

Ozone is an agent with a strong oxidative impact. In connection with this valuable attribute, it can be widely applied in many different industry field e.g. decontamination of the water or rooms with high-sterile standards, even as a factor which can be use in prolonging the shelf life of fruit. In nature, the ozone is created by atmospheric discharges, in turn, in industrial-scale it is usually produced during corona-discharges using pure oxygen (supplied by an oxygen generator or oxygen bottles) or oxygen from the air.

Many studies have shown that application of ozonation process in fruit storage contribute to the reduction of microbiological contamination, weight loss and pesticide residue in treated materials. The influence of ozone on the level of antioxidant compounds i.e. flavonoids, phenolic acids and vitamins is also interesting. Ozonation process inhibits the loss of antioxidants or intensifies their biosynthesis. However, the mechanism of positive ozone action in relation to the fruit quality is not fully explained. It can be associated both with strongly antimicrobial properties of ozone and its impact on the energy metabolism in mitochondria. Adenosine triphosphate (ATP) is a key molecule used by plant cells as a source of energy required to conduct many biochemical reactions necessary for cell functions and viability. Recently many studies have revealed that the use of some elicitors for postharvest treatment improves the activity of mitochondria metabolism leading to increase in fruit resistance unfavorable quality change during storage.

Currently, no studies have been published about the changes in energy metabolism in berry fruit during storage in ozone-enriched atmosphere. Therefore, in order to reveal their relation, the effect of ozonation process on the level of ATP, ADP, AMP and activity of enzymes involved in mitochondria respiratory metabolism, such as: succinate dehydrogenase, cytochrome C oxidase, and H^+ -ATPase, as well as the level of selected oxidative stress markers in raspberry mitochondria will be investigated in this project. Due to the fact that phenolic compounds are responsible for shaping the fruit color, tastiness and nutritional value, the relationships between the activity of mitochondria metabolism and the level of phenolic compounds as well as the activity participating in phenolic compounds biosynthesis will be explained.

In view of the above, the obtained results are going to complement knowledge in the field of agriculture science concerning the influence of ozonation on the quality of plant products.