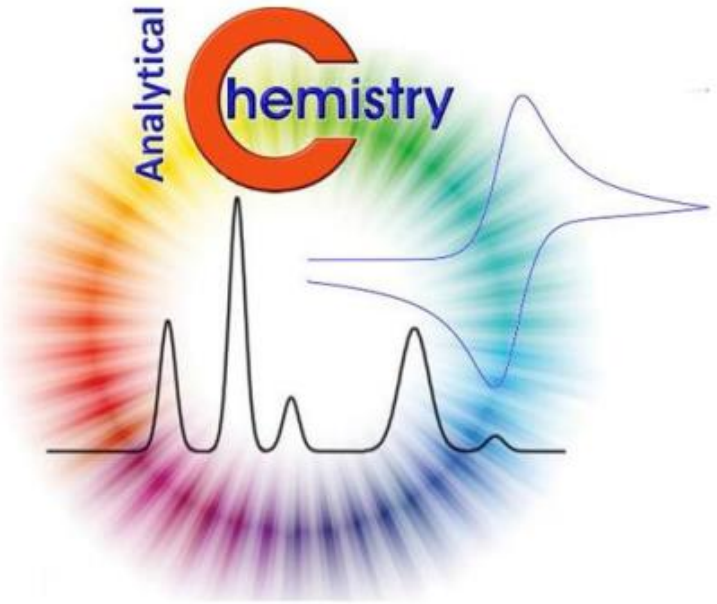
AACD 2016

International Conference

10th Aegean Analytical Chemistry Days

29 Sept. - 2 Oct., 2016



ABSTRACT BOOK
AACD2016

Çanakkale / TURKEY

P2-33

Effects of Different Pretreatment Methods on Production of Some Volatile Organic Compounds from Tomato and Pepper Pomaces

Hilal Şimşek, Müge İşleten Hoşoğlu, Yonca Karagül Yüceer*

Çanakkale Onsekiz Mart University, Department of Food Engineering, Canakkale

*E mail: yoncayuceer@comu.edu.tr

In recent years, obtaining volatile organic compounds from vegetable and animal sources or using biotechnological methods in their production becomes prominent due to consumer preferences. Production of these natural volatile compounds by utilizing lignocellulosic or organic agricultural or industrial wastes, which are abundant and sustainable sources, becomes more and more important in terms of both decreasing production costs and developing processes in which the present wastes can be utilized.

In our country, especially in the Marmara and Aegean regions, a significant amount of tomato and pepper pulp comes out as a natural biologic waste in paste production industry. In our previous study, it was demonstrated that those pomaces have a potential to use for the production of natural volatile compounds via fermentation (Güneşer ve ark., 2015). In this study, firstly, a series of pretreatments (ultrasound, dilute acid and enzymatic hydrolysis and their combinations) were undertaken for an effective conversion of tomato and pepper pomaces into fermentable sugar. Secondly, the yeast *K. marxianus* which find industrial application due to its GRAS status was cultivated on pretreated mediums. Effects of different pretreatments on production of volatile organic compounds by *K. marxianus* were evaluated by HS-SPME-GC-MS analysis. Results were also compared with the control group and the yeast growing on Yeast Extract Peptone Dextrose (YPD) medium. The yeast grown in the medium obtained by ultrasound-assisted acid hydrolysis (2% H_2SO_4 solution) produced higher amount of ethyl acetate (21.6 mg/kg), isoamyl acetate (9.2 mg/kg) and phenylethyl acetate (17 mg/kg) compared to control and YPD grown group. Also, ultrasound-assisted enzyme application on pepper pomaces led to an increase especially in the amount of fusel alcohols (isoamyl alcohol and phenyl ethyl alcohol) produced by *K. marxianus*. Experiments demonstrated that the amount of volatile organic compounds differed according to the type of hydrolysis applied to pomaces. Additionally, ultrasound-assisted pretreatment seemed to increase the yield for chemical and enzymatic hydrolysis, showing a promising technology to be used for hydrolysis for tomato and pepper pomaces. Therefore, Response Surface Methodology (RSM) has been applied for the optimization of pretreatment methods on tomato and pepper pomaces.

Keywords: Tomato And Pepper Pomace, Ultrasound, Dilute-Acid Pretreatment, Enzymatic Hydrolysis, Response Surface Methodology

References:

1.Guneser, O., Demirkol, A., Karagül Yüceer, Y., Ozmer Togay, S., İşleten Hoşoğlu, M., Elibol, M. Bioflavour production from tomato and pepper pomaces by *Kluyveromyces marxianus* and *Debaryomyces hansenii* Bioprocess Biosyst Eng (2015) 38 1143–1155.