

# PHYTOCHEMICALS COMPOSITION AND IN VITRO BIOLOGICAL ACTIVITIES OF GOJI BERRY CULTIVATED IN SERBIA

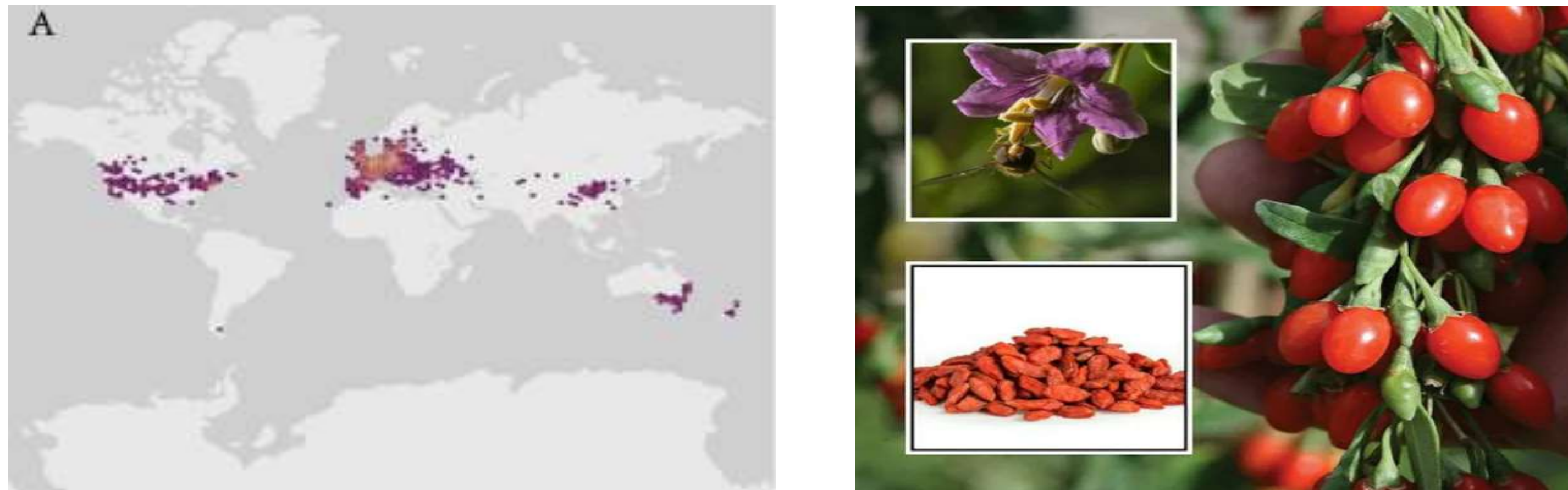


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## BACKGROUND

Due to the presence of many nutrients and bioactive compounds, fruits of *Lycium* species (*Fructus Lycii*, goji berries) are recognized as a "superfood," which regular consumption might exert many beneficial health effects. Therefore, in addition to China and other Asian countries, the cultivation of *Lycium* species has become widespread throughout Europe.



## AIM

This study investigated the total phenolics (TPC), total flavonoids (TFC) and polysaccharides content, as well as biological properties of goji berry (*Lycium barbarum* L.) cultivated in the Belgrade region, Serbia.

