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Hypoglycemic Effects of Fermented Chaga Mushroom(*Inonotus obliquus*) by *Bacillus* sp. WRD-2 strain in Genetically Diabetic Otsuka Long-Evans Tokushima Fatty (OLETF) Rats

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Changes in the levels of analytes in the blood and urine of a rodent animal model were taken as a measure of the hypoglycemic effects of a diet containing fermented Chaga mushroom. These studies were conducted using the genetically manipulated diabetic Otsuka Long-Evans Tokushima Fatty (OLETF) rat. The effects of 8-week long diets that included either fermented (FCM) or non-fermented (CM) Chaga mushroom powder (5% in the diet) on the OLETF rat were compared to the normal diet fed OLETF rat and the non-diabetic Long-Evans Tokushima Otsuka (LETO) rat. Hypoglycemia was tracked by measuring serum and urine concentrations of glucose, insulin, fructosamine, and leptin. Serum and urine levels of glucose, fructosamine, and leptin in the OLETF rats were higher than in LETO rats when fed normal diets but insulin levels did not differ between the two animal groups. The FCM rats were characterized by dramatically low levels of serum glucose and leptin in the OLETF rats whereas the levels of fructosamine and urine glucose trended lowerin response to FCM. The serum leptin level in the CM-fed OLETF rat was also lower than that in the normal diet fed OLETF control. Serum concentrations of insulin in the OLETF rats were higher following FCM or CM feeding compared to the normal diet. These observations imply that (a) a dietary supplement of fermented Chagamushroom may contribute to a hypoglycemic effect in the OLETF rat, and (b) and the increased blood insulin concentration following 8 weeks of an FCM diet may be important to the noted improvement in hyperglycemia.

Keywords : Chaga mushroom (*Inonotus obliquus*), diabetes mellitus, OLETF rats, leptin

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Deformed Root and leaf1 regulates *YABBY* gene in leaf development

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The establishment and differentiation of lateral organs, such as leaves, involves factors intrinsic to the primordia and interactions with the apical meristem from which they are derived. Recently, many of genes that regulate the maintenance of meristem activity and that are involved in leaf differentiation have been cloned and characterized. However, no direct factor has been found in the genetic interaction between meristem and differentiation of leaf organ. Here we identified the Arabidopsis *Deformed Root and Leaf1* (*DRL1*) gene by transposon-tagging. This mutant had narrow and filamentous leaves with defective meristems. The phenotype of mutant leaves was abaxialized suggesting that *DRL1* gene is involved in the regulation of leaf differentiation. Analysis of double mutant with filamentous flower, which is defective in dorsoventral patterning of lateral organs, suggested that *DRL1* might regulate *YABBY* gene family. The *DRL1* gene was found to encode a novel protein that shows homology to Elongator-associated protein of yeast KTI12. The expression of DRL1 gene of Arabidopsis can complement the yeast KTI12 suggesting that DRL1 may act as an Elongator-associate protein in higher organism.