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Valorization of cauliflower glaze as a source of bioactive compounds

Jelena Vukosavljević¹, Sara Hourani¹, Boris M. Popović², Branimir Pavlić¹

¹ *University of Novi Sad, Faculty of Technology Novi Sad*

² *University of Novi Sad, Faculty of Agriculture Novi Sad*

Introduction

Agri-food waste represents an underutilized source of biologically active compounds with potential applications in food, pharmaceutical, and cosmetic industries. Valorization of such by-products through the extraction of valuable polyphenols with antioxidant properties supports sustainability and circular economy goals. Cauliflower glaze, a by-product formed during the industrial glazing process of cauliflower florets, accounts for about 5% of waste and remains largely unexplored as a potential source of bioactive compounds.

Material and method

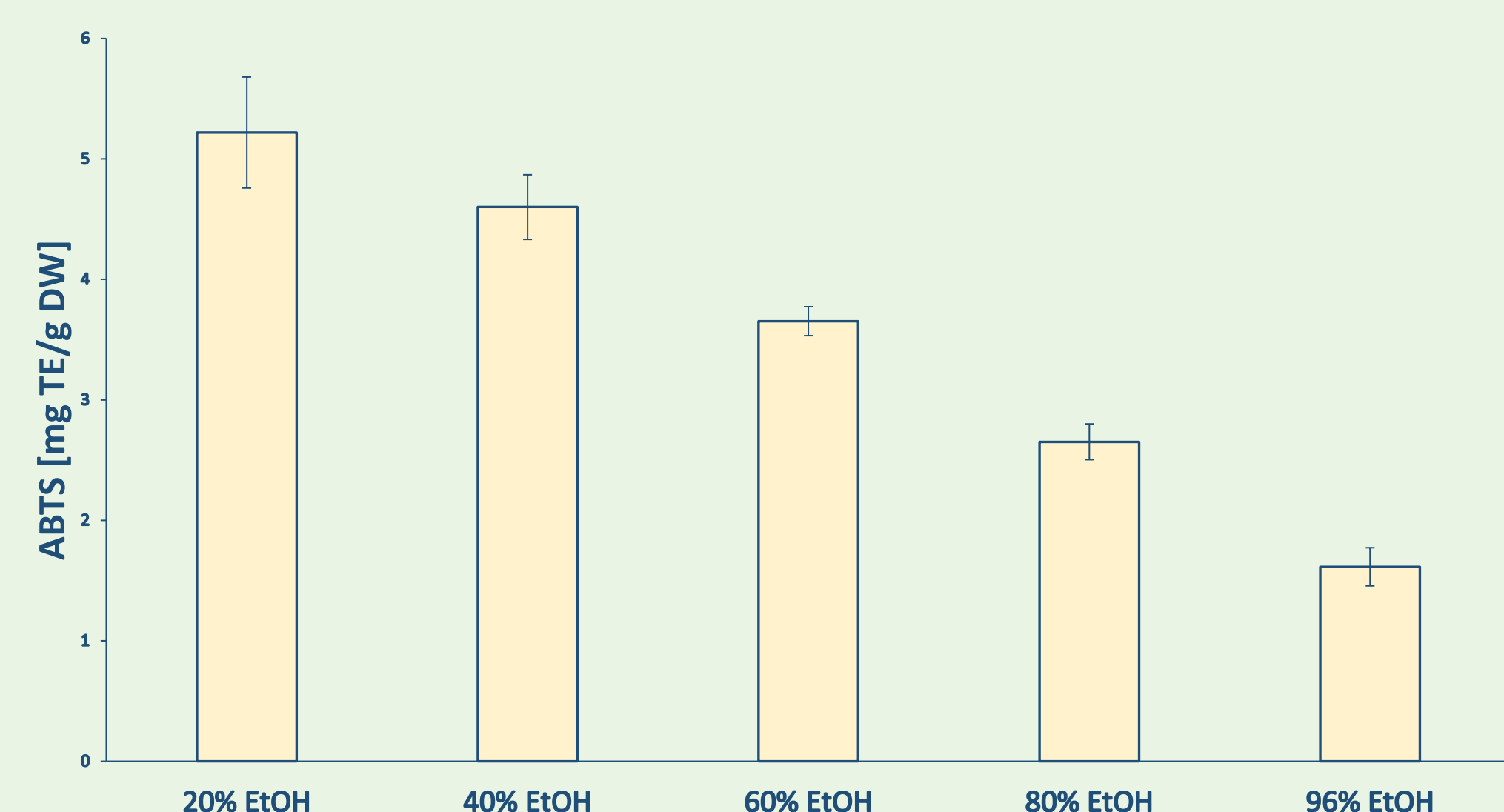
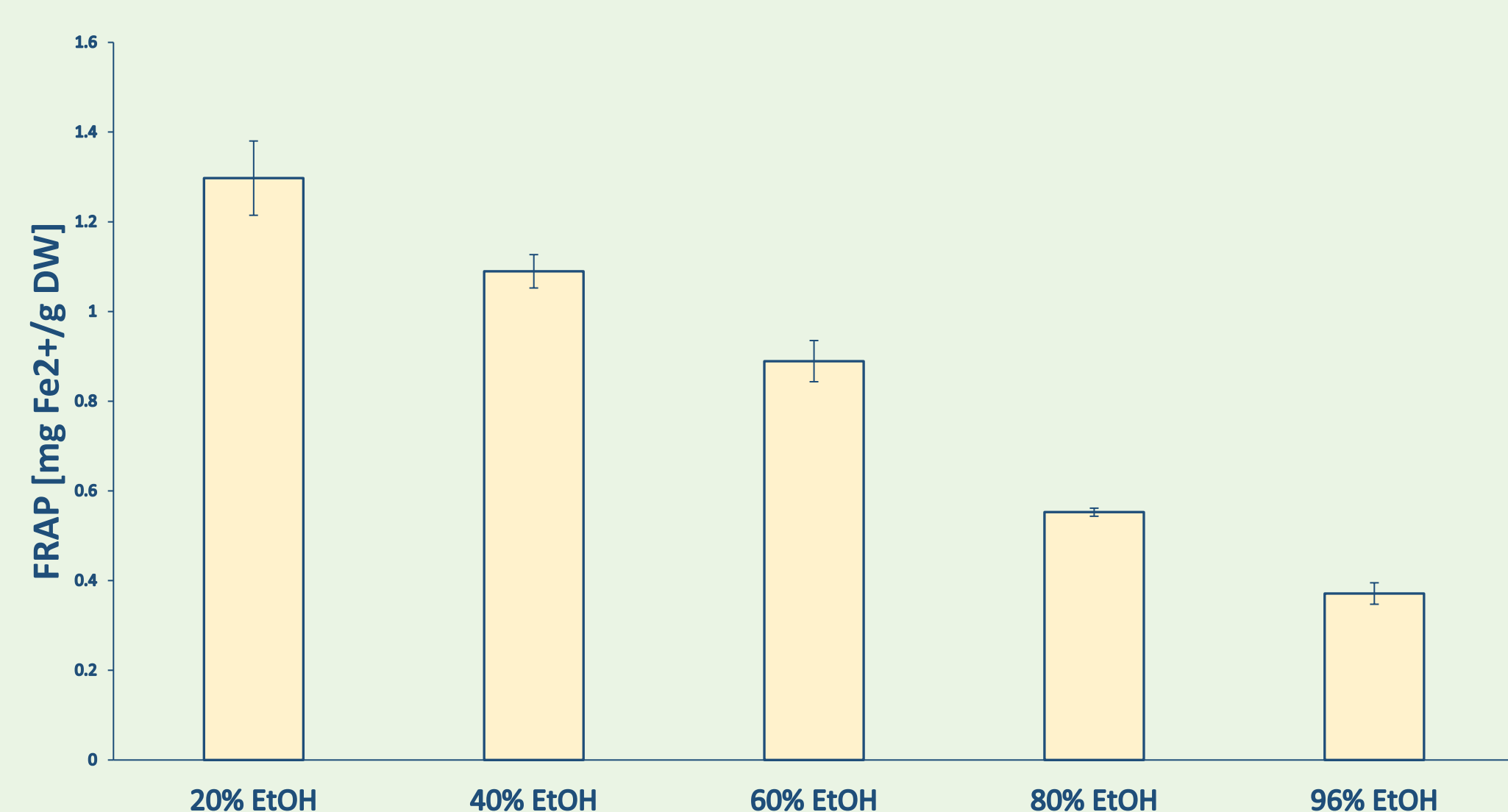
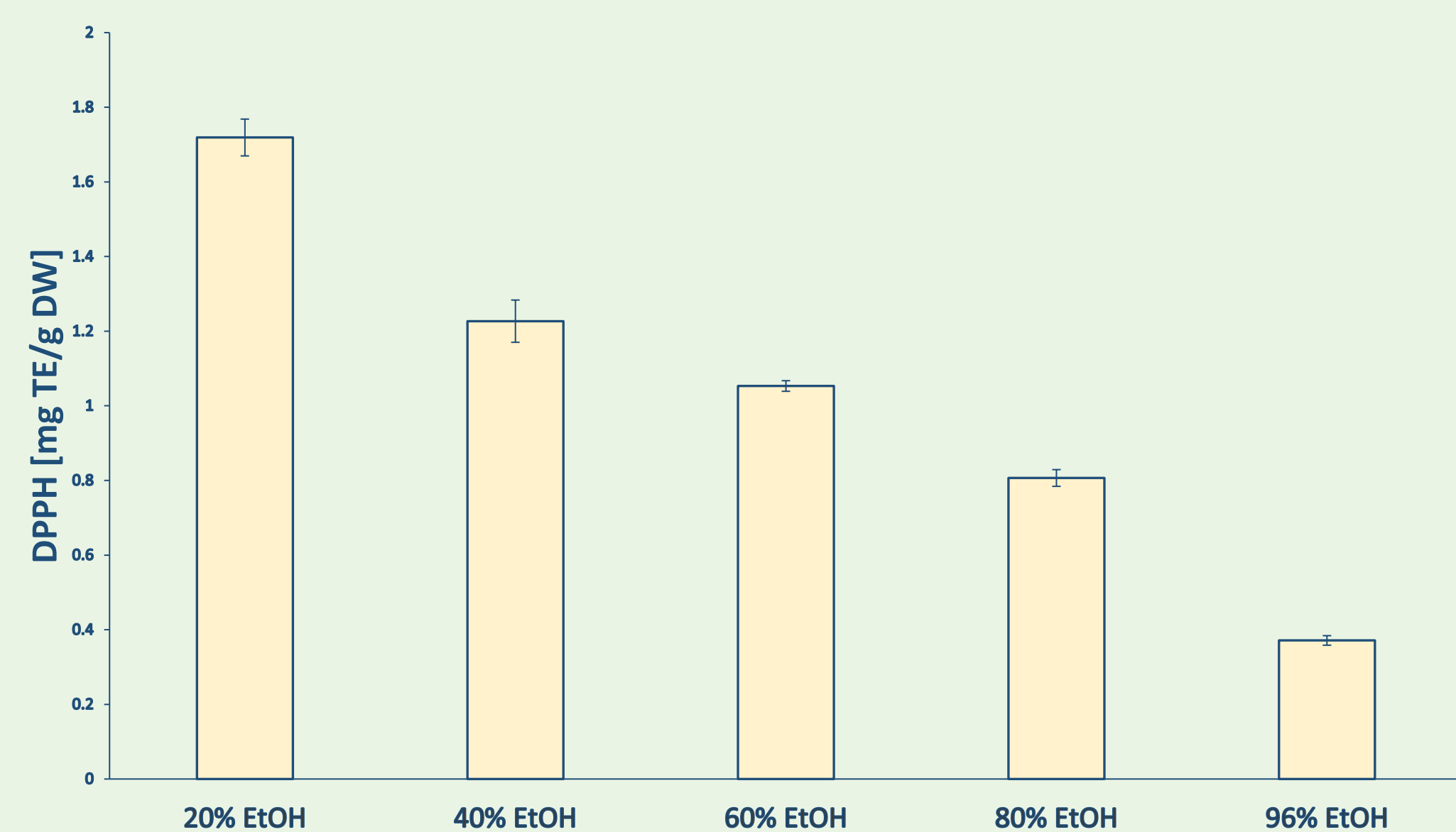
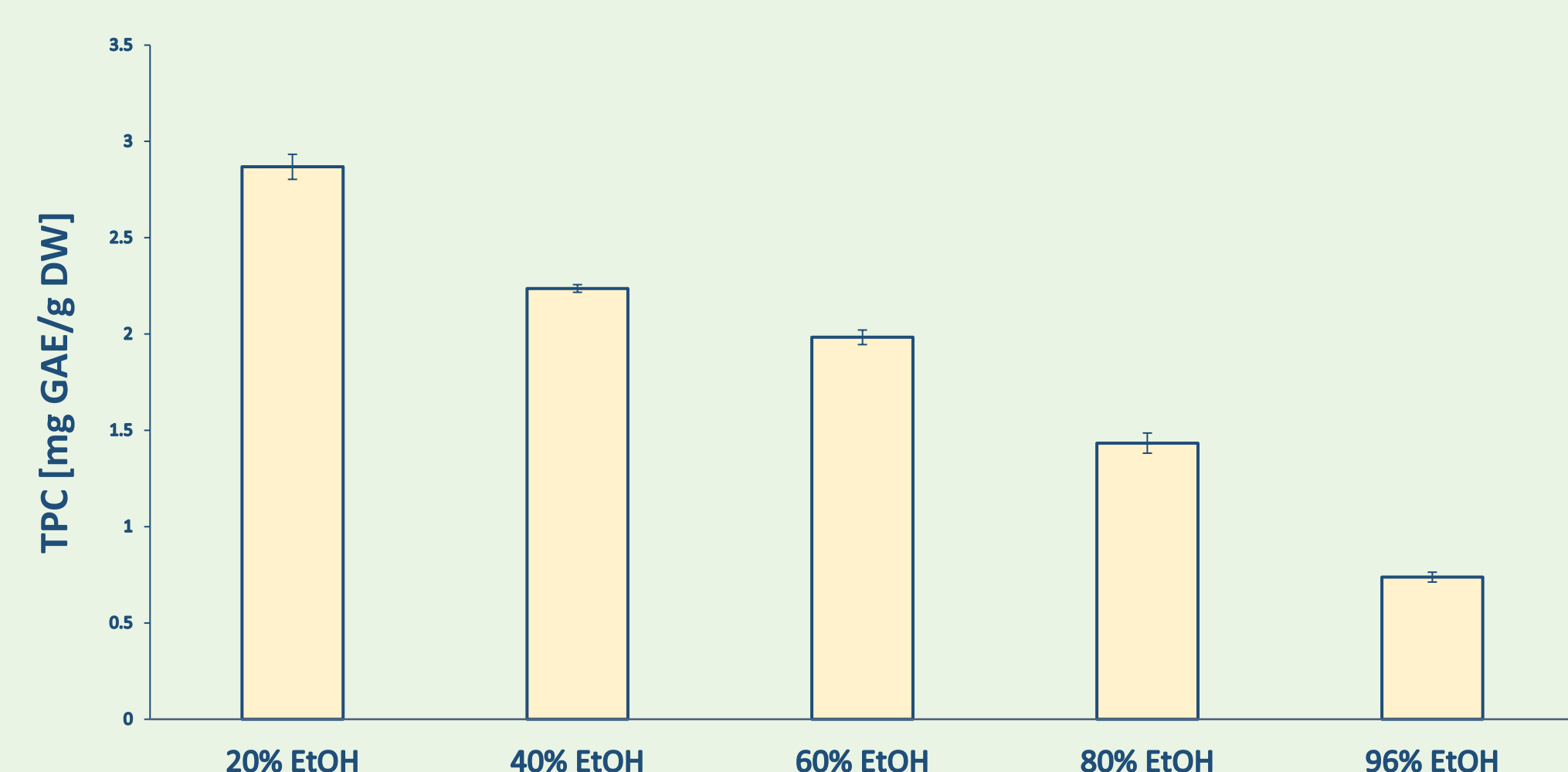
The aim of this study was to investigate the potential of dried cauliflower glaze as a source of polyphenols by applying traditional solid-liquid extraction using different concentrations of ethanol (20%, 40%, 60%, 80%, and 96%) as green solvents. The extraction was performed at a solid-to-solvent ratio of 1:10 (w/v), for 24 h at room temperature, under continuous stirring (150 rpm). The obtained extracts were evaluated for total polyphenol content (TPC) and antioxidant activity using DPPH, FRAP, and ABTS assays.

Conclusions

The results ranged from 0.74 to 2.87 mg GAE/g DW, 0.37 to 1.72 mg TE/g DW, 0.37 to 1.30 mg Fe²⁺/g DW, and 1.16 to 5.22 mg TE/g DW for TPC, DPPH, FRAP, and ABTS tests, respectively.

Future research should focus on the application of advanced green extraction techniques to maximize the recovery of polyphenolic compounds from agri-food waste and enhance the antioxidant potential of the resulting extracts, thereby promoting their potential use in agricultural, food, and pharmaceutical industries.

Results and discussion



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