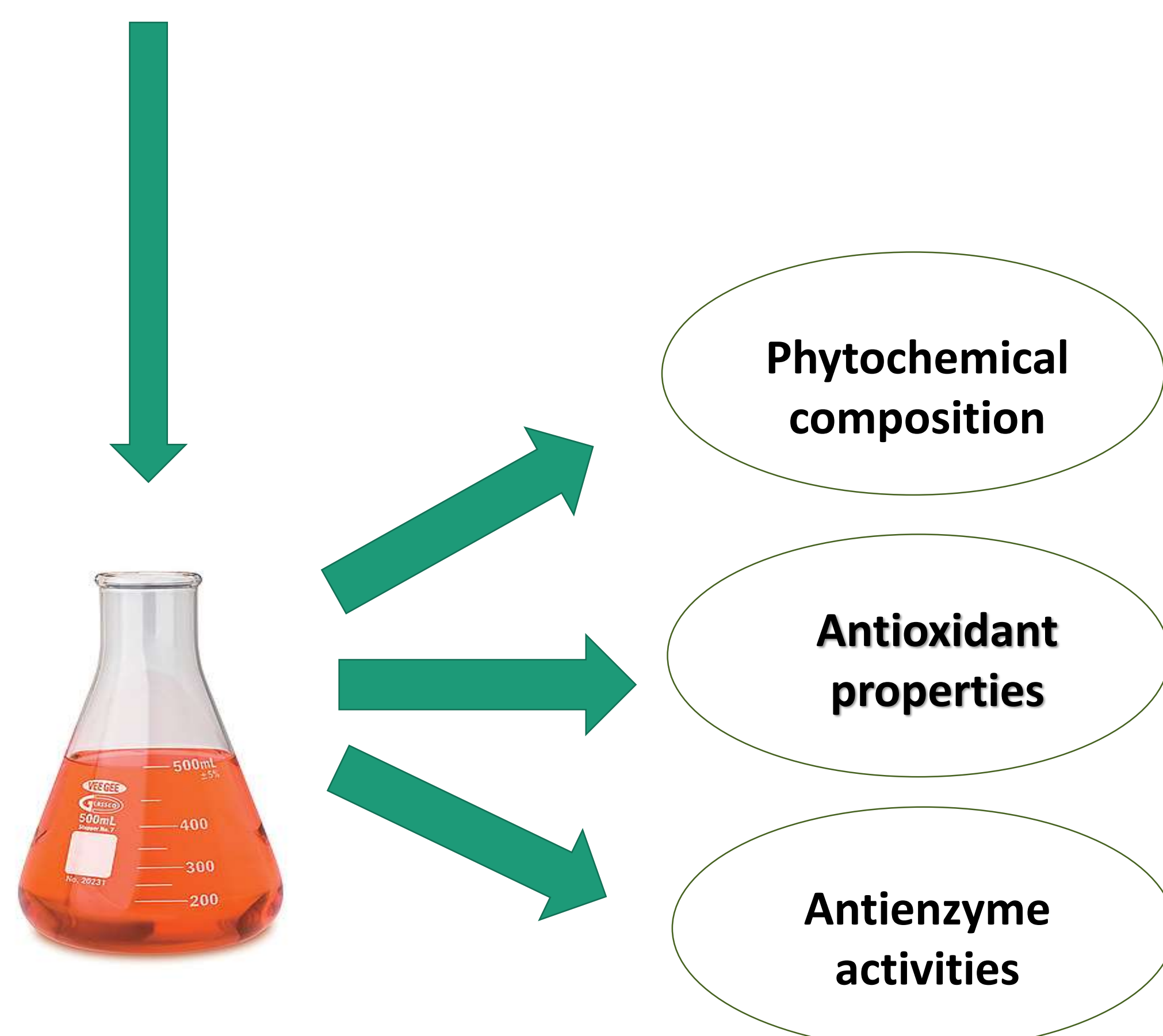
## METHODS

The HPLC method was used for the identification of individual phenolic compounds. Antioxidant properties of goji berry extracts with different solvent were evaluated for radical scavenging (DPPH, ABTS), reducing power (CUPRAC, FRAP), and  $\beta$ -carotene/linoleic acid bleaching inhibition capacity. Additionally, goji berry extracts were screened for their anti-diabetic ( $\alpha$ -amylase,  $\alpha$ -glucosidase), anti-tyrosinase, and anti-acetylcholinesterase activities.



