

# PHENOLIC PROFILE AND IN VITRO BIOLOGICAL ACTIVITIES OF BLACKTHORN FRUIT (*Prunus spinosa* L.)



**Mirjana, D, Marčetić<sup>1</sup>, Stevan, S, Samardžić<sup>1</sup>, Tijana, D, Ilić<sup>2</sup>, Dragana, D, Božić<sup>3</sup>, Bojana, B, Vidović<sup>2</sup>**



<sup>1</sup> University of Belgrade-Faculty of Pharmacy, Department of Pharmacognosy, Belgrade, Serbia

<sup>2</sup> University of Belgrade-Faculty of Pharmacy, Department of Bromatology, Belgrade, Serbia

<sup>3</sup> University of Belgrade-Faculty of Pharmacy, Department of Microbiology and Immunology, Belgrade, Serbia

The blackthorn, *Prunus spinosa* L. (Rosaceae) is a continental shrub widespread in Europe. The fruit is used in traditional medicine in the treatment of respiratory disorders, as well as diuretic, spasmolytic and anti-inflammatory agent.

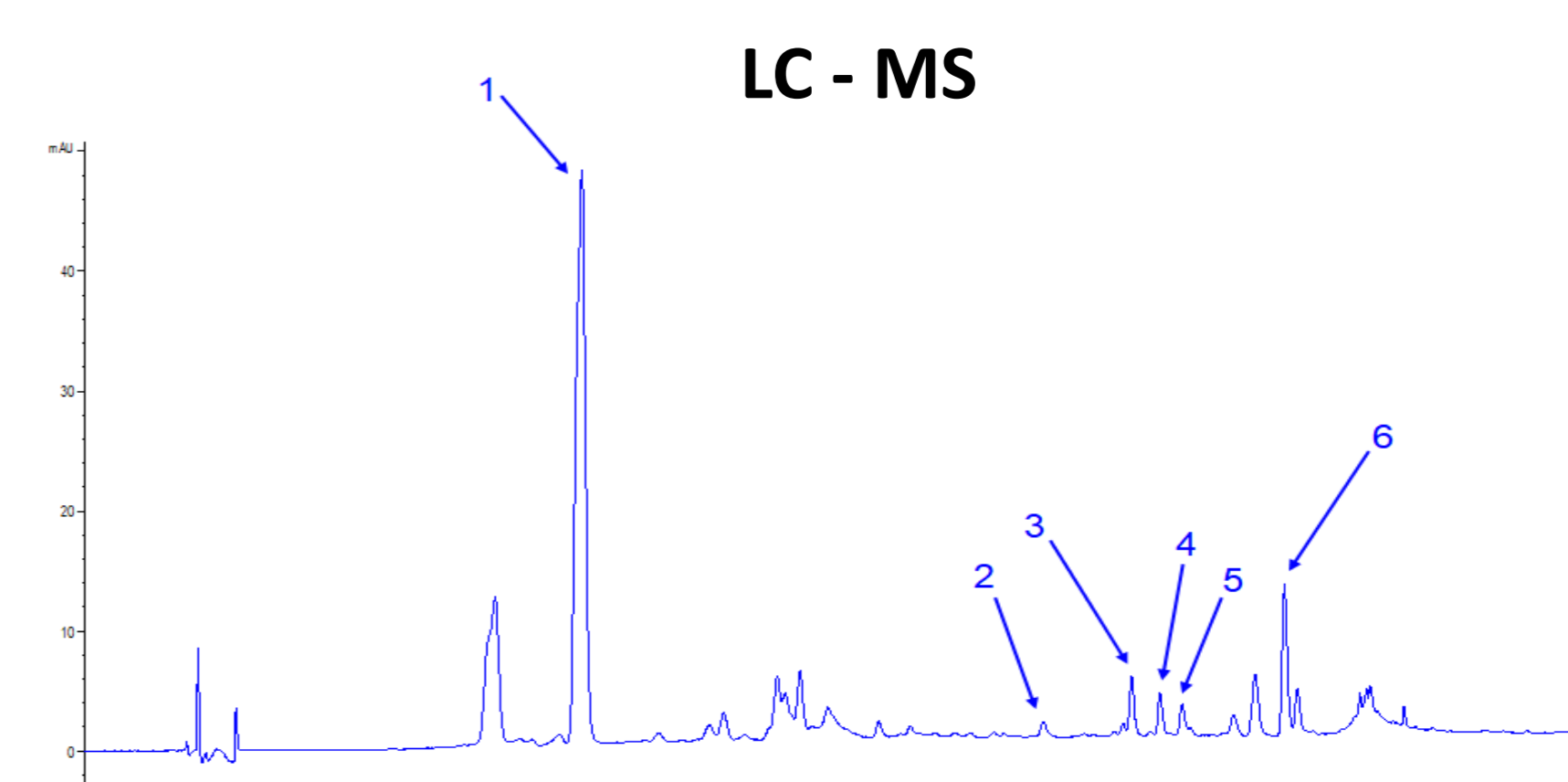
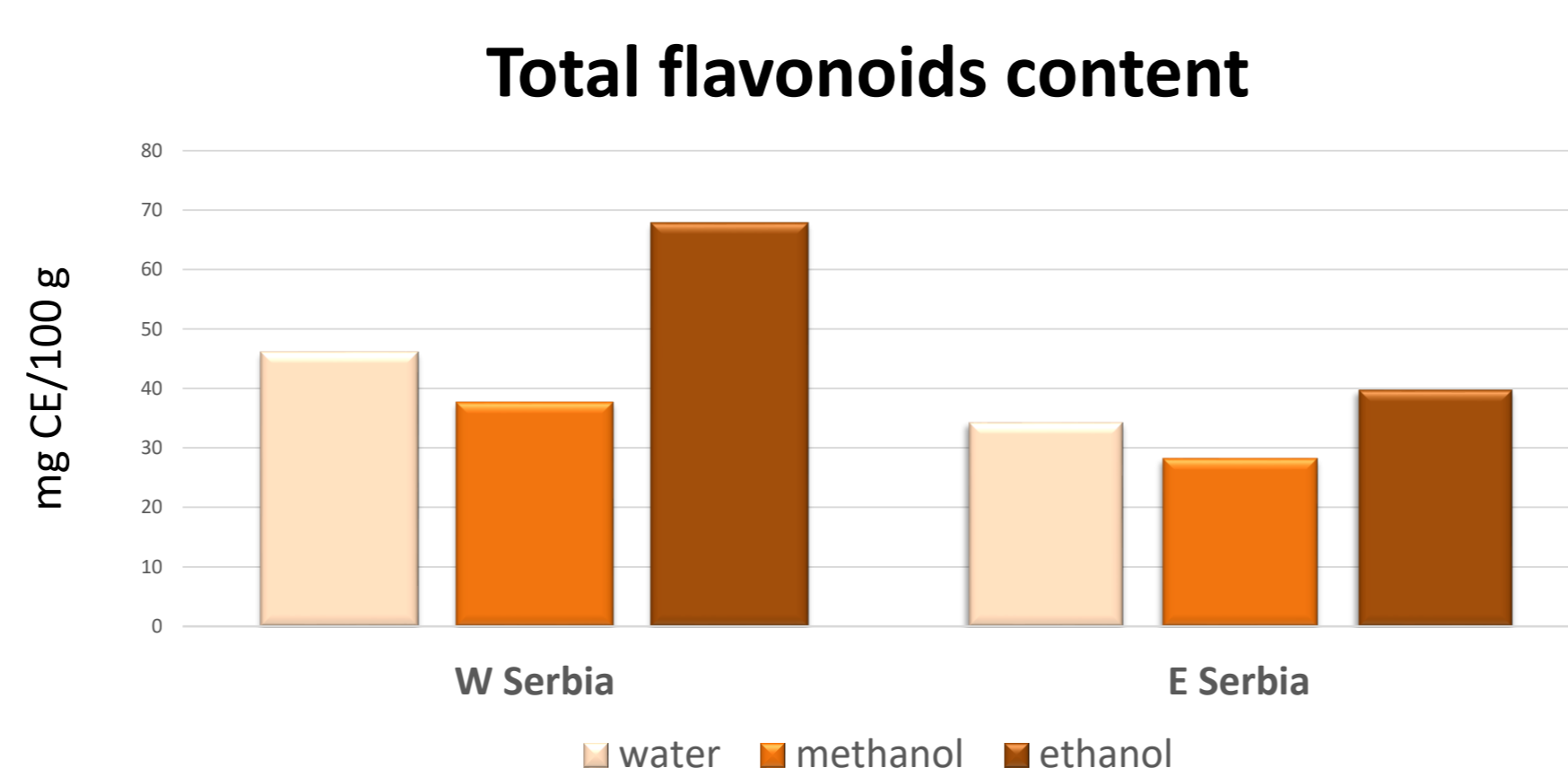
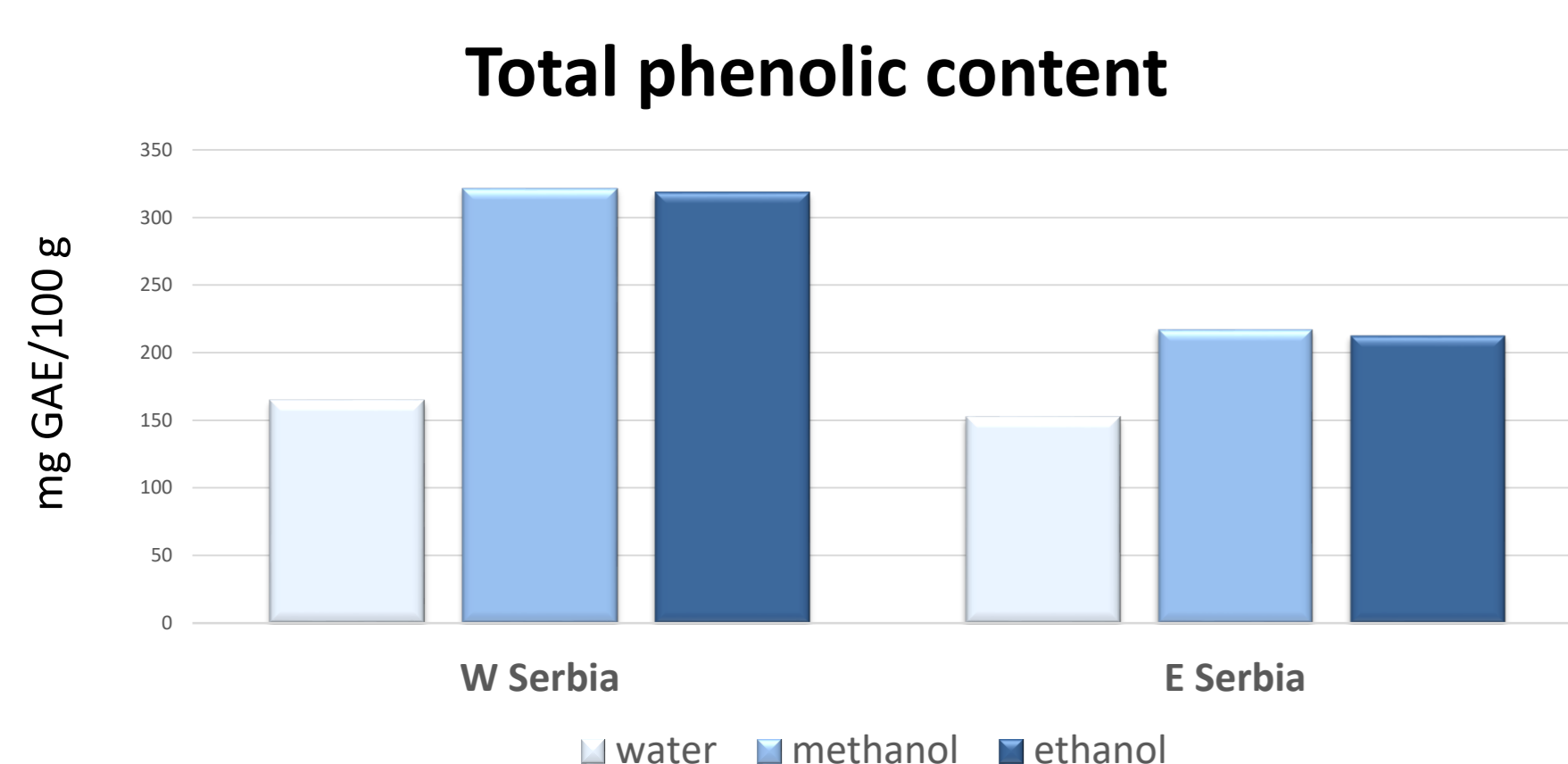


