

# **Dihydroquercetin and biochaga reduce H<sub>2</sub>O<sub>2</sub> induced DNA damage in peripheral blood mononuclear cells of obese women *in vitro*-a pilot study**

## **Abstract**

Systemic oxidative stress stemming from increased free radical production and reduced antioxidant capacity are common characteristics of obese individuals. Using hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) to induce DNA damage *in vitro*, in peripheral blood mononuclear cells (PBMCs) from obese subjects and controls, the DNA protective ability of dihydroquercetin (DHQ) and biochaga (B) alone or in combination, were evaluated. The effects of DHQ and B were estimated under two experimental conditions: pre-treatment, where cells were pre-incubated with the substances prior to H<sub>2</sub>O<sub>2</sub> exposure; and post-treatment when cells were first exposed to H<sub>2</sub>O<sub>2</sub>, and further treated with the compounds. DNA damage was evaluated using the comet assay. The results of pre- and post-treatment showed a significant decrease in DNA damage produced by H<sub>2</sub>O<sub>2</sub> in the obese group. This decrease was not significant in control group probably due to a small number of subjects in this pilot study. More prominent attenuation was noted in the pre-treatment with DHQ (250 µg/ml). Analysis of antioxidant properties revealed that DHQ's remarkable reducing power, 1,1-diphenyl-2-picrylhydrazyl (DPPH) scavenging activity, and potent ·OH scavenging properties may contribute to strong attenuation of H<sub>2</sub>O<sub>2</sub>-induced DNA damage. Also, B showed strong reducing power, DPPH, and ·OH scavenging ability, while reducing power and DPPH scavenger effects were increased in the presence of DHQ. Conclusively, DHQ and B may reduce H<sub>2</sub>O<sub>2</sub>-induced DNA damage in PBMCs from obese subjects when challenged *in vitro*, and could be valuable tools in future research against oxidative damage-related conditions.