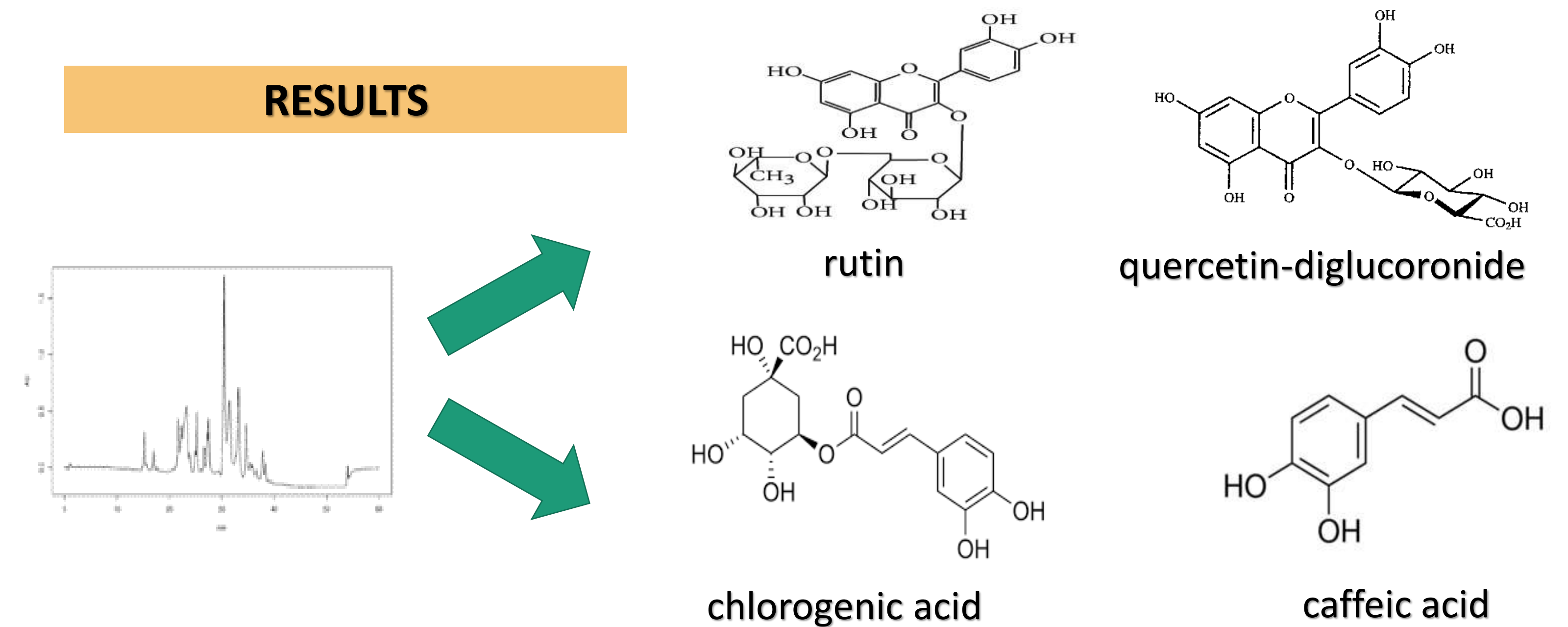
### Extraction

- Water
- 70% ethanol
- 70% methanol

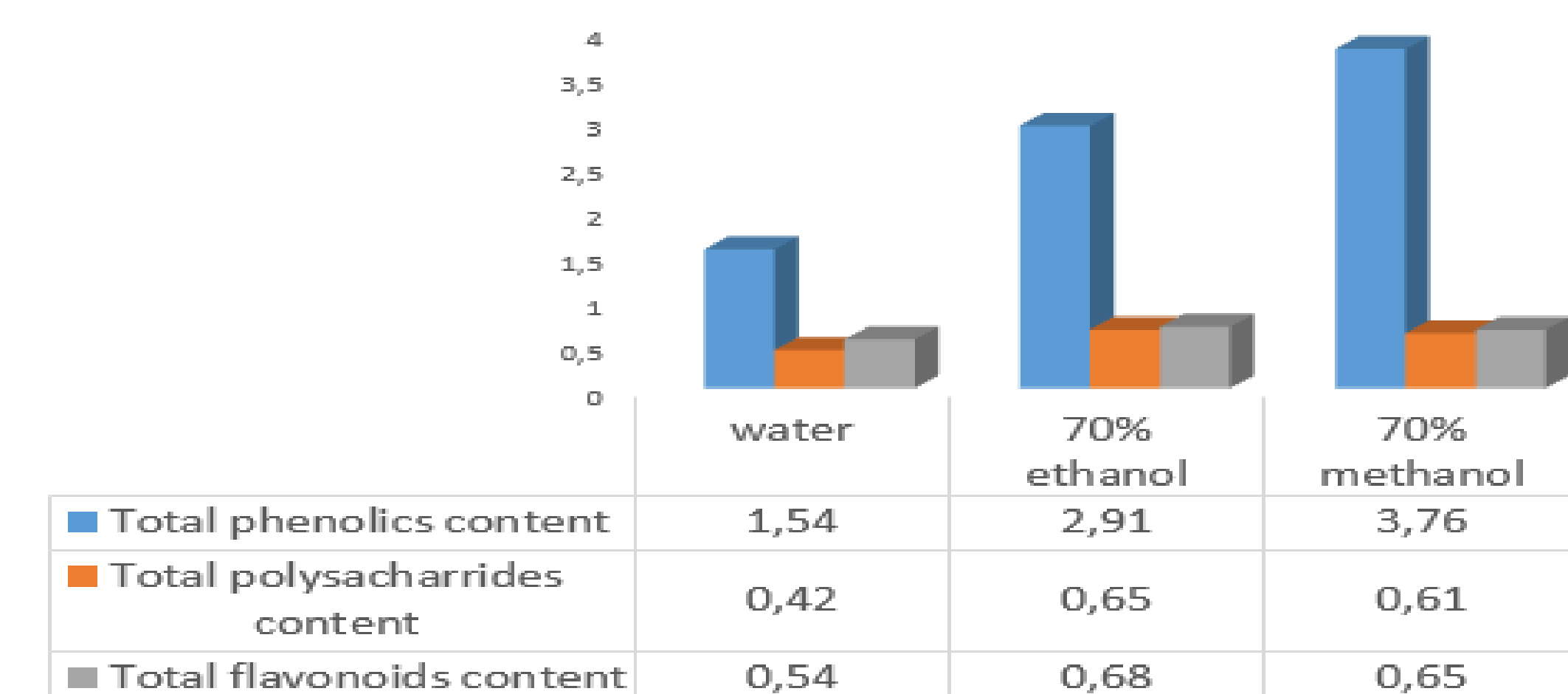


