

ABSTRACT

The issue of food product quality is not a new topic, but the increasing demands and needs of consumers make the topic ever relevant. Despite extensive knowledge of the use of high temperatures (especially pasteurization), there is still a need to find such methods of preservation that will change the physicochemical properties of the material to the least extent, without reducing its microbiological safety.

A promising one seems to be the extension of the shelf life of juices based on the introduction of natural additives, in the form of spices characterized by antioxidant and antimicrobial properties.

Another proposal is the use of cold atmospheric plasma, classified as a low-temperature treatment, allowing the preservation of thermolabile substances.

Taking the above into account, the scientific objective of the conducted research was to shape the quality of beverages (carrot juice, tomato juice, carrot-banana smoothie) through the addition of sumac (*Rhus coriaria* L.) and plasma treatment using an arc discharge reactor sliding along electrodes with the technological name GlidArc.

As the research showed, the addition of *Rhus coriaria* L. sumac fruit powder to fruit and vegetable beverages decreased their pH and increased the content of biologically active substances (carotenoids, polyphenols), further protecting each product from early spoilage. Very importantly, the use of cold plasma, generated in a sliding arc reactor, with the process gas air, effectively influenced the inactivation of the total number of aerobic microorganisms, as well as yeasts and molds contaminating juices prepared from carrots and tomatoes, while preserving their physicochemical properties. Undoubtedly, the use of a combined method, i.e. cold plasma treatment with addition of freshly pressed carrot juice with powdered fruit of sumac, allowed effective reduction of microorganisms (to undetectable levels), enriching the product with additional nutrients.

Keywords: beverage quality, sumac, food safety, cold atmospheric plasma, gliding arc reactor