

Determination of antioxidant capacity with a cyclic voltammetry in production step in a double fermentation process during the preparation of traditional home made fruit vinegar

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Cyclic voltammetry provides high potential for investigation of antioxidant compounds, assessment of antioxidant capacity and measurement of electrochemical kinetics. This method is the most commonly used technique for the characterization of antioxidant capacity in food control and other samples.

The aim of this work is the evaluation of the antioxidant activity of traditional home made fruit vinegar at each production step in a double fermentation process (alcoholic and acetic); the effect of antioxidant capacity in spontaneous acetic versus inoculated alcoholic fermentation was of special interest.

Antioxidant capacity has been evaluated using cyclic voltammetry (CV) measuring the speed of homogeneous redox reaction radical $ABTS^{\bullet+}$. The stable radical cation $ABTS^{\bullet+}$ electrochemically is generated on the surface of the glassy carbon electrode by electrochemical oxidation of an aqueous solution of ABTS. $ABTS^{\bullet+}$ radical cation is a mediator in the catalytic oxidation of the antioxidants present in vinegar. The calibration was made with theoretical simulation of the electrochemical analysis of potential standard substance depending on the kinetics of the electrode reaction and the anti-oxidative capacity of these samples were determined by measuring the intensity of anodic current, and was expressed in terms of the kinetics of the electrode reaction.

The results from cyclic voltammetry have shown that the homemade fruit vinegars have high antioxidant properties, which is with correlation with others performed antioxidant assays.

Keywords: cyclic voltammetry, fruit vinegar, kinetic constant, antioxidant capacity

References:

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