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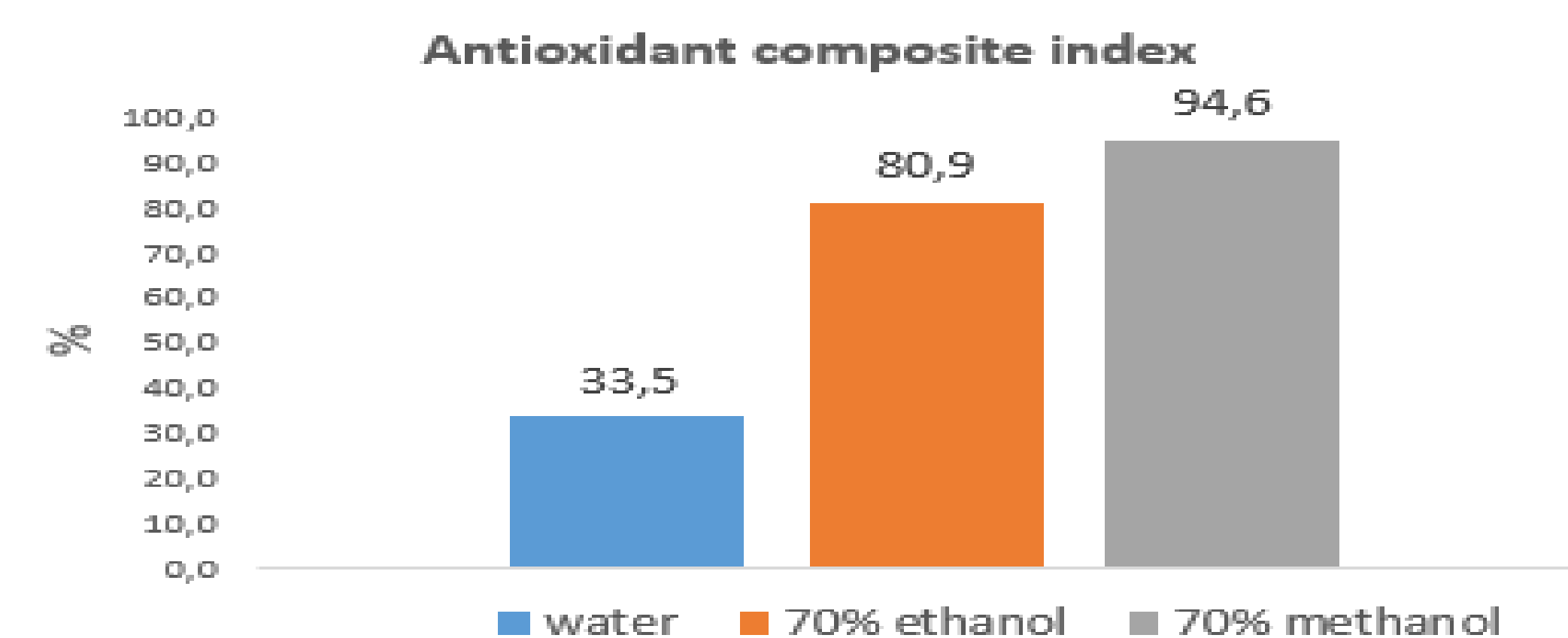
## RESULTS



