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Effect of anthocyanin-rich bilberry extract on serum glucose levels and TNF-α in rats with type 2 diabetes mellitus

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Type 2 diabetes is very common metabolic disease all over the world, with prevalence constantly increasing over the last few decades. Tumor necrosis factor-α (TNF-α) over-secretion is already proven to be involved in the pathogenesis of insulin resistance and diabetic complications. Anthocyanins are the largest group of water-soluble pigments in the plant kingdom, known collectively as flavonoids. The aim of the present work is to clarify whether treatment with anthocyanin-rich bilberry extract has positive effect on serum glucose and TNF-α levels in rats with type 2 diabetes mellitus. Bilberries were sampled at the full ripe stage in woods from Koroska in Slovenia. The total concentration of anthocyanin equivalents the bilberry extract was 4422.8±61.0 mg/L extract (determined by HPLC-DAD analysis). Wistar rats were divided into four groups: I (control), II (control receiving bilberry extract), III (diabetic) and IV (diabetic receiving bilberry extract). Type 2 diabetes was induced by intraperitoneal streptozotocin injection (65 mg/kg bw) following nicotinamide injection (230 mg/kg bw) (groups III and IV). After 4 weeks, when the model was fully developed, oral therapy with anthocyanin-rich bilberry extract (50 mg/kg bw) was introduced to groups II and IV. Treatment with anthocyanin-rich bilberry extract lasted for 2 weeks. Serum glucose levels were significantly higher in group III when compared to the group I ($p<0.001$). Anthocyanin-rich bilberry extract significantly reduced serum glucose and TNF-α levels in diabetic animals when compared to untreated group ($p<0.01$). Early application of anthocyanin-rich bilberry extract may prevent the development of diabetes type 2 complications due to suppression of TNF-α production and/or by reducing its activity.

Biography

Dusan Sokolovic finished Faculty of Medicine, University of Nis. He works as an Associate Professor in the Department of Biochemistry, Faculty of Medicine. He completed specialized studies in Clinical Biochemistry and a PhD at the Medical Faculty, University of Nis. He is the Head of the Serbian scientific project (number 43012), as well as a bilateral project with the Republic of Slovenia, entitled, "Anti-oxidative and anti-apoptotic effect of extracts of blueberry". He has published 50 papers in journals indexed in Science Citation Index. He is the author of textbooks: *Biochemistry (2006) and Clinical Biochemistry (2010)*. He is a member of numerous associations (FEBS, IFCC, EASL).

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