The aim was to investigate

- the phenolic profile
- biological activities: antioxidant, anti-diabetic, anti-acetylcholinesterase, anti-tyrosinase.
- the effect of blackthorn fruit extract on probiotic microorganisms.

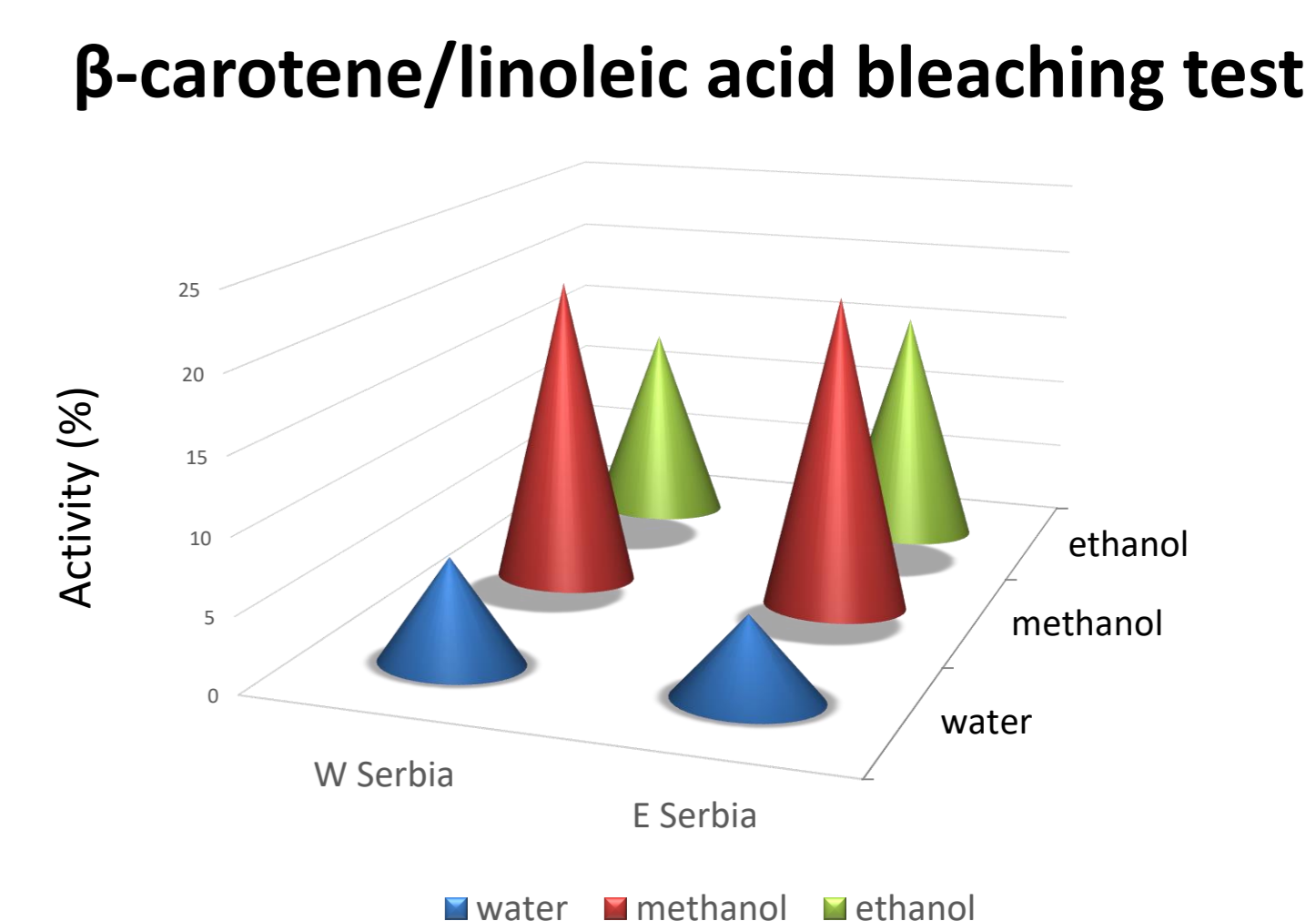
