

## Tea Seed Oil Alleviates Metabolic Derangement and Oxidative Stress in Rats Fed with High Fat and High Fructose Diet

Warinna Pinthong<sup>1</sup> and Thamolwan Suanarunsawat<sup>2\*</sup>

<sup>1</sup>Physiology Unit, Department of Medical Sciences, Faculty of Science, Rangsit University, Pathumtani 12000, Thailand

<sup>2</sup>Research Facilitation Division, Faculty of Medicine Vjira Hospital, Navamindradhiraj University, Bangkok 10300, Thailand

\*Corresponding author. E-mail: [tmw706@gmail.com](mailto:tmw706@gmail.com)  
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### ABSTRACT

*Tea seed oil (TSO) has been shown to exert therapeutic effects to treat various diseases. However, no experimental evidence is available to support its actions on metabolic derangement, and antioxidant effects to protect-risk organs against a high fat high fructose (HFHF) diet. The various fatty acids in TSO were determined using GC-MS. Three groups of male Wistar rats were used in the present study: normal rats, rats fed with HFHF diet for 12 weeks, and rats fed with HFHF diet along with TSO. Blood glucose, AUC of glucose, serum insulin, HOMA-IR, serum lipid profile were determined. Liver, kidney and cardiac injuries were evaluated. Lipid peroxide content and the activities of antioxidant enzymes in the liver, kidney and cardiac tissues were also assessed. Oleic acid was the primary fatty acid in TSO. HFHF diet slightly raised basal blood glucose and HOMA-IR. AUC of glucose, serum lipid profile, and serum levels of AST, ALT, LDH, CK-MB, creatinine and BUN were increased in HFHF-fed rats. TSO decreased AUC of glucose and serum lipid profile whereas it suppressed serum insulin level and HOMA-IR. The high levels of AST, ALT, LDH, CK-MB, creatinine and BUN were also normalized. TSO also suppressed the high levels of TBARS and enhanced the activities of antioxidant enzymes in the liver, cardiac and renal tissues. It can be concluded that TSO exerted anti-hyperglycemic and anti-hyperlipidemic activities as well as improved insulin sensitivity. It had free radical scavenging effect providing organ protection against HFHF diet feeding.*

**Keywords:** Tea seed oil, Metabolic syndrome, Oleic acid, Antioxidant enzyme activity