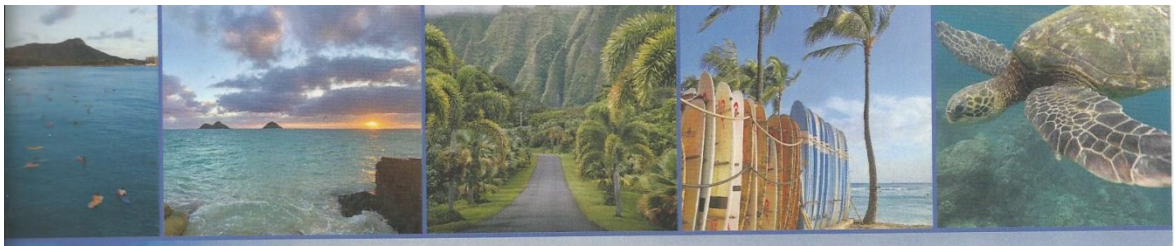

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P32 Anti-diabetic activity of oat avenanthramides in insulin-resistant HepG2 cells

Junsoo Lee* [1], Hyun Joo Kim[2], Seonghwa Hong[1]
[1] *Deparment of Food Science and Biotechnology, Chungbuk National University, Cheongju, Korea*
[2] *Department of Central Area Crop Science, National Institute of Crop Science, Suwon, Korea*

Diabetes mellitus is a complicated metabolic and endocrine disorder arising from defects in the production or action of insulin. Cereal grains are rich sources of natural antioxidants, possess numerous pharmacological properties with little or no side effects, and protect humans from various metabolic diseases including diabetes, obesity, and cardiovascular diseases. Major cereal grains used in the formulation of food products include rye, oats, barley, maize, triticale, millet, and sorghum. Oat (Avena sativa L.) contains various nutrients, including proteins, lipids, vitamins, minerals, [2]-glucan, and unique phytochemical polyphenol avenanthramides (AVNs). More than 20 different forms of AVNs are present when extracted from oats, and the three major forms are AVN A, B, and C. It has been reported that AVNs are beneficial for the prevention of inflammation, cancer, and cardiovascular disease. However, the effects of AVNs on hepatic glucose metabolism and insulin signaling pathway are unknown. This study evaluated anti-diabetic potential of AVN A, B, and C in insulin-resistant HepG2 cells induced by free fatty acid. The results indicated that all of AVNs significantly increased glucose consumption in insulin-resistant HepG2 cells, with no significant difference between AVNs. In addition, AVNs improved glycogen synthesis by activating phosphoinositide 3-kinase (PI3K), protein kinase B (Akt), and glycogen synthase kinase-3 beta (GSK3[2]) and inhibited gluconeogenesis by activating PI3K, Akt, and forkhead BoxO1 (FoxO1). Taken together, the findings suggested that oat-derived AVNs may be potential phytochemicals for the treatment of type 2 diabetes mellitus.

P33 Restorative properties of *P. alba* extract against pancreatic [2]-cell destruction and hyperlipidemia in streptozotocin-rat model of Type 2 diabetes mellitus

Tawakaltu AbdulRasheed-Adeleke*[1], Bashir Lawal[2], Sani Saidu[3]
[1] *Federal University of Technology P.M.B 65 Minna, Niger State, Nigeria*
[2] *Graduate Institute for Cancer Biology and Drug Discovery, Taipei Medical University, Taipei, Taiwan*
[3] *Alex Ekwueme Federal University Ndufu-Alike, Ikwo, Ebonyi State, Nigeria*

P. alba is a reputable medicinal plant employed for the treatment of diabetes and its associated complications. However, scientific literature on the potential of the extract from this plant is scanty. Herein, the protective effects of the methanolic extract of P. alba on an experimentally induced type 2 diabetes rat model was evaluated. Wistar rats with streptozotocin (STZ)-induced diabetes were randomly allocated into five groups containing five animals each as follows: a normal glycemic group (I), diabetic rats receiving distilled water group (II), diabetic rats treated with 150 mg/kg of P. alba group (III), diabetic rats treated with 300 mg/kg of P. alba group (IV), and diabetic rats treated with 100 mg/kg metformin group (V). All treatments were administered for 21 consecutive days through oral gavage. Results revealed that treatment with P. alba extract significantly restored alterations in levels of fasting blood glucose (FBG), body weight loss, serum and pancreatic insulin levels, and pancreatic histology. Result also showed that P. alba significantly attenuated the dyslipidemia [increased cholesterol, low-density lipoprotein-cholesterol (LDL-C), triglycerides, and high-density lipoprotein (HDL) in diabetic rats], serum biochemical alterations [alanine transaminase (ALT), aspartate transaminase (AST), alanine phosphatase (ALP), blood urea nitrogen (BUN), creatinine, uric acid, and urea] and full blood count distortion in rats with STZ-induced diabetes. The present study thus provided evidence of antidiabetic potential of the P. alba extract for the treatment of diabetes and its associated complications. Hence, *P. alba* maybe employed for the treatment of diabetes mellitus