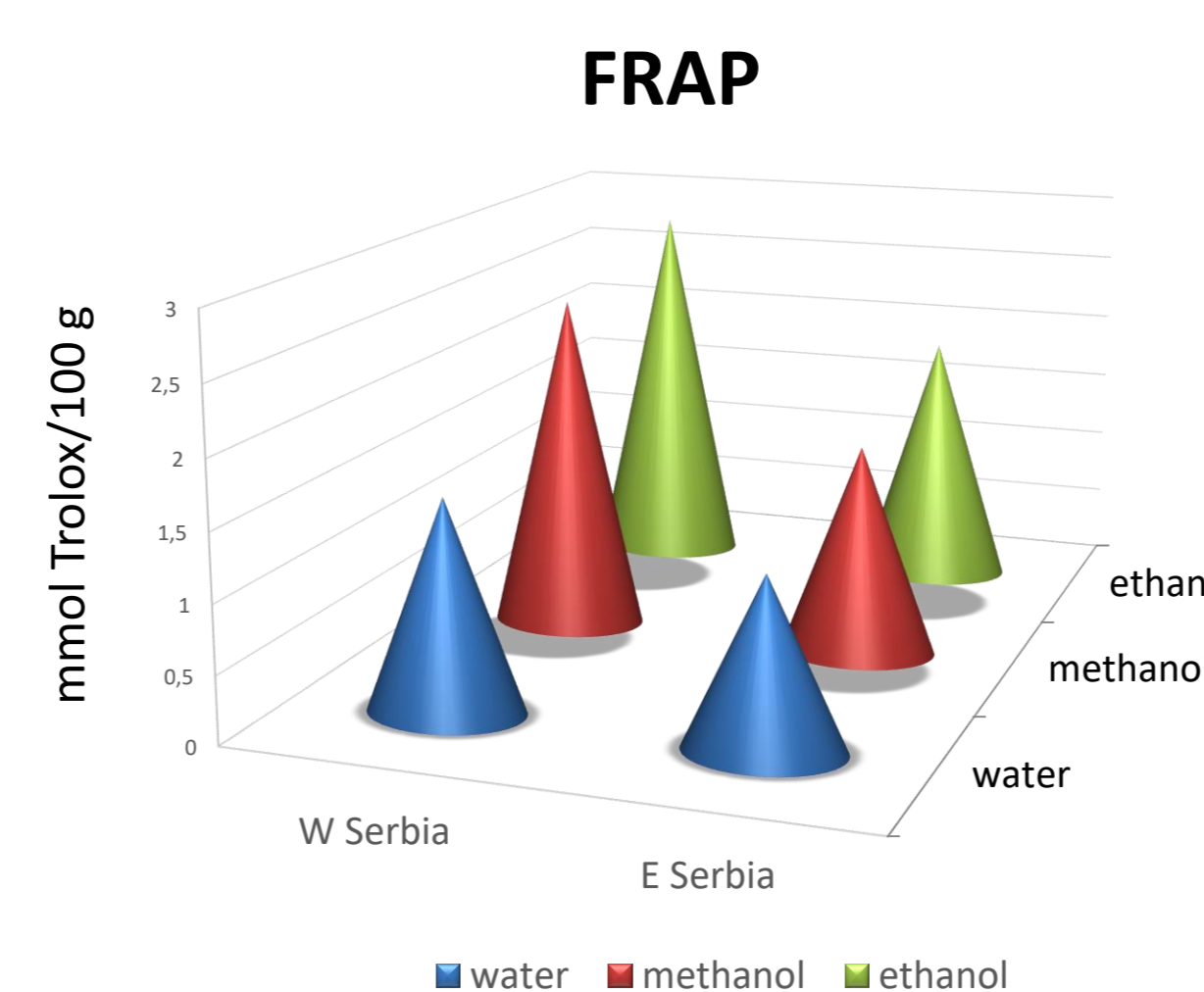
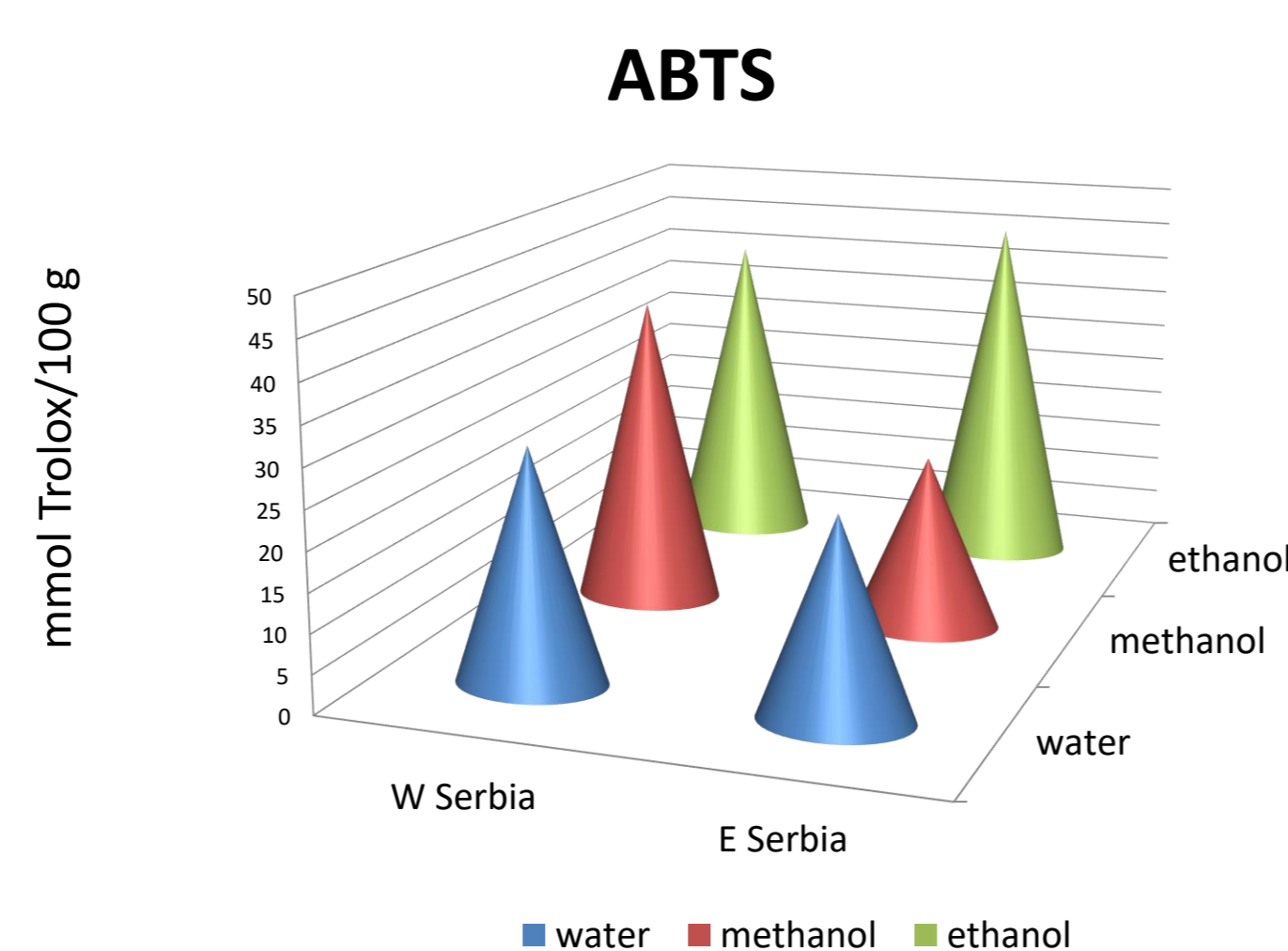
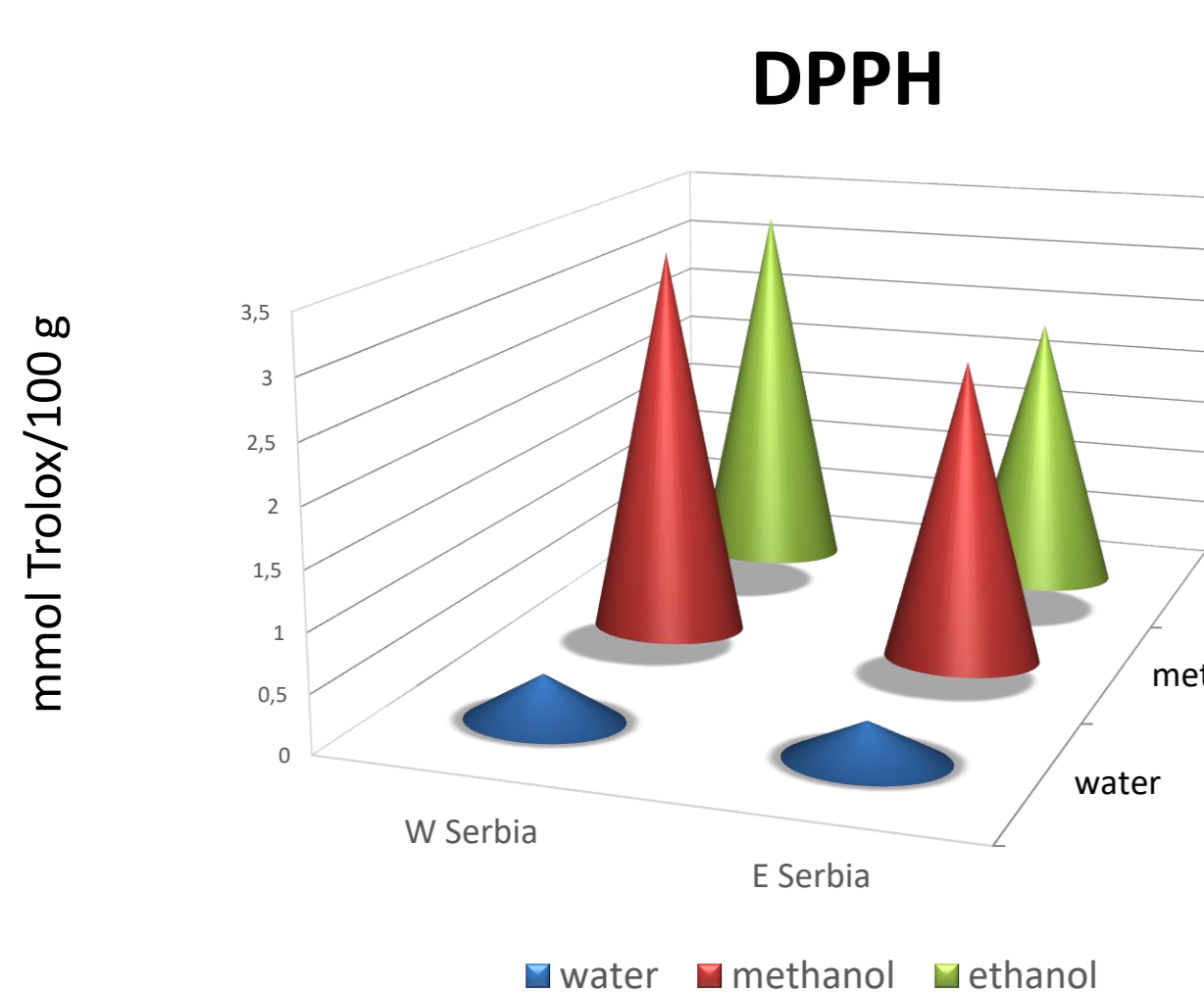


