






Abstract

The Effect of Adzuki Bean Extract on Antioxidant and Inflammatory Indices in Diabetic Rats [†]

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Abstract: One of the strategies used to alleviate metabolic disorders in diabetes is nutritional intervention. In order to achieve this goal, plant materials that contain compounds with high antioxidant potential, exhibit digestive enzyme inhibiting activity, or contain substances that improve insulin sensitivity are selected. The importance of legumes in the regulation of carbohydrate metabolism is currently the subject of many studies. Due to high α -glucosidase activity and phenolic profile, Adzuki bean (AB) may be considered as a plant with hypoglycemic and antioxidant properties. Thus, the aim of the study was to assess the effect of AB extract on antioxidant and inflammatory indices in diabetic rats. The experiment was conducted on male Wistar rats. The rats were divided into four groups; one was fed with the AIN-93M diet, while the other three were induced with diabetes by feeding them a high-fat diet for 4 weeks followed by intraperitoneal injection of streptozotocin (35 mg/kg b.w. in citrate buffer). The rats of the control group received citrate buffer alone. After confirmation of hyperglycemia, the rats were divided into three groups: diabetic control, diabetic fed diets supplemented with AB ethanolic extract with a lower dose (0.5%), and diabetic supplemented with AB extract with a higher dose (1%). The feeding period was 4 weeks. In serum, the glucose, CRP, TAS, SOD, CAT, and TBARS were determined. The inflammatory cytokines (TNF- α , IL-6) were measured in the liver and adipose tissue. In this study, induction of diabetes did not reveal strong inflammation in serum measured by serum CRP concentration ($p > 0.05$). However, in the liver, TNF- α and IL-6 increased, and a higher dose of AB extract normalized these indices. The serum TAS and activity of antioxidant enzymes (CAT, SOD, and ceruloplasmin) were unchanged in all experimental groups. On the other hand, CAT and SOD activity in the liver of diabetic rats decreased, and higher concentrations of AB extract normalized these values to a level comparable to the control group. In conclusion, the higher AB dose supplementation improved antioxidant potential and decreased inflammation in the liver of diabetic rats.



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