Methanol was identified as the most effective solvent for the extraction, resulting in the highest contents of TPC (3.76 mg GAE/g dry weight), TFC (0.65 mg CE/g dry weight), as well as superior antioxidant activity evaluated by all assays.

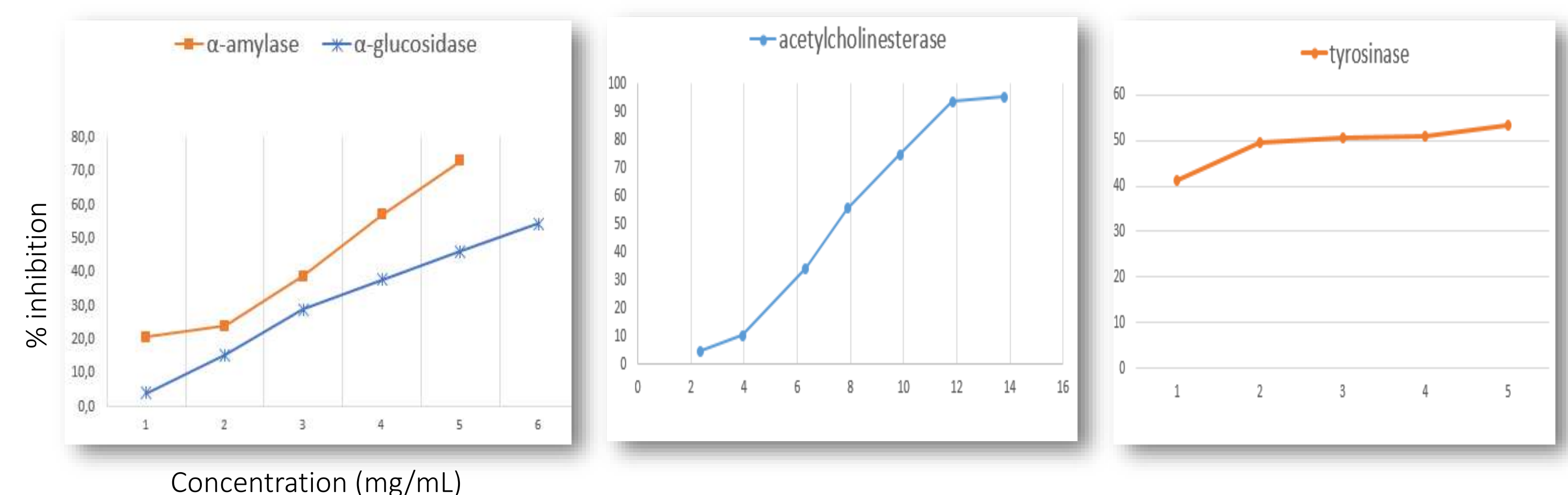


Graph 1. Total phenolics, polysaccharides, flavonoids content in different solvents



Graph 2. Antioxidant composite index depending on various solvents

Also, the methanol extract of goji berry inhibited all tested enzymes in concentration-dependent manners. The highest enzyme inhibitory activity was shown for tyrosinase ( $IC_{50}$  of 1.4 mg  $\pm$  0.01 mg/mL). The  $IC_{50}$  values were 4.66  $\pm$  0.25 mg/mL, 10.68  $\pm$  0.07 mg/mL, 7.07  $\pm$  0.1 mg/mL for  $\alpha$ -amylase,  $\alpha$ -glucosidase and acetylcholinesterase inhibition activity, respectively.



Graph 3. Enzyme inhibitory properties of the goji methanol extract

## CONCLUSION

Overall, obtained results suggest that goji berry cultivated in Serbia is a valuable source of bioactive compounds that can be used in the food, nutraceutical, and cosmetic industries.