

## **CORRECTION BY PLANT POLYPHENOLS THE ACUTE STRESS NEGATIVE CONSEQUENCES**

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Excess of stress situations in modern life increases the interest of researchers to acute effects of stressors on the metabolism. The influence of stress damaging factors on the endothelial cells ability to synthesize vasodilators is harmful and can lead to endothelial dysfunction (ED) development. So it is of interest to find ways of ED correction, especially using natural substances that have antioxidative and phytoestrogenic activity. Therefore, the study and use of therapeutic and prophylactic activity of grape products can be perspective.

Acute stress was caused in rats by subcutaneous injection of epinephrine (2 mg on 100 g body weight). The correction of stress consequences was done by grape seed polyphenol concentrate from grape "Cabernet" (PC) administration during 14 days (9 mg of polyphenols on 100 g body weight). There were determined: arginase activity and content of total protein, urea, citrulline, arginine, creatine, and creatinine. Epinephrine injection caused the significant decrease of arginine content in blood serum and liver tissue (by 15% and 20% respectively), moreover, arginase activity in liver increased in 2.25 times in stressed animals. However, citrulline content was decreased by 51%. Arginine deficiency that reduced NO formation and led to ED development can be caused by decrease of synthesis as well as by activation of its degradation or using for creatinine synthesis. Therefore, epinephrine injection not only causes ED development but provokes energy shortage under stress because of energy metabolism activation. The lack of arginine in these conditions causes deficiency of creatine required to form a source of metabolic energy – creatine phosphate. As a consequence creatinine was increased in the blood and liver of animals (by 98% and 29% respectively). Catabolism activation was also observed in rat liver tissue under adrenaline injection. Thereby total protein was decreased in liver by 24% that is the evidence of increased use of amino acids in the process of catabolism. Administration of PC increased arginine content in blood and liver and decreased arginase activity in stressed animals. PC administration completely normalized the arginine and citrulline levels in the liver tissue. PC administration obviously influences the muscle energy supply that is proved by increased creatine and decreased creatinine level in stressed animals.

Thus, our studies revealed the significant protective activity of polyphenol concentrate under the epinephrine injection.