

mellitus, thus delaying the onset of degenerative complications of diabetes.

Disclosure of interest The authors declare that they have no competing interest.

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Metabolic and antioxidant effects of micro algae in diabetic rats: Implications for the prevention of human pathologies

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Introduction Oxidative stress has been shown to play an important role during diabetes. Micro algae constitute a major field for the research of new bioactive molecules of interest for the health and care of the disease such as polyunsaturated fatty acids and carotenoids. *Nannochloropsis gaditana* is a genus microalgae that has anti-inflammatory, antioxidant and antidiabetic properties.

The purpose of the present study was to investigate the effect of micro algae *Nannochloropsis gaditana* supplementation on lipases activities and some markers of redox status in diabetic rats.

Materials and methods Wistar rat received streptozotocin (STZ) and were feed with different diets for 2 months: standard diet and

a diet supplemented with micro algae. After sacrifices the serum activity of lecithin cholesterol acyltransferase (LCAT) was determined as well as markers of erythrocyte lysates oxidative stress such as MDA, protein carbonyls, catalase, GSH and SOD. The adipose tissue, liver and pancreas were also used to study the activity of lipases.

Results and discussion We evidenced increased blood glucose and glycated hemoglobin in diabetic rats. *Nannochloropsis gaditana* supplementation lowered blood glucose and glycated hemoglobin.

Significant decreases in hepatic and pancreatic lipoprotein lipase (LPL) and LCAT activities were recorded in diabetic rats compared to their controls. In parallel, an increase in the adipose hormone sensitive lipase (HSL) activity in adipose tissue was noted in diabetic rats, probably due to lack of insulin. The administration of micro algae in diabetic animals induced a modulation of lipase activities and LCAT. Regarding to the oxidant/antioxidant status in the erythrocyte lysates, we evidenced an imbalance of redox status in diabetic rats. Supplementation with the micro algae *Nannochloropsis gaditana* attenuated oxidative stress in the diabetic rats by reducing lipid peroxidation markers such as MDA and protein carbonyls and increasing the activity of catalase, GSH and SOD, suggesting an important antioxidant defence.

Conclusion Our results suggest that *Nannochloropsis gaditana* has antidiabetic and antioxidant activities that can reduce oxidative stress and correct metabolic alterations associated with diabetes.

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