

# THE EFFECT OF THE DURATION OF SEPARATION AND WAVELENGTHS OF ABSORBANCE'S MEASUREMENT ON THE EFFECTIVENESS OF ELECTROPHORETIC SEPARATION OF GLIADINS BY GCE

Vesna Gojković Cvjetković<sup>1\*</sup>, Radoslav Grujić<sup>2</sup>, Željka Marjanović-Balaban<sup>3</sup>

<sup>1</sup>Faculty of Technology Zvornik, University of East Sarajevo, Karakaj 34a,  
75400 Zvornik, Bosnia and Herzegovina

<sup>2</sup>State High School of Medical Science - Prijedor, Nikole Pašića 4a,  
79101 Prijedor, Bosnia and Herzegovina

<sup>3</sup>Faculty of Forestry Banja Luka, University of Banja Luka, Bulevar Vojvode Stepe Stepanovića 75a,  
78000 Banja Luka, Bosnia and Herzegovina

\*e-mail: vesna.gojkovic@yahoo.com

## Abstract

Gliadins are one of the gluten components which are present in most wheat products. Based on their mobility in acidic polyacrylamide gel electrophoresis (A-PAGE), gliadins are divided into  $\alpha+\beta$ ,  $\gamma$ ,  $\omega 1.2$ , and  $\omega 5$  classes. Gliadins are allergenic proteins which play a key role in celiac disease pathogenesis. Considering that the number of people with celiac disease is increasing, the aim of this study was to examine how different duration of analysis (30, 35 and 40 minutes) and wavelengths (200, 210 and 230 nm) effect the gliadin separation effectiveness by glassy carbon electrode (GCE).

We examined the effect of duration of capillary gel electrophoresis (GCE) separation (30, 35 and 40 minutes) and measurement of absorbance at different wavelengths (200, 210, and 230 nm) on the effectiveness of electrophoretic separation by capillary gel electrophoresis, with the aim of faster identification and quantification of gliadin proteins. Separation of gliadin proteins by GCE was performed on an Agilent, CE 7100 apparatus. SDS-MW analysis kit, PA 800 plus (2015 Beckman Coulter, USA) was used.

Based on the obtained results the optimal duration of GCE separation was 30 minutes, because the number of observed proteins is the highest and the effectiveness of electrophoretic separation is the best ( $X_{av} = 23.50$ ). A wavelength of 200 nm proved to be the best wavelength. By measuring the absorbance at this wavelength, the total number of observed proteins is  $X_{av}=18.33$ .

In this study a duration of 30 minutes and a wavelength of 200 nm proved to be optimal. As the duration of analysis increases, the number of proteins decreases.

**Key words:** Gliadins, Different duration of GCE separation, Wavelengths, GCE.