expression even after a wounding through injection. These results indicate that PbCat is up-regulated after wounding and oxidative pressure induced by H_2O_2, reflecting an important role of PbCat in H_2O_2 scavenging.

Key words: Antioxidant enzyme, catalase, hydrogen peroxide, oxidative stress, *Protaetia brevitarsis,* reactive oxygen species (ROS), White-spotted flower chafer