The fruits were collected from two localities in Serbia and extracted with water, methanol and ethanol (50% V/V) at room temperature.

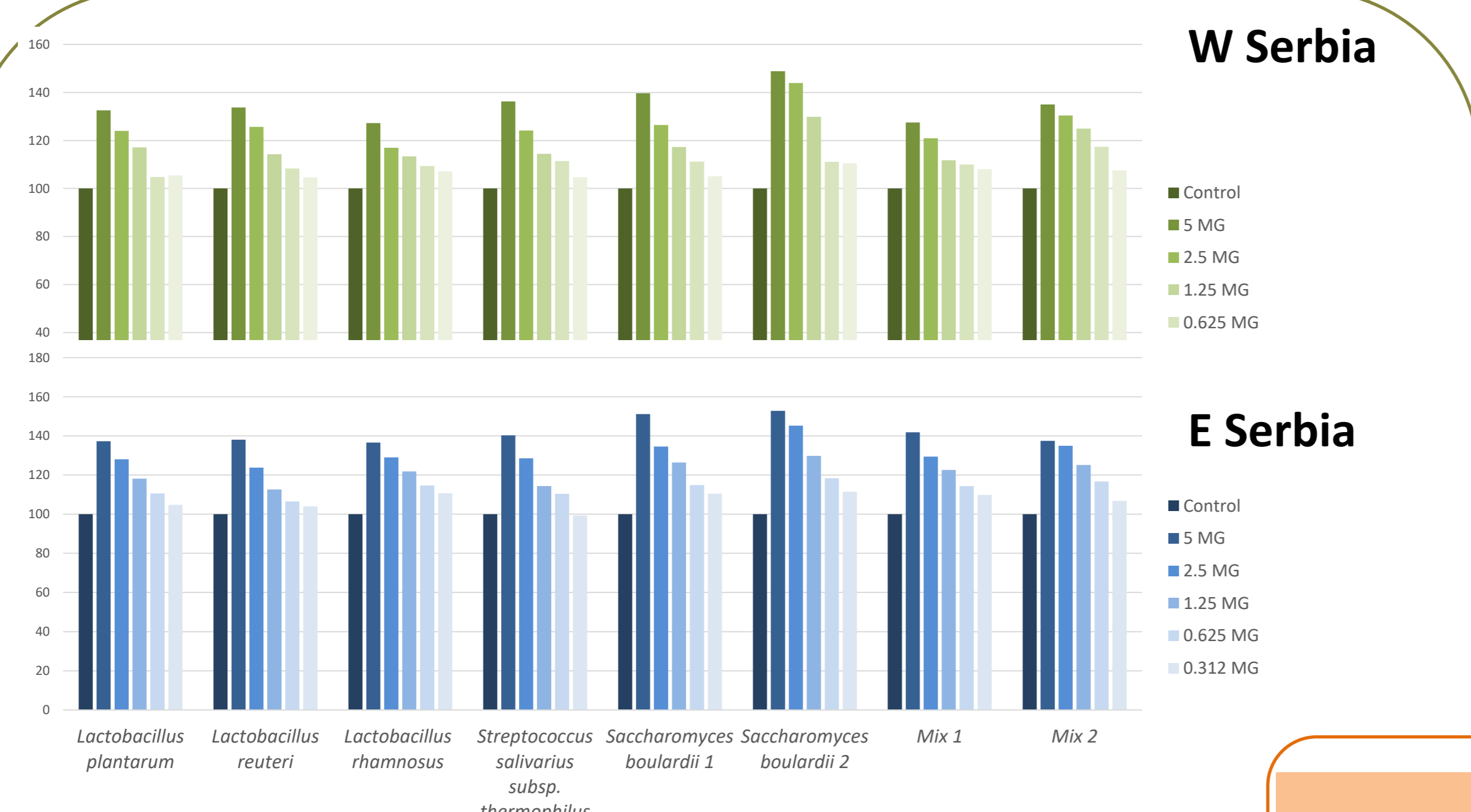


The total phenolic contents (Folin-Ciocalteu assay) was the highest in methanol extracts (321.36±9.13; 217.04±17.99 mg GAE/100 g). On the contrary ethanol extracts contained the highest total flavonoids content (67.88±1.05; 39.70±3.19 mg CE/100 g).

