Lingonberry (Vaccinium vitis-idaea L.) Exhibits Antidiabetic Activities in a Mouse Model of Diet-Induced Obesity

Vaccinium vitis-idaea, commonly known as lingonberry, has been identified among species used by the Cree of Eeyou Istchee of northern Quebec to treat symptoms of diabetes. In a previous study, the ethanol extract of berries of V. vitis-idaea enhanced glucose uptake in C2C12 muscle cells via stimulation of AMP-activated protein kinase (AMPK) pathway. The purpose of this study was to examine the effect of plant extract in a dietary mouse model of mild type 2 diabetes. C57BL/6 mice fed a high-fat diet (HFD, ~35% lipids) for 8 weeks that become obese and insulin-resistant (diet-induced obesity, DIO) were used. Treatment began by adding V. vitis-idaea extract to HFD at 3 different concentrations (125, 250, and 500 mg/kg) for a subsequent period of 8 weeks (total HFD, 16 weeks). The plant extract significantly decreased glycemia and strongly tended to decrease insulin levels in this model. This was correlated with a significant increase in GLUT4 content and activation of the AMPK and Akt pathways in skeletal muscle. V. vitis-idaea treatment also improved hepatic steatosis by decreasing hepatic triglyceride levels and significantly activated liver AMPK and Akt pathways. The results of the present study confirm that V. vitis-idaea represents a culturally relevant treatment option for Cree diabetics and pave the way to clinical studies.