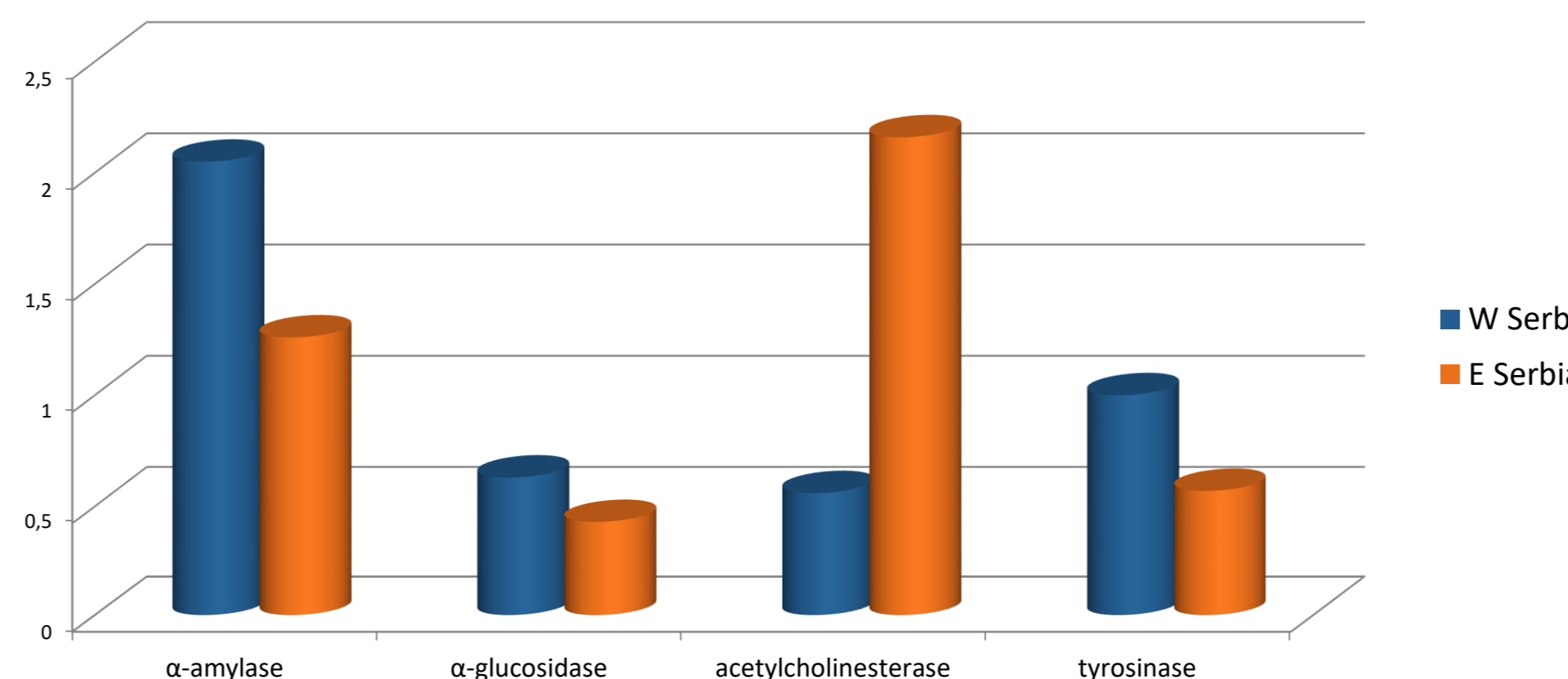
LC-DAD chromatogram of methanol extracts at 350 nm  
 1 – caffeoylquinic acid; 2 – caffeoyl hexoside; 3 – rutin;  
 4 – quercetin pentosyl-hexoside; 5 – isoquercitrin;  
 6 – quercetin pentoside



- Ethanol extracts showed highest activity in FRAP test (2.80±0.07; 1.89±0.01 mmol Trolox /100 g) and ABTS test (41.02±0.77; 45.84±1.01 mmol Trolox /100 g).
- Methanol extracts exerted significant DPPH radical scavenging activity (3.38±0.1; 2.61±0.17 mmol Trolox/100 g) and highest activity in β-carotene/linoleic acid bleaching test (20.89±2.28; 21.16±2.43%).



In addition the methanol extracts of both samples markedly stimulated the growth of investigated probiotic microorganisms.



Methanol extracts inhibited the enzymes: α-amylase (IC<sub>50</sub> 2.05±0.05; 1.26±0.04 mg/ml) α-glucosidase (IC<sub>50</sub> 0.63±0.02; 0.43±0.06 mg/ml), tyrosinase (IC<sub>50</sub> 1.0±0.07; 0.57±0.02 mg/ml), and acetylcholinesterase (IC<sub>50</sub> 0.56±0.28; 2.16±0.56 mg/ml).



**The blackthorn fruit represents a rich source of biologically active compounds and although it is almost forgotten it should be used again in human nutrition to maintain health.**